

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan  
District Shenzhen, China 518057

Telephone: +86 (0) 755 2601 2053  
Fax: +86 (0) 755 2671 0594  
Email: ee.shenzhen@sgs.com

Report No.: SZEM150900578401  
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## FCC REPORT

**Application No. :** SZEM1509005784BA  
**Applicant:** GUANGDONG PISEN ELECTRONICS CO., LTD.  
**Manufacturer:** GUANGDONG PISEN ELECTRONICS CO., LTD.  
**Factory:** 1.GUANGDONG PISEN ELECTRONICS CO., LTD.  
2.SICHUAN PISEN ELECTRONICS CO., LTD  
**Product Name:** portable mobile power, Laser Presenter Power Bank  
**Model No.(EUT):** TS-D192  
**Add Model No.:** GC-1330-TS-D192, GC-1330(X)-TS-D192, (X)-may be followed by an optional suffix one letter from A to Z representing different color.  
**FCC ID:** 2AF56-TS-D192  
**Standards:** 47 CFR Part 15, Subpart C (2014)  
**Date of Receipt:** 2015-09-17  
**Date of Test:** 2015-10-08 to 2015-10-26  
**Date of Issue:** 2015-10-28

<b>Test Result:</b>	<b>PASS *</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



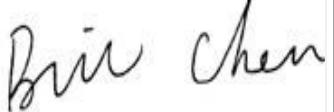
Jack Zhang  
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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## 2 Version

<b>Revision Record</b>				
<i>Version</i>	<i>Chapter</i>	<i>Date</i>	<i>Modifier</i>	<i>Remark</i>
00		2015-10-28		<i>Original</i>

Authorized for issue by:				
Tested By				2015-10-26
		(Bill Chen) /Project Engineer		Date
Prepared By				2015-10-28
		(Iris Zhou) /Clerk		Date
Checked By				2015-10-28
		(Eric Fu) /Reviewer		Date

### 3 Test Summary

Test Item	Test Requirement	Test method	Result
<b>Antenna Requirement</b>	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 (2009)	PASS
<b>AC Power Line Conducted Emission</b>	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2009)	PASS
<b>Field Strength of the Fundamental Signal</b>	47 CFR Part 15, Subpart C Section 15.249 (a)	ANSI C63.10 (2009)	PASS
<b>Spurious Emissions</b>	47 CFR Part 15, Subpart C Section 15.249 (a)/15.209	ANSI C63.10 (2009)	PASS
<b>Restricted bands around fundamental frequency (Radiated Emission)</b>	47 CFR Part 15, Subpart C Section 15.249(a)/15.205	ANSI C63.10 (2009)	PASS
<b>20dB Occupied Bandwidth</b>	47 CFR Part 15, Subpart C Section 15.215 (c)	ANSI C63.10 (2009)	PASS

Remark:

Model No.: TS-D192, GC-1330-TS-D192, GC-1330(X)-TS-D192, (X)-may be followed by an optional suffix one letter from A to Z representing different color.

Only the model TS-D192 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for all above models. Only different on color, product name and model.

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## 5 General Information

### 5.1 Client Information

Applicant:	GUANGDONG PISEN ELECTRONICS CO., LTD.
Address of Applicant:	NO.9, QINFU 1ST STREET JINTANG INDUSTRY ZONE LIUYUE, HENGGANG TOWN, LONGGANG DISTRICT, SHENZHEN, CHINA
Manufacturer:	GUANGDONG PISEN ELECTRONICS CO., LTD.
Address of Manufacturer:	NO.9, QINFU 1ST STREET JINTANG INDUSTRY ZONE LIUYUE, HENGGANG TOWN, LONGGANG DISTRICT, SHENZHEN, CHINA
Factory:	1.GUANGDONG PISEN ELECTRONICS CO., LTD. 2.SICHUAN PISEN ELECTRONICS CO., LTD
Address of Factory:	1.NO.5/7/9, QINFU 1ST STREET JINTANG INDUSTRY ZONE LIUYUE, HENGGANG TOWN, LONGGANG DISTRICT, SHENZHEN, CHINA 2.Cross-strait Industry Park, Wenjiang, Chengdu, CHINA

### 5.2 General Description of EUT

Name:	portable mobile power, Laser Presenter Power Bank
Model No.:	TS-D192
Frequency Range:	2406 MHz ~ 2476MHz
Modulation Type:	GFSK
Number of Channels:	4 (declared by the client)
Sample Type:	Portable production
Antenna Type:	Integral
Antenna Gain:	1.5 dBi
Power Supply:	Input: DC 5V 1A Output: DC 5V 1A Rechargeable battery: DC3.7V 2500mAh Rechargeable battery (charge by Adaptor)
Test Voltage:	AC 120V 60Hz

Operation Frequency each of channel					
Channel	Frequency	Channel	Frequency	Channel	Frequency
1CH	2406 MHz	2CH	2424 MHz	3CH	2447 MHz
4CH	2476 MHz				

Note:

Using test software was control EUT work in continuous transmitter and receiver mode.and select test channel as below:

Channel	Frequency
The Lowest channel(CH1)	2406MHz
The Middle channel(CH3)	2447MHz
The Highest channel(CH4)	2476MHz

### **5.3 Test Environment and Mode**

<b>Operating Environment:</b>	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar

### **5.4 Description of Support Units**

The EUT has been tested independent unit.

### **5.5 Test Location**

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch E&E Lab,  
No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.  
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

## **5.6 Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

The 3m Semi-anechoic chambers and the 10m Semi-anechoic chambers of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-2, 4620C-3.

## **5.7 Deviation from Standards**

None.

## **5.8 Abnormalities from Standard Conditions**

None.

## **5.9 Other Information Requested by the Customer**

None.

## 5.10 Equipment List

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	2015-05-13	2016-05-13
2	LISN	Rohde & Schwarz	ENV216	SEL0152	2015-10-09	2016-10-09
3	LISN	ETS-LINDGREN	3816/2	SEL0021	2015-05-13	2016-05-13
4	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLIS N-T8-02	SEL0162	2015-08-30	2016-08-30
5	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLIS N-T4-02	SEL0163	2015-08-30	2016-08-30
6	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLIS N-T2-02	SEL0164	2015-08-30	2016-08-30
7	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2015-05-13	2016-05-13
8	Coaxial Cable	SGS	N/A	SEL0025	2015-05-13	2016-05-13
9	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-09	2016-10-09
10	Humidity/ Temperature Indicator	Shanghai Qixiang	ZJ1-2B	SEL0103	2015-10-24	2016-10-24
11	Barometer	Chang Chun	DYM3	SEL0088	2015-05-13	2016-05-13

