FCC Test Report

Report No.:AGC08454190803FE07

FCC ID	:	2AUKT-ULTRALONG
APPLICATION PURPOSE	:	Class II Permissive Change
PRODUCT DESIGNATION	:	Pallet Tracker
BRAND NAME	:	N/A
MODEL NAME	:	Ultra Long, Ultra Wide, Ultra Wide QP, Ultra Medium, Ultra Thin, Ultra Short, Ultra B
APPLICANT	:	CHEP
DATE OF ISSUE	:	Sep. 24, 2019
STANDARD(S)	:	FCC Part 22 Rules FCC Part 24 Rules FCC Part 27 Rules FCC Part 90S- 2016
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd.

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Sep. 24, 2019	Valid	Class II Permissive Change

Note: In this report, the test results refer to the Certificate number (172181287/AA/00), report with item (No. RXA1706-0199RF01R1, RXA1706-0199RF02R1, RXA1706-0199RF03R1),
brand name (Quectel), model name (BG96), Hardware version (R1.0) and Software version (BG96MAR02A02 M1G); Re-evaluate the radiated output power and radiated spurs of the complete machine using this module and compare the differences.

TABLE OF CONTENTS

1.VERIFICATION OF COMPLIANCE 4
2. GENERAL INFORMATION 5
2.1 PRODUCT DESCRIPTION 5
2.3 RELATED SUBMITTAL(S) / GRANT (S) 7
2.4 TEST METHODOLOGY 7
2.5 TEST FACILITY 8
2.5 SPECIAL ACCESSORIES 10
2.6 EQUIPMENT MODIFICATIONS 10
3. SYSTEM TEST CONFIGURATION 11
3.1 EUT CONFIGURATION 11
3.2 EUT EXERCISE 11
3.3 GENERAL TECHNICAL REQUIREMENTS 11
3.4 CONFIGURATION OF EUT SYSTEM 12
4. SUMMARY OF TEST RESULTS 13
5. DESCRIPTION OF TEST MODES 14
6. RADIATED OUTPUT POWER 20
6.1 MEASUREMENT METHOD 20
6.2 PROVISIONS APPLICABLE 22
6. 3 Measurement Result 23
7. SPURIOUS EMISSION 36
7.1 CONDUCTED SPURIOUS EMISSION 36
7.2 RADIATED SPURIOUS EMISSION 39
APPENDIX D PHOTOGRAPHS OF TEST SETUP 49

1.VERIFICATION OF COMPLIANCE

Applicant	CHEP
Address	10-18,Higashi-kanda 2-chome Chiyoda-ku,Tokyo,Japan
Manufacturer	Travis GT b.v.
Address	Stationsplein 45, 3013 AK Rotterdam, The Netherlands, Rotterdam, Netherlands
Factory	SHENZHEN HUNGPHONE TECHNOLOGY CO., LTD
Address	F3-4, Block B6, XuJingChang Industry Park, Fuyong, Bao'an, Shenzhen,China
Product Designation	Pallet Tracker
Brand Name	N/A
Test Model	Ultra Long
Serial Model	Ultra Wide, Ultra Wide QP, Ultra Medium, Ultra Thin, Ultra Short, Ultra B
Difference Description	Number of Battery in each model are different, however, the supply voltage remains the same @ 3.0V
Date of test	June 18, 2019~Sep. 24, 2019
Deviation	None
Condition of Test Sample	Normal

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance(Shenzhen) Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI/TIA-603-E-2016. The sample tested as described in this report is in compliance with the FCC Rules Part 22, 24, 27 and Part 90S. The test results of this report relate only to the tested sample identified in this report.

Prepared By

Jeast Zhan

Jeast Zhan
(Project Engineer)

Sep. 24, 2019

Reviewed By

Max Zhang

Max Zhang
(Reviewer)

Sep. 24, 2019

Approved By

Forrest Lei

Forrest Lei
(Authorized Officer)

Sep. 24, 2019

2. GENERAL INFORMATION

2.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Radio System Type:	LTE	
Frequency Bands:	☒FDD Band 2 ☒FDD Band 4 ☒FDD Band 5 ☒FDD Band 12 ☒FDD Band 13 ☒FDD Band 26 (U.S. Bands) ☒FDD Band 1 ☒FDD Band 3 ☒FDD Band 8 ☒FDD Band 20 ☒FDD Band 28 (Non-U.S. Bands)	
Frequency Range	LTE Band 2	Transmission (TX): 1850 to 1909.9 MHz
		Receiving (RX): 1930 to 1989.9 MHz
	LTE Band 4	Transmission (TX): 1710 to 1754.9MHz
		Receiving (RX): 2110 to 2154.9MHz
	LTE Band 5	Transmission (TX): 824 to 848.9 MHz
		Receiving (RX): 869 to 893.9 MHz
	LTE Band 12	Transmission (TX): 699 to 715.9MHz
		Receiving (RX): 729 to 745.9MHz
	LTE Band 13	Transmission (TX): 777 to 786.9MHz
		Receiving (RX): 746 to 755.9MHz
	LTE Band 26	Transmission (TX): 824 to 848.3MHz
		Receiving (RX): 869 to 894MHz
	LTE Band 26	Transmission (TX): 815.5 to 822.5MHz
		Receiving (RX): 859.7 to 864MHz
Supported Channel Bandwidth	LTE Band 2	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz ☒ 15 MHz ☒ 20 MHz
	LTE Band 4	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz ☒ 15 MHz ☒ 20 MHz
	LTE Band 5	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz
	LTE Band 12	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz
	LTE Band 13	☒ 5 MHz ☒ 10 MHz
	LTE Band 26	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz ☒ 15 MHz
Hardware Version	Rev 2.1	
Software Version	01.02.0027	
Antenna:	CHIP Antenna	
Type of Modulation	QPSK/16QAM	
Antenna gain:	Band 2: 2.50dBi; Band 4: 2.78dBi; Band 5: 1.95dBi; Band 12:2.25dBi; Band 13:1.77dBi; Band 26:2.14dBi	

Power Supply:	DC 3.8V by battery
Single Card:	GSM/ LTE Card Slot
Extreme Vol. Limits:	DC3.23V to 4.35V (Normal: 3.8V)
Temperature range	-10℃ to +40℃
Note1: The High Voltage DC4.35V and Low Voltage DC3.23V were declared by manufacturer, The EUT couldn't be operating normally with higher or lower voltage..	

2.3 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID:2AUKT-ULTRALONG** , filing to comply with the FCC Part 22, Part 24, Part 27 and Part 90S requirements

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2.4 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of ANSI/TIA-603-E-2016, and FCC KDB 971168 D01 Power Means License Digital Systems V03R01.

2.5 TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong,China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

ALL TEST EQUIPMENT LIST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun.12, 2019	Jun.11, 2020
LISN	R&S	ESH2-Z5	100086	Aug.26, 2019	Aug.25, 2020
TEST RECEIVER	R&S	ESCI	10096	Jun.12, 2019	Jun.11, 2020
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec.20, 2018	Dec.18, 2019
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep.21, 2017	Sep.20, 2019
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep.19, 2019	Sep.18, 2021
preamplifier	ChengYi	EMC184045SE	980508	Oct. 31, 2018	Oct. 30, 2019
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May.17, 2019	May.16, 2021
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Jun.12, 2019	Jun.11, 2020
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.28, 2017	Sep.27, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.26, 2019	Sep.25, 2021
SIGNAL ANALYZER	Agilent	N9020A	MY52090123	Sep. 20, 2018	Sep. 19, 2019
SIGNAL ANALYZER	Agilent	N9020A	MY52090123	Sep. 18, 2019	Sep. 17, 2020
USB Wideband Power Sensor	Agilent	U2021XA	MY54110007	Sep. 20, 2018	Sep. 19, 2019
USB Wideband Power Sensor	Agilent	U2021XA	MY54110007	Sep. 18, 2019	Sep. 17, 2020
Wireless communication test	R&S	CMW500	120909	July 11, 2019	July 10, 2020

Power Splitter	Agilent	11636A	34	Jun.12, 2019	Jun.11, 2020
Attenuator	JFW	50FHC-006-50	N/A	Jun.12, 2019	Jun.11, 2020

2.5 SPECIAL ACCESSORIES

The battery was supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

2.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3. SYSTEM TEST CONFIGURATION

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

3.3 GENERAL TECHNICAL REQUIREMENTS

Item Number	Item Description		FCC Rules
1	Output Power	Radiated Output Power	22.913(a)(2)/24.232(c)/27.50(d)(4)/27.50(b)(10)/20.50(c)(10)/90.635(b)
2	Spurious Emission	Radiated spurious emission	2.1051/22.917(a)/24.238(a) 27.53(h)/ 27.53(g)/ 90.691

Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different.

