



**TEST REPORT**

**ETSI EN 301 908-1 V15.2.1 (2023-01)/ ETSI EN 301 908-13 V13.2.1 (2022-02)**

**Report Reference No.**.....: **HK2311205571-6ER**

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*Jason Zhou*

Date of issue.....: 2023/11/30

Testing Laboratory Name.....: Shenzhen HUAK Testing Technology Co., Ltd.  
Address.....: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

**Applicant's name**.....: EDA Technology Shanghai Co., Ltd.  
Address.....: Building 24, Shengchuang Enterprise Park, No.1661 Jialuo Road, Jiading District, Shanghai, PRC

**Test specification** .....: **ETSI EN 301 908-1 V15.2.1 (2023-01)**  
Standard.....: **ETSI EN 301 908-13 V13.2.1 (2022-02)**  
TRF Originator.....: Shenzhen HUAK Testing Technology Co., Ltd.  
Master TRF.....: Dated 2012-06

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**Product Name** .....: ED-IPC2100  
Trade Mark.....:   
Product Model.....: ED-IPC2110  
Serial Model.....: ED-IPC2120, ED-IPC2130, ED-IPC2140  
Modulation.....: QPSK, 16QAM  
E-UTRA Frequency Band.....: FDD1, FDD3, FDD7, FDD8, FDD20, FDD28, TDD38 & TDD40  
Power Class.....: Power Class 3  
Ratings.....: DC 9-36V  
Hardware version.....: V1.1  
Software version.....: V2.0  
Result.....: **PASS**

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# TEST REPORT

<b>Test Report No. :</b>	<b>HK2311205571-6ER</b>	2023/11/30
		Date of issue

Product Name : ED-IPC2100

Product Model : ED-IPC2110

Serial Model : ED-IPC2120, ED-IPC2130, ED-IPC2140

**Applicant** : EDA Technology Shanghai Co., Ltd.

Address : Building 24, Shengchuang Enterprise Park, No.1661 Jialuo Road, Jiading District, Shanghai, PRC

**Manufacturer** : EDA Technology Shanghai Co., Ltd.

Address : Building 24, Shengchuang Enterprise Park, No.1661 Jialuo Road, Jiading District, Shanghai, PRC

<b>Test Result</b>	<b>PASS</b>
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The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



**\*\* Modified History \*\***

<b>Revision</b>	<b>Description</b>	<b>Issued Data</b>	<b>Remark</b>
Revision 1.0	Initial Test Report Release	2023/11/30	Jason Zhou



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## **1. TEST STANDARDS**

The tests were performed according to following standards:

[ETSI EN 301 908-1 V15.2.1 \(2023-01\)](#)

IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Introduction and common requirements

[ETSI EN 301 908-13 V13.2.1 \(2022-02\)](#)

IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)

[ETSI TS 136 521-1 V16.6.0 \(2020-12\)](#)

3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification Radio transmission and reception Part 1: Conformance Testing;(Release 14)



## 2. SUMMARY

### 2.1. General Remarks

Date of receipt of test sample	:	2023/11/20
Testing commenced on	:	2023/11/20
Testing concluded on	:	2023/11/30

### 2.2. Product Description

Product Name:	ED-IPC2100
Model/Type reference:	ED-IPC2110
List Model:	ED-IPC2120, ED-IPC2130, ED-IPC2140
Model Diff:	The main difference between different models is the number of RS232 and RS485 interfaces, and the model with the most interfaces is ED-IPC2110.
Power supply:	DC 9-36V
Auxiliary test equipment:	N/A
<b>LTE</b>	
Operation Band:	FDD1, FDD3, FDD7, FDD8, FDD20, FDD28, TDD38 & TDD40
Release Version:	R8
Operation frequency:	TX: Band 1:1920-1980MHz,Band 3:1710-1785MHz, Band 7:2500-2570MHz, Band 8:880-915MHz, Band 20:832-862MHz, Band 28:703-733MHz, Band 38:2570-2620MHz, Band 40:2300-2400MHz RX: Band 1:1920-1980MHz,Band 3:1710-1785MHz, Band 7:2500-2570MHz, Band 8:880-915MHz, Band 20:832-862MHz, Band 28:703-733MHz, Band 38:2570-2620MHz, Band 40:2300-2400MHz
Power Class:	Power Class 3
Modulation Type:	QPSK , 16-QAM
Antenna type:	External Antenna
Antenna Gain:	2.0dBi
Note: EUT used the same communication chip, test data as same as report 2107RSU065-E1 for Quectel Wireless Solutions Co., Ltd	

#### Operation Frequency List:

Transmit Frequency Range			
Band 1		Band 3	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
18025	1922.5	19207	1710.70
:	:	:	:
18300	1950	19575	1747.50
:	:	:	:
18575	1977.5	19943	1784.30



Transmit Frequency Range			
Band 7		Band 8	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
20775	2502.5	21475	882.5
⋮	⋮	⋮	⋮
21110	2535	21625	897.5
⋮	⋮	⋮	⋮
21425	2567.5	21775	912.5
Transmit Frequency Range			
Band 20		Band 28	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
24175	834.5	27235	705.5
⋮	⋮	⋮	⋮
24300	847	27360	718.0
⋮	⋮	⋮	⋮
24425	859.5	27485	730.5
Transmit Frequency Range			
Band 38		Band 40	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
37775	2572.5	38675	2302.5
⋮	⋮	⋮	⋮
38000	2595	39150	2350
⋮	⋮	⋮	⋮
38225	2617.5	39625	2397.5

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### 2.3. Power supply system utilised

Power supply voltage	:	<input type="radio"/> 230V / 50 Hz	<input type="radio"/> 115V / 60Hz
		<input type="radio"/> 12 V DC	<input type="radio"/> 24 V DC
		<input checked="" type="radio"/> Other (specified in blank below)	

DC 9-36V

### 2.4. EUT operation mode

The EUT and test equipment were configured for testing according to ETSI EN 301 908-1 V15.1.1 (2021-09) and ETSI EN 301 908-13 V13.2.1 (2022-02), where refer to ETSI TS 136.521-1 for details.

### 2.5. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



Table 2-1 Equipment Used in Tested System

### 2.6. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- supplied by the manufacturer
- Supplied by the lab

<input type="radio"/> Power Cable	Length (m) :	/
	Shield :	/
	Detachable :	/
<input type="radio"/> Multimeter	Manufacturer :	/
	Model No. :	/

### 2.7. Modifications

No modifications were implemented to meet testing criteria.



### 3. TEST ENVIRONMENT

#### 3.1. Information of the Test Laboratory

Shenzhen HUAKE Testing Technology Co., Ltd.

1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

Testing Laboratory Authorization:

A2LA Accreditation Code is 4781.01.

FCC Designation Number is CN1229.

Canada IC CAB identifier is CN0045.

CNAS Registration Number is L9589.

#### 3.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature: 15 °C~35 °C

High Temperature: 40°C

Low Temperature: -10°C

Normal Voltage : DC 12V

High Voltage: DC 13.2V

Low Voltage: DC 10.8V

Relative Humidity: 15 %~75%

Air Pressure: 860 hPa ~ 1060 hPa

#### 3.3. Test Description

##### 3.5.1 Main Terms

Verdict

Verdict of each test cases.

Test Case

Test cases identification number and description in 3GPP test specification and ETSI specification.

##### 3.5.2 Terms used in Condition column

NTC

Normal voltage, Normal Temperature

HV

High voltage, Normal Temperature

LV

Low voltage, Normal Temperature

HTHV

High voltage, High Temperature

LTHV

High voltage, Low Temperature

HTLV

Low voltage, High Temperature

LTLV

Low voltage, Low Temperature

Vib

Vibration

##### 3.5.3 Terms used in Verdict column

Pass

This test cases has been tested, and EUT is conformant to the applied standards in the given frequency band.

Fail

This test cases has been tested, but EUT is not conformant to the applied standards in the given frequency band.

N/A

This test case is either not required/not applicable in the specified band or is not applicable according to the specific PICS/PIXIT for the EUT.

Inc

Test case result is ambiguous in the given frequency band.

Decl

Declaration is received from the client to demonstrate the conformity to the relevant specification in the given frequency band.

BR

This test cases is not tested in the given frequency band, but this testcases was tested with pass result for the initial model in the given frequency band.

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3.5.4 Summary Test Results

Test Item	Test Requirement ESTIEN301908-1	Test Method ESTIEN301908-1	Test Conditions	Verdict	LTE FDD Band 1	LTE FDD Band 3	LTE FDD Band 7	LTE FDD Band 8	Note:
Radiated emissions (UE)	Clause 4.2.2	clause 5.3.1	NT/NV	Pass	5M/10M/ 15M/20M	1.4M/3M/5M/ 10M/15M/20M	5M/10M/ 15M/20M	1.4M/3M/5M/ 10M/15M/20M	Reference to the section 4.2.1
Control and monitoring functions (UE)	Clause 4.2.4	clause 5.3.3	NT/NV	Pass	5M/10M/ 15M/20M	1.4M/3M/5M/ 10M/15M/20M	5M/10M/ 15M/20M	1.4M/3M/5M/ 10M/15M/20M	
Test Item	Test Requirement ESTIEN301908-1	Test Method ESTIEN301908-1	Test Conditions	Verdict	LTE FDD Band 20	LTE FDD Band 28	LTE TDD Band 38	LTE TDD Band 40	Note:
Radiated emissions (UE)	Clause 4.2.2	clause 5.3.1	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M/10M/ 15M/20M	5M/10M/ 15M/20M	
Control and monitoring functions (UE)	Clause 4.2.4	clause 5.3.3	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M/10M/ 15M/20M	5M/10M/ 15M/20M	
Test Item	Test Requirement ESTIEN30190813	Test Method ETSIEN30190813	Test Conditions	Verdict	LTE FDD Band 1	LTE FDD Band 3	LTE FDD Band 7	LTE FDD Band 8	Note:
Transmitter Maximum Output Power	Clause 4.2.2	clause 5.3.1	NT/NV	Pass	5M/20M	1.4M/5M/20M	5M/20M	1.4M/5M/20M	Reference to the section 4.1.1
			LT/LV	Pass					
			LT/HV	Pass					
			HT/LV	Pass					
			HT/HV	Pass					
Transmitter Spectrum Emission Mask	Clause 4.2.3	Clause 5.3.2	NT/NV	Pass	5M//10M/20M	1.4M/5M/ 10M/20M	5M//10M/20M	1.4M/5M/ 10M/20M	
Transmitter Spurious Emissions	Clause 4.2.4	Clause 5.3.3	NT/NV	Pass	5M/20M	1.4M/5M/20M	5M/20M	1.4M/5M/20M	
Transmitter Minimum Output Power	Clause 4.2.5	Clause 5.3.4	NT/NV	Pass	5M/20M	1.4M/5M/20M	5M/20M	1.4M/5M/20M	
			LT/LV	Pass					
			LT/HV	Pass					
			HT/LV	Pass					
			HT/HV	Pass					
Receiver Adjacent Channel Selectivity (ACS)	Clause 4.2.6	Clause5.3.5	NT/NV	Pass	5M/20M	1.4M/5M/20M	5M/20M	1.4M/5M/20M	
Receiver Blocking Characteristics	Clause 4.2.7	Clause 5.3.6	NT/NV	Pass	5M/20M	1.4M/5M/20M	5M/20M	1.4M/5M/20M	
Receiver Spurious Response	Clause 4.2.8	Clause5.3.7	NT/NV	Pass	5M/20M	1.4M/5M/20M	5M/20M	1.4M/5M/20M	
Receiver Intermodulation Characteristics	Clause 4.2.9	Clause5.3.8	NT/NV	Pass	5M/20M	1.4M/5M/20M	5M/20M	1.4M/5M/20M	
Receiver Spurious Emissions	Clause 4.2.10	Clause 5.3.9	NT/NV	Pass	5M/20M	1.4M/5M/20M	5M/20M	1.4M/5M/20M	

