TEST REPORT

Product Name:	GPS Tracker
FCC ID:	2BHRJ-ML920G
Trademark:	MiCODUS, spionlin
Model Number:	ML920G, MV501G, MV601G, MV710G, MV730G, MV750G, MV770G, MV880G, MV930G, MV55G, MV77G, ML150G, ML500G, ML505G, ML808G, ML910G, MP50G, MP88G, MP90G, MP99G
Prepared For:	SHENZHEN MiCODUS ELECTRONIC TECHNOLOGY CO., LIMITED
Address:	Unit 201D03-211, 2nd Floor, Building B, Shenfubao Science and Technology Industrial Park, Futian District, Shenzhen, China
Manufacturer:	SHENZHEN MiCODUS ELECTRONIC TECHNOLOGY CO., LIMITED
Address:	Unit 201D03-211, 2nd Floor, Building B, Shenfubao Science and Technology Industrial Park, Futian District, Shenzhen, China
Prepared By:	Shenzhen CTB Testing Technology Co., Ltd.
Address:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	Jun. 18, 2024
Sample tested Date:	Jun. 18, 2024 to Jul. 04, 2024
Issue Date:	Jul. 04, 2024
Report No.:	CTB240704042RFX
Test Standards	FCC Part 2, 22, 24E, 27
Test Results	PASS
Remark:	This is LTE radio test report.

Compiled by:	Reviewed by:	Approved by:
Zhou Kui	Arron Liu	Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. 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. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

TABLE OF CONTENT

(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB240704042RFX	Jul. 04, 2024	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 D01v03r01	PASS
Effective Radiated Power of Transmitter(EIRP)	Part 22.913(a)(2)/ Part 24.232(c)/Part27.50(h)(2)/ Part27.50(d)(4)/ Part27.50(c)(10)/ Part27.50(b)(10)/ Part27.50(a)(3)	TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
peak-to-average ratio	Part 22.913(d)/Part 27.50(d) /Part 27.50(a)(1)	KDB 971168 D01v03r01	PASS
99% & 26dB Occupied Bandwidth	Part 2.1049(h)	KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	Part 2.1051/ Part 24.238(a)/Part 27.53(g) (1) Part 22.917(a)/Part 27.53(i) (4)/ Part 27.53(c) /Part 27.253(f)/Part 27.53(a) (2)	KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 24.238(a)/Part 27.53(g) (1) Part 22.917(a)/Part 27.53(i) (4)/ Part 27.53(c) /Part 27.253(f)/Part 27.53(a) (2)	TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	Part 2.1051/ Part 24.238(a)/Part 27.53(g) (1) Part 22.917(a)/Part 27.53(i) (4)/ Part 27.53(c) /Part 27.253(f)/Part 27.53(a) (2)	TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Frequency stability	Part 2.1055/Part 27.54/ Part 22.355	TIA-603-E-2016 & KDB 971168 D01v03r01	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 camber 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℃
frequency	1×10-7

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	ML920G, MV501G, MV601G, MV710G, MV730G, MV750G, MV770G, MV880G, MV930G, MV55G, MV77G, ML150G, ML500G, ML505G, ML808G, ML910G, MP50G, MP88G, MP90G, MP99G
Model Description:	All the model are the same circuit and RF module, only the name and appearance are different. Test sample model: ML920G
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	FDD-LTE BAND 2: 1850-1910MHz FDD-LTE BAND 4: 1710-1755MHz FDD-LTE BAND 5: 824-849MHz FDD-LTE BAND 7: 2500-2570MHz FDD-LTE BAND 66: 1710-1780MHz
Max. RF output power:	FDD-LTE BAND 2: 21.73dBm FDD-LTE BAND 4: 21.85dBm FDD-LTE BAND 5: 21.93dBm FDD-LTE BAND 7: 21.65dBm FDD-LTE BAND 66: 22.67dBm
Type of Modulation:	QPSK, 16QAM
Antenna installation:	FPC antenna
Antenna Gain:	FDD-LTE BAND 2: -1.18dBi FDD-LTE BAND 4: -3.24dBi FDD-LTE BAND 5: -9.81dBi FDD-LTE BAND 7: 0.94dBi FDD-LTE BAND 66: -3.18dBi
Ratings:	DC 5V charging from adapter DC 3.7V by 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

Item	Equipment	Mfr/Brand	Model/TypeNo.	SeriesNo.	Note
1.	Adapter	JIYIN	JY-05100C	/	/

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	FDD-LTE BAND 5	Low, Middle, High Channels
TM4	FDD-LTE BAND 7	Low, Middle, High Channels
TM5	FDD-LTE BAND 66	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 7

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
LTE band 7	Low Range	5	20775	2502.5
		10	20800	2505
		15	20825	2507.5
		20	20850	2510
	Mid Range	5/10/15/20	21100	2535
	High Range	5	21425	2567.5
		10	21400	2565
		15	21375	2562.5
		20	21350	2560

