

TEST REPORT

Product Name: Pod
FCC ID: 2A2I5-V1
Trademark: SGL Pod. Powered by Sigrow
Model Number: V1
Prepared For: Sigrow B.V.
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Manufacturer: Sigrow B.V.
Address: Nieuwe Kazernelaan 2 D86, 6711 JC Ede, The Netherlands
Prepared By: Shenzhen CTB Testing Technology Co., Ltd.
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Sample Received Date: Jun. 10, 2021
Sample tested Date: Jun. 10, 2021 to Jun. 21, 2021
Issue Date: Jun. 21, 2021
Report No.: CTB210622004RFX
Test Standards: FCC Part 2, 22, 24E, 27
Test Results: PASS
Remark: This is LTE radio test report.

Compiled by:

Arron Liu

Reviewed by:

Bin Mei

Approved by:

Rita Xiao / Director

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(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB210622004RFX	Jun. 21, 2021	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Test Item	Test Requirement	Test method	Result
Conducted output power	Part 2.1046(a)	TIA-603-E-2016 & KDB 971168 D01v02r02	PASS
Effective Radiated Power of Transmitter(EIRP)	Part 22.913(a)(2)/Part27.50(d)(4)/ Part 24.232(c)/ Part27.50(c)(10)	TIA-603-E-2016 & KDB 971168 D01v02r02	PASS
peak-to-average ratio	Part 24.232(d)/ Part27.50(d)(5)	KDB 971168 D01v02r02	PASS
99% & 26dB Occupied Bandwidth	Part 2.1049(h)	KDB 971168 D01v02r02	PASS
Band Edge at antenna terminals	Part 24.238(a)/ Part 22.917(a)/Part 27.53(g) / Part 27.53(h)	KDB 971168 D01v02r02	PASS
Spurious emissions at antenna terminals	Part 24.238(a)/ Part 22.917(a)/ Part 27.53(g) / Part 27.53(h)	TIA-603-E-2016 & KDB 971168 D01v02r02	PASS
Field strength of spurious radiation	Part 24.238(a)/ Part 22.917(a)/ Part 27.53(g) / Part 27.53(h)	TIA-603-E-2016 & KDB 971168 D01v02r02	PASS
Frequency stability	Part 2.1055	TIA-603-E-2016 & KDB 971168 D01v02r02	PASS

3. MEASUREMENT UNCERTAINTY

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

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

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	V1
Model Description:	N/A
Hardware Version:	1.3.6
Software Version:	b43d36d61482534ec136
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
Max. RF output power:	FDD-LTE BAND 2: 22.47 dBm FDD-LTE BAND 4: 22.36 dBm FDD-LTE BAND 5: 22.66 dBm FDD-LTE BAND 12: 22.76 dBm
Type of Modulation:	QPSK, 16QAM
Antenna installation:	Internal antenna
Antenna Gain:	FDD-LTE BAND 2: 0dBi TDD-LTE BAND 4: 1dBi TDD-LTE BAND 5: 1dBi TDD-LTE BAND 12: 1dBi
Ratings:	DC 3.7V for battery

4.2 Test Setup Configuration

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

4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note

Notes:

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

4.4 Test Mode

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

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

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

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)
LTE band 5	Low Range	1.4	20407	824.7
		3	20415	825.5
		5	20425	826.5
		10	20000	829
	Mid Range	1.4/3/5/10	20525	836.5
	High Range	1.4	20643	848.3
		3	20635	847.5
		5	20625	846.5
		10	20600	844

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

4.5 Test Environment

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

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

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

5.2 Test Instrument Used

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	Sep. 28, 2020	Sep. 28, 2021
2	Power Sensor	Agilent	U2021XA	MY56120032	Sep. 28, 2020	Sep. 28, 2021
3	Power Sensor	Agilent	U2021XA	MY56120034	Sep. 28, 2020	Sep. 28, 2021
4	Communication test set	R&S	CMW500	108058	Sep. 28, 2020	Sep. 28, 2021
5	Spectrum Analyzer	R&S	FSP40	100550	Sep. 28, 2020	Sep. 28, 2021
6	Signal Generator	Agilent	N5181A	MY49060920	Sep. 28, 2020	Sep. 28, 2021
7	Signal Generator	Agilent	N5182A	MY47420195	Sep. 28, 2020	Sep. 28, 2021
8	Communication test set	Agilent	E5515C	MY50102567	Oct. 10, 2020	Oct. 10, 2021
9	band rejection filter	Shenxiang	MSF2400-24 83.5MS-1154	20181015001	Sep. 28, 2020	Sep. 28, 2021
10	band rejection filter	Shenxiang	MSF5150-58 50MS-1155	20181015001	Sep. 28, 2020	Sep. 28, 2021
11	band rejection filter	Xingbo	XBLBQ-DZA 120	190821-1-1	Sep. 28, 2020	Sep. 28, 2021
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	Sep. 28, 2020	Sep. 28, 2021
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	Sep. 28, 2020	Sep. 28, 2021
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	\	\
16	966 chamber	C.R.T.	966 Room	966	Nov. 9, 2019	Nov. 08, 2022
17	Receiver	R&S	ESPI	100362	Sep. 28, 2020	Sep. 28, 2021