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transmitter Adjacent Channel Leakage Power Ratio	Clause 4.2.11	Clause 5.3.10	NT/NV	Pass	5M//10M/20M	1.4M/5M/ 10M/20M	5M//10M/20M	1.4M/5M/ 10M/20M
			LT/LV	Pass				
			LT/HV	Pass				
			HT/LV	Pass				
			HT/HV	Pass				
Receiver Reference Sensitivity Level	Clause 4.2.12	Clause 5.3.11	NT/NV	Pass	5M//10M/20M	1.4M/5M/ 10M/20M	5M//10M/20M	1.4M/5M/ 10M/20M
Test Item	Test Requirement ESTIEN30190813	Test Method ETSIEN30190813	Test Conditions	Verdict	LTE FDD Band 20	LTE FDD Band 28	LTE TDD Band 38	LTE TDD Band 40
Transmitter Maximum Output Power	Clause 4.2.2	clause 5.3.1	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M/20M	5M/20M
			LT/LV	Pass				
			LT/HV	Pass				
			HT/LV	Pass				
			HT/HV	Pass				
Transmitter Spectrum Emission Mask	Clause 4.2.3	Clause 5.3.2	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M//10M/20M	5M//10M/20M
Transmitter Spurious Emissions	Clause 4.2.4	Clause 5.3.3	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M/20M	5M/20M
Transmitter Minimum Output Power	Clause 4.2.5	Clause 5.3.4	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M/20M	5M/20M
			LT/LV	Pass				
			LT/HV	Pass				
			HT/LV	Pass				
			HT/HV	Pass				
Receiver Adjacent Channel Selectivity (ACS)	Clause 4.2.6	Clause5.3.5	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M/20M	5M/20M
Receiver Blocking Characteristics	Clause 4.2.7	Clause 5.3.6	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M/20M	5M/20M
Receiver Spurious Response	Clause 4.2.8	Clause5.3.7	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M/20M	5M/20M
Receiver Intermodulation Characteristics	Clause 4.2.9	Clause5.3.8	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M/20M	5M/20M
Receiver Spurious Emissions	Clause 4.2.10	Clause 5.3.9	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M/20M	5M/20M
transmitter Adjacent Channel Leakage Power Ratio	Clause 4.2.11	Clause 5.3.10	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M//10M/20M	5M//10M/20M
			LT/LV	Pass				
			LT/HV	Pass				
			HT/LV	Pass				
			HT/HV	Pass				
Receiver Reference Sensitivity Level	Clause 4.2.12	Clause 5.3.11	NT/NV	Pass	5M/10M/ 15M/20M	3M/5M/10M/ 15M/20M	5M//10M/20M	5M//10M/20M

Remark: 1. The measurement uncertainty is not included in the test result;

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3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen HUAKE Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen HUAKE Testing Technology Co., Ltd. is reported:

Table with 3 columns: ETSI Standard, Test Description, and Uncertainty. It lists various test parameters like Radiated emissions (UE), Control and monitoring functions (UE), Maximum Output Power, Minimum Output Power, Spectrum Emission Mask, Adjacent Channel Leakage Power Ratio, Spurious Emissions, Adjacent Channel Selectivity, Blocking Characteristics, Spurious Response, and Intermodulation Characteristics.

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

**3.5. Equipments Used during the Test****Details for JSTS1120-1**

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	Power Sensor	Agilent	E9300A	HKE-086	2023/02/17	2024/02/16
2	Spectrum analyzer	Agilent	N9020A	HKE-025	2023/02/17	2024/02/16
3	Wireless Communication Test Set	R&S	CMU200	HKE-026	2023/02/17	2024/02/16
4	Wireless Communication Test Set	R&S	CMU200	HKE-188	2023/02/17	2024/02/16
5	Wireless Communication Test Set	R&S	CMW500	HKE-027	2023/02/17	2024/02/16
6	programmable power supply	Agilent	E3646A	HKE-092	2023/02/17	2024/02/16
7	Signal Generator	Agilent	83630A	HKE-028	2023/02/17	2024/02/16

**Details for Climate Chamber**

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	Receiver	SMQ	9*6*6	HKE-009	2023/02/17	2024/02/16

**Details for Control and Monitoring Functions**

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	Receiver	R&S	ESR-7	HKE-010	2023/02/17	2024/02/16

**Details for Radiated emissions test equipment**

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	2023/02/17	2024/02/16
2	Horn antenna	Schwarzbeck	9120D	HKE-013	2023/02/17	2024/02/16
3	Receiver	R&S	ESR-7	HKE-010	2023/02/17	2024/02/16
4	Position controller	Taiwan MF	MF7802	HKE-011	2023/02/17	2024/02/16
5	Preamplifier	Schwarzbeck	EMC05184 5SE	HKE-015	2023/02/17	2024/02/16
6	Preamplifier	Agilent	83051A	HKE-016	2023/02/17	2024/02/16
7	High pass filter unit	Tonscend	JS0806-F	HKE-055	2023/02/17	2024/02/16
8	Spectrum analyzer	Agilent	N9020A	HKE-048	2023/02/17	2024/02/16
9	EMI TEST Software	Tonscend	TS+ Rev 2.5.0.0	HKE-081	N/A	N/A
10	UNIVERSAL RADIO COMMUNICATION	Rohde&Schwarz	CMU500	HKE-027	2023/02/17	2024/02/16



## 4. TEST CONDITIONS AND RESULTS

### 4.1 ETSI EN301908-13 Requirement

#### 4.1.1 Transmitter Maximum Output Power

##### LIMIT

##### ETSI EN 301 908-13 Sub-clause 4.2.2.1.2

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)
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 (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).		

### TEST PROCEDURE

#### ETSI EN 301 908-13 Sub-clause 5.3.1.1.1.2

1. Set and send continuously Up power control commands to the UE.
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 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.
3. 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.
4. Measure the mean power of the UE in a bandwidth of at least (1+x) times the channel bandwidth of the radio access mode. The period of measurement shall be at least one (timeslot/frame/TTI).
5. Repeat for applicable test frequencies, channel bandwidths, operating band combinations and environmental conditions.

### TEST RESULTS

See Report 2107RSU065-E1 for test data.



### 4.1.2 Transmitter spectrum emission mask

#### LIMIT

The power of any UE emission shall fulfil requirements in tables 4.2.3.1.2-1 and 4.2.3.1.2-2.

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

$\Delta f_{OOB}$ (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  $\Delta f_{OOB}$  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  $\Delta f_{OOB}$  equals to 1,5 MHz and 2,0 MHz. Similarly for other  $\Delta f_{OOB}$  ranges.  
NOTE 3: The measurements are to 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  $\Delta f_{OOB}$  equals to 3 MHz.

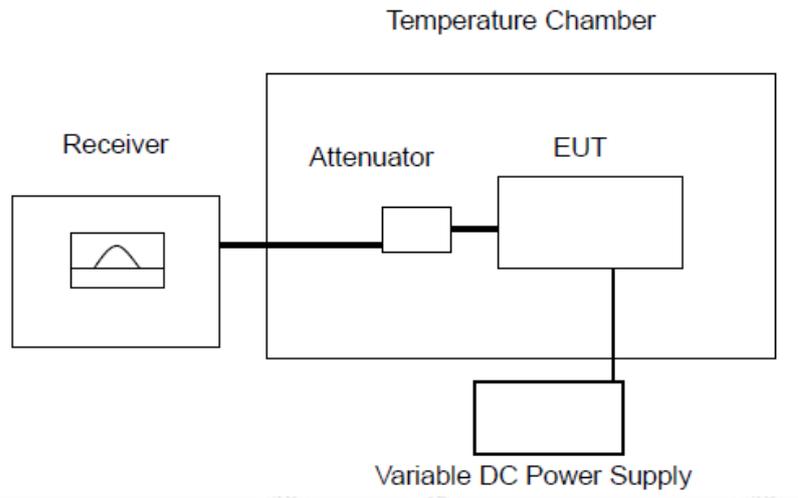
Table 4.2.3.1.2-2: General E-UTRA spectrum emission mask, 3 GHz < E-UTRA bands ≤ 4,2 GHz

$\Delta f_{OOB}$ (MHz)	Spectrum emission limit (dBm)/ Channel bandwidth						Measurement bandwidth
	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
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  $\Delta f_{OOB}$  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 are to 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  $\Delta f_{OOB}$  equals to 3 MHz.



**Setup**



**TEST PROCEDURE**

1. SS sends uplink scheduling information via PDCCH DCI format 0 for C\_RNTI to schedule the UL RMC according to TS 36 521-1 [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, 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 TSSs.
4. Repeat for applicable test frequencies, channel bandwidths, operating band combinations and environmental conditions.

**TEST RESULTS**

See Report 2107RSU065-E1 for test data.

**4.1.3 Radiated emissions (UE)**

**LIMIT**

**ETSI EN 301 908-1 Sub-clause 4.2.2.2**

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.

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].

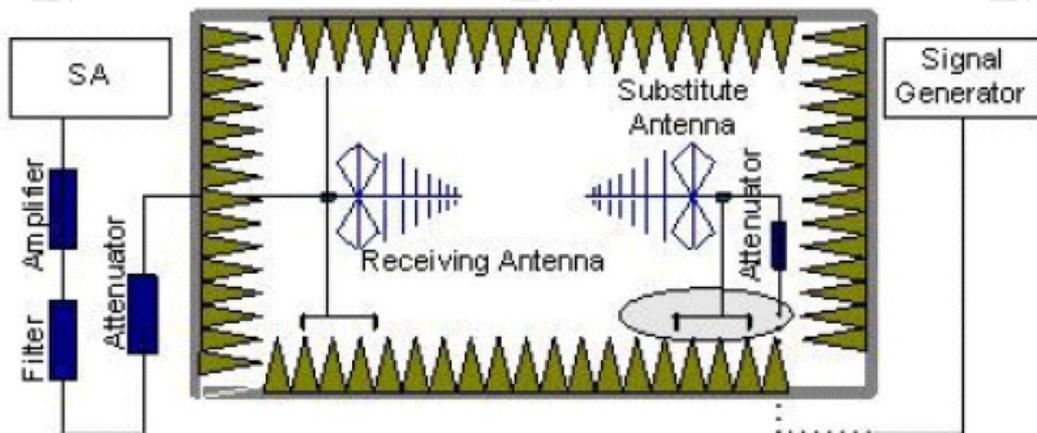
The requirements shown in table 4.2.2.2-1 are only applicable for frequencies in the spurious domain.

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

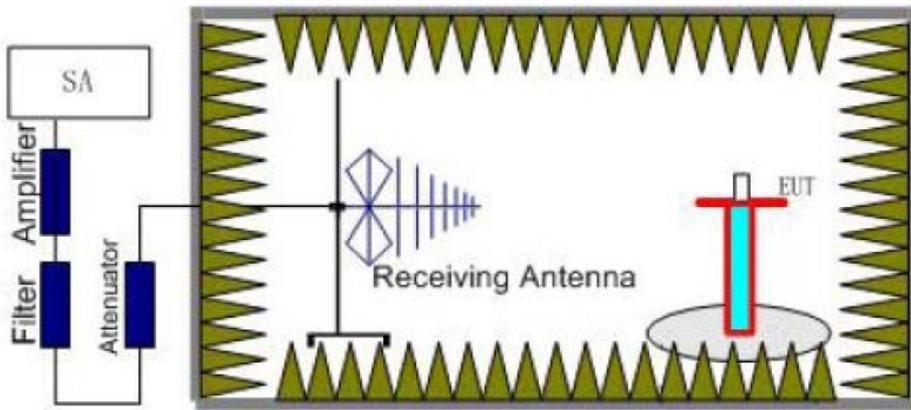
Frequency	Minimum requirement (e.r.p.)/ reference bandwidth idle mode	Minimum requirement (e.r.p.)/ reference bandwidth traffic mode	Applicability
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	-57 dBm/100 kHz	-36 dBm/100 kHz	All
$1 \text{ GHz} \leq f < 12.75 \text{ GHz}$	-47 dBm/1 MHz	-30 dBm/1 MHz	All
$f_c - 2.5 \times 5 \text{ MHz} < f < f_c + 2.5 \times 5 \text{ MHz}$		Not defined	UTRA FDD, UTRA TDD, 3,84 Mcps option, cdma2000, spreading rate 3
$f_c - 2.5 \times \text{BWChannel MHz} < f < f_c + 2.5 \times \text{BWChannel MHz}$		Not defined	E-UTRA FDD, E-UTRA TDD, Mobile WiMAX, UMB
$f_c - 2.5 \times 10 \text{ MHz} < f < f_{c1} + 2.5 \times 10 \text{ MHz}$		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

NOTE:  $f_c$  is the UE transmit centre frequency.

**TEST CONFIGURATION**



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**TEST PROCEDURE**

Please refer to ETSI EN 301 908-1

**Step 1:**

The measurement is carried out in the fully anechoic chamber. EUT was placed on a 1.50 meter high non-conductive table at a 3 meter test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna is 1.50 m and varies in certain range to find the maximum power value. Connect the EUT to the BTS simulator via the air interface. The measurement is carried out using a spectrum analyzer or receiver. Then the antenna height and turn table rotation is adjusted till the maximum power value is founded on spectrum analyzer or receiver. A filter is necessary in the band near to the carrier frequency. A filter is needed to avoid the distortion of the testing equipment in the band above the carrier frequency.