LTE BAND 66

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
LTE band 66	Low Range	1.4	66443	2110.7
		3	66451	2111.5
		5	66461	2112.5
		10	66486	2115
		15	66511	2117.5
		20	66536	2120
	Mid Range TX[1]	1.4/3/5/10/15/20	66786	2145
	Mid Range	1.4/3/5/10/15/20	66886	2155
	Paired High Range[2]	1.4	67129	2179.3
		3	67121	2178.5
		5	67111	2177.5
		10	67086	2175
		15	67061	2172.5

		20	67036	2170
	High Range[3]	1.4	67329	2199.3
		3	67321	2198.5
		5	67311	2197.5
		10	67286	2195
		15	67261	2192.5
		20	67236	2190

Note: EUT is UE category 1, 16QAM Modulation of 10MHz/15MHz/20MHz for all bands FULL RB size is not supported.

4.5 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(DC):	3.7V
Normal Temperature(℃)	23
Low Temperature(℃)	0
High Temperature(℃)	40

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 1&2F., Building A, No. 26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, 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	Type No.	Serial No.	Firmware Version	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	A.14.16	2024.07.05
2	Power Sensor	Agilent	U2021XA	MY56120032	/	2024.07.05
3	Power Sensor	Agilent	U2021XA	MY56120034	/	2024.07.05
4	Communication test set	R&S	CMW500	108058	V3.5.80	2024.07.05
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	A.14.16	2024.07.05
6	Signal Generator	Agilent	N5181A	MY50140365	A.01.60	2024.07.05
7	Vector signal generator	Agilent	N5182A	MY47420195	A.01.87	2024.07.05
8	Communication test set	Agilent	E5515C	MY50102567	B.19.07 （E1962B ）	2024.07.06
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	/	2024.07.05
10	5 GHz Filter	Shenxiang	MSF5150-5850MS-1155	20181015001	/	2024.07.06
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	/	2024.07.06
12	BT&WI-FI Automatic test software	Micowave	MTS8000	Ver. 2.0.0.0	/	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	/	2024.10.30
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	/	2024.07.05
15	234G Automatic test software	Micowave	MTS8200	Ver. 2.0.0.0	/	/
16	966 chamber	C.R.T.	966	/	/	2024.08.11
17	Receiver	R&S	ESPI	100362	RF_ATTEN_7 （104489/003）	2024.07.05
18	Amplifier	HP	8447E	2945A02747	/	2024.07.05
19	Amplifier	Agilent	8449B	3008A01838	/	2024.07.05
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	/	2024.07.08
21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	/	2024.07.08

22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	/	2024.07.08
24	loop antenna	ZHINAN	ZN30900A	GTS534	/	/
25	40G Horn antenna	A/H/System	SAS-574	588	/	2024.10.30
26	Amplifier	AEROFLEX	Aeroflex	097	/	2024.07.05

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.

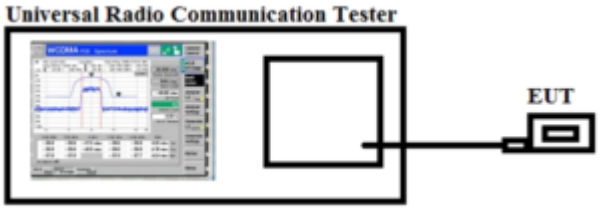
According to §27.50(h)(2), Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

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.

According to §27.50(a)(3), For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, *except that* for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth.

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

Please refer to Appendix 1: Conducted output power

Test result: Pass

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

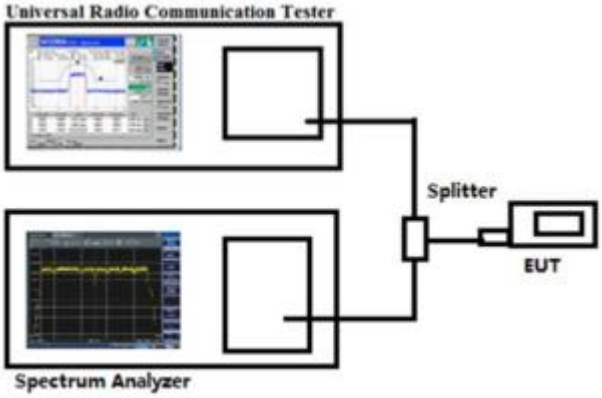
8.1 Standard Applicable

According to §22.913(d),
Power measurement. Measurement of the ERP of Cellular base transmitters and repeaters must be made using an average power measurement technique. The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB.
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(d), 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.
According to §27.50(a) (1), For base and fixed stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, 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.

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 3: 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.

