

# Test Report

<b>Test Report No..... :</b>	TCT241010E041	
<b>Date of issue..... :</b>	Oct. 23, 2024	
<b>Testing laboratory .....</b>	Shenzhen TCT Testing Technology Co., Ltd.	
<b>Testing location/ address:</b>	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China	
<b>Applicant's name..... :</b>	Shenzhen Huafurui Technology Co., Ltd.	
<b>Address..... :</b>	Unit 601-03, 6/F, Block A, Building 1, Ganfeng Technology Building, No. 993 Jiaxian Road, Xiangjiaotang Community, Bantian Street, Longgang District, Shenzhen, P.R. China	
<b>Manufacturer's name ... :</b>	Shenzhen Huafurui Technology Co., Ltd.	
<b>Address..... :</b>	Unit 601-03, 6/F, Block A, Building 1, Ganfeng Technology Building, No. 993 Jiaxian Road, Xiangjiaotang Community, Bantian Street, Longgang District, Shenzhen, P.R. China	
<b>Standard(s) .....</b>	ETSI EN 301 908-1 V15.2.1 (2023-01) ETSI EN 301 908-13 V13.2.1 (2022-02)	
<b>Product Name..... :</b>	Tablet	
<b>Trade Mark .....</b>	CUBOT	
<b>Model/Type reference..... :</b>	TAB 70	
<b>Rating(s)..... :</b>	Refer to EUT description of page 3	
<b>Date of receipt of test item .....</b>	Oct. 10, 2024	
<b>Date (s) of performance of test..... :</b>	Oct. 10, 2024 ~ Oct. 23, 2024	
<b>Tested by (+signature) ... :</b>	Brews XU	
<b>Check by (+signature).... :</b>	Beryl ZHAO	
<b>Approved by (+signature):</b>	Tomsin	



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## 1. General Product Information

### 1.1. EUT description

<b>Product Name</b> .....:	Tablet
<b>Model/Type reference</b> .....:	TAB 70
<b>Hardware Version</b> .....:	V1.0
<b>Software Version</b> .....	CUBOT_P111C_TAB 70_V01
<b>Operation Frequency</b> .....	LTE Band 1: (UL)1920MHz~1980MHz, (DL)2110MHz~2170MHz LTE Band 3: (UL)1710MHz~1785MHz, (DL)1805MHz~1880MHz LTE Band 7: (UL)2500MHz~2570MHz, (DL)2620MHz~2690MHz LTE Band 8: (UL)880MHz~915MHz, (DL)925MHz~960MHz LTE Band 20: (UL)832MHz~862MHz, (DL)791MHz~821MHz LTE Band 28: (UL)703MHz~748MHz, (DL)758MHz~803MHz
<b>Modulation Technology</b> .....	QPSK, 16-QAM
<b>Antenna Type</b> .....:	PIFA Antenna
<b>Antenna Gain</b> .....:	LTE band 1: -3.45dBi    LTE band 3: -1.46dBi LTE band 7: -1.26dBi    LTE band 8: -3.45dBi LTE band 20: -1.42dBi    LTE band 28: -2.39Bi
<b>Rating(s)</b> .....:	Adapter Information 1: Model: TPA-418G050200VU01 Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5.0V, 2.0A, 10.0W Adapter Information 2: Model: HJ-0502000W2-EU Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5.0V, 2.0A Output Power: 10.0W Rechargeable Li-ion Battery DC 3.8V

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

### 1.2. Model(s) list

None.

### 1.3. EUT Test Channels

Test Configuration LTE Band 1	5 MHz Bandwidth	Lowest	18025	1922.5 MHz
		Middle	18300	1950.0 MHz
		Highest	18575	1977.5 MHz
	10 MHz Bandwidth	Lowest	18050	1925.0 MHz
		Middle	18300	1950.0 MHz
		Highest	18550	1975.0 MHz
	20 MHz Bandwidth	Lowest	18100	1930.0 MHz
		Middle	18300	1950.0 MHz
		Highest	18500	1970.0 MHz
Test Configuration LTE Band 3	1.4 MHz Bandwidth	Lowest	19207	1710.7 MHz
		Middle	19575	1747.5 MHz
		Highest	19943	1784.3 MHz
	5 MHz Bandwidth	Lowest	19225	1712.5 MHz
		Middle	19575	1747.5 MHz
		Highest	19925	1782.5 MHz
	10 MHz Bandwidth	Lowest	19250	1715.0 MHz
		Middle	19575	1747.5 MHz
		Highest	19900	1780.0 MHz
	20 MHz Bandwidth	Lowest	19300	1720.0 MHz
		Middle	19575	1747.5 MHz
		Highest	19850	1775.0 MHz
Test Configuration LTE Band 7	5 MHz Bandwidth	Lowest	20775	2502.5 MHz
		Middle	21100	2535.0 MHz
		Highest	21425	2567.5 MHz
	10 MHz Bandwidth	Lowest	20800	2505.0 MHz
		Middle	21100	2535.0 MHz
		Highest	21400	2565.0 MHz
	20 MHz Bandwidth	Lowest	20850	2510.0 MHz
		Middle	21100	2535.0 MHz
		Highest	21350	2560.0 MHz
Test Configuration LTE Band 8	1.4 MHz Bandwidth	Lowest	21457	880.7 MHz
		Middle	21625	897.5 MHz
		Highest	21793	914.3 MHz
	5 MHz Bandwidth	Lowest	21475	882.5 MHz
		Middle	21625	897.5 MHz
		Highest	21775	912.5 MHz
	10 MHz Bandwidth	Lowest	21500	885.0 MHz
		Middle	21625	897.5 MHz
		Highest	21750	955.0 MHz
Test Configuration LTE Band 20	5 MHz Bandwidth	Lowest	24175	834.5 MHz
		Middle	24300	847.0 MHz

	10 MHz Bandwidth	Highest	24425	859.5 MHz
		Lowest	24200	837.0 MHz
		Middle	24300	847.0 MHz
	20 MHz Bandwidth	Highest	24400	857.0 MHz
		Lowest	24250	842.0 MHz
		Middle	24300	847.0 MHz
Test Configuration LTE Band 28	3 MHz Bandwidth	Highest	24350	852.0 MHz
		Lowest	27225	704.5 MHz
		Middle	27375	719.5 MHz
	5 MHz Bandwidth	Highest	27645	746.5 MHz
		Lowest	27235	705.5 MHz
		Middle	27385	720.5 MHz
	10 MHz Bandwidth	Highest	27635	745.5 MHz
		Lowest	27260	708.0 MHz
		Middle	27410	723.0 MHz
	20 MHz Bandwidth	Highest	27610	743.0 MHz
		Lowest	27310	713.0 MHz
		Middle	27460	728.0 MHz
		Highest	27560	738.0 MHz

## 2. Test Result Summary

No.	Description of Test	Result
1	Transmitter maximum output power	PASS
2	Transmitter spectrum emission mask	PASS
3	Transmitter spurious emissions	PASS
4	Transmitter minimum output power	PASS
5	Transmitter adjacent channel leakage power ratio	PASS
6	Control and monitoring functions	PASS
7	Receiver adjacent channel selectivity (ACS)	PASS
8	Receiver blocking characteristics	PASS
9	Receiver spurious response	PASS
10	Receiver intermodulation characteristics	PASS
11	Receiver spurious emissions	PASS
12	Radiated emissions	PASS
13*	Receiver Total Radiated Sensitivity (TRS)	N/A
14*	Total Radiated Power (TRP)	N/A

**Note:**

- 1 Pass: Test item meets the requirement.
2. N/A: Test case does not apply to the test object.
3. The test result judgment is decided by the limit of test standard.

### 3. General Information

#### 3.1. Test environment and mode

Item	Normal condition	Extreme condition			
		HVHT	LVHT	HVLT	LVLT
Temperature	+25°C	+40°C	+40°C	-20°C	-20°C
Voltage	DC 3.8V	DC 4.35V	DC 3.5V	DC 4.35V	DC 3.5V
Humidity	20%-75%				
Atmospheric Pressure:	1008 mbar				
Test Mode:	Keep the EUT in Transmitting mode by Simulator Base station.				

#### 3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

**Note:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

### 3.3. Test Instruments List

Name	Model No.	Manufacturer	Date of Cal.	Due Date
EMI Test Receiver	ESCI7	R&S	Feb. 01, 2024	Jan. 31, 2025
Spectrum Analyzer	FSQ40	R&S	Jun. 27, 2024	Jun. 26, 2025
Pre-amplifier	8447D	HP	Jun. 27, 2024	Jun. 26, 2025
Pre-amplifier	LNPA_0118G-45	SKET	Feb. 01, 2024	Jan. 31, 2025
Pre-amplifier	LNPA_1840G-50	SKET	Feb. 01, 2024	Jan. 31, 2025
Broadband Antenna	VULB9163	Schwarzbeck	Jun. 29, 2024	Jun. 28, 2025
Horn Antenna	BBHA 9120D	Schwarzbeck	Jun. 29, 2024	Jun. 28, 2025
Horn Antenna	BBHA 9170	Schwarzbeck	Feb. 03, 2024	Feb. 02, 2025
Coaxial cable	RE-03-D	SKET	Jun. 27, 2024	Jun. 26, 2025
Coaxial cable	RE-03-M	SKET	Jun. 27, 2024	Jun. 26, 2025
Coaxial cable	RE-03-L	SKET	Jun. 27, 2024	Jun. 26, 2025
Coaxial cable	RE-04-D	SKET	Jun. 27, 2024	Jun. 26, 2025
Coaxial cable	RE-04-M	SKET	Jun. 27, 2024	Jun. 26, 2025
Coaxial cable	RE-04-L	SKET	Jun. 27, 2024	Jun. 26, 2025
EMI Test Software	FA-03A2 RE+	EZ EMC	/	/
Spectrum Analyzer	N9020A	Agilent	Jun. 27, 2024	Jun. 26, 2025
Wideband Radio Communication Tester	CMW500	R&S	Feb. 01, 2024	Jan. 31, 2025
DC Power Supply	KR3005K	Kingrang	Jun. 27, 2024	Jun. 26, 2025
Programable tempratuce and humidity chamber	JQ-2000	JQ	Jun. 27, 2024	Jun. 26, 2025

## 4. Facilities and Accreditations

### 4.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Innovation, Science and Economic Development Canada for radio equipment testing.

