

FCC PART 15C

TEST REPORT

For

Shenzhen Xinguodu Technology Co., Ltd.

17B JinSong Mansion, Terra Industrial & Trade Park Chegongmiao, Futian District, Shenzhen,
China, 518040

FCC ID: XDQN5-1

Report Type: Original Report	Product Name: POS TERMINAL
Report Number: RDG190313003-00A	
Report Date: 2019-04-19	
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Reviewed By:	EMC Manager
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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

EUT Name:		POS TERMINAL
EUT Model:		N5
Rated Input Voltage:		DC3.7V from Battery or DC5V from adapter
Adapter Information	Model:	ADS-12CG-06 05010EPCU
	Input:	AC 100-240V, 50/60Hz, 0.3A
	Output:	DC5V, 2000mA
External Dimension:		186 mm(L)* 82 mm(W)* 64 mm(H)
Serial Number:		190313003
EUT Received Date:		2019.03.28

Objective

This type approval report is prepared on behalf of *Shenzhen Xinguodu Technology Co., Ltd.* in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communications Commission's rules.

The objective is to determine the compliance of the EUT with FCC rules, sec 15.203, 15.205, 15.207, 15.209 and 15.225.

Related Submittal(s)/Grant(s)

FCC Part 27 TNB submissions with FCC ID: XDQN5-1
FCC Part 15C DTS submissions with FCC ID: XDQN5-1
FCC Part 15B JBP submissions with FCC ID: XDQN5-1
FCC Part 15C DSS submissions with FCC ID: XDQN5-1.

Test Methodology

All measurements detailed in this Test Report were performed in accordance with 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). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
radiated Emissions	9kHz~30MHz: 4.12dB 30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical
Temperature	±1 °C
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

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.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a test mode.

EUT Exercise Software

No software used in test.

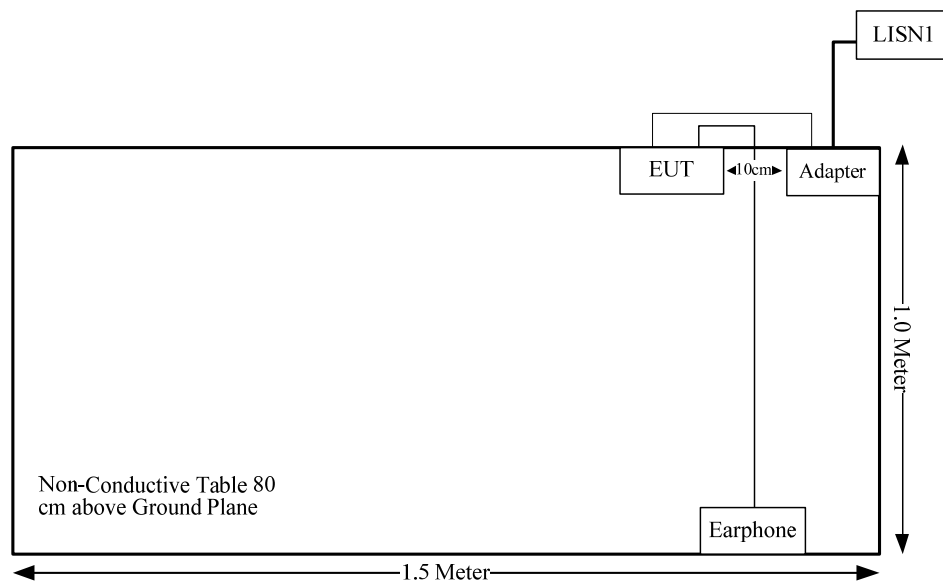
Equipment Modifications

No modification was made to the EUT.

