FCC PART 22/24 TEST REPORT

Report Reference No.....:	**LCSA060122034ED**
Date of Issue. .....:	**July 04, 2022**
Testing Laboratory Name .....:	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address .....:	101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
Applicant's name.....:	**ChargePoint, Inc.**
Address .....:	254 E. Hacienda Ave, Campbell, CA 95008, USA
Test specification .....**:**	
Standard.....:	**FCC Part 22H: Cellular Radiotelephone Service** **FCC Part 24E: Broadband PCS** **FCC Part 27: MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES** **RSS-132 Issue 3 / RSS-133 Issue 6 / RSS-139 Issue 3** **RSS-Gen Issue 5**
Test Report Form No .....:	LCSEMC-1.0
TRF Originator.....:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF.....:	Dated 2011-03

Test item description .....:	**LTE Module**
Trade Mark .....:	ChargePoint
Test Model.....:	EG25-G
Ratings .....:	Input: DC 5V
Hardware version .....:	R1.0
Software version .....:	EG25GGBR07A06M4G
Frequency .....:	UMTS Band II/IV//V
Result .....:	**PASS**

Compiled by:	**Supervised by:**	**Approved by:**
Vera Deng	Jin Wang	Gavin Liang
Vera Deng/ Administrator	Jin Wang/ Technique principal	Gavin Liang/ Manager

TEST REPORT

Test Report No. :	LCSA060122034ED	July 04, 2022 Date of issue

EUT.....	: LTE Module
Test Model.....	: EG25-G
Applicant.....	**: ChargePoint, Inc.**
Address.....	: 254 E. Hacienda Ave, Campbell, CA 95008, USA
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: ChargePoint, Inc.**
Address.....	: 254 E. Hacienda Ave, Campbell, CA 95008, USA
Telephone.....	: /
Fax.....	: /
Factory.....	**: ChargePoint, Inc.**
Address.....	: 254 E. Hacienda Ave, Campbell, CA 95008, USA
Telephone.....	: /
Fax.....	: /

Test Result:	**PASS**

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.

Revison History

Report Version	Issue Date	Revision Content	Revised By
000	July 04, 2022	Initial Issue	--

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Part 22H: Cellular Radiotelephone Service.
FCC Part 24E: Broadband PCS.
FCC Part 27: MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
TIA-603-E March 2016: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
47 CFR FCC Part 15 Subpart B: Unintentional Radiators.
FCC Part 2: Frequency Allocations And Radio Treaty Matters; General Rules And Regulations.
ANSI C63.4:2014: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
FCC KDB971168 D01 Power Meas License Digital Systems v03r01
RSS-132 Issue 3, January 2013: Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz
RSS-133 Issue 6, January 2018: 2 GHz Personal Communications Services
RSS-139 Issue 3, July 2015: Advanced Wireless Services (AWS) Equipment Operating in the Bands 1710-1780 MHz and 2110-2180 MHz
TIA-603-E March 2016: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
RSS-Gen Issue 5: General Requirements for Compliance of Radio Apparatus
ANSI C63.4:2014: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

2 SUMMARY

2.1 General Remarks

Date of receipt of test sample	:	June 06, 2022
Date of Test	:	June 06, 2022 ~ July 01, 2022
Date of Report	:	July 04, 2022

2.2 Product Description

The **ChargePoint, Inc.**'s Model: EG25-G or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