### 4.2. Location

Shenzhen TCT Testing Technology Co., Ltd.

Address: 2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

## 5. Test Results and Measurement Data

### 5.1. Transmitter Maximum Output Power

#### 5.1.1. Test Specification

<b>Test Requirement:</b>	ETSI EN 301 908-13 clause 4.2.2
<b>Test Method:</b>	ETSI EN 301 908-13 clause 5.3.1
<b>Test Setup:</b>	<pre> graph TD     subgraph Thermal Chamber         EUT[EUT]     end     DC Power[DC Power] --- EUT     CMW500[CMW500] --- EUT     </pre>
<b>Limit:</b>	23dBm +/- 2.7dB
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>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 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.</li> <li>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.</li> <li>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.</li> <li>4. Repeat for applicable test frequencies, channel bandwidths, operating band combinations and environmental conditions.</li> </ol>
<b>Test Instrument:</b>	Refer to Item 3.3
<b>Test Result:</b>	PASS

## 5.2. Transmitter Spectrum Emission Mask

### 5.2.1. Test Specification

<b>Test Requirement:</b>	ETSI EN 301 908-13 clause 4.2.3																																																																																
<b>Test Method:</b>	ETSI EN 301 908-13 clause 5.3.2																																																																																
<b>Test Setup:</b>																																																																																	
<b>Limit:</b>	<table border="1"> <thead> <tr> <th><math>\Delta f_{\text{OOB}}</math> (MHz)</th> <th>1,4 MHz</th> <th>3,0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> <th>Measurement bandwidth</th> </tr> </thead> <tbody> <tr> <td><math>\pm 0</math> to 1</td> <td>-8,5</td> <td>-11,5</td> <td>-13,5</td> <td>-16,5</td> <td>-18,5</td> <td>-19,5</td> <td>30 kHz</td> </tr> <tr> <td><math>\pm 1</math> to 2,5</td> <td>-8,5</td> <td>-8,5</td> <td>-8,5</td> <td>-8,5</td> <td>-8,5</td> <td>-8,5</td> <td>1 MHz</td> </tr> <tr> <td><math>\pm 2,5</math> to 2,8</td> <td>-23,5</td> <td>-8,5</td> <td>-8,5</td> <td>-8,5</td> <td>-8,5</td> <td>-8,5</td> <td>1 MHz</td> </tr> <tr> <td><math>\pm 2,8</math> to 5</td> <td></td> <td>-8,5</td> <td>-8,5</td> <td>-8,5</td> <td>-8,5</td> <td>-8,5</td> <td>1 MHz</td> </tr> <tr> <td><math>\pm 5</math> to 6</td> <td></td> <td>-23,5</td> <td>-11,5</td> <td>-11,5</td> <td>-11,5</td> <td>-11,5</td> <td>1 MHz</td> </tr> <tr> <td><math>\pm 6</math> to 10</td> <td></td> <td></td> <td>-23,5</td> <td>-11,5</td> <td>-11,5</td> <td>-11,5</td> <td>1 MHz</td> </tr> <tr> <td><math>\pm 10</math> to 15</td> <td></td> <td></td> <td></td> <td>-23,5</td> <td>-11,5</td> <td>-11,5</td> <td>1 MHz</td> </tr> <tr> <td><math>\pm 15</math> to 20</td> <td></td> <td></td> <td></td> <td></td> <td>-23,5</td> <td>-11,5</td> <td>1 MHz</td> </tr> <tr> <td><math>\pm 20</math> to 25</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-23,5</td> <td>1 MHz</td> </tr> </tbody> </table> <p>NOTE 1: The first and last measurement position with a 30 kHz filter is at <math>\Delta f_{\text{OOB}}</math> equals to 0,015 MHz and 0,985 MHz.</p> <p>NOTE 2: The first and last measurement position with a 1 MHz filter for 1 MHz - 2,5 MHz offset range is at <math>\Delta f_{\text{OOB}}</math> equals to 1,5 MHz and 2,0 MHz. Similarly for other <math>\Delta f_{\text{OOB}}</math> ranges.</p> <p>NOTE 3: The measurements are to be performed above the upper edge of the channel and below the lower edge of the channel.</p> <p>NOTE 4: For the 2,5 MHz - 2,8 MHz offset range with 1,4 MHz channel bandwidth, the measurement position is at <math>\Delta f_{\text{OOB}}</math> equals to 3 MHz.</p>	$\Delta f_{\text{OOB}}$ (MHz)	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Measurement bandwidth	$\pm 0$ to 1	-8,5	-11,5	-13,5	-16,5	-18,5	-19,5	30 kHz	$\pm 1$ to 2,5	-8,5	-8,5	-8,5	-8,5	-8,5	-8,5	1 MHz	$\pm 2,5$ to 2,8	-23,5	-8,5	-8,5	-8,5	-8,5	-8,5	1 MHz	$\pm 2,8$ to 5		-8,5	-8,5	-8,5	-8,5	-8,5	1 MHz	$\pm 5$ to 6		-23,5	-11,5	-11,5	-11,5	-11,5	1 MHz	$\pm 6$ to 10			-23,5	-11,5	-11,5	-11,5	1 MHz	$\pm 10$ to 15				-23,5	-11,5	-11,5	1 MHz	$\pm 15$ to 20					-23,5	-11,5	1 MHz	$\pm 20$ to 25						-23,5	1 MHz
$\Delta f_{\text{OOB}}$ (MHz)	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Measurement bandwidth																																																																										
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$\pm 1$ to 2,5	-8,5	-8,5	-8,5	-8,5	-8,5	-8,5	1 MHz																																																																										
$\pm 2,5$ to 2,8	-23,5	-8,5	-8,5	-8,5	-8,5	-8,5	1 MHz																																																																										
$\pm 2,8$ to 5		-8,5	-8,5	-8,5	-8,5	-8,5	1 MHz																																																																										
$\pm 5$ to 6		-23,5	-11,5	-11,5	-11,5	-11,5	1 MHz																																																																										
$\pm 6$ to 10			-23,5	-11,5	-11,5	-11,5	1 MHz																																																																										
$\pm 10$ to 15				-23,5	-11,5	-11,5	1 MHz																																																																										
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<b>Test procedure:</b>	<ol style="list-style-type: none"> <li>1. SS sends uplink scheduling information via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to 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.</li> <li>2. Send continuously uplink power control "up" commands in the uplink scheduling information to the UE until the UE transmits at PUMAX level.</li> <li>3. Measure the power of the transmitted signal with a measurement filter of bandwidths according to table 4.2.3.1.2-1 or 4.2.3.1.2-2, 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.</li> <li>4. Repeat for applicable test frequencies, channel bandwidths, operating band combinations and environmental conditions.</li> </ol>																																																																																
<b>Test Instruments:</b>	Refer to Item 3.3																																																																																
<b>Test Result</b>	PASS																																																																																

