ETSI EN 301 908-1 V13.1.1 (2019-11)
ETSI EN 301 908-2 V11.1.2 (2017-08)

TEST REPORT

For

Shenzhen Huafurui Technology Co., Ltd.

Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No.4 Building of Chongwen Garden), Crossing of the Liuxian Street and Tangling Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China

Tested Model: NOTE 9

Report Type:	**Product Type:**
Original Report	Smartphone

Report Number: SZ1210419-12396E-22G

Report Date: 2021-05-18

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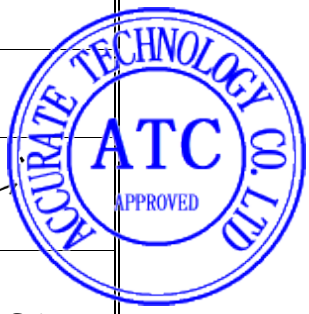

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Smartphone
Tested Model	NOTE 9
Trade mark	CUBOT
Frequency Range	WCDMA2100: 1920-1980 MHz (TX), 2110-2170 MHz (RX) WCDMA900: 880-915 MHz (TX), 925-960 MHz (RX)
Tune-up Transmit Power	WCDMA2100: 21.98dBm WCDMA900: 21.99dBm
Maximum Antenna gain	Band 1: 0.89dBi; Band 8: 0.68dBi;
Modulation Technique	WCDMA: BPSK, QPSK, 16QAM, 64QAM
Voltage Range	DC 3.7V from battery or DC 5V from adapter.
Date of Test	2021-05-08
Sample serial number	SZ1210419-12396E-RF-S1
Received date	2021-04-05
Sample/EUT Status	Good condition
Normal/Extreme Condition	N.V.: Nominal Voltage: 3.85V_{DC} L.V.: Low Voltage 3.6 V_{DC}; L.T.: Low Temperature 0℃ N.V.: Normal Voltage 4.2V_{DC}; N.T.: Normal Temperature +25℃ H.V.: High Voltage 4.4V_{DC}; H.T.: High Temperature +45℃ The extreme condition was declared by the manufacture
Adapter 1 information	Model: HJ-0501500-UK Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5V, 1.5A
Adapter 2 information	Model: HJ-0501500W2-EU Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5V, 1.5A

Objective

This test report is in accordance with ETSI EN 301 908-1 V13.1.1 (2019-11), IMT cellular networks;Harmonised Standard for access to radio spectrum; Part 1: Introduction and common requirements and ETSI EN 301 908-2 V11.1.2 (2017-08) , IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Part 2: CDMA Direct Spread (UTRA FDD) User Equipment (UE)

The objective is to determine compliance with ETSI EN 301 908-1 V13.1.1 (2019-11) and ETSI EN 301 908-2 V11.1.2 (2017-08).

Test Methodology

All measurements contained in this report were conducted with ETSI EN 301 908-1 V13.1.1 (2019-11) and ETSI EN 301 908-2 V11.1.2 (2017-08).

All radiated and conducted emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

According to the requirements of ETSI EN 301 908-1 and ETSI EN 301 908-2, F_{lab} (the value of the measurement uncertainty according to the requirements of ETSI TR 100 028) shall be, for each measurement, equal to or lower than the figure in the following table:

Item	Parameter	F_{lab}	Maximum allowable uncertainty
1	ERP 30MHz-180MHz	±3.62dB	±6 dB
2	ERP 180MHz-12750MHz	±2.6 dB	±3 dB
3	Transmitter maximum output power	±0.73 dB*	±0,7 dB
4	Transmitter spectrum emissions mask	±1,6 dB*	±1,5 dB
5	Transmitter spurious emissions f ≤ 2.2 GHz	±4.75 dB*	±1,5 dB
6	Transmitter spurious emissions 2.2 GHz < f ≤ 4 GHz	±4.75 dB*	±2,0 dB
7	Transmitter spurious emissions f > 4 GHz	±4.75 dB*	±4,0 dB
8	Transmitter spurious emissions 4 GHz < f ≤ 12,75 GHz	±4.75 dB*	±4,0 dB
9	Transmitter spurious emissions Co-existence band (≥ -60 dBm)	±4.75 dB*	±2,0 dB
10	Transmitter spurious emissions Co-existence band (< -60 dBm)	±4.75 dB*	±3,0 dB
11	Transmitter Minimum output power	±0.73 dB	±1,0 dB
12	Receiver Adjacent Channel Selectivity (ACS)	±2.8 dB*	±1,1 dB
13	Receiver Blocking characteristics f < 15 MHz offset	±1.5 dB*	±1,4 dB
14	Receiver Blocking characteristics 15 MHz offset ≤ f ≤ 2.2 GHz	±1.5 dB*	±1,0 dB
15	Receiver Blocking characteristics 2.2 GHz < f ≤ 4 GHz	±1.5 dB	±1,7 dB
16	Receiver Blocking characteristics f > 4 GHz	±3.3 dB*	±3,1 dB
17	Receiver spurious response f ≤ 2.2 GHz	±1.5 dB*	±1,0 dB
18	Receiver spurious response 2.2 GHz < f ≤ 4 GHz	±1.5 dB	±1,7 dB
19	Receiver spurious response f > 4 GHz	±3.3 dB*	±3,1 dB
20	Receiver intermodulation characteristics	±1.3 dB	±1,3 dB
21	Receiver spurious emissions UE receive band (-60 dBm)	±4.75 dB*	±3,0 dB
22	Receiver spurious emissions UE transmit band (-60 dBm)	±4.75 dB*	±3,0 dB
23	Receiver spurious emissions f ≤ 2.2 GHz	±4.75 dB*	±2,0 dB
24	Receiver spurious emissions 2.2 GHz < f ≤ 4 GHz	±4.75 dB*	±2,0 dB
25	Receiver spurious emissions f > 4 GHz	±4.75 dB*	±4,0 dB
26	Out of synchronization of handling power DPCCH Ec/lor	±0.4 dB	±0,4 dB
27	Out of synchronization of handling power Transmit OFF power	±1.0 dB	±1,0 dB
28	Transmitter adjacent channel leakage power ratio	±0.8 dB	±0,8 dB

Note: * Test system of laboratory have a measurement uncertainty greater than that specified in harmonized standard, this equipment can still be used provided that an adjustment is made follows: any additional uncertainty in the test system over and above that specified in harmonized standard should be used to tighten the test requirements - making the test harder to pass (for some tests, e.g. receiver tests, this may require modification of stimulus signals). This procedure will ensure that a test system not compliant with harmonized standard does not increase the probability of passing a EUT that would otherwise have failed a test if a test system compliant with harmonized standard had been used.

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing according to ETSI EN 301 908-1 V13.1.1 (2019-11), ETSI EN 301 908-2 V11.1.2 (2017-08).

EUT Exercise Software

No exercise software.

Special Accessories

No special accessory.

Equipment Modifications

No modifications were made to the EUT.

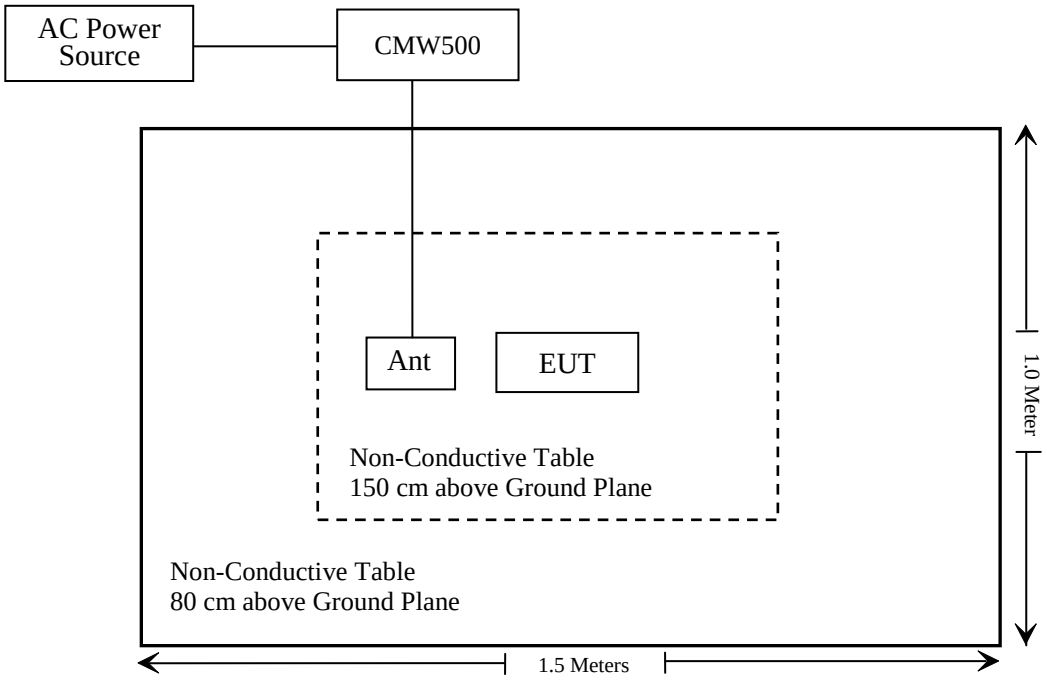
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	154606

External I/O Cable

Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

ETSI EN 301 908-1 V13.1.1	Description of Test	Test Result
§4.2.2	Radiated emissions (UE)	Compliance
§4.2.3	Radiated emissions (BS and repeater)	Not Applicable
§4.2.4	Control and monitoring functions (UE)	Compliance