EUT	:	LTE Module
Test Model	:	EG25-G
Additional Model No.	:	EG25-G MINIPCIE
Model Declaration	:	RF Module PCB board, the structure and interior of these models are the same, so the additional models did not test the other RF test items.
2G	:	
Support Band	:	☒GSM 900 (EU-Band) ☒DCS 1800 (EU-Band) ☒GSM 850 (U.S.-Band) ☒PCS 1900 (U.S.-Band)
Type Of Modulation	:	GMSK for GSM/GPRS
Antenna Description	:	Monopole Antenna 0dBi (max.) For 698MHz – 960 MHz 2dBi (max.) For 1710MHz – 2690 MHz
3G	:	
Support Band	:	☒WCDMA Band II (U.S.-Band) ☒WCDMA Band V (U.S.-Band) ☒WCDMA Band IV (U.S.-Band) ☒WCDMA Band I (EU-Band) ☒WCDMA Band VIII (EU-Band)
Type Of Modulation	:	WCDMA: QPSK; HSDPA/HSUPA: QPSK
Antenna Description	:	Monopole Antenna 0dBi (max.) For 698MHz – 960 MHz 2dBi (max.) For 1710MHz – 2690 MHz
LTE	:	
Support Band	:	☒E-UTRA Band 2 ☒E-UTRA Band 4 ☒E-UTRA Band 5 ☒E-UTRA Band 7 ☒E-UTRA Band 12 ☒E-UTRA Band 13 ☒E-UTRA Band 25 ☒E-UTRA Band 26 ☒E-UTRA Band 38 ☒E-UTRA Band 41
Type Of Modulation	:	QPSK/16QAM
Antenna Description	:	Monopole Antenna 0dBi (max.) For 698MHz – 960 MHz 2dBi (max.) For 1710MHz – 2690 MHz

2.3 Equipment under Test

Power supply system utilised

Power supply voltage	:	○	120V / 60 Hz	○	115V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below) 5.0 V DC		

Test frequency list

Test Mode	TX/RX	RF Channel		
		Low(L)	Middle (M)	High (H)
WCDMA Band V	TX	Channel 4132	Channel 4182	Channel 4233
		826.4 MHz	836.4 MHz	846.6 MHz
	RX	Channel 4357	Channel 4407	Channel 4458
		871.4 MHz	881.4 MHz	891.6 MHz
Test Mode	TX/RX	RF Channel		
		Low(L)	Middle (M)	High (H)
WCDMA Band II	TX	Channel 9262	Channel 9400	Channel 9538
		1852.4 MHz	1880.0 MHz	1907.6 MHz
	RX	Channel 9662	Channel 9800	Channel 9938
		1932.4 MHz	1960.0 MHz	1987.6 MHz
Test Mode	TX/RX	RF Channel		
		Low(L)	Middle (M)	High (H)
WCDMA Band IV	TX	Channel1312	Channel1413	Channel1513
		1712.4MHz	1732.6MHz	1752.6MHz
	RX	Channel1537	Channel1638	Channel1738
		2112.4MHz	2132.6MHz	2152.6MHz

2.4 Short description of the Equipment under Test (EUT)

2.4.1 General Description

LTE Module is subscriber equipment in the GSM/WCDMA/LTE system. GSM/GPRS frequency band is Band II//V.The HSPA/UMTS frequency band is Band II/IV/V. LTE frequency band is band 2/4/5/7/12/13/25/26/38/41. The HSPA/UMTS frequency band II, band IV and Band V test data included in this report. The LTE Module implements such functions as RF signal receiving/transmitting, GSM/GPRS/HSPA/UMTS/LTE protocol processing, video MMS service and etc. Externally it provides SIM card interface.

2.5 Internal Identification of AE used during the test

AE ID*	Description
AE1	Notebook

2.6 Normal Accessory setting

N/A

2.7 EUT configuration

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

- ● - supplied by the manufacturer
- ○ - supplied by the lab

○	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
○	Multimeter	Manufacturer :	/
		Model No. :	/

2.8 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: W38-201903EG25G & IC: 8854A-201903EG25G** filing to comply with FCC Part 22 , FCC Part 24 Rules, RSS-132 Issue 3 and RSS-133 Issue 6.

2.9 Modifications

No modifications were implemented to meet testing criteria.

2.10 General Test Conditions/Configurations

2.10.1 Test Modes

NOTE: The test mode(s) are selected according to relevant radio technology specifications.

Test Mode	Test Modes Description
UMTS/TM1	WCDMA system, QPSK, 16QAM modulation
UMTS/TM2	HSDPA system, QPSK, 16QAM modulation
UMTS/TM3	HSUPA system, QPSK, 16QAM modulation

Note: As WCDMA, HSDPA and HSUPA with the same emission designator, test result recorded in this report at the worst case UMTS/TM1 only after exploratory scan.

