



SGS-CSTC Standards Technical Services Ltd.

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Report No.: SZEM130900495301
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FCC REPORT

Application No. : SZEM1309004953RF
Applicant: Shenzhen Fuyeda Industry Development Co.,Ltd.Dongguan Branch
Manufacturer: Shenzhen Fuyeda Industry Development Co.,Ltd.Dongguan Branch
Factory: Shenzhen Fuyeda Industry Development Co.,Ltd.Dongguan Branch
Product Name: Green(Red) Laser 2.4G Wireless Presenter
Model No.(EUT): P-006
FCC ID: V4P-P-006
Standards: 47 CFR Part 15, Subpart C (2012)
Date of Receipt: 2013-09-04
Date of Test: 2013-09-13 to 2013-09-16
Date of Issue: 2013-10-10

Test Result:	PASS *
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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 Test Summary

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



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4 General Information

4.1 Client Information

Applicant:	Shenzhen Fuyeda Industry Development Co.,Ltd.Dongguan Branch
Address of Applicant:	No. 5 Xifa Road, Lin Village, Tangxia Town, Dongguan
Manufacturer:	Shenzhen Fuyeda Industry Development Co.,Ltd.Dongguan Branch
Address of Manufacturer:	No. 5 Xifa Road, Lin Village, Tangxia Town, Dongguan
Factory:	Shenzhen Fuyeda Industry Development Co.,Ltd.Dongguan Branch
Address of Factory:	No. 5 Xifa Road, Lin Village, Tangxia Town, Dongguan

4.2 General Description of EUT

Name:	Green(Red) Laser 2.4G Wireless Presenter
Model No.:	P-006
Trade Mark :	NEWMEN
Frequency Range:	2402-2475MHz
Modulation Type:	GFSK
Number of Channels:	74 (declared by the client)
Sample Type:	Portable production
Antenna Type:	Integral
Antenna Gain:	2.0dBi
Power Supply:	Li-ion battery 3.7V 300mAH
Test Voltage:	3.7V



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Operation Frequency each of channel									
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402	17	2418	33	2434	49	2450	65	2466
2	2403	18	2419	34	2435	50	2451	66	2467
3	2404	19	2420	35	2436	51	2452	67	2468
4	2405	20	2421	36	2437	52	2453	68	2469
5	2406	21	2422	37	2438	53	2454	69	2470
6	2407	22	2423	38	2439	54	2455	70	2471
7	2408	23	2424	39	2440	55	2456	71	2472
8	2409	24	2425	40	2441	56	2457	72	2473
9	2410	25	2426	41	2442	57	2458	73	2474
10	2411	26	2427	42	2443	58	2459	74	2475
11	2412	27	2428	43	2444	59	2460		
12	2413	28	2429	44	2445	60	2461		
13	2414	29	2430	45	2446	61	2462		
14	2415	30	2431	46	2447	62	2463		
15	2416	31	2432	47	2448	63	2464		
16	2417	32	2433	48	2449	64	2465		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel(CH1)	2402MHz
The Middle channel(CH40)	2441MHz
The Highest channel(CH74)	2475MHz

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4.3 Test Environment and Mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1010 mbar

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
Adapter	Supply by SGS	N/A

4.5 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.



4.6 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.

- **VCCI**

The 3m Semi-anechoic chamber, Full-anechoic Chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197, G-416, 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)**

Two 3m Semi-anechoic chambers of SGS-CSTC Standards Technical Services Co., Ltd. have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1 & 4620C-2.

4.7 Deviation from Standards

None.

4.8 Abnormalities from Standard Conditions

None.

4.9 Other Information Requested by the Customer

None.

**4.10 Equipment List**

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	2014-06-10
2	LISN	Rohde & Schwarz	ENV216	SEL0152	2013-10-24
3	LISN	ETS-LINDGREN	3816/2	SEL0021	2014-05-16
4	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	SEL0162	2013-11-10
5	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	SEL0163	2013-11-10
6	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	SEL0164	2013-11-10
7	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2014-05-16
8	Coaxial Cable	SGS	N/A	SEL0025	2014-05-29
9	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2013-10-24
10	Humidity/ Temperature Indicator	Shanghai Qixiang	ZJ1-2B	SEL0103	2013-10-24
11	Barometer	Chang Chun	DYM3	SEL0088	2014-05-24



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RE in Chamber					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2014-06-10
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2014-05-16
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2013-10-24
5	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2013-10-24
6	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2013-10-24
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2014-05-16
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2013-10-24
9	Coaxial cable	SGS	N/A	SEL0027	2014-05-29
10	Coaxial cable	SGS	N/A	SEL0189	2014-05-29
11	Coaxial cable	SGS	N/A	SEL0121	2014-05-29
12	Coaxial cable	SGS	N/A	SEL0178	2014-05-29
13	Band filter	Amindeon	82346	SEL0094	2014-05-16
14	Barometer	Chang Chun	DYM3	SEL0088	2014-05-24
15	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2013-10-24
16	Humidity/ Temperature Indicator	Shanghai Qixiang	ZJ1-2B	SEL0103	2013-10-24
17	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2014-05-16
18	Signal Generator	Rohde & Schwarz	SMY01	SEL0155	2013-10-24
19	Loop Antenna	Beijing Daze	ZN30401	SEL0203	2014-06-04

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RF connected test					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2013-10-24
2	Humidity/ Temperature Indicator	HYGRO	ZJ1-2B	SEL0033	2013-10-24
3	Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0154	2013-10-24
4	Coaxial cable	SGS	N/A	SEL0178	2014-05-29
5	Coaxial cable	SGS	N/A	SEL0179	2014-05-29
6	Barometer	ChangChun	DYM3	SEL0088	2014-05-24
7	Signal Generator	Rohde & Schwarz	SML03	SEL0068	2014-05-16
8	Band filter	amideon	82346	SEL0094	2014-05-16
9	POWER METER	R & S	NRVS	SEL0144	2013-10-24
10	Attenuator	Beijin feihang taida	TST-2-6dB	SEL0205	2014-05-16
11	Power Divider(splitter)	Agilent Technologies	11636B	SEL0130	2013-10-24

