FCC TEST REPORT

Product	:	2.4G Baby Monitor
Trade mark	:	Simyke
Model/Type reference	:	2AT2MBMU0S-RX
Serial Number	:	N/A
Report Number	:	EED32L00198402
FCC ID	:	2AT2MBMU0S-RX
Date of Issue	:	Aug. 20, 2019
Test Standards	:	47 CFR Part 15 Subpart C
Test result	:	PASS

Prepared for:

Abellstar Technology Limited
F1 Building of Dongguan Tianan-Cyber Park Huangjin Road, No.1, Nancheng , Dongguan, Guangdong Province, China 523080

Prepared by:

Centre Testing International Group Co., Ltd.
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Tested By:	Jay Zheng	Compiled by:	Alex Wu
Reviewed by:	Ware Xin	Approved by:	Kevin Yang
Date:	Aug. 20, 2019	Check No.:	2447682979

CENTRE TESTING INTERNATIONAL GROUP CO.,LTD. Report Seal

2 Version

Version No.	Date	Description
00	Aug. 20, 2019	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
Field Strength of the Fundamental Signal	47 CFR Part 15 Subpart C Section 15.249 (a)	ANSI C63.10-2013	PASS
Spurious Emissions	47 CFR Part 15 Subpart C Section 15.249 (a)/15.209	ANSI C63.10-2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15 Subpart C Section 15.249(a)/15.205	ANSI C63.10-2013	PASS
20dB Occupied Bandwidth	47 CFR Part 15 Subpart C Section 15.215 (c)	ANSI C63.10-2013	PASS

Remark:
The tested samples and the sample information are provided by the client.
Test according to ANSI C63.4-2014 & ANSI C63.10-2013.

4 Contents

5 General Information

5.1 Client Information

Applicant:	Abellstar Technology Limited
Address of Applicant:	F1 Building of Dongguan Tianan-Cyber Park Huangjin Road, No.1, Nancheng , Dongguan, Guangdong Province, China 523080
Manufacturer:	DONGGUAN SOUTHSTAR ELECTRONICS LTD
Address of Manufacturer:	3 Chengtian Road, Mintian, Shatian Town, Dongguan, Guangdong Province, China
Factory:	DONGGUAN SOUTHSTAR ELECTRONICS LTD
Address of Factory:	3 Chengtian Road, Mintian, Shatian Town, Dongguan, Guangdong Province, China

5.2 General Description of EUT

Product Name:	2.4G Baby Monitor	
Model No.(EUT):	2AT2MBMU0S-RX	
Trade Mark:	Simyke	
EUT Supports Radios application:	2410.875MHz - 2471.625MHz	
Power Supply:	AC adapter	Model: DCS10-0501000F Input:100-240V~50/60Hz 0.3A Output: 5.0V ⎓ 1000mA
	Battery	Lithium Battery: 3.7V, 1200mAh

5.3 Product Specification subjective to this standard

Frequency Range:	2410.875MHz - 2471.625MHz
Modulation Type:	GFSK
Hardware Version:	N/A
Software Version:	N/A
Antenna Type:	Chip Antenna
Antenna Gain:	3.4dBi
Test voltage:	AC 120V,60Hz
Sample Received Date:	Jul. 24, 2019
Sample tested Date:	Jul. 24, 2019 to Aug. 19, 2019

5.4 Test Environment and Mode

Operating Environment:	
Temperature:	24°C
Humidity:	53% RH
Atmospheric Pressure:	1010mbar
Test mode:	
Transmitting mode:	Keep the EUT transmitted the continuous modulation test signal at the specific channel(s)

5.5 Description of Support Units

The EUT has been tested independently

5.6 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.
Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, Guangdong, China
Telephone: +86 (0) 755 3368 3668 Fax:+86 (0) 755 3368 3385
No tests were sub-contracted.

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

5.10 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.31dB (30MHz-1GHz)
		0.57dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-12.75GHz)
4	Conduction emission	3.6dB (9kHz to 150kHz)
		3.2dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	2.8%
7	DC power voltages	0.025%

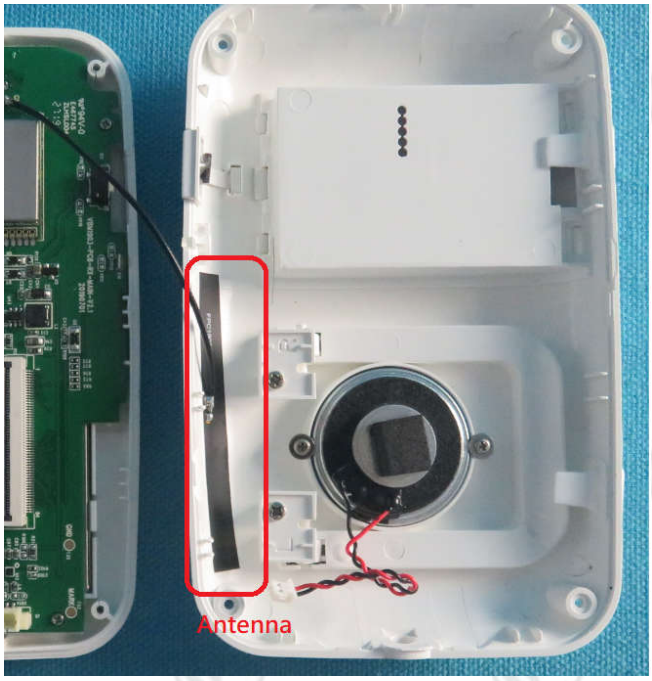
6 Equipment List

Conducted disturbance Test					
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Receiver	R&S	ESCI	100435	05-20-2019	05-18-2020
Temperature/ Humidity Indicator	Defu	TH128	/	06-14-2019	06-12-2020
Communication test set	Agilent	E5515C	GB47050 534	03-01-2019	02-28-2020
Communication test set	R&S	CMW500	102898	01-18-2019	01-17-2020
LISN	R&S	ENV216	100098	05-08-2019	05-06-2020
LISN	schwarzbeck	NNLK8121	8121-529	05-08-2019	05-06-2020
Voltage Probe	R&S	ESH2-Z3 0299.7810.5 6	100042	06-13-2017	06-11-2020
Current Probe	R&S	EZ-17 816.2063.03	100106	05-20-2019	05-18-2020
ISN	TESEQ	ISN T800	30297	01-06-2019	01-15-2020
Barometer	changchun	DYM3	1188	06-20-2019	06-18-2020

3M Semi/full-anechoic Chamber					
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05-24-2019	05-22-2020
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-401	12-21-2018	12-20-2019
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	07-26-2019	07-24-2020
Microwave Preamplifier	Agilent	8449B	3008A02425	07-12-2019	07-10-2020
Microwave Preamplifier	Tonscend	EMC051845SE	980380	01-16-2019	01-15-2020
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1869	04-25-2018	04-23-2021
Horn Antenna	ETS-LINDGREN	3117	00057410	06-05-2018	06-03-2021
Double ridge horn antenna	A.H.SYSTEMS	SAS-574	374	06-05-2018	06-04-2021
Pre-amplifier	A.H.SYSTEMS	PAP-1840-60	6041.6042	07-26-2019	07-24-2020
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-25-2018	04-25-2021
Spectrum Analyzer	R&S	FSP40	100416	04-28-2019	04-26-2020
Receiver	R&S	ESCI	100435	05-20-2019	05-18-2020
Receiver	R&S	ESCI7	100938-003	11-23-2018	11-22-2019
Multi device Controller	maturo	NCD/070/10711112	---	01-09-2019	01-08-2020
Signal Generator	Agilent	E4438C	MY45095744	03-01-2019	02-28-2020
Signal Generator	Keysight	E8257D	MY53401106	03-01-2019	02-28-2020
Temperature/ Humidity Indicator	Shanghai qixiang	HM10	1804298	10-12-2018	10-11-2019
Communication test set	Agilent	E5515C	GB47050534	03-01-2019	02-28-2020
Cable line	Fulai(7M)	SF106	5219/6A	01-09-2019	01-08-2020
Cable line	Fulai(6M)	SF106	5220/6A	01-09-2019	01-08-2020
Cable line	Fulai(3M)	SF106	5216/6A	01-09-2019	01-08-2020
Cable line	Fulai(3M)	SF106	5217/6A	01-09-2019	01-08-2020
High-pass filter	Sinoscite	FL3CX03WG18NM12-0398-002	---	01-09-2019	01-08-2020
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-09-2019	01-08-2020
band rejection filter	Sinoscite	FL5CX01CA09CL12-0395-001	---	01-09-2019	01-08-2020
band rejection filter	Sinoscite	FL5CX01CA08CL12-0393-001	---	01-09-2019	01-08-2020
band rejection filter	Sinoscite	FL5CX02CA04CL12-0396-002	---	01-09-2019	01-08-2020
band rejection filter	Sinoscite	FL5CX02CA03CL12-0394-001	---	01-09-2019	01-08-2020

7 Test results and Measurement Data

7.1 Antenna Requirement

Standard requirement:	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.	
EUT Antenna:	
The antenna is External antenna and no consideration of replacement. The best case gain of the antenna is 3.4dBi.	

