eRAN

Compact Bandwidth (FDD) Feature Parameter Description

Issue	05
Date	2019-01-21

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Contents

1 Change History

This section describes changes not included in the "Parameters", "Counters", "Glossary", and "Reference Documents" chapters. These changes include:

- Technical changes

  Changes in functions and their corresponding parameters
- Editorial changes

  Improvements or revisions to the documentation

1.1 eRAN13.1 05 (2019-01-21)

This issue includes the following changes.

Technical Changes

Change Description	Parameter Change	Base Station Model
Added 18.3 – 18.5 MHz to the scope of bandwidths supported by the 1800 MHz RRU3953. For details, see **Table 4-3**.	None	3900 and 5900 series base stations
Added 14.6 – 14.9 MHz to the scope of bandwidths supported by the 2100 MHz RRU3962. For details, see **Table 4-3**.	None	3900 and 5900 series base stations

Editorial Changes

Revised descriptions in this document.

1.2 eRAN13.1 04 (2018-10-30)

This issue includes the following changes.

Technical Changes

Change Description	Parameter Change	Base Station Model
Updated the list of RF modules that support bandwidths of 4.8 – 4.9 MHz, 7.4 – 7.5 MHz, and 14.6 – 14.9 MHz. For details, see **Table 4-3**.	None	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite
Changed the descriptions of how to set the **Cell.*UlPuncturedRbNumOffset*** parameter in LTE only scenarios. For details, see **Table 4-12**.	None	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite
Added the pRRU5918, pRRU5920, and pRRU5921 to RF modules that support bandwidths of 4.8 – 4.9 MHz, 7.4 – 7.5 MHz, 8MHz, and 14.6 – 14.9 MHz.	None	DBS3900 LampSite and DBS5900 LampSite

Editorial Changes

Revised descriptions in this document.

1.3 eRAN13.1 03 (2018-08-27)

This issue includes the following changes.

Technical Changes

Change Description	Parameter Change	Base Station Model
Updated the list of RF modules that support bandwidths of 4.8-4.9 MHz, 8.8 MHz, and 14.6-14.9 MHz. For details, see **Table 4-3**.	None	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite

Editorial Changes

Revised descriptions in this document.

1.4 eRAN13.1 02 (2018-06-30)

This issue includes the following changes.

Technical Changes

Change Description	Parameter Change	Base Station Model
Updated the list of RF modules that support bandwidths of 4.8-4.9 MHz, 7.4-7.5 MHz, 8 MHz, and 14.6-14.9 MHz. For details, see **Table 4-3**.	None	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite

Editorial Changes

Added descriptions of impact of compact bandwidth on precise AMC. For details, see **4.2.2 Impacts**.

Added descriptions of mutual exclusiveness with eMTC frequency hopping. For details, see **4.3.2 Software**.

Optimized the network monitoring method. For details, see **4.4.3 Network Monitoring**.

1.5 eRAN13.1 01 (2018-04-10)

This issue includes the following changes.

Technical Changes

Change Description	Parameter Change	Base Station Model
Added descriptions of mutual exclusiveness with in-band relay. For details, see section **4.3.2 Software**.	None	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite
Modified the optimization command examples. For details, see **4.4.1.2 Using MML Commands**.	None	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite

Editorial Changes

Revised descriptions in this document.

1.6 eRAN13.1 Draft B (2018-03-30)

This issue includes the following changes.

Technical Changes

Change Description	Parameter Change	Base Station Model
Added support for LTE-only network deployment at 4.4 MHz to 4.7 MHz. For details, see **3.2 LTE Only Scenario**.	None	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite
Added some RRUs to the scope of RF modules that support compact bandwidth. For details, see **Table 4-3**.	None	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite
Added requirements on the power spectrum density (PSD) in 5 MHz bandwidth scenarios. For details, see **4.3.4.1 Networking in Multi-RAT Scenarios** and **4.3.4.2 Networking in LTE Only Scenarios**.	None	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite
Added descriptions of this feature in 5 MHz bandwidth scenarios in **Table 4-14** of **4.4.1.1 Data Preparation**.	None	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite

Editorial Changes

Adjusted the display mode of punctured RBs in **Table 4-3**.

Added deactivation command examples. For details, see **4.4.1.2 Using MML Commands**.

1.7 eRAN13.1 Draft A (2018-01-15)

This issue introduces the following changes to eRAN12.1 03 (2017-06-29).

Technical Changes

Change Description	Parameter Change	Base Station Model
Added the following bandwidth ranges to support asymmetry compression: ● 7.4 MHz to 7.5 MHz ● 8.7 MHz ● 17.5 MHz to 17.8 MHz For details, see the following: **Table 4-3**	None	3900 and 5900 series base stations
Added six non-standardized bandwidths supported by eNodeBs: ● 7.4 MHz to 7.5 MHz ● 8 MHz ● 8.7 MHz ● 17.5 MHz to 17.8 MHz ● 13.9 MHz to 14.2 MHz ● 14.3 MHz to 14.5 MHz For details, see the following: **Table 3-1** **Table 4-3**	None	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite
Added support for LTE only scenarios. For details, see the following sections: ● **3.2 LTE Only Scenario** ● **PUCCH Resource Allocation and Power Control** ● **PUSCH Resource Allocation and Power Control**	Added parameters: **Cell.*CompactBwCtrlIntrfMode*** **Cell.*UlPuncturedRbNumOffset***	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite
Added support for DBS3900 LampSite and DBS5900 LampSite. For details, see the following: **Table 3-1** **4.1.3 Key Compact Bandwidth Technologies**	None	DBS3900 LampSite and DBS5900 LampSite

Change Description	Parameter Change	Base Station Model
Added support for the 1800 MHz AAU5972 which supports 11 non-standardized bandwidths. For details, see **Table 4-3**.	None	3900 and 5900 series base stations
Added a parameter to support power compensation and adaptive PUCCH and SRS resource allocation in cells with non-standardized bandwidths. For details, see **4.4.1.1 Data Preparation**.	Added the following parameter and options: **CellAlgoSwitch.*NonStandardBwAlgoSw***: ● **PCFICH_POWER_OPT_SWITCH** ● **PDCCH_POWER_OPT_SWITCH** ● **PUCCH_SRS_ADAPT_SWITCH**	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite
Added descriptions of impact of compact bandwidth on LTE in-band (NB-IoT). For details, see section **Function Impacts**.	None	3900 and 5900 series base stations
Added descriptions of impact of compact bandwidth on LTE guard band (NB-IoT). For details, see section **Function Impacts**.	None	3900 and 5900 series base stations
Added support for 1800 MHz RRU5905 modules which support the non-standardized bandwidth of 18.6 MHz to 18.9 MHz. For details, see **4.1.3 Key Compact Bandwidth Technologies**.	None	3900 and 5900 series base stations
Added descriptions of mutual exclusiveness with GSM and LTE spectrum concurrency (LTE FDD). For details, see **Mutually Exclusive Functions**.	None	3900 and 5900 series base stations

Editorial Changes

Reorganized this document using a new template.

Revised descriptions in this document.

2 About This Document

2.1 Applicable RAT

This document applies to FDD.

2.2 Features in This Document

This document describes the following FDD features.

Feature ID	Feature Name	Section
LOFD-001051	Compact Bandwidth	**4 Compact Bandwidth**

3 General Principles

Compact bandwidth compresses LTE guard bands or LTE available resource blocks (RBs) in cells with standardized LTE bandwidths of 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, or 20 MHz by using radio frequency (RF) modules to obtain LTE non-standardized bandwidths. In this document, standardized bandwidths before the compression refer to LTE original bandwidths. For example, the original bandwidth of the non-standardized bandwidth 18.6 MHz is 20 MHz.

3GPP defines 450 MHz, 850 MHz, 900 MHz, and 1800 MHz as LTE operating frequency bands. These frequency bands are currently used by CDMA, UMTS, and GSM networks. To deploy an LTE network on these frequency bands, refarming is performed on some or all of spectrum resources used by CDMA, UMTS, or GSM networks. During the refarming, CDMA, UMTS, and GSM networks release spectrum resources as follows:

- 1.23 MHz per CDMA carrier
- 5 MHz per UMTS carrier
- 200 kHz per GSM carrier

As a result, the released resources may not be standardized LTE operating bandwidths. The Compact Bandwidth feature is designed for the preceding scenario. This feature applies to the following scenarios:

- Multi-RAT scenarios
- LTE only scenarios

Table 3-1 lists all the non-standardized bandwidths supported by this feature.

Table 3-1 Non-standardized bandwidths, application scenarios, and base stations supported by this feature.

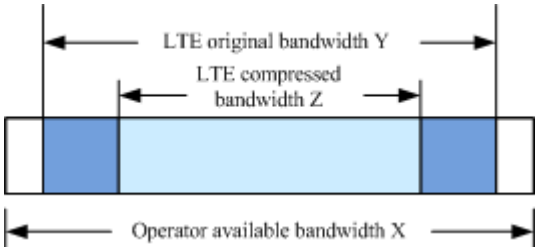
Non-standardized Bandwidth	Application Scenario	Base Station Model
1.2 MHz to 1.3 MHz	Multi-RAT scenarios	3900 and 5900 series base stations
4.4 MHz to 4.7 MHz	Multi-RAT and LTE only scenarios	3900 and 5900 series base stations

Non-standardized Bandwidth	Application Scenario	Base Station Model
4.8 MHz to 4.9 MHz	Multi-RAT scenarios	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite
7.4 MHz to 7.5 MHz	Multi-RAT and LTE only scenarios	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite
8 MHz	Multi-RAT scenarios	DBS3900 LampSite and DBS5900 LampSite
8.7 MHz	Multi-RAT and LTE only scenarios	3900 and 5900 series base stations
8.8 MHz	Multi-RAT scenarios	3900 and 5900 series base stations
8.9 MHz to 9.1 MHz	Multi-RAT scenarios	3900 and 5900 series base stations
9.2 MHz to 9.5 MHz	Multi-RAT scenarios	3900 and 5900 series base stations
9.6 MHz to 9.9 MHz	Multi-RAT scenarios	3900 and 5900 series base stations
13.9 MHz to 14.2 MHz	Multi-RAT scenarios	3900 and 5900 series base stations
14.3 MHz to 14.5 MHz	Multi-RAT scenarios	3900 and 5900 series base stations
14.6 MHz to 14.9 MHz	Multi-RAT and LTE only scenarios	● 3900 and 5900 series base stations ● DBS3900 LampSite and DBS5900 LampSite
17.5 MHz to 17.8 MHz	Multi-RAT and LTE only scenarios	3900 and 5900 series base stations
18.3 MHz to 18.5 MHz	Multi-RAT scenarios	3900 and 5900 series base stations
18.6 MHz to 18.9 MHz	Multi-RAT scenarios	3900 and 5900 series base stations
19 MHz to 19.2 MHz	Multi-RAT scenarios	3900 and 5900 series base stations
19.3 MHz to 19.9 MHz	Multi-RAT scenarios	3900 and 5900 series base stations

3.1 Multi-RAT Scenarios

In multi-RAT scenarios, operators can refarm CDMA, UMTS, or GSM spectrum to LTE, co-deploy CDMA, UMTS, or GSM networks with LTE, and allocate non-standardized bandwidth to LTE. In such scenarios, customers' available continuous spectrum bandwidth must meet the requirements shown in **Figure 3-1** requiring X ≥ Y> Z.

Figure 3-1 Bandwidth requirements of multi-RAT operators



For this type of operators, the LTE cell bandwidth must fall into the range of operators' available spectrum.

NOTE

LTE cell bandwidth, the LTE original bandwidth Y in **Figure 3-1** is specified by the **Cell.*UlBandWidth*** and **Cell.*DlBandWidth*** parameters.

For example, if a multi-RAT operator has a total bandwidth of 20 MHz or more and plans to deploy LTE networks with a bandwidth of 18.6 MHz, the rest of 1.4 MHz or more can be allocated to other RATs.

For example, if the 1800 MHz band is used and compact bandwidth is enabled, the remaining frequency resources can be used for GSM. These GSM frequencies are calculated by using the following formulas:

$Fl(n) = 1710.2 + 0.2 \times (n - 512) \quad (512 \le n \le 885)$

$Fu(n) = Fl(n) + 95$

where

- *n* indicates the absolute radio frequency channel number (ARFCN).
- Fl(*n*) indicates the center frequency in the lower frequency band for the uplink.
- Fu(*n*) indicates the center frequency in the upper frequency band for the downlink.

NOTE

The GSM channel spacing is 200 kHz, and the difference between the uplink and downlink frequencies is 95 MHz.

For example, in scenarios where the GSM and LTE cells do not share an RRU, if a compact bandwidth of 18.3 MHz is deployed for LTE in the band from 1805 MHz to 1825 MHz, 200 kHz bandwidth is available for each GSM frequency and the following GSM ARFCNs can be used for deploying GSM in the band:

$ARFCN = (1824.8 - 95 - 1710.2)/0.2 + 512 = 610$

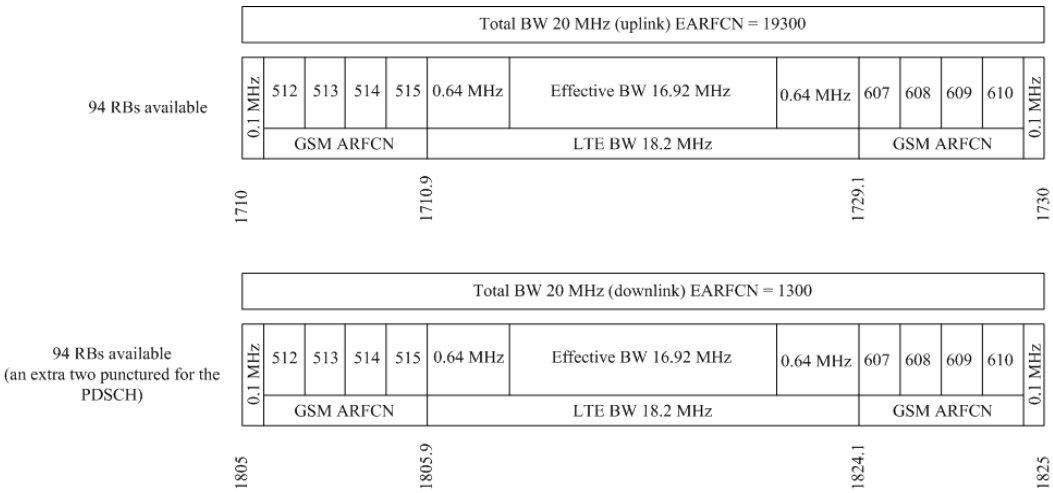
ARFCN = (1824.6 – 95 – 1710.2)/0.2 + 512 = 609

ARFCN = (1824.4 – 95 – 1710.2)/0.2 + 512 = 608

ARFCN = (1824.2 – 95 – 1710.2)/0.2 + 512 = 607

Figure 3-2 shows an example of compact bandwidth configurations.

Figure 3-2 Example of compact bandwidth configurations in multi-RAT scenarios



3.2 LTE Only Scenario

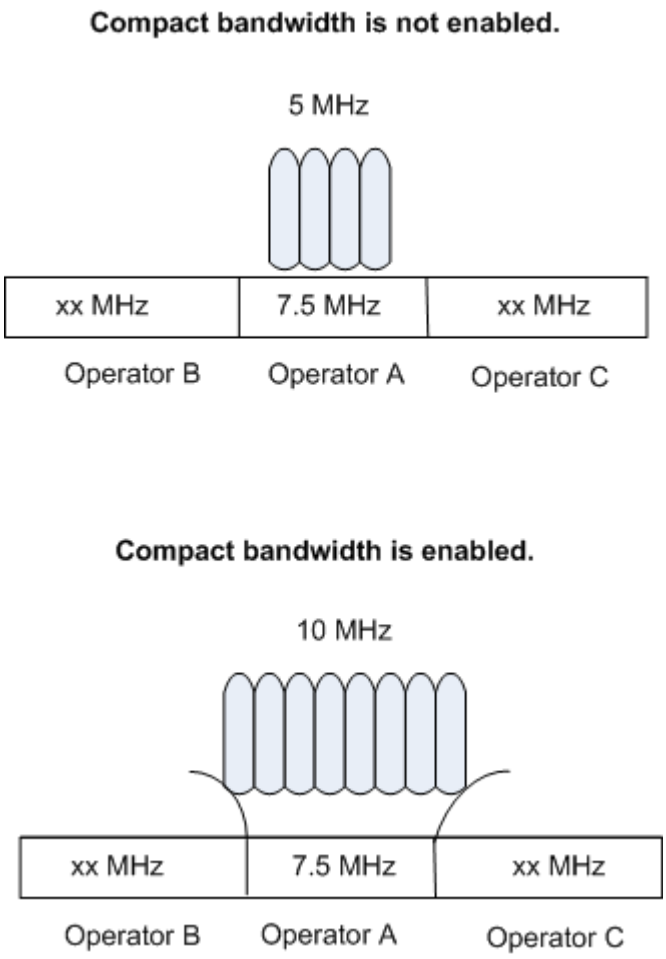
In LTE only scenarios, operators release all CDMA, UMTS, or GSM spectrum to LTE, and allocate non-standardized bandwidth to LTE. There is no CDMA, UMTS, or GSM network.

As shown in **Table 3-1**, the following five types of non-standardized bandwidths can be used in LTE only scenarios:

- 4.4 MHz to 4.7 MHz
- 7.4 MHz to 7.5 MHz
- 8.7 MHz
- 14.6 MHz to 14.9 MHz
- 17.5 MHz to 17.8 MHz

For example, if an operator has 7.5 MHz non-standardized bandwidth and compact bandwidth is not deployed, the operator can deploy LTE networks only on the LTE standardized bandwidth of 5 MHz. If compact bandwidth is deployed, the eNodeB can compress 10 MHz standardized bandwidth to 7.5 MHz, fully utilizing the bandwidth, as shown in **Figure 3-3**.

Figure 3-3 Changes before and after compact bandwidth is enabled in LTE only scenarios when the cell bandwidth is 7.5 MHz



4 Compact Bandwidth

4.1 Principles

Table 4-1 lists the number of available RBs under each standard bandwidth.

Table 4-1 Number of available RBs under each standard bandwidth

Bandwidth (MHz)	Number of Available RBs
1.4	6
3	15
5	25
10	50
15	75
20	100

Under a compact bandwidth, the number of available RBs may be less than that under the standard bandwidth. The following key techniques facilitate the deployment of LTE networks under non-standard bandwidths:

- Guard bandwidth reduction through stringent filtering
- Effective bandwidth reduction

These techniques apply to all compact bandwidths in various scenarios.

4.1.1 Reducing Guard Bandwidths

Guard bandwidths are reduced through stringent filtering which applies to only some bandwidths and radio frequency (RF) modules. LTE specifications stipulate a total guard bandwidth that is equal to 10% of each channel bandwidth, with 5% at each end of the cell's operating band. Stringent filtering enables guard bandwidths to fall below the stipulated value, while not affecting effective bandwidths. This technique helps achieve higher spectral

efficiency. It applies only in scenarios where an operator's non-standardized bandwidth is slightly smaller than a standardized bandwidth. For details about whether strict filtering can be used for each bandwidth, see the following table.

Table 4-2 Guard bandwidths corresponding to standardized bandwidths

Channel Bandwidth	Standardized Guard Bandwidth	Compact Guard Bandwidth
1.4 MHz (compressed to 1.2 MHz to 1.3 MHz)	160 kHz at each end of the band	60 kHz at each end of the band
5 MHz (compressed to 4.4 MHz to 4.9 MHz)	250 kHz at each end of the band	130 kHz at each end of the band
10 MHz (compressed to 7.4 MHz to 7.5 MHz)	500 kHz at each end of the band	435 kHz at each end of the band
10 MHz (compressed to 8 MHz)	500 kHz at each end of the band	400 kHz at each end of the band
10 MHz (compressed to 8.7 MHz)	500 kHz at each end of the band	500 kHz at each end of the band
10 MHz (compressed to 8.8 MHz)	500 kHz at each end of the band	260 kHz at each end of the band
10 MHz (compressed to 8.9 MHz to 9.9 MHz)	500 kHz at each end of the band	300 kHz at each end of the band
15 MHz (compressed to 13.9 MHz to 14.9 MHz)	750 kHz at each end of the band	550 kHz at each end of the band
20 MHz (compressed to 17.5 MHz to 17.8 MHz)	1 MHz at each end of the band	500 kHz at each end of the band
20 MHz (compressed to 18.3 MHz to 19.9 MHz)	1 MHz at each end of the band	650 kHz at each end of the band

NOTE

Requirements for guard bandwidths are stipulated in section 5.6 of 3GPP TS 36.104 V9.3.0 (2010-03).

4.1.2 Reducing Effective Bandwidths

The technique of reducing effective bandwidths configures a standardized bandwidth as a non-standardized bandwidth. Constraints are imposed on the standardized bandwidth and some RBs on the standardized bandwidth are punctured, confining data transmission to the non-standardized bandwidth. This technique has a broader use than the technique of reducing guard bandwidths. Reducing effective bandwidths is implemented by using the key techniques described in the following sections:

- **4.1.2.1 Physical Channel Resource Management**
- **4.1.2.2 CQI Adjustment**

The subsequent sections detail the preceding key techniques.

4.1.2.1 Physical Channel Resource Management

Under compact bandwidth, eNodeBs adjust related resource management algorithms for physical channels to reduce performance loss caused by RB puncturing. The adjustment prevents allocating punctured RBs to channels. The algorithms involve the following types of physical channels under compact bandwidth:

- Uplink physical channels
  - Physical random access channel (PRACH)

    A PRACH occupies six RBs and is adjacent to a physical uplink control channel (PUCCH) in the frequency domain. The compact bandwidth has no impact on the PRACH.
  - PUCCH

    eNodeBs spare edge RBs to move PUCCH resources towards each frequency band's center by specifying RBs for channel quality indicator (CQI) transmission and channel numbers.
  - Physical uplink shared channel (PUSCH)

    eNodeBs perform scheduling in a way that punctured RBs are not allocated to PUSCHs in cells.
  - Sounding reference signal (SRS)

    SRSs are transmitted by using available RBs. SRS resource allocation under compact bandwidths is the same as that under standardized bandwidths.
- Downlink physical channels
  - Physical control format indicator channel (PCFICH)

    Constraints are imposed on PCI assignment to ensure that PCFICHs in cells do not occupy subcarriers in punctured RBs.
  - Physical HARQ indicator channel (PHICH)

    Constraints are imposed on PCI assignment and the **Ng** parameter for PHICHs in cells to ensure that PHICHs do not occupy subcarriers in punctured RBs. The **Ng** value is specified by the **PHICHCfg.*PhichResource*** parameter
  - Physical downlink control channel (PDCCH)

    PDCCH demodulation performance must be improved because the control channel elements (CCEs) for some UEs are mapped to punctured RBs.
  - PDSCH

    Constraints are imposed on scheduling to ensure that punctured RBs are not allocated to PDSCHs in cells.

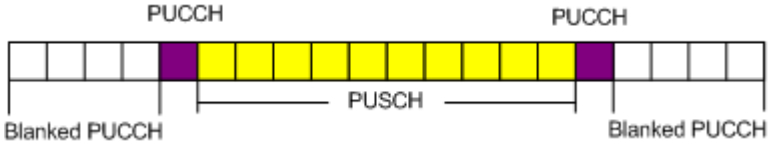
For details about resource allocation algorithms for physical channels under standardized bandwidths, see *Physical Channel Resource Management*.

PUCCH Resource Allocation and Power Control

PUCCHs occupy RBs at both ends of a standardized LTE bandwidth. To implement a compact bandwidth for a standardized bandwidth, the PUCCH is allocated more RBs than those under the standardized bandwidth. However, the PUCCH is transmitted only on RBs that are close to the center of the frequency band to spare a number of edge RBs on the standardized bandwidth. The number of spared edge RBs is the same as that of RBs punctured from the standardized bandwidth for the compact bandwidth. **Figure 4-1** shows an example of

PUCCH and PUSCH resource allocations on a standardized bandwidth for a compact bandwidth.

Figure 4-1 Example of PUCCH and PUSCH resource allocations in multi-RAT scenarios

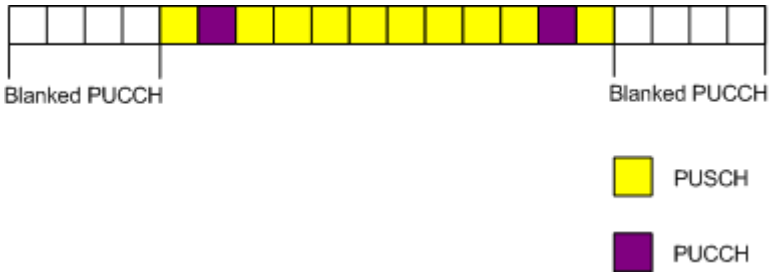


In LTE only scenarios, UEs regard bandwidths standard. Therefore, the PUCCH must be moved inwards to reduce the uplink out-of-band interference.

The **Cell.*CompactBwCtrlIntrfMode*** parameter can be set to **REDUCED** to move the PUCCH inwards to reduce uplink out-of-band interference. If uplink out-of-band interference is not reduced after the setting of the **Cell.*CompactBwCtrlIntrfMode*** parameter, configure the **Cell.*UlPuncturedRbNumOffset*** parameter to specify the number of RBs to be moved at each end.