ETSI EN 301 908-2 V11.1.2	Description of Test	Test Result
§4.2.2	Transmitter maximum output power	Compliance
§4.2.3	Transmitter spectrum emission mask	Compliance
§4.2.4	Transmitter spurious emissions	Compliance
§4.2.5	Transmitter minimum output power	Compliance
§4.2.6	Receiver Adjacent Channel Selectivity (ACS)	Compliance
§4.2.7	Receiver blocking characteristics	Compliance
§4.2.8	Receiver spurious response	Compliance
§4.2.9	Receiver intermodulation characteristics	Compliance
§4.2.10	Receiver spurious emissions	Compliance
§4.2.11	Out-of-synchronization handling of output power	Compliance
§4.2.12	Transmitter Adjacent Channel Leakage power Ratio (ACLR)	Compliance
§4.2.13	Receiver Reference Sensitivity level	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde & Schwarz	Test Receiver	ESR	101817	2020/12/24	2021/12/23
SONOMA INSTRUMENT	Amplifier	310 N	186131	2020/12/25	2021/12/24
A.H. Systems, inc.	Preamplifier	PAM-0118P	531	2020/07/08	2021/07/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-194	2021-01-05	2023-01-04
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021-01-05	2023-01-04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-655	2021-01-05	2023-01-04
Schwarzbeck	Horn Antenna	BBHA9170	9170-359	2021-01-05	2023-01-04
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2020/12/24	2021/12/23
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	154606	2020/12/25	2021/12/24
Anritsu	Signal Generator	68369B	004114	2020/7/31	2021/7/30
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2020/12/24	2021/12/23
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	154606	2020/12/25	2021/12/24
Gongwen	Temp. & Humid. Chamber	JB913R	GZ-WS004	2020/12/25	2021/12/24
Vector Signal Generator	AGILENT	N5182A	MY50143401	2020/12/25	2021/12/24
UNI-T	DC Power Supply	UTP8305B	10584	NCR	NCR
Fluke	Desktop Multi Meter	45	7664009	2020/12/25	2021/12/24

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

ETSI EN 301 908-1 V13.1.1 (2019-11) §4.2.2 – RADIATED EMISSIONS (UE)

Applicable Standard

Limits

The frequency boundary and reference bandwidths for the detailed transitions of the limits between the requirements for out-of-band emissions and spurious emissions are based on Recommendations ITU-R SM.329-12 [1] and SM.1539-1 [i.6].

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 MHz ≤ f < 1 000 MHz	-57 dBm/100 kHz	-36 dBm/100 kHz	All
1 GHz ≤ f < 12,75 GHz	-47 dBm/1 MHz	-30 dBm/1 MHz	All
fc - 2,5 × 5 MHz < f < fc + 2,5 × 5 MHz (note 2)		Not defined	UTRA FDD, UTRA TDD, 3,84 Mcps option, cdma2000, spreading rate 3
fc - 2,5 × $BW_{Channel}$ MHz < f < fc + 2,5 × $BW_{Channel}$ MHz (note 2)		Not defined	E-UTRA FDD, E-UTRA TDD, Mobile WiMAX™
fc - 2,5 × 10 MHz < f < fc1 + 2,5 × 10 MHz (note 2)		Not defined	UTRA TDD, 7,68 Mcps option
fc - 4 MHz < f < fc + 4 MHz (note 2)		Not defined	UTRA TDD, 1,28 Mcps option cdma2000, spreading rate 1
NOTE 1: fc is the UE transmit centre frequency. NOTE 2: This frequency range is not in the spurious domain, no requirement is then defined for this frequency range.			

Test Results Summary

According to the recorded data in following table, the EUT complied with the ETSI EN 301 908-1 V13.1.1 (2019-11).

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-08.

Test Result: Pass

Please refer to following data tables.

Pre-test with low, middle, high channel, the worst case as below:

Transmitting:

Frequency (MHz)	Receiver Reading (dBm)	Turntable Angle Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
BAND 1, Middle Channel								
176.88	-67.21	83	1.9	H	-5.41	-72.62	-36	36.62
178.13	-71.93	84	1.1	V	-6.58	-78.51	-36	42.51
3900.00	-45.49	52	1.6	H	5.82	-39.67	-30	9.67
3900.00	-46.01	246	1.8	V	5.72	-40.29	-30	10.29
BAND 8, Middle Channel								
176.88	-66.56	229	1.3	H	-5.41	-71.97	-36	35.97
178.13	-71.81	356	1.8	V	-6.58	-78.39	-36	42.39
1795.20	-36.73	337	1.6	H	-2.48	-39.21	-30	9.21
1795.20	-38.79	45	1.6	V	-2.5	-41.29	-30	11.29

Idle:

Frequency (MHz)	Receiver Reading (dBm)	Turntable Angle Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
BAND 1, Middle Channel								
176.88	-66.68	357	1.7	H	-5.41	-72.09	-57	15.09
178.13	-71.25	211	1.7	V	-6.58	-77.83	-57	20.83
8770.01	-68.49	233	1.6	H	15.68	-52.81	-47	5.81
8765.15	-68.91	44	1.7	V	14.38	-54.53	-47	7.53
BAND 8, Middle Channel								
176.88	-66.34	301	1.8	H	-5.41	-71.75	-57	14.75
178.13	-71.07	223	1.1	V	-6.58	-77.65	-57	20.65
6903.70	-66.75	16	1.9	H	12.59	-54.16	-47	7.16
6412.42	-65.84	54	1.3	V	10.91	-54.93	-47	7.93

Note:
Absolute Level = Reading Level + Substituted Factor
Substituted Factor contains: SG Level - Cable loss+ Antenna Gain
Margin = Limit - Absolute Level

ETSI EN 301 908-1 V13.1.1 (2019-11) §4.2.4 – CONTROL AND MONITORING FUNCTIONS (UE)

Applicable Standard

This requirement, together with other control and monitoring technical requirements identified in the table of cross references in the applicable part, verifies that the control and monitoring functions of the UE prevent it from transmitting in the absence of a valid network.

This test is applicable to radio communications equipment and ancillary equipment in the operating band defined in the applicable part of this multi-part harmonised standard.

This test shall be performed on the radio communications equipment and/or a representative configuration of the ancillary equipment.

Limits

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

Test Procedure

a) 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 μs 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 Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-08.

EUT operation mode: *Transmitting*

Test Result: Pass

No any emission was detected.

ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.2 – TRANSMITTER MAXIMUM OUTPUT POWER

Applicable Standard

The nominal maximum output power and its tolerance are defined according to the power class of the UE.

The nominal power defined is the broadband transmit power of the UE, i.e. the power in a bandwidth of at least (1 + α) times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

Limits

The UE maximum output power shall be within the shown value in table 4.2.2.1.2-1 even for the multi-code DPDCH transmission mode.

Table 4.2.2.1.2-1: UE power classes

Operating Band	Power Class 3		Power Class 3bis		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+24	+1,7/-3,7			+21	+2,7/-2,7
Band III	+24	+1,7/-3,7			+21	+2,7/-2,7
Band VII	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band VIII	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XV	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-1,7
Band XVI	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-1,7
Band XX	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XXII	+24	+1,7/-5.2	+23	+2,7/-4.2	+21	+2.7/-4.2

NOTE 1: These requirements do not take into account the maximum power reduction allowed to the UE in the presence of HS-DPCCH and E-DCH specified in ETSI TS 125 101 [4].

NOTE 2: The range of UE maximum output power for the various power classes are specified in ETSI TS 125 101 [4], clause 6.2.1. The values in table 4.2.2.1.2-1 correspond to the measurement limits taking into account the measurement uncertainty of measurement equipment (see clause 5.2).

Test Procedure

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §5.3.1.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-08.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to following data tables.

WCDMA2100:

Rel 6:

Test Conditions		Transmitter maximum output power (dBm)			
Temperature	**Voltage**	**Low Channel**	**Middle Channel**	**High Channel**	**Result**
Normal	Normal	21.63	21.57	21.44	Pass
Low	Low	21.90	21.96	21.63	Pass
Low	High	21.52	21.86	21.67	Pass
High	Low	21.62	21.95	21.83	Pass
High	High	21.63	21.52	21.66	Pass

HSPA Mode:

Test Condition	Test Mode	3GPP Sub Test	Averaged Mean Power (dBm)		
			Low Frequency	Middle Frequency	High Frequency
Normal	HSDPA	1	21.21	21.92	21.91
		2	21.64	21.91	21.51
		3	21.93	21.82	21.73
		4	21.95	21.60	21.89
	HSUPA	1	21.71	21.62	21.61
		2	21.98	21.65	21.63
		3	21.85	21.56	21.51
		4	21.58	21.80	21.59
		5	21.20	21.98	21.51
	DC-HSDPA	1	21.70	21.53	21.55
		2	21.52	21.78	21.58
		3	21.70	21.62	21.89
		4	21.30	21.62	21.75
	HSPA+	1	21.74	21.65	21.56

WCDMA 900:

Rel 99:

Test Conditions		Transmitter maximum output power (dBm)			
Temperature	Voltage	Low Channel	Middle Channel	High Channel	Result
Normal	Normal	21.92	21.94	21.81	Pass
Low	Low	21.69	21.79	21.73	Pass
Low	High	21.85	21.81	21.90	Pass
High	Low	21.66	21.73	21.80	Pass
High	High	21.58	21.52	21.60	Pass

HSPA Mode:

Test Condition	Test Mode	3GPP Sub Test	Averaged Mean Power (dBm)		
			Low Frequency	Middle Frequency	High Frequency
Normal	HSDPA	1	21.97	21.65	21.62
		2	21.62	21.97	21.53
		3	21.70	21.52	21.51
		4	21.99	21.68	21.81
	HSUPA	1	21.59	21.75	21.95
		2	21.70	21.61	21.73
		3	21.73	21.93	21.52
		4	21.70	21.65	21.58
		5	21.42	21.82	21.64
	DC-HSDPA	1	21.65	21.85	21.99
		2	21.57	21.73	21.74
		3	21.99	21.60	21.88
		4	21.06	21.97	21.57
	HSPA+	1	21.87	21.53	21.78

ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.3 – TRANSMITTER SPECTRUM EMISSION MASK

Applicable Standard

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.3, The spectrum emission mask of the UE applies to frequencies, which are between 2,5 MHz and 12,5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

Limits

The power of any UE emission shall not exceed the levels specified in table 4.2.3.2-1. The requirements are applicable for all for the values of β_c, β_d, β_{hs}, β_{ec} and β_{ed} defined in TS 125 214 [7].