3.4 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System

Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Remark
1	Pallet Tracker	Ultra Long	2AUKT-ULTRALONG	EUT

***Note: All the accessories have been used during the test. The following “EUT” in setup diagram means EUT system.

4. SUMMARY OF TEST RESULTS

Item Number	Item Description		FCC Rules	Result
1	Output Power	Radiated Output Power	22.913(a)(2)/24.232(c)/27.50(d)(4)/27.50(b)(10)/20.50(c)(10)/90.635(b)	Pass
2	Spurious Emission	Radiated Spurious Emission	2.1051/22.917(a)/24.238(a) 27.53(h)/ 27.53(g)/90.691	Pass

5. DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMW 500) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both LTE frequency band.
The worst condition was recorded in the test report if no other modes test data.

Test Mode	Test Modes Description
LTE	LTE system, QPSK modulation
LTE	LTE system, 16QAM modulation

Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 2	TX (1.4M)	Channel 18607	Channel 18900	Channel 19193
		1850.7 MHz	1880 MHz	1909.3 MHz
	TX (3M)	Channel 18615	Channel 18900	Channel 19185
		1851.5 MHz	1880 MHz	1908.5 MHz
	TX (5M)	Channel 18625	Channel 18900	Channel 19175
		1852.5 MHz	1880 MHz	1907.5 MHz
	TX (10M)	Channel 18650	Channel 18900	Channel 19150
		1855.0 MHz	1880 MHz	1905.0 MHz
	TX (20M)	Channel 18700	Channel 18900	Channel 19100
		1860.0 MHz	1880 MHz	1900.0 MHz
	RX (1.4M)	Channel 607	Channel 900	Channel 1193
		1930.7 MHz	1960 MHz	1989.3 MHz
	RX (3M)	Channel 615	Channel 900	Channel 1185
		1931.5 MHz	1960 MHz	1988.5 MHz
	RX (5M)	Channel 625	Channel 900	Channel 1175
		1932.5 MHz	1960 MHz	1987.5 MHz
	RX (10M)	Channel 650	Channel 900	Channel 1150
		1935 MHz	1960 MHz	1985 MHz
	RX (20M)	Channel 700	Channel 900	Channel 1100
		1940.0 MHz	1960 MHz	1980 MHz

Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 4	TX (1.4M)	Channel 19957	Channel 20175	Channel 20393
		1710.7MHz	1732.5 MHz	1754.3 MHz
	TX (3M)	Channel 19965	Channel 20175	Channel 20385
		1711.5 MHz	1732.5 MHz	1753.5 MHz
	TX (5M)	Channel 19975	Channel 20175	Channel 20375
		1712.5 MHz	1732.5 MHz	1752.5 MHz
	TX (10M)	Channel 20000	Channel 20175	Channel 20350
		1715.0 MHz	1732.5 MHz	1750.0 MHz
	TX (15M)	Channel 20025	Channel 20175	Channel 20325
		1717.5 MHz	1732.5 MHz	1747.5 MHz
	TX (20M)	Channel 20050	Channel 20175	Channel 20300
		1720.0 MHz	1732.5 MHz	1745.0MHz
	RX (1.4M)	Channel 1957	Channel 2175	Channel 2393
		2110.7 MHz	2132.5 MHz	2154.3 MHz
	RX (3M)	Channel 1965	Channel 2175	Channel 2385
		2111.5 MHz	2132.5 MHz	2153.5 MHz
	RX (5M)	Channel 1975	Channel 2175	Channel 2375
		2112.5 MHz	2132.5 MHz	2152.5 MHz
	RX (10M)	Channel 2000	Channel 2175	Channel 2350
		2115.0 MHz	2132.5 MHz	2150.0 MHz
	RX (15M)	Channel 2025	Channel 2175	Channel 2325
		2117.5 MHz	2132.5 MHz	2147.5 MHz
	RX (20M)	Channel 2050	Channel 2175	Channel 2300
		2120.0 MHz	2132.5 MHz	2145.0 MHz

Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 5	TX (1.4M)	Channel 20407	Channel 20525	Channel 20643
		824.7 MHz	836.5 MHz	848.3 MHz
	TX (3M)	Channel 20415	Channel 20525	Channel 20635
		825.5 MHz	836.5 MHz	847.5 MHz
	TX (5M)	Channel 20425	Channel 20525	Channel 20625
		826.5 MHz	836.5 MHz	846.5 MHz
	TX (10M)	Channel 20450	Channel 20525	Channel 20600
		829 MHz	836.5 MHz	844 MHz
	RX (1.4M)	Channel 2404	Channel 2525	Channel 2463
		869.4 MHz	881.5 MHz	893.3 MHz
	RX (3M)	Channel 2415	Channel 2525	Channel 2635
		870.5 MHz	881.5 MHz	892.5 MHz
	RX (5M)	Channel 2425	Channel 2525	Channel 2625
		871.5 MHz	881.5 MHz	891.5 MHz
	RX (10M)	Channel 2450	Channel 2525	Channel 2600
		874 MHz	881.5 MHz	889 MHz

Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 12	TX (1.4M)	Channel 23017	Channel 23095	Channel 23173
		699.7 MHz	707.5 MHz	715.3 MHz
	TX (3M)	Channel 23025	Channel 23095	Channel 23165
		700.5 MHz	707.5 MHz	714.5 MHz
	TX (5M)	Channel 23035	Channel 23095	Channel 23155
		701.5 MHz	707.5 MHz	713.5 MHz
	TX (10M)	Channel 23060	Channel 23095	Channel 23130
		704.0 MHz	707.5 MHz	711.0 MHz
	RX (1.4M)	Channel 5017	Channel 5095	Channel 5173
		729.7 MHz	737.5 MHz	745.3 MHz
	RX (3M)	Channel 5025	Channel 5095	Channel 5165
		730.5 MHz	737.5 MHz	744.5 MHz
	RX (5M)	Channel 5035	Channel 5095	Channel 5155
		731.5 MHz	737.5 MHz	743.5 MHz
	RX (10M)	Channel 5060	Channel 5095	Channel 5130
		734.0 MHz	737.5 MHz	741.0 MHz

	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 13	TX (5M)	Channel 5205	Channel 23230	Channel 23255
		779.5 MHz	782.0 MHz	784.5 MHz
	TX (10M)	Channel 23230	Channel 23230	Channel 23230
		782.0 MHz	782.0 MHz	782.0 MHz
	RX (5M)	Channel 5205	Channel 5230	Channel 5255
		748.5 MHz	751.0 MHz	753.5 MHz
	RX (10M)	Channel 5230	Channel 5230	Channel 5230
		751.0 MHz	751.0 MHz	751.0 MHz

Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 26	TX (1.4M)	Channel 26797	Channel 26915	Channel 27033
		824.7 MHz	836.5 MHz	848.3 MHz
		N/A	N/A	N/A
		N/A	N/A	N/A
	TX (3M)	Channel 26805	Channel 26915	Channel 27025
		825.5 MHz	836.5 MHz	847.5 MHz
		Channel 26705	Channel 26740	Channel 27775
		815.5MHz	819MHz	822.5MHz
	TX (5M)	Channel 26815	Channel 26915	Channel 27015
		826.5 MHz	836.5 MHz	846.5 MHz
		Channel 26715	Channel 26740	Channel 26765
		816.5 MHz	819MHz	821.5MHz
	TX (10M)	Channel 26840	Channel 26915	Channel 26990
		829 MHz	836.5 MHz	844 MHz
		/	Channel 26740	/
		/	819MHz	/
	TX (15M)	Channel 26865	Channel 26915	Channel 26965
		831.5 MHz	836.5 MHz	841.5 MHz
	RX (1.4M)	Channel 8797	Channel 8915	Channel 9033
		869.7 MHz	881.5 MHz	893.3 MHz
		N/A	N/A	N/A
		N/A	N/A	N/A
	RX (3M)	Channel 8805	Channel 8915	Channel 9025
		870.5 MHz	881.5 MHz	892.5 MHz
		Channel 26705	Channel 26740	Channel 27775
		860.5MHz	819MHz	867.5MHz
	RX (5M)	Channel 8815	Channel 8915	Channel 9015
		871.5 MHz	881.5 MHz	891.5 MHz
		Channel 26715	Channel 26740	Channel 26765
		861.5MHz	864MHz	866.5MHz
	RX (10M)	Channel 8840	Channel 8915	Channel 8990
		874 MHz	881.5 MHz	889 MHz
		/	Channel 26740	/
		/	864MHz	/

	RX (15M)	Channel 8865	Channel 8915	Channel 8965
		876.5 MHz	881.5 MHz	886.5 MHz

6. RADIATED OUTPUT POWER

6.1 MEASUREMENT METHOD

The measurements procedures specified in ANSI/TIA-603-E-2016 were applied.

