FCC TEST REPORT

FOR

South Surveying & Mapping Technology Co., Ltd.

GNSS RECEIVER

Test Model: INNO8

Additional Model No.: Please Refer to Page 7

Prepared for	:	South Surveying & Mapping Technology Co., Ltd.
Address	:	No.39, Sicheng Road, Tianhe District, Guangzhou
Prepared by	:	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
Tel	:	(+86)755-82591330
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Web	:	www.LCS-cert.com
Mail	:	webmaster@LCS-cert.com
Date of receipt of test sample	:	May 24, 2024
Number of tested samples	:	2
Sample No.	:	A240511060-1, A240511060-2
Serial number	:	Prototype
Date of Test	:	May 24, 2024 ~ June 20, 2024
Date of Report	:	June 24, 2024

FCC PART 22/27 TEST REPORT

FCC Part 22H/Part 27

Report Reference No.....:	**LCSA05164163EI**
FCC ID.....:	**2AJTU-INNO8**
Date of Issue.....:	**June 24, 2024**
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.....:	**South Surveying & Mapping Technology Co., Ltd.**
Address.....:	No.39, Sicheng Road, Tianhe District, Guangzhou
Test specification.....:	
Standard.....:	**FCC CFR Title 47 Part 2, Part 22H, Part 27** **TIA-603-E: 2016** **KDB971168 D01 Power Meas License Digital Systems v03r01**
Test Report Form No.....:	LCSEMC-1.0
TRF Originator.....:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF.....:	Dated 2011-03

Test item description.....:	**GNSS RECEIVER**
Trade Mark.....:	SOUTH, KOLIDA, SANDING, RUIDE, TIANYU
Test Model.....:	INNO8
Modulation Type.....:	QPSK, 16QAM
Rating.....:	Please Refer to Page 7
Result.....:	**PASS**

Compiled by:	**Supervised by:**	**Approved by:**
Diamond Lu	Cary Luo	Gavin Liang
Diamond Lu/ Administrator	Cary Luo/ Technique principal	Gavin Liang/ Manager

TEST REPORT

Test Report No. : LCSA05164163EI	June 24, 2024 Date of issue

EUT.....	: GNSS RECEIVER
Test Model.....	: INNO8
Applicant.....	**: South Surveying & Mapping Technology Co., Ltd.**
Address.....	: No.39, Sicheng Road, Tianhe District, Guangzhou
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: South Surveying & Mapping Technology Co., Ltd.**
Address.....	: No.39, Sicheng Road, Tianhe District, Guangzhou
Telephone.....	: /
Fax.....	: /
Factory.....	**: /**
Address.....	: /
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	June 24, 2024	Initial Issue	---

Contents

1 TEST STANDARDS

The tests were performed according to following standards:
FCC Part 22H: Cellular Radiotelephone Service
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 ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS
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

2 SUMMARY

2.1 Product Description

The **South Surveying & Mapping Technology Co., Ltd.**'s Model: INNO8 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	:	GNSS RECEIVER
Test Model	:	INNO8
Additional Model No.	:	ALPS1, ALPS2, ALPS3, ALPS4, ALPS5, ALPS6, INNO9, INNO6, INNO5, INNO3, INNO8 Pro, K60 Pro, K60, K2, KR1, KR2, KR3, T7, T7 Pro, T6, T6 Pro, T5, T5 Pro, RENO2S, RENO1 Pro, ROVA3, RAMA1, RAMA2, RAMA3, RAMA4, K50, K9S, T14, T15, RENO2, RENO3, ROVA2, Insight V3, V1
Model Declaration	:	PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Ratings	:	For AC Adapter Input: 100-240V~, 50/60Hz, 1.4A MAX Adapter Output: PD3.0: 5V⎓3A/9V⎓3A/15V⎓3A/20V⎓2.25A PPS: 3.3-11.0V⎓3A QC: 5V⎓3A/9V⎓3A/12V⎓3A DC 7.4V by Rechargeable Li-ion Battery, 10000mAh
Hardware Version	:	H0X0DY0N0210008063135G048C12
Software Version	:	PurpleCowY_RTK-V20231019
Bluetooth	:	
Frequency Range	:	2402MHz~2480MHz
Channel Number	:	79 channels for Bluetooth V4.2 (DSS) 40 channels for Bluetooth V4.2 (DTS)
Channel Spacing	:	1MHz for Bluetooth V4.2 (DSS) 2MHz for Bluetooth V4.2 (DTS)
Modulation Type	:	GFSK, π/4-DQPSK, 8-DPSK for Bluetooth V4.2 (DSS) GFSK for Bluetooth V4.2 (DTS)
Bluetooth Version	:	V4.2
Antenna Description	:	Internal Antenna, 2.70dBi(Max.)
WIFI(2.4G Band)	:	
Frequency Range	:	2412MHz~2462MHz
Channel Spacing	:	5MHz
Channel Number	:	11 Channels for 20MHz bandwidth (2412~2462MHz) 7 Channels for 40MHz bandwidth (2422~2452MHz)
Modulation Type	:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	:	Internal Antenna, 2.70dBi(Max.)
WIFI(5.2G Band)	:	
Frequency Range	:	5180MHz~5240MHz
Channel Number	:	4 Channels for 20MHz bandwidth(5180MHz~5240MHz) 2 channels for 40MHz bandwidth(5190MHz~5230MHz)
Modulation Type	:	IEEE 802.11a/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	:	Internal Antenna, 8.07dBi(Max.)
WIFI(5.3G Band)	:	

Frequency Range	: 5260MHz~5320MHz
Channel Number	: 4 Channels for 20MHz bandwidth(5260MHz~5320MHz) 2 channels for 40MHz bandwidth(5270MHz~5310MHz)
Modulation Type	: IEEE 802.11a/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: Internal Antenna, 6.95dBi(Max.)
WIFI(5.5G Band)	:
Frequency Range	: 5500MHz~5700MHz
Channel Number	: 11 Channels for 20MHz bandwidth(5500MHz~5700MHz) 5 Channels for 40MHz bandwidth(5510MHz~5670MHz)
Modulation Type	: IEEE 802.11a/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: Internal Antenna, 6.95dBi(Max.)
2G	:
Support Band	: ☒ GSM 850 (U.S.-Band) ☒ PCS 1900 (U.S.-Band)
Release Version	: R99
GPRS Class	: Class 12
EGPRS Class	: Class 12
Type Of Modulation	: GMSK for GSM/GPRS; GMSK/8PSK for EGPRS
Antenna Description	: Internal Antenna 0.63dBi (max.) For GSM 850 1.54dBi (max.) For PCS 1900
3G	:
Support Band	: ☒ WCDMA Band V (U.S.-Band)
Release Version	: R9
Type Of Modulation	: QPSK,16QAM
Antenna Description	: Internal Antenna 0.63dBi (max.) For WCDMA Band V
LTE	:
Support Band	: ☒ E-UTRA Band 5(U.S.-Band) ☒ E-UTRA Band 7(U.S.-Band) ☒ E-UTRA Band 41(U.S.-Band)
LTE Release Version	: R9
Type Of Modulation	: QPSK/16QAM
Antenna Description	: Internal Antenna 0.63dBi (max.) For E-UTRA Band 5 1.78dBi (max.) For E-UTRA Band 7 2.55dBi (max.) For E-UTRA Band 41
Power Class	: Class 3
NFC	:
Frequency Range	: 13.56MHz
Modulation Type	: ASK
Antenna Description	: Internal Antenna, 0dBi(Max.)
PMR	:

Operating Frequency	: 410MHz~470MHz
Channel Separation	: 12.5KHz
Modulation Type	: GMSK
rated power	: 3W
Antenna Description	: External Antenna, 2.14dBi(Max.)
Extreme temp. Tolerance	: -30°C to +50°C
Extreme vol. Limits	: 6.7VDC to 8.4VDC (nominal: 7.4VDC)

2.2 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)		

2.3 Short description of the Equipment under Test (EUT)

2.4.1 GeneralDescription

GNSS RECEIVER is subscriber equipment in the BT/BLE/2.4GWIFI/5.2GWIFI/5.3GWIFI/5.5GWIFI/GSM/WCDMA/LTE/NFC/PMR system. GSM/GPRS/EGPRS frequency band is Band II//V. The HSPA/UMTS frequency band is Band V. LTE frequency band is band 5/7/41.The HSPA/UMTS frequency Band V test data included in this report. The GNSS RECEIVER implements such functions as RF signal receiving/transmitting, GSM/GPRS/EGPRS HSPA/UMTS/LTE protocol processing, video MMS service and etc. Externally it provides SIM card interface.

2.4 Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
Diwen Enterprise Co., Ltd	SWITCHING POWER SUPPLY	S045SU2000225	---	FCC

2.5 External I/O Cable

I/O Port Description	Quantity	Cable
UHF Antenna Port	1	N/A
Type-C USB Port	1	USB Cable: 0.8m, unshielded
SIM Card Slot	1	N/A

2.6 Normal Accessory setting

Fully charged battery was used during the test.

2.7 Test Sample

The application provides 2 samples to meet requirement;

Sample Number	Description
Sample 1(A240511060-1)	Engineer sample – continuous transmit
Sample 2(A240511060-2)	Normal sample – Intermittent transmit

2.8 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. :	/

2.9 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2AJTU-INNO8 filing to comply with FCC Part 22 and Part 27 Rules

2.10 Modifications

No modifications were implemented to meet testing criteria.

2.11 General Test Conditions/Configurations

2.10.1 Test Environment

EnvironmentParameter	SelectedValuesDuringTests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	DC 6.7V
	VN	DC 7.4V
	VH	DC 8.4V

NOTE:VL=lower extreme testvoltage VN=nominal voltage
VH=upper extreme testvoltage 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 22.

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.

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

3.4 Test Description

Band 5 (824-849MHz pairedwith 869-894MHz)

Test Item	FCC Rule No.	Requirements	Verdict
Effective(Isotropic) Radiated Output Power	§2.1046, §22.913	FCC: ERP ≤ 7W.	Pass
Modulation Characteristics	§2.1047	Digital modulation	N/A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Pass
Band Edges Compliance	§2.1051, §22.917	≤-≤ -13dBm/1%*EBW, In 1MHz bands immediately outside and adjacent to The frequency block.	Pass
Spurious Emission at Antenna Terminals	§2.1051, §22.917	FCC: ≤ -13dBm/100kHz, from 9kHz to 10th harmonics but outside authorized operating frequency ranges.	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917	FCC: ≤ -13dBm/100kHz.	Pass
Frequency Stability	§2.1055, §22.355	≤ ±2.5ppm.	Pass
NOTE 1:For the verdict, the“N/A”denotes“not applicable”,the“N/T”de notes “not tested”.			

Band 7 (2500-2570MHz pairedwith 2620-2690MHz)

Test Item	FCC Rule No.	Requirements	Verdict
Effective(Isotropic) Radiated Output Power	§2.1046, §27.50(h)	FCC: EIRP ≤ 2W.	Pass
Peak-AverageRatio	§2.1046, §27.50(a)	Limit≤13dB	Pass
Modulation Characteristics	§2.1047	Digital modulation	N/A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Pass
Band Edges Compliance	§2.1051, §27.53(m)	More details specified in §27.53(m)(4)	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)	More details specified in §27.53(m)(4)	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(m)	More details specified in §27.53(m)(4)	Pass
Frequency Stability	§2.1055, §27.54	≤ ±2.5ppm.	Pass
NOTE 1:For the verdict, the“N/A”denotes“not applicable”,the“N/T”de notes “not tested”.			

TDD Band 41(2496-2690MHz)

Test Item	FCC Rule No.	Requirements	Verdict
Effective(Isotropic) Radiated Power Output Data	§2.1046, §27.50(h)	ERP ≤ 2W;	PASS
Peak-Average Ratio	§2.1046, §27.50	Limit≤13dB	PASS
Modulation Characteristics	§2.1047	Digitalmodulation	N/A
Bandwidth	§2.1049	OBW: Nolimit. EBW: Nolimit.	PASS
BandEdges Compliance	§2.1051, §27.53(m)	≤ -13dBm/1%*EBW,in1 MHz bands immediately outside and adjacent to The frequency block.	PASS
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)	≤ -13dBm/1MHz, from 9kHz to10th harmonics but outside authorized Operating frequency ranges.	PASS
Frequency Stability	§2.1055, §27.54	Within authorized bands of operation/frequency block.	PASS
Radiated spurious emission	§2.1053, §27.53(m)	≤ -25dBm/1MHz.	PASS
NOTE 1:For the verdict, the“N/A”denotes“not applicable”,the“N/T”de notes “not tested”.			

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	2023-06-09	2024-06-08
					2024-06-06	2025-06-05
2	Power Sensor	R&S	NRV-Z81	100458	2023-06-09	2024-06-08
					2024-06-06	2025-06-05
3	Power Sensor	R&S	NRV-Z32	10057	2023-06-09	2024-06-08
					2024-06-06	2025-06-05
4	LTE Test Software	Tonscend	JS1120-1	N/A	N/A	N/A
5	RF Control Unit	Tonscend	JS0806-1	158060009	2023-10-18	2024-10-17
6	MXA Signal Analyzer	Agilent	N9020A	MY51250905	2023-10-18	2024-10-17
7	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2023-06-09	2024-06-08
					2024-06-06	2025-06-05
8	DC Power Supply	Agilent	E3642A	N/A	2023-10-18	2024-10-17
9	EMI Test Software	AUDIX	E3	/	N/A	N/A
10	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2023-06-09	2024-06-08
					2024-06-06	2025-06-05
11	Positioning Controller	Max-Full	MF7802BS	MF780208586	N/A	N/A
12	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2021-08-29	2024-08-28
13	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-09-12	2024-09-11
14	By-log Antenna	SCHWARZBECK	VULB9163	9163-471	2021-09-12	2024-09-11
15	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-09-05	2024-09-04
16	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1926	2021-09-05	2024-09-04
17	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2021-08-29	2024-08-28
18	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	792	2021-08-29	2024-08-28
19	Broadband Preamplifier	SCHWARZBECK	BBV9719	9719-025	2021-08-29	2024-08-28
20	EMI Test Receiver	R&S	ESR 7	101181	2023-08-15	2024-08-14
21	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2023-07-17	2024-07-16
22	Low-frequency amplifier	SchwarzZBECK	BBV9745	00253	2023-10-18	2024-10-17
23	High-frequency amplifier	JS Denki Pte	PA0118-43	JSPA21009	2023-10-18	2024-10-17
24	6dB Attenuator	/	100W/6dB	1172040	2023-06-09	2024-06-08
					2024-06-06	2025-06-05
26	3dB Attenuator	/	2N-3dB	/	2023-10-18	2024-10-17
27	Temperature & Humidity Chamber	GUANGZHOU GOGNWEN	GDS-100	70932	2023-10-05	2024-10-04
28	EMI Test Software	Farad	EZ	/	N/A	N/A
29	RADIO COMMUNICATION TESTER	R&S	CMU 200	105988	2023-06-09	2024-06-08
					2024-06-06	2025-06-05