7.2 AC Power Line Conducted Emission

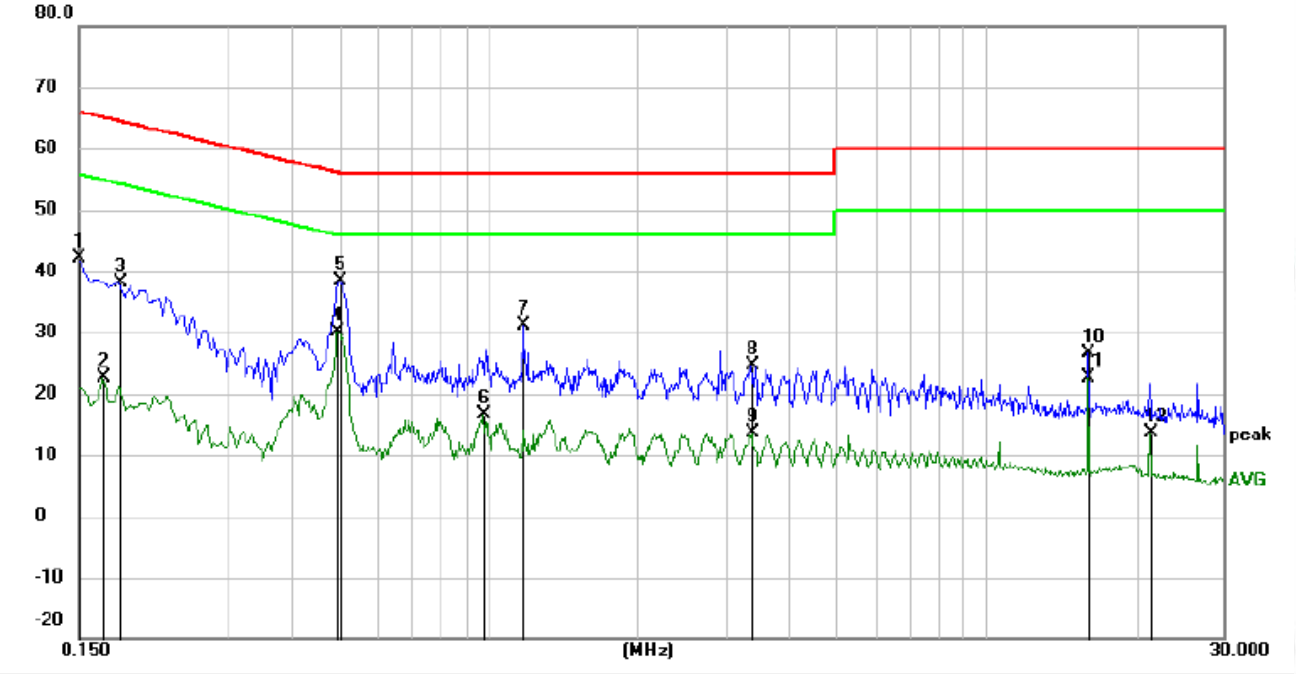
Test Procedure:	Test frequency range :150KHz-30MHz 1)The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all 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 on conducted measurement.
Limit:	

Frequency range (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.
NOTE : The lower limit is applicable at the transition frequency

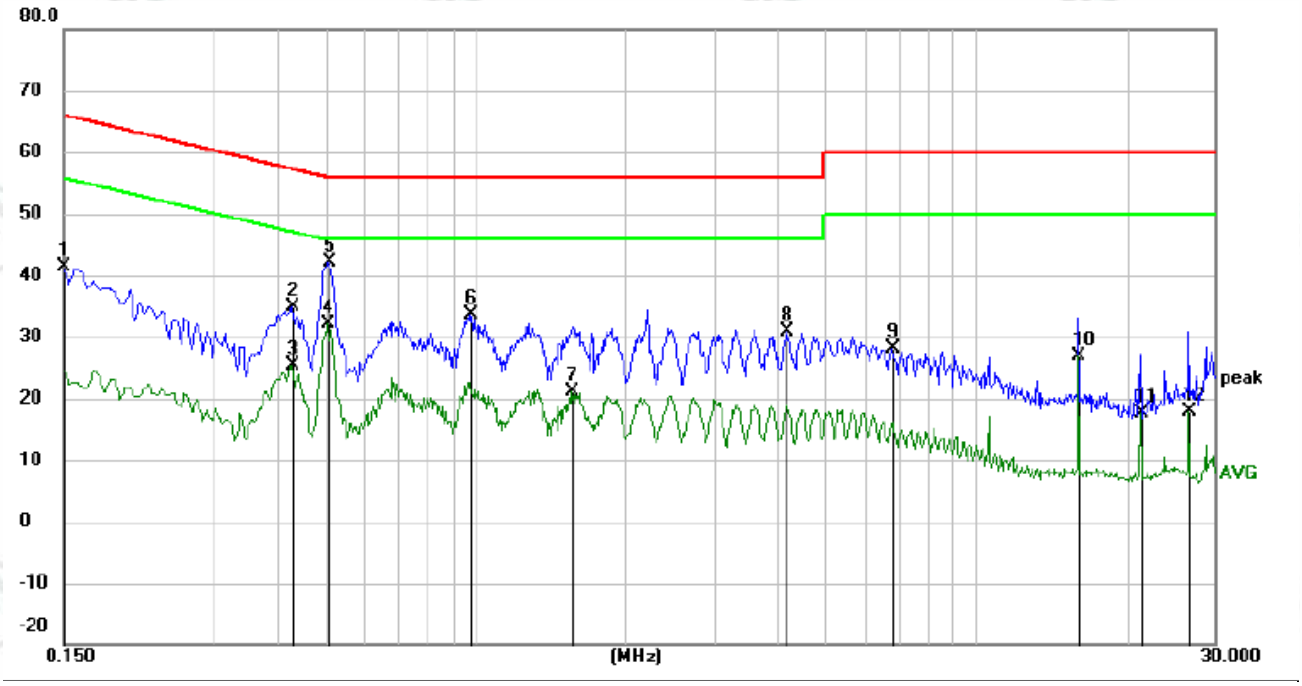
Measurement Data
An initial pre-scan was performed on the live and neutral lines with peak detector.
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live line:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	32.22	9.91	42.13	66.00	-23.87	QP	
2		0.1680	12.77	9.91	22.68	55.06	-32.38	AVG	
3		0.1815	28.31	9.91	38.22	64.42	-26.20	QP	
4	*	0.4965	20.26	9.89	30.15	46.06	-15.91	AVG	
5		0.5010	28.56	9.89	38.45	56.00	-17.55	QP	
6		0.9780	6.75	9.81	16.56	46.00	-29.44	AVG	
7		1.1760	21.45	9.79	31.24	56.00	-24.76	QP	
8		3.3810	14.91	9.72	24.63	56.00	-31.37	QP	
9		3.3855	3.91	9.72	13.63	46.00	-32.37	AVG	
10		15.9990	16.57	9.97	26.54	60.00	-33.46	QP	
11		15.9990	12.65	9.97	22.62	50.00	-27.38	AVG	
12		21.3270	3.73	9.92	13.65	50.00	-36.35	AVG	