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From	To
USB Cable	No	No	1.0	Adapter	EUT
Earphone Cable	No	No	1.2	EUT	Earphone

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207	AC Line Conducted Emission	Compliance
§15.225 §15.209 §15.205	Radiated Emission Test	Compliance
§15.225(e)	Frequency Stability	Compliance
§15.215(c)	20 dB Bandwidth	Compliance

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

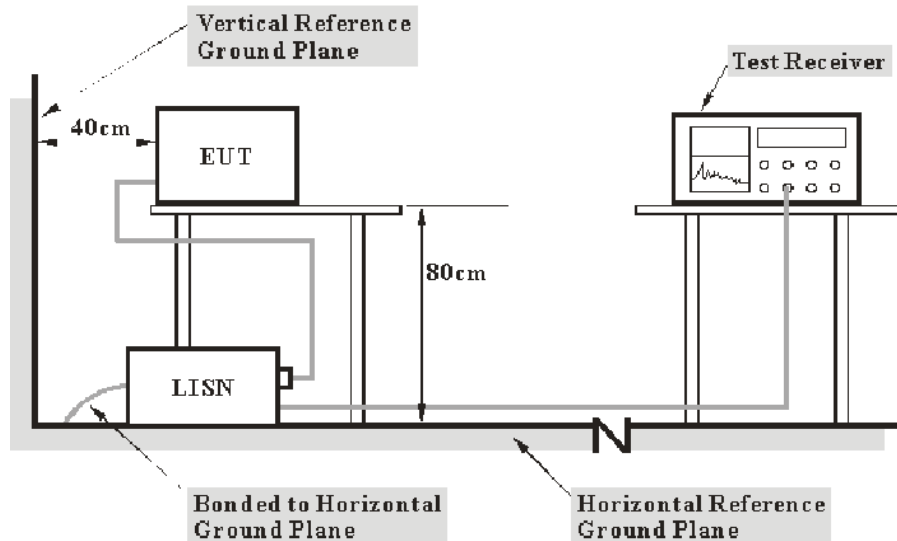
Antenna Connected Construction

The EUT has one integral antenna arrangement, which was permanently attached and fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC §15.207– AC LINE CONDUCTED EMISSIONS

EUT Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to the main lisn with an AC 120V/60Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	101121	2019-03-23	2020-03-23
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2018-09-05	2019-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
R&S	Two-line V-network	ENV 216	101614	2018-12-10	2019-12-10

* **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).

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

According FCC publication number 174176, for a device with a permanent antenna operating at or below 30 MHz, the measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

V_C : corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

The “**Margin**” column of the following data tables indicates the degree of compliance within 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:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

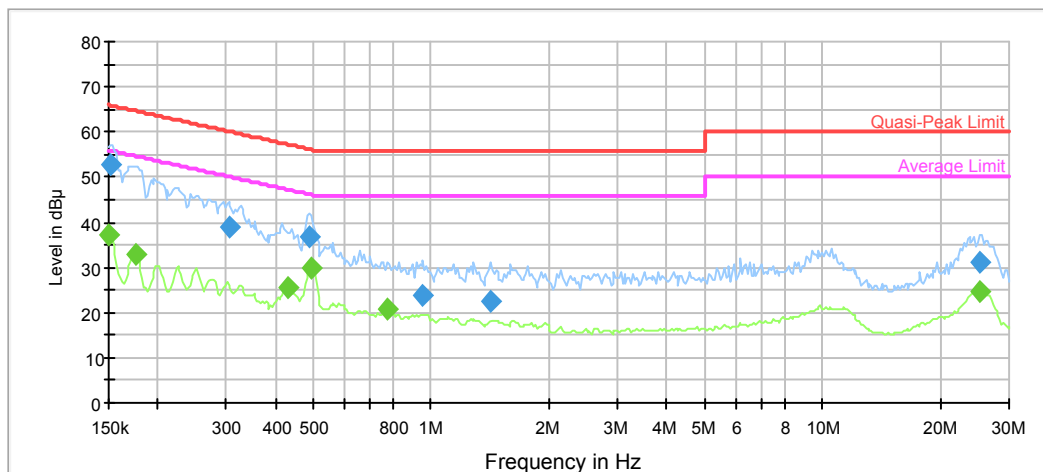
Test Data**Environmental Conditions**

Temperature:	28.2 °C
Relative Humidity:	57 %
ATM Pressure:	99.4 kPa

The testing was performed by Lily Xie on 2019-04-08.

