



TEST REPORT

Product Name: Smart phone
FCC ID: 2ANMU-WP38
Trademark: OUKITEL
Model Number: WP38, WP38 S, WP38 Pro, WP38 Ultra
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Sample Received Date: Dec. 21, 2023
Sample tested Date: Dec. 21, 2023 to Feb. 23, 2024
Issue Date: Feb. 23, 2024
Report No.: CTB240222009RFX
Test Standards: FCC Part 2, 22, 24E, 27
Test Results: PASS
Remark: This is LTE radio test report.

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(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
CTB240222009RFX	Feb. 23, 2024	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Test Item	Test Requirement	Test method	Result
Conducted output power	Part 2.1046(a)	TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Effective Radiated Power of Transmitter(EIRP)	Part 22.913(a)(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 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):	WP38, WP38 S, WP38 Pro, WP38 Ultra
Model Description:	All the model are the same circuit and RF module, only different for model name .Test sample model: WP38
Hardware Version:	E358_MAIN_PCB_V1.0
Software Version:	OUKITEL_WP38_EEA_V03
Operation Frequency:	FDD-LTE BAND 2:1850-1910MHz FDD-LTE BAND 4:1710-1755MHz FDD-LTE BAND 5:824-849MHz FDD-LTE BAND 7:2500-2570MHz FDD-LTE BAND 12: 699-716MHz FDD-LTE BAND 17:704-716MHz
Max. RF output power:	FDD-LTE BAND 2: 24.18dBm FDD-LTE BAND 4: 23.45dBm FDD-LTE BAND 5: 24.29dBm FDD-LTE BAND 7: 23.4dBm FDD-LTE BAND 12: 24.1dBm FDD-LTE BAND 17: 24.05dBm
Type of Modulation:	QPSK, 16QAM
Antenna installation:	Internal antenna
Antenna Gain:	LTE BAND 2: -1.02dBi LTE BAND 4: -2dBi LTE BAND 5: -2.33dBi LTE BAND 7: -0.91dBi LTE BAND 12: -2.65dBi LTE BAND 17: -2.65dBi
Ratings:	DC 5V charging from adapter DC 3.7V from battery

4.2 Test Setup Configuration

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

4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note

Notes:

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

4.4 Test Mode

Test Mode List		
Test Mode	Description	Remark
TM1	FDD-LTE BAND 2	Low, Middle, High Channels
TM2	FDD-LTE BAND 4	Low, Middle, High Channels
TM3	FDD-LTE BAND 5	Low, Middle, High Channels
TM4	FDD-LTE BAND 7	Low, Middle, High Channels
TM5	FDD-LTE BAND 12	Low, Middle, High Channels
TM6	FDD-LTE BAND 17	Low, Middle, High Channels

4.5 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(DC):	3.7
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, Xinh 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	XLBLQ-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.

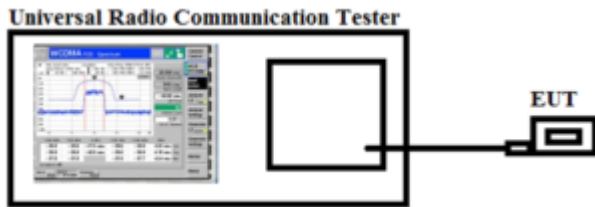
According to §24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

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	23.72	<33.00	PASS
		H	23.77		
	MCH	V	24.13		PASS
		H	23.80		
	HCH	V	23.73		PASS
		H	23.11		
16QAM	LCH	V	23.66	<33.00	PASS
		H	22.47		
	MCH	V	23.08		PASS
		H	23.23		
	HCH	V	22.41		PASS
		H	23.03		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.46	<33.00	PASS
		H	21.66		
	MCH	V	23.19		PASS
		H	22.52		
	HCH	V	22.46		PASS
		H	22.60		
16QAM	LCH	V	21.33	<33.00	PASS
		H	23.24		
	MCH	V	21.71		PASS
		H	22.95		
	HCH	V	23.10		PASS
		H	21.89		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	23.40	<33.00	PASS
		H	22.59		
	MCH	V	22.24		PASS
		H	23.33		

	HCH	V	21.91		PASS
		H	21.58		
16QAM	LCH	V	22.06	<33.00	PASS
		H	22.51		
	MCH	V	23.26		PASS
		H	22.51		
	HCH	V	22.97		PASS
		H	22.95		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	23.32	<33.00	PASS
		H	23.10		
	MCH	V	22.36		PASS
		H	23.27		
	HCH	V	21.84		PASS
		H	22.81		
16QAM	LCH	V	23.34	<33.00	PASS
		H	23.35		
	MCH	V	22.33		PASS
		H	21.87		
	HCH	V	22.66		PASS
		H	22.82		
Channel Bandwidth: 15 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.97	<33.00	PASS
		H	22.31		
	MCH	V	22.66		PASS
		H	22.09		
	HCH	V	22.02		PASS
		H	22.50		
16QAM	LCH	V	22.79	<33.00	PASS
		H	22.26		
	MCH	V	22.31		PASS
		H	22.40		
	HCH	V	22.07		PASS
		H	23.27		

