



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......: **HK2406123051-6ER**

Compiled by

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Jason Zhou

Date of issue.....: 2024/06/27

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 29, Shengchuang Enterprise Park, No.1661 Jialuo Road, Jiading District, Shanghai, PRC

Test specification

Standard.....: **ETSI EN 301 908-1 V15.2.1 (2023-01)**

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

Trade Mark



Product Model

Serial Model.....: ED-IPC2610, ED-IPC2612, ED-IPC2613, ED-IPC2614,
ED-IPC2620, ED-IPC2622, ED-IPC2623, ED-IPC2624,
ED-IPC2632, ED-IPC2633, ED-IPC2634

Modulation

E-UTRA Frequency Band.....: QPSK,16QAM
FDD1, FDD3, FDD7, FDD8, FDD20, FDD28, TDD38 & TDD40

Power Class.....: Power Class 3

Ratings.....: DC 9-36V

Hardware version

Software version.....: V1.1
V2.0

Result.....: **PASS**

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TEST REPORT

Test Report No. :	HK2406123051-6ER	2024/06/27
		Date of issue

Product Name : ED-IPC2600

Product Model : ED-IPC2630

Serial Model : ED-IPC2610, ED-IPC2612, ED-IPC2613, ED-IPC2614, ED-IPC2620, ED-IPC2622, ED-IPC2623, ED-IPC2624, ED-IPC2632, ED-IPC2633, ED-IPC2634

Applicant : EDA Technology Shanghai Co., Ltd.

Address : Building 29, Shengchuang Enterprise Park, No.1661 Jialuo Road, Jiading District, Shanghai, PRC

Manufacturer : EDA Technology Shanghai Co., Ltd.

Address : Building 29, Shengchuang Enterprise Park, No.1661 Jialuo Road, Jiading District, Shanghai, PRC

Test Result	PASS
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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 ****

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	2024/06/27	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	:	2024/06/12
Testing commenced on	:	2024/06/12
Testing concluded on	:	2024/06/27

2.2. Product Description

Product Name:	ED-IPC2600
Model/Type reference:	ED-IPC2630
List Model:	ED-IPC2610, ED-IPC2612, ED-IPC2613, ED-IPC2614, ED-IPC2620, ED-IPC2622, ED-IPC2623, ED-IPC2624, ED-IPC2632, ED-IPC2633, ED-IPC2634
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-IPC2630.
Power supply:	DC 9-36V
Auxiliary test equipment:	N/A
LTE	
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:Antenna gain Refer to the antenna specifications. The cable loss data is obtained from the supplier. The test results in the report only apply to the tested sample.	
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

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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 HUAK 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 EN 301 908-1, Test Description, Uncertainty. Rows include Radiated emissions (UE) with 2.20 dB uncertainty and Control and monitoring functions (UE) with 5.50 dB uncertainty. A second section for ETSI TS 136 521-1 includes Maximum Output Power (0.781 dB), Minimum Output Power (0.781 dB), and various Adjacent Channel Leakage Power Ratio (ACLR) and Spurious Emissions tests.

- (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	2024/02/20	2025/02/19
2	Spectrum analyzer	Agilent	N9020A	HKE-025	2024/02/20	2025/02/19
3	Wireless Communication Test Set	R&S	CMU200	HKE-026	2024/02/20	2025/02/19
4	Wireless Communication Test Set	R&S	CMU200	HKE-188	2024/02/20	2025/02/19
5	Wireless Communication Test Set	R&S	CMW500	HKE-027	2024/02/20	2025/02/19
6	programmable power supply	Agilent	E3646A	HKE-092	2024/02/20	2025/02/19
7	Signal Generator	Agilent	83630A	HKE-028	2024/02/20	2025/02/19

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	2024/02/20	2025/02/19

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	2024/02/20	2025/02/19

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	2024/02/21	2026/02/20
2	Horn antenna	Schwarzbeck	9120D	HKE-013	2024/02/21	2026/02/20
3	Receiver	R&S	ESR-7	HKE-010	2024/02/20	2025/02/19
4	Position controller	Taiwan MF	MF7802	HKE-011	2024/02/20	2025/02/19
5	Preamplifier	Schwarzbeck	EMC05184 5SE	HKE-015	2024/02/20	2025/02/19
6	Preamplifier	Agilent	83051A	HKE-016	2024/02/20	2025/02/19
7	High pass filter unit	Tonscend	JS0806-F	HKE-055	2024/02/20	2025/02/19
8	Spectrum analyzer	Agilent	N9020A	HKE-048	2024/02/20	2025/02/19
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	2024/02/20	2025/02/19



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

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

NOTE 1: The first and last measurement position with a 30 kHz filter is at Δf_{OOB} equals to 0,015 MHz and 0,985 MHz.
NOTE 2: The first and last measurement position with a 1 MHz filter for 1 MHz - 2,5 MHz offset range is at Δf_{OOB} equals to 1,5 MHz and 2,0 MHz. Similarly for other Δf_{OOB} ranges.
NOTE 3: The measurements 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 Δf_{OOB} equals to 3 MHz.

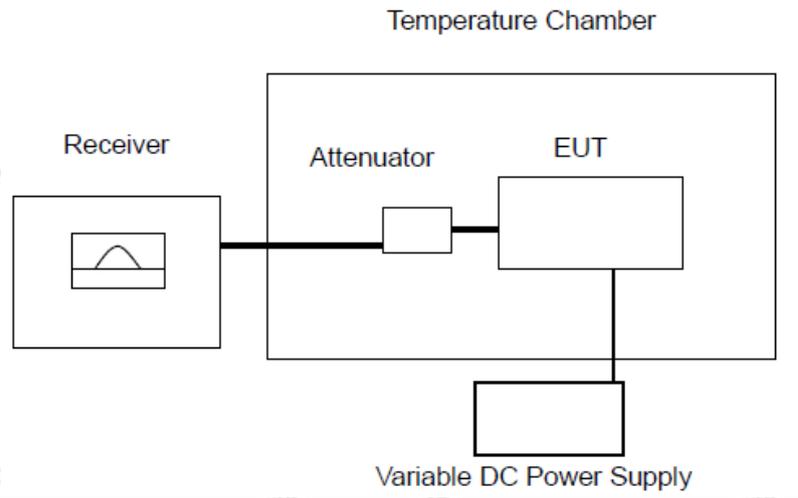
Table 4.2.3.1.2-2: General E-UTRA spectrum emission mask, 3 GHz < E-UTRA bands ≤ 4,2 GHz

Δf_{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 Δf_{OOB} equals to 0,015 MHz and 0,985 MHz.
NOTE 2: At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0,5 MHz and -0,5 MHz, respectively.
NOTE 3: The measurements 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 Δf_{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 136 521-1 [1], table 6.6.2.1.4.1-1. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.
2. Send continuously uplink power control "up" commands in the uplink scheduling information to the UE until the UE transmits at PUMAX level.
3. Measure the power of the transmitted signal with a measurement filter of bandwidths according to tables 4.2.3.1.2-1 or 4.2.3.1.2-2, as applicable. The center frequency of the filter shall be stepped in continuous steps according to the same table. The measured power shall be recorded for each step. The measurement period shall capture the active TSs.
4. Repeat for applicable test frequencies, channel bandwidths, 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].

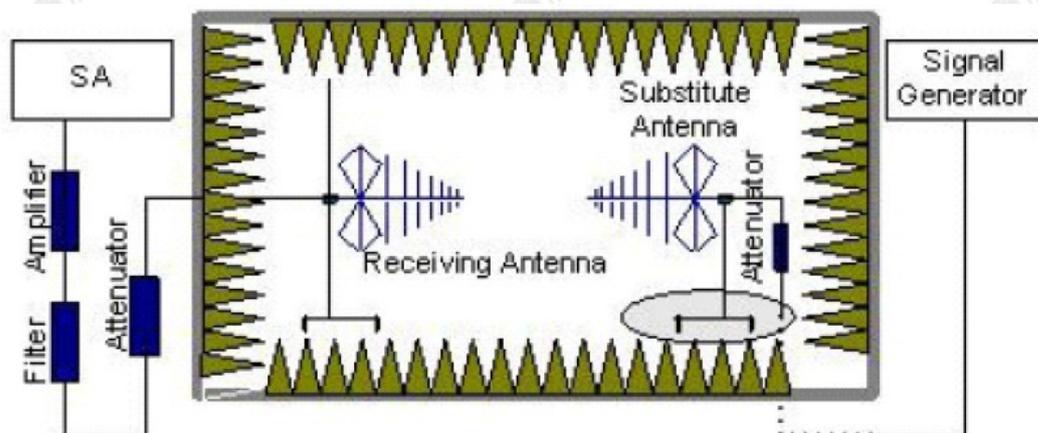
The requirements shown in table 4.2.2.2-1 are only applicable for frequencies in the spurious domain.

