

TEST REPORT

Product Name: Car navigation
FCC ID: 2A6CE-E10
Trademark: N/A
Model Number: E10, E8, E9, E11, E12, E13, E14, E15
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Sample Received Date: Feb. 24, 2022
Sample tested Date: Feb. 24, 2022 to Mar. 10, 2022
Issue Date: Mar. 10, 2022
Report No.: CTB220310002RFX
Test Standards: FCC Part 2, 22H, 27L
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
CTB220310002RFX	Mar. 10, 2022	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Test Item	Test Requirement	Test method	Result
Conducted output power	Part 2.1046(a)	TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Effective Radiated Power of Transmitter(EIRP)	Part 22.913(a)(5)/Part27.50(h)(2)	TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
peak-to-average ratio	Part 27.50(d)	KDB 971168 D01v03r01	PASS
99% & 26dB Occupied Bandwidth	Part 2.1049(h)	KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	Part 2.1051/ Part 22.917(a)/Part 27.53(m) (4)	KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 22.917(a)/Part 27.53(m) (4)	TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	Part 2.1053/ Part 22.917(a)/Part 27.53(m) (4)	TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Frequency stability	Part 2.1055/Part 27.54	TIA-603-E-2016 & KDB 971168 D01v03r01	PASS

3. MEASUREMENT UNCERTAINTY

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

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

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	E10, E8, E9, E10, E11, E12, E13, E14, E15
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: E10
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	FDD-LTE BAND 5:824-849MHz FDD-LTE BAND 7:2500-2570MHz TDD-LTE BAND 38: 2570-2620MHz TDD-LTE BAND 40A: 2305-2315MHz TDD-LTE BAND 40B: 2350-2360MHz TDD-LTE BAND 41: 2555-2655MHz
Max. RF output power:	FDD-LTE BAND 5: 21.13 dBm FDD-LTE BAND 7: 21.39dBm TDD-LTE BAND 38: 21.42 dBm TDD-LTE BAND 40A: 20.95 dBm TDD-LTE BAND 40B: 21.02dBm TDD-LTE BAND 41: 21.13dBm
Type of Modulation:	QPSK, 16QAM
Antenna installation:	Internal antenna
Antenna Gain:	FDD-LTE BAND 5:0.3dBi FDD--LTE BAND 7: 0dBi TDD-LTE BAND 38: -5.0dBi TDD-LTE BAND 40A: 2.0 dBi TDD-LTE BAND 40B: 2.0 dBi TDD-LTE BAND 41: 1.0 dBi
Ratings:	DC 12V from DC 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 5	Low, Middle, High Channels
TM2	FDD-LTE BAND 7	Low, Middle, High Channels
TM3	TDD-LTE BAND 38	Low, Middle, High Channels
TM4	TDD-LTE BAND 40A	Low, Middle, High Channels
TM5	TDD-LTE BAND 40B	Low, Middle, High Channels
TM6	TDD-LTE BAND 41	Low, Middle, High Channels

4.5 Test Environment

Humidity(%):	55
Atmospheric Pressure(kPa):	101.1
Normal Voltage(DC):	12.0V
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

No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2022.08.05
2	Power Sensor	Agilent	U2021XA	MY56120032	2022.08.05
3	Power Sensor	Agilent	U2021XA	MY56120034	2022.08.05
4	Communication test set	R&S	CMW500	108058	2022.08.05
5	Spectrum Analyzer	R&S	FSP40	100550	2022.08.05
6	Signal Generator	Agilent	N5181A	MY49060920	2022.08.05
7	Signal Generator	Agilent	N5182A	MY47420195	2022.08.05
8	Communication test set	Agilent	E5515C	MY50102567	2022.08.05
9	band rejection filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2022.08.05
10	band rejection filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	2022.08.05
11	band rejection filter	Xingbo	XBLBQ-DZA120	190821-1-1	2022.08.05
12	BT&WI-FI Automatic test software	Microwave	MTS8310	Ver. 2.0.0.0	2022.08.05
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2022.08.05
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2022.08.05
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	2022.08.05
16	966 chamber	C.R.T.	966 Room	966	2022.08.05
17	Receiver	R&S	ESPI	100362	2022.08.05
18	Amplifier	HP	8447E	2945A02747	2022.08.05
19	Amplifier	Agilent	8449B	3008A01838	2022.08.05
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	869	2022.08.05

21	Horn Antenna	Schwarzbeck	BBHA9120D	1911	2022.08.05
22	Software	Fala	EZ-EMC	FA-03A2 RE	2022.08.05
23	3-Loop Antenna	Daze	ZN30401	17014	2022.08.05
24	loop antenna	ZHINAN	ZN30900A	/	2022.08.05
25	Horn antenna	A/H/System	SAS-574	588	2022.08.05
26	Amplifier	AEROFLEX	/	S/N/ 097	2022.08.05

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.

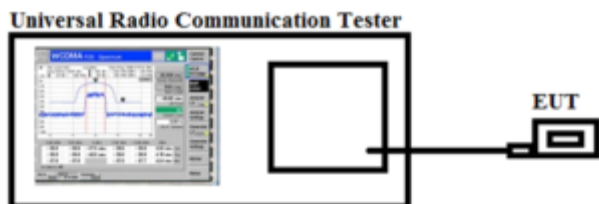
According to §24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

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 5

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	18.84	<38.45	PASS
		H	18.01		
	MCH	V	19.33		PASS
		H	19.42		
	HCH	V	18.57		PASS
		H	18.41		
16QAM	LCH	V	19.49	<38.45	PASS
		H	19.36		
	MCH	V	19.58		PASS
		H	18.73		
	HCH	V	19.01		PASS
		H	18.28		
Channel Bandwidth: 3 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	18.72	<38.45	PASS
		H	18.63		
	MCH	V	18.88		PASS
		H	19.77		
	HCH	V	18.75		PASS
		H	19.81		
16QAM	LCH	V	19.49	<38.45	PASS
		H	19.45		
	MCH	V	18.89		PASS
		H	19.53		
	HCH	V	18.52		PASS
		H	19.69		
Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	18.01	<38.45	PASS
		H	18.61		

