TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 95

MEASUREMENT AND TEST REPORT

For

Hebei Deguroon Electronic Technology Co., Ltd

Room 15-3-1303, No.295 Donggang Road Yuhua District, Shijiazhuang, Hebei Province, China

FCC ID: 2ASTODGRCITRADAR360
Model: CitRadar-360

Report Type:	**Product Type:**
Original Report	Omnidirectional tracking detection radar sensor

Report Number:	RDG190107001-00B
Report Date:	2019-03-20
Reviewed By:	Jerry Zhang EMC Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan). This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA* or any agency of the Federal Government. * This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "*".

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

EUT Name:	Omnidirectional tracking detection radar sensor
EUT Model:	CitRadar-360
Operation Frequency:	76.5 GHz
Maximum Output power: (EIRP)	29.97 dBm
Modulation Type:	FMCW
Bandwidth:	775 MHz
Rated Input Voltage:	DC 24V
External Dimension:	250 mm(L) x250 mm(W)x300mm(H)
Serial Number:	190107001
EUT Received Date:	2018.12.14

Objective

This report is prepared on behalf of ***Hebei Deguroon Electronic Technology Co., Ltd*** in accordance with Part 2 and Part 95, Subpart M of the Federal Communication Commissions rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All tests and measurements indicated in this document were performed in accordance with Part 95 Subpart M of the Federal Communication Commissions rules and KDB 653005 76-81 GHz Radars v01. And ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
Radiated Emissions	30MHz ~ 1GHz:5.85 dB 1G~40GHz: 5.23 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier : CN0022.

FAR Field Boundary Calculations

The far-field boundary is given in ANSI C63.10-2013:

$$R_m = 2D^2 / \lambda$$

Where:

D is the largest dimension of the antenna aperture in m and

λ is the free-space wavelength in m at the frequency of measurement.

The minimum test distance for the frequency range 40GHz-231GHz determine as below:

Model	Frequency Range (GHz)	Largest Dimension of the Horn Antenna (mm)	Minimum Test Distance R_m (m)
M19RH	40-60	46.3	0.57
861V/385	50-75	43.7	0.64
M12RH	60-90	30.02	0.36
M08RH	90-140	19.7	0.23
M05RH	140-220	12.5	0.15
M03RH	220-325	8.36	0.10

Note: the test distances used were 1.0 m from 40 GHz to 90 GHz, and 0.7 m from 90 GHz to 231GHz, it can be seen that the EUT was always in the Far-field of the Receive Antenna during all Radiated Emissions Tests.

Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
R&S	EMI Test Receiver	ESCI	100035	2018-08-03	2019-08-03
Sunol Sciences	Antenna	JB3	A060611-3	2017-07-21	2019-07-21
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2018-09-24	2019-09-24
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2018-09-05	2019-09-05
Sonoma	Amplifier	310N	185914	2018-10-13	2019-10-13
R&S	Spectrum Analyzer	FSP 38	100478	2018-12-10	2019-12-10
R&S	Spectrum Analyzer	8564E	3943A01781	2019-01-04	2020-01-04
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2016-11-18	2019-11-18
Ducommun Technolagies	Horn Antenna	ARH-2823-02	1007726-01 1302	2016-11-18	2019-11-18
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2018-09-05	2019-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2018-06-27	2019-06-27
MICRO-COAX	Coaxial Cable	UFA147-1-2362-100100	64639 231029-001	2018-02-24	2019-02-28
OML	Harmonic Mixer	WR19/M19HWD	U60313-1	2016-10-14	2019-10-14
OML	Horn Antenna	M19RH	11648-01	2016-10-14	2019-10-14
Flann Micowave	Horn Antenna	861V/385	736	2016-12-07	2019-12-07
OML	Harmonic Mixer	WR12/M12HWD	E60120-1	2016-10-19	2019-10-19
OML	Horn Antenna	M12RH	E60120-2	2016-10-19	2019-10-19
OML	Harmonic Mixer	WR08/M08HWD	F60313-1	2016-10-24	2019-10-24
OML	Horn Antenna	M08RH	F60313-2	2016-10-24	2019-10-24
OML	Harmonic Mixer	WR05/M05HWD	G60106-1	2016-10-27	2019-10-27
OML	Horn Antenna	M05RH	G60106-2	2016-10-27	2019-10-27
OML	Harmonic Mixer	WR03/M03HWD	H60120-1	2016-11-01	2019-11-01
OML	Horn Antenna	M03RH	H60120-2	2016-11-01	2019-11-01

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in Engineering Mode, which was provided by the manufacturer.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

The software "Radar View Lite.exe" was used to monitor the operating status during the test.

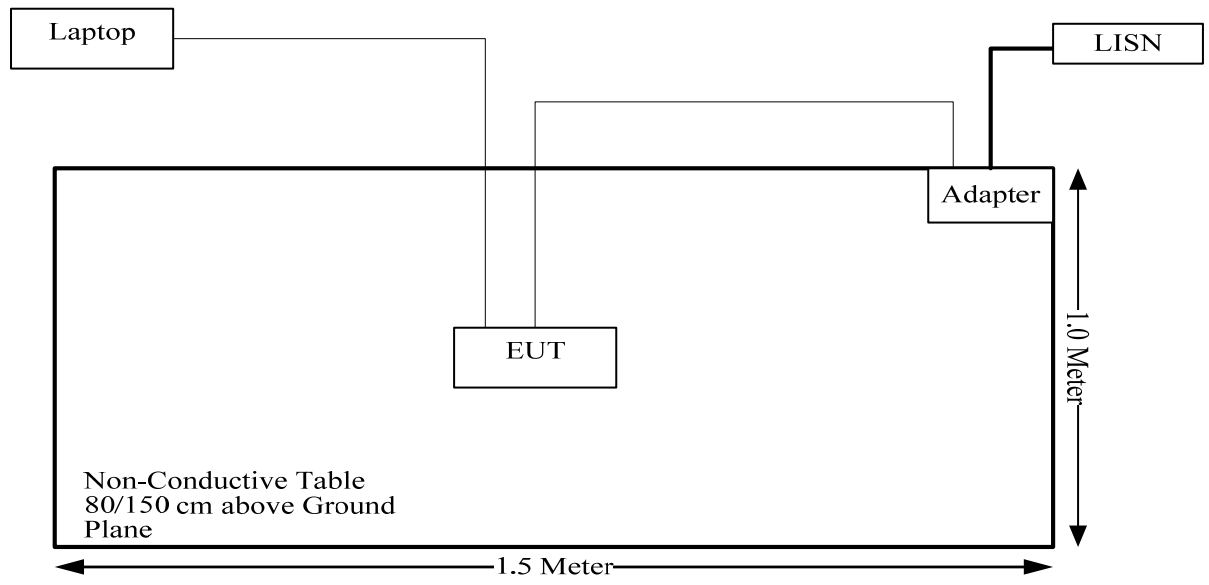
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	E6410	586N3Q1

