



TEST REPORT

Product Name: Pet GPS Tracker
FCC ID: 2BDWH-PT001NA
Trademark: AiPITE
Model Number: PT-001-NA
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Sample Received Date: Oct. 28, 2023
Sample tested Date: Oct. 28, 2023 to Nov. 23, 2023
Issue Date: Nov. 23, 2023
Report No.: CTB231123020RFX
Test Standards: FCC Part 2, 22, 24E, 27
Test Results: PASS
Remark: This is LTE radio test report.

Compiled by:

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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.

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(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
CTB231123020RFX	Nov. 23, 2023	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)(5)/Part27.50(h)(2)	TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
peak-to-average ratio	Part 27.50(d)	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 22.917(a)/Part 27.53(m) (4)	KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 22.917(a)/Part 27.53(m) (4)	TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	Part 2.1053/ Part 22.917(a)/Part 27.53(m) (4)	TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Frequency stability	Part 2.1055/Part 27.54	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):	PT-001-NA
Model Description:	N/A
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 12: 699-716MHz FDD-LTE BAND 13: 777-787MHz
Max. RF output power:	FDD-LTE BAND 2: 22.28dBm FDD-LTE BAND 4: 21.83dBm FDD-LTE BAND 5: 21.67dBm FDD-LTE BAND 12: 21.95dBm FDD-LTE BAND 13: 21.74dBm
Type of Modulation:	QPSK, 16QAM
Antenna installation:	PCB antenna
Antenna Gain:	LTE BAND 2: 1.0dBi LTE BAND 4: -1.04dBi LTE BAND 5: 0.61dBi LTE BAND 12: 1.0dBi LTE BAND 13:1.0dBi
Ratings:	DC 5V charging from adapter

4.2 Test Setup Configuration

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

4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
1	Adapter	JIYIN	JY-05100C	N/A	N/A

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 12	Low, Middle, High Channels
TM5	FDD-LTE BAND 13	Low, Middle, High Channels

4.5 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(DC):	5V
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, Xinghe 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

Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	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	2024.07.05
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	2024.07.05
6	Signal Generator	Agilent	N5181A	MY50140365	2024.07.05
7	Vector signal generator	Agilent	N5182A	MY47420195	2024.07.05
8	Communication test set	Agilent	E5515C	MY50102567	2024.07.06
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2024.07.05
10	5 GHz Filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	2024.07.06
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	2024.07.06
12	BT&WI-FI Automatic test software	Microwave	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	Microwave	MTS8200	Ver. 2.0.0.0	/
16	966 chamber	C.R.T.	966	/	2024.08.11
17	Receiver	R&S	ESPI	100362	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.

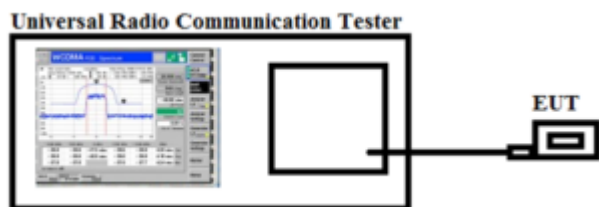
According to §24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

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.

7.2 Test Procedure

Conducted output power test method:



Radiated power test method:

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

7.3 Summary of Test Results/Plots

Max. Radiated Power:
FDD-LTE Band 2

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.55	<33.00	PASS
		H	20.06		
	MCH	V	20.58		PASS
		H	20.99		
	HCH	V	20.50		PASS
		H	21.14		
16QAM	LCH	V	20.02	<33.00	PASS
		H	21.29		
	MCH	V	20.15		PASS
		H	21.53		
	HCH	V	20.15		PASS
		H	20.61		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.44	<33.00	PASS
		H	21.12		
	MCH	V	20.21		PASS
		H	20.78		
	HCH	V	20.75		PASS
		H	20.33		
16QAM	LCH	V	20.78	<33.00	PASS
		H	20.51		
	MCH	V	20.32		PASS
		H	21.21		
	HCH	V	21.01		PASS
		H	20.70		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.49	<33.00	PASS
		H	21.33		
	MCH	V	20.86		PASS
		H	20.52		

	HCH	V	21.24		PASS
		H	21.36		
16QAM	LCH	V	20.09	<33.00	PASS
		H	20.86		
	MCH	V	20.67		PASS
		H	21.39		
	HCH	V	20.85		PASS
		H	20.37		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.43	<33.00	PASS
		H	21.49		
	MCH	V	21.38		PASS
		H	21.49		
	HCH	V	21.78		PASS
		H	21.06		
16QAM	LCH	V	21.62	<33.00	PASS
		H	20.37		
	MCH	V	20.54		PASS
		H	21.67		
	HCH	V	21.03		PASS
		H	21.23		
Channel Bandwidth: 15 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.57	<33.00	PASS
		H	22.10		
	MCH	V	20.91		PASS
		H	21.44		
	HCH	V	21.32		PASS
		H	21.29		
16QAM	LCH	V	21.56	<33.00	PASS
		H	20.86		
	MCH	V	20.75		PASS
		H	21.63		
	HCH	V	21.59		PASS
		H	20.60		

Channel Bandwidth: 20 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.28	<33.00	PASS
		H	21.85		
	MCH	V	21.09		PASS
		H	22.11		
	HCH	V	21.65		PASS
		H	21.98		
16QAM	LCH	V	22.24	<33.00	PASS
		H	20.78		
	MCH	V	21.17		PASS
		H	21.41		
	HCH	V	21.54		PASS
		H	20.40		

FDD-LTE Band 4

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.41	<30.00	PASS
		H	19.88		
	MCH	V	20.17		PASS
		H	20.36		
	HCH	V	20.00		PASS
		H	20.10		
16QAM	LCH	V	19.56	<30.00	PASS
		H	19.53		
	MCH	V	20.71		PASS
		H	20.33		
	HCH	V	19.89		PASS
		H	20.14		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	19.96	<30.00	PASS
		H	21.29		
	MCH	V	19.53		PASS
		H	20.85		
	HCH	V	20.57		PASS

		H	21.33		
16QAM	LCH	V	19.85	<30.00	PASS
		H	20.64		
	MCH	V	21.03		PASS
		H	20.77		
	HCH	V	20.69		PASS
		H	21.28		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.35	<30.00	PASS
		H	21.09		
	MCH	V	20.87		PASS
		H	21.69		
	HCH	V	20.08		PASS
		H	20.64		
16QAM	LCH	V	21.44	<30.00	PASS
		H	20.63		
	MCH	V	20.69		PASS
		H	21.46		
	HCH	V	21.76		PASS
		H	20.29		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.49	<30.00	PASS
		H	21.42		
	MCH	V	21.70		PASS
		H	20.06		
	HCH	V	21.63		PASS
		H	20.38		
16QAM	LCH	V	20.68	<30.00	PASS
		H	21.57		
	MCH	V	21.35		PASS
		H	21.15		
	HCH	V	20.85		PASS
		H	21.44		

Channel Bandwidth: 15 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.02	<30.00	PASS
		H	20.86		
	MCH	V	21.00		PASS
		H	21.13		
	HCH	V	21.46		PASS
		H	21.42		
16QAM	LCH	V	21.02	<30.00	PASS
		H	20.42		
	MCH	V	20.90		PASS
		H	20.28		
	HCH	V	21.12		PASS
		H	20.61		
Channel Bandwidth: 20 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.83	<30.00	PASS
		H	21.64		
	MCH	V	20.98		PASS
		H	20.19		
	HCH	V	20.39		PASS
		H	21.69		
16QAM	LCH	V	21.81	<30.00	PASS
		H	21.53		
	MCH	V	20.77		PASS
		H	20.97		
	HCH	V	21.38		PASS
		H	21.74		

