

TEST REPORT

Product Name:	Asset GPS tracker
FCC ID:	2AWWA-KYCSLOCATE
Trademark:	N/A
Model Number:	KYCS Locate LT
Prepared For:	KYCS Global Inc.
Address:	12 Proctor Rd, 2nd floor Schomberg Ontario Canada, Postal code L0G1T0
Manufacturer:	Shenzhen Kingwo IoT Co., Ltd.
Address:	Room 2403, 24th Floor, 2A, International Innovation Building, 1st Dashi Road, Xili, Nanshan District, Shenzhen, 518055 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. 23, 2025
Sample tested Date:	Jun. 23, 2025 to Jul. 30, 2025
Issue Date:	Jul. 30, 2025
Report No.:	CTB25062311301RF01
Test Standards	FCC Part 2, 22, 24E, 27
Test Results	PASS
Remark:	This is CATM1 radio test report.

Compiled by:

Zhou kui

Zhou Kui

Reviewed by:

Arron Liu

Arron Liu

Approved by:

Bin Mei

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

	Page
Test Report Declaration	
1. VERSION	3
2. TEST SUMMARY	4
3. MEASUREMENT UNCERTAINTY	5
4. PRODUCT INFORMATION AND TEST SETUP	6
4.1 Product Information	6
4.2 Test Setup Configuration	7
4.3 Support Equipment	7
4.4 Test Mode	7
4.5 Test Environment	9
5. TEST FACILITY AND TEST INSTRUMENT USED	10
5.1 Test Facility	10
5.2 Test Instrument Used	10
6. RF EXPOSURE	12
6.1 Standard Applicable	12
6.2 Test Result	12
7. RF OUTPUT POWER	13
7.1 Standard Applicable	13
7.3 Summary of Test Results/Plots	14
8. PEAK-TO-AVERAGE RATIO (PAR) OF TRANSMITTER	15
8.1 Standard Applicable	15
8.2 Test Procedure	15
8.3 Summary of Test Results	15
9. EMISSION BANDWIDTH	16
9.1 Standard Applicable	16
9.2 Test Procedure	16
9.3 Summary of Test Results/Plots	16
10. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL	17
10.1 Standard Applicable	17
10.2 Test Procedure	18
10.3 Summary of Test Results/Plots	18
11. SPURIOUS RADIATED EMISSIONS	19
11.1 Standard Applicable	19
11.2 Test Procedure	20
11.3 Summary of Test Results/Plots	20
12. FREQUENCY STABILITY	33
12.1 Standard Applicable	33
12.2 Test Procedure	33
12.3 Summary of Test Results/Plots	33

(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB25062311301RF01	Jul. 30, 2025	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 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):	KYCS Locate LT
Model Description:	N/A
Hardware Version:	KYCS Locate LT-P23
Software Version:	KYCS Locate LT-6.1
Operation Frequency:	CatM1 BAND 2: 1850-1910MHz CatM1 BAND 4: 1710-1755MHz CatM1 BAND 12: 699-716MHz CatM1 BAND 13: 777-787MHz
Max. RF output power:	CatM1 BAND 2: 19.49dBm CatM1 BAND 4: 18.79dBm CatM1 BAND 12: 20.27dBm CatM1 BAND 13: 20.23dBm
Type of Modulation:	QPSK, 16QAM
Antenna installation:	Internal antenna
Antenna Gain:	CatM1 BAND 2: 1.36dBi CatM1 BAND 4: 1.57dBi CatM1 BAND 12: -3.95dBi CatM1 BAND 13: -1.3dBi
Ratings:	Lithium Battery Single cell: 3V 1400mAh Three-link series connection: 3V 4200mAh

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/Type No.	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	CatM1 BAND 2	Low, Middle, High Channels
TM2	CatM1 BAND 4	Low, Middle, High Channels
TM3	CatM1 BAND 12	Low, Middle, High Channels
TM4	CatM1 BAND 13	Low, Middle, High Channels

CatM1 BAND 2

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
CatM1 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

CatM1 BAND 4

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
CatM1 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

CatM1 BAND 12

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
CatM1 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

CatM1 BAND 13

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
CatM1 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

