

Sub-test ^⓪	β_c ^⓪	β_d ^⓪	β_d (SF) ^⓪	β_c/β_d ^⓪	β_{hs} ⁽¹⁾ ^⓪	β_{ac} ^⓪	β_{ad} ^⓪	β_c ^(c) ^⓪ (SF) ^⓪	β_{ad} ^(c) ^⓪ (code) ^⓪	CM ⁽²⁾ ^⓪ (dB) ^⓪	MP R ^(c) ^⓪ (dB) ^⓪	AG ⁽⁴⁾ ^⓪ Inde ^x ^⓪	E-TFC I ^⓪
1 ^⓪	11/15 ⁽³⁾ ^⓪	15/15 ⁽³⁾ ^⓪	64 ^⓪	11/15 ⁽³⁾ ^⓪	22/15 ^⓪	209/225 ^⓪	1039/225 ^⓪	4 ^⓪	1 ^⓪	1.0 ^⓪	0.0 ^⓪	20 ^⓪	75 ^⓪
2 ^⓪	6/15 ^⓪	15/15 ^⓪	64 ^⓪	6/15 ^⓪	12/15 ^⓪	12/15 ^⓪	94/75 ^⓪	4 ^⓪	1 ^⓪	3.0 ^⓪	2.0 ^⓪	12 ^⓪	67 ^⓪
3 ^⓪	15/15 ^⓪	9/15 ^⓪	64 ^⓪	15/9 ^⓪	30/15 ^⓪	30/15 ^⓪	$\beta_{ad1}:47/15$ ^⓪ $\beta_{ad2}:47/15$ ^⓪	4 ^⓪	2 ^⓪	2.0 ^⓪	1.0 ^⓪	15 ^⓪	92 ^⓪
4 ^⓪	2/15 ^⓪	15/15 ^⓪	64 ^⓪	2/15 ^⓪	4/15 ^⓪	2/15 ^⓪	56/75 ^⓪	4 ^⓪	1 ^⓪	3.0 ^⓪	2.0 ^⓪	17 ^⓪	71 ^⓪
5 ^⓪	15/15 ⁽⁴⁾ ^⓪	15/15 ⁽⁴⁾ ^⓪	64 ^⓪	15/15 ⁽⁴⁾ ^⓪	30/15 ^⓪	24/15 ^⓪	134/15 ^⓪	4 ^⓪	1 ^⓪	1.0 ^⓪	0.0 ^⓪	21 ^⓪	81 ^⓪
Note 1: ΔACK , $\Delta NACK$ and $\Delta CQI=8$ $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$ Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference ^⓪ Note 3 : For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$ ^⓪ Note 4 : For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$ ^⓪ Note 5 : Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g ^⓪ Note 6: β_{ad} can not be set directly; it is set by Absolute Grant Value. ^⓪													

Table 6 : Subtests for UMTS Release 6 HSUPA

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI(ms)	Minimum Spreading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	10	2SF2&2SF	11484	5.76
	4	4	2	4	20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF	22996	?
	4	4	10	4	20000	?
NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4. UE categories 1 to 6 support QPSK only. UE category 7 supports QPSK and 16QAM. (TS25.306-7.3.0).						

Table 7 : HSUPA UE category

c) DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a Second serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS 34.108 v9.5.0.

A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13.

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

The measurements were performed with a Fixed Reference Channel (FRC) H-Set 12 with QPSK.

Parameter	Value
Nominal average inf. bit rate	60 kbit/s
Inter-TTI Distance	1 TTI's
Number of HARQ Processes	6 Processes
Information Bit Payload	120 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	960 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	3200 SMLs
Coding Rate	0.15
Number of Physical Channel Codes	1

Table 8 : settings of required H-Set 12 QPSK acc. To 3GPP 34.121

Note:

1. The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table above.
2. Maximum number of transmission is limited to 1,i.e.,retransmission is not allowed. The redundancy and constellation version 0 shall be used.

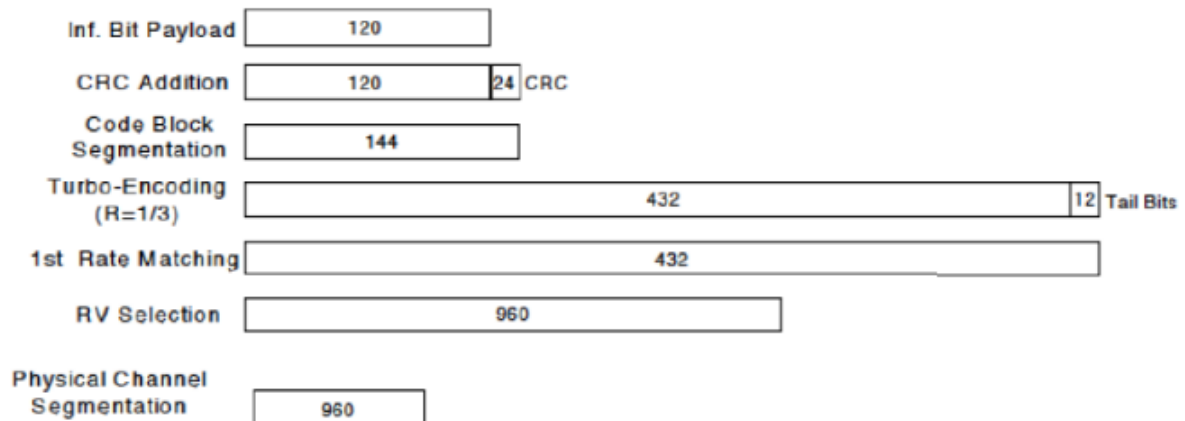


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 5 procedures. A summary of subtest settings are illustrated below:

Sub-test ^o	β_c ^o	β_d ^o	β_d (SF) ^o	β_c/β_d ^o	$\beta_{hs}(1)$ ^o	CM(dB)(2) ^o	MPR (dB) ^o
1 ^o	2/15 ^o	15/15 ^o	64 ^o	2/15 ^o	4/15 ^o	0.0 ^o	0 ^o
2 ^o	12/15(3) ^o	15/15(3) ^o	64 ^o	12/15(3) ^o	24/15 ^o	1.0 ^o	0 ^o
3 ^o	15/15 ^o	8/15 ^o	64 ^o	15/8 ^o	30/15 ^o	1.5 ^o	0.5 ^o
4 ^o	15/15 ^o	4/15 ^o	64 ^o	15/4 ^o	30/15 ^o	1.5 ^o	0.5 ^o
Note 1: Δ ACK, Δ NACK and Δ CQI=8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$ Note 2: CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases. Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$							

Up commands are set continuously to set the UE to Max power.

Note:

1. The Dual Carriers transmission only applies to HSDPA physical channels
2. The Dual Carriers belong to the same Node and are on adjacent carriers.
3. The Dual Carriers do not support MIMO to serve Ues configured for dual cell operation
4. The Dual Carriers operate in the same frequency band.
5. The device doesn't support the modulation of 16QAM in uplink but 64QAM in downlink for DC-HSDPA mode.
6. The device doesn't support carrier aggregation for it just can operate in Release 8.

d) HSPA+

SAR is required for Rel. 7 HSPA+ when SAR is required for Rel. 6 HSPA; otherwise, the 3G SAR test reduction procedure is applied to (uplink) HSPA+ with 12.2 kbps RMC as the primary mode. Power is measured for HSPA+ that supports uplink 16 QAM according to configurations in Table C.11.1.4 of 3GPP TS 34.121-1 to determine SAR test reduction.

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_{c} (Note 3)	β_{d}	β_{HS} (Note 1)	β_{ecl}	β_{ed1} (2xSF2) (Note 4)	β_{ed3} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105
Note 1: $\Delta_{\text{ACK}}, \Delta_{\text{NACK}}$ and $\Delta_{\text{CQI}} = 30/15$ with $\beta_{\text{HS}} = 30/15 * \beta_{\text{c}}$. Note 2: CM = 3.5 and the MPR is based on the relative CM difference, $\text{MPR} = \text{MAX}(\text{CM}-1, 0)$. Note 3: DPDCH is not configured, therefore the β_{c} is set to 1 and $\beta_{\text{d}} = 0$ by default. Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value. Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.											

