

TEST REPORT

Product Name: Swittons IoT Edge cellular
FCC ID: 2AUJP-SWIT500C-R
Trademark:  Swittons
Better Everything.
Model Number: SWIT500C-R, SWIT500C-N
Prepared For: OPTIKS SOLUTIONS, INC
Address: 15 CORPORATE PLACE SOUTH SUITE 105 PISCATAWAY NJ 08854, USA
Manufacturer: OPTIKS SOLUTIONS, INC
Address: 15 CORPORATE PLACE SOUTH SUITE 105 PISCATAWAY NJ 08854, USA
Prepared By: Shenzhen CTB Testing Technology Co., Ltd.
Address: Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong China
Sample Received Date: Jul. 16, 2021
Sample tested Date: Jul. 16, 2021 to Jul. 31, 2021
Issue Date: Aug. 5, 2021
Report No.: CTB210731030RFX
Test Standards: FCC Part 2, 22, 24E, 27
Test Results: PASS
Remark: This is LTE radio test report.

Compiled by:

Arron Liu

Reviewed by:

Bin Mei

Approved by:

Rita Xiao / Director

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

TABLE OF CONTENT

Test Report Declaration	Page
1. VERSION	4
2. TEST SUMMARY	5
3. MEASUREMENT UNCERTAINTY	6
4. PRODUCT INFORMATION AND TEST SETUP	7
4.1 Product Information	7
4.2 Test Setup Configuration	8
4.3 Support Equipment	8
4.4 Test Mode	8
4.5 Test Environment	13
5. TEST FACILITY AND TEST INSTRUMENT USED	14
5.1 Test Facility	14
5.2 Test Instrument Used	14
6. RF EXPOSURE	16
6.1 Standard Applicable	16
6.2 Test Result	16
7. RF OUTPUT POWER	17
7.1 Standard Applicable	17
7.2 Test Procedure	17
7.3 Summary of Test Results/Plots	18
8. PEAK-TO-AVERAGE RATIO (PAR) OF TRANSMITTER	37
8.1 Standard Applicable	37
8.2 Test Procedure	37
8.3 Summary of Test Results	37
9. EMISSION BANDWIDTH	38
9.1 Standard Applicable	38
9.2 Test Procedure	38
9.3 Summary of Test Results/Plots	38
10. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL	39
10.1 Standard Applicable	39
10.2 Test Procedure	40

10.3	Summary of Test Results/Plots.....	40
11.	SPURIOUS RADIATED EMISSIONS.....	41
11.1	Standard Applicable	41
11.2	Test Procedure	42
11.3	Summary of Test Results/Plots.....	43
12.	FREQUENCY STABILITY	61
12.1	Standard Applicable	61
12.2	Test Procedure	61
12.3	Summary of Test Results/Plots.....	61

(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB210731030RFX	Aug. 5, 2021	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Test Item	Test Requirement	Test method	Result
Conducted output power	Part 2.1046(a)	TIA-603-E-2016 & KDB 971168 D01v02r02	PASS
Effective Radiated Power of Transmitter(EIRP)	Part 22.913(a)(5)/Part27.50(h)(2)	TIA-603-E-2016 & KDB 971168 D01v02r02	PASS
peak-to-average ratio	Part 27.50(d)	KDB 971168 D01v02r02	PASS
99% & 26dB Occupied Bandwidth	Part 2.1049(h)	KDB 971168 D01v02r02	PASS
Band Edge at antenna terminals	Part 2.1051/ Part 22.917(a)/Part 27.53(m) (4)	KDB 971168 D01v02r02	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 22.917(a)/Part 27.53(m) (4)	TIA-603-E-2016 & KDB 971168 D01v02r02	PASS
Field strength of spurious radiation	Part 2.1053/ Part 22.917(a)/Part 27.53(m) (4)	TIA-603-E-2016 & KDB 971168 D01v02r02	PASS
Frequency stability	Part 2.1055/Part 27.54	TIA-603-E-2016 & KDB 971168 D01v02r02	PASS

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m chamber Radiated spurious emission(30MHz-1GHz)	4.6dB
3m chamber Radiated spurious emission(1GHz-18GHz)	5.1dB
3m chamber Radiated spurious emission(18GHz-40GHz)	3.4dB
Receiver Reference Sensitivity level	1.9dB
humidity uncertainty	5.5%
Temperature uncertainty	0.63°C
frequency	1×10^{-7}

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	SWIT500C-R, SWIT500C-N
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: SWIT500C-R
Hardware Version:	V3.0
Software Version:	V1.0.19
Operation Frequency:	FDD-LTE BAND 2:1850-1910MHz FDD-LTE BAND 4:1710-1755MHz FDD-LTE BAND 5: 824-849MHz FDD-LTE BAND 12: 699-716MHz FDD-LTE BAND 13: 777-787MHz FDD-LTE BAND 25: 1850-1915MHz
Max. RF output power:	FDD-LTE BAND 2:20.27 dBm FDD-LTE BAND 4: 21.35 dBm FDD-LTE BAND 5: 21.42dBm FDD-LTE BAND 12: 21.37 dBm FDD-LTE BAND 13: 21.55dBm FDD-LTE BAND 25: 21.09dBm
Type of Modulation:	QPSK, 16QAM
Antenna installation:	Integral antenna
Antenna Gain:	FDD-LTE Band 2:1.43dBi FDD-LTE BAND 4: 1.43dBi FDD-LTE BAND 5: 1.43dBi FDD-LTE BAND 12: 1.43dBi FDD-LTE BAND 13: 1.43dBi FDD-LTE BAND 25: 1.43dBi
Ratings:	DC 5.0V charging from adapter DC 3.7V from battery

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Test Mode

Test Mode List		
Test Mode	Description	Remark
TM1	FDD-LTE BAND 2	Low, Middle, High Channels
TM2	FDD-LTE BAND 4	Low, Middle, High Channels
TM3	TDD-LTE BAND 5	Low, Middle, High Channels
TM4	TDD-LTE BAND 12	Low, Middle, High Channels
TM5	TDD-LTE BAND 13	Low, Middle, High Channels
TM6	TDD-LTE BAND 25	Low, Middle, High Channels

LTE BAND 2

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
LTE band 2	Low Range	1.4	18607	1850.7
		3	18615	1851.5
		5	18625	1852.5
		10	18650	1855
		15	18675	1857.5
		20	18700	1860
	Mid Range	1.4/3/5/10/15/20	18900	1880
	High Range	1.4	19193	1909.3
		3	19185	1908.5
		5	19175	1907.5
		10	19150	1905
		15	19125	1902.5
		20	19100	1900

LTE BAND 4

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
LTE band 4	Low Range	1.4	19957	1710.7
		3	19965	1711.5
		5	19975	1712.5
		10	20000	1715
		15	20025	1717.5
		20	20050	1720
	Mid Range	1.4/3/5/10/15/20	20175	1732.5
	High Range	1.4	20393	1754.3
		3	20385	1753.5
		5	20375	1752.5
		10	20350	1750
		15	20325	1747.5
		20	20300	1745

LTE BAND 5

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
LTE band 5	Low Range	1.4	20407	824.7
		3	20415	825.5
		5	20425	826.5
		10	20450	829
	Mid Range	1.4/3/5/10	20525	836.5
	High Range	1.4	20643	848.3
		3	20635	847.5
		5	20625	846.5
		10	20600	844

LTE BAND 12

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
LTE band 12	Low Range	1.4	23017	699.7
		3	23025	700.5
		5	23035	701.5
		10	23060	704
	Mid Range	1.4/3/5/10	23095	707.5
	High Range	1.4	23173	715.3
		3	23165	714.5
		5	23155	713.5
		10	23130	711

LTE BAND 13

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
LTE band 13	Low Range	5	23025	779.5
		10	23230	782
	Mid Range	5/10	23230	782
	High Range	5	23255	784.5
		10	23230	782

LTE BAND 25

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
LTE band 25	Low Range	1.4	26047	1850.7
		3	26055	1851.5
		5	26065	1852.5
		10	26090	1855
		15	26115	1857.5
		20	26140	1860
	Mid Range	1.4/3/5/10/15/20	26365	1882.5
	High Range	1.4	26683	1914.3
		3	26675	1913.5
		5	26665	1912.5
		10	26640	1910
		15	26615	1907.5
		20	26590	1905

Test items	Modes	Bandwidth (MHz)						Modulation		RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	0	50%	100%	L	M	H
RF Power Output	LTE 2	0	0	0	0	0	0	0	0	0	-	0	0	0	0
	LTE 4	0	0	0	0	0	0	0	0	0	-	0	0	0	0
	LTE 5	0	0	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 12	0	0	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 13	-	-	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 25	0	0	0	0	0	0	0	0	0	-	0	0	0	0
Effective Isotropic Radiated power	LTE 2	0	0	0	0	0	0	0	0	0	-	0	0	0	0
	LTE 4	0	0	0	0	0	0	0	0	0	-	0	0	0	0
	LTE 5	0	0	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 12	0	0	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 13	-	-	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 25	0	0	0	0	0	0	0	0	0	-	0	0	0	0
Occupied Bandwidth	LTE 2	0	0	0	0	0	0	0	0	0	-	0	0	0	0
	LTE 4	0	0	0	0	0	0	0	0	0	-	0	0	0	0
	LTE 5	0	0	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 12	0	0	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 13	-	-	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 25	0	0	0	0	0	0	0	0	0	-	0	0	0	0
Band edge Compliance	LTE 2	0	0	0	0	0	0	0	0	0	-	0	0	-	0
	LTE 4	0	0	0	0	0	0	0	0	0	-	0	0	-	0
	LTE 5	0	0	0	0	-	-	0	0	0	-	0	0	-	0
	LTE 12	0	0	0	0	-	-	0	0	0	-	0	0	-	0
	LTE 13	-	-	0	0	-	-	0	0	0	-	0	0	-	0
	LTE 25	0	0	0	0	0	0	0	0	0	-	0	0	-	0
Peak-to-Average Power Ratio	LTE 2	0	0	0	0	0	0	0	0	0	-	0	-	0	-
	LTE 4	0	0	0	0	0	0	0	0	0	-	0	-	0	-
	LTE 5	0	0	0	0	-	-	0	0	0	-	0	-	0	-
	LTE 12	0	0	0	0	-	-	0	0	0	-	0	-	0	-
	LTE 13	-	-	0	0	-	-	0	0	0	-	0	-	0	-
	LTE 25	0	0	0	0	0	0	0	0	0	-	0	-	0	-
Frequency Stability	LTE 2	0	0	0	0	0	0	0	0	0	-	0	0	0	0
	LTE 4	0	0	0	0	0	0	0	0	0	-	0	0	0	0
	LTE 5	0	0	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 12	0	0	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 13	-	-	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 25	0	0	0	0	0	0	0	0	0	-	0	0	0	0
Conducted Spurious Emissions	LTE 2	0	0	0	0	0	0	0	0	0	-	0	0	0	0
	LTE 4	0	0	0	0	0	0	0	0	0	-	0	0	0	0
	LTE 5	0	0	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 12	0	0	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 13	-	-	0	0	-	-	0	0	0	-	0	0	0	0
	LTE 25	0	0	0	0	0	0	0	0	0	-	0	0	0	0
Radiates Spurious Emission	LTE 2	0	0	0	0	0		0	0	0	-	0	0	0	0
	LTE 4	0	0	0	0	0		0	0	0	-	0	0	0	0
	LTE 5	0	0	0	0	-		0	0	0	-	0	0	0	0
	LTE 12	0	0	0	0	-		0	0	0	-	0	0	0	0