**Step 2:**

A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

**Calculation procedure:**

The data of cable loss, antenna gain and air loss has been calibrated in full testing frequency range before the testing.

The power of the Radiated Spurious Emissions is calculated by adding the cable loss, antenna gain and air loss. The basic equation with a sample calculation is as followed:

$$P = P_R + L_C + L_A - G$$

Where

P: Power of the Radiated Spurious Emissions (dBm)

P<sub>R</sub>: reading of the receiver (dBm)

L<sub>C</sub>: Cable Lose and power amilifer gain and filter cable loss (dB)

L<sub>A</sub>: Air loss (dB)

G: Antenna Gain (dBi)

Assumed the reading of the receiver is -60dBm. A cable lose of 10dB, an air lose of 30dB and an antenna gain of 11dBi are added.

$$P = P_R + L_C + L_A - G = -60 + 10 + 30 - 11 = -31 \text{ dBm}$$

**TEST RESULTS**

This test was carried out in all the test modes LTE Band 1(5M,10M,20M),Band 3(1.4MHz,5MHz,20MHz), Band 7(1.4MHz,5MHz,20MHz), Band 8(1.4MHz,3MHz,5MHz,10MHz,20MHz), Band 20(5MHz,10MHz,20MHz), Band 28(3MHz,5MHz,20MHz), Band 38(5MHz,10MHz,20MHz) and Band 40(5MHz,10MHz,20MHz)and recorded the worst case at band 1(5MHz),Band 3(5MHz),band 7(5MHz),band 8(5MHz),band 20(5MHz), band 28(5MHz), band 34(5MHz), band 38(5MHz) and band 40(5MHz)

The EUT has met the requirements of 3GPP2 C.S0011-A's requirement.



LTE Band 1(5MHz)			
Test mode:	Traffic Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
170.32	V	-54.42	-36	-18.42	PASS
173.47	V	-53.46	-36	-17.46	PASS
255.46	V	-52.13	-36	-16.13	PASS
381.52	V	-54.18	-36	-18.18	PASS
476.22	V	-53.12	-36	-17.12	PASS
760.07	V	-55.46	-36	-19.46	PASS
214.25	H	-55.46	-36	-19.46	PASS
215.34	H	-57.36	-36	-21.36	PASS
258.11	H	-53.25	-36	-17.25	PASS
366.28	H	-53.43	-36	-17.43	PASS
578.72	H	-53.28	-36	-17.28	PASS
791.25	H	-52.45	-36	-16.45	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1197.01	V	-50.42	-30	-20.42	PASS
1780.93	V	-57.89	-30	-27.89	PASS
3009.11	V	-55.69	-30	-25.69	PASS
3616.88	V	-59.23	-30	-29.23	PASS
4974.46	V	-48.01	-30	-18.01	PASS
5407.84	V	-54.37	-30	-24.37	PASS
1748.63	H	-57.23	-30	-27.23	PASS
1999.95	H	-59.39	-30	-29.39	PASS
2485.64	H	-50.17	-30	-20.17	PASS
3189.09	H	-52.76	-30	-22.76	PASS
4333.83	H	-55.25	-30	-25.25	PASS
6080.25	H	-60.14	-30	-30.14	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 1(5MHz)			
Test mode:	idle Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
137.47	V	-73.38	-57	-16.38	PASS
170.84	V	-78.14	-57	-21.14	PASS
272.42	V	-71.67	-57	-14.67	PASS
386.63	V	-79.56	-57	-22.56	PASS
486.66	V	-71.84	-57	-14.84	PASS
758.51	V	-72.83	-57	-15.83	PASS
197.37	H	-76.28	-57	-19.28	PASS
208.35	H	-77.68	-57	-20.68	PASS
270.93	H	-73.47	-57	-16.47	PASS
348.23	H	-75.06	-57	-18.06	PASS
563.43	H	-73.42	-57	-16.42	PASS
791.56	H	-75.56	-57	-18.56	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					

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Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1402.87	V	-74.76	-47	-27.76	PASS
1805.84	V	-75.08	-47	-28.08	PASS
2971.84	V	-73.01	-47	-26.01	PASS
3749.34	V	-78.74	-47	-31.74	PASS
4905.12	V	-74.29	-47	-27.29	PASS
5304.93	V	-76.29	-47	-29.29	PASS
1763.12	H	-76.15	-47	-29.15	PASS
1980.05	H	-76.82	-47	-29.82	PASS
2410.58	H	-72.78	-47	-25.78	PASS
3345.42	H	-73.14	-47	-26.14	PASS
4325.16	H	-75.16	-47	-28.16	PASS
6009.71	H	-80.62	-47	-33.62	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 3(5MHz)			
Test mode:	Traffic Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
147.19	V	-54.63	-36	-18.63	PASS
176.02	V	-56.36	-36	-20.36	PASS
270.36	V	-55.66	-36	-19.66	PASS
378.81	V	-53.22	-36	-17.22	PASS
479.29	V	-51.39	-36	-15.39	PASS
770.43	V	-56.61	-36	-20.61	PASS
191.38	H	-52.93	-36	-16.93	PASS
217.51	H	-57.33	-36	-21.33	PASS
270.54	H	-55.99	-36	-19.99	PASS
377.15	H	-56.24	-36	-20.24	PASS
564.57	H	-55.87	-36	-19.87	PASS
790.51	H	-55.63	-36	-19.63	PASS

Note:  
 1. Cable loss and antenna gain was combined in the calculated result.  
 2. Other point of the measurements are below 20dB from the limit.



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1503.22	V	-51.88	-30	-21.88	PASS
1962.23	V	-57.64	-30	-27.64	PASS
3104.73	V	-56.93	-30	-26.93	PASS
3582.69	V	-58.54	-30	-28.54	PASS
4886.83	V	-50.04	-30	-20.04	PASS
5565.49	V	-53.97	-30	-23.97	PASS
1639.36	H	-53.43	-30	-23.43	PASS
1924.96	H	-57.33	-30	-27.33	PASS
2386.32	H	-52.58	-30	-22.58	PASS
3209.02	H	-51.08	-30	-21.08	PASS
4378.86	H	-53.87	-30	-23.87	PASS
5912.42	H	-59.68	-30	-29.68	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 3(5MHz)			
Test mode:	idle Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
161.93	V	-75.65	-57	-18.65	PASS
177.92	V	-78.01	-57	-21.01	PASS
266.09	V	-71.63	-57	-14.63	PASS
392.06	V	-76.03	-57	-19.03	PASS
479.19	V	-70.14	-57	-13.14	PASS
772.72	V	-77.37	-57	-20.37	PASS
189.23	H	-73.65	-57	-16.65	PASS
229.43	H	-77.58	-57	-20.58	PASS
254.58	H	-70.02	-57	-13.02	PASS
347.35	H	-79.76	-57	-22.76	PASS
557.23	H	-73.16	-57	-16.16	PASS
785.56	H	-79.66	-57	-22.66	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					