5) 3G SAR Test Reduction Procedure

According to KDB 941225D01, in the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq 1/4$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

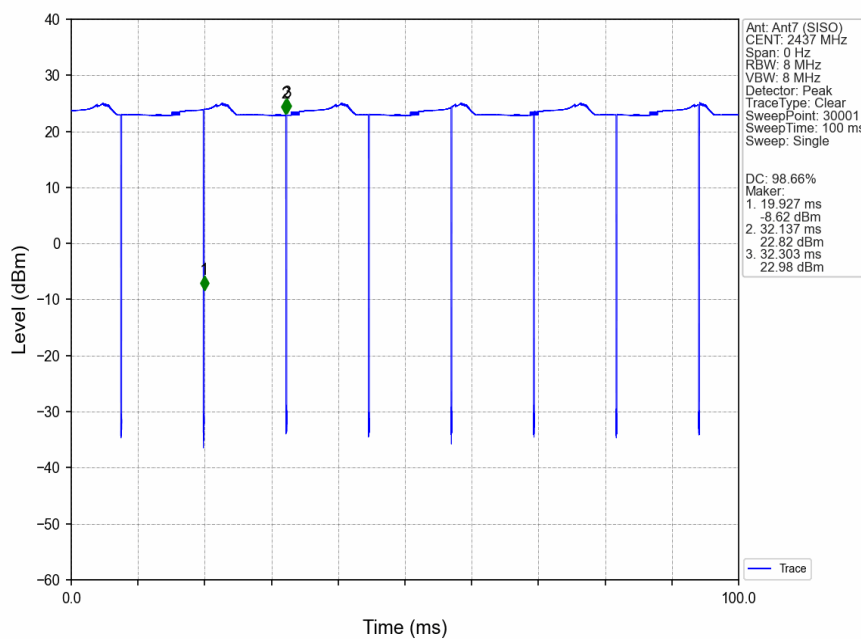
7.1.3 WIFI Test Configuration

A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement.

7.1.3.1 Duty cycle

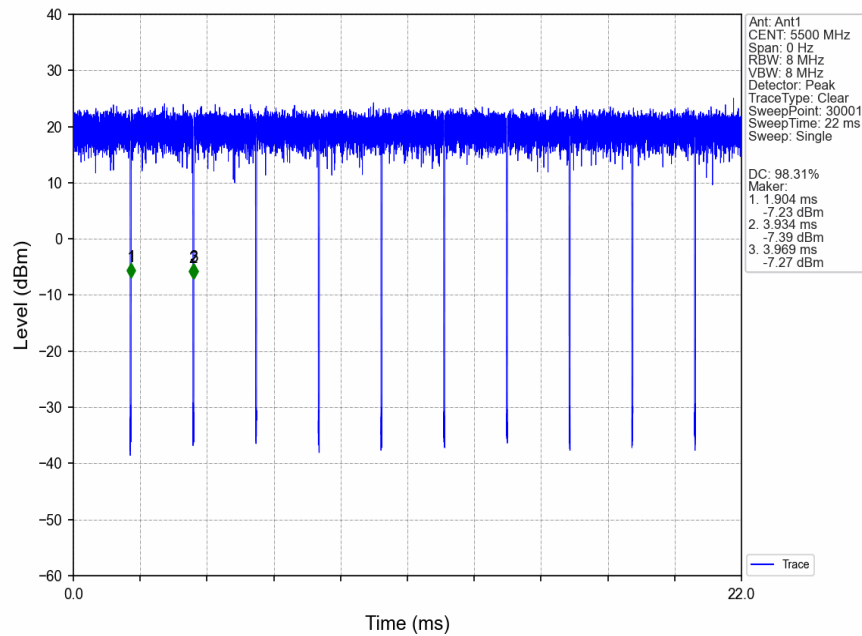
1) Wi-Fi 2.4GHz 802.11b:

Duty cycle=98.66%



2) Wi-Fi 5GHz 802.11a:

Duty cycle=98.31%



7.1.3.2 Initial Test Position SAR Test Reduction Procedure

DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures. The initial test position procedure is described in the following:

- 1) . When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).
- 2) . When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.
- 3) . For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested. a) Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.

7.1.3.3 Subsequent Test Configuration Procedures

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. The initial test position procedure is applied to next to the ear, UMPC mini-tablet and hotspot mode configurations. When the same maximum output power is specified for multiple transmission modes, additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. The subsequent test configuration and SAR measurement procedures are described in the following.

- 1) . When SAR test exclusion provisions of KDB Publication 447498 are applicable and SAR measurement is not required for the initial test configuration, SAR is also not required for the next highest maximum output power transmission mode subsequent test configuration(s) in that frequency band or aggregated band and exposure configuration.
- 2) . When the highest reported SAR for the initial test configuration (when applicable, include subsequent highest output channels), according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.
- 3) . The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.
 - a) SAR should first be measured for the channel with highest measured output power in the subsequent test configuration.
 - b) SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the reported SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested. i) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.
- 4) . SAR measurements for the remaining highest specified maximum output power OFDM transmission mode configurations that have not been tested in the initial test configuration (highest maximum output) or subsequent test configuration(s) (subsequent next highest maximum output power) is determined by recursively applying the subsequent test configuration procedures in this section to the remaining configurations according to the following:
 - a) replace "subsequent test configuration" with "next subsequent test configuration" (i.e., subsequent next highest specified maximum output power configuration)
 - b) replace "initial test configuration" with "all tested higher output power configurations"

7.1.3.4 2.4 GHz WiFi SAR Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions. When SAR measurement is required for an OFDM configuration, the initial test configuration, subsequent test configuration and initial test position procedures are applied. The SAR test exclusion requirements for 802.11g/n OFDM configurations are described in following.

- **802.11b DSSS SAR Test Requirements**

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

- 1) . When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) . When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

- **2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements**

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3, including sub-sections). SAR is not required for the following 2.4 GHz OFDM conditions.

- 1) . When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
- 2) . When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

- **SAR Test Requirements for OFDM configurations**

When SAR measurement is required for 802.11 g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

7.1.3.5 5 GHz WiFi SAR Procedures

- **U-NII-1 and U-NII-2A Bands**

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following:

- 1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, both bands are tested independently for SAR.
- 2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, both bands are tested independently for SAR.
- 3) The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50. Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest reported SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is > 1.2 W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

- **U-NII-2C and U-NII-3 Bands**

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. when Terminal Doppler Weather Radar (TDWR) restriction applies, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures.

When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements

The initial test configuration for 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures. When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

- 1) The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
- 2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
- 3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
- 4) When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n. After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.
 - a) The channel closest to mid-band frequency is selected for SAR measurement.
 - b) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

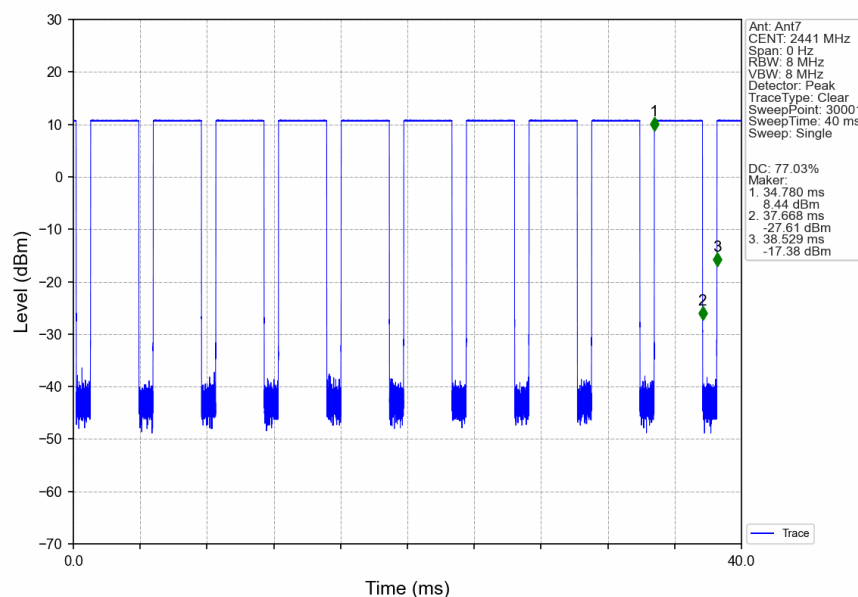
• SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

7.1.4 BT Test Configuration

For the Bluetooth SAR tests, a communication link is set up with the test mode software for BT mode test. Bluetooth USES frequency hopping technology to divide the transmitted data into packets and transmit the packets respectively through 79 designated Bluetooth channels, frequency hops at 1600 hops/second per the Bluetooth standard, the EUT is operated at the RF continuous emission mode.

BT DH5 Duty Cycle=77.03%



7.1.5 LTE Test Configuration

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The Radio Communication Analyzer was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

TDD LTE test consideration

For Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.