1 In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.

2 The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as ARpl=Pin + 2.15 - Pr. The ARpl is the attenuation of “reference path loss”, and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

3 The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

4 From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

5 The EUT is then put into continuously transmitting mode at its maximum power level.

6 Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 27.50(d)(4). The "reference path loss" from Step1 is added to this result.

7 This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

8 ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi..

Test Setup

NOTE: Effective radiated power (ERP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

Step 1: Pre-test

Measurement
System

Step 2: Substitution method to verify the maximum ERP

Measurement
System

Signal
Generator

6.2 PROVISIONS APPLICABLE

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.

Mode	FCC Part Section(s)	Nominal Peak Power
LTE Band 2	24.229(b)	<=33dBm (2W)
LTE Band 4	27.50(h)	<=30dBm (1W)
LTE Band 5	22.905(a)	<=38.45dBm (7W)
LTE Band 12	27.50(c)	<=34.77dBm(3W)
LTE Band 13	27.50(b)	<=34.77dBm(3W)
LTE Band 26	22.905(a)	<=38.45dBm (7W)
LTE Band 26	90.635(b)	<=50dBm(100W)

6. 3 Measurement Result

EIRP for LTE Band 2

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
1850.7	1.4	QPSK	1/0	9.37	V	7.95	0.79	16.53	33
1880.0	1.4	QPSK	1/0	6.58	V	7.95	0.79	13.74	33
1909.3	1.4	QPSK	1/0	6.51	V	7.95	0.79	13.67	33
1850.7	1.4	QPSK	1/0	8.56	H	7.95	0.79	15.72	33
1880.0	1.4	QPSK	1/0	7.51	H	7.95	0.79	14.67	33
1909.3	1.4	QPSK	1/0	8.25	H	7.95	0.79	15.41	33
1850.7	1.4	16-QAM	1/5	7.13	V	7.95	0.79	14.29	33
1880.0	1.4	16-QAM	1/0	8.94	V	7.95	0.79	16.1	33
1909.3	1.4	16-QAM	1/0	7.44	V	7.95	0.79	14.6	33
1850.7	1.4	16-QAM	1/5	7.45	H	7.95	0.79	14.61	33
1880.0	1.4	16-QAM	1/0	6.67	H	7.95	0.79	13.83	33
1909.3	1.4	16-QAM	1/0	9.40	H	7.95	0.79	16.56	33
1851.5	3	QPSK	1/0	6.32	V	7.95	0.79	13.48	33
1880.0	3	QPSK	1/0	8.75	V	7.95	0.79	15.91	33
1908.5	3	QPSK	1/0	9.03	V	7.95	0.79	16.19	33
1851.5	3	QPSK	1/0	6.86	H	7.95	0.79	14.02	33
1880.0	3	QPSK	1/0	8.69	H	7.95	0.79	15.85	33
1908.5	3	QPSK	1/0	7.56	H	7.95	0.79	14.72	33
1851.5	3	16-QAM	1/0	9.17	V	7.95	0.79	16.33	33
1880.0	3	16-QAM	1/0	8.81	V	7.95	0.79	15.97	33
1908.5	3	16-QAM	1/0	6.86	V	7.95	0.79	14.02	33
1851.5	3	16-QAM	1/0	7.18	H	7.95	0.79	14.34	33
1880.0	3	16-QAM	1/0	12.59	H	7.95	0.79	19.75	33
1908.5	3	16-QAM	1/0	13.17	H	7.95	0.79	20.33	33
1852.5	5	QPSK	1/0	15.11	V	7.95	0.79	22.27	33
1880.0	5	QPSK	1/0	14.13	V	7.95	0.79	21.29	33
1907.5	5	QPSK	1/24	15.88	V	7.95	0.79	23.04	33
1852.5	5	QPSK	1/0	13.81	H	7.95	0.79	20.97	33
1880.0	5	QPSK	1/0	8.76	H	7.95	0.79	15.92	33
1907.5	5	QPSK	1/24	7.65	H	7.95	0.79	14.81	33
1852.5	5	16-QAM	1/0	8.81	V	7.95	0.79	15.97	33
1880.0	5	16-QAM	1/0	6.68	V	7.95	0.79	13.84	33
1907.5	5	16-QAM	1/24	5.66	V	7.95	0.79	12.82	33

1852.5	5	16-QAM	1/0	9.93	H	7.95	0.79	17.09	33
1880.0	5	16-QAM	1/0	9.31	H	7.95	0.79	16.47	33
1907.5	5	16-QAM	1/24	7.80	H	7.95	0.79	14.96	33
1855	10	QPSK	1/0	7.37	V	7.95	0.79	14.53	33
1880	10	QPSK	1/49	8.69	V	7.95	0.79	15.85	33
1905	10	QPSK	1/0	7.21	V	7.95	0.79	14.37	33
1855	10	QPSK	1/0	6.10	H	7.95	0.79	13.26	33
1880	10	QPSK	1/49	6.84	H	7.95	0.79	14	33
1905	10	QPSK	1/0	8.01	H	7.95	0.79	15.17	33
1855	10	16-QAM	1/0	9.19	V	7.95	0.79	16.35	33
1880	10	16-QAM	1/49	6.98	V	7.95	0.79	14.14	33
1905	10	16-QAM	1/0	6.91	V	7.95	0.79	14.07	33
1855	10	16-QAM	1/0	6.54	H	7.95	0.79	13.7	33
1880	10	16-QAM	1/49	6.97	H	7.95	0.79	14.13	33
1905	10	16-QAM	1/0	7.47	H	7.95	0.79	14.63	33
1857.5	15	QPSK	1/0	8.74	V	7.95	0.79	15.9	33
1880	15	QPSK	1/74	10.65	V	7.95	0.79	17.81	33
1902.5	15	QPSK	1/0	11.91	V	7.95	0.79	19.07	33
1857.5	15	QPSK	1/0	11.22	H	7.95	0.79	18.38	33
1880	15	QPSK	1/74	9.34	H	7.95	0.79	16.5	33
1902.5	15	QPSK	1/0	9.56	H	7.95	0.79	16.72	33
1857.5	15	16-QAM	1/0	8.43	V	7.95	0.79	15.59	33
1880	15	16-QAM	1/74	11.01	V	7.95	0.79	18.17	33
1902.5	15	16-QAM	1/0	7.04	V	7.95	0.79	14.2	33
1857.5	15	16-QAM	1/0	8.03	H	7.95	0.79	15.19	33
1880	15	16-QAM	1/74	10.50	H	7.95	0.79	17.66	33
1902.5	15	16-QAM	1/0	7.22	H	7.95	0.79	14.38	33
1860	20	QPSK	1/99	9.26	V	7.95	0.79	16.42	33
1880	20	QPSK	1/99	10.27	V	7.95	0.79	17.43	33
1900	20	QPSK	1/0	9.45	V	7.95	0.79	16.61	33
1860	20	QPSK	1/99	7.59	H	7.95	0.79	14.75	33
1880	20	QPSK	1/99	10.69	H	7.95	0.79	17.85	33
1900	20	QPSK	1/0	8.74	H	7.95	0.79	15.9	33
1860	20	16-QAM	1/99	7.82	V	7.95	0.79	14.98	33
1880	20	16-QAM	1/99	10.78	V	7.95	0.79	17.94	33
1900	20	16-QAM	1/0	9.59	V	7.95	0.79	16.75	33
1860	20	16-QAM	1/99	8.47	H	7.95	0.79	15.63	33