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Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1193.08	V	-72.06	-47	-25.06	PASS
1876.68	V	-76.55	-47	-29.55	PASS
3083.55	V	-74.43	-47	-27.43	PASS
3635.02	V	-80.55	-47	-33.55	PASS
4953.53	V	-74.03	-47	-27.03	PASS
5318.42	V	-75.78	-47	-28.78	PASS
1656.94	H	-74.56	-47	-27.56	PASS
1859.82	H	-75.21	-47	-28.21	PASS
2417.78	H	-75.83	-47	-28.83	PASS
3340.42	H	-74.01	-47	-27.01	PASS
4338.46	H	-75.66	-47	-28.66	PASS
6021.47	H	-76.94	-47	-29.94	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 7(5MHz)			
Test mode:	Traffic Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
150.23	V	-51.83	-36	-15.83	PASS
166.16	V	-52.32	-36	-16.32	PASS
267.23	V	-50.96	-36	-14.96	PASS
378.51	V	-55.05	-36	-19.05	PASS
483.65	V	-52.06	-36	-16.06	PASS
757.77	V	-56.65	-36	-20.65	PASS
199.43	H	-52.54	-36	-16.54	PASS
223.67	H	-53.67	-36	-17.67	PASS
251.16	H	-55.66	-36	-19.66	PASS
364.68	H	-59.66	-36	-23.66	PASS
577.86	H	-56.05	-36	-20.05	PASS
780.24	H	-56.33	-36	-20.33	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1347.94	V	-50.37	-30	-20.37	PASS
1991.49	V	-58.88	-30	-28.88	PASS
3007.35	V	-50.19	-30	-20.19	PASS
3627.82	V	-61.86	-30	-31.86	PASS
4968.16	V	-48.68	-30	-18.68	PASS
5315.72	V	-51.44	-30	-21.44	PASS
1699.83	H	-53.23	-30	-23.23	PASS
1789.12	H	-57.82	-30	-27.82	PASS
2423.21	H	-51.62	-30	-21.62	PASS
3356.94	H	-50.59	-30	-20.59	PASS
4526.05	H	-55.09	-30	-25.09	PASS
6070.94	H	-59.41	-30	-29.41	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 7(5MHz)			
Test mode:	idle Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
165.25	V	-73.37	-57	-16.37	PASS
178.06	V	-81.39	-57	-24.39	PASS
268.48	V	-70.95	-57	-13.95	PASS
397.68	V	-79.16	-57	-22.16	PASS
478.43	V	-72.86	-57	-15.86	PASS
760.92	V	-78.39	-57	-21.39	PASS
188.33	H	-78.01	-57	-21.01	PASS
222.35	H	-74.94	-57	-17.94	PASS
267.32	H	-73.18	-57	-16.18	PASS
353.91	H	-76.58	-57	-19.58	PASS
563.29	H	-72.49	-57	-15.49	PASS
788.11	H	-78.48	-57	-21.48	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1109.14	V	-75.07	-47	-28.07	PASS
1913.53	V	-77.96	-47	-30.96	PASS
3054.89	V	-73.27	-47	-26.27	PASS
3651.05	V	-79.68	-47	-32.68	PASS
5010.32	V	-73.96	-47	-26.96	PASS
5294.32	V	-75.29	-47	-28.29	PASS
1730.98	H	-76.58	-47	-29.58	PASS
1836.17	H	-74.97	-47	-27.97	PASS
2506.79	H	-75.09	-47	-28.09	PASS
3251.47	H	-67.92	-47	-20.92	PASS
4215.57	H	-75.12	-47	-28.12	PASS
5968.75	H	-76.77	-47	-29.77	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 8(5MHz)			
Test mode:	Traffic Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
134.29	V	-56.65	-36	-20.65	PASS
163.02	V	-58.62	-36	-22.62	PASS
252.01	V	-54.81	-36	-18.81	PASS
380.27	V	-57.81	-36	-21.81	PASS
494.26	V	-55.53	-36	-19.53	PASS
776.74	V	-55.16	-36	-19.16	PASS
208.45	H	-55.93	-36	-19.93	PASS
212.35	H	-55.27	-36	-19.27	PASS
256.55	H	-58.56	-36	-22.56	PASS
363.61	H	-55.81	-36	-19.81	PASS
565.47	H	-55.54	-36	-19.54	PASS
784.35	H	-59.44	-36	-23.44	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1347.48	V	-52.37	-30	-22.37	PASS
1898.66	V	-56.41	-30	-26.41	PASS
2982.51	V	-55.55	-30	-25.55	PASS
3791.37	V	-60.11	-30	-30.11	PASS
5006.96	V	-51.33	-30	-21.33	PASS
5373.93	V	-57.65	-30	-27.65	PASS
1605.46	H	-50.42	-30	-20.42	PASS
1896.36	H	-54.17	-30	-24.17	PASS
2254.73	H	-57.05	-30	-27.05	PASS
3133.83	H	-50.34	-30	-20.34	PASS
4585.14	H	-52.61	-30	-22.61	PASS
6096.61	H	-57.43	-30	-27.43	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 8(5MHz)			
Test mode:	idle Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
140.86	V	-72.27	-57	-15.27	PASS
184.59	V	-80.46	-57	-23.46	PASS
264.82	V	-73.57	-57	-16.57	PASS
378.55	V	-74.65	-57	-17.65	PASS
488.27	V	-77.72	-57	-20.72	PASS
744.38	V	-78.07	-57	-21.07	PASS
191.32	H	-73.11	-57	-16.11	PASS
216.31	H	-80.52	-57	-23.52	PASS
247.72	H	-74.35	-57	-17.35	PASS
344.81	H	-77.01	-57	-20.01	PASS
568.39	H	-73.93	-57	-16.93	PASS
785.76	H	-80.19	-57	-23.19	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1483.62	V	-73.79	-47	-26.79	PASS
2159.14	V	-78.36	-47	-31.36	PASS
3209.38	V	-72.07	-47	-25.07	PASS
3530.52	V	-79.37	-47	-32.37	PASS
4922.78	V	-72.19	-47	-25.19	PASS
5502.44	V	-74.53	-47	-27.53	PASS
1744.09	H	-76.36	-47	-29.36	PASS
1737.06	H	-82.42	-47	-35.42	PASS
2584.33	H	-76.11	-47	-29.11	PASS
3393.27	H	-75.02	-47	-28.02	PASS
4399.79	H	-73.04	-47	-26.04	PASS
5774.11	H	-78.23	-47	-31.23	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 20(5MHz)			
Test mode:	Traffic Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
153.09	V	-54.43	-36	-18.43	PASS
184.19	V	-56.25	-36	-20.25	PASS
255.63	V	-53.58	-36	-17.58	PASS
378.94	V	-57.17	-36	-21.17	PASS
468.87	V	-53.89	-36	-17.89	PASS
763.22	V	-55.85	-36	-19.85	PASS
219.43	H	-56.23	-36	-20.23	PASS
239.75	H	-54.99	-36	-18.99	PASS
245.12	H	-53.88	-36	-17.88	PASS
376.49	H	-54.46	-36	-18.46	PASS
592.93	H	-51.82	-36	-15.82	PASS
788.53	H	-58.27	-36	-22.27	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1324.81	V	-52.23	-30	-22.23	PASS
1952.16	V	-58.83	-30	-28.83	PASS
2870.04	V	-52.52	-30	-22.52	PASS
3685.39	V	-60.26	-30	-30.26	PASS
4889.33	V	-50.21	-30	-20.21	PASS
5448.09	V	-56.21	-30	-26.21	PASS
1759.36	H	-55.16	-30	-25.16	PASS
1968.07	H	-58.29	-30	-28.29	PASS
2552.99	H	-50.27	-30	-20.27	PASS
3338.25	H	-49.07	-30	-19.07	PASS
4468.41	H	-51.77	-30	-21.77	PASS
6020.67	H	-60.27	-30	-30.27	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 20(5MHz)			
Test mode:	idle Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
150.57	V	-72.74	-57	-15.74	PASS
177.54	V	-78.46	-57	-21.46	PASS
272.18	V	-72.58	-57	-15.58	PASS
396.73	V	-77.94	-57	-20.94	PASS
474.11	V	-73.93	-57	-16.93	PASS
760.36	V	-74.69	-57	-17.69	PASS
205.16	H	-76.17	-57	-19.17	PASS
211.66	H	-83.35	-57	-26.35	PASS
268.02	H	-72.65	-57	-15.65	PASS
375.35	H	-75.35	-57	-18.35	PASS
576.86	H	-76.42	-57	-19.42	PASS
785.28	H	-76.73	-57	-19.73	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1299.26	V	-72.73	-47	-25.73	PASS
1792.31	V	-76.73	-47	-29.73	PASS
2969.33	V	-70.51	-47	-23.51	PASS
3660.13	V	-83.18	-47	-36.18	PASS
4819.74	V	-74.89	-47	-27.89	PASS
5223.36	V	-78.93	-47	-31.93	PASS
1722.94	H	-73.35	-47	-26.35	PASS
2010.01	H	-78.84	-47	-31.84	PASS
2488.94	H	-74.47	-47	-27.47	PASS
3389.88	H	-73.63	-47	-26.63	PASS
4327.51	H	-74.07	-47	-27.07	PASS
5882.67	H	-77.05	-47	-30.05	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 28(5MHz)			
Test mode:	Traffic Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
167.16	V	-52.43	-36	-16.43	PASS
180.51	V	-56.41	-36	-20.41	PASS
259.22	V	-52.98	-36	-16.98	PASS
387.18	V	-57.66	-36	-21.66	PASS
469.83	V	-54.56	-36	-18.56	PASS
770.94	V	-55.53	-36	-19.53	PASS
223.21	H	-56.98	-36	-20.98	PASS
233.33	H	-54.28	-36	-18.28	PASS
262.51	H	-56.21	-36	-20.21	PASS
378.01	H	-53.41	-36	-17.41	PASS
570.39	H	-51.05	-36	-15.05	PASS
788.28	H	-57.36	-36	-21.36	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1359.11	V	-52.25	-30	-22.25	PASS
1938.47	V	-57.46	-30	-27.46	PASS
2895.14	V	-51.68	-30	-21.68	PASS
3621.04	V	-61.41	-30	-31.41	PASS
4785.41	V	-51.45	-30	-21.45	PASS
5470.15	V	-53.25	-30	-23.25	PASS
1837.86	H	-56.99	-30	-26.99	PASS
2118.76	H	-58.73	-30	-28.73	PASS
2461.51	H	-49.12	-30	-19.12	PASS
3336.78	H	-51.44	-30	-21.44	PASS
4465.74	H	-52.14	-30	-22.14	PASS
6057.75	H	-58.77	-30	-28.77	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 28(5MHz)			
Test mode:	idle Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
155.53	V	-72.48	-57	-15.48	PASS
165.25	V	-79.82	-57	-22.82	PASS
266.71	V	-73.57	-57	-16.57	PASS
386.77	V	-76.46	-57	-19.46	PASS
467.98	V	-73.54	-57	-16.54	PASS
764.79	V	-74.69	-57	-17.69	PASS
204.14	H	-78.34	-57	-21.34	PASS
204.92	H	-80.38	-57	-23.38	PASS
267.41	H	-73.76	-57	-16.76	PASS
361.04	H	-71.62	-57	-14.62	PASS
577.98	H	-75.85	-57	-18.85	PASS
793.42	H	-77.18	-57	-20.18	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1362.12	V	-71.69	-47	-24.69	PASS
1791.39	V	-77.47	-47	-30.47	PASS
2966.72	V	-72.84	-47	-25.84	PASS
3615.65	V	-82.55	-47	-35.55	PASS
4852.06	V	-76.24	-47	-29.24	PASS
5294.68	V	-77.33	-47	-30.33	PASS
1662.56	H	-77.11	-47	-30.11	PASS
1881.79	H	-77.43	-47	-30.43	PASS
2512.35	H	-71.36	-47	-24.36	PASS
3321.01	H	-77.09	-47	-30.09	PASS
4251.13	H	-73.84	-47	-26.84	PASS
5810.46	H	-78.58	-47	-31.58	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 38(5MHz)			
Test mode:	Traffic Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
153.06	V	-53.84	-36	-17.84	PASS
183.27	V	-54.98	-36	-18.98	PASS
260.64	V	-51.87	-36	-15.87	PASS
383.66	V	-56.53	-36	-20.53	PASS
468.32	V	-53.39	-36	-17.39	PASS
760.43	V	-55.79	-36	-19.79	PASS
216.78	H	-55.68	-36	-19.68	PASS
239.34	H	-54.17	-36	-18.17	PASS
248.71	H	-54.66	-36	-18.66	PASS
369.46	H	-55.14	-36	-19.14	PASS
590.27	H	-52.85	-36	-16.85	PASS
780.93	H	-58.75	-36	-22.75	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1336.35	V	-52.54	-30	-22.54	PASS
1934.61	V	-58.13	-30	-28.13	PASS
2853.24	V	-53.35	-30	-23.35	PASS
3730.01	V	-60.35	-30	-30.35	PASS
4820.64	V	-50.83	-30	-20.83	PASS
5362.73	V	-55.41	-30	-25.41	PASS
1790.98	H	-54.21	-30	-24.21	PASS
1971.10	H	-56.92	-30	-26.92	PASS
2498.39	H	-49.67	-30	-19.67	PASS
3330.18	H	-50.34	-30	-20.34	PASS
4471.21	H	-50.92	-30	-20.92	PASS
5982.98	H	-59.46	-30	-29.46	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 38(5MHz)			
Test mode:	idle Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
153.53	V	-73.54	-57	-16.54	PASS
173.51	V	-78.58	-57	-21.58	PASS
269.86	V	-71.44	-57	-14.44	PASS
393.58	V	-76.13	-57	-19.13	PASS
468.83	V	-73.66	-57	-16.66	PASS
755.87	V	-73.18	-57	-16.18	PASS
197.74	H	-76.01	-57	-19.01	PASS
203.47	H	-83.18	-57	-26.18	PASS
261.83	H	-71.65	-57	-14.65	PASS
372.22	H	-75.76	-57	-18.76	PASS
581.25	H	-76.25	-57	-19.25	PASS
782.68	H	-77.59	-57	-20.59	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1388.82	V	-72.19	-47	-25.19	PASS
1756.16	V	-77.53	-47	-30.53	PASS
2978.96	V	-71.04	-47	-24.04	PASS
3604.14	V	-83.65	-47	-36.65	PASS
4781.01	V	-74.15	-47	-27.15	PASS
5258.25	V	-78.41	-47	-31.41	PASS
1682.08	H	-74.86	-47	-27.86	PASS
1978.32	H	-79.38	-47	-32.38	PASS
2460.95	H	-75.37	-47	-28.37	PASS
3368.45	H	-73.84	-47	-26.84	PASS
4261.81	H	-73.83	-47	-26.83	PASS
5795.33	H	-76.56	-47	-29.56	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 40(5MHz)			
Test mode:	Traffic Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
163.36	V	-53.27	-36	-17.27	PASS
183.45	V	-55.86	-36	-19.86	PASS
250.67	V	-52.91	-36	-16.91	PASS
392.01	V	-57.09	-36	-21.09	PASS
464.8	V	-53.05	-36	-17.05	PASS
764.13	V	-54.88	-36	-18.88	PASS
216.45	H	-56.38	-36	-20.38	PASS
229.12	H	-54.08	-36	-18.08	PASS
259.54	H	-57.16	-36	-21.16	PASS
379.32	H	-53.62	-36	-17.62	PASS
569.99	H	-50.84	-36	-14.84	PASS
785.73	H	-56.55	-36	-20.55	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1354.28	V	-52.63	-30	-22.63	PASS
2007.26	V	-57.83	-30	-27.83	PASS
2802.14	V	-50.82	-30	-20.82	PASS
3607.92	V	-61.75	-30	-31.75	PASS
4838.82	V	-50.55	-30	-20.55	PASS
5484.98	V	-54.08	-30	-24.08	PASS
1879.76	H	-56.29	-30	-26.29	PASS
2105.67	H	-59.19	-30	-29.19	PASS
2476.55	H	-49.42	-30	-19.42	PASS
3396.47	H	-50.78	-30	-20.78	PASS
4488.14	H	-51.09	-30	-21.09	PASS
6069.38	H	-58.18	-30	-28.18	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



LTE Band 40(5MHz)			
Test mode:	idle Mode	Polarity:	Horizontal/ Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
152.28	V	-73.76	-57	-16.76	PASS
167.61	V	-79.59	-57	-22.59	PASS
269.98	V	-74.58	-57	-17.58	PASS
390.97	V	-76.43	-57	-19.43	PASS
468.33	V	-74.15	-57	-17.15	PASS
765.27	V	-75.29	-57	-18.29	PASS
198.68	H	-78.54	-57	-21.54	PASS
202.66	H	-79.55	-57	-22.55	PASS
269.22	H	-72.65	-57	-15.65	PASS
358.37	H	-72.03	-57	-15.03	PASS
577.21	H	-76.73	-57	-19.73	PASS
791.39	H	-75.65	-57	-18.65	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					

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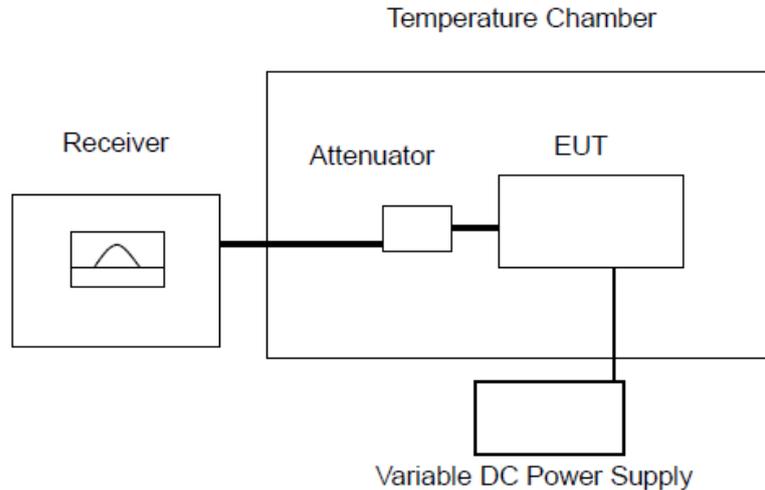
Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
1405.83	V	-71.34	-47	-24.34	PASS
1732.38	V	-77.23	-47	-30.23	PASS
2979.19	V	-71.31	-47	-24.31	PASS
3604.03	V	-82.47	-47	-35.47	PASS
4871.62	V	-76.07	-47	-29.07	PASS
5242.55	V	-78.23	-47	-31.23	PASS
1676.22	H	-76.35	-47	-29.35	PASS
1833.16	H	-77.65	-47	-30.65	PASS
2490.37	H	-70.65	-47	-23.65	PASS
3356.34	H	-77.69	-47	-30.69	PASS
4195.97	H	-74.16	-47	-27.16	PASS
5749.13	H	-77.76	-47	-30.76	PASS
<b>Note:</b> 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					

#### 4.1.4 Transmitter minimum output power

##### Limit

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

##### Setup



##### Test Procedures

- 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.
- 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 band combinations and environmental conditions. Details of the test method can be found in TS 136 521-1 [1], clause 6.3.2.