LTE TDD Band support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Frame structure type 2:

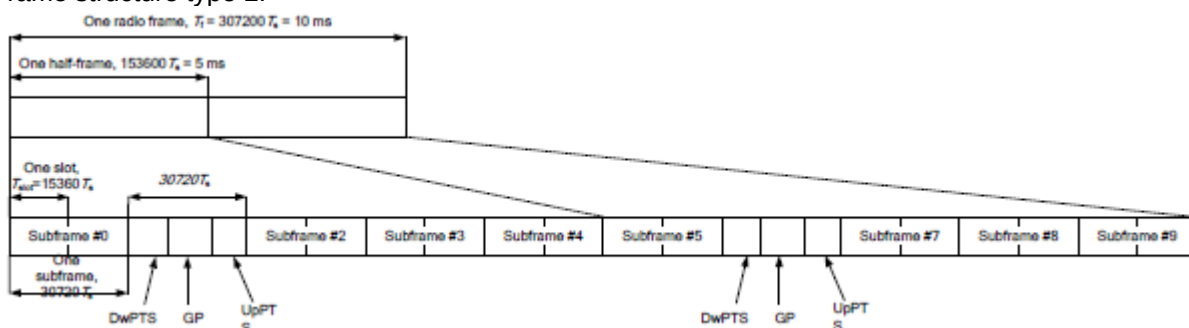


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	6592.Ts	2192.Ts	2560.Ts	7680.Ts	2192.Ts	2560.Ts
1	19760.Ts			20480.Ts		
2	21952.Ts			23040.Ts		
3	24144.Ts			25600.Ts		
4	26336.Ts	4384.Ts	5120.Ts	7680.Ts	4384.Ts	5120.Ts
5	6592.Ts			20480.Ts		
6	19760.Ts			23040.Ts		
7	21952.Ts			25600.Ts		
8	24144.Ts	-	-	-	-	-
9	13168.Ts			-	-	-

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Calculated Duty Cycle=[Extended cyclic prefix in uplink x (Ts) x # of S + # of U]/10ms

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

A) Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

B) MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

Modulation	Channel bandwidth/Transmission bandwidth						MPR (dB)
	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	0
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	1
16QAM	> 5	> 4	> 8	> 12	> 16	> 18	2
64QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	2
64QAM	> 5	> 4	> 8	> 12	> 16	> 18	3
256QAM	≥ 1						5

C) A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

D) Largest channel bandwidth standalone SAR test requirements

1) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.

3) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

4) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> \frac{1}{2}$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

E) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is $> \frac{1}{2}$ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

F) LTE CA additional specification

The device supports intra-band contiguous and inter-band discontinuous uplink and downlink LTE Carrier Aggregation (CA). When carrier aggregation applies, implementation and measurement details for the following are necessary.

- a) Intra-band carrier aggregation requirements for uplink.
- b) Intra-band and inter-band carrier aggregation requirements for downlink.

The downlink LTE CA test is not required since the maximum output power for downlink LTE CA was not more than 0.25dB higher than the maximum output power for without downlink LTE CA.

SAR test procedure for intra-band contiguous UL LTE CA as below:

1) Maximum output power is measured for each UL CA configuration for the required test channels described in KDB 941225 D05

- UL PCC configuration is determined by the required test channel
- SCC and subsequent CCs are added alternatively to either side of the PCC or within the transmission band for channels at the ends of a frequency band.

2) SAR for UL CA is required in each exposure condition and frequency band combination

3) For this device, as the maximum output for Intra-band uplink LTE CA is $\leq$ standalone LTE mode (without CA),

- PCC is configured according to the highest standalone SAR configuration tested.
- SCC and subsequent CCs are configured according to procedures used for power measurement and parameters (BW, RB etc.) similar to that used for the PCC

4) When the reported SAR for UL CA configuration, described above, is > 1.2 W/kg, UL CA SAR is also required for all required test channels (PCC based)

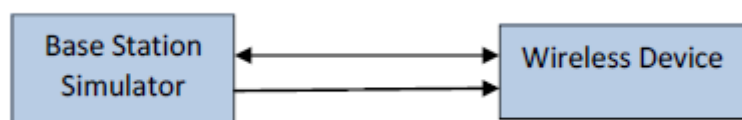
5) UL CA SAR is also required for standalone SAR configurations > 1.2 W/kg when they are scaled to the UL CA power level.

6) General PCC and SCC configuration selection procedure

- PCC uplink channel, channel bandwidth, modulation and RB configurations were selected based on section C)3)b)ii) of KDB 941225 D05 V01r02. All LTE bandwidth conducted powers needed for PCC uplink configuration selection can be found in appendix E. The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation.

- To maximize aggregated bandwidth, highest channel bandwidth available for that CA combination was selected for SCC. For inter-band CA, the SCC downlink channels were selected near the middle of their transmission bands. For contiguous intra-band CA, the downlink channel spacing between the component carriers was set to multiple of 300 kHz less than the nominal channel spacing defined in section 5.4.1A of 3GPP TS 36.521. For non-contiguous intra-band CA, the downlink channel spacing between the component carriers was set to be larger than the nominal channel spacing and provided maximum separation between the component carriers.

All selected PCC and SCC(s) remained fully within the uplink/downlink transmission band of the respective component carrier.



DL CA Power Measurement Setup

- c) Inter-band carrier aggregation requirements for uplink

For Inter band Uplink CA SAR, as the existing SAR test system cannot test the multiple different frequency bands simultaneous Transmission SAR at the same time, we suggest that the conservative “max + max” multi-Tx and SAR scaling method can be used to evaluate the inter-band Uplink CA SAR from standalone SAR test results of each LTE component band and the conservative “max + max” multi-Tx method to combine the scaled SAR value from each Inter band Uplink CA component band as the inter-band Uplink CA SAR.

The Inter band Uplink CA as below table:

Band/ Antenna		LTE Band 4		LTE Band 5	LTE Band 13	LTE Band 66	
		Ant2	Ant1	Ant0	Ant2	Ant2	Ant1
LTE Band 2	Ant2		√	√	√		√
	Ant1						
LTE Band 4	Ant2			√	√		
	Ant1						
LTE Band 5	Ant0					√	
LTE Band 13	Ant0					√	

7.1.6 NR Band Test Configuration

1. The general information supported by the NR band is as following table:

Band			n2	n5	n48	n66	n77	n78
Modulation	DFT-s-OFDM	PI/2 BPSK	Yes	Yes	Yes	Yes	Yes	Yes
		QPSK	Yes	Yes	Yes	Yes	Yes	Yes
		16QAM	Yes	Yes	Yes	Yes	Yes	Yes
		64QAM	Yes	Yes	Yes	Yes	Yes	Yes
		256QAM	Yes	Yes	Yes	Yes	Yes	Yes
	CP-OFDM	QPSK	Yes	Yes	Yes	Yes	Yes	Yes
		16QAM	Yes	Yes	Yes	Yes	Yes	Yes
		64QAM	Yes	Yes	Yes	Yes	Yes	Yes
		256QAM	Yes	Yes	Yes	Yes	Yes	Yes
Duty Cycle			100%	100%	100%	100%	100%	100%

Band	SCS	Bandwidth													
		5Mhz	10Mhz	15Mhz	20Mhz	25Mhz	30Mhz	35Mhz	40Mhz	50Mhz	60Mhz	70Mhz	80Mhz	90Mhz	100Mhz
N2	15KHZ	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N2	30KHZ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N5	15KHZ	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N5	30KHZ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N48	15KHZ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N48	30KHZ	N/A	Yes	N/A	Yes	N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
N66	15KHZ	Yes	Yes	Yes	Yes	Yes	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
N66	30KHZ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N77	15KHZ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N77	30KHZ	N/A	Yes	N/A	Yes	N/A	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N78	15KHZ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N78	30KHZ	N/A	Yes	N/A	Yes	N/A	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes

2. For 5G NR test procedure was following step similar FCC KDB 941225 D05:

- For DFT-OFDM and CP-OFDM output power measurement reduction, according to 3GPP 38.101 maximum power reduction for power class 3, the CP-OFDM mode will not higher than DFT-OFDM mode, therefore, similar FCC KDB 941225 D05 procedure for other modulation output power for each RB allocation configuration is $> \text{not } \frac{1}{2}$ dB higher than the same configuration in DFT-QPSK and the reported SAR for the DFT-QPSK configuration is ≤ 1.45 W/kg; CP-OFDM testing is not required.
- For DFT-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class 3, for PI/2 BPSK/16QAM/64QMA/256QAM and smaller bandwidth output power will spot check largest channel bandwidth worst RB configuration to ensure the PI/2 BPSK/16QAM/64QMA/256QAM and smaller bandwidth output power will not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth.
- SAR testing start with the largest SCS and largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
- 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
- QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
- PI/2 BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not $\frac{1}{2}$ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, PI/2 BPSK/16QAM/64QAM/256QAM SAR testing are not required.
- Smaller SCS/bandwidth output power for each RB allocation configuration for this device will not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device.

3. MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS 38.101-1 Section 6.2.2 under Table 6.2.2 -1 and Table 6.2.2 -2.

Table 6.2.2-1 Maximum power reduction (MPR) for power class 3

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	Pi/2 BPSK	$\leq 3.5^1$	$\leq 1.2^1$	$\leq 0.2^1$
		$\leq 0.5^2$	$\leq 0.5^2$	0 ²
	QPSK	≤ 1		0
	16 QAM	≤ 2		≤ 1
	64 QAM	≤ 2.5		
CP-OFDM	256 QAM	≤ 4.5		
	QPSK	≤ 3		≤ 1.5
	16 QAM	≤ 3		≤ 2
	64 QAM	≤ 3.5		
	256 QAM	≤ 6.5		
NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability <i>powerBoosting-pi2BPSK</i> and if the IE <i>powerBoostPi2BPSK</i> is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0 dB MPR is 26 dBm.				
NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 with Pi/2 BPSK modulation and if the IE <i>powerBoostPi2BPSK</i> is set to 0 and if more than 40 % of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.				

Table 6.2.2-2 Maximum power reduction (MPR) for power class 2

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	Pi/2 BPSK	≤ 3.5	≤ 0.5	0
	QPSK	≤ 3.5	≤ 1	0
	16 QAM	≤ 3.5	≤ 2	≤ 1
	64 QAM	≤ 3.5	≤ 2.5	
	256 QAM	≤ 4.5		
CP-OFDM	QPSK	≤ 3.5	≤ 3	≤ 1.5
	16 QAM	≤ 3.5	≤ 3	≤ 2
	64 QAM	≤ 3.5		
	256 QAM	≤ 6.5		

4. For FDD NR Band operation does not have the fixed UL/DL frame structure, but during the transmitting/receiving it can be operated in the slot structure of 100% UL duty cycle, we are proposing the conservative way to evaluate SAR at 100% duty cycle. For the purpose of test NR Band standalone SAR, and also test SAR level at 100% TX duty cycle.

5. For 5G NR Sub6GHz SISO Mode, SAR Test plan as below:

For 5G NR NSA mode with the same UL EN_DC combination but different DL EN_DC combinations, eg: EN-DC configuration: UL DC_7A_n5 (UL two bands) with DL DC_7C_n5 (DL two bands)

a) The UL EN-DC configuration, including the Tx antenna configuration, RF path, the channel bandwidth and other operating parameters are the same.

b) The maximum output power, including tolerance, for the UL EN-DC configuration with DL two or more bands must be ≤ the same UL EN-DC configuration with DL two bands only to qualify for the SAR test exclusion.

6. For EN-DC SAR

For EN-DC mode, as the existing SAR test system cannot test the multiple different frequency bands simultaneous Transmission SAR at the same time, we suggest that the conservative “max + max” multi-Tx and SAR scaling method can be used to evaluate the inter-band Uplink EN-DC SAR from standalone SAR test results of each LTE and NR EN-DC component band and the conservative “max + max” multi-Tx method to combine the scaled SAR value from each EN-DC component band as the inter-band Uplink EN-DC SAR. All Simultaneous Transmission Scenarios will be evaluated independently in the final SAR report. When the reported SAR for and EN DC configuration is greater than 1.2 W/kg, EN DC SAR is also required for other NR based test channels. EN DC SAR is also required for standalone NR configurations greater than 1.2 W/kg when scaled to the EN DC power level.

LTE+NR Band operations are possible only with LTE under EN-DC mode and the operations are possible as following table:

Band/ Antenna		n2	n5	n66		n77	n78
		Ant2	Ant0	Ant2	Ant1	Ant2	Ant2
LTE Band 2	Ant2		√		√		
	Ant1					√	
LTE Band 5	Ant0	√		√		√	√
LTE Band 7	Ant4			√		√	√
LTE Band 13	Ant0	√		√		√	
LTE Band 48	Ant2		√				
LTE Band 66	Ant2		√				
	Ant1	√				√	

8 Test Result

8.1 DUT Antenna Locations (Back View)

The DUT Antenna Locations can be referred to Appendix D

Note:

- 1) The test device is a smart phone, and the diagonal distance of this device is $\geq 160\text{mm}$ but $\leq 200\text{mm}$, so it is a Phablet per KDB 648474 D04.
- 2) The distance between the antennas and the sides of the EUT show as below table, when the antenna-to-edge distance is greater than 25mm, such position does not need to be SAR tested.

EUT Sides for SAR Testing							
Mode	Exposure Condition	Front side	Back side	Left side	Right side	Top side	Bottom side
Ant.0	Hotspot/Product specific 10g SAR	Yes	Yes	Yes	Yes	Yes	No
Ant.1	Hotspot/Product specific 10g SAR	Yes	Yes	Yes	Yes	No	Yes
Ant.2	Hotspot/Product specific 10g SAR	Yes	Yes	No	Yes	Yes	No
Ant.4	Hotspot/Product specific 10g SAR	Yes	Yes	Yes	Yes	Yes	No
Ant.7	Hotspot/Product specific 10g SAR	Yes	Yes	Yes	Yes	Yes	No

8.2 Measurement of RF Conducted Power

8.2.1 RF Conducted Power reduction specification

This device uses a single fixed level of power reduction through static table look-up for SAR compliance and it is triggered by a single event or operation

- 1) A fixed level power reduction is applied for some frequency bands when hotspot mode becomes active. When the hotspot is disabled, the power value will be recovered.
- 2) A fixed level power reduction is applied for some frequency bands when simultaneously transmitting with the other antennas in certain simultaneous transmission conditions.
- 3) This device uses the receiver to indicate whether the user is making a voice call in head scenario or not. The selection between head and body power levels is based on the receiver detection mechanism. A fixed level power reduction is applied for some frequency bands when the audio receiver is on.

8.2.2 RF Conducted Power Data

The detailed power data can be referred to Appendix E Conducted RF Output Power.

8.3 Measurement of SAR Data

Note:

- 2) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 3) Per KDB 447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - $\leq 0.8\text{W/kg}$ for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is $\leq 100\text{MHz}$.
 - $\leq 0.6\text{ W/kg}$ or 1.5 W/kg , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
 - $\leq 0.4\text{ W/kg}$ or 1.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\geq 200\text{ MHz}$.
- 4) The device does not support DTM function.
- 5) For WiFi 5G,U-NII-2A and U-NII-2C band does not support hotspot function.
- 6) For WiFi SAR test, as the highest reported SAR is smaller than 1.2 W/kg , and the tune-up of the other 802.11 modes are not higher than SAR measurement mode, therefore the adjusted SAR is $\leq 1.2\text{ W/kg}$ for other 802.11 modes, SAR test for the other 802.11 modes are not required. For Product specific 10gSAR the highest reported SAR is smaller than 3.0 W/kg , SAR test for the other 802.11 modes are also not required.
- 7) NFC is different from the working scenario of WIFI(Product specific 10gSAR) and does not participate in the simultaneous transmission.
- 8) According to TCB workshop (Overlapping LTE Bands): SAR in LTE band 17, NR Band n78 is respectively covered by LTE band 12, NR Band n77. Because the frequency range is similar, the maximum tuning limit is the same, and the channel bandwidth and other operating parameters for the smaller band is fully supported by the larger band.
- 9) The simultaneous transmission is reduced by XdB (the detailed power reduced can be referred to Conducted Power Appendix E), therefore, those SAR of simultaneous transmission mode are scaled based on standalone SAR results.