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2015-05-13	2016-05-13
2	EMI Test Receiver	Agilent Technologies	N9038A	SEL0312	2015-09-16	2016-09-16
3	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A
4	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2014-11-15	2017-11-15
5	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2015-10-17	2016-10-17
6	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2014-11-24	2017-11-24
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2015-05-13	2016-05-13
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2015-10-17	2016-10-17
9	Coaxial cable	SGS	N/A	SEL0027	2015-05-13	2016-05-13
10	Coaxial cable	SGS	N/A	SEL0189	2015-05-13	2016-05-13
11	Coaxial cable	SGS	N/A	SEL0121	2015-05-13	2016-05-13
12	Coaxial cable	SGS	N/A	SEL0178	2015-05-13	2016-05-13
13	Band filter	Amindeon	82346	SEL0094	2015-05-13	2016-05-13
14	Barometer	Chang Chun	DYM3	SEL0088	2015-05-13	2016-05-13
15	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-09	2016-10-09
16	Humidity/ Temperature Indicator	Shanghai Qixiang	ZJ1-2B	SEL0103	2015-10-24	2016-10-24
17	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2015-05-13	2016-05-13
18	Loop Antenna	Beijing Daze	ZN30401	SEL0203	2015-05-13	2016-05-13



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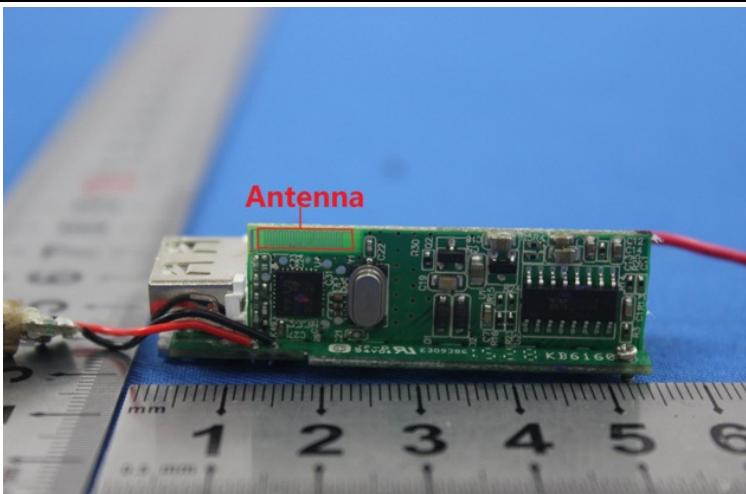
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RF connected test						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-09	2016-10-09
2	Humidity/ Temperature Indicator	HYGRO	ZJ1-2B	SEL0033	2015-10-24	2016-10-24
3	Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0154	2015-10-17	2016-10-17
4	Coaxial cable	SGS	N/A	SEL0178	2015-05-13	2016-05-13
5	Coaxial cable	SGS	N/A	SEL0179	2015-05-13	2016-05-13
6	Barometer	ChangChun	DYM3	SEL0088	2015-05-13	2016-05-13
7	Signal Generator	Rohde & Schwarz	SML03	SEL0068	2015-04-25	2016-04-25
8	POWER METER	R & S	NRVS	SEL0144	2015-10-09	2016-10-09
9	Attenuator	Beijin feihang taida	TST-2-6dB	SEL0205	2015-04-25	2016-04-25

## 6 Test results and Measurement Data

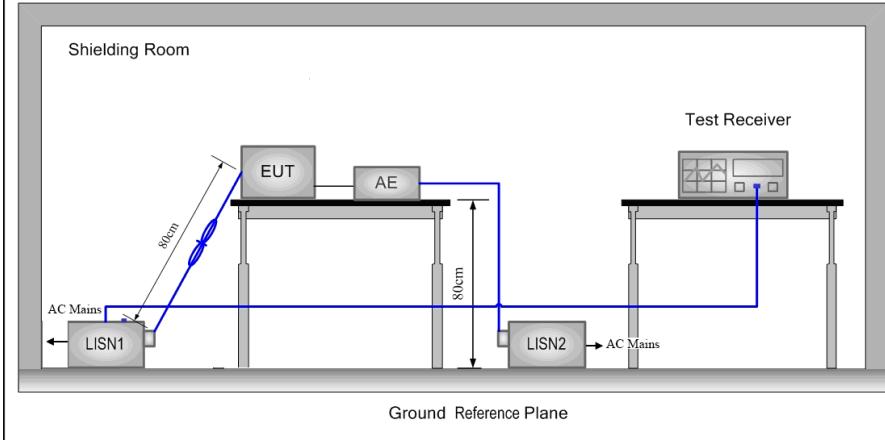
### 6.1 Antenna Requirement

<b>Standard requirement:</b>	47 CFR Part 15C Section 15.203
15.203 requirement:	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, 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.
<b>EUT Antenna:</b>	 <p>The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.5dBi.</p>

## 6.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2009		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)		Limit (dBuV)
			Quasi-peak      Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
Test Procedure:	5-30	60	50
	* Decreases with the logarithm of the frequency.		
	1) The mains terminal disturbance voltage test was conducted in a shielded room.		
	2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.		
	3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,		
	4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0,4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0,8 m from the LISN 2.		
	5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.		

## Test Setup:



## Test Mode:

Charging+transmitting mode

Through pre-scan, found the lowest channel was the worst case.  
Only the worst case is recorded in the report.