Neutral line:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	31.51	9.91	41.42	66.00	-24.58	QP	
2		0.4290	24.92	9.89	34.81	57.27	-22.46	QP	
3		0.4290	15.49	9.89	25.38	47.27	-21.89	AVG	
4		0.5055	22.12	9.90	32.02	46.00	-13.98	AVG	
5	*	0.5100	32.26	9.91	42.17	56.00	-13.83	QP	
6		0.9780	23.81	9.81	33.62	56.00	-22.38	QP	
7		1.5585	11.35	9.76	21.11	46.00	-24.89	AVG	
8		4.1955	21.13	9.73	30.86	56.00	-25.14	QP	
9		6.7830	18.48	9.74	28.22	60.00	-31.78	QP	
10		15.9990	16.95	9.97	26.92	50.00	-23.08	AVG	
11		21.3270	7.76	9.92	17.68	50.00	-32.32	AVG	
12		26.6685	7.86	9.94	17.80	50.00	-32.20	AVG	

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

7.3 Radiated Spurious Emission

Test Requirement: 47 CFR Part 15C Section 15.249 and 15.209

Test Method: ANSI C63.10

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	120kHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Setup:

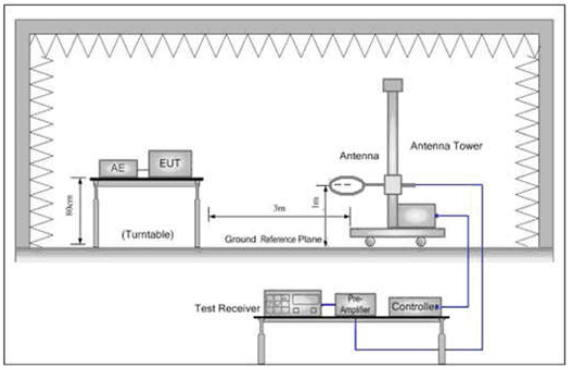


Figure 1. Below 30MHz

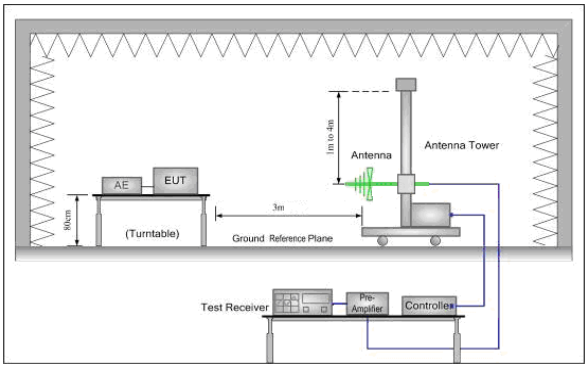


Figure 2. 30MHz to 1GHz

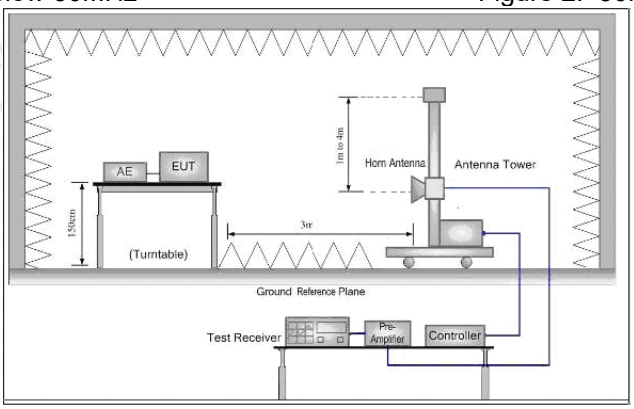


Figure 3. Above 1GHz

Test Procedure:

Below 1GHz test procedure as below:

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. 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 rota table 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.

Above 1GHz test procedure as below:

Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter).

Test the EUT in the lowest channel , the Highest channel

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.

Repeat above procedures until all frequencies measured was complete.

Limit: (Spurious Emissions)

Frequency	Field strength (microvolt/meter)	Limit (dBμV/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 (dBμV/m @3m)	Remark
2400MHz-2483.5MHz	94.0	Average Value
	114.0	Peak Value

Test Mode: Transmitting mode

Instruments Used: Refer to section 6 for details

Test Results: Pass

Measurement Data

Field Strength Of The Fundamental Signal

Peak value:

Frequency (MHz)	Antenna Factor (dB/m)	Preamp Gain (dB)	Cable Loss (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
2410	32.28	-42.43	13.35	65.76	68.96	114.00	45.04	Pass	H
2410	32.38	-42.43	13.35	65.80	68.99	114.00	45.01	Pass	V
2441	32.32	-42.41	13.49	65.70	69.10	114.00	44.90	Pass	H
2441	32.32	-42.41	13.49	66.30	69.70	114.00	44.30	Pass	V
2471	32.36	-42.41	13.43	66.19	69.58	114.00	44.42	Pass	H
2471	32.36	-42.41	13.43	64.67	68.06	114.00	45.94	Pass	V

Remark: As shown in this section, for field strength of the fundamental signal measurements, 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. So only the peak measurements were shown in the report.

Spurious Emissions

Below 1GHz

Mode:		RX			Channel:		2410.875		Remark: Peak	
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	63.9534	10.57	0.92	-32.05	48.91	28.35	40.00	11.65	Pass	H
2	74.6245	8.12	1.01	-32.06	52.26	29.33	40.00	10.67	Pass	H
3	138.6509	7.27	1.38	-31.99	53.94	30.60	43.50	12.90	Pass	H
4	208.0128	11.11	1.71	-31.95	48.66	29.53	43.50	13.97	Pass	H
5	600.0290	19.00	2.96	-31.99	39.70	29.67	46.00	16.33	Pass	H
6	974.9715	22.55	3.75	-30.95	38.96	34.31	54.00	19.69	Pass	H
7	69.2889	9.18	0.95	-32.05	49.97	28.05	40.00	11.95	Pass	V
8	74.6245	8.12	1.01	-32.06	56.18	33.25	40.00	6.75	Pass	V
9	79.9600	7.11	1.04	-32.07	56.06	32.14	40.00	7.86	Pass	V
10	208.8859	11.13	1.71	-31.94	49.84	30.74	43.50	12.76	Pass	V
11	600.0290	19.00	2.96	-31.99	40.21	30.18	46.00	15.82	Pass	V
12	974.9715	22.55	3.75	-30.95	38.49	33.84	54.00	20.16	Pass	V

Mode:		RX			Channel:		2441.250		Remark: Peak	
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	63.9534	10.57	0.92	-32.05	48.57	28.01	40.00	11.99	Pass	H
2	74.6245	8.12	1.01	-32.06	52.19	29.26	40.00	10.74	Pass	H
3	138.6509	7.27	1.38	-31.99	55.00	31.66	43.50	11.84	Pass	H
4	208.0128	11.11	1.71	-31.95	48.46	29.33	43.50	14.17	Pass	H
5	600.0290	19.00	2.96	-31.99	40.03	30.00	46.00	16.00	Pass	H
6	974.9715	22.55	3.75	-30.95	38.41	33.76	54.00	20.24	Pass	H
7	74.6245	8.12	1.01	-32.06	55.22	32.29	40.00	7.71	Pass	V
8	79.9600	7.11	1.04	-32.07	56.38	32.46	40.00	7.54	Pass	V
9	85.2955	8.32	1.06	-32.08	49.40	26.70	40.00	13.30	Pass	V
10	208.8859	11.13	1.71	-31.94	49.88	30.78	43.50	12.72	Pass	V
11	649.9890	19.40	3.10	-32.07	39.11	29.54	46.00	16.46	Pass	V
12	974.9715	22.55	3.75	-30.95	40.27	35.62	54.00	18.38	Pass	V

Mode:		RX			Channel:		2471.625		Remark: Peak	
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Preamp gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	36.6937	11.24	0.67	-32.11	41.86	21.66	40.00	18.34	Pass	H
2	156.0156	7.76	1.46	-31.99	41.53	18.76	43.50	24.74	Pass	H
3	325.0065	13.75	2.14	-31.79	41.48	25.58	46.00	20.42	Pass	H
4	455.9696	16.30	2.54	-31.86	41.39	28.37	46.00	17.63	Pass	H
5	575.9706	18.52	2.87	-31.99	41.77	31.17	46.00	14.83	Pass	H
6	892.9983	22.02	3.59	-31.62	35.07	29.06	46.00	16.94	Pass	H
7	36.6937	11.24	0.67	-32.11	40.98	20.78	40.00	19.22	Pass	V
8	54.7375	12.44	0.84	-32.08	38.15	19.35	40.00	20.65	Pass	V
9	208.8859	11.13	1.71	-31.94	49.24	30.14	43.50	13.36	Pass	V
10	325.0065	13.75	2.14	-31.79	41.31	25.41	46.00	20.59	Pass	V
11	575.9706	18.52	2.87	-31.99	40.63	30.03	46.00	15.97	Pass	V
12	891.8342	22.00	3.58	-31.61	35.05	29.02	46.00	16.98	Pass	V

