CE RF Test Report

for LTE User Equipment (UE)

Product Name : LTE Module
Model No.: EC25-E, EC25-E MINIPCIE

Prepared for:
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Product Name : LTE Module

Applicant : Quectel Wireless Solutions Co. Ltd

Address : Room 501, Building 13, No.99 Tianzhou Road, Xuhui District, Shanghai,China

Manufacturer : Quectel Wireless Solutions Co. Ltd

Address : Room 501, Building 13, No.99 Tianzhou Road, Xuhui District, Shanghai,China

Model No. : EC25-E, EC25-E MINIPCIE

Brand Name : Quectel

EUT Vlotage: Extreme Low: 3.3V Normal: 4.0V Extreme High:4.6V

Applicable Standard : ETSI EN 301 908-1 V11.1.1 (2016-07)

ETSI EN 301 908-13 V11.1.1 (2016-07)

3GPP TS 36.521-1 V13.3.0 (2016-12)

3GPP TS 36.508 V13.2.0 (2017-03)

Test Result : PASS

Performed Location : Unilab (Shanghai) Co., Ltd.
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Transmitter maximum output power	ETSI EN 301 908-13 V11.1.1 §4.2.2	PASS
Transmitter spectrum emission mask	ETSI EN 301 908-13 V11.1.1 §4.2.3	PASS
Transmitter spurious emissions	ETSI EN 301 908-13 V11.1.1 §4.2.4	PASS
Transmitter minimum output power	ETSI EN 301 908-13 V11.1.1 §4.2.5	PASS
Receiver Adjacent Channel Selectivity (ACS)	ETSI EN 301 908-13 V11.1.1 §4.2.6	PASS
Receiver blocking characteristics	ETSI EN 301 908-13 V11.1.1 §4.2.7	PASS
Receiver spurious response	ETSI EN 301 908-13 V11.1.1 §4.2.8	PASS
Receiver intermodulation characteristics	ETSI EN 301 908-13 V11.1.1 §4.2.9	PASS
Receiver spurious emissions	ETSI EN 301 908-13 V11.1.1 §4.2.10	PASS
Transmitter Adjacent Channel Leakage power Ratio (ACLR)	ETSI EN 301 908-13 V11.1.1 §4.2.11	PASS
Radiated emissions (UE)	ETSI EN 301 908-1 V11.1.1 §4.2.2	PASS
Control and monitoring functions (UE)	ETSI EN 301 908-1 V11.1.1 §4.2.4	PASS
Receiver Reference Sensitivity level	ETSI EN 301 908-13 V11.1.1 §4.2.12	PASS

2. General Information

2.1. EUT Description

Product Name:	LTE Module
Model Name:	EC25-E, EC25-E MINIPCIE
Hardware Version:	R1.0
Software Version:	EC25EFAR02A04M4G
Support Band:	LTE Band 1/3/7/8/20/38/40
Tx Frequency Range:	LTE Band 1: 1920-1980MHz LTE Band 3: 1710-1785MHz LTE Band 7: 2500-2570MHz LTE Band 8: 880-915MHz LTE Band 20: 832-862MHz LTE Band 38: 2570-2620MHz LTE Band 40: 2300-2400MHz
Rx Frequency Range:	LTE Band 1: 2110-2170MHz LTE Band 3: 1805-1880MHz LTE Band 7: 2620-2690MHz LTE Band 8: 925-960MHz LTE Band 20: 791-821MHz LTE Band 38: 2570-2620MHz LTE Band 40: 2300-2400MHz
Antenna Peak Gain:	4dBi
Type of modulation:	LTE: QPSK&16QAM&64QAM
Operating Band	Power Class 3

2.2. Test Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the apparatus

Parameter	Uncertainty
Radio Frequency	3.5 x10^(-8)
Total RF power, conducted	0.47 dB
Spurious emissions, conducted	2.94 dB
Spurious emissions, radiated	5.2dB
Duty Cycle	5.64 dB
Temperature	0.9 ℃
Humidity	4.5%RH
DC and low frequency voltages	0.45%

2.3. Test Mode Description

Unilab has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report is the worst test mode. All pre-test mode see below:

Pre-Test Mode
Mode 1: LTE Band 1 **Mode 2: LTE Band 3** **Mode 3: LTE Band 7** **Mode 4: LTE Band 8** **Mode 5: LTE Band 20** **Mode 6: LTE Band 38** **Mode 7: LTE Band 40**

Final Test Mode
Mode 1: LTE Band 1 **Mode 2: LTE Band 3** **Mode 3: LTE Band 7** **Mode 4: LTE Band 8** **Mode 5: LTE Band 20** **Mode 6: LTE Band 38** **Mode 7: LTE Band 40**

3. Technical Test

3.1. Test Environment

Temperature (℃)	20
Humidity (%RH)	52

3.2. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	11/04/2017
Radio Communication Tester	Agilent	CMW500	147183	11/07/2017
Signal Generator	Agilent	N5183A	MY50140938	09/22/2017
Power Splitter	Agilent	11667C/52401	MY53806148	02/25/2018
ESG Vector Signal Generator	Agilent	E4438C	MY42081708	09/22/2017
PSG Signal Generator	Agilent	E8257D	MY45470010	09/22/2017
Preamplifier	CEM	EM30180	3008A0245	02/25/2018
Temperature Chamber	WEISS	DU/20/40	58226017340050	12/01/2017
DC Power Supply	Agilent	6612C	MY43002989	03/01/2018
Bilog Antenna	Schwarzbeck	VULB9160	9160-3316	09/18/2017
VHF-UHF-Biconical Antenna	Schwarzbeck	VUBA9117	9117-263	09/18/2017
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-942	09/18/2017
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-943	09/18/2017

Notes: Normal: the Temperature is +20 ℃, the humidity is 52%, the voltage is 4.0V;
TL: the Temperature is -10 ℃;
TH: the Temperature is +55℃;
VL: the voltage is 3.3V DC
VH: the voltage is 4.6V DC
There is only show typical and worst test plots in this report.

4. Results

4.1. Transmitter maximum output power

Standard Applicable

According to ETSI EN 301 908-13, §4.2.2, The following UE Power Classes define the maximum output power for any transmission bandwidth within the channel bandwidth. The period of measurement shall be at least one sub-frame (1 ms).

Limits

The UE maximum output power shall be within the shown value in table 4.2.2.1.2-1.

Table 4.2.2.2-1: UE power classes

E-UTRA Band	Power Class 3 (dBm)	Tolerance (dB)
1	23	±2,7
3	23	±2,7 (see note)
7	23	±2,7 (see note)
8	23	±2,7 (see note)
20	23	±2,7 (see note)
22	23	+3,0/-4,5
28	23	+2,7/-3,2
33	23	±2,7
34	23	±2,7
38	23	±2,7
40	23	±2,7
42	23	+3,0/-4,0
43	23	+3,0/-4,0
NOTE: For transmission bandwidths (ETSI TS 136 521-1 [1], clause 5) confined within F_{UL_low} and F_{UL_low} + 4 MHz or F_{UL_high} - 4 MHz and F_{UL_high}, the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1,5 dB (tolerance = +2,7/-4,2).		

NOTE 1: These requirements do not take into account the maximum power reductions allowed to the UE in subject to certain transmission conditions specified in ETSI TS 136 101 [4], clauses 6.2.3 and 6.2.4.
NOTE 2: The range of UE maximum output power for the various power classes are specified in ETSI TS 136 101 [4], clause 6.2.2. The values in table 4.2.2.1.2-1 correspond to the measurement limits taking into account the measurement uncertainty of measurement equipment.

Test procedure

1) SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to table 6.2.2.1.4.1-1 of ETSI TS 136 521-1 [1]. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
2) Send continuously uplink power control "up" commands in every uplink scheduling information to the UE; allow at least 200 ms for the UE to reach PUMAX level.
3) Measure the mean power of the UE in the channel bandwidth of the radio access mode. The period of measurement shall be at least the continuous duration of one sub-frame (1 ms). For TDD slots with transient periods are not under test.
4) Repeat for applicable test frequencies, channel bandwidths, operating band combinations and environmental conditions.

Test Result

PASS

Test Environment: normal,TL/VL,TH/VL,TL/VH,TH/VH.

4.2. Transmitter spectrum emission mask

Standard Applicable

According to ETSI EN 301 908-13,§4.2.3, The spectrum emission mask of the UE applies to frequencies (Δf_{OOB}) starting from the ± edge of the assigned E-UTRA channel bandwidth.

Limits

The power of any UE emission shall fulfil requirements in tables from 4.2.3.1.2-1 to 4.2.3.1.2-3.

Table 4.2.3.1.2-1: General E-UTRA spectrum emission mask, E UTRA bands ≤ 3 GHz

Δf_{OOB} (MHz)	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Measurement bandwidth
0 to 1	-8,5	-11,5	-13,5	-16,5	-18,5	-19,5	30 kHz
1 to 2,5	-8,5	-8,5	-8,5	-8,5	-8,5	-8,5	1 MHz
2,5 to 2,8	-23,5	-8,5	-8,5	-8,5	-8,5	-8,5	1 MHz
2,8 to 5		-8,5	-8,5	-8,5	-8,5	-8,5	1 MHz
5 to 6		-23,5	-11,5	-11,5	-11,5	-11,5	1 MHz
6 to 10			-23,5	-11,5	-11,5	-11,5	1 MHz
10 to 15				-23,5	-11,5	-11,5	1 MHz
15 to 20					-23,5	-11,5	1 MHz
20 to 25						-23,5	1 MHz

NOTE 1: The first and last measurement position with a 30 kHz filter is at Δf_{OOB} equals to 0,015 MHz and 0,985 MHz.
NOTE 2: The first and last measurement position with a 1 MHz filter for 1 MHz - 2,5 MHz offset range is at Δf_{OOB} equals to 1,5 MHz and 2,0 MHz. Similarly for other Δf_{OOB} ranges.
NOTE 3: The measurements shall be performed above the upper edge of the channel and below the lower edge of the channel.
NOTE 4: For the 2,5 MHz - 2,8 MHz offset range with 1,4 MHz channel bandwidth, the measurement position is at Δf_{OOB} equals to 3 MHz.

Table 4.2.3.1.2-2: General E-UTRA spectrum emission mask, 3 GHz < E-UTRA bands ≤ 4,2 GHz

	Spectrum emission limit (dBm)/Channel bandwidth						
Δf_{OOB} (MHz)	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Measurement bandwidth
0 to 1	-8,2	-11,2	-13,2	-16,2	-18,2	-19,2	30 kHz
1 to 2,5	-8,2	-8,2	-8,2	-8,2	-8,2	-8,2	1 MHz
2,5 to 2,8	-23,2						1 MHz
2,8 to 5							1 MHz
5 to 6		-23,2	-11,2	-11,2	-11,2	-11,2	1 MHz
6 to 10			-23,2				1 MHz
10 to 15				-23,2			1 MHz
15 to 20					-23,2		1 MHz
20 to 25						-23,2	1 MHz

NOTE 1: The first and last measurement position with a 30 kHz filter is at Δf_{OOB} equals to 0,015 MHz and 0,985 MHz.
NOTE 2: At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0,5 MHz and -0,5 MHz, respectively.
NOTE 3: The measurements shall be performed above the upper edge of the channel and below the lower edge of the channel.
NOTE 4: For the 2,5-2,8 MHz offset range with 1,4 MHz channel bandwidth, the measurement position is at Δf_{OOB} equals to 3 MHz.