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	Yes	No	10	EUT	Laptop
DC Cable	No	No	3	Apdater	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§1.1310,§2.1091, §95.3385	Maximum Permissible Exposure	Compliance
§2.1046, §95.3367	Radiated power	Compliance
§2.1053, §95.3379	Unwanted emissions	Compliance
§2.1055(d), §95.3379	Frequency Stability	Compliance
§2.1049	Occupied Bandwidth	Compliance

FCC§1.1310 & §2.1091&§95.3385- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

According to §95.3385
Regardless of the power density levels permitted under this subpart, devices operating under the provisions of this subpart are subject to the radiofrequency radiation exposure requirements specified in §§1.1307(b), 2.1091, and 2.1093 of this chapter, as appropriate. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

Calculation Formula:

Prediction of Power Density at the distance of the applicable MPE Limit

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

Frequency (GHz)	**Average E.I.R.P**		**Evaluation Distance (cm)**	**Power Density (mW/cm^2)**	**MPE Limit (mW/cm^2)**
	(dBm)	**(mW)**			
76.5	22	158	20	0.03	1.0

Result: The device complied with the applicable MPE Limit at the 20 cm distance.

FCC §2.1046, §95.3367 – RADIATED POWER

Applicable Standard

Acorrding to FCC §95.3367

The fundamental radiated emission limits within the 76-81 GHz band are expressed in terms of Equivalent Isotropically Radiated Power (EIRP) and are as follows:

(a) The maximum power (EIRP) within the 76-81 GHz band shall not exceed 50 dBm based on measurements employing a power averaging detector with a 1 MHz Resolution Bandwidth (RBW).

(b) The maximum peak power (EIRP) within the 76-81 GHz band shall not exceed 55 dBm based on measurements employing a peak detector with a 1 MHz RBW.

Test Procedure

Refer to ANSI C63.10-2013 Clause 9.10

Connect the test antenna for the fundamental frequency band to a spectrum analyzer via an external mixer.

Set spectrum analyzer RBW, VBW, detector, span, and so on, to the proper values.

Maximize the fundamental emission, noting that multiple peaks may be found at different beam orientations and/or polarizations

Calculate the EIRP from the measured field strength using Equation (22).

$$\mathrm{EIRP} = E_{\mathrm{Meas}} + 20\log\left(d_{\mathrm{Meas}}\right) - 104.7 \quad (22)$$

Test Data

Environmental Conditions

Temperature:	22°C
Relative Humidity:	52%
ATM Pressure:	101.2kPa
Tester:	Sun Zhong
Test Date:	2019-01-11

Test Result: Compliance. Please refer to the below table.

Test Mode: Transmitting

Peak EIRP:

Frequency	Receiver		Rx Antenna		Corrected Amplitude	EIPR Power	Limit	Margin
	Reading	Detector	Polar	Factor				
GHz	dBµV	PK/AV	H/V	dB(1/m)	dBµV/m	dBm/MHz	dBm/MHz	dB
76.5	91.23	PK	H	43.44	134.67	29.97	55	25.03
76.5	90.73	PK	V	43.44	134.17	29.47	55	25.53

Average EIRP :

Frequency	Receiver		Rx Antenna		Corrected Amplitude	EIPR Power	Limit	Margin
	Reading	Detector	Polar	Factor				
GHz	dBµV	PK/AV	H/V	dB(1/m)	dBµV/m	dBm	dBm	dB
76.5	83.09	AV	H	43.44	126.53	21.83	50	28.17
76.5	82.57	AV	V	43.44	126.01	21.31	50	28.69

Note 1:The test distance is 1 m.
Note 2:Corrected Amplitude = Meter Reading + Antenna Factor
Note 3: The Mixers and it`s RF cables is compose a system for calibration, the conversion factor was added into the test Spectrum Analyzer in testing.
Note 4: per KDB 653005 76-81 GHz Radars v01, peak power test used 1MHz RBW, average power test used 1MHz RBW and integratedover the full OBW.

FCC §2.1053 & §95.3379 - UNWANTED EMISSIONS

Applicable Standard

FCC §2.1053 and §95.579

(a) The power density of any emissions outside the 76-81 GHz band shall consist solely of spurious emissions and shall not exceed the following:

(1) Radiated emissions below 40 GHz shall not exceed the field strength as shown in the following emissions table.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

(i) In the emissions table in paragraph (a)(1) of this section, the tighter limit applies at the band edges.

(ii) The limits in the table in paragraph (a)(1) of this section are based on the frequency of the unwanted emissions and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

(iii) The emissions limits shown in the table in paragraph (a)(1) of this section are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9.0-90.0 kHz, 110.0-490.0 kHz, and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector with a 1 MHz RBW.

(2) The power density of radiated emissions outside the 76-81 GHz band above 40.0 GHz shall not exceed the following, based on measurements employing an average detector with a 1 MHz RBW:

(i) For radiated emissions outside the 76-81 GHz band between 40 GHz and 200 GHz from field disturbance sensors and radar systems operating in the 76-81 GHz band: 600 pW/cm2 at a distance of 3 meters from the exterior surface of the radiating structure.

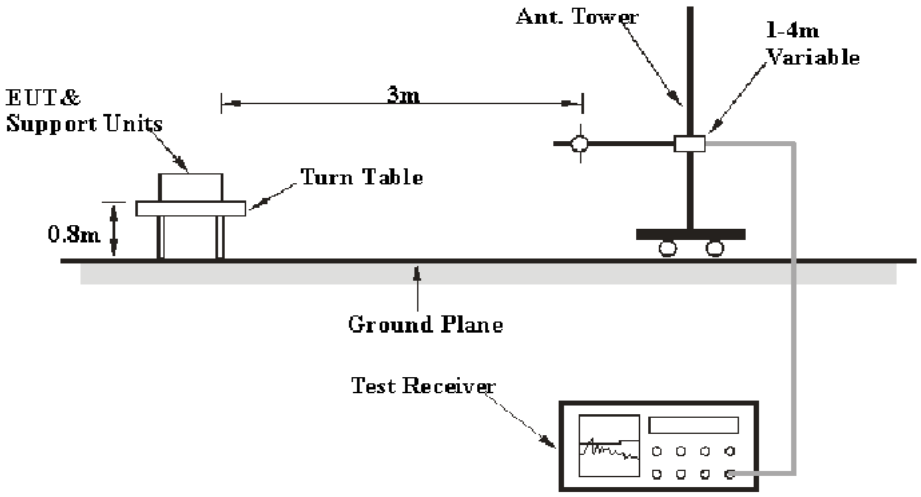
(ii) For radiated emissions above 200 GHz from field disturbance sensors and radar systems operating in the 76-81 GHz band: 1000 pW/cm2 at a distance of 3 meters from the exterior surface of the radiating structure.