	LTE 13	-	-	o	o	-		o	o	o	-	o	o	o	o
	LTE 25	o	o	o	o	o		o	o	o	-	o	o	o	o

Note:1.The mark o means that this configurations is chosen for testing
 Note:1.The mark - means that this configurations is not testing

4.5 Test Environment

Humidity (%):	55
Atmospheric Pressure(kPa):	101.1
Normal Voltage(DC):	3.7V
Normal Temperature(°C)	25
Low Temperature(°C)	0
High Temperature(°C)	40

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Floor 1&2, Building A, No. 26 of Xinh Road, Xinqiao Street, Baoan District, Shenzhen China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2021.09.27
2	Power Sensor	Agilent	U2021XA	MY56120032	2021.09.27
3	Power Sensor	Agilent	U2021XA	MY56120034	2021.09.27
4	Communication test set	R&S	CMW500	108058	2021.09.27
5	Spectrum Analyzer	R&S	FSP40	100550	2021.09.27
6	Signal Generator	Agilent	N5181A	MY49060920	2021.09.27
7	Signal Generator	Agilent	N5182A	MY47420195	2021.09.27
8	Communication test set	Agilent	E5515C	MY50102567	2021.09.27
9	band rejection filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2021.09.27
10	band rejection filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	2021.09.27
11	band rejection filter	Xingbo	XBLBQ-DZA120	190821-1-1	2021.09.27
12	BT&WI-FI Automatic test software	Microwave	MTS8310	Ver. 2.0.0.0	2021.09.27
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2021.09.27
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2021.09.27
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	2021.09.27
16	966 chamber	C.R.T.	966 Room	966	2021.09.27
17	Receiver	R&S	ESPI	100362	2021.09.27
18	Amplifier	HP	8447E	2945A02747	2021.09.27
19	Amplifier	Agilent	8449B	3008A01838	2021.09.27
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	869	2021.09.27

21	Horn Antenna	Schwarzbeck	BBHA9120D	1911	2021.09.27
22	Software	Fala	EZ-EMC	FA-03A2 RE	2021.09.27
23	3-Loop Antenna	Daze	ZN30401	17014	2021.09.27
24	loop antenna	ZHINAN	ZN30900A	/	2021.09.27
25	Horn antenna	A/H/System	SAS-574	588	2021.09.27
26	Amplifier	AEROFLEX	/	S/N/ 097	2021.09.27

6. RF EXPOSURE

6.1 Standard Applicable

According to §1.1307 and §2.1091, §2.1093, the portable transmitter must comply the RF exposure requirements.

6.2 Test Result

This product complied with the requirement of the RF exposure, please see the RF Exposure report.

7. RF OUTPUT POWER

7.1 Standard Applicable

According to §22.913(a)(2), the ERP of mobile and portable stations transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to §24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

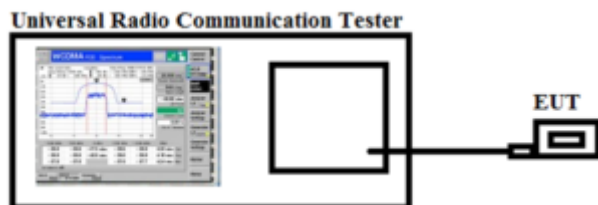
According to §27.50(d)(4), fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

According to §27.50(c)(10), portable stations (hand-held devices) in the 698-746 MHz band are limited to 3 watts ERP.

According to §27.50(b)(10), portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

7.2 Test Procedure

Conducted output power test method:



Radiated power test method:

1. The setup of EUT is according with per ANSI/TIA Standard 603E and ANSI C63.26 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

7.3 Summary of Test Results/Plots

Max. Radiated Power:

FDD-LTE Band 2

Channel Bandwidth:1.4MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.7	19.37	1.5	0	H	1.9	1.43	18.90	33.00
1850.7	19.29	1.5	0	V	1.9	1.43	18.82	33.00
Middle Channel								
1880	19.26	1.5	0	H	1.9	1.43	18.79	33.00
1880	19.33	1.5	0	V	1.9	1.43	18.86	33.00
High Channel								
1909.3	19.32	1.5	0	H	1.9	1.43	18.85	33.00
1909.3	19.26	1.5	0	V	1.9	1.43	18.79	33.00

Channel Bandwidth:1.4MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.7	20.42	1.5	0	H	1.9	1.43	19.95	33.00
1850.7	20.33	1.5	0	V	1.9	1.43	19.86	33.00
Middle Channel								
1880	19.33	1.5	0	H	1.9	1.43	18.86	33.00
1880	19.23	1.5	0	V	1.9	1.43	18.76	33.00
High Channel								
1909.3	20.34	1.5	0	H	1.9	1.43	19.87	33.00
1909.3	20.35	1.5	0	V	1.9	1.43	19.88	33.00

Channel Bandwidth:3.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1851.5	20.42	1.5	0	H	1.9	1.43	19.95	33.00
1851.5	20.33	1.5	0	V	1.9	1.43	19.86	33.00
Middle Channel								
1880	19.33	1.5	0	H	1.9	1.43	18.86	33.00
1880	19.23	1.5	0	V	1.9	1.43	18.76	33.00
High Channel								
1908.5	20.34	1.5	0	H	1.9	1.43	19.87	33.00
1908.5	20.35	1.5	0	V	1.9	1.43	19.88	33.00

Channel Bandwidth:3.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1851.5	20.27	1.5	0	H	1.9	1.43	19.80	33.00
1851.5	19.36	1.5	0	V	1.9	1.43	18.89	33.00
Middle Channel								
1880	20.23	1.5	0	H	1.9	1.43	19.76	33.00
1880	20.24	1.5	0	V	1.9	1.43	19.77	33.00
High Channel								
1908.5	20.25	1.5	0	H	1.9	1.43	19.78	33.00
1908.5	19.40	1.5	0	V	1.9	1.43	18.93	33.00

Channel Bandwidth:5.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.5	21.32	1.5	0	H	1.9	1.43	20.85	33.00
1852.5	21.30	1.5	0	V	1.9	1.43	20.83	33.00
Middle Channel								
1880	21.25	1.5	0	H	1.9	1.43	20.78	33.00
1880	21.23	1.5	0	V	1.9	1.43	20.76	33.00
High Channel								
1907.5	21.26	1.5	0	H	1.9	1.43	20.79	33.00
1907.5	21.27	1.5	0	V	1.9	1.43	20.80	33.00

Channel Bandwidth:5.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.5	21.08	1.5	0	H	1.9	1.43	20.61	33.00
1852.5	21.06	1.5	0	V	1.9	1.43	20.59	33.00
Middle Channel								
1880	21.00	1.5	0	H	1.9	1.43	20.53	33.00
1880	20.99	1.5	0	V	1.9	1.43	20.52	33.00
High Channel								
1907.5	20.92	1.5	0	H	1.9	1.43	20.45	33.00
1907.5	20.96	1.5	0	V	1.9	1.43	20.49	33.00

Channel Bandwidth:10.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1855	21.36	1.5	0	H	1.9	1.43	20.89	33.00
1855	21.28	1.5	0	V	1.9	1.43	20.81	33.00
Middle Channel								
1880	21.26	1.5	0	H	1.9	1.43	20.79	33.00
1880	21.23	1.5	0	V	1.9	1.43	20.76	33.00
High Channel								
1905	21.34	1.5	0	H	1.9	1.43	20.87	33.00
1905	21.31	1.5	0	V	1.9	1.43	20.84	33.00

Channel Bandwidth:10.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1855	21	1.5	0	H	1.90	1.43	20.53	33.00
1855	20.96	1.5	0	V	1.90	1.43	20.49	33.00
Middle Channel								
1880	20.83	1.5	0	H	1.90	1.43	20.36	33.00
1880	20.97	1.5	0	V	1.90	1.43	20.50	33.00
High Channel								
1905	20.98	1.5	0	H	1.90	1.43	20.51	33.00
1905	20.95	1.5	0	V	1.90	1.43	20.48	33.00

Channel Bandwidth:15.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1857.5	21.37	1.5	0	H	1.90	1.43	20.90	33.00
1857.5	21.36	1.5	0	V	1.90	1.43	20.89	33.00
Middle Channel								
1880	21.23	1.5	0	H	1.90	1.43	20.76	33.00
1880	21.28	1.5	0	V	1.90	1.43	20.81	33.00
High Channel								
1902.5	21.33	1.5	0	H	1.90	1.43	20.86	33.00
1902.5	21.2	1.5	0	V	1.90	1.43	20.73	33.00

Channel Bandwidth:15.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1857.5	21.05	1.50	0.00	H	1.90	1.43	20.58	33.00
1857.5	21.00	1.50	0.00	V	1.90	1.43	20.53	33.00
Middle Channel								
1880	20.96	1.50	0.00	H	1.90	1.43	20.49	33.00
1880	20.93	1.50	0.00	V	1.90	1.43	20.46	33.00
High Channel								
1902.5	20.94	1.50	0.00	H	1.90	1.43	20.47	33.00
1902.5	20.90	1.50	0.00	V	1.90	1.43	20.43	33.00

Channel Bandwidth:20.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1860	21.36	1.50	0.00	H	1.90	1.43	20.89	33.00
1860	21.28	1.50	0.00	V	1.90	1.43	20.81	33.00
Middle Channel								
1880	21.23	1.50	0.00	H	1.90	1.43	20.76	33.00
1880	21.32	1.50	0.00	V	1.90	1.43	20.85	33.00
High Channel								
1900	21.24	1.50	0.00	H	1.90	1.43	20.77	33.00
1900	21.30	1.50	0.00	V	1.90	1.43	20.83	33.00