FDD-LTE Band 5

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.74	<34.77	PASS
		H	20.63		
	MCH	V	19.79		PASS
		H	21.03		
	HCH	V	19.90		PASS

		H	21.44		
16QAM	LCH	V	19.58	<34.77	PASS
		H	20.17		
	MCH	V	21.09		PASS
		H	20.60		
	HCH	V	19.78		PASS
		H	20.31		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.71	<34.77	PASS
		H	21.48		
	MCH	V	20.82		PASS
		H	19.74		
	HCH	V	20.39		PASS
		H	20.27		
16QAM	LCH	V	21.30	<34.77	PASS
		H	20.27		
	MCH	V	20.86		PASS
		H	21.00		
	HCH	V	19.79		PASS
		H	20.06		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	19.58	<34.77	PASS
		H	21.39		
	MCH	V	20.44		PASS
		H	20.05		
	HCH	V	19.84		PASS
		H	21.19		
16QAM	LCH	V	21.12	<34.77	PASS
		H	21.01		
	MCH	V	20.64		PASS
		H	19.54		
	HCH	V	21.19		PASS
		H	21.34		

Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.67	<34.77	PASS
		H	21.28		
	MCH	V	21.13		PASS
		H	21.02		
	HCH	V	21.04		PASS
		H	20.82		
16QAM	LCH	V	21.65	<34.77	PASS
		H	20.93		
	MCH	V	21.44		PASS
		H	21.09		
	HCH	V	20.28		PASS
		H	21.42		

FDD-LTE Band 12

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.43	<34.77	PASS
		H	19.38		
	MCH	V	20.49		PASS
		H	19.38		
	HCH	V	21.40		PASS
		H	19.12		
16QAM	LCH	V	20.38	<34.77	PASS
		H	19.20		
	MCH	V	21.09		PASS
		H	19.21		
	HCH	V	20.08		PASS
		H	19.08		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.87	<34.77	PASS
		H	20.37		
	MCH	V	20.00		PASS
		H	21.20		

	HCH	V	19.56		PASS
		H	19.83		
16QAM	LCH	V	20.00	<34.77	PASS
		H	19.93		
	MCH	V	20.86		PASS
		H	21.24		
	HCH	V	20.45		PASS
		H	19.59		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.40	<34.77	PASS
		H	20.14		
	MCH	V	21.07		PASS
		H	19.92		
	HCH	V	21.18		PASS
		H	20.14		
16QAM	LCH	V	20.65	<34.77	PASS
		H	20.27		
	MCH	V	21.51		PASS
		H	20.25		
	HCH	V	21.11		PASS
		H	20.96		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.95	<34.77	PASS
		H	20.98		
	MCH	V	21.27		PASS
		H	20.62		
	HCH	V	21.51		PASS
		H	20.38		
16QAM	LCH	V	21.91	<34.77	PASS
		H	20.73		
	MCH	V	20.80		PASS
		H	20.68		
	HCH	V	20.43		PASS
		H	19.85		

FDD-LTE Band 13

Channel Bandwidth: 5MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.27	<34.77	PASS
		H	20.29		
	MCH	V	21.40		PASS
		H	21.49		
	HCH	V	19.71		PASS
		H	20.31		
16QAM	LCH	V	21.33	<34.77	PASS
		H	20.84		
	MCH	V	20.32		PASS
		H	20.71		
	HCH	V	21.55		PASS
		H	20.49		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.74	<34.77	PASS
		H	20.52		
	MCH	V	21.11		PASS
		H	21.06		
	HCH	V	20.81		PASS
		H	21.00		
16QAM	LCH	V	21.71	<34.77	PASS
		H	21.38		
	MCH	V	20.14		PASS
		H	20.13		
	HCH	V	21.44		PASS
		H	21.24		

Max. Conducted Output Power
Please refer to Appendix A: Average Power Output Data
Test result: Pass

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

8.1 Standard Applicable

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

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

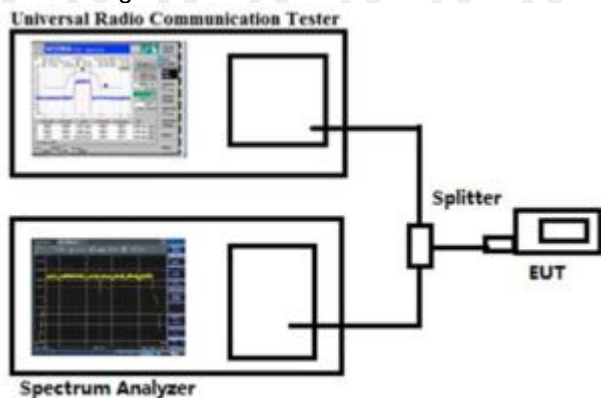
corresponding to the highest PAPR expected during periods of continuous transmission.

8.2 Test Procedure

According with KDB 971168

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

Test Configuration for the emission bandwidth testing:



8.3 Summary of Test Results

Please refer to Appendix 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.

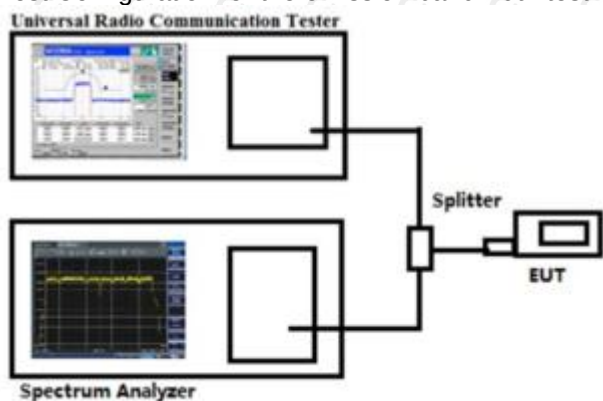
According to §24.238(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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.

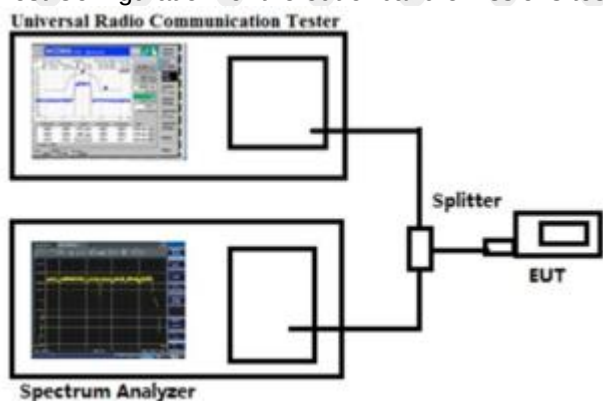
According to §27.53(g), for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ 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.