	MCH	V	18.54		PASS
		H	18.35		
	HCH	V	18.09		PASS
		H	18.37		
16QAM	LCH	V	18.87	<38.45	PASS
		H	18.98		
	MCH	V	18.43		PASS
		H	18.62		
	HCH	V	18.41		PASS
		H	18.50		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	18.74	<38.45	PASS
		H	18.11		
	MCH	V	19.58		PASS
		H	18.08		
	HCH	V	19.09		PASS
		H	19.82		
16QAM	LCH	V	19.64	<38.45	PASS
		H	18.82		
	MCH	V	18.02		PASS
		H	19.93		
	HCH	V	18.62		PASS
		H	18.93		

FDD-LTE Band 7

Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	18.85	<33.00	PASS
		H	19.23		
	MCH	V	19.01		PASS
		H	19.57		
	HCH	V	18.43		PASS
		H	19.40		
16QAM	LCH	V	18.45	<33.00	PASS
		H	18.88		
	MCH	V	19.60		PASS

	HCH	H	19.36		PASS
		V	18.88		
		H	18.87		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	19.37	<33.00	PASS
		H	19.15		
	MCH	V	18.10		PASS
		H	18.45		
	HCH	V	18.19		PASS
		H	19.33		
16QAM	LCH	V	19.59	<33.00	PASS
		H	18.86		
	MCH	V	18.07		PASS
		H	18.42		
	HCH	V	18.36		PASS
		H	18.51		
Channel Bandwidth: 15 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	18.85	<33.00	PASS
		H	19.23		
	MCH	V	19.01		PASS
		H	19.57		
	HCH	V	18.43		PASS
		H	19.40		
16QAM	LCH	V	18.45	<33.00	PASS
		H	18.88		
	MCH	V	19.60		PASS
		H	19.36		
	HCH	V	18.88		PASS
		H	18.87		
Channel Bandwidth: 20 MHz					
Modulation	Channel	Antenna Polar	ERP [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	19.37	<33.00	PASS
		H	19.73		
	MCH	V	18.10		PASS
		H	18.45		

16QAM	HCH	V	18.19	<33.00	PASS
		H	19.33		
	LCH	V	19.69		PASS
		H	18.86		
	MCH	V	18.07		PASS
		H	18.42		
	HCH	V	18.36		PASS
		H	18.51		

TDD-LTE Band 38

Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.47	<33.00	PASS
		H	19.02		
	MCH	V	20.49		PASS
		H	19.94		
	HCH	V	20.62		PASS
		H	19.65		
16QAM	LCH	V	20.34	<33.00	PASS
		H	19.36		
	MCH	V	19.34		PASS
		H	20.55		
	HCH	V	20.01		PASS
		H	20.65		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.74	<33.00	PASS
		H	20.86		
	MCH	V	20.15		PASS
		H	20.26		
	HCH	V	20.11		PASS
		H	20.71		
16QAM	LCH	V	20.71	<33.00	PASS
		H	20.62		
	MCH	V	19.95		PASS
		H	19.55		
	HCH	V	19.19		PASS

		H	20.59		
Channel Bandwidth: 15 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	19.39	<33.00	PASS
		H	19.85		
	MCH	V	20.36		PASS
		H	20.14		
	HCH	V	20.17		PASS
		H	19.44		
16QAM	LCH	V	19.24	<33.00	PASS
		H	19.58		
	MCH	V	20.37		PASS
		H	19.38		
	HCH	V	20.97		PASS
		H	19.97		
Channel Bandwidth: 20 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.36	<33.00	PASS
		H	21.12		
	MCH	V	20.22		PASS
		H	20.25		
	HCH	V	20.14		PASS
		H	20.15		
16QAM	LCH	V	20.2	<33.00	PASS
		H	21.38		
	MCH	V	20.94		PASS
		H	20.84		
	HCH	V	20.69		PASS

TDD-LTE Band 40A

Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.18	<24.00	PASS
		H	20.81		
	MCH	V	20.46		PASS
		H	20.99		
	HCH	V	19.68		PASS

		H	19.12		
16QAM	LCH	V	20.50	<24.00	PASS
		H	20.69		
	MCH	V	19.68		PASS
		H	20.39		
	HCH	V	20.33		PASS
		H	20.19		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	19.11	<24.00	PASS
		H	20.45		
	MCH	V	20.28		PASS
		H	20.45		
	HCH	V	19.91		PASS
		H	20.72		
16QAM	LCH	V	19.12	<24.00	PASS
		H	19.21		
	MCH	V	20.43		PASS
		H	20.23		
	HCH	V	19.61		PASS
		H	19.19		

TDD-LTE Band 40B

Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.23	<24.00	PASS
		H	19.84		
	MCH	V	19.62		PASS
		H	20.41		
	HCH	V	20.76		PASS
		H	19.40		
16QAM	LCH	V	20.55	<24.00	PASS
		H	19.14		
	MCH	V	19.75		PASS
		H	20.04		
	HCH	V	20.81		PASS
		H	19.51		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.20	<24.00	PASS
		H	20.36		
	MCH	V	20.88		PASS
		H	19.72		
	HCH	V	20.08		PASS
		H	20.09		
16QAM	LCH	V	20.50	<24.00	PASS
		H	20.78		
	MCH	V	20.85		PASS
		H	19.98		
	HCH	V	19.35		PASS
		H	19.00		

TDD-LTE Band 41

Channel Bandwidth: 5 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	19.88	<33.00	PASS
		H	19.85		
	MCH	V	20.26		PASS
		H	19.54		