Table 4.2.3.1.2-3: Additional spectrum emission mask (network signalled value "NS_01")

E-UTRA band	Frequency range	Channel Bandwidth	Spectrum emission limit (dBm)	Measurement Bandwidth
20	863 MHz ≤ f ≤ 867 MHz	10 MHz (note 2)	-11,5	1 MHz
	867 MHz ≤ f ≤ 870 MHz	10 MHz (note 2)	-14,5	1 MHz
NOTE 1: At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0,5 MHz and -0,5 MHz, respectively.				
NOTE 2: The conformance shall be assessed at test frequency 857 MHz with 50 RB allocation.				

NOTE: The values in table 4.2.3.1.2-3 are for conformance testing and can therefore be considered as worst case values. For coexistence studies different values can be used, because effects such as partial spectrum allocation or hand/head attenuation may result in lower OOB emissions during typical LTE UE usage.

Test procedure

1) SS sends uplink scheduling information via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to ETSI TS 136 521-1 [1], table 6.6.2.1.4.1-1. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.

2) Send continuously uplink power control "up" commands in the uplink scheduling information to the UE until the UE transmits at PUMAX level.

3) Measure the power of the transmitted signal with a measurement filter of bandwidths according to

tables 4.2.3.1.2-1 or 4.2.3.1.2-2 or 4.2.3.1.2-3, as applicable. The center frequency of the filter shall be stepped in continuous steps according to the same table. The measured power shall be recorded for each step. The measurement period shall capture the active TSs.

4) Repeat for applicable test frequencies, channel bandwidths and operating bands.

Test Result

PASS

Test Environment: normal

4.3. Transmitter spurious emissions

Standard Applicable

According to ETSI EN 301 908-13, §4.2.4, Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions. The spurious emission limits are specified in terms of general requirements in line with Recommendation ITU-R SM.329-12 [i.4] and E-UTRA operating band requirement to address UE co-existence.
To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

Limits

The measured average power of spurious emission for general requirements shall not exceed the described values in table 4.2.4.1.2-2.

Table 4.2.4.1.2-2: General spurious emissions requirements

Frequency range	Maximum level	Measurement bandwidth	Comment
9 kHz ≤ f < 150 kHz	-36 dBm	1 kHz	
150 kHz ≤ f < 30 MHz	-36 dBm	10 kHz	
30 MHz ≤ f < 1 000 MHz	-36 dBm	100 kHz	
1 GHz ≤ f < 12,75 GHz	-30 dBm	1 MHz	
12,75 GHz ≤ f < 5th harmonic of the upper frequency edge of the UL operating band in GHz	-30 dBm	1 MHz	See note
NOTE: Shall apply for Band 22, 42 and Band 43.			

Test procedure

1) SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to ETSI TS 136 521-1 [1], table 6.6.3.1.4.1-1. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.
2) Send continuously Up power control commands in the uplink scheduling information to the UE until the UE transmits at PUMAX level.
3) For each applicable requirement in tables from 4.2.4.1.2-2 to 4.2.4.1.2-6; measure the power of the transmitted signal with a measurement filter of bandwidths. The center frequency of the filter shall be stepped in contiguous steps according to the tables. The measured power shall be verified for each step. The measurement period shall capture the active time slots.
4) Repeat for applicable test frequencies, channel bandwidths and operating bands.

Test Result

Pass

Test Environment: normal

4.4. Transmitter minimum output power

Standard Applicable

According to ETSI EN 301 908-13, §4.2.5, The minimum controlled output power of the UE is defined as the broadband transmit power of the UE, i.e. the power in the channel bandwidth for all transmit bandwidth configurations (resource blocks), when the power is set to a minimum value.

Limits

The minimum output power measured shall not exceed the values specified in table 4.2.5.1.2-1..

Table 4.2.5.1.2-1: Minimum output power

	Channel bandwidth/minimum output power/measurement bandwidth					
	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Minimum output power	For carrier frequency f ≤ 3,0 GHz: ≤ -39 dBm For carrier frequency 3,0 GHz < f ≤ 4,2 GHz: ≤ -38,7 dBm					
Measurement bandwidth	1,08 MHz	2,7 MHz	4,5 MHz	9,0 MHz	13,5 MHz	18 MHz

Test procedure

1) SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to ETSI TS 136 521-1 [1], table 6.3.2.1.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
2) Send continuous uplink power control "down" commands in the uplink scheduling information to the UE to ensure that the UE transmits at its minimum output power.
3) Measure the mean power of the UE in the associated measurement bandwidth specified in table 4.5.2.1-1 for the specific channel bandwidth under test. The period of measurement shall be the continuous duration of one sub-frame (1 ms). For TDD slots with transient periods are not under test.
4) Repeat for applicable test frequencies, channel bandwidths, operating bands and environmental conditions.

Test Result

PASS

Test Environment: normal,TL/VL,TH/VL,TL/VH,TH/VH.

4.5. Receiver Adjacent Channel Selectivity (ACS)

Standard Applicable

According to ETSI EN 301 908-13, §4.2.6, Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive an E-UTRA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

Limits

The throughput R_{av} shall be ≥ 95 % of the maximum throughput of the reference measurement channels as specified in ETSI TS 136 521-1 [1] under the conditions specified in table 4.2.6.1.2-2 and also under the conditions specified in table 4.2.6.1.2-3.

Table 4.2.6.1.2-1: Adjacent channel selectivity

		Channel bandwidth					
Rx Parameter	**Units**	**1,4 MHz**	**3 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**
ACS	dB	33,0	33,0	33,0	33,0	30	27

Table 4.2.6.1.2-2: Test parameters for Adjacent channel selectivity, Case 1

Rx Parameter	**Units**	**Channel bandwidth**					
		1,4 MHz	**3 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**
Power in Transmission Bandwidth Configuration	dBm	REFSENS + 14 dB					
$P_{Interferer}$	dBm	REFSENS +45,5 dB	REFSENS +45,5 dB	REFSENS +45,5 dB	REFSENS +45,5 dB	REFSENS +42,5 dB	REFSENS +39,5 dB
$BW_{Interferer}$	MHz	1,4	3	5	5	5	5
$F_{Interferer}$ (offset)	MHz	1,4025	3,0075	5,0025	7,5075	10,0125	12,5025
NOTE 1: The transmitter shall be set to 4 dB below P_{CMAX_L} or $P_{CMAX\_L\_CA}$ as defined in clause 6.2.5 in ETSI TS 136 101 [3].							
NOTE 2: The interferer shall consist of the Reference measurement channel specified in clause A.3.2 of ETSI TS 136 521-1 [1] with set-up according to clause C.3.1 of ETSI TS 136 521-1 [1].							
NOTE 3: REFSENS as defined in ETSI TS 136 521-1 [1].							

Table 4.2.6.1.2-3: Test parameters for Adjacent channel selectivity, Case 2

Rx Parameter	**Units**	**Channel bandwidth**					
		1,4 MHz	**3 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**
Power in Transmission Bandwidth Configuration	dBm	-56,5	-56,5	-56,5	-56,5	-53,5	-50,5
$P_{Interferer}$	dBm	-25					
$BW_{Interferer}$	MHz	1,4	3	5	5	5	5
$F_{Interferer}$ (offset)	MHz	1,4025	3,0075	5,0025	7,5075	10,0125	12,5025
NOTE 1: The transmitter shall be set to 24 dB below P_{CMAX_L} or $P_{CMAX\_L\_CA}$ as defined in clause 6.2.5 in ETSI TS 136 101 [3].							
NOTE 2: The interferer shall consist of the Reference measurement channel specified in clause A.3.2 of ETSI TS 136 521-1 [1] with set-up according to clause C.3.1 of ETSI TS 136 521-1 [1].							

Test procedure

1) SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to ETSI TS 136 521-1 [1], table 7.5.4.1-1. The SS sends downlink MAC padding bits on the DL RMC.
2) SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to ETSI TS 136 521-1 [1], table 7.5.4.1-1. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.
3) Set the Downlink signal level to the value as defined in table 4.2.6.1.2-2 (Case 1). Send Uplink power control commands to the UE (less or equal to 1 dB step size should be used), to ensure that the UE output power is within +0, -3,4 dB of the target level in table 4.2.6.1.2-2 (Case 1) for carrier frequency f $\leqslant$ 3,0 GHz or within +0, -4,0 dB of the target level for carrier frequency 3,0 GHz < f $\leqslant$ 4,2 GHz, for at least the duration of the Throughput measurement (obtain correct UE output power as specified in ETSI TS 136 521-1 [1]).
4) Set the Interferer signal level to the value as defined in table 4.2.6.1.2-2 (Case 1) and frequency below the wanted signal, using a modulated interferer as defined in ETSI TS 136 521-1 [1], annex C.
5) Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of ETSI TS 136 521-1 [1]. ETSI 60 ETSI EN 301 908-13 V11.0.1 (2015-11)
6) Set the Downlink signal level to the value as defined in table 4.2.6.1.2-3 (Case 2). Send Uplink power control commands to the UE (less or equal to 1 dB step size should be used), to ensure that the UE output power is within +0, -3,4 dB of the target level in table 4.2.6.1.2-3 (Case 2) for carrier frequency f $\leqslant$ 3,0 GHz or within +0, -4,0 dB of the target level for carrier frequency 3,0 GHz < f $\leqslant$ 4,2 GHz, for at least the duration of the throughput measurement (obtain correct UE output power as specified in ETSI TS 136 521-1 [1]).
7) Set the Interferer signal level to the value as defined in table 4.2.6.1.2-3 (Case 2) and frequency below the wanted signal, using a modulated interferer as defined in ETSI TS 136 521-1 [1], annex C.
8) Measure the average throughput for a duration sufficient to achieve statistical significance according to ETSI TS 136 521-1 [1], annex G.
9) Repeat for applicable channel bandwidths in both Case 1 and Case 2.
10) Repeat for applicable test frequencies, channel bandwidths and operating bands.