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):	3V
Normal Temperature(°C)	23
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 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 Date	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	A.14.16	2025/5/23	2026/5/22
2	Power Sensor	Agilent	U2021XA	MY56120032	/	2025/5/23	2026/5/22
3	Power Sensor	Agilent	U2021XA	MY56120034	/	2025/5/23	2026/5/22
4	Communication test set	R&S	CMW500	108058	V3.5.80	2025/5/23	2026/5/22
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	A.14.16	2025/5/23	2026/5/22
6	Signal Generator	Agilent	N5181A	MY50140365	A.01.60	2025/5/22	2026/5/21
7	Vector signal generator	Agilent	N5182A	MY47420195	A.01.87	2025/5/22	2026/5/21
8	Communication test set	Agilent	E5515C	MY50102567	B.19.07 (E1962B)	2025/5/22	2026/5/21
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	/	2025/6/18	2026/6/17
10	5 GHz Filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	/	2025/6/18	2026/6/17
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	/	2025/5/24	2026/5/23
12	BT&WI-FI Automatic test software	Microwave	MTS8310	Ver. 2.0.0.0	/	/	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	/	2024/10/31	2025/10/30
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	/	2025/5/22	2026/5/21
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	/	/	/
16	966 chamber	C.R.T.	966	/	/	2024/6/23	2027/6/22
17	Receiver	R&S	ESPI	100362	RF_ATTEN_7 (104489/003)	2025/5/23	2026/5/22
18	Amplifier	HP	8447E	2945A02747	/	2025/5/23	2026/5/22
19	Amplifier	Agilent	8449B	3008A01838	/	2025/6/2	2026/6/1

20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	/	2025/6/29	2026/6/28
21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	/	2025/6/1	2026/5/31
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/	/	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	/	2025/6/2	2026/6/1
24	loop antenna	ZHINAN	ZN30900A	GTS534	/	/	/
25	40G Horn antenna	A/H/System	SAS-574	588	/	2025/6/2	2026/6/1
26	Amplifier	AEROFLEX	Aeroflex	097	/	2025/6/2	2026/6/1
27	Power Meter	KEYSIGHT	N1912AP	N/A	A.05.00	2025/6/2	2026/6/1

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.

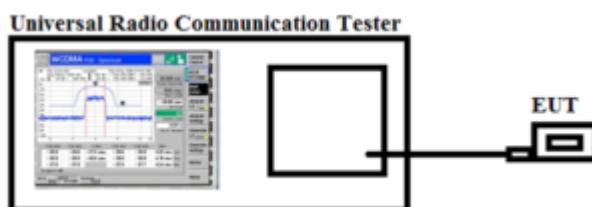
According to §27.50(h)(2), Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

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.

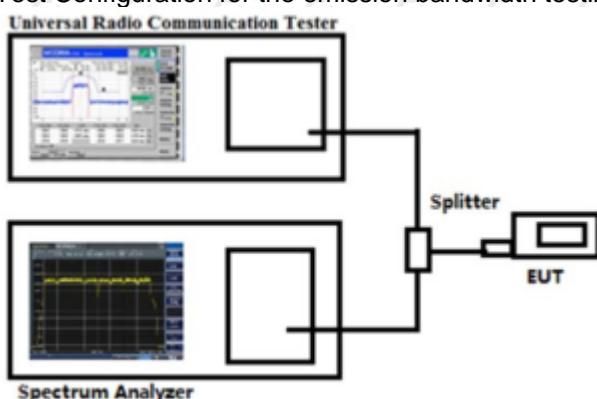
corresponding to the highest PAPR expected during periods of continuous transmission.

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.

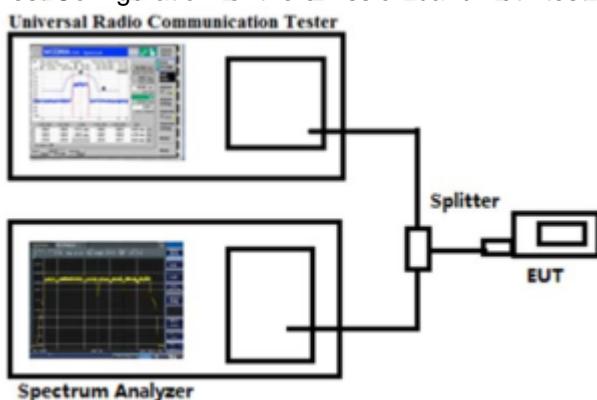
According to §24.238(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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 $43 + 10 \log_{10}(P)$ 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.

