

# TEST REPORT

**Product** : Home Assistant Connect ZWA-2  
**Trade mark** : Nabu Casa  
**Model/Type reference** : NC-ZWA-9734  
**Serial Number** : N/A  
**Report Number** : EED32R80742401  
**FCC ID** : 2A8ZE03  
**Date of Issue** : Jun. 17, 2025  
**Test Standards** : 47 CFR Part 15 Subpart C  
**Test result** : PASS

Prepared for:

**Nabu Casa, Inc.****8 The Green, Suite 12630, Dover, DE, United States, 19901**

Prepared by:

**Centre Testing International Group Co., Ltd.  
Hongwei Industrial Zone, Bao'an 70 District,  
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Jun. 17, 2025

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Aaron Ma

Date:

Check No.: 3120150525



## 1 Test Summary

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

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### 3 General Information

#### 3.1 Client Information

Applicant:	Nabu Casa, Inc.
Address of Applicant:	8 The Green, Suite 12630, Dover, DE, United States, 19901
Manufacturer:	Nabu Casa, Inc.
Address of Manufacturer:	8 The Green, Suite 12630, Dover, DE, United States, 19901
Factory:	Yuan Sheng Technology (Shenzhen) Co., Ltd.
Address of Factory:	3rd Floor, Building D1, Foxconn Industrial Park, Donghuan 2nd Road, Longhua District, Shenzhen City.

#### 3.2 General Description of EUT

Product Name:	Home Assistant Connect ZWA-2
Model No.:	NC-ZWA-9734
Trade mark:	Nabu Casa
Product Type:	<input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location
Frequency Range:	902~928MHz GFSK: 916MHz FSK: 908.4MHz FSK: 908.42MHz OQPSK: 912MHz OQPSK 920MHz
Number of Channels:	5
Modulation type:	GFSK, FSK, OQPSK
Antenna Type:	External Antenna
Antenna gain:	902~928MHz:2.78dBi
Test Software of EUT:	sscom5.13.1
Test Power Grade:	Default
Power Supply:	DC 5V
Test Voltage:	DC 5V
Sample Received Date:	May 27, 2025
Sample tested Date:	May 27, 2025 to May 30, 2025

<b>Operation Frequency each of channel :</b>	
Channel	Frequency(MHz)
CH1	908.4
CH2	908.42
CH3	912
CH4	916
CH5	920

Note:

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

Channel	Frequency(MHz)
CH1	908.4
CH2	908.42
CH3	912
CH4	916
CH5	920

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### 3.3 Test Environment and Mode

<b>Operating Environment:</b>	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
<b>Test mode:</b>	
Transmitting mode:	Keep the EUT in transmitting mode with modulation.

### 3.4 Description of Support Units

The EUT has been tested with associated equipment below.

1) support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
Netbook	Dell	P77F	FCC&CE	CTI

### 3.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd  
Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China  
Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385  
No tests were sub-contracted.  
FCC Designation No.: CN1164

### 3.6 Deviation from Standards

None.

### 3.7 Abnormalities from Standard Conditions

None.

### 3.8 Other Information Requested by the Customer

None.

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

No.	Item	Measurement Uncertainty
1	Radio Frequency	$7.9 \times 10^{-8}$
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	3.3dB (9kHz-30MHz)
		4.3dB (30MHz-1GHz)
		4.5dB (1GHz-18GHz)
		3.4dB (18GHz-40GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

## 4 Equipment List

RF test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Spectrum Analyzer	Keysight	N9010A	MY54510339	12-05-2024	12-04-2025
Signal Generator	Keysight	N5182B	MY53051549	11-30-2024	11-29-2025
DC Power	Keysight	E3642A	MY56376072	11-30-2024	11-29-2025
Communication test set	R&S	CMW500	169004	03-03-2025	03-02-2026
RF control unit(power unit)	JS Tonscend	JS0806-2	22G8060592	07-22-2024	07-21-2025
Wi-Fi 7GHz Band Extender	JS Tonscend	TS-WF7U2	2206200002	05-31-2024 05-12-2025	05-30-2025 05-11-2026
High-low temperature test chamber	Dong Guang Qin Zhuo	LK-80GA	QZ20150611879	11-30-2024	11-29-2025
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	05-29-2024 05-26-2025	05-28-2025 05-25-2026
BT&WI-FI Automatic test software	JS Tonscend	JS1120-3	V3.3.20	---	---
Spectrum Analyzer	R&S	FSV3044	101509	02-14-2025	02-13-2026

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
				(mm-dd-yyyy)	(mm-dd-yyyy)
Receiver	R&S	ESCI	100435	04-18-2024 04-08-2025	04-17-2025 04-07-2026
Temperature/ Humidity Indicator	Defu	TH128	/	04-25-2024 03-31-2025	04-24-2025 03-30-2026
LISN	R&S	ENV216	100098	09-19-2024	09-18-2025
Barometer	changchun	DYM3	1188	---	---
Test software	Fara	EZ-EMC	EMC-CON 3A1.1	---	---
Capacitive voltage probe	Schwarzbeck	CVP 9222C	00124	06-18-2024	06-17-2025
ISN	TESEQ	ISN T800	30297	12-05-2024	12-04-2025

3M Semi-anechoic Chamber (2)- Radiated disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
				(mm-dd-yyyy)	(mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	01-13-2024	01-12-2027-
Receiver	R&S	ESCI7	100938-003	09/07/2024	09/06/2025
Spectrum Analyzer	R&S	FSV40	101200	07/18/2024	07/17/2025
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	9163-618	05/22/2022 05-14-2025	05/21/2025 05-13-2026
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04/16/2024 04-07-2025	04/15/2025 04-06-2026
Microwave Preamplifier	Tonscend	EMC051845SE	980380	12/05/2024	12/04/2025
Horn Antenna	A.H.SYSTEMS	SAS-574	374	07/02/2023	07/01/2026
Horn Antenna	ETS-LINGREN	BBHA 9120D	9120D-1869	04/16/2024 04-07-2025	04/15/2025 04-06-2026
Preamplifier	Agilent	11909A	12-1	03/03/2025	03/02/2026
Preamplifier	CD	PAP-1840-60	6041.6042	06/19/2024	06/18/2025

Test software	Fara	EZ-EMC	EMEC-3A1-Pre	---	---
Cable line	Fulai(7M)	SF106	5219/6A	01-13-2024	01-12-2027-
Cable line	Fulai(6M)	SF106	5220/6A	01-13-2024	01-12-2027-
Cable line	Fulai(3M)	SF106	5216/6A	01-13-2024	01-12-2027-
Cable line	Fulai(3M)	SF106	5217/6A	01-13-2024	01-12-2027-

3M full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Fully Anechoic Chamber	TDK	FAC-3	---	01-09-2024	01-08-2027
Receiver	Keysight	N9038A	MY57290136	01-04-2025	01-03-2026
Spectrum Analyzer	Keysight	N9020B	MY57111112	01-14-2025	01-13-2026
Spectrum Analyzer	Keysight	N9030B	MY57140871	01-14-2025	01-13-2026
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-28-2024 04-12-2025	04-27-2025 04-11-2026
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-16-2024 04-12-2025	04-15-2025 04-11-2026-
Horn Antenna	ETS-LINDGREN	3117	57407	07-03-2024	07-02-2025
Preamplifier	EMCI	EMC001330	980563	03-03-2025 03-03-2025	03-02-2026 03-02-2026
Preamplifier	Tonscend	TAP-011858	AP21B806112	07-18-2024	07-17-2025
Preamplifier	Tonscend	EMC051845SE	980380	12-05-2024	12-04-2025
Communication test set	R&S	CMW500	102898	01-04-2025	01-03-2026
Temperature/Humidity Indicator	biaozhi	GM1360	EE1186631	04-07-2024 03-31-2025	04-06-2025 03-30-2026
RSE Automatic test software	JS Tonscend	JS36-RSE	V4.0.0.0	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0001	01-09-2024	01-08-2027

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Cable line	Times	SFT205-NMSM-2.50M	394812-0002	01-09-2024	01-08-2027
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	01-09-2024	01-08-2027
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	01-09-2024	01-08-2027
Cable line	Times	EMC104-NMNM-1000	SN160710	01-09-2024	01-08-2027
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	01-09-2024	01-08-2027
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	01-09-2024	01-08-2027
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	01-09-2024	01-08-2027
Cable line	Times	HF160-KMNM-3.00M	393493-0001	01-09-2024	01-08-2027

## 1 Test results and Measurement Data

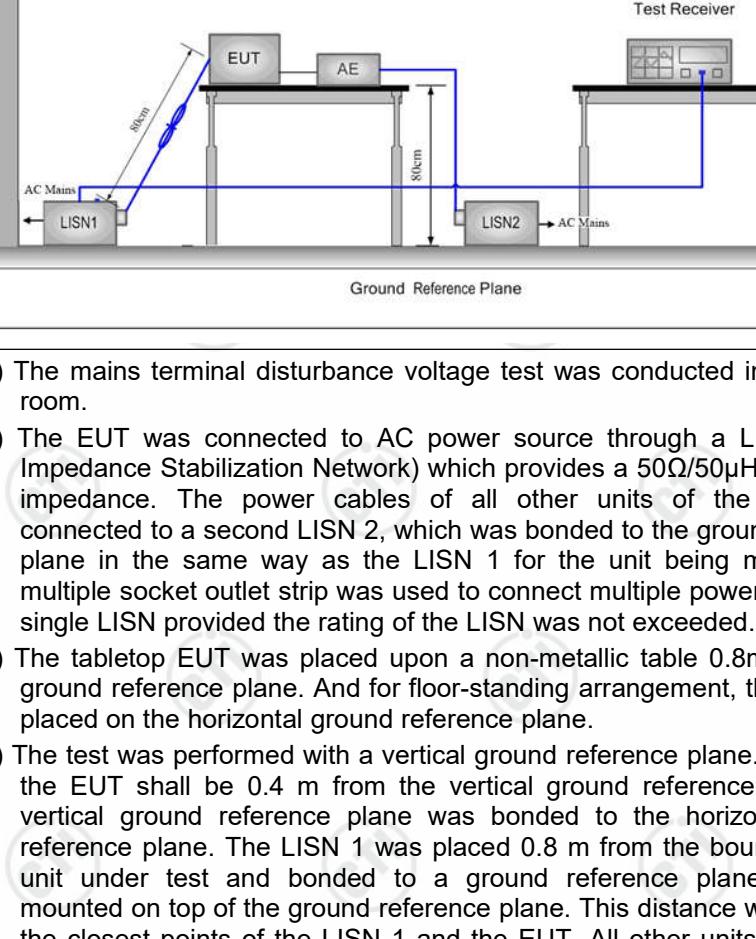
### 1.1 Antenna Requirement

<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>	Please see Internal photos The antenna is External Antenna, no consideration of replacement.

## 1.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207														
Test Method:	ANSI C63.10: 2013														
Test Frequency Range:	150kHz to 30MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	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
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 Setup:	 <p>Shielding Room</p> <p>Test Receiver</p> <p>Ground Reference Plane</p> <p>80cm</p> <p>80cm</p> <p>AC Mains</p> <p>LISN1</p> <p>EUT</p> <p>AE</p> <p>LISN2</p> <p>AC Mains</p> <p>Test Procedure:</p> <ol style="list-style-type: none"> <li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li> <li>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a <math>50\Omega/50\mu\text{H} + 5\Omega</math> 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.</li> <li>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.</li> <li>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.</li> <li>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: 2013 on conducted measurement.</li> </ol>
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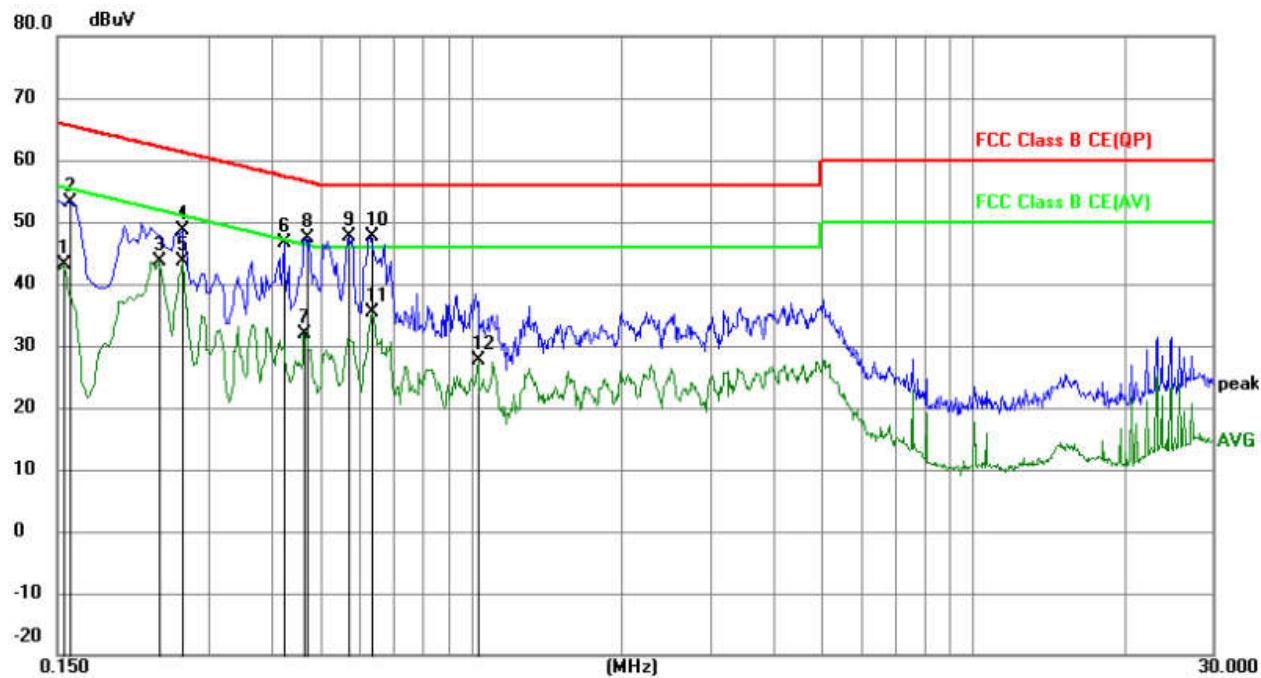
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Test Mode:	All modes were tested, only the worst case mode a was recorded in the report.
Test Results:	Pass

### Measurement Data

916MHz

Live line:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
1		0.1545	32.80	10.28	43.08	55.75	-12.67	AVG	
2		0.1590	42.93	10.27	53.20	65.52	-12.32	QP	
3		0.2400	33.37	10.18	43.55	52.10	-8.55	AVG	
4		0.2670	38.57	10.16	48.73	61.21	-12.48	QP	
5	*	0.2670	33.47	10.16	43.63	51.21	-7.58	AVG	
6		0.4245	36.58	10.09	46.67	57.36	-10.69	QP	
7		0.4650	21.68	10.08	31.76	46.60	-14.84	AVG	
8		0.4695	37.33	10.08	47.41	56.52	-9.11	QP	
9		0.5730	37.45	10.09	47.54	56.00	-8.46	QP	
10		0.6315	37.61	10.11	47.72	56.00	-8.28	QP	
11		0.6360	25.23	10.11	35.34	46.00	-10.66	AVG	
12		1.0320	17.55	10.18	27.73	46.00	-18.27	AVG	