Above 1GHz

Mode:		RX			Channel:		2410.875		Remark: Peak	
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	2590.9591	32.55	4.10	-42.35	53.42	47.72	74.00	26.28	Pass	H
2	3215.0143	33.29	4.59	-42.00	55.48	51.36	74.00	22.64	Pass	H
3	4823.1215	34.50	4.60	-40.64	49.33	47.79	74.00	26.21	Pass	H
4	8155.3437	36.46	6.41	-40.86	46.52	48.53	74.00	25.47	Pass	H
5	12232.6155	39.44	7.70	-41.16	45.68	51.66	74.00	22.34	Pass	H
6	14370.7581	40.07	8.65	-42.01	46.21	52.92	74.00	21.08	Pass	H
7	1607.2607	29.11	3.08	-42.88	52.99	42.30	74.00	31.70	Pass	V
8	2995.7996	33.19	4.54	-42.12	51.12	46.73	74.00	27.27	Pass	V
9	4823.1215	34.50	4.60	-40.64	53.72	52.18	74.00	21.82	Pass	V
10	8411.3608	36.56	6.35	-40.64	46.17	48.44	74.00	25.56	Pass	V
11	9140.4094	37.67	6.45	-40.73	46.09	49.48	74.00	24.52	Pass	V
12	11762.5842	39.11	7.47	-41.29	45.88	51.17	74.00	22.83	Pass	V

Mode:		RX			Channel:		2441.250		Remark: Peak	
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	1998.6999	31.69	3.47	-42.61	51.28	43.83	74.00	30.17	Pass	H
2	2746.1746	32.79	4.15	-42.26	54.75	49.43	74.00	24.57	Pass	H
3	3255.0170	33.30	4.46	-41.96	55.28	51.08	74.00	22.92	Pass	H
4	4881.1254	34.50	4.80	-40.59	50.02	48.73	74.00	25.27	Pass	H
5	8258.3506	36.50	6.19	-40.77	47.61	49.53	74.00	24.47	Pass	H
6	9768.4512	37.71	6.69	-40.61	46.12	49.91	74.00	24.09	Pass	H
7	1965.4966	31.47	3.44	-42.63	50.63	42.91	74.00	31.09	Pass	V
8	2989.3989	33.18	4.52	-42.12	50.77	46.35	74.00	27.65	Pass	V
9	4881.1254	34.50	4.80	-40.59	55.04	53.75	74.00	20.25	Pass	V
10	8168.3446	36.47	6.40	-40.86	46.70	48.71	74.00	25.29	Pass	V
11	9767.4512	37.71	6.70	-40.62	45.02	48.81	74.00	25.19	Pass	V
12	11764.5843	39.11	7.47	-41.29	46.09	51.38	74.00	22.62	Pass	V

Mode:		RX			Channel:		2471.625		Remark: Peak	
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	2781.5782	32.85	4.21	-42.24	54.20	49.02	74.00	24.98	Pass	H
2	3296.0197	33.32	4.57	-41.94	55.24	51.19	74.00	22.81	Pass	H
3	4942.1295	34.50	4.83	-40.55	53.01	51.79	74.00	22.21	Pass	H
4	7413.2942	36.51	5.85	-40.84	47.42	48.94	74.00	25.06	Pass	H
5	9889.4593	37.76	6.78	-40.51	47.69	51.72	74.00	22.28	Pass	H
6	11858.5906	39.19	7.41	-41.26	46.12	51.46	74.00	22.54	Pass	H
7	1647.4647	29.37	3.14	-42.79	53.56	43.28	74.00	30.72	Pass	V
8	3352.0235	33.34	4.52	-41.91	49.61	45.56	74.00	28.44	Pass	V
9	4942.1295	34.50	4.83	-40.55	57.13	55.91	74.00	18.09	Pass	V
10	8024.3350	36.41	6.07	-40.97	46.97	48.48	74.00	25.52	Pass	V
11	9884.4590	37.75	6.78	-40.50	46.18	50.21	74.00	23.79	Pass	V
12	12309.6206	39.49	7.71	-41.14	45.27	51.33	74.00	22.67	Pass	V

Mode:		RX			Channel:		2471.625		Remark: AV	
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
13	4943.9495	34.50	4.83	-40.55	45.99	44.77	54.00	9.23	Pass	V

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 - Correct Factor
   Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor
   Scan from the test data, The average value is lower than limit, and The below the limit need not be reported, so only the peak value had been displayed.

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.

7.4 Emissions Out of Band-edge

Test Requirement: 47 CFR Part 15C Section 15.209 and 15.205
Test Method: ANSI C63.10
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 (dBμV/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:

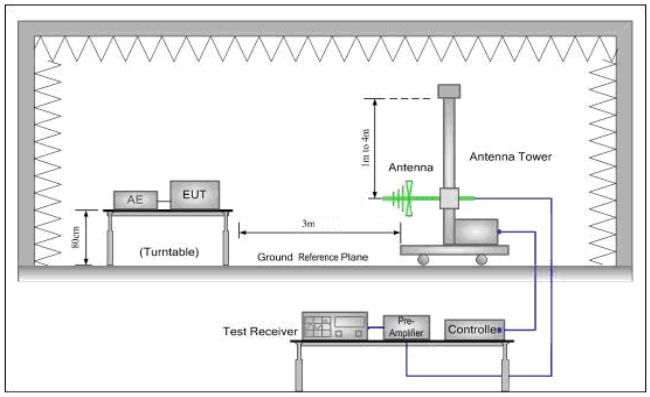


Figure 1. 30MHz to 1GHz

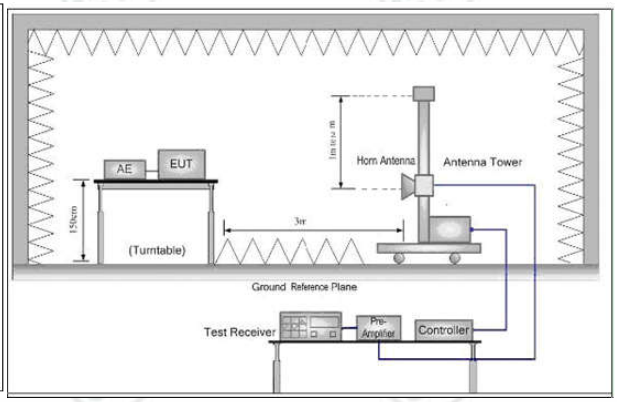


Figure 2. Above 1 GHz

Test Procedure:

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. 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 (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.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. 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.

Above 1GHz test procedure as below:

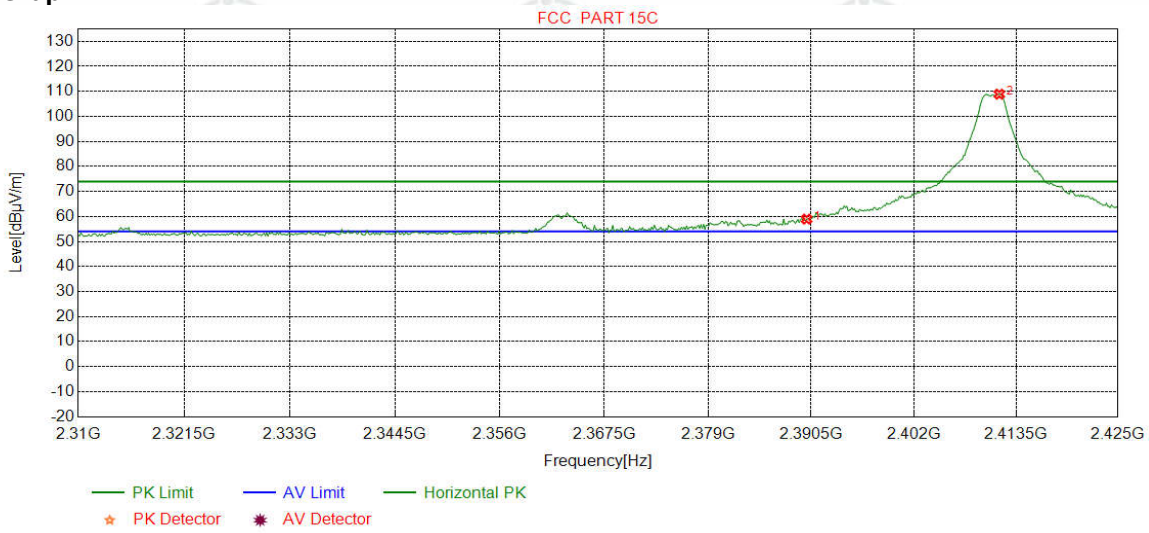
g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
h. Test the EUT in the lowest channel , the Highest channel
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
j. Repeat above procedures until all frequencies measured was complete.