Channel Bandwidth: 20 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	24.18	<33.00	PASS
		H	23.82		
	MCH	V	23.83		PASS
		H	22.97		
	HCH	V	22.72		PASS
		H	22.61		
16QAM	LCH	V	23.47	<33.00	PASS
		H	24.03		
	MCH	V	23.00		PASS
		H	22.35		
	HCH	V	22.53		PASS
		H	22.33		

FDD-LTE Band 4

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.28	<30.00	PASS
		H	22.32		
	MCH	V	22.19		PASS
		H	22.17		
	HCH	V	21.54		PASS
		H	21.80		
16QAM	LCH	V	22.31	<30.00	PASS
		H	22.08		
	MCH	V	21.87		PASS
		H	22.40		
	HCH	V	22.43		PASS
		H	21.49		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.34	<30.00	PASS
		H	22.62		
	MCH	V	22.92		PASS
		H	22.64		

	HCH	V	22.49		PASS
		H	22.38		
16QAM	LCH	V	22.75	<30.00	PASS
		H	22.76		
	MCH	V	22.70		PASS
		H	22.39		
	HCH	V	22.71		PASS
		H	22.88		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	21.53	<30.00	PASS
		H	21.81		
	MCH	V	21.93		PASS
		H	22.36		
	HCH	V	21.61		PASS
		H	22.16		
16QAM	LCH	V	21.48	<30.00	PASS
		H	21.97		
	MCH	V	22.05		PASS
		H	22.34		
	HCH	V	21.75		PASS
		H	21.43		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.92	<30.00	PASS
		H	22.77		
	MCH	V	22.50		PASS
		H	23.01		
	HCH	V	23.00		PASS
		H	22.58		
16QAM	LCH	V	22.66	<30.00	PASS
		H	22.64		
	MCH	V	22.67		PASS
		H	22.15		
	HCH	V	22.59		PASS
		H	22.58		

Channel Bandwidth: 15 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.41	<30.00	PASS
		H	22.14		
	MCH	V	21.83		PASS
		H	22.04		
	HCH	V	21.83		PASS
		H	21.88		
16QAM	LCH	V	22.31	<30.00	PASS
		H	21.58		
	MCH	V	22.16		PASS
		H	21.90		
	HCH	V	22.03		PASS
		H	21.73		
Channel Bandwidth: 20 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	23.45	<30.00	PASS
		H	22.51		
	MCH	V	23.34		PASS
		H	22.85		
	HCH	V	22.37		PASS
		H	22.95		
16QAM	LCH	V	22.11	<30.00	PASS
		H	22.91		
	MCH	V	22.03		PASS
		H	21.82		
	HCH	V	22.81		PASS
		H	23.38		

FDD-LTE Band 5

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	23.23	<34.77	PASS
		H	23.41		
	MCH	V	24.03		PASS
		H	23.84		
	HCH	V	23.32		PASS

		H	23.18		
16QAM	LCH	V	23.13	<34.77	PASS
		H	23.14		
	MCH	V	23.75		PASS
		H	23.92		
	HCH	V	23.94		PASS
		H	23.98		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	23.13	<34.77	PASS
		H	22.76		
	MCH	V	23.22		PASS
		H	23.01		
	HCH	V	22.30		PASS
		H	23.12		
16QAM	LCH	V	22.61	<34.77	PASS
		H	22.65		
	MCH	V	22.35		PASS
		H	22.27		
	HCH	V	22.86		PASS
		H	23.06		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.41	<34.77	PASS
		H	22.45		
	MCH	V	22.50		PASS
		H	22.62		
	HCH	V	22.54		PASS
		H	22.76		
16QAM	LCH	V	22.46	<34.77	PASS
		H	23.22		
	MCH	V	23.25		PASS
		H	22.50		
	HCH	V	22.64		PASS
		H	22.61		

Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	24.29	<34.77	PASS
		H	23.28		
	MCH	V	22.78		PASS
		H	23.31		
	HCH	V	24.07		PASS
		H	23.13		
16QAM	LCH	V	24.21	<34.77	PASS
		H	23.23		
	MCH	V	23.86		PASS
		H	22.44		
	HCH	V	22.76		PASS
		H	24.10		

FDD-LTE Band 7

Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.20	<33	PASS
		H	21.33		
	MCH	V	22.06		PASS
		H	21.88		
	HCH	V	22.14		PASS
		H	21.61		
16QAM	LCH	V	21.97	<33	PASS
		H	21.64		
	MCH	V	21.44		PASS
		H	21.53		
	HCH	V	22.16		PASS
		H	21.68		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.22	<33	PASS
		H	22.03		
	MCH	V	22.28		PASS
		H	22.62		

	HCH	V	22.18		PASS
		H	22.37		
16QAM	LCH	V	22.47	<33	PASS
		H	22.00		
	MCH	V	22.18		PASS
		H	22.61		
	HCH	V	21.66		PASS
		H	21.93		

Channel Bandwidth: 15 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.54	<33	PASS
		H	22.64		
	MCH	V	22.16		PASS
		H	22.13		
	HCH	V	22.16		PASS
		H	21.77		
16QAM	LCH	V	21.80	<33	PASS
		H	22.55		
	MCH	V	22.42		PASS
		H	21.90		
	HCH	V	22.25		PASS
		H	22.28		