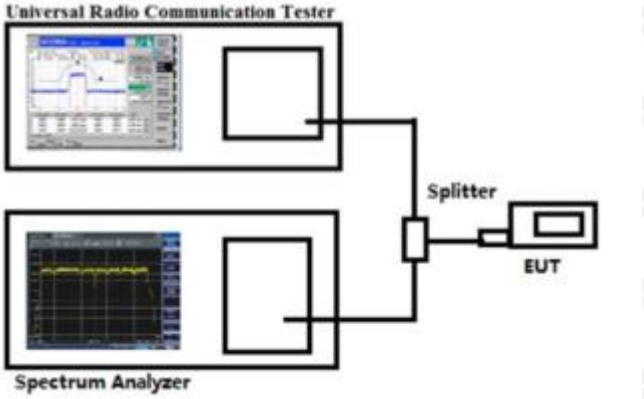
According to §24.238(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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 4: 26dB Bandwidth and 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 log10 (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 that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.

According to §27.53(a)(2), For base and fixed stations' operations in the 2305-2320 MHz band and the 2345-2360 MHz band:
(1) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, and not less than

75 + 10 log (P) dB on all frequencies between 2320 and 2345 MHz;

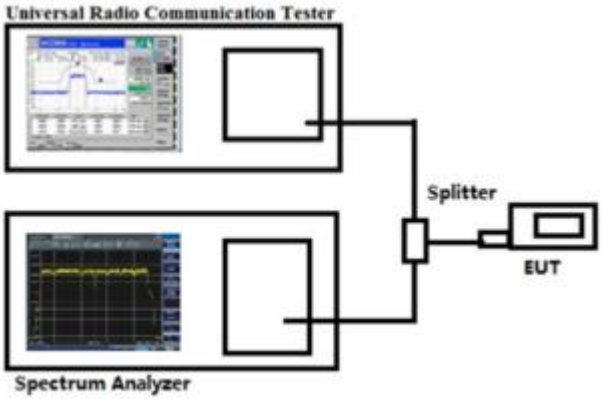
(2) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 70 + 10 log (P) dB on all frequencies between 2287.5 and 2300 MHz, 72 + 10 log (P) dB on all frequencies between 2285 and 2287.5 MHz, and 75 + 10 log (P) dB below 2285 MHz;

(3) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2362.5 MHz, 55 + 10 log (P) dB on all frequencies between 2362.5 and 2365 MHz, 70 + 10 log (P) dB on all frequencies between 2365 and 2367.5 MHz, 72 + 10 log (P) dB on all frequencies between 2367.5 and 2370 MHz, and 75 + 10 log (P) dB above 2370 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 5 & 6: Band Edge & Conducted Spurious Emission
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:

(6) 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;

(7) 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;

(8) 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;

(9) 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;

(10) 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 log10 (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 that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.

According to §27.53(a)(2), For base and fixed stations' operations in the 2305-2320 MHz band and the 2345-2360 MHz band:

(1) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, and not less than 75 + 10 log (P) dB on all frequencies between 2320 and 2345 MHz;

(2) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 70 + 10 log (P) dB on all frequencies between 2287.5 and 2300 MHz, 72 + 10 log (P) dB on all frequencies between 2285 and 2287.5 MHz, and 75 + 10 log (P) dB below 2285 MHz;

(3) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2362.5 MHz, 55 + 10 log (P) dB on all frequencies between 2362.5 and 2365 MHz, 70 + 10 log (P) dB on all frequencies between 2365 and 2367.5 MHz, 72 + 10 log (P) dB on all frequencies between 2367.5 and 2370 MHz, and 75 + 10 log (P) dB above 2370 MHz.