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;

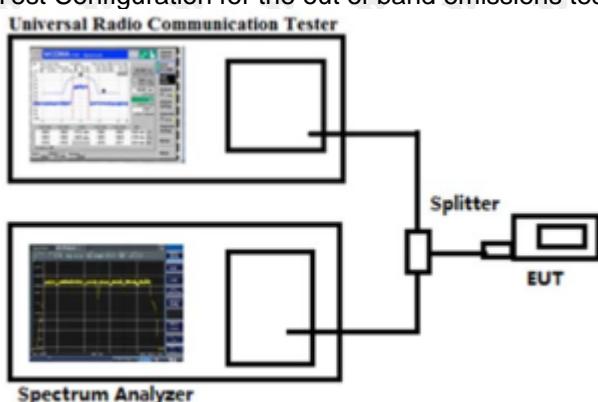
(2) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 70 + 10 log (P) dB on all frequencies between 2287.5 and 2300 MHz, 72 + 10 log (P) dB on all frequencies between 2285 and 2287.5 MHz, and 75 + 10 log (P) dB below 2285 MHz;

(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 $43 + 10 \log_{10}(P)$ 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.

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.
1238.95	156	235	-56.67	-13	-43.67	Pass	H
1637.92	148	131	-50.41	-13	-37.41	Pass	H
3874.62	142	30	-46.31	-13	-33.31	Pass	H
5793.37	150	102	-44.93	-13	-31.93	Pass	H
6458.74	153	102	-45.35	-13	-32.35	Pass	H
8116.21	146	223	-44.92	-13	-31.92	Pass	H
1133.88	144	345	-56.64	-13	-43.64	Pass	V
1495.46	158	65	-60.15	-13	-47.15	Pass	V
3631.38	155	64	-49.96	-13	-36.96	Pass	V
3794.87	145	22	-53.81	-13	-40.81	Pass	V
5738.08	152	176	-46.99	-13	-33.99	Pass	V
6605.74	159	221	-48.61	-13	-35.61	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.
1301.24	150	8	-55.47	-13	-42.47	Pass	H
1742.35	146	252	-52.94	-13	-39.94	Pass	H
3786.05	150	71	-52.80	-13	-39.80	Pass	H
5828.70	146	6	-44.18	-13	-31.18	Pass	H
6366.50	149	136	-49.21	-13	-36.21	Pass	H
7975.21	151	335	-50.32	-13	-37.32	Pass	H
1249.40	149	215	-56.42	-13	-43.42	Pass	V
1492.00	148	77	-59.49	-13	-46.49	Pass	V
3579.37	147	276	-51.30	-13	-38.30	Pass	V
3820.39	148	108	-52.60	-13	-39.60	Pass	V
5766.60	150	193	-50.43	-13	-37.43	Pass	V
6449.63	150	251	-49.31	-13	-36.31	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.
1313.32	150	300	-59.17	-13	-46.17	Pass	H
1606.76	151	285	-50.58	-13	-37.58	Pass	H
3809.03	155	329	-44.97	-13	-31.97	Pass	H
5963.01	147	61	-42.77	-13	-29.77	Pass	H
6448.00	149	63	-42.66	-13	-29.66	Pass	H
7948.57	148	348	-42.92	-13	-29.92	Pass	H
1214.45	149	306	-57.63	-13	-44.63	Pass	V
1307.19	150	280	-55.88	-13	-42.88	Pass	V
3551.95	152	296	-53.11	-13	-40.11	Pass	V
3825.43	149	52	-49.91	-13	-36.91	Pass	V
5792.02	146	234	-43.95	-13	-30.95	Pass	V
6541.13	145	332	-48.51	-13	-35.51	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.
1362.81	149	53	-61.16	-13	-48.16	Pass	H
1684.33	149	16	-47.10	-13	-34.10	Pass	H
3837.18	152	48	-47.01	-13	-34.01	Pass	H
5941.64	153	273	-44.34	-13	-31.34	Pass	H
6485.52	149	299	-43.86	-13	-30.86	Pass	H
8025.22	149	5	-44.27	-13	-31.27	Pass	H
1144.83	154	337	-52.28	-13	-39.28	Pass	V
1355.28	147	16	-55.84	-13	-42.84	Pass	V
3502.62	149	168	-50.46	-13	-37.46	Pass	V
3980.27	145	282	-52.56	-13	-39.56	Pass	V
5831.98	149	69	-47.29	-13	-34.29	Pass	V
6531.69	149	317	-47.76	-13	-34.76	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.