Channel Bandwidth:20.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1860	21.07	1.50	0.00	H	1.90	1.43	20.60	33.00
1860	21.06	1.50	0.00	V	1.90	1.43	20.59	33.00
Middle Channel								
1880	20.96	1.50	0.00	H	1.90	1.43	20.49	33.00
1880	21.00	1.50	0.00	V	1.90	1.43	20.53	33.00
High Channel								
1900	21.04	1.50	0.00	H	1.90	1.43	20.57	33.00
1900	21.05	1.50	0.00	V	1.90	1.43	20.58	33.00

FDD-LTE Band 4

Channel Bandwidth:1.4MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1710.7	21.17	1.50	0.00	H	1.71	1.43	20.89	30.00
1710.7	21.09	1.50	0.00	V	1.71	1.43	20.81	30.00
Middle Channel								
1732.5	21.01	1.50	0.00	H	1.71	1.43	20.73	30.00
1732.5	21.11	1.50	0.00	V	1.71	1.43	20.83	30.00
High Channel								
1754.3	21.10	1.50	0.00	H	1.71	1.43	20.82	30.00
1754.3	21.07	1.50	0.00	V	1.71	1.43	20.79	30.00

Channel Bandwidth:1.4MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1710.7	19.91	1.50	0.00	H	1.71	1.43	19.63	30.00
1710.7	19.90	1.50	0.00	V	1.71	1.43	19.62	30.00
Middle Channel								
1732.5	19.17	1.50	0.00	H	1.71	1.43	18.89	30.00
1732.5	19.14	1.50	0.00	V	1.71	1.43	18.86	30.00
High Channel								
1754.3	19.88	1.50	0.00	H	1.71	1.43	19.60	30.00
1754.3	19.80	1.50	0.00	V	1.71	1.43	19.52	30.00

Channel Bandwidth:3.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1711.5	20.17	1.50	0.00	H	1.71	1.43	19.89	30.00
1711.5	20.08	1.50	0.00	V	1.71	1.43	19.8	30.00
Middle Channel								
1732.5	20.10	1.50	0.00	H	1.71	1.43	19.82	30.00
1732.5	20.14	1.50	0.00	V	1.71	1.43	19.86	30.00
High Channel								
1753.5	20.13	1.50	0.00	H	1.71	1.43	19.85	30.00
1753.5	20.11	1.50	0.00	V	1.71	1.43	19.83	30.00

Channel Bandwidth:3.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1711.5	19.93	1.50	0.00	H	1.71	1.43	19.65	30.00
1711.5	19.90	1.50	0.00	V	1.71	1.43	19.62	30.00
Middle Channel								
1732.5	19.84	1.50	0.00	H	1.71	1.43	19.56	30.00
1732.5	19.91	1.50	0.00	V	1.71	1.43	19.63	30.00
High Channel								
1753.5	19.80	1.50	0.00	H	1.71	1.43	19.52	30.00
1753.5	19.88	1.50	0.00	V	1.71	1.43	19.6	30.00

Channel Bandwidth:5.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1712.5	21.33	1.50	0.00	H	1.71	1.43	21.05	30.00
1712.5	21.30	1.50	0.00	V	1.71	1.43	21.02	30.00
Middle Channel								
1732.5	21.17	1.50	0.00	H	1.71	1.43	20.89	30.00
1732.5	21.13	1.50	0.00	V	1.71	1.43	20.85	30.00
High Channel								
1752.5	21.11	1.50	0.00	H	1.71	1.43	20.83	30.00
1752.5	21.09	1.50	0.00	V	1.71	1.43	20.81	30.00

Channel Bandwidth:5.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1712.5	21.31	1.50	0.00	H	1.71	1.43	21.03	30.00
1712.5	21.30	1.50	0.00	V	1.71	1.43	21.02	30.00
Middle Channel								
1732.5	21.18	1.50	0.00	H	1.71	1.43	20.9	30.00
1732.5	21.17	1.50	0.00	V	1.71	1.43	20.89	30.00
High Channel								
1752.5	21.13	1.50	0.00	H	1.71	1.43	20.85	30.00
1752.5	21.12	1.50	0.00	V	1.71	1.43	20.84	30.00

Channel Bandwidth:10.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1715	21.18	1.50	0.00	H	1.71	1.43	20.90	30.00
1715	20.96	1.50	0.00	V	1.71	1.43	20.68	30.00
Middle Channel								
1732.5	21.07	1.50	0.00	H	1.71	1.43	20.79	30.00
1735.2	20.97	1.50	0.00	V	1.71	1.43	20.69	30.00
High Channel								
1750	21.02	1.50	0.00	H	1.71	1.43	20.74	30.00
1750	21.13	1.50	0.00	V	1.71	1.43	20.85	30.00

Channel Bandwidth:10.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1715	21.33	1.50	0.00	H	1.71	1.43	21.05	30.00
1715	21.17	1.50	0.00	V	1.71	1.43	20.89	30.00
Middle Channel								
1732.5	21.04	1.50	0.00	H	1.71	1.43	20.76	30.00
1735.2	21.03	1.50	0.00	V	1.71	1.43	20.75	30.00
High Channel								
1750	21.29	1.50	0.00	H	1.71	1.43	21.01	30.00
1750	21.30	1.50	0.00	V	1.71	1.43	21.02	30.00

Channel Bandwidth:15.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1717.5	21.28	1.50	0.00	H	1.71	1.43	21.00	30.00
1717.5	21.17	1.50	0.00	V	1.71	1.43	20.89	30.00
Middle Channel								
1732.5	21.13	1.50	0.00	H	1.71	1.43	20.85	30.00
1732.5	21.14	1.50	0.00	V	1.71	1.43	20.86	30.00
High Channel								
1747.5	21.04	1.50	0.00	H	1.71	1.43	20.76	30.00
1747.5	21.01	1.50	0.00	V	1.71	1.43	20.73	30.00

Channel Bandwidth:15.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1717.5	21.07	1.50	0.00	H	1.71	1.43	20.79	30.00
1717.5	21.01	1.50	0.00	V	1.71	1.43	20.73	30.00
Middle Channel								
1732.5	20.99	1.50	0.00	H	1.71	1.43	20.71	30.00
1732.5	20.97	1.50	0.00	V	1.71	1.43	20.69	30.00
High Channel								
1747.5	20.91	1.50	0.00	H	1.71	1.43	20.63	30.00
1747.5	21.03	1.50	0.00	V	1.71	1.43	20.75	30.00

Channel Bandwidth:20.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1720	21.48	1.50	0.00	H	1.71	1.43	21.20	30.00
1720	20.98	1.50	0.00	V	1.71	1.43	20.70	30.00
Middle Channel								
1732.5	21.07	1.50	0.00	H	1.71	1.43	20.79	30.00
1732.5	21.41	1.50	0.00	V	1.71	1.43	21.13	30.00
High Channel								
1745	21.42	1.50	0.00	H	1.71	1.43	21.14	30.00
1745	21.43	1.50	0.00	V	1.71	1.43	21.15	30.00

Channel Bandwidth:20.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1720	21.44	1.50	0.00	H	1.71	1.43	21.16	30.00
1720	21.31	1.50	0.00	V	1.71	1.43	21.03	30.00
Middle Channel								
1732.5	21.32	1.50	0.00	H	1.71	1.43	21.04	30.00
1732.5	21.38	1.50	0.00	V	1.71	1.43	21.10	30.00
High Channel								
1745	21.17	1.50	0.00	H	1.71	1.43	20.89	30.00
1745	21.14	1.50	0.00	V	1.71	1.43	20.86	30.00

FDD-LTE Band 5

Channel Bandwidth:1.4MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.7	21.05	1.50	0.00	H	1.50	1.43	20.98	33.00
824.7	20.89	1.50	0.00	V	1.50	1.43	20.82	33.00
Middle Channel								
836.5	21.03	1.50	0.00	H	1.50	1.43	20.96	33.00
836.5	20.75	1.50	0.00	V	1.50	1.43	20.68	33.00
High Channel								
848.3	20.77	1.50	0.00	H	1.50	1.43	20.70	33.00
848.3	20.82	1.50	0.00	V	1.50	1.43	20.75	33.00

Channel Bandwidth:1.4MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.7	20.12	1.50	0.00	H	1.50	1.43	20.05	33.00
824.7	19.98	1.50	0.00	V	1.50	1.43	19.91	33.00
Middle Channel								
836.5	20.11	1.50	0.00	H	1.50	1.43	20.04	33.00
836.5	20.10	1.50	0.00	V	1.50	1.43	20.03	33.00
High Channel								
848.3	20.08	1.50	0.00	H	1.50	1.43	20.01	33.00
848.3	20.03	1.50	0.00	V	1.50	1.43	19.96	33.00

Channel Bandwidth:3.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
825.5	20.77	1.50	0.00	H	1.50	1.43	20.70	33.00
825.5	20.76	1.50	0.00	V	1.50	1.43	20.69	33.00
Middle Channel								
836.5	20.69	1.50	0.00	H	1.50	1.43	20.62	33.00
836.5	20.60	1.50	0.00	V	1.50	1.43	20.53	33.00
High Channel								
847.5	20.68	1.50	0.00	H	1.50	1.43	20.61	33.00
847.5	20.72	1.50	0.00	V	1.50	1.43	20.65	33.00

Channel Bandwidth:3.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
825.5	20.28	1.50	0.00	H	1.50	1.43	20.21	33.00
825.5	20.26	1.50	0.00	V	1.50	1.43	20.19	33.00
Middle Channel								
836.5	20.23	1.50	0.00	H	1.50	1.43	20.16	33.00
836.5	19.96	1.50	0.00	V	1.50	1.43	19.89	33.00
High Channel								
847.5	19.74	1.50	0.00	H	1.50	1.43	19.67	33.00
847.5	19.72	1.50	0.00	V	1.50	1.43	19.65	33.00

Channel Bandwidth:5.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
826.5	20.97	1.50	0.00	H	1.50	1.43	20.90	33.00
826.5	20.96	1.50	0.00	V	1.50	1.43	20.89	33.00
Middle Channel								
836.5	20.91	1.50	0.00	H	1.50	1.43	20.84	33.00
836.5	20.90	1.50	0.00	V	1.50	1.43	20.83	33.00
High Channel								
846.5	20.83	1.50	0.00	H	1.50	1.43	20.76	33.00
846.5	20.82	1.50	0.00	V	1.50	1.43	20.75	33.00

Channel Bandwidth:5.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.7	21.42	1.50	0.00	H	1.50	1.43	21.35	33.00
1850.7	20.76	1.50	0.00	V	1.50	1.43	20.69	33.00
Middle Channel								
1880	20.60	1.50	0.00	H	1.50	1.43	20.53	33.00
1880	21.27	1.50	0.00	V	1.50	1.43	21.20	33.00
High Channel								
1909.3	21.17	1.50	0.00	H	1.50	1.43	21.10	33.00
1909.3	21.37	1.50	0.00	V	1.50	1.43	21.30	33.00