(3) For field disturbance sensors and radar systems operating in the 76-81 GHz band, the spectrum shall be investigated up to 231.0 GHz.

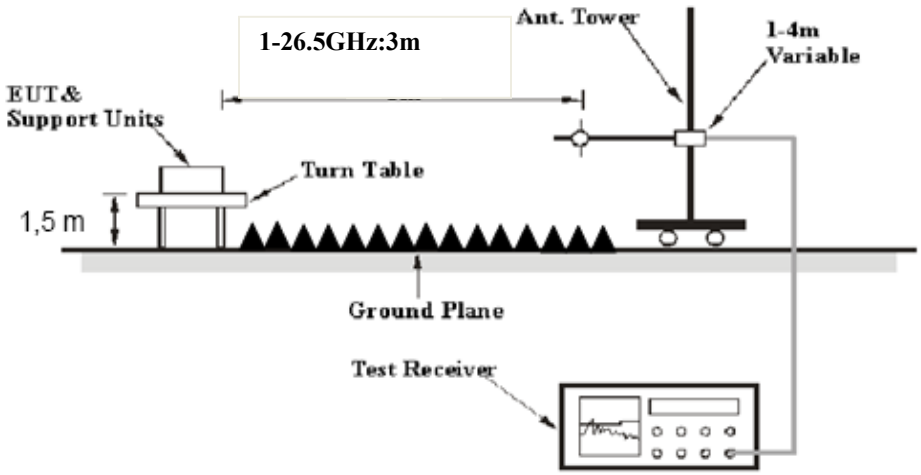
(b) Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range −20 to +50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

EUT Setup

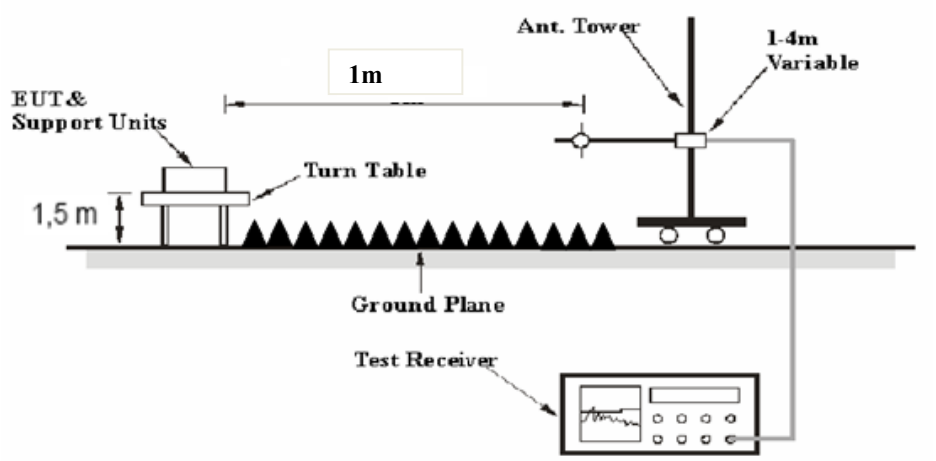
Below 1 GHz:



1-26.5 GHz:



26.5-40 GHz:



Above 40GHz:

The antenna is scanned around the entire perimeter surface of the EUT, in both horizontal and vertical polarizations, at the distance of 1.0 m from 40 GHz to 90 GHz, and 0.7 m for above 90GHz.

The radiated emission and out of band emission tests were performed in the 3 meters chamber test site A, using the setup accordance with the ANSI C63.10-2013 The specification used was the FCC 95. 3379 limits.

Test Equipment Setup

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
1-40 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave
40 GHz – 200 GHz	1MHz	3 MHz	/	PK

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

Refer to ANSI C63.10-2013 Clauses 9.9, 9.12, and 9.13.

A Maximizing procedure was performed to ensure that the highest emissions from the EUT were actually measured in all of the Test Arrangements of the EUT and Local Support Equipment.

According to C63.10, the 26.5-40GHz test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1m

Distance extrapolation factor =20 log (specific distance [3m]/test distance [1m]) dB= 9.54 dB

All emissions under the average limit and under the noise floor have not recorded in the report.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected = Antenna Loss + Cable Loss - Amplifier Gain

Or

Corrected Amplitude = Antenna Loss + Cable Loss - Amplifier Gain- Distance extrapolation factor

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Result = Reading + Corrected

Margin = Limit - Result

Test Data

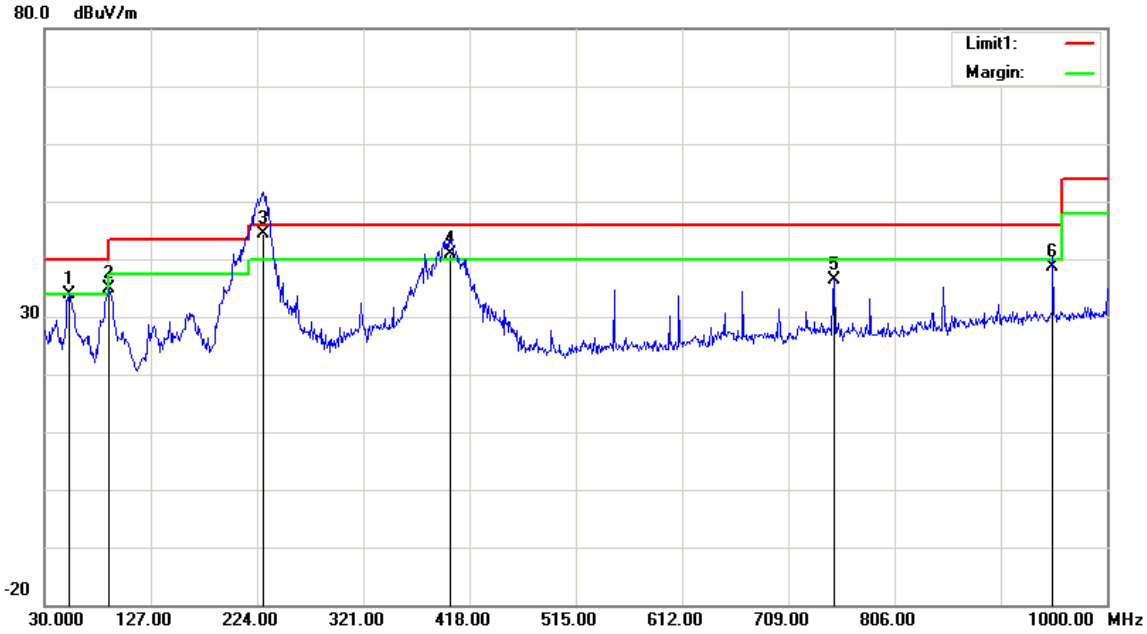
Environmental Conditions

Temperature:	22°C
Relative Humidity:	52%
ATM Pressure:	101.2kPa
Tester:	Sun Zhong
Test Date:	2019-01-11

Test Result: Compliance. Please refer to the below table and plots.