8.3.1 SAR Result of GSM850

Ant 0 Test Record										
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data SET_1										
Left cheek	GPRS 3TS	190/836.6	1:2.77	0.505	0.16	28.36	29.50	1.300	0.657	22.9
Left tilted	GPRS 3TS	190/836.6	1:2.77	0.450	0.08	28.36	29.50	1.300	0.585	22.9
Right cheek	GPRS 3TS	190/836.6	1:2.77	0.748	0.06	28.36	29.50	1.300	0.972	22.9
Right tilted	GPRS 3TS	190/836.6	1:2.77	0.547	-0.15	28.36	29.50	1.300	0.711	22.9
Right cheek	GPRS 3TS	128/824.2	1:2.77	0.716	0.11	28.29	29.50	1.321	0.946	22.9
Right cheek	GPRS 3TS	251/848.8	1:2.77	0.733	-0.14	28.35	29.50	1.303	0.955	22.9
Body worn Test data(Separate 15mm) SET_2										
Front side	GPRS 3TS	190/836.6	1:2.77	0.104	0.02	28.36	29.50	1.300	0.135	22.9
Back side	GPRS 3TS	190/836.6	1:2.77	0.121	0.07	28.36	29.50	1.300	0.157	22.9
Hotspot Test data(Separate 10mm) SET_3										
Front side	GPRS 3TS	190/836.6	1:2.77	0.163	0.14	28.36	29.50	1.300	0.212	22.9
Back side	GPRS 3TS	190/836.6	1:2.77	0.236	-0.02	28.36	29.50	1.300	0.307	22.9
Left side	GPRS 3TS	190/836.6	1:2.77	0.150	0.11	28.36	29.50	1.300	0.195	22.9
Right side	GPRS 3TS	190/836.6	1:2.77	0.082	-0.14	28.36	29.50	1.300	0.107	22.9
Top side	GPRS 3TS	190/836.6	1:2.77	0.211	0.16	28.36	29.50	1.300	0.274	22.9

8.3.2 SAR Result of GSM1900

Ant 2 Test Record										
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data SET_1										
Left cheek	GPRS 4TS	661/1880	1:2.075	0.903	0.08	24.92	26.00	1.282	1.158	23.3
Left cheek-Repeat SAR	GPRS 4TS	661/1880	1:2.075	0.895	-0.01	24.92	26.00	1.282	1.147	23.3
Left tilted	GPRS 4TS	661/1880	1:2.075	0.382	0.08	24.92	26.00	1.282	0.490	23.3
Right cheek	GPRS 4TS	661/1880	1:2.075	0.391	-0.02	24.92	26.00	1.282	0.501	23.3
Right tilted	GPRS 4TS	661/1880	1:2.075	0.345	0.17	24.92	26.00	1.282	0.442	23.3
Left cheek	GPRS 4TS	512/1850.2	1:2.075	0.886	0.18	24.88	26.00	1.294	1.146	23.3
Left cheek	GPRS 4TS	810/1909.8	1:2.075	0.887	-0.09	24.86	26.00	1.300	1.153	23.3
Body worn Test data(Separate 15mm) SET_2										
Front side	GPRS 3TS	661/1880	1:2.77	0.109	0.02	26.84	28.00	1.306	0.142	23.3
Back side	GPRS 3TS	661/1880	1:2.77	0.176	0.01	26.84	28.00	1.306	0.230	23.3
Hotspot Test data(Separate 10mm) SET_3										
Front side	GPRS 3TS	661/1880	1:2.77	0.171	0.16	26.84	28.00	1.306	0.223	23.3
Back side	GPRS 3TS	661/1880	1:2.77	0.297	0.01	26.84	28.00	1.306	0.388	23.3
Right side	GPRS 3TS	661/1880	1:2.77	0.196	-0.17	26.84	28.00	1.306	0.256	23.3
Top side	GPRS 3TS	661/1880	1:2.77	0.144	0.18	26.84	28.00	1.306	0.188	23.3

Test Position	Test ch./Freq.	Measured SAR (W/kg)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
Left cheek	661/1880	0.903	0.895	1.009	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).						
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						
5) The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds. The repeated measurement results must be clearly identified in the SAR report.						

8.3.3 SAR Result of WCDMA Band II

Ant 2 Test Record										
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data SET_1										
Left cheek	RMC	9400/1880	1:1	0.911	0.04	20.43	21.50	1.279	1.165	23.3
Left cheek-Repeat SAR	RMC	9400/1880	1:1	0.905	0.16	20.43	21.50	1.279	1.157	23.3
Left tilted	RMC	9400/1880	1:1	0.391	-0.08	20.43	21.50	1.279	0.500	23.3
Right cheek	RMC	9400/1880	1:1	0.417	-0.13	20.43	21.50	1.279	0.533	23.3
Right tilted	RMC	9400/1880	1:1	0.354	0.07	20.43	21.50	1.279	0.453	23.3
Left cheek	RMC	9262/1852.4	1:1	0.889	-0.16	20.35	21.50	1.303	1.158	23.3
Left cheek	RMC	9538/1907.6	1:1	0.885	-0.02	20.39	21.50	1.291	1.143	23.3
Body worn Test data(Separate 15mm) SET_2										
Front side	RMC	9400/1880	1:1	0.170	0.03	23.31	24.50	1.315	0.224	23.3
Back side	RMC	9400/1880	1:1	0.258	0.09	23.31	24.50	1.315	0.339	23.3
Hotspot Test data(Separate 10mm) SET_3										
Front side	RMC	9400/1880	1:1	0.327	-0.16	23.31	24.50	1.315	0.430	23.3
Back side	RMC	9400/1880	1:1	0.574	0.04	23.31	24.50	1.315	0.755	23.3
Right side	RMC	9400/1880	1:1	0.324	-0.18	23.31	24.50	1.315	0.426	23.3
Top side	RMC	9400/1880	1:1	0.285	-0.04	23.31	24.50	1.315	0.375	23.3

Test Position	Test ch./Freq.	Measured SAR (W/kg)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
Left cheek	9400/1880	0.911	0.905	1.007	N/A	N/A

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.

2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

5) The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds. The repeated measurement results must be clearly identified in the SAR report.

8.3.4 SAR Result of WCDMA Band V

Ant 0 Test Record										
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data SET_1										
Left cheek	RMC	4182/836.4	1:1	0.620	0.09	22.18	23.00	1.208	0.749	22.9
Left tilted	RMC	4182/836.4	1:1	0.592	-0.12	22.18	23.00	1.208	0.715	22.9
Right cheek	RMC	4182/836.4	1:1	0.962	0.06	22.18	23.00	1.208	1.162	22.9
Right cheek-Repeat SAR	RMC	4182/836.4	1:1	0.959	0.19	22.18	23.00	1.208	1.158	22.9
Right tilted	RMC	4182/836.4	1:1	0.661	-0.13	22.18	23.00	1.208	0.798	22.9
Right cheek	RMC	4132/826.4	1:1	0.934	-0.17	22.11	23.00	1.227	1.146	22.9
Right cheek	RMC	4233/846.6	1:1	0.952	0.17	22.14	23.00	1.219	1.160	22.9
Body worn Test data(Separate 15mm) SET_2										
Front side	RMC	4182/836.4	1:1	0.155	-0.14	23.22	24.00	1.197	0.186	22.9
Back side	RMC	4182/836.4	1:1	0.185	0.06	23.22	24.00	1.197	0.221	22.9
Hotspot Test data(Separate 10mm) SET_3										
Front side	RMC	4182/836.4	1:1	0.233	-0.17	23.22	24.00	1.197	0.279	22.9
Back side	RMC	4182/836.4	1:1	0.354	-0.16	23.22	24.00	1.197	0.424	22.9
Left side	RMC	4182/836.4	1:1	0.212	0.12	23.22	24.00	1.197	0.254	22.9
Right side	RMC	4182/836.4	1:1	0.108	-0.01	23.22	24.00	1.197	0.129	22.9
Top side	RMC	4182/836.4	1:1	0.269	0.09	23.22	24.00	1.197	0.322	22.9

Test Position	Test ch./Freq.	Measured SAR (W/kg)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
Right cheek	4182/836.4	0.962	0.959	1.003	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).						
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						
5) The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds. The repeated measurement results must be clearly identified in the SAR report.						