Channel Bandwidth:10.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
829	20.97	1.50	0.00	H	1.50	1.43	20.90	33.00
829	20.96	1.50	0.00	V	1.50	1.43	20.89	33.00
Middle Channel								
836.5	20.86	1.50	0.00	H	1.50	1.43	20.79	33.00
836.5	20.90	1.50	0.00	V	1.50	1.43	20.83	33.00
High Channel								
844	20.88	1.50	0.00	H	1.50	1.43	20.81	33.00
844	20.91	1.50	0.00	V	1.50	1.43	20.84	33.00

Channel Bandwidth:10.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
829	21.17	1.50	0.00	H	1.50	1.43	21.10	33.00
829	21.16	1.50	0.00	V	1.50	1.43	21.09	33.00
Middle Channel								
836.5	21.12	1.50	0.00	H	1.50	1.43	21.05	33.00
836.5	21.10	1.50	0.00	V	1.50	1.43	21.03	33.00
High Channel								
844	20.96	1.50	0.00	H	1.50	1.43	20.89	33.00
844	20.90	1.50	0.00	V	1.50	1.43	20.83	33.00

FDD-LTE Band 12

Channel Bandwidth:1.4MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
699.7	20.94	1.50	0.00	H	1.47	1.43	20.9	34.77
699.7	19.94	1.50	0.00	V	1.47	1.43	19.9	34.77
Middle Channel								
707.5	20.90	1.50	0.00	H	1.47	1.43	20.86	34.77
707.5	20.87	1.50	0.00	V	1.47	1.43	20.83	34.77
High Channel								
715.3	20.88	1.50	0.00	H	1.47	1.43	20.84	34.77
715.3	20.02	1.50	0.00	V	1.47	1.43	19.98	34.77

Channel Bandwidth:1.4MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
699.7	20.05	1.50	0.00	H	1.47	1.43	20.01	34.77
699.7	20.00	1.50	0.00	V	1.47	1.43	19.96	34.77
Middle Channel								
707.5	19.96	1.50	0.00	H	1.47	1.43	19.92	34.77
707.5	18.93	1.50	0.00	V	1.47	1.43	18.89	34.77
High Channel								
715.3	19.99	1.50	0.00	H	1.47	1.43	19.95	34.77
715.3	19.98	1.50	0.00	V	1.47	1.43	19.94	34.77

Channel Bandwidth:3.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
700.5	20.95	1.50	0.00	H	1.47	1.43	20.91	34.77
700.5	20.90	1.50	0.00	V	1.47	1.43	20.86	34.77
Middle Channel								
707.5	20.91	1.50	0.00	H	1.47	1.43	20.87	34.77
707.5	20.02	1.50	0.00	V	1.47	1.43	19.98	34.77
High Channel								
714.5	20.85	1.50	0.00	H	1.47	1.43	20.81	34.77
714.5	20.87	1.50	0.00	V	1.47	1.43	20.83	34.77

Channel Bandwidth:3.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
700.5	20.13	1.50	0.00	H	1.47	1.43	20.09	34.77
700.5	20.05	1.50	0.00	V	1.47	1.43	20.01	34.77
Middle Channel								
707.5	20.07	1.50	0.00	H	1.47	1.43	20.03	34.77
707.5	20.02	1.50	0.00	V	1.47	1.43	19.98	34.77
High Channel								
714.5	19.87	1.50	0.00	H	1.47	1.43	19.83	34.77
714.5	19.88	1.50	0.00	V	1.47	1.43	19.84	34.77

Channel Bandwidth:5.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
701.5	21.07	1.50	0.00	H	1.47	1.43	21.03	34.77
701.5	20.93	1.50	0.00	V	1.47	1.43	20.89	34.77
Middle Channel								
707.5	20.88	1.50	0.00	H	1.47	1.43	20.84	34.77
707.5	20.90	1.50	0.00	V	1.47	1.43	20.86	34.77
High Channel								
713.5	20.80	1.50	0.00	H	1.47	1.43	20.76	34.77
713.5	20.78	1.50	0.00	V	1.47	1.43	20.74	34.77

Channel Bandwidth:5.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
701.5	21.27	1.50	0.00	H	1.47	1.43	21.23	34.77
701.5	21.24	1.50	0.00	V	1.47	1.43	21.20	34.77
Middle Channel								
707.5	20.93	1.50	0.00	H	1.47	1.43	20.89	34.77
707.5	20.89	1.50	0.00	V	1.47	1.43	20.85	34.77
High Channel								
713.5	20.90	1.50	0.00	H	1.47	1.43	20.86	34.77
713.5	21.06	1.50	0.00	V	1.47	1.43	21.02	34.77

Channel Bandwidth:10.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
704	21.19	1.50	0.00	H	1.47	1.43	21.15	34.77
704	21.18	1.50	0.00	V	1.47	1.43	21.14	34.77
Middle Channel								
707.5	21.02	1.50	0.00	H	1.47	1.43	20.98	34.77
707.5	21.00	1.50	0.00	V	1.47	1.43	20.96	34.77
High Channel								
711	20.88	1.50	0.00	H	1.47	1.43	20.84	34.77
711	20.87	1.50	0.00	V	1.47	1.43	20.83	34.77

Channel Bandwidth:10.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
704	20.90	1.50	0.00	H	1.47	1.43	20.86	34.77
704	20.85	1.50	0.00	V	1.47	1.43	20.81	34.77
Middle Channel								
707.5	20.86	1.50	0.00	H	1.47	1.43	20.82	34.77
707.5	20.87	1.50	0.00	V	1.47	1.43	20.83	34.77
High Channel								
711	20.80	1.50	0.00	H	1.47	1.43	20.76	34.77
711	20.83	1.50	0.00	V	1.47	1.43	20.79	34.77

FDD-LTE Band 13

Channel Bandwidth:5.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
779.5	21.36	1.50	0.00	H	1.49	1.43	21.30	34.77
779.5	21.31	1.50	0.00	V	1.49	1.43	21.25	34.77
Middle Channel								
782	21.32	1.50	0.00	H	1.49	1.43	21.26	34.77
782	20.95	1.50	0.00	V	1.49	1.43	20.89	34.77
High Channel								
784.5	21.21	1.50	0.00	H	1.49	1.43	21.15	34.77
784.5	21.22	1.50	0.00	V	1.49	1.43	21.16	34.77

Channel Bandwidth:5.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
779.5	21.26	1.50	0.00	H	1.49	1.43	21.20	34.77
779.5	21.25	1.50	0.00	V	1.49	1.43	21.19	34.77
Middle Channel								
782	21.20	1.50	0.00	H	1.49	1.43	21.14	34.77
782	21.04	1.50	0.00	V	1.49	1.43	20.98	34.77
High Channel								
784.5	21.02	1.50	0.00	H	1.49	1.43	20.96	34.77
784.5	21.21	1.50	0.00	V	1.49	1.43	21.15	34.77

Channel Bandwidth:10.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
782	21.46	1.50	0.00	H	1.49	1.43	21.40	34.77
782	21.45	1.50	0.00	V	1.49	1.43	21.39	34.77
Middle Channel								
782	21.43	1.50	0.00	H	1.49	1.43	21.37	34.77
782	21.42	1.50	0.00	V	1.49	1.43	21.36	34.77
High Channel								
782	21.36	1.50	0.00	H	1.49	1.43	21.30	34.77
782	21.41	1.50	0.00	V	1.49	1.43	21.35	34.77

Channel Bandwidth:10.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
782	21.57	1.50	0.00	H	1.49	1.43	21.51	34.77
782	21.55	1.50	0.00	V	1.49	1.43	21.49	34.77
Middle Channel								
782	21.51	1.50	0.00	H	1.49	1.43	21.45	34.77
782	21.62	1.50	0.00	V	1.49	1.43	21.56	34.77
High Channel								
782	21.54	1.50	0.00	H	1.49	1.43	21.48	34.77
782	21.56	1.50	0.00	V	1.49	1.43	21.5	34.77

FDD-LTE Band 25

Channel Bandwidth:1.4MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.7	21.28	1.50	0.00	H	1.96	1.43	20.75	33.00
1850.7	21.24	1.50	0.00	V	1.96	1.43	20.71	33.00
Middle Channel								
1882.5	21.16	1.50	0.00	H	1.96	1.43	20.63	33.00
1882.5	21.17	1.50	0.00	V	1.96	1.43	20.64	33.00
High Channel								
1914.3	20.44	1.50	0.00	H	1.96	1.43	19.91	33.00
1914.3	20.49	1.50	0.00	V	1.96	1.43	19.96	33.00

Channel Bandwidth:1.4MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.7	20.34	1.50	0.00	H	1.96	1.43	19.81	33.00
1850.7	20.15	1.50	0.00	V	1.96	1.43	19.62	33.00
Middle Channel								
1882.5	20.31	1.50	0.00	H	1.96	1.43	19.78	33.00
1882.5	20.29	1.50	0.00	V	1.96	1.43	19.76	33.00
High Channel								
1914.3	20.19	1.50	0.00	H	1.96	1.43	19.66	33.00
1914.3	20.23	1.50	0.00	V	1.96	1.43	19.70	33.00

Channel Bandwidth:3.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1851.5	20.99	1.50	0.00	H	1.96	1.43	20.46	33.00
1851.5	20.93	1.50	0.00	V	1.96	1.43	20.40	33.00
Middle Channel								
1882.5	20.96	1.50	0.00	H	1.96	1.43	20.43	33.00
1882.5	20.89	1.50	0.00	V	1.96	1.43	20.36	33.00
High Channel								
1913.5	20.90	1.50	0.00	H	1.96	1.43	20.37	33.00
1913.5	20.84	1.50	0.00	V	1.96	1.43	20.31	33.00

Channel Bandwidth:3.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1851.5	20.54	1.50	0.00	H	1.96	1.43	20.01	33.00
1851.5	20.43	1.50	0.00	V	1.96	1.43	19.90	33.00
Middle Channel								
1882.5	20.31	1.50	0.00	H	1.96	1.43	19.78	33.00
1882.5	20.37	1.50	0.00	V	1.96	1.43	19.84	33.00
High Channel								
1913.5	19.43	1.50	0.00	H	1.96	1.43	18.9	33.00
1913.5	19.24	1.50	0.00	V	1.96	1.43	18.71	33.00