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:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

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

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

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

11.2 Test Procedure

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

11.3 Summary of Test Results/Plots

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

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

Test Data:
QPSK

Band 2 18607 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1267.85	140	344	-57.11	-13	-44.11	Pass	H
1672.66	144	172	-49.14	-13	-36.14	Pass	H
3920.76	153	77	-45.11	-13	-32.11	Pass	H
5917.07	145	211	-44.82	-13	-31.82	Pass	H
6451.11	157	275	-41.67	-13	-28.67	Pass	H
8174.12	153	254	-43.94	-13	-30.94	Pass	H
1217.62	154	157	-55.55	-13	-42.55	Pass	V
1470.13	157	76	-58.11	-13	-45.11	Pass	V
3621.09	153	69	-52.43	-13	-39.43	Pass	V
3922.45	148	210	-50.39	-13	-37.39	Pass	V
5856.87	151	67	-47.32	-13	-34.32	Pass	V
6599.20	157	27	-45.96	-13	-32.96	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.
1209.86	150	45	-59.04	-13	-46.04	Pass	H
1666.12	146	255	-52.17	-13	-39.17	Pass	H
3801.04	150	285	-51.23	-13	-38.23	Pass	H
5825.92	146	259	-44.81	-13	-31.81	Pass	H
6358.76	149	186	-46.17	-13	-33.17	Pass	H
8078.57	151	195	-48.51	-13	-35.51	Pass	H
1229.21	149	126	-55.26	-13	-42.26	Pass	V
1465.17	148	318	-56.28	-13	-43.28	Pass	V
3576.83	147	286	-55.61	-13	-42.61	Pass	V
3995.29	148	65	-49.17	-13	-36.17	Pass	V
5732.65	150	129	-47.65	-13	-34.65	Pass	V
6420.36	150	29	-45.67	-13	-32.67	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.
1277.28	148	20	-57.30	-13	-44.30	Pass	H
1696.77	152	144	-51.30	-13	-38.30	Pass	H
3895.42	149	186	-46.59	-13	-33.59	Pass	H
5981.69	145	150	-42.26	-13	-29.26	Pass	H
6603.70	152	297	-40.11	-13	-27.11	Pass	H
8017.28	148	65	-42.17	-13	-29.17	Pass	H
1253.51	151	223	-58.04	-13	-45.04	Pass	V
1460.52	150	143	-59.24	-13	-46.24	Pass	V
3487.96	150	256	-51.67	-13	-38.67	Pass	V
3903.59	146	181	-47.37	-13	-34.37	Pass	V
5695.15	145	179	-42.12	-13	-29.12	Pass	V
6558.93	146	108	-49.57	-13	-36.57	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.
1259.29	146	221	-59.21	-13	-46.21	Pass	H
1665.25	153	292	-48.27	-13	-35.27	Pass	H
3818.03	147	352	-51.71	-13	-38.71	Pass	H
5938.27	151	258	-46.87	-13	-33.87	Pass	H
6552.67	155	270	-44.60	-13	-31.60	Pass	H
7929.25	150	94	-42.94	-13	-29.94	Pass	H
1128.83	153	258	-55.05	-13	-42.05	Pass	V
1517.19	154	37	-54.90	-13	-41.90	Pass	V
3508.36	153	277	-50.86	-13	-37.86	Pass	V
3812.04	149	145	-50.51	-13	-37.51	Pass	V
5845.28	149	292	-44.34	-13	-31.34	Pass	V
6641.50	145	24	-49.12	-13	-36.12	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.
1413.61	149	267	-50.95	-13	-41.45	Pass	H
1657.53	150	145	-51.99	-13	-37.85	Pass	H
3812.81	154	210	-45.12	-13	-35.2	Pass	H
5873.72	152	20	-44.22	-13	-30.39	Pass	H
6499.53	145	288	-47.69	-13	-32.24	Pass	H
8113.01	146	121	-40.67	-13	-30.22	Pass	H
1108.47	149	125	-58.87	-13	-44.9	Pass	V
1308.26	146	192	-54.90	-13	-43.63	Pass	V
3557.89	150	153	-45.37	-13	-35.94	Pass	V
3938.96	153	13	-50.30	-13	-36.01	Pass	V
5881.17	151	115	-44.76	-13	-33.75	Pass	V
6433.39	152	69	-45.83	-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.
1251.18	152	338	-56.87	-13	-43.87	Pass	H
1621.20	155	88	-50.45	-13	-37.45	Pass	H
3825.80	152	134	-42.68	-13	-29.68	Pass	H
5814.83	148	117	-44.11	-13	-31.11	Pass	H
6472.92	154	74	-43.01	-13	-30.01	Pass	H
8166.16	149	153	-48.66	-13	-35.66	Pass	H
1221.35	145	226	-55.50	-13	-42.50	Pass	V
1457.64	148	350	-56.90	-13	-43.90	Pass	V
3486.95	150	275	-46.61	-13	-33.61	Pass	V
3817.82	154	38	-53.09	-13	-40.09	Pass	V
5736.09	151	71	-47.83	-13	-34.83	Pass	V
6644.83	150	194	-44.00	-13	-31.00	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.
1410.89	145	68	-55.59	-13	-42.59	Pass	H
1717.19	153	147	-50.08	-13	-37.08	Pass	H
3777.72	151	59	-48.85	-13	-35.85	Pass	H
6001.66	149	251	-46.56	-13	-33.56	Pass	H
6578.01	145	102	-43.20	-13	-30.20	Pass	H
7991.18	153	178	-41.42	-13	-28.42	Pass	H
1106.14	154	123	-51.32	-13	-38.32	Pass	V
1334.16	149	130	-55.99	-13	-42.99	Pass	V
3667.28	150	87	-49.09	-13	-36.09	Pass	V
3960.83	145	259	-51.10	-13	-38.10	Pass	V
5927.25	146	268	-41.90	-13	-28.90	Pass	V
6642.29	154	16	-46.64	-13	-33.64	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.
1264.19	146	173	-51.68	-13	-38.68	Pass	H
1808.75	154	191	-51.35	-13	-38.35	Pass	H
3753.95	155	324	-49.63	-13	-36.63	Pass	H
5857.48	146	282	-40.52	-13	-27.52	Pass	H
6431.26	148	241	-40.80	-13	-27.80	Pass	H
8025.89	151	220	-42.79	-13	-29.79	Pass	H
1134.95	150	137	-60.54	-13	-47.54	Pass	V
1365.77	152	330	-56.89	-13	-43.89	Pass	V
3624.64	146	6	-51.79	-13	-38.79	Pass	V
3822.69	150	265	-46.35	-13	-33.35	Pass	V
5747.91	146	261	-45.24	-13	-32.24	Pass	V
6578.21	153	166	-46.32	-13	-33.32	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.
1412.58	149	165	-56.21	-13	-43.21	Pass	H
1662.55	146	208	-46.12	-13	-33.12	Pass	H
3814.71	146	4	-43.26	-13	-30.26	Pass	H
5901.80	150	198	-40.97	-13	-27.97	Pass	H
6439.23	146	341	-41.23	-13	-28.23	Pass	H
8025.62	150	235	-42.94	-13	-29.94	Pass	H
1262.20	146	292	-51.62	-13	-38.62	Pass	V
1460.22	150	158	-59.58	-13	-46.58	Pass	V
3587.82	149	55	-52.64	-13	-39.64	Pass	V
3870.42	150	319	-47.73	-13	-34.73	Pass	V
5827.52	146	118	-44.86	-13	-31.86	Pass	V
6471.04	150	155	-45.56	-13	-32.56	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.
1304.47	150	78	-59.00	-13	-46.00	Pass	H
1782.67	149	291	-50.24	-13	-37.24	Pass	H
3831.87	151	213	-52.88	-13	-39.88	Pass	H
5906.00	150	89	-49.36	-13	-36.36	Pass	H
6578.20	151	329	-47.78	-13	-34.78	Pass	H
7969.53	148	138	-44.23	-13	-31.23	Pass	H
1145.49	149	99	-56.22	-13	-43.22	Pass	V
1469.73	148	217	-53.03	-13	-40.03	Pass	V
3665.07	150	12	-50.50	-13	-37.50	Pass	V
3848.10	150	137	-50.34	-13	-37.34	Pass	V
5731.11	146	356	-42.54	-13	-29.54	Pass	V
6598.84	146	95	-45.07	-13	-32.07	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.
1236.45	150	142	-56.07	-13	-43.07	Pass	H
1754.11	146	280	-51.60	-13	-38.60	Pass	H
3860.21	150	330	-46.82	-13	-33.82	Pass	H
5806.42	146	194	-47.70	-13	-34.70	Pass	H
6449.73	149	260	-47.41	-13	-34.41	Pass	H
7971.22	151	31	-45.24	-13	-32.24	Pass	H
1139.73	149	4	-56.61	-13	-43.61	Pass	V
1465.46	148	257	-59.34	-13	-46.34	Pass	V
3508.83	147	55	-48.57	-13	-35.57	Pass	V
4005.35	148	273	-49.95	-13	-36.95	Pass	V
5850.66	150	136	-48.40	-13	-35.40	Pass	V
6424.53	150	16	-46.44	-13	-33.44	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.
1337.05	149	156	-54.16	-13	-41.16	Pass	H
1648.37	149	170	-48.71	-13	-35.71	Pass	H
3789.27	149	127	-49.26	-13	-36.26	Pass	H
5822.74	146	42	-45.27	-13	-32.27	Pass	H
6466.32	147	69	-43.77	-13	-30.77	Pass	H
7930.83	151	110	-44.55	-13	-31.55	Pass	H
1215.52	148	61	-50.50	-13	-37.50	Pass	V
1355.60	147	266	-51.30	-13	-38.30	Pass	V
3476.33	148	303	-53.22	-13	-40.22	Pass	V
3905.03	149	195	-46.82	-13	-33.82	Pass	V
5746.10	147	323	-44.44	-13	-31.44	Pass	V
6489.94	146	325	-47.91	-13	-34.91	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.
1239.05	150	239	-58.26	-13	-45.26	Pass	H
1631.21	144	184	-49.54	-13	-36.54	Pass	H
3963.13	141	177	-44.92	-13	-31.92	Pass	H
5926.25	145	21	-44.23	-13	-31.23	Pass	H
6437.92	142	165	-42.17	-13	-29.17	Pass	H
8067.06	151	152	-43.06	-13	-30.06	Pass	H
1199.22	148	44	-56.12	-13	-43.12	Pass	V
1455.71	152	174	-55.96	-13	-42.96	Pass	V
3452.19	158	168	-51.81	-13	-38.81	Pass	V
3760.49	143	79	-50.34	-13	-37.34	Pass	V
5709.65	155	49	-47.38	-13	-34.38	Pass	V
6465.55	145	334	-47.14	-13	-34.14	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.
1328.85	150	20	-59.08	-13	-46.08	Pass	H
1778.35	146	105	-49.21	-13	-36.21	Pass	H
3808.90	150	233	-52.96	-13	-39.96	Pass	H
5963.15	146	169	-46.98	-13	-33.98	Pass	H
6449.24	149	310	-48.35	-13	-35.35	Pass	H
7987.58	151	122	-48.21	-13	-35.21	Pass	H
1164.59	149	293	-55.50	-13	-42.50	Pass	V
1408.35	148	230	-57.19	-13	-44.19	Pass	V
3548.62	147	309	-56.33	-13	-43.33	Pass	V
3866.49	148	359	-51.15	-13	-38.15	Pass	V
5879.28	150	273	-49.17	-13	-36.17	Pass	V
6598.26	150	66	-50.65	-13	-37.65	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.
1403.19	146	217	-57.85	-13	-44.85	Pass	H
1733.47	153	11	-53.73	-13	-40.73	Pass	H
3784.82	153	133	-44.79	-13	-31.79	Pass	H
5808.03	148	162	-43.56	-13	-30.56	Pass	H
6432.33	149	290	-44.97	-13	-31.97	Pass	H
8019.02	148	152	-42.08	-13	-29.08	Pass	H
1314.13	145	237	-56.73	-13	-43.73	Pass	V
1316.23	149	68	-58.70	-13	-45.70	Pass	V
3526.12	154	44	-54.05	-13	-41.05	Pass	V
3834.35	147	281	-47.97	-13	-34.97	Pass	V
5846.68	154	28	-43.41	-13	-30.41	Pass	V
6549.26	155	7	-49.05	-13	-36.05	Pass	V