Channel Bandwidth: 20 MHz					
Modulation	Channel	Antenna Polar	EIRP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	23.40	<33	PASS
		H	22.06		
	MCH	V	22.30		PASS
		H	22.45		
	HCH	V	22.23		PASS
		H	22.46		
16QAM	LCH	V	21.90	<33	PASS
		H	21.85		
	MCH	V	21.94		PASS
		H	21.84		
	HCH	V	22.65		PASS
		H	21.91		

FDD-LTE Band 12

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.37	<34.77	PASS
		H	22.46		
	MCH	V	22.90		PASS
		H	22.99		
	HCH	V	23.41		PASS
		H	23.36		
16QAM	LCH	V	23.50	<34.77	PASS
		H	22.84		
	MCH	V	23.42		PASS
		H	23.56		
	HCH	V	22.62		PASS
		H	23.45		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	22.99	<34.77	PASS
		H	22.93		
	MCH	V	23.52		PASS
		H	22.76		

	HCH	V	22.04		PASS
		H	22.79		
16QAM	LCH	V	23.54	<34.77	PASS
		H	22.69		
	MCH	V	23.14		PASS
		H	23.62		
	HCH	V	23.17		PASS
		H	23.03		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	23.42	<34.77	PASS
		H	23.02		
	MCH	V	22.26		PASS
		H	22.30		
	HCH	V	23.24		PASS
		H	21.99		
16QAM	LCH	V	23.14	<34.77	PASS
		H	21.97		
	MCH	V	21.85		PASS
		H	22.57		
	HCH	V	22.69		PASS
		H	21.86		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	24.10	<34.77	PASS
		H	23.88		
	MCH	V	23.34		PASS
		H	23.36		
	HCH	V	23.22		PASS
		H	23.88		
16QAM	LCH	V	23.27	<34.77	PASS
		H	23.71		
	MCH	V	22.77		PASS
		H	22.31		
	HCH	V	22.70		PASS
		H	23.31		

FDD-LTE Band 17

Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	23.27	<34.77	PASS
		H	23.10		
	MCH	V	22.32		PASS
		H	23.50		
	HCH	V	22.39		PASS
		H	23.04		
16QAM	LCH	V	23.78	<34.77	PASS
		H	22.25		
	MCH	V	23.10		PASS
		H	22.76		
	HCH	V	22.95		PASS
		H	22.21		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	24.05	<34.77	PASS
		H	22.96		
	MCH	V	23.33		PASS
		H	23.04		
	HCH	V	23.23		PASS
		H	23.02		
16QAM	LCH	V	23.87	<34.77	PASS
		H	23.82		
	MCH	V	23.29		PASS
		H	22.92		
	HCH	V	23.98		PASS
		H	23.44		

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

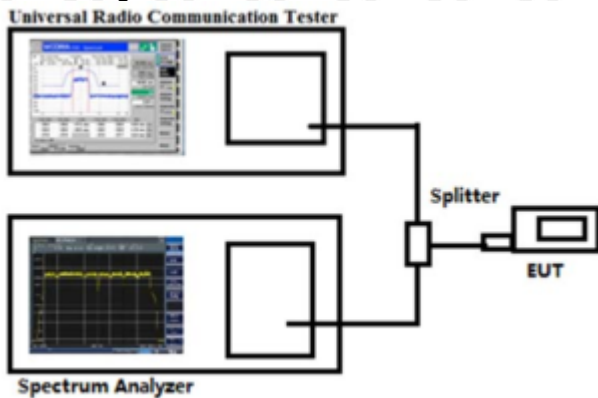
corresponding to the highest PAPR expected during periods of continuous transmission.

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.

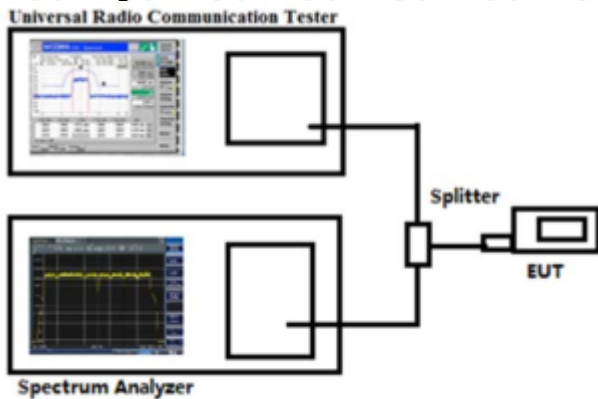
According to §24.238(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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.