## Instruments Used:

Refer to section 5.10 for details

## Test Results:

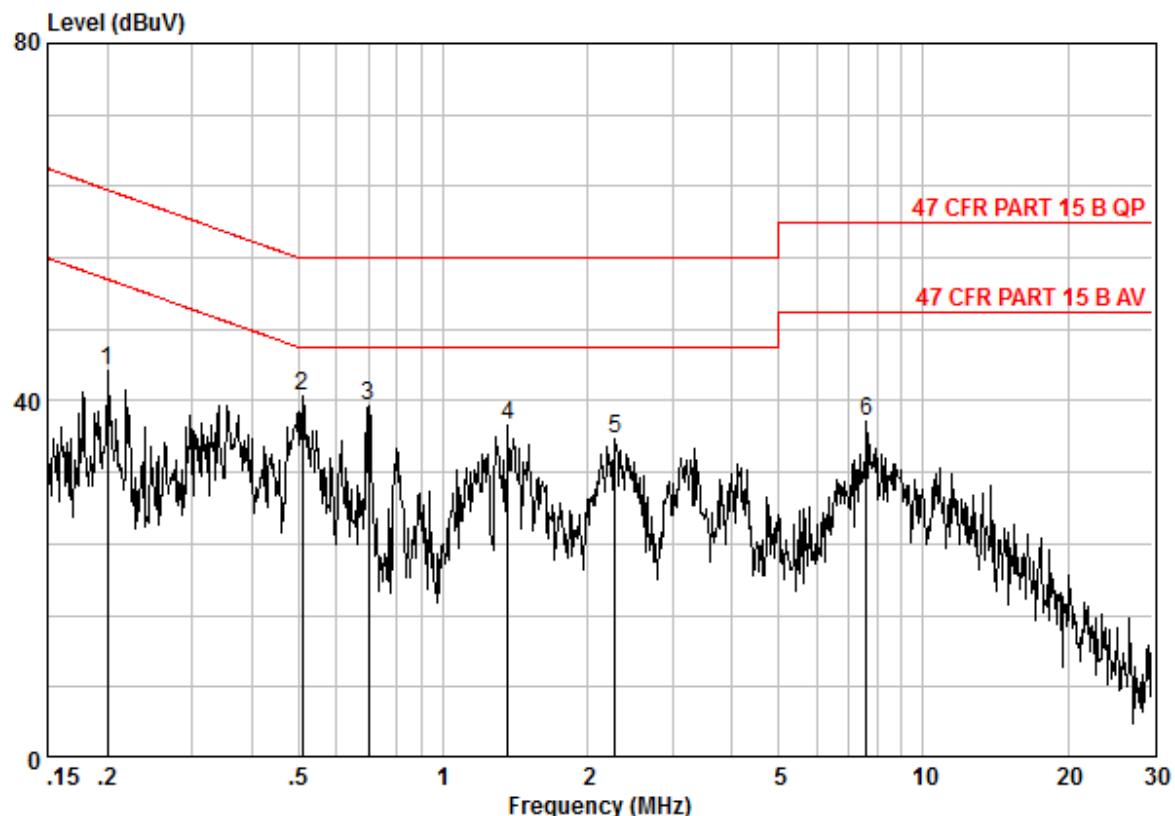
Pass

**Measurement Data**

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

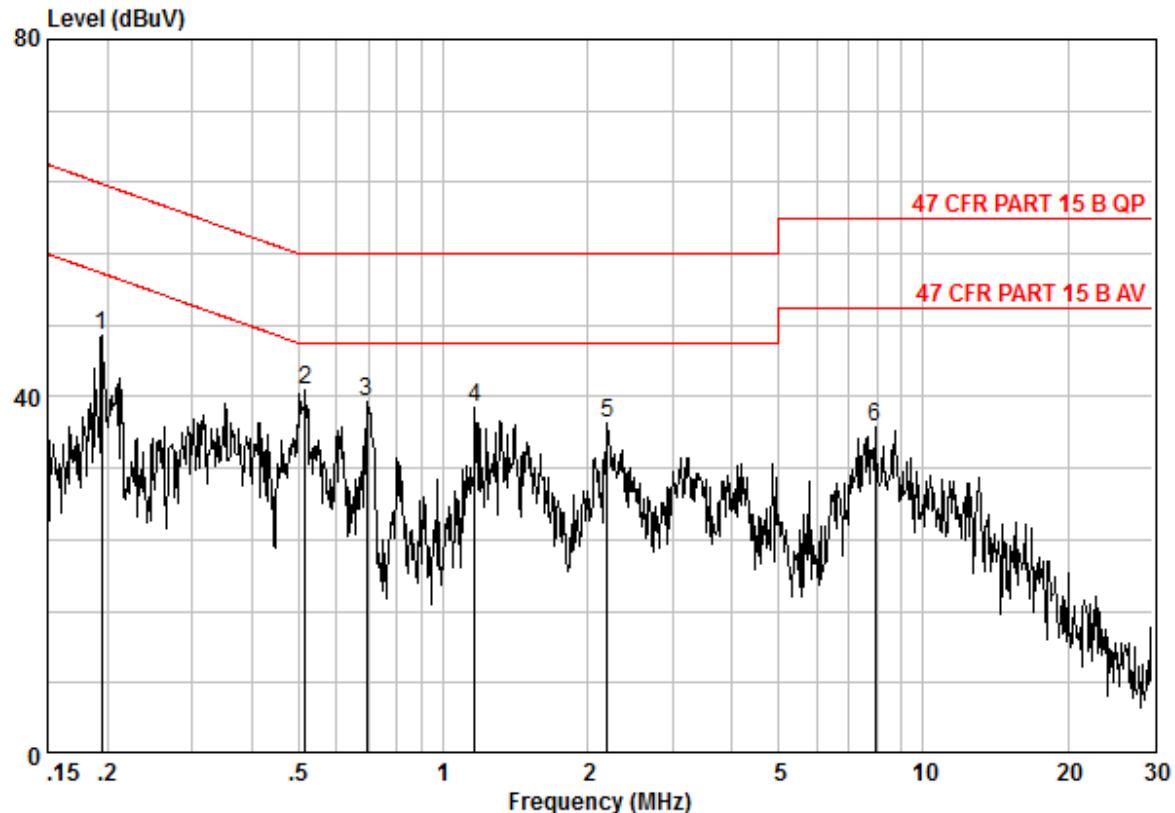
Live Line:



Site : Shielding Room  
Condition : 47 CFR PART 15 B QP CE LINE  
Job No. : 5784BA  
Test Mode : Charge+Tx

Freq	Cable	LISN	Read	Limit	Over	Remark
	Loss	Factor	Level	Level	Line	
	MHz	dB	dB	dBuV	dBuV	dB
1	0.19969	0.02	9.83	33.54	43.39	63.62 -20.23 Peak
2	0.51007	0.01	9.86	30.76	40.63	56.00 -15.37 Peak
3	0.70096	0.02	9.88	29.47	39.37	56.00 -16.63 Peak
4	1.367	0.02	9.92	27.41	37.35	56.00 -18.65 Peak
5	2.285	0.02	9.98	25.65	35.65	56.00 -20.35 Peak
6	7.606	0.01	10.15	27.49	37.65	60.00 -22.35 Peak

Neutral Line:



Site : Shielding Room  
Condition : 47 CFR PART 15 B QP CE NEUTRAL  
Job No. : 5784BA  
Test Mode : Charge+Tx

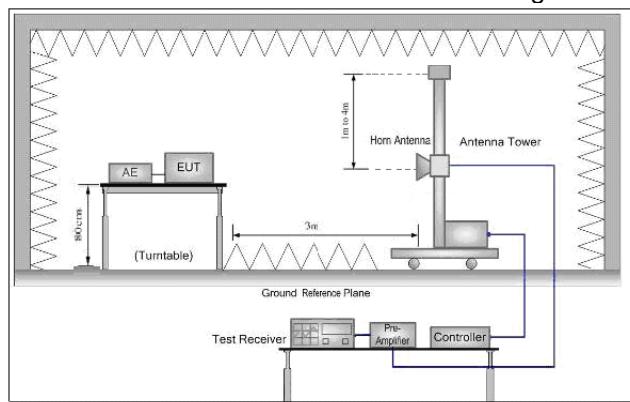
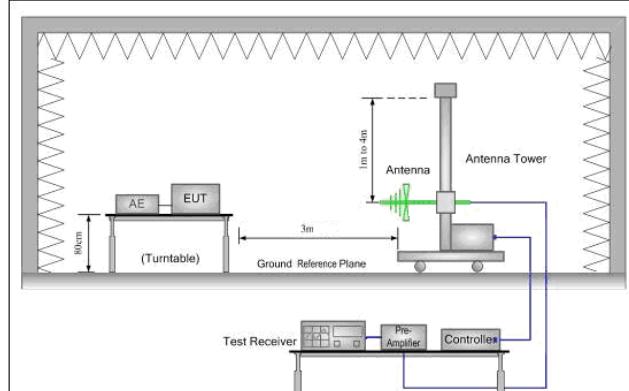
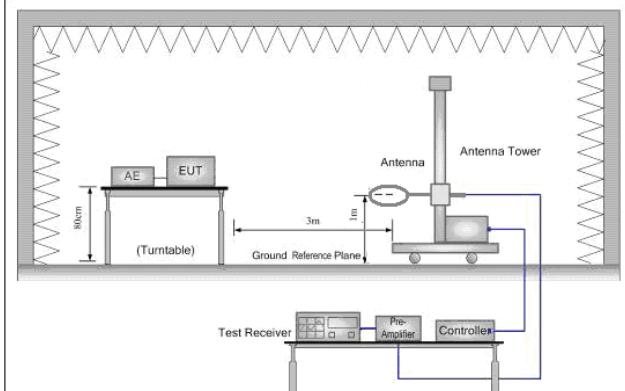
Freq	Cable	LISN	Read	Limit	Over	Over	Remark
	Loss	Factor	Level				
	MHz	dB	dB	dBuV	dBuV	dBuV	dB
1	0.19447	0.02	9.84	36.98	46.85	53.84	-7.00 Peak
2 @	0.51550	0.01	9.89	30.77	40.67	46.00	-5.33 Peak
3	0.69357	0.02	9.96	29.43	39.41	46.00	-6.59 Peak
4	1.166	0.02	10.04	28.64	38.70	46.00	-7.30 Peak
5	2.201	0.02	10.12	26.83	36.97	46.00	-9.03 Peak
6	7.935	0.01	10.13	26.51	36.65	50.00	-13.35 Peak