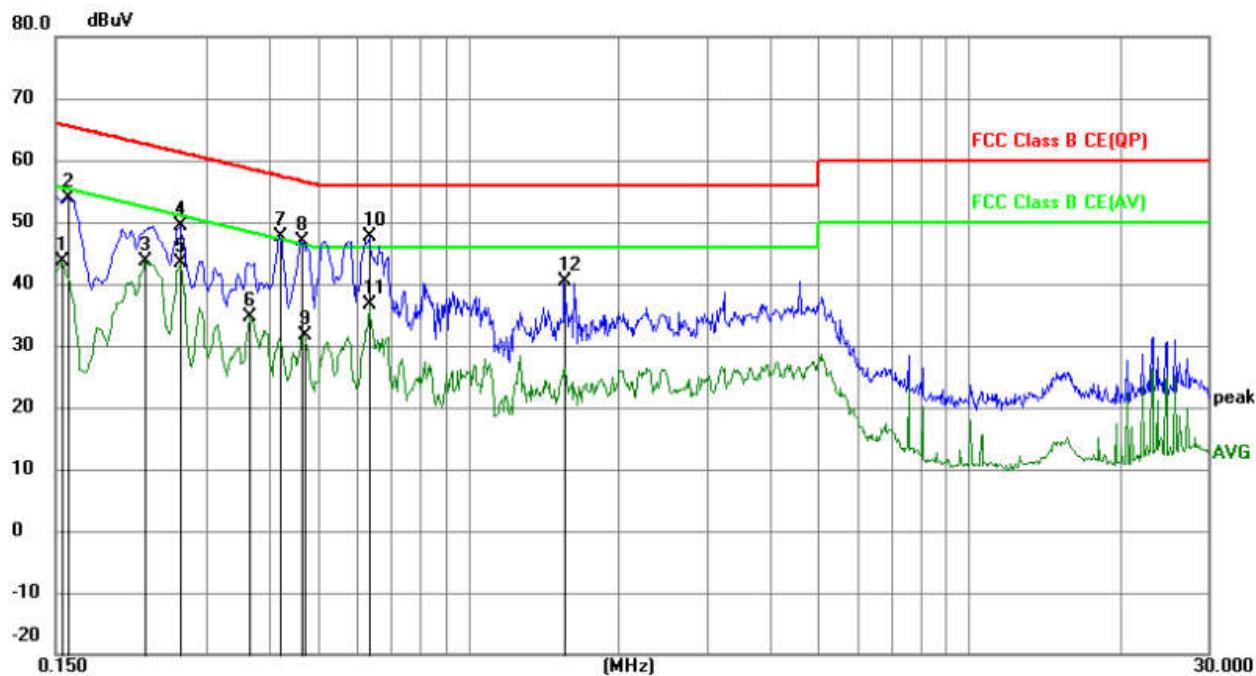
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Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1545	33.23	10.28	43.51	55.75	-12.24	AVG	
2		0.1590	43.58	10.27	53.85	65.52	-11.67	QP	
3		0.2265	33.37	10.19	43.56	52.58	-9.02	AVG	
4		0.2670	39.17	10.16	49.33	61.21	-11.88	QP	
5	*	0.2670	33.16	10.16	43.32	51.21	-7.89	AVG	
6		0.3660	24.57	10.10	34.67	48.59	-13.92	AVG	
7		0.4200	37.45	10.09	47.54	57.45	-9.91	QP	
8		0.4650	36.89	10.08	46.97	56.60	-9.63	QP	
9		0.4695	21.53	10.08	31.61	46.52	-14.91	AVG	
10		0.6360	37.40	10.11	47.51	56.00	-8.49	QP	
11		0.6360	26.50	10.11	36.61	46.00	-9.39	AVG	
12		1.5585	30.30	10.17	40.47	56.00	-15.53	QP	

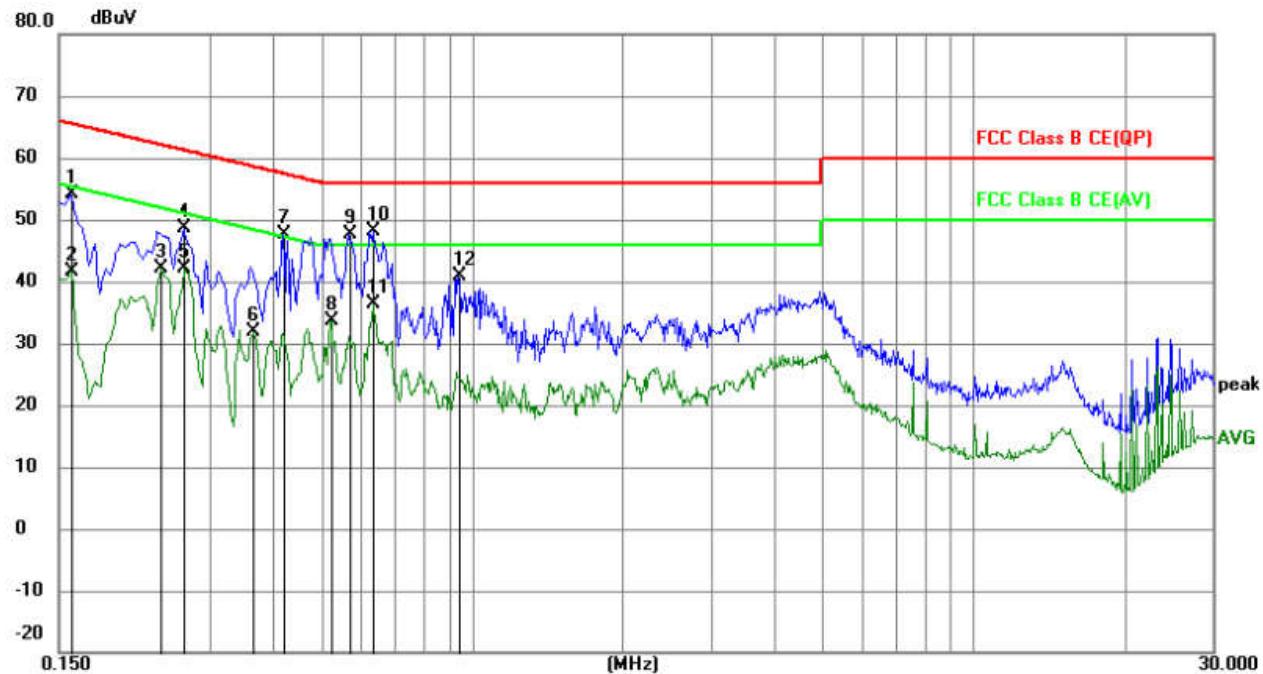
Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Measurement Data

908.4MHz

Live line:

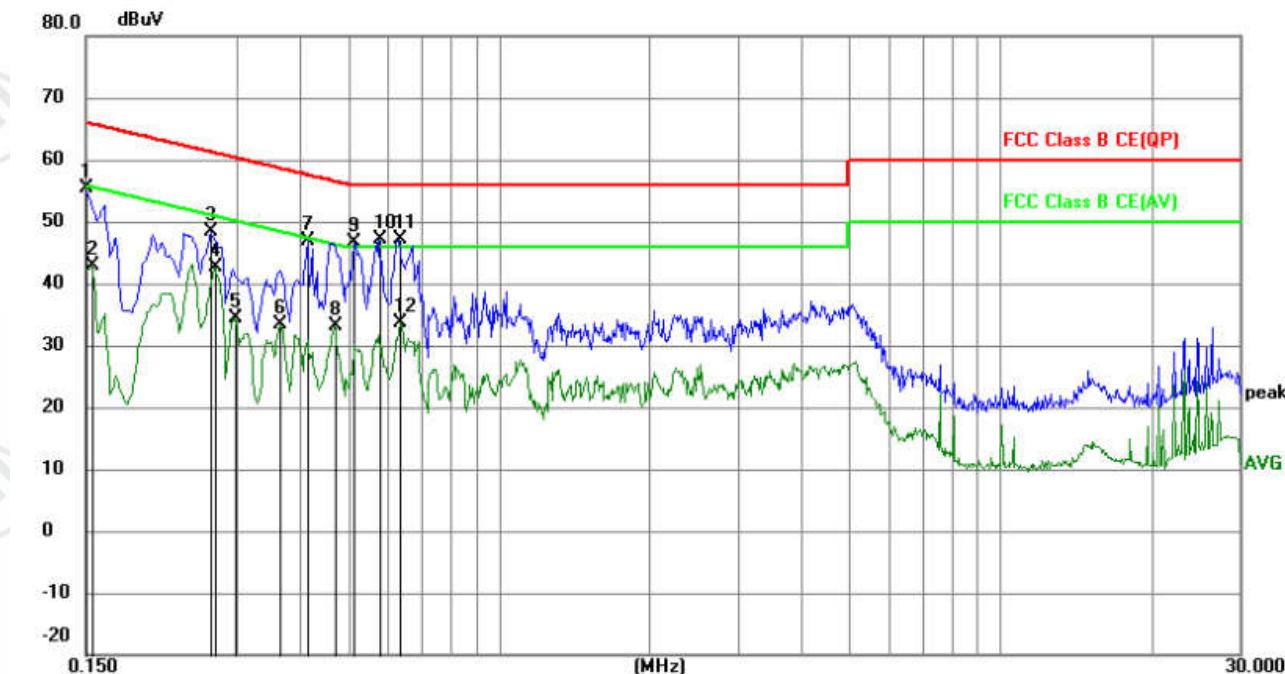


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
MHz dBuV dB dBuV dB									
1		0.1590	43.95	10.27	54.22	65.52	-11.30	QP	
2		0.1590	31.41	10.27	41.68	55.52	-13.84	AVG	
3		0.2400	32.01	10.18	42.19	52.10	-9.91	AVG	
4		0.2670	38.42	10.16	48.58	61.21	-12.63	QP	
5		0.2670	31.91	10.16	42.07	51.21	-9.14	AVG	
6		0.3660	21.87	10.10	31.97	48.59	-16.62	AVG	
7		0.4200	37.65	10.09	47.74	57.45	-9.71	QP	
8		0.5235	23.67	10.08	33.75	46.00	-12.25	AVG	
9		0.5685	37.56	10.09	47.65	56.00	-8.35	QP	
10	*	0.6360	38.00	10.11	48.11	56.00	-7.89	QP	
11		0.6360	26.18	10.11	36.29	46.00	-9.71	AVG	
12		0.9420	30.64	10.17	40.81	56.00	-15.19	QP	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1500	45.04	10.28	55.32	66.00	-10.68	QP	
2		0.1545	32.56	10.28	42.84	55.75	-12.91	AVG	
3		0.2670	38.28	10.16	48.44	61.21	-12.77	QP	
4	*	0.2714	32.37	10.15	42.52	51.07	-8.55	AVG	
5		0.2985	24.15	10.13	34.28	50.28	-16.00	AVG	
6		0.3660	23.20	10.10	33.30	48.59	-15.29	AVG	
7		0.4155	36.75	10.09	46.84	57.54	-10.70	QP	
8		0.4695	22.96	10.08	33.04	46.52	-13.48	AVG	
9		0.5144	36.50	10.08	46.58	56.00	-9.42	QP	
10		0.5775	37.13	10.10	47.23	56.00	-8.77	QP	
11		0.6315	37.14	10.11	47.25	56.00	-8.75	QP	
12		0.6360	23.50	10.11	33.61	46.00	-12.39	AVG	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

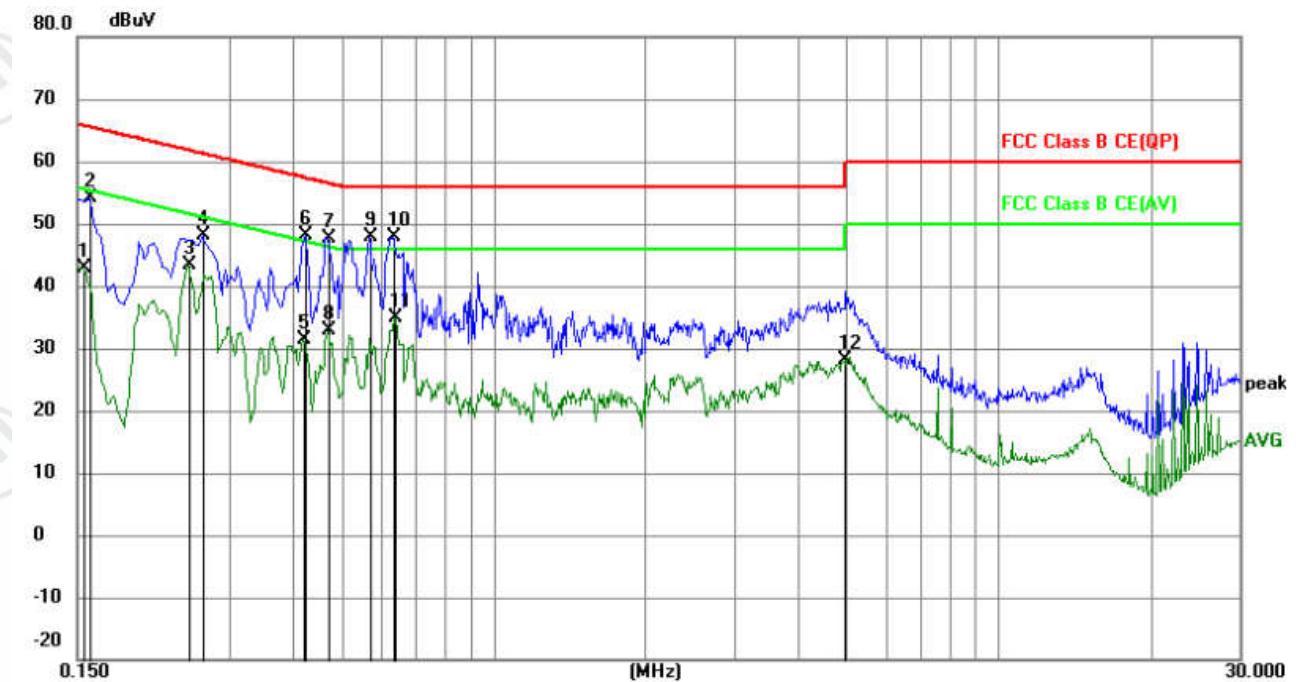
Measurement Data

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908.42MHz

Live line:

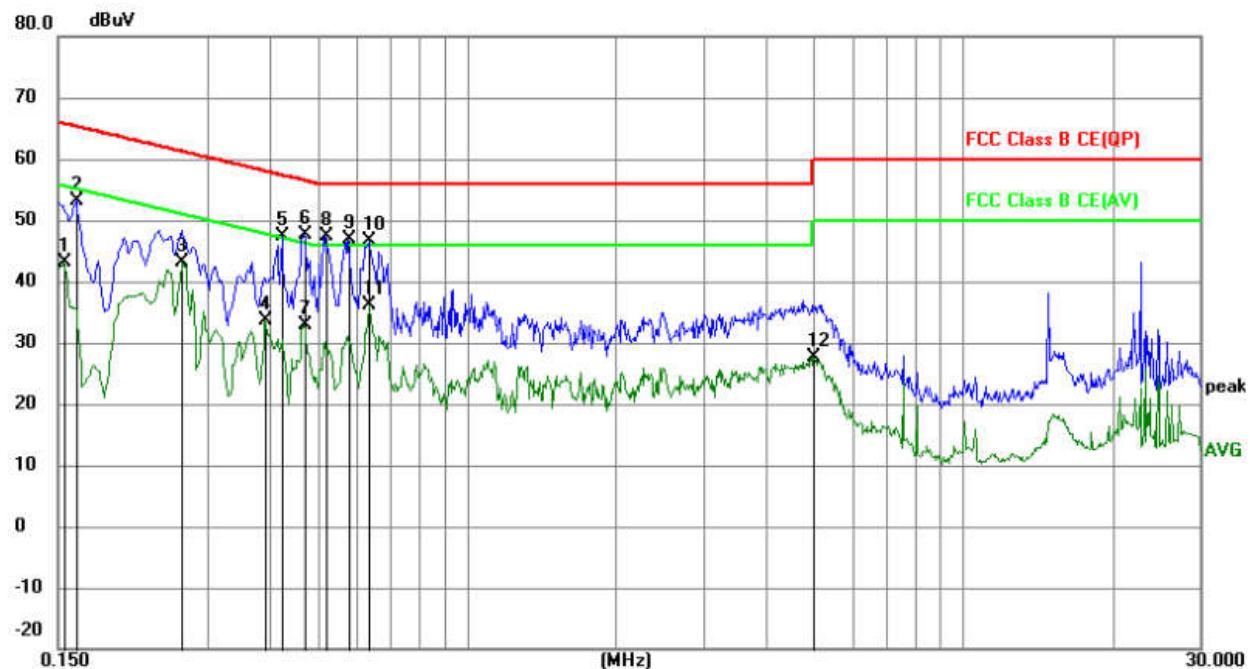


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1545	32.56	10.28	42.84	55.75	-12.91	AVG	
2		0.1590	43.90	10.27	54.17	65.52	-11.35	QP	
3		0.2490	33.09	10.17	43.26	51.79	-8.53	AVG	
4		0.2670	37.97	10.16	48.13	61.21	-13.08	QP	
5		0.4200	21.18	10.09	31.27	47.45	-16.18	AVG	
6		0.4245	38.11	10.09	48.20	57.36	-9.16	QP	
7		0.4695	37.65	10.08	47.73	56.52	-8.79	QP	
8		0.4695	22.73	10.08	32.81	46.52	-13.71	AVG	
9	*	0.5685	37.87	10.09	47.96	56.00	-8.04	QP	
10		0.6315	37.75	10.11	47.86	56.00	-8.14	QP	
11		0.6405	24.87	10.11	34.98	46.00	-11.02	AVG	
12		4.9650	18.03	10.06	28.09	46.00	-17.91	AVG	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