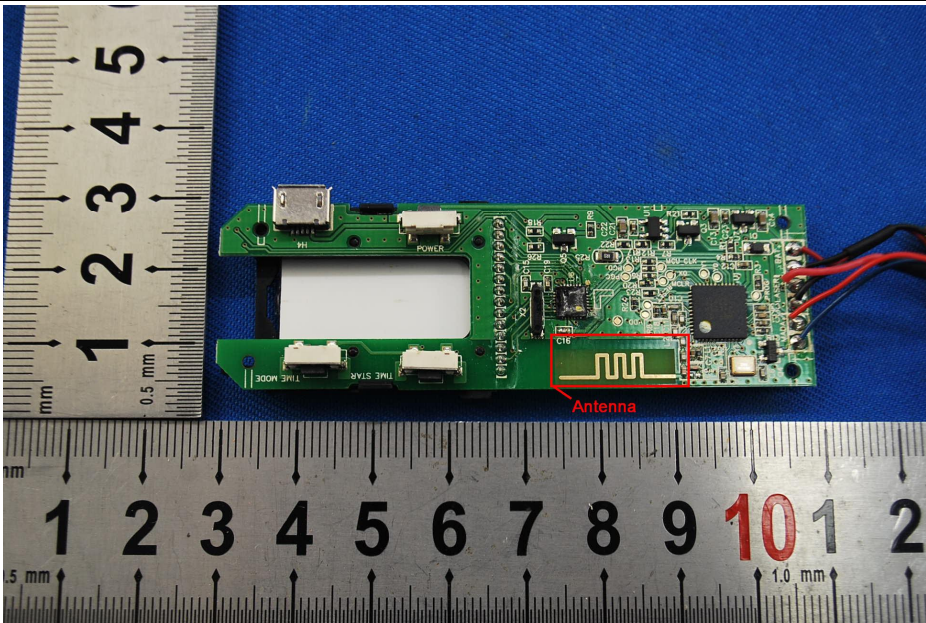
Note: The calibration interval is one year, all the instruments are valid.



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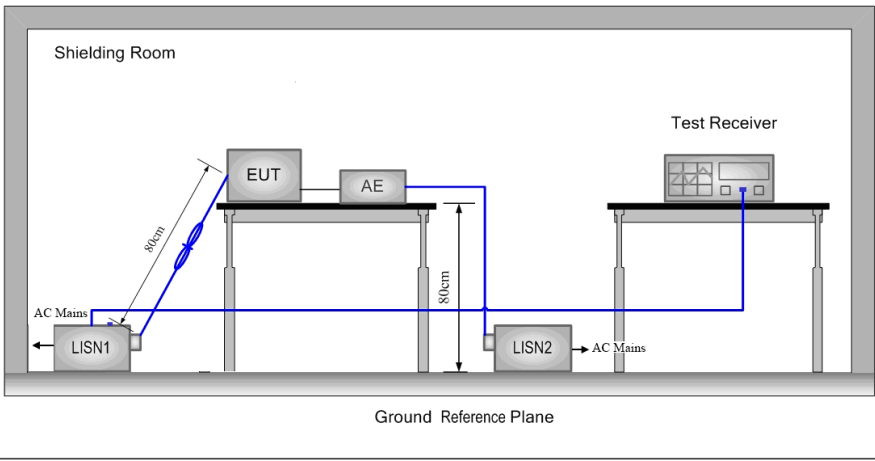
5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203
<p>15.203 requirement:</p> <p>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.</p>	
EUT Antenna:	
<p>The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.0dBi.</p>	
	

5.2 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
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	<ol style="list-style-type: none"> 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:	Keep the EUT in transmitting mode
Instruments Used:	Refer to section 4.10 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.

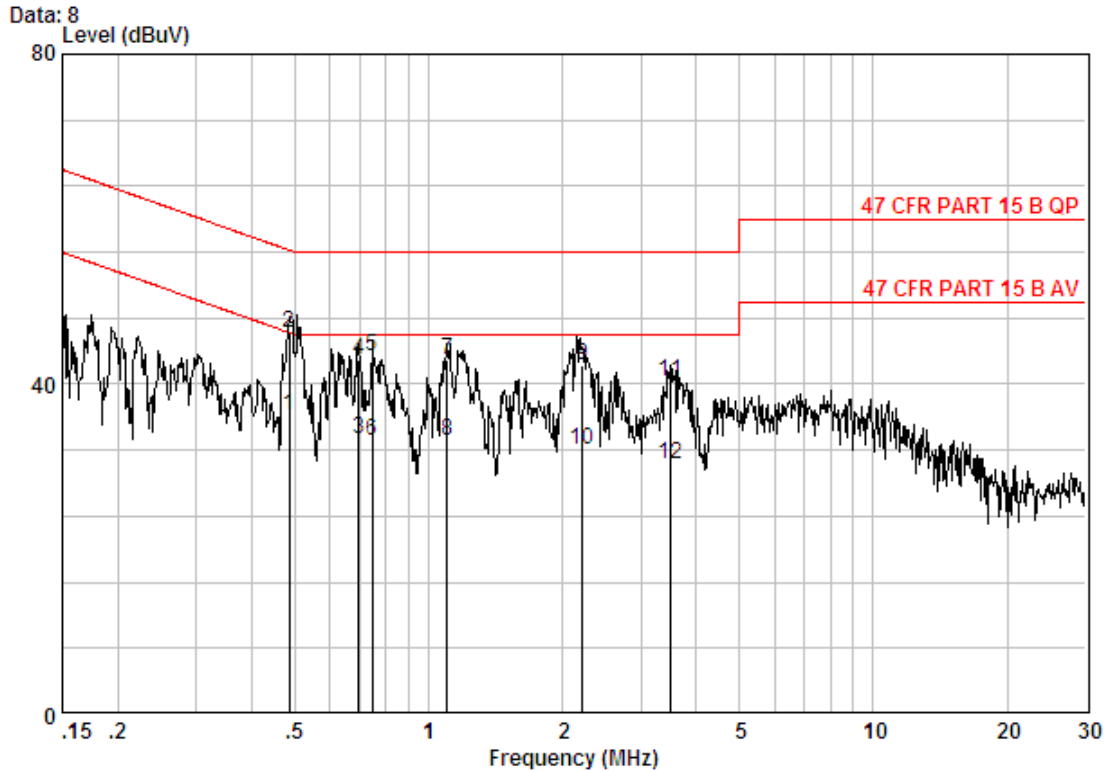


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Live Line:



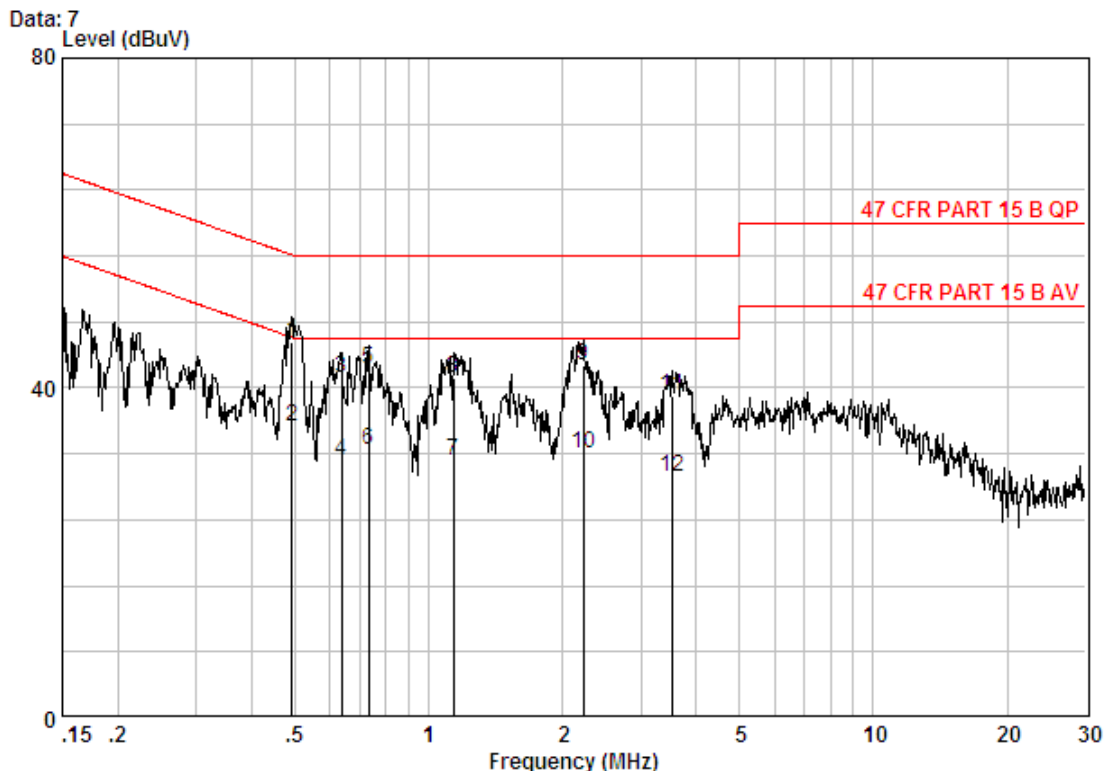
Site : Shielding Room
Condition : 47 CFR PART 15 B QP CE LINE
Test No. : 4953RF
Mode : AC charge +TX

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.48632	0.01	9.80	26.34	36.15	46.23	-10.08	Average
2 @	0.48632	0.01	9.80	36.47	46.28	56.23	-9.95	QP
3	0.69725	0.02	9.80	23.61	33.43	46.00	-12.57	Average
4	0.69725	0.02	9.80	33.01	42.83	56.00	-13.17	QP
5	0.74697	0.02	9.80	33.54	43.36	56.00	-12.64	QP
6	0.74697	0.02	9.80	23.28	33.10	46.00	-12.90	Average
7	1.100	0.02	9.80	33.12	42.94	56.00	-13.06	QP
8	1.100	0.02	9.80	23.41	33.23	46.00	-12.77	Average
9	2.213	0.02	9.81	32.52	42.35	56.00	-13.65	QP
10	2.213	0.02	9.81	22.28	32.11	46.00	-13.89	Average
11	3.509	0.02	9.86	30.34	40.22	56.00	-15.78	QP
12	3.509	0.02	9.86	20.34	30.22	46.00	-15.78	Average

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Neutral Line:



Site : Shielding Room
Condition : 47 CFR PART 15 B QP CE NEUTRAL
Test No. : 4953RF
Mode : AC charge +TX

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.49150	0.01	9.80	35.70	45.51	56.14	-10.63	QP
2	0.49150	0.01	9.80	25.61	35.42	46.14	-10.72	Average
3	0.63720	0.02	9.80	31.44	41.26	56.00	-14.74	QP
4	0.63720	0.02	9.80	21.34	31.16	46.00	-14.84	Average
5	0.73131	0.02	9.80	32.39	42.21	56.00	-13.79	QP
6	0.73131	0.02	9.80	22.61	32.43	46.00	-13.57	Average
7	1.135	0.02	9.80	21.34	31.16	46.00	-14.84	Average
8	1.135	0.02	9.80	31.45	41.27	56.00	-14.73	QP
9	2.225	0.02	9.81	32.95	42.78	56.00	-13.22	QP
10	2.225	0.02	9.81	22.28	32.11	46.00	-13.89	Average
11	3.528	0.02	9.86	29.16	39.04	56.00	-16.96	QP
12	3.528	0.02	9.86	19.34	29.22	46.00	-16.78	Average

Notes:

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

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5.3 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:					

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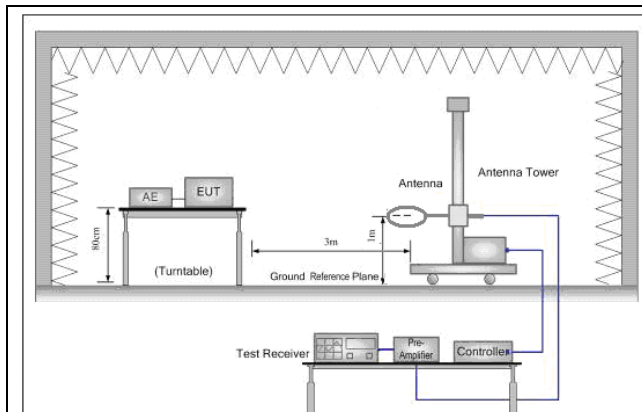


Figure 1. Below 30MHz

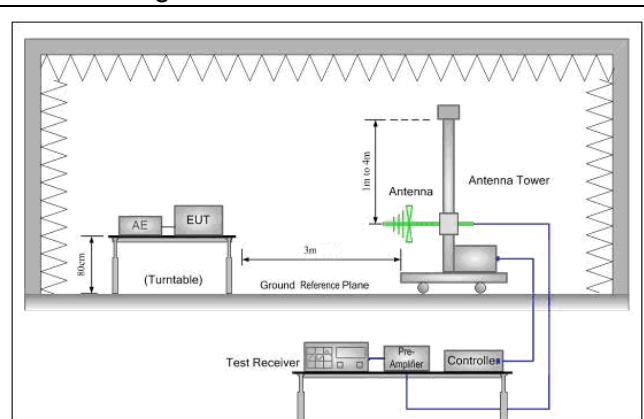


Figure 2. 30MHz to 1GHz

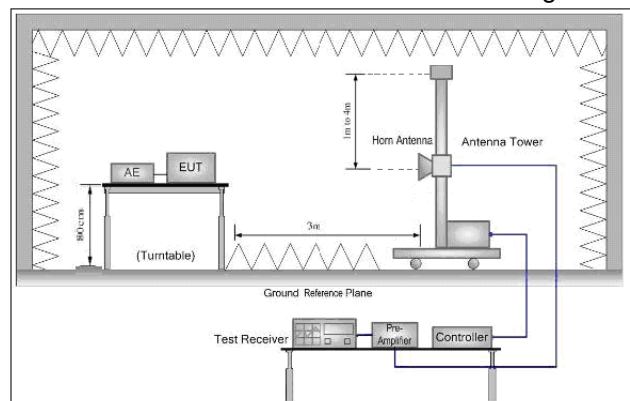


Figure 3. Above 1 GHz

<p>Test Procedure:</p>	<ol style="list-style-type: none"> 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. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 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. 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. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 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. Test the EUT in the lowest channel, the middle channel, the Highest channel The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is
------------------------	---



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	recorded in the report. i. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 4.7 for details
Test Mode:	Transmitting mode
Test Results:	Pass

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Measurement Data

5.3.1.1 Field Strength Of The Fundamental Signal

Peak value:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Peak Level (dBuV/m)	Average Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2402	2.98	32.51	39.86	96.23	91.86	114	-22.14	Horizontal
2402	2.98	32.51	39.86	89.74	85.37	114	-28.63	Vertical
2441	3.01	32.61	39.89	89.09	84.82	114	-29.18	Horizontal
2441	3.01	32.61	39.89	89.39	85.12	114	-28.88	Vertical
2475	3.02	32.67	39.92	87.41	83.18	114	-30.82	Horizontal
2475	3.02	32.67	39.92	90.13	85.90	114	-28.10	Vertical

Remark:

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.