**Test Result**

See Report 2107RSU065-E1 for test data.

**4.1.5 Receiver Adjacent Channel Selectivity (ACS)**

**Limit**

The throughput  $R_{av}$  shall be  $\geq 95\%$  of the maximum throughput of the reference measurement channels as specified in TS 136 521-1 [1] under the conditions specified in table 4.2.6.2-2 and also under the conditions specified in table 4.2.6.2-3.

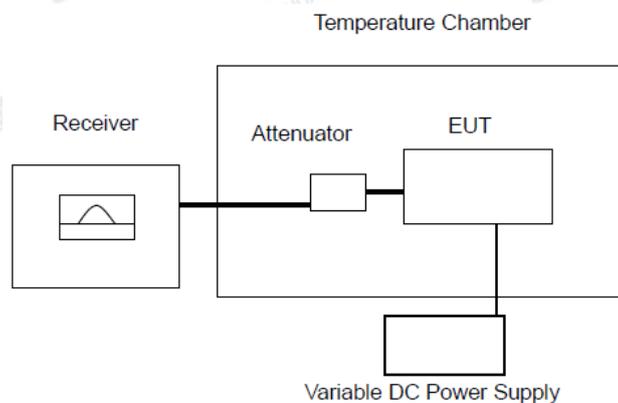
**Table 4.2.6.2-2: Test parameters for Adjacent channel selectivity, Case 1**

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 TS 136 101 [4].							
NOTE 2: The interferer consists of the Reference measurement channel specified in clause A.3.2 of TS 136 521-1 [1] with set-up according to clause C.3.1 of TS 136 521-1 [1].							
NOTE 3: REFSENS as defined in TS 136 521-1 [1].							

**Table 4.2.6.2-3: 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 TS 136 101 [4].							
NOTE 2: The interferer consists of the Reference measurement channel specified in clause A.3.2 of TS 136 521-1 [1] with set-up according to clause C.3.1 of TS 136 521-1 [1].							

**Setup**



**Test Procedures**

- 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.
- 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.
- 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  $f \leq 3,0$  GHz or within +0, -4,0 dB of the target level for carrier frequency  $3,0 \text{ GHz} < f \leq 4,2 \text{ GHz}$ , for at least the duration of the Throughput measurement (obtain correct UE output power as specified in TS 136 521-1 [1]).
- 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.
- 5) Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of TS 136 521-1 [1].
- 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  $f \leq 3,0$  GHz or within +0, -4,0 dB of the target level for carrier frequency  $3,0 \text{ GHz} < f \leq 4,2 \text{ GHz}$ , for at least the duration of the throughput measurement (obtain correct UE output power as specified in TS 136 521-1 [1]).
- 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.
- 8) Measure the average throughput for a duration sufficient to achieve statistical significance according to 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 band combinations.



**Test Result**

See Report 2107RSU065-E1 for test data.



### 4.1.6 Receiver blocking characteristics

#### Limit

With parameters specified in tables 4.2.7.2-1 and 4.2.7.2-2, the throughput shall be  $\geq 95\%$  of the maximum throughput of the reference measurement channels as specified in TS 136 521-1 [1].

With parameters specified in tables 4.2.7.2-3 and 4.2.7.2-4, the throughput shall be  $\geq 95\%$  of the maximum throughput of the reference measurement channels as specified in TS 136 521-1 [1], except for the spurious response frequencies. For table 4.2.7.2-4 in frequency range 1, 2 and 3, up to  $\max(24 \cdot \text{NRB} / 6, 6)$ , exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size, where NRB is the number of resource blocks in the downlink transmission bandwidth configuration. For these exceptions the requirements of clause 4.2.8 Spurious response are applicable. With parameters specified in table 4.2.7.2-5, the throughput shall be  $\geq 95\%$  of the maximum throughput of the reference measurement channels as specified in TS 136 521-1 [1].

Table 4.2.7.2-1: 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 <sub>Interferer</sub>	MHz	1,4	3	5	5	5	5
F <sub>offset, case 1</sub>	MHz	2,1125	4,5075	7,5125	7,5025	7,5075	7,5125
F <sub>offset, case 2</sub>	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 <sub>C<sub>MAX,L</sub></sub> at the minimum uplink configuration specified in TS 136 101 [4] (table 7.3.1-2 with P <sub>C<sub>MAX,L</sub></sub> as defined in clause 6.2.5).							
NOTE 2: The interferer consists of the Reference measurement channel specified in clause A.3.2 of TS 136 521-1 [1] with a set-up according to clause C.3.1 of TS 136 521-1 [1].							
NOTE 3: REFSENS as defined in TS 136 521-1 [1].							

Table 4.2.7.2-2: In-band blocking

E-UTRA band	Parameter	Units	Case 1	Case 2
		P <sub>Interferer</sub>	dBm	-56
	F <sub>Interferer (Offset)</sub>	MHz	= -BW/2 - F <sub>offset, case 1</sub> and = +BW/2 + F <sub>offset, case 1</sub>	$\leq -BW/2 - F_{\text{offset, case 2}}$ and $\geq +BW/2 + F_{\text{offset, case 2}}$
1, 3, 7, 8, 20, 33, 34, 38, 40	F <sub>Interferer</sub>	MHz	(note 2)	F <sub>DL_low</sub> - 15 to F <sub>DL_high</sub> + 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 - F <sub>offset, case 1</sub> ; and b) the carrier frequency + BW/2 + F <sub>offset, case 1</sub> .				
NOTE 3: F <sub>Interferer</sub> range values for unwanted modulated interfering signal are interferer center frequencies.				

**Table 4.2.7.2-3: 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 TS 136 101 [4] (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 TS 136 521-1 [1].							
NOTE 3: REFSENS as defined in TS 136 521-1 [1].							

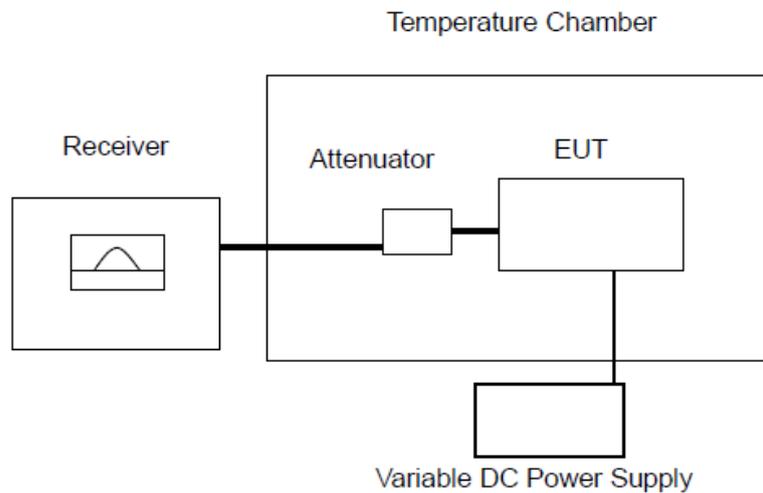
**Table 4.2.7.2-4: Out-of-band blocking**

E-UTRA band	Parameter	Units	Frequency		
			Range 1	Range 2	Range 3
	$P_{Interferer}$	dBm	-44	-30	-15
1, 3, 7, 8, 20, 33, 34, 38, 40	$F_{Interferer}$ (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: Range 3 shall be tested only with the highest channel bandwidth.					

**Table 4.2.7.2-5: 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 $\Delta f = 15$ 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 TS 136 101 [4] (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 TS 136 521-1 [1].							
NOTE 3: REFSENS as defined in TS 136 521-1 [1].							

**Setup**





## Test Procedures

### **In-Band Procedure**

- 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.
- 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.
- 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].
- 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  $f \leq 3,0$  GHz or within +0, -4,0 dB of the target level for carrier frequency  $3,0 \text{ GHz} < f \leq 4,2 \text{ GHz}$ , for at least the duration of the throughput measurement as specified in TS 136 521-1 [1].
- 5) Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of 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 TS 136 521-1 [1], table 7.6.1.4.2-1.
- 8) Repeat for applicable test frequencies, channel bandwidths and operating band combinations.

### **Out-Of-Band Procedure**

- 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.
- 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.
- 3) Set the parameters of the CW signal generator for an interfering signal according to table 4.2.7.2-4 as specified in TS 136 521-1 [1]. The frequency step size is 1 MHz.
- 4) Set the downlink signal level according to the table 4.2.7.2-3. 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 4.2.7.2-3 for carrier frequency  $f \leq 3,0$  GHz or within +0, -4,0 dB of the target level for carrier frequency  $3,0 \text{ GHz} < f \leq 4,2 \text{ GHz}$ , for at least the duration of the throughput measurement as specified in TS 136 521-1 [1].
- 5) Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of TS 136 521-1 [1].
- 6) For table 4.2.7.2-4 record the frequencies for which the throughput does not meet the requirements.
- 7) Repeat for applicable test frequencies, channel bandwidths and operating band combinations.

**Narrow-Band Procedure**

- 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 7.6.3.4.1-1. 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 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 4.2.7.2-5 as specified in TS 136 521-1 [1].
- 4) Set the downlink signal level according to the table 4.2.7.2-5. 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 4.2.7.2-5 for carrier frequency  $f \leq 3,0$  GHz or within +0, -4,0 dB of the target level for carrier frequency  $3,0 \text{ GHz} < f \leq 4,2$  GHz, for at least the duration of the throughput measurement as specified in TS 136 521-1 [1].
- 5) Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of 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 band combinations.

**Test Result**

See Report 2107RSU065-E1 for test data.

**4.1.7 Receiver spurious response**

**Limit**

The throughput shall be  $\geq 95\%$  of the maximum throughput of the reference measurement channels as specified in TS 136 521-1 [1] with parameters specified in tables 4.2.8.2-1 and 4.2.8.2-2.

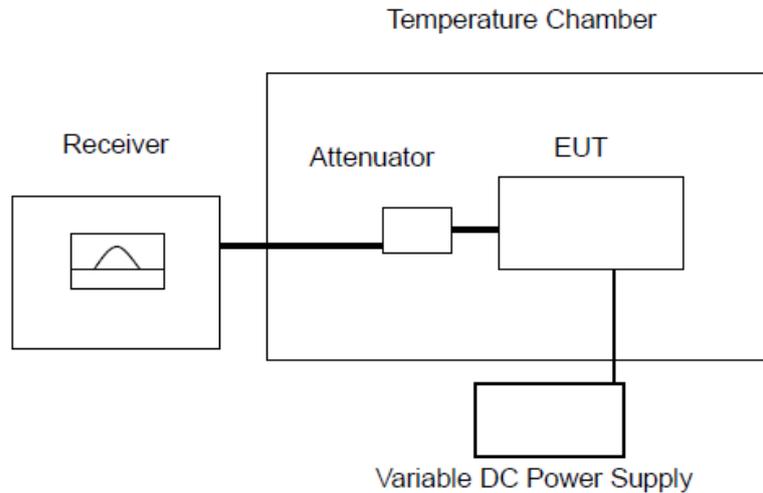
**Table 4.2.8.2-1: Spurious response parameters**

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 TS 136 101 [4] (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 TS 136 521-1 [1].							
NOTE 3: REFSENS as defined in TS 136 521-1 [1].							

**Table 4.2.8.2-2: Spurious Response**

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

**Setup**



**Test Procedures**

- 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.
- 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.
- 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.
- 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  $f \leq 3,0$  GHz or within +0, -4,0 dB of the target level for carrier frequency  $3,0 \text{ GHz} < f \leq 4,2 \text{ GHz}$ , for at least the duration of the throughput measurement as specified in TS 136 521-1 [1].
- 5) For the spurious frequency, measure the average throughput for a duration sufficient to achieve statistical significance.