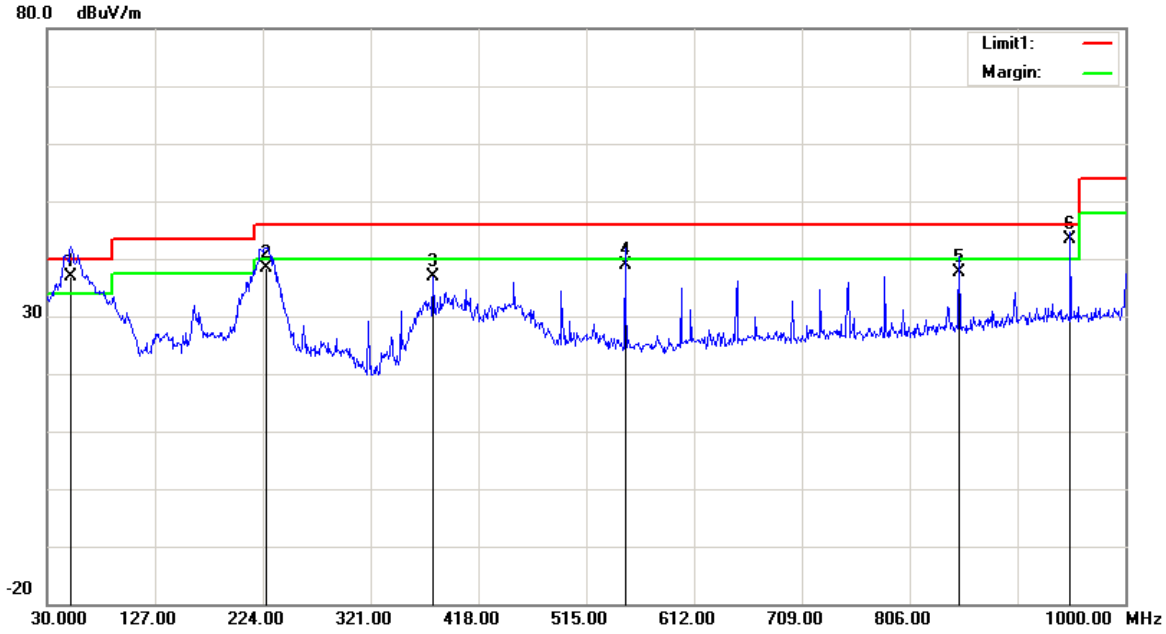
1) 30MHz-1GHz

Horizontal:



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
52.3100	49.73	peak	-15.81	33.92	40.00	6.08
89.1700	50.07	peak	-15.15	34.92	43.50	8.58
229.8200	55.06	QP	-10.56	44.50	46.00	1.50
400.5400	46.05	QP	-5.25	40.80	46.00	5.20
750.7100	35.66	peak	0.68	36.34	46.00	9.66
950.5300	33.66	QP	4.94	38.60	46.00	7.40

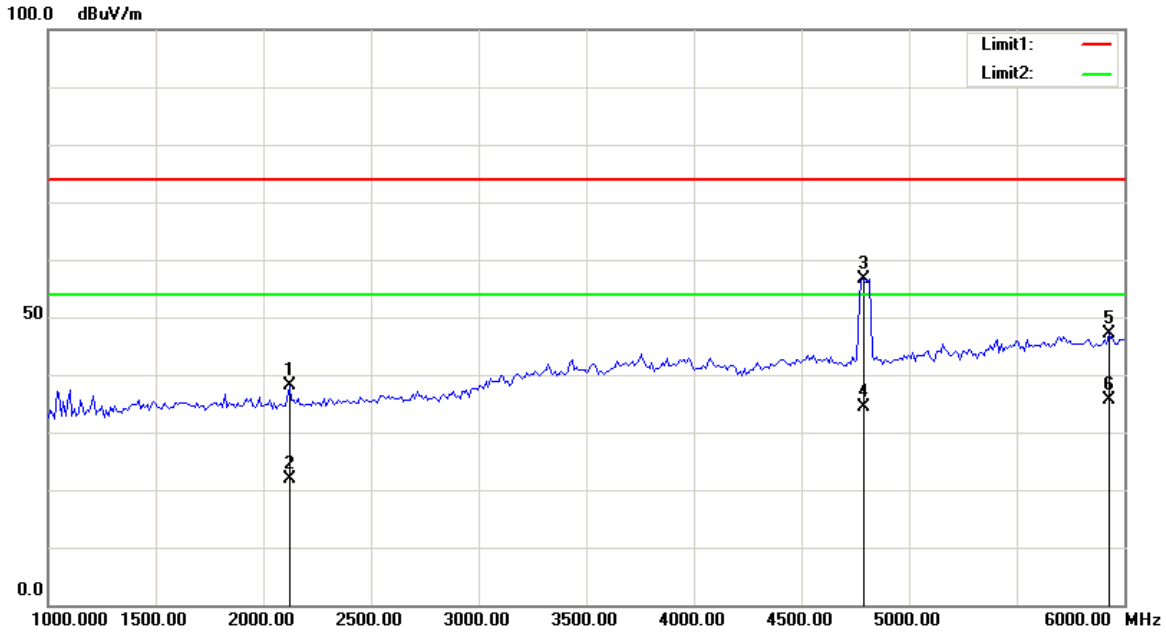
Vertical:



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
51.3400	52.54	QP	-15.74	36.80	40.00	3.20
226.9100	49.10	QP	-10.80	38.30	46.00	7.70
377.2600	42.70	peak	-5.92	36.78	46.00	9.22
549.9200	40.59	QP	-1.79	38.80	46.00	7.20
850.6200	35.62	QP	1.98	37.60	46.00	8.40
950.5300	38.46	QP	4.94	43.40	46.00	2.60