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 compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof 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

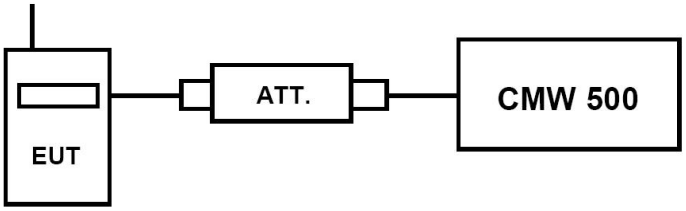
4.1 Output Power

TEST APPLICABLE

During the process of testing, the EUT was controlled via R&S Digital Radio Communication tester (CMW 500) to ensure max power transmission and proper modulation. This result contains output power and EIRP measurements for the EUT. In all cases, output power is within the specified limits.

4.1.1. Conducted Output Power

TEST CONFIGURATION



TEST PROCEDURE

Conducted Power Measurement:

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a CMW 500 by an Att.
c) EUT Communicate with CMW 500 then selects a channel for testing.
d) Add a correction factor to the display CMW 500, and then test.

TEST RESULTS

Remark:

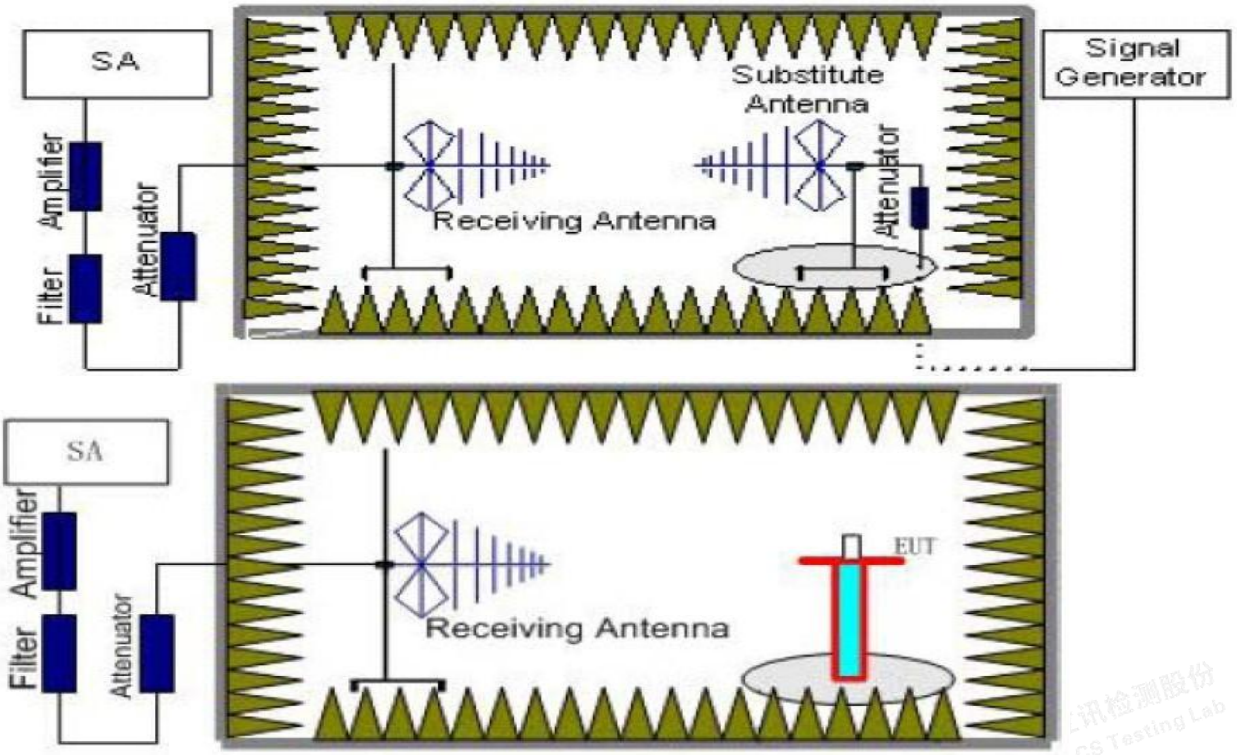
1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41; recorded worst case for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41.*
2. *For E-UTRA Band 5, please refer to Appendix G: Section G.1*
3. *For E-UTRA Band 7, please refer to Appendix H: Section H.1*
4. *For E-UTRA Band 41, please refer to Appendix I: Section I.1*

4.1.2. Radiated Output Power

LIMIT

This is the test for the maximum radiated power from the EUT.
Per §22.913(2) Extend coverage on a secondary basis into cellular unserved areas, as those areas are defined in §22.949, the ERP of base transmitters and cellular repeaters of such systems must not exceed 1000 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
Per Part 27.50(d) (4) specifies, Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755MHz band are limited to 1W EIRP. Fixed stations operating in this band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in this band must employ a means for limiting power to the minimum necessary for successful communications.
Per Part 27.50(c) (10)specifies, Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.
Per Part 27.50(h) (2)specifies Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

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=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.

TEST RESULTS

Radiated Measurement:

Remark:

1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41; recorded worst case for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41.*
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.*

LTE FDD Band 5_Channel Bandwidth 1.4MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	Correction (dB)	P_{Ag} (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
824.70	-15.50	3.45	8.45	2.15	33.79	21.14	38.45	-17.31	V
836.50	-16.12	3.49	8.45	2.15	33.85	20.54	38.45	-17.91	V
848.30	-16.44	3.55	8.36	2.15	33.88	20.10	38.45	-18.35	V

LTE FDD Band 5_Channel Bandwidth 3MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	Correction (dB)	P_{Ag} (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
825.50	-15.67	3.45	8.45	2.15	33.79	20.97	38.45	-17.48	V
836.50	-16.38	3.49	8.45	2.15	33.85	20.28	38.45	-18.17	V
847.50	-15.55	3.55	8.36	2.15	33.88	20.99	38.45	-17.46	V

LTE FDD Band 5_Channel Bandwidth 5MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	Correction (dB)	P_{Ag} (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
826.50	-15.91	3.45	8.45	2.15	33.79	20.73	38.45	-17.72	V
836.50	-15.51	3.49	8.45	2.15	33.85	21.15	38.45	-17.30	V
846.50	-15.64	3.55	8.36	2.15	33.88	20.90	38.45	-17.55	V

LTE FDD Band 5_Channel Bandwidth 10MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	Correction (dB)	P_{Ag} (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
829.00	-16.34	3.45	8.45	2.15	33.79	20.30	38.45	-18.15	V
836.50	-15.72	3.49	8.45	2.15	33.85	20.94	38.45	-17.51	V
844.00	-15.85	3.55	8.36	2.15	33.88	20.69	38.45	-17.76	V