1240.71	154	294	-53.62	-13	-41.45	Pass	H
1781.00	149	317	-50.12	-13	-37.85	Pass	H
3884.63	146	327	-51.16	-13	-35.2	Pass	H
5967.08	152	333	-44.62	-13	-30.39	Pass	H
6419.32	145	181	-44.03	-13	-32.24	Pass	H
8101.85	151	359	-43.66	-13	-30.22	Pass	H
1283.26	149	262	-57.57	-13	-44.9	Pass	V
1317.02	146	151	-57.16	-13	-43.63	Pass	V
3608.05	153	93	-46.45	-13	-35.94	Pass	V
3846.54	146	50	-46.33	-13	-36.01	Pass	V
5862.74	149	265	-48.98	-13	-33.75	Pass	V
6616.90	154	225	-45.39	-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.
1426.45	145	8	-56.09	-13	-43.09	Pass	H
1630.26	154	305	-48.28	-13	-35.28	Pass	H
3928.15	147	220	-43.58	-13	-30.58	Pass	H
5856.08	149	196	-43.78	-13	-30.78	Pass	H
6576.45	148	301	-41.34	-13	-28.34	Pass	H
8057.74	147	193	-44.74	-13	-31.74	Pass	H
1252.76	151	203	-56.94	-13	-43.94	Pass	V
1478.12	149	151	-55.66	-13	-42.66	Pass	V
3602.80	148	116	-48.79	-13	-35.79	Pass	V
3852.44	148	127	-50.73	-13	-37.73	Pass	V
5771.59	151	80	-48.79	-13	-35.79	Pass	V
6628.14	148	340	-42.35	-13	-29.35	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.
1241.44	152	272	-59.38	-13	-46.38	Pass	H
1651.10	154	141	-47.79	-13	-34.79	Pass	H
3794.08	147	221	-50.61	-13	-37.61	Pass	H
5998.52	154	328	-43.79	-13	-30.79	Pass	H
6503.49	151	222	-47.33	-13	-34.33	Pass	H
7973.87	152	195	-44.59	-13	-31.59	Pass	H
1244.27	146	207	-52.36	-13	-39.36	Pass	V
1349.59	155	100	-57.28	-13	-44.28	Pass	V
3619.78	145	239	-50.49	-13	-37.49	Pass	V
3959.20	147	256	-48.88	-13	-35.88	Pass	V
5770.63	150	118	-48.05	-13	-35.05	Pass	V
6558.67	154	87	-50.36	-13	-37.36	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.
1363.66	149	342	-52.56	-13	-39.56	Pass	H
1824.20	146	303	-46.87	-13	-33.87	Pass	H
3898.96	152	88	-50.13	-13	-37.13	Pass	H
5828.78	145	228	-41.52	-13	-28.52	Pass	H
6442.32	146	210	-40.26	-13	-27.26	Pass	H
8076.96	154	331	-44.13	-13	-31.13	Pass	H
1163.34	150	338	-59.57	-13	-46.57	Pass	V
1354.21	148	22	-61.24	-13	-48.24	Pass	V
3444.45	146	244	-46.03	-13	-33.03	Pass	V
3927.03	152	268	-47.78	-13	-34.78	Pass	V
5832.38	153	52	-41.88	-13	-28.88	Pass	V
6587.36	153	153	-47.94	-13	-34.94	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.
1312.05	149	260	-52.29	-13	-39.29	Pass	H
1767.82	151	163	-46.37	-13	-33.37	Pass	H
3896.98	148	11	-43.74	-13	-30.74	Pass	H
5827.49	152	201	-43.28	-13	-30.28	Pass	H
6480.75	154	358	-41.91	-13	-28.91	Pass	H
8115.64	148	321	-43.93	-13	-30.93	Pass	H
1256.65	148	79	-51.89	-13	-38.89	Pass	V
1449.34	148	193	-56.00	-13	-43.00	Pass	V
3472.28	151	51	-48.76	-13	-35.76	Pass	V
3845.67	153	32	-45.10	-13	-32.10	Pass	V
5792.83	154	86	-49.63	-13	-36.63	Pass	V
6649.65	154	84	-46.67	-13	-33.67	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.
1351.26	149	230	-54.00	-13	-41.00	Pass	H