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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.
1289.34	154	32	-56.92	-13	-43.92	Pass	H
1778.70	146	3	-48.32	-13	-35.32	Pass	H
3850.56	152	241	-46.79	-13	-33.79	Pass	H
6000.45	148	25	-44.13	-13	-31.13	Pass	H
6539.13	153	4	-44.91	-13	-31.91	Pass	H
8041.18	148	268	-42.41	-13	-29.41	Pass	H
1195.10	149	292	-51.36	-13	-38.36	Pass	V
1509.03	153	119	-58.54	-13	-45.54	Pass	V
3660.37	152	193	-53.16	-13	-40.16	Pass	V
3813.15	150	294	-49.70	-13	-36.70	Pass	V
5875.91	146	156	-44.91	-13	-31.91	Pass	V
6494.63	154	55	-47.60	-13	-34.60	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.
1416.95	153	291	-56.49	-13	-41.45	Pass	H
1768.46	154	288	-53.43	-13	-37.85	Pass	H
3946.48	154	113	-49.73	-13	-35.2	Pass	H
5915.12	148	100	-40.70	-13	-30.39	Pass	H
6410.77	148	3	-44.04	-13	-32.24	Pass	H
8145.14	149	263	-45.34	-13	-30.22	Pass	H
1253.33	150	220	-57.26	-13	-44.9	Pass	V
1385.12	151	133	-54.30	-13	-43.63	Pass	V
3453.25	148	325	-50.02	-13	-35.94	Pass	V
3832.38	148	192	-50.37	-13	-36.01	Pass	V
5820.25	146	177	-45.35	-13	-33.75	Pass	V
6469.14	150	161	-47.00	-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.
1316.62	145	58	-52.76	-13	-39.76	Pass	H
1709.43	150	185	-49.89	-13	-36.89	Pass	H
3910.95	146	82	-41.51	-13	-28.51	Pass	H
5829.24	147	12	-43.67	-13	-30.67	Pass	H
6514.03	153	134	-43.85	-13	-30.85	Pass	H
8086.92	153	312	-46.63	-13	-33.63	Pass	H
1202.61	146	22	-54.24	-13	-41.24	Pass	V
1472.87	148	93	-61.86	-13	-48.86	Pass	V
3500.20	151	333	-47.09	-13	-34.09	Pass	V
3766.84	150	212	-51.85	-13	-38.85	Pass	V
5899.71	151	117	-51.89	-13	-38.89	Pass	V
6572.16	152	194	-44.84	-13	-31.84	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.