LTE FDD Band 5_Channel Bandwidth 1.4MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	Correction (dB)	P_{Ag} (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
824.70	-16.64	3.45	8.45	2.15	33.79	20.00	38.45	-18.45	V
836.50	-16.62	3.49	8.45	2.15	33.85	20.04	38.45	-18.41	V
848.30	-16.94	3.55	8.36	2.15	33.88	19.60	38.45	-18.85	V

LTE FDD Band 5_Channel Bandwidth 3MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	Correction (dB)	P_{Ag} (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
825.50	-16.64	3.45	8.45	2.15	33.79	20.00	38.45	-18.45	V
836.50	-17.00	3.49	8.45	2.15	33.85	19.66	38.45	-18.79	V
847.50	-17.30	3.55	8.36	2.15	33.88	19.24	38.45	-19.21	V

LTE FDD Band 5_Channel Bandwidth 5MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	Correction (dB)	P_{Ag} (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
826.50	-16.87	3.45	8.45	2.15	33.79	19.77	38.45	-18.68	V
836.50	-17.17	3.49	8.45	2.15	33.85	19.49	38.45	-18.96	V
846.50	-17.24	3.55	8.36	2.15	33.88	19.30	38.45	-19.15	V

LTE FDD Band 5_Channel Bandwidth 10MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	Correction (dB)	P_{Ag} (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
829.00	-17.41	3.45	8.45	2.15	33.79	19.23	38.45	-19.22	V
836.50	-16.97	3.49	8.45	2.15	33.85	19.69	38.45	-18.76	V
844.00	-16.91	3.55	8.36	2.15	33.88	19.63	38.45	-18.82	V

LTE FDD Band 7_Channel Bandwidth 5MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2502.5	-18.15	4.32	6.80	36.14	20.47	33.01	-12.54	V
2535.0	-18.66	4.32	6.61	36.17	19.80	33.01	-13.21	V
2567.5	-18.77	4.33	6.57	36.22	19.69	33.01	-13.32	V

LTE FDD Band 7_Channel Bandwidth 10MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.0	-18.10	4.32	6.80	36.14	20.52	33.01	-12.49	V
2535.0	-18.51	4.32	6.61	36.17	19.95	33.01	-13.06	V
2565.0	-18.33	4.33	6.57	36.22	20.13	33.01	-12.88	V

LTE FDD Band 7_Channel Bandwidth 15MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2507.5	-18.58	4.32	6.80	36.14	20.04	33.01	-12.97	V
2535.0	-18.47	4.32	6.61	36.17	19.99	33.01	-13.02	V
2562.5	-18.65	4.33	6.57	36.22	19.81	33.01	-13.20	V

LTE FDD Band 7_Channel Bandwidth 20MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2510.0	-18.45	4.32	6.80	36.14	20.17	33.01	-12.84	V
2535.0	-18.37	4.32	6.61	36.17	20.09	33.01	-12.92	V
2560.0	-18.84	4.33	6.57	36.22	19.62	33.01	-13.39	V

LTE FDD Band 7_Channel Bandwidth 5MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2502.5	-19.58	4.32	6.80	36.14	19.04	33.01	-13.97	V
2535.0	-19.80	4.32	6.61	36.17	18.66	33.01	-14.35	V
2567.5	-19.36	4.33	6.57	36.22	19.10	33.01	-13.91	V

LTE FDD Band 7_Channel Bandwidth 10MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.0	-19.89	4.32	6.80	36.14	18.73	33.01	-14.28	V
2535.0	-19.53	4.32	6.61	36.17	18.93	33.01	-14.08	V
2565.0	-19.89	4.33	6.57	36.22	18.57	33.01	-14.44	V

LTE FDD Band 7_Channel Bandwidth 15MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2507.5	-19.59	4.32	6.80	36.14	19.03	33.01	-13.98	V
2535.0	-19.24	4.32	6.61	36.17	19.22	33.01	-13.79	V
2562.5	-19.68	4.33	6.57	36.22	18.78	33.01	-14.23	V

LTE FDD Band 7_Channel Bandwidth 20MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2510.0	-19.18	4.32	6.80	36.14	19.44	33.01	-13.57	V
2535.0	-19.46	4.32	6.61	36.17	19.00	33.01	-14.01	V
2560.0	-19.56	4.33	6.57	36.22	18.90	33.01	-14.11	V

LTE TDD Band 41_Channel Bandwidth 5MHz_QPSK

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
2498.5	-18.16	4.32	6.8	36.13	20.45	33.01	-12.56	V
2593.0	-18.38	4.36	6.55	36.26	20.07	33.01	-12.94	V
2687.5	-18.99	4.51	6.37	36.54	19.41	33.01	-13.60	V

LTE TDD Band 41_Channel Bandwidth 10MHz_QPSK

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
2501.0	-18.20	4.32	6.8	36.13	20.41	33.01	-12.60	V
2593.0	-18.96	4.36	6.55	36.26	19.49	33.01	-13.52	V
2685.0	-18.75	4.51	6.37	36.54	19.65	33.01	-13.36	V

LTE TDD Band 41_Channel Bandwidth 15MHz_QPSK

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
2503.5	-18.15	4.32	6.8	36.13	20.46	33.01	-12.55	V
2593.0	-18.56	4.36	6.55	36.26	19.89	33.01	-13.12	V
2682.5	-18.14	4.51	6.37	36.54	20.26	33.01	-12.75	V

LTE TDD Band 41_Channel Bandwidth 20MHz_QPSK

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
2506.0	-18.92	4.32	6.8	36.13	19.69	33.01	-13.32	V
2593.0	-18.45	4.36	6.55	36.26	20.00	33.01	-13.01	V
2680.0	-18.79	4.51	6.37	36.54	19.61	33.01	-13.40	V

LTE TDD Band 41_Channel Bandwidth 5MHz_16QAM

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
2498.5	-19.62	4.32	6.8	36.13	18.99	33.01	-14.02	V
2593.0	-19.85	4.36	6.55	36.26	18.60	33.01	-14.41	V
2687.5	-19.25	4.51	6.37	36.54	19.15	33.01	-13.86	V

LTE TDD Band 41_Channel Bandwidth 10MHz_16QAM

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
2501.0	-19.75	4.32	6.8	36.13	18.86	33.01	-14.15	V
2593.0	-19.29	4.36	6.55	36.26	19.16	33.01	-13.85	V
2685.0	-19.62	4.51	6.37	36.54	18.78	33.01	-14.23	V

LTE TDD Band 41_Channel Bandwidth 15MHz_16QAM

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
2503.5	-19.52	4.32	6.8	36.13	19.09	33.01	-13.92	V
2593.0	-19.26	4.36	6.55	36.26	19.19	33.01	-13.82	V
2682.5	-19.62	4.51	6.37	36.54	18.78	33.01	-14.23	V

LTE TDD Band 41_Channel Bandwidth 20MHz_16QAM

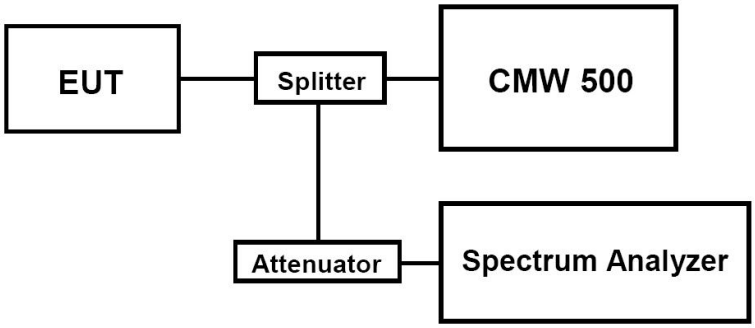
Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2506.0	-19.66	4.32	6.8	36.13	18.95	33.01	-14.06	V
2593.0	-19.37	4.36	6.55	36.26	19.08	33.01	-13.93	V
2680.0	-19.77	4.51	6.37	36.54	18.63	33.01	-14.38	V

4.2 Peak-to-Average Ratio (PAR)

LIMIT

The Peak-to-Average Ratio (PAR) of the transmission may not exceed 13 dB.