No.	Mk.	Freq.	Reading	Correct Factor	Measure-	Limit	Margin	Detector	Comment
			Level		ment				
1		0.1545	32.79	10.28	43.07	55.75	-12.68	AVG	
2		0.1635	42.98	10.26	53.24	65.28	-12.04	QP	
3	*	0.2670	32.88	10.16	43.04	51.21	-8.17	AVG	
4		0.3930	23.42	10.09	33.51	48.00	-14.49	AVG	
5		0.4245	37.30	10.09	47.39	57.36	-9.97	QP	
6		0.4695	37.49	10.08	47.57	56.52	-8.95	QP	
7		0.4695	22.81	10.08	32.89	46.52	-13.63	AVG	
8		0.5190	37.21	10.08	47.29	56.00	-8.71	QP	
9		0.5775	36.89	10.10	46.99	56.00	-9.01	QP	
10		0.6360	36.47	10.11	46.58	56.00	-9.42	QP	
11		0.6360	25.95	10.11	36.06	46.00	-9.94	AVG	
12		4.9965	17.59	10.06	27.65	46.00	-18.35	AVG	

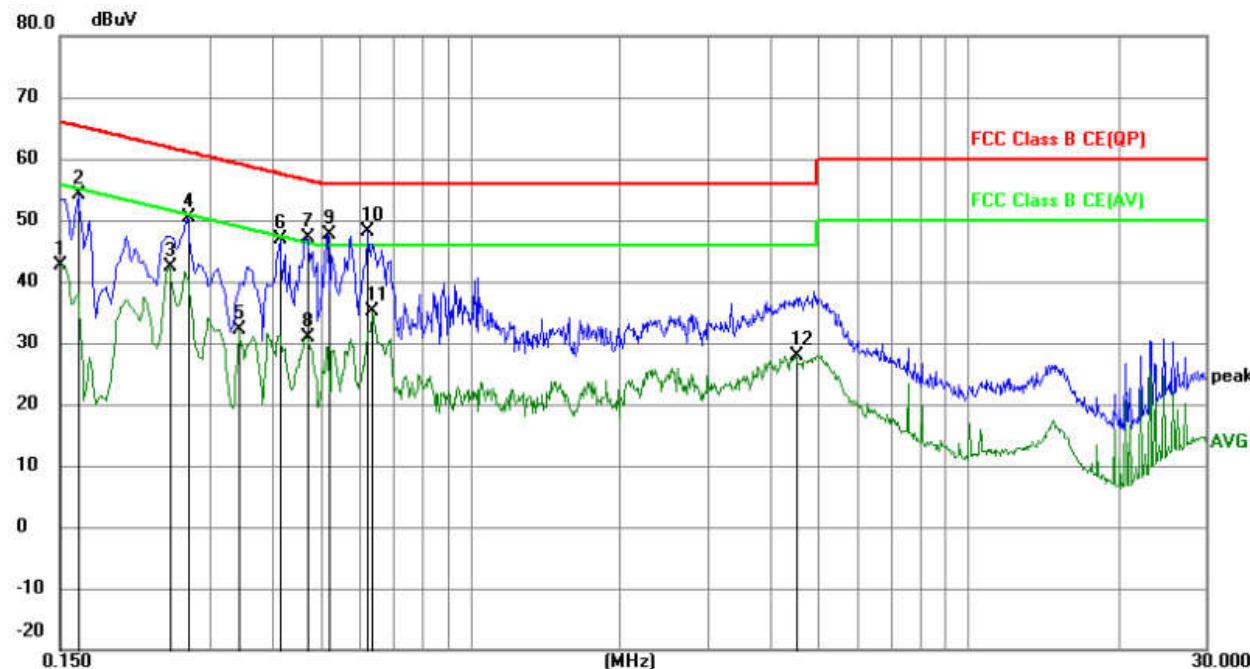
Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Measurement Data

912MHz

Live line:

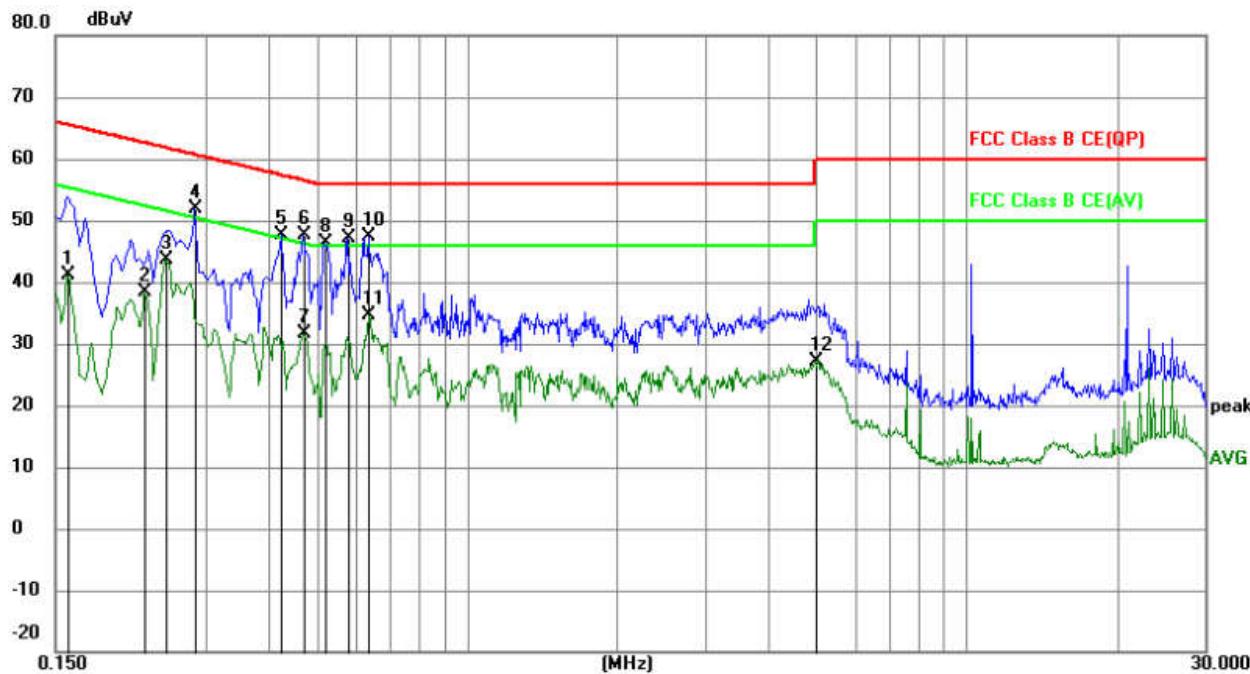


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
1		0.1500	32.36	10.28	42.64	56.00	-13.36	AVG	
2		0.1635	43.78	10.26	54.04	65.28	-11.24	QP	
3		0.2490	32.21	10.17	42.38	51.79	-9.41	AVG	
4		0.2714	40.22	10.15	50.37	61.07	-10.70	QP	
5		0.3435	21.95	10.11	32.06	49.12	-17.06	AVG	
6		0.4155	36.71	10.09	46.80	57.54	-10.74	QP	
7		0.4695	36.96	10.08	47.04	56.52	-9.48	QP	
8		0.4695	20.80	10.08	30.88	46.52	-15.64	AVG	
9		0.5190	37.64	10.08	47.72	56.00	-8.28	QP	
10	*	0.6225	37.94	10.11	48.05	56.00	-7.95	QP	
11		0.6360	24.98	10.11	35.09	46.00	-10.91	AVG	
12		4.5195	17.80	10.08	27.88	46.00	-18.12	AVG	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1590	30.96	10.27	41.23	55.52	-14.29	AVG	
2		0.2265	28.12	10.19	38.31	52.58	-14.27	AVG	
3	*	0.2490	33.56	10.17	43.73	51.79	-8.06	AVG	
4		0.2850	41.77	10.14	51.91	60.67	-8.76	QP	
5		0.4245	37.53	10.09	47.62	57.36	-9.74	QP	
6		0.4695	37.59	10.08	47.67	56.52	-8.85	QP	
7		0.4695	21.47	10.08	31.55	46.52	-14.97	AVG	
8		0.5190	36.30	10.08	46.38	56.00	-9.62	QP	
9		0.5775	36.97	10.10	47.07	56.00	-8.93	QP	
10		0.6360	37.35	10.11	47.46	56.00	-8.54	QP	
11		0.6360	24.41	10.11	34.52	46.00	-11.48	AVG	
12		5.0010	16.97	10.06	27.03	50.00	-22.97	AVG	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

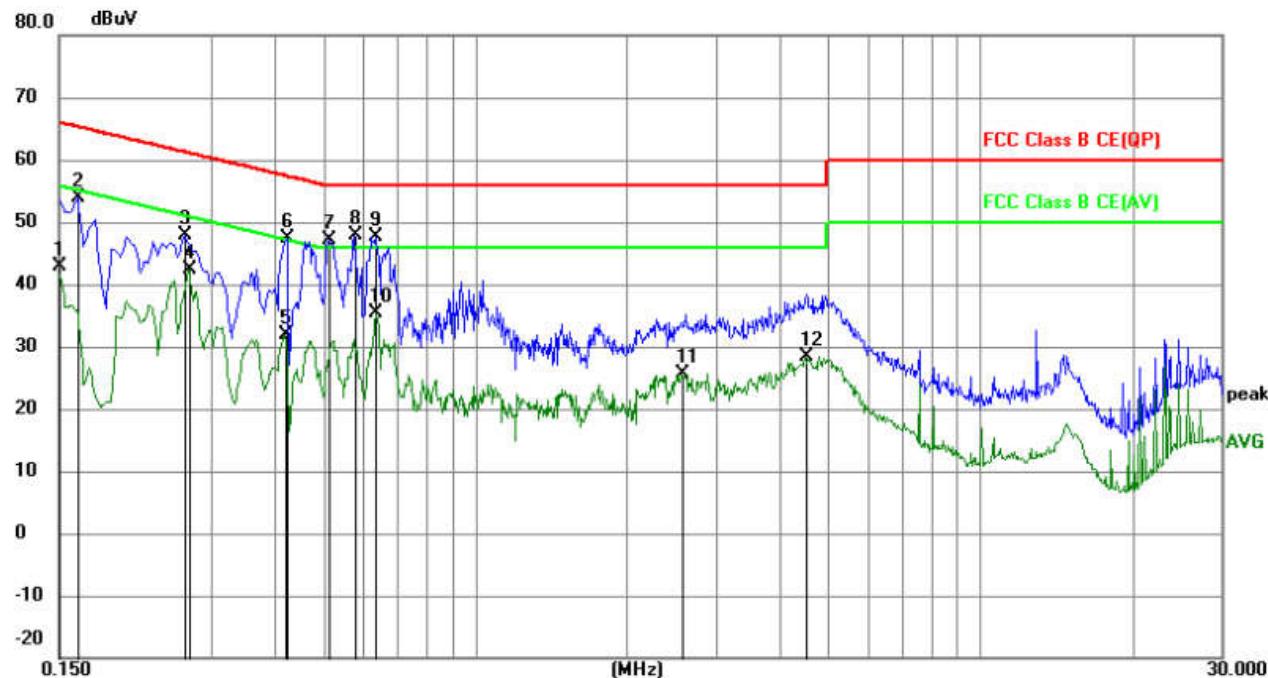
Measurement Data

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920MHz

Live line:

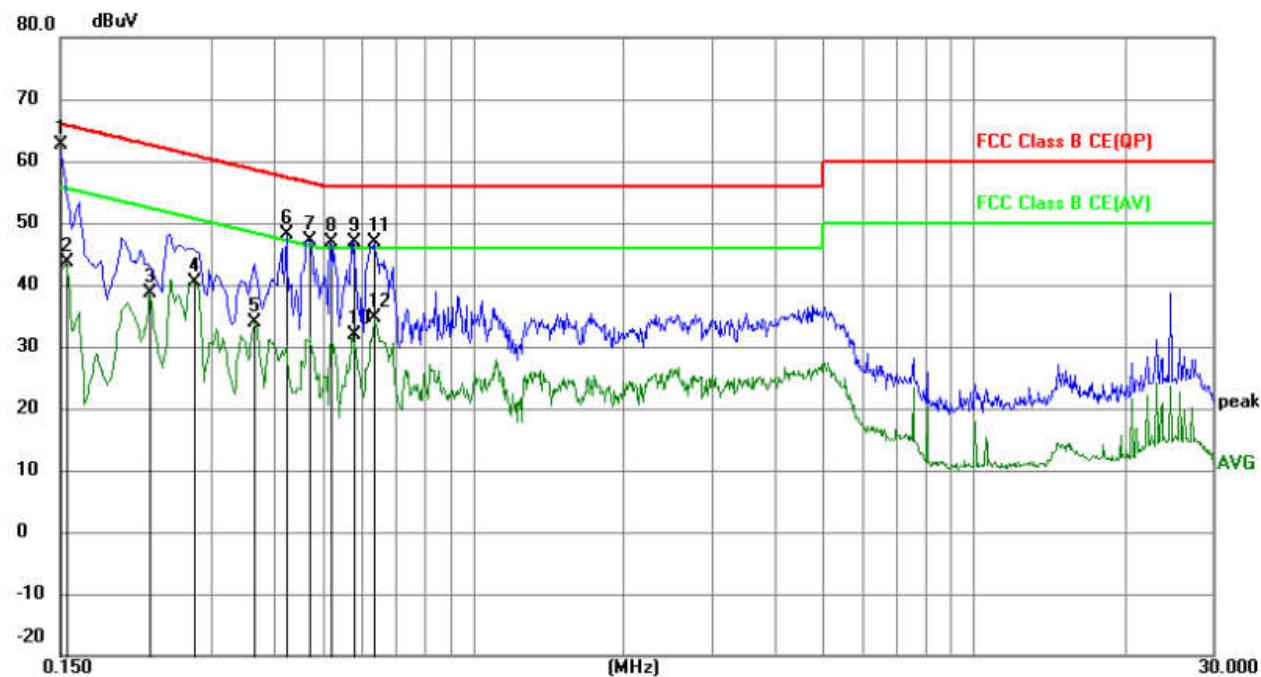


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1500	32.53	10.28	42.81	56.00	-13.19	AVG	
2		0.1635	43.53	10.26	53.79	65.28	-11.49	QP	
3		0.2670	37.75	10.16	47.91	61.21	-13.30	QP	
4		0.2714	32.33	10.15	42.48	51.07	-8.59	AVG	
5		0.4200	21.71	10.09	31.80	47.45	-15.65	AVG	
6		0.4245	37.34	10.09	47.43	57.36	-9.93	QP	
7		0.5144	36.93	10.08	47.01	56.00	-8.99	QP	
8	*	0.5775	37.74	10.10	47.84	56.00	-8.16	QP	
9		0.6360	37.61	10.11	47.72	56.00	-8.28	QP	
10		0.6360	25.38	10.11	35.49	46.00	-10.51	AVG	
11		2.5574	15.55	10.15	25.70	46.00	-20.30	AVG	
12		4.5104	18.30	10.08	28.38	46.00	-17.62	AVG	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1500	52.47	10.28	62.75	66.00	-3.25	QP	
2		0.1545	33.27	10.28	43.55	55.75	-12.20	AVG	
3		0.2265	28.42	10.19	38.61	52.58	-13.97	AVG	
4		0.2760	30.28	10.15	40.43	50.94	-10.51	AVG	
5		0.3660	23.87	10.10	33.97	48.59	-14.62	AVG	
6		0.4245	38.02	10.09	48.11	57.36	-9.25	QP	
7		0.4695	37.13	10.08	47.21	56.52	-9.31	QP	
8		0.5190	36.84	10.08	46.92	56.00	-9.08	QP	
9		0.5775	36.84	10.10	46.94	56.00	-9.06	QP	
10		0.5775	21.70	10.10	31.80	46.00	-14.20	AVG	
11		0.6360	36.69	10.11	46.80	56.00	-9.20	QP	
12		0.6360	24.41	10.11	34.52	46.00	-11.48	AVG	