### 5.3. Transmitter Spurious Emissions

#### 5.3.1. Test Specification

<b>Test Requirement:</b>	ETSI EN 301 908-13 clause 4.2.4																																																																																																																																							
<b>Test Method:</b>	ETSI EN 301 908-13 clause 5.3.3																																																																																																																																							
<b>Test Setup:</b>																																																																																																																																								
<b>Limit:</b>	<table border="1"> <thead> <tr> <th>Frequency range</th> <th>Maximum level</th> <th>Measurement bandwidth</th> <th>Comment</th> </tr> </thead> <tbody> <tr> <td>9 kHz ≤ f &lt; 150 kHz</td> <td>-36 dBm</td> <td>1 kHz</td> <td></td> </tr> <tr> <td>150 kHz ≤ f &lt; 30 MHz</td> <td>-36 dBm</td> <td>10 kHz</td> <td></td> </tr> <tr> <td>30 MHz ≤ f &lt; 1 000 MHz</td> <td>-36 dBm</td> <td>100 kHz</td> <td></td> </tr> <tr> <td>1 GHz ≤ f &lt; 12,75 GHz</td> <td>-30 dBm</td> <td>1 MHz</td> <td></td> </tr> <tr> <td>12,75 GHz ≤ f &lt; 5<sup>th</sup> harmonic of the upper frequency edge of the UL operating band in GHz</td> <td>-30 dBm</td> <td>1 MHz</td> <td>See note</td> </tr> </tbody> </table> <p>NOTE: Applies for Band 42 and Band 43.</p> <table border="1"> <thead> <tr> <th rowspan="2">E-UTRA Band</th> <th rowspan="2">Protected band</th> <th colspan="2">Spurious emission</th> <th rowspan="2">Maximum Level (dBm)</th> <th rowspan="2">MBW (MHz)</th> <th rowspan="2">Comment</th> </tr> <tr> <th>Frequency range (MHz)</th> <th></th> </tr> </thead> <tbody> <tr> <td rowspan="4">1</td> <td>E-UTRA Band 1, 7, 8, 20, 38, 40, 42, 43</td> <td>F<sub>DL_low</sub></td> <td>-</td> <td>F<sub>DL_high</sub></td> <td>-50</td> <td>1</td> <td></td> </tr> <tr> <td>E-UTRA Band 3, 34</td> <td>F<sub>DL_low</sub></td> <td>-</td> <td>F<sub>DL_high</sub></td> <td>-50</td> <td>1</td> <td>Note 3</td> </tr> <tr> <td>Frequency range</td> <td>1 900</td> <td>-</td> <td>1 915</td> <td>-15,5</td> <td>5</td> <td></td> </tr> <tr> <td>Frequency range</td> <td>1 915</td> <td>-</td> <td>1 920</td> <td>+1,6</td> <td>5</td> <td></td> </tr> <tr> <td rowspan="4">3</td> <td>E-UTRA Band 1, 7, 8, 20, 33, 34, 38, 43</td> <td>F<sub>DL_low</sub></td> <td>-</td> <td>F<sub>DL_high</sub></td> <td>-50</td> <td>1</td> <td></td> </tr> <tr> <td>E-UTRA Band 3</td> <td>F<sub>DL_low</sub></td> <td>-</td> <td>F<sub>DL_high</sub></td> <td>-50</td> <td>1</td> <td>Note 3</td> </tr> <tr> <td>E-UTRA Band 42</td> <td>F<sub>DL_low</sub></td> <td>-</td> <td>F<sub>DL_high</sub></td> <td>-50</td> <td>1</td> <td>Note 2</td> </tr> <tr> <td>E-UTRA Band 1, 3, 7, 8, 20, 33, 34, 42, 43</td> <td>F<sub>DL_low</sub></td> <td>-</td> <td>F<sub>DL_high</sub></td> <td>-50</td> <td>1</td> <td></td> </tr> <tr> <td rowspan="3">7</td> <td>E-UTRA Band 1, 3, 7, 8, 20, 33, 34, 42, 43</td> <td>F<sub>DL_low</sub></td> <td>-</td> <td>F<sub>DL_high</sub></td> <td>-50</td> <td>1</td> <td></td> </tr> <tr> <td>Frequency range</td> <td>2 570</td> <td>-</td> <td>2 575</td> <td>+1,6</td> <td>5</td> <td>Note 3</td> </tr> <tr> <td>Frequency range</td> <td>2 575</td> <td>-</td> <td>2 620</td> <td>-15,5</td> <td>5</td> <td>Note 3</td> </tr> <tr> <td rowspan="3">20</td> <td>E-UTRA Band 1, 3, 7, 8, 33, 34, 43</td> <td>F<sub>DL_low</sub></td> <td>-</td> <td>F<sub>DL_high</sub></td> <td>-50</td> <td>1</td> <td></td> </tr> <tr> <td>E-UTRA Band 20</td> <td>F<sub>DL_low</sub></td> <td>-</td> <td>F<sub>DL_high</sub></td> <td>-50</td> <td>1</td> <td>Note 3</td> </tr> <tr> <td>E-UTRA Band 38, 42</td> <td>F<sub>DL_low</sub></td> <td>-</td> <td>F<sub>DL_high</sub></td> <td>-50</td> <td>1</td> <td>Note 2</td> </tr> </tbody> </table>	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 < 5 <sup>th</sup> harmonic of the upper frequency edge of the UL operating band in GHz	-30 dBm	1 MHz	See note	E-UTRA Band	Protected band	Spurious emission		Maximum Level (dBm)	MBW (MHz)	Comment	Frequency range (MHz)		1	E-UTRA Band 1, 7, 8, 20, 38, 40, 42, 43	F <sub>DL_low</sub>	-	F <sub>DL_high</sub>	-50	1		E-UTRA Band 3, 34	F <sub>DL_low</sub>	-	F <sub>DL_high</sub>	-50	1	Note 3	Frequency range	1 900	-	1 915	-15,5	5		Frequency range	1 915	-	1 920	+1,6	5		3	E-UTRA Band 1, 7, 8, 20, 33, 34, 38, 43	F <sub>DL_low</sub>	-	F <sub>DL_high</sub>	-50	1		E-UTRA Band 3	F <sub>DL_low</sub>	-	F <sub>DL_high</sub>	-50	1	Note 3	E-UTRA Band 42	F <sub>DL_low</sub>	-	F <sub>DL_high</sub>	-50	1	Note 2	E-UTRA Band 1, 3, 7, 8, 20, 33, 34, 42, 43	F <sub>DL_low</sub>	-	F <sub>DL_high</sub>	-50	1		7	E-UTRA Band 1, 3, 7, 8, 20, 33, 34, 42, 43	F <sub>DL_low</sub>	-	F <sub>DL_high</sub>	-50	1		Frequency range	2 570	-	2 575	+1,6	5	Note 3	Frequency range	2 575	-	2 620	-15,5	5	Note 3	20	E-UTRA Band 1, 3, 7, 8, 33, 34, 43	F <sub>DL_low</sub>	-	F <sub>DL_high</sub>	-50	1		E-UTRA Band 20	F <sub>DL_low</sub>	-	F <sub>DL_high</sub>	-50	1	Note 3	E-UTRA Band 38, 42	F <sub>DL_low</sub>	-	F <sub>DL_high</sub>	-50	1	Note 2
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<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>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 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.</li> <li>Send continuously up power control commands in the uplink scheduling information to the UE until the UE transmits at PUMAX level.</li> <li>For each applicable requirement in tables 4.2.4.1.2-2, 4.2.4.1.2-3 and 4.2.4.1.2-4; 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.</li> <li>Repeat for applicable test frequencies, channel bandwidths and operating band combinations.</li> </ol>																																																																																																																																							

<b>Remark:</b>	Normal and extreme test conditions and all channel bandwidth types have been tested, only the measurement data of normal condition and 3MHz bandwidth (band 1), 3MHz bandwidth (band 3), 5MHz bandwidth (band 7), 5MHz bandwidth (band 20) are reported. Nothing emissions have been detected in the frequency range 9kHz to 30MHz
<b>Test Instrument:</b>	Refer to Item 3.3
<b>Test Result:</b>	PASS



## 5.4. Transmitter Minimum Output Power

### 5.4.1. Test Specification

<b>Test Requirement:</b>	ETSI EN 301 908-13 clause 4.2.5																											
<b>Test Method:</b>	ETSI EN 301 908-13 clause 5.2.6																											
<b>Test Setup:</b>	<pre> graph LR     subgraph Thermal Chamber         EUT[EUT]     end     DC[DC Power]     CMW[CMW500]     EUT --- DC     EUT --- CMW     </pre>																											
<b>Limit:</b>	<p>Table 4.2.5.1.2-1: Minimum output power</p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="6">Channel bandwidth/minimum output power/measurement bandwidth</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>Minimum output power</td> <td colspan="6">For carrier frequency <math>f \leq 3.0</math> GHz: <math>\leq -39</math> dBm For carrier frequency <math>3.0</math> GHz <math>&lt; f \leq 4.2</math> GHz: <math>\leq -38,7</math> dBm</td> </tr> <tr> <td>Measurement bandwidth</td> <td>1,08 MHz</td> <td>2,7 MHz</td> <td>4,5 MHz</td> <td>9,0 MHz</td> <td>13,5 MHz</td> <td>18 MHz</td> </tr> </tbody> </table>		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 $f \leq 3.0$ GHz: $\leq -39$ dBm For carrier frequency $3.0$ GHz $< f \leq 4.2$ GHz: $\leq -38,7$ dBm						Measurement bandwidth	1,08 MHz	2,7 MHz	4,5 MHz	9,0 MHz	13,5 MHz	18 MHz
	Channel bandwidth/minimum output power/measurement bandwidth																											
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																						
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Measurement bandwidth	1,08 MHz	2,7 MHz	4,5 MHz	9,0 MHz	13,5 MHz	18 MHz																						
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>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 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.</li> <li>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.</li> <li>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 (1ms). For TDD slots with transient periods are not under test.</li> <li>4. Repeat for applicable test frequencies, channel bandwidths, operating band combinations and environmental conditions.</li> </ol>																											
<b>Test Instrument:</b>	Refer to Item 3.3																											
<b>Remark:</b>	Normal and extreme test conditions have been tested, And we found out that normal condition is worst case, so only the measurement dada of normal condition in this report.																											
<b>Test Result:</b>	PASS																											

## 5.5. Transmitter Adjacent Channel Leakage Power Ratio

### 5.5.1. Test Specification

<b>Test Requirement:</b>	ETSI EN 301 908-13 clause 4.2.11
<b>Test Method:</b>	ETSI EN 301 908-13 clause 5.3.10
<b>Test Setup:</b>	
<b>Limit:</b>	See clause 4.2.4.11.1.2 of ETSI EN 301 908-13
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>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 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.</li> <li>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.</li> <li>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.</li> <li>4. Measure the filtered mean power for E-UTRA.</li> <li>5. Measure the filtered mean power of the first E-UTRA adjacent channel.</li> <li>6. Measure the RRC filtered mean power of the first and the second UTRA adjacent channel.</li> <li>7. Calculate the ratio of the power between the values measured in step 4) over step 5) for E-UTRAACLR.</li> <li>8. Calculated the ratio of the power between the values measured in step 4) over step 6) for UTRAACLR1, UTRAACLR2.</li> <li>9. Repeat for applicable test frequencies, channel bandwidths, operating band combinations and environmental conditions.</li> </ol>
<b>Test Instrument:</b>	Refer to Item 3.3
<b>Remark:</b>	Normal and extreme test conditions have been tested, And we found out that normal condition is worst case, so only the measurement dada of normal condition in this report.
<b>Test Result:</b>	PASS

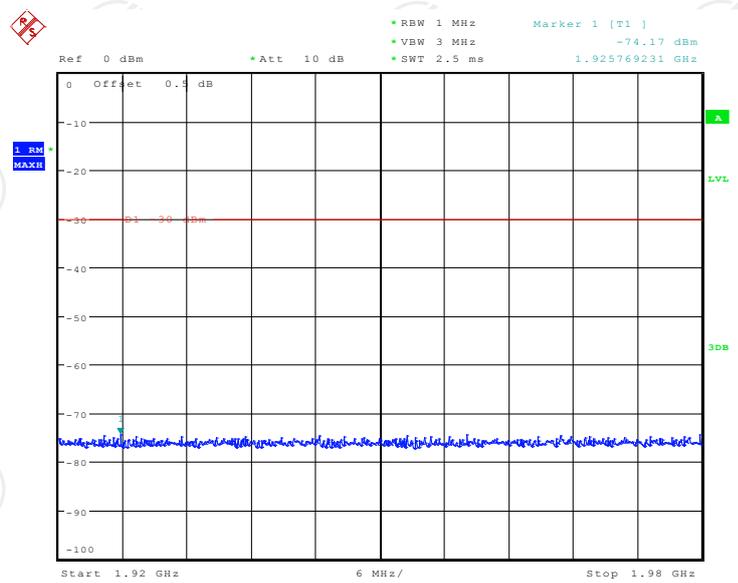
## 5.6. Control and Monitoring Functions (UE)