8.3.5 SAR Result of LTE Band 2

Ant 1 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data (1RB) SET_1											
Left cheek	20	QPSK 1_0	18900/1880	1:1	0.110	-0.07	23.49	24.50	1.262	0.139	22.7
Left tilted	20	QPSK 1_0	18900/1880	1:1	0.044	0.14	23.49	24.50	1.262	0.056	22.7
Right cheek	20	QPSK 1_0	18900/1880	1:1	0.086	0.15	23.49	24.50	1.262	0.109	22.7
Right tilted	20	QPSK 1_0	18900/1880	1:1	0.063	0.14	23.49	24.50	1.262	0.080	22.7
Head Test Data (50%RB) SET_1											
Left cheek	20	QPSK 50_0	18900/1880	1:1	0.105	0.08	22.44	23.50	1.276	0.134	22.7
Left tilted	20	QPSK 50_0	18900/1880	1:1	0.040	-0.02	22.44	23.50	1.276	0.051	22.7
Right cheek	20	QPSK 50_0	18900/1880	1:1	0.076	0.15	22.44	23.50	1.276	0.097	22.7
Right tilted	20	QPSK 50_0	18900/1880	1:1	0.054	-0.01	22.44	23.50	1.276	0.069	22.7
Body worn Test data (Separate 15mm 1RB) SET_2											
Front side	20	QPSK 1_0	18900/1880	1:1	0.110	0.19	19.48	20.50	1.265	0.139	22.7
Back side	20	QPSK 1_0	18900/1880	1:1	0.204	0.11	19.48	20.50	1.265	0.258	22.7
Body worn Test data (Separate 15mm 50%RB) SET_2											
Front side	20	QPSK 50_0	18900/1880	1:1	0.102	0.13	19.44	20.50	1.276	0.130	22.7
Back side	20	QPSK 50_0	18900/1880	1:1	0.198	0.16	19.44	20.50	1.276	0.253	22.7
Hotspot Test data (Separate 10mm 1RB) SET_3											
Front side	20	QPSK 1_0	18900/1880	1:1	0.146	-0.10	18.57	19.50	1.239	0.181	22.7
Back side	20	QPSK 1_0	18900/1880	1:1	0.279	0.09	18.57	19.50	1.239	0.346	22.7
Left side	20	QPSK 1_0	18900/1880	1:1	0.043	-0.01	18.57	19.50	1.239	0.053	22.7
Right side	20	QPSK 1_0	18900/1880	1:1	0.063	0.05	18.57	19.50	1.239	0.078	22.7
Bottom side	20	QPSK 1_0	18900/1880	1:1	0.359	0.11	18.57	19.50	1.239	0.445	22.7
Hotspot Test data (Separate 10mm 50%RB) SET_3											
Front side	20	QPSK 50_0	18900/1880	1:1	0.135	-0.04	18.43	19.50	1.279	0.173	22.7
Back side	20	QPSK 50_0	18900/1880	1:1	0.252	-0.05	18.43	19.50	1.279	0.322	22.7
Left side	20	QPSK 50_0	18900/1880	1:1	0.028	0.09	18.43	19.50	1.279	0.036	22.7
Right side	20	QPSK 50_0	18900/1880	1:1	0.057	0.16	18.43	19.50	1.279	0.073	22.7
Bottom side	20	QPSK 50_0	18900/1880	1:1	0.341	-0.16	18.43	19.50	1.279	0.436	22.7
Ant 2 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data (1RB) SET_1											
Left cheek	20	QPSK 1_0	18900/1880	1:1	0.594	-0.07	18.47	19.50	1.268	0.753	22.7
Left tilted	20	QPSK 1_0	18900/1880	1:1	0.241	0.11	18.47	19.50	1.268	0.306	22.7
Right cheek	20	QPSK 1_0	18900/1880	1:1	0.226	0.19	18.47	19.50	1.268	0.287	22.7
Right tilted	20	QPSK 1_0	18900/1880	1:1	0.232	-0.04	18.47	19.50	1.268	0.294	22.7
Head Test Data (50%RB) SET_1											
Left cheek	20	QPSK 50_0	18900/1880	1:1	0.690	0.05	18.44	19.50	1.276	0.880	22.7
Left tilted	20	QPSK 50_0	18900/1880	1:1	0.242	-0.15	18.44	19.50	1.276	0.309	22.7
Right cheek	20	QPSK 50_0	18900/1880	1:1	0.232	0.18	18.44	19.50	1.276	0.296	22.7
Right tilted	20	QPSK 50_0	18900/1880	1:1	0.214	-0.03	18.44	19.50	1.276	0.273	22.7
Left cheek	20	QPSK 50_0	18700/1860	1:1	0.672	0.10	18.41	19.50	1.285	0.864	22.7
Left cheek	20	QPSK 50_0	19100/1900	1:1	0.677	-0.17	18.42	19.50	1.282	0.868	22.7
Head Test Data (100%RB) SET_1											

Left cheek	20	QPSK 100_0	18900/1880	1:1	0.659	0.15	18.34	19.50	1.306	0.861	22.7
Head Test Data (1RB) SET_1(ULCA&ENDC)											
Left cheek	20	QPSK 1_0	18900/1880	1:1	0.594	-0.07	18.47	17.50	0.800	0.475	22.7
Left tilted	20	QPSK 1_0	18900/1880	1:1	0.241	0.11	18.47	17.50	0.800	0.193	22.7
Right cheek	20	QPSK 1_0	18900/1880	1:1	0.226	0.19	18.47	17.50	0.800	0.181	22.7
Right tilted	20	QPSK 1_0	18900/1880	1:1	0.232	-0.04	18.47	17.50	0.800	0.186	22.7
Head Test Data (50%RB) SET_1(ULCA&ENDC)											
Left cheek	20	QPSK 50_0	18900/1880	1:1	0.690	0.05	18.44	17.50	0.805	0.555	22.7
Left tilted	20	QPSK 50_0	18900/1880	1:1	0.242	-0.15	18.44	17.50	0.805	0.195	22.7
Right cheek	20	QPSK 50_0	18900/1880	1:1	0.232	0.18	18.44	17.50	0.805	0.187	22.7
Right tilted	20	QPSK 50_0	18900/1880	1:1	0.214	-0.03	18.44	17.50	0.805	0.172	22.7
Left cheek	20	QPSK 50_0	18700/1860	1:1	0.672	0.10	18.41	17.50	0.811	0.545	22.7
Left cheek	20	QPSK 50_0	19100/1900	1:1	0.677	-0.17	18.42	17.50	0.809	0.548	22.7
Head Test Data (100%RB) SET_1(ULCA&ENDC)											
Left cheek	20	QPSK 100_0	18900/1880	1:1	0.659	0.15	18.34	17.50	0.824	0.543	22.7
Body worn Test data (Separate 15mm 1RB) SET_2											
Front side	20	QPSK 1_0	18900/1880	1:1	0.187	0.01	22.47	23.50	1.268	0.237	22.7
Back side	20	QPSK 1_0	18900/1880	1:1	0.259	0.14	22.47	23.50	1.268	0.328	22.7
Body worn Test data (Separate 15mm 50%RB) SET_2											
Front side	20	QPSK 50_0	18900/1880	1:1	0.199	-0.10	22.46	23.50	1.271	0.253	22.7
Back side	20	QPSK 50_0	18900/1880	1:1	0.268	-0.01	22.46	23.50	1.271	0.341	22.7
Body worn Test data (Separate 15mm 1RB) SET_2(ULCA&ENDC)											
Front side	20	QPSK 1_0	18900/1880	1:1	0.187	0.01	22.47	20.50	0.635	0.119	22.7
Back side	20	QPSK 1_0	18900/1880	1:1	0.259	0.14	22.47	20.50	0.635	0.164	22.7
Body worn Test data (Separate 15mm 50%RB) SET_2(ULCA&ENDC)											
Front side	20	QPSK 50_0	18900/1880	1:1	0.199	-0.10	22.46	20.50	0.637	0.127	22.7
Back side	20	QPSK 50_0	18900/1880	1:1	0.268	-0.01	22.46	20.50	0.637	0.171	22.7
Hotspot Test data (Separate 10mm 1RB) SET_3											
Front side	20	QPSK 1_0	18900/1880	1:1	0.250	-0.12	21.44	22.50	1.276	0.319	22.7
Back side	20	QPSK 1_0	18900/1880	1:1	0.546	0.11	21.44	22.50	1.276	0.697	22.7
Right side	20	QPSK 1_0	18900/1880	1:1	0.289	0.16	21.44	22.50	1.276	0.369	22.7
Top side	20	QPSK 1_0	18900/1880	1:1	0.261	-0.01	21.44	22.50	1.276	0.333	22.7
Hotspot Test data (Separate 10mm 50%RB) SET_3											
Front side	20	QPSK 50_0	18900/1880	1:1	0.311	0.11	21.40	22.50	1.288	0.401	22.7
Back side	20	QPSK 50_0	18900/1880	1:1	0.568	-0.16	21.40	22.50	1.288	0.732	22.7
Right side	20	QPSK 50_0	18900/1880	1:1	0.344	0.18	21.40	22.50	1.288	0.443	22.7
Top side	20	QPSK 50_0	18900/1880	1:1	0.253	0.18	21.40	22.50	1.288	0.326	22.7
Hotspot Test data (Separate 10mm 1RB) SET_3(ULCA&ENDC)											
Front side	20	QPSK 1_0	18900/1880	1:1	0.250	-0.12	21.44	19.50	0.640	0.160	22.7
Back side	20	QPSK 1_0	18900/1880	1:1	0.546	0.11	21.44	19.50	0.640	0.349	22.7
Right side	20	QPSK 1_0	18900/1880	1:1	0.289	0.16	21.44	19.50	0.640	0.185	22.7
Top side	20	QPSK 1_0	18900/1880	1:1	0.261	-0.01	21.44	19.50	0.640	0.167	22.7
Hotspot Test data (Separate 10mm 50%RB) SET_3(ULCA&ENDC)											
Front side	20	QPSK 50_0	18900/1880	1:1	0.311	0.11	21.40	19.50	0.646	0.201	22.7
Back side	20	QPSK 50_0	18900/1880	1:1	0.568	-0.16	21.40	19.50	0.646	0.367	22.7
Right side	20	QPSK 50_0	18900/1880	1:1	0.344	0.18	21.40	19.50	0.646	0.222	22.7
Top side	20	QPSK 50_0	18900/1880	1:1	0.253	0.18	21.40	19.50	0.646	0.163	22.7