Table 4.2.3.1.2-1: Spectrum emission mask requirement

Δf in MHz (note 1)	Minimum requirement (note 2)		Measurement bandwidth (note 5)
	Relative requirement	Absolute requirement (in measurement bandwidth)	
2,5 MHz to 3,5 MHz	$\left\{-33{,}5-15\cdot\left(\frac{\Delta f}{MHz}-2{,}5\right)\right\}dBc$	-69,6 dBm	30 kHz (see note 3)
3,5 MHz to 7,5 MHz	$\left\{-33{,}5-1\cdot\left(\frac{\Delta f}{MHz}-3{,}5\right)\right\}dBc$	-54,3 dBm	1 MHz (see note 4)
7,5 MHz to 8,5 MHz	$\left\{-37{,}5-10\cdot\left(\frac{\Delta f}{MHz}-7{,}5\right)\right\}dBc$	-54,3 dBm	1 MHz (see note 4)
8,5 MHz to 12,5 MHz	-47,5 dBc	-54,3 dBm	1 MHz (see note 4)

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.
NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.
NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz and 3,485 MHz.
NOTE 4: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.
NOTE 5: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

Test Procedure

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §5.3.2.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-08.

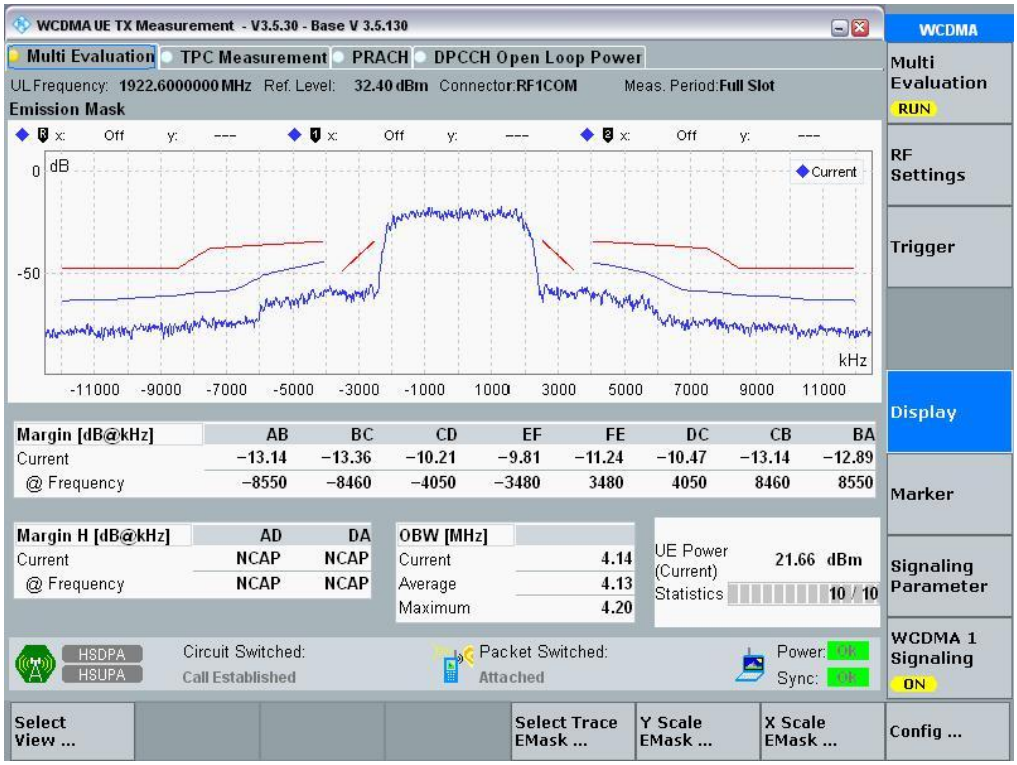
EUT operation mode: Transmitting

Test Result: Pass

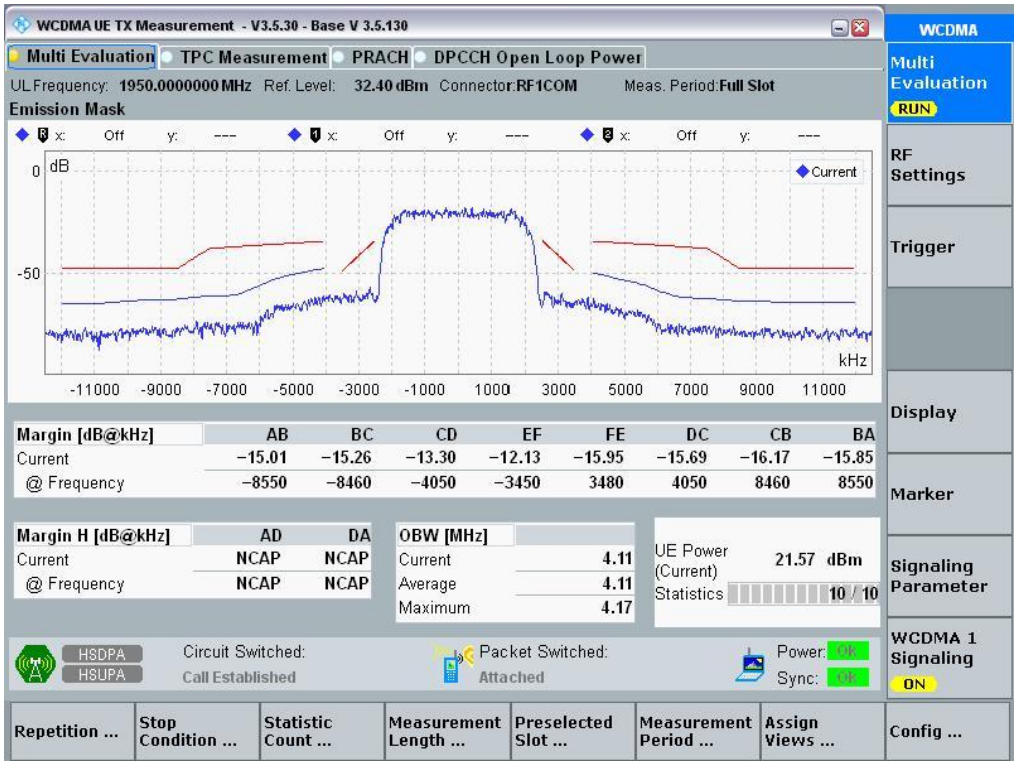
Please refer to following data tables.