TEST CONFIGURATION



TEST PROCEDURE

1. Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
2. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
3. Set the number of counts to a value that stabilizes the measured CCDF curve;
4. Set the measurement interval as follows:
   1). for continuous transmissions, set to 1 ms,
   2). for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
5. Record the maximum PAPR level associated with a probability of 0.1%.

TEST RESULTS

Remark:

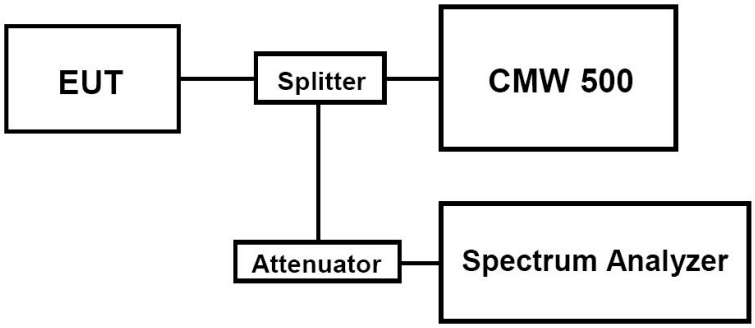
1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41; recorded worst case for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41.*
2. *For E-UTRA Band 5, please refer to Appendix G: Section G.2*
3. *For E-UTRA Band 7, please refer to Appendix H: Section H.2*
4. *For E-UTRA Band 41, please refer to Appendix I: Section I.2*

4.3 Occupied Bandwidth and Emission Bandwidth

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at low, middle and high channel in each band. The -26dBc Emission bandwidth was also measured and recorded.
Set RBW was set to about 1% of emission BW, VBW≥3 times RBW.
-26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

TEST RESULTS

Remark:

1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41; recorded worst case for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41.*
2. *For E-UTRA Band 5, please refer to Appendix G: Section G.3*
3. *For E-UTRA Band 7, please refer to Appendix H: Section H.3*
4. *For E-UTRA Band 41, please refer to Appendix I: Section I.3*

4.4 Band Edge compliance

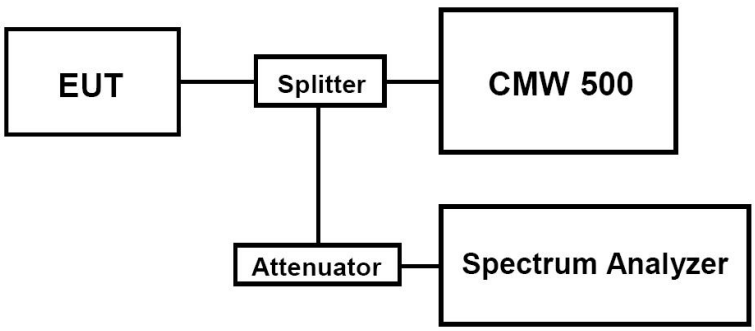
LIMIT

For LTE FDD Band 5:Per FCC §22.917 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 + 10log(P) dB.

For LTE FDD Band 7: Per FCC §27.53 (m)(4): For mobile digital stations, the attenuation factor shall be not less than:
○40+10logP dB (−10 dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge,
○43+10logP dB (−13 dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge, and
○55+10logP dB (−25 dBm, 3 nW) on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz or the actual emission bandwidth (26 dB). [§ 27.53(m)(4)]
In addition, the attenuation factor (fixed limit) shall not be less than:
○43+10logP dB on all frequencies between 2490.5 MHz and 2496 MHz, and
○55+10logP dB at or below 2490.5 MHz. [§ 27.53(m)(4)]

For LTE TDD Band 41: Per §27.53 (m)(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.
(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.Show citation box.

TEST CONFIGURATION



TEST PROCEDURE

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowestand highest channels for each band and different modulation.
5. Measure Band edge using RMS (Average) detector by spectrum

TEST RESULTS

Remark:

1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41; recorded worst case for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41.*
2. *For E-UTRA Band 5, please refer to Appendix G: Section G.4*
3. *For E-UTRA Band 7, please refer to Appendix H: Section H.4*
4. *For E-UTRA Band 41, please refer to Appendix I: Section I.4*

4.5 Spurious Emssion on Antenna Port

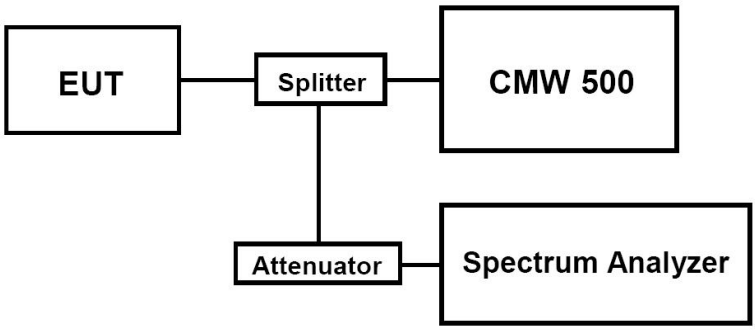
LIMIT

For LTE FDD Band 5:Per FCC §22.917 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 + 10log(P) dB.

For LTE FDD Band 7: Per FCC §27.53 (m)(4): For mobile digital stations, the attenuation factor shall be not less than:
○40+10logP dB (−10 dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge,
○43+10logP dB (−13 dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge, and
○55+10logP dB (−25 dBm, 3 nW) on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz or the actual emission bandwidth (26 dB). [§ 27.53(m)(4)]
In addition, the attenuation factor (fixed limit) shall not be less than:
○43+10logP dB on all frequencies between 2490.5 MHz and 2496 MHz, and
○55+10logP dB at or below 2490.5 MHz. [§ 27.53(m)(4)]

For LTE TDD Band 41: Per §27.53 (m)(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.
(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.Show citation box.
For LTE FDD Band 66: Per §27.53(h): For operations in the 1710–1780 MHz and 2110–2200 MHz bands, the power of any emission outside a licensee’s frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was setup according to TIA-603-E

a. Place the EUT on a bench and set it in transmitting mode.
b. Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW 500 by a Directional Couple.
c. EUT Communicate with CMW 500, then select a channel for testing.
d. Add a correction factor to the display of spectrum, and then test.
e. The resolution bandwidth of the spectrum analyzer was setsufficient scans were taken to show the out of band Emission if any up to10^{th} harmonic.
f. Please refer to following tables for test antenna conducted emissions.