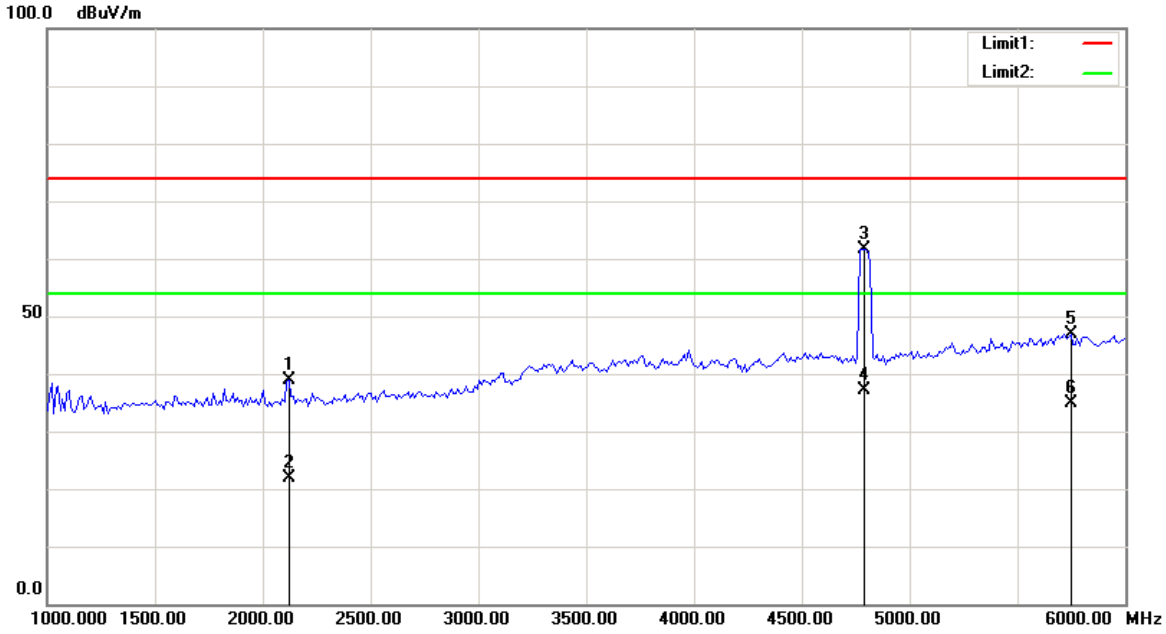
1GHz-40GHz:

Horizontal



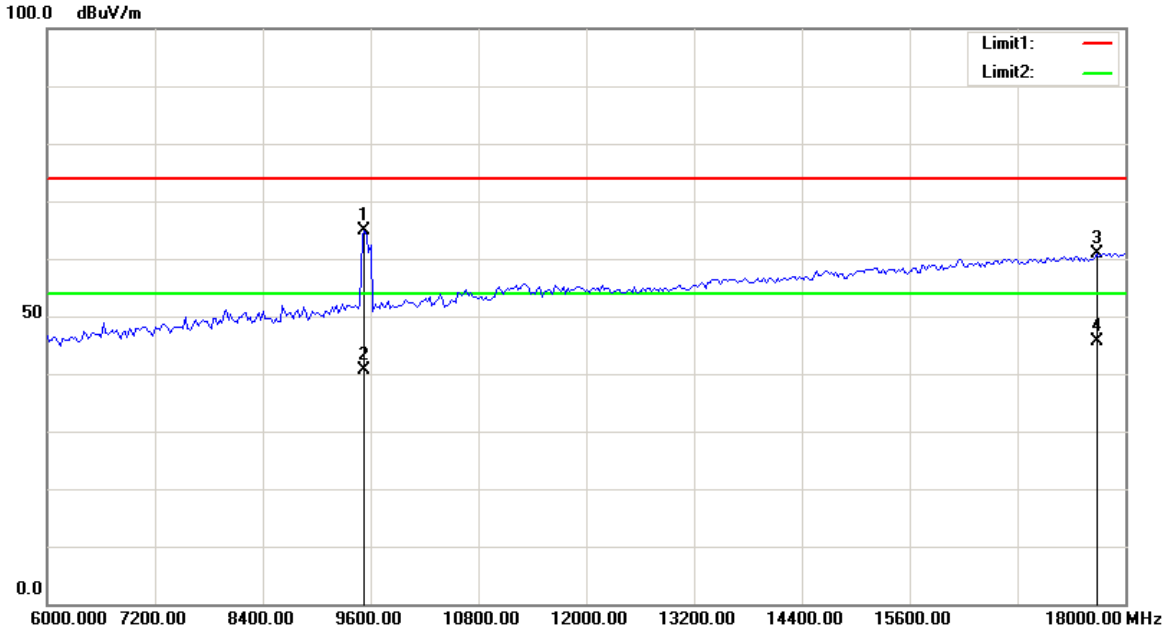
Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2122.244	38.64	peak	-0.47	38.17	74.00	35.83
2122.244	22.40	AVG	-0.47	21.93	54.00	32.07
4787.575	49.84	peak	6.88	56.72	74.00	17.28
4787.575	27.60	AVG	6.88	34.48	54.00	19.52
5929.860	36.90	peak	10.27	47.17	74.00	26.83
5929.860	25.40	AVG	10.27	35.67	54.00	18.33

Vertical:



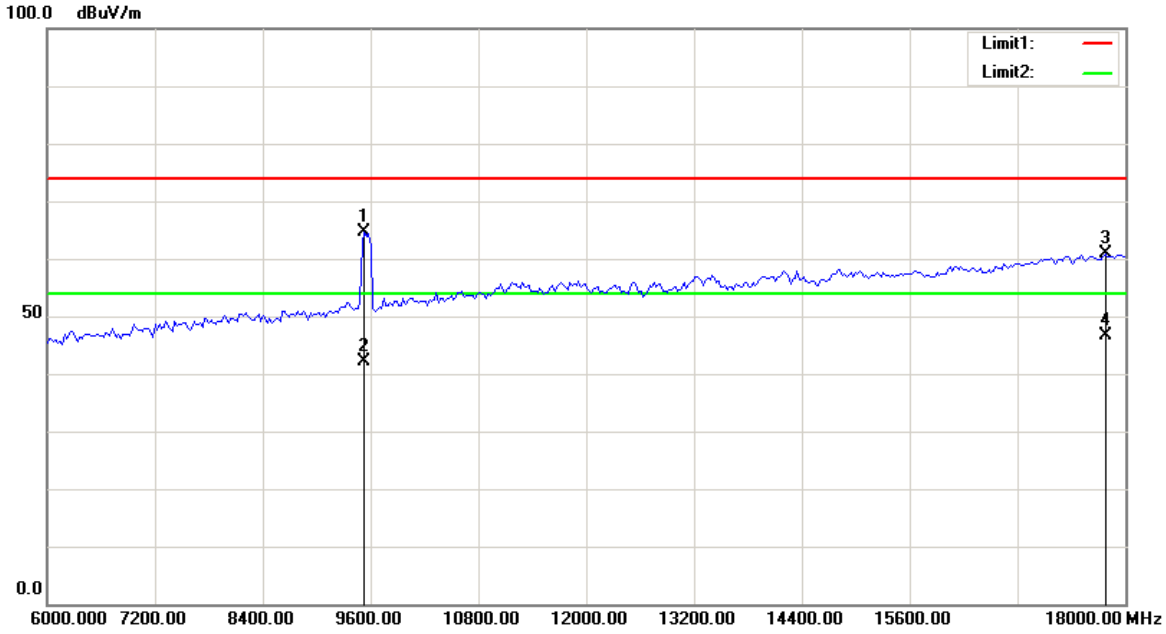
Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2122.244	39.46	peak	-0.47	38.99	74.00	35.01
2122.244	22.40	AVG	-0.47	21.93	54.00	32.07
4787.575	54.76	peak	6.88	61.64	74.00	12.36
4787.575	30.35	AVG	6.88	37.23	54.00	16.77
5749.499	36.87	peak	9.91	46.78	74.00	27.22
5749.499	24.87	AVG	9.91	34.78	54.00	19.22

Horizontal



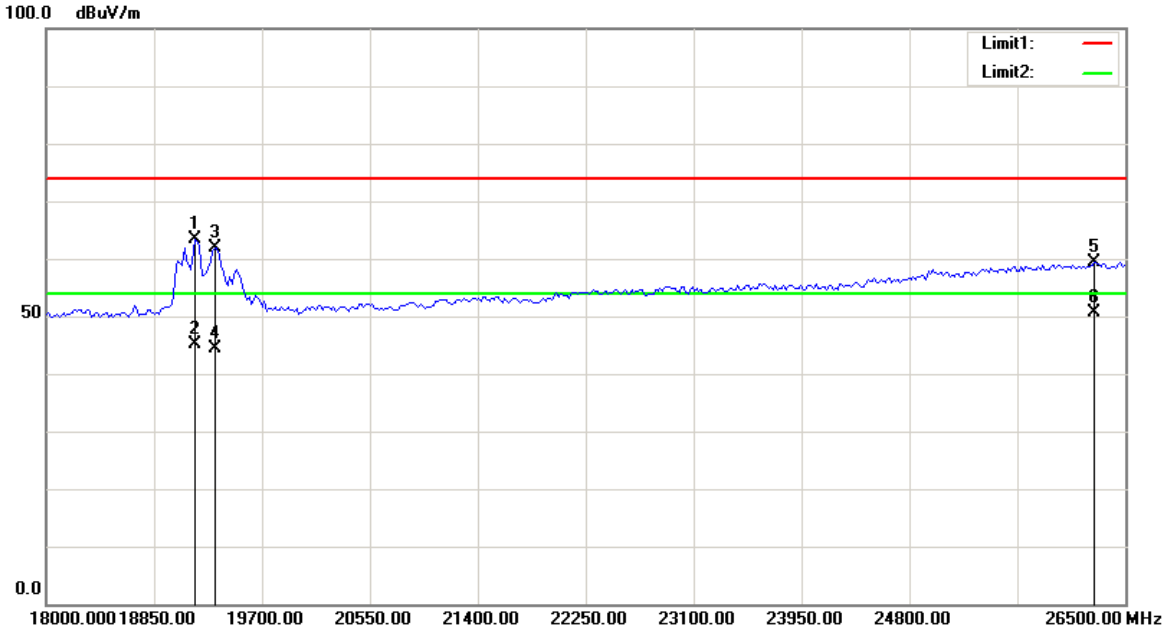
Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
9535.070	48.97	peak	15.97	64.94	74.00	9.06
9535.070	24.56	AVG	15.97	40.53	54.00	13.47
17687.375	33.66	peak	27.32	60.98	74.00	13.02
17687.375	18.21	AVG	27.32	45.53	54.00	8.47

Vertical:



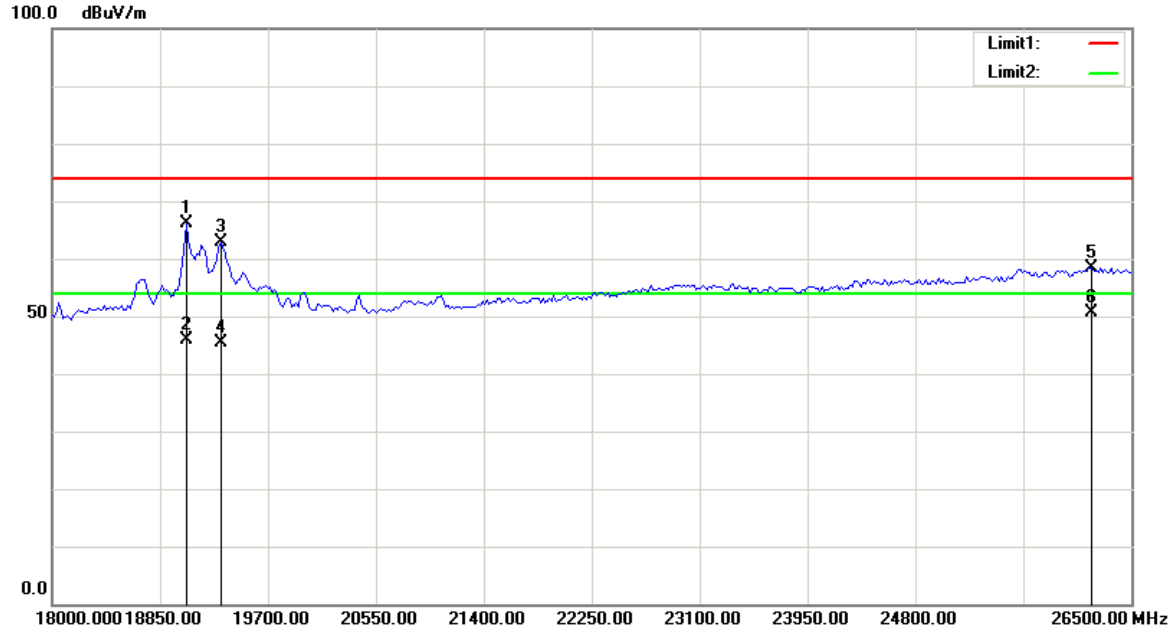
Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
9535.070	48.56	peak	15.97	64.53	74.00	9.47
9535.070	26.23	AVG	15.97	42.20	54.00	11.80
17783.567	33.50	peak	27.31	60.81	74.00	13.19
17783.567	19.32	AVG	27.31	46.63	54.00	7.37