WCDMA 2100

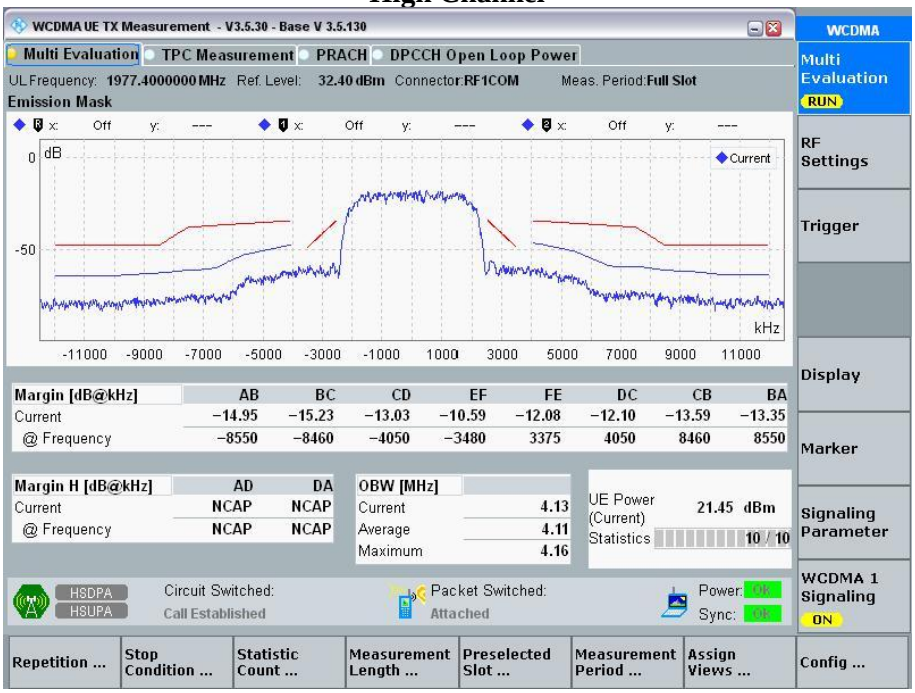
Low Channel



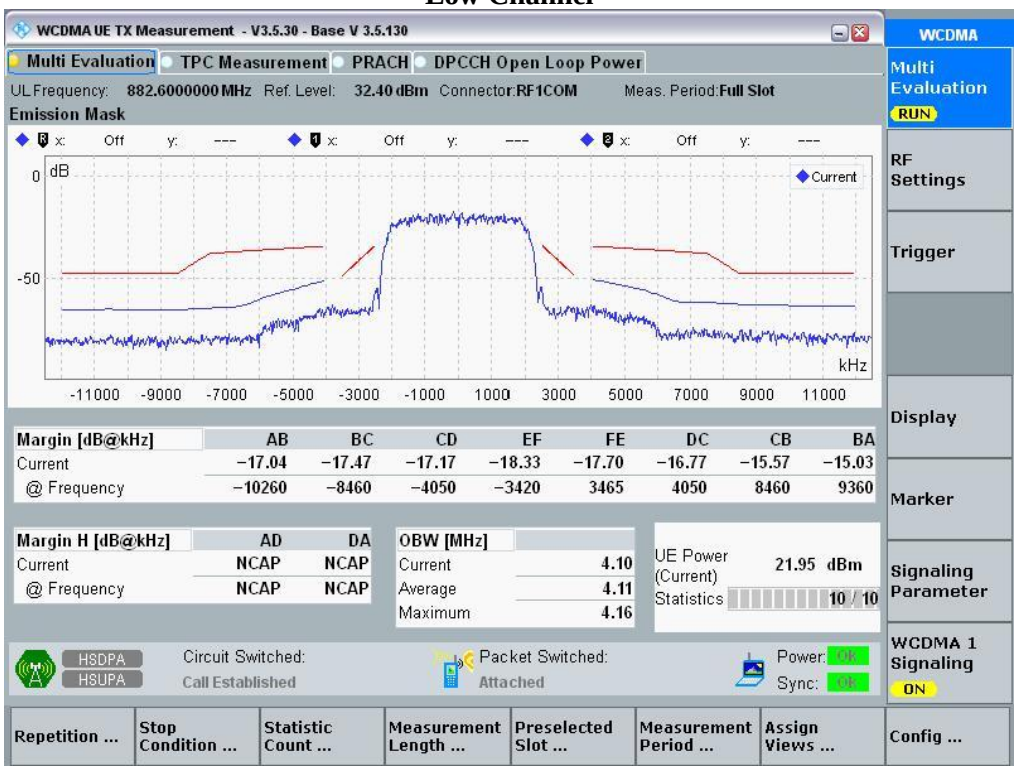
Middle Channel



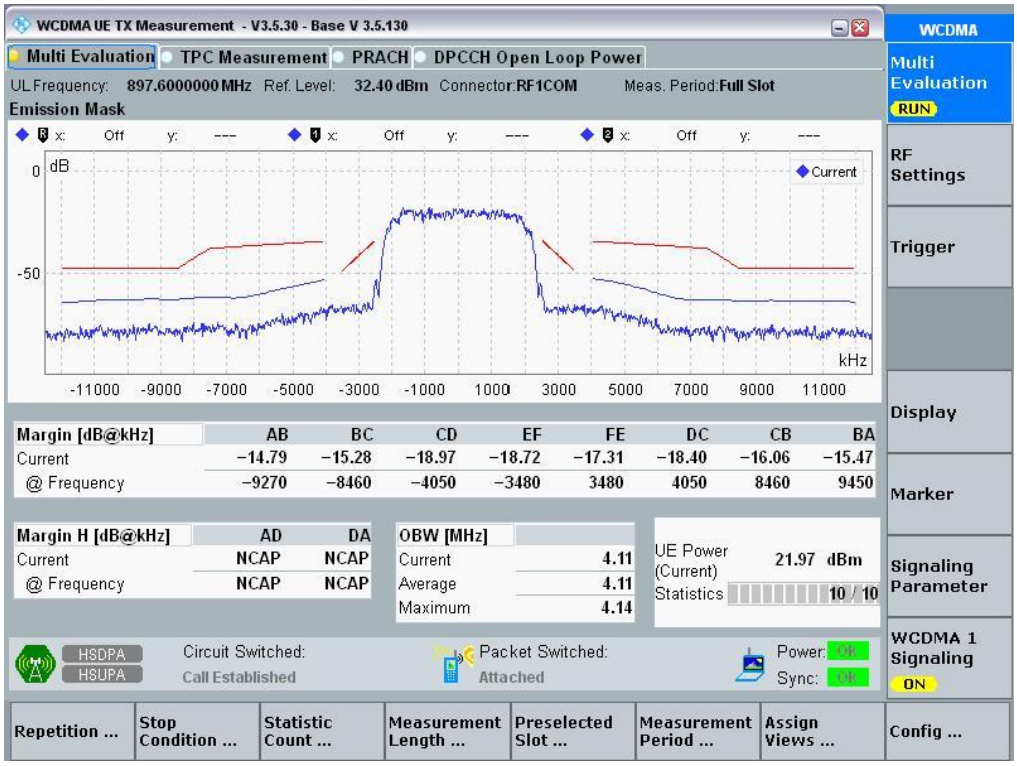
High Channel



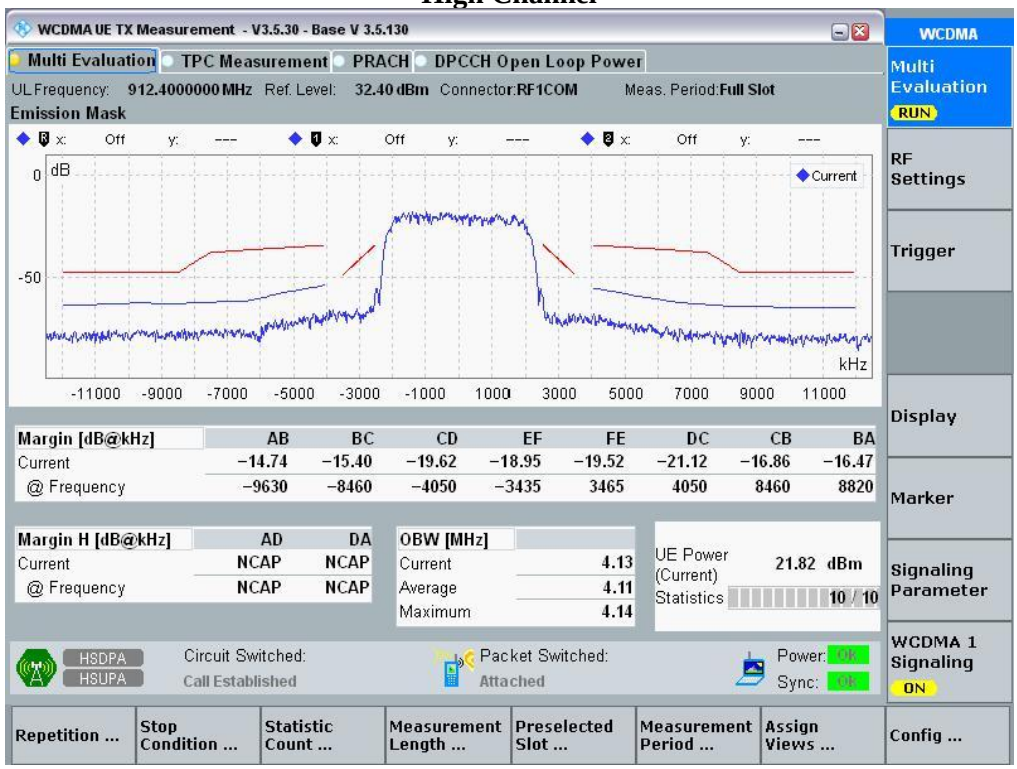
WCDMA 900:
Low Channel



Middle Channel



High Channel



ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.4 – TRANSMITTER SPURIOUS EMISSIONS

Applicable Standard

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.4, Spurious emissions are emissions, which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

Limits

The power of spurious emissions shall not exceed the limits defined in tables 4.2.4.1.2-1 and 4.2.4.1.2-2. The limits shown in tables 4.2.4.1.2-1 and 4.2.4.1.2-2 are only applicable for frequencies, which are greater than 12,5 MHz away from the UE centre carrier frequency.

Table 4.2.4.1.2-1: General spurious emissions requirements

Frequency bandwidth	Measurement bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	-36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	-36 dBm
30 MHz ≤ f < 1 000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12,75 GHz	1 MHz	-30 dBm
12,75 GHz ≤ f < 5th harmonic of the upper frequency edge of the UL operating band in GHz	1 MHz	-30 dBm (note)
NOTE: Applies only for Band XXII.		

Table 4.2.4.1.2-2: Additional spurious emissions requirements

Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
I	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note 1)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
III	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note 1)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
VII	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note 1)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
	2 590 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
VIII	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz 3,84 MHz	-79 dBm (note 1) -60 dBm
	1 805 MHz < f ≤ 1 830 MHz	100 kHz 3,84 MHz	-71 dBm (notes 1 and 2) -60 dBm (note 2)
	1 830 MHz < f ≤ 1 880 MHz	100 kHz 3,84 MHz	-71 dBm (note 1) -60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 640 MHz	3,84 MHz	-60 dBm
	2 640 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm (note 2)
XV	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f ≤ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm

Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
XVI	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f ≤ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XX	470 MHz ≤ f ≤ 790 MHz	8 MHz	-65 dBm (note 3)
	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f ≤ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XXII	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
	3 510 MHz ≤ f ≤ 3 525 MHz	1 MHz	-40 dBm
	3 525 MHz ≤ f ≤ 3 590 MHz	1 MHz	-50 dBm
	3 600 MHz ≤ f ≤ 3 800 MHz	3,84 MHz	-50 dBm

NOTE 1: The transmitter additional spurious emission measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 4.2.4.1.2-1 are permitted for each UARFCN used in the measurement.