18	Amplifier	HP	8447E	2945A02747	Sep. 28, 2020	Sep. 28, 2021
19	Amplifier	Agilent	8449B	3008A01838	Sep. 28, 2020	Sep. 28, 2021
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	Nov. 02, 2020	Nov. 01, 2021
21	Horn Antenna	Schwarzbeck	BBHA9120D	1911	Nov. 02, 2020	Nov. 01, 2021
22	Software	Fala	EZ-EMC	FA-03A2 RE	\	\
23	3-Loop Antenna	Daze	ZN30401	17014	Sep. 28, 2020	Sep. 28, 2021
24	loop antenna	ZHINAN	ZN30900A	/	Sep. 28, 2020	Sep. 28, 2021
25	Horn antenna	A/H/System	SAS-574	588	Sep. 28, 2020	Sep. 28, 2021
26	Amplifier	AEROFLEX	/	S/N/ 097	Sep. 28, 2020	Sep. 28, 2021

6. RF EXPOSURE

6.1 Standard Applicable

According to §1.1307 and §2.1091, §2.1093, , §27.50(b) 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.

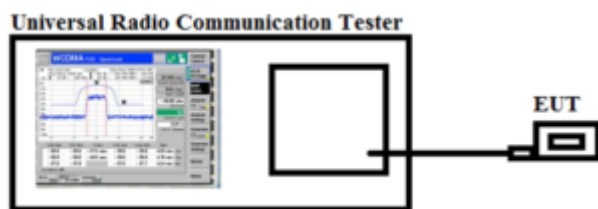
According to §24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

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 12

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.30	<34.77	PASS
		H	21.30		
	MCH	V	22.29		PASS
		H	21.34		
	HCH	V	21.59		PASS
		H	22.26		
16QAM	LCH	V	21.47	<34.77	PASS
		H	21.43		
	MCH	V	20.84		PASS
		H	21.25		
	HCH	V	21.40		PASS
		H	21.30		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.30	<34.77	PASS
		H	21.21		
	MCH	V	21.01		PASS
		H	20.89		
	HCH	V	21.03		PASS
		H	21.40		
16QAM	LCH	V	20.62	<34.77	PASS
		H	20.58		
	MCH	V	20.43		PASS
		H	20.22		
	HCH	V	20.48		PASS
		H	20.51		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict

QPSK	LCH	V	21.27	<34.77	PASS
		H	21.22		
	MCH	V	21.01		PASS
		H	21.19		
	HCH	V	21.17		PASS
		H	20.03		
16QAM	LCH	V	21.27	<34.77	PASS
		H	20.22		
	MCH	V	20.20		PASS
		H	20.24		
	HCH	V	20.26		PASS
		H	20.23		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.33	<34.77	PASS
		H	21.22		
	MCH	V	21.28		PASS
		H	21.10		
	HCH	V	21.23		PASS
		H	21.21		
16QAM	LCH	V	21.09	<34.77	PASS
		H	20.32		
	MCH	V	20.22		PASS
		H	20.21		
	HCH	V	20.36		PASS
		H	20.38		

FDD-LTE Band 2

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.20	<33.00	PASS
		H	20.22		
	MCH	V	20.32		PASS
		H	20.56		
	HCH	V	20.32		PASS
		H	20.76		
16QAM	LCH	V	20.76	<33.00	PASS
		H	20.55		
	MCH	V	20.32		PASS
		H	20.56		
	HCH	V	20.36		PASS
		H	20.22		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.68	<33.00	PASS
		H	21.22		
	MCH	V	21.14		PASS
		H	21.06		
	HCH	V	21.14		PASS
		H	21.09		
16QAM	LCH	V	20.25	<33.00	PASS
		H	20.21		
	MCH	V	20.19		PASS
		H	20.27		
	HCH	V	19.75		PASS
		H	19.69		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.87	<33.00	PASS
		H	20.60		
	MCH	V	19.89		PASS
		H	19.98		
	HCH	V	19.84		PASS