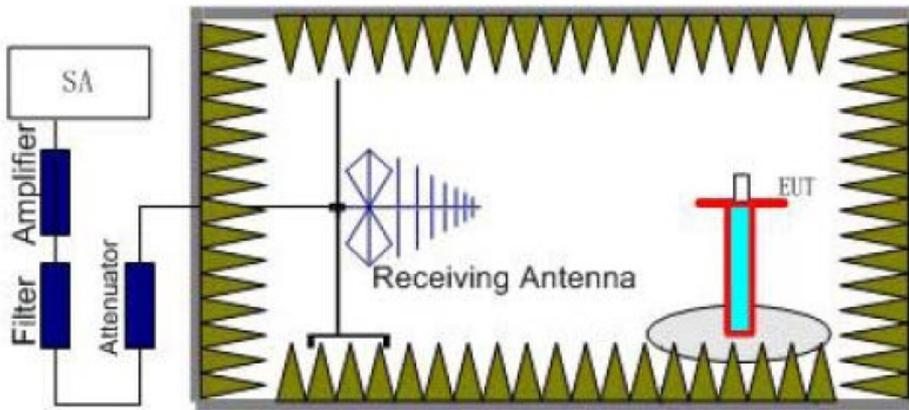
Table 4.2.2.2-1: Radiated spurious emissions requirements (UE)

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





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_R : reading of the receiver (dBm)

L_C : Cable Lose and power amilifer gain and filter cable loss (dB)