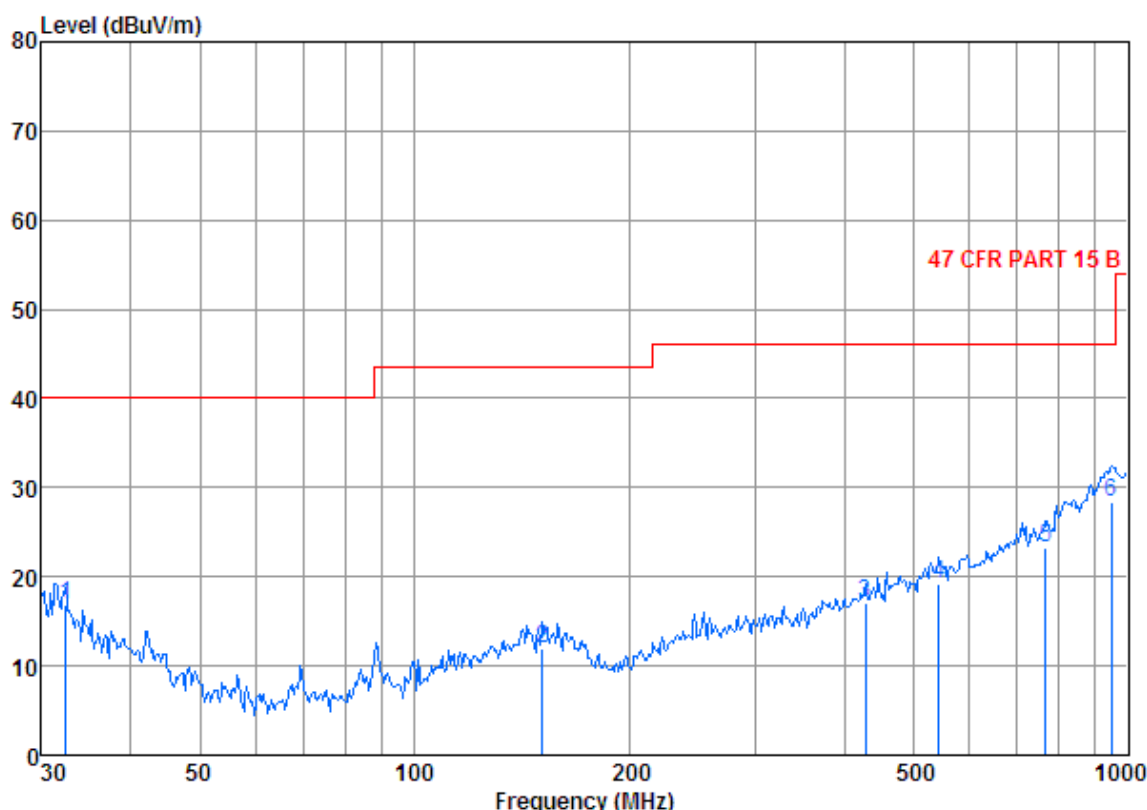
5.3.1.2 Spurious Emissions

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

QP value:

Vertical:

Data: 309



Condition: 47 CFR PART 15 B 3m 3142C VERTICAL

Job No. : 4953RF

Mode : TX mode

	Freq	Cable	Antenna	Preamplifier	Read	Level	Limit	Over
	MHz	Loss	Factor	Factor	Level	dBuV/m	dBuV/m	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	32.41	0.60	16.10	27.35	27.43	16.78	40.00	-23.22
2	151.07	1.32	9.37	26.90	28.07	11.86	43.50	-31.64
3	428.02	2.32	11.67	27.31	30.48	17.16	46.00	-28.84
4	543.27	2.65	14.74	27.63	29.38	19.14	46.00	-26.86
5	766.06	3.11	18.23	27.33	29.14	23.15	46.00	-22.85
6	948.76	3.65	21.40	26.54	29.95	28.46	46.00	-17.54



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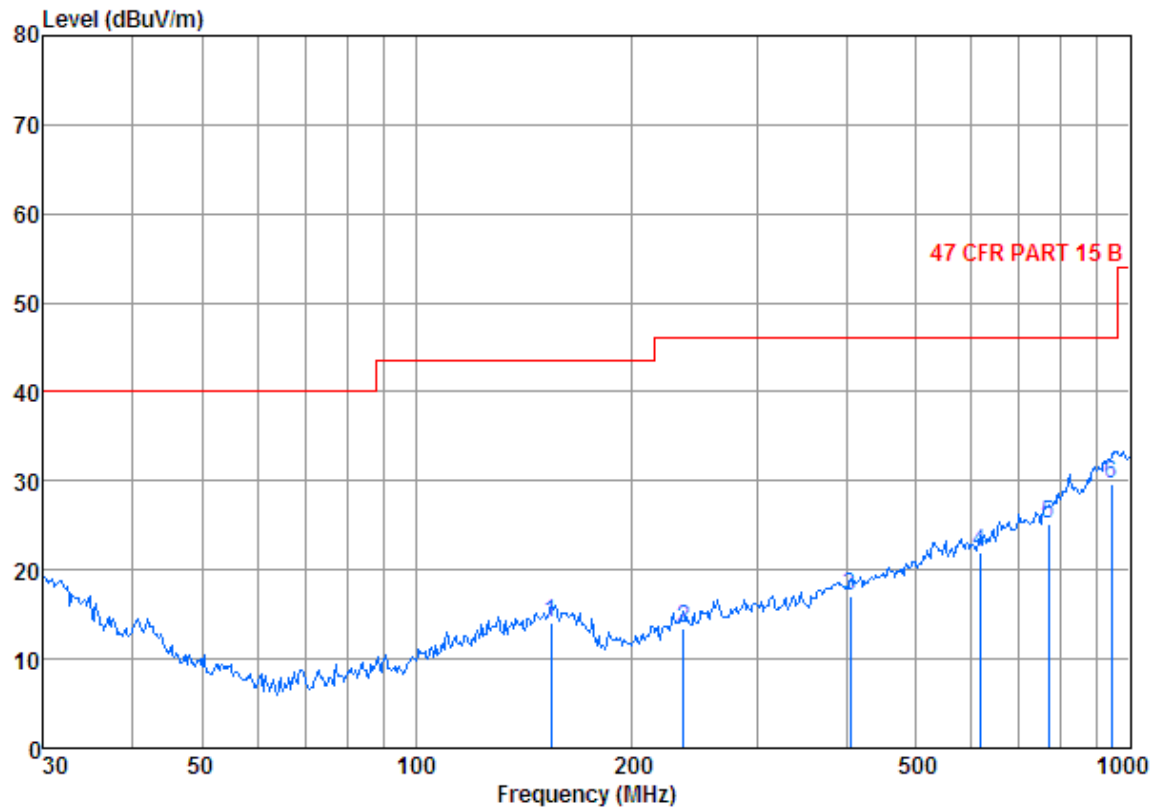
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Horizontal:

Data: 308



Condition: 47 CFR PART 15 B 3m 3142C HORIZONTAL

Job No. : 4953RF

Mode : TX mode

	Freq	Cable Loss	Antenna Factor	Preamplifier Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	154.28	1.33	9.53	26.89	30.01	13.98	43.50	-29.52
2	236.64	1.61	8.33	26.58	30.09	13.45	46.00	-32.55
3	406.09	2.23	11.50	27.17	30.48	17.04	46.00	-28.96
4	616.37	2.74	15.42	27.52	31.23	21.87	46.00	-24.13
5	768.75	3.11	18.30	27.33	31.12	25.20	46.00	-20.80
6	942.13	3.64	20.87	26.58	31.79	29.72	46.00	-16.28

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Above 1GHz								
Test mode:		Transmitting		Test channel:		Lowest		Remark:
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
3274.672	3.55	33.29	40.51	48.31	44.64	74	-29.36	Vertical
4181.159	4.28	34.31	41.16	48.73	46.16	74	-27.84	Vertical
6047.776	5.14	35.76	40.87	47.21	47.24	74	-26.76	Vertical
8859.766	6.16	36.48	38.44	43.54	47.74	74	-26.26	Vertical
10944.090	6.21	38.48	37.84	40.20	47.05	74	-26.95	Vertical
11963.890	6.46	38.87	38.26	41.45	48.52	74	-25.48	Horizontal
3049.394	3.35	33.38	40.34	48.64	45.03	74	-28.97	Horizontal
3993.903	4.16	33.80	41.04	49.91	46.83	74	-27.17	Horizontal
6032.401	5.13	35.74	40.89	45.76	45.74	74	-28.26	Horizontal
6956.627	5.48	35.85	40.08	46.79	48.04	74	-25.96	Horizontal

Test mode:		Transmitting		Test channel:		Middle		Remark:
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
2950.135	3.29	33.33	40.27	48.82	45.17	74	-28.83	Vertical
3588.939	3.81	33.30	40.73	50.04	46.42	74	-27.58	Vertical
5297.966	4.88	34.70	41.53	46.08	44.13	74	-29.87	Vertical
6886.154	5.43	35.92	40.15	46.12	47.32	74	-26.68	Vertical
9393.966	6.04	37.08	37.98	45.08	50.22	74	-23.78	Vertical
11027.980	6.23	38.49	37.88	43.77	50.61	74	-23.39	Horizontal
2678.135	3.14	32.96	40.06	47.94	43.98	74	-30.02	Horizontal
3728.625	3.93	33.49	40.84	50.71	47.29	74	-26.71	Horizontal
5311.469	4.88	34.72	41.52	45.72	43.80	74	-30.20	Horizontal
6921.301	5.47	35.89	40.12	46.67	47.91	74	-26.09	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			
2950.135	3.29	33.33	40.27	48.82	45.17	74	-28.83	Vertical			
3963.520	4.13	33.76	41.01	49.52	46.40	74	-27.60	Vertical			
5406.961	4.92	34.80	41.43	45.94	44.23	74	-29.77	Vertical			
7741.590	6.22	36.00	39.41	46.14	48.95	74	-25.05	Vertical			
10480.590	6.09	38.28	37.65	43.55	50.27	74	-23.73	Vertical			
11782.550	6.42	38.68	38.19	44.20	51.11	74	-22.89	Horizontal			
2789.463	3.20	33.10	40.14	48.35	44.51	74	-29.49	Horizontal			
3963.520	4.13	33.76	41.01	49.52	46.40	74	-27.60	Horizontal			
5532.263	4.96	34.96	41.32	45.66	44.26	74	-29.74	Horizontal			
7643.683	6.23	36.00	39.49	46.07	48.81	74	-25.19	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 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.
- 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.

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5.4 Band edge (Radiated Emission)

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)
	30MHz-88MHz	40.0
	88MHz-216MHz	43.5
	216MHz-960MHz	46.0
	960MHz-1GHz	54.0
	Above 1GHz	54.0
		74.0
		Peak Value
Test Setup:		

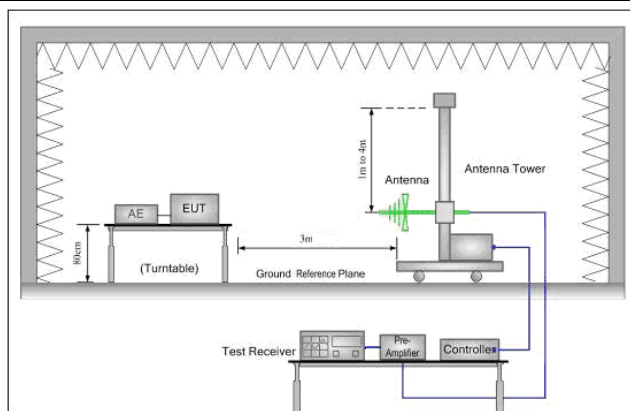


Figure 1. 30MHz to 1GHz

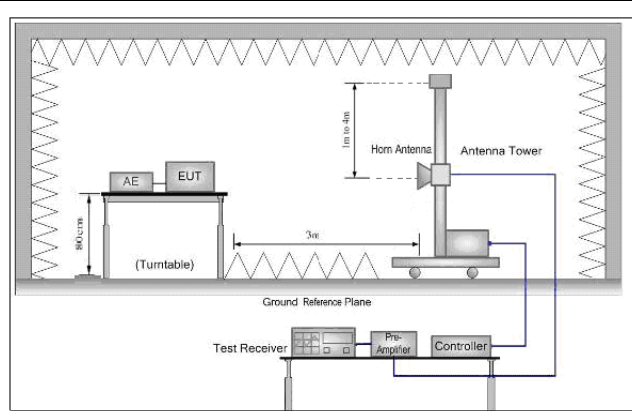


Figure 2. Above 1 GHz



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Test Procedure:	<ul style="list-style-type: none">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.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.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.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.e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.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 channelg. Test the EUT in the lowest channel , the Highest channelh. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.i. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 4.10 for details
Test Mode:	Transmitting mode
Test Results:	Pass