		H	19.78		
16QAM	LCH	V	21.16	<33.00	PASS
		H	19.89		
	MCH	V	20.79		PASS
		H	20.89		
	HCH	V	20.81		PASS
		H	20.86		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.77	<33.00	PASS
		H	20.73		
	MCH	V	20.71		PASS
		H	21.09		
	HCH	V	21.03		PASS
		H	21.04		
16QAM	LCH	V	20.45	<33.00	PASS
		H	20.19		
	MCH	V	20.01		PASS
		H	20.14		
	HCH	V	21.02		PASS
		H	20.84		
Channel Bandwidth: 15 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.88	<33.00	PASS
		H	20.70		
	MCH	V	20.42		PASS
		H	20.35		
	HCH	V	20.22		PASS
		H	20.34		
16QAM	LCH	V	20.17	<33.00	PASS
		H	19.37		
	MCH	V	19.94		PASS
		H	19.80		
	HCH	V	19.69		PASS
		H	19.62		
Channel Bandwidth: 20 MHz					

Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.70	<33.00	PASS
		H	20.98		
	MCH	V	20.42		PASS
		H	20.35		
	HCH	V	20.45		PASS
		H	20.34		
16QAM	LCH	V	20.66	<33.00	PASS
		H	19.37		
	MCH	V	19.94		PASS
		H	19.80		
	HCH	V	19.69		PASS

FDD-LTE Band 4

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.86	<30	PASS
		H	21.03		
	MCH	V	20.48		PASS
		H	20.65		
	HCH	V	21.82		PASS
		H	21.84		
16QAM	LCH	V	20.59	<30	PASS
		H	20.48		
	MCH	V	19.78		PASS
		H	19.75		
	HCH	V	19.94		PASS
		H	19.93		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.21	<30	PASS
		H	22.20		
	MCH	V	20.93		PASS
		H	20.88		
	HCH	V	20.49		PASS
		H	20.39		

16QAM	LCH	V	20.99	<30	PASS
		H	20.89		
	MCH	V	20.08		PASS
		H	20.21		
	HCH	V	20.63		PASS
		H	20.65		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.93	<30	PASS
		H	20.89		
	MCH	V	20.14		PASS
		H	20.13		
	HCH	V	19.97		PASS
		H	19.93		
16QAM	LCH	V	21.14	<30	PASS
		H	21.13		
	MCH	V	20.78		PASS
		H	20.69		
	HCH	V	19.93		PASS
		H	19.92		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.10	<30	PASS
		H	20.70		
	MCH	V	21.01		PASS
		H	19.89		
	HCH	V	20.87		PASS
		H	19.98		
16QAM	LCH	V	20.19	<30	PASS
		H	20.04		
	MCH	V	19.08		PASS
		H	19.88		
	HCH	V	19.51		PASS
		H	20.00		
Channel Bandwidth: 15 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict

QPSK	LCH	V	21.89	<30	PASS
		H	21.80		
	MCH	V	21.08		PASS
		H	19.89		
	HCH	V	19.90		PASS
		H	19.98		
16QAM	LCH	V	21.00	<30	PASS
		H	19.80		
	MCH	V	19.68		PASS
		H	19.88		
	HCH	V	20.75		PASS
		H	20.45		
Channel Bandwidth: 20 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.24	<30	PASS
		H	21.80		
	MCH	V	21.08		PASS
		H	19.89		
	HCH	V	20.85		PASS
		H	19.98		
16QAM	LCH	V	21.20	<30	PASS
		H	21.04		
	MCH	V	20.91		PASS
		H	20.21		
	HCH	V	20.75		PASS
		H	20.45		

FDD-LTE Band 5

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.10	<38.45	PASS
		H	22.00		
	MCH	V	21.37		PASS
		H	21.47		
	HCH	V	20.38		PASS
		H	21.22		
16QAM	LCH	V	21.50	<38.45	PASS
		H	21.49		
	MCH	V	21.37		PASS
		H	20.90		
	HCH	V	20.88		PASS
		H	21.40		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.05	<38.45	PASS
		H	21.89		
	MCH	V	21.15		PASS
		H	21.14		
	HCH	V	20.78		PASS
		H	20.44		
16QAM	LCH	V	20.80	<38.45	PASS
		H	21.38		
	MCH	V	21.15		PASS
		H	20.78		
	HCH	V	20.33		PASS
		H	20.48		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.40	<38.45	PASS
		H	22.20		
	MCH	V	21.51		PASS
		H	21.65		
	HCH	V	20.29		PASS

		H	20.26		
16QAM	LCH	V	21.38	<38.45	PASS
		H	20.89		
	MCH	V	21.07		PASS
		H	21.25		
	HCH	V	20.40		PASS
		H	20.37		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.35	<38.45	PASS
		H	22.25		
	MCH	V	21.39		PASS
		H	21.38		
	HCH	V	20.47		PASS
		H	20.51		
16QAM	LCH	V	21.47	<38.45	PASS
		H	20.49		
	MCH	V	20.41		PASS
		H	20.35		
	HCH	V	20.47		PASS
		H	20.56		

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.