### 5.6.1. Test Specification

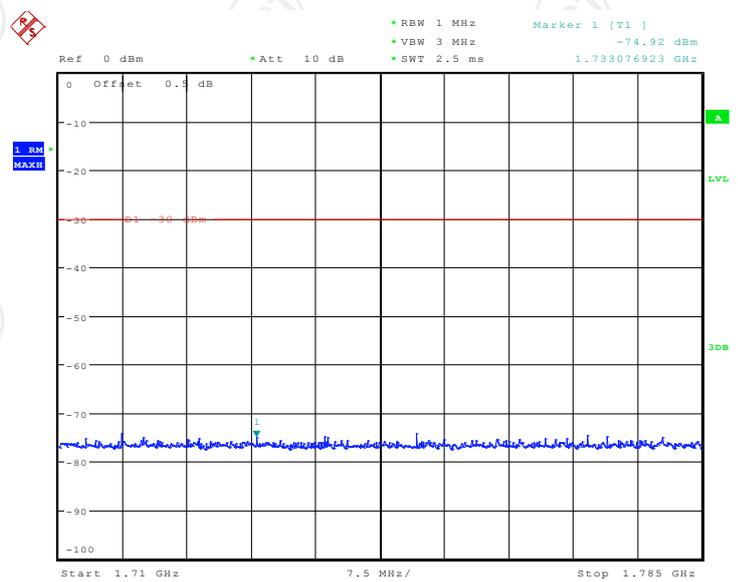
<b>Test Requirement:</b>	ETSI EN 301 908-1 clause 4.2.4
<b>Test Method:</b>	ETSI EN 301 908-2 clause 5.3.3
<b>Test Setup:</b>	<pre> graph LR     EUT[EUT] --- DC[DC Power]     DC --- Combiner[Combiner]     CMW500[CMW500] --- Combiner     Combiner --- SA[SA]     </pre>
<b>Limit:</b>	The maximum measured power during the duration of the test shall not exceed -30dBm.
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. At the start of the test, the UE shall be switched off. The UE antenna connector shall be connected to a power measuring equipment, with the following characteristics: - the RF bandwidth shall exceed the total operating transmit frequency range of the UE for operation with an applicable part; - the response time of the power measuring equipment shall be such that the measured power has reached within 1 dB of its steady state value within 100 <math>\mu</math>s of a CW signal being applied; - it shall record the maximum power measured.</li> <li>2. The UE shall be switched on for a period of approximately fifteen minutes, and then switched off.</li> <li>3. The EUT shall remain switched off for a period of at least thirty seconds, and shall then be switched on for a period of approximately one minute.</li> <li>4. The maximum power emitted from the UE throughout the duration of the test shall be recorded.</li> </ol>
<b>Test Instrument:</b>	Refer to Item 3.3
<b>Test Result:</b>	PASS

5.6.2. Test Data

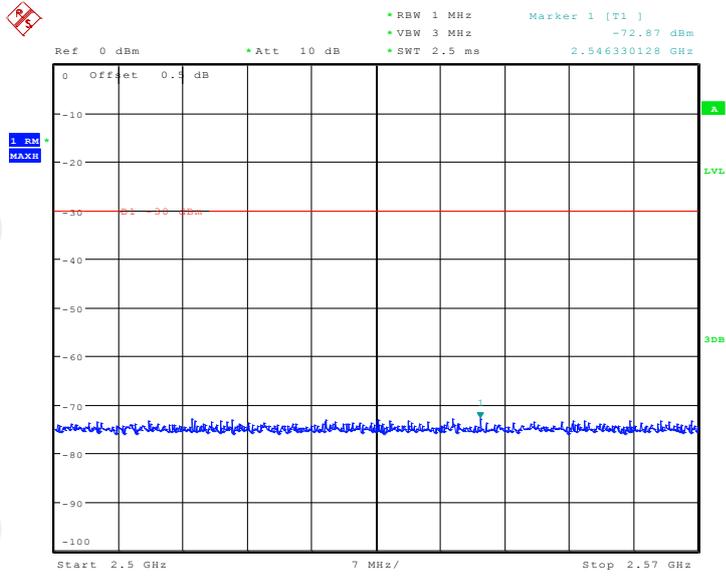
Band 1



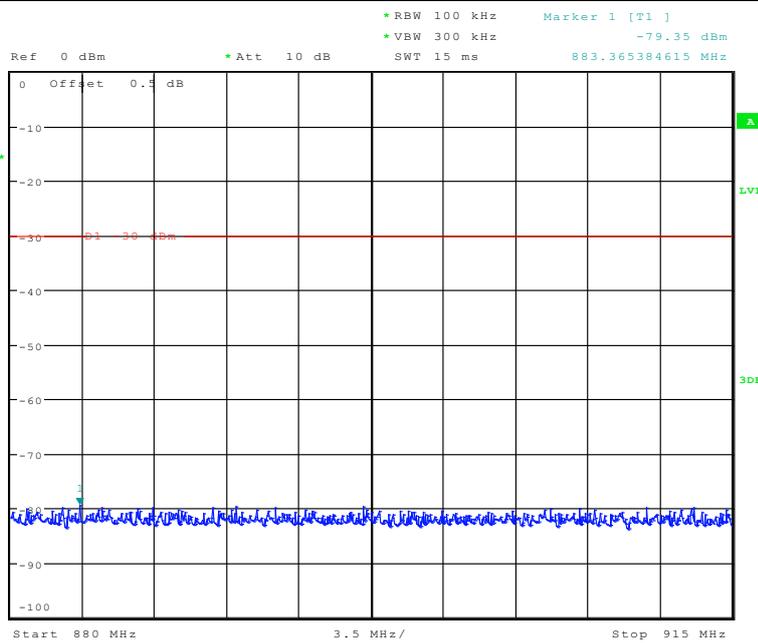
Band 3



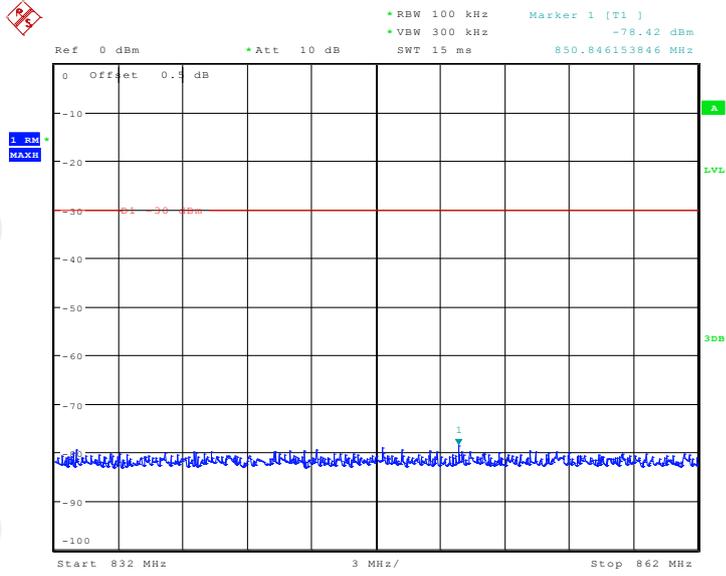
## Band 7



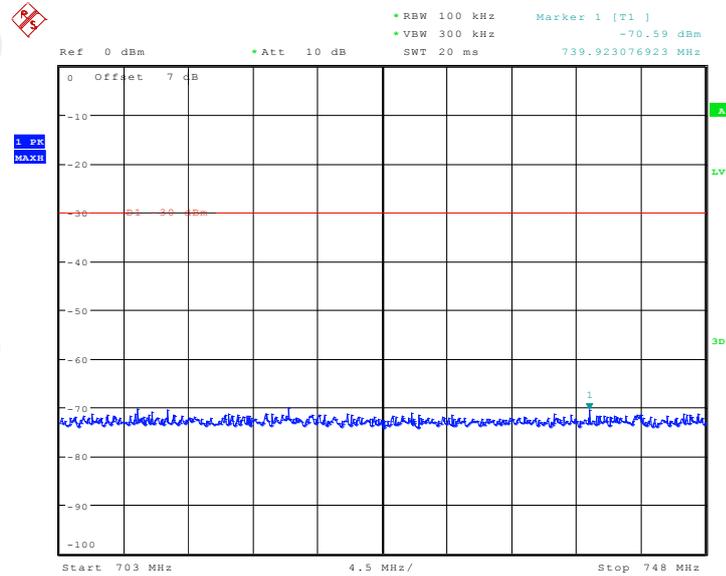
## Band 8



**Band 20**



**Band 28**



## 5.7. Receiver Adjacent Channel Selectivity (ACS)

### 5.7.1. Test Specification

<b>Test Requirement:</b>	ETSI EN 301 908-13 clause 4.2.6
<b>Test Method:</b>	ETSI EN 301 908-13 clause 5.2.5
<b>Test Setup:</b>	<pre> graph LR     EUT[EUT] --- DC[DC Power]     DC --- Combiner[Combiner]     CMW500[CMW500] --- Combiner     Combiner --- InterSG[Inter. SG]     </pre>
<b>Limit:</b>	The throughput $R_{av}$ shall be $\geq 95\%$
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to TS 136 521-1 [1], table 7.5.4.1-1. The SS sends downlink MAC padding bits on the DL RMC.</li> <li>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 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.</li> <li>3. Set the Downlink signal level to the value as defined in table 4.2.6.2-2 (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 4.2.6.2-2 (Case 1) for carrier frequency <math>f \leq 3,0</math> GHz or within +0, -4,0 dB of the target level for carrier frequency <math>3,0</math> GHz <math>&lt; f \leq 4,2</math> GHz, for at least the duration of the Throughput measurement (obtain correct UE output power as specified in TS 136 521-1 [1]).</li> <li>4. Set the Interferer signal level to the value as defined in table 4.2.6.2-2 (Case 1) and frequency below the wanted signal, using a modulated interferer as defined in TS 136 521-1 [1], annex D.</li> <li>5. Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of TS 136 521-1 [1].</li> <li>6. Set the Downlink signal level to the value as defined in table 4.2.6.2-3 (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 4.2.6.2-3 (Case 2) for carrier frequency <math>f \leq 3,0</math> GHz or within +0, -4,0 dB of the target level for carrier frequency <math>3,0</math> GHz <math>&lt; f \leq 4,2</math></li> </ol>