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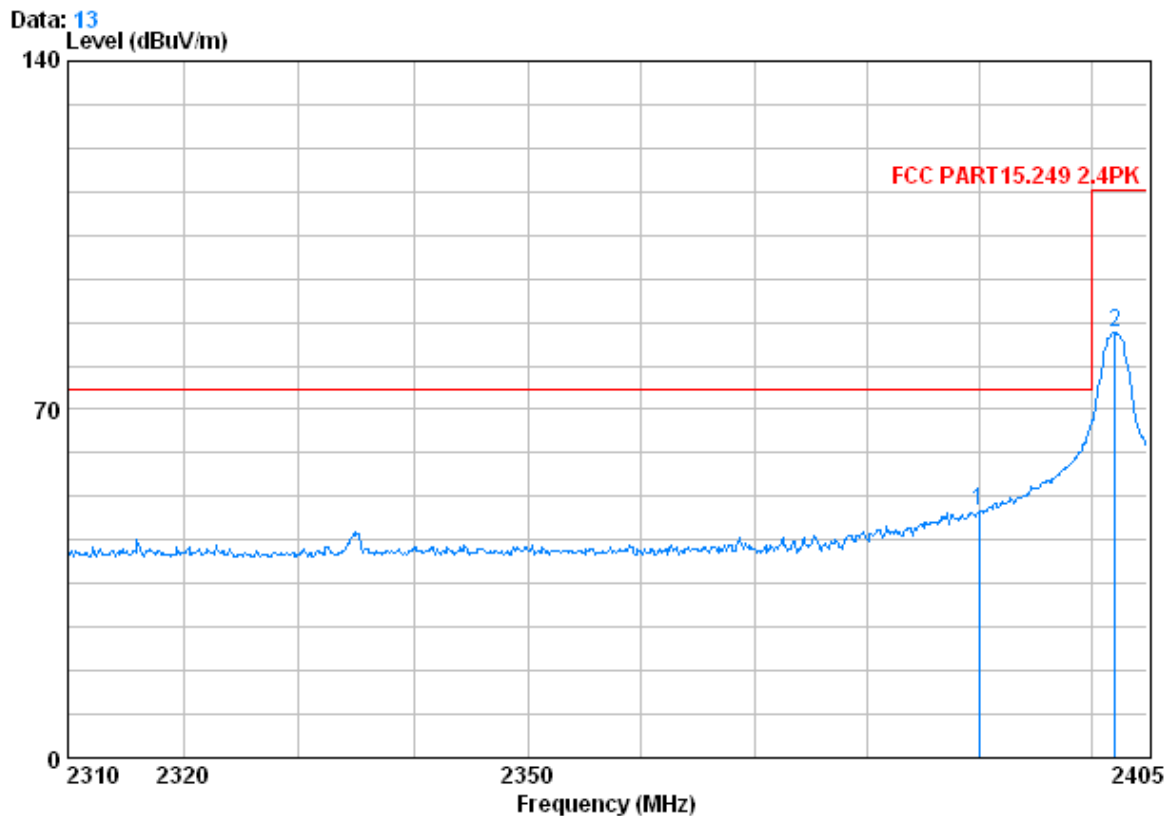


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Band edge test data (Radiated Emission)						
Test mode:	Transmitting	Test channel:	Lowest	Remark:	Peak	Vertical



Condition : FCC PART 15.249 2.4PK 3m VERTICAL
Job NO. : 4953RF
Mode : 2402 Bandedge

	Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	53.93	49.58	74.00	-24.42
2	2402.150	2.98	32.51	39.86	89.74	85.37	114.00	-28.63

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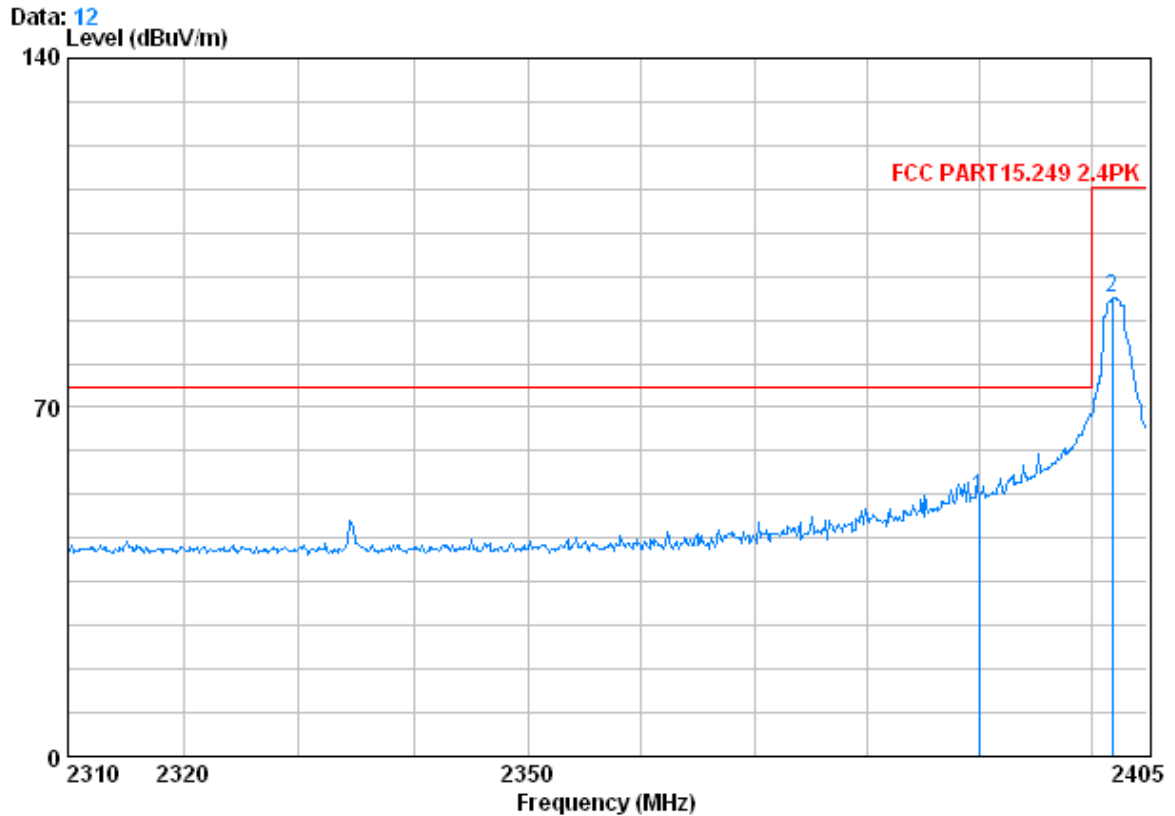