Remark:

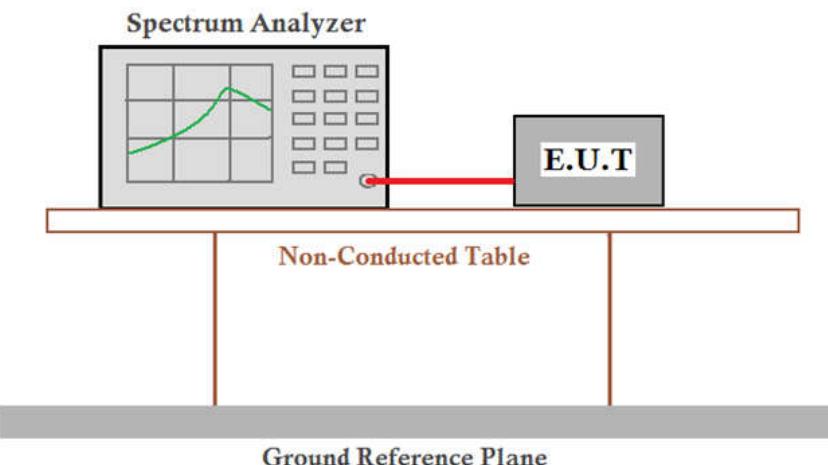
1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

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## 1.3 Radiated Spurious Emissions

### 1.3.1 Duty Cycle

**Test Requirement:** 47 CFR Part 15C Section 15.35 (c)**Test Method:** ANSI C63.10:2013**Test Setup:****Limit:**

N/A

**Test Mode:**

Transmitting mode

**Test Results:**

Pass

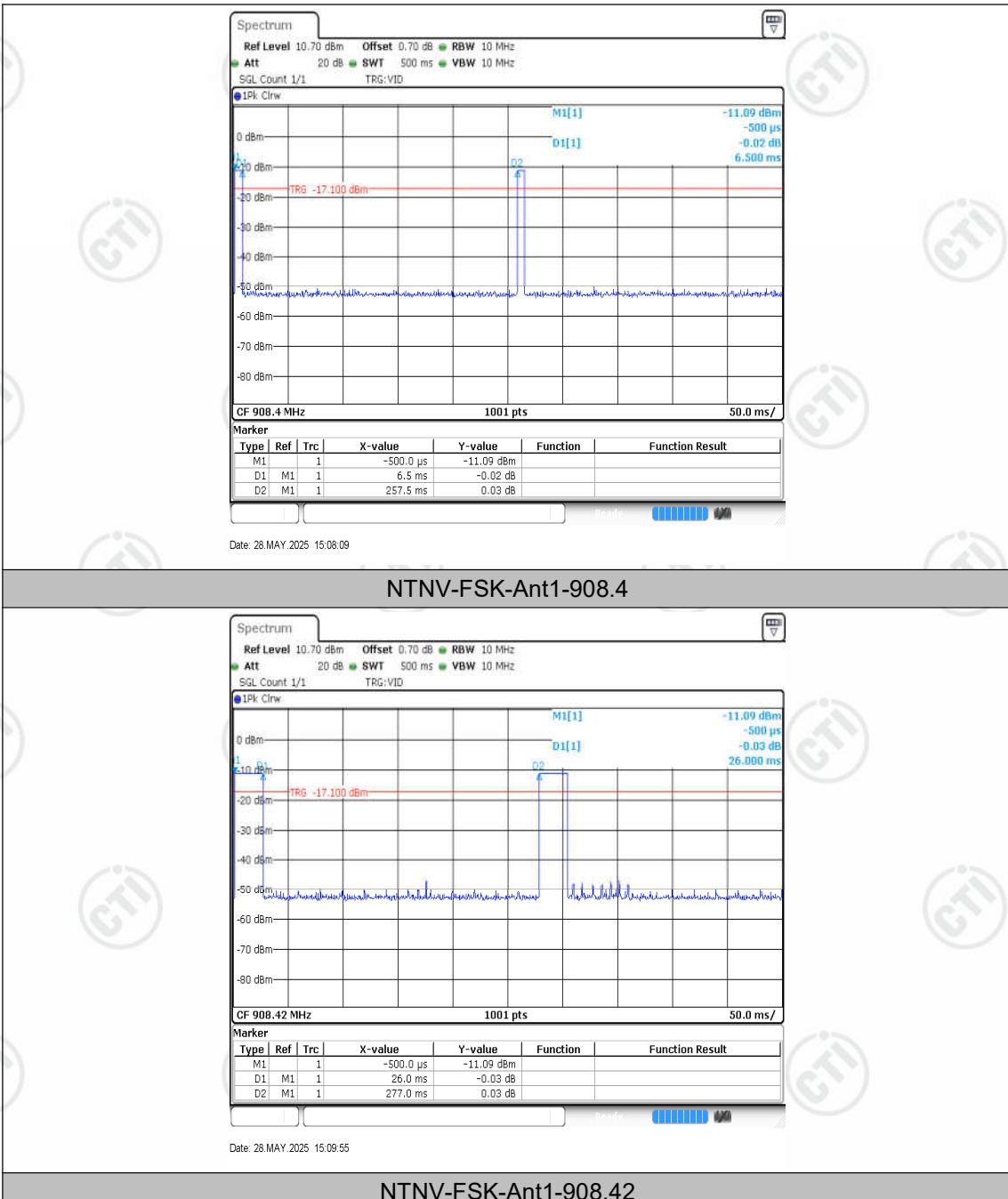
TestMode	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
FSK	908.4	6.50	257.50	2.52	15.99
FSK	908.42	26.00	277.00	9.39	10.27
OQPSK	912	5.00	256.00	1.95	17.10
GFSK	916	4.50	256.00	1.76	17.54
OQPSK	920	5.00	256.00	1.95	17.10

Note:

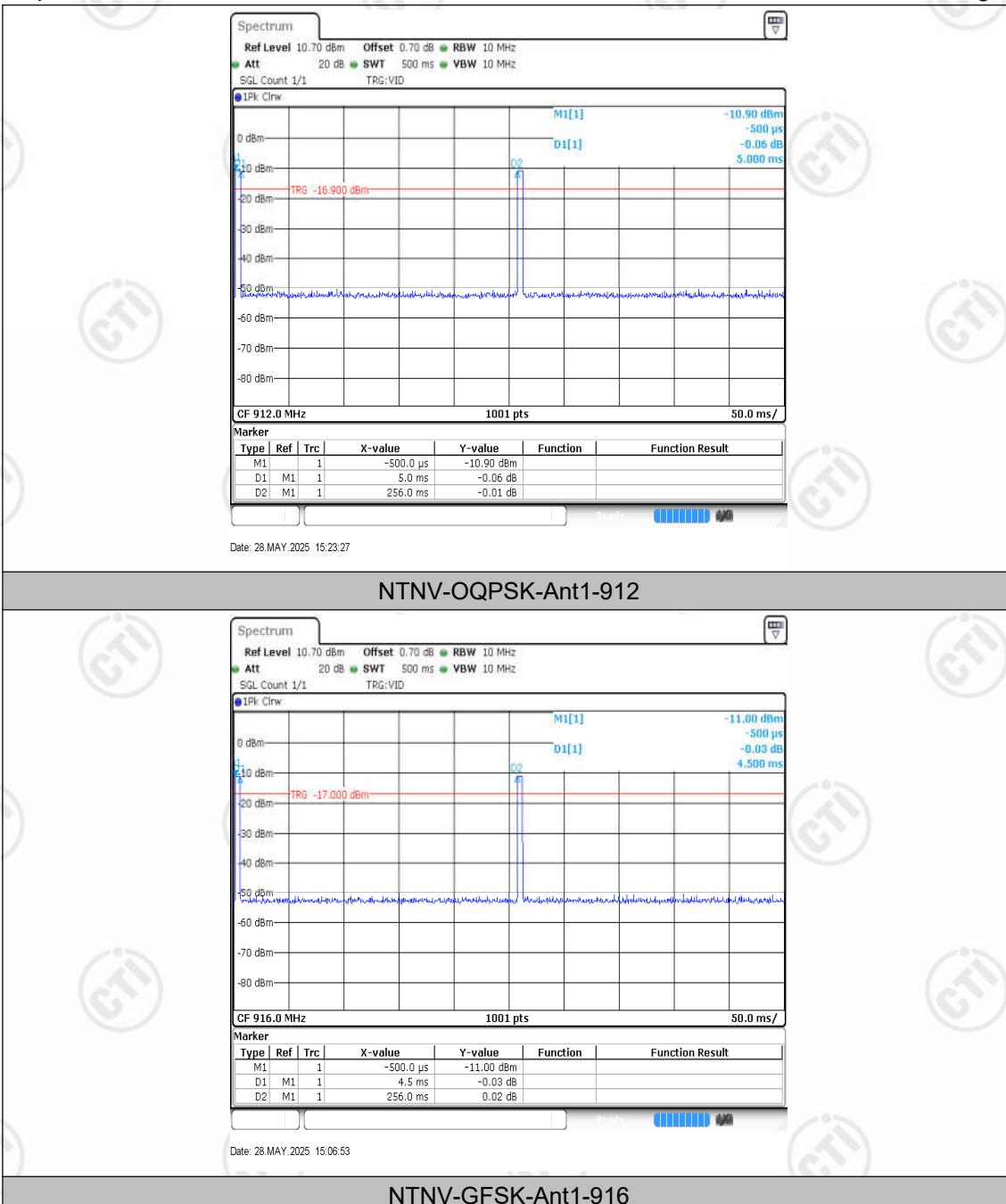
①T on time(ms)/1000ms=The number of pulses of duration/100ms\*T on time(ms)/one burst;

②According to ANSI C63.10-2013 section 7.5,since T on time(ms)/1000ms is greater than 100ms, Duty is calculated in terms of 100ms;

**Test Graphs**



NTNV-FSK-Ant1-908.4



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## Radiated Spurious Emissions

**Test Requirement:** 47 CFR Part 15C Section 15.249 and 15.209 and 15.205

**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	10kHz	Average

**Limit:**  
(Spurious Emissions)

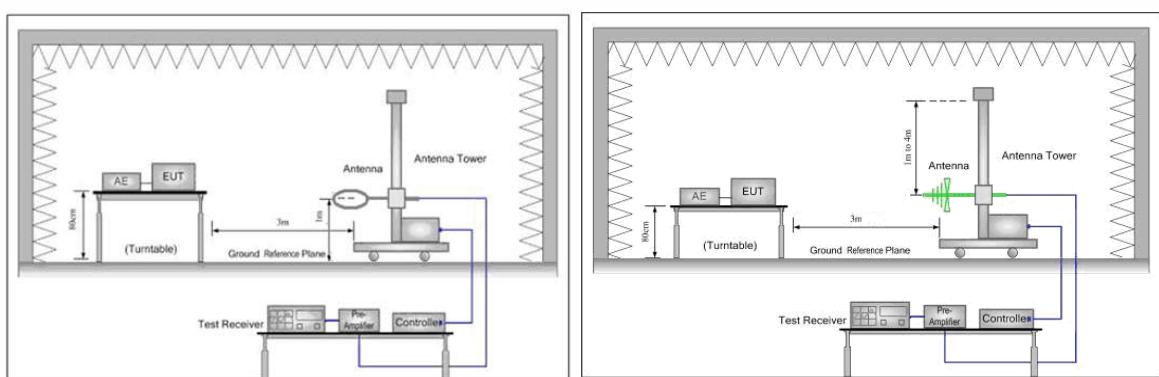
Frequency	Field strength (microvolt/meter)	Limit (dB $\mu$ V/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
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 (dB $\mu$ V/m @3m)	Remark
911MHz-919MHz	94.0	Average Value
	114.0	Peak Value

**Test Setup:**



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Figure 1. Below 30MHz

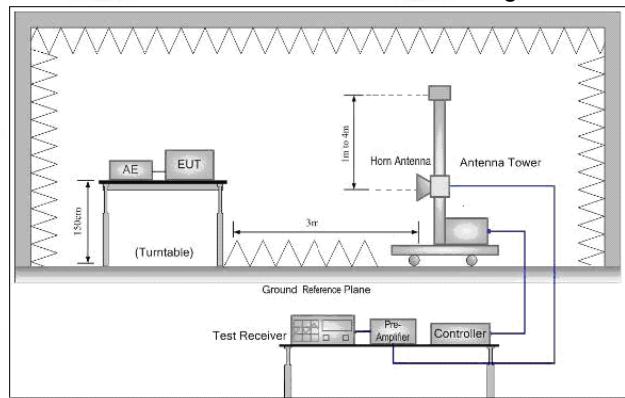


Figure 2. 30MHz to 1GHz

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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 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 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 metre to 1.5 metre( Above 18GHz the distance is 1 meter and table is 1.5 metre).

Test the EUT in the only 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.

Transmitting mode

#### Test Mode:

#### Test Results:

Pass

**Test data:**

**Field Strength of the Fundamental Signal:**

a.

Modulation type:	FSK
Test channel:	908.4MHz

<b>Average value:</b>	
Calculate Formula:	Average value=Peak value + PDCF
	PDCF=20*log(Duty cycle)
	Duty cycle= T on time / T period
Test data:	T on time = 6.50ms
	T period = 257.50ms
	PDCF= -31.972

<b>Antenna polarization: Horizontal</b>						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
908.4	78.93	27.34	106.27	114.00	-7.73	Peak
908.4	-	-	74.298	94.00	-19.70	Average

<b>Antenna polarization: Vertical</b>						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
908.4	78.93	27.34	106.27	114.00	-7.73	Peak
908.4	-	-	74.298	94.00	-19.70	Average

b.

Modulation type:	FSK
Test channel:	908.42MHz

**Average value:**

Calculate Formula:	Average value=Peak value + PDCF
	PDCF=20*log(Duty cycle)
	Duty cycle= T on time / T period
Test data:	T on time = 26.00ms
	T period = 277.00ms
	PDCF= -20.547

**Antenna polarization: Horizontal**

Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
908.42	78.93	27.34	106.27	114.00	-7.73	Peak
908.42	-	-	85.723	94.00	-8.277	Average

**Antenna polarization: Vertical**

Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
908.42	78.93	27.34	106.27	114.00	-7.73	Peak
908.42	-	-	85.723	94.00	-8.277	Average

c.

Modulation type:	OQPSK
Test channel:	912MHz

**Average value:**

Calculate Formula:	Average value=Peak value + PDCF
	PDCF=20*log(Duty cycle)
	Duty cycle= T on time / T period
Test data:	T on time = 5.00ms
	T period = 256.00ms
	PDCF= -34.199

**Antenna polarization: Horizontal**

Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
912	78.96	27.35	106.31	114.00	-7.69	Peak
912	-	-	72.110	94.00	-21.889	Average

**Antenna polarization: Vertical**

Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
912	78.96	27.35	106.31	114.00	-7.69	Peak
912	-	-	72.110	94.00	-21.889	Average

d.

Modulation type:	GFSK
Test channel:	916MHz

<b>Average value:</b>	
Calculate Formula:	Average value=Peak value + PDCF PDCF=20*log(Duty cycle)
	Duty cycle= T on time / T period
Test data:	T on time = 4.50ms T period =256.00ms PDCF=-30.089

<b>Antenna polarization: Horizontal</b>						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
916	78.96	27.37	106.33	114.00	-7.67	Peak
916	-	-	72.14	94.00	-21.86	Average

<b>Antenna polarization: Vertical</b>						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
916	78.96	27.37	106.33	114.00	-7.67	Peak
916	-	-	72.14	94.00	-21.86	Average

e.