Channel Bandwidth:5.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.5	21.73	1.50	0.00	H	1.96	1.43	21.2	33.00
1852.5	21.63	1.50	0.00	V	1.96	1.43	21.1	33.00
Middle Channel								
1882.5	21.69	1.50	0.00	H	1.96	1.43	21.16	33.00
1882.5	21.51	1.50	0.00	V	1.96	1.43	20.98	33.00
High Channel								
1912.5	21.27	1.50	0.00	H	1.96	1.43	20.74	33.00
1912.5	21.56	1.50	0.00	V	1.96	1.43	21.03	33.00

Channel Bandwidth:5.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.5	21.03	1.50	0.00	H	1.96	1.43	20.5	33.00
1852.5	20.94	1.50	0.00	V	1.96	1.43	20.41	33.00
Middle Channel								
1882.5	20.85	1.50	0.00	H	1.96	1.43	20.32	33.00
1882.5	20.84	1.50	0.00	V	1.96	1.43	20.31	33.00
High Channel								
1912.5	20.96	1.50	0.00	H	1.96	1.43	20.43	33.00
1912.5	21.02	1.50	0.00	V	1.96	1.43	20.49	33.00

Channel Bandwidth:10.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1855	21.55	1.50	0.00	H	1.96	1.43	21.02	33.00
1855	21.49	1.50	0.00	V	1.96	1.43	20.96	33.00
Middle Channel								
1882.5	21.21	1.50	0.00	H	1.96	1.43	20.68	33.00
1882.5	21.20	1.50	0.00	V	1.96	1.43	20.67	33.00
High Channel								
1910	21.27	1.50	0.00	H	1.96	1.43	20.74	33.00
1910	21.40	1.50	0.00	V	1.96	1.43	20.87	33.00

Channel Bandwidth:10.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1855	21.18	1.50	0.00	H	1.96	1.43	20.65	33.00
1855	21.14	1.50	0.00	V	1.96	1.43	20.61	33.00
Middle Channel								
1882.5	21.07	1.50	0.00	H	1.96	1.43	20.54	33.00
1882.5	21.16	1.50	0.00	V	1.96	1.43	20.63	33.00
High Channel								
1910	21.20	1.50	0.00	H	1.96	1.43	20.67	33.00
1910	21.22	1.50	0.00	V	1.96	1.43	20.69	33.00

Channel Bandwidth:15.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1857.5	21.36	1.50	0.00	H	1.96	1.43	20.83	33.00
1857.5	21.29	1.50	0.00	V	1.96	1.43	20.76	33.00
Middle Channel								
1882.5	21.22	1.50	0.00	H	1.96	1.43	20.69	33.00
1882.5	21.27	1.50	0.00	V	1.96	1.43	20.74	33.00
High Channel								
1907.5	21.34	1.50	0.00	H	1.96	1.43	20.81	33.00
1907.5	21.25	1.50	0.00	V	1.96	1.43	20.72	33.00

Channel Bandwidth:15.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1857.5	21.42	1.50	0.00	H	1.96	1.43	20.89	33.00
1857.5	21.34	1.50	0.00	V	1.96	1.43	20.81	33.00
Middle Channel								
1882.5	20.49	1.50	0.00	H	1.96	1.43	19.96	33.00
1882.5	20.38	1.50	0.00	V	1.96	1.43	19.85	33.00
High Channel								
1907.5	21.27	1.50	0.00	H	1.96	1.43	20.74	33.00
1907.5	21.25	1.50	0.00	V	1.96	1.43	20.72	33.00

Channel Bandwidth:20.0 MHz QPSK

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1860	21.62	1.50	0.00	H	1.96	1.43	21.09	33.00
1860	21.58	1.50	0.00	V	1.96	1.43	21.05	33.00
Middle Channel								
1882.5	21.20	1.50	0.00	H	1.96	1.43	20.67	33.00
1882.5	21.22	1.50	0.00	V	1.96	1.43	20.69	33.00
High Channel								
1905	21.50	1.50	0.00	H	1.96	1.43	20.97	33.00
1905	21.35	1.50	0.00	V	1.96	1.43	20.82	33.00

Channel Bandwidth:20.0MHz 16QAM

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1860	21.51	1.50	0.00	H	1.96	1.43	20.98	33.00
1860	21.42	1.50	0.00	V	1.96	1.43	20.89	33.00
Middle Channel								
1882.5	21.36	1.50	0.00	H	1.96	1.43	20.83	33.00
1882.5	21.50	1.50	0.00	V	1.96	1.43	20.97	33.00
High Channel								
1905	21.27	1.50	0.00	H	1.96	1.43	20.74	33.00
1905	21.32	1.50	0.00	V	1.96	1.43	20.79	33.00

Note: Result = Substitute - Cable loss + Antenna Gain

Max. Conducted Output Power

Please refer to Appendix : 1 Conducted output power

Test result: Pass

8. PEAK-TO-AVERAGE RATIO (PAR) OF TRANSMITTER

8.1 Standard Applicable

According to §24.232(d), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51, in measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

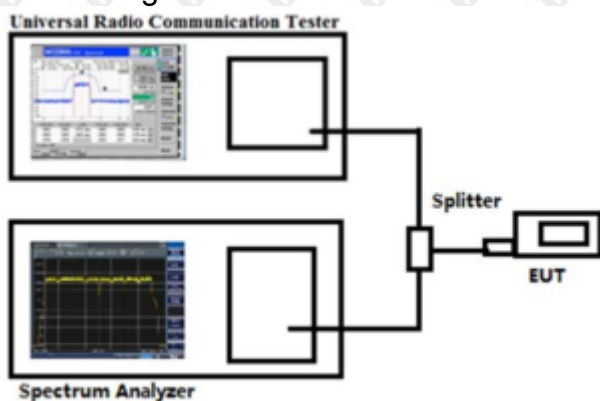
According to §27.50(B), the peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

8.2 Test Procedure

According with KDB 971168

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Configuration for the emission bandwidth testing:



8.3 Summary of Test Results

Please refer to Appendix : 2 Peak-to-Average Ratio

Test result: Pass

9. EMISSION BANDWIDTH

9.1 Standard Applicable

According to §22.917(b), 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.

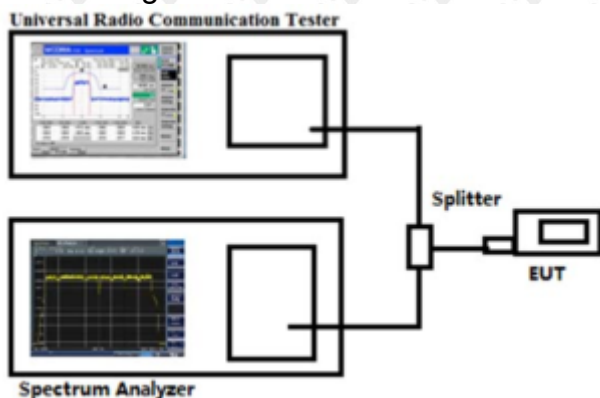
According to §24.238(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

According to §27.53, 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.

9.2 Test Procedure

According to § 22.917(b), 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.

Test Configuration for the emission bandwidth testing:



9.3 Summary of Test Results/Plots

Please refer to Appendix : 3 Occupied bandwidth
Test result: Pass

10. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

10.1 Standard Applicable

According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
- (6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

According to §27.53 (f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

According to §27.53(h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

According to §27.53(g), for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be

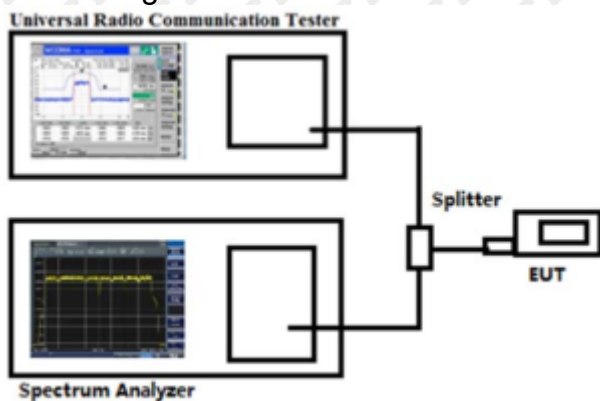
attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB.

According to §27.53(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 than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz.

10.2 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 100kHz and 1MHz for the scan frequency from 30MHz to 1GHz and the scan frequency from 1GHz to up to 10 th harmonic.

Test Configuration for the out of band emissions testing:



10.3 Summary of Test Results/Plots

Please refer to Appendix: 4 Band edge & 5 Out-of-band emissions

Test result: Pass

11. SPURIOUS RADIATED EMISSIONS

11.1 Standard Applicable

According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to § 24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to § 27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
- (6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

According to § 27.53 (f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

According to § 27.53(h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

According to § 27.53(g) the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB.

11.2 Test Procedure

1. The setup of EUT is according with per ANSI/TIA-603-E and ANSI C63.4-2014 measurement procedure.
 2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
 3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
 4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.
- Spurious attenuation limit in dB = $43 + 10 \log_{10}(\text{power out in Watts})$

11.3 Summary of Test Results/Plots

Note: 1. this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

2. All test modes (different bandwidth and different modulation) are performed, but only the worst case is recorded in this report.

Test Data: QPSK

Band 2 18607 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1337.237	150	78	-57.51	-13	-44.51	Pass	H
1726.177	149	291	-47.74	-13	-34.74	Pass	H
3902.699	151	213	-48.88	-13	-35.88	Pass	H
5856.307	150	89	-48.07	-13	-35.07	Pass	H
6497.747	151	329	-46.75	-13	-33.75	Pass	H
7995.832	148	138	-47.92	-13	-34.92	Pass	H
1219.071	149	99	-59.58	-13	-46.58	Pass	V
1438.698	148	217	-54.81	-13	-41.81	Pass	V
3569.889	150	12	-50.75	-13	-37.75	Pass	V
3836.887	150	137	-49.26	-13	-36.26	Pass	V
5802.828	146	356	-46.05	-13	-33.05	Pass	V
6552.836	146	95	-49.26	-13	-36.26	Pass	V

Band 2 18900 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1295.988	150	142	-56.91	-13	-43.91	Pass	H
1714.655	146	280	-52.88	-13	-39.88	Pass	H
3876.579	150	330	-49.17	-13	-36.17	Pass	H
5867.171	146	194	-44.25	-13	-31.25	Pass	H
6457.356	149	260	-45.76	-13	-32.76	Pass	H
8020.670	151	31	-48.80	-13	-35.80	Pass	H
1236.157	149	4	-53.98	-13	-40.98	Pass	V
1394.991	148	257	-61.06	-13	-48.06	Pass	V
3590.395	147	55	-52.53	-13	-39.53	Pass	V
3915.239	148	273	-50.87	-13	-37.87	Pass	V
5826.916	150	136	-47.98	-13	-34.98	Pass	V
6516.433	150	16	-51.38	-13	-38.38	Pass	V