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Test mode:	Transmitting	Test channel:	Lowest	Remark:	Peak	Horizontal
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Condition : FCC PART15.249 2.4PK 3m HORIZONTAL

Job NO. : 4953RF

Mode : 2402 Bandedge

		Cable	Antenna	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	56.42	52.07	74.00	-21.93
2	2401.865	2.98	32.51	39.86	96.23	91.86	114.00	-22.14

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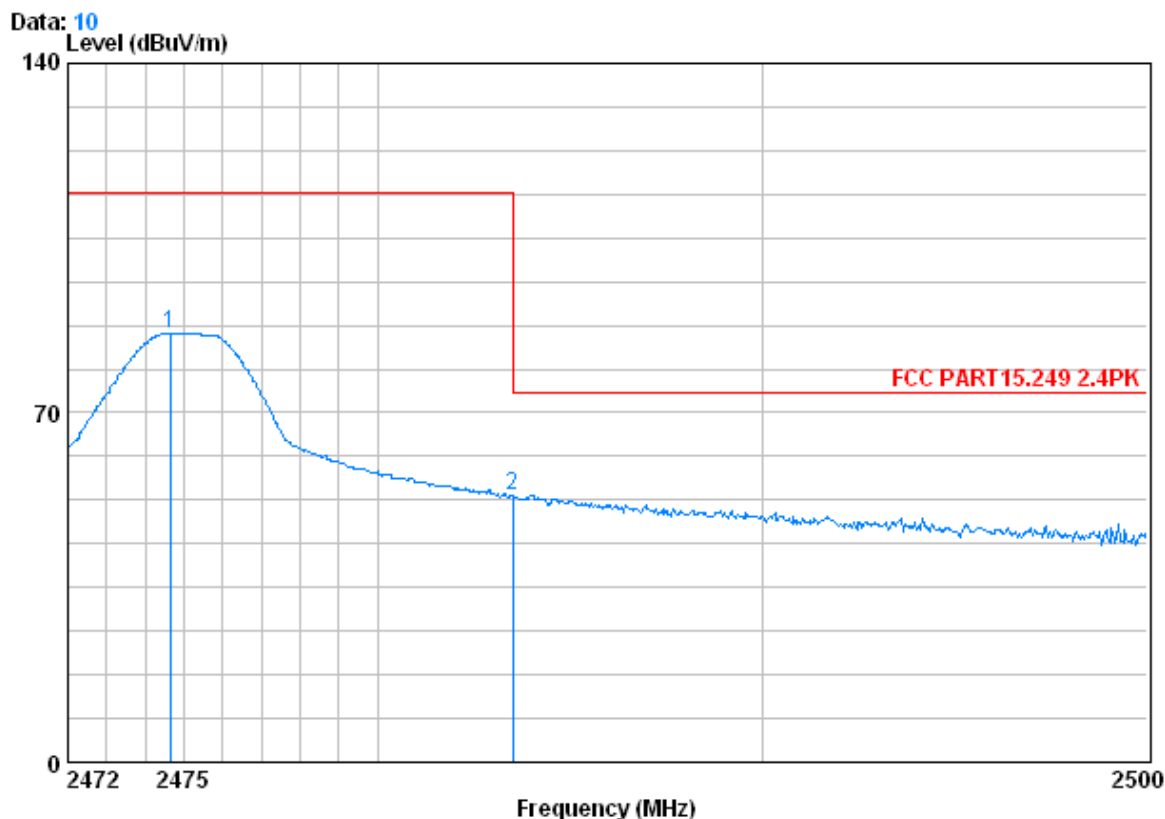


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Test mode:	Transmitting	Test channel:	Highest	Remark:	Peak	Vertical
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Condition : FCC PART15.249 2.4PK 3m VERTICAL

Job NO. : 4953RF

Mode : 2475 Bandedge

	Freq	Cable Loss	Antenna Factor	Preamplifier Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2474.632	3.02	32.67	39.92	90.13	85.90	114.00	-28.10
2	2483.500	3.03	32.67	39.92	57.47	53.25	74.00	-20.75

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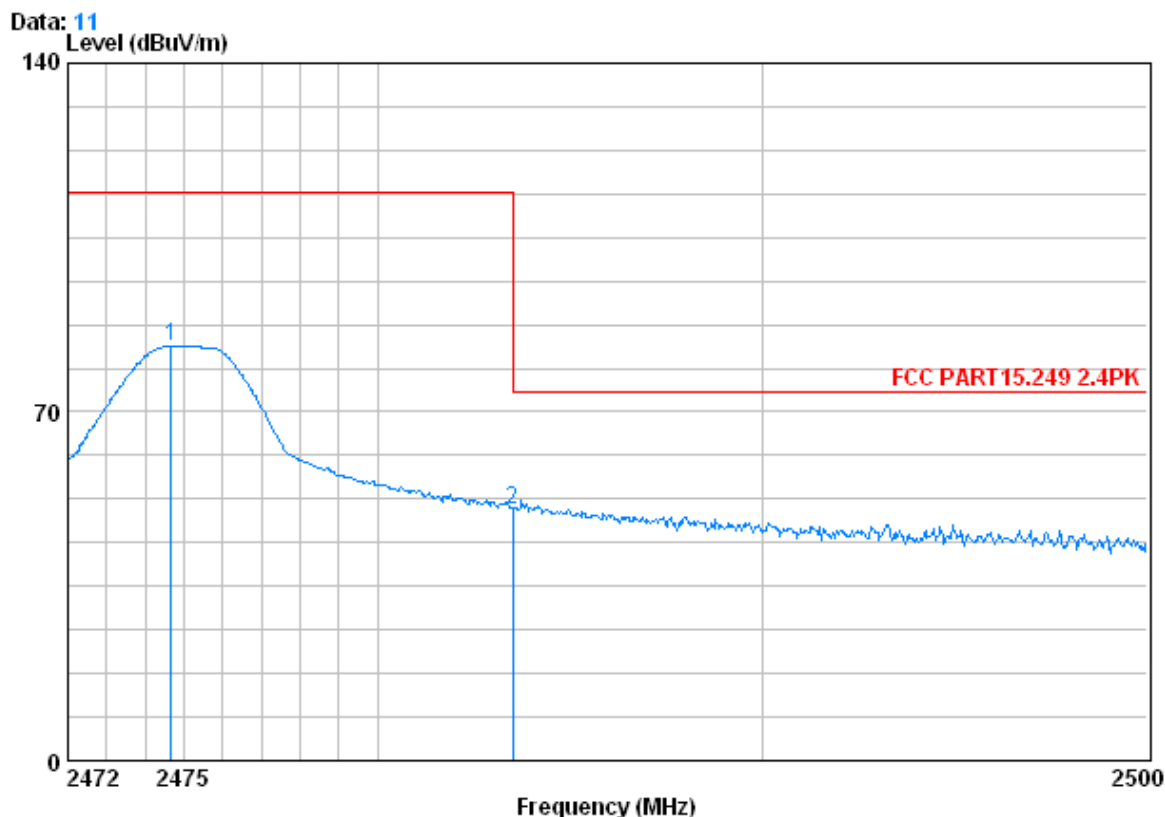