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 (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.
1385.19	147	157	-58.10	-13	-45.10	Pass	H
1629.18	160	55	-48.15	-13	-35.15	Pass	H
3891.16	148	205	-44.80	-13	-31.80	Pass	H
5791.71	160	32	-43.90	-13	-30.90	Pass	H
6604.42	145	191	-43.42	-13	-30.42	Pass	H
8057.73	154	224	-40.91	-13	-27.91	Pass	H
1163.76	152	169	-54.53	-13	-41.53	Pass	V
1454.86	160	30	-59.38	-13	-46.38	Pass	V
3517.89	153	199	-52.77	-13	-39.77	Pass	V
3736.62	156	351	-50.99	-13	-37.99	Pass	V
5817.53	158	277	-50.76	-13	-37.76	Pass	V
6570.87	145	359	-46.14	-13	-33.14	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.
1240.98	150	240	-57.58	-13	-44.58	Pass	H
1635.11	146	323	-54.75	-13	-41.75	Pass	H
3868.56	150	142	-47.73	-13	-34.73	Pass	H
5905.45	146	332	-44.56	-13	-31.56	Pass	H
6449.17	149	104	-50.52	-13	-37.52	Pass	H
8095.39	151	208	-51.39	-13	-38.39	Pass	H
1320.97	149	18	-54.58	-13	-41.58	Pass	V
1461.56	148	287	-60.23	-13	-47.23	Pass	V
3534.66	147	48	-56.02	-13	-43.02	Pass	V
3943.65	148	107	-51.74	-13	-38.74	Pass	V
5746.17	150	254	-51.27	-13	-38.27	Pass	V
6439.00	150	229	-46.78	-13	-33.78	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.
1269.94	151	99	-58.77	-13	-45.77	Pass	H
1730.31	153	83	-52.15	-13	-39.15	Pass	H
3846.42	149	261	-48.56	-13	-35.56	Pass	H
5997.70	155	181	-38.41	-13	-25.41	Pass	H
6620.76	146	176	-41.13	-13	-28.13	Pass	H
8083.57	147	348	-42.20	-13	-29.20	Pass	H
1247.20	152	67	-58.94	-13	-45.94	Pass	V
1440.89	154	12	-55.34	-13	-42.34	Pass	V
3547.13	146	97	-52.94	-13	-39.94	Pass	V
3923.33	154	169	-51.17	-13	-38.17	Pass	V
5810.48	151	228	-41.44	-13	-28.44	Pass	V
6659.95	150	234	-46.43	-13	-33.43	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.
1362.99	148	305	-59.40	-13	-46.40	Pass	H
1763.64	149	165	-48.80	-13	-35.80	Pass	H
3945.85	151	93	-47.70	-13	-34.70	Pass	H
5871.52	150	337	-44.09	-13	-31.09	Pass	H
6562.11	149	34	-44.56	-13	-31.56	Pass	H
8002.47	150	208	-40.39	-13	-27.39	Pass	H
1217.34	149	184	-52.39	-13	-39.39	Pass	V
1403.95	150	308	-52.74	-13	-39.74	Pass	V
3575.86	151	132	-54.26	-13	-41.26	Pass	V
3862.51	155	223	-54.47	-13	-41.47	Pass	V
5954.18	147	243	-46.92	-13	-33.92	Pass	V
6669.13	148	32	-47.19	-13	-34.19	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.
1316.77	146	79	-54.31	-13	-41.45	Pass	H
1706.77	150	219	-48.51	-13	-37.85	Pass	H
3839.03	146	60	-46.67	-13	-35.2	Pass	H
5993.41	150	84	-44.95	-13	-30.39	Pass	H
6429.78	148	204	-41.77	-13	-32.24	Pass	H
8128.72	153	106	-43.52	-13	-30.22	Pass	H
1138.70	150	347	-55.51	-13	-44.9	Pass	V
1291.76	150	327	-53.21	-13	-43.63	Pass	V
3631.02	148	111	-47.43	-13	-35.94	Pass	V
3833.11	146	194	-45.47	-13	-36.01	Pass	V
5860.53	149	260	-45.86	-13	-33.75	Pass	V
6430.08	154	237	-46.30	-13	-32.41	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.
1292.59	152	202	-52.47	-13	-39.47	Pass	H
1666.82	152	89	-52.00	-13	-39.00	Pass	H
3918.16	150	181	-44.89	-13	-31.89	Pass	H
5916.27	146	77	-44.54	-13	-31.54	Pass	H
6475.35	154	335	-43.13	-13	-30.13	Pass	H
7985.34	154	137	-45.10	-13	-32.10	Pass	H
1162.22	146	270	-56.76	-13	-43.76	Pass	V
1458.13	154	216	-60.57	-13	-47.57	Pass	V
3505.37	153	344	-46.53	-13	-33.53	Pass	V
3921.88	149	204	-52.94	-13	-39.94	Pass	V
5715.72	152	326	-47.38	-13	-34.38	Pass	V
6650.01	148	113	-46.75	-13	-33.75	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.
1381.84	149	90	-56.81	-13	-43.81	Pass	H
1687.17	150	145	-43.50	-13	-30.50	Pass	H
3888.80	146	168	-49.15	-13	-36.15	Pass	H
5977.38	151	62	-43.15	-13	-30.15	Pass	H
6522.86	150	320	-42.48	-13	-29.48	Pass	H
8099.03	154	134	-42.20	-13	-29.20	Pass	H
1147.97	154	187	-56.81	-13	-43.81	Pass	V
1392.06	146	21	-58.74	-13	-45.74	Pass	V
3657.87	155	111	-47.11	-13	-34.11	Pass	V
3883.08	153	127	-49.69	-13	-36.69	Pass	V
5769.46	146	258	-46.09	-13	-33.09	Pass	V
6565.79	146	341	-49.04	-13	-36.04	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.
1413.28	152	129	-57.16	-13	-44.16	Pass	H
1737.08	154	287	-48.66	-13	-35.66	Pass	H
3830.82	150	16	-44.71	-13	-31.71	Pass	H
5995.54	149	119	-39.59	-13	-26.59	Pass	H
6518.78	153	338	-42.71	-13	-29.71	Pass	H
7973.69	154	140	-42.38	-13	-29.38	Pass	H
1095.69	152	322	-58.40	-13	-45.40	Pass	V
1415.95	154	103	-55.96	-13	-42.96	Pass	V
3568.75	149	251	-50.45	-13	-37.45	Pass	V
3944.36	148	2	-45.81	-13	-32.81	Pass	V
5809.88	145	187	-41.32	-13	-28.32	Pass	V
6571.65	154	55	-42.56	-13	-29.56	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.
1266.01	149	165	-54.09	-13	-41.09	Pass	H
1653.53	146	208	-48.94	-13	-35.94	Pass	H
3961.84	146	4	-46.40	-13	-33.40	Pass	H
5926.14	150	198	-43.96	-13	-30.96	Pass	H
6459.42	146	341	-42.49	-13	-29.49	Pass	H
8018.78	150	235	-43.19	-13	-30.19	Pass	H
1285.38	146	292	-53.71	-13	-40.71	Pass	V
1494.92	150	158	-55.11	-13	-42.11	Pass	V
3499.10	149	55	-49.47	-13	-36.47	Pass	V
3803.79	150	319	-50.31	-13	-37.31	Pass	V
5818.24	146	118	-49.88	-13	-36.88	Pass	V
6586.23	150	155	-46.97	-13	-33.97	Pass	V