Working Frequency	Sub range (GHz)	RBW	VBW	Sweep time (s)
LTE FDD Band 5	0.000009~0.000015	1KHz	3KHz	Auto
	0.000015~0.03	10KHz	30KHz	Auto
	0.03~26	1 MHz	3 MHz	Auto
LTE FDD Band 7	0.000009~0.000015	1KHz	3KHz	Auto
	0.000015~0.03	10KHz	30KHz	Auto
	0.03~26	1 MHz	3 MHz	Auto
LTE FDD Band 41	0.000009~0.000015	1KHz	3KHz	Auto
	0.000015~0.03	10KHz	30KHz	Auto
	0.03~26	1 MHz	3 MHz	Auto

TEST RESULTS

Remark:
1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41; recorded worst case for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41.*
2. *For E-UTRA Band 5, please refer to Appendix G: Section G.5*
3. *For E-UTRA Band 7, please refer to Appendix H: Section H.5*
4. *For E-UTRA Band 41, please refer to Appendix I: Section I.5*

4.6 Radiated Spurious Emssion

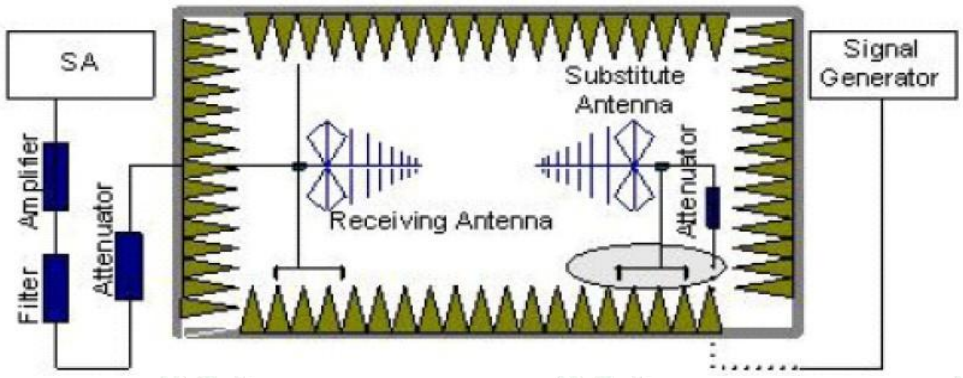
LIMIT

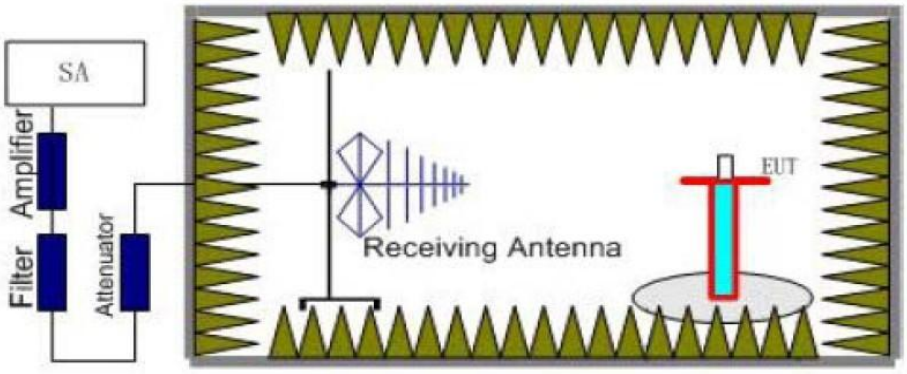
For LTE FDD Band 5:Per FCC §22.917 the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

For LTE FDD Band 7: Per FCC §27.53 (m)(4): For mobile digital stations, the attenuation factor shall be not less than:
○40+10logP dB (−10 dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge,
○43+10logP dB (−13 dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge, and
○55+10logP dB (−25 dBm, 3 nW) on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz or the actual emission bandwidth (26 dB). [§ 27.53(m)(4)]
In addition, the attenuation factor (fixed limit) shall not be less than:
○43+10logP dB on all frequencies between 2490.5 MHz and 2496 MHz, and
○55+10logP dB at or below 2490.5 MHz. [§ 27.53(m)(4)]

For LTE TDD Band 41: Per §27.53 (m)(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.
(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.Show citation box.

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=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)
LTE FDD Band 5	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
	8~9	1 MHz	3 MHz	3
LTE FDD Band 7	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
	20~26	1 MHz	3 MHz	2
LTE TDD Band 41	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
	20~26	1 MHz	3 MHz	2

Frequency	Channel	Frequency Range	Verdict
LTE FDD Band 5	Low	9KHz -9GHz	PASS
	Middle	9KHz -9GHz	PASS
	High	9KHz -9GHz	PASS
LTE FDD Band 7	Low	9KHz -26GHz	PASS
	Middle	9KHz -26GHz	PASS
	High	9KHz -26GHz	PASS
LTE TDD Band 41	Low	9KHz -26GHz	PASS
	Middle	9KHz -26GHz	PASS
	High	9KHz -26GHz	PASS

TEST RESULTS

Remark:
1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41; recorded worst case for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41.
3. We were not recorded other points as values lower than limits.
4. Power(EIRP)=P_{Mea}+ P_{Ag} - P_{cl} + G_a
5. Margin = EIRP - Limit

LTE FDD Band 5_Channel Bandwidth 10MHz_QPSK_ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1658.00	-38.30	3.86	3.00	8.56	-33.60	-13.00	-20.60	H
2487.00	-45.71	4.29	3.00	6.98	-43.02	-13.00	-30.02	H
1658.00	-35.39	3.86	3.00	8.56	-30.69	-13.00	-17.69	V
2487.00	-38.03	4.29	3.00	6.98	-35.34	-13.00	-22.34	V

LTE FDD Band 5_Channel Bandwidth 10MHz_QPSK_ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.00	-41.83	3.90	3.00	8.58	-37.15	-13.00	-24.15	H
2509.50	-46.70	4.32	3.00	6.80	-44.22	-13.00	-31.22	H
1673.00	-33.73	3.90	3.00	8.58	-29.05	-13.00	-16.05	V
2509.50	-37.42	4.32	3.00	6.80	-34.94	-13.00	-21.94	V

LTE FDD Band 5_Channel Bandwidth 10MHz_QPSK_ High Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1688.00	-39.53	3.91	3.00	9.06	-34.38	-13.00	-21.38	H
2532.00	-44.37	4.32	3.00	6.65	-42.04	-13.00	-29.04	H
1688.00	-34.58	3.91	3.00	9.06	-29.43	-13.00	-16.43	V
2532.00	-37.38	4.32	3.00	6.65	-35.05	-13.00	-22.05	V

LTE FDD Band 5_Channel Bandwidth 10MHz_16QAM _ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1658.00	-41.91	3.86	3.00	8.56	-37.21	-13.00	-24.21	H
2487.00	-48.07	4.29	3.00	6.98	-45.38	-13.00	-32.38	H
1658.00	-36.82	3.86	3.00	8.56	-32.12	-13.00	-19.12	V
2487.00	-42.26	4.29	3.00	6.98	-39.57	-13.00	-26.57	V