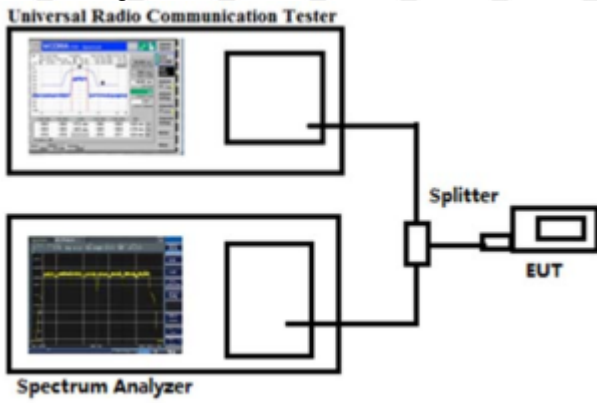
According to §27.53(g), for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ 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.
1295.47	159	149	-55.83	-13	-42.83	Pass	H
1731.51	158	190	-49.51	-13	-36.51	Pass	H
3994.68	142	332	-48.01	-13	-35.01	Pass	H
5851.76	159	273	-43.22	-13	-30.22	Pass	H
6497.90	143	109	-44.18	-13	-31.18	Pass	H
7992.04	140	279	-43.36	-13	-30.36	Pass	H
1290.50	145	72	-54.30	-13	-41.30	Pass	V
1420.14	142	212	-56.51	-13	-43.51	Pass	V
3528.95	151	133	-51.83	-13	-38.83	Pass	V
3776.80	152	207	-51.01	-13	-38.01	Pass	V
5769.40	152	10	-47.80	-13	-34.80	Pass	V
6571.10	148	336	-48.78	-13	-35.78	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.
1380.27	150	210	-57.72	-13	-44.72	Pass	H
1716.72	146	49	-51.05	-13	-38.05	Pass	H
3965.73	150	310	-48.62	-13	-35.62	Pass	H
5834.29	146	117	-47.38	-13	-34.38	Pass	H
6442.68	149	258	-46.72	-13	-33.72	Pass	H
7927.39	151	191	-50.85	-13	-37.85	Pass	H
1166.72	149	28	-55.39	-13	-42.39	Pass	V
1423.86	148	295	-62.06	-13	-49.06	Pass	V
3580.05	147	212	-51.92	-13	-38.92	Pass	V
3886.77	148	323	-51.11	-13	-38.11	Pass	V
5873.40	150	205	-51.15	-13	-38.15	Pass	V
6587.67	150	65	-46.69	-13	-33.69	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.
1398.95	151	155	-55.77	-13	-42.77	Pass	H
1592.08	153	316	-49.12	-13	-36.12	Pass	H
3779.84	149	129	-43.25	-13	-30.25	Pass	H
5937.19	154	215	-41.19	-13	-28.19	Pass	H
6517.40	154	54	-44.35	-13	-31.35	Pass	H
8079.68	147	8	-44.25	-13	-31.25	Pass	H
1252.12	152	240	-54.77	-13	-41.77	Pass	V
1379.32	148	133	-55.89	-13	-42.89	Pass	V
3584.28	150	107	-53.47	-13	-40.47	Pass	V
3876.77	152	332	-50.05	-13	-37.05	Pass	V
5689.39	146	359	-45.07	-13	-32.07	Pass	V
6648.83	149	280	-47.64	-13	-34.64	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.
1364.49	151	212	-59.19	-13	-46.19	Pass	H
1629.19	153	31	-46.55	-13	-33.55	Pass	H
3896.79	155	43	-46.66	-13	-33.66	Pass	H
5855.67	148	3	-44.32	-13	-31.32	Pass	H
6578.20	152	263	-43.15	-13	-30.15	Pass	H
8052.96	148	317	-43.54	-13	-30.54	Pass	H
1100.27	147	181	-50.51	-13	-37.51	Pass	V
1424.87	152	327	-53.97	-13	-40.97	Pass	V
3538.51	152	241	-53.93	-13	-40.93	Pass	V
3991.55	153	292	-48.61	-13	-35.61	Pass	V
5874.07	154	206	-43.69	-13	-30.69	Pass	V
6570.13	149	241	-47.59	-13	-34.59	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.
1387.82	149	216	-55.97	-13	-41.45	Pass	H
1762.23	151	276	-53.72	-13	-37.85	Pass	H
3866.80	154	36	-49.14	-13	-35.2	Pass	H
5861.01	149	190	-43.42	-13	-30.39	Pass	H
6490.17	153	42	-45.45	-13	-32.24	Pass	H
8023.70	151	146	-43.76	-13	-30.22	Pass	H
1282.66	152	241	-57.50	-13	-44.9	Pass	V
1340.00	147	182	-54.88	-13	-43.63	Pass	V
3493.18	149	295	-46.72	-13	-35.94	Pass	V
3944.86	150	111	-45.18	-13	-36.01	Pass	V
5737.89	146	348	-45.93	-13	-33.75	Pass	V
6457.48	154	102	-43.92	-13	-32.41	Pass	V
Band 2 19193 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1426.18	151	188	-56.73	-13	-43.73	Pass	H
1796.88	151	225	-49.72	-13	-36.72	Pass	H
3931.85	148	179	-43.46	-13	-30.46	Pass	H
5963.87	147	117	-45.35	-13	-32.35	Pass	H
6457.16	149	184	-39.97	-13	-26.97	Pass	H
8017.44	155	33	-44.15	-13	-31.15	Pass	H
1221.45	154	97	-52.34	-13	-39.34	Pass	V
1541.07	150	49	-62.15	-13	-49.15	Pass	V
3458.28	152	282	-50.13	-13	-37.13	Pass	V
3733.85	150	229	-50.67	-13	-37.67	Pass	V
5867.97	148	104	-46.42	-13	-33.42	Pass	V