1880	20	16-QAM	1/99	8.35	H	7.95	0.79	15.51	33
1900	20	16-QAM	1/0	7.35	H	7.95	0.79	14.51	33

EIRP for LTE Band 4

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
1710.7	1.4	QPSK	1/0	11.77	V	7.95	0.79	18.93	30
1732.5	1.4	QPSK	1/0	11.54	V	7.95	0.79	18.7	30
1754.3	1.4	QPSK	1/0	11.45	V	7.95	0.79	18.61	30
1710.7	1.4	QPSK	1/0	11.43	H	7.95	0.79	18.59	30
1732.5	1.4	QPSK	1/0	9.88	H	7.95	0.79	17.04	30
1754.3	1.4	QPSK	1/0	9.48	H	7.95	0.79	16.64	30
1710.7	1.4	16-QAM	1/5	11.30	V	7.95	0.79	18.46	30
1732.5	1.4	16-QAM	1/0	10.75	V	7.95	0.79	17.91	30
1754.3	1.4	16-QAM	1/0	10.96	V	7.95	0.79	18.12	30
1710.7	1.4	16-QAM	1/5	11.04	H	7.95	0.79	18.2	30
1732.5	1.4	16-QAM	1/0	10.52	H	7.95	0.79	17.68	30
1754.3	1.4	16-QAM	1/0	11.81	H	7.95	0.79	18.97	30
1711.5	3	QPSK	1/0	11.18	V	7.95	0.79	18.34	30
1732.5	3	QPSK	1/0	11.33	V	7.95	0.79	18.49	30
1753.5	3	QPSK	1/0	11.18	V	7.95	0.79	18.34	30
1711.5	3	QPSK	1/0	10.01	H	7.95	0.79	17.17	30
1732.5	3	QPSK	1/0	10.40	H	7.95	0.79	17.56	30
1753.5	3	QPSK	1/0	12.11	H	7.95	0.79	19.27	30
1711.5	3	16-QAM	1/0	11.81	V	7.95	0.79	18.97	30
1732.5	3	16-QAM	1/0	11.20	V	7.95	0.79	18.36	30
1753.5	3	16-QAM	1/0	10.03	V	7.95	0.79	17.19	30
1711.5	3	16-QAM	1/0	10.23	H	7.95	0.79	17.39	30
1732.5	3	16-QAM	1/0	13.81	H	7.95	0.79	20.97	30
1753.5	3	16-QAM	1/0	12.78	H	7.95	0.79	19.94	30
1712.5	5	QPSK	1/0	13.12	V	7.95	0.79	20.28	30
1732.5	5	QPSK	1/0	13.42	V	7.95	0.79	20.58	30
1752.5	5	QPSK	1/24	10.60	V	7.95	0.79	17.76	30
1712.5	5	QPSK	1/0	11.50	H	7.95	0.79	18.66	30
1732.5	5	QPSK	1/0	10.43	H	7.95	0.79	17.59	30
1752.5	5	QPSK	1/24	12.25	H	7.95	0.79	19.41	30
1712.5	5	16-QAM	1/0	10.20	V	7.95	0.79	17.36	30
1732.5	5	16-QAM	1/0	11.86	V	7.95	0.79	19.02	30
1752.5	5	16-QAM	1/24	12.51	V	7.95	0.79	19.67	30
1712.5	5	16-QAM	1/0	9.91	H	7.95	0.79	17.07	30
1732.5	5	16-QAM	1/0	10.59	H	7.95	0.79	17.75	30
1752.5	5	16-QAM	1/24	12.18	H	7.95	0.79	19.34	30

1715	10	QPSK	1/0	11.43	V	7.95	0.79	18.59	30
1732.5	10	QPSK	1/49	10.03	V	7.95	0.79	17.19	30
1750	10	QPSK	1/0	10.04	V	7.95	0.79	17.2	30
1715	10	QPSK	1/0	11.89	H	7.95	0.79	19.05	30
1732.5	10	QPSK	1/49	11.64	H	7.95	0.79	18.8	30
1750	10	QPSK	1/0	10.65	H	7.95	0.79	17.81	30
1715	10	16-QAM	1/0	10.35	V	7.95	0.79	17.51	30
1732.5	10	16-QAM	1/49	10.71	V	7.95	0.79	17.87	30
1750	10	16-QAM	1/0	11.55	V	7.95	0.79	18.71	30
1715	10	16-QAM	1/0	11.69	H	7.95	0.79	18.85	30
1732.5	10	16-QAM	1/49	10.81	H	7.95	0.79	17.97	30
1750	10	16-QAM	1/0	10.45	H	7.95	0.79	17.61	30
1717.5	15	QPSK	1/0	9.69	V	7.95	0.79	16.85	30
1732.5	15	QPSK	1/74	10.20	V	7.95	0.79	17.36	30
1747.5	15	QPSK	1/0	11.50	V	7.95	0.79	18.66	30
1717.5	15	QPSK	1/0	10.32	H	7.95	0.79	17.48	30
1732.5	15	QPSK	1/74	9.58	H	7.95	0.79	16.74	30
1747.5	15	QPSK	1/0	10.97	H	7.95	0.79	18.13	30
1717.5	15	16-QAM	1/0	10.53	V	7.95	0.79	17.69	30
1732.5	15	16-QAM	1/74	10.74	V	7.95	0.79	17.9	30
1747.5	15	16-QAM	1/0	8.98	V	7.95	0.79	16.14	30
1717.5	15	16-QAM	1/0	9.89	H	7.95	0.79	17.05	30
1732.5	15	16-QAM	1/74	10.59	H	7.95	0.79	17.75	30
1747.5	15	16-QAM	1/0	9.33	H	7.95	0.79	16.49	30
1720	20	QPSK	1/99	9.24	V	7.95	0.79	16.4	30
1732.5	20	QPSK	1/99	11.00	V	7.95	0.79	18.16	30
1745	20	QPSK	1/0	11.73	V	7.95	0.79	18.89	30
1720	20	QPSK	1/99	11.84	H	7.95	0.79	19.00	30
1732.5	20	QPSK	1/99	10.94	H	7.95	0.79	18.1	30
1745	20	QPSK	1/0	10.96	H	7.95	0.79	18.12	30
1720	20	16-QAM	1/99	11.11	V	7.95	0.79	18.27	30
1732.5	20	16-QAM	1/99	11.08	V	7.95	0.79	18.24	30
1745	20	16-QAM	1/0	11.46	V	7.95	0.79	18.62	30
1720	20	16-QAM	1/99	11.00	H	7.95	0.79	18.16	30
1732.5	20	16-QAM	1/99	10.00	H	7.95	0.79	17.16	30
1745	20	16-QAM	1/0	11.38	H	7.95	0.79	18.54	30

EIRP for LTE Band 5

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
824.7	1.4	QPSK	1/0	9.90	V	6.7	0.49	16.11	38.45
836.5	1.4	QPSK	1/0	9.47	V	6.7	0.49	15.68	38.45
848.3	1.4	QPSK	1/0	9.08	V	6.7	0.49	15.29	38.45
824.7	1.4	QPSK	1/0	8.30	H	6.7	0.49	14.51	38.45
836.5	1.4	QPSK	1/0	8.67	H	6.7	0.49	14.88	38.45
848.3	1.4	QPSK	1/0	8.92	H	6.7	0.49	15.13	38.45
824.7	1.4	16-QAM	1/0	7.73	V	6.7	0.49	13.94	38.45
836.5	1.4	16-QAM	1/0	10.30	V	6.7	0.49	16.51	38.45
848.3	1.4	16-QAM	1/0	6.86	V	6.7	0.49	13.07	38.45
824.7	1.4	16-QAM	1/0	8.37	H	6.7	0.49	14.58	38.45
836.5	1.4	16-QAM	1/0	9.02	H	6.7	0.49	15.23	38.45
848.3	1.4	16-QAM	1/0	10.87	H	6.7	0.49	17.08	38.45
825.5	3	QPSK	1/0	7.22	V	6.7	0.49	13.43	38.45
836.5	3	QPSK	1/0	9.29	V	6.7	0.49	15.5	38.45
847.5	3	QPSK	1/0	10.32	V	6.7	0.49	16.53	38.45
825.5	3	QPSK	1/0	8.03	H	6.7	0.49	14.24	38.45
836.5	3	QPSK	1/0	8.79	H	6.7	0.49	15.00	38.45
847.5	3	QPSK	1/0	7.44	H	6.7	0.49	13.65	38.45
825.5	3	16-QAM	1/0	9.29	V	6.7	0.49	15.5	38.45
836.5	3	16-QAM	1/0	12.13	V	6.7	0.49	18.34	38.45
847.5	3	16-QAM	1/0	9.86	V	6.7	0.49	16.07	38.45
825.5	3	16-QAM	1/0	8.38	H	6.7	0.49	14.59	38.45
836.5	3	16-QAM	1/0	15.20	H	6.7	0.49	21.41	38.45
847.5	3	16-QAM	1/0	17.40	H	6.7	0.49	23.61	38.45
826.5	5	QPSK	1/0	16.50	V	6.7	0.49	22.71	38.45
836.5	5	QPSK	1/0	14.34	V	6.7	0.49	20.55	38.45
846.5	5	QPSK	1/0	16.58	V	6.7	0.49	22.79	38.45
826.5	5	QPSK	1/0	15.62	H	6.7	0.49	21.83	38.45
836.5	5	QPSK	1/0	9.03	H	6.7	0.49	15.24	38.45
846.5	5	QPSK	1/0	9.78	H	6.7	0.49	15.99	38.45
826.5	5	16-QAM	1/0	9.97	V	6.7	0.49	16.18	38.45
836.5	5	16-QAM	1/0	9.89	V	6.7	0.49	16.10	38.45
846.5	5	16-QAM	1/0	8.66	V	6.7	0.49	14.87	38.45
826.5	5	16-QAM	1/0	5.89	H	6.7	0.49	12.1	38.45
836.5	5	16-QAM	1/0	12.78	H	6.7	0.49	18.99	38.45
846.5	5	16-QAM	1/0	9.38	H	6.7	0.49	15.59	38.45