LTE FDD Band 5_Channel Bandwidth 10MHz_16QAM _ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.00	-42.17	3.90	3.00	8.58	-37.49	-13.00	-24.49	H
2509.50	-46.02	4.32	3.00	6.80	-43.54	-13.00	-30.54	H
1673.00	-36.42	3.90	3.00	8.58	-31.74	-13.00	-18.74	V
2509.50	-39.27	4.32	3.00	6.80	-36.79	-13.00	-23.79	V

LTE FDD Band 5_Channel Bandwidth 10MHz_16QAM _ High Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1688.00	-41.93	3.91	3.00	9.06	-36.78	-13.00	-23.78	H
2532.00	-47.58	4.32	3.00	6.65	-45.25	-13.00	-32.25	H
1688.00	-36.66	3.91	3.00	9.06	-31.51	-13.00	-18.51	V
2532.00	-42.99	4.32	3.00	6.65	-40.66	-13.00	-27.66	V

LTE FDD Band 7_Channel Bandwidth 20MHz_QPSK_ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5020.0	-41.23	5.88	3.00	10.77	-36.34	-25.00	-11.34	H
7530.0	-46.83	7.12	3.00	12.26	-41.69	-25.00	-16.69	H
5020.0	-34.33	5.88	3.00	10.77	-29.44	-25.00	-4.44	V
7530.0	-39.69	7.12	3.00	12.26	-34.55	-25.00	-9.55	V

LTE FDD Band 7_Channel Bandwidth 20MHz_QPSK_ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5070.0	-40.38	5.90	3.00	10.81	-35.47	-25.00	-10.47	H
7605.0	-45.19	7.19	3.00	12.32	-40.06	-25.00	-15.06	H
5070.0	-36.80	5.90	3.00	10.81	-31.89	-25.00	-6.89	V
7605.0	-36.12	7.19	3.00	12.32	-30.99	-25.00	-5.99	V

LTE FDD 7_Channel Bandwidth 20MHz_QPSK_ High Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5120.0	-41.43	5.94	3.00	10.86	-36.51	-25.00	-11.51	H
7680.0	-45.69	7.25	3.00	12.98	-39.96	-25.00	-14.96	H
5120.0	-36.75	5.94	3.00	10.86	-31.83	-25.00	-6.83	V
7680.0	-38.97	7.25	3.00	12.98	-33.24	-25.00	-8.24	V

LTE FDD Band 7_Channel Bandwidth 20MHz_16QAM _ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5020.0	-42.74	5.88	3.00	10.77	-37.85	-25.00	-12.85	H
7530.0	-46.66	7.12	3.00	12.26	-41.52	-25.00	-16.52	H
5020.0	-37.22	5.88	3.00	10.77	-32.33	-25.00	-7.33	V
7530.0	-41.57	7.12	3.00	12.26	-36.43	-25.00	-11.43	V

LTE FDD Band 7_Channel Bandwidth 20MHz_16QAM _ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5070.0	-44.14	5.90	3.00	10.81	-39.23	-25.00	-14.23	H
7605.0	-47.56	7.19	3.00	12.32	-42.43	-25.00	-17.43	H
5070.0	-37.33	5.90	3.00	10.81	-32.42	-25.00	-7.42	V
7605.0	-42.61	7.19	3.00	12.32	-37.48	-25.00	-12.48	V

LTE FDD Band 7_Channel Bandwidth 20MHz_16QAM _ High Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5120.0	-42.57	5.94	3.00	10.86	-37.65	-25.00	-12.65	H
7680.0	-49.94	7.25	3.00	12.98	-44.21	-25.00	-19.21	H
5120.0	-37.42	5.94	3.00	10.86	-32.50	-25.00	-7.50	V
7680.0	-40.70	7.25	3.00	12.98	-34.97	-25.00	-9.97	V

LTE TDD Band 41_Channel Bandwidth 20MHz_QPSK_ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5012.0	-41.42	7.15	3.00	9.88	-38.69	-25.00	-13.69	H
7518.0	-45.15	8.36	3.00	11.36	-42.15	-25.00	-17.15	H
5012.0	-44.98	7.15	3.00	9.88	-42.25	-25.00	-17.25	V
7518.0	-42.11	8.36	3.00	11.36	-39.11	-25.00	-14.11	V

LTE TDD Band 41_Channel Bandwidth 20MHz_QPSK_ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5186.0	-38.05	7.26	3.00	10.03	-35.28	-25.00	-10.28	H
7779.0	-46.77	8.48	3.00	11.41	-43.84	-25.00	-18.84	H
5186.0	-46.37	7.26	3.00	10.03	-43.60	-25.00	-18.60	V
7779.0	-41.50	8.48	3.00	11.41	-38.57	-25.00	-13.57	V

LTE TDD Band 41_Channel Bandwidth 20MHz_QPSK_ High Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5360.0	-40.52	7.17	3.00	9.62	-38.07	-25.00	-13.07	H
8040.0	-46.49	8.39	3.00	11.46	-43.42	-25.00	-18.42	H
5360.0	-47.62	7.17	3.00	9.62	-45.17	-25.00	-20.17	V
8040.0	-42.03	8.39	3.00	11.46	-38.96	-25.00	-13.96	V

LTE TDD Band 41_Channel Bandwidth 20MHz_16QAM_ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5012.0	-42.80	7.15	3.00	9.88	-40.07	-25.00	-15.07	H
7518.0	-48.72	8.36	3.00	11.36	-45.72	-25.00	-20.72	H
5012.0	-44.86	7.15	3.00	9.88	-42.13	-25.00	-17.13	V
7518.0	-40.91	8.36	3.00	11.36	-37.91	-25.00	-12.91	V

LTE TDD Band 41_Channel Bandwidth 20MHz_16QAM_ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5186.0	-42.54	7.26	3.00	10.03	-39.77	-25.00	-14.77	H
7779.0	-46.50	8.48	3.00	11.41	-43.57	-25.00	-18.57	H
5186.0	-47.05	7.26	3.00	10.03	-44.28	-25.00	-19.28	V
7779.0	-43.83	8.48	3.00	11.41	-40.90	-25.00	-15.90	V

LTE TDD Band 41_Channel Bandwidth 20MHz_16QAM_ High Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5360.0	-42.13	7.17	3.00	9.62	-39.68	-25.00	-14.68	H
8040.0	-46.29	8.39	3.00	11.46	-43.22	-25.00	-18.22	H
5360.0	-44.21	7.17	3.00	9.62	-41.76	-25.00	-16.76	V
8040.0	-42.65	8.39	3.00	11.46	-39.58	-25.00	-14.58	V

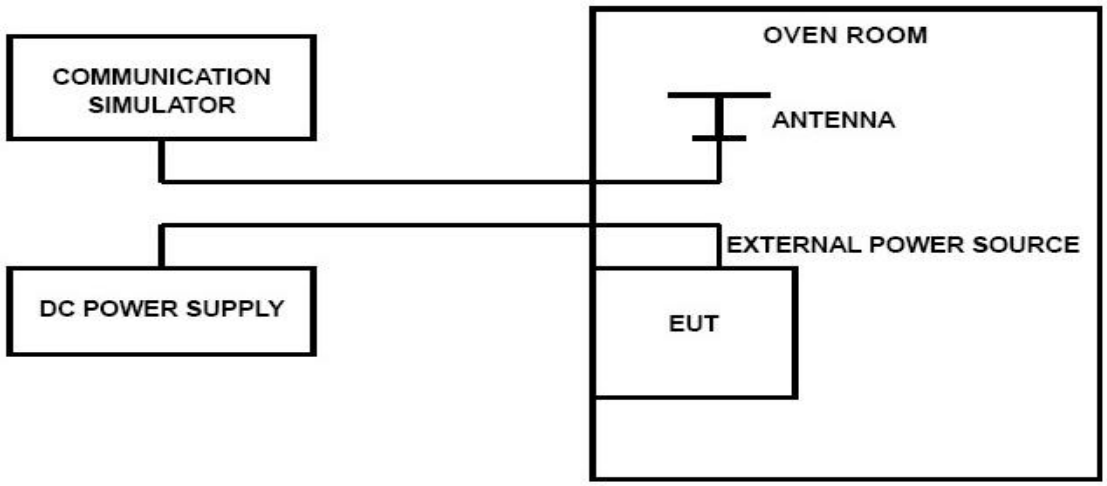
Notes：All channel bandwidth were tested,the report recorded the worst data.