Horizontal



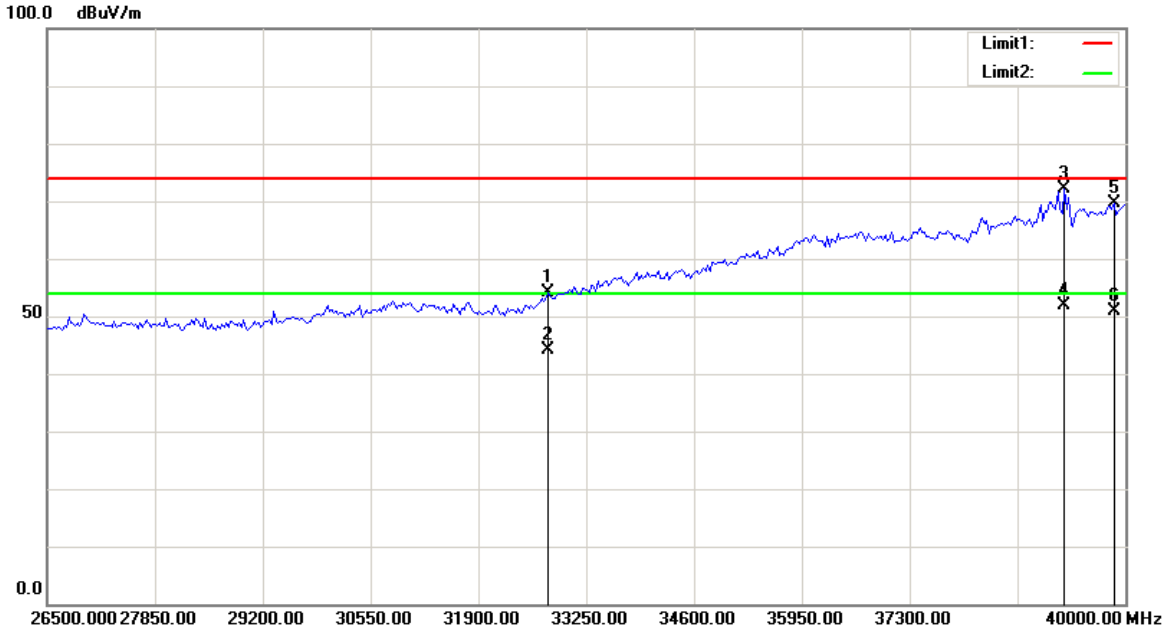
Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
19175.351	54.79	peak	8.47	63.26	74.00	10.74
19175.351	36.54	AVG	8.47	45.01	54.00	8.99
19328.657	53.59	peak	8.30	61.89	74.00	12.11
19328.657	36.20	AVG	8.30	44.50	54.00	9.50
26261.523	48.75	peak	10.56	59.31	74.00	14.69
26261.523	40.00	AVG	10.56	50.56	54.00	3.44

Vertical:



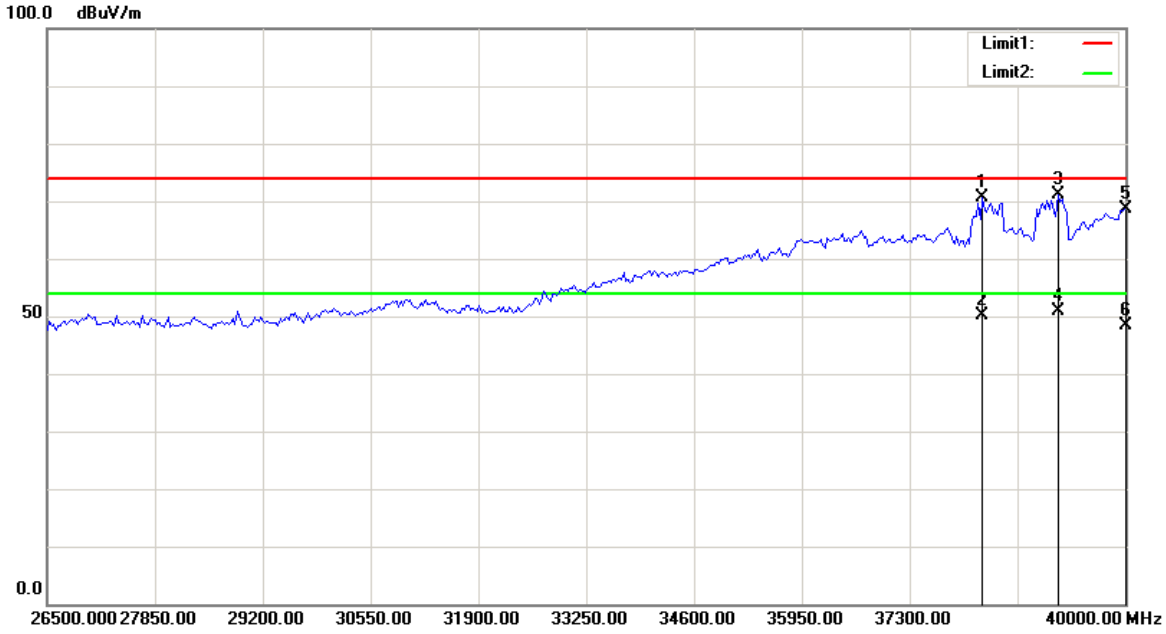
Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
19056.112	57.84	peak	8.31	66.15	74.00	7.85
19056.112	37.50	AVG	8.31	45.81	54.00	8.19
19328.657	54.50	peak	8.30	62.80	74.00	11.20
19328.657	37.00	AVG	8.30	45.30	54.00	8.70
26193.387	48.13	peak	10.35	58.48	74.00	15.52
26193.387	40.23	AVG	10.35	50.58	54.00	3.42

Horizontal



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
32776.553	47.52	peak	6.58	54.10	74.00	19.90
32776.553	37.50	AVG	6.58	44.08	54.00	9.92
39242.485	63.51	peak	8.62	72.13	74.00	1.87
39242.485	43.14	AVG	8.62	51.76	54.00	2.24
39864.730	60.51	peak	9.16	69.67	74.00	4.33
39864.730	41.70	AVG	9.16	50.86	54.00	3.14