16QAM

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.
1372.60	150	78	-57.57	-13	-44.57	Pass	H
1675.82	149	291	-52.38	-13	-39.38	Pass	H
3970.86	151	213	-48.56	-13	-35.56	Pass	H
5795.53	150	89	-49.09	-13	-36.09	Pass	H
6553.28	151	329	-44.73	-13	-31.73	Pass	H
7963.23	148	138	-46.50	-13	-33.50	Pass	H
1186.76	149	99	-58.35	-13	-45.35	Pass	V
1405.71	148	217	-54.31	-13	-41.31	Pass	V
3478.23	150	12	-50.45	-13	-37.45	Pass	V
3785.88	150	137	-46.94	-13	-33.94	Pass	V
5817.65	146	356	-48.39	-13	-35.39	Pass	V
6635.57	146	95	-46.72	-13	-33.72	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.
1329.15	150	142	-53.76	-13	-40.76	Pass	H
1808.97	146	280	-51.66	-13	-38.66	Pass	H
3847.99	150	330	-49.68	-13	-36.68	Pass	H
5855.89	146	194	-41.74	-13	-28.74	Pass	H
6500.74	149	260	-53.19	-13	-40.19	Pass	H
8059.78	151	31	-47.14	-13	-34.14	Pass	H
1321.88	149	4	-55.93	-13	-42.93	Pass	V
1415.89	148	257	-61.44	-13	-48.44	Pass	V
3603.60	147	55	-54.93	-13	-41.93	Pass	V
3839.99	148	273	-49.93	-13	-36.93	Pass	V
5894.93	150	136	-54.41	-13	-41.41	Pass	V
6577.16	150	16	-48.46	-13	-35.46	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.
1298.68	149	156	-58.86	-13	-45.86	Pass	H
1573.60	149	170	-50.50	-13	-37.50	Pass	H
3824.06	149	127	-46.25	-13	-33.25	Pass	H
5879.07	146	42	-43.50	-13	-30.50	Pass	H
6512.68	147	69	-45.52	-13	-32.52	Pass	H
7931.49	151	110	-45.34	-13	-32.34	Pass	H
1213.27	148	61	-54.36	-13	-41.36	Pass	V
1347.81	147	266	-56.49	-13	-43.49	Pass	V
3463.83	148	303	-53.99	-13	-40.99	Pass	V
3834.29	149	195	-45.94	-13	-32.94	Pass	V
5733.65	147	323	-43.66	-13	-30.66	Pass	V
6506.96	146	325	-50.29	-13	-37.29	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/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1420.60	151	251	-58.82	-13	-45.82	Pass	H
1711.28	141	255	-47.86	-13	-34.86	Pass	H
3961.69	151	204	-49.25	-13	-36.25	Pass	H
5834.96	157	74	-43.96	-13	-30.96	Pass	H
6469.73	152	307	-42.85	-13	-29.85	Pass	H
7999.11	143	275	-42.53	-13	-29.53	Pass	H
1150.70	144	84	-52.63	-13	-39.63	Pass	V
1393.38	141	291	-57.16	-13	-44.16	Pass	V
3592.43	157	338	-50.45	-13	-37.45	Pass	V
3879.73	146	20	-51.69	-13	-38.69	Pass	V
5891.95	146	226	-47.39	-13	-34.39	Pass	V
6507.82	154	121	-48.50	-13	-35.50	Pass	V
Band 5 20525 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1307.15	150	307	-57.06	-13	-44.06	Pass	H
1706.16	146	139	-48.90	-13	-35.90	Pass	H
3917.29	150	316	-52.91	-13	-39.91	Pass	H
5794.87	146	246	-42.81	-13	-29.81	Pass	H
6409.86	149	106	-46.37	-13	-33.37	Pass	H
7947.06	151	148	-47.66	-13	-34.66	Pass	H
1296.94	149	270	-53.25	-13	-40.25	Pass	V
1441.27	148	133	-56.72	-13	-43.72	Pass	V
3507.00	147	194	-52.12	-13	-39.12	Pass	V
3960.89	148	355	-52.60	-13	-39.60	Pass	V
5897.07	150	98	-49.19	-13	-36.19	Pass	V
6586.52	150	335	-45.80	-13	-32.80	Pass	V