**Test Result**

See Report 2107RSU065-E1 for test data.



**4.1.8 Receiver intermodulation characteristics**

**Limit**

The throughput shall be  $\geq 95\%$  of the maximum throughput of the reference measurement channels as specified in TS 136 521-1 [1] with parameters specified in table 4.2.9.2-1 for the specified wanted signal mean power in the presence of two interfering signals.

**Table 4.2.9.2-1: 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
$P_{\text{Interferer 1 (CW)}}$	dBm	-46					
$P_{\text{Interferer 2 (Modulated)}}$	dBm	-46					
$BW_{\text{Interferer 2}}$		1,4	3	5			
$F_{\text{Interferer 1 (Offset)}}$	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			
$F_{\text{Interferer 2 (Offset)}}$		MHz	$2 \times F_{\text{Interferer 1}}$				
NOTE 1: The transmitter shall be set to 4 dB below $P_{\text{CMAX,L}}$ at the minimum uplink configuration specified in TS 136 101 [4] (table 7.3.1-2 with $P_{\text{CMAX,L}}$ as defined in clause 6.2.5).							
NOTE 2: Reference measurement channel is clause A.3.2 of TS 136 521-1 [1].							
NOTE 3: The modulated interferer consists of the Reference measurement channel specified in clause A.3.2 of TS 136 521-1 [1] with set-up according to clause C.3.1 of TS 136 521-1 [1]. The interfering modulated signal is 5 MHz E-UTRA signal as described in annex D for channel bandwidth $\geq 5$ MHz.							
NOTE 4: REFSENS as defined in TS 136 521-1 [1].							

**Test Procedures**

- 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.
- 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.
- 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  $f \leq 3,0$  GHz or within +0, -4,0 dB of the target level for carrier frequency  $3,0$  GHz  $< f \leq 4,2$  GHz, for at least the duration of the throughput measurement as specified in TS 136 521-1 [1].
- 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].
- 5) Measure the average throughput for a duration sufficient to achieve statistical significance according to clause G.2 of TS 136 521-1 [1].
- 6) Repeat for applicable test frequencies, channel bandwidths and operating band combinations.

**Test Result**

See Report 2107RSU065-E1 for test data.



**4.1.9 Transmitter Adjacent Channel Leakage power Ratio**

**Limit**

If the measured adjacent channel power is greater than -50 dBm then the measured E-UTRA<sub>ACLR</sub> shall be higher than the limits in table 4.2.11.1.2-1.

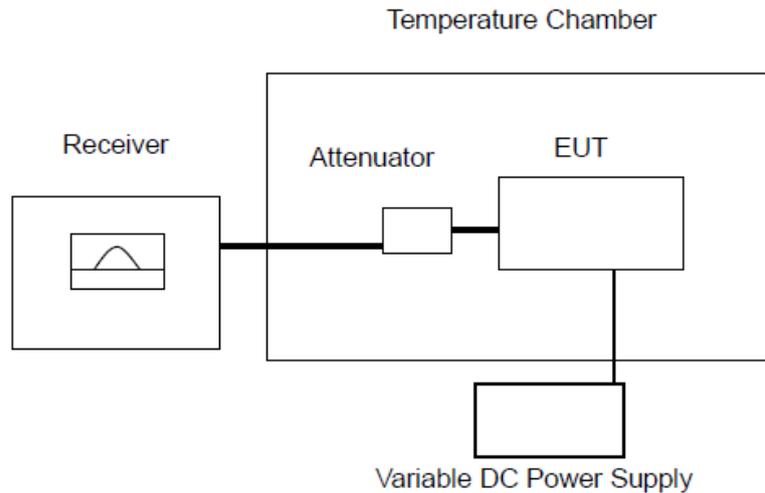
**Table 4.2.11.1.2-1: E-UTRA UE ACLR**

	Channel bandwidth/E-UTRA <sub>ACLR1</sub> /measurement bandwidth					
	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
<b>E-UTRA<sub>ACLR1</sub></b>	29,2 dB	29,2 dB	29,2 dB	29,2 dB	29,2 dB	29,2 dB
<b>E-UTRA channel Measurement bandwidth</b>	1,08 MHz	2,7 MHz	4,5 MHz	9,0 MHz	13,5 MHz	18 MHz
<b>UE channel</b>	+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 UTRA<sub>ACLR1</sub>, UTRA<sub>ACLR2</sub> shall be higher than the limits in table 4.2.11.2-2.

**Table 4.2.11.2-2: UTRA UE ACLR**

	Channel bandwidth/UTRA <sub>ACLR1/2</sub> /measurement bandwidth					
	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
<b>UTRA<sub>ACLR1</sub></b>	32,2 dB	32,2 dB	32,2 dB	32,2 dB	32,2 dB	32,2 dB
<b>Adjacent channel centre frequency offset (in MHz)</b>	0,7 + BW <sub>UTRA</sub> /2 / -0,7 - BW <sub>UTRA</sub> /2	1,5 + BW <sub>UTRA</sub> /2 / -1,5 - BW <sub>UTRA</sub> /2	2,5 + BW <sub>UTRA</sub> /2 / -2,5 - BW <sub>UTRA</sub> /2	5 + BW <sub>UTRA</sub> /2 / -5 - BW <sub>UTRA</sub> /2	7,5 + BW <sub>UTRA</sub> /2 / -7,5 - BW <sub>UTRA</sub> /2	10 + BW <sub>UTRA</sub> /2 / -10 - BW <sub>UTRA</sub> /2
<b>UTRA<sub>ACLR2</sub></b>	-	-	35,2 dB	35,2 dB	35,2 dB	35,2 dB
<b>Adjacent channel centre frequency offset (in MHz)</b>	-	-	2,5 + 3 x BW <sub>UTRA</sub> /2 / -2,5 - 3 x BW <sub>UTRA</sub> /2	5 + 3 x BW <sub>UTRA</sub> /2 / -5 - 3 x BW <sub>UTRA</sub> /2	7,5 + 3 x BW <sub>UTRA</sub> /2 / -7,5 - 3 x BW <sub>UTRA</sub> /2	10 + 3 x BW <sub>UTRA</sub> /2 / -10 - 3 x BW <sub>UTRA</sub> /2
<b>E-UTRA channel Measurement bandwidth</b>	1,08 MHz	2,7 MHz	4,5 MHz	9,0 MHz	13,5 MHz	18 MHz
<b>UTRA 5 MHz channel Measurement bandwidth (see note 1)</b>	3,84 MHz	3,84 MHz	3,84 MHz	3,84 MHz	3,84 MHz	3,84 MHz
<b>UTRA 1,6 MHz channel measurement bandwidth (see note 2)</b>	1,28 MHz	1,28 MHz	1,28 MHz	1,28 MHz	1,28 MHz	1,28 MHz
NOTE 1: Applicable for E-UTRA FDD co-existence with UTRA FDD in paired spectrum.						
NOTE 2: Applicable for E-UTRA TDD co-existence with UTRA TDD in unpaired spectrum.						
NOTE 3: BW <sub>UTRA</sub> for UTRA FDD is 5 MHz and for UTRA TDD is 1,6 MHz.						

**Setup****Test Procedures**

- 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.
- 2) Send continuous uplink power control "up" commands in the uplink scheduling information to the UE to ensure that the UE transmits at P UMAX 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 band combinations and environmental conditions.

**Test Result**

See Report 2107RSU065-E1 for test data.

**4.1.10 Receiver Reference Sensitivity Level**

**Limit**

The throughput shall be  $\geq 95\%$  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  $P_{REFSENS}$**

E-UTRA Band	Channel bandwidth						Duplex Mode
	1,4 MHz (dBm)	3 MHz (dBm)	5 MHz (dBm)	10 MHz (dBm)	15 MHz (dBm)	20 MHz (dBm)	
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

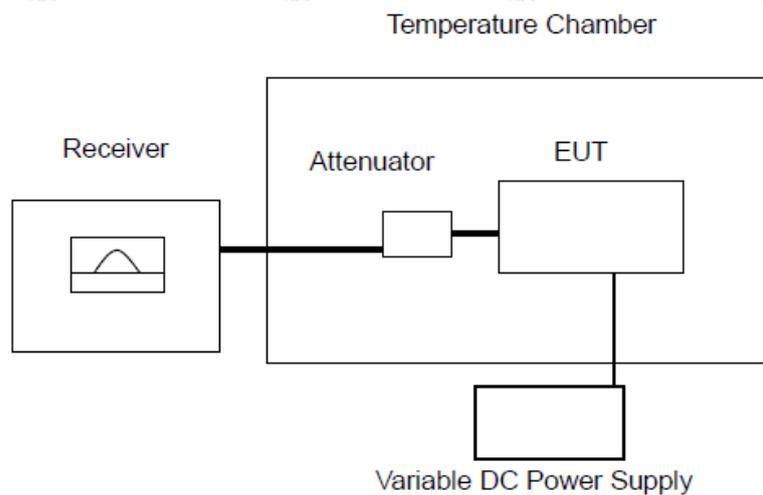
NOTE 1: The transmitter shall be set to maximum output power level (ETSI TS 136 521-1 [1], table 7.3.5-2).

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.

The reference receive sensitivity (REFSENS) requirement specified in table 4.2.12.1.2-1 shall be met for an uplink transmission bandwidth less than or equal to that specified in ETSI TS 136 521-1 [1], table 7.3.5-2.

**Setup**



**Test Procedures**

- 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.  
Details of the test method can be found in ETSI TS 136 521-1 [1], clause 7.3.

**Test Result**

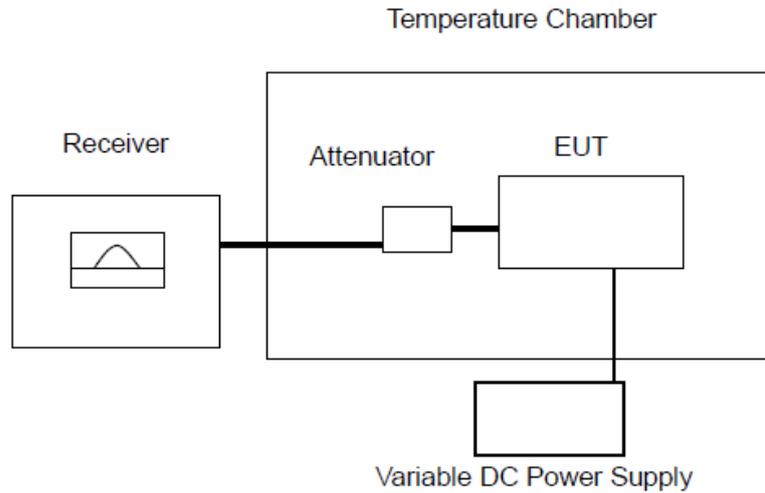
See Report 2107RSU065-E1 for test data.

#### 4.1.11 Control and monitoring functions (UE)

##### Limit

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

##### Setup



##### Test Procedures

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  $\mu$ s of a CW signal being applied;
- it shall record the maximum power measured.

##### NOTE:

The equipment may include a video low pass filter to minimize its response to transients or Gaussian noise peaks.

- The UE shall be switched on for a period of approximately fifteen minutes, and then switched off.
- 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.
- The maximum power emitted from the UE throughout the duration of the test shall be recorded.

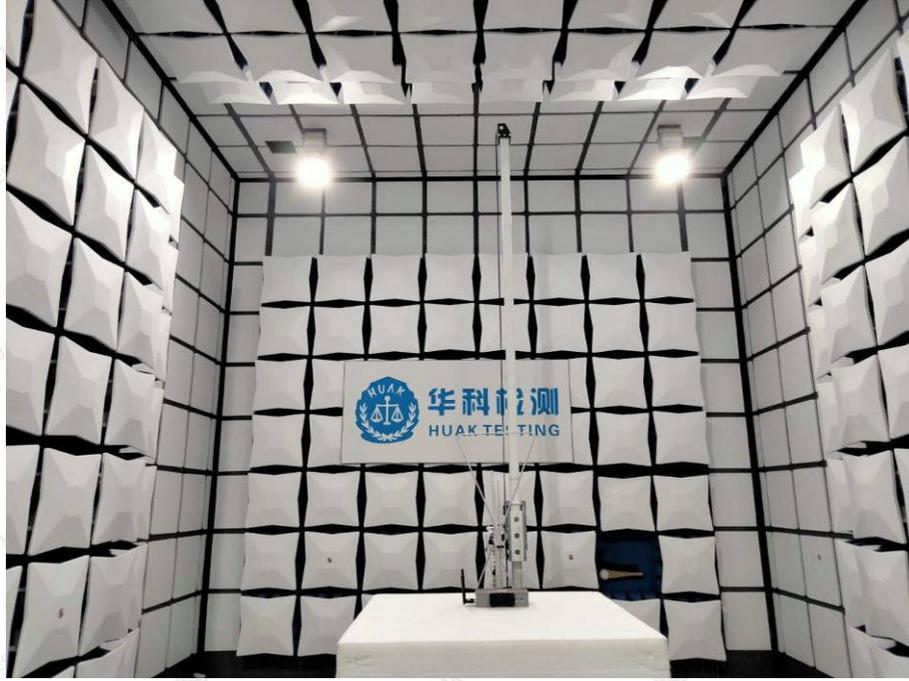
The results obtained shall be compared to the limits in clause 4.2.4.2 in order to prove compliance.