L_A : 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
Below 1GHz:					
171.08	V	-54.54	-36	-18.54	PASS
174.23	V	-53.58	-36	-17.58	PASS
256.22	V	-52.25	-36	-16.25	PASS
382.28	V	-54.36	-36	-18.36	PASS
476.98	V	-53.24	-36	-17.24	PASS
760.83	V	-55.58	-36	-19.58	PASS
215.01	H	-55.58	-36	-19.58	PASS
216.14	H	-57.48	-36	-21.48	PASS
258.87	H	-53.37	-36	-17.37	PASS
367.04	H	-53.55	-36	-17.55	PASS
579.48	H	-53.43	-36	-17.43	PASS
792.01	H	-52.57	-36	-16.57	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
Above 1GHz:					
1188.62	V	-50.54	-30	-20.54	PASS
1772.54	V	-58.01	-30	-28.01	PASS
3000.72	V	-55.81	-30	-25.81	PASS
3608.49	V	-59.35	-30	-29.35	PASS
4966.07	V	-48.13	-30	-18.13	PASS
5399.45	V	-54.49	-30	-24.49	PASS
1740.24	H	-57.35	-30	-27.35	PASS
1991.56	H	-59.51	-30	-29.51	PASS
2477.25	H	-50.29	-30	-20.29	PASS
3180.73	H	-52.88	-30	-22.88	PASS
4325.44	H	-55.37	-30	-25.37	PASS
6071.86	H	-60.26	-30	-30.26	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
138.23	V	-73.53	-57	-16.53	PASS
171.63	V	-78.26	-57	-21.26	PASS
273.18	V	-71.79	-57	-14.79	PASS
387.39	V	-79.68	-57	-22.68	PASS
487.42	V	-71.96	-57	-14.96	PASS
759.27	V	-72.95	-57	-15.95	PASS
198.13	H	-76.45	-57	-19.45	PASS
209.11	H	-77.84	-57	-20.84	PASS
271.69	H	-73.59	-57	-16.59	PASS
348.99	H	-75.18	-57	-18.18	PASS
564.19	H	-73.54	-57	-16.54	PASS
792.32	H	-75.68	-57	-18.68	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
Above 1GHz:					
1394.48	V	-74.88	-47	-27.88	PASS
1797.45	V	-75.23	-47	-28.23	PASS
2963.45	V	-73.13	-47	-26.13	PASS
3740.95	V	-78.86	-47	-31.86	PASS
4896.73	V	-74.41	-47	-27.41	PASS
5296.54	V	-76.41	-47	-29.41	PASS
1754.73	H	-76.27	-47	-29.27	PASS
1971.66	H	-76.94	-47	-29.94	PASS
2402.19	H	-72.95	-47	-25.95	PASS
3337.03	H	-73.26	-47	-26.26	PASS
4316.77	H	-75.28	-47	-28.28	PASS
6001.32	H	-80.74	-47	-33.74	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
147.95	V	-54.75	-36	-18.75	PASS
176.78	V	-56.48	-36	-20.48	PASS
271.12	V	-55.78	-36	-19.78	PASS
379.57	V	-53.34	-36	-17.34	PASS
480.05	V	-51.51	-36	-15.51	PASS
771.19	V	-56.73	-36	-20.73	PASS
192.14	H	-53.05	-36	-17.05	PASS
218.27	H	-57.45	-36	-21.45	PASS
271.34	H	-56.11	-36	-20.11	PASS
377.91	H	-56.36	-36	-20.36	PASS
565.33	H	-55.99	-36	-19.99	PASS
791.27	H	-55.75	-36	-19.75	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
Above 1GHz:					
1494.83	V	-52.15	-30	-22.15	PASS
1953.84	V	-57.76	-30	-27.76	PASS
3096.34	V	-57.05	-30	-27.05	PASS
3574.33	V	-58.66	-30	-28.66	PASS
4878.44	V	-50.16	-30	-20.16	PASS
5557.15	V	-54.09	-30	-24.09	PASS
1630.97	H	-53.55	-30	-23.55	PASS
1916.57	H	-57.45	-30	-27.45	PASS
2377.93	H	-52.75	-30	-22.75	PASS
3200.63	H	-51.24	-30	-21.24	PASS
4370.47	H	-53.99	-30	-23.99	PASS
5904.03	H	-59.83	-30	-29.83	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
162.69	V	-75.77	-57	-18.77	PASS
178.68	V	-78.13	-57	-21.13	PASS
266.85	V	-71.75	-57	-14.75	PASS
392.82	V	-76.15	-57	-19.15	PASS
479.95	V	-70.26	-57	-13.26	PASS
773.48	V	-77.49	-57	-20.49	PASS
189.99	H	-73.77	-57	-16.77	PASS
230.19	H	-77.74	-57	-20.74	PASS
255.34	H	-70.14	-57	-13.14	PASS
348.11	H	-79.88	-57	-22.88	PASS
557.99	H	-73.28	-57	-16.28	PASS
786.32	H	-79.78	-57	-22.78	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
Above 1GHz:					
1184.69	V	-72.18	-47	-25.18	PASS
1868.29	V	-76.67	-47	-29.67	PASS
3075.16	V	-74.55	-47	-27.55	PASS
3626.63	V	-80.67	-47	-33.67	PASS
4945.14	V	-74.15	-47	-27.15	PASS
5310.03	V	-75.93	-47	-28.93	PASS
1648.55	H	-74.68	-47	-27.68	PASS
1851.43	H	-75.33	-47	-28.33	PASS
2409.39	H	-75.95	-47	-28.95	PASS
3332.03	H	-74.13	-47	-27.13	PASS
4330.07	H	-75.78	-47	-28.78	PASS
6013.08	H	-77.06	-47	-30.06	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
150.99	V	-51.95	-36	-15.95	PASS
166.92	V	-52.44	-36	-16.44	PASS
267.99	V	-51.08	-36	-15.08	PASS
379.27	V	-55.17	-36	-19.17	PASS
484.41	V	-52.18	-36	-16.18	PASS
758.53	V	-56.77	-36	-20.77	PASS
200.19	H	-52.66	-36	-16.66	PASS
224.43	H	-53.79	-36	-17.79	PASS
251.92	H	-55.78	-36	-19.78	PASS
365.44	H	-59.78	-36	-23.78	PASS
578.62	H	-56.17	-36	-20.17	PASS
781.63	H	-56.45	-36	-20.45	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
Above 1GHz:					
1339.55	V	-50.49	-30	-20.49	PASS
1983.14	V	-59.32	-30	-29.32	PASS
2998.96	V	-50.31	-30	-20.31	PASS
3619.43	V	-61.98	-30	-31.98	PASS
4959.77	V	-48.83	-30	-18.83	PASS
5307.33	V	-51.56	-30	-21.56	PASS
1691.44	H	-53.35	-30	-23.35	PASS
1780.73	H	-57.94	-30	-27.94	PASS
2414.82	H	-51.74	-30	-21.74	PASS
3348.55	H	-50.71	-30	-20.71	PASS
4517.66	H	-55.21	-30	-25.21	PASS
6062.55	H	-59.53	-30	-29.53	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
166.01	V	-73.49	-57	-16.49	PASS
178.82	V	-81.51	-57	-24.51	PASS
269.24	V	-71.07	-57	-14.07	PASS
398.44	V	-79.28	-57	-22.28	PASS
479.19	V	-72.98	-57	-15.98	PASS
761.68	V	-78.51	-57	-21.51	PASS
189.09	H	-78.13	-57	-21.13	PASS
223.11	H	-75.06	-57	-18.06	PASS
268.08	H	-73.34	-57	-16.34	PASS
354.67	H	-76.73	-57	-19.73	PASS
564.05	H	-72.61	-57	-15.61	PASS
788.87	H	-78.64	-57	-21.64	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
Above 1GHz:					
1100.75	V	-75.19	-47	-28.19	PASS
1905.14	V	-78.08	-47	-31.08	PASS
3046.52	V	-73.39	-47	-26.39	PASS
3642.66	V	-79.83	-47	-32.83	PASS
5001.93	V	-74.08	-47	-27.08	PASS
5285.93	V	-75.41	-47	-28.41	PASS
1722.59	H	-76.75	-47	-29.75	PASS
1827.78	H	-75.09	-47	-28.09	PASS
2498.45	H	-75.21	-47	-28.21	PASS
3243.08	H	-68.04	-47	-21.04	PASS
4207.18	H	-75.24	-47	-28.24	PASS
5960.36	H	-76.89	-47	-29.89	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
135.05	V	-56.77	-36	-20.77	PASS
163.78	V	-58.74	-36	-22.74	PASS
252.77	V	-54.93	-36	-18.93	PASS
381.03	V	-57.93	-36	-21.93	PASS
495.02	V	-55.65	-36	-19.65	PASS
777.53	V	-55.28	-36	-19.28	PASS
209.21	H	-56.05	-36	-20.05	PASS
213.11	H	-55.39	-36	-19.39	PASS
257.31	H	-58.68	-36	-22.68	PASS
364.37	H	-55.93	-36	-19.93	PASS
566.23	H	-55.66	-36	-19.66	PASS
785.11	H	-59.56	-36	-23.56	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
Above 1GHz:					
1339.09	V	-52.49	-30	-22.49	PASS
1890.27	V	-56.53	-30	-26.53	PASS
2974.12	V	-55.67	-30	-25.67	PASS
3782.98	V	-60.23	-30	-30.23	PASS
4998.57	V	-51.45	-30	-21.45	PASS
5365.54	V	-57.77	-30	-27.77	PASS
1597.07	H	-50.54	-30	-20.54	PASS
1887.97	H	-54.29	-30	-24.29	PASS
2246.34	H	-57.17	-30	-27.17	PASS
3125.44	H	-50.46	-30	-20.46	PASS
4576.75	H	-52.73	-30	-22.73	PASS
6088.22	H	-57.55	-30	-27.55	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
141.62	V	-72.39	-57	-15.39	PASS
185.35	V	-80.58	-57	-23.58	PASS
265.58	V	-73.69	-57	-16.69	PASS
379.31	V	-74.77	-57	-17.77	PASS
489.03	V	-77.84	-57	-20.84	PASS
745.14	V	-78.19	-57	-21.19	PASS
192.08	H	-73.23	-57	-16.23	PASS
217.07	H	-80.64	-57	-23.64	PASS
248.48	H	-74.47	-57	-17.47	PASS
345.57	H	-77.13	-57	-20.13	PASS
569.15	H	-74.05	-57	-17.05	PASS
786.52	H	-80.31	-57	-23.31	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