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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.
1355.61	154	340	-57.05	-13	-44.05	Pass	H
1713.13	153	190	-45.78	-13	-32.78	Pass	H
3934.49	154	155	-51.58	-13	-38.58	Pass	H
5994.68	150	347	-46.27	-13	-33.27	Pass	H
6525.13	151	184	-42.27	-13	-29.27	Pass	H
8068.46	149	340	-40.03	-13	-27.03	Pass	H
1174.41	150	106	-55.63	-13	-42.63	Pass	V
1474.73	153	100	-55.78	-13	-42.78	Pass	V
3552.39	148	250	-51.57	-13	-38.57	Pass	V
3809.27	151	351	-51.83	-13	-38.83	Pass	V
5841.57	154	83	-43.11	-13	-30.11	Pass	V
6502.24	149	262	-49.53	-13	-36.53	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.
1403.11	150	312	-52.90	-13	-39.90	Pass	H
1806.68	150	181	-47.20	-13	-34.20	Pass	H
3854.56	146	328	-50.43	-13	-37.43	Pass	H
5865.36	148	161	-41.73	-13	-28.73	Pass	H
6443.86	147	263	-40.23	-13	-27.23	Pass	H
8116.95	150	10	-45.24	-13	-32.24	Pass	H
1132.90	147	305	-58.32	-13	-45.32	Pass	V
1285.87	150	56	-56.45	-13	-43.45	Pass	V
3452.20	149	281	-47.98	-13	-34.98	Pass	V
3852.55	150	61	-48.88	-13	-35.88	Pass	V
5852.61	150	208	-44.71	-13	-31.71	Pass	V
6588.73	152	158	-46.69	-13	-33.69	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.
1410.11	149	165	-51.55	-13	-38.55	Pass	H
1662.37	146	208	-45.65	-13	-32.65	Pass	H
3831.10	146	4	-45.31	-13	-32.31	Pass	H
5906.71	150	198	-43.80	-13	-30.80	Pass	H
6572.38	146	341	-46.33	-13	-33.33	Pass	H
8063.64	150	235	-39.28	-13	-26.28	Pass	H
1130.26	146	292	-56.95	-13	-43.95	Pass	V
1553.93	150	158	-53.65	-13	-40.65	Pass	V
3502.24	149	55	-48.59	-13	-35.59	Pass	V
3848.28	150	319	-49.71	-13	-36.71	Pass	V
5843.94	146	118	-43.56	-13	-30.56	Pass	V
6508.67	150	155	-50.78	-13	-37.78	Pass	V

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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.
1416.49	150	78	-54.72	-13	-41.72	Pass	H
1799.06	149	291	-49.48	-13	-36.48	Pass	H
3818.57	151	213	-52.19	-13	-39.19	Pass	H
5804.48	150	89	-43.82	-13	-30.82	Pass	H
6546.12	151	329	-46.46	-13	-33.46	Pass	H
7914.50	148	138	-47.29	-13	-34.29	Pass	H
1183.78	149	99	-56.85	-13	-43.85	Pass	V
1516.86	148	217	-57.40	-13	-44.40	Pass	V
3594.72	150	12	-46.58	-13	-33.58	Pass	V
3788.17	150	137	-50.17	-13	-37.17	Pass	V
5846.38	146	356	-45.06	-13	-32.06	Pass	V
6616.60	146	95	-50.86	-13	-37.86	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.
1209.31	150	142	-57.55	-13	-44.55	Pass	H
1791.47	146	280	-55.37	-13	-42.37	Pass	H
3816.97	150	330	-50.27	-13	-37.27	Pass	H
5850.39	146	194	-45.53	-13	-32.53	Pass	H
6361.25	149	260	-52.87	-13	-39.87	Pass	H
8092.90	151	31	-48.25	-13	-35.25	Pass	H
1229.81	149	4	-56.06	-13	-43.06	Pass	V
1380.44	148	257	-59.91	-13	-46.91	Pass	V
3550.09	147	55	-50.03	-13	-37.03	Pass	V
3859.91	148	273	-53.19	-13	-40.19	Pass	V
5890.16	150	136	-50.96	-13	-37.96	Pass	V
6609.96	150	16	-47.93	-13	-34.93	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.
1264.07	149	156	-55.34	-13	-42.34	Pass	H
1655.81	149	170	-52.40	-13	-39.40	Pass	H
3749.15	149	127	-44.20	-13	-31.20	Pass	H
5841.04	146	42	-39.86	-13	-26.86	Pass	H
6463.96	147	69	-39.89	-13	-26.89	Pass	H
7944.04	151	110	-49.11	-13	-36.11	Pass	H
1253.12	148	61	-55.34	-13	-42.34	Pass	V
1371.52	147	266	-55.37	-13	-42.37	Pass	V
3445.16	148	303	-49.09	-13	-36.09	Pass	V
3867.61	149	195	-46.98	-13	-33.98	Pass	V
5709.31	147	323	-47.09	-13	-34.09	Pass	V
6507.63	146	325	-50.27	-13	-37.27	Pass	V

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Band 13 23205 channel/BW5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1397.59	149	238	-54.12	-13	-41.12	Pass	H
1656.33	147	117	-47.24	-13	-34.24	Pass	H
3822.52	153	136	-49.36	-13	-36.36	Pass	H
5989.54	148	80	-44.77	-13	-31.77	Pass	H
6506.56	149	315	-46.04	-13	-33.04	Pass	H
8095.17	147	307	-41.75	-13	-28.75	Pass	H
1117.59	148	345	-50.70	-13	-37.70	Pass	V
1399.73	151	39	-54.64	-13	-41.64	Pass	V
3614.26	149	29	-53.00	-13	-40.00	Pass	V
3912.62	147	267	-53.33	-13	-40.33	Pass	V
5915.83	152	45	-43.53	-13	-30.53	Pass	V
6647.78	146	20	-46.21	-13	-33.21	Pass	V
Band 13 23230 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1320.37	148	196	-51.53	-13	-38.53	Pass	H
1704.86	154	141	-47.56	-13	-34.56	Pass	H
3834.22	147	351	-46.13	-13	-33.13	Pass	H
5897.38	154	9	-43.70	-13	-30.70	Pass	H
6560.84	150	276	-45.81	-13	-32.81	Pass	H
7964.94	151	104	-46.43	-13	-33.43	Pass	H
1252.49	148	289	-53.68	-13	-40.68	Pass	V
1392.22	146	269	-62.51	-13	-49.51	Pass	V
3595.52	149	248	-48.57	-13	-35.57	Pass	V
3764.29	155	276	-47.01	-13	-34.01	Pass	V
5802.28	147	239	-43.57	-13	-30.57	Pass	V
6523.35	147	351	-42.77	-13	-29.77	Pass	V

Band 13 23255 channel/BW5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1265.91	149	165	-51.70	-13	-38.70	Pass	H
1623.81	146	208	-47.55	-13	-34.55	Pass	H
3960.36	146	4	-44.90	-13	-31.90	Pass	H
5896.76	150	198	-39.12	-13	-26.12	Pass	H
6608.65	146	341	-43.56	-13	-30.56	Pass	H
8068.23	150	235	-40.08	-13	-27.08	Pass	H
1255.07	146	292	-53.07	-13	-40.07	Pass	V
1381.79	150	158	-57.78	-13	-44.78	Pass	V
3558.00	149	55	-49.25	-13	-36.25	Pass	V
3744.64	150	319	-48.10	-13	-35.10	Pass	V
5718.01	146	118	-46.43	-13	-33.43	Pass	V
6558.03	150	155	-47.95	-13	-34.95	Pass	V

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Band 13 23205 channel/BW5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1433.85	150	78	-52.77	-13	-39.77	Pass	H
1732.04	149	291	-49.41	-13	-36.41	Pass	H
3901.92	151	213	-48.52	-13	-35.52	Pass	H
5930.65	150	89	-48.60	-13	-35.60	Pass	H
6570.47	151	329	-43.94	-13	-30.94	Pass	H
7924.85	148	138	-49.52	-13	-36.52	Pass	H
1256.05	149	99	-58.22	-13	-45.22	Pass	V
1534.45	148	217	-51.66	-13	-38.66	Pass	V
3495.90	150	12	-48.04	-13	-35.04	Pass	V
3812.28	150	137	-46.87	-13	-33.87	Pass	V
5735.70	146	356	-46.77	-13	-33.77	Pass	V
6568.41	146	95	-49.62	-13	-36.62	Pass	V