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

### 6.3 Radiated Emission

Test Requirement:	47 CFR Part 15C Section 15.249 and 15.209				
Test Method:	ANSI C63.10: 2009				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30KHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30KHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30KHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30KHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30KHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit: (Spurious Emissions)	Frequency	Field strength (microvolt/meter )	Limit (dBuV/m )	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F (kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F (kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark	
	2400MHz-2483.5MHz	94.0		Average Value	
		114.0		Peak Value	
Test Setup:					



Test Procedure:	<ol style="list-style-type: none"> <li>The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</li> <li>Test the EUT in the lowest channel, the middle channel, the Highest channel</li> <li>The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</li> <li>Repeat above procedures until all frequencies measured was complete.</li> </ol>
Instruments Used:	Refer to section 5.10 for details



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Exploratory Test Mode:	Transmitting mode, Charging+Transmitting mode
Final Test Mode:	Pretest the EUT at Transmitting mode and Charge + Transmitting mode, found the Charge + Transmitting mode which it is worse case For below 1GHz part, through pre-scan, found the lowest channel was the worst case. Only the worst case is recorded in the report.
Test Results:	Pass

**Measurement Data****6.3.1.1 Field Strength Of The Fundamental Signal**

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark:
2406	4.92	32.41	38.46	82.63	81.5	114.00	-32.5	Peak
2447	4.98	32.43	38.46	83.41	82.36	114.00	-31.64	Peak
2476	5.02	32.44	38.47	82.09	81.08	114.00	-32.92	Peak

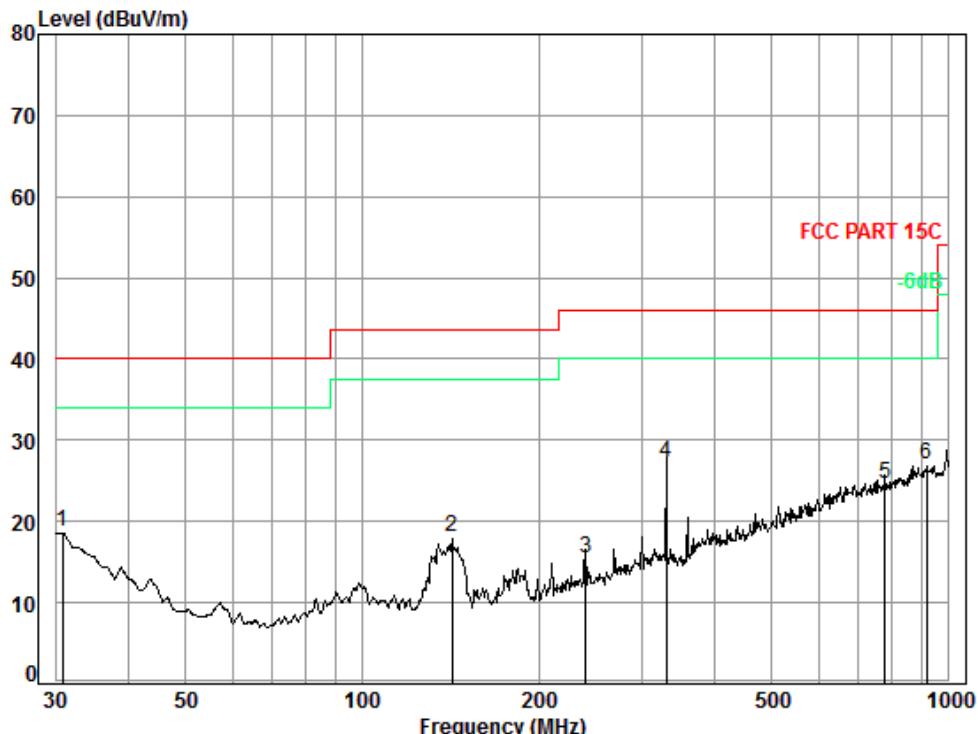
Rmark:

The horizontal direction test data is the worst case. Only the worst case is recorded in the report.