##### Test Result

See Report 2107RSU065-E1 for test data.



## 5. Test Set-up Photos of the EUT

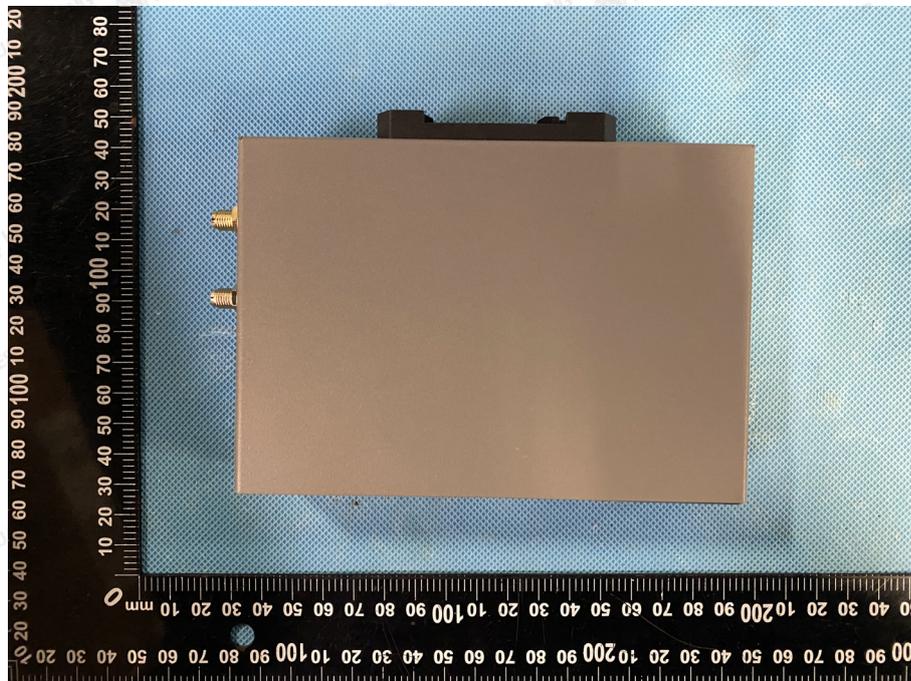


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## 6. External and Internal Photos of the EUT