1736.29	153	348	-55.50	-13	-42.50	Pass	H
3952.91	153	263	-52.84	-13	-39.84	Pass	H
5793.74	147	352	-48.28	-13	-35.28	Pass	H
6433.81	145	262	-44.41	-13	-31.41	Pass	H
7982.00	152	21	-48.22	-13	-35.22	Pass	H
1308.86	154	87	-56.36	-13	-43.36	Pass	V
1463.93	153	86	-54.63	-13	-41.63	Pass	V
3476.05	148	150	-48.86	-13	-35.86	Pass	V
3844.84	152	190	-49.69	-13	-36.69	Pass	V
5740.61	152	59	-45.63	-13	-32.63	Pass	V
6557.71	154	161	-47.36	-13	-34.36	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.
1276.44	146	329	-56.04	-13	-43.04	Pass	H
1807.95	153	179	-51.18	-13	-38.18	Pass	H
3906.88	152	351	-48.73	-13	-35.73	Pass	H
5808.71	153	168	-40.94	-13	-27.94	Pass	H
6545.79	151	145	-52.26	-13	-39.26	Pass	H
8044.81	150	264	-46.28	-13	-33.28	Pass	H
1199.63	154	20	-55.11	-13	-42.11	Pass	V
1323.09	152	297	-61.06	-13	-48.06	Pass	V
3651.54	152	180	-54.95	-13	-41.95	Pass	V
3921.85	146	260	-53.97	-13	-40.97	Pass	V
5826.85	145	188	-51.56	-13	-38.56	Pass	V
6416.67	154	337	-46.33	-13	-33.33	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.
1276.29	154	157	-55.05	-13	-42.05	Pass	H
1658.46	149	78	-49.17	-13	-36.17	Pass	H
3818.62	154	130	-45.69	-13	-32.69	Pass	H
5839.27	151	349	-43.20	-13	-30.20	Pass	H
6467.18	147	334	-40.89	-13	-27.89	Pass	H
7998.67	154	327	-48.40	-13	-35.40	Pass	H
1230.14	150	248	-52.62	-13	-39.62	Pass	V
1311.28	153	252	-55.75	-13	-42.75	Pass	V
3457.27	147	289	-49.78	-13	-36.78	Pass	V
3853.12	151	184	-49.40	-13	-36.40	Pass	V
5691.19	150	350	-47.49	-13	-34.49	Pass	V
6528.30	148	162	-49.23	-13	-36.23	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 12 23017 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1346.43	155	28	-56.13	-13	-43.13	Pass	H
1714.48	156	353	-48.38	-13	-35.38	Pass	H
3906.25	140	203	-46.54	-13	-33.54	Pass	H
5964.39	149	3	-42.96	-13	-29.96	Pass	H
6437.00	148	280	-41.59	-13	-28.59	Pass	H
8038.97	140	61	-44.73	-13	-31.73	Pass	H
1169.16	143	260	-56.02	-13	-43.02	Pass	V
1463.90	142	338	-58.33	-13	-45.33	Pass	V
3615.97	154	43	-50.35	-13	-37.35	Pass	V
3877.38	142	348	-50.80	-13	-37.80	Pass	V
5829.62	148	163	-50.35	-13	-37.35	Pass	V
6568.06	144	287	-47.76	-13	-34.76	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.
1269.75	150	297	-54.03	-13	-41.03	Pass	H
1675.33	146	287	-54.80	-13	-41.80	Pass	H
3928.10	150	171	-49.01	-13	-36.01	Pass	H
5871.76	146	94	-47.05	-13	-34.05	Pass	H
6378.56	149	246	-48.42	-13	-35.42	Pass	H
7982.97	151	111	-50.69	-13	-37.69	Pass	H
1243.94	149	145	-54.50	-13	-41.50	Pass	V
1358.29	148	136	-57.80	-13	-44.80	Pass	V
3644.62	147	205	-56.54	-13	-43.54	Pass	V
3912.57	148	133	-52.04	-13	-39.04	Pass	V
5874.15	150	152	-50.18	-13	-37.18	Pass	V
6596.61	150	347	-45.83	-13	-32.83	Pass	V