NOTE 2: The transmitter additional spurious emission measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in table 4.2.4.1.2-1 are permitted for each UARFCN used in the measurement due to 2nd, 3rd and 4th harmonic spurious emissions.

NOTE 3: The conformance shall be assessed using the measurement position placed at the following centre frequencies: 474 MHz, 586 MHz, 690 MHz, 754 MHz, 770 MHz and 786 MHz.

Test Procedure

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §5.3.3.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-08.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to following data tables.

WCDMA 2100(pre-test with Low/Middle/High channel and worst case is Middle channel):

Mode	Frequency Range (MHz)	Detector (Peak or Average)	RBW/VBW Setting (kHz)	Result Level (dBm)	Limit (dBm)	Margin (dB)	Result
WCDMA 2100	0.009-0.15	Average	1/3	-71.54	-36	35.54	Pass
	0.15-30	Average	10/30	-71.47	-36	35.47	Pass
	30-1000	Average	100/300	-68.96	-36	32.96	Pass
	791-821	Average	3840	-73.60	-60	13.6	Pass
	821-921	Average	100/300	-60.53	-36	24.53	Pass
	921-925	Average	100/300	-69.68	-60	9.68	Pass
	925-935	Average	100/300	-75.79	-67	8.79	Pass
	935-960	Average	100/300	-90.92	-79	11.92	Pass
	960-1000	Average	100/300	-70.97	-36	34.97	Pass
	1000-1805	Average	1000/3000	-61.51	-30	31.51	Pass
	1805-1880	Average	100/300	-77.80	-71	6.8	Pass
	1880-1937.5	Average	1000/3000	-59.97	-30	29.97	Pass
	1962.5-2110	Average	1000/3000	-51.63	-30	21.63	Pass
	2110-2170	Average	3840	-72.45	-60	12.45	Pass
	2170-2585	Average	1000/3000	-70.77	-30	40.77	Pass
	2585-2690	Average	3840	-69.05	-60	9.05	Pass
	2690-12750	Average	1000/3000	-39.18	-30	9.18	Pass

WCDMA 900 (pretest with Low/Middle/High channel, the worst case is Middle channel):

Mode	Frequency Range (MHz)	Detector (Peak or Average)	RBW/VBW Setting (kHz)	Result Level (dBm)	Limit (dBm)	Margin (dB)	Result
WCDMA 900	0.009-0.15	Average	1/3	-71.41	-36	35.41	Pass
	0.15-30	Average	10/30	-76.17	-36	40.17	Pass
	30-791	Average	100/300	-70.84	-36	34.84	Pass
	791-821	Average	3840	-73.63	-60	13.63	Pass
	821-885.1	Average	100/300	-64.20	-36	28.2	Pass
	910.1-925	Average	100/300	-67.07	-36	31.07	Pass
	925-935	Average	100/300	-83.09	-67	16.09	Pass
		Average	3840	-69.50	-60	9.5	Pass
	935-960	Average	100/300	-87.75	-79	8.75	Pass
		Average	3840	-69.52	-60	9.52	Pass
	960-1000	Average	100/300	-74.40	-36	38.4	Pass
	1000-1805	Average	1000/3000	-66.74	-30	36.74	Pass
	1805-1830	Average	100/300	-84.11	-71	13.11	Pass
		Average	3840	-68.76	-60	8.76	Pass
	1830-1880	Average	100/300	-83.65	-71	12.65	Pass
		Average	3840	-70.67	-60	10.67	Pass
	1880-2110	Average	1000/3000	-63.96	-30	33.96	Pass
	2110-2170	Average	3840	-68.38	-60	8.38	Pass
	2170-2585	Average	1000/3000	-75.52	-30	45.52	Pass
	2585-2640	Average	3840	-71.84	-60	11.84	Pass
	2640-2690	Average	3840	-68.40	-60	8.4	Pass
	2690-12750	Average	1000/3000	-41.06	-30	11.06	Pass

ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.5 – TRANSMITTER MINIMUM OUTPUT POWER

Applicable Standard

The minimum controlled output power of the UE is when the power is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The minimum transmit power is defined as a mean power in one time slot.

Limits

The minimum output power shall be less than -49 dBm.

Test Procedure

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §5.3.4.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

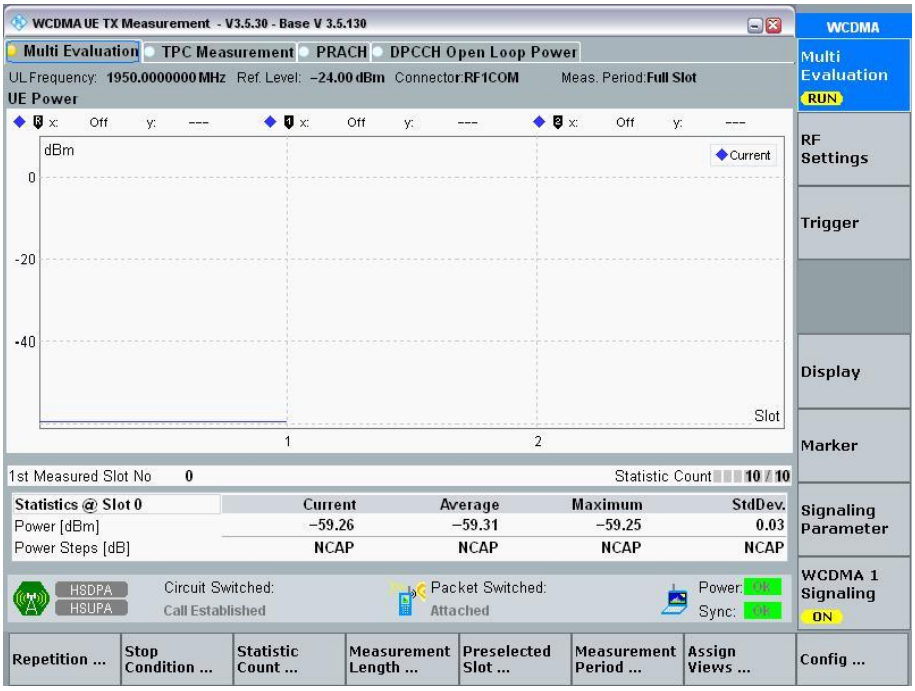
The testing was performed by Fan Yang on 2021-05-08.

EUT operation mode: Transmitting

WCDMA 2100:

Test Conditions		Transmitter minimum output power (dBm) Limit: -49dBm	
Temperature	**Voltage**	**Middle Channel**	**Result**
Normal	Normal	-59.31	Pass
Low	Low	-59.35	Pass
Low	High	-59.34	Pass
High	Low	-59.32	Pass
High	High	-59.35	Pass

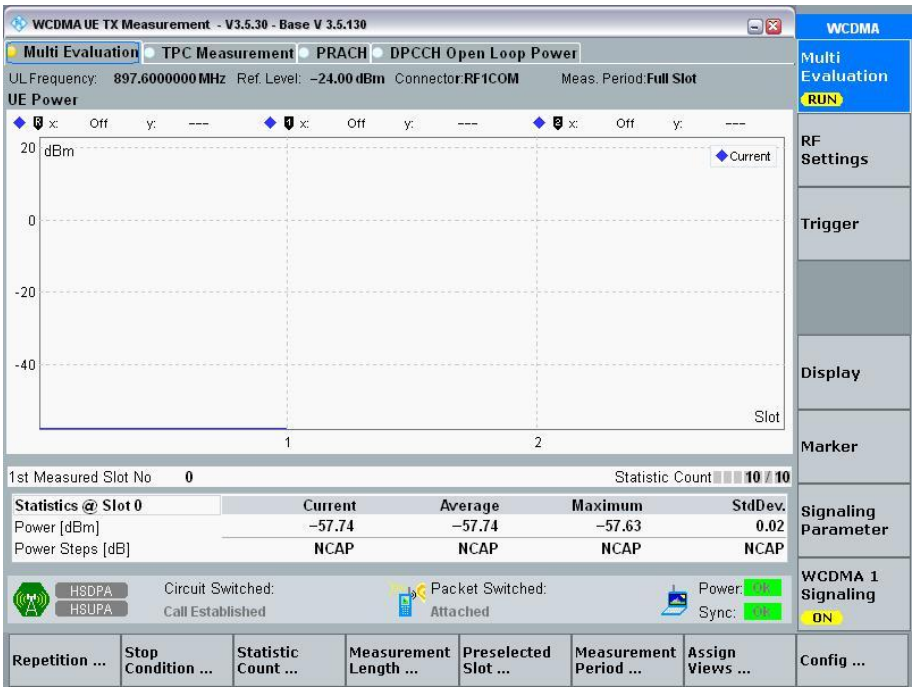
Normal Condition



WCDMA 900:

Test Conditions		Transmitter minimum output power (dBm) Limit: -49dBm	
Temperature	**Voltage**	**Middle Channel**	**Result**
Normal	Normal	-57.74	Pass
Low	Low	-57.79	Pass
Low	High	-57.76	Pass
High	Low	-57.75	Pass
High	High	-57.74	Pass

Normal Condition



ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.6 – RECEIVER ADJACENT CHANNEL SELECTIVITY (ACS)

Applicable Standard

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.6, Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a WCDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

Limits

For the UE of power class 3 and 4, the BER shall not exceed 0,001 for the parameters specified in table 4.2.6.2-1. This test condition is equivalent to the ACS value 33 dB.