2.10.2 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VN	DC 5.0V

NOTE: VN=nominal voltage;TN=normal temperature

3 TEST ENVIRONMENT

3.1 Address of the test laboratory

Shenzhen LCS Compliance Testing Laboratory Ltd

101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
The sites are constructed in conformance with the requirements of ANSI C63.4 (2014) and CISPR Publication 32.

3.2 Test Facility

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

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

Test Firm Registration Number: 254912.

ISED Designation Number is 9642A

3.3 Environmental conditions

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

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

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

3.4 Test Description

3.4.1 Cellular Band (824-849MHz paired with 869-894MHz) (Band V)

Test Item	FCC Rule No.	Requirements	Verdict
Effective(Isotropic) Radiated Output Power	§2.1046, §22.913 RSS-132: 5.4	FCC: ERP ≤ 7W. IC: ERP ≤ 11.5W	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917 RSS-132: 5.5	≤ -13dBm/100kHz.	Pass
NOTE 1: For the verdict, the “N/A” denotes “not applicable”, the “N/T” de notes “not tested”.			

3.4.2 PCS Band (1850-1910MHz paired with 1930-1990MHz) (Band II)

Test Item	FCC Rule No.	Requirements	Verdict
Effective(Isotropic) Radiated Output Power	§2.1046, §24.232 RSS-133: 6.4	EIRP ≤ 2W	Pass
Field Strength of Spurious Radiation	§2.1053, §24.238 RSS-133: 6.5	≤ -13dBm/1MHz.	Pass

3.4.3 AWS Band (1710-1755MHz pairedwith 2110-2155MHz) (Band IV)

Test Item	FCC RuleNo.	Requirements	Verdict
Effective(Isotropic) Radiated Power Output Data	§2.1046, §27.50(d) RSS-139: 6.5	EIRP ≤ 1W;	Pass
Radiated spurious emission	§2.1053, §27.53(h) RSS-139: 6.6	≤ -13dBm/1MHz. Required attenuated below P(dBW): 43 + 10 $\log_{10}$(p) (watts) dBc	Pass

3.5 Equipments Used during the Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power Meter	R&S	NRVS	100444	2022-06-16	2023-06-15
2	Power Sensor	R&S	NRV-Z81	100458	2022-06-16	2023-06-15
3	Power Sensor	R&S	NRV-Z32	10057	2022-06-16	2023-06-15
4	LTE Test Software	Tonscend	JS1120-1	N/A	N/A	N/A
5	RF Control Unit	Tonscend	JS0806	158060009	2021-11-25	2022-11-24
6	MXA Signal Analyzer	Agilent	N9020A	MY51250905	2021-11-16	2022-11-15
7	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2022-06-16	2023-06-15
8	DC Power Supply	Agilent	E3642A	N/A	2021-11-25	2022-11-24
9	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
10	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2022-06-16	2023-06-15
11	Positioning Controller	MF	MF7082	MF78020803	2022-06-16	2023-06-15
12	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2021-07-25	2024-07-24
13	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-07-25	2024-07-24
14	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-07-01	2024-06-30
15	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2020-09-20	2023-09-19
16	Broadband Preamplifier	SCHWARZBECK	BBV9745	9719-025	2022-06-16	2023-06-15
17	EMI Test Receiver	R&S	ESR 7	101181	2022-06-16	2023-06-15
18	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2021-11-16	2022-11-15
19	Broadband Preamplifier	/	BP-01M18G	P190501	2022-06-16	2023-06-15
20	6dB Attenuator	/	100W/6dB	1172040	2022-06-16	2023-06-15
21	3dB Attenuator	/	2N-3dB	/	2021-11-16	2022-11-15
22	Temperature & Humidity Chamber	GUANGZHOU GOGNWEN	GDS-100	70932	2021-10-07	2022-10-06
23	EMI Test Software	Farad	EZ	N/A	N/A	N/A