Band 2 19193 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1337.322	149	156	-56.63	-13	-43.63	Pass	H
1671.528	149	170	-50.13	-13	-37.13	Pass	H
3840.797	149	127	-46.38	-13	-33.38	Pass	H
5911.846	146	42	-42.65	-13	-29.65	Pass	H
6532.331	147	69	-41.77	-13	-28.77	Pass	H
7998.821	151	110	-47.36	-13	-34.36	Pass	H
1260.420	148	61	-57.05	-13	-44.05	Pass	V
1404.853	147	266	-55.21	-13	-42.21	Pass	V
3523.185	148	303	-49.66	-13	-36.66	Pass	V
3911.307	149	195	-48.81	-13	-35.81	Pass	V
5790.792	147	323	-43.84	-13	-30.84	Pass	V
6575.984	146	325	-48.40	-13	-35.40	Pass	V

16QAM

Band 2 18607 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1336.907	147	256	-57.73	-13	-44.73	Pass	H
1682.663	147	243	-47.32	-13	-34.32	Pass	H
3871.274	148	259	-49.46	-13	-36.46	Pass	H
5925.650	149	28	-45.65	-13	-32.65	Pass	H
6559.754	148	108	-44.09	-13	-31.09	Pass	H
8001.296	147	328	-43.52	-13	-30.52	Pass	H
1177.623	150	16	-54.16	-13	-41.16	Pass	V
1429.235	148	117	-57.30	-13	-44.30	Pass	V
3597.872	147	325	-51.25	-13	-38.25	Pass	V
3899.699	149	302	-51.14	-13	-38.14	Pass	V
5853.550	147	15	-45.48	-13	-32.48	Pass	V
6581.770	147	280	-47.41	-13	-34.41	Pass	V

Band 2 18900 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.647	151	14	-56.65	-13	-43.65	Pass	H
1725.490	147	71	-49.75	-13	-36.75	Pass	H
3853.462	150	318	-48.68	-13	-35.68	Pass	H
5927.549	147	56	-45.10	-13	-32.10	Pass	H
6504.403	147	216	-44.01	-13	-31.01	Pass	H
8058.027	151	79	-45.02	-13	-32.02	Pass	H
1191.497	151	65	-54.07	-13	-41.07	Pass	V
1382.748	146	225	-56.71	-13	-43.71	Pass	V
3535.962	149	47	-50.43	-13	-37.43	Pass	V
3854.731	150	73	-49.63	-13	-36.63	Pass	V
5820.738	147	168	-47.64	-13	-34.64	Pass	V
6519.852	150	28	-46.82	-13	-33.82	Pass	V

Band 2 19193 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.118	149	165	-57.004	-13	-44.00	Pass	H
1703.154	146	208	-46.732	-13	-33.73	Pass	H
3902.917	146	4	-45.103	-13	-32.10	Pass	H
5887.888	150	198	-44.433	-13	-31.43	Pass	H
6509.903	146	341	-41.354	-13	-28.35	Pass	H
8081.135	150	235	-43.022	-13	-30.02	Pass	H
1205.018	146	292	-56.048	-13	-43.05	Pass	V
1459.940	150	158	-56.375	-13	-43.38	Pass	V
3542.835	149	55	-52.933	-13	-39.93	Pass	V
3828.779	150	319	-48.953	-13	-35.95	Pass	V
5801.924	146	118	-46.025	-13	-33.02	Pass	V
6557.392	150	155	-46.010	-13	-33.01	Pass	V

Note:

- 1) Scan from 9kHz to 40GHz, the disturbance above 13GHz and below 1GHz are attenuated more than 20 dB below the applicable limit and not required to be reported, the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 2) Tested with all kind of bandwidth, RB Size and RB Offset, Found the 1.4MHz with full RB were the worst case; and then Only the worst case is recorded in the report.

QPSK

Band 4 19957 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1337.165	150	78	-55.59	-13	-42.59	Pass	H
1726.699	149	291	-48.64	-13	-35.64	Pass	H
3902.150	151	213	-46.31	-13	-33.31	Pass	H
5858.336	150	89	-44.45	-13	-31.45	Pass	H
6497.501	151	329	-49.77	-13	-36.77	Pass	H
7995.748	148	138	-46.34	-13	-33.34	Pass	H
1218.212	149	99	-59.26	-13	-46.26	Pass	V
1437.966	148	217	-57.53	-13	-44.53	Pass	V
3569.882	150	12	-50.15	-13	-37.15	Pass	V
3836.513	150	137	-53.00	-13	-40.00	Pass	V
5802.267	146	356	-47.78	-13	-34.78	Pass	V
6552.320	146	95	-48.03	-13	-35.03	Pass	V

Band 4 20175 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1285.754	148	28	-58.44	-13.00	-45.44	Pass	H
1592.179	153	40	-52.71	-13.00	-39.71	Pass	H
3863.718	150	91	-50.18	-13.00	-37.18	Pass	H
5772.008	150	24	-47.41	-13.00	-34.41	Pass	H
6508.712	150	64	-46.74	-13.00	-33.74	Pass	H
7987.524	151	158	-48.53	-13.00	-35.53	Pass	H
1187.078	149	257	-58.30	-13.00	-45.30	Pass	V
1444.228	152	217	-58.50	-13.00	-45.50	Pass	V
3491.005	152	166	-52.75	-13.00	-39.75	Pass	V
3828.463	150	321	-50.01	-13.00	-37.01	Pass	V
5819.595	149	256	-48.91	-13.00	-35.91	Pass	V
6517.992	152	119	-49.78	-13.00	-36.78	Pass	V

Band 4 20393 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1341.160	149	156	-60.06	-13	-47.06	Pass	H
1668.917	149	170	-49.70	-13	-36.70	Pass	H
3846.284	149	127	-48.30	-13	-35.30	Pass	H
5911.546	146	42	-40.57	-13	-27.57	Pass	H
6529.904	147	69	-43.85	-13	-30.85	Pass	H
8002.531	151	110	-43.62	-13	-30.62	Pass	H
1255.737	148	61	-55.65	-13	-42.65	Pass	V
1402.731	147	266	-55.80	-13	-42.80	Pass	V
3527.335	148	303	-49.99	-13	-36.99	Pass	V
3910.032	149	195	-46.68	-13	-33.68	Pass	V
5792.425	147	323	-42.20	-13	-29.20	Pass	V
6578.315	146	325	-46.62	-13	-33.62	Pass	V

16QAM

Band4 19957 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1335.700	147	256	-58.28	-13	-45.28	Pass	H
1686.632	147	243	-47.57	-13	-34.57	Pass	H
3866.799	148	259	-50.17	-13	-37.17	Pass	H
5925.624	149	28	-45.18	-13	-32.18	Pass	H
6560.186	148	108	-43.51	-13	-30.51	Pass	H
7999.369	147	328	-42.93	-13	-29.93	Pass	H
1180.953	150	16	-54.63	-13	-41.63	Pass	V
1425.609	148	117	-56.26	-13	-43.26	Pass	V
3597.772	147	325	-52.79	-13	-39.79	Pass	V
3903.179	149	302	-48.88	-13	-35.88	Pass	V
5854.496	147	15	-43.24	-13	-30.24	Pass	V
6579.026	147	280	-47.55	-13	-34.55	Pass	V

Band 4 20175 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1280.766	149	13	-59.67	-13.00	-46.67	Pass	H
1623.596	148	27	-51.65	-13.00	-38.65	Pass	H
3825.338	151	290	-50.94	-13.00	-37.94	Pass	H
5852.068	149	241	-47.10	-13.00	-34.10	Pass	H
6500.431	149	72	-48.31	-13.00	-35.31	Pass	H
7960.070	151	192	-48.74	-13.00	-35.74	Pass	H
1235.840	152	310	-57.98	-13.00	-44.98	Pass	V
1363.961	150	155	-59.62	-13.00	-46.62	Pass	V
3443.031	153	298	-51.90	-13.00	-38.90	Pass	V
3878.058	150	279	-50.73	-13.00	-37.73	Pass	V
5775.252	150	80	-46.61	-13.00	-33.61	Pass	V
6526.687	153	148	-50.28	-13.00	-37.28	Pass	V

Band 4 20393 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.827	151	14	-54.19	-13	-41.19	Pass	H
1725.017	147	71	-51.15	-13	-38.15	Pass	H
3852.961	150	318	-47.70	-13	-34.70	Pass	H
5927.563	147	56	-43.96	-13	-30.96	Pass	H
6505.127	147	216	-44.07	-13	-31.07	Pass	H
8058.542	151	79	-42.70	-13	-29.70	Pass	H
1191.729	151	65	-54.13	-13	-41.13	Pass	V
1382.254	146	225	-59.70	-13	-46.70	Pass	V
3535.917	149	47	-49.68	-13	-36.68	Pass	V
3855.214	150	73	-49.69	-13	-36.69	Pass	V
5820.447	147	168	-48.48	-13	-35.48	Pass	V
6519.767	150	28	-42.85	-13	-29.85	Pass	V

Note:

3) Scan from 9kHz to 40GHz, the disturbance above 13GHz and below 1GHz are attenuated more than 20 dB below the applicable limit and not required to be reported, the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

4) Tested with all kind of bandwidth, RB Size and RB Offset, Found the 1.4MHz with full RB were the worst case; and then Only the worst case is recorded in the report.