Above 1GHz:					
1475.23	V	-73.91	-47	-26.91	PASS
2150.75	V	-78.48	-47	-31.48	PASS
3200.99	V	-72.19	-47	-25.19	PASS
3522.13	V	-79.49	-47	-32.49	PASS
4914.39	V	-72.31	-47	-25.31	PASS
5494.05	V	-74.65	-47	-27.65	PASS
1735.72	H	-76.48	-47	-29.48	PASS
1728.67	H	-82.54	-47	-35.54	PASS
2575.94	H	-76.23	-47	-29.23	PASS
3384.88	H	-75.14	-47	-28.14	PASS
4391.45	H	-73.16	-47	-26.16	PASS
5765.72	H	-78.35	-47	-31.35	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
153.85	V	-54.55	-36	-18.55	PASS
184.95	V	-56.37	-36	-20.37	PASS
256.39	V	-53.74	-36	-17.74	PASS
379.73	V	-57.29	-36	-21.29	PASS
469.63	V	-54.01	-36	-18.01	PASS
763.98	V	-55.97	-36	-19.97	PASS
220.19	H	-56.35	-36	-20.35	PASS
240.51	H	-55.11	-36	-19.11	PASS
245.88	H	-54.69	-36	-18.69	PASS
377.25	H	-54.58	-36	-18.58	PASS
593.69	H	-51.94	-36	-15.94	PASS
789.29	H	-58.39	-36	-22.39	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
Above 1GHz:					
1316.42	V	-52.35	-30	-22.35	PASS
1943.77	V	-58.95	-30	-28.95	PASS
2861.65	V	-52.64	-30	-22.64	PASS
3677.58	V	-60.38	-30	-30.38	PASS
4880.94	V	-50.33	-30	-20.33	PASS
5439.72	V	-56.33	-30	-26.33	PASS
1750.97	H	-55.28	-30	-25.28	PASS
1959.68	H	-58.41	-30	-28.41	PASS
2544.62	H	-50.39	-30	-20.39	PASS
3329.86	H	-49.19	-30	-19.19	PASS
4460.02	H	-51.89	-30	-21.89	PASS
6012.28	H	-60.39	-30	-30.39	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
151.33	V	-72.86	-57	-15.86	PASS
178.35	V	-78.58	-57	-21.58	PASS
272.94	V	-72.74	-57	-15.74	PASS
397.49	V	-78.06	-57	-21.06	PASS
474.87	V	-74.05	-57	-17.05	PASS
761.12	V	-74.81	-57	-17.81	PASS
205.92	H	-76.29	-57	-19.29	PASS
212.42	H	-83.47	-57	-26.47	PASS
268.78	H	-72.77	-57	-15.77	PASS
376.11	H	-75.47	-57	-18.47	PASS
577.62	H	-76.54	-57	-19.54	PASS
786.04	H	-76.85	-57	-19.85	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
Above 1GHz:					
1290.87	V	-72.85	-47	-25.85	PASS
1783.92	V	-76.85	-47	-29.85	PASS
2960.94	V	-70.63	-47	-23.63	PASS
3651.74	V	-83.33	-47	-36.33	PASS
4811.35	V	-75.01	-47	-28.01	PASS
5214.97	V	-79.05	-47	-32.05	PASS
1714.55	H	-73.47	-47	-26.47	PASS
2001.62	H	-78.96	-47	-31.96	PASS
2480.55	H	-74.59	-47	-27.59	PASS
3381.49	H	-73.75	-47	-26.75	PASS
4319.12	H	-74.19	-47	-27.19	PASS
5874.28	H	-77.17	-47	-30.17	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
167.92	V	-52.55	-36	-16.55	PASS
181.27	V	-56.53	-36	-20.53	PASS
259.98	V	-53.15	-36	-17.15	PASS
387.94	V	-57.78	-36	-21.78	PASS
470.59	V	-54.68	-36	-18.68	PASS
771.73	V	-55.65	-36	-19.65	PASS
223.97	H	-57.14	-36	-21.14	PASS
234.09	H	-54.46	-36	-18.46	PASS
263.27	H	-56.33	-36	-20.33	PASS
378.77	H	-53.53	-36	-17.53	PASS
571.15	H	-51.17	-36	-15.17	PASS
789.04	H	-57.48	-36	-21.48	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
Above 1GHz:					
1350.72	V	-52.37	-30	-22.37	PASS
1930.08	V	-57.58	-30	-27.58	PASS
2886.75	V	-51.82	-30	-21.82	PASS
3612.65	V	-61.53	-30	-31.53	PASS
4777.02	V	-51.57	-30	-21.57	PASS
5461.76	V	-53.37	-30	-23.37	PASS
1829.47	H	-57.11	-30	-27.11	PASS
2110.37	H	-58.85	-30	-28.85	PASS
2453.12	H	-49.24	-30	-19.24	PASS
3328.39	H	-51.56	-30	-21.56	PASS
4457.35	H	-52.26	-30	-22.26	PASS
6049.36	H	-58.89	-30	-28.89	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
156.29	V	-72.63	-57	-15.63	PASS
166.01	V	-79.94	-57	-22.94	PASS
267.47	V	-73.69	-57	-16.69	PASS
387.53	V	-76.58	-57	-19.58	PASS
468.74	V	-73.66	-57	-16.66	PASS
765.55	V	-74.81	-57	-17.81	PASS
204.93	H	-78.46	-57	-21.46	PASS
205.68	H	-80.56	-57	-23.56	PASS
268.17	H	-73.88	-57	-16.88	PASS
361.84	H	-71.74	-57	-14.74	PASS
578.74	H	-75.97	-57	-18.97	PASS
794.18	H	-77.35	-57	-20.35	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
Above 1GHz:					
1353.73	V	-71.81	-47	-24.81	PASS
1783.39	V	-77.59	-47	-30.59	PASS
2958.33	V	-72.96	-47	-25.96	PASS
3607.26	V	-82.67	-47	-35.67	PASS
4843.67	V	-76.36	-47	-29.36	PASS
5286.29	V	-77.45	-47	-30.45	PASS
1654.17	H	-77.23	-47	-30.23	PASS
1873.48	H	-77.55	-47	-30.55	PASS
2503.96	H	-71.48	-47	-24.48	PASS
3312.62	H	-77.21	-47	-30.21	PASS
4242.74	H	-73.96	-47	-26.96	PASS
5802.07	H	-78.72	-47	-31.72	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
153.82	V	-53.96	-36	-17.96	PASS
184.03	V	-55.13	-36	-19.13	PASS
261.46	V	-51.99	-36	-15.99	PASS
384.42	V	-56.65	-36	-20.65	PASS
469.08	V	-53.51	-36	-17.51	PASS
761.19	V	-55.91	-36	-19.91	PASS
217.54	H	-55.85	-36	-19.85	PASS
240.14	H	-54.29	-36	-18.29	PASS
249.47	H	-54.78	-36	-18.78	PASS
370.22	H	-55.26	-36	-19.26	PASS
591.03	H	-52.97	-36	-16.97	PASS
781.69	H	-58.87	-36	-22.87	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
Above 1GHz:					
1327.96	V	-52.66	-30	-22.66	PASS
1926.22	V	-58.25	-30	-28.25	PASS
2844.85	V	-53.47	-30	-23.47	PASS
3721.62	V	-60.47	-30	-30.47	PASS
4812.25	V	-50.95	-30	-20.95	PASS
5354.34	V	-55.53	-30	-25.53	PASS
1782.59	H	-54.33	-30	-24.33	PASS
1962.71	H	-57.04	-30	-27.04	PASS
2490.65	H	-49.79	-30	-19.79	PASS
3321.79	H	-50.46	-30	-20.46	PASS
4462.82	H	-51.04	-30	-21.04	PASS
5974.59	H	-59.58	-30	-29.58	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
154.29	V	-73.66	-57	-16.66	PASS
174.27	V	-78.75	-57	-21.75	PASS
270.62	V	-71.56	-57	-14.56	PASS
394.34	V	-76.25	-57	-19.25	PASS
469.59	V	-73.78	-57	-16.78	PASS
756.63	V	-73.33	-57	-16.33	PASS
198.53	H	-76.13	-57	-19.13	PASS
204.23	H	-83.32	-57	-26.32	PASS
262.59	H	-71.77	-57	-14.77	PASS
372.98	H	-75.88	-57	-18.88	PASS
582.01	H	-76.37	-57	-19.37	PASS
783.44	H	-77.71	-57	-20.71	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
Above 1GHz:					
1380.43	V	-72.31	-47	-25.31	PASS
1747.77	V	-77.65	-47	-30.65	PASS
2970.57	V	-71.16	-47	-24.16	PASS
3595.75	V	-83.77	-47	-36.77	PASS
4772.62	V	-74.27	-47	-27.27	PASS
5249.86	V	-78.53	-47	-31.53	PASS
1673.69	H	-74.98	-47	-27.98	PASS
1969.93	H	-79.53	-47	-32.53	PASS
2452.56	H	-75.49	-47	-28.49	PASS
3360.06	H	-73.96	-47	-26.96	PASS
4253.42	H	-73.95	-47	-26.95	PASS
5786.94	H	-76.68	-47	-29.68	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
164.12	V	-53.39	-36	-17.39	PASS
184.21	V	-55.98	-36	-19.98	PASS
251.43	V	-53.03	-36	-17.03	PASS
392.77	V	-57.21	-36	-21.21	PASS
465.56	V	-53.17	-36	-17.17	PASS
764.89	V	-55.14	-36	-19.14	PASS
217.21	H	-56.52	-36	-20.52	PASS
229.88	H	-54.23	-36	-18.23	PASS
260.35	H	-57.28	-36	-21.28	PASS
380.08	H	-53.74	-36	-17.74	PASS
570.75	H	-50.96	-36	-14.96	PASS
786.49	H	-56.67	-36	-20.67	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
Above 1GHz:					
1345.89	V	-52.75	-30	-22.75	PASS
1998.87	V	-57.95	-30	-27.95	PASS
2793.75	V	-50.94	-30	-20.94	PASS
3599.53	V	-61.87	-30	-31.87	PASS
4830.43	V	-50.67	-30	-20.67	PASS
5476.59	V	-54.23	-30	-24.23	PASS
1871.37	H	-56.41	-30	-26.41	PASS
2097.28	H	-59.31	-30	-29.31	PASS
2468.16	H	-49.54	-30	-19.54	PASS
3388.08	H	-50.92	-30	-20.92	PASS
4479.75	H	-51.21	-30	-21.21	PASS
6060.99	H	-58.34	-30	-28.34	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.					