829	10	QPSK	1/0	6.89	V	6.7	0.49	13.10	38.45
836.5	10	QPSK	1/0	6.56	V	6.7	0.49	12.77	38.45
844	10	QPSK	1/0	10.35	V	6.7	0.49	16.56	38.45
829	10	QPSK	1/0	5.95	H	6.7	0.49	12.16	38.45
836.5	10	QPSK	1/0	9.00	H	6.7	0.49	15.21	38.45
844	10	QPSK	1/0	8.34	H	6.7	0.49	14.55	38.45
829	10	16-QAM	1/0	7.68	V	6.7	0.49	13.89	38.45
836.5	10	16-QAM	1/0	10.34	V	6.7	0.49	16.55	38.45
844	10	16-QAM	1/0	9.32	V	6.7	0.49	15.53	38.45
829	10	16-QAM	1/0	5.58	H	6.7	0.49	11.79	38.45
836.5	10	16-QAM	1/0	6.87	H	6.7	0.49	13.08	38.45
844	10	16-QAM	1/0	8.63	H	6.7	0.49	14.84	38.45

EIRP for LTE Band 12

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
699.7	1.4	QPSK	1/0	7.36	V	6.6	0.47	13.49	34.77
707.5	1.4	QPSK	1/0	12.87	V	6.6	0.47	19.00	34.77
715.3	1.4	QPSK	1/24	7.46	V	6.6	0.47	13.59	34.77
699.7	1.4	QPSK	1/0	11.14	H	6.6	0.47	17.27	34.77
707.5	1.4	QPSK	1/0	10.95	H	6.6	0.47	17.08	34.77
715.3	1.4	QPSK	1/24	8.97	H	6.6	0.47	15.10	34.77
699.7	1.4	16-QAM	1/0	10.48	V	6.6	0.47	16.61	34.77
707.5	1.4	16-QAM	1/0	8.28	V	6.6	0.47	14.41	34.77
715.3	1.4	16-QAM	1/24	9.59	V	6.6	0.47	15.72	34.77
699.7	1.4	16-QAM	1/0	11.29	H	6.6	0.47	17.42	34.77
707.5	1.4	16-QAM	1/0	9.82	H	6.6	0.47	15.95	34.77
715.3	1.4	16-QAM	1/24	11.13	H	6.6	0.47	17.26	34.77
700.5	3	QPSK	1/0	10.95	V	6.6	0.47	17.08	34.77
707.5	3	QPSK	1/49	11.05	V	6.6	0.47	17.18	34.77
714.5	3	QPSK	1/0	11.87	V	6.6	0.47	18.00	34.77
700.5	3	QPSK	1/0	10.31	H	6.6	0.47	16.44	34.77
707.5	3	QPSK	1/49	8.29	H	6.6	0.47	14.42	34.77
714.5	3	QPSK	1/0	10.65	H	6.6	0.47	16.78	34.77
700.5	3	16-QAM	1/0	9.30	V	6.6	0.47	15.43	34.77
707.5	3	16-QAM	1/49	8.13	V	6.6	0.47	14.26	34.77
714.5	3	16-QAM	1/0	8.68	V	6.6	0.47	14.81	34.77
700.5	3	16-QAM	1/0	11.72	H	6.6	0.47	17.85	34.77
707.5	3	16-QAM	1/49	14.23	H	6.6	0.47	20.36	34.77
714.5	3	16-QAM	1/0	10.72	H	6.6	0.47	16.85	34.77
701.5	5	QPSK	1/0	12.93	V	6.6	0.47	19.06	34.77
707.5	5	QPSK	1/74	13.57	V	6.6	0.47	19.70	34.77
713.5	5	QPSK	1/0	13.03	V	6.6	0.47	19.16	34.77
701.5	5	QPSK	1/0	11.47	H	6.6	0.47	17.60	34.77
707.5	5	QPSK	1/74	7.86	H	6.6	0.47	13.99	34.77
713.5	5	QPSK	1/0	9.50	H	6.6	0.47	15.63	34.77
701.5	5	16-QAM	1/0	9.99	V	6.6	0.47	16.12	34.77
707.5	5	16-QAM	1/74	11.00	V	6.6	0.47	17.13	34.77
713.5	5	16-QAM	1/0	9.46	V	6.6	0.47	15.59	34.77
701.5	5	16-QAM	1/0	8.01	H	6.6	0.47	14.14	34.77
707.5	5	16-QAM	1/74	10.73	H	6.6	0.47	16.86	34.77
713.5	5	16-QAM	1/0	9.20	H	6.6	0.47	15.33	34.77
704.0	10	QPSK	1/99	8.64	V	6.6	0.47	14.77	34.77

707.5	10	QPSK	1/99	10.29	V	6.6	0.47	16.42	34.77
711.0	10	QPSK	1/0	12.42	V	6.6	0.47	18.55	34.77
704.0	10	QPSK	1/99	10.84	H	6.6	0.47	16.97	34.77
707.5	10	QPSK	1/99	9.94	H	6.6	0.47	16.07	34.77
711.0	10	QPSK	1/0	10.18	H	6.6	0.47	16.31	34.77
704.0	10	16-QAM	1/99	10.81	V	6.6	0.47	16.94	34.77
707.5	10	16-QAM	1/99	9.41	V	6.6	0.47	15.54	34.77
711.0	10	16-QAM	1/0	9.82	V	6.6	0.47	15.95	34.77
704.0	10	16-QAM	1/99	12.18	H	6.6	0.47	18.31	34.77
707.5	10	16-QAM	1/99	10.27	H	6.6	0.47	16.40	34.77
711.0	10	16-QAM	1/0	10.03	H	6.6	0.47	16.16	34.77

EIRP for LTE Band 13

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
779.5	5	QPSK	1/0	15.89	V	6.6	0.47	22.02	34.77
782.0	5	QPSK	1/0	12.69	V	6.6	0.47	18.82	34.77
784.5	5	QPSK	1/0	15.20	V	6.6	0.47	21.33	34.77
779.5	5	QPSK	1/0	14.11	H	6.6	0.47	20.24	34.77
782.0	5	QPSK	1/0	10.09	H	6.6	0.47	16.22	34.77
784.5	5	QPSK	1/0	9.55	H	6.6	0.47	15.68	34.77
779.5	5	16-QAM	1/0	10.58	V	6.6	0.47	16.71	34.77
782.0	5	16-QAM	1/0	10.17	V	6.6	0.47	16.30	34.77
784.5	5	16-QAM	1/0	7.84	V	6.6	0.47	13.97	34.77
779.5	5	16-QAM	1/0	6.22	H	6.6	0.47	12.35	34.77
782.0	5	16-QAM	1/0	13.27	H	6.6	0.47	19.40	34.77
784.5	5	16-QAM	1/0	9.29	H	6.6	0.47	15.42	34.77
782.0	10	QPSK	1/0	7.79	V	6.6	0.47	13.92	34.77
782.0	10	QPSK	1/0	6.84	V	6.6	0.47	12.97	34.77
782.0	10	QPSK	1/0	9.47	V	6.6	0.47	15.60	34.77
782.0	10	QPSK	1/0	4.70	H	6.6	0.47	10.83	34.77
782.0	10	QPSK	1/0	8.14	H	6.6	0.47	14.27	34.77
782.0	10	QPSK	1/0	8.11	H	6.6	0.47	14.24	34.77
782.0	10	16-QAM	1/0	7.61	V	6.6	0.47	13.74	34.77
782.0	10	16-QAM	1/0	8.99	V	6.6	0.47	15.12	34.77
782.0	10	16-QAM	1/0	8.93	V	6.6	0.47	15.06	34.77
782.0	10	16-QAM	1/0	7.02	H	6.6	0.47	13.15	34.77
782.0	10	16-QAM	1/0	8.28	H	6.6	0.47	14.41	34.77
782.0	10	16-QAM	1/0	9.17	H	6.6	0.47	15.30	34.77