QPSK

Band 5 20407 channel/BW 1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1334.524	150	78	-59.53	-13	-46.53	Pass	H
1726.222	149	291	-48.70	-13	-35.70	Pass	H
3901.995	151	213	-48.70	-13	-35.70	Pass	H
5856.822	150	89	-47.27	-13	-34.27	Pass	H
6497.806	151	329	-44.99	-13	-31.99	Pass	H
7998.507	148	138	-46.22	-13	-33.22	Pass	H
1218.021	149	99	-59.70	-13	-46.70	Pass	V
1438.276	148	217	-58.68	-13	-45.68	Pass	V
3570.825	150	12	-51.88	-13	-38.88	Pass	V
3835.217	150	137	-51.61	-13	-38.61	Pass	V
5802.438	146	356	-47.32	-13	-34.32	Pass	V
6554.050	146	95	-50.50	-13	-37.50	Pass	V

Band 5 20525 channel/BW 1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1295.437	150	142	-56.74	-13	-43.74	Pass	H
1715.587	146	280	-49.14	-13	-36.14	Pass	H
3877.322	150	330	-48.97	-13	-35.97	Pass	H
5865.869	146	194	-44.29	-13	-31.29	Pass	H
6457.705	149	260	-45.43	-13	-32.43	Pass	H
8020.750	151	31	-44.70	-13	-31.70	Pass	H
1235.481	149	4	-56.09	-13	-43.09	Pass	V
1396.094	148	257	-63.70	-13	-50.70	Pass	V
3590.054	147	55	-54.46	-13	-41.46	Pass	V
3913.387	148	273	-52.60	-13	-39.60	Pass	V
5827.844	150	136	-46.48	-13	-33.48	Pass	V
6515.895	150	16	-46.81	-13	-33.81	Pass	V

Band 5 20643 channel/BW 5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1342.206	149	156	-58.69	-13	-45.69	Pass	H
1668.021	149	170	-51.40	-13	-38.40	Pass	H
3841.862	149	127	-48.72	-13	-35.72	Pass	H
5908.354	146	42	-40.59	-13	-27.59	Pass	H
6532.012	147	69	-44.46	-13	-31.46	Pass	H
7998.656	151	110	-44.67	-13	-31.67	Pass	H
1255.755	148	61	-57.03	-13	-44.03	Pass	V
1401.256	147	266	-56.55	-13	-43.55	Pass	V
3523.464	148	303	-52.85	-13	-39.85	Pass	V
3907.092	149	195	-49.61	-13	-36.61	Pass	V
5789.106	147	323	-42.80	-13	-29.80	Pass	V
6577.212	146	325	-48.58	-13	-35.58	Pass	V

16QAM

Band 5 20407 channel/BW 1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1336.047	147	256	-60.47	-13	-47.47	Pass	H
1686.086	147	243	-46.94	-13	-33.94	Pass	H
3869.598	148	259	-50.40	-13	-37.40	Pass	H
5927.153	149	28	-47.69	-13	-34.69	Pass	H
6556.274	148	108	-43.61	-13	-30.61	Pass	H
8000.472	147	328	-43.44	-13	-30.44	Pass	H
1180.323	150	16	-55.03	-13	-42.03	Pass	V
1428.365	148	117	-55.53	-13	-42.53	Pass	V
3597.437	147	325	-51.51	-13	-38.51	Pass	V
3899.327	149	302	-49.05	-13	-36.05	Pass	V
5849.938	147	15	-45.87	-13	-32.87	Pass	V
6579.274	147	280	-48.35	-13	-35.35	Pass	V

Band 5 20525 channel/BW 1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.981	151	14	-53.19	-13	-40.19	Pass	H
1724.730	147	71	-50.95	-13	-37.95	Pass	H
3853.572	150	318	-47.18	-13	-34.18	Pass	H
5927.050	147	56	-42.13	-13	-29.13	Pass	H
6505.163	147	216	-43.64	-13	-30.64	Pass	H
8058.547	151	79	-41.68	-13	-28.68	Pass	H
1191.658	151	65	-56.25	-13	-43.25	Pass	V
1382.513	146	225	-61.37	-13	-48.37	Pass	V
3536.066	149	47	-47.20	-13	-34.20	Pass	V
3855.156	150	73	-50.77	-13	-37.77	Pass	V
5820.359	147	168	-47.07	-13	-34.07	Pass	V
6519.743	150	28	-46.54	-13	-33.54	Pass	V

Band 5 20643 channel/BW 1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1334.220	149	165	-56.824	-13	-43.82	Pass	H
1701.637	146	208	-46.570	-13	-33.57	Pass	H
3901.033	146	4	-44.282	-13	-31.28	Pass	H
5890.155	150	198	-42.666	-13	-29.67	Pass	H
6509.753	146	341	-41.512	-13	-28.51	Pass	H
8080.788	150	235	-43.215	-13	-30.22	Pass	H
1205.148	146	292	-54.583	-13	-41.58	Pass	V
1459.802	150	158	-56.797	-13	-43.80	Pass	V
3542.006	149	55	-52.482	-13	-39.48	Pass	V
3830.447	150	319	-50.001	-13	-37.00	Pass	V
5802.053	146	118	-46.970	-13	-33.97	Pass	V
6557.117	150	155	-47.180	-13	-34.18	Pass	V

Note:

- 1)Scan from 9kHz to 40GHz, the disturbance above 13GHz and below 1GHz are attenuated more than 20 dB below the applicable limit and not required to be reported, the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 2)Tested with all kind of bandwidth, RB Size and RB Offset, Found the 5.0MHz with full RB were the worst case; and then Only the worst case is recorded in the report.

QPSK

Band 12 23017 channel/BW 1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1335.464	150	78	-59.67	-13	-46.67	Pass	H
1726.468	149	291	-52.51	-13	-39.51	Pass	H
3902.447	151	213	-46.69	-13	-33.69	Pass	H
5857.695	150	89	-46.97	-13	-33.97	Pass	H
6497.433	151	329	-48.30	-13	-35.30	Pass	H
7995.797	148	138	-46.47	-13	-33.47	Pass	H
1220.297	149	99	-56.29	-13	-43.29	Pass	V
1439.848	148	217	-60.28	-13	-47.28	Pass	V
3570.475	150	12	-52.80	-13	-39.80	Pass	V
3837.270	150	137	-49.57	-13	-36.57	Pass	V
5802.086	146	356	-44.75	-13	-31.75	Pass	V
6552.281	146	95	-51.76	-13	-38.76	Pass	V

Band 12 23095 channel/BW 1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1294.227	150	142	-57.79	-13	-44.79	Pass	H
1713.556	146	280	-52.94	-13	-39.94	Pass	H
3876.366	150	330	-45.81	-13	-32.81	Pass	H
5866.678	146	194	-46.15	-13	-33.15	Pass	H
6458.430	149	260	-44.67	-13	-31.67	Pass	H
8019.920	151	31	-48.63	-13	-35.63	Pass	H
1234.977	149	4	-56.64	-13	-43.64	Pass	V
1394.262	148	257	-62.71	-13	-49.71	Pass	V
3588.922	147	55	-55.09	-13	-42.09	Pass	V
3913.422	148	273	-53.52	-13	-40.52	Pass	V
5826.580	150	136	-51.81	-13	-38.81	Pass	V
6518.333	150	16	-49.31	-13	-36.31	Pass	V

Band 12 23173 channel/BW 1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1340.068	149	156	-56.80	-13	-43.80	Pass	H
1670.143	149	170	-52.00	-13	-39.00	Pass	H
3844.848	149	127	-47.19	-13	-34.19	Pass	H
5909.358	146	42	-42.33	-13	-29.33	Pass	H
6532.419	147	69	-43.38	-13	-30.38	Pass	H
7999.054	151	110	-44.31	-13	-31.31	Pass	H
1256.425	148	61	-56.86	-13	-43.86	Pass	V
1400.678	147	266	-56.34	-13	-43.34	Pass	V
3524.367	148	303	-51.97	-13	-38.97	Pass	V
3909.897	149	195	-48.06	-13	-35.06	Pass	V
5788.240	147	323	-44.94	-13	-31.94	Pass	V
6577.550	146	325	-46.10	-13	-33.10	Pass	V

16QAM

Band 12 23017 channel/BW 1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1334.580	147	256	-58.10	-13	-45.10	Pass	H
1686.652	147	243	-49.50	-13	-36.50	Pass	H
3867.493	148	259	-49.72	-13	-36.72	Pass	H
5925.844	149	28	-46.04	-13	-33.04	Pass	H
6558.699	148	108	-44.60	-13	-31.60	Pass	H
8002.935	147	328	-44.05	-13	-31.05	Pass	H
1178.077	150	16	-54.13	-13	-41.13	Pass	V
1429.576	148	117	-57.35	-13	-44.35	Pass	V
3598.091	147	325	-51.38	-13	-38.38	Pass	V
3903.859	149	302	-49.36	-13	-36.36	Pass	V
5853.152	147	15	-43.38	-13	-30.38	Pass	V
6582.157	147	280	-46.87	-13	-33.87	Pass	V

Band 12 23095 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.703	151	14	-56.57	-13	-43.57	Pass	H
1725.434	147	71	-47.29	-13	-34.29	Pass	H
3853.166	150	318	-47.26	-13	-34.26	Pass	H
5927.403	147	56	-42.06	-13	-29.06	Pass	H
6504.301	147	216	-43.33	-13	-30.33	Pass	H
8058.095	151	79	-43.55	-13	-30.55	Pass	H
1191.371	151	65	-56.03	-13	-43.03	Pass	V
1382.781	146	225	-57.59	-13	-44.59	Pass	V
3536.283	149	47	-46.54	-13	-33.54	Pass	V
3854.566	150	73	-46.82	-13	-33.82	Pass	V
5820.614	147	168	-45.28	-13	-32.28	Pass	V
6520.125	150	28	-46.25	-13	-33.25	Pass	V

Band 12 23173 channel/BW 1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1334.290	149	165	-55.829	-13	-42.83	Pass	H
1703.281	146	208	-48.114	-13	-35.11	Pass	H
3902.105	146	4	-45.761	-13	-32.76	Pass	H
5887.891	150	198	-44.903	-13	-31.90	Pass	H
6510.445	146	341	-43.291	-13	-30.29	Pass	H
8078.427	150	235	-44.687	-13	-31.69	Pass	H
1206.383	146	292	-56.547	-13	-43.55	Pass	V
1459.787	150	158	-58.252	-13	-45.25	Pass	V
3542.429	149	55	-53.015	-13	-40.02	Pass	V
3829.268	150	319	-51.065	-13	-38.06	Pass	V
5800.351	146	118	-47.749	-13	-34.75	Pass	V
6556.333	150	155	-48.629	-13	-35.63	Pass	V

Note:

- 1)Scan from 9kHz to 40GHz, the disturbance above 13GHz and below 1GHz are attenuated more than 20 dB below the applicable limit and not required to be reported, the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 2)Tested with all kind of bandwidth, RB Size and RB Offset, Found the 5.0MHz with full RB were the worst case; and then Only the worst case is recorded in the report.