Modulation type:	OQPSK
Test channel:	920MHz

**Average value:**

Calculate Formula:	Average value=Peak value + PDCF
	PDCF=20*log(Duty cycle)
	Duty cycle= T on time / T period
Test data:	T on time = 5.00ms
	T period = 256.00ms
	PDCF= -34.199

**Antenna polarization: Horizontal**

Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
920	78.96	27.38	106.34	114.00	-7.66	Peak
920	-	-	72.111	94.00	-21.889	Average

**Antenna polarization: Vertical**

Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
920	78.96	27.38	106.34	114.00	-7.66	Peak
920	-	-	72.111	94.00	-21.889	Average

**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 + Antenna Factor + Cable Factor – Preamplifier Factor

### Spurious Emissions

#### 9KHz-30MHz:

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

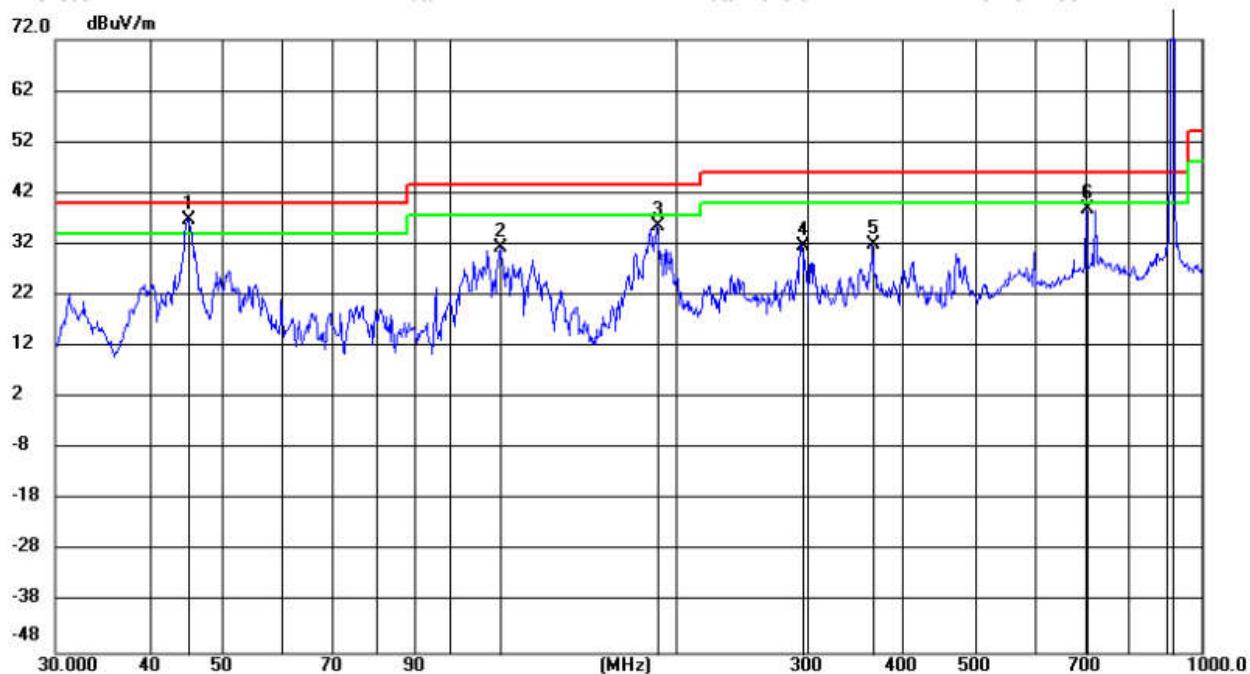
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

#### 30MHz-1GHz & Restricted bands:

Test channel:

916MHz

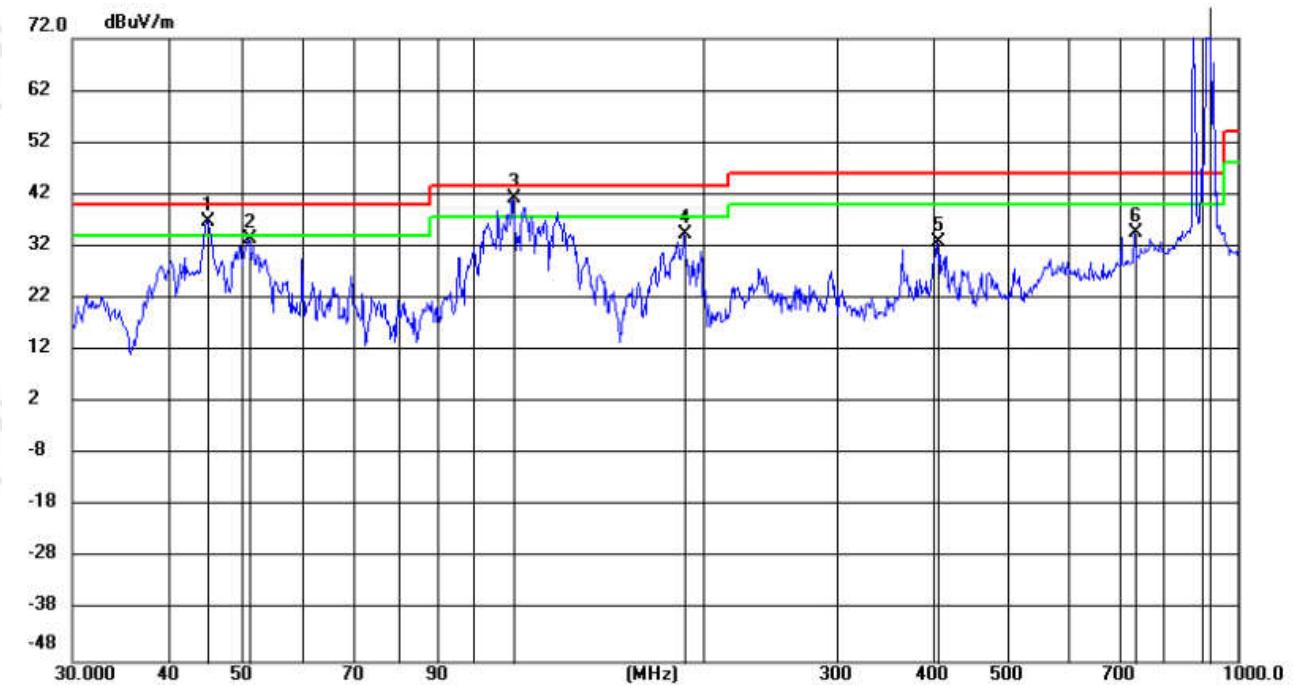
Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	45.1135	23.06	13.77	36.83	40.00	-3.17	QP	199	7	
2		117.0109	18.84	12.38	31.22	43.50	-12.28	QP	199	219	
3		189.4725	23.00	12.70	35.70	43.50	-7.80	QP	199	156	
4		294.2684	15.44	16.36	31.80	46.00	-14.20	QP	100	226	
5		365.7955	13.26	18.56	31.82	46.00	-14.18	QP	100	268	
6		704.1026	14.65	24.26	38.91	46.00	-7.09	QP	199	7	
7	*	916.0686	78.96	27.37	106.33	46.00	60.33	peak	100	195	

Note: No.1 is the fundamental center frequency point of product operation.

Vertical:

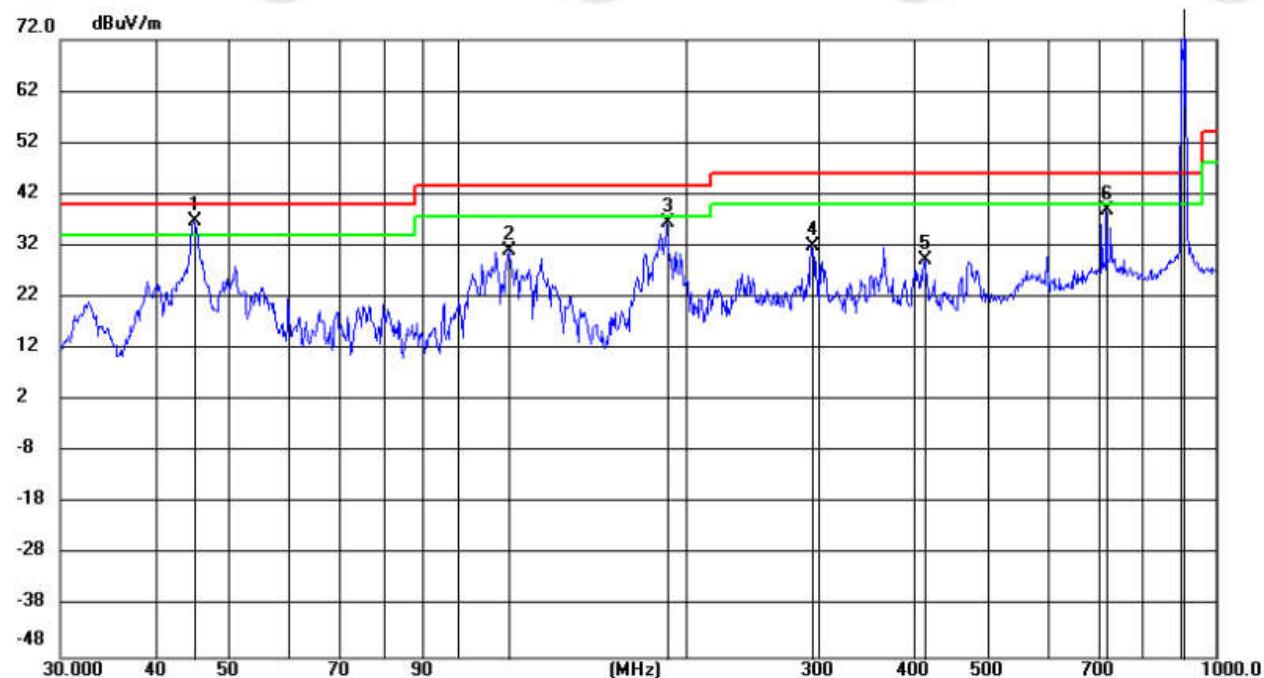


No.	Mk.	Freq.	Reading	Correct Factor	Measure- ment	Limit	Margin	Antenna Height	Table Degree	Comment
			Level							
			MHz	dBuV	dB/m	dBuV/m	dB	Detector	cm	degree
1	!	45.0820	23.12	13.77	36.89	40.00	-3.11	QP	100	123
2		51.0672	18.92	14.44	33.36	40.00	-6.64	QP	100	7
3	!	112.9592	27.90	13.43	41.33	43.50	-2.17	QP	100	102
4		189.3729	21.62	12.69	34.31	43.50	-9.19	QP	100	102
5		404.7375	13.19	19.64	32.83	46.00	-13.17	QP	100	155
6		732.1769	10.32	24.46	34.78	46.00	-11.22	QP	200	205
7	*	916.0687	78.96	27.37	106.33	46.00	60.33	peak	200	352

Note: No.1 is the fundamental center frequency point of product operation.

Test channel:	908.4MHz
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Horizontal:



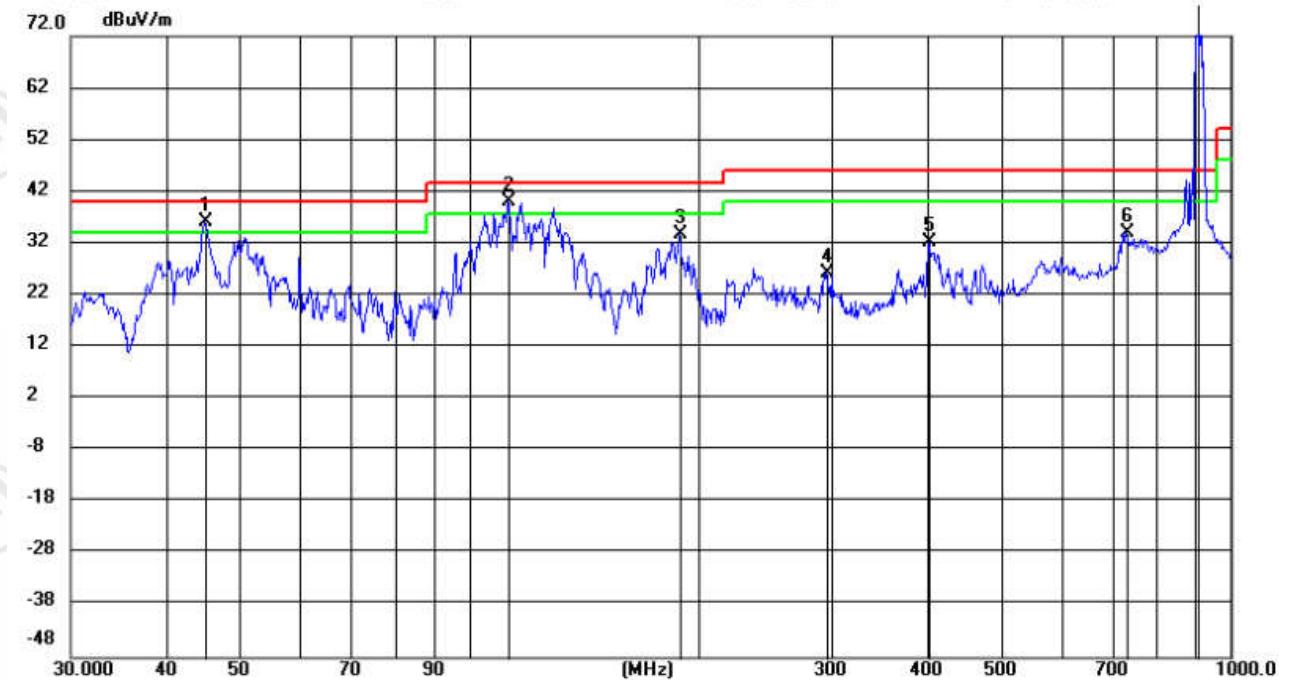
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		45.0030	22.92	13.76	36.68	40.00	-3.32	QP	199	352
2		117.0520	18.54	12.37	30.91	43.50	-12.59	QP	199	194
3		189.4725	23.80	12.70	36.50	43.50	-7.00	QP	100	153
4		293.6500	15.68	16.34	32.02	46.00	-13.98	QP	100	227
5		413.4880	9.57	19.75	29.32	46.00	-16.68	QP	100	164
6		718.6952	14.46	24.36	38.82	46.00	-7.18	QP	199	257
7	*	908.5509	78.93	27.34	106.27	46.00	60.27	peak	100	27

Note: No.1 is the fundamental center frequency point of product operation.

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Vertical:

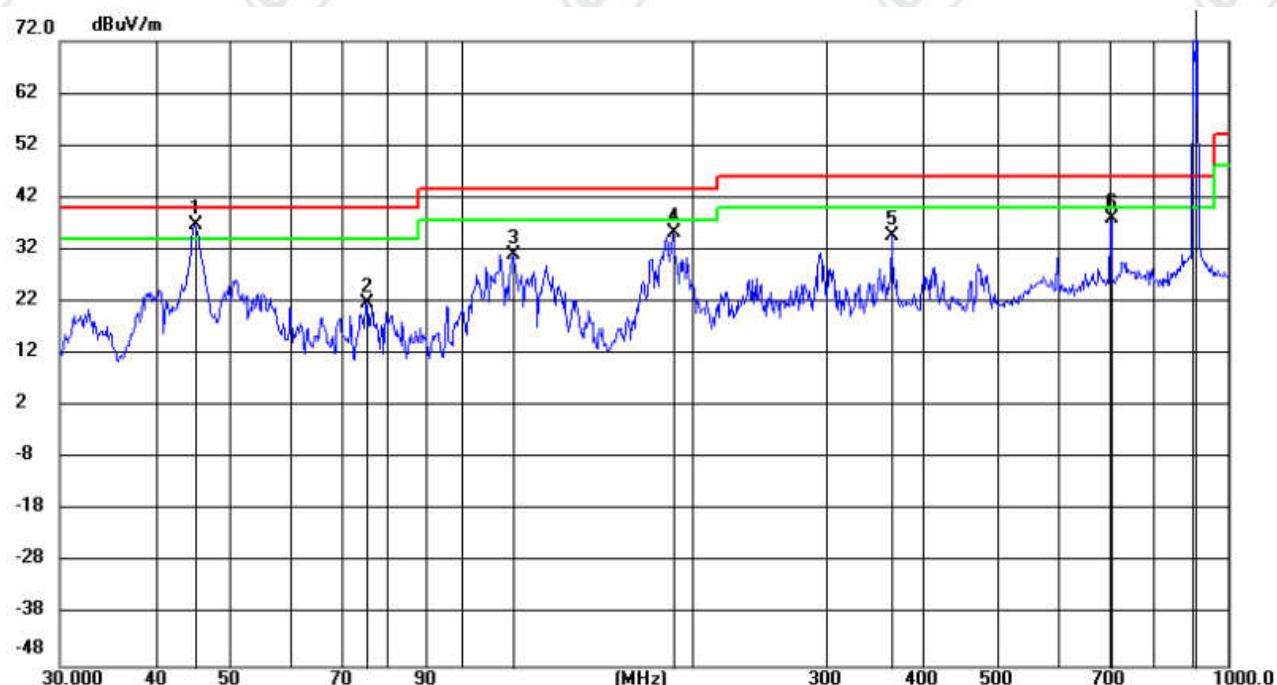


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table		
			Level	Factor	ment					Degree	
			MHz	dBuV	dB/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	44.9950	22.48	13.75	36.23	40.00	-3.77	QP	100	76	
2	!	112.7416	26.58	13.49	40.07	43.50	-3.43	QP	100	161	
3		189.5058	21.15	12.71	33.86	43.50	-9.64	QP	100	108	
4		294.4233	9.99	16.37	26.36	46.00	-19.64	QP	100	97	
5		400.7128	12.61	19.59	32.20	46.00	-13.80	QP	100	171	
6		731.1507	9.65	24.45	34.10	46.00	-11.90	QP	100	97	
7	*	908.5509	78.93	27.34	106.27	46.00	60.27	peak	200	7	

Note: No.1 is the fundamental center frequency point of product operation.