Instruments Used: Refer to section 6 for details
Test Mode: Transmitting mode
Test Results: Pass

Test plot as follows:

Mode:	TX	Channel:	2410.875
Remark:	PK		

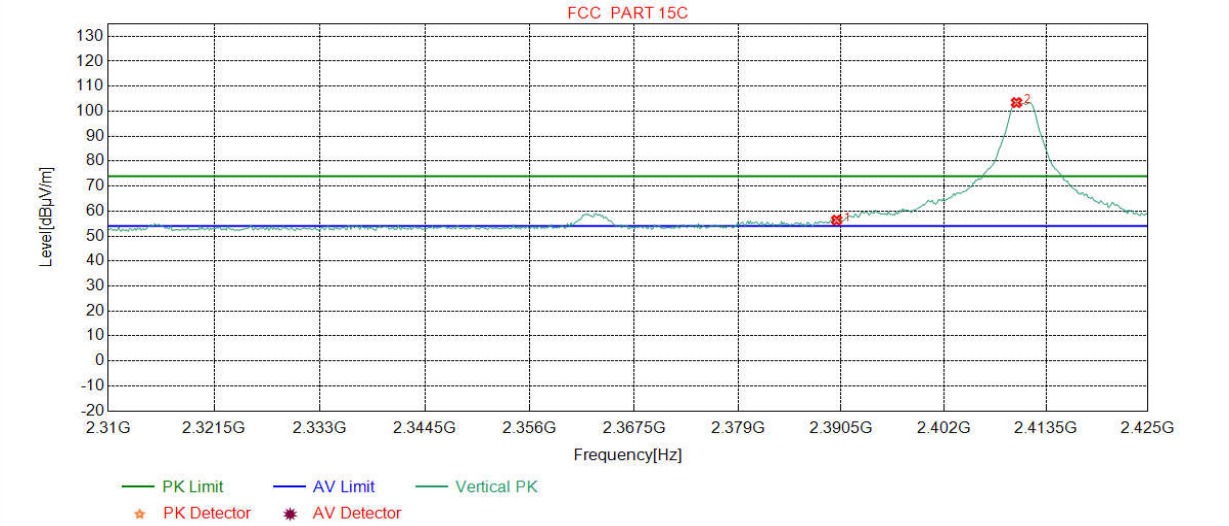
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	2390.0000	32.25	13.37	-42.44	55.77	58.95	74.00	15.05	Pass	Horizontal
2	2411.6145	32.28	13.35	-42.43	105.70	108.90	74.00	-34.90	Pass	Horizontal

Mode:	TX	Channel:	2410.875
Remark:	PK		

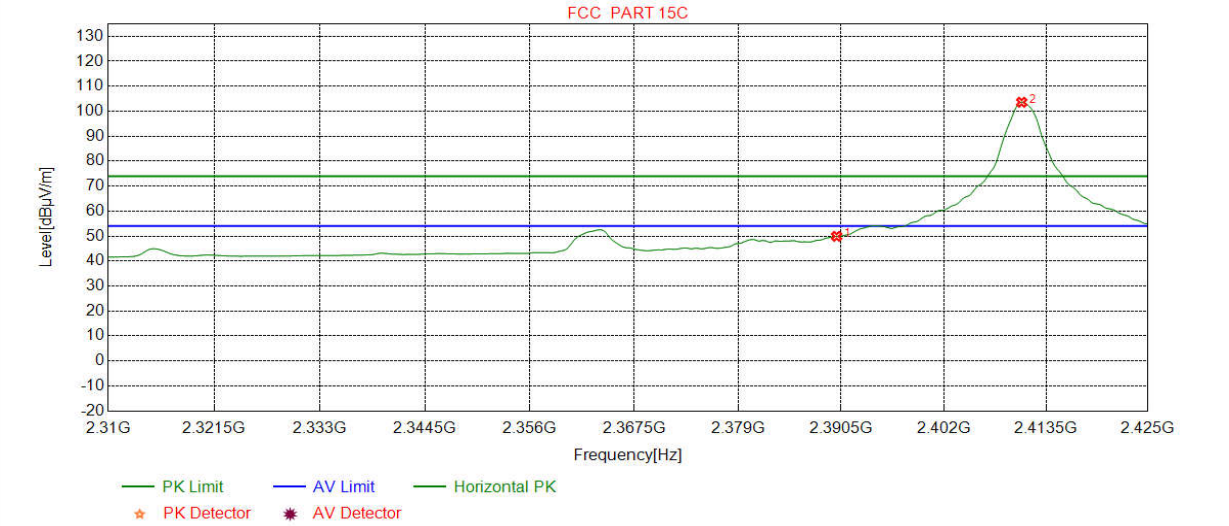
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Preamp gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	2390.0000	32.25	13.37	-42.44	53.18	56.36	74.00	17.64	Pass	Vertical
2	2410.1752	32.27	13.35	-42.43	100.26	103.45	74.00	-29.45	Pass	Vertical

Mode:	TX	Channel:	2410.875
Remark:	AV		

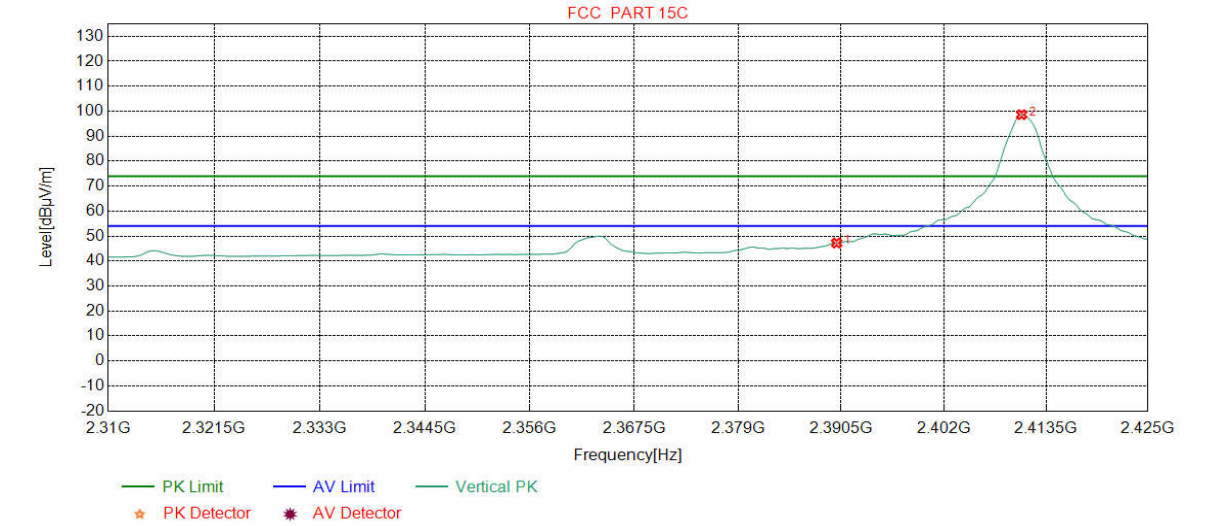
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	2390.0000	32.25	13.37	-42.44	46.71	49.89	54.00	4.11	Pass	Horizontal
2	2410.7509	32.28	13.35	-42.43	100.39	103.59	54.00	-49.59	Pass	Horizontal