	HCH	V	20.81		PASS
		H	20.89		
16QAM	LCH	V	20.92	<33.00	PASS
		H	20.34		
	MCH	V	19.33		PASS
		H	19.98		
	HCH	V	20.52		PASS
		H	20.10		
Channel Bandwidth: 10 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	19.70	<33.00	PASS
		H	19.27		
	MCH	V	19.38		PASS
		H	19.81		
	HCH	V	19.19		PASS
		H	20.78		
16QAM	LCH	V	19.36	<33.00	PASS
		H	20.38		
	MCH	V	20.07		PASS
		H	20.02		
	HCH	V	19.89		PASS
		H	20.54		
Channel Bandwidth: 15 MHz					
Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	19.73	<33.00	PASS
		H	20.25		
	MCH	V	20.35		PASS
		H	19.97		
	HCH	V	20.79		PASS
		H	19.76		
16QAM	LCH	V	20.07	<33.00	PASS
		H	20.87		
	MCH	V	20.70		PASS
		H	20.30		
	HCH	V	20.77		PASS
		H	20.00		
Channel Bandwidth: 20 MHz					

Modulation	Channel	Antenna Polar	E.i.r.p [dBm]	Limit (dBm)	Verdict
QPSK	LCH	V	20.56	<33.00	PASS
		H	19.41		
	MCH	V	19.57		PASS
		H	19.52		
	HCH	V	19.86		PASS
		H	19.14		
16QAM	LCH	V	19.44	<33.00	PASS
		H	20.85		
	MCH	V	20.26		PASS
		H	19.75		
	HCH	V	20.79		PASS
		H	19.50		

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.

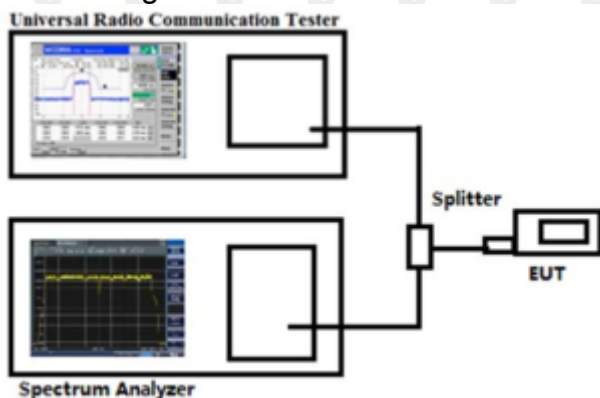
According to §27.50(B), the peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for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

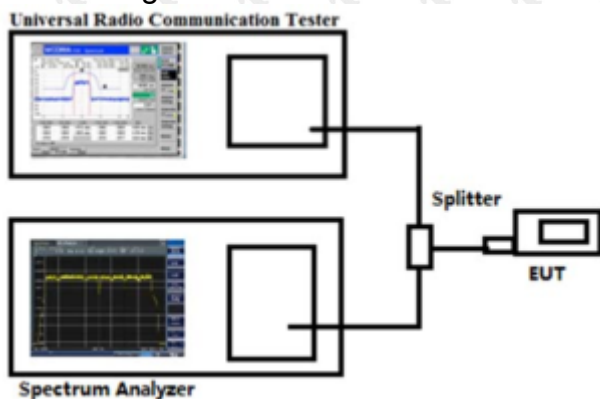
According to §24.238(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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,

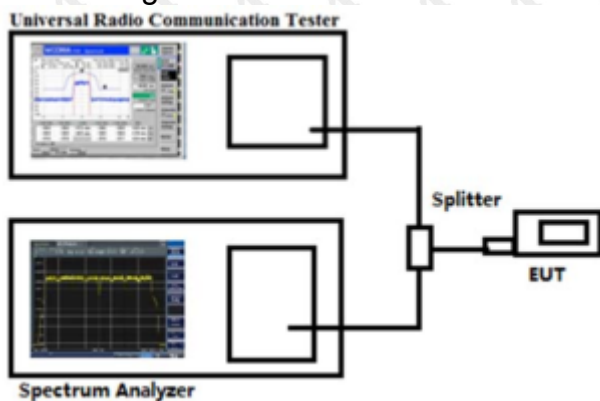
measured in watts, by at least $43 + 10 \log (P)$ dB.

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 = $43 + 10 \log 10$ (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.

QPSK

Band 7 20775 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1425.99	147	14	-56.21	-13	-44.67	Pass	H
1701.95	146	234	-49.41	-13	-34.41	Pass	H
3833.75	154	46	-46.89	-13	-36.9	Pass	H
5976.01	150	153	-43.90	-13	-33.07	Pass	H
6591.17	151	13	-43.06	-13	-31.79	Pass	H
8091.81	151	353	-44.22	-13	-28.84	Pass	H
1152.64	153	327	-56.10	-13	-41.24	Pass	V
1385.17	147	80	-58.40	-13	-43.57	Pass	V
3619.74	151	229	-53.77	-13	-37.85	Pass	V
3881.57	155	73	-47.66	-13	-38.46	Pass	V
5904.68	152	312	-41.78	-13	-32.52	Pass	V
6674.97	149	194	-48.63	-13	-35.32	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.
1285.23	146	273	-56.53	-13	-43.53	Pass	H
1793.02	149	159	-46.00	-13	-33.00	Pass	H
3908.44	148	301	-47.39	-13	-34.39	Pass	H
5904.78	148	104	-41.25	-13	-28.25	Pass	H
6467.53	152	278	-44.14	-13	-31.14	Pass	H
8049.27	153	4	-41.60	-13	-28.60	Pass	H
1110.41	153	165	-57.80	-13	-44.80	Pass	V
1291.19	151	97	-57.71	-13	-44.71	Pass	V
3492.65	149	261	-48.25	-13	-35.25	Pass	V
3860.00	152	222	-44.23	-13	-31.23	Pass	V
5810.12	148	267	-45.06	-13	-32.06	Pass	V
6545.60	146	300	-45.86	-13	-32.86	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.
1320.52	149	165	-53.56	-13	-40.56	Pass	H
1613.98	146	208	-50.60	-13	-37.60	Pass	H
3884.70	146	4	-42.11	-13	-29.11	Pass	H
5926.36	150	198	-38.46	-13	-25.46	Pass	H
6551.90	146	341	-45.75	-13	-32.75	Pass	H
8142.78	150	235	-44.63	-13	-31.63	Pass	H
1240.78	146	292	-50.91	-13	-37.91	Pass	V
1488.30	150	158	-57.78	-13	-44.78	Pass	V
3626.88	149	55	-49.18	-13	-36.18	Pass	V
3846.48	150	319	-45.42	-13	-32.42	Pass	V
5886.70	146	118	-46.76	-13	-33.76	Pass	V
6475.23	150	155	-48.51	-13	-35.51	Pass	V

