

R&S®SMU-/SMATE-/ R&S®SMJ-/SMBV-/ R&S®AMU-K84 EUTRA/LTE Release 9 and enhanced features Specifications

Definitions

(see Digital Standards for Signal Generators data sheet, PD 5213.9434.22)

EUTRA/LTE Release 9 and enhanced features

For the R&S®SMU-K84, R&S®SMATE-K84, R&S®SMJ-K84, R&S®SMBV-K84 and R&S®AMU-K84 options.

For each R&S®SMU-/SMATE-/SMJ-/SMBV-/AMU-K84 option, an R&S®SMU-/SMATE-/SMJ-/SMBV-/AMU-K55 option, which is described in the Digital Standards for Signal Generators data sheet (PD 5213.9434.22), must be installed on the instrument.

General description

This option enhances the R&S®SMU-/SMATE-/SMJ-/SMBV-/AMU-K55 option (EUTRA/LTE digital standard) to support LTE Release 9, including the following features:

- Generation of positioning reference signals (PRS)
- Dual-layer beamforming (transmission mode 8)
- MBMS single frequency network (MBSFN)

The R&S®SMU-/SMATE-/SMJ-/SMBV-/AMU-K84 option requires the R&S®SMU-/SMATE-/SMJ-/SMBV-/AMU-K55 option. Therefore, all general parameters of the R&S®SMU-/SMATE-/SMJ-/SMBV-/AMU-K55 option are also valid, unless stated otherwise in the following sections.

Specifications

EUTRA/LTE digital standard		in line with the 3GPP Release 9 standard (March 2011): TS 36.211 v.9.1.0, TS 36.212 v.9.3.0, TS 36.213 v.9.3.0
Positioning reference signals (PRS)		
PRS state		ON/OFF
PRS configuration index	in line with 36.211-910, table 6.10.4.3-1	0 to 2399
PRS periodicity (T_PRS)	read-only, displays the periodicity of the PRS generation in line with 36.211-910, table 6.10.4.3-1	160, 320, 640, 1280 subframes
PRS subframe offset (Delta_PRS)	read-only, displays the subframe offset of the PRS generation in line with 36.211-910, table 6.10.4.3-1	0 to 1279 subframes
Number of PRS DL subframes (N_PRS)	defines the number of consecutive PRS subframes	1, 2, 4, 6 subframes
PRS bandwidth	defines the resource blocks in which the PRS are transmitted	1.4/3/5/10/15/20 MHz
PRS power	sets the power of a PRS resource element relative to a common reference signal (CRS) resource element	-80.00 dB to +10.00 dB
Dual-layer beamforming		
This option enables the generation of downlink signals dedicated to UE that is set to transmission mode 8. In order to support this mode, the DCI format 2C is introduced. The way that the (logical) antenna ports are mapped to the (physical) TX antennas of the signal generator is configurable. This feature allows UE receiver testing in line with the beamforming model defined in TS 36.101, B.4.		
Antenna port mapping	defines how the (logical) antenna ports are mapped to the (physical) TX antennas of the signal generator	codebook, random codebook, fixed weights
MBMS single frequency network (MBSFN)		
This option enables the generation of MBSFN subframes. All different allocation, modification and repetition periods can be set individually within the maximum number of frames that can be generated in line with the sequence length enabled by the R&S [®] SMU-/SMATE-/SMJ-/SMBV-/AMU-K55 option. References to the official 3GPP TS 36.331 v.9.5.0 specification are abbreviated as 36.331.		
MBSFN mode	mixed: 15 kHz subcarrier spacing, dedicated: 7.5 kHz subcarrier spacing ¹	OFF, mixed, dedicated
MBSFN rho A	sets the power of the MBSFN channels relative to the common reference signals	-80.00 dB to +10.00 dB
UE category	defines the MBMS UE category as defined in 36.306	1 to 5
Radio frame allocation period	(from 36.331, MBSFN-SubframeConfig) indicates the radio frames that contain MBSFN subframes	1, 2, 4, 8, 16, 32 frames
Radio frame allocation offset	(from 36.331, MBSFN-SubframeConfig) indicates the radio frames that contain MBSFN subframes	0 to 7 frames
Subframe allocation mode	(from 36.331, MBSFN-SubframeConfig) defines whether MBSFN periodic scheduling is done in 1 or 4 frame mode	1 frame, 4 frames
Allocation value (HEX)	(from 36.331, MBSFN-SubframeConfig, identical to bitmap of subframeAllocation) defines which subframes are used for MBSFN	
	1 frame	0x00 to 0x3F
	4 frames	0x000000 to 0xFFFFFFFF
Area ID (N_ID_MBSFN)	(from 36.331, MBSFN-AreaInfoList) indicates the MBSFN area ID	0 to 255
Non-MBSFN region length	(from 36.331, MBSFN-AreaInfoList) indicates how many symbols from the beginning of the subframe constitute the non-MBSFN region	1, 2 OFDMA symbols
Notification indicator	(from 36.331, MBSFN-AreaInfoList) indicates which PDCCH bit is used to notify the UE about an MCCH change	0 to 7