8.3.6 SAR Result of LTE Band 4

Ant 2 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data (1RB) SET_1											
Left cheek	20	QPSK 1_0	20175/1732.5	1:1	0.685	0.02	20.64	21.50	1.219	0.835	23.2
Left tilted	20	QPSK 1_0	20175/1732.5	1:1	0.270	0.08	20.64	21.50	1.219	0.329	23.2
Right cheek	20	QPSK 1_0	20175/1732.5	1:1	0.321	-0.06	20.64	21.50	1.219	0.391	23.2
Right tilted	20	QPSK 1_0	20175/1732.5	1:1	0.275	-0.01	20.64	21.50	1.219	0.335	23.2
Head Test Data (50%RB) SET_1											
Left cheek	20	QPSK 50_0	20175/1732.5	1:1	0.790	0.13	20.57	21.50	1.239	0.979	23.2
Left tilted	20	QPSK 50_0	20175/1732.5	1:1	0.274	0.13	20.57	21.50	1.239	0.339	23.2
Right cheek	20	QPSK 50_0	20175/1732.5	1:1	0.325	-0.17	20.57	21.50	1.239	0.403	23.2
Right tilted	20	QPSK 50_0	20175/1732.5	1:1	0.273	-0.06	20.57	21.50	1.239	0.338	23.2
Head Test Data (100%RB) SET_1											
Left cheek	20	QPSK 100_0	20175/1732.5	1:1	0.662	0.01	20.42	21.50	1.282	0.849	23.2
Head Test Data (1RB) SET_1(ULCA)											
Left cheek	20	QPSK 1_0	20175/1732.5	1:1	0.685	0.02	20.64	17.50	0.485	0.332	23.2
Left tilted	20	QPSK 1_0	20175/1732.5	1:1	0.270	0.08	20.64	17.50	0.485	0.131	23.2
Right cheek	20	QPSK 1_0	20175/1732.5	1:1	0.321	-0.06	20.64	17.50	0.485	0.156	23.2
Right tilted	20	QPSK 1_0	20175/1732.5	1:1	0.275	-0.01	20.64	17.50	0.485	0.133	23.2
Head Test Data (50%RB) SET_1(ULCA)											
Left cheek	20	QPSK 50_0	20175/1732.5	1:1	0.790	0.13	20.57	17.50	0.493	0.389	23.2
Left tilted	20	QPSK 50_0	20175/1732.5	1:1	0.274	0.13	20.57	17.50	0.493	0.135	23.2
Right cheek	20	QPSK 50_0	20175/1732.5	1:1	0.325	-0.17	20.57	17.50	0.493	0.160	23.2
Right tilted	20	QPSK 50_0	20175/1732.5	1:1	0.273	-0.06	20.57	17.50	0.493	0.135	23.2
Head Test Data (100%RB) SET_1(ULCA)											
Left cheek	20	QPSK 100_0	20175/1732.5	1:1	0.662	0.01	20.42	17.50	0.511	0.338	23.2
Body worn Test data (Separate 15mm 1RB) SET_2											
Front side	20	QPSK 1_0	20175/1732.5	1:1	0.169	0.05	22.55	23.50	1.245	0.210	23.2
Back side	20	QPSK 1_0	20175/1732.5	1:1	0.242	0.17	22.55	23.50	1.245	0.301	23.2
Body worn Test data (Separate 15mm 50%RB) SET_2											
Front side	20	QPSK 50_0	20175/1732.5	1:1	0.173	0.02	22.48	23.50	1.265	0.219	23.2
Back side	20	QPSK 50_0	20175/1732.5	1:1	0.266	0.12	22.48	23.50	1.265	0.336	23.2
Body worn Test data (Separate 15mm 1RB) SET_2(ULCA)											
Front side	20	QPSK 1_0	20175/1732.5	1:1	0.169	0.05	22.55	20.50	0.624	0.105	23.2
Back side	20	QPSK 1_0	20175/1732.5	1:1	0.242	0.17	22.55	20.50	0.624	0.151	23.2
Body worn Test data (Separate 15mm 50%RB) SET_2(ULCA)											
Front side	20	QPSK 50_0	20175/1732.5	1:1	0.173	0.02	22.48	20.50	0.634	0.110	23.2
Back side	20	QPSK 50_0	20175/1732.5	1:1	0.266	0.12	22.48	20.50	0.634	0.169	23.2
Hotspot Test data (Separate 10mm 1RB) SET_3											
Front side	20	QPSK 1_0	20175/1732.5	1:1	0.218	0.06	21.60	22.50	1.230	0.268	23.2
Back side	20	QPSK 1_0	20175/1732.5	1:1	0.446	0.04	21.60	22.50	1.230	0.549	23.2
Right side	20	QPSK 1_0	20175/1732.5	1:1	0.272	-0.15	21.60	22.50	1.230	0.335	23.2
Top side	20	QPSK 1_0	20175/1732.5	1:1	0.267	-0.18	21.60	22.50	1.230	0.328	23.2
Hotspot Test data (Separate 10mm 50%RB) SET_3											
Front side	20	QPSK 50_0	20175/1732.5	1:1	0.278	0.02	21.50	22.50	1.259	0.350	23.2
Back side	20	QPSK 50_0	20175/1732.5	1:1	0.463	-0.14	21.50	22.50	1.259	0.583	23.2
Right side	20	QPSK 50_0	20175/1732.5	1:1	0.352	0.01	21.50	22.50	1.259	0.443	23.2