16QAM

Band 7 20775 channel/BW 5 (lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1400.50	150	78	-58.25	-13	-45.25	Pass	H
1792.34	149	291	-53.00	-13	-40.00	Pass	H
3947.45	151	213	-49.41	-13	-36.41	Pass	H
5855.03	150	89	-48.82	-13	-35.82	Pass	H
6439.36	151	329	-50.66	-13	-37.66	Pass	H
7972.50	148	138	-47.80	-13	-34.80	Pass	H
1158.72	149	99	-59.05	-13	-46.05	Pass	V
1340.78	148	217	-57.56	-13	-44.56	Pass	V
3638.03	150	12	-52.36	-13	-39.36	Pass	V
3735.38	150	137	-45.36	-13	-32.36	Pass	V
5726.77	146	356	-44.88	-13	-31.88	Pass	V
6643.34	146	95	-44.22	-13	-31.22	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.
1197.42	150	142	-59.87	-13	-46.87	Pass	H
1770.91	146	280	-54.62	-13	-41.62	Pass	H
3883.74	150	330	-48.58	-13	-35.58	Pass	H
5791.11	146	194	-44.51	-13	-31.51	Pass	H
6467.94	149	260	-51.65	-13	-38.65	Pass	H
7955.34	151	31	-45.57	-13	-32.57	Pass	H
1312.52	149	4	-52.57	-13	-39.57	Pass	V
1304.67	148	257	-59.56	-13	-46.56	Pass	V
3635.64	147	55	-49.06	-13	-36.06	Pass	V
3872.68	148	273	-51.94	-13	-38.94	Pass	V
5789.21	150	136	-51.21	-13	-38.21	Pass	V
6596.42	150	16	-47.56	-13	-34.56	Pass	V

Band 7 21425 channel/BW 5 (highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1334.80	149	156	-59.37	-13	-46.37	Pass	H
1635.28	149	170	-48.18	-13	-35.18	Pass	H
3761.50	149	127	-49.15	-13	-36.15	Pass	H
5879.24	146	42	-39.22	-13	-26.22	Pass	H
6428.95	147	69	-45.01	-13	-32.01	Pass	H
7913.97	151	110	-47.01	-13	-34.01	Pass	H
1223.05	148	61	-54.99	-13	-41.99	Pass	V
1353.86	147	266	-53.34	-13	-40.34	Pass	V
3433.76	148	303	-53.84	-13	-40.84	Pass	V
3881.12	149	195	-44.75	-13	-31.75	Pass	V
5772.56	147	323	-45.61	-13	-32.61	Pass	V
6555.43	146	325	-49.17	-13	-36.17	Pass	V

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.
1428.52	148	218	-53.75	-13	-40.75	Pass	H
1751.98	140	19	-48.76	-13	-35.76	Pass	H
3895.93	151	120	-48.97	-13	-35.97	Pass	H
5929.15	151	191	-47.68	-13	-34.68	Pass	H
6443.53	146	226	-45.95	-13	-32.95	Pass	H
8033.20	156	179	-46.17	-13	-33.17	Pass	H
1180.13	152	186	-56.69	-13	-43.69	Pass	V
1341.70	147	137	-58.49	-13	-45.49	Pass	V
3572.88	156	271	-52.83	-13	-39.83	Pass	V
3778.86	145	336	-47.91	-13	-34.91	Pass	V
5883.75	148	26	-48.04	-13	-35.04	Pass	V
6554.82	142	131	-47.15	-13	-34.15	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.
1368.60	150	125	-55.73	-13	-42.73	Pass	H
1742.79	146	285	-53.22	-13	-40.22	Pass	H
3976.34	150	333	-48.72	-13	-35.72	Pass	H
5911.13	146	66	-46.23	-13	-33.23	Pass	H
6545.04	149	252	-49.42	-13	-36.42	Pass	H
8083.69	151	151	-50.61	-13	-37.61	Pass	H
1189.32	149	210	-53.85	-13	-40.85	Pass	V
1305.01	148	62	-61.71	-13	-48.71	Pass	V
3514.90	147	94	-52.24	-13	-39.24	Pass	V
3936.16	148	252	-52.64	-13	-39.64	Pass	V
5865.47	150	8	-47.31	-13	-34.31	Pass	V
6515.73	150	272	-46.55	-13	-33.55	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.
1340.71	153	339	-56.73	-13	-43.73	Pass	H
1669.90	154	168	-52	-13	-39	Pass	H
3845.50	154	257	-45.66	-13	-32.66	Pass	H
5906.91	150	216	-40.96	-13	-27.96	Pass	H
6531.65	147	240	-42.47	-13	-29.47	Pass	H
8000.07	148	13	-44.74	-13	-31.74	Pass	H
1257.63	146	149	-56.49	-13	-43.49	Pass	V
1403.18	145	37	-56.84	-13	-43.84	Pass	V
3525.24	148	181	-52.79	-13	-39.79	Pass	V
3912.13	154	83	-48.59	-13	-35.59	Pass	V
5788.31	153	150	-43.05	-13	-30.05	Pass	V
6576.29	150	235	-47.76	-13	-34.76	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.
1401.60	154	155	-59.46	-13	-46.46	1401.60	H
1696.32	149	3	-49.71	-13	-36.71	1696.32	H
3827.88	152	92	-49.11	-13	-36.11	3827.88	H
5869.49	149	188	-47.07	-13	-34.07	5869.49	H
6633.08	146	138	-43.28	-13	-30.28	6633.08	H
7952.79	149	110	-42.61	-13	-29.61	7952.79	H
1202.83	147	204	-51.78	-13	-38.78	1202.83	V
1466.09	154	77	-57.48	-13	-44.48	1466.09	V
3682.66	150	287	-53.21	-13	-40.21	3682.66	V
3992.37	153	11	-49.25	-13	-36.25	3992.37	V
5764.09	152	264	-45.41	-13	-32.41	5764.09	V
6567.57	153	265	-49.24	-13	-36.24	6567.57	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.
1345.96	155	189	-53.87	-13	-41.45	Pass	H
1628.25	151	229	-48.21	-13	-37.85	Pass	H
3897.56	150	193	-44.91	-13	-35.2	Pass	H
5943.73	149	21	-43.74	-13	-30.39	Pass	H
6588.33	153	208	-47.09	-13	-32.24	Pass	H
7982.12	147	213	-40.83	-13	-30.22	Pass	H
1287.06	152	147	-57.47	-13	-44.9	Pass	V
1478.22	147	236	-59.40	-13	-43.63	Pass	V
3619.06	154	117	-48.80	-13	-35.94	Pass	V
3920.82	151	187	-48.28	-13	-36.01	Pass	V
5773.76	149	306	-45.60	-13	-33.75	Pass	V
6487.25	153	26	-45.72	-13	-32.41	Pass	V