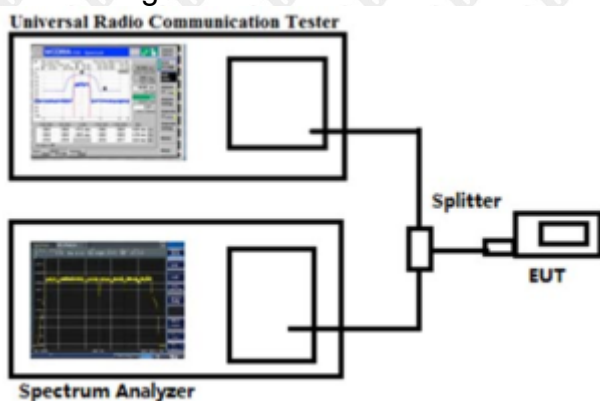
According to §27.50(B), the peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for 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 B: 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.

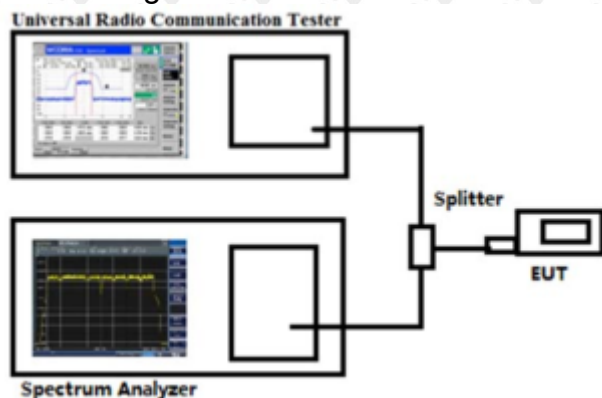
According to §24.238(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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 C: 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

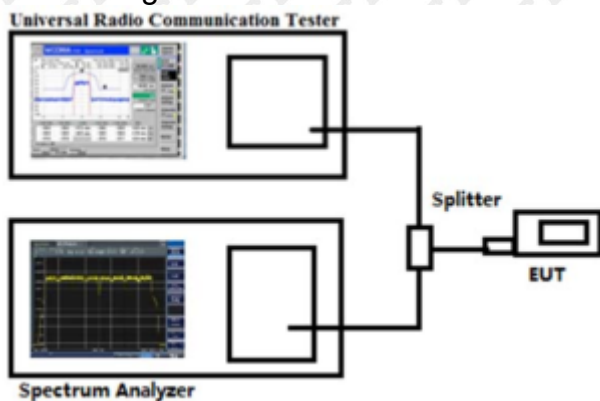
attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB.

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 D & E: 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 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.
1337.305	149	156	-59.94	-13	-46.94	Pass	H
1671.075	149	170	-52.60	-13	-39.60	Pass	H
3843.463	149	127	-48.92	-13	-35.92	Pass	H
5907.980	146	42	-41.26	-13	-28.26	Pass	H
6528.813	147	69	-42.47	-13	-29.47	Pass	H
8000.547	151	110	-46.05	-13	-33.05	Pass	H
1259.327	148	61	-56.39	-13	-43.39	Pass	V
1404.231	147	266	-53.97	-13	-40.97	Pass	V
3527.879	148	303	-51.32	-13	-38.32	Pass	V
3911.515	149	195	-49.43	-13	-36.43	Pass	V
5792.289	147	323	-44.48	-13	-31.48	Pass	V
6577.203	146	325	-45.81	-13	-32.81	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.
1296.314	150	142	-56.43	-13	-43.43	Pass	H
1714.649	146	280	-51.06	-13	-38.06	Pass	H
3874.971	150	330	-48.98	-13	-35.98	Pass	H
5866.075	146	194	-42.97	-13	-29.97	Pass	H
6457.151	149	260	-45.32	-13	-32.32	Pass	H
8020.469	151	31	-44.36	-13	-31.36	Pass	H
1236.391	149	4	-55.53	-13	-42.53	Pass	V
1393.786	148	257	-62.68	-13	-49.68	Pass	V
3588.748	147	55	-52.24	-13	-39.24	Pass	V
3913.554	148	273	-54.18	-13	-41.18	Pass	V
5828.665	150	136	-50.82	-13	-37.82	Pass	V
6518.221	150	16	-47.05	-13	-34.05	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.
1337.414	150	78	-60.22	-13	-47.22	Pass	H
1726.831	149	291	-47.87	-13	-34.87	Pass	H
3900.765	151	213	-49.07	-13	-36.07	Pass	H
5856.644	150	89	-44.79	-13	-31.79	Pass	H
6498.573	151	329	-49.58	-13	-36.58	Pass	H
7996.641	148	138	-47.56	-13	-34.56	Pass	H
1220.189	149	99	-59.49	-13	-46.49	Pass	V
1440.396	148	217	-58.47	-13	-45.47	Pass	V
3569.990	150	12	-52.45	-13	-39.45	Pass	V
3835.977	150	137	-51.39	-13	-38.39	Pass	V
5802.465	146	356	-48.09	-13	-35.09	Pass	V
6553.654	146	95	-47.00	-13	-34.00	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.
1336.088	147	256	-58.48	-13	-45.48	Pass	H
1686.544	147	243	-49.18	-13	-36.18	Pass	H
3867.298	148	259	-49.64	-13	-36.64	Pass	H
5926.615	149	28	-47.41	-13	-34.41	Pass	H
6557.178	148	108	-44.00	-13	-31.00	Pass	H
8002.552	147	328	-41.62	-13	-28.62	Pass	H
1178.980	150	16	-52.63	-13	-39.63	Pass	V
1423.815	148	117	-55.79	-13	-42.79	Pass	V
3594.250	147	325	-50.71	-13	-37.71	Pass	V
3902.348	149	302	-51.10	-13	-38.10	Pass	V
5851.765	147	15	-45.56	-13	-32.56	Pass	V
6583.748	147	280	-46.52	-13	-33.52	Pass	V