**6.3.1.2 Spurious Emissions**

30MHz~1GHz (QP)	
Test mode:	Charge+Transmitting

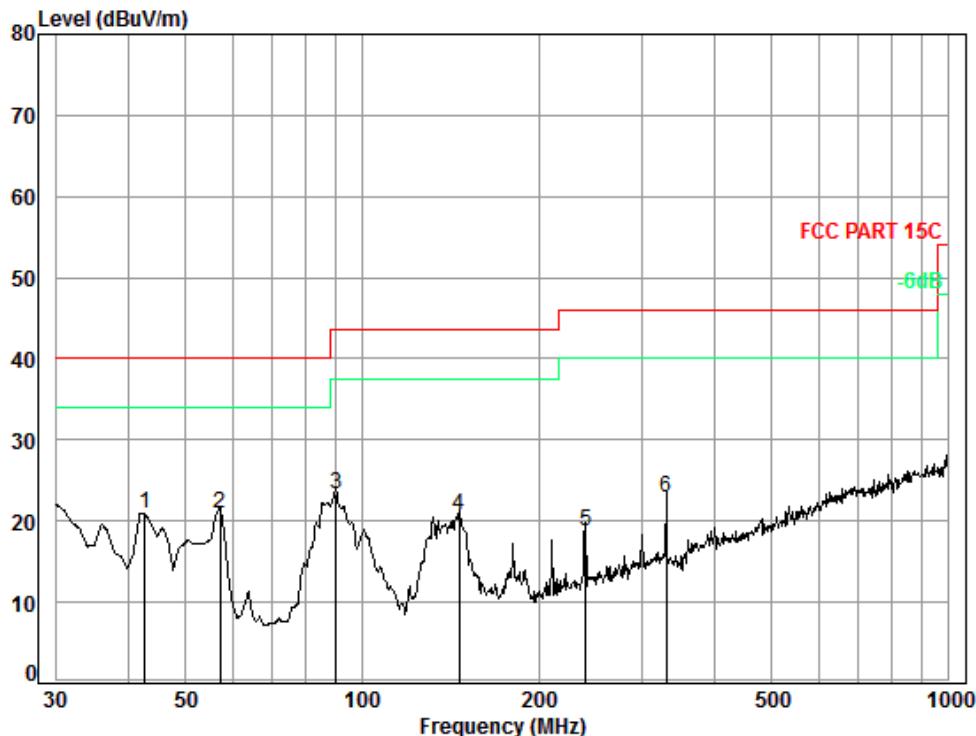


Condition: FCC PART 15C 3m 3142C Horizontal

Job No. : 5784BA

Test Mode: Charge+Tx

Freq	Cable		Ant	Preamp	Read	Limit	Over
	Loss	Factor	Factor	Level	Level		
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m
1	30.75	0.60	18.51	27.35	26.92	18.68	40.00 -21.32
2	142.32	1.30	8.61	26.94	35.10	18.07	43.50 -25.43
3	240.83	1.63	11.92	26.56	28.50	15.49	46.00 -30.51
4	330.19	2.00	14.95	26.64	36.94	27.25	46.00 -18.75
5	779.61	3.14	21.92	27.32	26.94	24.68	46.00 -21.32
6	919.29	3.62	23.35	26.68	26.64	26.93	46.00 -19.07



Condition: FCC PART 15C 3m 3142C Vertical

Job No. : 5784BA

Test Mode: Charge+Tx

Freq	Cable Loss		Ant Factor		Read Level	Limit Level	Line Limit	Over Limit
	MHz	dB	dB/m	Factor	dB	dBuV	dBuV/m	dBuV/m
1	42.60	0.66	11.99	27.31	35.54	20.88	40.00	-19.12
2	57.19	0.80	7.65	27.27	39.69	20.87	40.00	-19.13
3	90.22	1.10	8.81	27.21	40.53	23.23	43.50	-20.27
4	146.37	1.31	8.98	26.93	37.26	20.62	43.50	-22.88
5	240.83	1.63	11.92	26.56	31.67	18.66	46.00	-27.34
6	330.19	2.00	14.95	26.64	32.66	22.97	46.00	-23.03



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Above 1GHz								
Test mode:		Transmitting	Test channel:		Lowest	Remark:		Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3657.721	6.88	33.04	38.81	45.68	46.79	74	-27.21	Vertical
4812.000	6.44	34.71	39.24	49.84	51.75	74	-22.25	Vertical
5947.702	8.00	36.20	39.19	46.17	51.18	74	-22.82	Vertical
7218.000	8.94	35.62	39.07	45.53	51.02	74	-22.98	Vertical
9624.000	9.98	37.38	37.92	42.30	51.74	74	-22.26	Vertical
12173.120	10.87	38.92	38.85	42.38	53.32	74	-20.68	Horizontal
3754.236	6.82	33.12	38.85	45.25	46.34	74	-27.66	Horizontal
4812.000	6.44	34.71	39.24	51.92	53.83	74	-20.17	Horizontal
6043.124	8.07	36.25	39.18	46.64	51.78	74	-22.22	Horizontal
7218.000	8.94	35.62	39.07	47.67	53.16	74	-20.84	Horizontal

Test mode:		Transmitting	Test channel:		Middle	Remark:		Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3689.614	6.86	33.07	38.82	45.95	47.06	74	-26.94	Vertical
4894.000	6.61	34.80	39.27	49.25	51.39	74	-22.61	Vertical
6069.413	8.06	36.22	39.18	46.55	51.65	74	-22.35	Vertical
7341.000	9.10	35.48	39.05	47.77	53.30	74	-20.70	Vertical
9788.000	9.89	37.88	37.82	42.20	52.15	74	-21.85	Vertical
12297.040	11.06	39.07	38.95	42.09	53.27	74	-20.73	Horizontal
3792.453	6.80	33.14	38.87	45.56	46.63	74	-27.37	Horizontal
4894.000	6.61	34.80	39.27	51.50	53.64	74	-20.36	Horizontal
6078.201	8.06	36.21	39.18	45.99	51.08	74	-22.92	Horizontal
7341.000	9.10	35.48	39.05	48.13	53.66	74	-20.34	Horizontal



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Test mode:	Transmitting	Test channel:		Highest	Remark:		Peak	
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3684.279	6.86	33.06	38.82	45.65	46.75	74	-27.25	Vertical
4952.000	6.74	34.85	39.28	47.16	49.47	74	-24.53	Vertical
5999.562	8.08	36.30	39.18	46.81	52.01	74	-21.99	Vertical
7428.000	9.22	35.43	39.05	47.92	53.52	74	-20.48	Vertical
9904.000	9.82	38.22	37.76	41.55	51.83	74	-22.17	Vertical
12120.390	10.79	38.85	38.80	42.74	53.58	74	-20.42	Horizontal
3781.495	6.81	33.14	38.86	46.04	47.13	74	-26.87	Horizontal
4952.000	6.74	34.85	39.28	50.82	53.13	74	-20.87	Horizontal
5879.252	7.89	36.07	39.20	47.13	51.89	74	-22.11	Horizontal
7428.000	9.22	35.43	39.05	48.21	53.81	74	-20.19	Horizontal

## Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 2) Scan from 9kHz to 25GHz, The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported .
- 3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

## 6.4 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205	
Test Method:	ANSI C63.10: 2009	
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)	
Limit(band edge):	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.	
Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
	74.0	Peak Value