Test Result

Operating Band	Channel Bandwidth	R_{av}	Result
LTE Band 1	5 MHz	$\geqslant$ 95 %	Pass
	20 MHz	$\geqslant$ 95 %	Pass
LTE Band 3	1.4 MHz	$\geqslant$ 95 %	Pass
	5 MHz	$\geqslant$ 95 %	Pass
	20 MHz	$\geqslant$ 95 %	Pass
LTE Band 7	5 MHz	$\geqslant$ 95 %	Pass
	20 MHz	$\geqslant$ 95 %	Pass
LTE Band 8	1.4 MHz	$\geqslant$ 95 %	Pass
	5 MHz	$\geqslant$ 95 %	Pass
	10 MHz	$\geqslant$ 95 %	Pass
LTE Band 20	5 MHz	$\geqslant$ 95 %	Pass
	20 MHz	$\geqslant$ 95 %	Pass
LTE Band 38	5 MHz	$\geqslant$ 95 %	Pass
	20 MHz	$\geqslant$ 95 %	Pass
LTE Band 40	5 MHz	$\geqslant$ 95 %	Pass
	20 MHz	$\geqslant$ 95 %	Pass

Test Environment: normal

4.6. Receiver blocking characteristics

Standard Applicable

According to ETSI EN 301 908-13, §4.2.7, The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

Limits

With parameters specified in tables 4.2.7.1.2-1 and 4.2.7.1.2-2, the throughput shall be ⩾ 95 % of the maximum throughput of the reference measurement channels as specified in ETSI TS 136 521-1 [1].
With parameters specified in tables 4.2.7.1.2-3 and 4.2.7.1.2-4, the throughput shall be ⩾ 95 % of the maximum throughput of the reference measurement channels as specified in ETSI TS 136 521-1 [1], except for the spurious response frequencies.
For table 4.2.7.1.2-4 in frequency range 1, 2 and 3, up to max(24, $6 \cdot \lceil NRB / 6 \rceil$) exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size, where is the number of resource blocks in the downlink transmission bandwidth configuration. For these exceptions the requirements of clause 4.2.8.1 Spurious response are applicable.
With parameters specified in table 4.2.7.1.2-5, the throughput shall be ⩾ 95 % of the maximum throughput of the reference measurement channels as specified in ETSI TS 136 521-1 [1].

Table 4.2.7.1.2-1: In-band blocking parameters

Rx Parameter	Units	Channel bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Power in Transmission Bandwidth Configuration	dBm	REFSENS + channel bandwidth specific value below					
		6	6	6	6	7	9
$BW_{Interferer}$	MHz	1,4	3	5	5	5	5
$F_{Ioffset, case\ 1}$	MHz	2,1125	4,5075	7,5125	7,5025	7,5075	7,5125
$F_{Ioffset, case\ 2}$	MHz	3,5075	7,5075	12,5075	12,5125	12,5025	12,5075
NOTE 1: The transmitter shall be set to 4 dB below P_{CMAX_L} at the minimum uplink configuration specified in ETSI TS 136 101 [3] (table 7.3.1-2 with P_{CMAX_L} as defined in clause 6.2.5).							
NOTE 2: The interferer shall consist of the Reference measurement channel specified in clause A.3.2 of ETSI TS 136 521-1 [1] with a set-up according to clause C.3.1 of ETSI TS 136 521-1 [1].							
NOTE 3: REFSENS as defined in ETSI TS 136 521-1 [1].							

Table 4.2.7.1.2-2: In-band blocking

E-UTRA band	Parameter	Units	Case 1	Case 2
	$P_{Interferer}$	dBm	-56	-44
	$F_{Interferer}$ (Offset)	MHz	= -BW/2 - $F_{Ioffset, case\ 1}$ and = +BW/2 + $F_{Ioffset, case\ 1}$	≤ -BW/2 - $F_{Ioffset, case\ 2}$ and ≥ +BW/2 + $F_{Ioffset, case\ 2}$
1, 3, 7, 8, 20, 22, 28, 33, 34, 38, 40, 42, 43	$F_{Interferer}$	MHz	(note 2)	F_{DL_low} - 15 to F_{DL_high} + 15
NOTE 1: For certain bands, the unwanted modulated interfering signal may not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.				
NOTE 2: For each carrier frequency the requirement is valid for two frequencies: a) the carrier frequency -BW/2 - Floffset, case 1; and b) the carrier frequency + BW/2 + Floffset, case 1.				
NOTE 3: $F_{Interferer}$ range values for unwanted modulated interfering signal are interferer center frequencies.				

Table 4.2.7.1.2-3: Out-of-band blocking parameters

Rx Parameter	Units	Channel bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Power in Transmission Bandwidth Configuration	dBm	REFSENS + channel bandwidth specific value below					
		6	6	6	6	7	9
NOTE 1: The transmitter shall be set to 4 dB below P_{CMAX_L} at the minimum uplink configuration specified in ETSI TS 136 101 [3] (table 7.3.1-2 with P_{CMAX_L} as defined in clause 6.2.5). NOTE 2: Reference measurement channel is clause A.3.2 of ETSI TS 136 521-1 [1]. NOTE 3: REFSENS as defined in ETSI TS 136 521-1 [1].							

Table 4.2.7.1.2-4: Out-of-band blocking

E-UTRA band	Parameter	Units	Frequency		
			Range 1	Range 2	Range 3
	$P_{Interferer}$	dBm	-44	-30	-15
1, 3, 7, 8, 20, 22, 28, 33, 34, 38, 40, 42 (NOTE 2), 43 (NOTE 2)	$F_{Interferer}$ (CW)	MHz	F_{DL_low} - 15 to F_{DL_low} - 60	F_{DL_low} - 60 to F_{DL_low} - 85	F_{DL_low} - 85 to 1 MHz
			F_{DL_high} + 15 to F_{DL_high} + 60	F_{DL_high} + 60 to F_{DL_high} + 85	F_{DL_high} + 85 to +12 750 MHz
NOTE 1: Range 3 shall be tested only with the highest channel bandwidth. NOTE 2: The power level of the interferer ($P_{Interferer}$) for Range 3 shall be modified to -20 dBm for $F_{Interferer}$ > 2 800 MHz and $F_{Interferer}$ < 4 400 MHz.					

Table 4.2.7.1.2-5: Narrow-band blocking

Parameter	Unit	Channel Bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
P_w	dBm	$P_{REFSENS}$ + channel-bandwidth specific value below					
		22	18	16	13	14	16
P_{uw} (CW)	dBm	-55	-55	-55	-55	-55	-55
F_{uw} (offset for Δf = 15 kHz)	MHz	0,9075	1,7025	2,7075	5,2125	7,7025	10,2075
NOTE 1: The transmitter shall be set a 4 dB below P_{CMAX_L} at the minimum uplink configuration specified in ETSI TS 136 101 [3] (table 7.3.1-2 with P_{CMAX_L} as defined in clause 6.2.5). NOTE 2: Reference measurement channel is in clause A.3.2 of ETSI TS 136 521-1 [1]. NOTE 3: REFSENS as defined in ETSI TS 136 521-1 [1].							

Test procedure

In-Band Procedure

1) SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to ETSI TS 136 521-1 [1], table 7.6.1.4.1-1. The SS sends downlink MAC padding bits on the DL RMC.
2) SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to ETSI TS 136 521-1 [1], table 7.6.1.4.1-1. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.
3) Set the parameters of the signal generator for an interfering signal below the wanted signal in Case 1 according to tables 4.2.7.1.2-1 and 4.2.7.1.2-2 as specified in ETSI TS 136 521-1 [1].
4) Set the downlink signal level according to the table 4.2.7.1.2-1. Send uplink power control commands to the UE (less or equal to 1 dB step size should be used), to ensure that the UE output power is within +0, -3,4 dB of the target level in table 4.2.7.1.2-1 for carrier frequency f ⩽ 3,0 GHz or within +0, -4,0 dB of the target level for carrier frequency 3,0 GHz < f ⩽ 4,2 GHz, for at least the duration of the throughput measurement as specified in ETSI TS 136 521-1 [1].
5) Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of ETSI TS 136 521-1 [1].
6) Repeat steps from 3 to 5, using an interfering signal above the wanted signal in Case 1 at step 3.
7) Repeat steps from 3 to 6, using interfering signals in Case 2 at step 3) and 6). The ranges of case 2 are covered in steps equal to the interferer bandwidth. The test frequencies are chosen in analogy to ETSI TS 136 521-1 [1], table 7.6.1.4.2-1.
8) Repeat for applicable test frequencies, channel bandwidths and operating bands.

Out-Of-Band Procedure

1) SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to ETSI TS 136 521-1 [1], table 7.6.2.4.1-1. The SS sends downlink MAC padding bits on the DL RMC.

2) SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to ETSI TS 136 521-1 [1], table 7.6.2.4.1-1. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.
3) Set the parameters of the CW signal generator for an interfering signal according to table 4.2.7.1.2-4 as specified in ETSI TS 136 521-1 [1]. The frequency step size is 1 MHz.
4) Set the downlink signal level according to the table 4.2.7.1.2-3. Send uplink power control commands to the UE (less or equal to 1 dB step size should be used), to ensure that the UE output power is within +0, -3,4 dB of the target level in table 4.2.7.1.2-3 for carrier frequency f ⩽ 3,0 GHz or within +0, -4,0 dB of the target level for carrier frequency 3,0 GHz < f ⩽ 4,2 GHz, for at least the duration of the throughput measurement as specified in ETSI TS 136 521-1 [1].
5) Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of ETSI TS 136 521-1 [1].
6) For table 4.2.7.1.2-4 record the frequencies for which the throughput does not meet the requirements.
7) Repeat for applicable test frequencies, channel bandwidths and operating bands.

Narrow-Band Procedure
1) SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to ETSI TS 136 521-1 [1], table 7.6.3.4.1-1. The SS sends downlink MAC padding bits on the DL RMC.
2) SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to ETSI TS 136 521-1 [1], table 7.6.3.4.1-1. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.
3) Set the parameters of the CW signal generator for an interfering signal below the wanted signal according to table 4.2.7.1.2-5 as specified in ETSI TS 136 521-1 [1].
4) Set the downlink signal level according to the table 4.2.7.1.2-5. Send uplink power control commands to the UE (less or equal to 1 dB step size should be used), to ensure that the UE output power is within +0, -3,4 dB of the target level in table 4.2.7.1.2-5 for carrier frequency f ⩽ 3,0 GHz or within +0, -4,0 dB of the target level for carrier frequency 3,0 GHz < f ⩽ 4,2 GHz, for at least the duration of the throughput measurement as specified in ETSI TS 136 521-1 [1].
5) Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of ETSI TS 136 521-1 [1].
6) Repeat steps from 3 to 5, using an interfering signal above the wanted signal at step 3.
7) Repeat for applicable test frequencies, channel bandwidths and operating bands.