Band 12 23095 channel/BW1.4 (middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.577	151	14	-53.39	-13	-40.39	Pass	H
1724.686	147	71	-47.30	-13	-34.30	Pass	H
3853.677	150	318	-47.18	-13	-34.18	Pass	H
5927.873	147	56	-43.16	-13	-30.16	Pass	H
6504.647	147	216	-42.11	-13	-29.11	Pass	H
8057.903	151	79	-44.86	-13	-31.86	Pass	H
1191.505	151	65	-57.70	-13	-44.70	Pass	V
1382.257	146	225	-59.78	-13	-46.78	Pass	V
3536.180	149	47	-48.61	-13	-35.61	Pass	V
3854.876	150	73	-48.38	-13	-35.38	Pass	V
5819.882	147	168	-48.22	-13	-35.22	Pass	V
6519.338	150	28	-44.38	-13	-31.38	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.
1334.596	149	165	-53.984	-13	-40.98	Pass	H
1702.138	146	208	-49.058	-13	-36.06	Pass	H
3902.012	146	4	-44.955	-13	-31.96	Pass	H
5887.975	150	198	-43.082	-13	-30.08	Pass	H
6510.096	146	341	-42.305	-13	-29.31	Pass	H
8078.265	150	235	-44.840	-13	-31.84	Pass	H
1206.855	146	292	-56.369	-13	-43.37	Pass	V
1460.415	150	158	-57.892	-13	-44.89	Pass	V
3542.081	149	55	-49.875	-13	-36.88	Pass	V
3830.266	150	319	-51.418	-13	-38.42	Pass	V
5800.443	146	118	-45.454	-13	-32.45	Pass	V
6557.118	150	155	-44.851	-13	-31.85	Pass	V

Note:

- 1) Scan from 9kHz to 25GHz, 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 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.
1336.204	147	256	-59.05	-13	-46.05	Pass	H
1684.179	147	243	-46.87	-13	-33.87	Pass	H
3870.243	148	259	-49.71	-13	-36.71	Pass	H
5926.551	149	28	-45.18	-13	-32.18	Pass	H
6560.743	148	108	-44.62	-13	-31.62	Pass	H
8002.593	147	328	-41.63	-13	-28.63	Pass	H
1176.972	150	16	-52.85	-13	-39.85	Pass	V
1428.104	148	117	-55.81	-13	-42.81	Pass	V
3593.877	147	325	-51.02	-13	-38.02	Pass	V
3903.935	149	302	-49.59	-13	-36.59	Pass	V
5855.540	147	15	-44.40	-13	-31.40	Pass	V
6578.921	147	280	-46.56	-13	-33.56	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.
1334.222	147	256	-58.62	-13	-45.62	Pass	H
1684.106	147	243	-48.48	-13	-35.48	Pass	H
3866.818	148	259	-49.68	-13	-36.68	Pass	H
5925.565	149	28	-47.07	-13	-34.07	Pass	H
6560.225	148	108	-44.02	-13	-31.02	Pass	H
8002.612	147	328	-42.89	-13	-29.89	Pass	H
1179.466	150	16	-53.95	-13	-40.95	Pass	V
1426.413	148	117	-56.18	-13	-43.18	Pass	V
3595.137	147	325	-52.17	-13	-39.17	Pass	V
3903.111	149	302	-51.57	-13	-38.57	Pass	V
5853.443	147	15	-44.33	-13	-31.33	Pass	V
6578.608	147	280	-48.48	-13	-35.48	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.
1332.989	147	256	-60.12	-13	-47.12	Pass	H
1686.103	147	243	-46.83	-13	-33.83	Pass	H
3869.869	148	259	-48.65	-13	-35.65	Pass	H
5926.202	149	28	-45.89	-13	-32.89	Pass	H
6556.453	148	108	-45.49	-13	-32.49	Pass	H
8001.050	147	328	-41.68	-13	-28.68	Pass	H
1178.966	150	16	-53.18	-13	-40.18	Pass	V
1426.544	148	117	-56.69	-13	-43.69	Pass	V
3598.229	147	325	-51.18	-13	-38.18	Pass	V
3904.689	149	302	-50.74	-13	-37.74	Pass	V
5855.011	147	15	-43.36	-13	-30.36	Pass	V
6581.788	147	280	-47.60	-13	-34.60	Pass	V