- If the **Cell.*CompactBwCtrlIntrfMode*** parameter is set to **REDUCED** and the **Cell.*UlPuncturedRbNumOffset*** parameter is set to **0**, the PUCCH is moved one RB inwards at each end and the uplink bandwidth remains unchanged, as shown in **Figure 4-2**.

  Figure 4-2 Example of PUCCH and PUSCH resource allocations in LTE only scenarios

- If the **Cell.*CompactBwCtrlIntrfMode*** parameter is set to **REDUCED** and the **Cell.*UlPuncturedRbNumOffset*** parameter is set to a non-zero value, the number of RBs punctured from the PUCCH and PUSCH at each end equals the value of the **Cell.*UlPuncturedRbNumOffset*** parameter.

  Number of RBs occupied by the PUCCH and PUSCH = Number of uplink RBs after initial compression – 2 x **Cell.*UlPuncturedRbNumOffset***

  The number of uplink RBs after initial compression is the values of **Number of Available Uplink RBs** in **Table 4-3**.

  For example, when the non-standardized bandwidth of 7.4 MHz to 7.5 MHz is used, the number of RBs occupied used by the PUCCH and PUSCH is calculated using the following formula:

  Number of RBs occupied used by the PUCCH and PUSCH = 36 – 2 x **Cell.*UlPuncturedRbNumOffset***

PUSCH Resource Allocation and Power Control

Under compact bandwidths, PUSCH resource allocation is the same as that under standardized bandwidths, though the number of RBs available for each PUSCH decreases because the PUCCH is allocated more RBs than those under the standardized bandwidth.

After the PUCCH is moved inwards, the PUSCH RBs on the outside of the PUCCH are scheduled as follows to reduce uplink out-of-band interference:

- If there is only one RB, independent scheduling is not required.
- If there are two or more RBs, scheduling can be performed.

SRS and PRACH Resource Allocation

Under compact bandwidths, SRS and PRACH resource allocation is the same as that under standardized bandwidths. SRSs and PRACHs are transmitted on available RBs.

PCFICH and PHICH Resource Allocation

The positions of resource elements (REs) occupied by a PCFICH depend on the PCI of each cell. The PCI is specified by the **Cell.*PhyCellId*** parameter. Compact bandwidth imposes constraints on PCI assignment to ensure that a PCFICH occupies the REs that are located outside punctured RBs and that UEs can correctly interpret the PCFICH.

The positions of REs occupied by a PHICH depend on the PCI of each cell and the *Ng* setting (**PHICHCfg.*PhichResource***). Compact bandwidth imposes constraints on PCI assignment and the *Ng* setting to ensure that a PHICH occupies the REs that are located outside punctured RBs and that UEs can correctly interpret the PHICH.

When operators use bandwidths listed in **Table 4-3**, the **Cell.*PhyCellId*** parameter must be set in a certain range. For details, see **Table 4-3**.

The **PHICHCfg.*PhichResource*** parameter cannot be set to **TWO**.

For details about the *Ng* parameter, see section 6.9 in 3GPP TS 36.211 V9.1.0 (2010-03).

PDCCH Resource Allocation and Power Control

The resource allocation and power control mechanisms for PDCCHs under compact bandwidths are different from those for PDCCHs under standardized bandwidths.

Under compact bandwidths, PDCCHs for some UEs may be transmitted on punctured RBs, resulting in deterioration in PDCCH demodulation performance. To improve the performance, the following methods are available:

- Raising the CCE aggregation level for PDCCHs
- Increasing the transmit power of PDCCHs based on the number of punctured resource element groups (REGs)

The **Cell.*DlPuncturedRbNum*** parameter specifies the number of downlink RBs blocked in a cell.

- If this parameter is set to **255**, bandwidths in **Table 4-3** take effect by default.
- If this parameter is set to other values, the number of punctured RBs is less than the default ones, increasing effective bandwidths and spectral efficiency. The bandwidths specified in **Table 4-4** take effect. It is recommended that this parameter be configured

when GSM and LTE cells share the same RRU. For details, see **4.1.3 Key Compact Bandwidth Technologies**. The settings of the **Cell.*DlPuncturedRbNum*** parameter can take effect when GSM and LTE cells do not share an RRU. However, these settings increase downlink interference and degrade the cell performance.

- If the **Cell.*DlPuncturedRbNum*** parameter is set to **0**, downlink RBs are not punctured. In this case, the number of RBs occupied by the PDCCH equals to that occupied by the PDSCH.
- If the **Cell.*DlPuncturedRbNum*** parameter is set to a non-zero value, the number of RBs occupied by the PDCCH equals to the difference between the number of RBs in the standardized bandwidth and **Cell.*DlPuncturedRbNum***.

After the RB is punctured, the number of RBs occupied by the PDSCH equals to those occupied by the PDCCH minus 2. For example, under the bandwidths of 4.4 MHz to 4.7 MHz, if the number of RBs occupied by the PDCCH is 23, the number of available downlink PDSCH RBs is 21.

The number of RBs occupied by the PDSCH is two less than those occupied by the PDCCH. This is because:

As RB compression is transparent to the UE, the UE performs reference signal measurement and channel estimation based on the standardized bandwidth. The channel estimation condition of two downlink PDSCH RBs at both ends of the frequency band is poor for the bandwidth ranges of 4.4 – 4.7 MHz, 7.4 – 7.5 MHz, 8 MHz, 8.7 MHz, 8.8 MHz, 8.9 – 9.1 MHz, 9.2 – 9.5 MHz, 13.9 – 14.2 MHz, 14.3 – 14.5 MHz, 17.5 – 17.8 MHz, 18.3 – 18.5 MHz, 18.6 – 18.9 MHz, and 19 – 19.2 MHz listed in **4.1.3 Key Compact Bandwidth Technologies**. The bit error rate (BER) is high when these two PDSCH RBs are used.

The test results prove that using these two PDSCH RBs decreases the throughput. Therefore, these two PDSCH RBs are not used. To guarantee the performance, one more RB is punctured at both ends of the frequency band for the downlink than that for the uplink.

PDSCH Resource Allocation and Power Control

PDSCH resource allocation is the same as that under standardized bandwidths under compact bandwidths, though the number of RBs available for each PDSCH decreases with the total number of available RBs.

4.1.2.2 CQI Adjustment

Under a compact bandwidth, UEs have no knowledge about the number of punctured RBs and therefore measure full-band reference signals (RSs) over the entire related standardized bandwidth. The measurement covers the punctured RBs. However, eNodeBs do not transmit RSs on punctured RBs. As a result, the following errors occur: The full-band signal to interference plus noise ratio (SINR) measured by UEs is lower than the actual SINR, especially in areas close to the cell center.

The CQI adjustment algorithm applies to standardized and compact bandwidths as follows:

- If an eNodeB performs only frequency non-selective scheduling based on full-band CQIs from a UE, the CQI adjustment algorithm can offset the measurement deviations to improve spectral efficiency of the compact bandwidth.
- If an eNodeB performs frequency selective scheduling based on subband CQIs with reporting mode 2-x from a UE, the eNodeB uses wideband CQIs for subbands where no subband CQIs are available. In this situation, the eNodeB derives a modulation and

coding scheme (MCS) based on the combined wideband and subband CQIs and delivers the MCS to the UE. As a result, the CQI adjustment algorithm provides lower accuracy, which has little impact on performance and overall resource allocation fairness in frequency selective scheduling mode.

For details about the CQI adjustment algorithm, see *Channel State Management*.

4.1.3 Key Compact Bandwidth Technologies

eNodeBs provide solutions for 18 ranges of compact bandwidths, as described in **Table 4-3**. These solutions provide compact bandwidths by reducing guard bandwidths or effective bandwidths.

Table 4-3 Compact bandwidth solutions supported by eNodeBs

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
1	1.2 to 1.3	eNodeBs take all values ranging from 1.2 MHz to 1.3 MHz as 1.2 MHz, and use special stringent filters for 1.4 MHz in their radio frequency (RF) units to minimize signal spill-over from the available bandwidth. This solution does not require RB puncturing from the standardized bandwidth.	6	0	0	The physical cell identifier (PCI) value range in this solution is the same as that under the standardized 1.4 MHz bandwidth.	450 MHz RRU3668

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
2	4.4 to 4.7	eNodeBs take all values ranging from 4.4 MHz to 4.7 MHz as 4.4 MHz. The eNodeBs puncture four RBs from the standard 5 MHz bandwidth and use special stringent filters for 5 MHz in their RF units to minimize signal spill-over from the available bandwidth.	23	4	2	In this solution, a constraint is imposed on the PCI value range. For details about the constraint, see descriptions of the **Cell.*PhyCellId*** parameter.	1800 MHz AAU5972 port A, 450 MHz RRU3668, 1800 MHz RRU3959w, 1800 MHz RRU3953w, 1800 MHz MRFUd V6, 1800 MHz MRFUdw V6, and 1800 MHz RRU3959, 800 MHz RRU3959a, and 850 MHz (band 5) RRU3952

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
3	4.8 to 4.9	eNodeBs take all values ranging from 4.8 MHz to 4.9 MHz as 4.8 MHz. The eNodeBs use special stringent filters for 5 MHz in their RF units to minimize signal spill-over from the available bandwidth. This solution does not require RB puncturing from the standardized bandwidth.	25	0	0	The PCI value range in this solution is the same as that under the standardized 5 MHz bandwidth.	MRFUd, 1800 MHz RRU3928, 1800 MHz RRU3929, 1800 MHz RRU3962d, AAU3940, 850 MHz RRU3662 V6, RRU3959, RRU3959a, 1800 MHz RRU3953w, 1800 MHz MRFUdw V6, 1800 MHz AAU5972 port A, pRRU5913, pRRU5918, pRRU5920, pRRU5922, pRRU5923, pRRU5921, 900 MHz RRU5909, 900 MHz MRFUdv3, and hRRU5901

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
4	7.4 to 7.5	eNodeBs take all values ranging from 7.4 MHz to 7.5 MHz as 7.35 MHz. The eNodeBs puncture 14 RBs from the standardized 10 MHz bandwidth and use special stringent filters for 10 MHz in their RF units to minimize signal spill-over from the available bandwidth.	36	Symmetric compression scenarios: 16 Asymmetric compression scenarios: 15	14	The PCI value range in this solution is the same as that under the standardized 10 MHz bandwidth.	900 MHz RRU3938, 850 MHz RRU3652, 850 MHz RRU3653, 850 MHz RRU3662, pRRU5913, pRRU5918, pRRU5920, pRRU5922, pRRU5923, pRRU5921, and hRRU5901
5	8	eNodeBs use 8 MHz compact bandwidth. They puncture 10 RBs from the standardized 10 MHz bandwidth and use special stringent filters for 10 MHz in their RF units to minimize signal spill-over from the available bandwidth.	40	12	10	In this solution, a constraint is imposed on the PCI value range. For details about the constraint, see descriptions of the **Cell.** ***PhyCellId*** parameter.	pRRU5921, pRRU5913, pRRU5918, pRRU5920, pRRU5922, and pRRU5923

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
6	8.7	eNodeBs take all values ranging from 8.7 MHz to 8.75 MHz. The eNodeBs puncture eight RBs from the standardized 10 MHz bandwidth and use special stringent filters for 10 MHz in their RF units to minimize signal spill-over from the available bandwidth.	42	Symmetric compression scenarios: 10 Asymmetric compression scenarios: 9	8	The PCI value range in this solution is the same as that under the standardized 10 MHz bandwidth.	850 MHz RRU3652, 850 MHz RRU3653, and 850 MHz RRU3662
7	8.8	eNodeBs use 8.8 MHz compact bandwidth. They puncture six RBs from the standard 10 MHz bandwidth and use special stringent filters for 10 MHz in their RF units to minimize signal spill-over from the available bandwidth.	46	6	4	In this solution, a constraint is imposed on the PCI value range. For details about the constraint, see descriptions of the **Cell.*PhyCellId*** parameter.	1800 MHz AAU5972 port A, 1800 MHz RRU3959, 1800 MHz RRU3959a, 1800 MHz MRFU V6, 1800 MHz AAU3920, and 1800 MHz RRU5502

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
8	8.9 to 9.1	eNodeBs take all values ranging from 8.9 MHz to 9.1 MHz as 8.88 MHz. The eNodeBs puncture six RBs from the standard 10 MHz bandwidth and use special stringent filters for 10 MHz in their RF units to minimize signal spill-over from the available bandwidth.	46	6	4	In this solution, a constraint is imposed on the PCI value range. For details about the constraint, see descriptions of the **Cell.*PhyCellId*** parameter.	1800 MHz AAU5972 port A
9	9.2 to 9.5	eNodeBs take all values ranging from 9.2 MHz to 9.5 MHz as 9.20 MHz. The eNodeBs puncture four RBs from the standard 10 MHz bandwidth and use special stringent filters for 10 MHz in their RF units to minimize signal spill-over from the available bandwidth.	48	4	2	In this solution, a constraint is imposed on the PCI value range. For details about the constraint, see descriptions of the **Cell.*PhyCellId*** parameter.	1800 MHz RRU3939, RRU3959, RRU3959a, 1800 MHz AAU3920, AAU3940, 1800 MHz AAU5972 port A, 1800 MHz RRU3953, 1800 MHz RRU3942, 1800 MHz RRU3935, 1800 MHz RRU3929, 1800 MHz RRU3936, 1800 MHz RRU3928, and 1800 MHz RRU3938

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
10	9.6 to 9.9	eNodeBs take all values ranging from 9.6 MHz to 9.9 MHz as 9.6 MHz. The eNodeBs use special stringent filters for 10 MHz in their RF units to minimize signal spill-over from the available bandwidth. This solution does not require RB puncturing from the standardized bandwidth.	50	0	0	The PCI value range in this solution is the same as that under the standardized 10 MHz bandwidth.	900 MHz/1800 MHz MRFUd, 900 MHz/1800 MHz RRU3928, 900 MHz/1800 MHz RRU3929, 900 MHz RRU3938, 1800 MHz RRU3953, 900 MHz RRU3959, 900 MHz RRU3959a, 1800 MHz RRU3962d, 1800 MHz RRU3971, 1800 MHz RRU3971a, 1800 MHz AAU3940, 1800 MHz AAU5972 port A, 900 MHz MRFUd V3, 900 MHz RRU3929 V3, 900 MHz RRU3953 V6, 900 MHz RRU3959 V6, and 900 MHz RRU3939

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
11	13.9 to 14.2	eNodeBs take all values ranging from 13.9 MHz to 14.2 MHz as 13.9 MHz. The eNodeBs puncture six RBs from the standardized 15 MHz bandwidth and use special stringent filters for 15 MHz in their RF units to minimize signal spill-over from the available bandwidth.	71	6	4	In this solution, a constraint is imposed on the PCI value range. For details about the constraint, see descriptions of the **Cell.*PhyCellId*** parameter.	None
12	14.3 to 14.5	eNodeBs take all values ranging from 14.3 MHz to 14.5 MHz as 14.3 MHz. The eNodeBs puncture four RBs from the standardized 15 MHz bandwidth and use special stringent filters for 15 MHz in their RF units to minimize signal spill-over from the available bandwidth.	73	4	2	In this solution, a constraint is imposed on the PCI value range. For details about the constraint, see descriptions of the **Cell.*PhyCellId*** parameter.	1800 MHz RRU3953

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
13	14.6 to 14.9	eNodeBs take all values ranging from 14.6 MHz to 14.9 MHz as 14.6 MHz. The eNodeBs use special stringent filters for 15 MHz in their RF units to minimize signal spill-over from the available bandwidth. This solution does not require RB puncturing from the standardized bandwidth.	75	0	0	The PCI value range in this solution is the same as that under the standardized 15 MHz bandwidth.	1800 MHz MRFUd, 1800 MHz RRU3928, 1800 MHz RRU3929, 1800 MHz RRU3962d, AAU3940, 1800 MHz RRU3939, 1800 MHz MRFUd V6, 1800 MHz RRU3959, 1800 MHz RRU3959a, 1800 MHz RRU3953w, 1800 MHz AAU5972 port A, pRRU5913, pRRU5918, pRRU5920, pRRU5922, pRRU5923, pRRU5921, 2100 MHz WRFUe, 2100 MHz WRFUd, 2100 MHz RRU3829, 2100 MHz RRU3839, 2100 MHz RRU3971, 2100 MHz RRU5909, 2100 MHz RRU5904, 2100 MHz AAU3902, 2100 MHz AAU3911, hRRU5901, 2100 MHz

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
							RRU5501, 2100 MHz RRU5502, 2100 MHz RRU5507, 2100 MHz RRU3838, and 2100 MHz RRU3962
14	17.5 to 17.8	eNodeBs take all values ranging from 17.5 MHz to 17.8 MHz as 17.5 MHz. The eNodeBs puncture 14 RBs from the standardized 20 MHz bandwidth and use special stringent filters for 20 MHz in their RF units to minimize signal spill-over from the available bandwidth.	86	Symmetric compression scenarios: 16 Asymmetric compression scenarios: 15	14	The PCI value range in this solution is the same as that under the standardized 20 MHz bandwidth.	700 MHz RRU3268

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
15	18.3 to 18.5	eNodeBs take all values ranging from 18.3 MHz to 18.5 MHz as 18.2 MHz. The eNodeBs puncture eight RBs from the standardized 20 MHz bandwidth and use special stringent filters for 20 MHz in their RF units to minimize signal spill-over from the available bandwidth.	94	8	6	In this solution, a constraint is imposed on the PCI value range. For details about the constraint, see descriptions of the **Cell.*PhyCellId*** parameter.	1800 MHz MRFUd, 1800 MHz RRU3928, 1800 MHz RRU3929, 1800 MHz RRU3962d, AAU3940, 1800 MHz RRU5905, 1800 MHz AAU5972 port A, 1800 MHz RRU3939, 1800 MHz RRU3935, 1800 MHz RRU3936, 1800 MHz RRU3938, 1800 MHz RRU3959, 1800 MHz RRU3959a, and 1800 MHz RRU3953

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
16	18.6 to 18.9	eNodeBs take all values ranging from 18.6 MHz to 18.9 MHz as 18.6 MHz. The eNodeBs puncture six RBs from the standardized 20 MHz bandwidth and use special stringent filters for 20 MHz in their RF units to minimize signal spill-over from the available bandwidth.	96	6	4	In this solution, a constraint is imposed on the PCI value range. For details about the constraint, see descriptions of the **Cell.*PhyCellId*** parameter.	1800 MHz MRFUd, 1800 MHz RRU3928, 1800 MHz RRU3929, 1800 MHz RRU3962d, AAU3940, 1800 MHz RRU5905, 1800 MHz RRU5909, 1800 MHz RRU5901, 1800 MHz RRU3971, 1800 MHz RRU3971a, 1800 MHz AAU5972 port A, 1800 MHz RRU3938, 1800 MHz RRU3959, 1800 MHz RRU3959a, 1800 MHz RRU3939, 1800 MHz MRFUd V6, 1800 MHz RRU3959W, 1800 MHz RRU3929 V3, and 1800 MHz RRU3971

No.	Compact Bandwidth Range Supported by eNodeBs MHz	Compact Bandwidth Solution	Number of Available Uplink RBs	Number of RBs Punctured by the PDSCH	Number of Punctured Uplink RBs	PCI Value Range	Supporting RF Module
17	19 to 19.2	eNodeBs take all values that are in the range of 19 MHz to 19.2 MHz as 18.94 MHz. They puncture four RBs from the standard 20 MHz bandwidth and use special stringent filters for 20 MHz in their RF units to minimize signal spill-over from the available bandwidth.	98	4	2	In this solution, a constraint is imposed on the PCI value range. For details about the constraint, see descriptions of the **Cell.*PhyCellId*** parameter.	1800 MHz MRFUd, 1800 MHz RRU3928, 1800 MHz RRU3929, 1800 MHz RRU3962d, AAU3940, 1800 MHz AAU5972 port A, 1800 MHz RRU3939, 1800 MHz MRFUd V6, 1800 MHz RRU3959, and 1800 MHz RRU3959a
18	19.3 to 19.9	eNodeBs take all values ranging from 19.3 MHz to 19.9 MHz as 19.3 MHz. The eNodeBs use special stringent filters for 20 MHz in their RF units to minimize signal spill-over from the available bandwidth. This solution does not require RB puncturing from the standardized bandwidth.	100	0	0	The PCI value range in this solution is the same as that under the standardized 20 MHz bandwidth.	1800 MHz MRFUd, 1800 MHz RRU3928, 1800 MHz RRU3929, 1800 MHz RRU3953, 1800 MHz RRU3962d, 1800 MHz RRU3971, 1800 MHz RRU3971a, AAU3940, and 1800 MHz AAU5972 port A

Solutions 4, 6, and 14 in **Table 4-3** support both symmetric compression on both sides of a bandwidth and asymmetric compression on only one side of a bandwidth. This function is controlled by the **Cell**.***CompactBwCtrlIntrfMode*** parameter and only applies to macro base stations.

eNodeBs provide the **Cell.*CustomizedBandWidthCfgInd*** parameter for activation and deactivation of the compact bandwidth. If the parameter is set to **CFG**, compact bandwidth is activated. Set the **Cell.*UlBandWidth*** and **Cell.*DlBandWidth*** parameters to the standardized bandwidth that is closest to the operator's non-standardized bandwidth.

- For the uplink, the compact bandwidth range supported by the eNodeB is the value of the **Cell.*CustomizedULBandWidth*** parameter.
- For the downlink
  - When GSM and LTE cells do not share an RRU, the compact bandwidth range by the eNodeB is the value of the **Cell.*CustomizedDLBandWidth*** parameter.
  - When GSM and LTE cells share an RRU, the actual valid bandwidth supported by the eNodeB is specified by the **Cell.*DlPuncturedRbNum*** parameter. The compact bandwidth supported by the eNodeB is the corresponding valid bandwidth in **Table 4-4**.

Table 4-4 Compact bandwidth range when GSM and LTE cells share an RRU

Cell.*CustomizedDLBandWidth* Value	**Cell.*DlPuncturedRbNum* Value**	**Valid Bandwidth**
8.8 MHz to 9.1 MHz	2	9.2 MHz
	Other values	For details, see the **Compact Bandwidth Solution** column for bandwidths ranging from 8.8 MHz to 9.1 MHz in **Table 4-3**.
9.2 MHz to 9.5 MHz	0	9.6 MHz
	Other values	For details, see the **Compact Bandwidth Solution** column for bandwidths ranging from 9.2 MHz to 9.5 MHz in **Table 4-3**.
9.6 MHz to 10.0 MHz	N/A	For details, see the **Compact Bandwidth Solution** column for bandwidths ranging from 9.6 MHz to 10.0 MHz in **Table 4-3**.
18.3 MHz to 18.5 MHz	0	19.3 MHz
	2	19 MHz
	4	18.6 MHz

Cell.*CustomizedDLBandWidth* Value	Cell.*DlPuncturedRbNum* Value	Valid Bandwidth
	Other values	For details, see the **Compact Bandwidth Solution** column for bandwidths ranging from 18.3 MHz to 18.5 MHz in **Table 4-3**.
18.6 MHz to 18.9 MHz	0	19.3 MHz
	2	19 MHz
	Other values	For details, see the **Compact Bandwidth Solution** column for bandwidths ranging from 18.6 MHz to 18.9 MHz in **Table 4-3**.
19.0 MHz to 19.2 MHz	0	19.3 MHz
	Other values	For details, see the **Compact Bandwidth Solution** column for bandwidths ranging from 19.0 MHz to 19.2 MHz in **Table 4-3**.
19.3 MHz to 20.0 MHz	N/A	For details, see the **Compact Bandwidth Solution** column for bandwidths ranging from 19.3 MHz to 20.0 MHz in **Table 4-3**.

The settings of the **Cell.*DlPuncturedRbNum*** parameter in the preceding table can take effect when GSM and LTE cells do not share an RRU, but these settings increase downlink interference and degrade the cell performance.

On GSM+LTE 450/850/900/1800 MHz networks, if the **Cell.*CustomizedULBandWidth*** and **Cell.*CustomizedDLBandWidth*** parameters are set using the Configuration Management Express (CME) for the LTE network, the CME performs parameter checks based on the configured values; however, the bandwidth settings take effect according to the Compact Bandwidth solution. For example, if the two parameters are set to indicate a bandwidth of 19.9 MHz, the CME performs a parameter check based on 19.9 MHz, but the bandwidth that takes effect is 19.3 MHz according to solution 18 described in **Table 4-3**.

If the **Cell.*CustomizedULBandWidth*** parameter is set to **8**, it is recommended that **Cell.*DlPuncturedRbNum*** be set to **255** rather than 8. Otherwise, downlink interference increases, and spectral efficiency decreases.

4.2 Network Analysis

4.2.1 Benefits

The compact bandwidth feature increases spectral efficiency, raises cell throughput, and improves user experience. It is transparent to UEs and compatible with Third Generation Partnership Project (3GPP) Release 8 and later. This function does not require any modifications to algorithms in UEs.

4.2.2 Impacts

Network Impacts

For a given available bandwidth, this feature uses compact bandwidths to provide higher spectrum efficiency and larger system capacity than standardized bandwidths.

The techniques for compact bandwidth are transparent to UEs. UEs behave in the same way as in a cell with the corresponding standardized bandwidth when this feature is used. UEs in a cell with a compact bandwidth experience higher inter-RAT interference (for example, GSM interference in GSM/LTE refarming scenarios) than those in a cell with the corresponding standardized bandwidth. The higher interference causes network performance deterioration in terms of the access success rate, handover success rate, service drop rate, and BLER.