Test Result

Operating Band	Channel Bandwidth	R_{av}	Result
LTE Band 1	5 MHz	⩾ 95 %	Pass
	20 MHz	⩾ 95 %	Pass
LTE Band 3	1.4 MHz	⩾ 95 %	Pass
	5 MHz	⩾ 95 %	Pass
	20 MHz	⩾ 95 %	Pass
LTE Band 7	5 MHz	⩾ 95 %	Pass
	20 MHz	⩾ 95 %	Pass
LTE Band 8	1.4 MHz	⩾ 95 %	Pass
	5 MHz	⩾ 95 %	Pass
	10 MHz	⩾ 95 %	Pass
LTE Band 20	5 MHz	⩾ 95 %	Pass
	20 MHz	⩾ 95 %	Pass
LTE Band 38	5 MHz	⩾ 95 %	Pass
	20 MHz	⩾ 95 %	Pass
LTE Band 40	5 MHz	⩾ 95 %	Pass
	20 MHz	⩾ 95 %	Pass

Test Environment: normal

4.7. Receiver spurious response

Standard Applicable

According to ETSI EN 301 908-13, §4.2.8, Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out-of-band blocking limit as specified in table 4.2.7.1.2-4 is not met.

Limits

The throughput shall be ⩾ 95 % of the maximum throughput of the reference measurement channels as specified in ETSI TS 136 521-1 [1] with parameters specified in tables 4.2.8.1.2-1 and 4.2.8.1.2-2. Table

Table 4.2.8.1.2-1: Spurious response parameters

Rx Parameter	Units	Channel bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Power in Transmission Bandwidth Configuration	dBm	REFSENS + channel bandwidth specific value below					
		6	6	6	6	7	9
NOTE 1: The transmitter shall be set to 4 dB below P_{CMAX_L} at the minimum uplink configuration specified in ETSI TS 136 101 [3] (table 7.3.1-2 with P_{CMAX_L} as defined in clause 6.2.5).							
NOTE 2: Reference measurement channel is clause A.3.2 of ETSI TS 136 521-1 [1].							
NOTE 3: REFSENS as defined in ETSI TS 136 521-1 [1].							

Table 4.2.8.1.2-2: Spurious Response

Parameter	Unit	Level
$P_{Interferer}$ (CW)	dBm	-44
$F_{Interferer}$	MHz	Spurious response frequencies

Test procedure

1) SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to ETSI TS 136 521-1 [1], table 7.6.2.4.1-1. The SS sends downlink MAC padding bits on the DL RMC.
2) SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to ETSI TS 136 521-1 [1], table 7.6.2.4.1-1. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.
3) Set the parameters of the CW signal generator for an interfering signal according to table 4.2.8.1.2-2. The spurious frequencies are taken from step 5) records in clause 5.3.6.1.1.2.
4) Set the downlink signal level according to the table 4.2.8.1.2-1. Send uplink power control commands to the UE (less or equal to 1 dB step size should be used), to ensure that the UE output power is within +0, -3,4 dB of the target level in table 4.2.8.1.2-1 for carrier frequency f ⩽ 3,0 GHz or within +0, -4,0 dB of the target level for carrier frequency 3,0 GHz < f ⩽ 4,2 GHz, for at least the duration of the throughput measurement as specified in ETSI TS 136 521-1 [1].
5) For the spurious frequency, measure the average throughput for a duration sufficient to achieve statistical significance.

Test Result

Operating Band	Channel Bandwidth	R_{av}	Result
LTE Band 1	5 MHz	⩾ 95 %	Pass
	20 MHz	⩾ 95 %	Pass
LTE Band 3	1.4 MHz	⩾ 95 %	Pass
	5 MHz	⩾ 95 %	Pass
	20 MHz	⩾ 95 %	Pass
LTE Band 7	5 MHz	⩾ 95 %	Pass
	20 MHz	⩾ 95 %	Pass
LTE Band 8	1.4 MHz	⩾ 95 %	Pass
	5 MHz	⩾ 95 %	Pass
	10 MHz	⩾ 95 %	Pass
LTE Band 20	5 MHz	⩾ 95 %	Pass
	20 MHz	⩾ 95 %	Pass
LTE Band 38	5 MHz	⩾ 95 %	Pass
	20 MHz	⩾ 95 %	Pass
LTE Band 40	5 MHz	⩾ 95 %	Pass
	20 MHz	⩾ 95 %	Pass

Test Environment: normal

4.8. Receiver Intermodulation characteristics

Standard Applicable

According to ETSI EN 301 908-13, §4.2.9, Intermodulation response rejection is a measure of the capability of the receiver to receiver a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

Limits

The throughput shall be ⩾ 95 % of the maximum throughput of the reference measurement channels as specified in ETSI TS 136 521-1 [1] with parameters specified in table 4.2.9.1.2-1 for the specified wanted signal mean power in the presence of two interfering signals.

Table 4.2.9.1.2-1: Test parameters for Wide band intermodulation

Rx Parameter	Units	Channel bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Power in Transmission Bandwidth Configuration	dBm	REFSENS + channel bandwidth specific value below					
		12	8	6	6	7	9
$P_{Interferer\ 1}$ (CW)	dBm	-46					
$P_{Interferer\ 2}$ (Modulated)	dBm	-46					
$BW_{Interferer\ 2}$		1,4	3	5			
$F_{Interferer\ 1}$ (Offset)	MHz	-BW/2 - 2,1 / +BW/2 + 2,1	-BW/2 - 4,5 / +BW/2 + 4,5	-BW/2 - 7,5 / +BW/2 + 7,5			
$F_{Interferer\ 2}$ (Offset)	MHz	$2 \times F_{Interferer\ 1}$					

NOTE 1: The transmitter shall be set to 4 dB below P_{CMAX_L} at the minimum uplink configuration specified in ETSI TS 136 101 [3] (table 7.3.1-2 with P_{CMAX_L} as defined in clause 6.2.5).
NOTE 2: Reference measurement channel is clause A.3.2 of ETSI TS 136 521-1 [1].
NOTE 3: The modulated interferer shall consist of the Reference measurement channel specified in clause A.3.2 of ETSI TS 136 521-1 [1] with set-up according to clause C.3.1 of ETSI TS 136 521-1 [1].
The interfering modulated signal is 5 MHz E-UTRA signal as described in annex C of ETSI TS 136 521-1 [1] for channel bandwidth ≥ 5 MHz.
NOTE 4: REFSENS as defined in ETSI TS 136 521-1 [1].

Test procedure

1) SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to ETSI TS 136 521-1 [1], table 7.8.1.4.1-1. The SS sends downlink MAC padding bits on the DL RMC.
2) SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to ETSI TS 136 521-1 [1], table 7.8.1.4.1-1. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.
3) Set the Downlink signal level to the value as defined in table 4.2.9.1.2-1. Send uplink power control commands to the UE (less or equal to 1 dB step size should be used), to ensure that the UE output power is within +0, -3,4 dB of the target level in table 4.2.9.1.2-1 for carrier frequency f $\leqslant$ 3,0 GHz or within +0, -4,0 dB of the target level for carrier frequency 3,0 GHz < f $\leqslant$ 4,2 GHz, for at least the duration of the throughput measurement as specified in ETSI TS 136 521-1 [1].
4) Set the Interfering signal levels to the values as defined in table 4.2.9.1.2-1, using a modulated interferer bandwidth as defined in annex C of ETSI TS 136 521-1 [1]. 5) Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of ETSI TS 136 521-1 [1].
6) Repeat for applicable test frequencies, channel bandwidths and operating bands.

Test Result

Operating Band	Channel Bandwidth	R_{av}	Result
LTE Band 1	5 MHz	$\geqslant$ 95 %	Pass
	20 MHz	$\geqslant$ 95 %	Pass
LTE Band 3	1.4 MHz	$\geqslant$ 95 %	Pass
	5 MHz	$\geqslant$ 95 %	Pass
	20 MHz	$\geqslant$ 95 %	Pass
LTE Band 7	5 MHz	$\geqslant$ 95 %	Pass
	20 MHz	$\geqslant$ 95 %	Pass
LTE Band 8	1.4 MHz	$\geqslant$ 95 %	Pass
	5 MHz	$\geqslant$ 95 %	Pass
	10 MHz	$\geqslant$ 95 %	Pass
LTE Band 20	5 MHz	$\geqslant$ 95 %	Pass
	20 MHz	$\geqslant$ 95 %	Pass
LTE Band 38	5 MHz	$\geqslant$ 95 %	Pass
	20 MHz	$\geqslant$ 95 %	Pass
LTE Band 40	5 MHz	$\geqslant$ 95 %	Pass
	20 MHz	$\geqslant$ 95 %	Pass

Test Environment: normal

4.9. Receiver spurious emissions

Standard Applicable

According to ETSI EN 301 908-13, §4.2.10 The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the UE antenna connector.

Limits

The measured spurious emissions derived in clause 5.3.9 shall not exceed the maximum level specified in table 4.2.10.1.2-1.

Table 4.2.10.1.2-1: General receiver spurious emission requirements

Frequency Band	Measurement bandwidth	Maximum level	Note
30 MHz ≤ f < 1 GHz	100 kHz	-57 dBm	
1 GHz ≤ f ≤ 12,75 GHz	1 MHz	-47 dBm	
12,75 GHz ≤ f ≤ 5th harmonic of the upper frequency edge of the DL operating band in GHz	1 MHz	-47 dBm	Note 1
NOTE 1: Shall apply only for Band 22, 42 and Band 43. NOTE 2: Unused PDCCH resources are padded with resource element groups with power level given by PDCCH_RA/RB as defined in ETSI TS 136 101 [3], clause C.3.1.			

Test procedure

1) Configure SCC according to ETSI TS 136 521-1 [1], clauses C.0, C.1 and clause C.3.1 for all downlink physical channels except PHICH.
2) The SS shall configure SCC as per ETSI TS 136 508 [2], clause 5.2A.4.
3) SS activates SCC by sending the activation MAC-CE. Wait for at least 2 seconds.
4) SS transmits PDSCH via PDCCH DCI format 2A for C_RNTI to transmit the DL RMC according to ETSI TS 136 521-1 [1], table 7.9A.4.1-1 on both PCC and SCC. The SS sends downlink MAC padding bits on the DL RMC.
5) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission. During measurement SS sends no uplink scheduling information to the UE.
6) Repeat steps 1) to 5) for all E-UTRA DL-only band Rx antennas of the UE.

Test Result

Pass

Test Environment: normal

4.10. Transmitter Adjacent Channel Leakage Power Ratio

Standard Applicable

According to ETSI EN 301 908-13, §4.2.11, Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the filtered mean power centred on the assigned channel frequency to the filtered mean power centred on an adjacent channel frequency.

Limits

If the measured adjacent channel power is greater than -50 dBm then the measured E-UTRAACLR shall be higher than the limits in table 4.2.11.1.2-1.