Table 4.2.6.2-1: Test parameters for adjacent channel selectivity

Parameter	Unit	Case 1	Case 2
DPCH_Ec	dBm/3,84 MHz	<REFSENS> + 14 dB	<REFSENS> + 41 dB
$\hat{I}_{or}$	dBm/3,84 MHz	<REF$\hat{I}_{or}$> + 14 dB	<REF$\hat{I}_{or}$> + 41 dB
I_{oac} mean power (modulated)	dBm	-52	-25
F_{uw} (offset)	MHz	+5 or -5	+5 or -5
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	20 (for Power class 3) 18 (for Power class 4)
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1]. NOTE 2: The I_{oac} (modulated) signal consists of the common channels and the 16 dedicated data channels as specified in ETSI TS 125 101 [4].			

Test Procedure

1) Set the parameters of the interference signal generator as shown in table 4.2.6.2-1 case 1.
2) Set the power level of UE according to the table 4.2.6.2-1 case 1 with ± 1 dB tolerance.
3) Measure the BER of DCH received from the UE at the SS.
4) Set the parameters of the interference signal generator as shown in table 4.2.6.2-1 case 2.
5) Set the power level of UE according to the table 4.2.6.2-1 case 2 with ± 1 dB tolerance.
6) Measure the BER of DCH received from the UE at the SS.

Details of test method for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clauses 6.4 and 6.4A.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-08.

EUT operation mode: Loopback

Test channel: Middle channel

Test condition: Normal

Test Result: Pass

WCDMA 2100:

The BER are 0.000%, in the case 1 interfering signal and case 2 interfering signal conditions. No errors were detected

WCDMA 900:

The BER are 0.000%, in the case 1 interfering signal and case 2 interfering signal conditions. No errors were detected

ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.7 – RECEIVER BLOCKING CHARACTERISTICS

Applicable Standard

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.7, The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

Limits:

The BER shall not exceed 0,001 for the parameters specified in tables 4.2.7.2-1 and 4.2.7.2-2. For table 4.2.7.2-2 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

Table 4.2.7.2-1: Test parameters for in-band blocking characteristics

Parameter	Unit	Level	
DPCH_Ec	dBm/3,84 MHz	<REFSENS> + 3 dB	
$\hat{I}_{or}$	dBm/3,84 MHz	<REF$\hat{I}_{or}$> + 3 dB	
$I_{blocking}$ mean power (modulated)	dBm	-56 (for F_{uw} offset ±10 MHz)	-44 (for F_{uw} offset ±15 MHz)
F_{uw} (Band I operation)	MHz	2 102,4 ≤ f ≤ 2 177,6	2 095 ≤ f ≤ 2 185
F_{uw} (Band III operation)	MHz	1 797,4 ≤ f ≤ 1 887,6	1 790 ≤ f ≤ 1 895
F_{uw} (Band VII operation)	MHz	2 612,4 ≤ f ≤ 2 697,6	2 605 ≤ f ≤ 2 705
F_{uw} (Band VIII operation)	MHz	917,4 ≤ f ≤ 967,6	910 ≤ f ≤ 975
F_{uw} (Band XX operation)	MHz	783,4 ≤ f ≤ 828,6	776 ≤ f ≤ 836
F_{uw} (Band XXII operation)	MHz	3 502,4 ≤ f ≤ 3 597,6	3 495 ≤ f ≤ 3 605
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4) (note 3)	
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1]. NOTE 2: The $I_{blocking}$ (modulated) signal consists of the common channels and the 16 dedicated data channels as specified in ETSI TS 125 101 [4]. NOTE 3: The UE transmitted mean power shall be reduced by 0,5 dB for a UE operating in band XXII.			

Table 4.2.7.2-2: Test parameters for out-of-band blocking characteristics

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3
DPCH_Ec	dBm/3,84 MHz	<REFSENS> + 3 dB	<REFSENS> + 3 dB	<REFSENS> + 3 dB
$\hat{I}_{or}$	dBm/3,84 MHz	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB
$I_{blocking}$ (CW)	dBm	-44	-30	-15
F_{uw} (Band I operation)	MHz	2 050 < f < 2 095 2 185 < f < 2 230	2 025 < f ≤ 2 050 2 230 ≤ f < 2 255	1 < f ≤ 2 025 2 255 ≤ f < 12 750
F_{uw} (Band III operation)	MHz	1 745 < f < 1 790 1 895 < f < 1 940	1 720 < f ≤ 1 745 1 940 ≤ f < 1 965	1 < f ≤ 1 720 1 965 ≤ f < 12 750
F_{uw} (Band VII operation)	MHz	2 570 < f < 2 605 2 705 < f < 2 750	Na 2 750 ≤ f < 2 775	1 < f ≤ 2 570 2 775 ≤ f < 12 750
F_{uw} (Band VIII operation)	MHz	865 < f < 910 975 < f < 1 020	840 < f < 865 1 020 ≤ f < 1 045	1 < f ≤ 840 1 045 ≤ f < 12 750
Fuw (Band XV operation)	MHz	2 570 < f < 2 585 2 705 < f < 2 750	Na 2 750 ≤ f < 2 775	1 < f ≤ 2 570 2 775 ≤ f < 12 750
Fuw (Band XVI operation)	MHz	Na 2 705 < f < 2 750	2 500 < f ≤ 2 570 2 750 ≤ f < 2 775	1 < f ≤ 2 500 2 775 ≤ f < 12 750
F_{uw} (Band XX operation)	MHz	731 < f < 776 836 < f < 881	706 < f ≤ 731 881 ≤ f < 906	1 < f ≤ 706 906 ≤ f < 12 750
Fuw (Band XXII operation)	MHz	3 450 < f < 3 495 3 605 < f < 3 650	3 425 < f ≤ 3 450 3 650 ≤ f < 3 675	1 < f ≤ 3 425 3 675 ≤ f < 12 750
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)		
Band I operation	For 2 095 MHz ≤ f ≤ 2 185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3
Band III operation	For 1 790 MHz ≤ f ≤ 1 895 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band VII operation	For 2 605 MHz ≤ f ≤ 2 705 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band VIII operation	For 910 MHz ≤ f ≤ 975 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band XV operation	For 2 585 MHz ≤ f ≤ 2 705 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band XVI operation	For 2 570 MHz ≤ f ≤ 2 705 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band XX operation	For 776 MHz ≤ f ≤ 836 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band XXII operation	For 3 495 ≤ f ≤ 3 605 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and clause 4.2.7.2-1 shall be applied. (note 2)			
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1]. NOTE 2: The UE transmitted mean power shall be reduced by 0,5 dB for a UE operating in band XXII.				

Table 4.2.7.2-3: Test parameters for narrow band blocking

Parameter	Unit	Band III, VIII
DPCH_Ec	dBm/3,84 MHz	<REFSENS> + 10 dB
$\hat{I}_{or}$	dBm/3,84 MHz	<REF$\hat{I}_{or}$> + 10 dB
$I_{blocking}$ (GMSK)	dBm	-56
F_{uw} (offset)	MHz	2,8
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1].		
NOTE 2: $I_{blocking}$ (GMSK) is an interfering signal as defined in ETSI TS 145 004 [8]. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.		

Test Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in tables 4.2.7.2-1, 4.2.7.2-2 and 4.2.7.2-3. For table 4.2.7.2-2 the frequency step size is 1 MHz.
2) Set the power level of the UE according to tables 4.2.7.2-1, 4.2.7.2-2 and 4.2.7.2-3 with a ±1 dB tolerance.
3) Measure the BER of DCH received from the UE at the SS.
4) For table 4.2.7.2-2, record the frequencies for which the BER exceeds the test requirements.

Details of test method for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.5.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-08.

EUT operation mode: Loopback

Test channel: Middle channel

Test condition: Normal

Test Result: Pass

Please refer to following data tables.

WCDMA 2100:

Frequency Range	Interfering Frequency (MHz)	Interfering Level (dBm)	BER
Frequency Range 1	2050	-43	0.000%
	2070	-43	0.000%
	2095	-43	0.000%
	2185	-43	0.000%
	2210	-43	0.000%
	2230	-43	0.000%
Frequency Range 2	2025	-30	0.000%
	2030	-30	0.000%
	2050	-30	0.000%
	2230	-30	0.000%
	2240	-30	0.000%
	2255	-30	0.000%
Frequency Range 3	2255	-16	0.000%
	2620	-16	0.000%
	2650	-16	0.000%
	2690	-16	0.000%
	12750	-16	0.000%

WCDMA 900:

Frequency Range	Interfering Frequency (MHz)	Interfering Level (dBm)	BER
Frequency Range 1	890	-43	0.000%
	990	-43	0.000%
Frequency Range 2	850	-30	0.000%
	1030	-30	0.000%
Frequency Range 3	820	-16	0.000%
	1045	-16	0.000%
	12745	-16	0.000%

ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.8 – RECEIVER SPURIOUS RESPONSE

Applicable Standard

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.8, Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out-of-band blocking limit as specified in table 4.2.7.2-2 is not met.

Limits

The BER shall not exceed 0,001 for the parameters specified in table 4.2.8.2-1.

Table 4.2.8.2-1: Test parameters for spurious response

Parameter	Level	Unit
DPCH_Ec	<REFSENS> + 3 dB	dBm/3,84 MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> + 3 dB	dBm/3,84 MHz
$I_{blocking}$(CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4) (note 2)	dBm
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1].		
NOTE 2: The UE transmitted mean power shall be reduced by 0,5 dB, for a UE operating in band XXII.		

Test Procedure

1) Set the parameter of the CW generator as shown in table 4.2.8.2-1. The spurious response frequencies are determined in step 4) of clause 5.3.6.1.2.
2) Set the power level of the UE according to table 4.2.8.2-1 with a ±1 dB tolerance.
3) Measure the BER of DCH received from the UE at the SS.

Details of test method for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.6.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-08.