EIRP for LTE Band 26

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
824.7	1.4	QPSK	1/0	15.26	V	6.8	0.48	21.58	38.45
836.5	1.4	QPSK	1/0	17.51	V	6.8	0.48	23.83	38.45
848.3	1.4	QPSK	1/0	16.13	V	6.8	0.48	22.45	38.45
824.7	1.4	QPSK	1/0	18.33	H	6.8	0.48	24.65	38.45
836.5	1.4	QPSK	1/0	15.74	H	6.8	0.48	22.06	38.45
848.3	1.4	QPSK	1/0	17.01	H	6.8	0.48	23.33	38.45
824.7	1.4	16-QAM	1/5	15.36	V	6.8	0.48	21.68	38.45
836.5	1.4	16-QAM	1/0	17.22	V	6.8	0.48	23.54	38.45
848.3	1.4	16-QAM	1/0	17.07	V	6.8	0.48	23.39	38.45
824.7	1.4	16-QAM	1/5	13.34	H	6.8	0.48	19.66	38.45
836.5	1.4	16-QAM	1/0	14.46	H	6.8	0.48	20.78	38.45
848.3	1.4	16-QAM	1/0	15.33	H	6.8	0.48	21.65	38.45
825.5	3	QPSK	1/0	17.39	V	6.8	0.48	23.71	38.45
836.5	3	QPSK	1/0	16.13	V	6.8	0.48	22.45	38.45
847.5	3	QPSK	1/0	16.94	V	6.8	0.48	23.26	38.45
825.5	3	QPSK	1/0	17.03	H	6.8	0.48	23.35	38.45
836.5	3	QPSK	1/0	18.01	H	6.8	0.48	24.33	38.45
847.5	3	QPSK	1/0	16.39	H	6.8	0.48	22.71	38.45
825.5	3	16-QAM	1/0	14.66	V	6.8	0.48	20.98	38.45
836.5	3	16-QAM	1/0	15.00	V	6.8	0.48	21.32	38.45
847.5	3	16-QAM	1/0	16.06	V	6.8	0.48	22.38	38.45
825.5	3	16-QAM	1/0	18.24	H	6.8	0.48	24.56	38.45
836.5	3	16-QAM	1/0	20.03	H	6.8	0.48	26.35	38.45
847.5	3	16-QAM	1/0	19.47	H	6.8	0.48	25.79	38.45
826.5	5	QPSK	1/0	17.31	V	6.8	0.48	23.63	38.45
836.5	5	QPSK	1/0	16.44	V	6.8	0.48	22.76	38.45
864.5	5	QPSK	1/24	15.67	V	6.8	0.48	21.99	38.45
826.5	5	QPSK	1/0	16.97	H	6.8	0.48	23.29	38.45
836.5	5	QPSK	1/0	17.82	H	6.8	0.48	24.14	38.45
864.5	5	QPSK	1/24	18.37	H	6.8	0.48	24.69	38.45
826.5	5	16-QAM	1/0	14.03	V	6.8	0.48	20.35	38.45
836.5	5	16-QAM	1/0	16.19	V	6.8	0.48	22.51	38.45
864.5	5	16-QAM	1/24	15.84	V	6.8	0.48	22.16	38.45
826.5	5	16-QAM	1/0	15.77	H	6.8	0.48	22.09	38.45
836.5	5	16-QAM	1/0	16.69	H	6.8	0.48	23.01	38.45
864.5	5	16-QAM	1/24	15.79	H	6.8	0.48	22.11	38.45

829	10	QPSK	1/0	16.13	V	6.8	0.48	22.45	38.45
836.5	10	QPSK	1/49	15.33	V	6.8	0.48	21.65	38.45
844	10	QPSK	1/0	15.74	V	6.8	0.48	22.06	38.45
829	10	QPSK	1/0	15.55	H	6.8	0.48	21.87	38.45
836.5	10	QPSK	1/49	16.73	H	6.8	0.48	23.05	38.45
844	10	QPSK	1/0	17.25	H	6.8	0.48	23.57	38.45
829	10	16-QAM	1/0	17.31	V	6.8	0.48	23.63	38.45
836.5	10	16-QAM	1/49	16.33	V	6.8	0.48	22.65	38.45
844	10	16-QAM	1/0	16.49	V	6.8	0.48	22.81	38.45
829	10	16-QAM	1/0	17.43	H	6.8	0.48	23.75	38.45
836.5	10	16-QAM	1/49	18.11	H	6.8	0.48	24.43	38.45
844	10	16-QAM	1/0	16.64	H	6.8	0.48	22.96	38.45
831.5	15	QPSK	1/0	15.46	V	6.8	0.48	21.78	38.45
836.5	15	QPSK	1/74	17.35	V	6.8	0.48	23.67	38.45
841.5	15	QPSK	1/0	17.63	V	6.8	0.48	23.95	38.45
831.5	15	QPSK	1/0	17.59	H	6.8	0.48	23.91	38.45
836.5	15	QPSK	1/74	19.59	H	6.8	0.48	25.91	38.45
841.5	15	QPSK	1/0	16.09	H	6.8	0.48	22.41	38.45
831.5	15	16-QAM	1/0	17.24	V	6.8	0.48	23.56	38.45
836.5	15	16-QAM	1/74	14.15	V	6.8	0.48	20.47	38.45
841.5	15	16-QAM	1/0	15.79	V	6.8	0.48	22.11	38.45
831.5	15	16-QAM	1/0	16.13	H	6.8	0.48	22.45	38.45
836.5	15	16-QAM	1/74	15.82	H	6.8	0.48	22.14	38.45
841.5	15	16-QAM	1/0	16.93	H	6.8	0.48	23.25	38.45

EIRP for LTE Band 26 (PART 90S)

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
815.5	3	QPSK	1/0	14.82	V	6.8	0.48	21.14	50
819	3	QPSK	1/0	16.36	V	6.8	0.48	22.68	50
822.5	3	QPSK	1/0	14.88	V	6.8	0.48	21.20	50
815.5	3	QPSK	1/0	16.29	H	6.8	0.48	22.61	50
819	3	QPSK	1/0	15.97	H	6.8	0.48	22.29	50
822.5	3	QPSK	1/0	17.35	H	6.8	0.48	23.67	50
815.5	3	16-QAM	1/0	15.43	V	6.8	0.48	21.75	50
819	3	16-QAM	1/0	13.97	V	6.8	0.48	20.29	50
822.5	3	16-QAM	1/0	14.88	V	6.8	0.48	21.20	50
815.5	3	16-QAM	1/0	15.53	H	6.8	0.48	21.85	50
819	3	16-QAM	1/0	17.88	H	6.8	0.48	24.20	50
822.5	3	16-QAM	1/0	21.14	H	6.8	0.48	27.46	50
816.5	5	QPSK	1/0	19.81	V	6.8	0.48	26.13	50
819	5	QPSK	1/0	17.55	V	6.8	0.48	23.87	50
821.5	5	QPSK	1/24	17.72	V	6.8	0.48	24.04	50
816.5	5	QPSK	1/0	15.95	H	6.8	0.48	22.27	50
819	5	QPSK	1/0	17.14	H	6.8	0.48	23.46	50
821.5	5	QPSK	1/24	17.19	H	6.8	0.48	23.51	50
816.5	5	16-QAM	1/0	17.84	V	6.8	0.48	24.16	50
819	5	16-QAM	1/0	13.90	V	6.8	0.48	20.22	50
821.5	5	16-QAM	1/24	15.18	V	6.8	0.48	21.50	50
816.5	5	16-QAM	1/0	15.45	H	6.8	0.48	21.77	50
819	5	16-QAM	1/0	15.50	H	6.8	0.48	21.82	50
821.5	5	16-QAM	1/24	16.18	H	6.8	0.48	22.50	50
819	10	QPSK	1/49	14.89	V	6.8	0.48	21.21	50
819	10	QPSK	1/49	15.16	H	6.8	0.48	21.48	50
819	10	16-QAM	1/49	14.12	V	6.8	0.48	20.44	50
819	10	16-QAM	1/49	15.09	H	6.8	0.48	21.41	50

7. SPURIOUS EMISSION

7.1 CONDUCTED SPURIOUS EMISSION

7.1.1 MEASUREMENT METHOD

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.