3.6 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 ETSI TR 100 028 " Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics" and is documented in the Shenzhen LCS Compliance Testing Laboratory 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 LCS Compliance Testing Laboratory Ltd. is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	3.10 dB	(1)
Radiated Emission	1~18GHz	3.80 dB	(1)
Radiated Emission	18-40GHz	3.90 dB	(1)
Conducted Disturbance	0.15~30MHz	1.63 dB	(1)
Conducted Power	9KHz~18GHz	0.61 dB	(1)
Spurious RF Conducted Emission	9KHz~40GHz	1.22 dB	(1)
Band Edge Compliance of RF Emission	9KHz~40GHz	1.22 dB	(1)
Occuiped Bandwidth	9KHz~40GHz	-	(1)

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

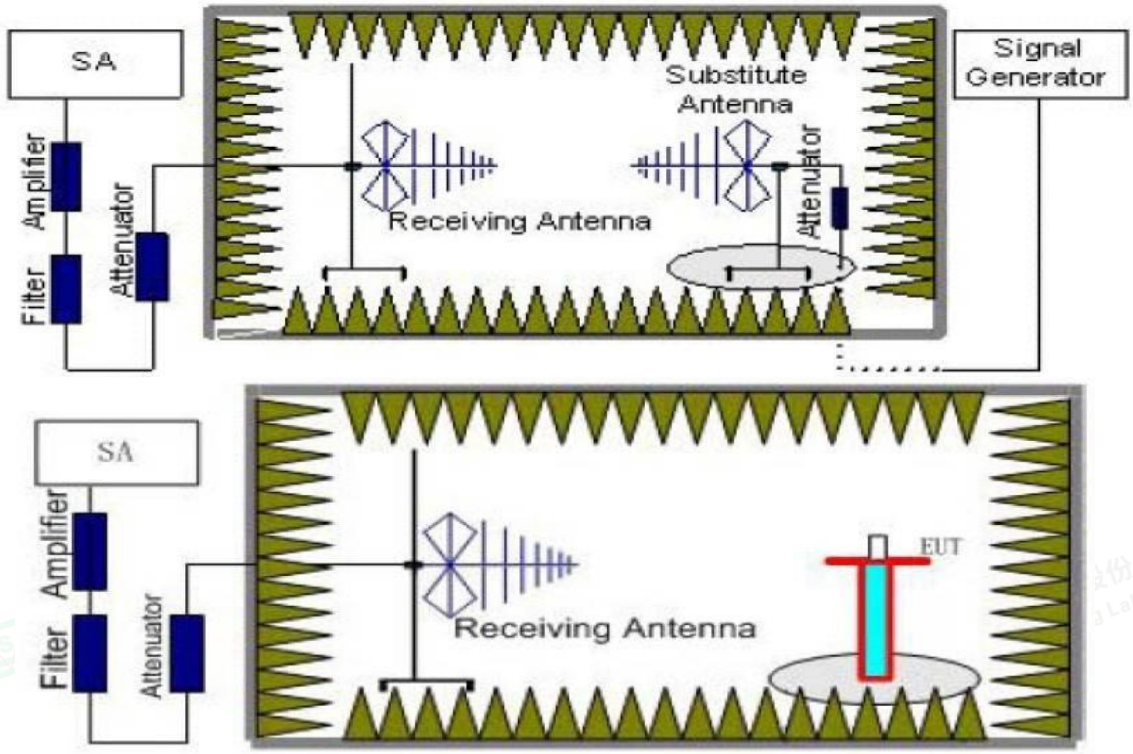
4 TEST CONDITIONS AND RESULTS

4.1.1 Radiated Output Power

TEST DESCRIPTION

This is the test for the maximum radiated power from the EUT.
Rule Part 24.232(c) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(e) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."
Rule Part 22.913(a) specifies ” The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”
Rule RSS-132 section 5.4 specifies "The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts." and RSS-133 section 6.4 specifies that " The equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510 (2 watts)."
Rule RSS-139 section 6.5 specifies " The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt."

TEST CONFIGURATION



TEST PROCEDURE

1. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
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.