Test channel:	908.42MHz
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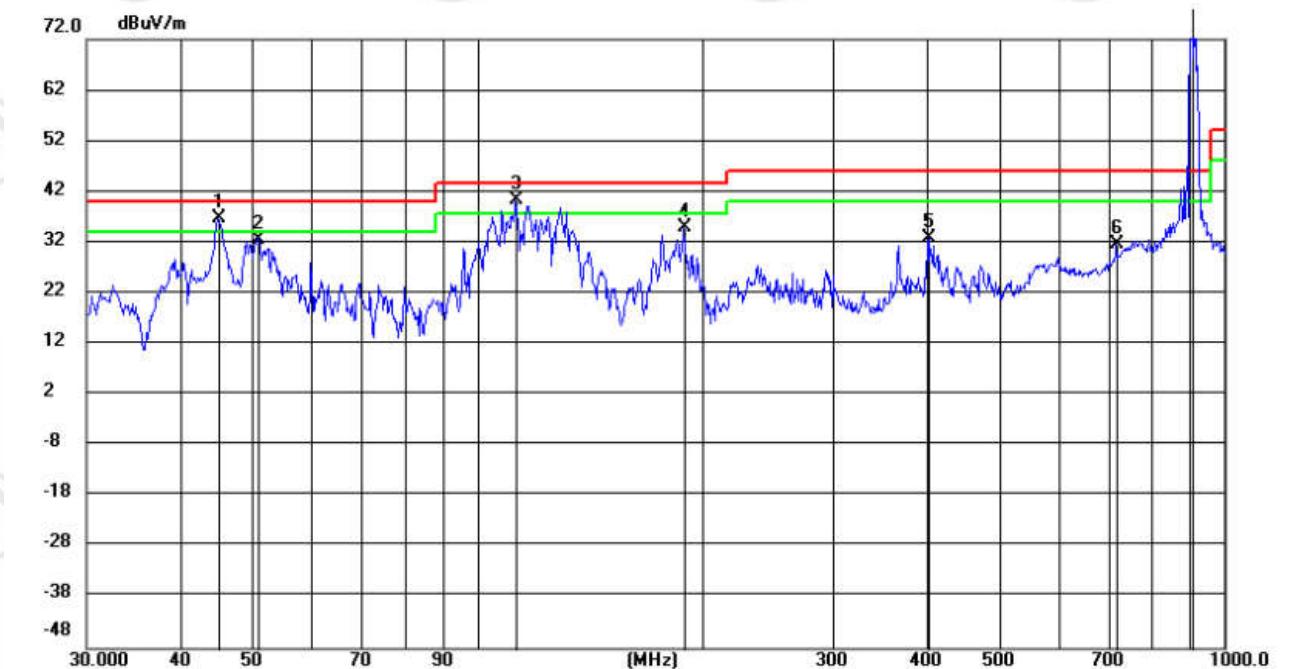
Horizontal:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table		
			Level	Factor	ment					Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	45.0345	22.92	13.76	36.68	40.00	-3.32	QP	200	352	
2		75.4463	11.59	10.06	21.65	40.00	-18.35	QP	200	24	
3		117.0109	18.60	12.38	30.98	43.50	-12.52	QP	200	193	
4		189.5390	22.68	12.71	35.39	43.50	-8.11	QP	100	164	
5		365.4749	16.02	18.55	34.57	46.00	-11.43	QP	100	164	
6		704.3495	13.74	24.26	38.00	46.00	-8.00	QP	100	7	
7	*	908.5509	78.93	27.34	106.27	46.00	60.27	peak	100	28	

Note: No.1 is the fundamental center frequency point of product operation.

Vertical:

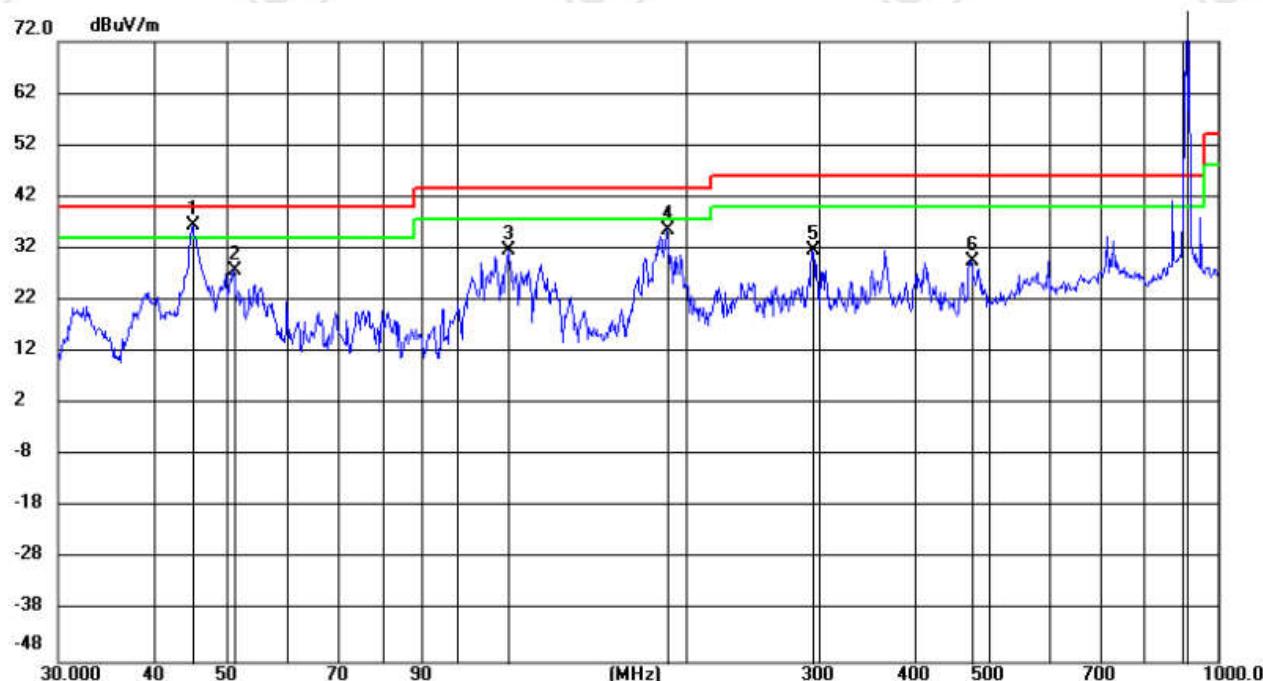


No.	Mk.	Freq.	Reading	Correct	Measure-	Margin	Antenna		Table	Degree	
			Level	Factor	ment		Height	Height	Degree		
			MHz	dBuV	dB/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	45.0030	22.91	13.76	36.67	40.00	-3.33	QP	100	109	
2		50.8438	18.23	14.47	32.70	40.00	-7.30	QP	100	56	
3	!	112.7218	26.95	13.49	40.44	43.50	-3.06	QP	100	0	
4		189.3065	22.15	12.68	34.83	43.50	-8.67	QP	100	88	
5		401.9089	13.31	19.61	32.92	46.00	-13.08	QP	100	151	
6		717.3106	7.36	24.35	31.71	46.00	-14.29	QP	100	246	
7	*	908.5509	78.93	27.34	106.27	46.00	60.27	peak	200	7	

Note: No.1 is the fundamental center frequency point of product operation.

Test channel:	912MHz
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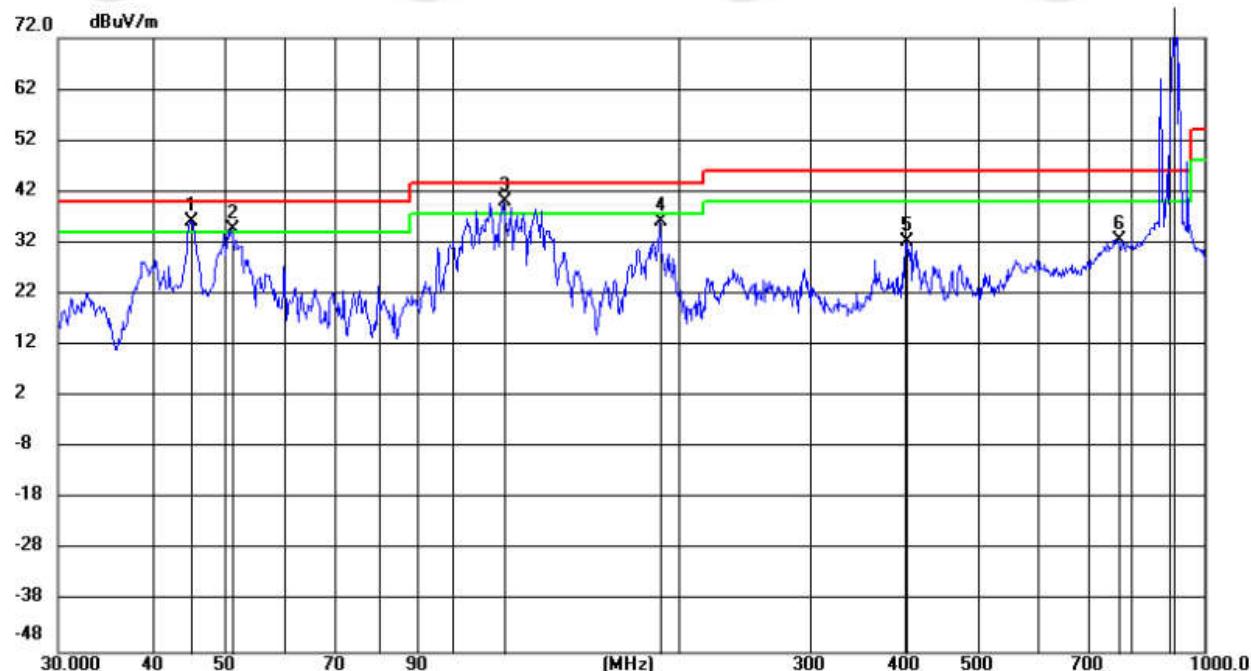
Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	Antenna Height	Table Degree		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	45.0741	22.69	13.77	36.46	40.00	-3.54	QP	199	352	
2		51.0850	13.46	14.44	27.90	40.00	-12.10	QP	199	162	
3		117.3191	19.31	12.30	31.61	43.50	-11.89	QP	199	151	
4		189.4061	23.00	12.69	35.69	43.50	-7.81	QP	100	154	
5		293.5985	15.38	16.34	31.72	46.00	-14.28	QP	100	228	
6		474.3333	9.05	20.50	29.55	46.00	-16.45	QP	199	236	
7	*	912.0621	78.96	27.35	106.31	46.00	60.31	peak	100	28	

Note: No.1 is the fundamental center frequency point of product operation.

Vertical:

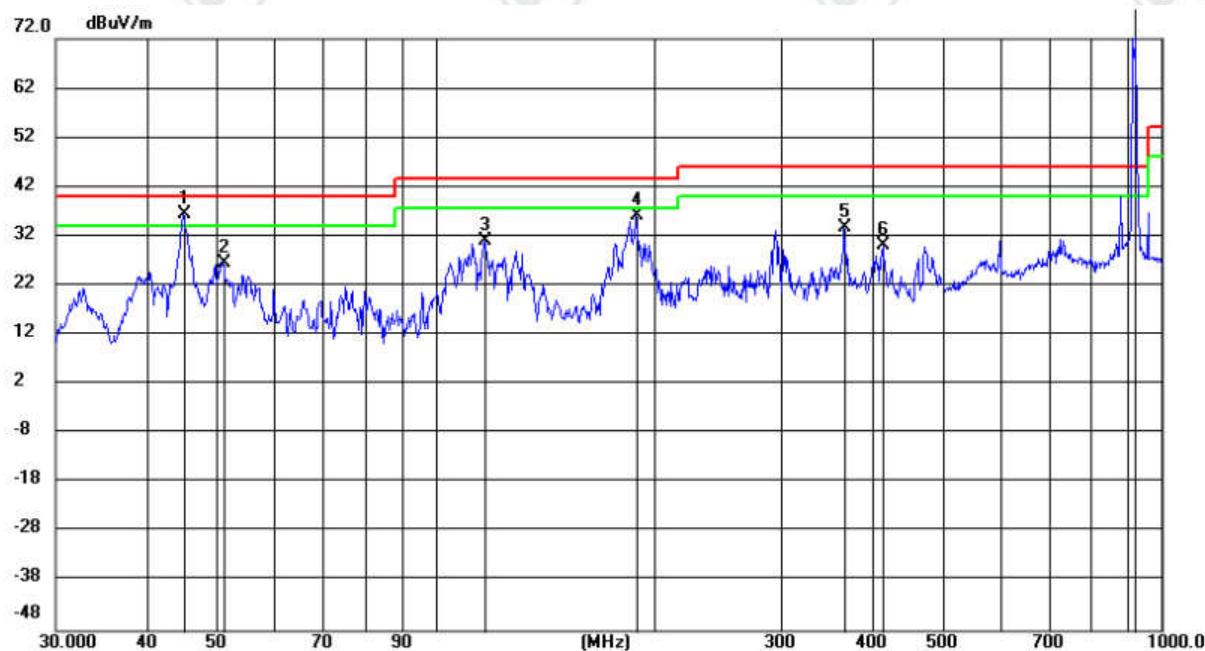


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table	Degree		
			Level	Factor	ment							
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	45.1057	22.45	13.77	36.22	40.00	-3.78	QP	100	108		
2	!	51.0582	20.33	14.44	34.77	40.00	-5.23	QP	100	65		
3	!	117.6900	27.75	12.20	39.95	43.50	-3.55	QP	100	246		
4		189.5390	23.33	12.71	36.04	43.50	-7.46	QP	100	151		
5		402.2614	12.67	19.62	32.29	46.00	-13.71	QP	100	172		
6		769.5573	7.79	24.73	32.52	46.00	-13.48	QP	100	352		
7	*	912.0621	78.96	27.35	106.31	46.00	60.31	peak	200	7		

Note: No.1 is the fundamental center frequency point of product operation.