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

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
153.04	V	-73.88	-57	-16.88	PASS
168.37	V	-79.71	-57	-22.71	PASS
270.74	V	-74.72	-57	-17.72	PASS
391.73	V	-76.55	-57	-19.55	PASS
469.09	V	-74.27	-57	-17.27	PASS
766.03	V	-75.41	-57	-18.41	PASS
199.44	H	-78.66	-57	-21.66	PASS
203.42	H	-79.67	-57	-22.67	PASS
269.98	H	-72.77	-57	-15.77	PASS
359.13	H	-72.15	-57	-15.15	PASS
577.97	H	-76.85	-57	-19.85	PASS
792.15	H	-75.77	-57	-18.77	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.					

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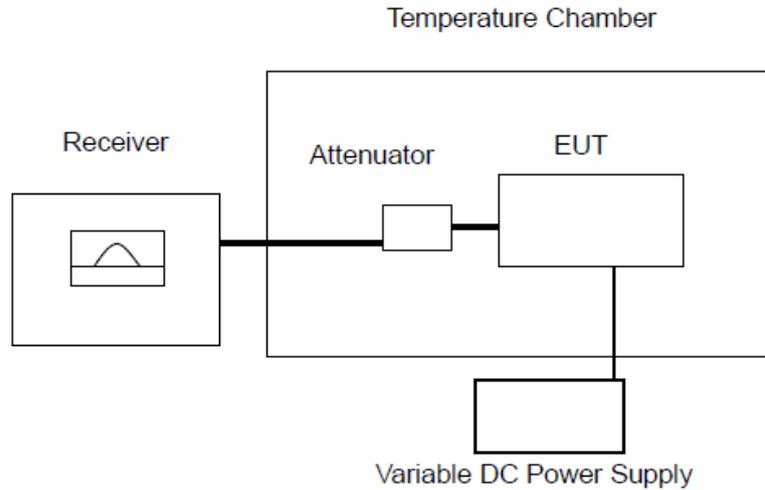
Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Above 1GHz:					
1397.44	V	-71.46	-47	-24.46	PASS
1723.99	V	-77.35	-47	-30.35	PASS
2970.83	V	-71.43	-47	-24.43	PASS
3595.64	V	-82.59	-47	-35.59	PASS
4863.23	V	-76.19	-47	-29.19	PASS
5234.16	V	-78.35	-47	-31.35	PASS
1667.83	H	-76.47	-47	-29.47	PASS
1824.77	H	-77.77	-47	-30.77	PASS
2481.98	H	-70.77	-47	-23.77	PASS
3347.95	H	-77.81	-47	-30.81	PASS
4187.58	H	-74.28	-47	-27.28	PASS
5740.74	H	-77.88	-47	-30.88	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.					

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.

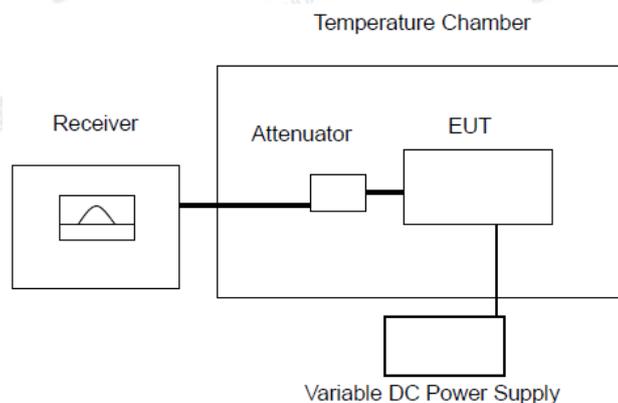
Table 4.2.6.2-2: Test parameters for Adjacent channel selectivity, Case 1

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 $P_{C_{MAX_L}}$ or $P_{C_{MAX_L_CA}}$ 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 $P_{C_{MAX_L}}$ or $P_{C_{MAX_L_CA}}$ 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 $3,0$ GHz $< f \leq 4,2$ 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 $3,0$ GHz $< f \leq 4,2$ 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 ≥ 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 ≥ 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 · INRB 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 ≥ 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

Table with 8 columns: Rx Parameter, Units, Channel bandwidth (1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz). Rows include Power in Transmission Bandwidth Configuration, BW Interferer, F_offset, case 1, and F_offset, case 2. Includes three notes at the bottom.

Table 4.2.7.2-2: In-band blocking

Table with 5 columns: E-UTRA band, Parameter, Units, Case 1, Case 2. Rows include P_Interferer, F_Interferer (Offset), and F_Interferer for specific bands. Includes three notes at the bottom.

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].							

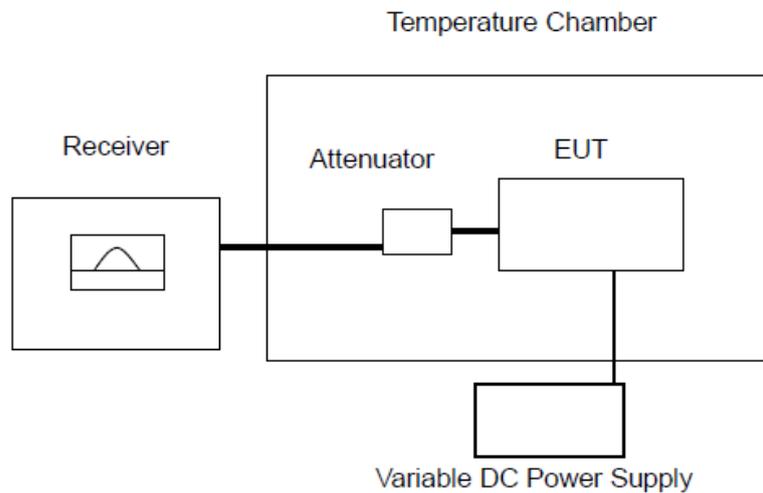
Table 4.2.7.2-4: Out-of-band blocking

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 $3,0$ 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.

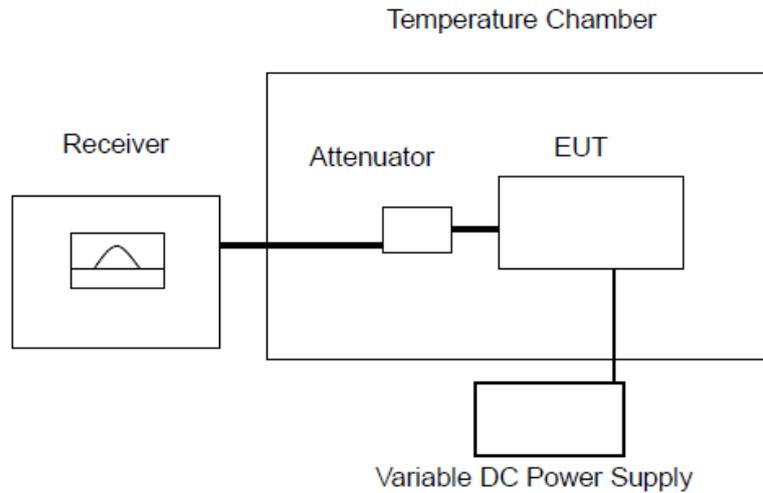
Table 4.2.8.2-1: Spurious response parameters

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 $3,0 \text{ GHz} < f \leq 4,2$ 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 ≥ 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 $3,0 \text{ GHz} < f \leq 4,2 \text{ GHz}$, for at least the duration of the throughput measurement as specified in TS 136 521-1 [1].
- 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_{ACLR} shall be higher than the limits in table 4.2.11.1.2-1.

Table 4.2.11.1.2-1: E-UTRA UE ACLR

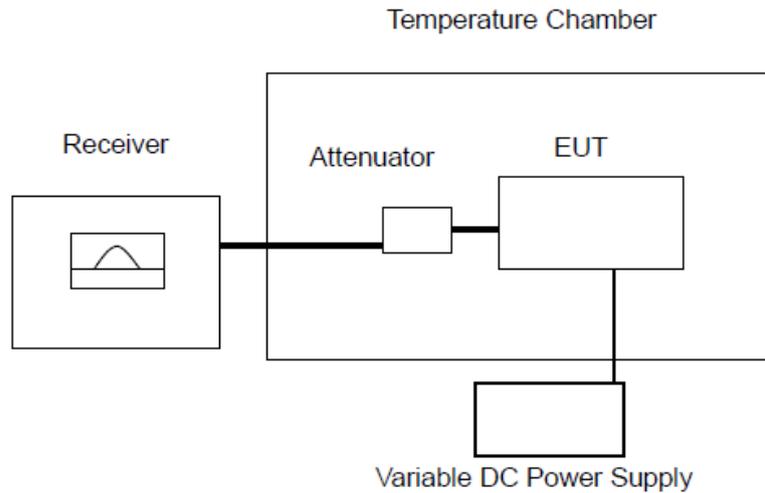
	Channel bandwidth/E-UTRA _{ACLR1} /measurement bandwidth					
	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
E-UTRA_{ACLR1}	29,2 dB	29,2 dB	29,2 dB	29,2 dB	29,2 dB	29,2 dB
E-UTRA channel Measurement bandwidth	1,08 MHz	2,7 MHz	4,5 MHz	9,0 MHz	13,5 MHz	18 MHz
UE channel	+1,4 MHz or -1,4 MHz	+3 MHz or -3 MHz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