	<p>GHz, for at least the duration of the throughput measurement (obtain correct UE output power as specified in TS 136 521-1 [1]).</p> <ol style="list-style-type: none"> <li>7. Set the Interferer signal level to the value as defined in table 4.2.6.2-3 (Case 2) and frequency below the wanted signal, using a modulated interferer as defined in TS 136 521-1 [1], annex D.</li> <li>8. Measure the average throughput for a duration sufficient to achieve statistical significance according to TS 136 521-1 [1], annex G.</li> <li>9. Repeat for applicable channel bandwidths in both Case 1 and Case 2.</li> <li>10. Repeat for applicable test frequencies, channel bandwidths and operating band combinations.</li> </ol>
<b>Test Instrument:</b>	Refer to Item 3.3
<b>Test Result:</b>	PASS

## 5.8. Receiver Blocking Characteristics

### 5.8.1. Test Specification

<b>Test Requirement:</b>	ETSI EN 301 908-13 clause 4.2.7
<b>Test Method:</b>	ETSI EN 301 908-13 clause 5.3.6
<b>Test Setup:</b>	<pre> graph LR     EUT[EUT] --- DC[DC Power]     DC --- Combiner[Combiner]     CMW500[CMW500] --- Combiner     Combiner --- InterSG[Inter. SG]     </pre>
<b>Limit:</b>	The throughput $R_{av}$ shall be $\geq 95\%$
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to TS 136 521-1 [1], table 7.6.1.4.1-1. The SS sends downlink MAC padding bits on the DL RMC.</li> <li>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 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.</li> <li>3. Set the parameters of the signal generator for an interfering signal below the wanted signal in Case 1 according to tables 4.2.7.2-1 and 4.2.7.2-2 as specified in TS 136 521-1 [1].</li> <li>4. Set the downlink signal level according to the table 4.2.7.2-1. 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 4.2.7.2-1 for carrier frequency <math>f \leq 3,0</math> GHz or within +0, -4,0 dB of the target level for carrier frequency <math>3,0</math> GHz <math>&lt; f \leq 4,2</math> GHz, for at least the duration of the throughput measurement as specified in TS 136 521-1 [1].</li> <li>5. Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of TS 136 521-1 [1].</li> <li>6. Repeat steps from 3 to 5, using an interfering signal above the wanted signal in Case 1 at step 3.</li> <li>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 TS 136 521-1 [1], table 7.6.1.4.2-1.</li> <li>8. Repeat for applicable test frequencies, channel bandwidths and operating band combinations.</li> </ol>

Test Instrument:	Refer to Item 3.3
Test Result:	PASS



## 5.9. Receiver Intermodulation Characteristics

### 5.9.1. Test Specification

<b>Test Requirement:</b>	ETSI EN 301 908-13 clause 4.2.9
<b>Test Method:</b>	ETSI EN 301 908-13 clause 5.3.8
<b>Test Setup:</b>	<pre> graph LR     EUT[EUT] --- DC[DC Power]     DC --- Combiner[Combiner]     Combiner --- CMW_SG[CMW SG]     CMW_SG --- CMW500[CMW500]     </pre>
<b>Limit:</b>	The throughput $R_{av}$ shall be $\geq 95\%$
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to TS 136 521-1 [1], table 7.8.1.4.1-1. The SS sends downlink MAC padding bits on the DL RMC.</li> <li>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 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.</li> <li>3. Set the Downlink signal level to the value as defined in table 4.2.9.2-1. 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 4.2.9.2-1 for carrier frequency <math>f \leq 3,0</math> GHz or within +0, -4,0 dB of the target level for carrier frequency <math>3,0 \text{ GHz} &lt; f \leq 4,2 \text{ GHz}</math>, for at least the duration of the throughput measurement as specified in TS 136 521-1 [1].</li> <li>4. Set the Interfering signal levels to the values as defined in table 4.2.9.2-1, using a modulated interferer bandwidth as defined in annex D of TS 136 521-1 [1].</li> <li>5. Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of TS 136 521-1 [1].</li> <li>6. Repeat for applicable test frequencies, channel bandwidths and operating band combinations.</li> </ol>
<b>Test Instrument:</b>	Refer to Item 3.3
<b>Test Result:</b>	PASS

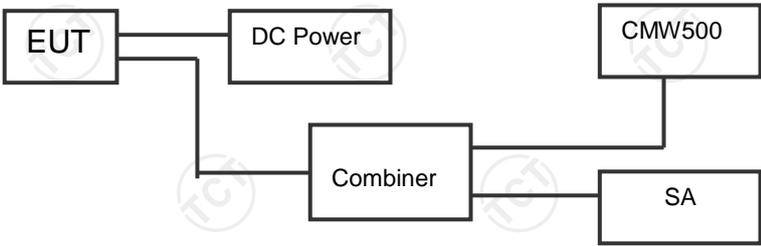
## 5.10. Receiver Spurious Response

### 5.10.1. Test Specification

<b>Test Requirement:</b>	ETSI EN 301 908-13 clause 4.2.8
<b>Test Method:</b>	ETSI EN 301 908-13 clause 5.3.7
<b>Test Setup:</b>	<pre> graph LR     EUT[EUT] --- DC[DC Power]     DC --- Combiner[Combiner]     Combiner --- CMW500[CMW500]     Combiner --- CMWSG[CMW SG]     </pre>
<b>Limit:</b>	The throughput $R_{av}$ shall be $\geq 95\%$
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to TS 136 521-1 [1], table 7.6.2.4.1-1. The SS sends downlink MAC padding bits on the DL RMC.</li> <li>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 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.</li> <li>3. Set the parameters of the CW signal generator for an interfering signal according to table 4.2.8.2-2. The spurious frequencies are taken from step 5) records in clause 5.3.6.1.2.</li> <li>4. Set the downlink signal level according to the table 4.2.8.2-1. 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 4.2.8.2-1 for carrier frequency <math>f \leq 3,0</math> GHz or within +0, -4,0 dB of the target level for carrier frequency <math>3,0</math> GHz <math>&lt; f \leq 4,2</math> GHz, for at least the duration of the throughput measurement as specified in TS 136 521-1 [1].</li> <li>5. For the spurious frequency, measure the average throughput for a duration sufficient to achieve statistical significance.</li> </ol>
<b>Test Instrument:</b>	Refer to Item 3.3
<b>Test Result:</b>	PASS

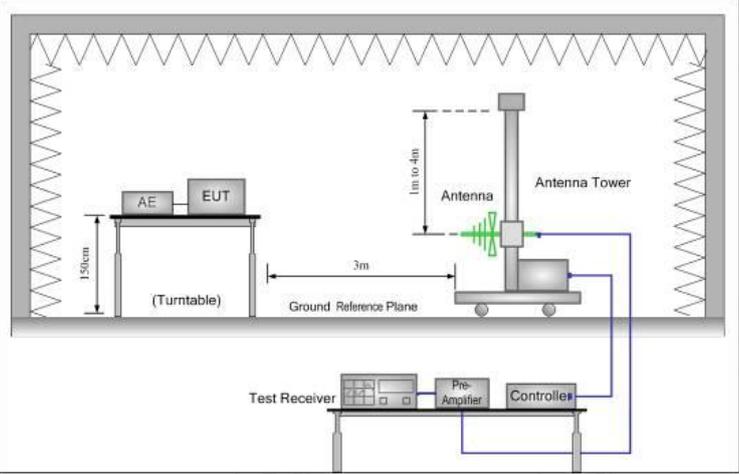
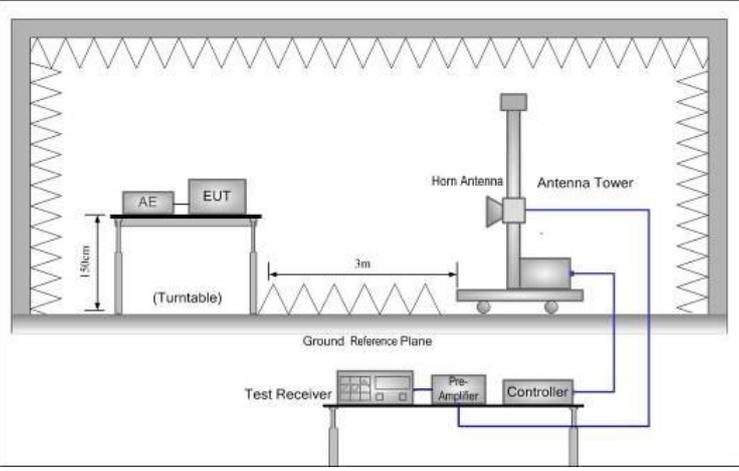
## 5.11. Receiver Spurious Emissions