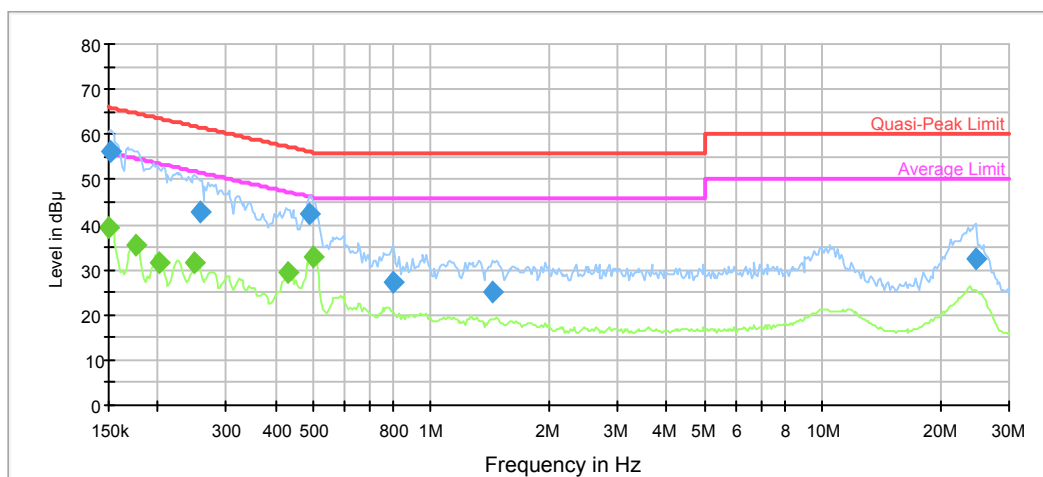
Test Mode: Transmitting

AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.151500	52.9	9.000	L1	11.2	13.0	65.9
0.304025	39.0	9.000	L1	10.1	21.1	60.1
0.490157	36.9	9.000	L1	9.9	19.3	56.2
0.954700	24.0	9.000	L1	9.8	32.0	56.0
1.421419	22.6	9.000	L1	9.8	33.4	56.0
25.211521	31.0	9.000	L1	10.1	29.0	60.0

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.150000	37.2	9.000	L1	11.2	18.8	56.0
0.175887	32.7	9.000	L1	10.8	22.0	54.7
0.430682	25.5	9.000	L1	9.9	21.7	47.2
0.495058	30.0	9.000	L1	9.9	16.1	46.1
0.774673	20.7	9.000	L1	9.8	25.3	46.0
25.211521	24.4	9.000	L1	10.1	25.6	50.0

AC120 V, 60 Hz, Neutral:

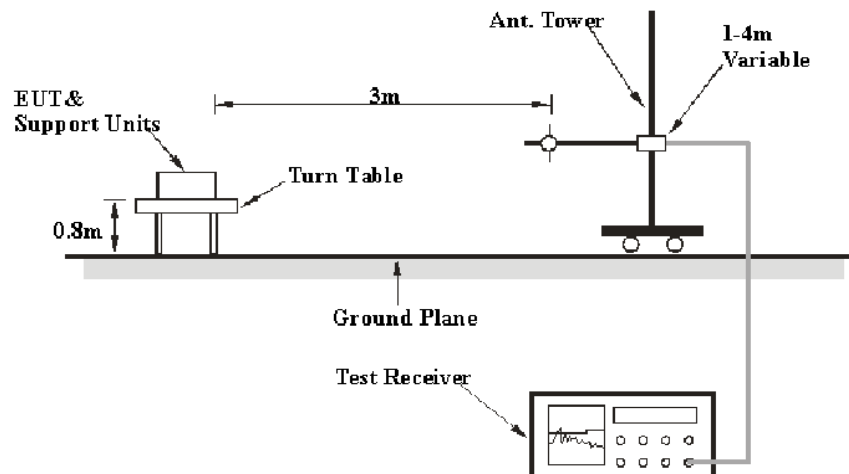
Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.151500	56.2	9.000	N	11.1	9.7	65.9
0.256712	42.8	9.000	N	10.3	18.7	61.5
0.490157	42.6	9.000	N	9.9	13.6	56.2
0.798146	27.1	9.000	N	9.8	28.9	56.0
1.435633	25.2	9.000	N	9.8	30.8	56.0
24.714754	32.3	9.000	N	10.1	27.7	60.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	39.3	9.000	N	11.2	16.7	56.0
0.175887	35.5	9.000	N	10.8	19.2	54.7
0.202177	31.7	9.000	N	10.6	21.8	53.5
0.249162	31.5	9.000	N	10.3	20.3	51.8
0.430682	29.2	9.000	N	9.9	18.0	47.2
0.500009	32.7	9.000	N	9.9	13.3	46.0

FCC§15.225, §15.205 & §15.209- RADIATED EMISSIONS**Applicable Standard**

As per FCC Part 15.225

- (a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

EUT Setup

The radiated emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.10-2013.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 1 GHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	Measurement
9 kHz – 150 kHz	200 Hz	1 kHz	QP/Average
150 kHz – 30 MHz	9 kHz	30 kHz	QP/Average
30 MHz – 1000 MHz	120 kHz	300 kHz	QP

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

If the maximized peak measured value complies with the limit, then it is unnecessary to perform an QP/Average measurement

Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2018-12-10	2019-12-10
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
EMCO	Passive Loop	6512	9706-1206	2017-03-05	2020-03-04
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2018-05-06	2019-05-06
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
HP	Amplifier	8447D	2727A05902	2018-09-05	2019-09-05

* **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).

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209&15.225.