Function Impacts

Function Name	Function Switch	Reference	Description
Physical channel management	None	*Physical Channel Resource Management*	The amount and distribution of resources allocated to physical channels under compact bandwidths are slightly different from those under standardized bandwidths. The physical channels include the PRACH, PUCCH, PUSCH, SRS, PCFICH, PHICH, PDCCH, and PDSCH.
Uplink power control	**CellAlgoSwitch.*UlPcAlgoSwitch***	*Power Control*	Under compact bandwidths, PDCCH power must be increased occasionally to offset the energy loss caused by RB puncturing from the corresponding standardized bandwidths.
Dynamic downlink power allocation	**CellAlgoSwitch.*DlPcAlgoSwitch***		

Function Name	Function Switch	Reference	Description
PCI conflict detection and self-optimization	**ENodeBAlgoSwitch**.***PciConflictDetectSwitch***	*PCI Conflict Detection and Self-Optimization*	PCIs of cells affect the locations of RBs occupied by PHICHs and PCFICHs. Under Compact Bandwidth, constraints are imposed on PCI assignment to prevent punctured RBs from being occupied by PHICHs and PCFICHs. When compact bandwidth and PCI conflict detection and self-optimization are enabled, the range of available PCIs for PCI conflict detection and self-optimization must be set and cannot exceed the range of available PCIs for compact bandwidth.
CQI adjustment	**CqiAdjAlgoSwitch** option of the **CellAlgoSwitch**.***CqiAdjAlgoSwitch*** parameter	*Channel State Management*	CQI measurement errors caused by compact bandwidths are corrected using the CQI adjustment algorithm.
Admission control	**UlSwitch** option of the **CellAlgoSwitch**.***RacAlgoSwitch*** parameter **DlSwitch** option of the **CellAlgoSwitch**.***RacAlgoSwitch*** parameter	*Admission and Congestion Control*	When calculating the RB usage and checking the number of RBs occupied by guaranteed bit rate (GBR) services, the admission control and load balancing algorithms measure the total number of RBs available for services based on the maximum number of RBs under compact bandwidths.
Intra-LTE load balancing	**InterFreqMlbSwitch** option of the **CellAlgoSwitch**.***MlbAlgoSwitch*** parameter	*Intra-RAT Mobility Load Balancing*	

Function Name	Function Switch	Reference	Description
eMBMS phase 1 based on centralized MCE architecture	**CELLMBMSCFG**.***MBMSSwitch***	*eMBMS*	eMBMS signals are transmitted using all the RBs corresponding to the system bandwidth specified by system messages. If RBs are punctured in the downlink, eMBMS cannot normally function. Therefore, do not enable eMBMS if RBs are punctured for compact bandwidth, that is, if the **Cell**.***DlPuncturedRbNum*** parameter is set to a non-zero value.
UL CRA	**UL_COORD_RES_ALLOC_SWITCH** option of the **UlCsAlgoPara**.***UlCsSw*** parameter	*Uplink Coordinated Scheduling*	UL CRA does not take effect when PUSCH resources are inconsecutive or the available system bandwidth is less than 5 MHz.
TDoA positioning	**TDOA_SWITCH** option of the **CellAlgoSwitch**.***LbsSwitch*** parameter	None	When TDoA positioning is activated on LampSite eNodeBs, the number of available uplink RBs must be greater than or equal to 72. Otherwise, TDoA positioning does not take effect.
eMTC introduction	**CellEmtcAlgo**.***EmtcAlgoSwitch***	*eMTC*	eMTC is incompatible with compact bandwidth when the cell bandwidth is 5 MHz and the number of punctured RBs is not 0.
LTE in-band deployment	None	*NB-IoT Radio and Performance Basics (FDD)*	After compact bandwidth is deployed, the available bandwidth range for LTE in-band deployment decreases. It is recommended that the uplink NB-IoT RBs be configured at the edge of the available LTE RBs.
LTE guard band deployment	None	*NB-IoT Radio and Performance Basics (FDD)*	This function cannot be deployed because the guard band is small in some compact bandwidths.
Static shared beam	None	*Massive MIMO (FDD)*	In massive MIMO scenarios, it is not recommended that compact bandwidth be enabled. Otherwise, the performance of massive MIMO may be affected.
Dynamic dedicated beam	None	*Massive MIMO (FDD)*	

Function Name	Function Switch	Reference	Description
Precise AMC	**PreciseAmcSwitch** option of the **CellAlgoSwitch**.***EmimoSwitch*** parameter	*eMIMO (FDD)*	Enabling the compact bandwidth function affects the accuracy of calculated interference from neighboring cells and therefore affects the performance of precise AMC. If the punctured RBs account for a larger proportion of the RBs in the configured LTE bandwidth, precise AMC offers lower gains.

4.3 Requirements

4.3.1 Licenses

The following are license requirements.

Feature ID	Feature Name	Model	Sales Unit
LOFD-001051	Compact Bandwidth	LT1S00CPBW00	Per Cell

4.3.2 Software

Prerequisite Functions

None

Mutually Exclusive Functions

Function Name	Function Switch	Reference	Description
Flexible bandwidth based on overlapping carriers	**DdCellGroup.*DdBandWidth***	*Flexible Bandwidth based on Overlap Carriers (FDD)*	This function does not support addition of cells with the following ranges of compact bandwidths into a double deck cell group: 4.4 MHz to 4.7 MHz, 8.8 MHz, 8.9 MHz to 9.2 MHz, 9.3 MHz to 9.5 MHz, 18.3 MHz to 18.5 MHz, 18.6 MHz to 18.9 MHz, and 19 MHz to 19.2 MHz

Function Name	Function Switch	Reference	Description
GSM and LTE zero bufferzone	**GLZeroBufferZoneSwitch** option of the **CellAlgoSwitch.*DynSpectrumShareSwitch*** parameter	*GSM and LTE Zero Bufferzone*	None
GSM and LTE FDD dynamic spectrum sharing (LTE FDD)	**GLDynSpectrumShareSwitch** option of the **CellAlgoSwitch.*DynSpectrumShareSwitch*** parameter	*GSM and LTE FDD Dynamic Spectrum Sharing*	None
GSM and LTE spectrum concurrency (LTE FDD)	**GL_SPECTRUM_CONCURRENCY** option of the **SpectrumCloud.*SpectrumCloudSwitch*** parameter	*GSM and LTE Spectrum Concurrency*	None
In-band relay	**InBandRelayDeNbSwitch** and **InBandRelayReNbSwitch** options of the **CellAlgoSwitch**.***RelaySwitch*** parameter	*Relay*	In-band relay does not support compact bandwidth. (Neither the DeNB nor ReNB supports this function.)
eMTC frequency hopping	**CellEmtcAlgo**.***EmtcFreqHoppingSwitch***	*eMTC*	eMTC frequency hopping does not work with functions related to non-standardized bandwidths.

4.3.3 Hardware

Base Station Models

- 3900 and 5900 series base stations
- DBS3900 LampSite and DBS5900 LampSite

In multi-RAT scenarios, base stations of LTE and other RATs must share antennas, and the ratio of LTE sites to sites of other RATs is 1:1. Base stations of all RATs must be provided by Huawei.

Boards

Board	Supported Scenario
UMPT	Multi-RAT and LTE only scenarios
LMPT	Multi-RAT and LTE only scenarios
UMDU	Multi-RAT and LTE only scenarios
UBBPd	Multi-RAT and LTE only scenarios
UBBPe	Multi-RAT and LTE only scenarios
UBBPei	Multi-RAT and LTE only scenarios
UBBPem	Multi-RAT and LTE only scenarios
UBBPep	Multi-RAT and LTE only scenarios
LBBPd	Multi-RAT and LTE only scenarios (Only symmetric compression is supported. For details, see **Table 4-3**.)
LBBPc	Multi-RAT scenarios

RF Modules

For details about RF modules supporting different compact bandwidths, see the last column in **4.1.3 Key Compact Bandwidth Technologies**.

4.3.4 Networking

4.3.4.1 Networking in Multi-RAT Scenarios

Spectrum Requirements

LTE cell bandwidth, which is specified by the **Cell.*UlBandWidth*** and **Cell.*DlBandWidth*** parameters, must fall into the range of operators' spectrum.

When planning frequency resources, ensure that the frequency bands for LTE services do not overlap with the edge frequencies of the 450 MHz, 850 MHz, 900 MHz, and 1800 MHz bands, or with the edge frequencies of the band supported by the RRU. The goal is to ensure the successful deployment of the standardized bandwidths corresponding to the compact bandwidths, which are implemented by puncturing RBs at the two ends of the standardized bandwidths.

For example, an operator expects to release certain frequency resources in the 1800 MHz GSM band for deploying an LTE network with a compact bandwidth of 19 MHz, which corresponds to the standardized bandwidth of 20 MHz. 3GPP specifications specify that the frequency range for the 1800 MHz band is 1805-1880 MHz. To achieve this expectation, the operator can use 1805.5 MHz to 1824.5 MHz for LTE with the center frequency at 1815 MHz.

PSD Requirements

LTE and other RATs have the following requirements on the power spectrum density (PSD) difference:

- If compact bandwidth is performed on the 5 MHz or 10 MHz bandwidth, the PSD difference between LTE and other RATs cannot exceed 11 dB.
- If compact bandwidth is performed on the 15 MHz or 20 MHz bandwidth, the PSD difference between LTE and other RATs cannot exceed 14 dB.

Co-antenna scenarios

In co-antenna and 1:1 site deployment scenarios, the PSD can be calculated based on the configured power.

NOTE

1:1 site deployment refers to scenarios where an LTE cell and a GSM cell cover the same area.

For example, if the LTE bandwidth of 10 MHz (50 RBs with each of 0.18 MHz) is compressed to 8.6 MHz and two transmit antennas are used, the following parameters are set as follows:

PDSCHCfg.*ReferenceSignalPwr* = 212

PDSCHCfg.*Pb* = 1

CellDlpcPdschPa.*PaPcOff* = -3

In this case, the LTE cell power is 2 x 40 W. If the power of a neighboring GSM cell is 20 W (a single carrier with a bandwidth of 0.2 MHz), the power difference between LTE and GSM cells is –10.5 dB, which is calculated by the following formula:

10 x log([2 x 40/(50 x 0.18)]/(20/0.2)) = –10.5 dB

The absolute value of this difference is 10.5 dB, which is less than 11 dB.

Non-co-antenna scenarios

In non-co-antenna scenarios, the PSD difference between LTE and other RATs must be measured through drive tests because such a difference cannot be calculated based on the configured power spectrum density.

NOTE

When the **DlNonStandardBwMaxPwrSwitch** option of the **CellAlgoSwitch.*DlPcAlgoSwitch*** parameter is selected, the actual cell power changes, but the PSD calculation is not affected.

4.3.4.2 Networking in LTE Only Scenarios

Spectrum Requirements

LTE cell bandwidth, which is specified by the **Cell.*UlBandWidth*** and **Cell.*DlBandWidth*** parameters, must fall into the range of operators' spectrum.

When planning frequency resources, ensure that the frequency bands for LTE services do not overlap with the edge frequencies of the 450 MHz, 850 MHz, 900 MHz, and 1800 MHz bands, or with the edge frequencies of the band supported by the RRU. The goal is to ensure the successful deployment of the standardized bandwidths corresponding to the compact

bandwidths, which are implemented by puncturing RBs at the two ends of the standardized bandwidths.

For example, an operator expects to release certain frequency resources in the 1800 MHz GSM band for deploying an LTE network with a compact bandwidth of 19 MHz, which corresponds to the standardized bandwidth of 20 MHz. 3GPP specifications specify that the frequency range for the 1800 MHz band is 1805-1880 MHz. To achieve this expectation, the operator can use 1805.5 MHz to 1824.5 MHz for LTE with the center frequency at 1815 MHz.

Interference caused by spectrum leakage exists in the uplink because UEs transmit signals in the uplink using standardized bandwidths. Therefore, UEs on the live network need to be tested. If the test results meet spectrum leakage requirements specified in 3GPP specifications, this function can be deployed. Otherwise, this function cannot be deployed.

PSD Requirements

LTE and adjacent networks have the following requirements on the PSD difference:

- If compact bandwidth is performed on the 5 MHz or 10 MHz bandwidth, the PSD difference between the local LTE cell and adjacent cells cannot exceed 11 dB.
- If compact bandwidth is performed on the 15 MHz or 20 MHz bandwidth, the PSD difference between the local LTE cell and adjacent cells cannot exceed 14 dB.

In LTE only scenarios, the LTE cell cannot share the antenna system with adjacent cells. Therefore, the PSD cannot be directly evaluated based on the power configuration. The PSD difference between the local LTE cell and adjacent cells needs to be obtained through drive tests. For details about how to calculate the PSD in co-antenna scenarios, see **PSD Requirements**.

4.4 Operation and Maintenance

4.4.1 Data Configuration

Compact bandwidth is recommended when both of the following conditions are met:

- The bandwidths acquired by an operator are within the ranges listed in **4.1.3 Key Compact Bandwidth Technologies** and meet bandwidth requirements listed in **4.3.3 Hardware**.
- When both compact bandwidth and carrier aggregation are enabled, you are not advised to configure cells with customized bandwidths as primary serving cells.

4.4.1.1 Data Preparation

To activate this function, perform the following steps:

Step 1 Configure the standardized bandwidths of a cell and enable compact bandwidth in the cell. For details, see **Table 4-5**.

Step 2 Configure operators' non-standardized cell bandwidths. Values of related parameters vary according to scenarios. For details, see the following sections.

----End

Table 4-5 Parameters used for configuring the standardized bandwidths of a cell and enabling compact bandwidth in the cell

Parameter Name	Parameter ID	Setting Notes
Uplink bandwidth	**Cell.*UlBandWidth***	Set this parameter based on the network plan.
Downlink bandwidth	**Cell.*DlBandWidth***	Set this parameter based on the network plan.
Customized bandwidth configure indicator	**Cell.*CustomizedBandWidthCfgInd***	CFG

Scenario 1: In multi-RAT scenarios, non-standardized bandwidths include 4.4-4.7 MHz, 7.4-7.5 MHz, 8 MHz, 8.7 MHz, 8.8 MHz, 8.9-9.1 MHz, 9.2-9.5 MHz, 13.9-14.2 MHz, 14.3-14.5 MHz, 17.5-17.8 MHz, 18.3-18.5 MHz, 18.6-18.9 MHz, or 19-19.2 MHz.

The following table describes the parameters used for function activation in scenario 1.

Table 4-6 Parameters used for function activation (scenario 1)

Parameter Name	Parameter ID	Setting Notes
Physical cell ID	**Cell.*PhyCellId***	Set this parameter based on the constraints described in **PCFICH and PHICH Resource Allocation**.
Customized downlink bandwidth	**Cell.*CustomizedDLBandWidth***	Set this parameter based on the network plan. The **Cell.*CustomizedDLBandWidth*** and **Cell.*CustomizedULBandWidth*** parameters can be set to either the same value or different values. If they are set to different values, different numbers of RBs are punctured in the uplink and downlink.
Customized uplink bandwidth	**Cell.*CustomizedULBandWidth***	Set this parameter based on the network plan. The **Cell.*CustomizedDLBandWidth*** and **Cell.*CustomizedULBandWidth*** parameters can be set to either the same value or different values. If they are set to different values, different numbers of RBs are punctured in the uplink and downlink.

The following table describes the parameters used for function optimization in scenario 1.

Table 4-7 Parameters used for function optimization (scenario 1)

Parameter Name	Parameter ID	Option	Setting Notes
Downlink power control algorithm switch	**CellAlgoSwitch.*DlPcAlgoSwitch***	DlNonStandardBwMaxPwrSwitch	Select this option.
PHICH duration	**PHICHCfg.*PhichDuration***	N/A	Set this parameter to **NORMAL**.
PHICH resource	**PHICHCfg.*PhichResource***	N/A	Set this parameter to **ONE**. In scenario 1, set this parameter to a value other than **TWO**.

Scenario 2: In multi-RAT scenarios, non-standardized bandwidths include 1.2-1.3 MHz, 4.8-4.9 MHz, 9.6-9.9 MHz, 14.6-14.9 MHz, or 19.3-19.9 MHz.

The following table describes the parameters used for function activation in scenario 2.

Table 4-8 Parameters used for function activation (scenario 2)

Parameter Name	Parameter ID	Setting Notes
Physical cell ID	**Cell.*PhyCellId***	Set this parameter based on the network plan.
Customized downlink bandwidth	**Cell.*CustomizedDLBandWidth***	Set this parameter based on the network plan. The **Cell.*CustomizedDLBandWidth*** and **Cell.*CustomizedULBandWidth*** parameters can be set to either the same value or different values. If they are set to different values, different numbers of RBs are punctured in the uplink and downlink.
Customized uplink bandwidth	**Cell.*CustomizedULBandWidth***	Set this parameter based on the network plan. The **Cell.*CustomizedDLBandWidth*** and **Cell.*CustomizedULBandWidth*** parameters can be set to either the same value or different values. If they are set to different values, different numbers of RBs are punctured in the uplink and downlink.

The following table describes the parameters used for function optimization in scenario 2.

Table 4-9 Parameters used for function optimization (scenario 2)

Parameter Name	Parameter ID	Option	Setting Notes
Downlink power control algorithm switch	**CellAlgoSwitch.*DlPcAlgoSwitch***	DlNonStandardBwMaxPwrSwitch	Select this option.
PHICH duration	**PHICHCfg.*PhichDuration***	N/A	Set this parameter to **NORMAL**.
PHICH resource	**PHICHCfg.*PhichResource***	N/A	Set this parameter to **ONE**.

Scenario 3: In multi-RAT scenarios, GSM and LTE cells share RRUs.

The following table describes the parameters used for function activation in scenario 3.

For details, see **Table 4-4**.

Table 4-10 Parameters used for function activation (scenario 3)

Parameter Name	Parameter ID	Setting Notes
Physical cell ID	**Cell.*PhyCellId***	Set this parameter based on the network plan.
Customized downlink bandwidth	**Cell.*CustomizedDLBandWidth***	Set this parameter based on the network plan. The **Cell.*CustomizedDLBandWidth*** and **Cell.*CustomizedULBandWidth*** parameters can be set to either the same value or different values. If they are set to different values, different numbers of RBs are punctured in the uplink and downlink.
Customized uplink bandwidth	**Cell.*CustomizedULBandWidth***	Set this parameter based on the network plan. The **Cell.*CustomizedDLBandWidth*** and **Cell.*CustomizedULBandWidth*** parameters can be set to either the same value or different values. If they are set to different values, different numbers of RBs are punctured in the uplink and downlink.
Downlink Punctured RB Number	**Cell.*DlPuncturedRbNum***	Set this parameter according to the actual scenarios. For details, see **4.1.3 Key Compact Bandwidth Technologies**.

The following table describes the parameters used for function optimization in scenario 3.

Table 4-11 Parameters used for function optimization (scenario 3)

Parameter Name	Parameter ID	Option	Setting Notes
Downlink power control algorithm switch	**CellAlgoSwitch**.***DlPcAlgoSwitch***	DlNonStandardBwMaxPwrSwitch	Select this option.
PHICH duration	**PHICHCfg.*PhichDuration***	N/A	You are advised to set this parameter to **NORMAL**. ● When this parameter is set to **NORMAL**, the number of OFDM symbols occupied by the PDCCH can be adaptively adjusted. ● When this parameter is set to **EXTENDED**, the number of OFDM symbols occupied by the PDCCH must be set to 3 for a standardized cell bandwidth of 1.4 MHz, 5 MHz, 10 MHz, 15 MHz, or 20 MHz.
PHICH resource	**PHICHCfg.*PhichResource***	N/A	Set this parameter to **ONE**.

Scenario 4: LTE only scenarios

The following table describes the parameters used for function activation in scenario 4.

Table 4-12 Parameters used for function activation (scenario 4)

Parameter Name	Parameter ID	Setting Notes
Physical cell ID	**Cell.*PhyCellId***	Set this parameter based on the network plan.
Customized downlink bandwidth	**Cell.*CustomizedDLBandWidth***	Set this parameter based on the network plan. The **Cell.*CustomizedDLBandWidth*** and **Cell.*CustomizedULBandWidth*** parameters can be set to either the same value or different values. If they are set to different values, different numbers of RBs are punctured in the uplink and downlink.

Parameter Name	Parameter ID	Setting Notes
Customized uplink bandwidth	**Cell.*CustomizedULBandWidth***	Set this parameter based on the network plan.
Compact Bandwidth Control Interference Mode	**Cell.*CompactBwCtrlIntrfMode***	Set this parameter to its recommended value. This parameter can be set only if the **PUCCH_SRS_ADAPT_SWITCH** option of the **CellAlgoSwitch.*NonStandardBwAlgoSw*** parameter is selected.

Parameter Name	Parameter ID	Setting Notes
Uplink Punctured RB Number Offset	**Cell.*UlPuncturedRbNumOffset***	Set this parameter to **0** by default. If this parameter is set to a value other than **0**, the uplink PUCCH or PUSCH RBs are punctured or extended further on the basis of punctured RBs. Adjust this parameter based on the measured uplink interference from the UE. **NOTE** If this parameter is set to a value greater than 0, the uplink capacity decreases. If this parameter is set to a value greater than **2**, perform any of the following operations to prevent cell activation failures: Method 1: Set **SRSCFG**.***SrsCfgInd*** to **BOOLEAN_FALSE**. When this parameter is set to **BOOLEAN_TRUE**, the cell cannot be activated. With this method, all features that depend on SRS such as SFN and virtual 4T4R cannot be enabled. Method 2: Set the **RACHCfg**.***PrachFreqOffsetStrategy*** parameter to **AUTOMATIC** and set PUCCH-related parameters according to **Table 4-14**. Method 3: Select the **PUCCH_SRS_ADAPT_SWITCH** option of the **CellAlgoSwitch.*NonStandardBwAlgoSw*** parameter so that PUCCH and SRS resources are allocated based on the number of available uplink RBs. The PUCCH resources are allocated based on the maximum number of UEs that can be admitted to the cell, which is specified by the **CellRacThd**.***AcUserNumber*** parameter. This method is recommended as it is the adaptive method of method 2.

Parameter Name	Parameter ID	Setting Notes
		NOTE When the **PUCCH_SRS_ADAPT_SWITCH** option of the **CellAlgoSwitch.*NonStandardBwAlgoSw*** parameter is selected, the compact bandwidth supports the limited moving speed in high-speed railway scenarios. In high-speed railway scenarios, when the original bandwidth is 5 MHz, set the SRS period to 40 ms. When the original bandwidth is 10 MHz or higher, set the SRS period to 80 ms. For example, if the original bandwidth is 10 MHz, the cell-specific SRS bandwidth consists of 24 RBs, the UE-specific SRS bandwidth consists of 4 RBs, and the SRS period is 80 ms, the maximum moving speed under compact bandwidth can reach only 151 km/h. In other scenarios, the maximum moving speed can reach 300 km/h.

The following table describes the parameters used for function optimization in scenario 4.

Table 4-13 Parameters used for function optimization (scenario 4)

Parameter Name	Parameter ID	Option	Setting Notes
Non-Standard Bandwidth Algorithm Switch	**CellAlgoSwitch.*NonStandardBwAlgoSw***	PCFICH_POWER_OPT_SWITCH	Select this option.
		PDCCH_POWER_OPT_SWITCH	Select this option.
Downlink power control algorithm switch	**CellAlgoSwitch.*DlPcAlgoSwitch***	DlNonStandardBwMaxPwrSwitch	Select this option.
DL schedule switch	**CellAlgoSwitch.*DlSchSwitch***	EnAperiodicCqiRptSwitch	Select this option.
FD UE Enhanced Aperiodic CQI Trigger Period	**CellDlschAlgo.*FDUEEnhAperCQITrigPeriod***	N/A	Set this parameter to **40ms**.
PDCCH Power Enhanced Switch	**CellPdcchAlgo.*PdcchPowerEnhancedSwitch***	N/A	Set this parameter to **ON**.

Parameter Name	Parameter ID	Option	Setting Notes
PHICH duration	**PHICHCfg.*PhichDuration***	N/A	Set this parameter to **NORMAL**.
PHICH resource	**PHICHCfg.*PhichResource***	N/A	Set this parameter to **ONE**. In scenario 1, set this parameter to a value other than **TWO**.
RB Damage Cell Near Point User IBLER Thd	**CellDlschAlgo**.***RBDamageNearPointIblerTh***	N/A	Set this parameter to its recommended value if the power difference between LTE and other RATs cannot be calculated. You are advised to set this parameter to **0** if the power difference between LTE and other RATs can be calculated.

The following table describes the parameters used for function activation in all scenarios.