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Test mode:	Transmitting	Test channel:	Highest	Remark:	Peak	Horizontal
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Condition : FCC PART15.249 2.4PK 3m HORIZONTAL

Job NO. : 4953RF

Mode : 2475 Bandedge

	Freq	Cable	Antenna	Preamp	Read		Limit	Over
		Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2474.660	3.02	32.67	39.92	87.41	83.18	114.00	-30.82
2	2483.500	3.03	32.67	39.92	54.76	50.54	74.00	-23.46

Note:

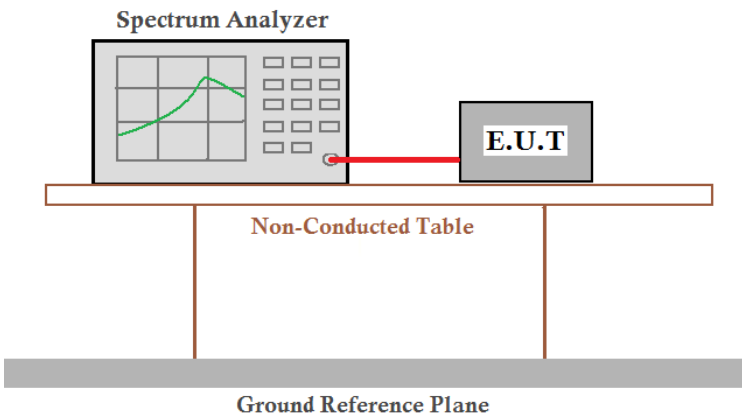
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

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

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.

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5.5 20dB Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10:2009
Test Setup:	
Instruments Used:	Refer to section 4.10 for details
Test Mode:	Transmitting mode
Limit:	N/A
Test Results:	Pass

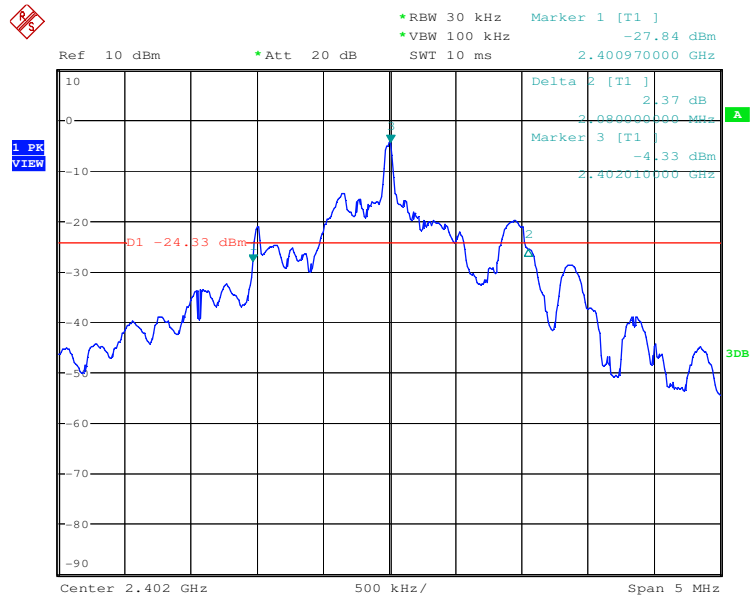
Measurement Data

Test channel	20dB bandwidth (MHz)	Results
Lowest	2.08	Pass
Middle	2.13	Pass
Highest	2.07	Pass

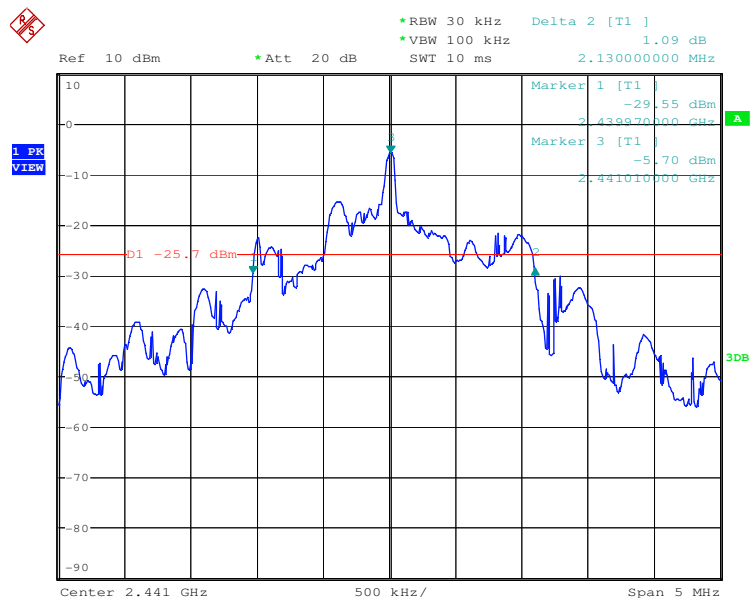


Test plot as follows:

Test channel:	Lowest
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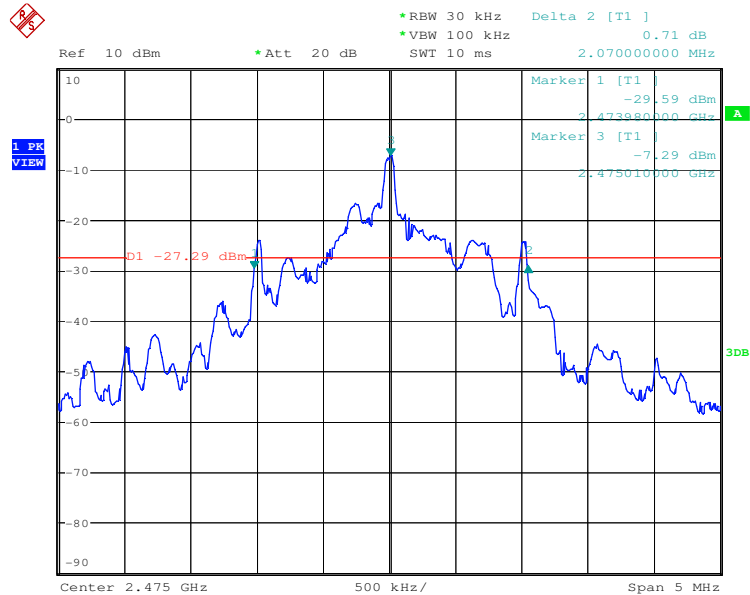
Test channel:	Middle
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Test channel: Highest



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