Table 4.2.11.1.2-1: E-UTRA UE ACLR

	Channel bandwidth/E-UTRA$_{ACLR1}$/measurement bandwidth					
	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
E-UTRA$_{ACLR1}$	29,2 dB	29,2 dB	29,2 dB	29,2 dB	29,2 dB	29,2 dB
E-UTRA channel Measurement bandwidth	1,08 MHz	2,7 MHz	4,5 MHz	9,0 MHz	13,5 MHz	18 MHz
UE channel	+1,4 MHz or -1,4 MHz	+3 MHz or -3 MHz	+5 MHz or -5 MHz	+10 MHz or -10 MHz	+15 MHz or -15 MHz	+20 MHz or -20 MHz

If the measured UTRA channel power is greater than -50 dBm then the measured UTRAACLR1, UTRAACLR2 shall be higher than the limits in table 4.2.11.2-2.

Table 4.2.11.1.2-2: UTRA UE ACLR

	Channel bandwidth/UTRA$_{ACLR1/2}$/measurement bandwidth					
	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
UTRA$_{ACLR1}$	32,2 dB	32,2 dB	32,2 dB	32,2 dB	32,2 dB	32,2 dB
Adjacent channel centre frequency offset (in MHz)	0,7 + $BW_{UTRA}/2$ / -0,7 - $BW_{UTRA}/2$	1,5 + $BW_{UTRA}/2$ / -1,5 - $BW_{UTRA}/2$	2,5 + $BW_{UTRA}/2$ / -2,5 - $BW_{UTRA}/2$	5 + $BW_{UTRA}/2$ / -5 - $BW_{UTRA}/2$	7,5 + $BW_{UTRA}/2$ / -7,5 - $BW_{UTRA}/2$	10 + $BW_{UTRA}/2$ / -10 - $BW_{UTRA}/2$
UTRA$_{ACLR2}$	-	-	35,2 dB	35,2 dB	35,2 dB	35,2 dB
Adjacent channel centre frequency offset (in MHz)	-	-	2,5 + 3 × $BW_{UTRA}/2$ / -2,5 - 3 × $BW_{UTRA}/2$	5 + 3 × $BW_{UTRA}/2$ / -5 - 3 × $BW_{UTRA}/2$	7,5 + 3 × $BW_{UTRA}/2$ / -7,5 - 3 × $BW_{UTRA}/2$	10 + 3 × $BW_{UTRA}/2$ / -10 - 3 × $BW_{UTRA}/2$
E-UTRA channel Measurement bandwidth	1,08 MHz	2,7 MHz	4,5 MHz	9,0 MHz	13,5 MHz	18 MHz
UTRA 5 MHz channel Measurement bandwidth (see note 1)	3,84 MHz	3,84 MHz	3,84 MHz	3,84 MHz	3,84 MHz	3,84 MHz
UTRA 1,6 MHz channel measurement bandwidth (see note 2)	1,28 MHz	1,28 MHz	1,28 MHz	1,28 MHz	1,28 MHz	1,28 MHz
NOTE 1: Shall apply for E-UTRA FDD co-existence with UTRA FDD in paired spectrum. NOTE 2: Shall apply for E-UTRA TDD co-existence with UTRA TDD in unpaired spectrum. NOTE 3: BW_{UTRA} for UTRA FDD shall be 5 MHz and for UTRA TDD shall be 1,6 MHz.						

Test procedure

1) SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to ETSI TS 136 521-1 [1], table 6.6.2.3.4.1-1. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.
2) Send continuous uplink power control "up" commands in the uplink scheduling information to the UE to ensure that the UE transmits at PUMAX level.
3) Measure the mean power of the UE in the channel bandwidth of the radio access mode according to the test configuration, which shall meet the requirements described in tables 4.2.11.1.2-1 and 4.2.11.1.2-2. The period of the measurement shall be at least the continuous duration of one sub-frame (1 ms). For TDD slots with transient periods are not under test.
4) Measure the filtered mean power for E-UTRA.
5) Measure the filtered mean power of the first E-UTRA adjacent channel.
6) Measure the RRC filtered mean power of the first and the second UTRA adjacent channel.
7) Calculate the ratio of the power between the values measured in step 4) over step 5) for E-UTRAACLR.
8) Calculated the ratio of the power between the values measured in step 4) over step 6) for UTRAACLR1, UTRAACLR2.
9) Repeat for applicable test frequencies, channel bandwidths, operating bands and environmental conditions.

Test Result

Pass

Test Environment: normal, TL/VL, TL/VH, TH/VL, TH/VH

4.11. Radiated emissions (UE)

Standard Applicable

According to ETSI EN 301 908-1 V11.1.1 (2016-07) §4.2.2, This test assesses the ability of radio communications equipment and ancillary equipment to limit unwanted emissions from the enclosure port. This test is applicable to radio communications equipment and ancillary equipment.
This test shall be performed on the radio communications equipment and/or a representative configuration of the ancillary equipment.

Limits

The frequency boundary and reference bandwidths for the detailed transitions of the limits between the requirements for out-of-band emissions and spurious emissions are based on ITU-R Recommendations SM.329-10 [3] and SM.1539-1 [4].

Table 4.2.2.2-1: Radiated spurious emissions requirements (UE)

Frequency	Minimum requirement (e.r.p.)/ reference bandwidth idle mode	Minimum requirement (e.r.p.)/ reference bandwidth traffic mode	Applicability
30 MHz ≤ f < 1 000 MHz	-57 dBm/100 kHz	-36 dBm/100 kHz	All
1 GHz ≤ f < 12,75 GHz	-47 dBm/1 MHz	-30 dBm/1 MHz	All
fc - 2,5 × 5 MHz < f < fc + 2,5 × 5 MHz		Not defined	UTRA FDD, UTRA TDD, 3,84 Mcps option, cdma2000, spreading rate 3
fc - 2,5 × $BW_{Channel}$ MHz < f < fc + 2,5 × $BW_{Channel}$ MHz		Not defined	E-UTRA FDD, E-UTRA TDD, Mobile WiMAX, UMB
fc - 2,5 × 10 MHz < f < fc1 + 2,5 × 10 MHz		Not defined	UTRA TDD, 7,68 Mcps option
fc - 4 MHz < f < fc + 4 MHz		Not defined	UTRA TDD, 1,28 Mcps option cdma2000, spreading rate 1
fc - 500 kHz < f < fc + 500 kHz		Not defined	UWC 136, 200 kHz option
fc - 250 kHz < f < fc + 250 kHz		Not defined	UWC 136, 30 kHz option
NOTE: fc is the UE transmit centre frequency.			

Test Result

Pass

Test Environment: normal

Please refer to following data tables.

LTE Band 1 Idle Mode

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
1572.3	43.61	125	1.5	H	1572.3	-52.68	H	7.72	6.9	-51.86	-47
2530	44.25	86	1.4	V	2530	-54.35	V	8.56	7.12	-52.91	-47
1629	43.65	165	1.6	V	1629	-55.18	V	1.77	6.58	-59.99	-47
414.2	30.88	99	1.4	H	414.2	-62.25	H	1.39	3.75	-64.61	-57
63.32	32.15	206	1.5	V	63.32	-63.25	V	-0.44	2.59	-66.28	-57

LTE Band 3 Idle Mode

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
2610	45.86	66	1.6	H	2610	-56.25	H	8.33	7.89	-55.81	-47
1632	43.55	69	1.7	V	1632	-53.82	H	8.57	6.54	-51.79	-47
1426	39.36	135	1.6	V	1426	-58.33	V	8.97	5.26	-54.62	-47
318	37.56	165	1.5	H	318	-62.45	H	1.76	2.16	-62.85	-57
63	41.52	199	1.5	V	63	-63.46	V	-0.68	1.12	-65.26	-57

LTE Band 7 Idle Mode

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
1633	41.21	245	1.6	V	1633	-56.69	H	7.80	6.00	-54.89	-47
2783	41.15	302	1.5	H	2783	-59.02	H	8.46	7.42	-57.98	-47
74.4	40.20	125	1.4	V	1744	-58.66	V	-0.26	2.09	-61.01	-47
56.25	40.88	78	1.5	H	56.25	-61.35	V	-0.26	3.18	-64.79	-57
419.1	38.21	318	1.7	V	419.1	-61.21	V	1.45	4.48	-64.24	-57

LTE Band 8 Idle Mode

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
1679.2	43.56	123	1.5	H	1679.2	-51.38	H	7.72	6.90	-50.56	-47
2514	45.68	84	1.3	V	2514	-52.35	V	8.56	7.12	-50.91	-47
1626	42.59	175	1.4	V	1626	-56.17	V	1.77	6.58	-60.98	-47
415.3	31.77	81	1.6	H	415.3	-59.48	H	1.39	3.75	-61.84	-57
79.87	35.98	175	1.2	V	79.87	-56.46	V	-0.44	2.59	-59.49	-57

LTE Band 20 Idle Mode

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
2612.3	45.11	87	1.1	H	2612.3	-56.48	H	8.33	7.89	-56.04	-47
1623.1	44.13	117	1.1	V	1623.1	-53.74	V	8.57	6.54	-51.71	-47
1424.4	39.49	6	1.8	V	1424.4	-58.00	V	8.97	5.26	-54.29	-47
313.6	39.33	209	1.8	H	313.6	-63.62	H	1.76	2.16	-64.02	-57
66.2	40.28	343	1.3	V	66.2	-63.61	V	-0.68	1.12	-65.41	-57

LTE Band 38 Idle Mode

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
2562	44.26	62	1.6	H	2562	-55.68	H	8.33	7.89	-55.24	-47
1611	45.39	90	1.7	H	1611	-55.26	H	8.57	6.54	-53.23	-47
1247	39.35	112	1.6	V	1247	-57.33	V	8.97	5.26	-53.62	-47
358	38.88	265	1.6	H	358	-62.59	H	1.76	2.16	-62.99	-57
89	42.21	100	1.5	V	89	-63.56	V	-0.68	1.12	-65.36	-57

LTE Band 40 Idle Mode

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
2545	44.19	262	1.4	H	2545	-55.02	H	8.33	7.89	-54.58	-47
1617	46.16	97	1.7	H	1617	-55.33	H	8.57	6.54	-53.30	-47
1239	39.66	125	1.4	V	1239	-57.70	V	8.97	5.26	-53.99	-47
347	39.76	285	1.5	H	347	-61.76	H	1.76	2.16	-62.16	-57
88	41.83	130	1.5	V	88	-62.76	V	-0.68	1.12	-64.56	-57

LTE Band 1 traffic Mode in middle channel

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
3900	48.32	76	1.5	H	3900	-35.32	H	8.98	7.11	-33.45	-30
5850	42.26	57	1.7	V	5850	-36.35	V	14.56	12.57	-34.36	-30
866	31.27	188	1.5	H	866	-45.31	V	8.2	5.84	-42.95	-36
763	35.58	193	1.7	V	763	-47.86	V	6.5	4.95	-46.31	-36
631	36.62	201	1.6	H	631	-48.35	H	7.2	4.56	-45.71	-36