Band 12 23173 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1255.60	149	138	-56.66	-13	-43.66	Pass	H
1688.74	150	303	-53.61	-13	-40.61	Pass	H
3926.57	146	178	-48.02	-13	-35.02	Pass	H
5964.08	146	23	-43.91	-13	-30.91	Pass	H
6493.85	147	50	-45.39	-13	-32.39	Pass	H
8057.70	149	97	-46.22	-13	-33.22	Pass	H
1303.17	150	224	-55.68	-13	-42.68	Pass	V
1418.68	147	307	-57.46	-13	-44.46	Pass	V
3592.52	146	82	-51.37	-13	-38.37	Pass	V
3833.00	154	219	-49.61	-13	-36.61	Pass	V
5760.24	149	15	-44.69	-13	-31.69	Pass	V
6485.44	151	239	-49.23	-13	-36.23	Pass	V

16QAM

Band 12 23017 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1305.66	148	100	-61.49	-13	-48.49	Pass	H
1677.82	152	355	-48.84	-13	-35.84	Pass	H
3938.56	148	330	-49.75	-13	-36.75	Pass	H
5877.51	148	189	-44.75	-13	-31.75	Pass	H
6482.84	155	349	-44.42	-13	-31.42	Pass	H
8032.98	151	16	-44.10	-13	-31.10	Pass	H
1268.07	152	237	-53.65	-13	-40.65	Pass	V
1500.11	145	213	-54.88	-13	-41.88	Pass	V
3601.71	154	252	-54.40	-13	-41.40	Pass	V
3815.17	151	78	-50.58	-13	-37.58	Pass	V
5846.84	150	7	-47.89	-13	-34.89	Pass	V
6587.13	146	355	-49.95	-13	-36.95	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.
1375.15	150	307	-53.27	-13	-41.45	Pass	H
1685.44	150	285	-47.83	-13	-37.85	Pass	H
3877.59	147	145	-47.65	-13	-35.2	Pass	H
5901.24	148	298	-45.63	-13	-30.39	Pass	H
6516.85	145	202	-44.82	-13	-32.24	Pass	H
8025.02	154	177	-39.51	-13	-30.22	Pass	H
1154.65	147	349	-54.56	-13	-44.9	Pass	V
1302.22	149	177	-54.73	-13	-43.63	Pass	V
3496.16	153	234	-49.15	-13	-35.94	Pass	V
3756.73	148	134	-49.15	-13	-36.01	Pass	V
5873.23	153	234	-44.79	-13	-33.75	Pass	V
6459.90	148	98	-43.39	-13	-32.41	Pass	V
Band 12 23173 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1429.96	145	128	-54.70	-13	-41.70	Pass	H
1744.08	151	155	-51.83	-13	-38.83	Pass	H
3884.24	147	183	-40.96	-13	-27.96	Pass	H
5818.09	150	55	-40.31	-13	-27.31	Pass	H
6526.66	147	308	-40.01	-13	-27.01	Pass	H
8026.76	145	27	-44.69	-13	-31.69	Pass	H
1154.86	152	101	-54.13	-13	-41.13	Pass	V
1554.74	154	280	-60.30	-13	-47.30	Pass	V
3500.45	153	199	-50.77	-13	-37.77	Pass	V
3851.06	148	150	-50.17	-13	-37.17	Pass	V
5888.81	153	261	-50.36	-13	-37.36	Pass	V
6526.77	153	71	-42.47	-13	-29.47	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 13 23025 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1293.65	153	241	-52.20	-25	-27.20	Pass	H
1770.03	148	52	-44.05	-25	-19.05	Pass	H
3891.33	149	100	-43.75	-25	-18.75	Pass	H
5840.53	146	245	-43.14	-25	-18.14	Pass	H
6567.27	148	341	-40.92	-25	-15.92	Pass	H
8079.61	153	22	-44.87	-25	-19.87	Pass	H
1256.93	146	356	-49.80	-25	-24.80	Pass	V
1510.29	152	20	-60.89	-25	-35.89	Pass	V
3526.23	149	318	-51.73	-25	-26.73	Pass	V
3772.11	154	312	-49.36	-25	-24.36	Pass	V
5850.37	147	158	-49.71	-25	-24.71	Pass	V
6553.71	154	48	-47.51	-25	-22.51	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.
1433.08	151	24	-50.47	-25	-25.47	Pass	H
1760.63	153	112	-47.03	-25	-22.03	Pass	H
3839.27	148	279	-43.05	-25	-18.05	Pass	H
5910.91	147	132	-41.01	-25	-16.01	Pass	H
6426.36	147	48	-44.00	-25	-19.00	Pass	H
8056.13	148	25	-43.41	-25	-18.41	Pass	H
1213.67	149	186	-53.89	-25	-28.89	Pass	V
1559.51	146	315	-55.35	-25	-30.35	Pass	V
3445.51	147	341	-47.32	-25	-22.32	Pass	V
3909.24	145	167	-46.48	-25	-21.48	Pass	V
5889.40	153	305	-46.18	-25	-21.18	Pass	V
6597.16	155	15	-48.63	-25	-23.63	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.
1350.09	145	360	-54.50	-25	-29.50	Pass	H
1740.10	152	193	-45.81	-25	-20.81	Pass	H
3877.22	148	303	-43.77	-25	-18.77	Pass	H
5983.35	147	25	-43.74	-25	-18.74	Pass	H
6580.92	146	272	-40.95	-25	-15.95	Pass	H
8066.69	146	264	-38.96	-25	-13.96	Pass	H
1258.90	146	14	-50.06	-25	-25.06	Pass	V
1430.62	148	232	-57.30	-25	-32.30	Pass	V
3639.77	151	57	-48.74	-25	-23.74	Pass	V
3763.13	147	218	-52.10	-25	-27.10	Pass	V
5864.87	149	154	-44.70	-25	-19.70	Pass	V
6477.78	149	48	-46.43	-25	-21.43	Pass	V