Band 5 20643 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1282.62	147	9	-58.10	-13	-45.10	Pass	H
1755.49	155	149	-50.11	-13	-37.11	Pass	H
3892.51	153	146	-44.06	-13	-31.06	Pass	H
5835.83	147	89	-38.80	-13	-25.80	Pass	H
6489.76	147	94	-40.94	-13	-27.94	Pass	H
8090.93	152	141	-42.91	-13	-29.91	Pass	H
1343.89	147	356	-58.26	-13	-45.26	Pass	V
1494.40	145	59	-57.55	-13	-44.55	Pass	V
3517.53	147	301	-54.90	-13	-41.90	Pass	V
3846.51	151	82	-46.83	-13	-33.83	Pass	V
5808.71	150	349	-41.99	-13	-28.99	Pass	V
6576.57	150	353	-45.57	-13	-32.57	Pass	V

16QAM

Band 5 20407 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1429.12	154	77	-58.55	-13	-45.55	Pass	H
1592.65	145	316	-46.83	-13	-33.83	Pass	H
3933.91	155	298	-47.56	-13	-34.56	Pass	H
5851.83	150	302	-43.23	-13	-30.23	Pass	H
6529.76	152	296	-46.63	-13	-33.63	Pass	H
8001.88	155	199	-43.77	-13	-30.77	Pass	H
1117.98	148	15	-51.79	-13	-38.79	Pass	V
1467.60	151	12	-54.71	-13	-41.71	Pass	V
3520.86	147	287	-52.98	-13	-39.98	Pass	V
3876.39	145	270	-54.14	-13	-41.14	Pass	V
5891.03	154	204	-43.56	-13	-30.56	Pass	V
6565.52	150	280	-49.40	-13	-36.40	Pass	V

Band 5 20525 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1376.72	145	199	-50.94	-13	-41.45	Pass	H
1728.23	150	210	-46.94	-13	-37.85	Pass	H
3793.80	149	198	-48.55	-13	-35.2	Pass	H
5939.11	150	76	-43.92	-13	-30.39	Pass	H
6513.40	147	53	-45.17	-13	-32.24	Pass	H
7958.41	146	34	-41.94	-13	-30.22	Pass	H
1217.27	154	166	-58.52	-13	-44.9	Pass	V
1358.34	147	132	-58.45	-13	-43.63	Pass	V
3525.60	146	63	-49.62	-13	-35.94	Pass	V
3944.69	149	164	-46.12	-13	-36.01	Pass	V
5864.33	152	297	-47.97	-13	-33.75	Pass	V
6455.12	154	330	-44.69	-13	-32.41	Pass	V
Band 5 20643 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1258.86	153	211	-55.18	-13	-42.18	Pass	H
1712.85	154	223	-46.46	-13	-33.46	Pass	H
3965.60	155	323	-44.47	-13	-31.47	Pass	H
5969.86	153	88	-42.40	-13	-29.40	Pass	H
6577.23	152	84	-37.82	-13	-24.82	Pass	H
8160.73	152	8	-42.66	-13	-29.66	Pass	H
1155.57	146	210	-58.68	-13	-45.68	Pass	V
1451.10	146	7	-55.88	-13	-42.88	Pass	V
3586.84	153	117	-50.60	-13	-37.60	Pass	V
3776.98	154	260	-53.14	-13	-40.14	Pass	V
5901.26	151	215	-45.40	-13	-32.40	Pass	V
6524.57	154	304	-45.92	-13	-32.92	Pass	V

Note:

5) 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.

6) 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 7 20775 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1419.62	150	266	-55.51	-13	-42.51	Pass	H
1713.45	146	190	-44.34	-13	-31.34	Pass	H
3799.19	147	310	-50.61	-13	-37.61	Pass	H
5862.62	153	85	-46.55	-13	-33.55	Pass	H
6512.98	146	12	-43.17	-13	-30.17	Pass	H
7904.60	154	117	-39.02	-13	-26.02	Pass	H
1111.67	153	278	-53.98	-13	-40.98	Pass	V
1430.56	145	83	-54.10	-13	-41.10	Pass	V
3653.97	148	128	-52.08	-13	-39.08	Pass	V
3897.35	151	253	-51.37	-13	-38.37	Pass	V
5772.27	152	222	-44.10	-13	-31.10	Pass	V
6556.79	145	183	-48.50	-13	-35.50	Pass	V