LTE Band 3 traffic Mode in middle channel

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
1795.2	46.68	58	1.6	H	1795.2	-40.52	H	7.95	7.03	-39.6	-30
2692.8	45.36	69	1.6	V	2692.8	-41.63	V	8.74	7.93	-40.82	-30
873	35.82	180	1.5	V	873	-47.63	V	6.9	4.57	-45.3	-36
752	34.59	161	1.6	v	752	-48.36	H	7.8	5.89	-46.45	-36
358	33.27	251	1.4	H	358	-49.55	H	2.56	2.35	-49.34	-36

LTE Band 7 traffic Mode in middle channel

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
2318.8	42.09	62	1.0	H	2318.8	-35.30	H	8.46	7.13	-36.12	-30
5614.8	32.76	75	1.4	V	5614.8	-41.78	V	13.10	11.22	-42.05	-30
2184.4	34.46	251	1.1	H	2184.4	-51.71	V	10.4	6.79	-48.1	-30
781.7	37.85	301	1.5	V	781.7	-53.50	V	5.8	3.83	-53.68	-36
757.5	34.60	256	1.3	H	757.5	-46.85	H	5.8	3.73	-46.93	-36

LTE Band 8 traffic Mode in middle channel

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
2254.2	48.54	45	1.5	H	2254.2	-36.44	H	8.98	7.55	-35.01	-30
5539.4	39.76	61	1.6	V	5539.4	-39.28	V	14.56	11.26	-35.98	-30
823.5	29.53	126	1.7	V	823.5	-47.59	V	8.2	5.75	-45.14	-36
682.5	34.04	194	1.2	V	682.5	-50.51	V	6.5	4.12	-48.13	-36
731.8	36.89	187	1.5	H	731.8	-43.59	H	7.2	4.77	-41.16	-36

LTE Band 20 traffic Mode in middle channel

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
2118	46.58	10	1.5	H	2118	-45.08	H	7.95	7.03	-44.16	-30
2767	35.36	77	1.3	V	2767	-40.87	V	8.74	7.93	-40.06	-30
580	36.25	120	1.7	V	580	-43.63	V	6.9	4.57	-41.30	-36
859	33.59	358	1.6	H	859	-44.45	H	7.8	5.89	-42.54	-36
451	31.29	43	1.5	V	451	-54.97	V	2.56	2.35	-54.76	-36

LTE Band 38 traffic Mode in middle channel

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
2120	46.58	90	1.5	H	2120	-44.26	H	7.95	7.03	-43.34	-30
2721	35.36	77	1.4	V	2721	-41.59	V	8.74	7.93	-40.78	-30
590	36.25	320	1.5	V	590	-44.63	V	6.9	4.57	-42.30	-36
866	33.59	168	1.6	H	866	-44.33	H	7.8	5.89	-42.42	-36
448	31.29	113	1.4	H	448	-54.59	H	2.56	2.35	-54.38	-36

LTE Band 40 traffic Mode in middle channel

Indicated		Table Angle Degree	Test Ant.		Substituted			Ant. Gain Correction (dBi)	Cable Loss (dBm)	Absolute Level (dBm)	Limit (dBm)
Freq. (MHz)	Receiver Reading (dBμV)		Height	Polar (H/V)	Freq. (MHz)	Level (dBm)	Polar (H/V)				
2251.6	47.95	36	2.0	H	2251.6	-37.36	H	8.98	7.55	-35.93	-30
5535.0	40.61	20	1.4	V	5535.0	-39.46	V	14.56	11.26	-36.16	-30
819.4	29.28	351	1.9	V	819.4	-46.64	V	8.2	5.75	-44.19	-36
681.8	33.42	93	1.9	V	681.8	-49.85	V	6.5	4.12	-47.47	-36
730.7	36.62	289	1.1	H	730.7	-44.37	H	7.2	4.77	-41.94	-36

4.12. Control and monitoring functions (UE)

Standard Applicable

According to ETSI EN 301 908-1 V11.1.1 (2016-07) §4.2.4, This requirement, together with other control and monitoring technical requirements identified in the table of cross references in the applicable part, verifies that the control and monitoring functions of the UE prevent it from transmitting in the absence of a valid network.
This test is applicable to radio communications equipment and ancillary equipment in the operating band defined in the applicable part of this multipart harmonized standard.
This test shall be performed on the radio communications equipment and/or a representative configuration of the ancillary equipment.

Limits

The maximum measured power during the duration of the test shall not exceed -30 dBm.

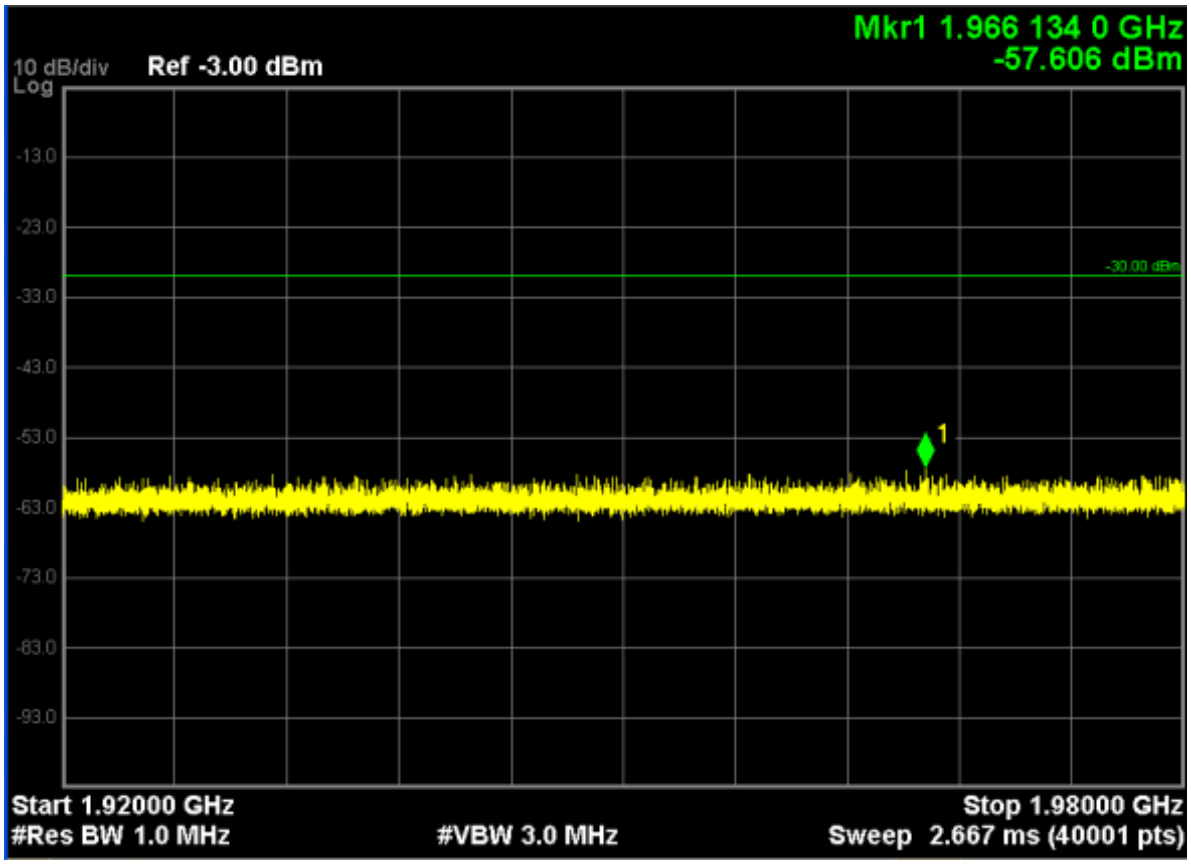
Test Result

Band	Measured power(dBm)	Results
LTE Band 1	< -30	Pass
LTE Band 3	< -30	Pass
LTE Band 7	< -30	Pass
LTE Band 8	< -30	Pass
LTE Band 20	< -30	Pass
LTE Band 38	< -30	Pass
LTE Band 40	< -30	Pass

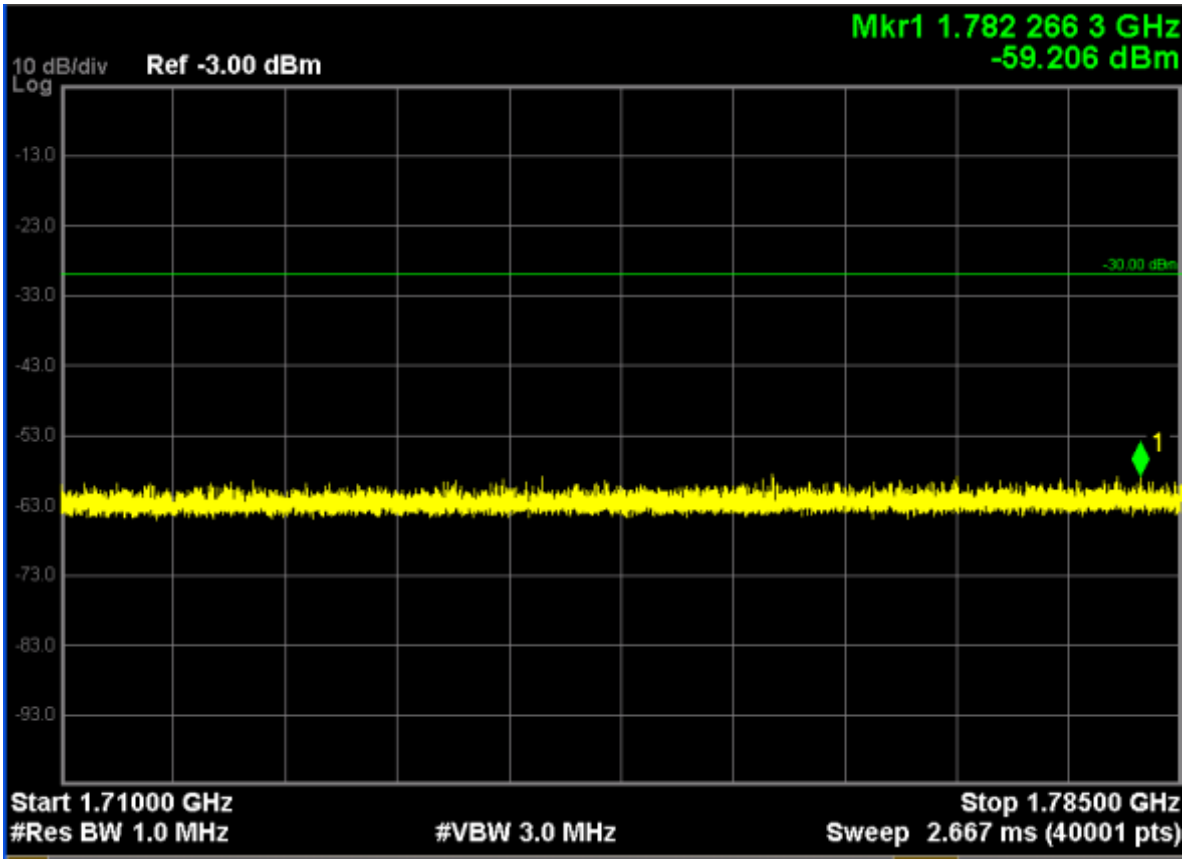
Test Environment: normal

Please refer to following data plots.