3. The EUT is then put into continuously transmitting mode at its maximum power level during the test.Set Test Receiver or Spectrum RBW=10MHz,VBW=10MHz, And the maximum value of the receiver should be recorded as (P_r).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (P_{cl}) ,the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.
   The measurement results are obtained as described below:
   Power(EIRP)=P_{Mea}+ P_{Ag} - P_{cl} + G_a
6. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
7. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

TEST LIMIT

According to 22.913(a)(5), 24.232(c)the ERP(EIRP) should be not exceeding following table limits:
According to RSS-132 section 5.4 and RSS-133 section 6.4, the ERP(EIRP) should be not exceeding following table limits:

	Burst Average EIRP
UMTS Band II	≤33.01dBm (2W)

	Burst Average ERP
UMTS Band V	≤38.45dBm (7W)

	Burst Average EIRP
UMTS Band IV	≤30.00dBm (1W)

TEST RESULTS

Remark:

1. *We were tested all Configuration refer 3GPP TS134 121.*
2. *EIRP=P_{Mea}(dBm)-P_{cl}(dB)+P_{Ag}(dB)+G_a(dBi)*
3. *ERP = EIRP – 2.15dBi as EIRP by subtracting the gain of the dipole.*
4. *Margin = Emission Level - Limit*
5. *We tested the worst-case records for H and V directions, and only the worst-case records for V direction were recorded in the report.*

UMTS/TM1/UMTS Band II

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain (dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1852.4	-14.37	4.03	8.38	35.51	25.49	33.01	-7.52	V
1880.0	-14.32	4.08	8.33	35.56	25.49	33.01	-7.52	V
1907.6	-14.81	4.14	8.26	35.63	24.94	33.01	-8.07	V

UMTS/TM1/UMTS Band V

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain (dB)	Correction (dB)	P_{Ag} (dB)	Burst Average ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
826.4	-13.18	3.45	8.45	2.15	33.79	23.46	38.45	-13.18	V
836.4	-12.93	3.49	8.45	2.15	33.85	23.73	38.45	-12.93	V
846.6	-13.26	3.55	8.36	2.15	33.88	23.28	38.45	-13.26	V

UMTS/TM1/UMTS Band IV

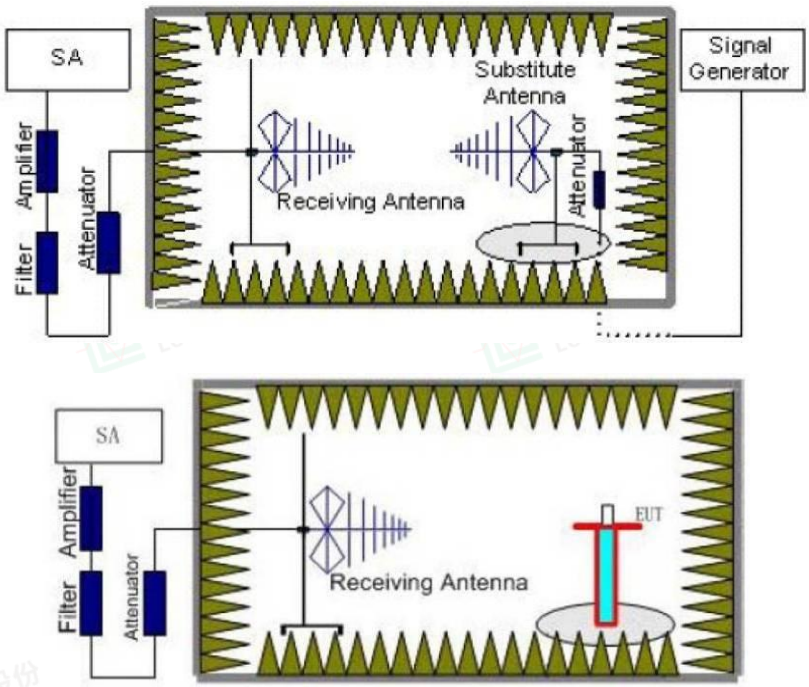
Frequency (MHz)	PMea (dBm)	Pcl (dB)	Ga Antenna Gain (dB)	PAg (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1712.4	-14.17	3.93	9.05	34.96	25.91	30	-4.09	V
1732.6	-14.38	3.93	8.89	35.01	25.59	30	-4.41	V
1752.6	-14.15	3.94	8.76	35.08	25.75	30	-4.25	V