16QAM

Band 5 20407 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1338.109	147	256	-59.50	-13	-46.50	Pass	H
1682.824	147	243	-47.74	-13	-34.74	Pass	H
3868.285	148	259	-50.92	-13	-37.92	Pass	H
5926.742	149	28	-45.72	-13	-32.72	Pass	H
6555.944	148	108	-43.69	-13	-30.69	Pass	H
8000.362	147	328	-43.93	-13	-30.93	Pass	H
1178.443	150	16	-54.94	-13	-41.94	Pass	V
1428.016	148	117	-57.00	-13	-44.00	Pass	V
3597.371	147	325	-52.21	-13	-39.21	Pass	V
3900.522	149	302	-49.09	-13	-36.09	Pass	V
5850.828	147	15	-43.95	-13	-30.95	Pass	V
6578.989	147	280	-48.91	-13	-35.91	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.
1333.125	151	14	-55.46	-13	-42.46	Pass	H
1724.724	147	71	-46.84	-13	-33.84	Pass	H
3853.311	150	318	-49.37	-13	-36.37	Pass	H
5927.838	147	56	-45.44	-13	-32.44	Pass	H
6504.775	147	216	-44.97	-13	-31.97	Pass	H
8058.412	151	79	-41.87	-13	-28.87	Pass	H
1191.404	151	65	-57.14	-13	-44.14	Pass	V
1383.176	146	225	-61.30	-13	-48.30	Pass	V
3536.205	149	47	-47.40	-13	-34.40	Pass	V
3854.637	150	73	-46.27	-13	-33.27	Pass	V
5820.127	147	168	-47.05	-13	-34.05	Pass	V
6519.756	150	28	-44.16	-13	-31.16	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.
1334.776	149	165	-55.494	-13	-42.49	Pass	H
1703.757	146	208	-47.736	-13	-34.74	Pass	H
3902.677	146	4	-45.666	-13	-32.67	Pass	H
5889.742	150	198	-44.558	-13	-31.56	Pass	H
6509.380	146	341	-44.390	-13	-31.39	Pass	H
8080.887	150	235	-44.134	-13	-31.13	Pass	H
1206.547	146	292	-56.912	-13	-43.91	Pass	V
1460.088	150	158	-56.893	-13	-43.89	Pass	V
3542.758	149	55	-50.826	-13	-37.83	Pass	V
3829.320	150	319	-50.699	-13	-37.70	Pass	V
5801.160	146	118	-49.118	-13	-36.12	Pass	V
6557.693	150	155	-46.865	-13	-33.86	Pass	V

Note:

3) Scan from 9kHz to 25GHz, 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 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.
1335.437	150	78	-55.29	-13	-42.29	Pass	H
1726.504	149	291	-47.55	-13	-34.55	Pass	H
3903.016	151	213	-45.83	-13	-32.83	Pass	H
5856.288	150	89	-45.62	-13	-32.62	Pass	H
6498.022	151	329	-46.87	-13	-33.87	Pass	H
7996.932	148	138	-42.98	-13	-29.98	Pass	H
1220.656	149	99	-58.39	-13	-45.39	Pass	V
1438.748	148	217	-57.77	-13	-44.77	Pass	V
3571.850	150	12	-53.12	-13	-40.12	Pass	V
3836.336	150	137	-48.39	-13	-35.39	Pass	V
5802.512	146	356	-48.12	-13	-35.12	Pass	V
6553.601	146	95	-48.03	-13	-35.03	Pass	V