### Test Setup:

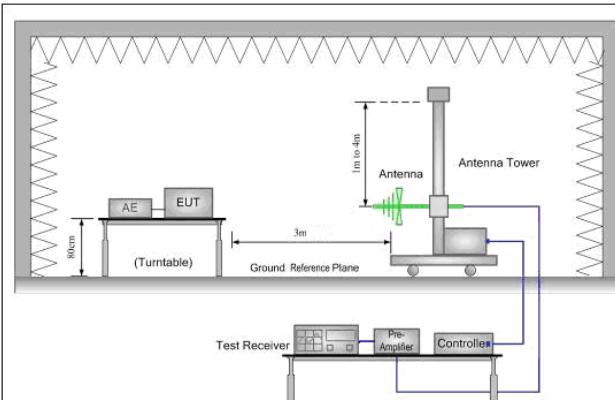


Figure 1. 30MHz to 1GHz

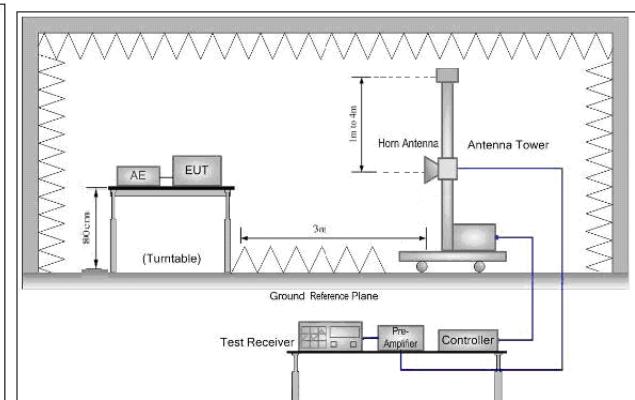
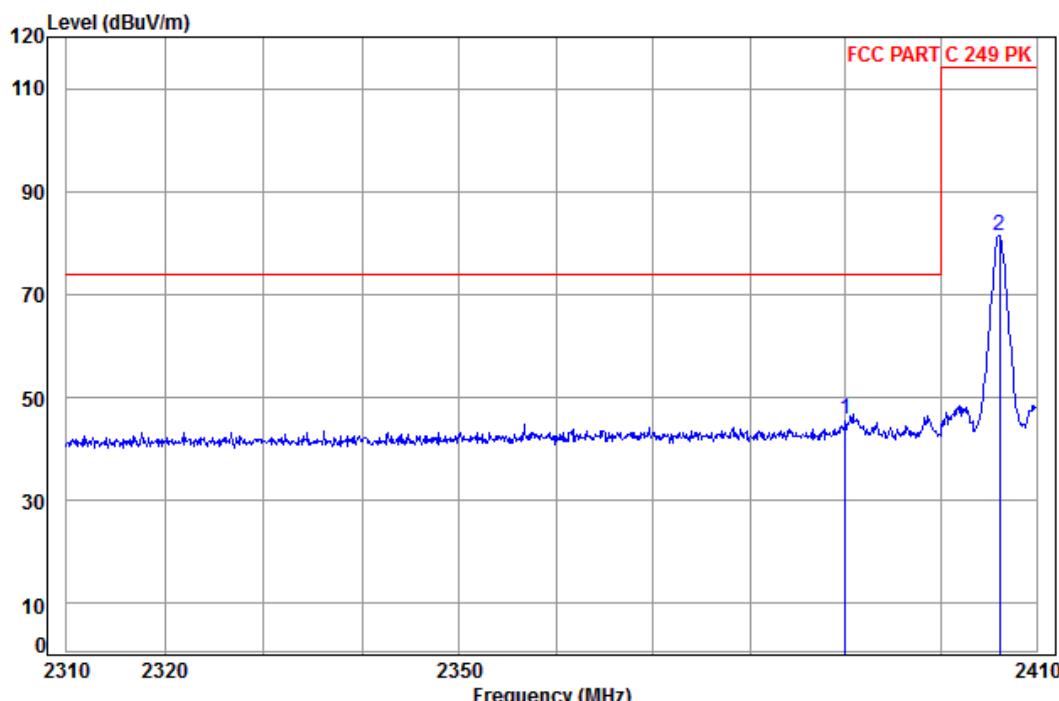


Figure 2. Above 1 GHz

Test Procedure:	<ol style="list-style-type: none"><li>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li><li>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li><li>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li><li>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li><li>f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel</li><li>g. Test the EUT in the lowest channel , the Highest channel</li><li>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</li><li>i. Repeat above procedures until all frequencies measured was complete.</li></ol>
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting mode, Charging+Transmitting mode
Final Test Mode:	Transmitting mode, Charging+Transmitting mode Pretest the EUT at Transmitting mode and Charge + Transmitting mode, found the Charge + Transmitting mode which it is worse case Only the worst case is recorded in the report.
Test Results:	Pass

**Band edge test data (Radiated Emission)**

Test mode:	Charging+Transmitting mode	Test channel:	Lowest	Remark:	Horizontal
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**Data: 4**

Site : chamber

Condition: FCC PART C 249 PK 3m Horizontal

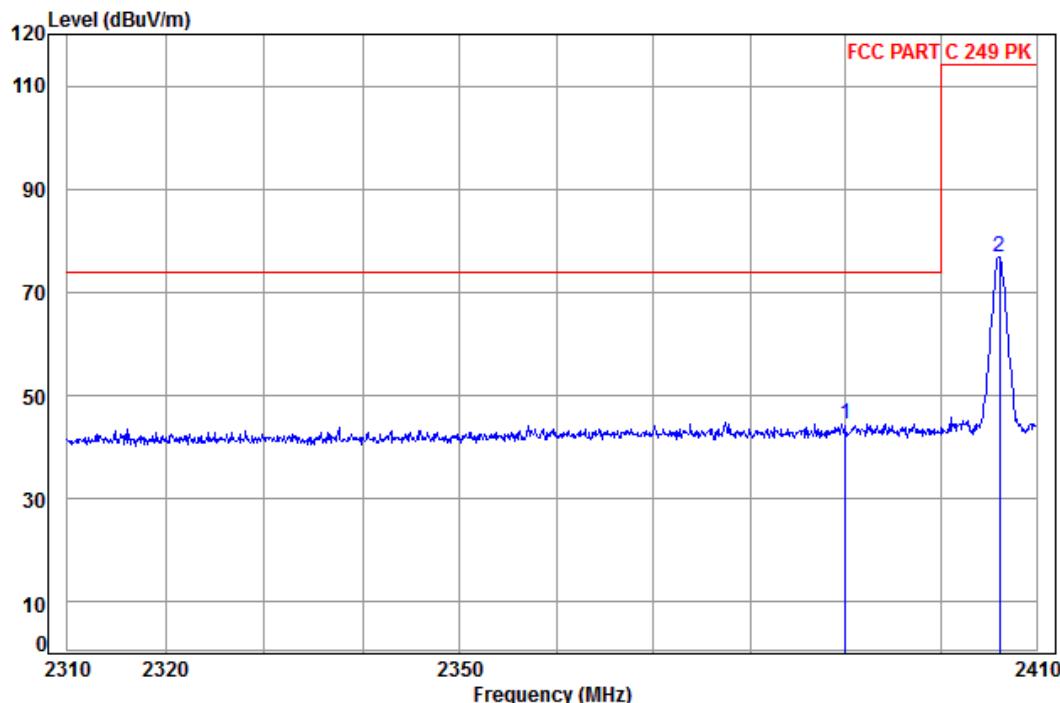
Job No: : 5784BA

Mode: : 2406 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2390.00	4.90	32.35	38.46	47.10	45.89	74.00	-28.11
2	2406.12	4.92	32.41	38.46	82.63	81.50	114.00	-32.50

Test mode:	Charging+Transmitting mode	Test channel:	Lowest	Remark:	Vertical
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Data: 3