Table 4-14 Setting parameters related to the PUCCH

Parameter Name (ID)	Scenario 1 Use 5 MHz Bandwidth and Extended CP and Disable CA	Scenario 2 Use 5 MHz Bandwidth, CA, and Extended CP	Scenario 3 Use 10 MHz Bandwidth and Extended CP and Disable CA	Scenario 4 Use 10 MHz Bandwidth, CA, and Extended CP	Scenario 5 Use 15 MHz Bandwidth and Extended CP and Disable CA	Scenario 6 Use 15 MHz Bandwidth, CA, and Extended CP	Scenario 7 Use 20 MHz Bandwidth and Extended CP and Disable CA	Scenario 8 Use 20 MHz Bandwidth, CA, and Extended CP
PUCCH algorithm switch (**CellAlgoSwitch**.***PucchAlgoSwitch***)	Deselect the **PucchSwitch** option of this parameter.	Deselect the **PucchSwitch** option and select the **Dl2CCAckResShareSw** and **SCCAckResourceCfgSw** options of this parameter.	Deselect the **PucchSwitch** option of this parameter.	Deselect the **PucchSwitch** option and select the **Dl2CCAckResShareSw** option of this parameter. Select the **SCCAckResourceCfgSw** option of this parameter.	Deselect the **PucchSwitch** option of this parameter.	Deselect the **PucchSwitch** option and select the **Dl2CCAckResShareSw** and **SCCAckResourceCfgSw** options of this parameter.	Deselect the **PucchSwitch** option of this parameter.	Deselect the **PucchSwitch** option and select the **Dl2CCAckResShareSw** and **SCCAckResourceCfgSw** options of this parameter.
CQI Period Adaptive Switch (**CellCqiAdaptiveCfg**.***CqiPeriodAdaptive***)	OFF	OFF	Retain the default value.	OFF	OFF	OFF	OFF	OFF

Parameter Name (ID)	Scenario 1 Use 5 MHz Bandwidth and Extended CP and Disable CA	Scenario 2 Use 5 MHz Bandwidth, CA, and Extended CP	Scenario 3 Use 10 MHz Bandwidth and Extended CP and Disable CA	Scenario 4 Use 10 MHz Bandwidth, CA, and Extended CP	Scenario 5 Use 15 MHz Bandwidth and Extended CP and Disable CA	Scenario 6 Use 15 MHz Bandwidth, CA, and Extended CP	Scenario 7 Use 20 MHz Bandwidth and Extended CP and Disable CA	Scenario 8 Use 20 MHz Bandwidth, CA, and Extended CP
User CQI period **CellCqiAdaptiveCfg**.***UserCqiPeriod***	ms160	ms160	Retain the default value.	ms160	ms160	ms160	ms160	ms160
SRI Period Adaptive Switch (**PUCCHCfg**.***SriPeriodAdaptive***)	OFF	OFF	Retain the default value.	OFF	Retain the default value.	Retain the default value.	Retain the default value.	OFF
Delta shift (**PUCCHCfg.*DeltaShift***)	DS3_DELTA_SHIFT	DS3_DELTA_SHIFT	DS3_DELTA_SHIFT	DS3_DELTA_SHIFT	DS3_DELTA_SHIFT	DS3_DELTA_SHIFT	DS3_DELTA_SHIFT	DS3_DELTA_SHIFT
CQI RB number (**PUCCHCfg.*CqiRbNum***)	Set this parameter to **1**.	Set this parameter to **2**.	Set this parameter to **1**.	Set this parameter to **2**.	Set this parameter to **1**.	Set this parameter to **2**.	Set this parameter to **1**.	Set this parameter to **2**.

Parameter Name (ID)	Scenario 1 Use 5 MHz Bandwidth and Extended CP and Disable CA	Scenario 2 Use 5 MHz Bandwidth, CA, and Extended CP	Scenario 3 Use 10 MHz Bandwidth and Extended CP and Disable CA	Scenario 4 Use 10 MHz Bandwidth, CA, and Extended CP	Scenario 5 Use 15 MHz Bandwidth and Extended CP and Disable CA	Scenario 6 Use 15 MHz Bandwidth, CA, and Extended CP	Scenario 7 Use 20 MHz Bandwidth and Extended CP and Disable CA	Scenario 8 Use 20 MHz Bandwidth, CA, and Extended CP
ACK/SRI Channel Number (**PUCCHCfg**.***NaSriChNum***)	Set this parameter to **20**.	Set this parameter to **12**.	Set this parameter to **47**.	Set this parameter to **39**.	Set this parameter to **58**.	Set this parameter to **50**.	Set this parameter to **52**.	Set this parameter to **44**.
Format 3 RB Number (**PUCCHCfg**.***Format3RbNum***)	Retain the default value.	Set this parameter to **1**.	Retain the default value.	Set this parameter to **1**.	Retain the default value.	Set this parameter to **1**.	Retain the default value.	Set this parameter to **1**.
Max 2CC ACK Channel Number (**PUCCHCfg**.***Max2CCAckChNum***)	Retain the default value.	MAX_CH_NUM8	Retain the default value.	MAX_CH_NUM8	Retain the default value.	MAX_CH_NUM8	Retain the default value.	MAX_CH_NUM8
SRI Period (**CellQciPara.*SriPeriod***)	ms40	ms40	Retain the default value.	ms40	Retain the default value.	Retain the default value.	Retain the default value.	ms40

4.4.1.2 Using MML Commands

Activation Command Examples

Scenarios 1 and 2

```
ADD CELL: LocalCellId=0, CellName="0", FreqBand=3, UlEarfcnCfgInd=NOT_CFG,
DlEarfcn=1300, UlBandWidth=CELL_BW_N100, DlBandWidth=CELL_BW_N100, CellId=0,
PhyCellId=8, FddTddInd=CELL_FDD, RootSequenceIdx=0,
CustomizedBandWidthCfgInd=CFG, CustomizedDLBandWidth=183,
CustomizedULBandWidth=183, EmergencyAreaIdCfgInd=NOT_CFG,
UePowerMaxCfgInd=NOT_CFG, MultiRruCellFlag=BOOLEAN_FALSE, TxRxMode=2T2R;
```

Scenario 3

```
ADD CELL: LocalCellId=0, CellName="0", FreqBand=3, UlEarfcnCfgInd=NOT_CFG,
DlEarfcn=1300, UlBandWidth=CELL_BW_N100, DlBandWidth=CELL_BW_N100, CellId=0,
PhyCellId=8, FddTddInd=CELL_FDD, RootSequenceIdx=0,
CustomizedBandWidthCfgInd=CFG, CustomizedDLBandWidth=183,
CustomizedULBandWidth=183,DlPuncturedRbNum=0, EmergencyAreaIdCfgInd=NOT_CFG,
UePowerMaxCfgInd=NOT_CFG, MultiRruCellFlag=BOOLEAN_FALSE, TxRxMode=2T2R;
```

Scenario 4

```
ADD CELL: LocalCellId=0, CellName="0", FreqBand=3, UlEarfcnCfgInd=NOT_CFG,
DlEarfcn=1300, UlBandWidth=CELL_BW_N50, DlBandWidth=CELL_BW_N50, CellId=0,
PhyCellId=8, FddTddInd=CELL_FDD, RootSequenceIdx=0,
CustomizedBandWidthCfgInd=CFG, CustomizedDLBandWidth=87,
CustomizedULBandWidth=87, DlPuncturedRbNum=255, EmergencyAreaIdCfgInd=NOT_CFG,
UePowerMaxCfgInd=NOT_CFG, MultiRruCellFlag=BOOLEAN_FALSE, DlPuncturedRbNum=255,
CompactBwCtrlIntrfMode=REDUCED, UlPuncturedRbNumOffset=0, TxRxMode=2T2R;
```

Optimization Command Examples

Scenarios 1, 2, and 3

```
//Selecting the DlNonStandardBwMaxPwrSwitch option of the DlPcAlgoSwitch
parameter and modifying the reference signal power to ensure the coverage after
the feature activation
MOD CELLALGOSWITCH:LOCALCELLID=2,DLPCALGOSWITCH=DlNonStandardBwMaxPwrSwitch-1;

//Modifying the PHICH configuration
MOD PHICHCFG: LocalCellId=0, PhichDuration=NORMAL, PhichResource=ONE;
```

Scenario 4

```
//Turning on the non-standardized bandwidth algorithm switch
MOD
CELLALGOSWITCH:LOCALCELLID=0,NonStandardBwAlgoSw=PCFICH_POWER_OPT_SWITCH-1&PDCCH_P
OWER_OPT_SWITCH-1&PUCCH_SRS_ADAPT_SWITCH-1;

//Selecting the DlNonStandardBwMaxPwrSwitch option of the DlPcAlgoSwitch
parameter and modifying the reference signal power to ensure the coverage after
the feature activation
MOD CELLALGOSWITCH:LOCALCELLID=0,DLPCALGOSWITCH=DlNonStandardBwMaxPwrSwitch-1;

//Configuring the aperiodic CQI reporting period of a UE adopting frequency
diversity (FD) scheduling
MOD CELLDLSCHALGO:LOCALCELLID=0,FDUEEnhAperCQITrigPeriod=40ms;

//Enabling enhanced aperiodic CQI reporting
MOD CELLALGOSWITCH:LOCALCELLID=0,DLSCHSWITCH=EnAperiodicCqiRptSwitch-1;

//Turning on the PDCCH power enhanced switch
MOD CELLPDCCHALGO:LOCALCELLID=0,PdcchPowerEnhancedSwitch=ON;
```



```
//Modifying the PHICH configuration
MOD PHICHCFG: LocalCellId=0, PhichDuration=NORMAL, PhichResource=ONE;
```

Scenario 4 (If the power difference between LTE and other RATs cannot be calculated, perform the following operations based on the preceding optimization)

```
//Setting the RB Damage Cell Near Point User IBLER Thd parameter to its default
value 20
MOD CELLDLSCHALGO:LOCALCELLID=0,RBDamageNearPointIblerTh=20;
```

Scenario 4 (If the power difference between LTE and other RATs can be calculated, perform the following operations based on the preceding optimization)

```
//Setting the RB Damage Cell Near Point User IBLER Thd parameter
MOD CELLDLSCHALGO:LOCALCELLID=0,RBDamageNearPointIblerTh=0;
```

Deactivation Command Examples

```
//Disabling the compact bandwidth function
MOD CELL: LocalCellId=0, CustomizedBandWidthCfgInd=NOT_CFG;
```

4.4.1.3 Using the CME

For detailed operations, see CME-based Feature Configuration.

4.4.2 Activation Verification

The following procedure takes activation observation for the compact bandwidth within the range of 19-19.2 MHz as an example:

Step 1 Set the **Cell.*UlBandWidth*** and **Cell.*DlBandWidth*** parameters to **CELL_BW_N100(20M)**, **Cell.*CustomizedULBandWidth*** and **Cell.*CustomizedDLBandWidth*** parameters to the values within the range of 19 to 19.2 MHz, and the **Cell.*CustomizedBandWidthCfgInd*** parameter to **CFG**.

Step 2 After this feature is activated in a cell, check whether the value of **L.ChMeas.PRB.UL.Avail** is 98 and the value of **L.ChMeas.PRB.DL.Avail** is 96. If they are, compact bandwidth has been activated.

----End

The following procedure takes activation observation for the compact bandwidth in scenario 3 with 9.2 MHz original bandwidth and 9.6 MHz valid bandwidth as an example:

Step 1 Set the **Cell.*UlBandWidth*** and **Cell.*DlBandWidth*** parameters both to **10 MHz**, the **Cell.*CustomizedULBandWidth*** and **Cell.*CustomizedDLBandWidth*** parameters both to **9.2 MHz**, the **Cell.*CustomizedBandWidthCfgInd*** parameter to **CFG**, and the **Cell.*DlPuncturedRbNum*** parameter to **0**.

Step 2 After the cell is activated, check whether the value of **L.ChMeas.PRB.UL.Avail** is 48 and the value of **L.ChMeas.PRB.DL.Avail** is 50. If they are, the valid bandwidth for compact bandwidth has taken effect.

----End

NOTE

System Bandwidth in the result of the received signal strength indicator (RSSI) statistics monitoring task on the U2000 indicates the standardized bandwidth before compression.

4.4.3 Network Monitoring

Downlink cell capacity and **User Downlink Average Throughput** can be monitored to evaluate the gains brought by this function.

Cell downlink capacity = **L.ChMeas.PRB.DL.Avail** x ((**L.Traffic.DL.SCH.QPSK.TB.bits** + **L.Traffic.DL.SCH.16QAM.TB.bits** + **L.Traffic.DL.SCH.64QAM.TB.bits** + **L.Traffic.DL.SCH.256QAM.TB.bits**)/**L.ChMeas.PRB.DL.Used.Avg**/Measurement period/10^6)

If a compact bandwidth produces much higher cell downlink capacity and **User Downlink Average Throughput** than the corresponding standardized bandwidth, the compact bandwidth function takes effect. If standardized bandwidth performance is superior to compact bandwidth performance, this function does not take effect. For example, an operator that has a bandwidth of 14.6 MHz can use only 10 MHz bandwidth before the operator activates the compact bandwidth function. In contrast, the operator can use the 14.6 MHz bandwidth after activating the function.

5 Parameters

Table 5-1 Parameters

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
Cell	UlPuncturedRbNumOffset	ADD CELL MOD CELL LST CELL	LOFD-001051	Compact Bandwidth	Meaning: Indicates the offset for the number of RBs blocked in a cell in the uplink. This parameter applies only to LTE FDD. GUI Value Range: -5~8 Unit: None Actual Value Range: -5~8 Default Value: 0
Cell	CompactBwCtrlIntrfMode	ADD CELL MOD CELL LST CELL	LOFD-001051	Compact Bandwidth	Meaning: Indicates the interference control mode for scenarios where compact bandwidth is used. This parameter applies only to LTE FDD. GUI Value Range: NORMAL(NORMAL), REDUCED(REDUCED), REDUCED_LEFT(REDUCED_LEFT), REDUCED_RIGHT(REDUCED_RIGHT) Unit: None Actual Value Range: NORMAL, REDUCED, REDUCED_LEFT, REDUCED_RIGHT Default Value: NORMAL(NORMAL)

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	NonStandardBwAlgoSw	MOD CELLALGOSWITCH LST CELLALGOSWITCH	MRFD-130221 LOFD-001051	GSM and LTE Spectrum Concurrency (LTE FDD) Compact Bandwidth	Meaning: Indicates whether to enable enhanced algorithms in cells with non-standard bandwidths. PCFICH_POWER_OPT_SWITCH: Indicates whether to enable PCFICH power adaptation in cells with non-standard bandwidths. PCFICH power adaptation is enabled only if this option is selected. This option applies only to LTE FDD. PDCCH_POWER_OPT_SWITCH: Indicates whether to enable PDCCH power optimization in cells with non-standard bandwidths. PDCCH power optimization is enabled only if this option is selected. This option applies only to LTE FDD. PUCCH_SRS_ADAPT_SWITCH: Indicates whether to enable adaptive PUCCH and SRS resource allocation in cells with non-standard bandwidths. Adaptive PUCCH and SRS resource allocation is enabled only if this option is selected. This option applies only to LTE FDD. GUI Value Range: PCFICH_POWER_OPT_SWITCH(PCFICH_POWER_OPT_SWITCH), PDCCH_POWER_OPT_SWITCH(PDCCH_POWER_OPT_SWITCH), PUCCH_SRS_ADAPT_SWITCH(PUCCH_SRS_ADAPT_SWITCH) Unit: None Actual Value Range: PCFICH_POWER_OPT_SWITCH, PDCCH_POWER_OPT_SWITCH, PUCCH_SRS_ADAPT_SWITCH Default Value: PCFICH_POWER_OPT_SWITCH:Off, PDCCH_POWER_OPT_SWITCH:Off, PUCCH_SRS_ADAPT_SWITCH:Off

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
Cell	UlBandWidth	ADD CELL MOD CELL LST CELL	LOFD-001051 LBFD-002009/ TDLBFD-002009 TDLBFD-001003	Compact Bandwidth Broadcast of system information Scalable Bandwidth	Meaning: Indicates the UL bandwidth of the cell, which is based on the number of resource blocks (RBs). The value CELL_BW_N25 indicates a cell bandwidth of 25 RBs. The value CELL_BW_N50 indicates a cell bandwidth of 50 RBs. The mapping between the parameter value and the actual cell bandwidth (that is, the number of RBs) can be deduced similarly. For details, see 3GPP TS 36.104. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: CELL_BW_N6(1.4M), CELL_BW_N15(3M), CELL_BW_N25(5M), CELL_BW_N50(10M), CELL_BW_N75(15M), CELL_BW_N100(20M) Unit: None Actual Value Range: CELL_BW_N6, CELL_BW_N15, CELL_BW_N25, CELL_BW_N50, CELL_BW_N75, CELL_BW_N100 Default Value: None
Cell	DlBandWidth	ADD CELL MOD CELL DSP DDCELLGROUP LST CELL	LOFD-001051 LBFD-002009/ TDLBFD-002009 TDLBFD-001003	Compact Bandwidth Broadcast of system information Scalable Bandwidth	Meaning: Indicates the DL bandwidth of the cell, which is based on the number of resource blocks (RBs). The value CELL_BW_N25 indicates a cell bandwidth of 25 RBs. The value CELL_BW_N50 indicates a cell bandwidth of 50 RBs. The mapping between the parameter value and the actual cell bandwidth (that is, the number of RBs) can be deduced similarly. For details, see 3GPP TS 36.104. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: CELL_BW_N6(1.4M), CELL_BW_N15(3M), CELL_BW_N25(5M), CELL_BW_N50(10M), CELL_BW_N75(15M), CELL_BW_N100(20M) Unit: None Actual Value Range: CELL_BW_N6, CELL_BW_N15, CELL_BW_N25, CELL_BW_N50, CELL_BW_N75, CELL_BW_N100 Default Value: None

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
PHICHCfg	PhichResource	MOD PHICHCFG LST PHICHCFG	LBFD-002003/TDLBFD-002003 LOFD-001051 LBFD-002009/TDLBFD-002009	Physical Channel Management Compact Bandwidth Broadcast of system information	Meaning: Indicates a coefficient that is used to calculate the resources used by the PHICH for the cell. It corresponds to the Ng parameter in the protocol. For details on the usage of the Ng parameter, see 3GPP TS 36.211. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: ONE_SIXTH, HALF, ONE, TWO Unit: None Actual Value Range: ONE_SIXTH, HALF, ONE, TWO Default Value: ONE
Cell	PhyCellId	ADD CELL MOD CELL LST CELL	LOFD-001051 LBFD-002009/TDLBFD-002009/MLBFD-12000229	Compact Bandwidth Broadcast of system information	Meaning: Indicates the physical cell ID. For details, see 3GPP TS 36.331. GUI Value Range: 0~503 Unit: None Actual Value Range: 0~503 Default Value: None
Cell	DlPuncturedRbNum	ADD CELL MOD CELL LST CELL	LOFD-001051	Compact Bandwidth	Meaning: Indicates the number of downlink RBs blocked in a cell. This parameter applies only to LTE FDD. GUI Value Range: 0~13,255 Unit: None Actual Value Range: 0~13,255 Default Value: 255
Cell	CustomizedBandWidthCfgInd	ADD CELL MOD CELL LST CELL	LOFD-001051	Compact Bandwidth	Meaning: Indicates whether to configure a compact bandwidth for a cell. A compact bandwidth can be configured only when a standard bandwidth 1.4 MHz, 5 MHz, 10 MHz, 15 MHz, or 20 MHz has been configured. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: NOT_CFG(Not configure), CFG(Configure) Unit: None Actual Value Range: NOT_CFG, CFG Default Value: NOT_CFG(Not configure)

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
Cell	CustomizedULBandWidth	ADD CELL MOD CELL LST CELL	LOFD-001051	Compact Bandwidth	Meaning: Indicates a customized uplink bandwidth configured for a cell. A compact bandwidth can be configured only when a standard bandwidth 1.4 MHz, 5 MHz, 10 MHz, 15 MHz, or 20 MHz has been configured. This parameter applies only to LTE FDD. GUI Value Range: 12~14,44~50,74~75,80,87~100,139~150,175~178,183~200 Unit: 0.1MHz Actual Value Range: 1.2~1.4,4.4~5.0,7.4~7.5,8.0,8.7~10.0,13.9~15.0,17.5~17.8,18.3~20.0 Default Value: 98
Cell	CustomizedDLBandWidth	ADD CELL MOD CELL LST CELL	LOFD-001051	Compact Bandwidth	Meaning: Indicates a customized downlink bandwidth configured for a cell. A compact bandwidth can be configured only when a standard bandwidth 1.4 MHz, 5 MHz, 10 MHz, 15 MHz, or 20 MHz has been configured. This parameter applies only to LTE FDD. GUI Value Range: 12~14,44~50,74~75,80,87~100,139~150,175~178,183~200 Unit: 0.1MHz Actual Value Range: 1.2~1.4,4.4~5.0,7.4~7.5,8.0,8.7~10.0,13.9~15.0,17.5~17.8,18.3~20.0 Default Value: 98

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	UlPcAlgoSwitch	MOD CELLALGOSWITCH LST CELLALGOSWITCH	LBFD-002026/ TDLBFD-002026 LBFD-081101/ TDLBFD-081104 LEOFD-111305 TDLOFD-081232	Uplink Power Control PUCCH Outer Loop Power Control Virtual 4T4R Enhanced Uplink Power Control	Meaning: Indicates whether to enable power control for the PUSCH or PUCCH. This parameter includes the following options: CloseLoopSpsSwitch: Indicates whether to enable closed-loop power control for the PUSCH in semi-persistent scheduling mode. If this option is selected, TPC commands are adjusted based on correctness of the received initial-transmission packets to decrease the IBLER. This option applies only to LTE FDD and LTE TDD. InnerLoopPuschSwitch: Indicates whether to enable inner-loop power control for the PUSCH in dynamic scheduling mode. Inner-loop power control for the PUSCH in dynamic scheduling mode is enabled only when this option is selected. This option applies only to LTE FDD and LTE TDD. InnerLoopPucchSwitch: Indicates whether to enable inner-loop power control for the PUCCH. Inner-loop power control for the PUCCH is enabled only when this option is selected. This option applies only to LTE FDD and LTE TDD. CloseLoopOptPUSCHSwitch: Indicates whether to enable the optimization on closed-loop power control for the PUSCH in dynamic scheduling mode. The optimization is enabled only when this option is selected. This option applies only to LTE TDD. PucchPcDtxSinrSwitch: Indicates whether the eNodeB processes the measured uplink SINR in the DTX state when the PUCCH DTX is detected. If this option is deselected, the eNodeB does not process the measured uplink SINR in the DTX state when the PUCCH DTX is detected. If this option is selected, the eNodeB processes the measured uplink SINR even when PUCCH DTX is detected, generates power control commands based on the SINR, and delivers the power control commands to UEs. This option applies only to LTE FDD and LTE TDD. PuschIoTCtrlSwitch: Indicates whether to enable interference control in closed-loop power control for the PUSCH in dynamic scheduling mode. Interference control in closed-loop power control for the PUSCH in dynamic scheduling mode is enabled only when

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					this option is selected. This option applies only to LTE FDD and LTE TDD. SrsPcSwitch: Indicates whether to enable SRS power control adjustment. SRS power control adjustment is enabled only when this option is selected. This option applies only to LTE TDD. NearPointUeOptPUSCHSwitch: Indicates whether to apply optimized closed-loop power control for the PUSCH to UEs in the cell center. The optimization helps UEs in the cell center to prevent unnecessary power lowering due to inter-RAT or abrupt interference. Optimized closed-loop power control for the PUSCH is applied to UEs in the cell center only when this option is selected. This option applies only to LTE FDD. PuschRsrpHighThdSwitch: Indicates whether closed-loop power control for the PUSCH limits the maximum value of RSRP. If this option is deselected, closed-loop power control for the PUSCH does not limit the maximum value of RSRP. If this option is selected, the maximum value of RSRP cannot exceed the RSRP value specified by the PuschRsrpHighThd parameter in the CellPcAlgo MO. This option applies only to LTE FDD and LTE TDD. OuterLoopPucchSwitch: Indicates whether to enable outer-loop PUCCH power control. Outer-loop PUCCH power control is enabled only when this option is selected. This option applies only to LTE FDD and LTE TDD. PucchInitialPcSwitch: Indicates whether to apply fast PUCCH power control on newly accessed UEs. Fast PUCCH power control is applied to newly accessed UEs only when this option is selected. This option applies only to LTE FDD. GroupPCForPucchSwitch: Indicates whether to enable group power control for the PUCCH in dynamic scheduling mode. This option applies only to LTE TDD and requires UEs' support of group power control for the PUCCH. This option applies only to LTE TDD. NearBigPacketUeFastPcSwitch: Indicates whether to enable fast power increase for large-packet UEs in the cell center to counteract deep fading. Fast power increase is enabled for large-packet UEs in the cell center only if this option is selected. This option applies only to LTE FDD. UlCaPuschPcOptSwitch: If