Band 4 20175 channel/BW1.4 (middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1293.957	150	142	-57.29	-13	-44.29	Pass	H
1716.114	146	280	-53.84	-13	-40.84	Pass	H
3876.489	150	330	-49.26	-13	-36.26	Pass	H
5867.103	146	194	-45.29	-13	-32.29	Pass	H
6458.087	149	260	-49.41	-13	-36.41	Pass	H
8020.528	151	31	-46.78	-13	-33.78	Pass	H
1234.570	149	4	-57.98	-13	-44.98	Pass	V
1394.336	148	257	-63.51	-13	-50.51	Pass	V
3588.922	147	55	-54.94	-13	-41.94	Pass	V
3915.784	148	273	-50.49	-13	-37.49	Pass	V
5829.047	150	136	-49.95	-13	-36.95	Pass	V
6517.286	150	16	-47.47	-13	-34.47	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.
1337.800	149	156	-56.66	-13	-43.66	Pass	H
1669.403	149	170	-50.15	-13	-37.15	Pass	H
3845.483	149	127	-46.85	-13	-33.85	Pass	H
5908.230	146	42	-42.35	-13	-29.35	Pass	H
6531.264	147	69	-42.26	-13	-29.26	Pass	H
8000.893	151	110	-46.87	-13	-33.87	Pass	H
1260.838	148	61	-54.33	-13	-41.33	Pass	V
1400.867	147	266	-56.41	-13	-43.41	Pass	V
3523.975	148	303	-51.72	-13	-38.72	Pass	V
3908.632	149	195	-49.57	-13	-36.57	Pass	V
5792.207	147	323	-43.40	-13	-30.40	Pass	V
6577.834	146	325	-46.28	-13	-33.28	Pass	V

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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.
1335.136	147	256	-57.65	-13	-44.65	Pass	H
1682.278	147	243	-49.55	-13	-36.55	Pass	H
3869.830	148	259	-50.94	-13	-37.94	Pass	H
5921.544	149	28	-46.47	-13	-33.47	Pass	H
6557.097	148	108	-45.76	-13	-32.76	Pass	H
7997.695	147	328	-43.26	-13	-30.26	Pass	H
1179.956	150	16	-54.41	-13	-41.41	Pass	V
1429.609	148	117	-55.87	-13	-42.87	Pass	V
3596.649	147	325	-51.13	-13	-38.13	Pass	V
3901.226	149	302	-51.51	-13	-38.51	Pass	V
5853.605	147	15	-43.65	-13	-30.65	Pass	V
6580.477	147	280	-48.34	-13	-35.34	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.
1333.283	151	14	-53.10	-13	-40.10	Pass	H
1724.757	147	71	-48.94	-13	-35.94	Pass	H
3853.527	150	318	-49.09	-13	-36.09	Pass	H
5927.007	147	56	-41.75	-13	-28.75	Pass	H
6504.446	147	216	-45.31	-13	-32.31	Pass	H
8058.220	151	79	-41.19	-13	-28.19	Pass	H
1192.076	151	65	-55.79	-13	-42.79	Pass	V
1382.315	146	225	-57.52	-13	-44.52	Pass	V
3536.156	149	47	-47.63	-13	-34.63	Pass	V
3854.535	150	73	-49.39	-13	-36.39	Pass	V
5820.501	147	168	-47.24	-13	-34.24	Pass	V
6520.094	150	28	-44.63	-13	-31.63	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.
1334.330	149	165	-56.272	-13	-43.27	Pass	H
1704.286	146	208	-49.945	-13	-36.94	Pass	H
3900.951	146	4	-46.754	-13	-33.75	Pass	H
5887.870	150	198	-41.638	-13	-28.64	Pass	H
6508.875	146	341	-41.935	-13	-28.93	Pass	H
8080.207	150	235	-43.518	-13	-30.52	Pass	H
1205.958	146	292	-53.983	-13	-40.98	Pass	V
1461.027	150	158	-59.093	-13	-46.09	Pass	V
3544.374	149	55	-50.235	-13	-37.23	Pass	V
3831.229	150	319	-48.007	-13	-35.01	Pass	V
5801.384	146	118	-47.276	-13	-34.28	Pass	V
6558.421	150	155	-45.672	-13	-32.67	Pass	V

QPSK

Band 2 18607 channel/BW 1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1337.239	150	78	-58.23	-13	-45.23	Pass	H
1727.098	149	291	-52.89	-13	-39.89	Pass	H
3900.662	151	213	-49.21	-13	-36.21	Pass	H
5857.141	150	89	-45.93	-13	-32.93	Pass	H
6498.970	151	329	-46.77	-13	-33.77	Pass	H
7996.093	148	138	-44.95	-13	-31.95	Pass	H
1218.454	149	99	-58.24	-13	-45.24	Pass	V
1437.869	148	217	-58.70	-13	-45.70	Pass	V
3571.790	150	12	-49.04	-13	-36.04	Pass	V
3835.234	150	137	-48.98	-13	-35.98	Pass	V
5804.185	146	356	-43.56	-13	-30.56	Pass	V
6552.361	146	95	-49.56	-13	-36.56	Pass	V