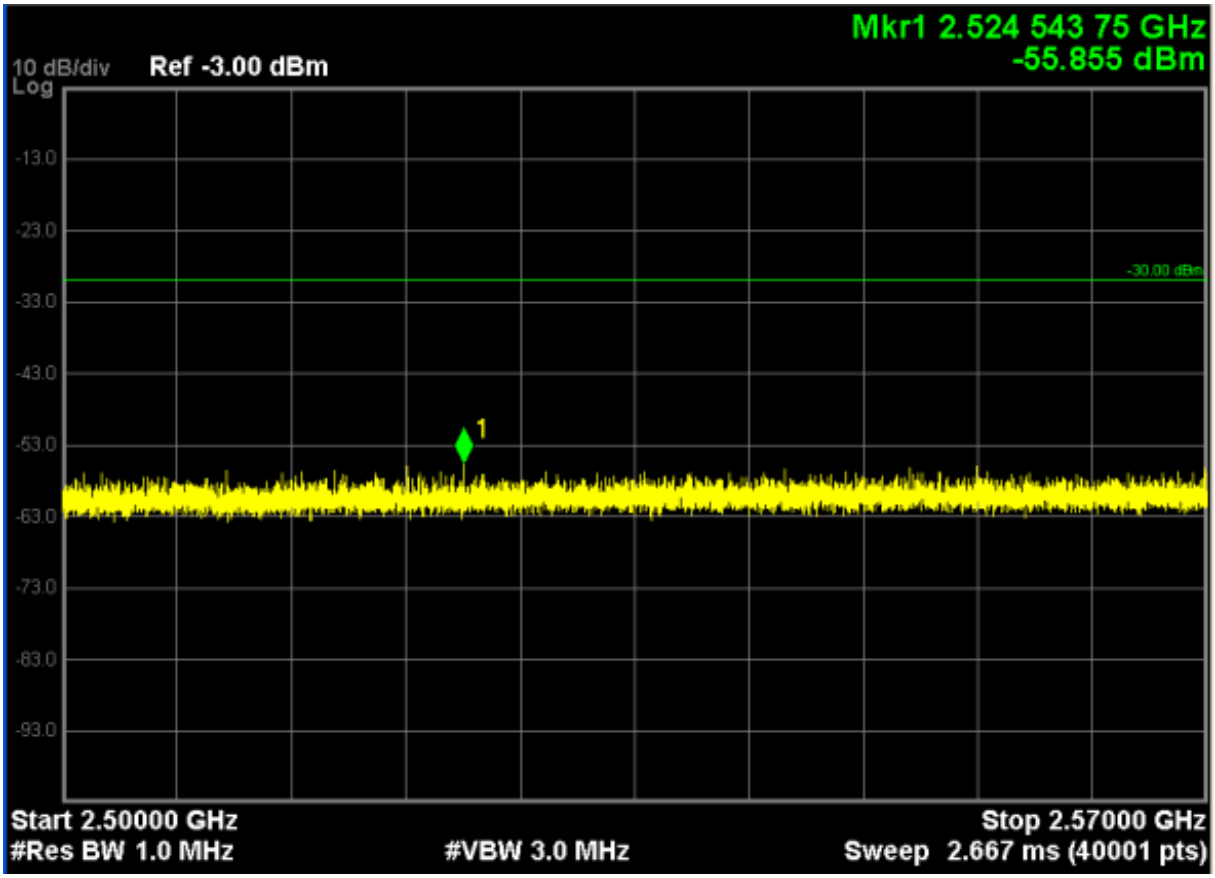
LTE Band 1



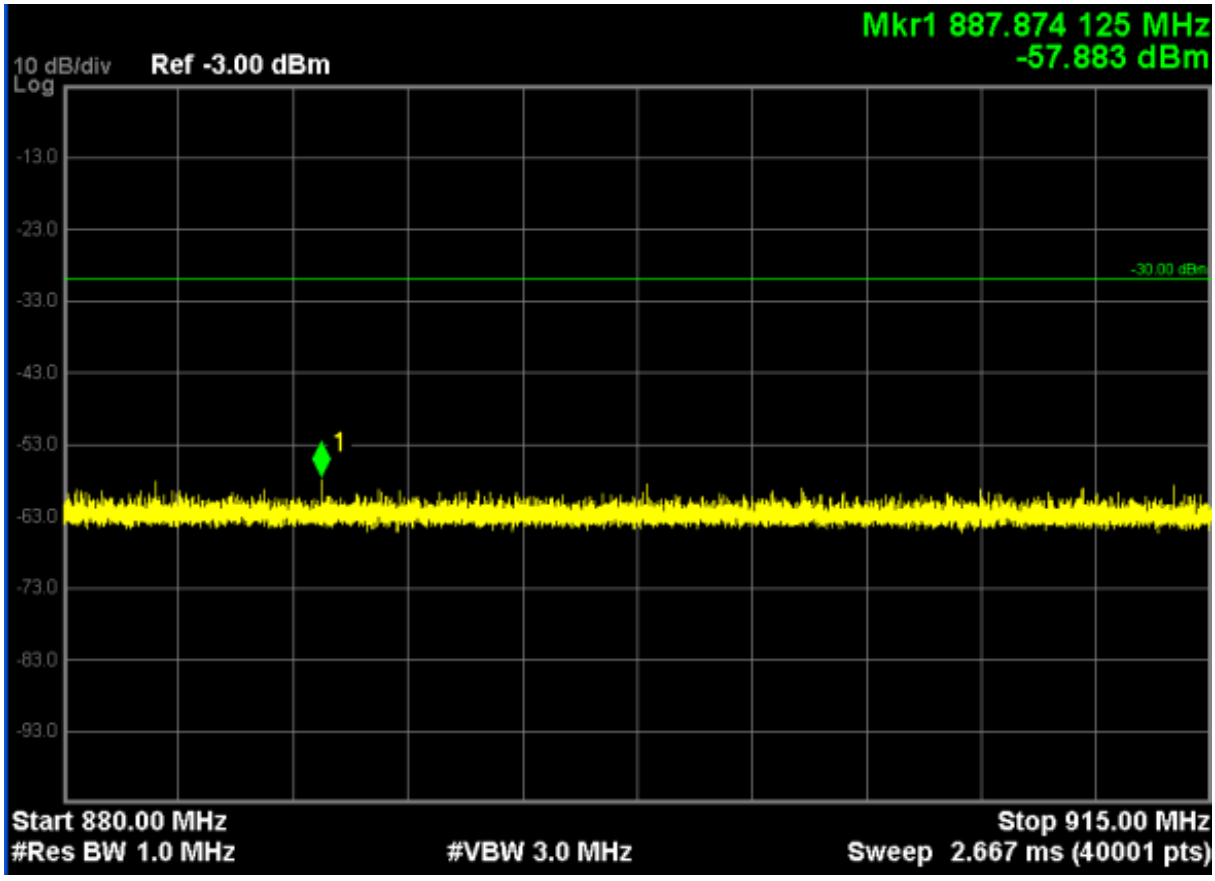
LTE Band 3



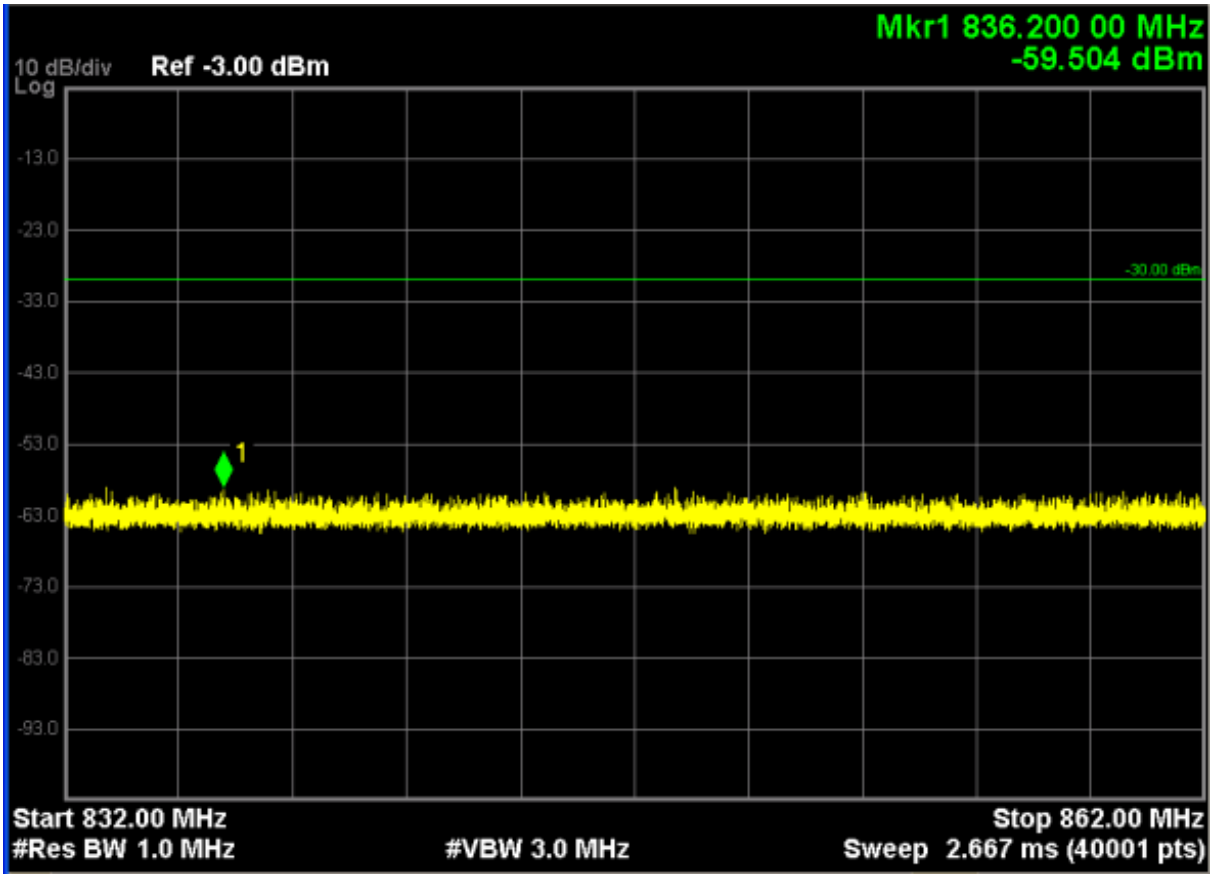
LTE Band 7



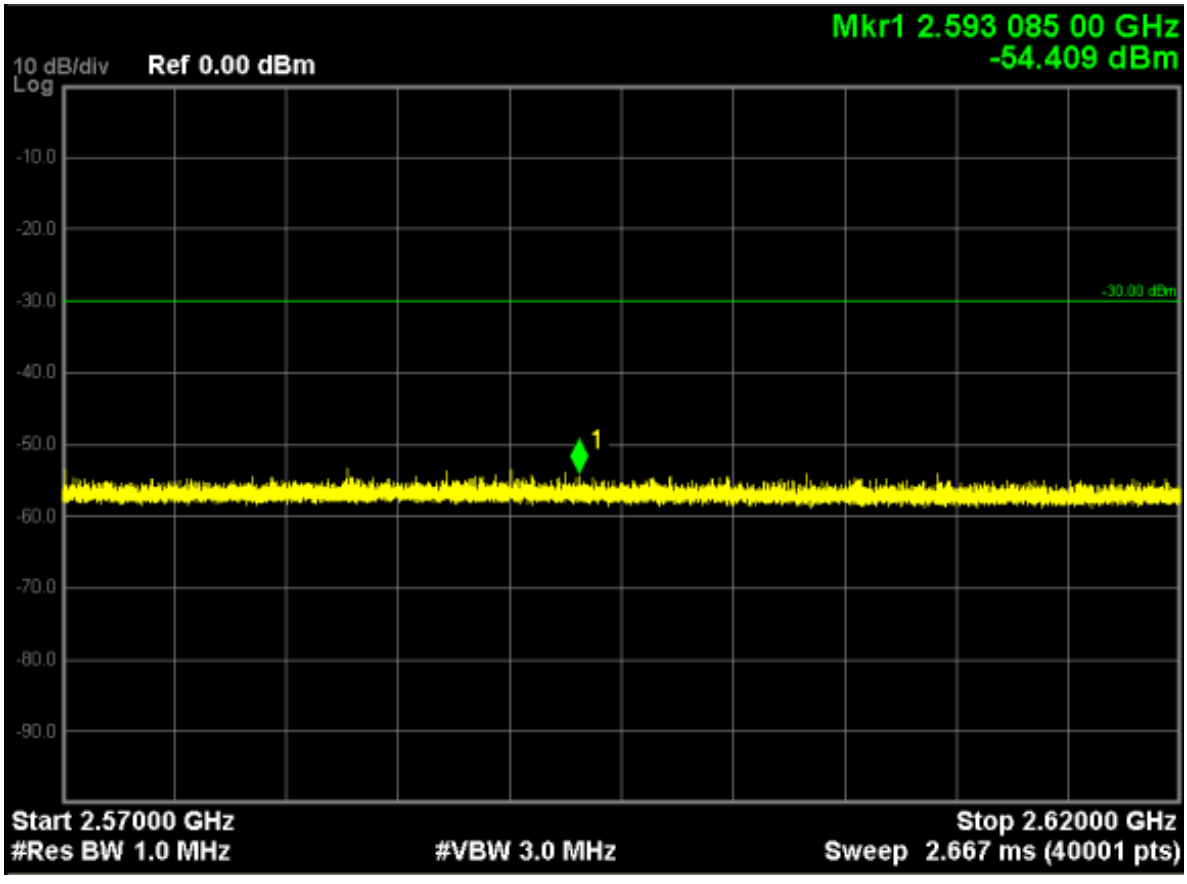
LTE Band 8



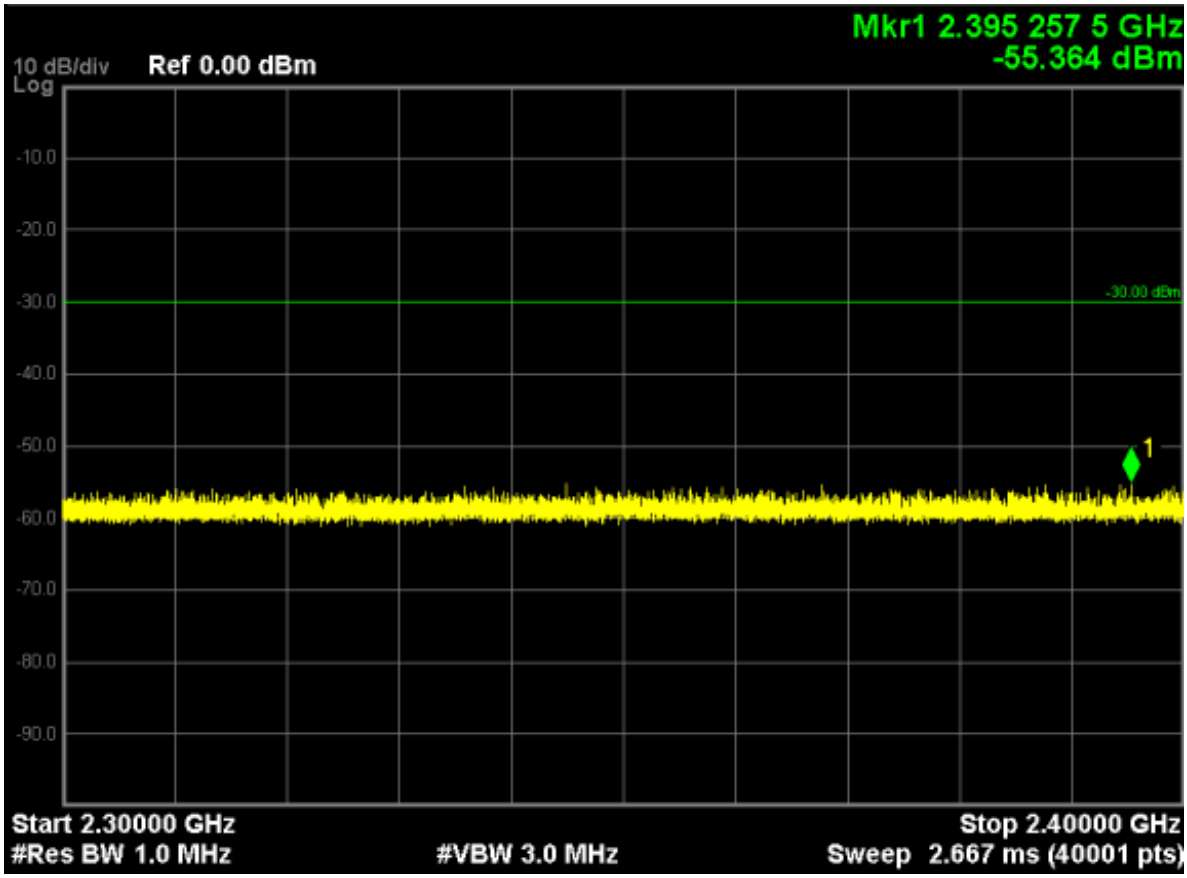
LTE Band 20



LTE Band 38



LTE Band 40


Mkr1 2.395 257 5 GHz
-55.364 dBm
10 dB/div
Log
Ref 0.00 dBm
-10.0
-20.0
-30.0
-30.00 dBm
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
1
Start 2.30000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 2.40000 GHz
Sweep 2.667 ms (40001 pts)

4.13. Receiver Reference Sensitivity Level

Standard Applicable

According to ETSI EN 301 908-13 V11.1.1(2016-07) §4.2.12, Reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Bit Error Ratio (BER) shall not exceed a specific value.

Limits

The throughput shall be ⩾ 95 % of the maximum throughput of the reference measurement channels as specified in ETSI TS 136 521-1 [1], clauses A.2.2, A.2.3 and A.3.2 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in ETSI TS 136 521-1 [1], clauses A.5.1.1/A.5.2.1) with parameters specified in table 4.2.12.1.2-1 and table 7.3.3-2.

Table 4.2.12.1.2-1: Reference sensitivity QPSK PREFSENS

Channel bandwidth							
E-UTRA Band	1,4 MHz (dBm)	3 MHz (dBm)	5 MHz (dBm)	10 MHz (dBm)	15 MHz (dBm)	20 MHz (dBm)	Duplex Mode
1	-	-	-99,3	-96,3	-94,5	-93,3	FDD
3	-101,0	-98,0	-96,3	-93,3	-91,5	-90,3	FDD
7	-	-	-97,3	-94,3	-92,5	-91,3	FDD
8	-101,5	-98,5	-96,3	-93,3	-	-	FDD
20	-	-	-96,3	-93,3	-90,5	-89,3	FDD
22	-	-	-96,0	-93,0	-91,2	-90,0	FDD
28	-	-99,5	-97,8	-94,8	-93,0	-90,3	FDD
33	-	-	-99,3	-96,3	-94,5	-93,3	TDD
34	-	-	-99,3	-96,3	-94,5	-	TDD
38	-	-	-99,3	-96,3	-94,5	-93,3	TDD
40	-	-	-99,3	-96,3	-94,5	-93,3	TDD
42	-	-	-98,0	-95,0	-93,2	-92,0	TDD
43	-	-	-98,0	-95,0	-93,2	-92,0	TDD

NOTE 1: The transmitter shall be set to maximum output power level (ETSI TS 136 521-1 [1], table 7.3.5-2).
NOTE 2: The reference measurement channel is specified in ETSI TS 136 521-1 [1], clause A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in ETSI TS 136 521-1 [1], clauses A.5.1.1/A.5.2.1.
NOTE 3: The signal power is specified per port.

Test procedure

1) SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to ETSI TS 136 521-1 [1], table 7.3.4.1-1. The SS sends downlink MAC padding bits on the DL RMC.
2) SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to ETSI TS 136 521-1 [1], table 7.3.4.1-1. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.
3) Set the Downlink signal level to the appropriate REFSENS value defined in table 4.2.12.1.2-1. Send continuously uplink power control "up" commands in the uplink scheduling information to the UE to ensure the UE transmits PUMAX level for at least the duration of the Throughput measurement. (obtain correct UE output power as specified in ETSI TS 136 521-1 [1]).
4) Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of ETSI TS 136 521-1 [1].
5) Repeat for applicable test frequencies, channel bandwidths and operating bands.

Test Result

Pass

Test Environment: normal, TL/VL, TL/VH, TH/VL, TH/VH

Please refer to following data tables.

Band	Channel Bandwidth(MHz)	Test Environment	Throughput			Result
			Low Channel	Middle Channel	High Channel	
LTE Band I	5	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
	20	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
LTE Band 3	1.4	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
	5	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
	20	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
LTE Band 7	5	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
	20	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
LTE Band 8	1.4	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
	5	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass

		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
	10	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
LTE Band 20	5	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
	20	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
LTE Band 38	5	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
	20	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
LTE Band 40	5	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
	20	normal	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TL/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VL	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass
		TH/VH	⩾ 95 %	⩾ 95 %	⩾ 95 %	Pass

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

Please refer to the file named “RF Test Setup Photos”.

APPENDIX 2 PHOTOGRAPHS OF EUT

Please refer to the file named “EUT Photos”.

----End of the report----