If the measured UTRA channel power is greater than -50 dBm then the measured UTRA_{ACLR1}, UTRA_{ACLR2} 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 _{ACLR1/2} /measurement bandwidth					
	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
UTRA_{ACLR1}	32,2 dB	32,2 dB	32,2 dB	32,2 dB	32,2 dB	32,2 dB
Adjacent channel centre frequency offset (in MHz)	0,7 + BW _{UTRA} /2 / -0,7 - BW _{UTRA} /2	1,5 + BW _{UTRA} /2 / -1,5 - BW _{UTRA} /2	2,5 + BW _{UTRA} /2 / -2,5 - BW _{UTRA} /2	5 + BW _{UTRA} /2 / -5 - BW _{UTRA} /2	7,5 + BW _{UTRA} /2 / -7,5 - BW _{UTRA} /2	10 + BW _{UTRA} /2 / -10 - BW _{UTRA} /2
UTRA_{ACLR2}	-	-	35,2 dB	35,2 dB	35,2 dB	35,2 dB
Adjacent channel centre frequency offset (in MHz)	-	-	2,5 + 3 x BW _{UTRA} /2 / -2,5 - 3 x BW _{UTRA} /2	5 + 3 x BW _{UTRA} /2 / -5 - 3 x BW _{UTRA} /2	7,5 + 3 x BW _{UTRA} /2 / -7,5 - 3 x BW _{UTRA} /2	10 + 3 x BW _{UTRA} /2 / -10 - 3 x BW _{UTRA} /2
E-UTRA channel Measurement bandwidth	1,08 MHz	2,7 MHz	4,5 MHz	9,0 MHz	13,5 MHz	18 MHz
UTRA 5 MHz channel Measurement bandwidth (see note 1)	3,84 MHz	3,84 MHz	3,84 MHz	3,84 MHz	3,84 MHz	3,84 MHz
UTRA 1,6 MHz channel measurement bandwidth (see note 2)	1,28 MHz	1,28 MHz	1,28 MHz	1,28 MHz	1,28 MHz	1,28 MHz

NOTE 1: 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_{UTRA} 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

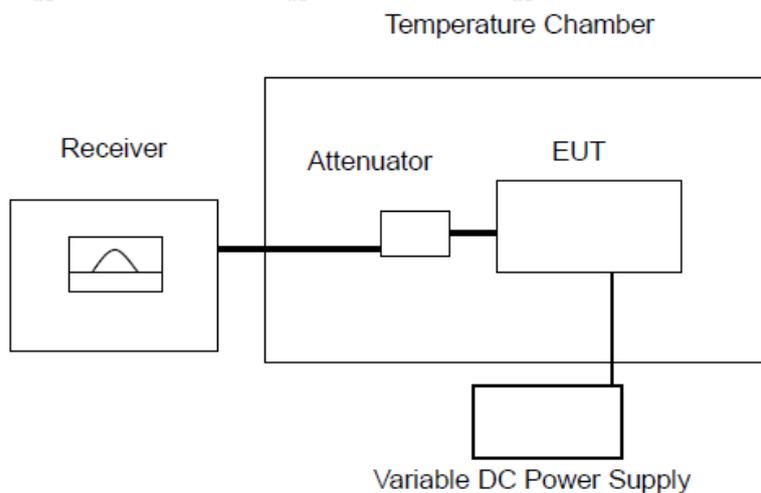
NOTE 1: The transmitter shall be set to maximum output power level (ETSI TS 136 521-1 [1], table 7.3.5-2).

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

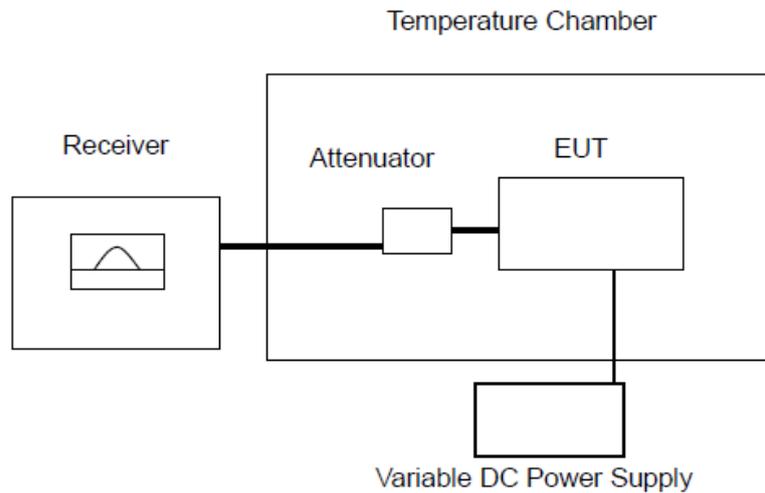
See Report 2107RSU065-E1 for test data.

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 μ 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.

- b) The UE shall be switched on for a period of approximately fifteen minutes, and then switched off.
 - c) 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.
 - d) 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



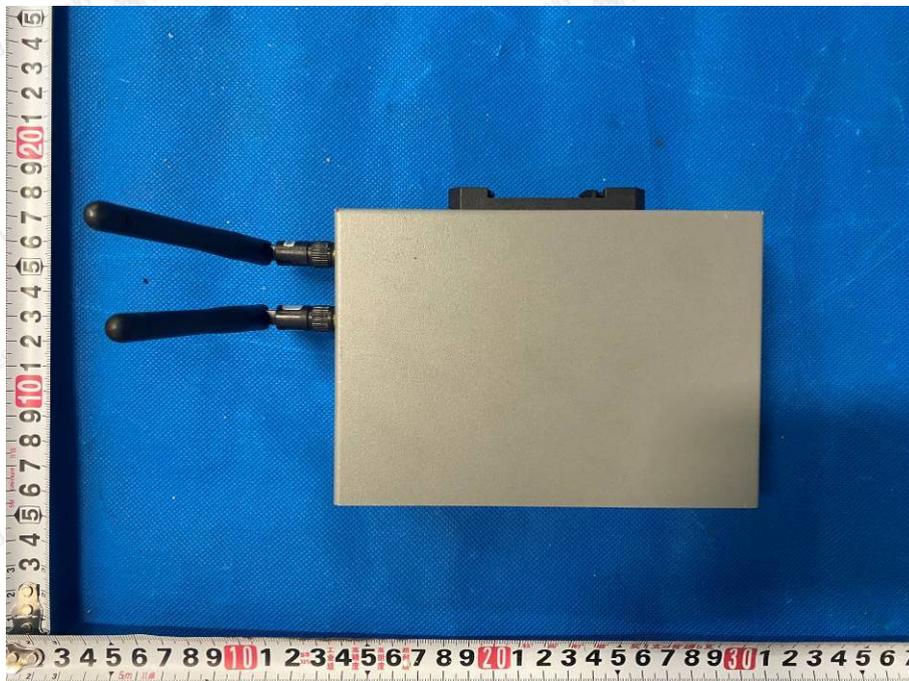
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

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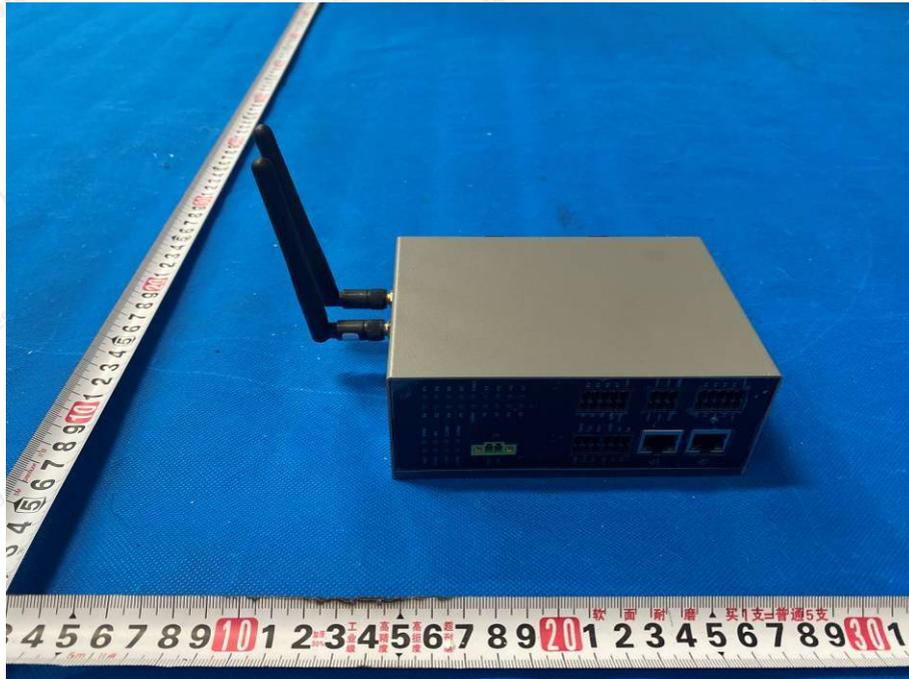
6. External and Internal Photos of the EUT