6550.77	147	114	-45.76	-13	-32.76	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.
1384.72	151	44	-57.78	-13	-44.78	Pass	H
1695.11	158	150	-46.58	-13	-33.58	Pass	H
3852.48	150	174	-48.66	-13	-35.66	Pass	H
5879.33	151	303	-42.78	-13	-29.78	Pass	H
6444.25	159	247	-43.71	-13	-30.71	Pass	H
8120.59	148	171	-40.56	-13	-27.56	Pass	H
1168.60	151	227	-56.50	-13	-43.50	Pass	V
1426.56	155	324	-58.66	-13	-45.66	Pass	V
3487.62	151	321	-51.42	-13	-38.42	Pass	V
3760.19	142	309	-53.43	-13	-40.43	Pass	V
5896.65	141	348	-48.73	-13	-35.73	Pass	V
6519.44	150	260	-47.81	-13	-34.81	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.
1347.05	150	65	-55.64	-13	-42.64	Pass	H
1645.68	146	143	-52.47	-13	-39.47	Pass	H
3800.78	150	337	-48.98	-13	-35.98	Pass	H
5891.56	146	50	-43.83	-13	-30.83	Pass	H
6438.22	149	303	-47.93	-13	-34.93	Pass	H
8048.04	151	223	-50.73	-13	-37.73	Pass	H
1230.00	149	285	-52.38	-13	-39.38	Pass	V
1321.30	148	32	-60.92	-13	-47.92	Pass	V
3624.78	147	95	-52.71	-13	-39.71	Pass	V
3966.59	148	138	-52.53	-13	-39.53	Pass	V
5823.60	150	43	-45.69	-13	-32.69	Pass	V
6572.58	150	317	-50.73	-13	-37.73	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.
1422.57	153	136	-54.61	-13	-41.61	Pass	H
1755.43	152	244	-51.86	-13	-38.86	Pass	H
3791.50	147	157	-44.66	-13	-31.66	Pass	H
5984.87	155	218	-38.78	-13	-25.78	Pass	H
6446.65	146	77	-43.56	-13	-30.56	Pass	H
7984.88	153	125	-41.90	-13	-28.90	Pass	H
1338.07	146	55	-56.78	-13	-43.78	Pass	V
1477.11	149	28	-59.71	-13	-46.71	Pass	V
3592.95	150	338	-52.95	-13	-39.95	Pass	V
3817.66	153	120	-48.04	-13	-35.04	Pass	V
5737.35	154	105	-41.33	-13	-28.33	Pass	V
6479.64	146	271	-49.78	-13	-36.78	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.
1377.69	147	119	-61.03	-13	-48.03	Pass	H
1736.88	154	302	-47.88	-13	-34.88	Pass	H
3797.58	149	293	-51.51	-13	-38.51	Pass	H
5851.96	150	261	-42.65	-13	-29.65	Pass	H
6597.11	150	266	-44.06	-13	-31.06	Pass	H
8072.92	148	354	-42.57	-13	-29.57	Pass	H
1130.29	148	179	-49.73	-13	-36.73	Pass	V
1398.85	145	9	-57.93	-13	-44.93	Pass	V
3519.40	152	17	-51.47	-13	-38.47	Pass	V
3957.10	151	230	-50.33	-13	-37.33	Pass	V
5775.53	152	34	-44.32	-13	-31.32	Pass	V
6517.34	149	315	-48.81	-13	-35.81	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.
1379.08	152	128	-56.32	-13	-41.45	Pass	H
1659.61	147	205	-47.06	-13	-37.85	Pass	H
3847.47	146	328	-49.88	-13	-35.2	Pass	H
6006.48	153	189	-42.95	-13	-30.39	Pass	H
6444.21	145	342	-43.67	-13	-32.24	Pass	H
8132.19	147	236	-43.37	-13	-30.22	Pass	H
1286.42	150	351	-54.19	-13	-44.9	Pass	V
1352.31	146	278	-58.48	-13	-43.63	Pass	V
3607.32	146	114	-51.24	-13	-35.94	Pass	V
3810.42	146	241	-47.45	-13	-36.01	Pass	V
5822.64	147	92	-44.83	-13	-33.75	Pass	V
6531.64	152	289	-41.44	-13	-32.41	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.
1387.72	155	178	-53.10	-13	-40.10	Pass	H
1754.64	154	287	-49.71	-13	-36.71	Pass	H
3857.17	153	91	-40.63	-13	-27.63	Pass	H
5834.29	147	357	-39.54	-13	-26.54	Pass	H
6425.91	152	58	-44.13	-13	-31.13	Pass	H
8052.17	147	77	-46.99	-13	-33.99	Pass	H
1106.46	151	240	-58.58	-13	-45.58	Pass	V
1416.16	155	147	-62.13	-13	-49.13	Pass	V
3482.61	155	272	-52.95	-13	-39.95	Pass	V
3856.82	154	355	-51.75	-13	-38.75	Pass	V
5862.39	152	276	-47.46	-13	-34.46	Pass	V
6606.82	147	21	-48.24	-13	-35.24	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.