For Band 7:
(i) 40 + 10 log10 p from the channel edges to 5 MHz away
(ii) 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and
(iii) 55 + 10 log10 p at X MHz and beyond from the channel edges

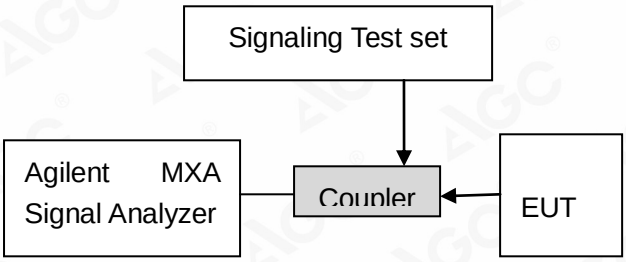
Test Procedure Used
KDB 971168 D01v03 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = max hold
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Test Instrument & Measurement Setup

shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

Test Note

Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. 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. 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 emission are attenuated at least 26 dB below the transmitter power.

7.1.2 MEASUREMENT RESULT

PLEASE REFER TO: APPENDIX A TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

Note: 1. No emission found in standby or receive mode, no recording in this report.

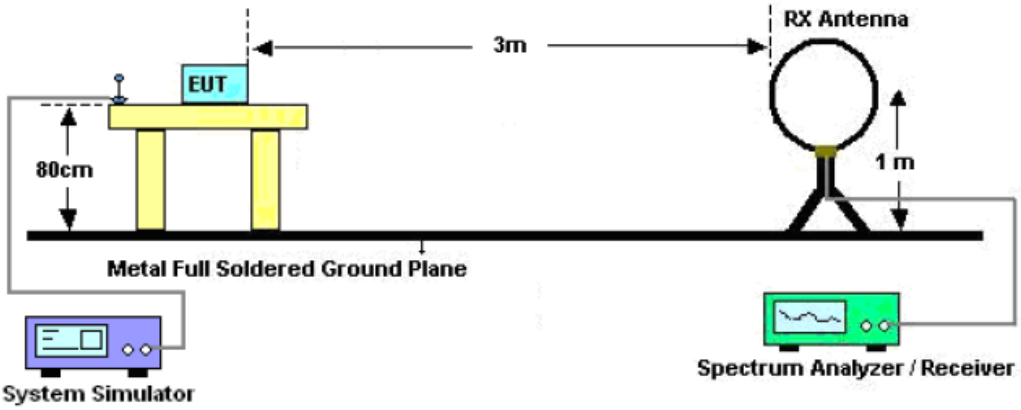
7.2 RADIATED SPURIOUS EMISSION

7.2.1. MEASUREMENT PROCEDURE

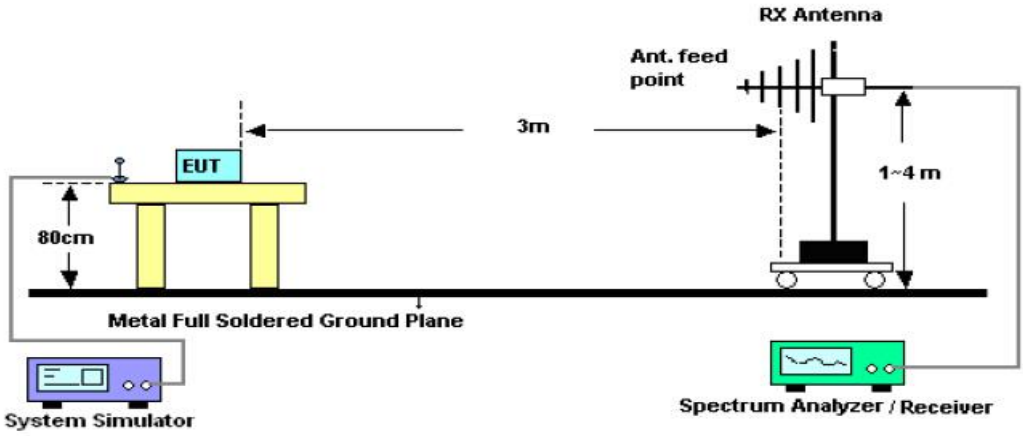
1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

7.2.2. TEST SETUP

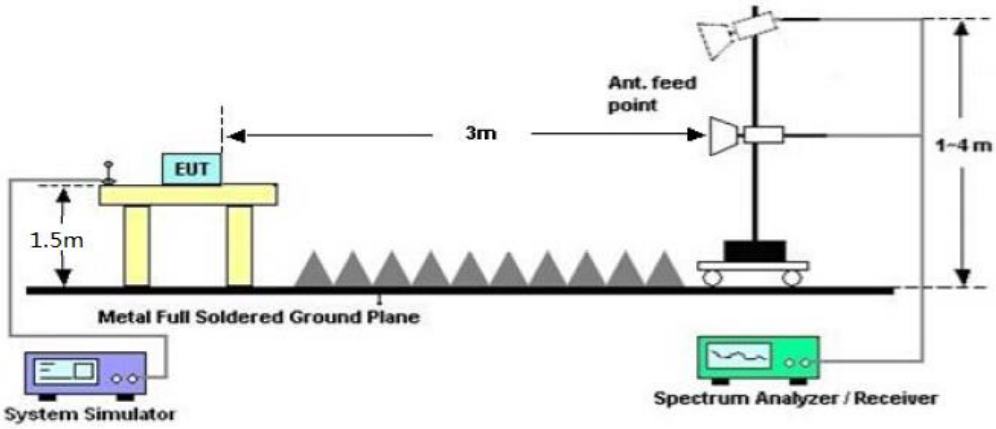
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



7.2.3 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(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.

Note: Only record the worst condition of each test mode:

7.2.4 MEASUREMENT RESULT

LTE Band 2
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3720	V	-58.28	-13	-45.28
694.1	V	-62.52	-13	-49.52
527.4	V	-67.21	-13	-54.21
3720	H	-56.66	-13	-43.66
841.3	H	-61.58	-13	-48.58
630.6	H	-66.57	-13	-53.57

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3760	V	-57.53	-13	-44.53
492.5	V	-64.00	-13	-51.00
395.5	V	-62.88	-13	-49.88
3760	H	-59.43	-13	-46.43
604.3	H	-65.57	-13	-52.57
519.9	H	-65.85	-13	-52.85

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3800	V	-57.86	-13	-44.86
716.1	V	-63.98	-13	-50.98
593.5	V	-64.06	-13	-51.06
3800	H	-56.82	-13	-43.82
667.2	H	-62.66	-13	-49.66
589.4	H	-62.35	-13	-49.35

LTE Band 4

Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3440	V	-36.05	-13	-23.05
742.6	V	-40.62	-13	-27.62
613.5	V	-40.48	-13	-27.48
3440	H	-35.73	-13	-22.73
693.3	H	-40.15	-13	-27.15
430.2	H	-41.99	-13	-28.99

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3465	V	-33.10	-13	-20.1
897.7	V	-39.87	-13	-26.87
789.4	V	-43.31	-13	-30.31
3465	H	-34.72	-13	-21.72
599.6	H	-38.98	-13	-25.98
301.3	H	-41.12	-13	-28.12

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3490	V	-35.97	-13	-22.97
665.5	V	-41.48	-13	-28.48
498.3	V	-42.32	-13	-29.32
3490	H	-33.30	-13	-20.3
551.5	H	-39.05	-13	-26.05
493.7	H	-42.27	-13	-29.27

LTE Band 5

Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1658	V	-58.12	-13	-45.12
508.6	V	-64.91	-13	-51.91
346.3	V	-67.05	-13	-54.05
1658	H	-57.13	-13	-44.13
584.2	H	-64.34	-13	-51.34
351.7	H	-62.41	-13	-49.41

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1673	V	-56.96	-13	-43.96
569.5	V	-62.01	-13	-49.01
458.7	V	-65.36	-13	-52.36
1673	H	-57.88	-13	-44.88
611.8	H	-63.08	-13	-50.08
469.2	H	-61.57	-13	-48.57

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1688	V	-55.32	-13	-42.32
703.1	V	-63.95	-13	-50.95
669.5	V	-62.79	-13	-49.79
1688	H	-58.30	-13	-45.3
521.0	H	-63.64	-13	-50.64
339.7	H	-62.22	-13	-49.22

LTE Band 12
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1408	V	-57.50	-13	-44.50
706.5	V	-64.78	-13	-51.78
665.4	V	-65.63	-13	-52.63
1408	H	-57.62	-13	-44.62
718.1	H	-65.27	-13	-52.27
620.2	H	-62.89	-13	-49.89