EUT operation mode: Loopback

Test channel: Middle channel

Test condition: Normal

Test Result: Pass

WCDMA 2100:

The BER are 0.000%, for the parameters specified in table 4.2.8.2-1. No errors were detected in the presence.

WCDMA 900:

The BER are 0.000%, for the parameters specified in table 4.2.8.2-1. No errors were detected in the presence.

ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.9 – RECEIVER INTERMODULATION CHARACTERISTICS

Applicable Standard

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.9, Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receiver a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

Limits

The BER shall not exceed 0,001 for the parameters specified in table 4.2.9.2-1.

Table 4.2.9.2-1: Receive intermodulation characteristics

Parameter	Level		Unit
DPCH_Ec	<REFSENS> + 3 dB		dBm/3,84 MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> + 3 dB		dBm/3,84 MHz
I_{ouw1} (CW)	-46		dBm
I_{ouw2} mean power (modulated)	-46		dBm
F_{uw1} (offset)	10	-10	MHz
F_{uw2} (offset)	20	-20	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4) (note 3)		dBm
NOTE 1: I_{ouw2} (modulated) consists of the common channels and the 16 dedicated data channels as specified in ETSI TS 125 101 [4]. NOTE 2: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1]. NOTE 3: The UE transmitted mean power shall be reduced by 0,5 dB for a UE operating in band XXII.			

Table 4.2.9.2-2: Test parameters for narrow band intermodulation characteristics

Parameter	Unit	Band III, VIII	
DPCH_Ec	dBm/3,84 MHz	<REFSENS> + 10 dB	
$\hat{I}_{or}$	dBm/3,84 MHz	<REF$\hat{I}_{or}$> + 10 dB	
I_{ouw1} (CW)	dBm	-43	
I_{ouw2} (GMSK)	dBm	-43	
F_{uw1} (offset)	MHz	3,6	-3,6
F_{uw2} (offset)	MHz	6,0	-6,0
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1]. NOTE 2: I_{ouw2} (GMSK) is an interfering signal as defined in ETSI TS 145 004 [8]. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.			

Test Procedure

1) Set the parameters of the CW generator and interference generator as shown in tables 4.2.9.2-1 and 4.2.9.2-2.
2) Set the power level of the UE according to tables 4.2.9.2-1 and 4.2.9.2-2 with a ±1 dB tolerance.
3) Measure the BER of DCH received from the UE at the SS.

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.7.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-08.

EUT operation mode: Loopback

Test channel: Middle channel

Test condition: Normal

Test Result: Pass

WCDMA2100:

The BER are 0.000%, No errors were detected in the presence.

WCDMA900:

The BER are 0.000%, No errors were detected in the presence.

ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.10 – RECEIVER SPURIOUS EMISSIONS

Applicable Standard

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.10, The spurious emissions power is the power of emissions, generated or amplified in a receiver, which appear at the UE antenna connector. The requirements in UE transmit bands are valid in URA_PCH, Cell_PCH and idle state.

Limits

The power of any narrow band CW spurious emission shall not exceed the maximum level specified in tables 4.2.10.2-1 and 4.2.10.2-2.

Table 4.2.10.2-1: General receiver spurious emission requirements

Frequency band	Measurement bandwidth	Maximum level
30 MHz ≤ f < 1 GHz	100 kHz	-57 dBm
1 GHz ≤ f ≤ 12,75 GHz	1 MHz	-47 dBm

Table 4.2.10.2-2: Additional receiver spurious emission requirements

Band	Frequency Range	Measurement Bandwidth	Maximum level
I	1 920 MHz ≤ f ≤ 1 980 MHz	3,84 MHz	-60 dBm
III	1 710 MHz ≤ f ≤ 1 785 MHz	3,84 MHz	-60 dBm
VII	2 500 MHz ≤ f ≤ 2 570 MHz	3,84 MHz	-60 dBm
VIII	880 MHz ≤ f ≤ 915 MHz	3,84 MHz	-60 dBm
XV	791 MHz ≤ f < 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz ≤ f < 935 MHz	100 kHz 3,84 MHz	-67 dBm (see note) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (see note)
	1 900 MHz ≤ f ≤ 1 920 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm

Band	Frequency Range	Measurement Bandwidth	Maximum level
XVI	791 MHz ≤ f < 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz ≤ f < 935 MHz	100 kHz 3,84 MHz	-67 dBm (see note) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (see note)
	2 010 MHz ≤ f ≤ 2 025 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XX	832 MHz ≤ f ≤ 862 MHz	3,84 MHz	-60 dBm
XXII	3 410 MHz ≤ f ≤ 3 490 MHz	3,84 MHz	-60 dBm
NOTE:	The receiver additional spurious emission measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 4.2.10.2-1 are permitted for each UARFCN used in the measurement. This note applies also to receiver additional spurious emission measurements according to table 4.2.12.1.2-1.		

Test Procedure

Sweep the spectrum analyser (or other suitable test equipment) over a frequency range from 30 MHz to 12,75 GHz and measure the average power of the spurious emissions.

Details of test method for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.8.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-08.

EUT operation mode: Receiving

Test Result: Pass

Please refer to following data tables.

WCDMA 2100:

Mode	Frequency Range (MHz)	Detector (Peak or Average)	RBW/VBW Setting (kHz)	Result Level (dBm)	Limit (dBm)	Margin (dB)	Result
WCDMA 2100	30-1000	Average	100/300	-69.91	-57	12.91	Pass
	1000-1920	Average	1000/3000	-71.32	-47	24.32	Pass
	1920-1980	Average	3840	-74.19	-60	14.19	Pass
	1980-12750	Average	1000/3000	-67.11	-47	20.11	Pass

WCDMA 900:

Mode	Frequency Range (MHz)	Detector (Peak or Average)	RBW/VBW Setting (kHz)	Result Level (dBm)	Limit (dBm)	Margin (dB)	Result
WCDMA 900	30-880	Average	100/300	-71.02	-57	14.02	Pass
	880-915	Average	3840	-70.77	-60	10.77	Pass
	915-1000	Average	100/300	-74.45	-57	17.45	Pass
	1000-12750	Average	1000/3000	-66.89	-47	19.89	Pass

ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.11 – OUT-OF-SYNCHRONIZATION HANDLING OF OUTPUT POWER

Applicable Standard

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.11, The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1. The threshold Q_{out} specifies at what DPCCH quality levels the UE shall shut its power off. The threshold is not defined explicitly, but is defined by the conditions under which the UE shall shut its transmitter off, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the threshold Q_{out} for the purpose of monitoring synchronization. The threshold Q_{out} should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 20 %.

Limits

When the UE estimates the DPCCH quality over the last 160 ms period to be worse than a threshold Q_{out}, the UE shall shut its transmitter off within 40 ms.

The quality level at the thresholds Q_{out}correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 4.2.11.2-1, a signal with the quality at the level Q_{out} can be generated by a DPCCH_Ec/Ior ratio of -25 dB. The DL reference measurement channel 12,2 kbit/s is specified in ETSI TS 134 121-1 [1] and with static propagation conditions. The downlink physical channels, other than those specified in table 4.2.11.2-1, are as specified in ETSI TS 134 121-1 [1].

Table 4.2.11.2-1: DCH parameters for test of out-of-synchronization handling

Parameter	Value	Unit
$\hat{I}_{or}/I_{oc}$	-1	dB
I_{oc}	-60	dBm/3,84 MHz
$\frac{DPDCH\_E_c}{I_{or}}$	See figure 4.2.11.2-1: Before point A: • -16,6 for UEs not supporting enhanced receiver performance type 1 for DCH • -19,6 for UEs supporting enhanced receiver performance type 1 for DCH After point A not defined	dB
$\frac{DPCCH\_E_c}{I_{or}}$	See figure 4.2.11.2-1	dB
Information Data Rate	12,2	kbit/s

Figure 4.2.11.2-1 and table 4.2.11.2-2 show an example scenario where the DPCCH_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Q_{out} where the UE shall shut its power off.

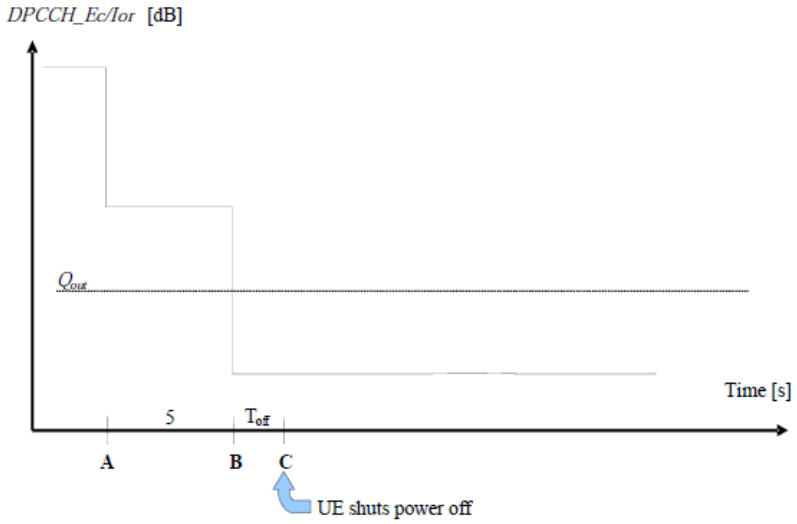


Figure 4.2.11.2-1: Conditions for out-of-synchronization handling in the UE

Table 4.2.11.2-2: Conditions for out-of-synchronization handling in the UE

Clause from figure 4.2.11.2-1	DPCCH_Ec/Ior (UE, not supporting enhanced receiver performance requirements type 1 for DCH)	DPCCH_Ec/Ior (UE, supporting enhanced receiver performance requirements type 1 for DCH)	Unit
Before A	-16,6	-19,6	dB
A to B	-21,6	-24,6	dB
After B	-28,4	-31,4	dB

The requirements for the UE are that it shall shut its transmitter off before point C.
The UE transmitter is considered to be OFF if the measured RRC filtered mean power is less than -55 dBm.