### 5.11.1. Test Specification

<b>Test Requirement:</b>	ETSI EN 301 908-13 clause 4.2.10												
<b>Test Method:</b>	ETSI EN 301 908-13 clause 5.3.9												
<b>Test Setup:</b>	 <pre> graph LR     EUT[EUT] --- DC[DC Power]     EUT --- C[Combiner]     DC --- C     C --- CMW[CMW500]     C --- SA[SA]     </pre>												
<b>Limit:</b>	<p>Table 4.2.10.2-1: General receiver spurious emission requirements</p> <table border="1"> <thead> <tr> <th>Frequency Band</th> <th>Measurement bandwidth</th> <th>Maximum level</th> <th>Note</th> </tr> </thead> <tbody> <tr> <td>30 MHz ≤ f &lt; 1 GHz</td> <td>100 kHz</td> <td>-57 dBm</td> <td></td> </tr> <tr> <td>1 GHz ≤ f ≤ 12.75 GHz</td> <td>1 MHz</td> <td>-47 dBm</td> <td></td> </tr> </tbody> </table> <p>NOTE: Unused PDCCH resources are padded with resource element groups with power level given by PDCCH_RA/RB as defined in TS 136 101 [4] clause C.3.1.</p>	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	
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											
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. Sweep the spectrum analyzer (or other suitable test equipment) over a frequency range from 30 MHz to 12.75 GHz and measure the average power of the spurious emissions.</li> <li>2. Repeat step 1) for all E-UTRA Rx antennas of the UE.</li> <li>3. Repeat for applicable test frequencies, channel bandwidths and operating band combinations.</li> </ol>												
<b>Test Instrument:</b>	Refer to Item 3.3												
<b>Remark:</b>	Nothing emissions have been detected in the frequency range 9kHz to 30MHz, only show the worst test plots in this report, and the worst channel is middle range.												
<b>Test Result:</b>	PASS												

## 5.12. Radiated Emissions

### 5.12.1. Test Specification

<b>Test Requirement:</b>	ETSI EN 301 908-1 clause 4.2.2																																				
<b>Test Method:</b>	ETSI EN 301 908-1 clause 5.3.1																																				
<b>Test Setup:</b>	<p>Below 1GHz</p>  <p>Above 1GHz</p> 																																				
<b>Limit:</b>	<p>Table 4.2.2.2-1: Radiated spurious emissions requirements (UE)</p> <table border="1" data-bbox="528 1536 1385 1895"> <thead> <tr> <th>Frequency</th> <th>Minimum requirement (e.r.p.)/ reference bandwidth idle mode</th> <th>Minimum requirement (e.r.p.)/ reference bandwidth traffic mode</th> <th>Applicability</th> </tr> </thead> <tbody> <tr> <td><math>30 \text{ MHz} \leq f &lt; 1\,000 \text{ MHz}</math></td> <td>-57 dBm/100 kHz</td> <td>-36 dBm/100 kHz</td> <td>All</td> </tr> <tr> <td><math>1 \text{ GHz} \leq f &lt; 12,75 \text{ GHz}</math></td> <td>-47 dBm/1 MHz</td> <td>-30 dBm/1 MHz</td> <td>All</td> </tr> <tr> <td><math>f_c - 2,5 \times 5 \text{ MHz} &lt; f &lt; f_c + 2,5 \times 5 \text{ MHz}</math></td> <td></td> <td>Not defined</td> <td>UTRA FDD, UTRA TDD, 3,84 Mcps option, cdma2000, spreading rate 3</td> </tr> <tr> <td><math>f_c - 2,5 \times \text{BW}_{\text{Channel}} \text{ MHz} &lt; f &lt; f_c + 2,5 \times \text{BW}_{\text{Channel}} \text{ MHz}</math></td> <td></td> <td>Not defined</td> <td>E-UTRA FDD, E-UTRA TDD, Mobile WiMAX, UMB</td> </tr> <tr> <td><math>f_c - 2,5 \times 10 \text{ MHz} &lt; f &lt; f_c + 2,5 \times 10 \text{ MHz}</math></td> <td></td> <td>Not defined</td> <td>UTRA TDD, 7,68 Mcps option</td> </tr> <tr> <td><math>f_c - 4 \text{ MHz} &lt; f &lt; f_c + 4 \text{ MHz}</math></td> <td></td> <td>Not defined</td> <td>UTRA TDD, 1,28 Mcps option cdma2000, spreading rate 1</td> </tr> <tr> <td><math>f_c - 500 \text{ kHz} &lt; f &lt; f_c + 500 \text{ kHz}</math></td> <td></td> <td>Not defined</td> <td>UWC 136, 200 kHz option</td> </tr> <tr> <td><math>f_c - 250 \text{ kHz} &lt; f &lt; f_c + 250 \text{ kHz}</math></td> <td></td> <td>Not defined</td> <td>UWC 136, 30 kHz option</td> </tr> </tbody> </table> <p>NOTE: <math>f_c</math> is the UE transmit centre frequency.</p>	Frequency	Minimum requirement (e.r.p.)/ reference bandwidth idle mode	Minimum requirement (e.r.p.)/ reference bandwidth traffic mode	Applicability	$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	-57 dBm/100 kHz	-36 dBm/100 kHz	All	$1 \text{ GHz} \leq f < 12,75 \text{ GHz}$	-47 dBm/1 MHz	-30 dBm/1 MHz	All	$f_c - 2,5 \times 5 \text{ MHz} < f < f_c + 2,5 \times 5 \text{ MHz}$		Not defined	UTRA FDD, UTRA TDD, 3,84 Mcps option, cdma2000, spreading rate 3	$f_c - 2,5 \times \text{BW}_{\text{Channel}} \text{ MHz} < f < f_c + 2,5 \times \text{BW}_{\text{Channel}} \text{ MHz}$		Not defined	E-UTRA FDD, E-UTRA TDD, Mobile WiMAX, UMB	$f_c - 2,5 \times 10 \text{ MHz} < f < f_c + 2,5 \times 10 \text{ MHz}$		Not defined	UTRA TDD, 7,68 Mcps option	$f_c - 4 \text{ MHz} < f < f_c + 4 \text{ MHz}$		Not defined	UTRA TDD, 1,28 Mcps option cdma2000, spreading rate 1	$f_c - 500 \text{ kHz} < f < f_c + 500 \text{ kHz}$		Not defined	UWC 136, 200 kHz option	$f_c - 250 \text{ kHz} < f < f_c + 250 \text{ kHz}$		Not defined	UWC 136, 30 kHz option
Frequency	Minimum requirement (e.r.p.)/ reference bandwidth idle mode	Minimum requirement (e.r.p.)/ reference bandwidth traffic mode	Applicability																																		
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	-57 dBm/100 kHz	-36 dBm/100 kHz	All																																		
$1 \text{ GHz} \leq f < 12,75 \text{ GHz}$	-47 dBm/1 MHz	-30 dBm/1 MHz	All																																		
$f_c - 2,5 \times 5 \text{ MHz} < f < f_c + 2,5 \times 5 \text{ MHz}$		Not defined	UTRA FDD, UTRA TDD, 3,84 Mcps option, cdma2000, spreading rate 3																																		
$f_c - 2,5 \times \text{BW}_{\text{Channel}} \text{ MHz} < f < f_c + 2,5 \times \text{BW}_{\text{Channel}} \text{ MHz}$		Not defined	E-UTRA FDD, E-UTRA TDD, Mobile WiMAX, UMB																																		
$f_c - 2,5 \times 10 \text{ MHz} < f < f_c + 2,5 \times 10 \text{ MHz}$		Not defined	UTRA TDD, 7,68 Mcps option																																		
$f_c - 4 \text{ MHz} < f < f_c + 4 \text{ MHz}$		Not defined	UTRA TDD, 1,28 Mcps option cdma2000, spreading rate 1																																		
$f_c - 500 \text{ kHz} < f < f_c + 500 \text{ kHz}$		Not defined	UWC 136, 200 kHz option																																		
$f_c - 250 \text{ kHz} < f < f_c + 250 \text{ kHz}$		Not defined	UWC 136, 30 kHz option																																		
	<p>Substitution method was performed to determine the actual ERP emission levels of the EUT. The following test procedure as below:</p>																																				

**Test Procedure:**

## 1&gt;.Below 1GHz test procedure:

1. On the test site as test setup graph above, the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider.
2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter. The output of the test antenna shall be connected to the measuring receiver.
3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.
4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
5. Repeat step 4 for test frequency with the test antenna polarized horizontally.
6. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.
7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
8. Repeat step 7 with both antennas horizontally polarized for each test frequency.
9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:  
$$\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}$$
where:  
Pg is the generator output power into the

	Substitution antenna. 2>.Above 1GHz test procedure: Different between above is the test site, change from Semi-Anechoic Chamber to fully Anechoic Chamber, and the test antenna do not need to raise from 1 to 4m, just test in 1.5m height.
<b>Test Instrument:</b>	Refer to Item 3.3
<b>Test Result:</b>	PASS

5.12.2. Test Data

EUTRA Band 1, Middle Channel- traffic mode				
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Result
	Polarization	Level dBm(EIRP)		
364.31	Vertical	-54.05	Blew 1G: -36 Above 1G: -30	Pass
1910	V	-44.25		
3950	V	-48.71		
364.31	Horizontal	-50.63		
1910	H	-45.39		
3950	H	-48.45		
EUTRA Band 1, Middle Channel - idle mode				
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Result
	Polarization	Level dBm(EIRP)		
364.31	Vertical	-74.45	Below 1G: -57 Above 1G: -47	Pass
1910	V	-77.75		
3950	V	-67.12		
364.31	Horizontal	-75.44		
1910	H	-82.01		
3950	H	-69.76		

**Note:** The test frequency range is 30MHz to 12,75GHz, the reading of other frequencies emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