Band 13 23230 channel/BW5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1236.42	150	142	-53.58	-13	-40.58	Pass	H
1623.39	146	280	-54.65	-13	-41.65	Pass	H
3837.61	150	330	-50.34	-13	-37.34	Pass	H
5843.59	146	194	-42.15	-13	-29.15	Pass	H
6469.28	149	260	-52.86	-13	-39.86	Pass	H
7971.46	151	31	-45.27	-13	-32.27	Pass	H
1160.40	149	4	-50.80	-13	-37.80	Pass	V
1491.37	148	257	-64.23	-13	-51.23	Pass	V
3576.12	147	55	-53.08	-13	-40.08	Pass	V
3973.61	148	273	-55.77	-13	-42.77	Pass	V
5822.78	150	136	-51.87	-13	-38.87	Pass	V
6523.96	150	16	-49.01	-13	-36.01	Pass	V
Band 13 23255 channel/BW5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1273.34	149	156	-56.19	-13	-43.19	Pass	H
1646.58	149	170	-52.53	-13	-39.53	Pass	H
3765.44	149	127	-47.05	-13	-34.05	Pass	H
5874.60	146	42	-42.33	-13	-29.33	Pass	H
6468.87	147	69	-46.21	-13	-33.21	Pass	H
7957.70	151	110	-46.79	-13	-33.79	Pass	H
1175.43	148	61	-53.99	-13	-40.99	Pass	V
1401.81	147	266	-52.71	-13	-39.71	Pass	V
3491.30	148	303	-52.64	-13	-39.64	Pass	V
3845.68	149	195	-47.32	-13	-34.32	Pass	V
5698.19	147	323	-44.64	-13	-31.64	Pass	V
6530.10	146	325	-50.37	-13	-37.37	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= DC3.7V; Low Voltage LV=DC3.33; High Voltage HV=DC4.07V

Test result: Pass

LTE Band 2

Test Frequency:1880.0MHz QPSK 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	7	0.0037	2.5
40		9	0.0048	2.5
30		7	0.0037	2.5
20		1	0.0005	2.5
10		-4	-0.0021	2.5
0		0	0.0000	2.5
-10		0	0.0000	2.5
-20		8	0.0043	2.5
-30		8	0.0043	2.5
20	3.33	-6	-0.0032	2.5
20	4.07	-1	-0.0005	2.5

Test Frequency:1880.0MHz 16QAM 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	5	0.0027	2.5
40		-1	-0.0005	2.5
30		-7	-0.0037	2.5
20		1	0.0005	2.5
10		6	0.0032	2.5
0		-7	-0.0037	2.5
-10		9	0.0048	2.5
-20		5	0.0027	2.5
-30		-7	-0.0037	2.5
20	3.33	3	0.0016	2.5
20	4.07	9	0.0048	2.5

LTE Band 2

Test Frequency:1880.0MHz QPSK 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	7	0.0037	2.5
40		-4	-0.0021	2.5
30		7	0.0037	2.5
20		2	0.0011	2.5
10		5	0.0027	2.5
0		-1	-0.0005	2.5
-10		1	0.0005	2.5
-20		9	0.0048	2.5
-30		1	0.0005	2.5
20	3.33	11	0.0059	2.5
20	4.07	-7	-0.0037	2.5

Test Frequency:1880.0MHz 16QAM 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	0	0.0000	2.5
40		1	0.0005	2.5
30		1	0.0005	2.5
20		-1	-0.0005	2.5
10		1	0.0005	2.5
0		2	0.0011	2.5
-10		-6	-0.0032	2.5
-20		-8	-0.0043	2.5
-30		-6	-0.0032	2.5
20	3.33	-6	-0.0032	2.5
20	4.07	2	0.0011	2.5

LTE Band 2

Test Frequency:1880.0MHz QPSK 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-11	-0.0059	2.5
40		-11	-0.0059	2.5
30		-7	-0.0037	2.5
20		-2	-0.0011	2.5
10		-4	-0.0021	2.5
0		-5	-0.0027	2.5
-10		-5	-0.0027	2.5
-20		-6	-0.0032	2.5
-30		-3	-0.0016	2.5
20	3.33	-4	-0.0021	2.5
20	4.07	4	0.0021	2.5

Test Frequency:1880.0MHz 16QAM 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	4	0.0021	2.5
40		-2	-0.0011	2.5
30		-5	-0.0027	2.5
20		-3	-0.0016	2.5
10		-1	-0.0005	2.5
0		-4	-0.0021	2.5
-10		5	0.0027	2.5
-20		-1	-0.0005	2.5
-30		2	0.0011	2.5
20	3.33	-4	-0.0021	2.5
20	4.07	2	0.0011	2.5

LTE Band 2

Test Frequency:1880.0MHz QPSK 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	7	0.0037	2.5
40		4	0.0021	2.5
30		7	0.0037	2.5
20		4	0.0021	2.5
10		2	0.0011	2.5
0		11	0.0059	2.5
-10		2	0.0011	2.5
-20		8	0.0043	2.5
-30		11	0.0059	2.5
20	3.33	0	0.0000	2.5
20	4.07	13	0.0069	2.5

Test Frequency:1880.0MHz 16QAM 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	7	0.0037	2.5
40		13	0.0069	2.5
30		1	0.0005	2.5
20		5	0.0027	2.5
10		1	0.0005	2.5
0		8	0.0043	2.5
-10		1	0.0005	2.5
-20		-4	-0.0021	2.5
-30		4	0.0021	2.5
20	3.33	3	0.0016	2.5
20	4.07	-4	-0.0021	2.5

LTE Band 2

Test Frequency:1880.0MHz QPSK 15MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-5	-0.0027	2.5
40		4	0.0021	2.5
30		5	0.0027	2.5
20		1	0.0005	2.5
10		7	0.0037	2.5
0		-7	-0.0037	2.5
-10		-2	-0.0011	2.5
-20		4	0.0021	2.5
-30		5	0.0027	2.5
20	3.33	-6	-0.0032	2.5
20	4.07	-6	-0.0032	2.5

Test Frequency:1880.0MHz 16QAM 15MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	15	0.0080	2.5
40		3	0.0016	2.5
30		10	0.0053	2.5
20		6	0.0032	2.5
10		2	0.0011	2.5
0		1	0.0005	2.5
-10		12	0.0064	2.5
-20		9	0.0048	2.5
-30		0	0.0000	2.5
20	3.33	9	0.0048	2.5
20	4.07	6	0.0032	2.5

LTE Band 2

Test Frequency:1880.0MHz QPSK 20MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-7	-0.0037	2.5
40		-1	-0.0005	2.5
30		-8	-0.0043	2.5
20		-6	-0.0032	2.5
10		-14	-0.0074	2.5
0		1	0.0005	2.5
-10		-11	-0.0059	2.5
-20		-11	-0.0059	2.5
-30		-5	-0.0027	2.5
20	3.33	-9	-0.0048	2.5
20	4.07	-8	-0.0043	2.5