16QAM

Band 13 23025 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1280.08	148	93	-57.92	-25	-32.92	Pass	H
1665.45	155	341	-47.94	-25	-22.94	Pass	H
3811.91	152	192	-47.05	-25	-22.05	Pass	H
5821.39	150	175	-46.23	-25	-21.23	Pass	H
6462.54	151	223	-46.45	-25	-21.45	Pass	H
7903.58	148	69	-47.13	-25	-22.13	Pass	H
1167.33	152	172	-62.15	-25	-37.15	Pass	V
1416.55	153	170	-54.15	-25	-29.15	Pass	V
3513.78	155	336	-45.89	-25	-20.89	Pass	V
3780.61	147	16	-53.63	-25	-28.63	Pass	V
5844.91	150	234	-45.80	-25	-20.80	Pass	V
6467.06	152	323	-49.08	-25	-24.08	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.
1235.28	148	205	-56.15	-25	-31.15	Pass	H
1625.90	149	296	-47.01	-25	-22.01	Pass	H
3802.14	149	333	-50.11	-25	-25.11	Pass	H
5758.41	152	304	-50.88	-25	-25.88	Pass	H
6398.37	148	127	-42.02	-25	-17.02	Pass	H
7898.08	154	306	-45.26	-25	-20.26	Pass	H
1120.90	154	334	-57.17	-25	-32.17	Pass	V
1340.58	145	356	-59.12	-25	-34.12	Pass	V
3470.70	152	229	-50.64	-25	-25.64	Pass	V
3738.25	148	198	-48.39	-25	-23.39	Pass	V
5703.02	153	253	-42.15	-25	-17.15	Pass	V
6454.39	148	134	-45.82	-25	-20.82	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.
1383.52	154	116	-55.34	-25	-30.34	Pass	H
1755.13	150	344	-48.70	-25	-23.70	Pass	H
3803.26	155	337	-50.57	-25	-25.57	Pass	H
5868.73	148	229	-42.99	-25	-17.99	Pass	H
6406.72	148	42	-46.78	-25	-21.78	Pass	H
7962.61	151	29	-48.96	-25	-23.96	Pass	H
1144.72	152	277	-56.33	-25	-31.33	Pass	V
1358.45	154	197	-58.38	-25	-33.38	Pass	V
3498.78	148	61	-53.44	-25	-28.44	Pass	V
3894.87	151	178	-50.69	-25	-25.69	Pass	V
5844.17	147	7	-40.23	-25	-15.23	Pass	V
6593.35	153	222	-52.11	-25	-27.11	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.

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=DC 3 V; Low Voltage LV=DC 2.7V; High Voltage HV=DC 3.3V

Please refer to Appendix 2: Frequency Stability

Test result: Pass

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