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1415	V	-57.66	-13	-44.66
569.3	V	-64.46	-13	-51.46
431.0	V	-63.57	-13	-50.57
1415	H	-57.61	-13	-44.61
495.5	H	-63.58	-13	-50.58
312.1	H	-63.35	-13	-50.35

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1422	V	-58.52	-13	-45.52
880.5	V	-64.04	-13	-51.04
731.0	V	-64.69	-13	-51.69
1422	H	-56.00	-13	-43.00
764.2	H	-62.29	-13	-49.29
649.3	H	-63.56	-13	-50.56

LTE Band 13
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1564	V	-55.60	-13	-42.6
468.5	V	-63.27	-13	-50.27
413.7	V	-64.55	-13	-51.55
1564	H	-58.11	-13	-45.11
564.5	H	-62.93	-13	-49.93
463.8	H	-67.39	-13	-54.39

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1425	V	-57.31	-13	-44.31
596.3	V	-63.79	-13	-50.79
384.1	V	-63.82	-13	-50.82
1528	H	-55.68	-13	-42.68
556.7	H	-62.89	-13	-49.89
332.5	H	-63.91	-13	-50.91

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1365	V	-58.52	-13	-45.52
698.7	V	-63.90	-13	-50.90
523.5	V	-63.67	-13	-50.67
1422	H	-57.17	-13	-44.17
663.4	H	-63.22	-13	-50.22
511.1	H	-63.48	-13	-50.48

LTE Band 26
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1663	V	-55.55	-13	-42.55
846.5	V	-64.32	-13	-51.32
546.7	V	-63.73	-13	-50.73
1663	H	-55.70	-13	-42.70
754.3	H	-63.95	-13	-50.95
669.5	H	-60.42	-13	-47.42

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1673	V	-56.04	-13	-43.04
846.5	V	-63.21	-13	-50.21
596.4	V	-63.88	-13	-50.88
1673	H	-54.18	-13	-41.18
774.7	H	-61.39	-13	-48.39
691.5	H	-63.36	-13	-50.36

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1683	V	-59.06	-13	-46.06
846.3	V	-64.76	-13	-51.76
779.6	V	-63.09	-13	-50.09
1683	H	-58.10	-13	-45.10
894.3	H	-62.19	-13	-49.19
769.5	H	-63.44	-13	-50.44

LTE Band 26
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1633	V	-56.31	-13	-43.31
746.5	V	-63.98	-13	-50.98
593.8	V	-63.50	-13	-50.50
1633	H	-56.33	-13	-43.33
738.6	H	-62.94	-13	-49.94
584.2	H	-60.89	-13	-47.89

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1638	V	-56.90	-13	-43.90
801.3	V	-63.10	-13	-50.10
746.2	V	-63.81	-13	-50.81
1638	H	-54.34	-13	-41.34
799.1	H	-62.78	-13	-49.78
689.5	H	-63.41	-13	-50.41

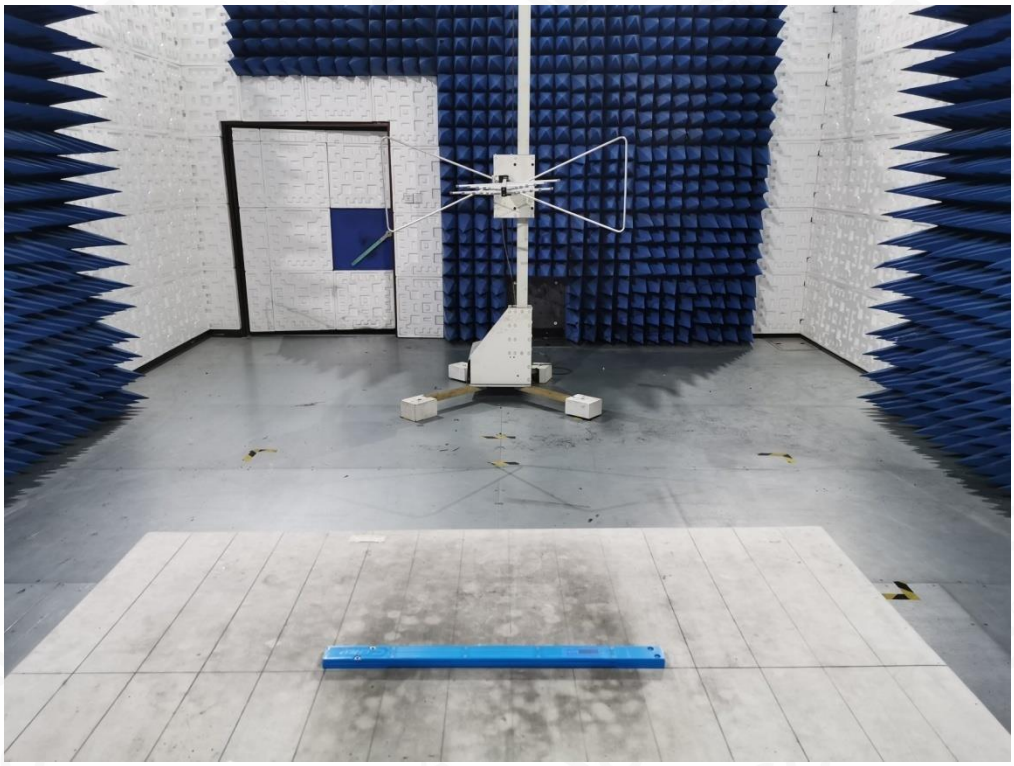
High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1643	V	-58.88	-13	-45.88
745.5	V	-64.23	-13	-51.23
631.2	V	-63.08	-13	-50.08
1643	H	-58.72	-13	-45.72
723.8	H	-62.24	-13	-49.24
629.5	H	-63.85	-13	-50.85

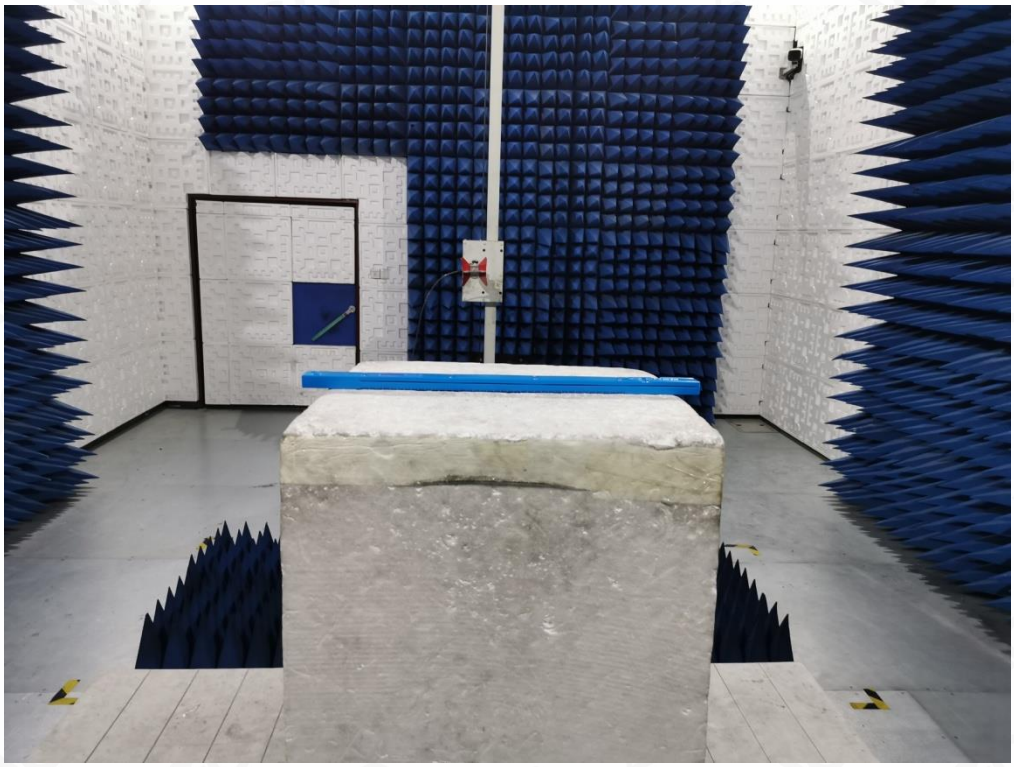
Note: 1. Margin = Emission Level -Limit
2. (30MHz-26GHz) Below 30MHZ no Spurious found and above is the worst mode data

APPENDIX D PHOTOGRAPHS OF TEST SETUP

RADIATED EMISSION TEST SETUP



RADIATED EMISSION ABOVE 1G TEST SETUP



----END OF REPORT----