Mode:	TX	Channel:	2410.875
Remark:	AV		

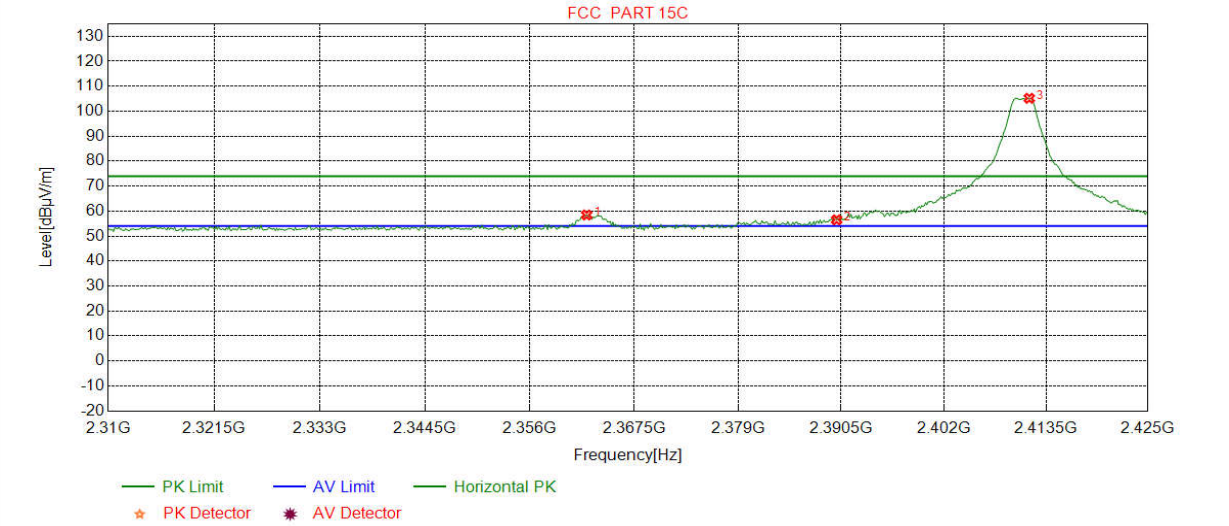
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	2390.0000	32.25	13.37	-42.44	44.05	47.23	54.00	6.77	Pass	Vertical
2	2410.7509	32.28	13.35	-42.43	95.41	98.61	54.00	-44.61	Pass	Vertical

Mode:	TX	Channel:	2410.875
Remark:	PK		

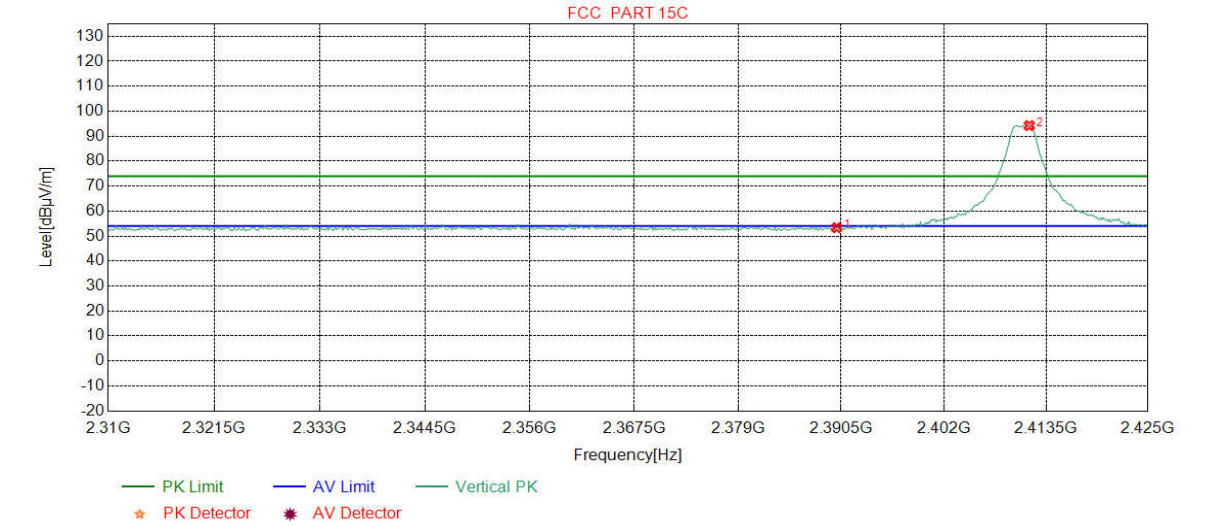
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	2362.2466	32.21	13.58	-42.45	55.11	58.45	74.00	15.55	Pass	Horizontal
2	2390.0000	32.25	13.37	-42.44	53.31	56.49	74.00	17.51	Pass	Horizontal
3	2411.6145	32.28	13.35	-42.43	101.97	105.17	74.00	-31.17	Pass	Horizontal

Mode:	TX	Channel:	2410.875
Remark:	PK		

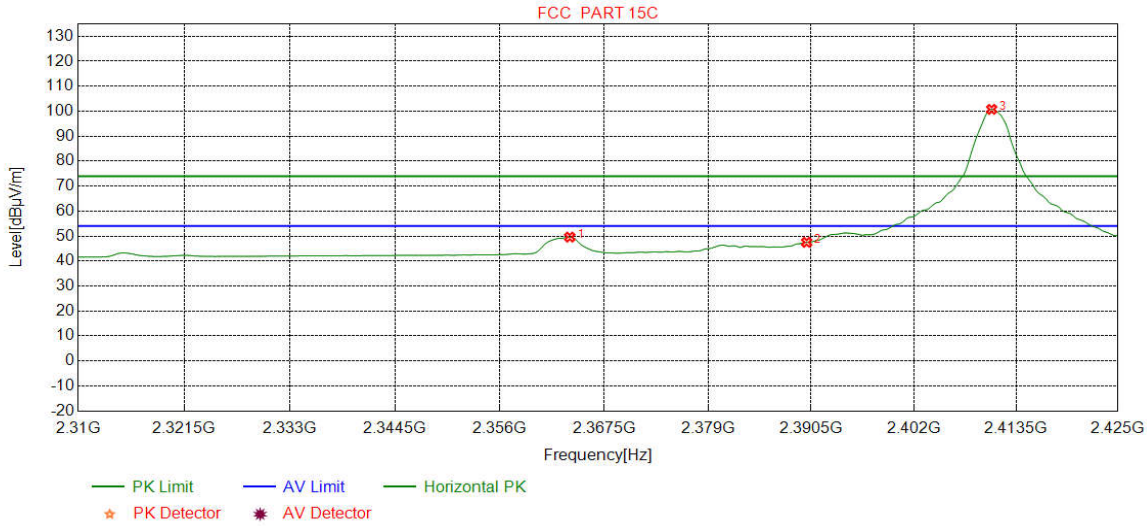
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Preamp gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	2390.0000	32.25	13.37	-42.44	50.16	53.34	74.00	20.66	Pass	Vertical
2	2411.6145	32.28	13.35	-42.43	91.04	94.24	74.00	-20.24	Pass	Vertical

Mode:	TX	Channel:	2410.875
Remark:	AV		

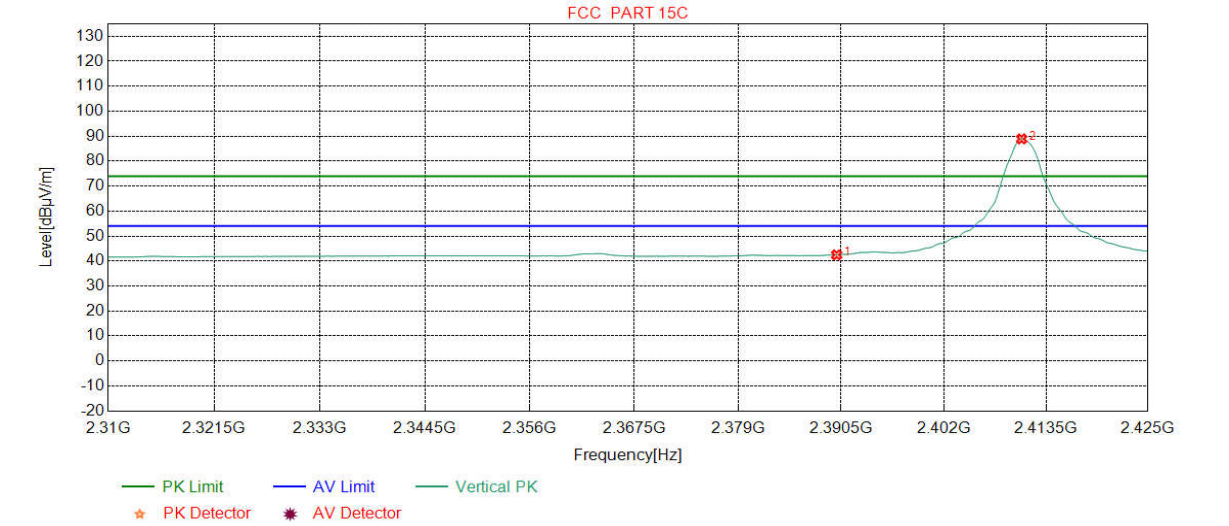
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	2363.6859	32.21	13.57	-42.45	46.24	49.57	54.00	4.43	Pass	Horizontal
2	2390.0000	32.25	13.37	-42.44	44.32	47.50	54.00	6.50	Pass	Horizontal
3	2410.7509	32.28	13.35	-42.43	97.54	100.74	54.00	-46.74	Pass	Horizontal