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Band 7 20775 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1322.19	149	226	-56.71	-13	-43.71	Pass	H
1662.37	152	31	-47.78	-13	-34.78	Pass	H
3869.43	147	151	-51.33	-13	-38.33	Pass	H
5897.52	153	288	-42.58	-13	-29.58	Pass	H
6597.74	154	310	-44.50	-13	-31.50	Pass	H
8012.91	151	326	-40.27	-13	-27.27	Pass	H
1239.32	152	36	-50.44	-13	-37.44	Pass	V
1397.42	148	264	-58.72	-13	-45.72	Pass	V
3628.15	150	30	-48.59	-13	-35.59	Pass	V
3912.06	147	148	-53.87	-13	-40.87	Pass	V
5949.76	147	217	-45.78	-13	-32.78	Pass	V
6514.35	155	110	-48.54	-13	-35.54	Pass	V

Band 7 21100 channel/BW 5 (middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1321.60	147	343	-54.39	-13	-41.39	Pass	H
1796.44	150	111	-45.46	-13	-32.46	Pass	H
3870.06	152	301	-45.15	-13	-32.15	Pass	H
5878.30	150	97	-44.89	-13	-31.89	Pass	H
6511.74	150	257	-41.55	-13	-28.55	Pass	H
8028.94	148	226	-43.11	-13	-30.11	Pass	H
1235.15	152	7	-54.17	-13	-41.17	Pass	V
1478.73	155	293	-59.22	-13	-46.22	Pass	V
3618.65	150	350	-49.62	-13	-36.62	Pass	V
3891.73	154	248	-46.57	-13	-33.57	Pass	V
5792.78	151	194	-46.09	-13	-33.09	Pass	V
6557.54	153	40	-43.11	-13	-30.11	Pass	V

Band 7 21425 channel/BW 5 (highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1373.21	149	165	-53.44	-13	-40.44	Pass	H
1678.21	146	208	-47.64	-13	-34.64	Pass	H
3902.03	146	4	-44.01	-13	-31.01	Pass	H
5923.78	150	198	-39.97	-13	-26.97	Pass	H
6471.33	146	341	-44.71	-13	-31.71	Pass	H
8124.94	150	235	-38.89	-13	-25.89	Pass	H
1156.11	146	292	-52.57	-13	-39.57	Pass	V
1378.02	150	158	-52.79	-13	-39.79	Pass	V
3497.92	149	55	-52.77	-13	-39.77	Pass	V
3768.72	150	319	-46.56	-13	-33.56	Pass	V
5817.33	146	118	-44.53	-13	-31.53	Pass	V
6530.57	150	155	-50.73	-13	-37.73	Pass	V

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Band 7 20775 channel/BW 5 (lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1283.77	150	78	-53.93	-13	-40.93	Pass	H
1821.89	149	291	-52.51	-13	-39.51	Pass	H
3888.47	151	213	-50.76	-13	-37.76	Pass	H
5942.84	150	89	-45.81	-13	-32.81	Pass	H
6490.78	151	329	-44.81	-13	-31.81	Pass	H
7905.85	148	138	-45.66	-13	-32.66	Pass	H
1302.41	149	99	-59.85	-13	-46.85	Pass	V
1361.89	148	217	-58.04	-13	-45.04	Pass	V
3668.14	150	12	-48.17	-13	-35.17	Pass	V
3911.16	150	137	-49.81	-13	-36.81	Pass	V
5810.86	146	356	-46.07	-13	-33.07	Pass	V
6508.91	146	95	-48.09	-13	-35.09	Pass	V

Band 7 21100 channel/BW 5 (middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1313.23	150	142	-53.60	-13	-40.60	Pass	H
1746.78	146	280	-54.76	-13	-41.76	Pass	H
3843.73	150	330	-51.37	-13	-38.37	Pass	H
5786.79	146	194	-43.46	-13	-30.46	Pass	H
6487.11	149	260	-47.46	-13	-34.46	Pass	H
8016.60	151	31	-47.01	-13	-34.01	Pass	H
1205.82	149	4	-55.95	-13	-42.95	Pass	V
1486.33	148	257	-62.23	-13	-49.23	Pass	V
3646.12	147	55	-51.72	-13	-38.72	Pass	V
4004.49	148	273	-55.36	-13	-42.36	Pass	V
5766.46	150	136	-49.14	-13	-36.14	Pass	V
6446.76	150	16	-47.25	-13	-34.25	Pass	V