4.2 Radiated Spurious Emssion

TEST APPLICABLE

According to the TIA-603-E:2016 and FCC Part 2.1033 test method, The Receiver or Spectrum was scanned from lowest frequency frequency generated within the equipment to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910 MHz. The resolution bandwidth is set as outlined in Part 24.238, Part 22.917, The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of WCDMA Band II and WCDMA Band V.
According to the TIA-603-E:2016 test method, The Receiver or Spectrum was scanned from lowest frequency frequency generated within the equipment to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910 MHz. The resolution bandwidth is set as outlined in Part 24.238, Part 22.917, RSS-132 §5.5, RSS-133 §6.5 and RSS-139 §6.6. The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of WCDMA Band II, WCDMA Band IV and WCDMA Band V.

TEST CONFIGURATION



TEST PROCEDURE

1. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50 m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
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.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test.Set Test Receiver or Spectrum RBW=1MHz,VBW=3MHz, And the maximum value of the receiver should be recorded as (P_r).

4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (P_{cl}) ,the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.
   The measurement results are obtained as described below:
   Power(EIRP)=P_{Mea}+ P_{Ag} - P_{cl} + G_a
6. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
7. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.
8. In order to make sure test results more clearly,we set frequency range and sweep time for difference frequency range as follows table:

Working Frequency	Subrange (GHz)	RBW	VBW	Sweep time (s)
UMTS/TM1/ WCDMA Band V	0.00009~0.15	1KHz	3KHz	30
	0.00015~0.03	10KHz	30KHz	10
	0.03~1	100KHz	300KHz	10
	1~2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~10	1 MHz	3 MHz	3
UMTS/TM1/ WCDMA Band II	0.00009~0.15	1KHz	3KHz	30
	0.00015~0.03	10KHz	30KHz	10
	0.03~1	100KHz	300KHz	10
	1~2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~11	1 MHz	3 MHz	3
	11~14	1 MHz	3 MHz	3
	14~18	1 MHz	3 MHz	3
	18~20	1 MHz	3 MHz	2
UMTS/TM1/ WCDMA Band IV	0.00009~0.15	1KHz	3KHz	30
	0.00015~0.03	10KHz	30KHz	10
	0.03~1	100KHz	300KHz	10
	1~2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~11	1 MHz	3 MHz	3
	11~14	1 MHz	3 MHz	3
	14~18	1 MHz	3 MHz	3

TEST LIMITS

According to 24.238, 22.917, specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

According to RSS-132 section 5.5, RSS-133 section 6.5 and RSS-139 section 6.6 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Frequency	Channel	Frequency Range	Verdict
UMTS/TM1/ WCDMA Band V	Low	9KHz - 10GHz	PASS
	Middle	9KHz - 10GHz	PASS
	High	9KHz - 10GHz	PASS
UMTS/TM1/ WCDMA Band II	Low	9KHz - 20GHz	PASS
	Middle	9KHz - 20GHz	PASS
	High	9KHz - 20GHz	PASS
UMTS/TM1/ WCDMA Band IV	Low	9KHz – 18GHz	PASS
	Middle	9KHz – 18GHz	PASS
	High	9KHz – 18GHz	PASS

TEST RESULTS

Remark:
1. We were tested all Configuration refer 3GPP TS134 121.
2. EIRP=P_{Mea}(dBm)-P_{cl}(dB)+P_{Ag}(dB)+G_a(dBi)
3. ERP = EIRP – 2.15dBi as EIRP by subtracting the gain of the dipole.
4. Margin = EIRP - Limit

UMTS/TM1/ WCDMA Band II _ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3704.8	-39.33	5.26	3.00	9.88	-34.71	-13.00	-21.71	H
5557.2	-44.65	6.11	3.00	11.36	-39.40	-13.00	-26.40	H
3704.8	-44.77	5.26	3.00	9.88	-40.15	-13.00	-27.15	V
5557.2	-47.98	6.11	3.00	11.36	-42.73	-13.00	-29.73	V