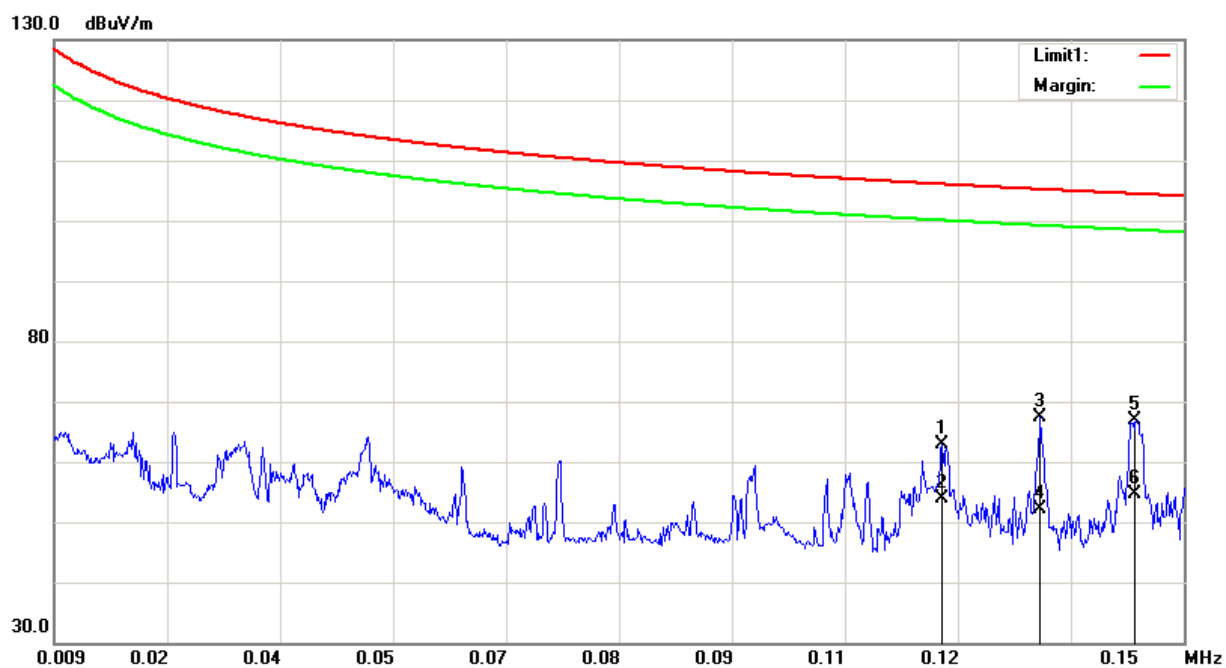
Test Data**Environmental Conditions**

Temperature:	26.8 °C
Relative Humidity:	36 %
ATM Pressure:	99.7 kPa

** The testing was performed by Vern Shen on 2019-04-08.*

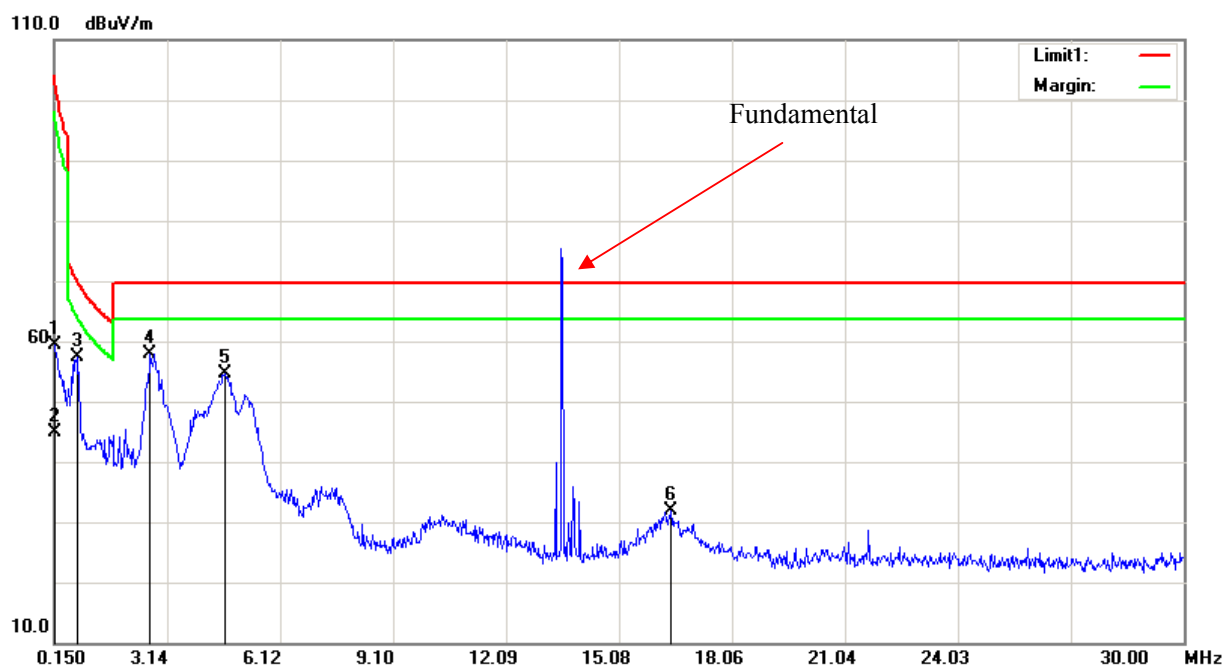
Test mode: Transmitting

9 kHz~150 kHz:



Frequency (MHz)	Receiver Reading (dB μ V)	Detector	Correction Factor (dB)	Cord. Amp. (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
0.1198	22.25	peak	40.75	63.00	106.03	43.03
0.1320	27.59	peak	39.90	67.49	105.19	37.70
0.1440	27.94	peak	39.05	66.99	104.43	37.44

150kHz~30 MHz:



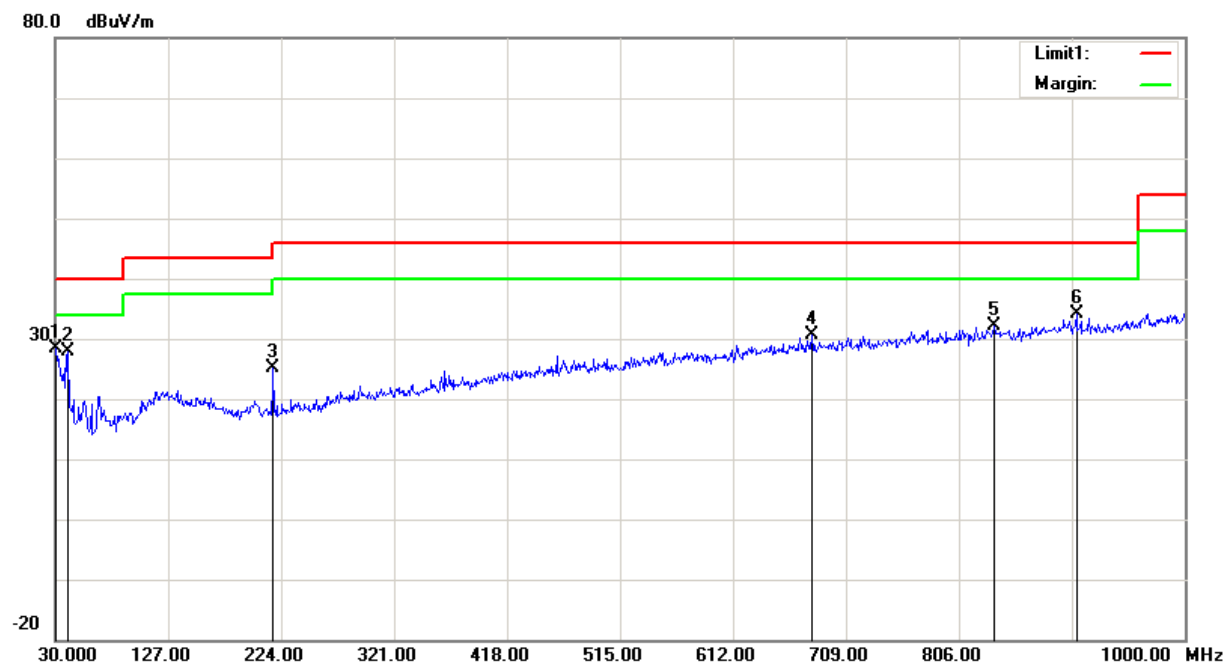
Frequency (MHz)	Receiver Reading (dB μ V)	Detector	Correction Factor (dB)	Cord. Amp. (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
0.1500	20.72	peak	38.62	59.34	104.08	44.74
0.7470	33.31	peak	24.13	57.44	70.13	12.69
2.6872	43.61	peak	14.31	57.92	69.54	11.62
4.6574	43.44	peak	11.09	54.53	69.54	15.01
16.4481	22.60	peak	9.24	31.84	69.54	37.70

Fundamental:



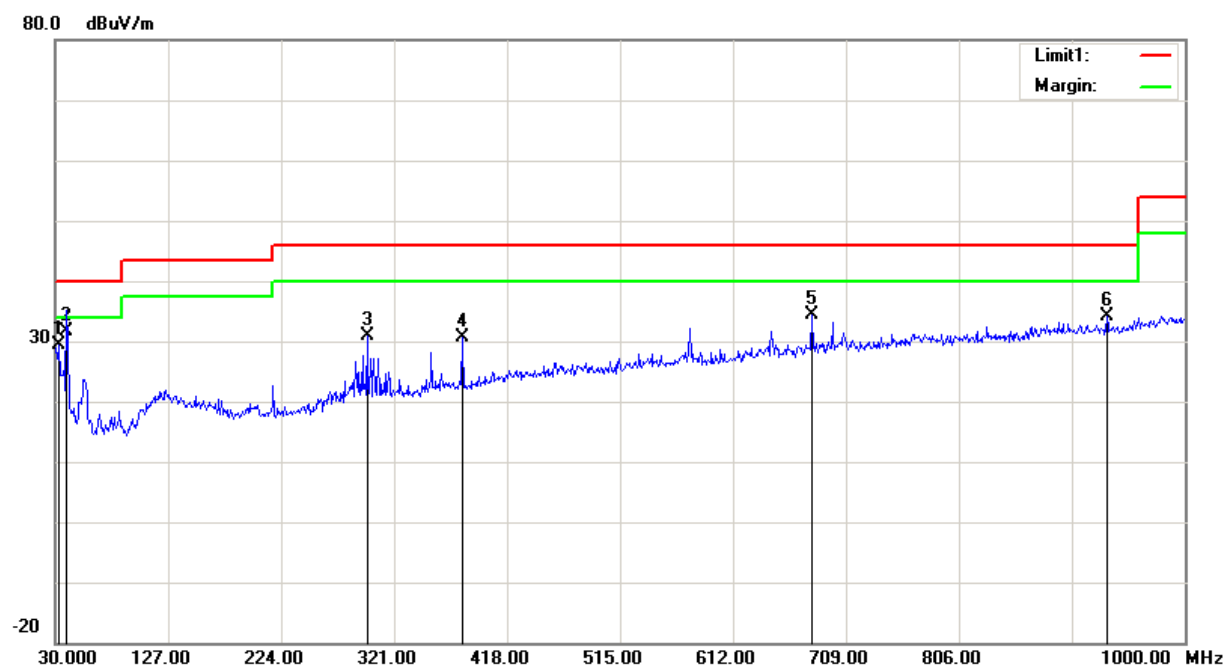
Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
13.5618	65.95	peak	9.36	75.31	124.00	48.69

30MHz-1GHz

Horizontal

Frequency (MHz)	Receiver Reading (dB μ V)	Detector	Correction Factor (dB)	Cord. Amp. (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
30.9700	27.42	peak	0.91	28.33	40.00	11.67
40.6700	34.13	peak	-6.32	27.81	40.00	12.19
217.2100	32.26	peak	-7.14	25.12	46.00	20.88
679.9000	27.86	peak	2.66	30.52	46.00	15.48
836.0700	27.16	peak	5.03	32.19	46.00	13.81
906.8800	37.85	peak	-3.76	34.09	46.00	11.91

Vertical



Frequency (MHz)	Receiver Reading (dB μ V)	Detector	Correction Factor (dB)	Cord. Amp. (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
32.9100	30.00	peak	-0.56	29.44	40.00	10.56
39.7000	37.36	QP	-5.66	31.70	40.00	8.30
297.7200	34.90	peak	-3.92	30.98	46.00	15.02
379.2000	33.24	peak	-2.58	30.66	46.00	15.34
679.9000	31.82	peak	2.66	34.48	46.00	11.52
933.0700	37.64	peak	-3.45	34.19	46.00	11.81

FCC§15.225(e) - FREQUENCY STABILITY**Applicable Standard**

As per FCC Part 15.225:

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power.

The EUT was placed inside the temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Spectrum Analyzer.