Mode:	TX	Channel:	2410.875
Remark:	AV		

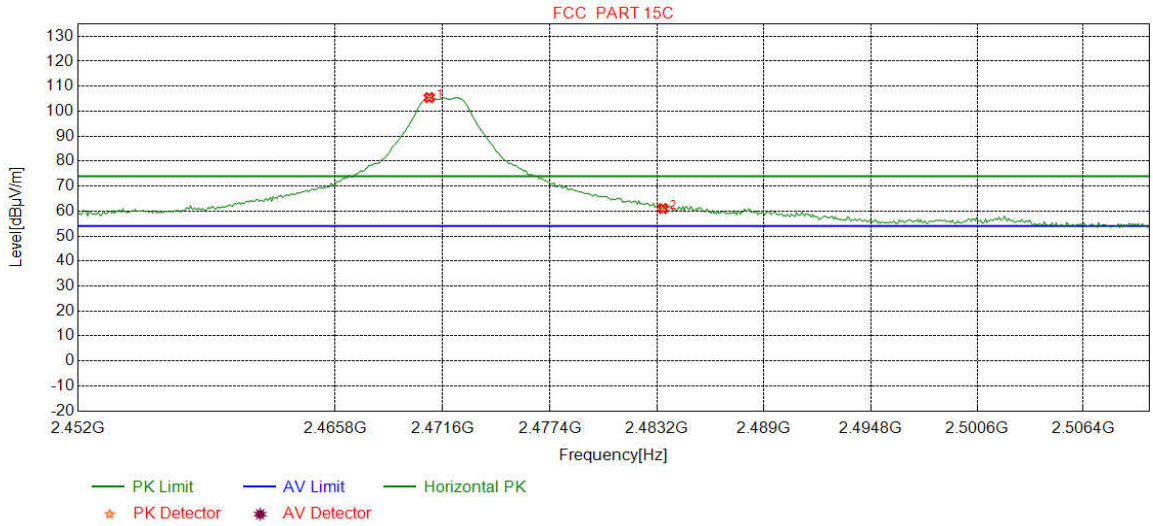
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	2390.0000	32.25	13.37	-42.44	39.30	42.48	54.00	11.52	Pass	Vertical
2	2410.7509	32.28	13.35	-42.43	85.71	88.91	54.00	-34.91	Pass	Vertical

Mode:	TX	Channel:	2471.625
Remark:	PK		

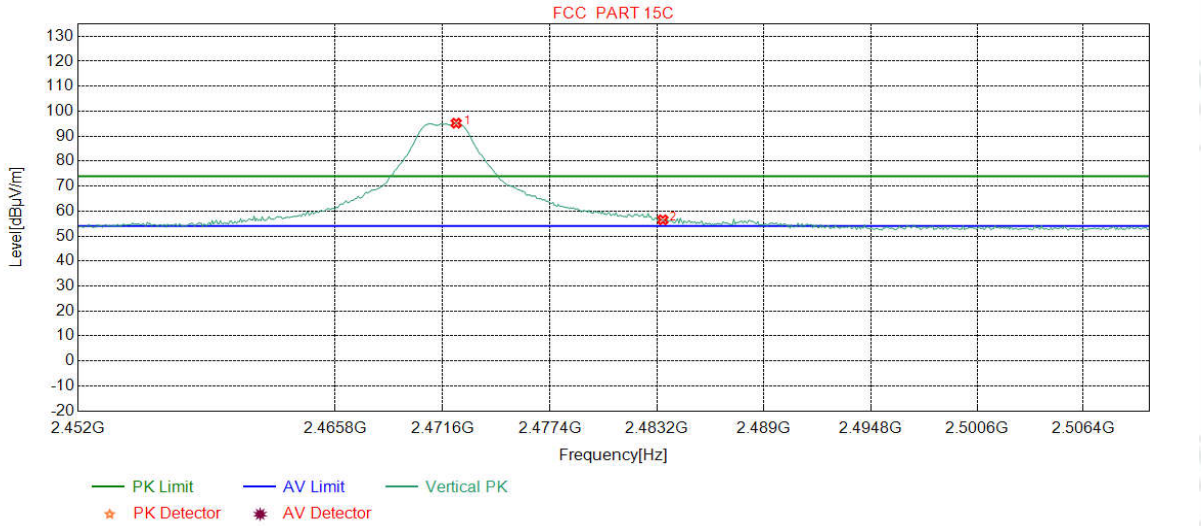
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Preamp gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	2470.8736	32.36	13.43	-42.40	102.05	105.44	74.00	-31.44	Pass	Horizontal
2	2483.5000	32.38	13.38	-42.40	57.69	61.05	74.00	12.95	Pass	Horizontal

Mode:	TX	Channel:	2471.625
Remark:	PK		

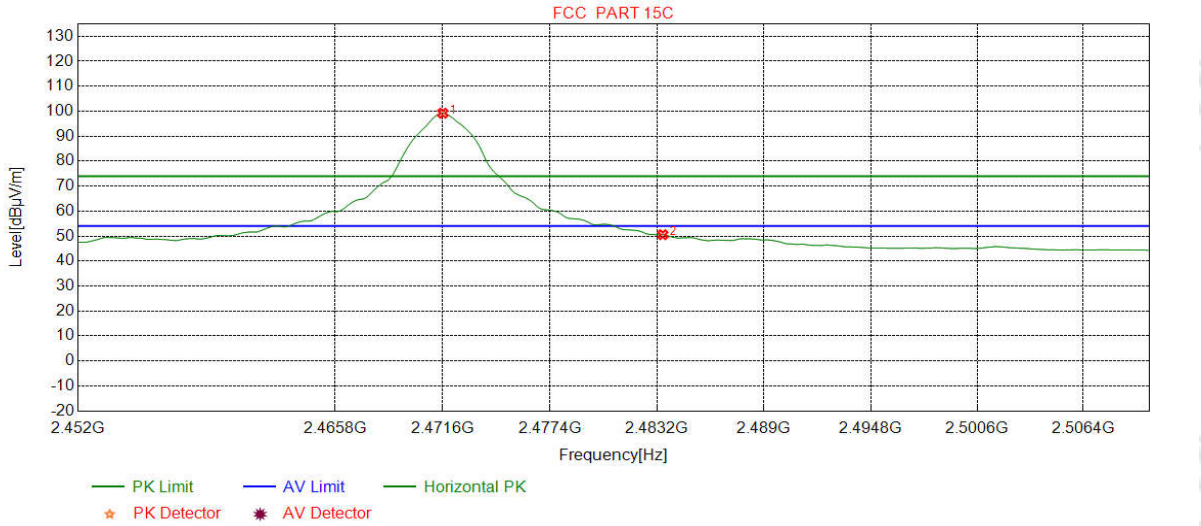
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Preamp gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	2472.3254	32.36	13.43	-42.40	91.82	95.21	74.00	-21.21	Pass	Vertical
2	2483.5000	32.38	13.38	-42.40	53.14	56.50	74.00	17.50	Pass	Vertical