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					this option is selected, large-packet UEs near the cell center can enter dual-transmission by decreasing the transmit power spectrum. This helps increase the uplink throughput when there are available SCC resources. If this option is deselected, dual-transmission conditions are met only when UEs are very close to the cell center. UEs near the cell center cannot enter dual-transmission. This option applies only to LTE FDD and LTE TDD. SpecUePUSCHPcOptSwitch: If this option is selected, the transmit power spectrum of target UEs increases in cells for which WTTx device-pipe synergy is enabled, increasing the uplink throughput. If this option is deselected, the transmit power spectrum of such UEs does not increase. This option applies only to LTE TDD. GUI Value Range: CloseLoopSpsSwitch(CloseLoopSpsSwitch), InnerLoopPuschSwitch(InnerLoopPuschSwitch), InnerLoopPucchSwitch(InnerLoopPucchSwitch), CloseLoopOptPUSCHS-witch(CloseLoopOptPUSCHSwitch), PucchPcDtxSinrSwitch(PucchPcDtxSinrSwitch), PuschIoTCtrlSwitch(PuschIoTCtrlSwitch), SrsPcSwitch(SrsPcSwitch), NearPointUeOptPUSCHS-witch(NearPointUeOptPUSCHSwitch), PuschRsrpHighThdSwitch(PuschRsrpHighThd-Switch), OuterLoopPucchSwitch(OuterLoopPucchS-witch), PucchInitialPcSwitch(PucchInitialPcSwitch), GroupPCForPucchSwitch(GroupPCForPucchSwitch), NearBigPacketUeFastPcSwitch(NearBigPacketUe-FastPcSwitch), UlCaPuschPcOptS-witch(UlCaPuschPcOptSwitch), SpecUePUSCHPcOptSwitch(SpecUePUSCHPcOptS-witch) Unit: None Actual Value Range: CloseLoopSpsSwitch, InnerLoopPuschSwitch, InnerLoopPucchSwitch, CloseLoopOptPUSCHSwitch, PucchPcDtxSinrS-witch, PuschIoTCtrlSwitch, SrsPcSwitch, NearPointUeOptPUSCHSwitch, PuschRsrpHighThd-Switch, OuterLoopPucchSwitch, PucchInitialPcS-witch, GroupPCForPucchSwitch, NearBigPacketUe-FastPcSwitch, UlCaPuschPcOptSwitch, SpecUePUSCHPcOptSwitch

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					Default Value: CloseLoopSpsSwitch:Off, InnerLoopPuschSwitch:On, InnerLoopPucchSwitch:On, CloseLoopOptPUSCHSwitch:Off, PucchPcDtxSinrSwitch:On, PuschIoTCtrlSwitch:Off, SrsPcSwitch:On, NearPointUeOptPUSCHSwitch:Off, PuschRsrpHighThdSwitch:Off, OuterLoopPucchSwitch:Off, PucchInitialPcSwitch:On, GroupPCForPucchSwitch:Off, NearBigPacketUeFastPcSwitch:Off, UlCaPuschPcOptSwitch:Off, SpecUePUSCHPcOptSwitch:Off

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	DlPcAlgoSwitch	MOD CELLALGOSWITCH LST CELLALGOSWITCH	LBFD-002003/ TDLBFD-002003 LBFD-002016/ TDLBFD-002016 TDLOFD-001049 TDLOFD-001061 LOFD-001051 LEOFD-121204	Physical Channel Management Dynamic Downlink Power Allocation Single Streaming Beamforming Dual Streaming Beamforming Compact Bandwidth 3D Beamforming	Meaning: Indicates whether to enable power control for the PDSCH, PDCCH, and PHICH. PhichInnerLoopPcSwitch: Indicates whether to enable PHICH inner-loop power control. If this option is deselected, only the initial transmit power for the PHICH is set. If this option is selected, the eNodeB controls the physical channel transmit power for the convergence of the receive SINR to the target SINR. This option applies only to LTE FDD and LTE TDD. PdcchPcSwitch: Indicates whether to enable PDCCH power control. If this option is deselected, power is allocated evenly on the PDCCH. If this option is selected, the PDCCH power is adjusted dynamically. This option applies only to LTE FDD and LTE TDD. EDlMaxTXPwrSwitch: If this option is deselected, the maximum transmit power of the cell is determined by the RS power and the scaling factor indexes Pa and Pb. If this option is selected, the maximum transmit power of the cell can be increased to improve the cell RB usage. This option has no impact on 10 MHz, 15 MHz and 20 MHz LTE TDD cells. This option applies only to LTE FDD. BFModeUserPwrSwitch: Indicates whether to enable power optimization for beamforming UEs. If this option is deselected, the original power allocation scheme is adopted for beamforming UEs. If this option is selected, the eNodeB uses the configured power headroom to increase the power for beamforming UEs. This option applies only to LTE TDD. SigPowerIncreaseSwitch: Indicates whether to enable signaling power improvement. If this option is selected, the PDSCH transmit power increases when scheduling is performed for downlink retransmission of signaling during network entry. This option applies only to LTE TDD. BFModeUserAdptPwrSwitch: Indicates whether to enable power adaptation for beamforming UEs. If this option is selected, the eNodeB adaptively increases the power of beamforming UEs in the cell based on the available power of the RRU and loads at neighboring cell edges. In this way, the average cell

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					throughput increases. This option applies only to LTE TDD. BfEnhChnPwrFormSwitch: Indicates whether to enable enhanced channel power forming for beamforming. If this option is selected, the eNodeB determines the TX power differences between antennas based on the Eigen beamforming weights of the antennas, determines the channel power headroom based on the percentage of idle RBs available in the current TTI in downlink scheduling, and flexibly allocates TX power to each channel of the RRU. This option applies only to LTE TDD. DlNonStandardBwMaxPwrSwitch: If this option is deselected, the eNodeB determines the maximum transmit power of a cell of a non-standard bandwidth based on the number of available downlink RBs for a standard bandwidth. If this option is selected, the eNodeB determines the maximum power of a cell of a non-standard bandwidth based on the number of available downlink RBs for a customized bandwidth. Changing the setting of this option will change the calculated total power and require cell re-activation. This option applies only to LTE FDD. PhichPwrRestrictSwitch: Indicates whether to enable PHICH power restriction. If this option is selected, the maximum number of UEs that can be scheduled in the uplink in each TTI is restricted by available PHICH power resources. If this option is deselected, the maximum number is not restricted by available PHICH power resources. This option takes effect only on cells with Cell.TxRxMode set to a value other than 64T64R. This option applies only to LTE FDD and LTE TDD. GUI Value Range: PhichInnerLoopPcSwitch, PdcchPcSwitch, EDlMaxTXPwrSwitch, BFModeUserPwrSwitch, SigPowerIncreaseSwitch, BFModeUserAdptPwrSwitch, BfEnhChnPwrFormSwitch(BfEnhChnPwrFormSwitch), DlNonStandardBwMaxPwrSwitch(DlNonStandardBwMaxPwrSwitch), PhichPwrRestrictSwitch(PhichPwrRestrictSwitch) Unit: None Actual Value Range: PhichInnerLoopPcSwitch, PdcchPcSwitch, EDlMaxTXPwrSwitch, BFModeUserPwrSwitch, SigPowerIncreaseSwitch, BFModeUserAdptPwrSwitch, BfEnhChnPwrFormS-

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					witch, DlNonStandardBwMaxPwrSwitch, PhichPwrRestrictSwitch Default Value: PhichInnerLoopPcSwitch:Off, PdcchPcSwitch:On, EDlMaxTXPwrSwitch:Off, BFModeUserPwrSwitch:Off, SigPowerIncreaseSwitch:Off, BFModeUserAdptPwrSwitch:Off, BfEnhChnPwrFormSwitch:Off, DlNonStandardBwMaxPwrSwitch:Off, PhichPwrRestrictSwitch:Off
ENodeBAlgoSwitch	PciConflictDetectSwitch	MOD ENODEBALGOSWITCH LST ENODEBALGOSWITCH	LOFD-002007/ TDLOFD-002007	PCI Collision Detection and Self-Optimization	Meaning: Indicates whether to report PCI conflict information. This parameter is used with the PciConflictAlmSwitch parameter in the ENodeBAlgoSwitch MO. COLLISION_DETECT_SWITCH: If this option is selected and the PciConflictAlmSwitch parameter in the ENodeBAlgoSwitch MO is set to ON(On), PCI collision information is displayed on the alarm console if a PCI collision occurs. If this option is deselected or the PciConflictAlmSwitch parameter in the ENodeBAlgoSwitch MO is set to OFF(Off), PCI collision information is not displayed on the alarm console. For details about PCI collision, see 3GPP TS 36.902. This option applies only to LTE FDD and LTE TDD. CONFUSION_DETECT_SWITCH: If this option is selected and the PciConflictAlmSwitch parameter in the ENodeBAlgoSwitch MO is set to ON(On), PCI confusion information is displayed on the alarm console if a PCI confusion occurs. If this option is deselected or the PciConflictAlmSwitch parameter in the ENodeBAlgoSwitch MO is set to OFF(Off), PCI confusion information is not displayed on the alarm console. For details about PCI confusion, see 3GPP TS 36.902. This option applies only to LTE FDD and LTE TDD. GUI Value Range: COLLISION_DETECT_SWITCH(COLLISION_DETECT_SWITCH), CONFUSION_DETECT_SWITCH(CONFUSION_DETECT_SWITCH) Unit: None Actual Value Range: COLLISION_DETECT_SWITCH, CONFUSION_DETECT_SWITCH Default Value: COLLISION_DETECT_SWITCH:Off, CONFUSION_DETECT_SWITCH:On

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	CqiAdjAlgoSwitch	MOD CELLALGOSWITCH LST CELLALGOSWITCH	LBFD-00101501 / TDLBFD-00101501 LBFD-00101502 / TDLBFD-00101502 LBFD-002005/ TDLBFD-002005 TDLOFD-081231	CQI Adjustment Dynamic Scheduling DL Asynchronous HARQ Optimized CFI-Calculation-based MCS Index Selection	Meaning: CqiAdjAlgoSwitch: Indicates whether to allow the eNodeB to adjust the UE-reported CQI based on the initial block error rate (IBLER). If this option is selected, the CQI adjustment algorithm is enabled. In this case, the eNodeB adjusts the UE-reported CQI based on the IBLER. If this option is deselected, the CQI adjustment algorithm is disabled. In this case, the eNodeB does not adjust the UE-reported CQI based on the IBLER. This option applies only to LTE FDD and LTE TDD. StepVarySwitch: Indicates whether to enable variable-step-based adjustment. If this option is selected, variable-step-based adjustment is enabled to accelerate the convergence of IBLER. In this case, rapid adjustment at large steps is applied if there is a large difference between the measured IBLER and target IBLER; fine-tuning at small steps is applied if the measured IBLER is close to the target IBLER. If this option is deselected, the adjustment is performed at a fixed step. This option applies only to LTE FDD and LTE TDD. DlVarIBLERtargetSwitch: Indicates whether to enable downlink target IBLER adaptation. If this option is selected, the downlink target IBLER is adaptively adjusted based on the TBS to improve spectral efficiency. If this option is deselected, the target IBLER is determined based on the setting of the DlEnVarIblerTargetSwitch option of this parameter. This option applies only to LTE FDD and LTE TDD. TddBundlingCqiAdjOptSwitch: Indicates whether to enable optimized CQI adjustment in ACK bundling mode. If this option is selected, optimized CQI adjustment is enabled. If this option is deselected, optimized CQI adjustment is disabled. This option applies only to LTE TDD. TddMultiplexingCqiAdjOptSwitch: Indicates whether to enable optimized CQI adjustment in ACK multiplexing mode. If this option is selected, optimized CQI adjustment is enabled. If this option is deselected, optimized CQI adjustment is disabled. This option applies only to LTE TDD. AdaptiveStepVarySwitch: Indicates whether to enable adaptive step change in CQI adjustment. This option applies only to LTE FDD and LTE TDD. If this option

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					is selected, the CQI adjustment is performed at a large step when significant changes in the signal quality are detected, accelerating the IBLER convergence. If this option is deselected, the CQI adjustment is performed at a fixed step. DlCqiAdjDeltaOptSwitch: Indicates whether to optimize CQI adjustment value calculation. If this option is deselected, the CQI adjustment value is calculated using the following formula: CQI adjustment value = (Number of ACKs for initial transmissions x CQI adjustment value per ACK + Number of NACKs for initial transmissions x CQI adjustment value per NACK)/(Number of NACKs for initial transmissions + Number of ACKs for initial transmissions). If this option is selected, the CQI adjustment value is calculated using the following formula: CQI adjustment value = Number of ACKs for initial transmissions x CQI adjustment value per ACK + Number of NACKs for initial transmissions x CQI adjustment value per NACK. This option applies only to LTE FDD and LTE TDD. DlEnVarIblerTargetSwitch: Indicates whether to enable enhanced downlink target IBLER adaptation. If this option is selected, the downlink target IBLER is adaptively adjusted based on CQI fluctuation and TBS. If this option is deselected, the downlink target IBLER policy is controlled by the DlVarIBLERtargetSwitch option of this parameter. This option applies only to LTE FDD and LTE TDD. DlRetxTbsIndexAdjOptSwitch: Indicates whether to optimize transport block size (TBS) index adjustment in retransmissions. If this option is selected, TBS index adjustment in retransmissions is optimized. The TBS index is lowered for the scheduling of the last two retransmissions, and the TBS index is determined based on the CQI adjustment result for the scheduling of other retransmissions. If this option is deselected, TBS index adjustment in retransmissions is not optimized. The TBS index is determined based on the CQI adjustment result for the scheduling of all retransmissions. This option applies only to LTE FDD and LTE TDD. CfiConvertOptSwitch: Indicates whether to optimize CFI conversion. If this option is selected, new CFI calculation tables for normal and special subframes are used to ensure more accurate MCS selection in

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					normal and special subframes and facilitate IBLER convergence to the target value. If this option is deselected, the original CFI calculation tables for normal and special subframes are used. This option applies only to LTE TDD. BundlingOptThdSwitch: Indicates whether to adjust the MCS index threshold for enabling the optimized CQI adjustment algorithm in TDD bundling mode. If this option is selected, the lower MCS index threshold for enabling the optimized CQI adjustment algorithm in TDD bundling mode is changed from MCS index 6 to MCS index 0. If this option is deselected, the lower MCS index threshold for enabling the optimized CQI adjustment algorithm in TDD bundling mode is MCS index 6. This option applies only to LTE TDD. DlSpsMcsIncreaseSwitch: Indicates whether to enable MCS index increase for semi-persistent scheduling (SPS). If this option is selected, MCS index increase is enabled for SPS, reducing the number of RBs for SPS and improving cell performance when RB resources are limited. However, the VoLTE MOS value may decrease. If this option is deselected, MCS index increase is disabled for SPS, increasing the VoLTE MOS value. However, more RBs may be consumed for SPS. This option applies only to LTE FDD and LTE TDD. CqiAdjTimeEffSwitch: Indicates whether to enable validity evaluation and adjustment for CQI adjustment values, and whether to trigger large-step-based CQI adjustment when a long time has elapsed before a UE begins to perform services based on the setting of the AdaptiveStepVarySwitch option of this parameter. If this option is selected, the eNodeB evaluates the validity of all CQI adjustment values in a unified manner and adjusts these adjustment values based on the evaluation results. If this option and the AdaptiveStepVarySwitch option are selected, large-step-based CQI adjustment is triggered when a long time has elapsed before a UE begins to perform services. If this option is deselected, the eNodeB does not evaluate the validity of CQI adjustment values or adjust these values in a unified manner, and large-step-based CQI adjustment is not triggered when a long time has elapsed before a UE begins to perform services. This option applies only to LTE TDD. RptCqiFltInitSwitch: Indicates whether to adjust the initial filtered value of the reported CQI. If this option

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					is selected, the initial filtered value of the reported CQI is determined based on the CQI value reported by the UE, and the filtering coefficient for the reported CQI in the first several reporting periods is adjusted. If this option is deselected, the initial filtered value of CQIs reported by all UEs is fixed to 4. This option applies only to LTE FDD and LTE TDD. UeSigInitCqiModSwitch: Indicates the time when the reported initial CQI takes effect. If this option is selected, the reported initial CQI takes effect when the ACK to Msg4 HARQ retransmission is received or when Msg5 is received. If this option is deselected, the reported CQI immediately takes effect. This option applies only to LTE TDD. CqiFastCompstSwitch: Indicates whether the eNodeB performs fast CQI compensation for the following UEs: UEs handed over to cells whose values of PCI modulo 3 conflict with source cells' values of PCI modulo 3, beamforming UEs in 8T8R cells, and UEs reporting aperiodic CQIs during network access in busy hours. If this option is selected, the eNodeB identifies these UEs and quickly compensates for their CQIs. If this option is deselected, the eNodeB does not identify these UEs for CQI compensation. This option applies only to LTE TDD. CfiConvertWiDrsSwitch: Indicates whether to consider the DMRS overhead when converting the control format indicator (CFI) for beamforming UEs. If this option is selected, the eNodeB considers the DMRS overhead when converting the CFI of beamforming UEs. If this option is deselected, the eNodeB does not consider the DMRS overhead when converting the CFI of beamforming UEs in open-loop TM7, TM8, or TM9 mode. This option applies only to LTE FDD and LTE TDD. IblerCqiOffsetSwitch: Indicates whether to perform CQI compensation based on the target IBLER. The eNodeB performs CQI compensation based on the target IBLER only if this option is selected. This option applies only to LTE TDD. CqiFltOptSwitch: Indicates whether to optimize CQI filtering. If this option is selected, the eNodeB determines whether to discard a UE-reported CQI based on this reported CQI and the previous HARQ retransmission IBLER, does not filter CQIs again in case of TM change, and triggers both large step

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					increase and large step decrease during step adaptation. If this option is deselected, the eNodeB directly uses UE-reported CQIs, filters CQIs again in case of TM change, and triggers only large step increase during step adaptation. This option applies only to LTE TDD. PreciseMcsAdaptSwitch: Indicates whether to enable precise MCS adaptation. If this option is selected, the eNodeB selects the TBS with a higher index for the first downlink HARQ retransmission. In addition, when the initial CQI adjustment value is relatively conservative, the eNodeB increases and compensates for the CQI adjustment value. If this option is deselected, the eNodeB does not perform the preceding operations. This option applies only to LTE FDD. PilotOffCqiAdjOptSwitch: Indicates CQI adaptation optimization for CRS transmission disabling. If this option is selected, for UEs regarded as large-packet UEs when the BreathingPilotSwitch or EmimoCpsSwitch option is selected, the CQI adjustment is performed at a large step in case of significant signal quality changes. If this option is deselected, the CQI adjustment is performed at a fixed step for the preceding UEs. This option applies only to LTE FDD. GUI Value Range: CqiAdjAlgoSwitch(CqiAdjAlgoSwitch), StepVarySwitch(StepVarySwitch), DlVarIBLERtargetSwitch(DlVarIBLERtargetSwitch), TddBundlingCqiAdjOptSwitch(TddBundlingCqiAdjOptSwitch), TddMultiplexingCqiAdjOptSwitch(TddMultiplexingCqiAdjOptSwitch), AdaptiveStepVarySwitch(AdaptiveStepVarySwitch), DlCqiAdjDeltaOptSwitch(DlCqiAdjDeltaOptSwitch), DlEnVarIblerTargetSwitch(DlEnVarIblerTargetSwitch), DlRetxTbsIndexAdjOptSwitch(DlRetxTbsIndexAdjOptSwitch), CfiConvertOptSwitch(CfiConvertOptSwitch), BundlingOptThdSwitch(BundlingOptThdSwitch), DlSpsMcsIncreaseSwitch(DlSpsMcsIncreaseSwitch), CqiAdjTimeEffSwitch(CqiAdjTimeEffSwitch), RptCqiFltInitSwitch(RptCqiFltInitSwitch), UeSigInitCqiModSwitch(UeSigInitCqiModSwitch), CqiFastCompstSwitch(CqiFastCompstSwitch), CfiConvertWiDrsSwitch(CfiConvertWiDrsSwitch), IblerCqiOffsetSwitch(IblerCqiOffsetSwitch),

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					CqiFltOptSwitch(CqiFltOptSwitch), PreciseMcsAdaptSwitch(PreciseMcsAdaptSwitch), PilotOffCqiAdjOptSwitch(PilotOffCqiAdjOptSwitch) Unit: None Actual Value Range: CqiAdjAlgoSwitch, StepVarySwitch, DlVarIBLERtargetSwitch, TddBundlingCqiAdjOptSwitch, TddMultiplexingCqiAdjOptSwitch, AdaptiveStepVarySwitch, DlCqiAdjDeltaOptSwitch, DlEnVarIblerTargetSwitch, DlRetxTbsIndexAdjOptSwitch, CfiConvertOptSwitch, BundlingOptThdSwitch, DlSpsMcsIncreaseSwitch, CqiAdjTimeEffSwitch, RptCqiFltInitSwitch, UeSigInitCqiModSwitch, CqiFastCompstSwitch, CfiConvertWiDrsSwitch, IblerCqiOffsetSwitch, CqiFltOptSwitch, PreciseMcsAdaptSwitch, PilotOffCqiAdjOptSwitch Default Value: CqiAdjAlgoSwitch:On, StepVarySwitch:Off, DlVarIBLERtargetSwitch:Off, TddBundlingCqiAdjOptSwitch:Off, TddMultiplexingCqiAdjOptSwitch:Off, AdaptiveStepVarySwitch:Off, DlCqiAdjDeltaOptSwitch:Off, DlEnVarIblerTargetSwitch:Off, DlRetxTbsIndexAdjOptSwitch:On, CfiConvertOptSwitch:Off, BundlingOptThdSwitch:Off, DlSpsMcsIncreaseSwitch:Off, CqiAdjTimeEffSwitch:Off, RptCqiFltInitSwitch:On, UeSigInitCqiModSwitch:Off, CqiFastCompstSwitch:Off, CfiConvertWiDrsSwitch:Off, IblerCqiOffsetSwitch:Off, CqiFltOptSwitch:Off, PreciseMcsAdaptSwitch:Off, PilotOffCqiAdjOptSwitch:Off

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	RacAlgoSwitch	MOD CELLALGOSWITCH LST CELLALGOSWITCH	LBFD-002023/ TDLBFD-002023 LBFD-002024/ TDLBFD-002024 LOFD-0102901/ TDLOFD-00102901 LOFD-081218/ TDLOFD-110230 LTROFD-111201/ TDLOFD-121103 LTROFD-111202/ TDLOFD-121104 LBFD-002028/ TDLBFD-002028 LOFD-002015/ TDLOFD-002015/ TDLOFD-002015	Admission Control Congestion Control Radio and Transmission Resource Pre-Emption Enhanced Extended QCI MCPTT QoS Management Congestion Control for Public Safety Emergency call RACH Optimization Enhanced Extended QCI	Meaning: Indicates whether to enable admission and load control algorithms. DlSwitch: Indicates whether to enable satisfaction-rate-based downlink admission control. If this option is selected, satisfaction-rate-based downlink admission control is enabled. If this option is deselected, satisfaction-rate-based downlink admission control is disabled. During the calculation of the satisfaction rate of services with different QCIs, the satisfaction estimation method dedicated to VoIP services is implemented on services with QCI 1. If a service with QCI 1 is not a VoIP service, the satisfaction rate calculated using this method is lower than the actual value, which affects the admission of GBR services. Therefore, if all services with QCI 1 are not VoIP services, it is recommended that this option be deselected. This option applies only to LTE FDD and LTE TDD. UlSwitch: Indicates whether to enable satisfaction-rate-based uplink admission control. If this option is selected, satisfaction-rate-based uplink admission control is enabled. If this option is deselected, satisfaction-rate-based uplink admission control is disabled. During the calculation of the satisfaction rate of services with different QCIs, the satisfaction estimation method dedicated to VoIP services is implemented on services with QCI 1. If a service with QCI 1 is not a VoIP service, the satisfaction rate calculated using this method is lower than the actual value, which affects the admission of GBR services. Therefore, if all services with QCI 1 are not VoIP services, it is recommended that this option be deselected. This option applies only to LTE FDD and LTE TDD. DlLdcSwitch: Indicates whether to perform downlink load control for a cell. If this option is selected, the eNodeB checks for congestion in the downlink for the cell. If the cell is congested in the downlink, the eNodeB performs load control for the cell. If this option is deselected, the eNodeB does not check for congestion in the downlink for the cell and downlink congestion of the cell, if any, cannot be relieved. During the calculation of the satisfaction rate of services with different QCIs, the satisfaction estimation method dedicated to VoIP services is implemented on services with QCI 1. If a service with

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
			TDLOFD-110230		QCI 1 is not a VoIP service, the satisfaction rate calculated using this method is lower than the actual value, which affects the cell load control. Therefore, if all services with QCI 1 are not VoIP services, it is recommended that this option be deselected. This option applies only to LTE FDD and LTE TDD. UlLdcSwitch: Indicates whether to perform uplink load control for the cell. If this option is selected, the eNodeB checks for congestion in the uplink for the cell. If the cell is congested in the uplink, the eNodeB performs load control for the cell. If this option is deselected, the eNodeB does not check for congestion in the uplink for the cell and uplink congestion of the cell, if any, cannot be relieved. During the calculation of the satisfaction rate of services with different QCIs, the satisfaction estimation method dedicated to VoIP services is implemented on services with QCI 1. If a service with QCI 1 is not a VoIP service, the satisfaction rate calculated using this method is lower than the actual value, which affects the cell load control. Therefore, if all services with QCI 1 are not VoIP services, it is recommended that this option be deselected. This option applies only to LTE FDD and LTE TDD. PreemptionSwitch: Indicates whether to enable resource preemption. If this option is selected, the eNodeB allows high-priority services to preempt resources for admission when admission of such services fails. If this option is deselected, only emergency calls can be admitted when resources are insufficient. This option applies only to LTE FDD and LTE TDD. PttAcSwitch: Indicates whether to enable RB usage-based admission control for PTT services. If this option is selected, RB usage-based admission control is enabled for PTT services. If this option is deselected, RB usage-based admission control is disabled for PTT services. This option applies only to LTE FDD and LTE TDD. VoltePrefAdmissionSwitch: Indicates whether to enable preferential access of VoLTE services. This option takes effect only when the EutranVoipSupportSwitch parameter in the ENodeBAlgoSwitch MO is set to ON(On). If this option is selected, VoLTE services can be preferentially admitted to the network. If this option is

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					deselected, VoLTE services cannot be preferentially admitted to the network. This option applies only to LTE FDD and LTE TDD. VoltePreemptionSwitch: Indicates whether to allow VoLTE UEs to preempt resources of other UEs to ensure preferential access of VoLTE services. This option takes effect only when the VoltePrefAdmissionSwitch option of this parameter is selected. If this option is selected, VoLTE UEs can preempt resources of other UEs. If this option is deselected, VoLTE UEs cannot preempt resources of other UEs. This option applies only to LTE FDD and LTE TDD. UeExpBasedCongCtrlSw: If this option is selected, the eNodeB reduces the number of uplink and downlink scheduling times for UEs with poor signal quality when the cell is congested. If this option is deselected, the eNodeB takes no actions when the cell is congested. This option applies only to LTE FDD and LTE TDD. EmcAdmitCongSwitch: Indicates the admission and congestion control policies for emergency calls. If this option is selected, emergency call services can be admitted based on the QoS satisfaction rate when the MCPTT QoS Management and Congestion Control for Public Safety features take effect. In addition, services with a higher ARP priority than that of emergency call services can preempt resources for emergency call services, which means that emergency call services may be released during congestion control. If this option is deselected, emergency call services can be admitted directly and cannot be preempted or released. This option takes effect only when both the MCPTT QoS Management and Congestion Control for Public Safety features take effect. This option applies only to LTE FDD and LTE TDD. DlDelayBasedSatisStatSw: Indicates whether to enable downlink delay-based satisfaction rate statistics mode. If this option is selected, the eNodeB uses this mode for downlink delay-sensitive services with QCIs of 3 and 75 and the statistics about these services are collected together. If this option is deselected, the eNodeB inherits the mode that is used in earlier versions for services with QCI of 3. This option applies only to LTE FDD and LTE TDD.