Site : chamber

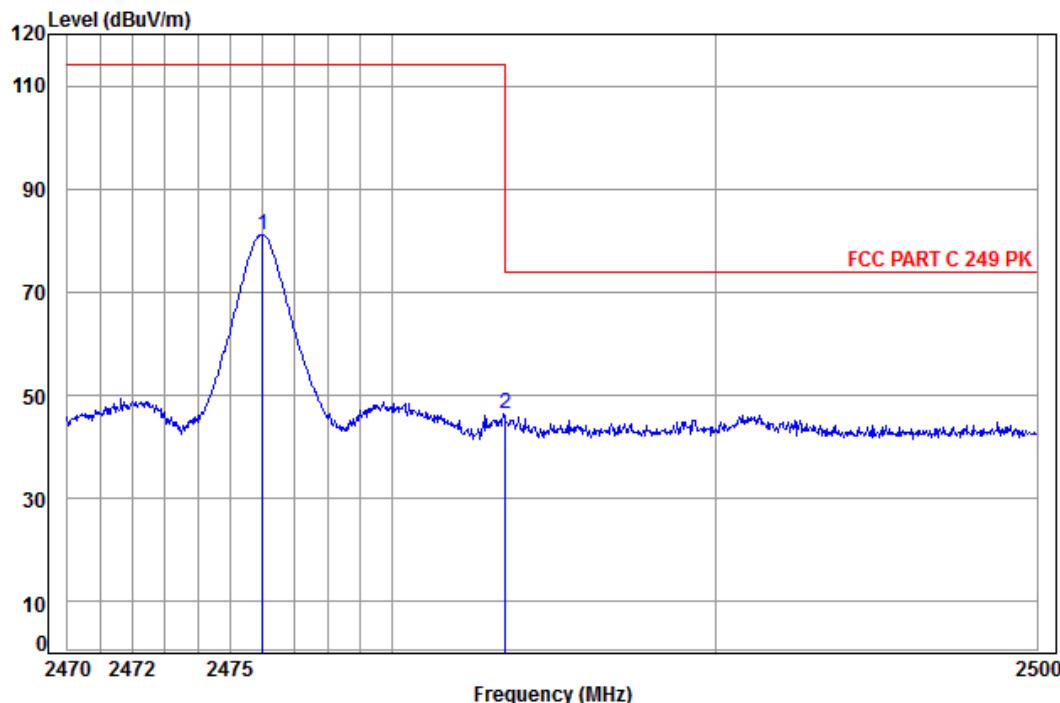
Condition: FCC PART C 249 PK 3m Vertical

Job No: : 5784BA

Mode: : 2406 Band edge

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp	2390.00	4.90	32.35	38.46	45.78	44.57	74.00	-29.43
2		2406.12	4.92	32.41	38.46	77.83	76.70	114.00	-37.30

Test mode:	Charging+Transmitting mode	Test channel:	Highest	Remark:	Horizontal
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**Data: 5**

Site : chamber

Condition: FCC PART C 249 PK 3m Horizontal

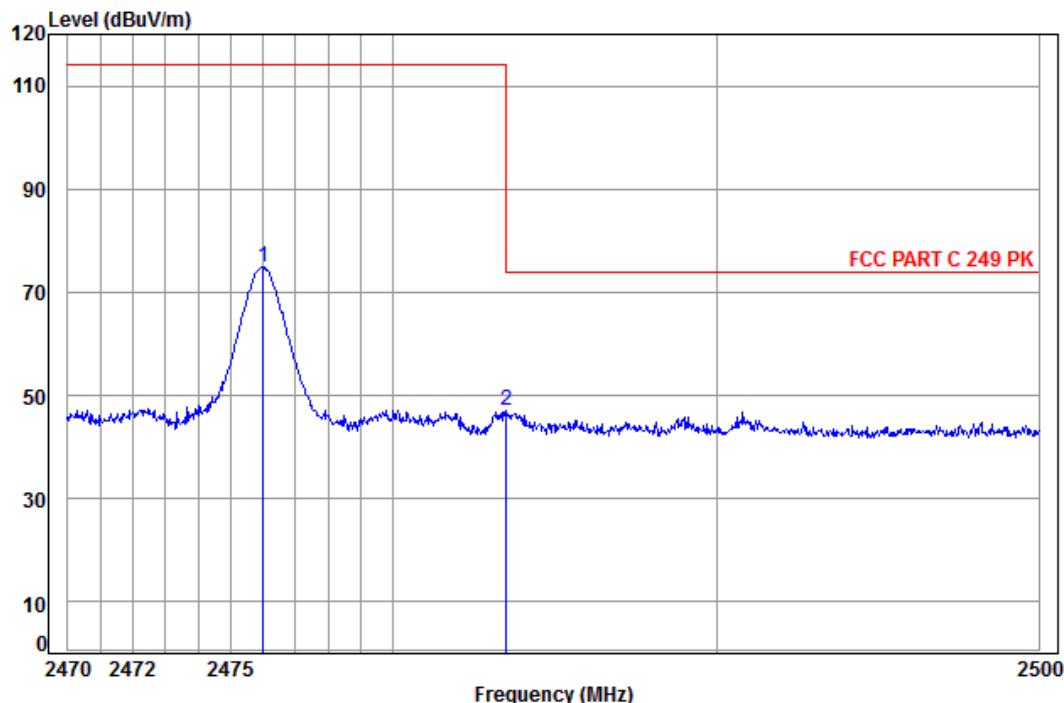
Job No: : 5784BA

Mode: : 2476 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit
	MHz	dB	dB/m		dBuV	dBuV/m	dBuV/m	dB
1	2476.00	5.02	32.44	38.47	82.09	81.08	114.00	-32.92
2 pp	2483.50	5.03	32.44	38.47	47.34	46.34	74.00	-27.66

Test mode:	Charging+Transmitting mode	Test channel:	Highest	Remark:	Vertical
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Data: 6



Site : chamber

Condition: FCC PART C 249 PK 3m Vertical

Job No. : 5784BA

Mode: : 2476 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2476.00	5.02	32.44	38.47	75.86	74.85	114.00	-39.15
2 pp	2483.50	5.03	32.44	38.47	48.24	47.24	74.00	-26.76

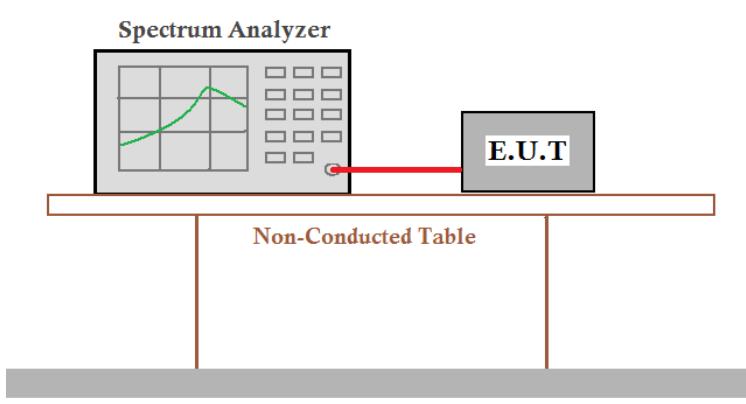
## Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor



## 6.5 20dB Bandwidth

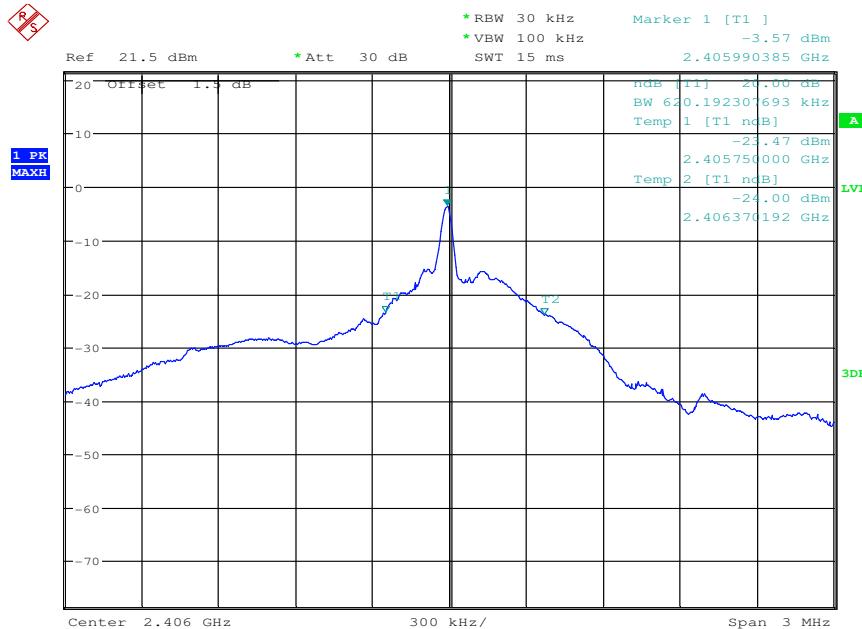
Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10:2009
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Limit:	Within the band 2400MHz-2483.5MHz
Test Mode:	Transmitter mode
Test Results:	Pass
Limit:	Within the band 2400MHz-2483.5MHz

### Measurement Data

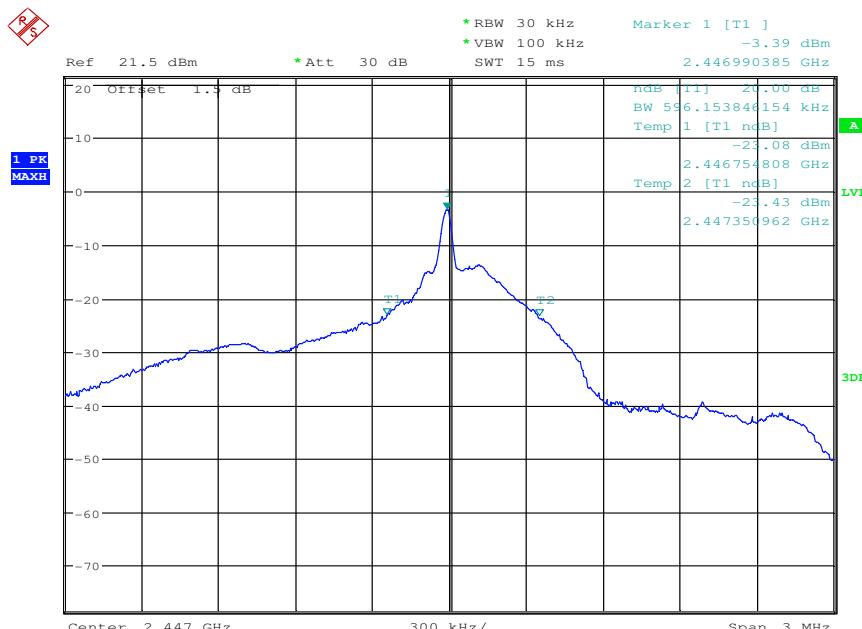
Test channel	20dB bandwidth (MHz)	Results
Lowest	0.620	Pass
Middle	0.596	Pass
Highest	0.576	Pass

**Test plot as follows:**

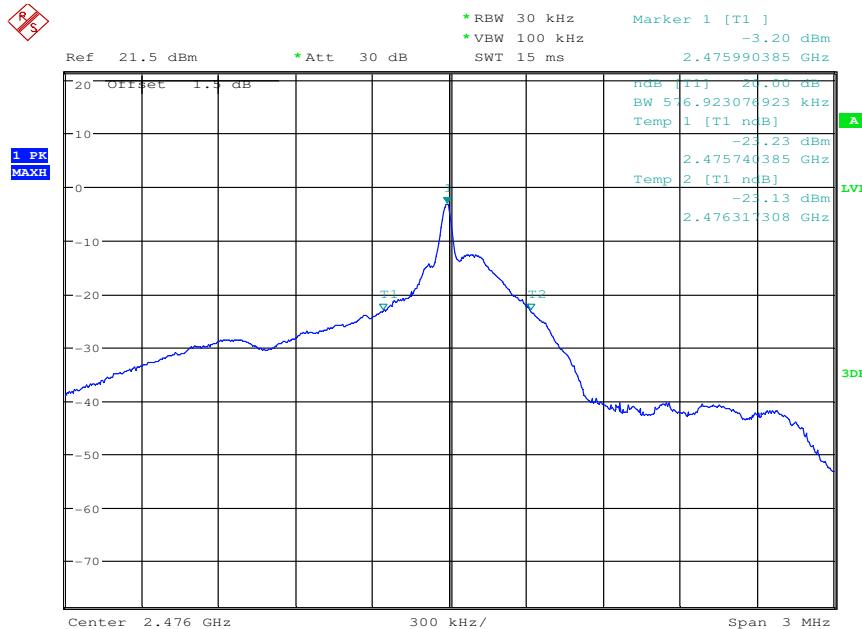
Test channel: Lowest



Test channel: Middle



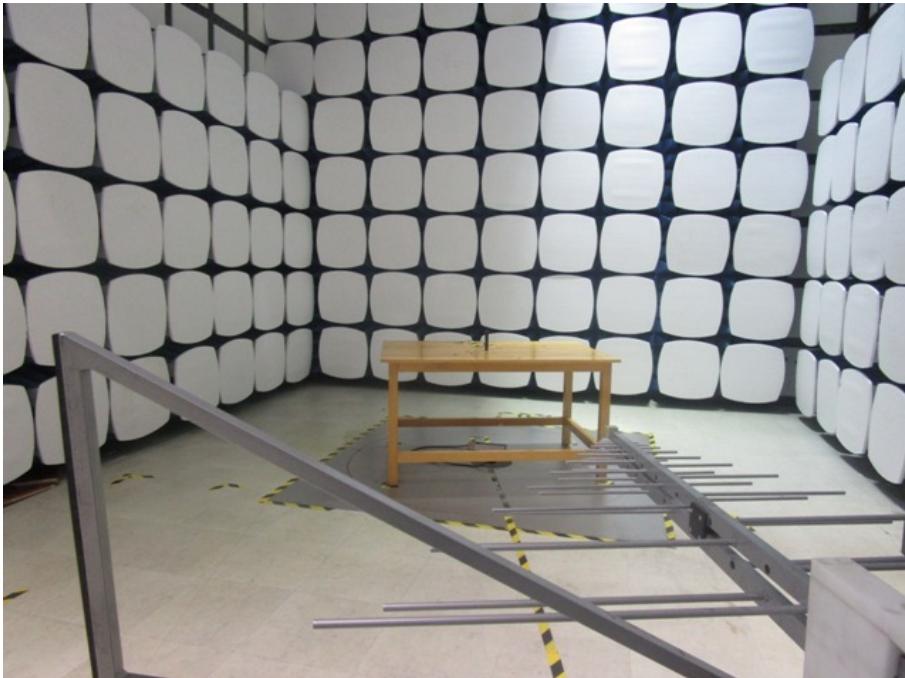
Test channel:	Highest
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## 7 Photographs

Test model No.: TS-D192

### 7.1 Radiated Emission Test Setup



## 7.2 Conducted Emission



## 7.3 EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1509005784CR.