EUTRA Band 3, Middle Channel- traffic mode				
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Result
	Polarization	Level dBm(EIRP)		
252.06	Vertical	-51.67	Below 1G: -36 Above 1G: -30	PASS
3495	V	-44.65		
5242.5	V	-47.50		
252.06	Horizontal	-45.94		
3495	H	-41.88		
5242.5	H	-50.83		
EUTRA Band 3, Middle Channel- idle mode				
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Result
	Polarization	Level dBm(EIRP)		
252.06	Vertical	-78.22	Below 1G: -57 Above 1G: -47	PASS
3495	V	-78.07		
5242.5	V	-67.52		
252.06	Horizontal	-77.65		
3495	H	-78.12		
5242.5	H	-69.63		

**Note:** The test frequency range is 30MHz to 12,75GHz, the reading of other frequencies emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

EUTRA Band 7, Middle Channel- traffic mode				
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Result
	Polarization	Level dBm(EIRP)		
252.06	Vertical	-51.55	Below 1G: -36 Above 1G: -30	PASS
1795	V	-44.80		
2692.5	V	-48.78		
252.06	Horizontal	-50.23		
1795	H	-46.31		
2692.5	H	-47.38		
EUTRA Band 7, Middle Channel- idle mode				
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Result
	Polarization	Level dBm(EIRP)		
252.06	Vertical	-79.23	Below 1G: -57 Above 1G: -47	PASS
1795	V	-79.21		
2692.5	V	-68.26		
252.06	Horizontal	-82.27		
1795	H	-77.03		
2692.5	H	-72.20		

**Note:** The test frequency range is 30MHz to 12,75GHz, the reading of other frequencies emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

EUTRA Band 8, Middle Channel- traffic mode				
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Result
	Polarization	Level dBm(EIRP)		
343.16	Vertical	-51.08	Below 1G: -36 Above 1G: -30	PASS
1180	V	-44.00		
2140	V	-47.21		
343.16	Horizontal	-49.63		
1180	H	-44.10		
2140	H	-47.27		
EUTRA Band 8, Middle Channel- idle mode				
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Result
	Polarization	Level dBm(EIRP)		
343.16	Vertical	-75.06	Below 1G: -57 Above 1G: -47	PASS
1180	V	-77.80		
2140	V	-65.61		
343.16	Horizontal	-78.85		
1180	H	-79.19		
2140	H	-67.02		

**Note:** The test frequency range is 30MHz to 12,75GHz, the reading of other frequencies emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

EUTRA Band 20, Middle Channel- traffic mode				
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Result
	Polarization	Level dBm(EIRP)		
252.06	Vertical	-51.09	Below 1G: -36 Above 1G: -30	PASS
3495	V	-44.22		
5242.5	V	-46.31		
252.06	Horizontal	-49.15		
3495	H	-43.51		
5242.5	H	-48.46		
EUTRA Band 20, Middle Channel- idle mode				
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Result
	Polarization	Level dBm(EIRP)		
252.06	Vertical	-77.81	Below 1G: -57 Above 1G: -47	PASS
3495	V	-80.27		
5242.5	V	-69.86		
252.06	Horizontal	-80.17		
3495	H	-82.25		
5242.5	H	-67.34		

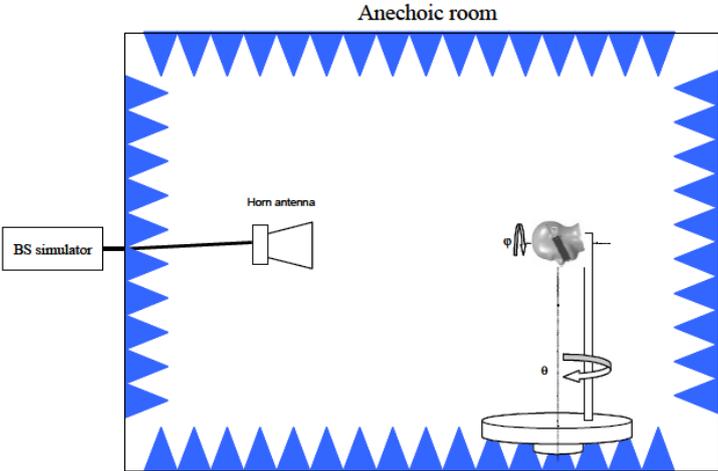
**Note:** The test frequency range is 30MHz to 12,75GHz, the reading of other frequencies emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

EUTRA Band 28, Middle Channel- traffic mode				
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Result
	Polarization	Level dBm(EIRP)		
342.51	Vertical	-45.19	Below 1G: -36 Above 1G: -30	PASS
2952.1	V	-41.49		
5549.5	V	-43.84		
342.51	Horizontal	-45.02		
2952.1	H	-41.27		
5549.5	H	-45.38		
EUTRA Band 28, Middle Channel- idle mode				
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Result
	Polarization	Level dBm(EIRP)		
342.51	Vertical	-75.09	Below 1G: -57 Above 1G: -47	PASS
2952.1	V	-76.51		
5549.5	V	-66.65		
342.51	Horizontal	-76.98		
2952.1	H	-78.24		
5549.5	H	-65.28		

**Note:** The test frequency range is 30MHz to 12,75GHz, the reading of other frequencies emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

### 5.13. Receiver Total Radiated Sensitivity

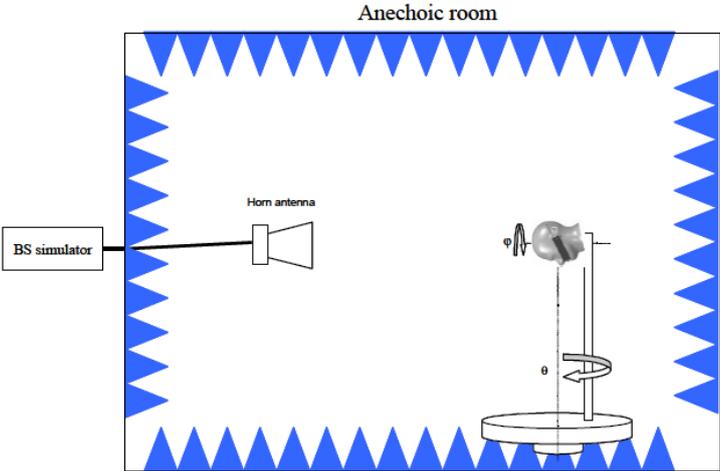
#### 5.13.1. Test Specification

<b>Test Requirement:</b>	ETSI EN 301 908-13																												
<b>Test Method:</b>	ETSI EN 301 908-13																												
<b>Test Setup:</b>																													
<b>Limit:</b>	<p>The average measured Total Radiated Sensitivity (TRS) of low, mid and high channels for handheld UE shall be lower than the average TRS requirement specified in table 4.2.13.2-1. The averaging shall be done in linear scale for the TRS results of both right and left side of the phantom head. Average TRS requirement is shown in the column "Average" on the requirement tables.</p> $TRS_{average} = 10 \log \left[ 6 \left( \frac{1}{10^{P_{left\_low}/10}} + \frac{1}{10^{P_{left\_mid}/10}} + \frac{1}{10^{P_{left\_high}/10}} + \frac{1}{10^{P_{right\_low}/10}} + \frac{1}{10^{P_{right\_mid}/10}} + \frac{1}{10^{P_{right\_high}/10}} \right) \right]$ <p><b>Table 4.2.13.2-1: TRS minimum requirements for E-UTRA FDD and TDD bands in the speech position Beside Head Hand Left and Beside Head Hand Right (BHHL/BHHR) for the primary mechanical mode</b></p> <table border="1" data-bbox="683 1361 1257 1585"> <thead> <tr> <th rowspan="2">Operating band</th> <th rowspan="2">Unit</th> <th>&lt;REF1or&gt;</th> </tr> <tr> <th>Average</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>dBm/10 MHz</td> <td>-86</td> </tr> <tr> <td>3</td> <td>dBm/10 MHz</td> <td>-86</td> </tr> <tr> <td>7</td> <td>dBm/10 MHz</td> <td>-85,7</td> </tr> <tr> <td>8</td> <td>dBm/10 MHz</td> <td>-82,5</td> </tr> <tr> <td>20</td> <td>dBm/10 MHz</td> <td>-82,5</td> </tr> <tr> <td>28</td> <td>dBm/10 MHz</td> <td>-82,5</td> </tr> <tr> <td>38</td> <td>dBm/20 MHz</td> <td>-82,5</td> </tr> <tr> <td>40</td> <td>dBm/20 MHz</td> <td>-82,5</td> </tr> </tbody> </table> <p>NOTE: Not applicable for carrier aggregation.</p>	Operating band	Unit	<REF1or>	Average	1	dBm/10 MHz	-86	3	dBm/10 MHz	-86	7	dBm/10 MHz	-85,7	8	dBm/10 MHz	-82,5	20	dBm/10 MHz	-82,5	28	dBm/10 MHz	-82,5	38	dBm/20 MHz	-82,5	40	dBm/20 MHz	-82,5
Operating band	Unit			<REF1or>																									
		Average																											
1	dBm/10 MHz	-86																											
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7	dBm/10 MHz	-85,7																											
8	dBm/10 MHz	-82,5																											
20	dBm/10 MHz	-82,5																											
28	dBm/10 MHz	-82,5																											
38	dBm/20 MHz	-82,5																											
40	dBm/20 MHz	-82,5																											
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1) Position the UE according to the DUT positioning for speech mode.</li> <li>2) Power on the UE.</li> <li>3) Set the initial conditions as per Subclause 7.3 of 3GPP TS 36.521-1, with the following exception: set the carrier frequency, channel bandwidth, RB length and RB location as per Table 5.3-2 for FDD mode or Table 5.4-2 for TDD mode. For DUTs with more than one receiver port, all the tests should be performed using both (all) antenna ports simultaneously.</li> <li>4) Follow Steps 1 through 4 in Subclause 7.3.4.2 of 3GPP TS 36.521-1, with the following exception: measure the receiver</li> </ol>																												

	<p>sensitivity by adjusting the downlink signal level to 95 % throughput of the maximum throughput of the reference channel (maximum throughput is per Annex A of 3GPP TS 36.521-1).</p> <p>5) For the anechoic chamber based methodologies, For FDD mode: repeat Step 1) with 3-D sampling grid specified in Subclause 4.4. The minimum RF power level resulting in a data throughput greater than or equal to 95 % throughput of the maximum throughput for each test shall be recorded for integration pursuant to Subclause 7.1.5.1 to calculate TRS. For TDD mode: Repeat Step 1) until a sufficient number of independent samples (see section 4.5) of <math> S_{21,n,m}^{chres} ^2</math> has been measured. The minimum RF power level resulting in a data throughput greater than or equal to 95 % throughput of the maximum throughput for each sample shall be recorded for calculating the TRS according to Subclause 7.1.6.1.</p> <p>6) Repeat the measurement of the DUT on the left and right ears of the head phantom using the left and right hand phantom for low, mid and high channels.</p> <p>4) Calculate the average and minimum TRS.</p>
<b>Test Instrument:</b>	Refer to Item 3.3
<b>Test Result:</b>	N/A, The product width is greater than 72mm.