Band 7 21425 channel/BW 5 (highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1311.91	149	156	-58.10	-13	-45.10	Pass	H
1589.62	149	170	-54.21	-13	-41.21	Pass	H
3835.78	149	127	-49.73	-13	-36.73	Pass	H
5832.78	146	42	-44.05	-13	-31.05	Pass	H
6518.04	147	69	-46.25	-13	-33.25	Pass	H
7912.11	151	110	-47.67	-13	-34.67	Pass	H
1166.67	148	61	-52.69	-13	-39.69	Pass	V
1388.80	147	266	-55.52	-13	-42.52	Pass	V
3461.59	148	303	-48.54	-13	-35.54	Pass	V
3903.75	149	195	-43.77	-13	-30.77	Pass	V
5700.43	147	323	-41.81	-13	-28.81	Pass	V
6489.78	146	325	-44.32	-13	-31.32	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.
1336.19	144	326	-57.96	-13	-44.96	Pass	H
1670.91	143	124	-51.38	-13	-38.38	Pass	H
3851.86	143	2	-48.66	-13	-35.66	Pass	H
5794.46	147	340	-42.56	-13	-29.56	Pass	H
6507.29	148	285	-42.55	-13	-29.55	Pass	H
8067.36	156	237	-43.92	-13	-30.92	Pass	H
1153.57	140	148	-56.35	-13	-43.35	Pass	V
1515.77	158	266	-59.63	-13	-46.63	Pass	V
3516.85	153	101	-51.87	-13	-38.87	Pass	V
3802.65	153	104	-52.26	-13	-39.26	Pass	V
5896.83	152	304	-49.15	-13	-36.15	Pass	V
6526.03	144	24	-46.78	-13	-33.78	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.
1276.56	150	77	-55.85	-13	-42.85	Pass	H
1643.76	146	220	-50.14	-13	-37.14	Pass	H
3908.07	150	28	-48.45	-13	-35.45	Pass	H
5907.06	146	97	-47.98	-13	-34.98	Pass	H
6388.97	149	208	-47.38	-13	-34.38	Pass	H
7966.49	151	121	-51.01	-13	-38.01	Pass	H
1319.51	149	116	-50.91	-13	-37.91	Pass	V
1449.14	148	17	-57.30	-13	-44.30	Pass	V
3508.26	147	166	-53.63	-13	-40.63	Pass	V
3876.01	148	282	-49.28	-13	-36.28	Pass	V
5854.89	150	259	-50.09	-13	-37.09	Pass	V
6425.82	150	319	-48.18	-13	-35.18	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.
1347.82	149	275	-55.75	-13	-42.75	Pass	H
1708.27	148	88	-52.84	-13	-39.84	Pass	H
3910.60	148	199	-45.52	-13	-32.52	Pass	H
5962.62	145	85	-43.57	-13	-30.57	Pass	H
6433.57	152	266	-41.89	-13	-28.89	Pass	H
8082.21	151	142	-42.16	-13	-29.16	Pass	H
1253.72	147	42	-59.39	-13	-46.39	Pass	V
1370.80	148	84	-53.90	-13	-40.90	Pass	V
3576.18	150	52	-50.15	-13	-37.15	Pass	V
3986.26	146	162	-47.53	-13	-34.53	Pass	V
5818.82	147	88	-42.90	-13	-29.90	Pass	V
6588.13	146	303	-50.30	-13	-37.30	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.
1419.15	148	158	-61.50	-13	-48.50	Pass	H
1651.91	148	321	-48.14	-13	-35.14	Pass	H
3801.12	151	230	-48.63	-13	-35.63	Pass	H
5970.22	154	105	-47.08	-13	-34.08	Pass	H
6549.08	147	16	-42.59	-13	-29.59	Pass	H
7909.13	150	103	-45.26	-13	-32.26	Pass	H
1220.69	155	58	-53.75	-13	-40.75	Pass	V
1524.98	155	117	-55.78	-13	-42.78	Pass	V
3559.62	153	70	-50.97	-13	-37.97	Pass	V
3817.21	146	47	-48.60	-13	-35.60	Pass	V
5896.72	151	34	-44.67	-13	-31.67	Pass	V
6564.16	152	319	-50.70	-13	-37.70	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.
1418.15	154	334	-52.72	-13	-41.45	Pass	H
1810.16	155	191	-47.28	-13	-37.85	Pass	H
3926.67	148	255	-49.90	-13	-35.2	Pass	H
6018.79	151	333	-45.33	-13	-30.39	Pass	H
6473.03	149	119	-46.42	-13	-32.24	Pass	H
8088.50	146	226	-44.89	-13	-30.22	Pass	H
1253.50	149	86	-54.52	-13	-44.9	Pass	V
1283.46	155	244	-57.36	-13	-43.63	Pass	V
3530.40	148	182	-45.28	-13	-35.94	Pass	V
3779.06	153	143	-48.43	-13	-36.01	Pass	V
5793.10	147	302	-43.24	-13	-33.75	Pass	V
6483.76	150	102	-45.39	-13	-32.41	Pass	V

Band 12 23173 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1249.40	154	235	-54.91	-13	-41.91	Pass	H
1644.52	148	48	-48.58	-13	-35.58	Pass	H
3806.96	154	159	-41.23	-13	-28.23	Pass	H
5901.85	154	78	-43.86	-13	-30.86	Pass	H
6579.24	147	346	-43.05	-13	-30.05	Pass	H
8030.18	145	76	-46.98	-13	-33.98	Pass	H
1288.09	151	296	-58.49	-13	-45.49	Pass	V
1495.31	149	187	-57.13	-13	-44.13	Pass	V
3460.30	151	38	-51.96	-13	-38.96	Pass	V
3880.04	145	135	-53.12	-13	-40.12	Pass	V
5774.45	148	75	-48.87	-13	-35.87	Pass	V
6503.60	145	64	-46.91	-13	-33.91	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.