Band 7 21100 channel/BW 5 (middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1371.39	149	2	-50.80	-13	-37.80	Pass	H
1770.06	148	181	-46.80	-13	-33.80	Pass	H
3933.75	146	200	-45.70	-13	-32.70	Pass	H
5868.44	152	154	-38.93	-13	-25.93	Pass	H
6555.34	152	78	-40.52	-13	-27.52	Pass	H
8156.20	151	312	-47.71	-13	-34.71	Pass	H
1214.86	149	163	-57.63	-13	-44.63	Pass	V
1479.46	149	242	-58.54	-13	-45.54	Pass	V
3541.16	155	256	-48.69	-13	-35.69	Pass	V
3864.20	145	265	-44.12	-13	-31.12	Pass	V
5743.23	147	57	-46.01	-13	-33.01	Pass	V
6559.89	145	355	-46.75	-13	-33.75	Pass	V

Band 7 21425 channel/BW 5 (highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1357.46	149	165	-52.80	-13	-39.80	Pass	H
1621.22	146	208	-50.09	-13	-37.09	Pass	H
3890.17	146	4	-46.19	-13	-33.19	Pass	H
5975.76	150	198	-38.55	-13	-25.55	Pass	H
6438.62	146	341	-46.40	-13	-33.40	Pass	H
8061.03	150	235	-44.11	-13	-31.11	Pass	H
1137.78	146	292	-57.47	-13	-44.47	Pass	V
1380.52	150	158	-53.49	-13	-40.49	Pass	V
3447.52	149	55	-46.59	-13	-33.59	Pass	V
3878.75	150	319	-47.69	-13	-34.69	Pass	V
5737.13	146	118	-46.96	-13	-33.96	Pass	V
6644.63	150	155	-46.80	-13	-33.80	Pass	V

16QAM

Band 7 20775 channel/BW 5 (lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1319.12	150	78	-52.82	-13	-39.82	Pass	H
1727.85	149	291	-49.52	-13	-36.52	Pass	H
3854.39	151	213	-47.59	-13	-34.59	Pass	H
5789.88	150	89	-43.30	-13	-30.30	Pass	H
6494.04	151	329	-50.85	-13	-37.85	Pass	H
8071.72	148	138	-50.74	-13	-37.74	Pass	H
1296.16	149	99	-56.92	-13	-43.92	Pass	V
1405.26	148	217	-55.96	-13	-42.96	Pass	V
3666.48	150	12	-49.17	-13	-36.17	Pass	V
3910.82	150	137	-46.57	-13	-33.57	Pass	V
5770.01	146	356	-46.67	-13	-33.67	Pass	V
6480.38	146	95	-46.94	-13	-33.94	Pass	V

Band 7 21100 channel/BW 5 (middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1245.12	150	142	-59.85	-13	-46.85	Pass	H
1661.33	146	280	-52.59	-13	-39.59	Pass	H
3804.56	150	330	-50.61	-13	-37.61	Pass	H
5842.78	146	194	-41.21	-13	-28.21	Pass	H
6491.59	149	260	-52.27	-13	-39.27	Pass	H
7974.62	151	31	-47.67	-13	-34.67	Pass	H
1224.32	149	4	-57.16	-13	-44.16	Pass	V
1459.78	148	257	-64.73	-13	-51.73	Pass	V
3654.92	147	55	-49.23	-13	-36.23	Pass	V
3966.22	148	273	-53.04	-13	-40.04	Pass	V
5852.48	150	136	-49.66	-13	-36.66	Pass	V
6607.54	150	16	-46.56	-13	-33.56	Pass	V

Band 7 21425 channel/BW 5 (highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1325.39	149	156	-54.52	-13	-41.52	Pass	H
1597.43	149	170	-48.93	-13	-35.93	Pass	H
3764.79	149	127	-48.13	-13	-35.13	Pass	H
5835.34	146	42	-42.85	-13	-29.85	Pass	H
6488.62	147	69	-45.15	-13	-32.15	Pass	H
7935.12	151	110	-46.67	-13	-33.67	Pass	H
1190.21	148	61	-53.69	-13	-40.69	Pass	V
1391.68	147	266	-53.27	-13	-40.27	Pass	V
3485.67	148	303	-53.83	-13	-40.83	Pass	V
3837.05	149	195	-49.05	-13	-36.05	Pass	V
5710.51	147	323	-48.06	-13	-35.06	Pass	V
6567.82	146	325	-44.41	-13	-31.41	Pass	V

Note:

7) 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.