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					SpanPlmnVoicePreemptionSwitch: Indicates whether the eNodeB allows voice UEs to preempt inter-PLMN resources in RAN sharing scenarios. If this option is selected, the preemption is enabled. If this option is deselected, the preemption is disabled. GUI Value Range: DlSwitch(dlCacSwitch), UlSwitch(ulCacSwitch), DlLdcSwitch(dlLdcSwitch), UlLdcSwitch(ulLdcSwitch), PreemptionSwitch(PreemptionSwitch), PttAcSwitch(PttAcSwitch), VoltePrefAdmissionSwitch(VoltePrefAdmissionSwitch), VoltePreemptionSwitch(VoltePreemptionSwitch), UeExpBasedCongCtrlSw(UeExpBasedCongCtrlSw), EmcAdmitCongSwitch(EmcAdmitCongSwitch), DlDelayBasedSatisStatSw(DlDelayBasedSatisStatSw) Unit: None Actual Value Range: DlSwitch, UlSwitch, DlLdcSwitch, UlLdcSwitch, PreemptionSwitch, PttAcSwitch, VoltePrefAdmissionSwitch, VoltePreemptionSwitch, UeExpBasedCongCtrlSw, EmcAdmitCongSwitch, DlDelayBasedSatisStatSw Default Value: DlSwitch:Off, UlSwitch:Off, DlLdcSwitch:Off, UlLdcSwitch:Off, PreemptionSwitch:Off, PttAcSwitch:Off, VoltePrefAdmissionSwitch:Off, VoltePreemptionSwitch:Off, UeExpBasedCongCtrlSw:Off, EmcAdmitCongSwitch:Off, DlDelayBasedSatisStatSw:Off

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	MlbAlgoSwitch	MOD CELLALGOSWITCH LST CELLALGOSWITCH	LOFD-001032/ TDLOFD-001032 LOFD-001044/ TDLOFD-001044 LOFD-001045/ TDLOFD-001045 LOFD-001057/ TDLOFD-001057 LOFD-081218 LTROFD-111201/ TDLOFD-121103 LOFD-121201/ TDLOFD-131046 TDLOFD-070215/ TDLOFD-070215 TDLOFD-110230 LTROFD-111202/ TDLOFD	Intra-LTE Load Balancing Inter-RAT Load Sharing to UTRAN Inter-RAT Load Sharing to GERAN Load Balancing based on Transport QoS Enhanced Extended QCI MCPTT QoS Management Multi-band Optimal Carrier Selection Intra-LTE User Number Load Balancing Enhanced	Meaning: Indicates whether to enable MLB algorithms. This parameter provides the following options: InterFreqMlbSwitch, InterFreqIdleMlbSwitch, InterFreqBlindMlbSwitch, UtranMlbSwitch, UtranIdleMlbSwitch, GeranMlbSwitch, MlbLoadInfoSwitch, VoIPOffloadSwitch, PTTOffloadSwitch, MbfcsSwitch. If one option is selected, the corresponding algorithm is enabled to balance the load between the serving cell and neighboring cells of the specified category. InterFreqMlbSwitch: Indicates whether to enable inter-frequency MLB. Inter-frequency MLB is enabled only if this option is selected. This option applies only to LTE FDD and LTE TDD. UtranMlbSwitch: Indicates whether to enable MLB to UTRAN. MLB to UTRAN is enabled only if this option is selected. This option applies only to LTE FDD and LTE TDD. GeranMlbSwitch: Indicates whether to enable MLB to GERAN. MLB to GERAN is enabled only if this option is selected. This option applies only to LTE FDD and LTE TDD. UtranIdleMlbSwitch: Indicates whether to enable MLB to UTRAN by transferring UEs in idle mode. MLB to UTRAN by transferring UEs in idle mode is enabled only if this option is selected. This option applies only to LTE FDD and LTE TDD. MlbLoadInfoSwitch: Indicates whether the load of an inter-RAT cell is considered when MLB is performed between an E-UTRAN cell and an inter-RAT cell. The load of an inter-RAT cell is considered during MLB between an E-UTRAN cell and an inter-RAT cell only if this option is selected. This inter-RAT cell must be a UTRAN cell in the current version. If both the MlbLoadInfoSwitch and UtranMlbSwitch options are selected, a UTRAN cell whose load status has been obtained and is normal or medium can be a candidate cell for MLB to UTRAN. If both the MlbLoadInfoSwitch and UtranIdleMlbSwitch options are selected, a UTRAN cell whose load status has been obtained and is normal can be a candidate cell for MLB to UTRAN. This option applies only to LTE FDD and LTE TDD.

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
			D-121104 LAOFD-131011 / TDLOFD-131047	Extended QCI Congestion Control for Public Safety Inter-vendor MLB	InterFreqBlindMlbSwitch: Indicates whether to enable inter-frequency MLB without load information exchange. Inter-frequency MLB without load information exchange is enabled only if this option is selected. This option applies only to LTE FDD and LTE TDD. InterFreqIdleMlbSwitch: Indicates whether to enable inter-frequency MLB by transferring UEs in idle mode. Inter-frequency MLB by transferring UEs in idle mode is enabled only if this option is selected. If this option is selected, this type of MLB takes effect only if at least one inter-frequency MLB mode is selected for UEs in idle mode. This option applies only to LTE FDD and LTE TDD. VoIPOffloadSwitch: Indicates whether to enable the VoIP offload function. If this option is selected, satisfaction rate assessment is performed for VoIP services. If the satisfaction rate of VoIP services is lower than the preset threshold, inter-frequency or inter-RAT offload of VoIP services is triggered. If this option is deselected, the VoIP offload function is disabled. This option applies only to LTE FDD and LTE TDD. PTTOffloadSwitch: Indicates whether to enable the PTT voice service offload function. If this option is selected, satisfaction rate assessment is performed for PTT voice services (with QCIs 65 and 66 and enhanced extended QCIs). If the satisfaction rate of PTT voice services is lower than the preset threshold, inter-frequency offload of PTT voice services is triggered. If this option is deselected, PTT voice service offload is disabled. The setting of this option is valid only if the VoIPOffloadSwitch option is selected. This option applies only to LTE FDD and LTE TDD. MbfcsSwitch: Indicates whether to enable intra-RAT multi-band fast carrier selection. Multi-band fast carrier selection is enabled only if this option is selected. This option applies only to LTE FDD and LTE TDD. MmLoadSteeringSw: Indicates whether to enable offload between massive MIMO cells and inter-frequency non-massive-MIMO cells. Offload between massive MIMO cells and inter-frequency non-massive-MIMO cells is enabled only if this option is selected. This option applies only to LTE FDD and LTE TDD.

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					InterVendorMlbSwitch: Indicates whether to enable inter-vendor MLB. Inter-vendor MLB is enabled only if this option is selected. This option applies only to LTE FDD and LTE TDD. CovBasedMlbEnhSw: Indicates whether to enable the coverage-based MLB enhancement algorithm. This algorithm is enabled only if the option is selected. The setting of this option takes effect only if the InterVendorMlbSwitch option of the MlbAlgoSwitch parameter in the CellAlgoSwitch MO is selected. This option applies only to LTE FDD and LTE TDD. GUI Value Range: InterFreqMlbSwitch(InterFreqMlbSwitch), UtranMlbSwitch(UtranMlbSwitch), GeranMlbSwitch(GeranMlbSwitch), UtranIdleMlbSwitch(UtranIdleMlbSwitch), MlbLoadInfoSwitch(MlbLoadInfoSwitch), InterFreqBlindMlbSwitch(InterFreqBlindMlbSwitch), InterFreqIdleMlbSwitch(InterFreqIdleMlbSwitch), VoIPOffloadSwitch(VoIPOffloadSwitch), PTTOffloadSwitch(PTTOffloadSwitch), MbfcsSwitch(MbfcsSwitch), MmLoadSteeringSw(MmLoadSteeringSw), InterVendorMlbSwitch(InterVendorMlbSwitch), CovBasedMlbEnhSw(CovBasedMlbEnhSw) Unit: None Actual Value Range: InterFreqMlbSwitch, UtranMlbSwitch, GeranMlbSwitch, UtranIdleMlbSwitch, MlbLoadInfoSwitch, InterFreqBlindMlbSwitch, InterFreqIdleMlbSwitch, VoIPOffloadSwitch, PTTOffloadSwitch, MbfcsSwitch, MmLoadSteeringSw, InterVendorMlbSwitch, CovBasedMlbEnhSw Default Value: InterFreqMlbSwitch:Off, UtranMlbSwitch:Off, GeranMlbSwitch:Off, UtranIdleMlbSwitch:Off, MlbLoadInfoSwitch:Off, InterFreqBlindMlbSwitch:Off, InterFreqIdleMlbSwitch:Off, VoIPOffloadSwitch:Off, PTTOffloadSwitch:Off, MbfcsSwitch:Off, MmLoadSteeringSw:Off, InterVendorMlbSwitch:Off, CovBasedMlbEnhSw:Off

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellMBMSCfg	MBMSSwitch	MOD CELLMBMSCFG LST CELLMBMSCFG	LOFD-070220/TDLOFD-070220	eMBMS Phase 1 based on Centralized MCE Architecture	Meaning: Indicates whether to enable the MBMS function. MBMSSwitch: If this option is selected, the MBMS function is enabled, and the cell supports the MBMS service. If this option is deselected, the MBMS function is disabled. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: MBMSSwitch(MBMSSwitch) Unit: None Actual Value Range: MBMSSwitch Default Value: MBMSSwitch:Off
UlCsAlgoPara	UlCsSw	MOD ULCSALGOPARA LST ULCSALGOPARA	LOFD-081206	Uplink Coordinated Scheduling	Meaning: Indicates whether to enable functions of UL coordinated scheduling (CS) for a cell. UL_COORD_RES_ALLOC_SWITCH: Indicates whether to enable UL coordinated resource allocation. UL coordinated resource allocation is enabled only if this option is selected. This option applies only to LTE FDD. UL_COORD_PC_SWITCH: Indicates whether to enable UL coordinated power control (CPC). UL CPC is enabled only if this option is selected. This option applies only to LTE FDD. GUI Value Range: UL_COORD_RES_ALLOC_SWITCH(UL_COORD_RES_ALLOC_SWITCH), UL_COORD_PC_SWITCH(UL_COORD_PC_SWITCH) Unit: None Actual Value Range: UL_COORD_RES_ALLOC_SWITCH, UL_COORD_PC_SWITCH Default Value: UL_COORD_RES_ALLOC_SWITCH:Off, UL_COORD_PC_SWITCH:Off

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	LbsSwitch	MOD CELLALGOSWITCH LST CELLALGOSWITCH	None	None	Meaning: This parameter is intended for the LTE cellular positioning engine feature of the service anchor. TDOA_SWITCH: Indicates whether TDoA-based positioning is enabled. The TDoA feature takes effect only when this option is selected. The TDoA feature applies only to LampSite eNodeBs with a bandwidth of 20 MHz. When this option is selected, physical cells cannot be set up on the LBBP, UBBPda, UBBPdb, or UBBPea board. This feature must work with pRRU3911. When the CellCapacityMode parameter of an FDD cell is set to LARGECAPACITY, TDoA-based positioning is not supported. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: TDOA_SWITCH(TDOA_SWITCH) Unit: None Actual Value Range: TDOA_SWITCH Default Value: TDOA_SWITCH:Off

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellEmtcAlgo	EmtcAlgoSwitch	MOD CELLEMTCALGO LST CELLEMTCALGO	MLOFD-121280 / TDLEOFD-121611 MLOFD-121282 TDLEOFD-121614	eMTC Introduction Power Saving on eMTC Power Saving on eMTC	Meaning: Indicates whether to enable eMTC-related algorithms. EMTC_SWITCH: Indicates whether to enable eMTC. If this option is selected, eMTC UEs can access the cell and perform services normally. If this option is deselected, eMTC UEs cannot access the cell to perform services. This option applies only to LTE FDD and LTE TDD. IDLE_EDRX_SWITCH: Indicates whether to enable eDRX in idle mode. If this option is selected, eDRX takes effect in idle mode. If this option is deselected, eDRX does not take effect in idle mode. This option applies only to LTE FDD and LTE TDD. G_VALUE_CFG_SWITCH: Indicates value G configured for eMTC UEs. If this option is deselected, the eNodeB adapts value G for eMTC UEs. If this option is selected, value G is fixed to 1 for eMTC UEs. If the value of this parameter is changed, the value of the mpdcch-startSF-CSS-RA-r13 IE is changed, and eMTC UEs that already accessed the cell will be proactively released. This option applies only to LTE TDD. SI_UPDATE_REL_UE_SWITCH: Indicates whether to proactively release eMTC UEs when system information changes. If this option is selected, when system information changes due to the changes of cell-level SRS resources allocated to eMTC UEs, the eNodeB proactively releases eMTC UEs that have accessed the network before the system information change. If this option is deselected, when system information changes due to the changes of cell-level SRS resources allocated to eMTC UEs, the eNodeB does not proactively release eMTC UEs that have accessed the network before the system information change. This option applies only to LTE FDD. EMTC_ONLY_CELL_SWITCH: Indicates whether a cell is an eMTC-only cell. When this option is selected, a cell enters the eMTC-only state, and common UEs cannot access this cell. When this option is deselected, the cell exits the eMTC-only state, and common UEs can access this cell. eMTC-only cells support only 1.4 MHz, 3 MHz, or 5 MHz bandwidth. This option applies only to LTE FDD. MODE_A_UE_TA_SCHEDULING_SWITCH: Indicates whether the eNodeB proactively allocates

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					PUSCH resources to ModeA UEs for uplink timing measurement. When ModeA UEs do not have sufficient PUSCH resources, the eNodeB proactively allocates PUSCH resources to ModeA UEs for uplink timing measurement only if this option is selected. This option applies only to LTE FDD and LTE TDD. EMTC_UE_ACK_START_OFFSET_CFG: Indicates whether to enable configuration of UE-level ACK resource start positions for eMTC UEs. If this option is deselected, UE-level ACK resource start positions are not configured. If this option is selected, UE-level ACK resource start positions can be configured for eMTC UEs whose coverage level is 0. This option takes effect only if the cell bandwidth is 10 MHz or higher and the DeltaShift parameter in the PUCCHCFG MO is set to DS1_DELTA_SHIFT(ds1) or DS2_DELTA_SHIFT(ds2) for the cell. This option applies only to LTE FDD. DL_PERFORMANCE_ENHANCE_SWITCH: Indicates whether to enable downlink performance enhancement for eMTC UEs. The enhancement is enabled only if this option is selected. This option applies only to LTE FDD and LTE TDD. UL_PERFORMANCE_ENHANCE_SWITCH: Indicates whether to optimize the uplink and downlink scheduling cooperation and the resource allocation strategy for eMTC UEs so as to improve the uplink link adaptation performance for eMTC UEs. This option applies only to LTE FDD and LTE TDD. MPDCCH_MORE_AVAIL_NB_SWITCH: Indicates whether to allow more narrowbands to be allocated to the MPDCCH of the cell. If this option is selected, up to 12 narrowbands can be allocated to the MPDCCH. If this option is deselected, only the default narrowbands are allocated to the MPDCCH. This option takes effect only on cells with the 15 MHz or 20 MHz bandwidth. This option applies only to LTE FDD and LTE TDD. UL_MCS_SCHEDULING_OPT_SWITCH: Indicates whether to enable optimum selection of RBs, MCSs, and the number of repetition times for uplink transmissions of eMTC UEs located at the cell edge. This option applies only to LTE FDD. GUI Value Range: EMTC_SWITCH(EMTC_SWITCH),

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					IDLE_EDRX_SWITCH(IDLE_EDRX_SWITCH), G_VALUE_CFG_SWITCH(G_VALUE_CFG_SWITCH), SI_UPDATE_REL_UE_SWITCH(SI_UPDATE_REL_UE_SWITCH), EMTC_ONLY_CELL_SWITCH(EMTC_ONLY_CELL_SWITCH), MODE_A_UE_TA_SCHEDULING_SWITCH(MODE_A_UE_TA_SCHEDULING_SWITCH), EMTC_UE_ACK_START_OFFSET_CFG(EMTC_UE_ACK_START_OFFSET_CFG), DL_PERFORMANCE_ENHANCE_SWITCH(DL_PERFORMANCE_ENHANCE_SWITCH), UL_PERFORMANCE_ENHANCE_SWITCH(UL_PERFORMANCE_ENHANCE_SWITCH), MPDCCH_MORE_AVAIL_NB_SWITCH(MPDCCH_MORE_AVAIL_NB_SWITCH), UL_MCS_SCHEDULING_OPT_SWITCH(UL_MCS_SCHEDULING_OPT_SWITCH) Unit: None Actual Value Range: EMTC_SWITCH, IDLE_EDRX_SWITCH, G_VALUE_CFG_SWITCH, SI_UPDATE_REL_UE_SWITCH, EMTC_ONLY_CELL_SWITCH, MODE_A_UE_TA_SCHEDULING_SWITCH, EMTC_UE_ACK_START_OFFSET_CFG, DL_PERFORMANCE_ENHANCE_SWITCH, UL_PERFORMANCE_ENHANCE_SWITCH, MPDCCH_MORE_AVAIL_NB_SWITCH, UL_MCS_SCHEDULING_OPT_SWITCH Default Value: EMTC_SWITCH:Off, IDLE_EDRX_SWITCH:Off, G_VALUE_CFG_SWITCH:Off, SI_UPDATE_REL_UE_SWITCH:Off, EMTC_ONLY_CELL_SWITCH:Off, MODE_A_UE_TA_SCHEDULING_SWITCH:On, EMTC_UE_ACK_START_OFFSET_CFG:Off, DL_PERFORMANCE_ENHANCE_SWITCH:Off, UL_PERFORMANCE_ENHANCE_SWITCH:Off, MPDCCH_MORE_AVAIL_NB_SWITCH:Off, UL_MCS_SCHEDULING_OPT_SWITCH:Off

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	EmimoSwitch	MOD CELLALGOSWITCH LST CELLALGOSWITCH	LEOFD-111305 LEOFD-111307	Virtual 4T4R eMIMO	Meaning: Indicates whether to enable eMIMO-related algorithms. Virtual4T4RSwitch: Indicates whether to enable the virtual 4T4R function. This option applies only to FDD. The function is enabled only if this option is selected. EmimoMuMimoSwitch: Indicates whether to enable the eMIMO MU-MIMO function. This option applies only to FDD. The function is enabled only if this option is selected. EmimoCpsSwitch: Indicates whether to enable coordinated pilot scheduling for eMIMO. This option applies only to FDD. The function is enabled only if this option is selected. When this option is selected, the eNodeB determines the pilot transmission mode based on inter-cell load status. EmimoFbaSwitch: Indicates whether to enable the following functions: fast beam alignment for eMIMO and extending UE rank reporting period in non-high-speed-railway scenarios when the CQI reporting period is adaptively changed to 40 ms. The preceding two functions are enabled only if this option is selected. This option applies only to LTE FDD. New4TCodebookSwitch: Indicates whether to use the new 4T codebook. The new 4T codebook can be used for UEs that support the new 4T codebook only if this option is selected. This option applies only to LTE FDD. 4TxTM9MuMimoSwitch: Indicates whether to enable the 4TX TM9 MU-MIMO function. This option applies only to FDD. The function is enabled only if this option is selected. DrxSimulAckNackAndCqiSwitch: Indicates whether to allow UEs in DRX mode to send CQI and ACK/NACK simultaneously on the PUCCH when SimulAckNackAndCqiSwitch is set to ON and CqiMask is set to OFF. This option takes effect when the number of configured downlink transmit antennas of the cell is greater than two. If this option is selected, UEs in DRX mode can send CQI and ACK/NACK simultaneously on the PUCCH when SimulAckNackAndCqiSwitch is set to ON and CqiMask is set to OFF. If this option is deselected, the

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					settings of the SimulAckNackAndCqiSwitch and CqiMask parameters determine whether to allow UEs in DRX mode to send CQI and ACK/NACK simultaneously on the PUCCH. PreciseAmcSwitch: Indicates whether to enable precise AMC. This option applies only to LTE FDD. If this option is selected, target IBLERs are adjusted based on the interference level information exchanged with neighboring cells. If this option is deselected, the function does not take effect. EmimoCsiEnhanceSwitch: Indicates whether to enable CSI reporting enhancement. If this option is selected, CSI reporting enhancement for eMIMO is enabled. Function 1: A shorter CSI reporting period can be set for UEs running large-packet services and fast beam alignment does not take effect. This function applies only to LTE FDD. If this option is deselected, CSI reporting enhancement for eMIMO is disabled. PUSCH12Switch: Indicates whether to enable the PUSCH 1-2 feedback mode. This option applies only to LTE FDD. If this option is selected, UEs that support reporting on PUSCH 1-2 use this mode to aperiodically report CQIs. If this option is deselected, the mode cannot be used. GUI Value Range: Virtual4T4RSwitch(Virtual4T4RSwitch), EmimoMuMimoSwitch(EmimoMuMimoSwitch), EmimoCpsSwitch(EmimoCpsSwitch), EmimoFbaSwitch(EmimoFbaSwitch), New4TCodebookSwitch(New4TCodebookSwitch), 4TxTM9MuMimoSwitch(4TxTM9MuMimoSwitch), DrxSimulAckNackAndCqiSwitch(DrxSimulAckNackAndCqiSwitch), PreciseAmcSwitch(PreciseAmcSwitch), EmimoCsiEnhanceSwitch(EmimoCsiEnhanceSwitch), PUSCH12Switch(PUSCH12Switch) Unit: None Actual Value Range: Virtual4T4RSwitch, EmimoMuMimoSwitch, EmimoCpsSwitch, EmimoFbaSwitch, New4TCodebookSwitch, 4TxTM9MuMimoSwitch, DrxSimulAckNackAndCqiSwitch, PreciseAmcSwitch, EmimoCsiEnhanceSwitch, PUSCH12Switch Default Value: Virtual4T4RSwitch:Off, EmimoMuMimoSwitch:Off, EmimoCpsSwitch:Off,

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					EmimoFbaSwitch:Off, New4TCodebookSwitch:Off, 4TxTM9MuMimoSwitch:Off, DrxSimulAckNack-AndCqiSwitch:Off, PreciseAmcSwitch:Off, EmimoCsiEnhanceSwitch:Off, PUSCH12Switch:Off
DdCell Group	DdBandwidth	ADD DDCELLGROUP LST DDCELLGROUP RMV DDCELLGROUP DSP DDCELLGROUP	LEOFD-111302	Flexible Bandwidth based on Overlap Carriers	Meaning: Indicates the bandwidth of a Double Deck cell group. This parameter applies only to FDD. GUI Value Range: BW_2DOT6M(2.6M), BW_4M(4M), BW_5DOT7M(5.7M), BW_7DOT3M(7.3M), BW_7DOT6M(7.6M), BW_10DOT8M(10.8M), BW_12DOT2M(12.2M), BW_12DOT5M(12.5M), BW_17DOT1M(17.1M), BW_17DOT4M(17.4M), BW_27DOT6M(27.6M), BW_28DOT5M(28.5M), BW_23DOT9M(23.9M), BW_8DOT6M(8.6M), BW_8DOT9M(8.9M), BW_14DOT1M(14.1M), BW_14DOT4M(14.4M), BW_18DOT7M(18.7M), BW_19M(19M) Unit: None Actual Value Range: BW_2DOT6M, BW_4M, BW_5DOT7M, BW_7DOT3M, BW_7DOT6M, BW_10DOT8M, BW_12DOT2M, BW_12DOT5M, BW_17DOT1M, BW_17DOT4M, BW_27DOT6M, BW_28DOT5M, BW_23DOT9M, BW_8DOT6M, BW_8DOT9M, BW_14DOT1M, BW_14DOT4M, BW_18DOT7M, BW_19M Default Value: None