Band 5 20643 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1428.40	154	99	-57.63	-13	-44.63	Pass	H
1744.05	152	304	-48.02	-13	-35.02	Pass	H
3915.33	146	2	-43.61	-13	-30.61	Pass	H
5857.86	151	151	-40.01	-13	-27.01	Pass	H
6531.87	148	147	-41.72	-13	-28.72	Pass	H
8152.62	149	2	-46.10	-13	-33.10	Pass	H
1155.70	148	51	-51.77	-13	-38.77	Pass	V
1520.47	149	190	-61.19	-13	-48.19	Pass	V
3596.53	147	331	-51.11	-13	-38.11	Pass	V
3787.28	147	291	-48.82	-13	-35.82	Pass	V
5749.89	153	258	-49.82	-13	-36.82	Pass	V
6593.40	151	129	-43.59	-13	-30.59	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 38 37775 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1406.10	155	311	-51.50	-25	-26.50	Pass	H
1733.60	147	135	-50.03	-25	-25.03	Pass	H
3824.27	147	238	-47.66	-25	-22.66	Pass	H
5792.13	153	213	-46.66	-25	-21.66	Pass	H
6588.14	146	168	-47.88	-25	-22.88	Pass	H
8012.23	152	86	-48.23	-25	-23.23	Pass	H
1278.91	148	359	-58.92	-25	-33.92	Pass	V
1402.41	149	296	-55.07	-25	-30.07	Pass	V
3612.81	155	100	-48.02	-25	-23.02	Pass	V
3762.86	147	157	-51.48	-25	-26.48	Pass	V
5778.85	154	42	-45.02	-25	-20.02	Pass	V
6520.97	155	282	-48.80	-25	-23.80	Pass	V

Band 38 38000 channel/BW 5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1235.46	151	87	-59.16	-25	-34.16	Pass	H
1625.72	145	50	-47.10	-25	-22.10	Pass	H
3801.45	155	132	-48.79	-25	-23.79	Pass	H
5758.09	147	253	-49.55	-25	-24.55	Pass	H
6398.27	151	91	-44.64	-25	-19.64	Pass	H
7897.39	151	246	-45.15	-25	-20.15	Pass	H
1121.03	150	116	-60.61	-25	-35.61	Pass	V
1339.76	155	214	-62.74	-25	-37.74	Pass	V
3470.70	150	219	-47.62	-25	-22.62	Pass	V
3738.05	155	324	-49.29	-25	-24.29	Pass	V
5703.71	154	76	-43.77	-25	-18.77	Pass	V
6454.15	146	277	-49.85	-25	-24.85	Pass	V

Band 38 38225 channel/BW 5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1278.41	153	226	-56.19	-25	-31.19	Pass	H
1820.73	151	94	-47.61	-25	-22.61	Pass	H
3911.61	147	285	-50.65	-25	-25.65	Pass	H
5776.54	146	65	-43.73	-25	-18.73	Pass	H
6553.53	145	138	-43.07	-25	-18.07	Pass	H
8061.79	151	232	-46.95	-25	-21.95	Pass	H
1183.91	145	44	-61.01	-25	-36.01	Pass	V
1354.81	147	74	-56.24	-25	-31.24	Pass	V
3547.33	150	248	-50.50	-25	-25.50	Pass	V
3864.01	151	248	-51.20	-25	-26.20	Pass	V
5876.81	146	4	-45.63	-25	-20.63	Pass	V
6534.16	148	77	-48.25	-25	-23.25	Pass	V

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Band 38 37775 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1369.67	147	17	-52.45	-25	-27.45	Pass	H
1818.92	149	336	-52.56	-25	-27.56	Pass	H
3902.82	149	175	-48.13	-25	-23.13	Pass	H
5781.05	146	277	-43.82	-25	-18.82	Pass	H
6455.27	154	73	-43.67	-25	-18.67	Pass	H
7930.69	146	177	-41.39	-25	-16.39	Pass	H
1124.69	152	236	-62.25	-25	-37.25	Pass	V
1364.46	147	68	-54.67	-25	-29.67	Pass	V
3591.68	154	45	-51.95	-25	-26.95	Pass	V
3926.34	148	78	-46.77	-25	-21.77	Pass	V
5743.38	146	320	-46.19	-25	-21.19	Pass	V
6574.44	149	99	-53.11	-25	-28.11	Pass	V