Test Procedure

1) The SS sends continuously up power control commands to the UE until the UE transmitter power reach maximum level.
2) The SS controls the DPCCH_Ec/Ior ratio level according to table 4.2.11.2-2, 'A to B'.
3) The SS controls the DPCCH_Ec/Ior ratio level according to table 4.2.11.2-2, 'after B'. The SS waits 200 ms and then verifies that the UE transmitter has been switched off.
4) The SS monitors the UE transmitted power for 5 s and verifies that the UE transmitter is not switched on during this time.

Details of test method for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 5.4.4.

Test Result: Pass

ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.12 – TRANSMITTER ADJACENT CHANNEL LEAKAGE POWER RATIO (ACLR)

Applicable Standard

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.12, Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

Limits

If the adjacent channel power is greater than -50 dBm then the ACLR shall be higher than the value specified in table 4.2.12.1.2-1.The requirements are applicable for all for the values of β_c, β_d, β_{hs}, β_{ec} and βed defined in ETSI TS 125 214 [7].

Table 4.2.12.1.2-1: UE ACLR

Power Class	Adjacent channel frequency relative to assigned channel frequency	ACLR limit
3	+5 MHz or -5 MHz	32,2 dB
3	+10 MHz or -10 MHz	42,2 dB
4	+5 MHz or -5 MHz	32,2 dB
4	+10 MHz or -10 MHz	42,2 dB
NOTE: The requirement shall still be met in the presence of switching transients.		

Test Procedure

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §5.3.11.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-08.

EUT operation mode: Loopback (worst case)

Test Result: Pass

Please refer to following data tables.

WCDMA 2100:

Condition	Transmitter Adjacent Channel Leakage Power Ratio (dB)			
	ACLR (-10 MHz)	ACLR (-5 MHz)	ACLR (+5 MHz)	ACLR (+10 MHz)
Normal	-57.75	-45.04	-47.17	-58.17
TL/VL	-57.73	-45.11	-47.13	-58.15
TL/VH	-57.72	-45.09	-47.11	-58.17
TH/VL	-57.76	-45.08	-47.15	-58.14
TH/VH	-57.74	-45.07	-47.16	-58.17

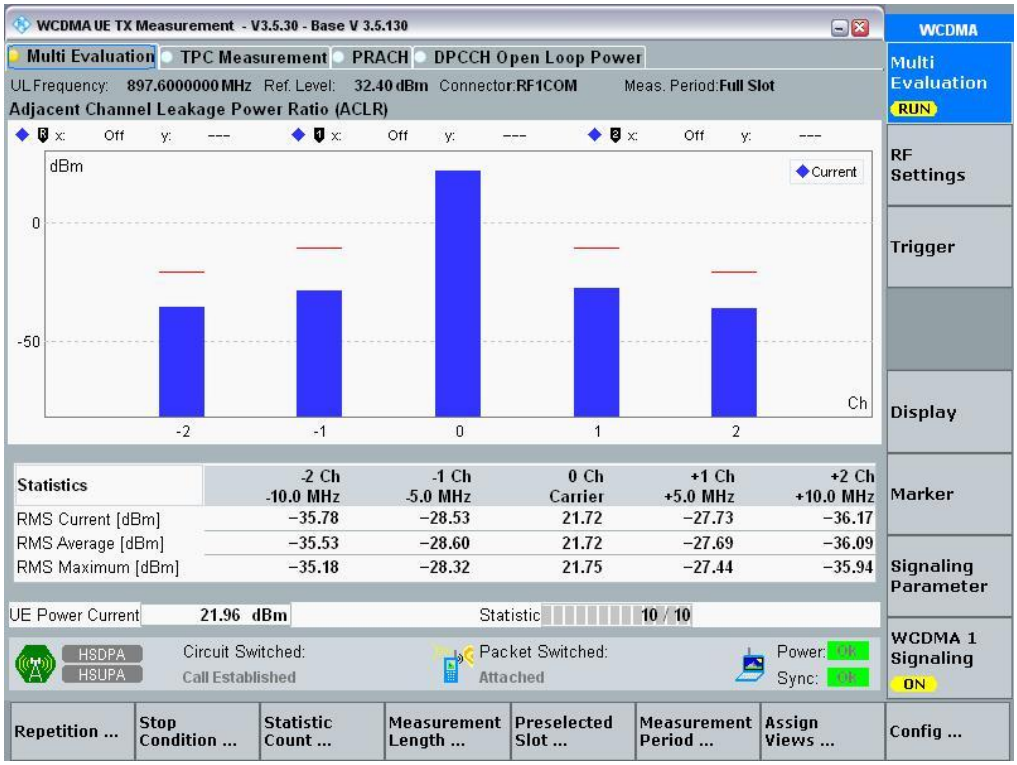
Normal Condition

WCDMA 900:

Test Channel: Middle

Condition	Transmitter Adjacent Channel Leakage Power Ratio (dB)			
	ACLR (-10 MHz)	ACLR (-5 MHz)	ACLR (+5 MHz)	ACLR (+10 MHz)
Normal	-57.25	-50.32	-49.41	-57.81
TL/VL	-57.23	-50.34	-49.43	-57.83
TL/VH	-57.29	-50.36	-49.44	-57.84
TH/VL	-57.24	-50.34	-49.46	-57.81
TH/VH	-57.28	-50.33	-49.47	-57.83

Normal Condition



ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.13 –RECEIVER REFERENCE SENSITIVITY LEVEL

Applicable Standard

According to ETSI EN 301 908-2 V11.1.2 (2017-08) §4.2.13, The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Bit Error Ratio (BER) shall not exceed a specific value.

Limits

The measured BER shall not exceed 0,001.

Table 4.2.13.2-1: Test parameters for Reference Sensitivity Level

Operating Band	Unit	DPCH_Ec <REFSENS>	<REFÎ$_{or}$>
I	dBm/3,84 MHz	-116,3	-106
III	dBm/3,84 MHz	-113,3	-103
VII	dBm/3,84 MHz	-114,3	-104
VIII	dBm/3,84 MHz	-113,3	-103
XX	dBm/3,84 MHz	-113,3	-103
XXII	dBm/3,84 MHz	-113,3	-103
NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power. NOTE 2: For Power class 4 this shall be at the maximum output power.			

NOTE: These requirements do not take into account the allowed increase of the reference sensitivity level of DPCH_Ec <REFSENS> and corresponding < REF Îbr>in ETSI TS 134 121-1 [1], table 6.2.2 by the amount defined in minimum requirement clause for the UE, which supports DB-DC-HSDPA or dual band 4C-HSDPA and/or E-UTRA inter-band carrier aggregation.

Test Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the BER of DCH received from the UE at the SS.

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.2.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-08.

EUT operation mode: Loopback

Test channel: Low/Middle/High channel

Test condition: Normal, LT/LV, LT/HV, HT/LV, HT/HV

Test Result: Pass

WCDMA2100:

The BER are 0.000%, No errors were detected in the presence.

WCDMA900:

The BER are 0.000%, No errors were detected in the presence.

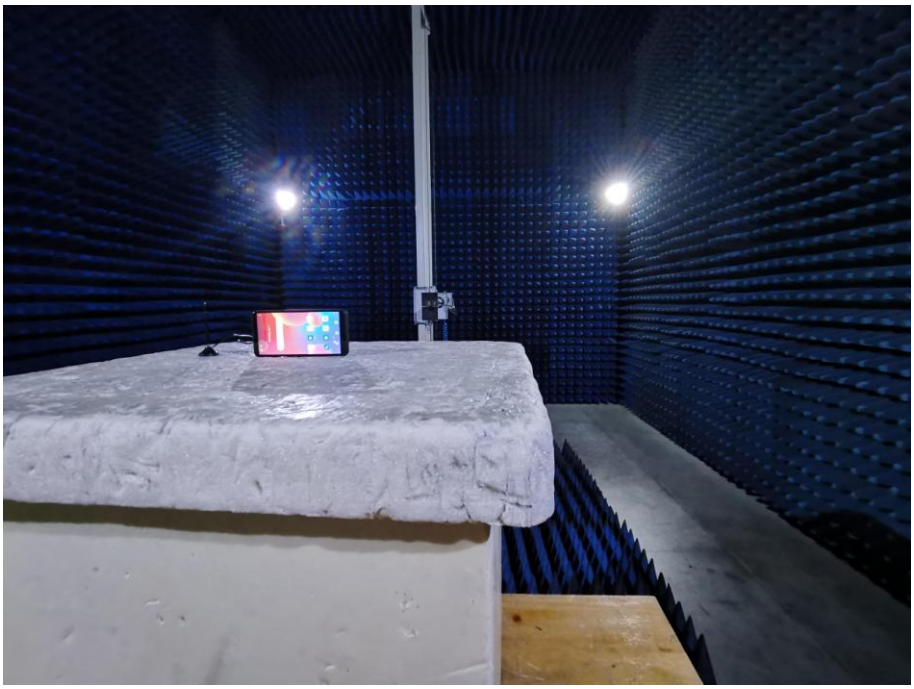
EXHIBIT A - EUT PHOTOGRAPHS

Please refer to the Attachment.

EXHIBIT B - TEST SETUP PHOTOGRAPHS

Radiated Spurious Emissions Test View (Below 1GHz)

Radiated Spurious Emissions Test View (Above 1GHz)



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