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	DynSpectrumShareSwitch	MOD CELLALGOSWITCH LST CELLALGOSWITCH	MRFD-090202 MRFD-111401	GSM and LTE FDD Dynamic Spectrum Sharing(LTE FDD) GSM and LTE Zero Bufferzone	Meaning: Indicates whether to enable dynamic spectrum sharing in an E-UTRAN cell, including GSM and LTE (GL) dynamic spectrum sharing and GL zero bufferzone. GLDynSpectrumShareSwitch: The GSM and LTE Dynamic Spectrum Sharing(LTE FDD) feature is enabled only when this option is selected. This option applies only to LTE FDD. GLZeroBufferZoneSwitch: The GSM and LTE Zero Bufferzone feature is enabled only when this option is selected. This option applies only to LTE FDD. Before the GLDynSpectrumShareSwitch or GLZeroBufferZoneSwitch option is selected, parameters HighFreqShareRbNum and LowFreqShareRbNum must be set. By means of spectrum sharing, the idle GERAN spectrum can be used by the E-UTRAN cell, thereby increasing the bandwidth and throughput of the E-UTRAN cell. GUI Value Range: GLDynSpectrumShareSwitch(GLDynSpectrumShareSwitch), GLZeroBufferZoneSwitch(GLZeroBufferZoneSwitch) Unit: None Actual Value Range: GLDynSpectrumShareSwitch, GLZeroBufferZoneSwitch Default Value: GLDynSpectrumShareSwitch:Off, GLZeroBufferZoneSwitch:Off

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
SpectrumCloud	SpectrumCloud Switch	ADD SPECTRUMCLOUD MOD SPECTRUMCLOUD LST SPECTRUMCLOUD	MRFD-130221 MRFD-130222	GSM and LTE Spectrum Concurrency (LTE FDD) UMTS and LTE Spectrum Sharing (LTE FDD)	Meaning: Indicates whether to enable the spectrum cloudification feature. When this parameter is set to OFF, spectrum cloudification is disabled. When this parameter is set to GL_SPECTRUM_CONCURRENCY, GSM and LTE spectrum concurrency is enabled. When this parameter is set to UL_SPECTRUM_SHARING, UMTS and LTE spectrum sharing is enabled. This parameter applies only to LTE FDD. GUI Value Range: OFF(OFF), GL_SPECTRUM_CONCURRENCY(GL_SPECTRUM_CONCURRENCY), UL_SPECTRUM_SHARING(UL_SPECTRUM_SHARING) Unit: None Actual Value Range: OFF, GL_SPECTRUM_CONCURRENCY, UL_SPECTRUM_SHARING Default Value: OFF(OFF)

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	RelaySwitch	MOD CELLALGOSWITCH LST CELLALGOSWITCH	LAOFD-111202/ TDLAOFD-080405 LAOFD-131208 / TDLAOFD-131406	Out of Band Relay In-Band Relay	Meaning: Indicates whether to enable relay-related functions. OutOfBandRelaySwitch: Indicates whether to enable out-of-band relay. If this option is selected, out-of-band relay is enabled. If this option is deselected, out-of-band relay is disabled. This option applies only to LTE FDD and LTE TDD. InBandRelayDeNbSwitch: Indicates whether to enable in-band relay for the DeNB. If this option is selected, in-band relay is enabled for the DeNB. If this option is deselected, in-band relay is disabled for the DeNB. This option applies only to LTE FDD and LTE TDD. InBandRelayReNbSwitch: Indicates whether to enable in-band relay for the ReNB. If this option is selected, in-band relay is enabled for the ReNB. If this option is deselected, in-band relay is disabled for the ReNB. This option applies only to LTE FDD and LTE TDD. InBandRelayDistantDeploySw: Indicates whether to allow the first-hop ReNB to be deployed less than 20 km from the DeNB in in-band relay scenarios. If this option is selected, the first-hop ReNB can be deployed less than 20 km from the DeNB in in-band relay scenarios. If this option is deselected, the first-hop ReNB cannot be deployed less than 20 km from the DeNB in in-band relay scenarios. This option applies only to LTE FDD and LTE TDD. GUI Value Range: OutOfBandRelaySwitch(OutOfBandRelaySwitch), InBandRelayDeNbSwitch(InBandRelayDeNbSwitch), InBandRelayReNbSwitch(InBandRelayReNbSwitch), InBandRelayDistantDeploySw(InBandRelayDistant-DeploySw) Unit: None Actual Value Range: OutOfBandRelaySwitch, InBandRelayDeNbSwitch, InBandRelayReNbSwitch, InBandRelayDistantDeploySw Default Value: OutOfBandRelaySwitch:Off, InBandRelayDeNbSwitch:Off, InBandRelayReNbS-witch:Off, InBandRelayDistantDeploySw:Off

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellEmtcAlgo	EmtcFreqHoppingSwitch	MOD CELLEMTCALGO LST CELLEMTCALGO	MLOFD-121280 / TDLEOFD-121611 MLOFD-131301 / TDLEOFD-131616	eMTC Introduction eMTC Frequency Hopping	Meaning: Indicates whether to enable frequency hopping for eMTC UEs. PRACH_FREQ_HOPPING_SW: Indicates whether to enable PRACH frequency hopping for eMTC UEs. If this option is selected, PRACH frequency hopping is enabled for eMTC UEs, and PRACH is transmitted based on the PRACH frequency-domain offset for eMTC UEs in accordance with a protocol-specified spectrum bitmap. For details, see section 5.7.1 in 3GPP TS 36.211 R14. If this option is deselected, PRACH frequency hopping is disabled for eMTC UEs. This option applies only to LTE FDD and LTE TDD. PUSCH_FREQ_HOPPING_SW: Indicates whether to enable PUSCH frequency hopping for eMTC UEs. If this option is selected, PUSCH frequency hopping is enabled for eMTC UEs, and PUSCH is transmitted based on the PUSCH frequency-domain offset and uplink time-domain interval for eMTC UEs in accordance with a protocol-specified spectrum bitmap. For details, see section 5.3.4 in 3GPP TS 36.211 R14. If this option is deselected, PRACH frequency hopping is disabled for eMTC UEs. This option applies only to LTE FDD and LTE TDD. MPDCCH_PDSCH_FREQ_HOPPING_SW: Indicates whether to enable frequency hopping for downlink channels for eMTC UEs. If this option is selected, the MPDCCH/PDSCH, RAR/Msg4, SI, paging messages, and Msg3 are transmitted in unicast mode, and frequency hopping is enabled. The eNodeB uses System Information Block type 1 to broadcast downlink frequency hopping parameters (for details, see section 6.2.2 in 3GPP TS 36.331 R14), sets frequency hopping parameters in common radio messages, and transmits channels in accordance with protocol-specified spectrum bitmaps (for details, see section 6.4.1 in 3GPP TS 36.211 R14). If this option is deselected, frequency hopping is disabled for downlink channels for eMTC UEs. This option applies only to LTE FDD and LTE TDD. GUI Value Range: PRACH_FREQ_HOPPING_SW(PRACH_FREQ_HOPPING_SW), PUSCH_FREQ_HOPPING_SW(PUSCH_FREQ_HOPPING_SW),

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					MPDCCH_PDSCH_FREQ_HOPPING_SW(MPDCCH_PDSCH_FREQ_HOPPING_SW) Unit: None Actual Value Range: PRACH_FREQ_HOPPING_SW, PUSCH_FREQ_HOPPING_SW, MPDCCH_PDSCH_FREQ_HOPPING_SW Default Value: PRACH_FREQ_HOPPING_SW:Off, PUSCH_FREQ_HOPPING_SW:Off, MPDCCH_PDSCH_FREQ_HOPPING_SW:Off
PDSCHCfg	ReferenceSignalPwr	MOD PDSCHCFG LST PDSCHCFG	LBFD-002016/TDLBFD-002016 LBFD-002009/TDLBFD-002009 MLBFD-12000229	Dynamic Downlink Power Allocation Broadcast of system information Broadcast of system information	Meaning: Indicates the cell reference signal power of each physical antenna (the precision of converting dBm to mW is 0.01 mW). However, the cell reference signal power delivered in SIB2 is that of each logical antenna. If the EMTC_SWITCH option of the EmtcAlgoSwitch parameter in a CellEmtcAlgo MO is selected and the value of this parameter is changed, eMTC UEs that already accessed the cell will be proactively released. GUI Value Range: -600~500 Unit: 0.1dBm Actual Value Range: -60~50 Default Value: 182
PDSCHCfg	Pb	MOD PDSCHCFG LST PDSCHCFG	LBFD-002016/TDLBFD-002016 LBFD-002009/TDLBFD-002009	Dynamic Downlink Power Allocation Broadcast of system information	Meaning: Indicates the scaling factor index of the Energy Per Resource Element (EPRE) on the PDSCH. This scaling factor is determined by the value of this parameter and the antenna port. For details, see 3GPP TS 36.213. If the EMTC_SWITCH option of the EmtcAlgoSwitch parameter in a CellEmtcAlgo MO is selected and the value of this parameter is changed, eMTC UEs that already accessed the cell will be proactively released. GUI Value Range: 0~3 Unit: None Actual Value Range: 0~3 Default Value: 1

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellDlpcPdschPa	PaPcOff	MOD CELLDLPCPDSCHPA LST CELLDLPCPDSCHPA	LBFD-002016/ TDLBFD-002016 LOFD-070208	Dynamic Downlink Power Allocation Coordinated Scheduling based Power Control	Meaning: Indicates the PA to be used when DL ICIC is disabled, and the even power distribution is used for the PDSCH. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: DB_6_P_A(-6 dB), DB_4DOT77_P_A(-4.77 dB), DB_3_P_A(-3 dB), DB_1DOT77_P_A(-1.77 dB), DB0_P_A(0 dB), DB1_P_A(1 dB), DB2_P_A(2 dB), DB3_P_A(3 dB) Unit: dB Actual Value Range: DB_6_P_A, DB_4DOT77_P_A, DB_3_P_A, DB_1DOT77_P_A, DB0_P_A, DB1_P_A, DB2_P_A, DB3_P_A Default Value: DB_3_P_A(-3 dB)
PHICHCfg	PhichDuration	MOD PHICHCFG LST PHICHCFG	LBFD-002003/ TDLBFD-002003 LOFD-001051 LBFD-002009/ TDLBFD-002009	Physical Channel Management Compact Bandwidth Broadcast of system information	Meaning: Indicates the PHICH duration type. If this parameter is set to NORMAL, the number of OFDM symbols occupied by the PDCCH is automatically adjusted. If this parameter is set to EXTENDED, the number of OFDM symbols occupied by the PDCCH is fixed. Specifically, this number is fixed to 3 or 4 for 1.4 MHz cells and 3 for cells with other bandwidths. For the mapping between the type and the duration, see 3GPP TS 36.211. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: NORMAL, EXTENDED Unit: None Actual Value Range: NORMAL, EXTENDED Default Value: NORMAL

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
SRSCfg	SrsCfgInd	MOD SRSCFG LST SRSCFG	LBFD-002003/ TDLBFD-002003 LEOFD-111305 TDLAOFD-081409 TDLEOFD-121615 TDLOFD-001049	Physical Channel Management Virtual 4T4R DL 4-Layer MIMO Based on TM9 DL Flexible 3D-Beamforming Single Streaming Beamforming	Meaning: Indicates whether to configure sounding reference signal (SRS) resources for UEs in a cell. The value BOOLEAN_TRUE indicates that SRS resources are available in the cell and can be configured for UEs in the cell. The value BOOLEAN_FALSE indicates that no SRS resource is available in the cell, and therefore no UE in the cell is configured with SRS resources. This parameter does not take effect on: (1) FDD cell that is established on an LBBPc and uses four or more RX antennas. (2) FDD cell that is established on an LBBPc and uses extended cyclic prefix (CP) in the uplink. (3) TDD cell established on an LBBPc. If this parameter does not take effect on a cell but SRS resources are available in the cell, SRS resources can be configured for UEs in the cell. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: BOOLEAN_FALSE(False), BOOLEAN_TRUE(True) Unit: None Actual Value Range: BOOLEAN_FALSE, BOOLEAN_TRUE Default Value: BOOLEAN_TRUE(True)

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
RACHCfg	PrachFreqOffsetStrategy	MOD RACHCFG LST RACHCFG	LOFD-002015/ TDLOFD-002015 TDLBFD-002010	RACH Optimization Random Access	Meaning: Indicates the policy of determining the PRACH frequency-domain offset. If this parameter is set to AUTOMATIC(AUTOMATIC) or FULLY_AUTOMATIC(FULLY_AUTOMATIC), the eNodeB determines the PRACH frequency-domain offset. If this parameter is set to MANUAL(MANUAL), the PRACH frequency-domain offset is specified by the PrachFreqOffset parameter. In an LTE FDD cell, the eNodeB determines the PRACH frequency-domain offset only if this parameter is set to FULLY_AUTOMATIC(FULLY_AUTOMATIC) when the PucchSwitch option of the PucchAlgoSwitch parameter is deselected. In an LTE TDD cell, the parameter value MANUAL(MANUAL) does not take effect when preamble format 4 is used. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: AUTOMATIC(AUTOMATIC), MANUAL(MANUAL), FULLY_AUTOMATIC(FULLY_AUTOMATIC) Unit: None Actual Value Range: AUTOMATIC, MANUAL, FULLY_AUTOMATIC Default Value: AUTOMATIC(AUTOMATIC)
CellRacThd	AcUserNumber	MOD CELLRACTHD LST CELLRACTHD	LBFD-002023/ TDLBFD-002023	Admission Control	Meaning: Indicates the maximum number of UEs that can be admitted to the cell. GUI Value Range: 0~65535 Unit: None Actual Value Range: 0~65535 Default Value: 65535

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	DlSchSwitch	MOD CELLALGOSWITCH LST CELLALGOSWITCH	LOFD-110205/ TDLOFD-110227 LOFD-001016/ TDLOFD-001016 LBFD-00101502/ TDLBFD-00101502 LOFD-001109/ TDLOFD-001109 LOFD-001070/ TDLOFD-001070 TDLOFD-070222/ LOFD-131213 LBFD-002025/ TDLBFD-002025 LBFD-002031/ TDLBFD-002031 LBFD-070102/ TDLBFD-070102	Traffic Model Based Performance Optimization VoIP Semi-persistent Scheduling Dynamic Scheduling DL Non-GBR Packet Bundling Symbol Power Saving Scheduling Based on Max Bit Rate Basic Scheduling Aperiodic CQI Reporting MBR>GBR Configuration Enhanced DL Frequency	Meaning: Indicates whether to enable downlink scheduling algorithms in a cell. This parameter includes the following options: FreqSelSwitch: Indicates whether to enable frequency-selective scheduling. If this option is selected, data is transmitted on the frequency band of high channel quality. This option applies only to LTE FDD and LTE TDD. SpsSchSwitch: Indicates whether to enable semi-persistent scheduling during talk spurts of VoLTE services. If this option is selected, semi-persistent scheduling is applied during talk spurts of VoLTE services. If this option is deselected, dynamic scheduling is applied during talk spurts of VoLTE services. This option applies only to LTE FDD and LTE TDD. MBSFNShutDownSwitch: Indicates whether to enable Multimedia Broadcast multicast service Single Frequency Network (MBSFN) subframe shutdown. If this option is selected, MBSFN subframe shutdown is applied. If this option is deselected, MBSFN subframe shutdown is not applied. This option takes effect only if the SymbolShutdownSwitch option of the PowerSaveSwitch parameter is selected. If the MBSFNShutDownSwitch option is selected, the setting of the switch for mapping SIBs to SI messages becomes invalid. If the MBSFNShutDownSwitch option is deselected, the setting of the switch for mapping SIBs to SI messages becomes valid. The MBSFNShutDownSwitch option applies only to LTE-only base stations. This option applies only to LTE FDD and LTE TDD. NonGbrBundlingSwitch: Indicates whether to enable downlink non-GBR packet bundling. If this option is selected, delay of non-GBR services can be controlled in non-congestion scenarios. If this option is deselected, delay of non-GBR services cannot be controlled. This option applies only to LTE FDD and LTE TDD. EnAperiodicCqiRptSwitch: Indicates whether to enable enhanced aperiodic channel quality indicator (CQI) reporting. If this option is selected, the eNodeB triggers aperiodic CQI reporting for a UE based on downlink services of the UE and the interval at which

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
			LBFD-060103 LOFD-081218 LTROFD-111204/ TDLOFD-121106 TDLBFD-002005 LBFD-060101 LBFD-060103/ TDLBFD-080102 LEOFD-111305 LEOFD-111307 TDLOFD-121105	Selective Scheduling Enhanced Extended QCI MCPTT Voice Management DL Asynchronous HARQ Optimization of CQI Reporting Enhanced DL Frequency Selective Scheduling Virtual 4T4R eMIMO RRC and DRX Policy for Public Safety	the UE sends periodic CQI reports. If this option is deselected, UEs under non-frequency-selective scheduling do not trigger aperiodic CQI reporting based on downlink services and trigger an aperiodic CQI reporting if no valid periodic CQI reports are sent in eight consecutive periodic CQI reporting periods. This option applies only to LTE FDD and LTE TDD. DlMbrCtrlSwitch: Indicates whether to enable downlink scheduling based on the maximum bit rate (MBR) and guaranteed bit rate (GBR) on GBR bearers. If this option is selected, the eNodeB performs downlink scheduling on GBR bearers based on the MBR and GBR. If this option is deselected, the eNodeB performs downlink scheduling on GBR bearers based on the GBR only. This option applies only to LTE FDD and LTE TDD. MbrDlSchSwitch: Indicates whether the eNodeB performs downlink scheduling based on MBR. If this option is selected, the eNodeB prioritizes UEs based on the MBRs during downlink scheduling. This parameter applies only to LTE FDD and LTE TDD. UeAmbrDlSchSwitch: Indicates whether the eNodeB performs downlink scheduling based on per UE aggregate maximum bit rates (UE-AMBRs). If this option is selected, the eNodeB prioritizes UEs based on the UE-AMBRs during downlink scheduling. This option applies only to LTE FDD and LTE TDD. EpfEnhancedSwitch: Indicates whether to enable enhanced proportional fair (EPF) enhancement for scheduling. EPF enhancement for scheduling is enabled only if this option is selected. This option applies only to LTE FDD and LTE TDD. AperiodicCqiTrigOptSwitch: Indicates whether to optimize triggering of aperiodic CQI reporting. If this option is selected, a UE performing initial access triggers aperiodic CQI reporting based on related trigger conditions after the DLMAC instance has been established for 200 ms and the eNodeB receives MSG5. Consider that aperiodic CQI reporting is triggered by invalid CQI reports in eight consecutive CQI reporting periods. If cyclic redundancy check (CRC) on aperiodic CQI reports fails, aperiodic CQI reporting is not repeatedly triggered when DRX is enabled; or aperiodic CQI reporting is triggered after eight TTIs when DRX is disabled. If this option is deselected, a UE performing initial access triggers

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					aperiodic CQI reporting based on related trigger conditions after the DLMAC instance has been established for 200 ms. Consider that aperiodic CQI reporting is triggered by invalid CQI reports in eight consecutive CQI reporting periods. If CRC on aperiodic CQI reports fails, aperiodic CQI reporting is triggered after eight TTIs, regardless of the DRX status. This option applies only to LTE FDD and LTE TDD. VoipTbsBasedMcsSelSwitch: Indicates whether the modulation and coding scheme (MCS) index is selected based on the transport block size (TBS) in downlink scheduling for VoLTE services. The MCS index is selected based on the TBS in downlink dynamic scheduling for VoLTE services only if this option is selected. This option applies only to LTE FDD and LTE TDD. PagingInterfRandSwitch: Indicates whether to enable interference randomization for paging messages. If this option is selected, interference randomization is enabled for paging messages. This option applies only to LTE FDD and LTE TDD. DlSingleUsrMcsOptSwitch: Indicates conditions for lowering the MCS index for a single UE. If this option is selected, the MCS index can be lowered for a UE if the UE is the only UE to be scheduled in a transmission time interval (TTI). If this option is deselected, the MCS index can be lowered for a UE if the threshold for the function of lowering the MCS index to increase the number of RBs is reached and the UE is the only UE to be scheduled in a TTI. This option applies only to LTE FDD and LTE TDD. UeSigMcsEnhanceSwitch: Indicates whether to enable MCS optimization for UE signaling. If this option is selected, MCS optimization for UE signaling is enabled. For LTE FDD, the MCS index for UE signaling is the same as the MCS index for data. For LTE TDD, the MCS index for UE signaling is lowered based on the MCS index for data. If this option is deselected, a fixed low MCS index is used for UE signaling. This option applies only to LTE FDD and LTE TDD. SubframeSchDiffSwitch: For TDD cells, this option indicates whether to perform scheduling in subframes 3 and 8 based on the policy of increasing the number of UEs scheduled in the uplink when uplink-downlink

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					configuration 2 is used. If this option is selected, scheduling in subframes 3 and 8 is performed based on the policy of increasing the number of UEs scheduled in the uplink when uplink-downlink configuration 2 is used. If this option is deselected, the scheduling policy used in subframes 3 and 8 is the same as that used in other downlink subframes when uplink-downlink configuration 2 is used. For NB-IoT cells, this option indicates whether to enable scheduling priority optimization. If this option is deselected, the scheduling priority of downlink services is higher than that of uplink services for UEs for which control plane CIoT EPS optimization is used. If this option is selected, the scheduling priority of downlink services is the same as that of uplink services for UEs for which control plane CIoT EPS optimization is used. This option applies only to LTE TDD and NB-IoT. TailPackagePriSchSwitch: Indicates whether to enable scheduling of downlink connected tail packages in the bearer. If this option is selected, the connected tail package is scheduled preferentially in the next TTI, which reduces the delay and increases the transmission rate. If this option is deselected, the scheduling policy of the connected tail package is the same as other downlink subframes. This option applies only to LTE TDD. SIB1InterfRandSwitch: Indicates whether to enable SIB1 interference randomization. If this option is selected, interference randomization is enabled for SIB1. This option applies only to LTE TDD. FreqSelJudgeIgnorDopplerSwitch: Indicates whether to ignore Doppler conditions. If this option is selected, Doppler conditions are ignored during frequency selective channel determination. If this option is deselected, Doppler conditions are considered during frequency selective channel determination. This parameter applies only to LTE FDD and LTE TDD. EnhExtQCISpsSchSwitch: Indicates whether to enable semi-persistent scheduling during talk spurts of PTT services with standardized QCI 65, standardized QCI 66, or an enhanced extended QCI. If this option is selected, semi-persistent scheduling is applied. If this option is deselected, dynamic scheduling is applied. This option applies only to LTE FDD and LTE TDD.