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Band 17 23755 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1275.75	150	79	-59.43	-13	-46.43	Pass	H
1767.77	153	238	-48.54	-13	-35.54	Pass	H
3776.39	147	34	-47.99	-13	-34.99	Pass	H
5968.28	148	291	-48.80	-13	-35.80	Pass	H
6536.30	147	44	-40.94	-13	-27.94	Pass	H
8066.80	150	317	-43.54	-13	-30.54	Pass	H
1088.52	147	268	-52.25	-13	-39.25	Pass	V
1376.13	148	180	-58.01	-13	-45.01	Pass	V
3567.96	146	295	-47.76	-13	-34.76	Pass	V
3925.72	148	73	-54.05	-13	-41.05	Pass	V
5818.33	147	162	-47.24	-13	-34.24	Pass	V
6549.76	145	283	-47.25	-13	-34.25	Pass	V

Band 17 23790 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1248.92	147	20	-56.08	-13	-43.08	Pass	H
1756.11	149	346	-48.45	-13	-35.45	Pass	H
3779.99	149	55	-47.47	-13	-34.47	Pass	H
5984.70	148	52	-44.27	-13	-31.27	Pass	H
6490.11	152	160	-42.11	-13	-29.11	Pass	H
8040.00	152	174	-47.36	-13	-34.36	Pass	H
1217.42	145	355	-60.56	-13	-47.56	Pass	V
1389.35	154	50	-56.79	-13	-43.79	Pass	V
3459.52	148	43	-46.45	-13	-33.45	Pass	V
3792.32	145	139	-44.63	-13	-31.63	Pass	V
5724.25	153	32	-40.56	-13	-27.56	Pass	V
6479.99	150	356	-42.16	-13	-29.16	Pass	V

Band 17 23825 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1248.51	149	165	-54.53	-13	-41.53	Pass	H
1726.83	146	208	-50.24	-13	-37.24	Pass	H
3834.87	146	4	-45.05	-13	-32.05	Pass	H
5929.67	150	198	-43.02	-13	-30.02	Pass	H
6489.29	146	341	-42.92	-13	-29.92	Pass	H
8075.01	150	235	-44.10	-13	-31.10	Pass	H
1231.17	146	292	-53.53	-13	-40.53	Pass	V
1428.75	150	158	-55.97	-13	-42.97	Pass	V
3637.11	149	55	-50.08	-13	-37.08	Pass	V
3879.72	150	319	-49.81	-13	-36.81	Pass	V
5902.42	146	118	-49.86	-13	-36.86	Pass	V
6540.44	150	155	-46.90	-13	-33.90	Pass	V

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Band 17 23755 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1400.97	150	78	-55.27	-13	-42.27	Pass	H
1680.05	149	291	-55.60	-13	-42.60	Pass	H
3935.74	151	213	-51.51	-13	-38.51	Pass	H
5826.11	150	89	-45.98	-13	-32.98	Pass	H
6524.40	151	329	-50.59	-13	-37.59	Pass	H
8018.30	148	138	-46.39	-13	-33.39	Pass	H
1128.12	149	99	-57.32	-13	-44.32	Pass	V
1436.45	148	217	-55.13	-13	-42.13	Pass	V
3655.97	150	12	-48.92	-13	-35.92	Pass	V
3843.60	150	137	-46.38	-13	-33.38	Pass	V
5882.34	146	356	-45.33	-13	-32.33	Pass	V
6557.15	146	95	-49.70	-13	-36.70	Pass	V

Band 17 23790 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1314.62	150	142	-56.16	-13	-43.16	Pass	H
1699.29	146	280	-50.70	-13	-37.70	Pass	H
3812.19	150	330	-47.94	-13	-34.94	Pass	H
5782.72	146	194	-42.63	-13	-29.63	Pass	H
6523.04	149	260	-53.30	-13	-40.30	Pass	H
8025.46	151	31	-46.34	-13	-33.34	Pass	H
1152.41	149	4	-57.02	-13	-44.02	Pass	V
1429.07	148	257	-64.39	-13	-51.39	Pass	V
3593.75	147	55	-54.37	-13	-41.37	Pass	V
3949.85	148	273	-55.42	-13	-42.42	Pass	V
5892.38	150	136	-53.61	-13	-40.61	Pass	V
6444.84	150	16	-49.81	-13	-36.81	Pass	V

Band 17 23825 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1267.26	149	156	-56.15	-13	-43.15	Pass	H
1589.91	149	170	-53.93	-13	-40.93	Pass	H
3837.10	149	127	-47.89	-13	-34.89	Pass	H
5883.14	146	42	-42.49	-13	-29.49	Pass	H
6472.27	147	69	-46.24	-13	-33.24	Pass	H
7901.93	151	110	-47.24	-13	-34.24	Pass	H
1179.66	148	61	-55.02	-13	-42.02	Pass	V
1322.35	147	266	-50.63	-13	-37.63	Pass	V
3431.66	148	303	-54.57	-13	-41.57	Pass	V
3854.06	149	195	-49.13	-13	-36.13	Pass	V
5701.15	147	323	-45.25	-13	-32.25	Pass	V
6533.13	146	325	-49.14	-13	-36.14	Pass	V

Note:

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

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

12. FREQUENCY STABILITY

12.1 Standard Applicable

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

12.2 Test Procedure

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

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

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode

12.3 Summary of Test Results/Plots

Note: 1.Normal Voltage NV= DC3.7V; Low Voltage LV=DC3.33; High Voltage HV=DC4.07V

Please refer to Appendix 2: Frequency stability

Test result: Pass

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