Test Frequency:1880.0MHz 16QAM 20MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-12	-0.0064	2.5
40		0	0.0000	2.5
30		-8	-0.0043	2.5
20		-7	-0.0037	2.5
10		-8	-0.0043	2.5
0		-11	-0.0059	2.5
-10		-9	-0.0048	2.5
-20		1	0.0005	2.5
-30		-1	-0.0005	2.5
20	3.33	-6	-0.0032	2.5
20	4.07	-6	-0.0032	2.5

LTE Band 4

Test Frequency:1732.5MHz QPSK 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-5	-0.0029	2.5
40		-1	-0.0006	2.5
30		-2	-0.0012	2.5
20		1	0.0006	2.5
10		-1	-0.0006	2.5
0		10	0.0058	2.5
-10		5	0.0029	2.5
-20		7	0.0040	2.5
-30		-8	-0.0046	2.5
20	3.33	-5	-0.0029	2.5
20	4.07	7	0.0040	2.5

Test Frequency:1732.5MHz 16QAM 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	5	0.0029	2.5
40		9	0.0052	2.5
30		9	0.0052	2.5
20		2	0.0012	2.5
10		8	0.0046	2.5
0		1	0.0006	2.5
-10		4	0.0023	2.5
-20		1	0.0006	2.5
-30		7	0.0040	2.5
20	3.33	4	0.0023	2.5
20	4.07	-1	-0.0006	2.5

LTE Band 4

Test Frequency:1732.5MHz QPSK 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-5	-0.0029	2.5
40		9	0.0052	2.5
30		3	0.0017	2.5
20		3	0.0017	2.5
10		3	0.0017	2.5
0		-3	-0.0017	2.5
-10		3	0.0017	2.5
-20		4	0.0023	2.5
-30		2	0.0012	2.5
20	3.33	12	0.0069	2.5
20	4.07	5	0.0029	2.5

Test Frequency:1732.5MHz 16QAM 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	5	0.0029	2.5
40		11	0.0063	2.5
30		5	0.0029	2.5
20		4	0.0023	2.5
10		2	0.0012	2.5
0		-4	-0.0023	2.5
-10		-1	-0.0006	2.5
-20		0	0.0000	2.5
-30		5	0.0029	2.5
20	3.33	2	0.0012	2.5
20	4.07	2	0.0012	2.5

LTE Band 4

Test Frequency:1732.5MHz QPSK 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	(Hz)	(ppm)	(ppm)
40		4	0.0023	2.5
30		0	0.0000	2.5
20		13	0.0075	2.5
10		5	0.0029	2.5
0		12	0.0069	2.5
-10		11	0.0063	2.5
-20		10	0.0058	2.5
-30		2	0.0012	2.5
20	3.33	6	0.0035	2.5
20	4.07	3	0.0017	2.5

Test Frequency:1732.5MHz 16QAM 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	1	0.0006	2.5
40		-2	-0.0012	2.5
30		7	0.0040	2.5
20		6	0.0035	2.5
10		0	0.0000	2.5
0		4	0.0023	2.5
-10		-1	-0.0006	2.5
-20		5	0.0029	2.5
-30		-1	-0.0006	2.5
20	3.33	9	0.0052	2.5
20	4.07	9	0.0052	2.5

LTE Band 4

Test Frequency:1732.5MHz QPSK 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	13	0.0075	2.5
40		13	0.0075	2.5
30		-2	-0.0012	2.5
20		7	0.0040	2.5
10		13	0.0075	2.5
0		2	0.0012	2.5
-10		0	0.0000	2.5
-20		5	0.0029	2.5
-30		3	0.0017	2.5
20	3.33	15	0.0087	2.5
20	4.07	8	0.0046	2.5

Test Frequency:1732.5MHz 16QAM 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-7	-0.0040	2.5
40		-2	-0.0012	2.5
30		1	0.0006	2.5
20		-1	-0.0006	2.5
10		-9	-0.0052	2.5
0		-8	-0.0046	2.5
-10		-5	-0.0029	2.5
-20		8	0.0046	2.5
-30		-2	-0.0012	2.5
20	3.33	6	0.0035	2.5
20	4.07	-6	-0.0035	2.5

LTE Band 4

Test Frequency:1732.5MHz QPSK 15MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	1	0.0006	2.5
40		7	0.0040	2.5
30		6	0.0035	2.5
20		-2	-0.0012	2.5
10		-2	-0.0012	2.5
0		-7	-0.0040	2.5
-10		-8	-0.0046	2.5
-20		-10	-0.0058	2.5
-30		-10	-0.0058	2.5
20	3.33	-6	-0.0035	2.5
20	4.07	-1	-0.0006	2.5

Test Frequency:1732.5MHz 16QAM 15MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	1	0.0006	2.5
40		-5	-0.0029	2.5
30		-9	-0.0052	2.5
20		-3	-0.0017	2.5
10		-5	-0.0029	2.5
0		-6	-0.0035	2.5
-10		-3	-0.0017	2.5
-20		-4	-0.0023	2.5
-30		4	0.0023	2.5
20	3.33	-6	-0.0035	2.5
20	4.07	-6	-0.0035	2.5

LTE Band 4

Test Frequency:1732.5MHz QPSK 20MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-11	-0.0063	2.5
40		-13	-0.0075	2.5
30		-1	-0.0006	2.5
20		-4	-0.0023	2.5
10		-11	-0.0063	2.5
0		-4	-0.0023	2.5
-10		-12	-0.0069	2.5
-20		2	0.0012	2.5
-30		3	0.0017	2.5
20	3.33	3	0.0017	2.5
20	4.07	-7	-0.0040	2.5

Test Frequency:1732.5MHz 16QAM 20MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-5	-0.0029	2.5
40		0	0.0000	2.5
30		-2	-0.0012	2.5
20		-5	-0.0029	2.5
10		-7	-0.0040	2.5
0		-9	-0.0052	2.5
-10		-4	-0.0023	2.5
-20		-13	-0.0075	2.5
-30		-2	-0.0012	2.5
20	3.33	-9	-0.0052	2.5
20	4.07	-10	-0.0058	2.5

LTE Band 5

Test Frequency:836.5MHz QPSK 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-2	-0.0024	2.5
40		-4	-0.0048	2.5
30		8	0.0096	2.5
20		1	0.0012	2.5
10		-3	-0.0036	2.5
0		3	0.0036	2.5
-10		4	0.0048	2.5
-20		-2	-0.0024	2.5
-30		5	0.0060	2.5
20	3.33	3	0.0036	2.5
20	4.07	2	0.0024	2.5

Test Frequency:836.5MHz 16QAM 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	2	0.0024	2.5
40		11	0.0132	2.5
30		-6	-0.0072	2.5
20		2	0.0024	2.5
10		-2	-0.0024	2.5
0		-7	-0.0084	2.5
-10		1	0.0012	2.5
-20		9	0.0108	2.5
-30		-6	-0.0072	2.5
20	3.33	11	0.0132	2.5
20	4.07	7	0.0084	2.5

LTE Band 5

Test Frequency:836.5MHz QPSK 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-5	-0.0060	2.5
40		9	0.0108	2.5
30		4	0.0048	2.5
20		3	0.0036	2.5
10		11	0.0132	2.5
0		-1	-0.0012	2.5
-10		4	0.0048	2.5
-20		-5	-0.0060	2.5
-30		-1	-0.0012	2.5
20	3.33	1	0.0012	2.5
20	4.07	-2	-0.0024	2.5