4.7 Frequency Stability under Temperature & Voltage Variations

LIMIT

According to FCC §2.1055,§22.355, §27.54 requirement, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation and should not exceed 2.5ppm.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was setup according to TIA-603-E

Frequency Stability Under Temperature Variations:
In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMW 500 DIGITAL RADIO COMMUNICATION TESTER.
1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMW 500 and in a simulated call on middle channel for LTE band 5, LTE band 7, LTE band 41; measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10℃ increments from -30℃ to +50℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50℃.
7. With the EUT, powered via nominal voltage, connected to the CMW 500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 ℃ increments from +50℃ to -30℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

Frequency Stability Under Voltage Variations:
Set chamber temperature to 20℃. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.
Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

TEST RESULTS

Remark:
We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41; recorded worst case for each Channel Bandwidth of LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 41.

LTE Band 5, QPSK, 1.4MHz bandwidth(worst case of all bandwidths)

LTE FDD Band 5					
DC Power	Temperature (℃)	Frequency error(Hz)	Frequency error(ppm)	Limit (ppm)	Verdict
VL	20	0	0.000	±2.50	PASS
VN	20	-30	-0.036	±2.50	PASS
VH	20	-22	-0.027	±2.50	PASS
VN	-30	19	0.023	±2.50	PASS
VN	-20	48	0.058	±2.50	PASS
VN	-10	-49	-0.059	±2.50	PASS
VN	0	21	0.025	±2.50	PASS
VN	10	-3	-0.004	±2.50	PASS
VN	20	27	0.033	±2.50	PASS
VN	30	-37	-0.045	±2.50	PASS
VN	40	15	0.018	±2.50	PASS
VN	50	50	0.061	±2.50	PASS

LTE Band 5, 16QAM, 1.4MHz bandwidth(worst case of all bandwidths)

LTE FDD Band 5					
DC Power	Temperature (℃)	Frequency error(Hz)	Frequency error(ppm)	Limit (ppm)	Verdict
VL	20	42	0.051	±2.50	PASS
VN	20	-31	-0.038	±2.50	PASS
VH	20	49	0.059	±2.50	PASS
VN	-30	-2	-0.002	±2.50	PASS
VN	-20	-16	-0.019	±2.50	PASS
VN	-10	48	0.058	±2.50	PASS
VN	0	3	0.004	±2.50	PASS
VN	10	10	0.012	±2.50	PASS
VN	20	44	0.053	±2.50	PASS
VN	30	48	0.058	±2.50	PASS
VN	40	1	0.001	±2.50	PASS
VN	50	20	0.024	±2.50	PASS

LTE Band 7, QPSK, 5MHz bandwidth (worst case of all bandwidths and modulation type)

LTE FDD Band 7					
DC Power	Temperature (℃)	Frequency error(Hz)	Frequency error(ppm)	Limit (ppm)	Verdict
VL	20	0	0.000	±2.50	PASS
VN	20	19	0.007	±2.50	PASS
VH	20	-2	-0.001	±2.50	PASS
VN	-30	-18	-0.007	±2.50	PASS
VN	-20	-2	-0.001	±2.50	PASS
VN	-10	16	0.006	±2.50	PASS
VN	0	14	0.006	±2.50	PASS
VN	10	-8	-0.003	±2.50	PASS
VN	20	2	0.001	±2.50	PASS
VN	30	20	0.008	±2.50	PASS
VN	40	-6	-0.002	±2.50	PASS
VN	50	19	0.007	±2.50	PASS

LTE Band 7, 16QAM, 5MHz bandwidth (worst case of all bandwidths and modulation type)

LTE FDD Band 7					
DC Power	Temperature (℃)	Frequency error(Hz)	Frequency error(ppm)	Limit (ppm)	Verdict
VL	20	-10	-0.004	±2.50	PASS
VN	20	-19	-0.007	±2.50	PASS
VH	20	-20	-0.008	±2.50	PASS
VN	-30	-1	0.000	±2.50	PASS
VN	-20	11	0.004	±2.50	PASS
VN	-10	-3	-0.001	±2.50	PASS
VN	0	3	0.001	±2.50	PASS
VN	10	7	0.003	±2.50	PASS
VN	20	-13	-0.005	±2.50	PASS
VN	30	7	0.003	±2.50	PASS
VN	40	-9	-0.004	±2.50	PASS
VN	50	-11	-0.004	±2.50	PASS

LTE Band 41, 5MHz bandwidth, QPSK (worst case of all bandwidths)

LTE TDD Band 41					
DC Power	**Temperature (℃)**	**Frequency error(Hz)**	**Frequency error(ppm)**	**Limit (ppm)**	**Verdict**
VL	20	91	0.043	2.50	PASS
VN	20	93	0.044	2.50	PASS
VH	20	32	0.015	2.50	PASS
VN	-30	15	0.007	2.50	PASS
VN	-20	74	0.035	2.50	PASS
VN	-10	43	0.021	2.50	PASS
VN	0	3	0.001	2.50	PASS
VN	10	84	0.040	2.50	PASS
VN	20	41	0.020	2.50	PASS
VN	30	27	0.013	2.50	PASS
VN	40	41	0.020	2.50	PASS
VN	50	85	0.041	2.50	PASS

LTE Band 41, 5MHz bandwidth, 16QAM (worst case of all bandwidths)

LTE TDD Band 41					
DC Power	**Temperature (℃)**	**Frequency error(Hz)**	**Frequency error(ppm)**	**Limit (ppm)**	**Verdict**
VL	20	84	0.040	2.50	PASS
VN	20	46	0.022	2.50	PASS
VH	20	16	0.008	2.50	PASS
VN	-30	15	0.007	2.50	PASS
VN	-20	39	0.019	2.50	PASS
VN	-10	21	0.010	2.50	PASS
VN	0	83	0.040	2.50	PASS
VN	10	69	0.033	2.50	PASS
VN	20	57	0.027	2.50	PASS
VN	30	23	0.011	2.50	PASS
VN	40	49	0.023	2.50	PASS
VN	50	70	0.033	2.50	PASS

5 Test Setup Photos of the EUT

Pleaserefer to separated files for Test Setup Photos of the EUT.

6 External Photos of the EUT

Pleaserefer to separated files for External Photos of the EUT.

7 Internal Photos of the EUT

Pleaserefer to separated files for Internal Photos of the EUT.

----------THE END OF TEST REPORT----------