Mode:	TX	Channel:	2471.625
Remark:	AV		

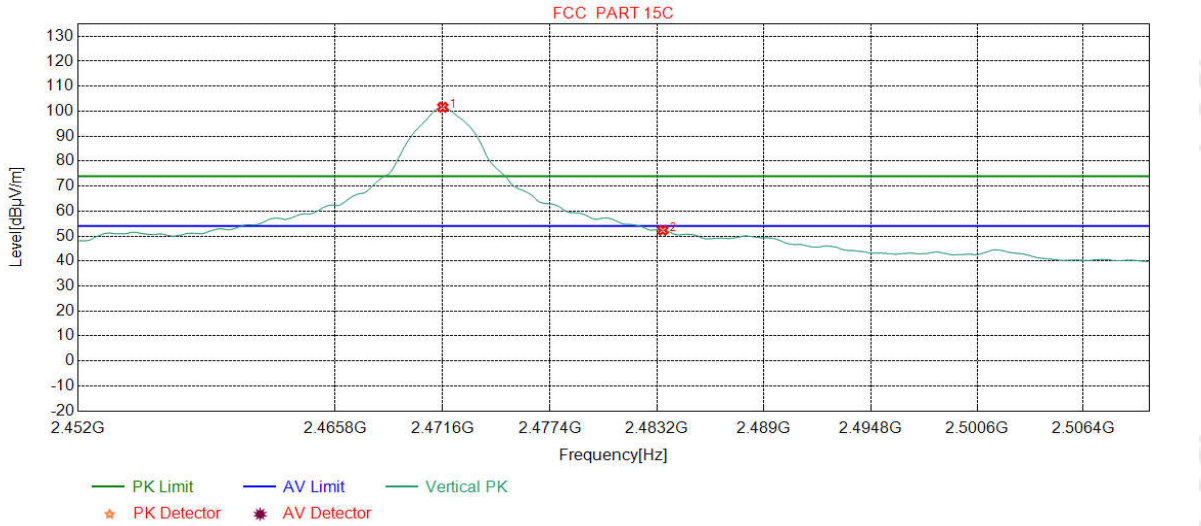
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Preamp gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	2471.5995	32.36	13.43	-42.40	95.81	99.20	54.00	-45.20	Pass	Horizontal
2	2483.5000	32.38	13.38	-42.40	47.20	50.56	54.00	3.44	Pass	Horizontal

Mode:	TX	Channel:	2471.625
Remark:	AV		

Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	2471.5995	32.36	13.43	-42.40	98.20	101.59	54.00	-47.59	Pass	Vertical
2	2483.5000	32.38	13.38	-42.40	48.94	52.30	54.00	1.70	Pass	Vertical

Remark:

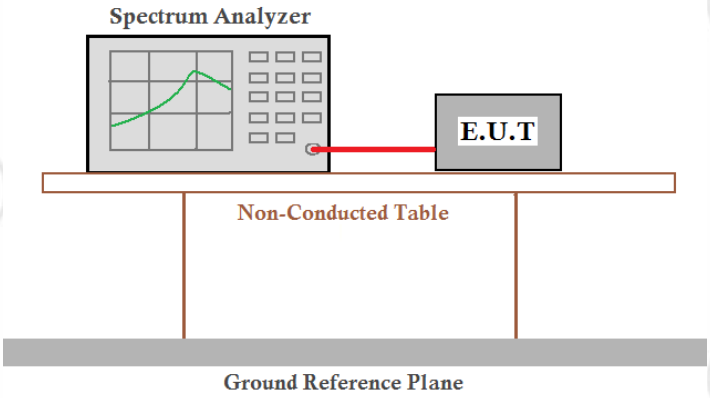
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

7.5 20dB Bandwidth

Test Requirement: 47 CFR Part 15C Section 15.215
Test Method: ANSI C63.10
Test Setup:

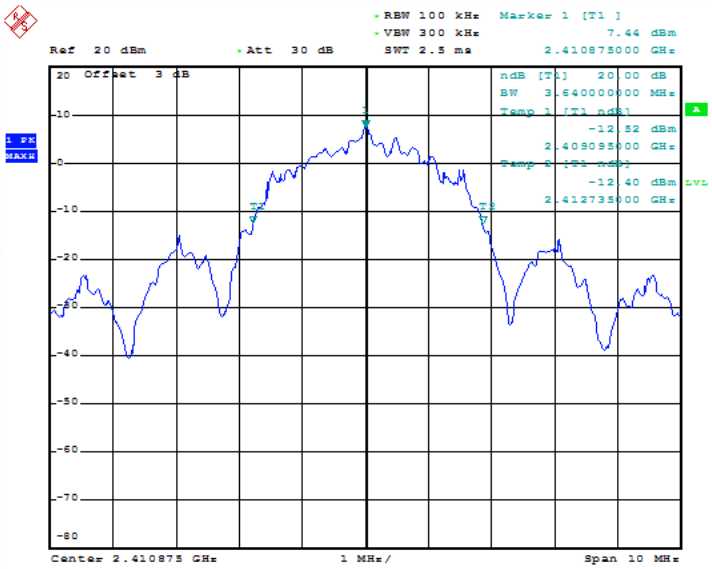


Test Mode: Transmitter mode
Limit: N/A
Instruments Used: Refer to section 6 for details

Test Channel/Frequency	20dB bandwidth (MHz)
2410.875MHz	3.64
2441.250MHz	3.68
2471.625MHz	3.70

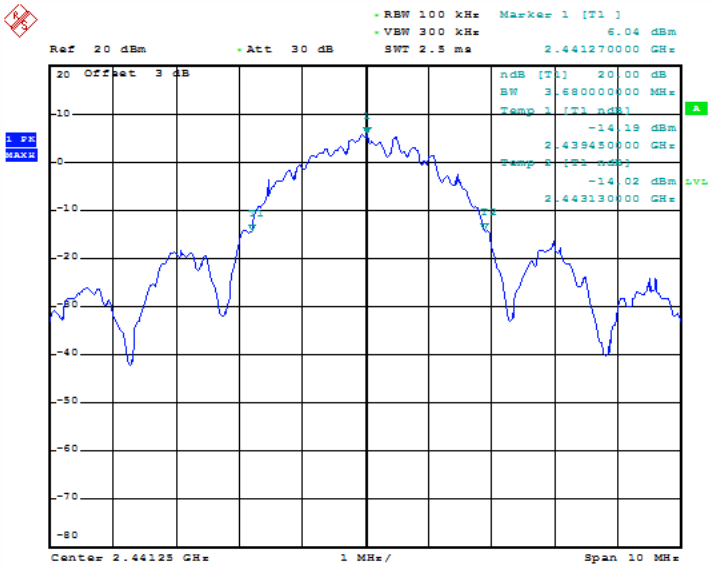
Test plot as follows:

2410.875MHz



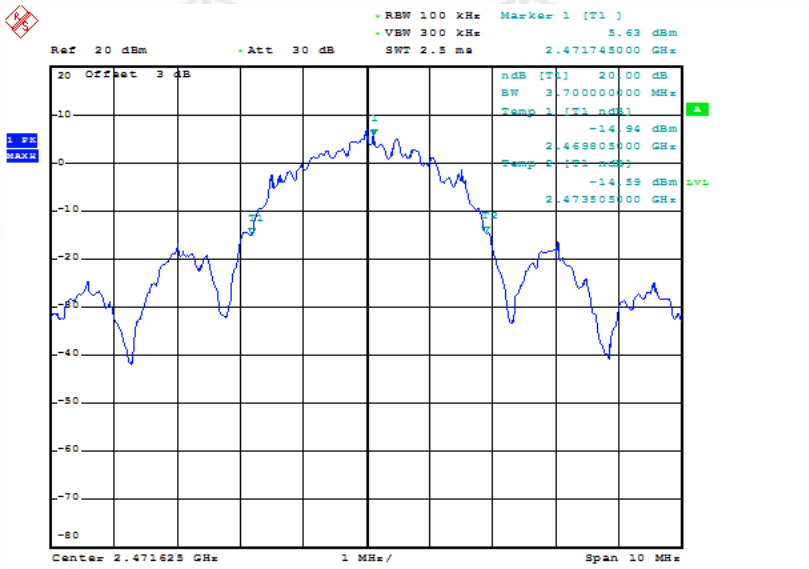
Date: 29.JUL.2019 10:43:02

2441.250MHz



Date: 29.JUL.2019 10:44:11

2471.625MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
Marker 1 [T1]
5.63 dBm
2.471745000 GHz
Ref 20 dBm
Att 30 dB
20 Offset 3 dB
ndB [T1] 20.00 dB
BW 3.700000000 MHz
-14.94 dBm
2.469805000 GHz
-14.59 dBm
2.473505000 GHz
1 PK MAXH
Center 2.471625 GHz
1 MHz/
Span 10 MHz
Date: 29.JUL.2019 10:45:18