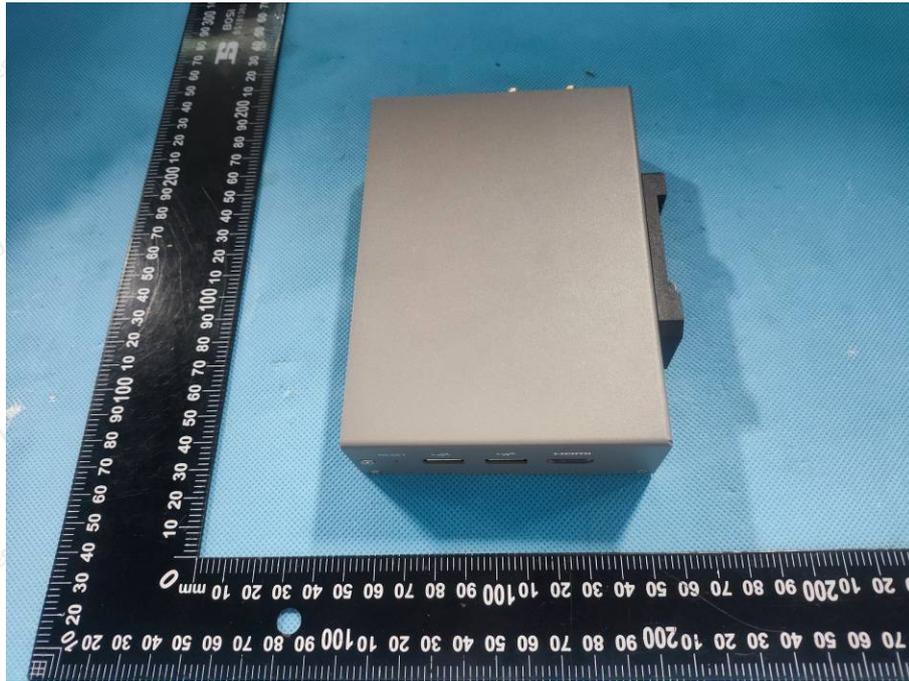




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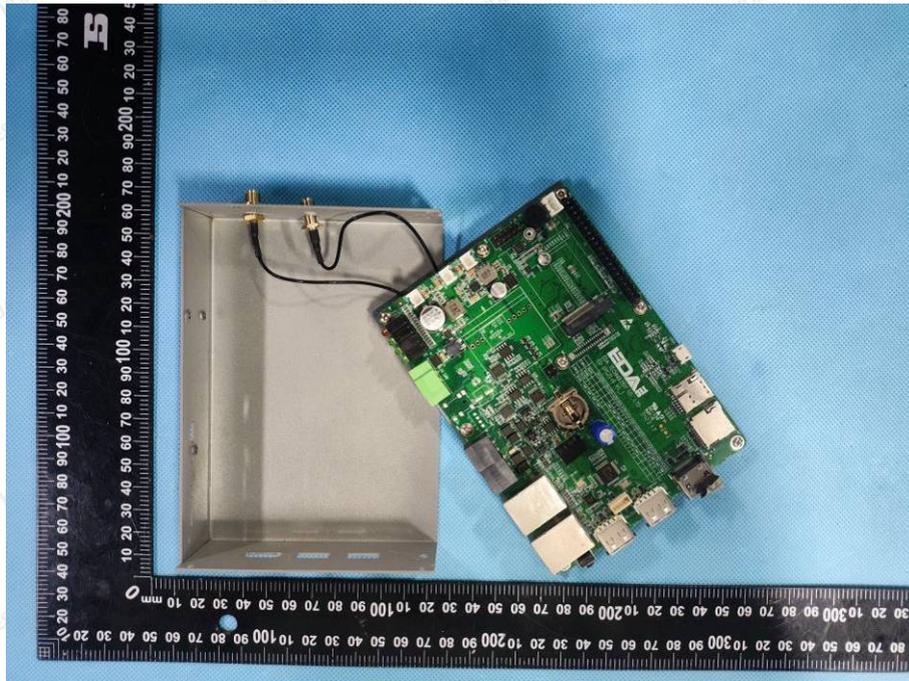
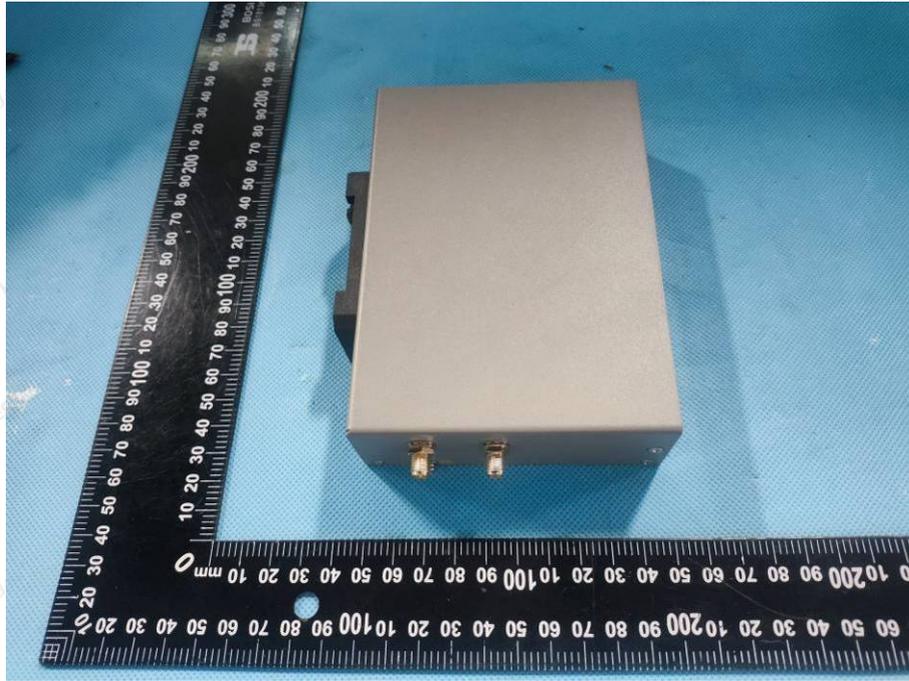
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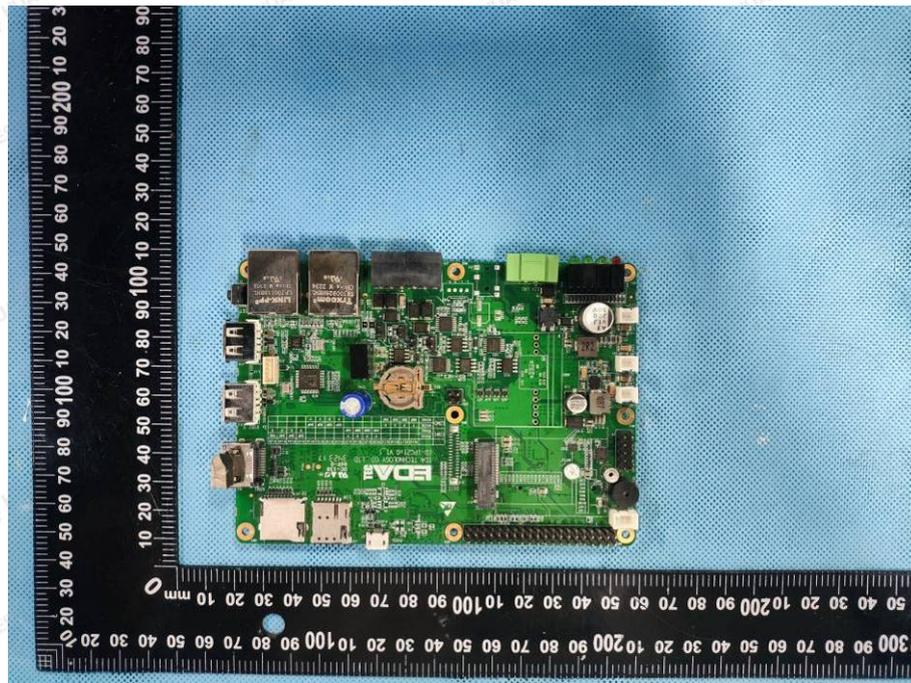
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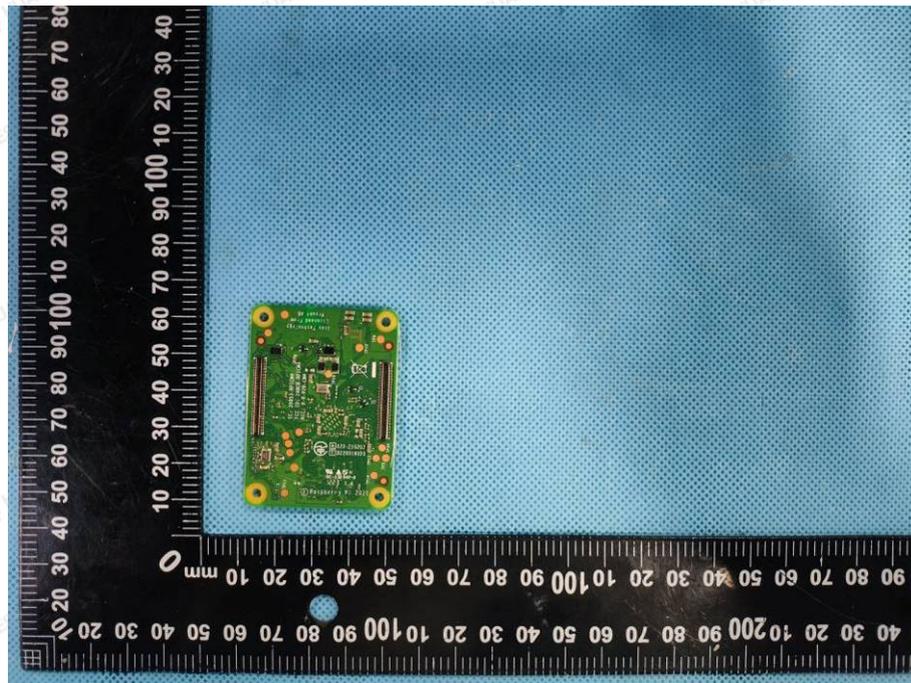
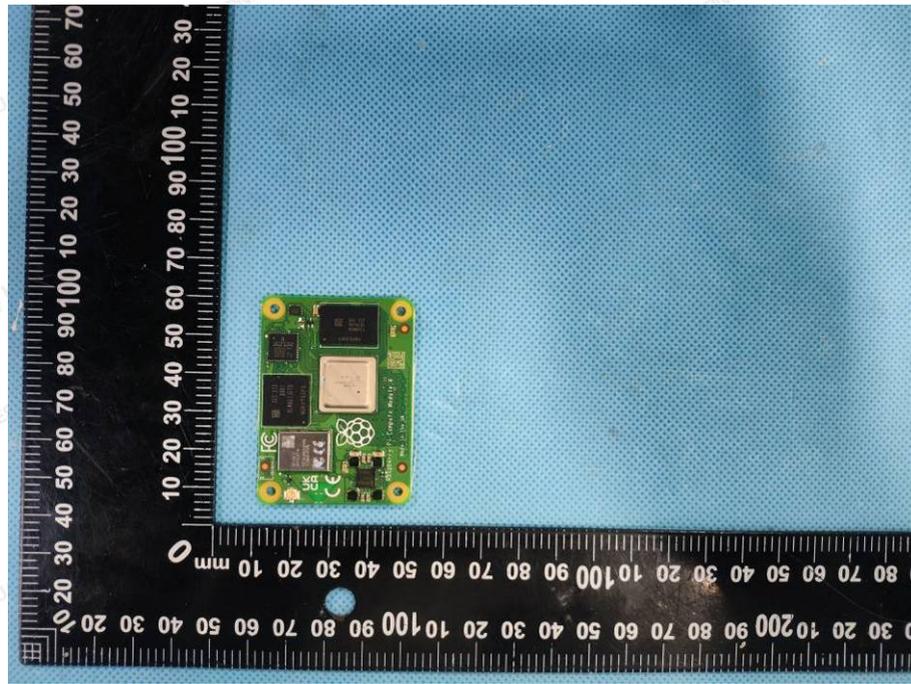
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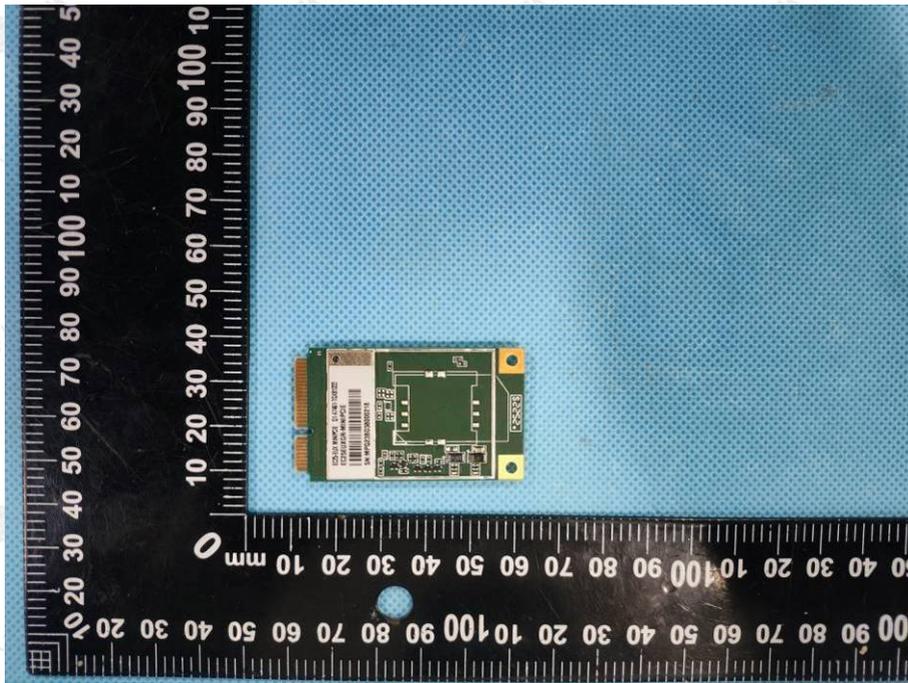
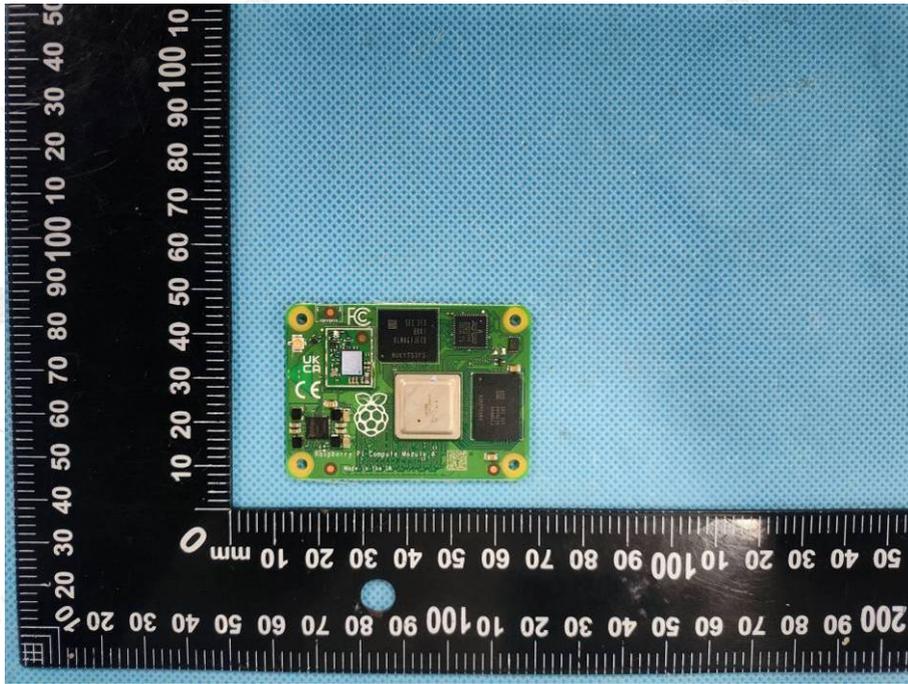
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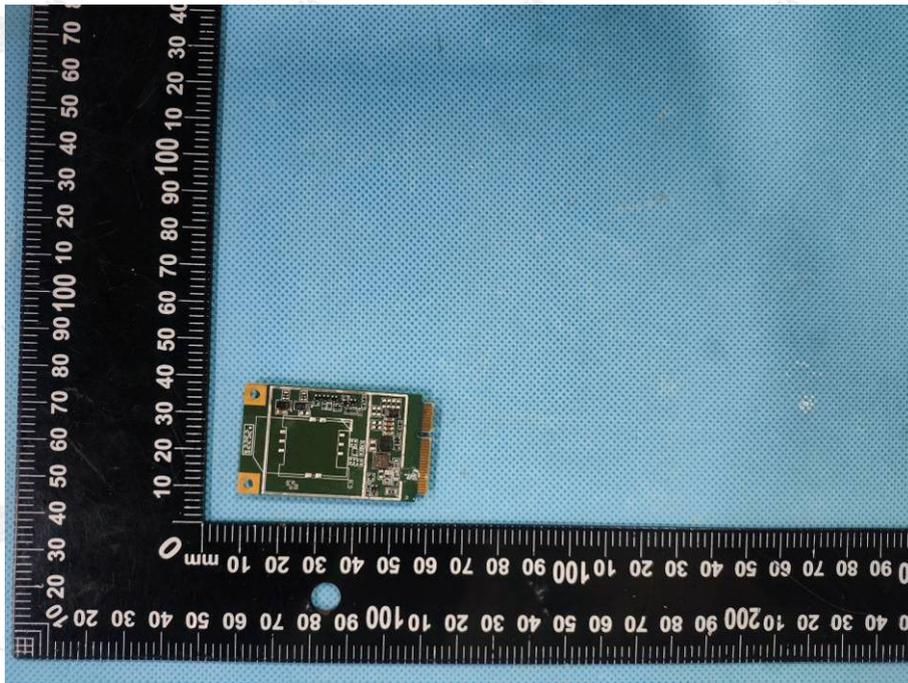
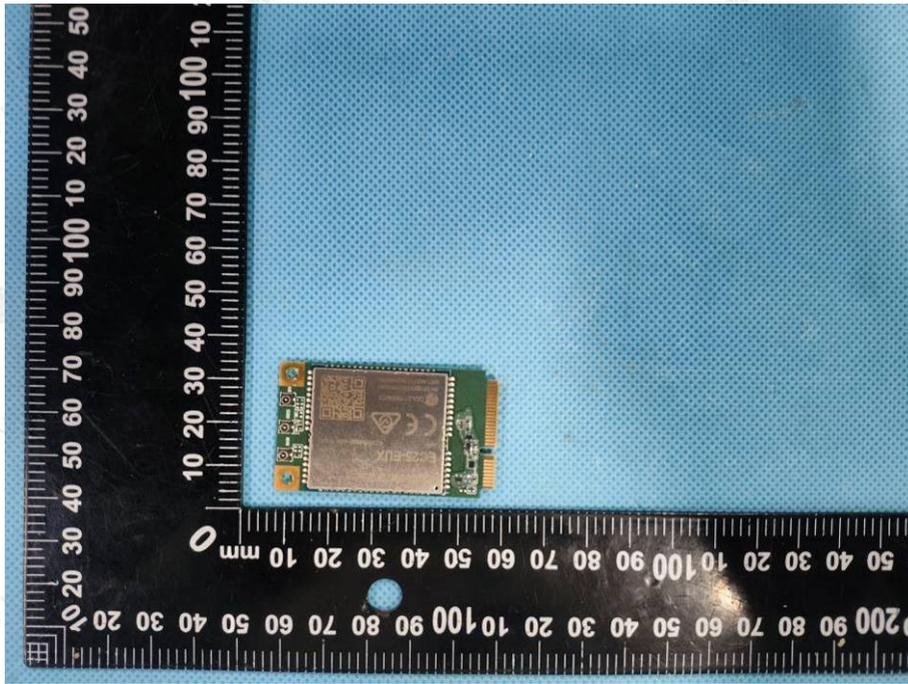
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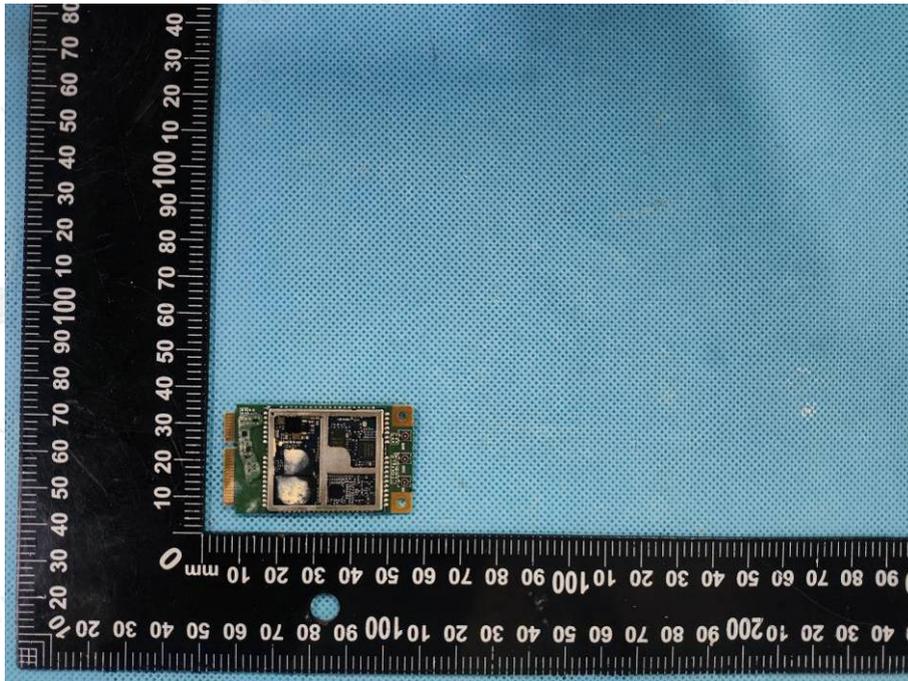
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