8) 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 66 131979 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1420.23	152	313	-54.26	-13	-41.26	Pass	H
1704.05	149	131	-48.15	-13	-35.15	Pass	H
3783.49	147	345	-51.82	-13	-38.82	Pass	H
6000.05	148	320	-43.18	-13	-30.18	Pass	H
6515.29	150	327	-44.57	-13	-31.57	Pass	H
8009.40	146	294	-44.46	-13	-31.46	Pass	H
1230.48	146	119	-55.00	-13	-42.00	Pass	V
1441.11	154	261	-53.80	-13	-40.80	Pass	V
3564.10	147	120	-48.67	-13	-35.67	Pass	V
3864.63	149	160	-53.02	-13	-40.02	Pass	V
5940.24	146	258	-43.83	-13	-30.83	Pass	V
6536.35	147	35	-44.34	-13	-31.34	Pass	V
Band 66 132322 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1351.02	149	165	-54.25	-13	-41.25	Pass	H
1627.44	146	208	-48.68	-13	-35.68	Pass	H
3961.76	146	4	-42.21	-13	-29.21	Pass	H
5980.63	150	198	-38.91	-13	-25.91	Pass	H
6557.36	146	341	-41.15	-13	-28.15	Pass	H
8111.25	150	235	-40.81	-13	-27.81	Pass	H
1188.81	146	292	-54.20	-13	-41.20	Pass	V
1385.55	150	158	-57.75	-13	-44.75	Pass	V
3478.56	149	55	-48.48	-13	-35.48	Pass	V
3777.49	150	319	-46.34	-13	-33.34	Pass	V
5807.42	146	118	-45.01	-13	-32.01	Pass	V
6526.45	150	155	-50.44	-13	-37.44	Pass	V

Band 66 132665 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1361.70	149	153	-56.66	-13	-43.66	Pass	H
1756.16	147	92	-53.04	-13	-40.04	Pass	H
3763.38	152	174	-47.05	-13	-34.05	Pass	H
5935.81	154	207	-38.42	-13	-25.42	Pass	H
6460.41	148	82	-42.48	-13	-29.48	Pass	H
7905.12	149	162	-44.31	-13	-31.31	Pass	H
1342.56	155	49	-57.52	-13	-44.52	Pass	V
1390.31	151	239	-54.61	-13	-41.61	Pass	V
3592.17	149	61	-51.10	-13	-38.10	Pass	V
3818.52	147	110	-48.26	-13	-35.26	Pass	V
5878.40	150	214	-45.06	-13	-32.06	Pass	V
6604.74	148	13	-47.20	-13	-34.20	Pass	V

16QAM

Band 66 131979 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1388.30	150	78	-52.71	-13	-39.71	Pass	H
1721.72	149	291	-55.75	-13	-42.75	Pass	H
3982.13	151	213	-48.92	-13	-35.92	Pass	H
5773.59	150	89	-48.97	-13	-35.97	Pass	H
6413.53	151	329	-46.02	-13	-33.02	Pass	H
8002.26	148	138	-45.54	-13	-32.54	Pass	H
1314.22	149	99	-57.17	-13	-44.17	Pass	V
1474.52	148	217	-55.37	-13	-42.37	Pass	V
3604.94	150	12	-48.98	-13	-35.98	Pass	V
3844.50	150	137	-49.35	-13	-36.35	Pass	V
5744.51	146	356	-46.53	-13	-33.53	Pass	V
6633.14	146	95	-45.88	-13	-32.88	Pass	V

Band 66 132322 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1259.91	150	142	-56.45	-13	-43.45	Pass	H
1709.78	146	280	-50.38	-13	-37.38	Pass	H
3964.35	150	330	-47.60	-13	-34.60	Pass	H
5844.58	146	194	-42.28	-13	-29.28	Pass	H
6489.01	149	260	-50.48	-13	-37.48	Pass	H
7933.15	151	31	-48.30	-13	-35.30	Pass	H
1154.08	149	4	-50.88	-13	-37.88	Pass	V
1489.06	148	257	-63.94	-13	-50.94	Pass	V
3493.57	147	55	-53.15	-13	-40.15	Pass	V
3825.67	148	273	-53.30	-13	-40.30	Pass	V
5738.59	150	136	-54.40	-13	-41.40	Pass	V
6614.55	150	16	-51.50	-13	-38.50	Pass	V
Band 66 132665 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1306.57	149	156	-57.61	-13	-44.61	Pass	H
1654.76	149	170	-50.34	-13	-37.34	Pass	H
3797.88	149	127	-45.81	-13	-32.81	Pass	H
5864.62	146	42	-45.56	-13	-32.56	Pass	H
6478.02	147	69	-46.10	-13	-33.10	Pass	H
7901.60	151	110	-46.59	-13	-33.59	Pass	H
1253.79	148	61	-53.34	-13	-40.34	Pass	V
1347.20	147	266	-52.70	-13	-39.70	Pass	V
3489.14	148	303	-53.06	-13	-40.06	Pass	V
3898.10	149	195	-49.26	-13	-36.26	Pass	V
5700.20	147	323	-47.05	-13	-34.05	Pass	V
6541.15	146	325	-50.12	-13	-37.12	Pass	V

Note:

9) 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.

10) 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.

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=DC3.33V; High Voltage HV=DC4.07V
Please refer to Appendix 2: Frequency Stability
Test result: Pass

※※※※※ **END OF REPORT** ※※※※※