Vertical:



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
38214.429	62.56	peak	7.98	70.54	74.00	3.46
38214.429	42.23	AVG	7.98	50.21	54.00	3.79
39161.323	62.62	peak	8.53	71.15	74.00	2.85
39161.323	42.32	AVG	8.53	50.85	54.00	3.15
40000.000	59.34	peak	9.24	68.58	74.00	5.42
40000.000	39.24	AVG	9.24	48.48	54.00	5.52

40GHz-231GHz:

Frequency	Receiver		Rx Antenna		Corrected Amplitude	EIPR Power	Power Density	Limit
	Reading	Detector	Polar	Factor				
GHz	dBµV	PK/AV	H/V	dB(1/m)	dBµV/m	dBm	pW/cm^2	pW/cm^2
58.73	48.32	AV	H	41.71	90.03	-14.67	30.18	600
58.73	47.83	AV	V	41.71	89.54	-15.16	26.96	600
87.82	49.25	AV	H	44.84	94.09	-10.61	76.87	600
87.84	48.65	AV	V	44.84	93.49	-11.21	66.95	600
153.47	50.14	AV	H	49.48	99.62	-8.178	134.57	600
153.47	49.36	AV	V	49.48	98.84	-8.958	112.45	600

Note 1:

EIRP = E-meas +20log(d-meas)-104.7

where:

EIRP : is the equivalent isotopically radiated power, in dBm

E-meas. : is the field strength of the emission at the measurement distance, in dBµV/m

d-meas. : is the measurement distance, in m

Note 2:The test distance is 1 m. for 40-90GHz, and 0.7m for 90-231GHz

Note 3:Corrected Amplitude = Meter Reading + Antenna Factor

Note 4: The Mixers and it`s RF cables is compose a system for calibration, the conversion factor was added into the test Spectrum Analyzer in testing.

Note 5:

$$PD = \frac{EIRP_{Linear}}{4\pi d^2}$$

where

PD	is the power density at the distance specified by the limit, in W/m^2
$EIRP_{Linear}$	is the equivalent isotropically radiated power, in watts
d	is the distance at which the power density limit is specified, in m

The Specified distance is 3m.

FCC§2.1055 (d), §95.3379- FREQUENCY STABILITY

Applicable Standard

According to FCC §95.3379

(b) Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range −20 to +50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external power supply and the RF output was connected to Test equipment via feed-through attenuators. The EUT was placed inside the temperature chamber. The power leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Frequency Counter.

Frequency Stability vs. Voltage:

1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

The output frequency was recorded for each voltage.

Test Data

Environmental Conditions

Temperature:	22°C
Relative Humidity:	52%
ATM Pressure:	101.2kPa
Tester:	Sun Zhong
Test Date:	2019-01-11

Test Result: Compliance. Please refer to the below table.

Test Mode: Transmitting

Temperature	Voltage	Frequency (MHz)			
℃	V_{AC}	f_L	f_H	f_L Limit	f_H Limit
-20	120	76.108	76.883	76000	81000
-10	120	76.109	76.884	76000	81000
0	120	76.108	76.883	76000	81000
10	120	76.107	76.882	76000	81000
20	120	76.108	76.883	76000	81000
30	120	76.108	76.883	76000	81000
40	120	76.106	76.885	76000	81000
50	120	76.106	76.885	76000	81000
20	102	76.107	76.882	76000	81000
20	138	76.107	76.882	76000	81000

Note: The extreme voltage was declared by applicant.

FCC§2.1049- OCCUPIED BANDWIDTH

Applicable Standard

According to FCC §2.1049

Test Procedure

Use the 99% OBW function to measure the Occupied Bandwidth.

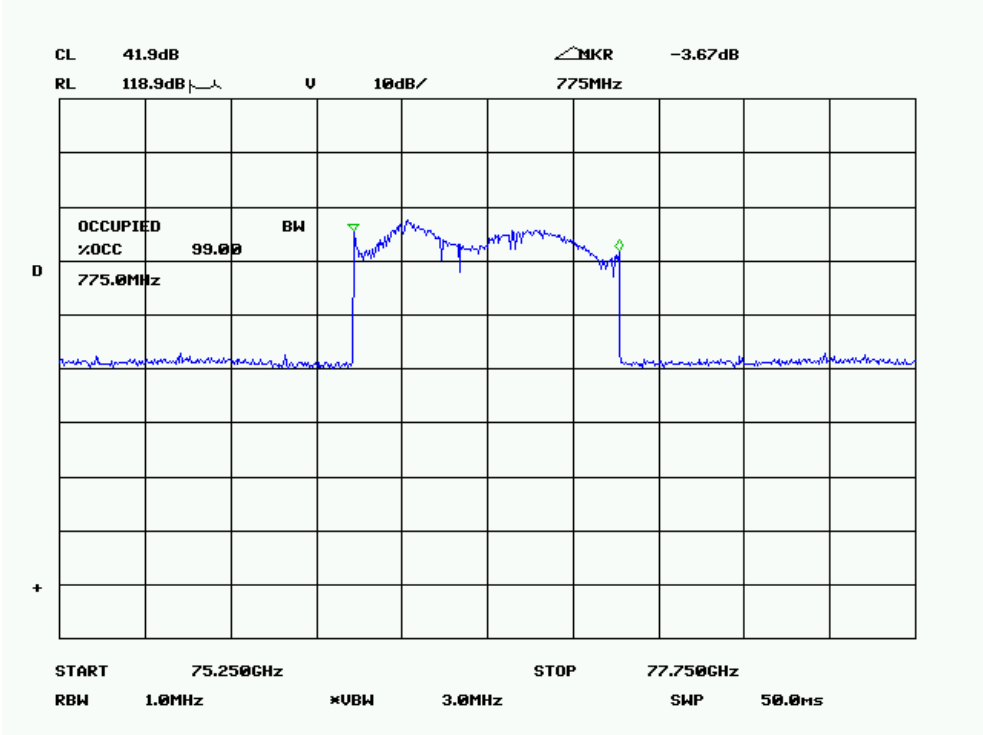
Environmental Conditions

Temperature:	22°C
Relative Humidity:	52%
ATM Pressure:	101.2kPa
Tester:	Sun Zhong
Test Date:	2019-01-11

Test Result: Compliance. Please refer to the following tables and plots:

Test Mode: Transmitting

Frequency (GHz)	99% Bandwidth (MHz)
76.5	775



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