## 5.14. Total Radiated Power

### 5.14.1. Test Specification

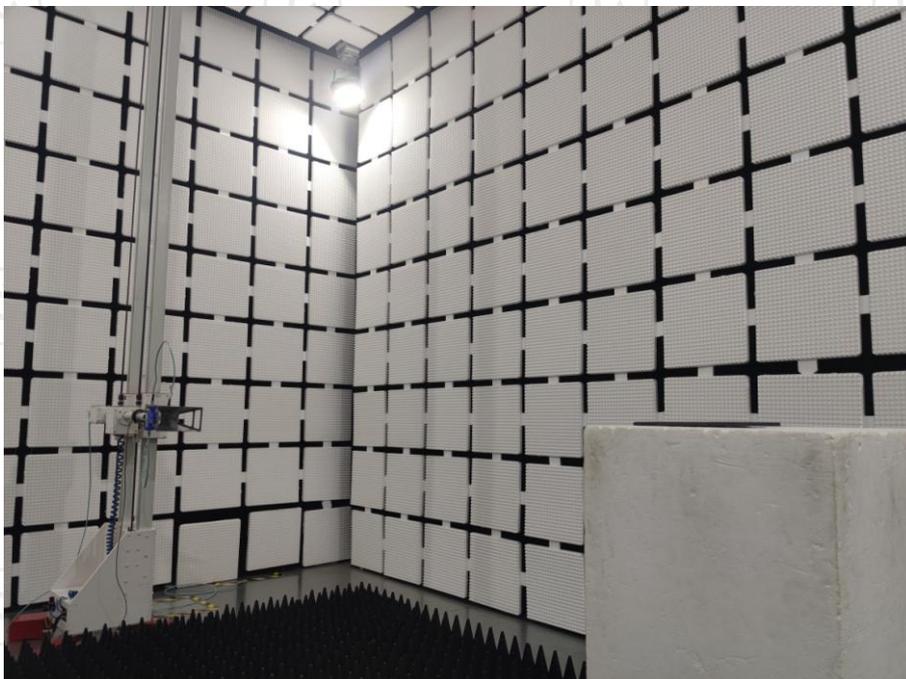
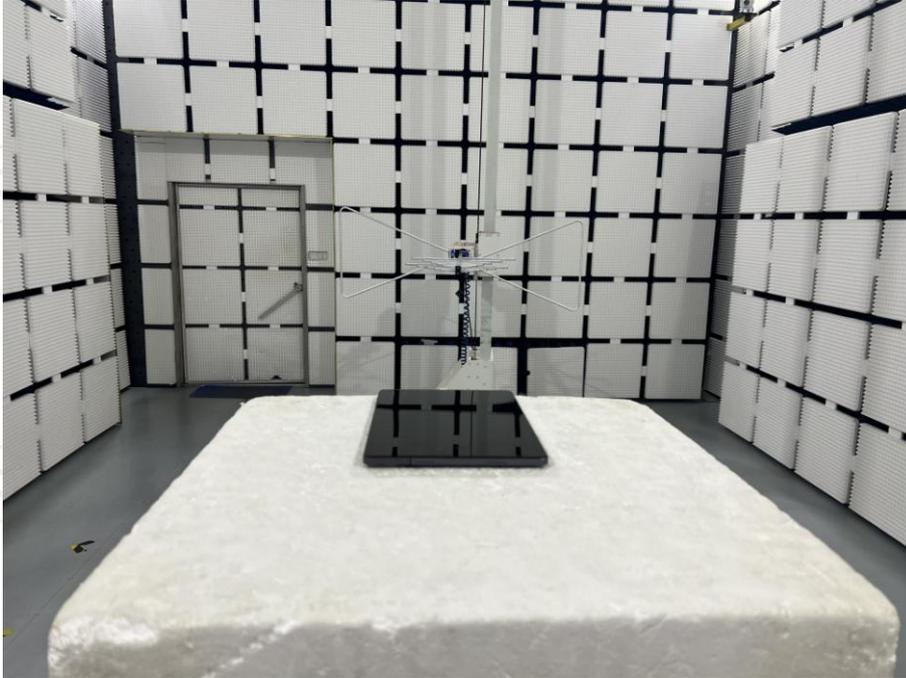
<b>Test Requirement:</b>	ETSI EN 301 908-13																												
<b>Test Method:</b>	ETSI EN 301 908-13																												
<b>Test Setup:</b>																													
<b>Limit:</b>	<p>The average TRP of low, mid and high channels in beside head position shall be higher than minimum performance requirements for roaming bands shown in table 4.2.14.2-1. The averaging shall be done in linear scale for the TRP results of both right and left side of the phantom head.</p> $TRP_{average} = 10 \log \left[ \frac{10^{P_{left\_low}/10} + 10^{P_{left\_mid}/10} + 10^{P_{left\_high}/10} + 10^{P_{right\_low}/10} + 10^{P_{right\_mid}/10} + 10^{P_{right\_high}/10}}{6} \right]$ <p>Table 4.2.14.2-1: TRP minimum performance requirement for E-UTRA FDD and TDD bands in the speech position Beside Head Hand Left and Beside Head Hand Right (BHHL/BHHR) for primary mechanical mode</p> <table border="1" data-bbox="667 1339 1262 1585"> <thead> <tr> <th rowspan="2">Operating band</th> <th rowspan="2">Unit</th> <th>Power Class 3</th> </tr> <tr> <th>Power (dBm) Average</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>dBm/10 MHz</td> <td>10,9</td> </tr> <tr> <td>3</td> <td>dBm/10 MHz</td> <td>10,9</td> </tr> <tr> <td>7</td> <td>dBm/10 MHz</td> <td>10,9</td> </tr> <tr> <td>8</td> <td>dBm/10 MHz</td> <td>7,6</td> </tr> <tr> <td>20</td> <td>dBm/10 MHz</td> <td>7,6</td> </tr> <tr> <td>28</td> <td>dBm/10 MHz</td> <td>7,6</td> </tr> <tr> <td>38</td> <td>dBm/20 MHz</td> <td>10,9</td> </tr> <tr> <td>40</td> <td>dBm/20 MHz</td> <td>10,9</td> </tr> </tbody> </table> <p>NOTE: Not applicable for carrier aggregation.</p>	Operating band	Unit	Power Class 3	Power (dBm) Average	1	dBm/10 MHz	10,9	3	dBm/10 MHz	10,9	7	dBm/10 MHz	10,9	8	dBm/10 MHz	7,6	20	dBm/10 MHz	7,6	28	dBm/10 MHz	7,6	38	dBm/20 MHz	10,9	40	dBm/20 MHz	10,9
Operating band	Unit			Power Class 3																									
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38	dBm/20 MHz	10,9																											
40	dBm/20 MHz	10,9																											
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1) Position the UE according to the DUT positioning for speech mode.</li> <li>2) Power on the UE.</li> <li>3) Set the initial conditions as per Subclause 6.2.2 of 3GPP TS 36.521-1, with the following exception: set the carrier frequency, channel bandwidth, RB length and RB location as per Table 5.3-1 for FDD mode or TDD mode.</li> <li>4) Follow Steps 1 and 2 in section 6.2.2.4.2 of 3GPP TS 36.521-1 and ensure that the DUT transmits with its maximum power.</li> <li>5) For the anechoic chamber based methodologies, measure the spherical effective isotropic radiated power (EIRP)</li> </ol>																												

	<p>pattern following the sampling grid specified in Subclause 4.4.</p> <p>For FDD mode: Calculate the TRP using the EIRP pattern data as per Subclause 6.1.5.1.</p> <p>For TDD mode:</p> <p>Slots with transient periods are not under test. The uplink downlink configuration and the special subframe configuration in TDD is set as per Table 8.2.2-1 of 3GPP TS 36.521-1. Calculate the TRP using the EIRP pattern data as per Subclause 6.1.6.1</p> <p>6) Repeat the measurement of the DUT on the left and right ears of the head phantom using the left and right hand phantom for low, mid and high channels.</p> <p>7) Calculate the average and minimum TRP</p>
<b>Test Instrument:</b>	Refer to Item 3.3
<b>Test Result:</b>	N/A, The product width is greater than 72mm.



## 6. Photographs of Test Configuration

### Radiated Emission



## 7. Photographs of EUT

Please refer to document Appendix No.: TCT241010E012-B & TCT241010E012-C

## 8. Test Data for LTE Band 1, LTE Band 3, LTE Band 7, LTE Band 8, LTE Band 20, LTE Band 28

Refer to Appendix LTE Band 1, LTE Band 3, LTE Band 7, LTE Band 8, LTE Band 20, LTE Band 28

**\*\*\*\*\*END OF REPORT\*\*\*\*\***