Top side	20	QPSK 50_0	20175/1732.5	1:1	0.243	0.11	21.50	22.50	1.259	0.306	23.2
Hotspot Test data (Separate 10mm 1RB) SET_3(ULCA)											
Front side	20	QPSK 1_0	20175/1732.5	1:1	0.218	0.06	21.60	19.50	0.617	0.135	23.2
Back side	20	QPSK 1_0	20175/1732.5	1:1	0.446	0.04	21.60	19.50	0.617	0.275	23.2
Right side	20	QPSK 1_0	20175/1732.5	1:1	0.272	-0.15	21.60	19.50	0.617	0.168	23.2
Top side	20	QPSK 1_0	20175/1732.5	1:1	0.267	-0.18	21.60	19.50	0.617	0.165	23.2
Hotspot Test data (Separate 10mm 50%RB) SET_3(ULCA)											
Front side	20	QPSK 50_0	20175/1732.5	1:1	0.278	0.02	21.50	19.50	0.631	0.175	23.2
Back side	20	QPSK 50_0	20175/1732.5	1:1	0.463	-0.14	21.50	19.50	0.631	0.292	23.2
Right side	20	QPSK 50_0	20175/1732.5	1:1	0.352	0.01	21.50	19.50	0.631	0.222	23.2
Top side	20	QPSK 50_0	20175/1732.5	1:1	0.243	0.11	21.50	19.50	0.631	0.153	23.2
Ant 1 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data (1RB) SET_1											
Left cheek	20	QPSK 1_0	20175/1732.5	1:1	0.044	0.14	23.11	24.50	1.377	0.061	23.2
Left tilted	20	QPSK 1_0	20175/1732.5	1:1	0.023	0.18	23.11	24.50	1.377	0.032	23.2
Right cheek	20	QPSK 1_0	20175/1732.5	1:1	0.001	0.16	23.11	24.50	1.377	0.001	23.2
Right tilted	20	QPSK 1_0	20175/1732.5	1:1	0.001	-0.10	23.11	24.50	1.377	0.001	23.2
Head Test Data (50%RB) SET_1											
Left cheek	20	QPSK 50_0	20175/1732.5	1:1	0.040	0.02	22.06	23.50	1.393	0.056	23.2
Left tilted	20	QPSK 50_0	20175/1732.5	1:1	0.001	0.14	22.06	23.50	1.393	0.001	23.2
Right cheek	20	QPSK 50_0	20175/1732.5	1:1	0.001	0.01	22.06	23.50	1.393	0.001	23.2
Right tilted	20	QPSK 50_0	20175/1732.5	1:1	0.001	0.10	22.06	23.50	1.393	0.001	23.2
Body worn Test data (Separate 15mm 1RB) SET_2											
Front side	20	QPSK 1_0	20175/1732.5	1:1	0.048	0.02	19.15	20.50	1.365	0.066	23.2
Back side	20	QPSK 1_0	20175/1732.5	1:1	0.116	-0.03	19.15	20.50	1.365	0.158	23.2
Body worn Test data (Separate 15mm 50%RB) SET_2											
Front side	20	QPSK 50_0	20175/1732.5	1:1	0.040	0.14	19.05	20.50	1.396	0.056	23.2
Back side	20	QPSK 50_0	20175/1732.5	1:1	0.112	0.02	19.05	20.50	1.396	0.156	23.2
Hotspot Test data (Separate 10mm 1RB) SET_3											
Front side	20	QPSK 1_0	20175/1732.5	1:1	0.066	-0.04	18.13	19.50	1.371	0.090	23.2
Back side	20	QPSK 1_0	20175/1732.5	1:1	0.164	0.19	18.13	19.50	1.371	0.225	23.2
Left side	20	QPSK 1_0	20175/1732.5	1:1	0.001	0.01	18.13	19.50	1.371	0.001	23.2
Right side	20	QPSK 1_0	20175/1732.5	1:1	0.001	-0.15	18.13	19.50	1.371	0.001	23.2
Bottom side	20	QPSK 1_0	20175/1732.5	1:1	0.200	0.02	18.13	19.50	1.371	0.274	23.2
Hotspot Test data (Separate 10mm 50%RB) SET_3											
Front side	20	QPSK 50_0	20175/1732.5	1:1	0.057	-0.02	18.06	19.50	1.393	0.079	23.2
Back side	20	QPSK 50_0	20175/1732.5	1:1	0.150	0.15	18.06	19.50	1.393	0.209	23.2
Left side	20	QPSK 50_0	20175/1732.5	1:1	0.001	0.16	18.06	19.50	1.393	0.001	23.2
Right side	20	QPSK 50_0	20175/1732.5	1:1	0.001	0.08	18.06	19.50	1.393	0.001	23.2
Bottom side	20	QPSK 50_0	20175/1732.5	1:1	0.190	0.03	18.06	19.50	1.393	0.265	23.2

8.3.7 SAR Result of LTE Band 5

Ant 0 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data (1RB) SET_1											
Left cheek	10	QPSK 1_0	20525/836.5	1:1	0.619	0.02	21.98	22.50	1.127	0.698	22.8
Left tilted	10	QPSK 1_0	20525/836.5	1:1	0.507	0.14	21.98	22.50	1.127	0.571	22.8
Right cheek	10	QPSK 1_0	20525/836.5	1:1	0.856	-0.01	21.98	22.50	1.127	0.965	22.8
Right cheek-Repeat SAR	10	QPSK 1_0	20525/836.5	1:1	0.849	0.09	21.98	22.50	1.127	0.957	22.8
Right tilted	10	QPSK 1_0	20525/836.5	1:1	0.705	-0.03	21.98	22.50	1.127	0.795	22.8
Head Test Data (50%RB) SET_1											
Left cheek	10	QPSK 25_0	20525/836.5	1:1	0.521	-0.19	21.93	22.50	1.140	0.594	22.8
Left tilted	10	QPSK 25_0	20525/836.5	1:1	0.444	0.15	21.93	22.50	1.140	0.506	22.8
Right cheek	10	QPSK 25_0	20525/836.5	1:1	0.715	-0.14	21.93	22.50	1.140	0.815	22.8
Right tilted	10	QPSK 25_0	20525/836.5	1:1	0.604	-0.09	21.93	22.50	1.140	0.689	22.8
Head Test Data (100%RB) SET_1											
Right cheek	10	QPSK 50_0	20525/836.5	1:1	0.707	0.02	21.89	22.50	1.151	0.814	22.8
Head Test Data (1RB) SET_1(ULCA&ENDC)											
Left cheek	10	QPSK 1_0	20525/836.5	1:1	0.619	0.02	21.98	21.50	0.895	0.554	22.8
Left tilted	10	QPSK 1_0	20525/836.5	1:1	0.507	0.14	21.98	21.50	0.895	0.454	22.8
Right cheek	10	QPSK 1_0	20525/836.5	1:1	0.856	-0.01	21.98	21.50	0.895	0.766	22.8
Right cheek-Repeat SAR	10	QPSK 1_0	20525/836.5	1:1	0.849	0.09	21.98	21.50	0.895	0.760	22.8
Right tilted	10	QPSK 1_0	20525/836.5	1:1	0.705	-0.03	21.98	21.50	0.895	0.631	22.8
Head Test Data (50%RB) SET_1(ULCA&ENDC)											
Left cheek	10	QPSK 25_0	20525/836.5	1:1	0.521	-0.19	21.93	21.50	0.906	0.472	22.8
Left tilted	10	QPSK 25_0	20525/836.5	1:1	0.444	0.15	21.93	21.50	0.906	0.402	22.8
Right cheek	10	QPSK 25_0	20525/836.5	1:1	0.715	-0.14	21.93	21.50	0.906	0.648	22.8
Right tilted	10	QPSK 25_0	20525/836.5	1:1	0.604	-0.09	21.93	21.50	0.906	0.547	22.8
Head Test Data (100%RB) SET_1(ULCA&ENDC)											
Right cheek	10	QPSK 50_0	20525/836.5	1:1	0.707	0.02	21.89	21.50	0.914	0.646	22.8
Body worn Test data (Separate 15mm 1RB) SET_2											
Front side	10	QPSK 1_0	20525/836.5	1:1	0.147	0.03	23.95	24.50	1.135	0.167	22.8
Back side	10	QPSK 1_0	20525/836.5	1:1	0.172	0.12	23.95	24.50	1.135	0.195	22.8
Body worn Test data (Separate 15mm 50%RB) SET_2											
Front side	10	QPSK 25_0	20525/836.5	1:1	0.121	-0.01	22.95	23.50	1.135	0.137	22.8
Back side	10	QPSK 25_0	20525/836.5	1:1	0.148	0.14	22.95	23.50	1.135	0.168	22.8
Hotspot Test data (Separate 10mm 1RB) SET_3											
Front side	10	QPSK 1_0	20525/836.5	1:1	0.270	0.02	23.95	24.50	1.135	0.306	22.8
Back side	10	QPSK 1_0	20525/836.5	1:1	0.411	0.01	23.95	24.50	1.135	0.466	22.8
Left side	10	QPSK 1_0	20525/836.5	1:1	0.222	0.14	23.95	24.50	1.135	0.252	22.8
Right side	10	QPSK 1_0	20525/836.5	1:1	0.120	-0.10	23.95	24.50	1.135	0.136	22.8
Top side	10	QPSK 1_0	20525/836.5	1:1	0.316	-0.05	23.95	24.50	1.135	0.359	22.8
Hotspot Test data (Separate 10mm 50%RB) SET_3											
Front side	10	QPSK 25_0	20525/836.5	1:1	0.233	0.11	22.95	23.50	1.135	0.264	22.8
Back side	10	QPSK 25_0	20525/836.5	1:1	0.359	-0.01	22.95	23.50	1.135	0.407	22.8
Left side	10	QPSK 25_0	20525/836.5	1:1	0.185	0.01	22.95	23.50	1.135	0.210	22.8
Right side	10	QPSK 25_0	20525/836.5	1:1	0.098	-0.15	22.95	23.50	1.135	0.111	22.8
Top side	10	QPSK 25_0	20525/836.5	1:1	0.275	0.18	22.95	23.50	1.135	0.312	22.8

Test Position	Test ch./Freq.	Measured SAR (W/kg)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
Right cheek	20525/836.5	0.856	0.849	1.008	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).						
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						
5) The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds. The repeated measurement results must be clearly identified in the SAR report.						