Test channel:	920MHz
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Horizontal:



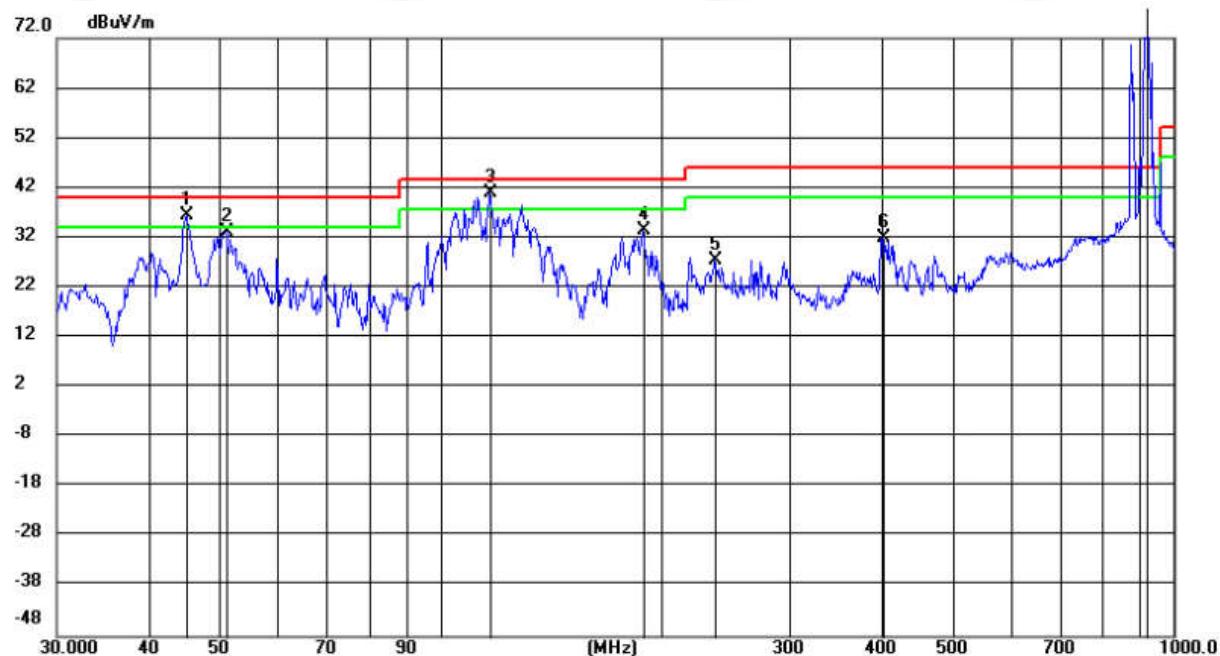
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table		
			Level	Factor	ment						
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	45.0108	22.63	13.76	36.39	40.00	-3.61	QP	199	352	
2		51.0671	12.21	14.44	26.65	40.00	-13.35	QP	199	151	
3		116.9904	18.74	12.38	31.12	43.50	-12.38	QP	199	193	
4		189.4061	23.34	12.69	36.03	43.50	-7.47	QP	100	166	
5		365.9879	15.05	18.56	33.61	46.00	-12.39	QP	100	49	
6		413.5605	10.30	19.75	30.05	46.00	-15.95	QP	100	176	
7	*	920.0927	78.96	27.38	106.34	46.00	60.34	peak	100	38	

Note: No.1 is the fundamental center frequency point of product operation.

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Vertical:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table		
			Level	Factor	ment				Height	Degree	
			MHz	dBuV	dB/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	45.1374	22.74	13.78	36.52	40.00	-3.48	QP	100	76	
2		51.1030	18.71	14.44	33.15	40.00	-6.85	QP	100	118	
3	!	116.9290	28.54	12.40	40.94	43.50	-2.56	QP	100	76	
4		189.3397	20.85	12.68	33.53	43.50	-9.97	QP	200	92	
5		236.8523	13.31	14.18	27.49	46.00	-18.51	QP	100	341	
6		400.4319	12.39	19.59	31.98	46.00	-14.02	QP	100	172	
7	*	920.0928	78.96	27.38	106.34	46.00	60.34	peak	200	7	

Note: No.1 is the fundamental center frequency point of product operation.

**Above 1GHz:**

Test mode:					916Mhz				
NO	Freq. [MHz]	Factor [dB]	Reading [dB $\mu$ V]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Result	Polarity	Remark
1	1110.5407	-22.82	63.68	40.86	74.00	33.14	PASS	Horizontal	PK
2	1829.922	-20.07	60.86	40.79	74.00	33.21	PASS	Horizontal	PK
3	3016.2511	-14.54	54.43	39.89	74.00	34.11	PASS	Horizontal	PK
4	5489.666	-6.49	49.20	42.71	74.00	31.29	PASS	Horizontal	PK
5	7320.188	-2.86	49.43	46.57	74.00	27.43	PASS	Horizontal	PK
6	11821.0881	2.43	45.04	47.47	74.00	26.53	PASS	Horizontal	PK
7	1399.6266	-21.69	62.23	40.54	74.00	33.46	PASS	Vertical	PK
8	1830.0553	-20.06	66.14	46.08	74.00	27.92	PASS	Vertical	PK
9	3189.8127	-14.49	58.93	44.44	74.00	29.56	PASS	Vertical	PK
10	4575.055	-9.50	51.97	42.47	74.00	31.53	PASS	Vertical	PK
11	7320.188	-2.86	51.76	48.90	74.00	25.10	PASS	Vertical	PK
12	12315.7711	3.80	44.59	48.39	74.00	25.61	PASS	Vertical	PK

Test mode:					908.4Mhz				
NO	Freq. [MHz]	Factor [dB]	Reading [dB $\mu$ V]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Result	Polarity	Remark
1	1288.4192	-22.14	64.06	41.92	74.00	32.08	PASS	Horizontal	PK
2	1866.0577	-19.97	56.09	36.12	74.00	37.88	PASS	Horizontal	PK
3	3910.0607	-11.96	52.92	40.96	74.00	33.04	PASS	Horizontal	PK
4	6280.7687	-4.82	47.40	42.58	74.00	31.42	PASS	Horizontal	PK
5	7966.9811	-1.38	47.83	46.45	74.00	27.55	PASS	Horizontal	PK
6	11826.9385	2.46	45.50	47.96	74.00	26.04	PASS	Horizontal	PK
7	1246.4164	-22.35	71.87	49.52	74.00	24.48	PASS	Vertical	PK
8	1816.9878	-20.09	62.02	41.93	74.00	32.07	PASS	Vertical	PK
9	3197.6132	-14.46	58.85	44.39	74.00	29.61	PASS	Vertical	PK
10	5450.6634	-6.43	50.34	43.91	74.00	30.09	PASS	Vertical	PK
11	7963.7309	-1.39	50.43	49.04	74.00	24.96	PASS	Vertical	PK
12	12368.4246	4.05	44.23	48.28	74.00	25.72	PASS	Vertical	PK

Test mode:					908.42Mhz				
NO	Freq. [MHz]	Factor [dB]	Reading [dB $\mu$ V]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Result	Polarity	Remark
1	1313.6209	-22.06	71.05	48.99	74.00	25.01	PASS	Horizontal	PK
2	2279.952	-18.28	57.87	39.59	74.00	34.41	PASS	Horizontal	PK
3	3841.8061	-12.14	52.46	40.32	74.00	33.68	PASS	Horizontal	PK
4	5450.6634	-6.43	50.04	43.61	74.00	30.39	PASS	Horizontal	PK
5	8175.645	-1.31	47.16	45.85	74.00	28.15	PASS	Horizontal	PK
6	11325.755	2.36	45.66	48.02	74.00	25.98	PASS	Horizontal	PK
7	1244.4163	-22.36	71.97	49.61	74.00	24.39	PASS	Vertical	PK
8	1816.9878	-20.09	61.51	41.42	74.00	32.58	PASS	Vertical	PK
9	3198.9133	-14.46	58.69	44.23	74.00	29.77	PASS	Vertical	PK
10	4541.9028	-9.61	56.14	46.53	74.00	27.47	PASS	Vertical	PK
11	7996.2331	-1.36	47.73	46.37	74.00	27.63	PASS	Vertical	PK
12	11810.0373	2.40	46.95	49.35	74.00	24.65	PASS	Vertical	PK

Test mode:					912Mhz				
NO	Freq. [MHz]	Factor [dB]	Reading [dB $\mu$ V]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Result	Polarity	Remark
1	1249.35	-22.36	68.73	46.37	74.00	27.63	PASS	Horizontal	PK
2	2279.8187	-18.28	56.74	38.46	74.00	35.54	PASS	Horizontal	PK
3	3759.9007	-12.78	52.29	39.51	74.00	34.49	PASS	Horizontal	PK
4	5137.9925	-7.41	48.71	41.30	74.00	32.70	PASS	Horizontal	PK
5	7714.1143	-1.62	46.92	45.30	74.00	28.70	PASS	Horizontal	PK
6	11893.2429	2.73	44.73	47.46	74.00	26.54	PASS	Horizontal	PK
7	1365.8911	-21.90	62.51	40.61	74.00	33.39	PASS	Vertical	PK
8	2389.6926	-17.90	61.23	43.33	74.00	30.67	PASS	Vertical	PK
9	3187.2125	-14.50	60.29	45.79	74.00	28.21	PASS	Vertical	PK
10	5476.6651	-6.48	49.89	43.41	74.00	30.59	PASS	Vertical	PK
11	8399.26	-0.85	45.70	44.85	74.00	29.15	PASS	Vertical	PK
12	12347.6232	4.14	44.60	48.74	74.00	25.26	PASS	Vertical	PK

Test mode:					920Mhz				
NO	Freq. [MHz]	Factor [dB]	Reading [dB $\mu$ V]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Result	Polarity	Remark
1	1309.8873	-22.06	69.00	46.94	74.00	27.06	PASS	Horizontal	PK
2	2279.952	-18.28	57.29	39.01	74.00	34.99	PASS	Horizontal	PK
3	3865.8577	-12.05	52.19	40.14	74.00	33.86	PASS	Horizontal	PK
4	5111.9908	-7.53	49.12	41.59	74.00	32.41	PASS	Horizontal	PK
5	8459.0639	-0.54	45.89	45.35	74.00	28.65	PASS	Horizontal	PK
6	12359.324	4.12	44.27	48.39	74.00	25.61	PASS	Horizontal	PK
7	1250.0167	-22.36	68.20	45.84	74.00	28.16	PASS	Vertical	PK
8	1770.8514	-20.33	66.28	45.95	74.00	28.05	PASS	Vertical	PK
9	2503.7002	-17.14	57.77	40.63	74.00	33.37	PASS	Vertical	PK
10	3187.2125	-14.50	59.51	45.01	74.00	28.99	PASS	Vertical	PK
11	5521.5181	-6.41	52.04	45.63	74.00	28.37	PASS	Vertical	PK
12	10346.7898	1.83	47.56	49.39	74.00	24.61	PASS	Vertical	PK

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:  

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Correct Factor}$$

$$\text{Correct Factor} = \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$
- 2) Scan from 9kHz to 18GHz, 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 .

Report No. : EED32R80742401

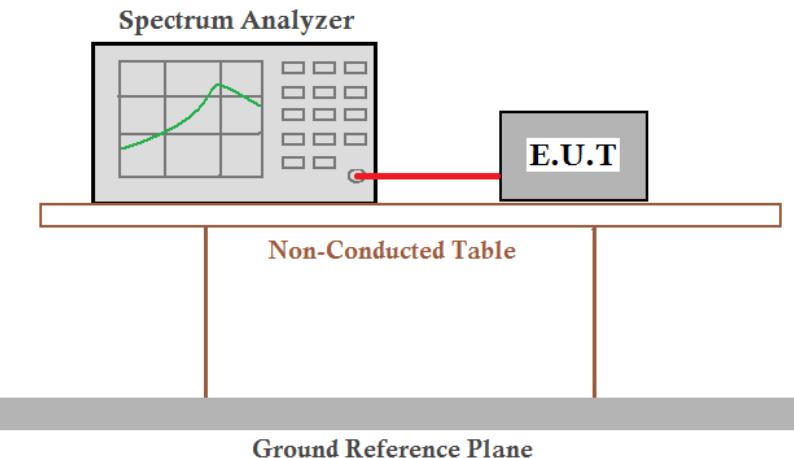
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## 1.3.2 20dB Bandwidth

**Test Requirement:** 47 CFR Part 15C Section 15.215

**Test Method:** ANSI C63.10: 2013

**Test Setup:**



Remark: Offset=Cable loss+ attenuation factor.

- 1) The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 2) Set to the maximum power setting and enable the EUT transmit continuously.
- 3) Use the following spectrum analyzer settings for 20dB Bandwidth measurement.  
Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a test channel;  $1\% \leq RBW \leq 5\%$  of the 20 dB bandwidth;  $VBW \geq 3RBW$ ;  
Sweep = auto; Detector function = peak; Trace = max hold.
- 4) Measure and record the results in the test report.

**Test Procedure:** N/A

**Test Mode:** Transmitter mode

**Test Results:** Pass

The test data please refer to Appendix: EED32R8072401 Appendix A.

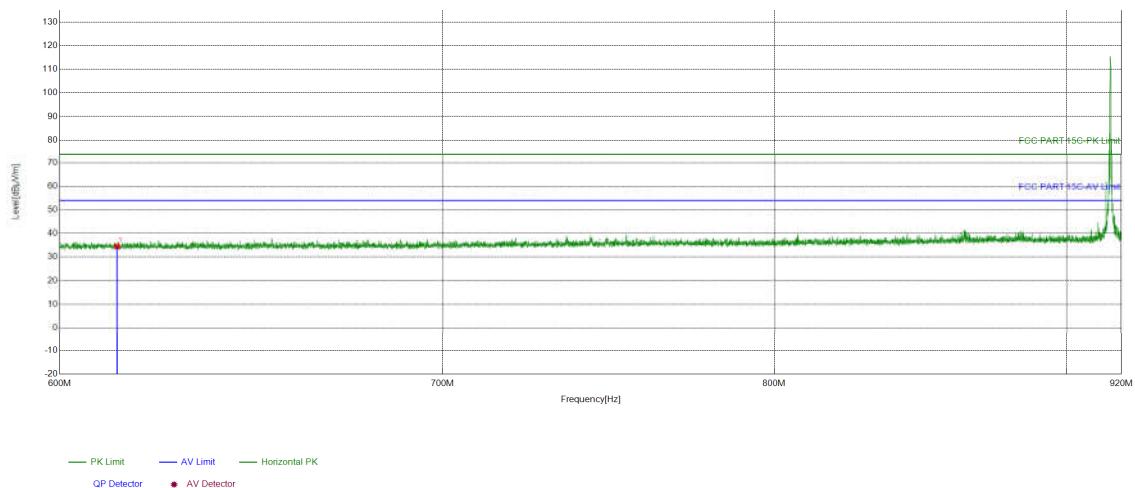
Report No. : EED32R80742401

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**Test plot as follows:**

Test_Mode	GFSK	Test_Frequency	916MHz
Tset_Engineer	chenjun	Test_Date	2025/05/30

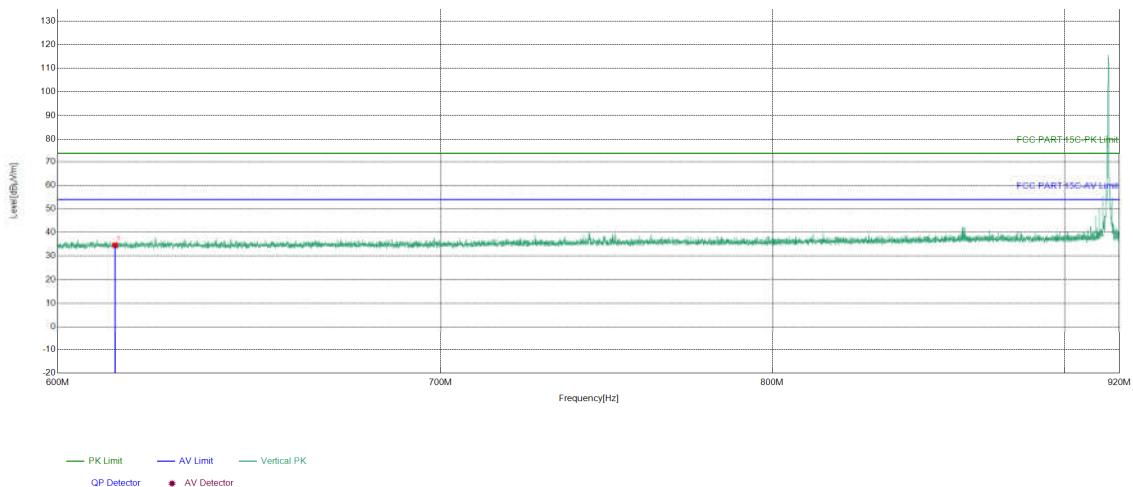
**Test Graph**



<b>Suspected List</b>									
NO	Freq. [MHz]	Factor [dB]	Reading [dB $\mu$ V]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	42.99	34.50	74.00	39.50	PASS	Horizontal	PK