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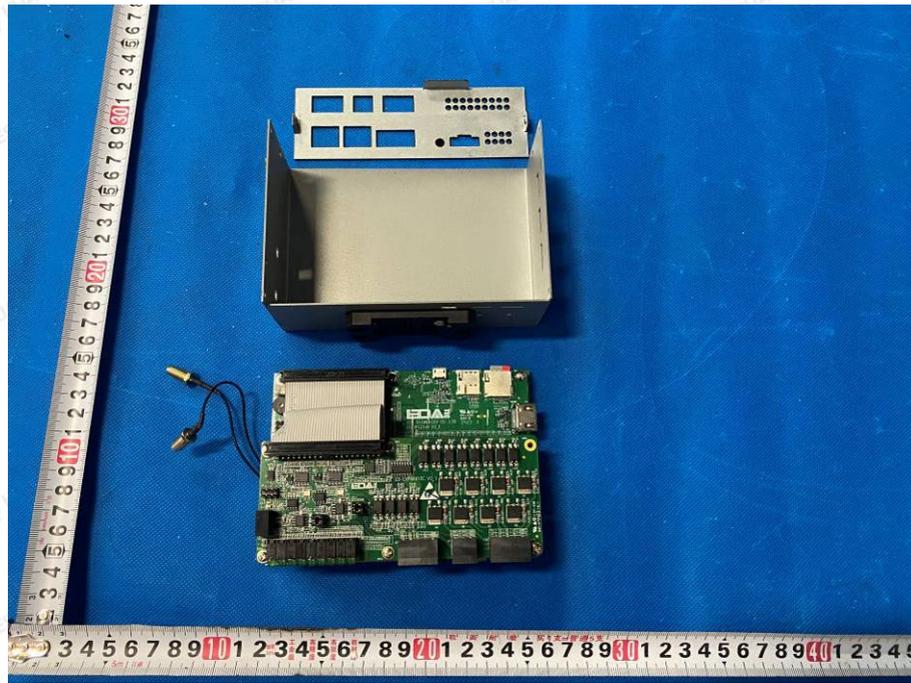
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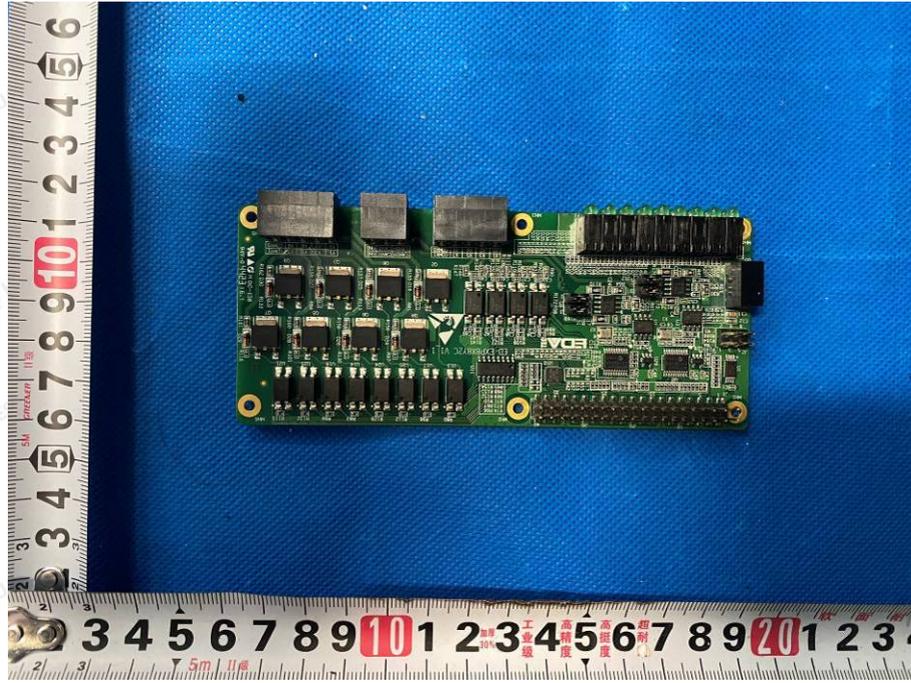
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