Band 38 38000 channel/BW 5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1402.60	153	200	-52.25	-25	-27.25	Pass	H
1781.76	145	4	-51.20	-25	-26.20	Pass	H
3900.97	153	97	-51.13	-25	-26.13	Pass	H
5777.04	151	68	-49.85	-25	-24.85	Pass	H
6470.85	154	117	-45.70	-25	-20.70	Pass	H
7989.02	148	22	-39.51	-25	-14.51	Pass	H
1277.64	148	101	-59.97	-25	-34.97	Pass	V
1481.05	145	16	-56.57	-25	-31.57	Pass	V
3666.26	153	132	-52.12	-25	-27.12	Pass	V
3838.58	154	154	-54.10	-25	-29.10	Pass	V
5816.56	148	350	-44.64	-25	-19.64	Pass	V
6625.61	146	177	-49.96	-25	-24.96	Pass	V

Band 38 38225 channel/BW 5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1256.68	154	143	-52.54	-25	-27.54	Pass	H
1733.78	147	253	-46.27	-25	-21.27	Pass	H
3814.04	149	42	-50.95	-25	-25.95	Pass	H
5852.12	148	283	-46.77	-25	-21.77	Pass	H
6546.12	155	149	-49.73	-25	-24.73	Pass	H
7921.14	150	229	-42.34	-25	-17.34	Pass	H
1304.60	145	241	-57.30	-25	-32.30	Pass	V
1417.55	153	341	-60.03	-25	-35.03	Pass	V
3514.01	149	23	-47.81	-25	-22.81	Pass	V
3791.01	155	220	-50.47	-25	-25.47	Pass	V
5708.54	151	0	-49.08	-25	-24.08	Pass	V
6518.11	145	147	-50.01	-25	-25.01	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.

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Band 40A 38725 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1383.54	150	61	-53.88	-40	-13.88	Pass	H
1761.83	153	325	-48.89	-40	-8.89	Pass	H
3830.13	151	98	-50.79	-40	-10.79	Pass	H
5993.77	146	311	-41.70	-40	-1.70	Pass	H
6421.24	155	285	-46.82	-40	-6.82	Pass	H
8047.41	152	12	-43.27	-40	-3.27	Pass	H
1265.06	150	134	-51.61	-40	-11.61	Pass	V
1341.33	148	135	-61.78	-40	-21.78	Pass	V
3586.86	153	253	-49.79	-40	-9.79	Pass	V
3778.54	154	342	-42.72	-40	-2.72	Pass	V
5844.38	153	191	-47.92	-40	-7.92	Pass	V
6578.37	155	225	-44.26	-40	-4.26	Pass	V

Band 40A 38750 channel/BW 5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1420.24	152	9	-58.73	-40	-18.73	Pass	H
1788.92	152	353	-53.91	-40	-13.91	Pass	H
3815.29	145	287	-48.94	-40	-8.94	Pass	H
5953.40	151	194	-46.25	-40	-6.25	Pass	H
6498.87	153	201	-49.59	-40	-9.59	Pass	H
8081.71	151	350	-42.03	-40	-2.03	Pass	H
1192.82	151	117	-59.21	-40	-19.21	Pass	V
1334.19	146	323	-59.61	-40	-19.61	Pass	V
3575.42	153	279	-51.06	-40	-11.06	Pass	V
3808.93	153	171	-49.26	-40	-9.26	Pass	V
5781.34	152	234	-50.03	-40	-10.03	Pass	V
6604.75	146	108	-45.86	-40	-5.86	Pass	V

Band 40A 38775 channel/BW 5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1307.42	147	320	-54.23	-40	-14.23	1307.42	H
1802.48	150	96	-50.21	-40	-10.21	1802.48	H
3942.39	153	331	-51.13	-40	-11.13	3942.39	H
5989.63	151	187	-44.56	-40	-4.56	5989.63	H
6583.70	155	82	-44.38	-40	-4.38	6583.70	H
8152.26	149	316	-47.15	-40	-7.15	8152.26	H
1263.16	150	309	-60.10	-40	-20.10	1263.16	V
1359.22	149	63	-62.47	-40	-22.47	1359.22	V
3557.78	151	227	-51.82	-40	-11.82	3557.78	V
3907.35	152	230	-51.87	-40	-11.87	3907.35	V
5758.81	148	87	-48.25	-40	-8.25	5758.81	V
6504.97	150	56	-48.59	-40	-5.68	6504.97	V

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Band 40A 38725 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1306.75	146	87	-53.59	-40	-13.59	Pass	H
1639.17	149	85	-50.39	-40	-10.39	Pass	H
3867.38	147	104	-49.40	-40	-9.40	Pass	H
5995.53	148	272	-48.36	-40	-8.36	Pass	H
6513.96	154	199	-48.11	-40	-8.11	Pass	H
8092.06	151	181	-43.63	-40	-3.63	Pass	H
1153.35	151	7	-59.37	-40	-19.37	Pass	V
1291.57	147	160	-58.83	-40	-18.83	Pass	V
3515.06	153	146	-53.80	-40	-13.80	Pass	V
3833.81	154	353	-50.89	-40	-10.89	Pass	V
5902.20	153	264	-48.89	-40	-8.89	Pass	V
6434.83	152.30	11.81	-45.89	-40	-5.89	Pass	V

Band 40A 38750channel/BW 5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1261.03	147	230	-54.25	-40	-14.25	Pass	H
1626.91	154	317	-50.78	-40	-10.78	Pass	H
3888.22	147	23	-52.02	-40	-12.02	Pass	H
5970.29	146	164	-43.79	-40	-3.79	Pass	H
6559.55	152	305	-48.21	-40	-8.21	Pass	H
7965.76	150	358	-43.76	-40	-3.76	Pass	H
1262.26	151	101	-57.08	-40	-17.08	Pass	V
1439.80	154	243	-62.59	-40	-22.59	Pass	V
3631.81	149	18	-49.54	-40	-9.54	Pass	V
3801.15	153	43	-52.06	-40	-12.06	Pass	V
5747.65	146	262	-47.46	-40	-7.46	Pass	V
6544.04	152	6	-45.76	-40	-5.76	Pass	V