Test Frequency:836.5MHz 16QAM 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-4	-0.0048	2.5
40		5	0.0060	2.5
30		-4	-0.0048	2.5
20		4	0.0048	2.5
10		10	0.0120	2.5
0		-3	-0.0036	2.5
-10		-4	-0.0048	2.5
-20		-5	-0.0060	2.5
-30		1	0.0012	2.5
20	3.33	3	0.0036	2.5
20	4.07	7	0.0084	2.5

LTE Band 5

Test Frequency:836.5MHz QPSK 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	13	0.0155	2.5
40		-1	-0.0012	2.5
30		6	0.0072	2.5
20		5	0.0060	2.5
10		2	0.0024	2.5
0		12	0.0143	2.5
-10		8	0.0096	2.5
-20		3	0.0036	2.5
-30		7	0.0084	2.5
20	3.33	3	0.0036	2.5
20	4.07	6	0.0072	2.5

Test Frequency:836.5MHz 16QAM 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	-2	-0.0024	2.5
40		11	0.0132	2.5
30		1	0.0012	2.5
20		6	0.0072	2.5
10		11	0.0132	2.5
0		2	0.0024	2.5
-10		0	0.0000	2.5
-20		-3	-0.0036	2.5
-30		1	0.0012	2.5
20	3.33	13	0.0155	2.5
20	4.07	3	0.0036	2.5

LTE Band 5

Test Frequency:836.5MHz QPSK 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	7	0.0084	2.5
40		11	0.0132	2.5
30		16	0.0191	2.5
20		7	0.0084	2.5
10		4	0.0048	2.5
0		0	0.0000	2.5
-10		9	0.0108	2.5
-20		11	0.0132	2.5
-30		0	0.0000	2.5
20	3.33	-2	-0.0024	2.5
20	4.07	16	0.0191	2.5

Test Frequency:836.5MHz 16QAM 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	16	0.0191	2.5
40		0	0.0000	2.5
30		11	0.0132	2.5
20		8	0.0096	2.5
10		12	0.0143	2.5
0		5	0.0060	2.5
-10		1	0.0012	2.5
-20		0	0.0000	2.5
-30		16	0.0191	2.5
20	3.33	7	0.0084	2.5
20	4.07	13	0.0155	2.5

LTE Band 12

Test Frequency:707.5MHz QPSK 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	4	0.0016	2.5
40		4	0.0016	2.5
30		12	0.0047	2.5
20		5	0.0020	2.5
10		7	0.0028	2.5
0		10	0.0039	2.5
-10		11	0.0043	2.5
-20		3	0.0012	2.5
-30		13	0.0051	2.5
20	3.33	1	0.0004	2.5
20	4.07	-2	-0.0008	2.5

Test Frequency:707.5MHz 16QAM 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	6	0.0024	2.5
40		4	0.0016	2.5
30		-6	-0.0024	2.5
20		3	0.0012	2.5
10		11	0.0043	2.5
0		-3	-0.0012	2.5
-10		-5	-0.0020	2.5
-20		4	0.0016	2.5
-30		8	0.0032	2.5
20	3.33	-1	-0.0004	2.5
20	4.07	-5	-0.0020	2.5

LTE Band 12

Test Frequency:707.5MHz QPSK 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	1	0.0004	2.5
40		7	0.0028	2.5
30		10	0.0039	2.5
20		1	0.0004	2.5
10		7	0.0028	2.5
0		7	0.0028	2.5
-10		5	0.0020	2.5
-20		-8	-0.0032	2.5
-30		-4	-0.0016	2.5
20	3.33	7	0.0028	2.5
20	4.07	-4	-0.0016	2.5

Test Frequency:707.5MHz 16QAM 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	4	0.0016	2.5
40		0	0.0000	2.5
30		-5	-0.0020	2.5
20		3	0.0012	2.5
10		11	0.0043	2.5
0		-5	-0.0020	2.5
-10		4	0.0016	2.5
-20		-4	-0.0016	2.5
-30		11	0.0043	2.5
20	3.33	-5	-0.0020	2.5
20	4.07	9	0.0036	2.5

LTE Band 12

Test Frequency:707.5MHz QPSK 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	4	0.0016	2.5
40		4	0.0016	2.5
30		0	0.0000	2.5
20		3	0.0012	2.5
10		4	0.0016	2.5
0		6	0.0024	2.5
-10		7	0.0028	2.5
-20		1	0.0004	2.5
-30		6	0.0024	2.5
20	3.33	-5	-0.0020	2.5
20	4.07	9	0.0036	2.5

Test Frequency:707.5MHz 16QAM 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	3	0.0012	2.5
40		8	0.0032	2.5
30		5	0.0020	2.5
20		6	0.0024	2.5
10		-1	-0.0004	2.5
0		13	0.0051	2.5
-10		6	0.0024	2.5
-20		-1	-0.0004	2.5
-30		12	0.0047	2.5
20	3.33	5	0.0020	2.5
20	4.07	14	0.0055	2.5

LTE Band 12

Test Frequency:707.5MHz QPSK 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	10	0.0039	2.5
40		-6	-0.0024	2.5
30		11	0.0043	2.5
20		3	0.0012	2.5
10		6	0.0024	2.5
0		-2	-0.0008	2.5
-10		12	0.0047	2.5
-20		9	0.0036	2.5
-30		4	0.0016	2.5
20	3.33	-5	-0.0020	2.5
20	4.07	10	0.0039	2.5

Test Frequency:707.5MHz 16QAM 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	6	0.0024	2.5
40		-5	-0.0020	2.5
30		-7	-0.0028	2.5
20		-2	-0.0008	2.5
10		0	0.0000	2.5
0		-1	-0.0004	2.5
-10		-3	-0.0012	2.5
-20		0	0.0000	2.5
-30		0	0.0000	2.5
20	3.33	-10	-0.0039	2.5
20	4.07	-1	-0.0004	2.5

LTE Band 13

Test Frequency: 782MHz QPSK 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	3	0.0038	2.5
40		-6	-0.0077	2.5
30		5	0.0064	2.5
20		6	0.0077	2.5
10		6	0.0077	2.5
0		-3	-0.0038	2.5
-10		6	0.0077	2.5
-20		-3	-0.0038	2.5
-30		10	0.0128	2.5
20	3.33	6	0.0077	2.5
20	4.07	4	0.0051	2.5

Test Frequency: 782MHz 16QAM 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	5	0.0064	2.5
40		1	0.0013	2.5
30		5	0.0064	2.5
20		5	0.0064	2.5
10		12	0.01535	2.5
0		0	0.0000	2.5
-10		1	0.0013	2.5
-20		7	0.00895	2.5
-30		1	0.0013	2.5
20	3.33	13	0.01662	2.5
20	4.07	-1	-0.0013	2.5

LTE Band 13

Test Frequency: 782MHz QPSK 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	2	0.0026	2.5
40		2	0.0026	2.5
30		6	0.0077	2.5
20		4	0.0051	2.5
10		4	0.0051	2.5
0		2	0.0026	2.5
-10		2	0.0026	2.5
-20		5	0.0064	2.5
-30		5	0.0064	2.5
20	3.33	2	0.0026	2.5
20	4.07	2	0.0026	2.5

Test Frequency: 782MHz 16QAM 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.7	7	0.0090	2.5
40		8	0.0102	2.5
30		2	0.0026	2.5
20		2	0.0026	2.5
10		1	0.0013	2.5
0		1	0.0013	2.5
-10		5	0.0064	2.5
-20		5	0.0064	2.5
-30		8	0.0102	2.5
20	3.33	4	0.0051	2.5
20	4.07	-4	-0.0051	2.5

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