UMTS/TM1/ WCDMA Band II _ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3760.0	-38.25	5.32	3.00	10.03	-33.54	-13.00	-20.54	H
5640.0	-43.55	6.19	3.00	11.41	-38.33	-13.00	-25.33	H
3760.0	-43.87	5.32	3.00	10.03	-39.16	-13.00	-26.16	V
5640.0	-48.07	6.19	3.00	11.41	-42.85	-13.00	-29.85	V

UMTS/TM1/ WCDMA Band II _ High Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3815.2	-43.57	5.36	3.00	9.62	-39.31	-13.00	-26.31	H
5722.8	-51.31	6.24	3.00	11.46	-46.09	-13.00	-33.09	H
3815.2	-46.65	5.36	3.00	9.62	-42.39	-13.00	-29.39	V
5722.8	-53.37	6.24	3.00	11.46	-48.15	-13.00	-35.15	V

UMTS/TM1/ WCDMA Band V _ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1652.8	-48.01	3.86	3.00	8.56	-43.31	-13.00	-30.31	H
2479.2	-48.93	4.29	3.00	6.98	-46.24	-13.00	-33.24	H
1652.8	-44.18	3.86	3.00	8.56	-39.48	-13.00	-26.48	V
2479.2	-44.57	4.29	3.00	6.98	-41.88	-13.00	-28.88	V

UMTS/TM1/ WCDMA Band V _ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1672.8	-49.35	3.9	3.00	8.58	-44.67	-13.00	-31.67	H
2509.2	-51.25	4.32	3.00	6.8	-48.77	-13.00	-35.77	H
1672.8	-45.41	3.9	3.00	8.58	-40.73	-13.00	-27.73	V
2509.2	-45.28	4.32	3.00	6.8	-42.80	-13.00	-29.80	V

UMTS/TM1/ WCDMA Band V _ High Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1693.2	-52.44	3.91	3.00	9.06	-47.29	-13.00	-34.29	H
2539.8	-54.79	4.32	3.00	6.65	-52.46	-13.00	-39.46	H
1693.2	-49.31	3.91	3.00	9.06	-44.16	-13.00	-31.16	V
2539.8	-51.21	4.32	3.00	6.65	-48.88	-13.00	-35.88	V

UMTS/TM1/ WCDMA Band IV _ Low Channel

Frequency (MHz)	PMea (dBm)	Pcl (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3424.8	-45.87	4.62	3.00	9.81	-40.68	-13.00	-27.68	H
5137.2	-49.70	5.94	3.00	10.86	-44.78	-13.00	-31.78	H
3424.8	-49.32	4.62	3.00	9.81	-44.13	-13.00	-31.13	V
5137.2	-53.76	5.94	3.00	10.86	-48.84	-13.00	-35.84	V

UMTS/TM1/ WCDMA Band IV _ Middle Channel

Frequency (MHz)	PMea (dBm)	Pcl (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3465.2	-41.26	4.63	3.00	9.84	-36.05	-13.00	-23.05	H
5197.8	-46.24	5.94	3.00	10.86	-41.32	-13.00	-28.32	H
3465.2	-44.32	4.63	3.00	9.84	-39.11	-13.00	-26.11	V
5197.8	-49.44	5.94	3.00	10.86	-44.52	-13.00	-31.52	V

UMTS/TM1/ WCDMA Band IV _ High Channel

Frequency (MHz)	PMea (dBm)	Pcl (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3505.2	-48.46	4.65	3.00	9.9	-43.21	-13.00	-30.21	H
5257.8	-51.56	5.95	3.00	10.91	-46.60	-13.00	-33.60	H
3505.2	-50.38	4.65	3.00	9.9	-45.13	-13.00	-32.13	V
5257.8	-53.89	5.95	3.00	10.91	-48.93	-13.00	-35.93	V

5 Test Setup Photos of the EUT

Please refer to separated files for Test Setup Photos of the EUT.

6 External Photos of the EUT

Please refer to separated files for External Photos of the EUT.

7 Internal Photos of the EUT

Please refer to separated files for Internal Photos of the EUT.

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