Band 40A 38875 channel/BW 5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1296.22	153	70	-56.97	-40	-16.97	Pass	H
1670.97	151	78	-46.43	-40	-6.43	Pass	H
3896.70	147	317	-46.73	-40	-6.73	Pass	H
5922.56	148	15	-47.01	-40	-7.01	Pass	H
6518.93	147	352	-46.94	-40	-6.94	Pass	H
8092.88	145	191	-43.46	-40	-3.46	Pass	H
1161.69	146	103	-56.25	-40	-16.25	Pass	V
1370.34	149	115	-61.73	-40	-21.73	Pass	V
3463.36	152	142	-51.17	-40	-11.17	Pass	V
3810.76	146	48	-49.82	-40	-9.82	Pass	V
5893.93	152	78	-47.21	-40	-7.21	Pass	V
6522.92	153	358	-44.97	-40	-4.97	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 5.0MHz with full RB were the worst case; and then Only the worst case is recorded in the report.

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Band 40B 39175channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1424.99	151	239	-55.82	-40	-15.82	Pass	H
1724.07	145	272	-50.13	-40	-10.13	Pass	H
3904.63	150	99	-50.34	-40	-10.34	Pass	H
5891.14	147	16	-42.66	-40	-2.66	Pass	H
6445.86	151	16	-47.99	-40	-7.99	Pass	H
8106.58	151	293	-45.75	-40	-5.75	Pass	H
1190.51	155	35	-57.67	-40	-17.67	Pass	V
1388.10	151	302	-59.81	-40	-19.81	Pass	V
3528.79	147	71	-47.48	-40	-7.48	Pass	V
3846.12	146	244	-50.21	-40	-10.21	Pass	V
5732.31	150	338	-45.71	-40	-5.71	Pass	V
6599.81	152	64	-45.13	-40	-5.13	Pass	V

Band 40B 39200 channel/BW 5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1428.33	147	55	-58.07	-40	-18.07	Pass	H
1651.51	148	316	-49.69	-40	-9.69	Pass	H
3782.16	146	295	-51.08	-40	-11.08	Pass	H
5851.61	148	177	-45.49	-40	-5.49	Pass	H
6497.16	148	228	-47.15	-40	-7.15	Pass	H
8118.14	148	75	-47.08	-40	-7.08	Pass	H
1257.00	149	95	-58.66	-40	-18.66	Pass	V
1321.07	146	352	-57.15	-40	-17.15	Pass	V
3597.84	151	140	-50.50	-40	-10.50	Pass	V
3943.38	151	46	-50.13	-40	-10.13	Pass	V
5728.80	153	40	-45.69	-40	-5.69	Pass	V
6453.59	151	164	-47.11	-40	-7.11	Pass	V

Band 40B 39225 channel/BW 5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1324.83	149	349	-57.82	-40	-17.82	Pass	H
1750.93	148	299	-51.28	-40	-11.28	Pass	H
3762.15	148	203	-50.37	-40	-10.37	Pass	H
5996.37	149	20	-43.80	-40	-3.80	Pass	H
6420.34	150	282	-48.10	-40	-8.10	Pass	H
8130.75	149	286	-46.03	-40	-6.03	Pass	H
1210.74	150	198	-58.74	-40	-18.74	Pass	V
1333.59	150	84	-58.75	-40	-18.75	Pass	V
3623.22	154	138	-52.24	-40	-12.24	Pass	V
3763.80	148	182	-49.95	-40	-9.95	Pass	V
5749.33	146	279	-47.88	-40	-7.88	Pass	V
6521.98	155	40	-43.15	-40	-3.15	Pass	V

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Band 40B 39175 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1395.34	152	72	-52.50	-40	-12.50	Pass	H
1720.37	146	158	-47.93	-40	-7.93	Pass	H
3942.93	154	198	-49.19	-40	-9.19	Pass	H
5863.68	146	312	-44.54	-40	-4.54	Pass	H
6593.68	146	231	-48.34	-40	-8.34	Pass	H
8094.30	145	353	-45.19	-40	-5.19	Pass	H
1175.63	152	335	-59.76	-40	-19.76	Pass	V
1363.38	152	130	-61.21	-40	-21.21	Pass	V
3519.60	146	356	-51.49	-40	-11.49	Pass	V
3920.89	148	256	-47.88	-40	-7.88	Pass	V
5778.98	152	146	-48.38	-40	-8.38	Pass	V
6454.80	148	213	-48.81	-40	-8.81	Pass	V

Band 40B 39200channel/BW 5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1432.68	146	252	-53.99	-40	-13.99	Pass	H
1637.85	146	190	-48.78	-40	-8.78	Pass	H
3834.45	145	268	-46.64	-40	-6.64	Pass	H
5997.81	145	28	-46.75	-40	-6.75	Pass	H
6535.23	146	309	-44.84	-40	-4.84	Pass	H
8105.37	146	31	-46.64	-40	-6.64	Pass	H
1197.97	145	247	-57.83	-40	-17.83	Pass	V
1428.23	146	334	-60.78	-40	-20.78	Pass	V
3606.55	145	58	-50.96	-40	-10.96	Pass	V
3886.76	146	100	-51.21	-40	-11.21	Pass	V
5814.69	146	74	-50.35	-40	-10.35	Pass	V
6526.13	146	271	-44.58	-40	-4.58	Pass	V

Band 40B 39225 channel/BW 5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1370.44	154	204	-53.52	-40	-13.52	Pass	H
1761.01	152	22	-48.92	-40	-8.92	Pass	H
3842.76	151	31	-49.90	-40	-9.90	Pass	H
5858.23	149	267	-47.53	-40	-7.53	Pass	H
6501.72	146	231	-47.54	-40	-7.54	Pass	H
8150.04	146	215	-44.63	-40	-4.63	Pass	H
1264.48	147	148	-56.30	-40	-16.30	Pass	V
1301.99	155	218	-58.22	-40	-18.22	Pass	V
3461.17	155	256	-50.30	-40	-10.30	Pass	V
3786.14	147	2	-51.78	-40	-11.78	Pass	V
5775.61	147	90	-47.32	-40	-7.32	Pass	V
6543.07	153	319	-43.32	-40	-3.32	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 5.0MHz with full RB were the worst case; and then Only the worst case is recorded in the report.