Test_Mode	GFSK	Test_Frequency	916Mhz
Tset_Engineer	chenjun	Test_Date	2025/05/30

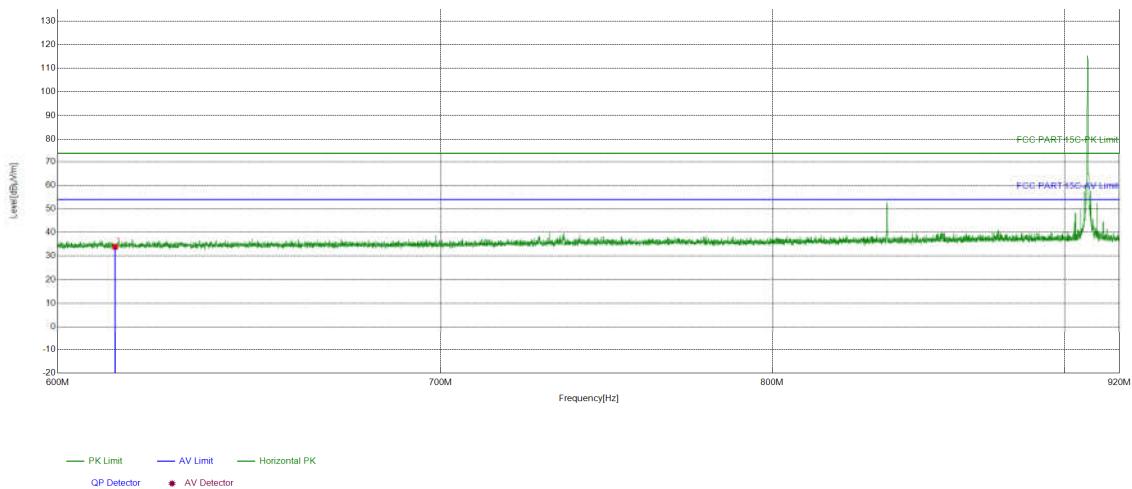
**Test Graph**



<b>Suspected List</b>									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	43.07	34.58	74.00	39.42	PASS	Vertical	PK

Test_Mode	FSK	Test_Frequency	908.4Mhz
Tset_Engineer	chenjun	Test_Date	2025/05/30

### Test Graph

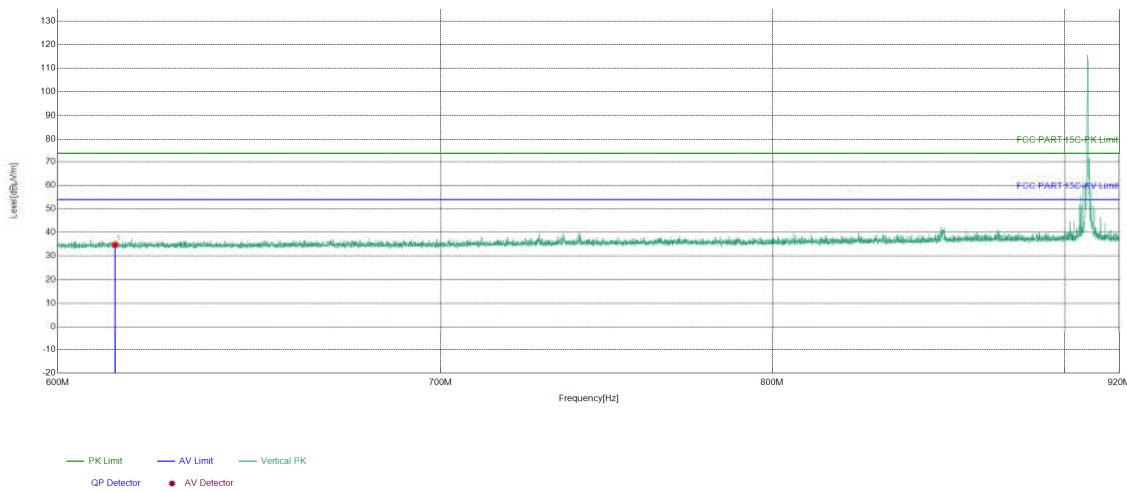


### Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	42.40	33.91	74.00	40.09	PASS	Horizontal	PK

Test_Mode	FSK	Test_Frequency	908.4Mhz
Tset_Engineer	chenjun	Test_Date	2025/05/30

**Test Graph**

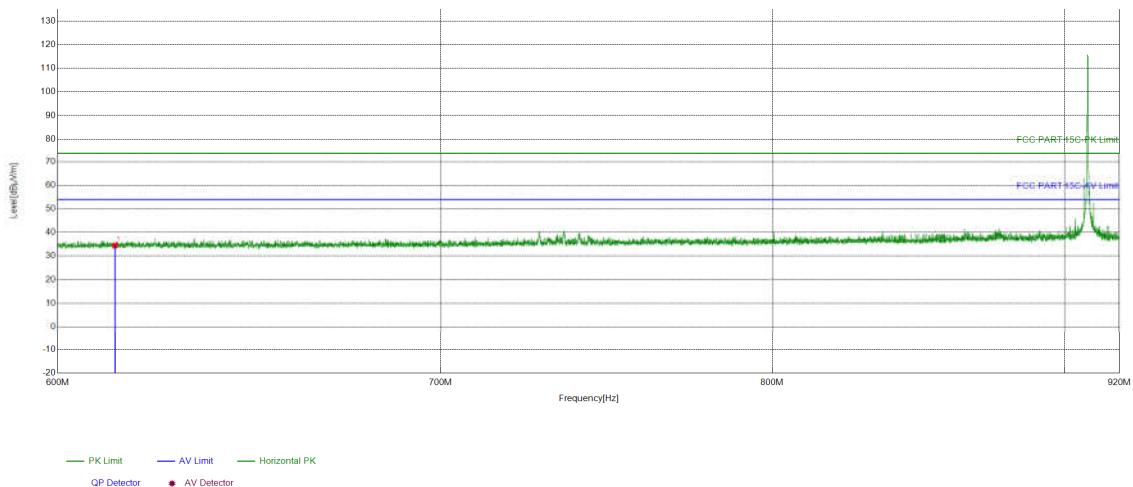


**Suspected List**

NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	43.32	34.83	74.00	39.17	PASS	Vertical	PK

Test_Mode	FSK	Test_Frequency	908.42Mhz
Test_Engineer	chenjun	Test_Date	2025/05/30

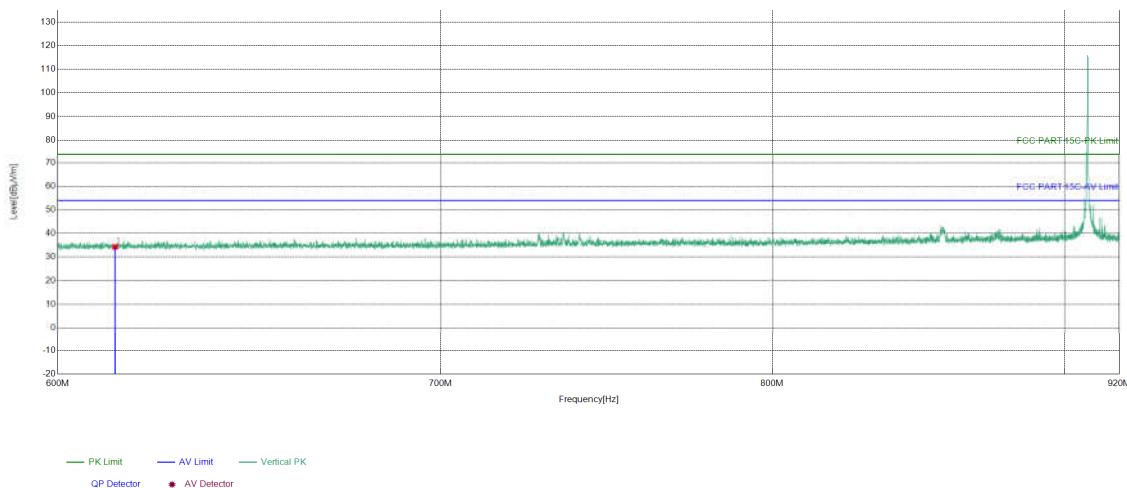
**Test Graph**



<b>Suspected List</b>									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	42.97	34.48	74.00	39.52	PASS	Horizontal	PK

Test_Mode	FSK	Test_Frequency	908.42Mhz
Tset_Engineer	chenjun	Test_Date	2025/05/30

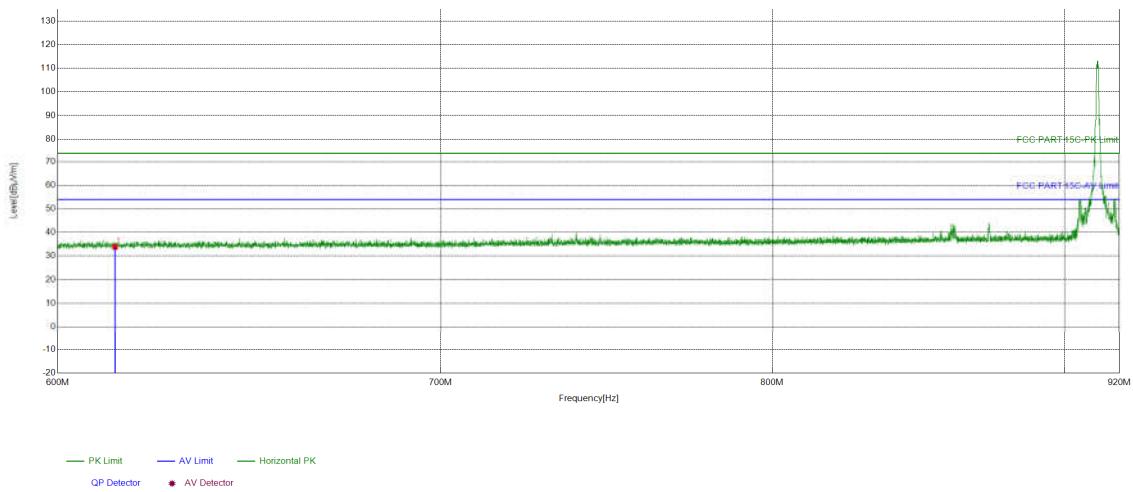
**Test Graph**



<b>Suspected List</b>									
NO	Freq. [MHz]	Factor [dB]	Reading [dB $\mu$ V]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	42.81	34.32	74.00	39.68	PASS	Vertical	PK

Test_Mode	OQPSK	Test_Frequency	912Mhz
Tset_Engineer	chenjun	Test_Date	2025/05/30

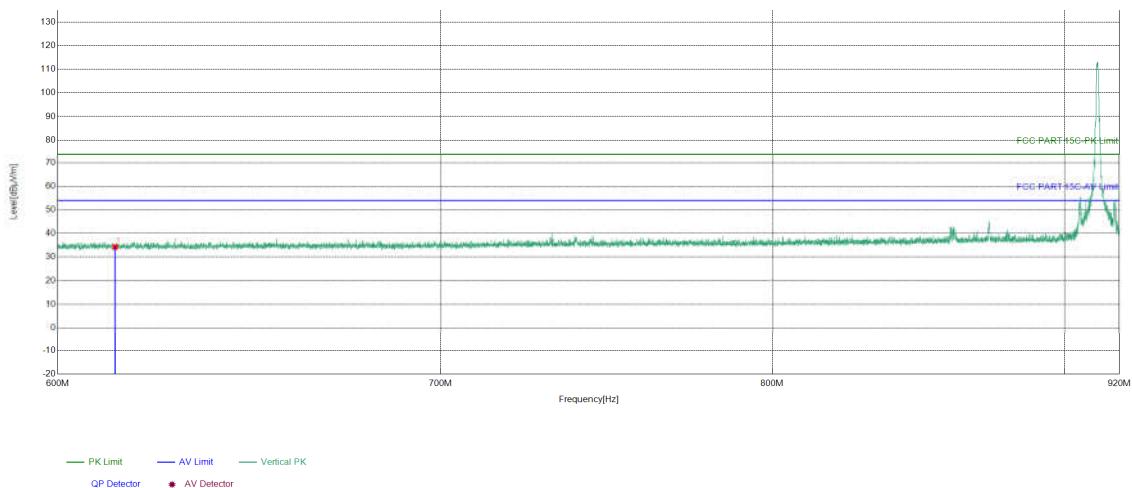
**Test Graph**



<b>Suspected List</b>									
NO	Freq. [MHz]	Factor [dB]	Reading [dB $\mu$ V]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	42.35	33.86	74.00	40.14	PASS	Horizontal	PK

Test_Mode	OQPSK	Test_Frequency	912Mhz
Tset_Engineer	chenjun	Test_Date	2025/05/30

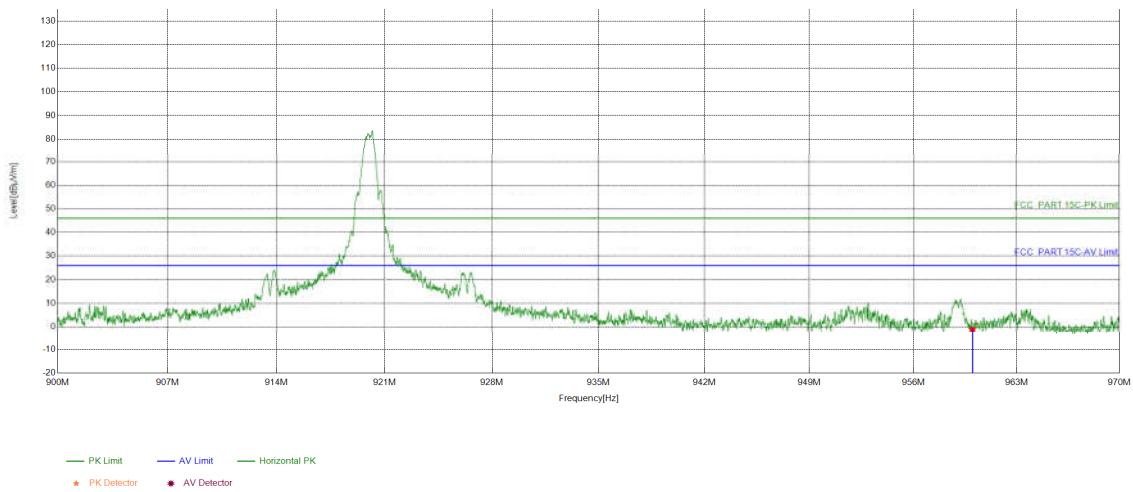
**Test Graph**



<b>Suspected List</b>									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	42.77	34.28	74.00	39.72	PASS	Vertical	PK

Test_Mode	OQPSK	Test_Frequency	920Mhz
Tset_Engineer	chenjun	Test_Date	2025/05/30

### Test Graph

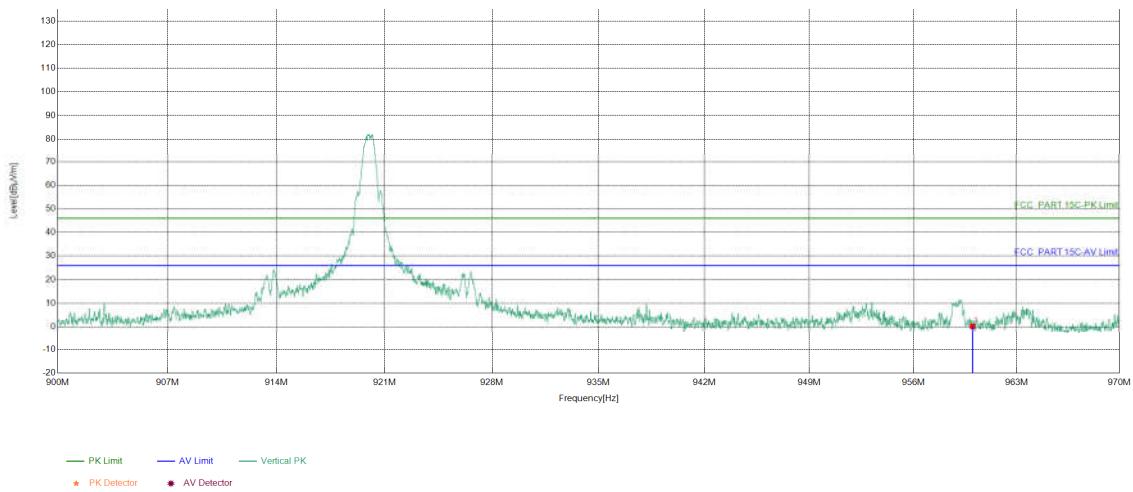


### Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dB $\mu$ V]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Result	Polarity	Remark
1	960	-35.46	34.23	-1.23	46.00	47.23	PASS	Horizontal	PK

Test_Mode	OQPSK	Test_Frequency	920Mhz
Tset_Engineer	chenjun	Test_Date	2025/05/30

### Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	960	-35.46	35.68	0.22	46.00	45.78	PASS	Vertical	PK

## Statement

1. This report is considered invalid without approved signature, special seal and the seal on the perforation;
2. The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;
3. The result(s) shown in this report refer(s) only to the sample(s) tested;
4. Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule stated in ILAC-G8:09/2019/CNAS-GL015:2022;
5. Without written approval of CTI, this report can't be reproduced except in full;

\*\*\* End of Report \*\*\*