Frequency Stability vs. Voltage: An external variable DC power supply Source. The voltage was set to the end point of the battery. The output frequency was recorded for each voltage.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2017-12-11	2018-12-11
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
EMCO	Passive Loop	6512	9706-1206	2017-03-05	2020-03-04
UNI-T	Multimeter	UT39A	M130199938	2018-07-24	2019-07-24
ESPEC	Constant temperature and humidity Tester	ESX-4CA	018 463	2019-03-26	2020-03-26
Pro instrument	DC Power Supply	pps3300	3300012	N/A	N/A
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05

* **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).

Test Data**Environmental Conditions**

Temperature:	26.8 °C
Relative Humidity:	36 %
ATM Pressure:	99.7 kPa

** The testing was performed by Vern Shen on 2019-04-08.*

Test Mode: Transmitting

Test Result: Pass

f₀ = 13.56 MHz				
Temperature	Voltage	Measured frequency	Frequency Error	Limit
°C	V_{DC}	MHz	Hz	Hz
-30	3.7	13.560075	75	±1356
-20		13.560065	65	±1356
-10		13.560066	66	±1356
0		13.560065	65	±1356
10		13.560077	77	±1356
20		13.560066	66	±1356
25		13.560065	65	±1356
30		13.560065	65	±1356
40		13.560066	66	±1356
50		13.560066	66	±1356
25	3.5	13.560055	55	±1356
25	4.2	13.560068	68	±1356

FCC §15.215(c)– 20 dB BANDWIDTH TESTING

Applicable Standard

Per FCC §15.215 (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through § 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Test Procedure

Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2017-12-11	2018-12-11
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
EMCO	Passive Loop	6512	9706-1206	2017-03-05	2020-03-04
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-09-05	2018-09-05

* **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).

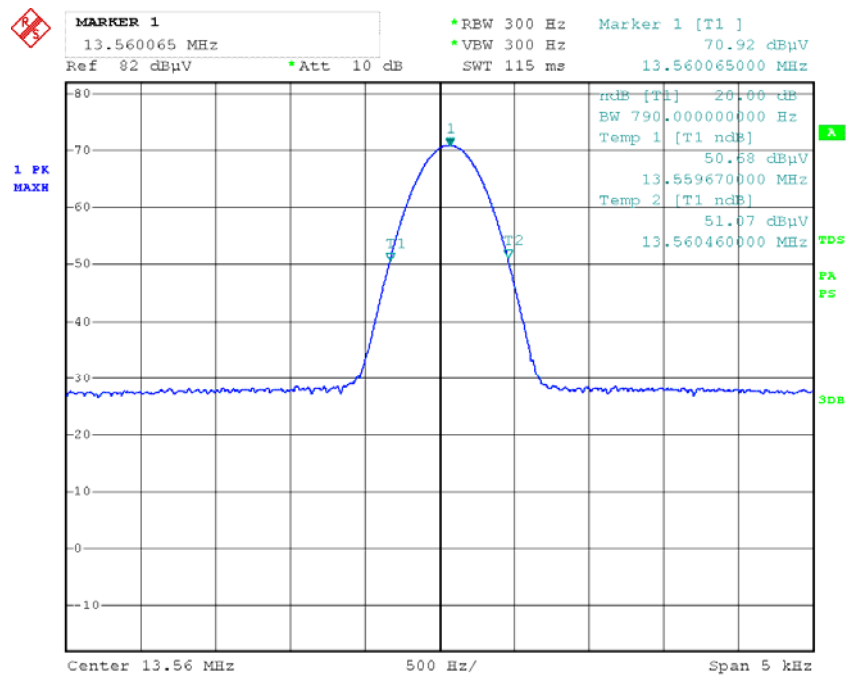
Test Data**Environmental Conditions**

Temperature:	26.8 °C
Relative Humidity:	36 %
ATM Pressure:	99.7 kPa

* The testing was performed by Vern Shen on 2019-04-08.

Test Mode: Transmitting

Frequency (MHz)	20 dB Bandwidth (KHz)
13.56	0.79

20 dB Bandwidth

Date: 8.APR.2019 18:45:25

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