QPSK

Band 13 23205 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1336.024	150	78	-59.89	-13	-46.89	Pass	H
1726.436	149	291	-52.30	-13	-39.30	Pass	H
3902.453	151	213	-48.29	-13	-35.29	Pass	H
5856.663	150	89	-45.25	-13	-32.25	Pass	H
6497.842	151	329	-46.72	-13	-33.72	Pass	H
7998.116	148	138	-46.33	-13	-33.33	Pass	H
1219.922	149	99	-58.18	-13	-45.18	Pass	V
1439.564	148	217	-60.00	-13	-47.00	Pass	V
3571.582	150	12	-48.16	-13	-35.16	Pass	V
3836.498	150	137	-47.76	-13	-34.76	Pass	V
5802.828	146	356	-45.66	-13	-32.66	Pass	V
6552.336	146	95	-47.24	-13	-34.24	Pass	V

Band 13 23230 channel/BW 5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1260.747	150	158	-60.77	-25	-35.77	Pass	H
1579.946	153	320	-52.95	-25	-27.95	Pass	H
3805.355	152	130	-49.95	-25	-24.95	Pass	H
5847.537	148	59	-46.78	-25	-21.78	Pass	H
6495.263	153	158	-47.65	-25	-22.65	Pass	H
8019.626	150	234	-47.15	-25	-22.15	Pass	H
1214.194	148	30	-57.80	-25	-32.8	Pass	V
1372.369	152	47	-58.56	-25	-33.56	Pass	V
3505.945	152	309	-52.53	-25	-27.53	Pass	V
3871.903	150	282	-52.30	-25	-27.3	Pass	V
5802.199	150	357	-46.02	-25	-21.02	Pass	V
6534.315	151	2	-49.45	-25	-24.45	Pass	V

Band 13 23255 channel/BW 5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1341.562	149	156	-57.65	-13	-44.65	Pass	H
1670.726	149	170	-50.67	-13	-37.67	Pass	H
3845.740	149	127	-46.18	-13	-33.18	Pass	H
5909.655	146	42	-41.23	-13	-28.23	Pass	H
6528.378	147	69	-41.75	-13	-28.75	Pass	H
8000.445	151	110	-44.42	-13	-31.42	Pass	H
1255.171	148	61	-55.64	-13	-42.64	Pass	V
1400.911	147	266	-54.82	-13	-41.82	Pass	V
3523.632	148	303	-52.01	-13	-39.01	Pass	V
3911.195	149	195	-50.04	-13	-37.04	Pass	V
5788.875	147	323	-44.49	-13	-31.49	Pass	V
1341.562	149	156	-57.65	-13	-44.65	Pass	V

16QAM

Band 13 23205 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1335.273	147	256	-58.80	-13	-45.80	Pass	H
1685.266	147	243	-48.03	-13	-35.03	Pass	H
3870.406	148	259	-50.97	-13	-37.97	Pass	H
5924.662	149	28	-47.43	-13	-34.43	Pass	H
6560.091	148	108	-45.21	-13	-32.21	Pass	H
8001.918	147	328	-42.61	-13	-29.61	Pass	H
1177.964	150	16	-54.84	-13	-41.84	Pass	V
1428.390	148	117	-55.48	-13	-42.48	Pass	V
3595.142	147	325	-52.64	-13	-39.64	Pass	V
3904.502	149	302	-49.64	-13	-36.64	Pass	V
5851.608	147	15	-45.90	-13	-32.90	Pass	V
6581.059	147	280	-47.06	-13	-34.06	Pass	V

Band 13 23230 channel/BW 5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.619	151	14	-55.55	-13	-42.55	Pass	H
1724.694	147	71	-51.05	-13	-38.05	Pass	H
3853.878	150	318	-46.30	-13	-33.30	Pass	H
5927.326	147	56	-43.69	-13	-30.69	Pass	H
6504.362	147	216	-43.02	-13	-30.02	Pass	H
8057.746	151	79	-44.49	-13	-31.49	Pass	H
1191.332	151	65	-55.56	-13	-42.56	Pass	V
1382.796	146	225	-60.99	-13	-47.99	Pass	V
3536.125	149	47	-46.63	-13	-33.63	Pass	V
3854.739	150	73	-50.35	-13	-37.35	Pass	V
5820.066	147	168	-46.81	-13	-33.81	Pass	V
6519.563	150	28	-43.40	-13	-30.40	Pass	V

Band 13 23255 channel/BW 5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.878	149	165	-53.471	-13	-40.47	Pass	H
1702.309	146	208	-49.174	-13	-36.17	Pass	H
3900.479	146	4	-44.271	-13	-31.27	Pass	H
5890.423	150	198	-42.673	-13	-29.67	Pass	H
6508.783	146	341	-42.486	-13	-29.49	Pass	H
8080.880	150	235	-42.732	-13	-29.73	Pass	H
1206.510	146	292	-56.622	-13	-43.62	Pass	V
1459.732	150	158	-56.082	-13	-43.08	Pass	V
3542.039	149	55	-51.892	-13	-38.89	Pass	V
3828.989	150	319	-48.627	-13	-35.63	Pass	V
5802.083	146	118	-47.724	-13	-34.72	Pass	V
6557.714	150	155	-47.227	-13	-34.23	Pass	V

Note:

- 1)Scan from 9kHz to 40GHz, the disturbance above 13GHz and below 1GHz are attenuated more than 20 dB below the applicable limit and not required to be reported, the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 2)Tested with all kind of bandwidth,RB Size and RB Offset, Found the 5.0MHz with full RB were the worst case; and then Only the worst case is recorded in the report.

QPSK

Band 25 26047 channel/BW 1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1336.486	150	78	-59.83	-13	-46.83	Pass	H
1725.953	149	291	-50.86	-13	-37.86	Pass	H
3901.895	151	213	-45.45	-13	-32.45	Pass	H
5857.167	150	89	-47.23	-13	-34.23	Pass	H
6498.159	151	329	-45.94	-13	-32.94	Pass	H
7996.814	148	138	-45.84	-13	-32.84	Pass	H
1219.087	149	99	-57.04	-13	-44.04	Pass	V
1437.768	148	217	-56.21	-13	-43.21	Pass	V
3568.902	150	12	-47.35	-13	-34.35	Pass	V
3837.158	150	137	-50.01	-13	-37.01	Pass	V
5802.642	146	356	-47.74	-13	-34.74	Pass	V
6552.424	146	95	-51.80	-13	-38.80	Pass	V

Band 25 26365 channel/BW 1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1295.134	150	142	-56.92	-13	-43.92	Pass	H
1715.671	146	280	-48.74	-13	-35.74	Pass	H
3875.819	150	330	-47.19	-13	-34.19	Pass	H
5867.950	146	194	-43.46	-13	-30.46	Pass	H
6457.238	149	260	-47.42	-13	-34.42	Pass	H
8020.296	151	31	-44.10	-13	-31.10	Pass	H
1235.705	149	4	-58.66	-13	-45.66	Pass	V
1393.774	148	257	-60.54	-13	-47.54	Pass	V
3588.363	147	55	-51.46	-13	-38.46	Pass	V
3915.127	148	273	-52.82	-13	-39.82	Pass	V
5827.132	150	136	-47.43	-13	-34.43	Pass	V
6517.574	150	16	-51.23	-13	-38.23	Pass	V

Band 25 26883 channel/BW 1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1341.748	149	156	-59.34	-13	-46.34	Pass	H
1668.526	149	170	-49.35	-13	-36.35	Pass	H
3841.137	149	127	-47.96	-13	-34.96	Pass	H
5907.995	146	42	-41.80	-13	-28.80	Pass	H
6529.793	147	69	-44.34	-13	-31.34	Pass	H
8000.561	151	110	-47.01	-13	-34.01	Pass	H
1257.805	148	61	-55.06	-13	-42.06	Pass	V
1402.763	147	266	-56.65	-13	-43.65	Pass	V
3528.507	148	303	-51.02	-13	-38.02	Pass	V
3906.555	149	195	-47.11	-13	-34.11	Pass	V
5789.120	147	323	-41.90	-13	-28.90	Pass	V
6575.543	146	325	-49.65	-13	-36.65	Pass	V

16QAM

Band 25 26047 channel/BW 1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.895	147	256	-58.76	-13	-45.76	Pass	H
1686.272	147	243	-49.03	-13	-36.03	Pass	H
3867.273	148	259	-50.01	-13	-37.01	Pass	H
5925.777	149	28	-47.75	-13	-34.75	Pass	H
6558.825	148	108	-44.56	-13	-31.56	Pass	H
7999.857	147	328	-43.10	-13	-30.10	Pass	H
1176.489	150	16	-52.63	-13	-39.63	Pass	V
1427.749	148	117	-57.58	-13	-44.58	Pass	V
3597.197	147	325	-53.05	-13	-40.05	Pass	V
3900.967	149	302	-51.53	-13	-38.53	Pass	V
5854.475	147	15	-44.62	-13	-31.62	Pass	V
6579.557	147	280	-47.38	-13	-34.38	Pass	V

Band 25 26365 channel/BW 1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.273	151	14	-54.86	-13	-41.86	Pass	H
1724.859	147	71	-49.78	-13	-36.78	Pass	H
3853.033	150	318	-49.38	-13	-36.38	Pass	H
5927.405	147	56	-45.42	-13	-32.42	Pass	H
6504.386	147	216	-45.66	-13	-32.66	Pass	H
8058.009	151	79	-45.33	-13	-32.33	Pass	H
1191.718	151	65	-55.45	-13	-42.45	Pass	V
1383.061	146	225	-56.39	-13	-43.39	Pass	V
3536.725	149	47	-49.86	-13	-36.86	Pass	V
3854.563	150	73	-47.37	-13	-34.37	Pass	V
5820.150	147	168	-44.82	-13	-31.82	Pass	V
6519.653	150	28	-47.47	-13	-34.47	Pass	V

Band 25 26883 channel/BW 1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.216	149	165	-56.419	-13	-43.42	Pass	H
1704.344	146	208	-47.013	-13	-34.01	Pass	H
3900.567	146	4	-47.773	-13	-34.77	Pass	H
5889.341	150	198	-41.347	-13	-28.35	Pass	H
6511.060	146	341	-43.142	-13	-30.14	Pass	H
8079.447	150	235	-45.063	-13	-32.06	Pass	H
1204.443	146	292	-55.131	-13	-42.13	Pass	V
1461.100	150	158	-57.502	-13	-44.50	Pass	V
3542.612	149	55	-52.067	-13	-39.07	Pass	V
3831.259	150	319	-47.849	-13	-34.85	Pass	V
5801.793	146	118	-46.106	-13	-33.11	Pass	V
6558.351	150	155	-47.341	-13	-34.34	Pass	V

Note:

- 1)Scan from 9kHz to 40GHz, the disturbance above 13GHz and below 1GHz are attenuated more than 20 dB below the applicable limit and not required to be reported, the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 2)Tested with all kind of bandwidth,RB Size and RB Offset, Found the 5.0MHz with full RB were the worst case; and then Only the worst case is recorded in the report.

12. FREQUENCY STABILITY

12.1 Standard Applicable

According to §22.355, §24.235, §27.54 the limit is 2.5ppm.

12.2 Test Procedure

According to §2.1055, the following test procedure was performed.

The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a

Frequency Domain Analyzer in histogram mode

12.3 Summary of Test Results/Plots

Note: 1.Normal Voltage NV=DC3.7V; Low Voltage LV=DC3.72V; High Voltage HV=DC4.18V

Please refer to Appendix: 6 Frequency stability

Test result: Pass

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