¹ Dedicated mode will be supported in a later version.

MCCH state		ON/OFF
MCCH repetition period	(from 36.331, MBSFN-AreaInfoList) defines the interval between transmissions of MCCH information in radio frames	32, 64, 128, 256 frames
MCCH offset	(from 36.331, MBSFN-AreaInfoList) indicates, together with the MCCH repetition period, the radio frames in which the MCCH is scheduled ²	0 to 7 frames
MCCH modification period	(from 36.331, MBSFN-AreaInfoList) defines periodically appearing boundaries, the contents of different transmissions of MCCH information can only be different if there is at least one such boundary in-between them	512, 1024 frames
MCCH MCS	(from 36.331, MBSFN-AreaInfoList) indicates the modulation and coding scheme (MCS) for the MCCH	2, 7, 13, 19
Notification subframe index	(from 36.331, MBMS-NotificationConfig) indicates the subframe used to transmit MCCH change notifications on PDCCH	1 to 6
Notification repetition coefficient	(from 36.331, MBMS-NotificationConfig) actual change notification repetition period for the MCCH	2, 4
Notification offset	(from 36.331, MBMS-NotificationConfig) indicates, together with the notification repetition coefficient, the radio frames in which the MCCH information change notification is scheduled ²	0 to 7 frames
Common subframe allocation period	(from 36.331, MBSFN-AreaConfiguration) indicates the period during which resources corresponding with the radio frame allocation period field are divided between the PMCHs that are configured for this MBSFN area	4, 8, 16, 32, 64, 128, 256 frames
Number of PMCHs	defines the number of PMCHs of the simulated MBSFN area	1 to 15
Subframe allocation start	indicates the first subframe allocated to a specific PMCH within a period identified by the radio frame allocation period	0 to 1534
Subframe allocation end	indicates the last subframe allocated to a specific PMCH within a period identified by the radio frame allocation period	1 to 1535
Scheduling period	(from 36.331, PMCH-InfoList) indicates the MCH scheduling period i.e. the periodicity used for providing MCH scheduling information at lower layers (MAC) for a specific PMCH	8, 16, 32, 64, 128, 256, 512, 1024 frames
MCS	(from 36.331, PMCH-InfoList) indicates the modulation and coding scheme (MCS) for a specific PMCH	0 to 28
Data source	sets the data source for a specific PMCH	PN9, PN11, PN15 to PN 23, DList, pattern, All 0, All 1

² Read-only, same value as radio frame allocation offset.

Ordering information

Designation	Type	Order No.
EUTRA/LTE Release 9 and enhanced features	R&S [®] SMU-K84	1408.8475.02
EUTRA/LTE Release 9 and enhanced features	R&S [®] SMATE-K84	1404.8829.02
EUTRA/LTE Release 9 and enhanced features	R&S [®] SMJ-K84	1409.3360.02
EUTRA/LTE Release 9 and enhanced features	R&S [®] SMBV-K84	1415.8602.02
EUTRA/LTE Release 9 and enhanced features	R&S [®] AMU-K84	1403.0818.02

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ISO 9001

Certified Environmental System
ISO 14001

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