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Band 41 40265 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1335.025	149	165	-54.261	-25	-29.26	Pass	H
1704.403	146	208	-47.458	-25	-22.46	Pass	H
3901.685	146	4	-43.908	-25	-18.91	Pass	H
5890.630	150	198	-41.854	-25	-16.85	Pass	H
6509.255	146	341	-42.843	-25	-17.84	Pass	H
8081.144	150	235	-42.206	-25	-17.21	Pass	H
1207.252	146	292	-54.890	-25	-29.89	Pass	V
1459.204	150	158	-58.228	-25	-33.23	Pass	V
3541.764	149	55	-52.488	-25	-27.49	Pass	V
3828.927	150	319	-48.580	-25	-23.58	Pass	V
5801.649	146	118	-45.947	-25	-20.95	Pass	V
6558.230	150	155	-45.888	-25	-20.89	Pass	V

Band 41 40740 channel/BW 5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.341	149	165	-55.346	-25	-30.35	Pass	H
1704.019	146	208	-49.041	-25	-24.04	Pass	H
3901.865	146	4	-46.960	-25	-21.96	Pass	H
5889.602	150	198	-41.933	-25	-16.93	Pass	H
6510.126	146	341	-43.699	-25	-18.70	Pass	H
8079.150	150	235	-43.112	-25	-18.11	Pass	H
1205.603	146	292	-54.005	-25	-29.00	Pass	V
1459.731	150	158	-59.050	-25	-34.05	Pass	V
3542.938	149	55	-51.114	-25	-26.11	Pass	V
3828.983	150	319	-48.855	-25	-23.86	Pass	V
5800.934	146	118	-46.328	-25	-21.33	Pass	V
6556.704	150	155	-46.620	-25	-21.62	Pass	V

Band 41 41215 channel/BW 5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1334.798	149	165	-54.235	-25	-29.24	Pass	H
1704.076	146	208	-46.986	-25	-21.99	Pass	H
3902.422	146	4	-46.609	-25	-21.61	Pass	H
5888.803	150	198	-43.825	-25	-18.82	Pass	H
6510.043	146	341	-43.065	-25	-18.07	Pass	H
8078.215	150	235	-42.662	-25	-17.66	Pass	H
1206.930	146	292	-56.641	-25	-31.64	Pass	V
1459.520	150	158	-59.554	-25	-34.55	Pass	V
3542.981	149	55	-51.763	-25	-26.76	Pass	V
3829.859	150	319	-48.836	-25	-23.84	Pass	V
5800.363	146	118	-46.675	-25	-21.67	Pass	V
6557.630	150	155	-46.430	-25	-21.43	Pass	V

16QAM

Band 41 40365 channel/BW 5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1334.250	149	165	-56.502	-25	-31.50	Pass	H
1702.316	146	208	-49.926	-25	-24.93	Pass	H
3900.545	146	4	-47.618	-25	-22.62	Pass	H
5888.952	150	198	-41.655	-25	-16.65	Pass	H
6509.077	146	341	-43.334	-25	-18.33	Pass	H
8079.276	150	235	-44.109	-25	-19.11	Pass	H
1205.004	146	292	-56.354	-25	-31.35	Pass	V
1461.030	150	158	-58.223	-25	-33.22	Pass	V
3542.603	149	55	-51.061	-25	-26.06	Pass	V
3829.825	150	319	-50.856	-25	-25.86	Pass	V
5800.477	146	118	-48.776	-25	-23.78	Pass	V
6558.651	150	155	-46.735	-25	-21.74	Pass	V

Band 41 40740 channel/BW 5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1333.527	149	165	-55.678	-25	-30.68	Pass	H
1701.961	146	208	-48.488	-25	-23.49	Pass	H
3901.881	146	4	-44.198	-25	-19.20	Pass	H
5890.719	150	198	-44.573	-25	-19.57	Pass	H
6510.800	146	341	-42.634	-25	-17.63	Pass	H
8079.541	150	235	-46.000	-25	-21.00	Pass	H
1206.976	146	292	-53.877	-25	-28.88	Pass	V
1460.600	150	158	-59.777	-25	-34.78	Pass	V
3542.333	149	55	-49.419	-25	-24.42	Pass	V
3829.156	150	319	-50.547	-25	-25.55	Pass	V
5801.598	146	118	-48.217	-25	-23.22	Pass	V
6557.771	150	155	-48.783	-25	-23.78	Pass	V

Band 41 41215 channel/BW 5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1335.350	149	165	-55.984	-25	-30.98	Pass	H
1703.300	146	208	-47.648	-25	-22.65	Pass	H
3900.427	146	4	-44.684	-25	-19.68	Pass	H
5889.242	150	198	-43.210	-25	-18.21	Pass	H
6511.172	146	341	-45.147	-25	-20.15	Pass	H
8080.767	150	235	-45.163	-25	-20.16	Pass	H
1205.281	146	292	-55.454	-25	-30.45	Pass	V
1460.033	150	158	-58.071	-25	-33.07	Pass	V
3542.421	149	55	-50.357	-25	-25.36	Pass	V
3829.920	150	319	-49.143	-25	-24.14	Pass	V
5800.599	146	118	-47.026	-25	-22.03	Pass	V
6556.329	150	155	-48.719	-25	-23.72	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=DC12.0V; Low Voltage LV=DC10.8; High Voltage HV=DC13.2V

Please refer to Appendix F: Frequency Stability

Test result: Pass

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