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					DlVoipBundlingSwitch: Indicates whether to enable active packet bundling for downlink VoLTE services. Active packet bundling is enabled for downlink VoLTE services only if this option is selected. If this option is selected, PDCCH resources can be saved for downlink data services or uplink services, thereby increasing the VoLTE capacity for VoLTE services or increasing the throughput of data services in mixed service scenarios. However, the delay in VoLTE voice packet scheduling will increase in the downlink and MOSs may decrease. You are advised to deselect this option if you prefer VoLTE performance and do not expect MOS reduction. This option applies only to LTE FDD and LTE TDD. DlPacketLenAwareSchSw: Indicates whether to enable packet length awareness performance optimization in the downlink. Packet length awareness performance optimization is enabled in the downlink only if this option is selected. This option applies only to LTE FDD and LTE TDD. RLCArqFeedbackEnhancedSwitch: Indicates whether to modify HARQ feedback results based on RLC status reports when uplink-downlink configuration 2 is used. If this option is selected, the eNodeB modifies HARQ feedback results based on RLC status reports after receiving the reports. This prevents unnecessary HARQ retransmissions. This option applies only to LTE TDD. PaReconfigOptSwitch: Indicates whether to enable PA reconfiguration optimization. The optimization is enabled when this option is selected. This option applies only to LTE FDD and LTE TDD. RankRapidRptSwitch: Indicates whether to enable fast rank reporting. If this option is selected, an aperiodic CQI reporting is immediately triggered after successful network access. If this option is deselected, an aperiodic CQI reporting is not immediately triggered after successful network access. This option applies only to LTE FDD and LTE TDD. DlRLCStateReportSchDelaySw: Indicates whether to enable optimization on the delay-based scheduling of downlink RLC status reports. The optimization is enabled when this option is selected. This option applies only to LTE FDD and LTE TDD. SmallPktMcsSelectAlgoSw: Indicates whether to enable MCS selection for small packets. If this option

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					is selected, the scheduler selects an MCS with a lower index based on the amount of data to be initially transmitted and the allocated TBS in each TTI on condition that the allocated TB can carry the data. The function is enabled only if this option is selected. This option applies only to LTE FDD and LTE TDD. SRB0SplitSchSw: Indicates whether to enable separate scheduling of SRB0 and contention resolution MCE. If this option is selected, SRB0 and contention resolution MCE are separately scheduled. This option applies only to LTE FDD and LTE TDD. BfUserPairPriorSwitch: Indicates whether to preferentially allocate resources to paired beamforming UEs for UE pairing features such as MU beamforming and D-MIMO. If this option is selected, the eNodeB preferentially allocates resources to paired beamforming UEs for UE pairing features such as MU beamforming and D-MIMO. This option applies only to LTE TDD. HarqAllocOptSwitch: Indicates whether to optimize the allocation of HARQ processes. If this option is selected, the downlink UE rate increases. This option takes effect only when D-MIMO or massive MIMO is enabled. This option applies only to LTE TDD. Pusch32Switch: Indicates whether to enable the PUSCH 3-2 feedback mode. If this option is selected, UEs that support the PUSCH 3-2 feedback mode use this mode to aperiodically report CQIs. If this option is deselected, the mode cannot be used. This option applies only to LTE FDD. DlPreciseAmbrCtrlSwitch: Indicates whether to enable precise downlink AMBR control. If this option is selected, a more accurate optimization algorithm applies to the AMBR control, which achieves more accurate AMBR control. If this option is deselected, the original AMBR control algorithm is used. This option applies only to LTE FDD and LTE TDD. GUI Value Range: FreqSelSwitch(FreqSelSwitch), SpsSchSwitch(SpsSchSwitch), MBSFNShutDownSwitch(MBSFNShutDownSwitch), NonGbrBundlingSwitch(NonGbrBundlingSwitch), EnAperiodicCqiRptSwitch(EnAperiodicCqiRptSwitch), DlMbrCtrlSwitch(DlMbrCtrlSwitch), MbrDlSchSwitch(MbrDlSchSwitch), UeAmbrDlSchSwitch(UeAmbrDlSchSwitch),

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					EpfEnhancedSwitch(EpfEnhancedSwitch), AperiodicCqiTrigOptSwitch(AperiodicCqiTrigOptSwitch), VoipTbsBasedMcsSelSwitch(VoipTbsBasedMcsSelSwitch), PagingInterfRandSwitch(PagingInterfRandSwitch), DlSingleUsrMcsOptSwitch(DlSingleUsrMcsOptSwitch), SubframeSchDiffSwitch(SubframeSchDiffSwitch), TailPackagePriSchSwitch(TailPackagePriSchSwitch), UeSigMcsEnhanceSwitch(UeSigMcsEnhanceSwitch), FreqSelJudgeIgnorDopplerSwitch(FreqSelJudgeIgnorDopplerSwitch), SIB1InterfRandSwitch(SIB1InterfRandSwitch), EnhExtQCISpsSchSwitch(EnhExtQCISpsSchSwitch), DlVoipBundlingSwitch(DlVoipBundlingSwitch), DlPacketLenAwareSchSw(DlPacketLenAwareSchSw), RLCArqFeedbackEnhancedSwitch(RLCArqFeedbackEnhancedSwitch), PaReconfigOptSwitch(PaReconfigOptSwitch), RankRapidRptSwitch(RankRapidRptSwitch), DlRLCStateReportSchDelaySw(DlRLCStateReportSchDelaySw), SmallPktMcsSelectAlgoSw(SmallPktMcsSelectAlgoSw), SRB0SplitSchSw(SRB0SplitSchSw), BfUserPairPriorSwitch(BfUserPairPriorSwitch), HarqAllocOptSwitch(HarqAllocOptSwitch), Pusch32Switch(Pusch32Switch), DlPreciseAmbrCtrlSwitch(DlPreciseAmbrCtrlSwitch) Unit: None Actual Value Range: FreqSelSwitch, SpsSchSwitch, MBSFNShutDownSwitch, NonGbrBundlingSwitch, EnAperiodicCqiRptSwitch, DlMbrCtrlSwitch, MbrDlSchSwitch, UeAmbrDlSchSwitch, EpfEnhancedSwitch, AperiodicCqiTrigOptSwitch, VoipTbsBasedMcsSelSwitch, PagingInterfRandSwitch, DlSingleUsrMcsOptSwitch, SubframeSchDiffSwitch, TailPackagePriSchSwitch, UeSigMcsEnhanceSwitch, FreqSelJudgeIgnorDopplerSwitch, SIB1InterfRandSwitch, EnhExtQCISpsSchSwitch, DlVoipBundlingSwitch, DlPacketLenAwareSchSw, RLCArqFeedbackEnhancedSwitch, PaReconfigOptSwitch, RankRapidRptSwitch, DlRLCStateReportSchDelaySw, SmallPktMcsSelectAlgoSw, SRB0SplitSchSw, BfUserPairPriorSwitch, HarqAllocOptSwitch, Pusch32Switch, DlPreciseAmbrCtrlSwitch Default Value: FreqSelSwitch:Off, SpsSchSwitch:Off, MBSFNShutDownSwitch:Off, NonGbrBundlingS-

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					witch:Off, EnAperiodicCqiRptSwitch:Off, DlMbrCtrlSwitch:Off, MbrDlSchSwitch:Off, UeAmbrDlSchSwitch:Off, EpfEnhancedSwitch:Off, AperiodicCqiTrigOptSwitch:On, VoipTbsBasedMcsSelSwitch:On, PagingInterfRandSwitch:Off, DlSingleUsrMcsOptSwitch:Off, SubframeSchDiffSwitch:Off, TailPackagePriSchSwitch:Off, UeSigMcsEnhanceSwitch:Off, FreqSelJudgeIgnorDopplerSwitch:Off, SIB1InterfRandSwitch:On, EnhExtQCISpsSchSwitch:Off, DlVoipBundlingSwitch:Off, DlPacketLenAwareSchSw:Off, RLCArqFeedbackEnhancedSwitch:Off, PaReconfigOptSwitch:Off, RankRapidRptSwitch:Off, DlRLCStateReportSchDelaySw:Off, SmallPktMcsSelectAlgoSw:Off, SRB0SplitSchSw:Off, BfUserPairPriorSwitch:Off, HarqAllocOptSwitch:Off, Pusch32Switch:Off, DlPreciseAmbrCtrlSwitch:Off
CellDlschAlgo	FDUEEnhAperCQITrigPeriod	MOD CELLDLSCHALGO LST CELLDLSCHALGO	LBFD-060103 LBFD-00101502	Enhanced DL Frequency Selective Scheduling Dynamic Scheduling	Meaning: Indicates the aperiodic channel quality indicator (CQI) reporting period of a UE adopting frequency diversity (FD) scheduling. This parameter can be set to 5ms, 10ms, 20ms, 40ms, 80ms, 160ms, and inf. The parameter value inf indicates that the aperiodic CQI reporting is not triggered. This parameter applies only to LTE FDD. GUI Value Range: 5ms, 10ms, 20ms, 40ms, 80ms, 160ms, inf Unit: None Actual Value Range: 5ms, 10ms, 20ms, 40ms, 80ms, 160ms, inf Default Value: 5ms
CellPdchAlgo	PdcchPowerEnhancedSwitch	MOD CELLPDCCHALGO LST CELLPDCCHALGO	LBFD-002003/TDLBFD-002003 LAOFD-110203 LBFD-070107	Physical Channel Management ePDCCH PDCCH Utilization Improvement	Meaning: Indicates whether to enable enhanced PDCCH power control. If this switch is turned on, the eNodeB selects appropriate PDCCH transmit power based on channel quality to increase PDCCH capacity. This parameter applies only to LTE FDD and LTE TDD massive MIMO cells for which the policy of selecting the aggregation level based on capacity is adopted. GUI Value Range: OFF(Off), ON(On) Unit: None Actual Value Range: OFF, ON Default Value: OFF(Off)

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellDlschAlgo	RBDamageNearPointIblerTh	MOD CELLDLSCHALGO LST CELLDLSCHALGO	LEOFD-111302 LOFD-003029/TDLOFD-001075 LOFD-070205/TDLOFD-002008 LOFD-081208 LOFD-081209 LAOFD-00100101 LAOFD-001002 LAOFD-070201 LAOFD-080202 LAOFD-080207 LAOFD-080208 LOFD-001060 LOFD-001051	Flexible Bandwidth based on Overlap Carriers SFN Adaptive SFN/SDMA Inter-eNodeB SFN Based on Coordinated eNodeB Inter-eNodeB Adaptive SFN/SDMA Based on Coordinated eNodeB Carrier Aggregation for Downlink 2CC Carrier Aggregation for Downlink 2CC in 40MHz Flexible CA from Multiple Carriers Carrier Aggrega	Meaning: Indicates the IBLER threshold for determining cell-center UEs when certain RBs are unavailable, or the IBLER threshold for 4R UEs to perform rank 3 or 4 measurement when CA and MIMO cooperation, the algorithm of 4x4 MIMO in the overlapping areas of an SFN cell, or the algorithm of adaptively entering TM4 and TM9 modes is used. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: 0~1000 Unit: None Actual Value Range: 0~1, step: 0.001 Default Value: 20

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
				tion for Uplink 2CC Carrier Aggregation for Downlink 3CC in 40MHz Carrier Aggregation for Downlink 3CC in 60MHz DL 4x4 MIMO Compact BandWidth	

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	PucchAlgoSwitch	MOD CELLALGOSWITCH LST CELLALGOSWITCH	LBFD-002003/ TDLBFD-002003 LOFD-003029/ TDLOFD-001075 LEOFD-111306 LOFD-001093/ TDLOFD-131207 LOFD-002015/ TDLOFD-002015	Physical Channel Management SFN Breathing Pilot PUCCH Flexible Configuration RACH Optimization	Meaning: PucchSwitch: Indicates whether to enable PUCCH resource adjustment. If this option is selected, the eNodeB initiates PUCCH resource adjustment when PUCCH resources are insufficient or excessive. If this option is deselected, the eNodeB cannot adjust PUCCH resources. PucchFlexCfgSwitch: Indicates whether to enable flexible PUCCH configuration. For LTE FDD, this option does not take effect if an LBBPc is used or the cell bandwidth is 1.4 MHz or 3 MHz. If flexible PUCCH configuration is enabled, frequency-domain uplink ICIC and uplink frequency hopping scheduling do not take effect. For LTE TDD, this option does not take effect when one of the following conditions is met: (1) An LBBPc is used. (2) The cell bandwidth is 1.4 MHz, 3 MHz, or 5 MHz. (3) The SRSCfg.TddSrsCfgMode parameter is set to ACCESS_FIRST or EXPERIENCE_FIRST. (4) The CellRicAlgo.MuteUpPTSSymNum parameter is set to a non-zero value or the TddAvoidUpPTSInterfSwitch option of the CellAlgoSwitch.AvoidInterfSwitch parameter is selected. (5) The Cell.SubframeAssignment parameter is set to a value other than SA0, SA1, or SA2, or the Cell.SpecialSubframePatterns parameter is set to a value ranging from SSP0 to SSP4 (for a normal CP) or a value ranging from SSP0 to SSP3 (for an extended CP). If flexible PUCCH configuration is enabled, frequency-domain uplink ICIC, uplink ICS, and uplink frequency hopping scheduling do not take effect. If this option is selected, an equal number of RBs (specified by the PucchExtendedRBNum parameter) are separately added to both ends of the uplink band allocated for the PUCCH. The total number of extension PUCCH RBs equals to the PucchExtendedRBNum parameter value multiplied by two, and the extension RBs can be used for PUSCH scheduling. If this option is deselected, flexible PUCCH configuration is disabled. This option applies only to LTE FDD and LTE TDD. Dl2CCAckResShareSw: Indicates whether to enable PUCCH ACK channel resource sharing for downlink 2CC CA. The eNodeB divides the ACK code channel resources on the PCC for downlink 2CC CA into four

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					groups. If this option is deselected, CA UEs scheduled on each SCC associated with this PCC are allowed to use the ACK channel resources in only one group. If this option is selected, CA UEs scheduled on each SCC associated with this PCC can use the ACK channel resources in any group. SCCAckResourceCfgSW: Indicates whether to enable SCC ACK resource configuration. If this option is selected, the eNodeB controls the maximum number of RBs that can be used by PUCCH format 3 and the maximum number of code channels that can be used by SCC ACKs in 2CC CA scenarios according to the settings of the Format3RBNum and Max2CCAckChNum parameters in the PUCCHCfg MO, respectively. If this option is deselected, the eNodeB controls the maximum number of RBs that can be used by PUCCH format 3 and the maximum number of code channels that can be used by SCC ACKs in 2CC CA scenarios. EmtcAckModeSw: Indicates the ACK feedback mode of eMTC UEs. If this option is deselected, eMTC UEs always send ACKs in bundling mode. If this option is selected, eMTC UEs always send ACKs in multiplexing mode when the eNodeB sends all the csi-NumRepetitionCE, mPDCCH-NumRepetition, and pucch-NumRepetitionCE-format1 IEs only once. If the eNodeB repeatedly sends any of these IEs, eMTC UEs send ACKs in bundling mode. This option is deselected by default. This option applies only to LTE TDD. PucchMeasOptSwitch: Indicates whether the baseband processing unit (BBP) uses the PUCCH CQI RSRP measurement algorithm. The optimized PUCCH CQI measurement algorithm is used only after this option is selected. Specifications are affected when the measurement algorithm changes, which also changes the PUCCH resource allocation algorithm. If this option is deselected, the original PUCCH CQI measurement algorithm and PUCCH resource allocation algorithm are used. This option does not apply if LBBPc is used. This option applies only to LTE FDD. GUI Value Range: PucchSwitch(PucchSwitch), PucchFlexCfgSwitch(PucchFlexCfgSwitch), Dl2CCAckResShareSw(Dl2CCAckResShareSw), SCCAckResourceCfgSw(SCCAckResourceCfgSw),

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					EmtcAckModeSw(EmtcAckModeSw), PucchMeasOptSwitch(PucchMeasOptSwitch) Unit: None Actual Value Range: PucchSwitch, PucchFlexCfgSwitch, Dl2CCAckResShareSw, SCCAckResourceCfgSw, EmtcAckModeSw, PucchMeasOptSwitch Default Value: PucchSwitch:On, PucchFlexCfgSwitch:Off, Dl2CCAckResShareSw:On, SCCAckResourceCfgSw:Off, EmtcAckModeSw:Off, PucchMeasOptSwitch:Off
CellCqiAdaptiveCfg	CqiPeriodAdaptive	MOD CELLCQIADAPTIVECFG LST CELLCQIADAPTIVECFG	LBFD-002025/ TDLBFD-002025 LBFD-00101502/ TDLBFD-00101502 TDLOFD-001049 TDLOFD-001061 TDLBFD-002003 TDLBFD-002031 LBFD-060101	Basic Scheduling Dynamic Scheduling Single Streaming Beamforming Dual Streaming Beamforming Physical Channel Management Aperiodic CQI Reporting Optimization of CQI Reporting	Meaning: Indicates whether to enable CQI reporting period adaptation. If this parameter is set to ON(On), the CQI reporting period adaptively changes based on the air interface load of the cell. If this parameter is set to OFF(Off), the CQI reporting period is specified by the UserCqiPeriod parameter. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: OFF(Off), ON(On) Unit: None Actual Value Range: OFF, ON Default Value: ON(On)

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellCqiAdaptiveCfg	UserCqiPeriod	MOD CELLCQIADAPTIVECFG LST CELLCQIADAPTIVECFG	LBFD-002025/ TDLBFD-002025 LBFD-00101502/ TDLBFD-00101502 TDLBFD-002003	Basic Scheduling Dynamic Scheduling Physical Channel Management	Meaning: Indicates the fixed CQI reporting period. This parameter takes effect only if the CqiPeriodAdaptive parameter is set to OFF(Off). If the UserCqiPeriod parameter is set to ms2(2ms), the period is automatically changed to 5ms for the TDD cell. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: ms2(2ms), ms5(5ms), ms10(10ms), ms20(20ms), ms40(40ms), ms80(80ms), ms160(160ms) Unit: ms Actual Value Range: ms2, ms5, ms10, ms20, ms40, ms80, ms160 Default Value: ms40(40ms)
PUCCHCfg	SriPeriodAdaptive	MOD PUCCHCFG LST PUCCHCFG	LBFD-002003/ TDLBFD-002003	Physical Channel Management	Meaning: Indicates whether to enable scheduling request indicator (SRI) period adaptation. If this parameter is set to QCIADAPTIVE(QCIADAPTIVE), the SRI period adaptively changes based on the cell load and bearers with different QCIs. If this parameter is set to NOQCIADAPTIVE(NOQCIADAPTIVE), the SRI period adaptively changes based only on the cell load. If this parameter is set to OFF(OFF), the SRI period is dependent on the value of the FixedSriPeriod parameter in the PUCCHCfg MO: If the FixedSriPeriod parameter value is Disable(Disable), the SRI period is set to the value of the SriPeriod parameter in the CellQciPara MO; if the FixedSriPeriod parameter value is not Disable(Disable), the SRI period is set to the value of the FixedSriPeriod parameter. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: OFF(OFF), QCIADAPTIVE(QCIADAPTIVE), NOQCIADAPTIVE(NOQCIADAPTIVE) Unit: None Actual Value Range: OFF, QCIADAPTIVE, NOQCIADAPTIVE Default Value: QCIADAPTIVE(QCIADAPTIVE)

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
PUCCHCfg	DeltaShift	MOD PUCCHCFG LST PUCCHCFG	LBFD-002003/TDLBFD-002003 LAOFD-110203 TDLAOFD-111401 LEOFD-111306	Physical Channel Management ePDCCH ePDCCH Breathing Pilot	Meaning: Indicates the interval between cyclic shifts used for the PUCCH. The interval between cyclic shifts used for the PUCCH can be acquired based on the average delay spread in the cell, where the average delay spread is acquired based on the networking environment. The parameter value DS1_DELTA_SHIFT is not supported by the LBBPc. If a cell is established on an LBBPc but this parameter is set to DS1_DELTA_SHIFT, the value of this parameter is automatically changed to DS2_DELTA_SHIFT when this parameter takes effect. For details, see 3GPP TS 36.211. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: DS1_DELTA_SHIFT(ds1), DS2_DELTA_SHIFT(ds2), DS3_DELTA_SHIFT(ds3) Unit: None Actual Value Range: DS1_DELTA_SHIFT, DS2_DELTA_SHIFT, DS3_DELTA_SHIFT Default Value: DS1_DELTA_SHIFT(ds1)
PUCCHCfg	CqiRbNum	MOD PUCCHCFG LST PUCCHCFG	LBFD-002003/TDLBFD-002003 LEOFD-111306	Physical Channel Management Breathing Pilot	Meaning: Indicates the number of RBs allocated to the CQI at the RRC layer of cell. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: 0~20 Unit: None Actual Value Range: 0~20 Default Value: 1
PUCCHCfg	NaSriChNum	MOD PUCCHCFG LST PUCCHCFG	LBFD-002003/TDLBFD-002003 LEOFD-111306	Physical Channel Management Breathing Pilot	Meaning: Indicates the number of resource indexes allocated to SRI and semi-persistent ACK at the RRC layer for the cell. If this parameter is set to 0, UEs may fail to access the cell. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: 0~1000 Unit: None Actual Value Range: 0~1000 Default Value: 6

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
PUCCHCfg	Format3RbNum	MOD PUCCHCFG LST PUCCHCFG	LBFD-002003/TDLBFD-002003	Physical Channel Management	Meaning: Indicates the maximum number of RBs that can be used by PUCCH resources in Format 3. This parameter takes effect only when the SCCAckResourceCfgSw option of the PucchAlgoSwitch parameter is selected. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: 0~2 Unit: None Actual Value Range: 0~2 Default Value: 2
PUCCHCfg	Max2CCAckChNum	MOD PUCCHCFG LST PUCCHCFG	LBFD-002003/TDLBFD-002003	Physical Channel Management	Meaning: Indicates the maximum number of code channels that can be used by SCC ACKs in 2CC CA scenarios. This parameter takes effect only when options Dl2CCAckResShareSw and SCCAckResourceCfgSw of the PucchAlgoSwitch parameter are selected. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: MAX_CH_NUM8(Ch8), MAX_CH_NUM16(Ch16), MAX_CH_NUM24(Ch24), MAX_CH_NUM32(Ch32) Unit: None Actual Value Range: MAX_CH_NUM8, MAX_CH_NUM16, MAX_CH_NUM24, MAX_CH_NUM32 Default Value: MAX_CH_NUM32(Ch32)
CellQciPara	SriPeriod	ADD CELLQCIPARA MOD CELLQCIPARA LST CELLQCIPARA	LBFD-002003/TDLBFD-002003	Physical Channel Management	Meaning: Indicates the interval at which scheduling request indicators are sent. This parameter applies only to LTE FDD and LTE TDD. GUI Value Range: ms5(SRI 5ms), ms10(SRI 10ms), ms20(SRI 20ms), ms40(SRI 40ms), ms80(SRI 80ms) Unit: None Actual Value Range: ms5, ms10, ms20, ms40, ms80 Default Value: ms10(SRI 10ms)

6 Counters

Table 6-1 Counters

Counter ID	Counter Name	Counter Description	Feature ID	Feature Name
1526726740	L.ChMeas.PRB.DL.Used.Avg	Average number of used PDSCH PRBs	Multi-mode: None GSM: None UMTS: None LTE: LBFD-002025 TDLBFD-002025 LOFD-070205 LEOFD-111305 NR: None	Basic Scheduling Basic Scheduling Adaptive SFN/SDMA Virtual 4T4R
1526727357	L.Traffic.DL.SCH.QPSK.TB.bits	Number of bits of TBs initially transmitted on the downlink SCH in QPSK modulation mode	Multi-mode: None GSM: None UMTS: None LTE: LBFD-002002 LBFD-001005 TDLBFD-002002 TDLBFD-001005 NR: None	Transport Channel Management Modulation: DL/UL QPSK, DL/UL 16QAM, DL 64QAM Transport Channel Management Modulation: DL/UL QPSK, DL/UL 16QAM, DL 64QAM

Counter ID	Counter Name	Counter Description	Feature ID	Feature Name
1526727358	L.Traffic.DL.SCH.16QAM.TB.bits	Number of bits of TBs initially transmitted on the downlink SCH in 16QAM modulation mode	Multi-mode: None GSM: None UMTS: None LTE: LBFD-002002 LBFD-001005 TDLBFD-002002 TDLBFD-001005 NR: None	Transport Channel Management Modulation: DL/UL QPSK, DL/UL 16QAM, DL 64QAM Transport Channel Management Modulation: DL/UL QPSK, DL/UL 16QAM, DL 64QAM
1526727359	L.Traffic.DL.SCH.64QAM.TB.bits	Number of bits of TBs initially transmitted on the downlink SCH in 64QAM modulation mode	Multi-mode: None GSM: None UMTS: None LTE: LBFD-002002 LBFD-001005 TDLBFD-002002 TDLBFD-001005 NR: None	Transport Channel Management Modulation: DL/UL QPSK, DL/UL 16QAM, DL 64QAM Transport Channel Management Modulation: DL/UL QPSK, DL/UL 16QAM, DL 64QAM
1526728433	L.ChMeas.PRB.DL.Avail	Number of available downlink PRBs	Multi-mode: MRFD-090202 MRFD-130221 MRFD-130222 GSM: None UMTS: None LTE: LAOFD-001001 LAOFD-001002 LOFD-070205 TDLOFD-001075 LEOFD-111305 NR: None	GSM and LTE FDD Dynamic Spectrum Sharing(LTE FDD) GSM and LTE Spectrum Concurrency (LTE FDD) UMTS and LTE Spectrum Sharing (LTE FDD) LTE-A Introduction Carrier Aggregation for Downlink 2CC in 40MHz Adaptive SFN/SDMA SFN Virtual 4T4R

Counter ID	Counter Name	Counter Description	Feature ID	Feature Name
1526728434	L.ChMeas.PRB.UL.Avail	Number of available uplink PRBs	Multi-mode: MRFD-090202 MRFD-130221 MRFD-130222 GSM: None UMTS: None LTE: LAOFD-001001 LAOFD-001002 LOFD-070205 TDLOFD-001075 NR: None	GSM and LTE FDD Dynamic Spectrum Sharing(LTE FDD) GSM and LTE Spectrum Concurrency (LTE FDD) UMTS and LTE Spectrum Sharing (LTE FDD) LTE-A Introduction Carrier Aggregation for Downlink 2CC in 40MHz Adaptive SFN/SDMA SFN
1526739657	L.Traffic.DL.SCH.256QAM.TB.bits	Number of bits of TBs initially transmitted on the downlink SCH in 256QAM modulation scheme	Multi-mode: None GSM: None UMTS: None LTE: LBFD-002002 LBFD-001005 TDLBFD-002002 TDLBFD-001005 LEOFD-110301 TDLEOFD-110515 NR: None	Transport Channel Management Modulation: DL/UL QPSK, DL/UL 16QAM, DL 64QAM Transport Channel Management Modulation: DL/UL QPSK, DL/UL 16QAM, DL 64QAM DL 256QAM DL 256QAM

7 Glossary

For the acronyms, abbreviations, terms, and definitions, see *Glossary*.

8 Reference Documents

1. 3GPP TS 36.104, "Base Station (BS) radio transmission and reception"
2. 3GPP TS 36.211, "Physical Channels and Modulation"
3. *Physical Channel Resource Management*
4. *Power Control*
5. *Scheduling*
6. *Admission and Congestion Control*
7. *Intra-RAT Mobility Load Balancing*
8. *Inter-RAT Mobility Load Balancing*