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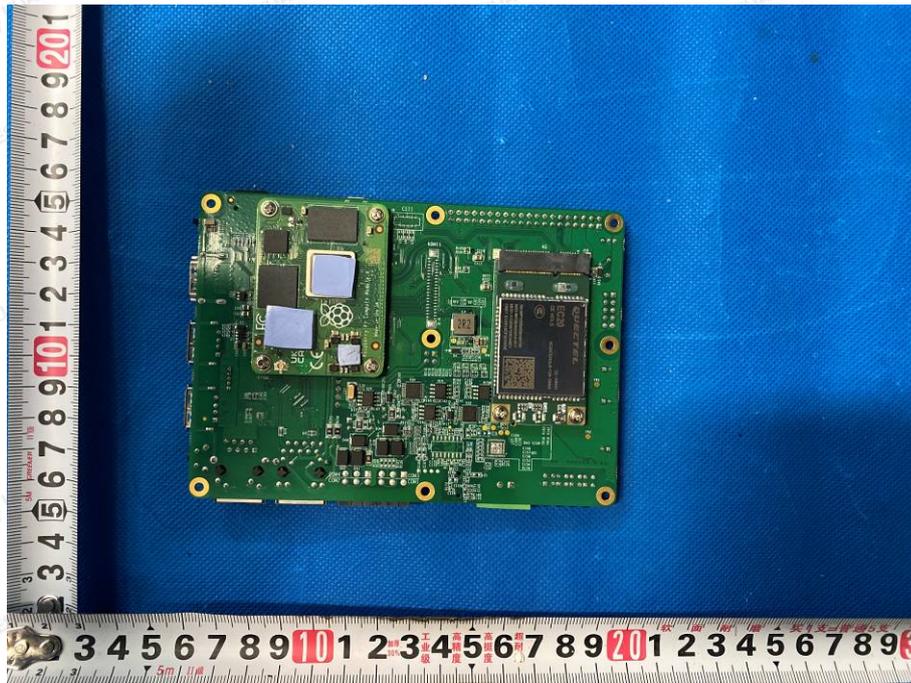
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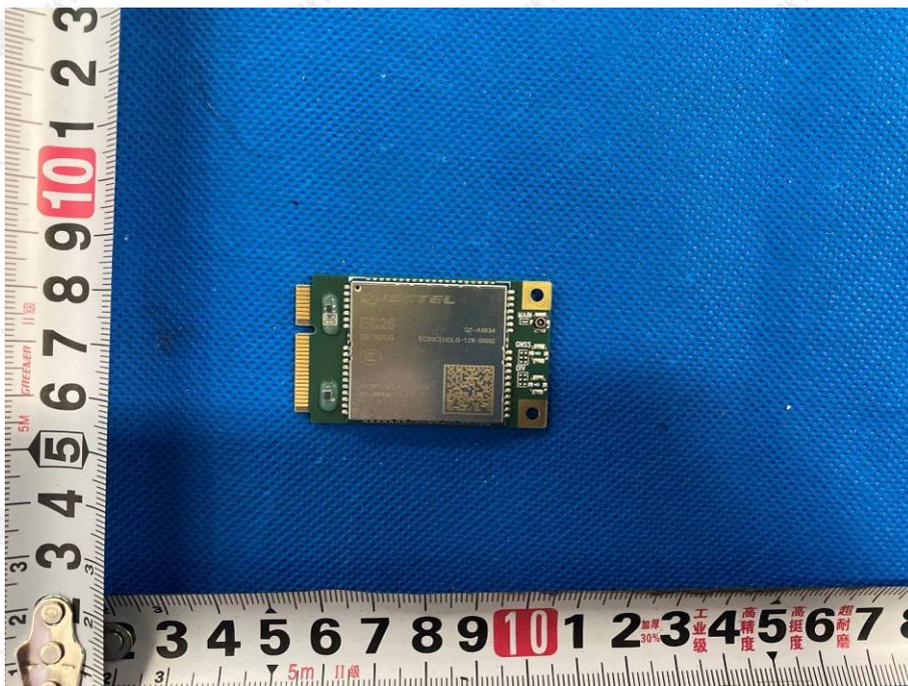
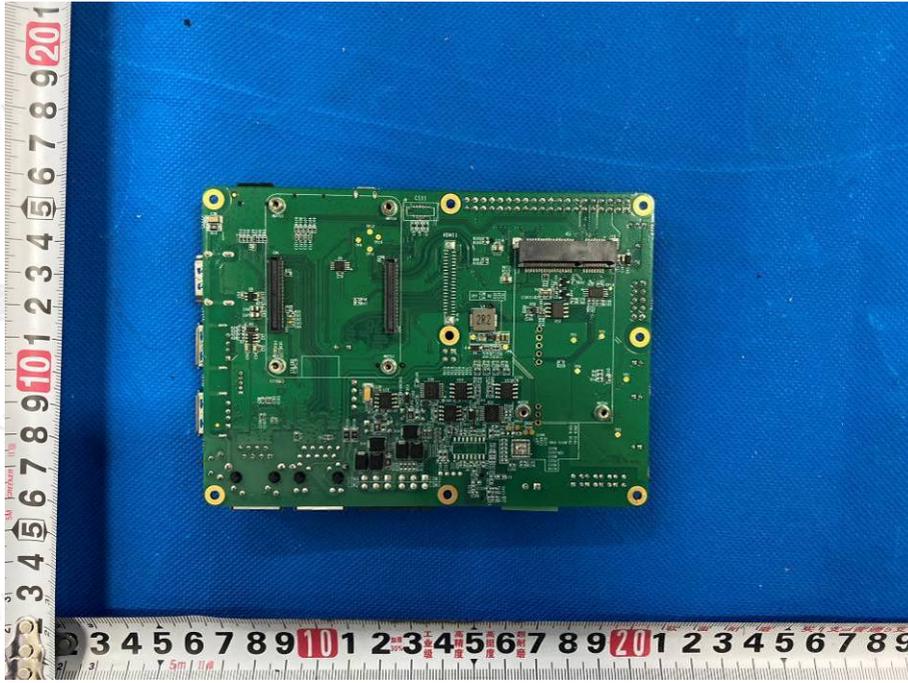
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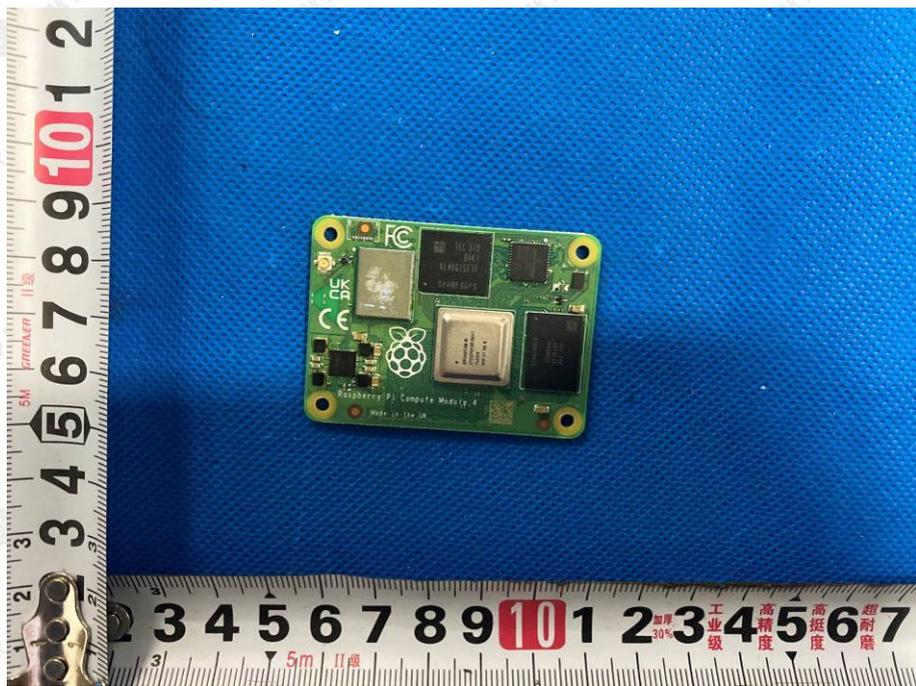
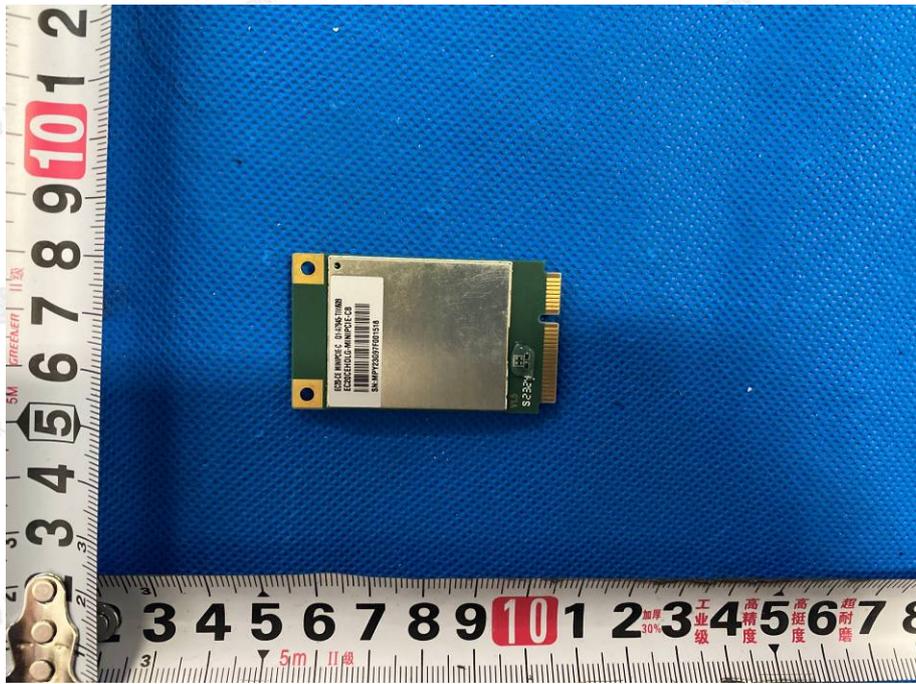
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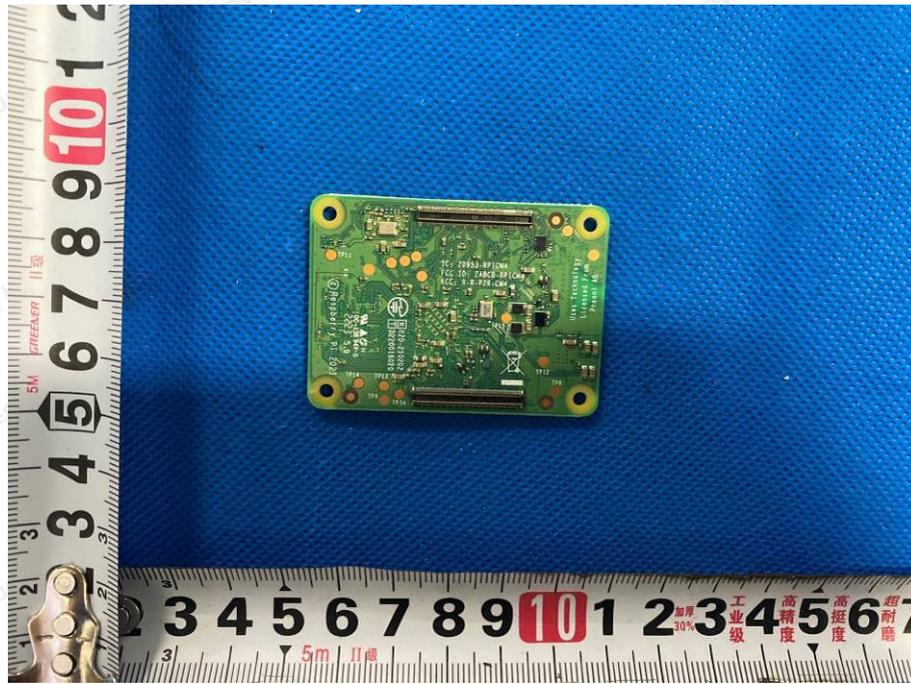
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.....End of Report.....