Band 2 18900 channel/BW 1.4 (middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1295.471	150	142	-55.78	-13	-42.78	Pass	H
1714.431	146	280	-49.40	-13	-36.40	Pass	H
3875.386	150	330	-51.31	-13	-38.31	Pass	H
5867.066	146	194	-47.05	-13	-34.05	Pass	H
6459.603	149	260	-49.94	-13	-36.94	Pass	H
8020.761	151	31	-48.70	-13	-35.70	Pass	H
1234.242	149	4	-59.15	-13	-46.15	Pass	V
1393.941	148	257	-58.90	-13	-45.90	Pass	V
3589.842	147	55	-50.54	-13	-37.54	Pass	V
3915.134	148	273	-56.02	-13	-43.02	Pass	V
5827.201	150	136	-46.29	-13	-33.29	Pass	V
6516.198	150	16	-46.62	-13	-33.62	Pass	V

Band 2 19193 channel/BW 1.4 (highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1342.104	149	156	-56.88	-13	-43.88	Pass	H
1666.751	149	170	-49.32	-13	-36.32	Pass	H
3845.313	149	127	-47.73	-13	-34.73	Pass	H
5910.451	146	42	-43.48	-13	-30.48	Pass	H
6531.855	147	69	-44.26	-13	-31.26	Pass	H
8001.260	151	110	-44.45	-13	-31.45	Pass	H
1257.694	148	61	-56.80	-13	-43.80	Pass	V
1404.226	147	266	-55.28	-13	-42.28	Pass	V
3525.935	148	303	-52.18	-13	-39.18	Pass	V
1342.104	149	156	-56.88	-13	-43.88	Pass	V
1666.751	149	170	-49.32	-13	-36.32	Pass	V
3845.313	149	127	-47.73	-13	-34.73	Pass	V

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Band 2 18607 channel/BW 1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.065	147	256	-58.88	-13	-45.88	Pass	H
1684.333	147	243	-47.80	-13	-34.80	Pass	H
3871.418	148	259	-48.84	-13	-35.84	Pass	H
5923.500	149	28	-46.15	-13	-33.15	Pass	H
6556.642	148	108	-45.01	-13	-32.01	Pass	H
8000.451	147	328	-41.94	-13	-28.94	Pass	H
1178.884	150	16	-54.70	-13	-41.70	Pass	V
1425.039	148	117	-55.22	-13	-42.22	Pass	V
3598.221	147	325	-52.42	-13	-39.42	Pass	V
3904.313	149	302	-51.25	-13	-38.25	Pass	V
5850.025	147	15	-46.11	-13	-33.11	Pass	V
6582.863	147	280	-48.33	-13	-35.33	Pass	V

Band 2 18900 channel/BW 1.4 (middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.219	151	14	-52.41	-13	-39.41	Pass	H
1725.098	147	71	-50.06	-13	-37.06	Pass	H
3853.603	150	318	-49.71	-13	-36.71	Pass	H
5927.833	147	56	-43.83	-13	-30.83	Pass	H
6504.818	147	216	-45.14	-13	-32.14	Pass	H
8057.758	151	79	-45.01	-13	-32.01	Pass	H
1191.915	151	65	-54.94	-13	-41.94	Pass	V
1382.350	146	225	-60.23	-13	-47.23	Pass	V
3536.650	149	47	-51.17	-13	-38.17	Pass	V
3854.688	150	73	-50.96	-13	-37.96	Pass	V
5819.801	147	168	-46.06	-13	-33.06	Pass	V
6519.954	150	28	-47.09	-13	-34.09	Pass	V

Band 2 19193 channel/BW 1.4 (highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.166	149	165	-53.735	-13	-40.74	Pass	H
1703.230	146	208	-48.703	-13	-35.70	Pass	H
3902.319	146	4	-44.776	-13	-31.78	Pass	H
5888.799	150	198	-44.200	-13	-31.20	Pass	H
6509.956	146	341	-41.216	-13	-28.22	Pass	H
8079.249	150	235	-43.789	-13	-30.79	Pass	H
1207.243	146	292	-53.498	-13	-40.50	Pass	V
1461.079	150	158	-57.141	-13	-44.14	Pass	V
3544.477	149	55	-51.525	-13	-38.52	Pass	V
3829.378	150	319	-48.618	-13	-35.62	Pass	V
5803.080	146	118	-47.213	-13	-34.21	Pass	V
6557.800	150	155	-48.331	-13	-35.33	Pass	V

Note:

- 1) Scan from 9kHz to 25GHz, 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.

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=DC3.3V; High Voltage HV=DC4.1V

Please refer to Appendix F: Frequency Stability

Test result: Pass

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