

# FCC Part 15C

## Measurement and Test Report

For

**MICA ELECTRONIC CORP /DBA VOCOPRO**

**1728 CURTISS COURT, LA VERNE, CA**

**FCC ID: 2AAMDHYBRID-QUAD-H**

**FCC Rule(s):** FCC Part 15.249

**Product Description:** HANDHELD

**Tested Model:** HYBRID-QUAD-H

**Report No.:** STR16048017I

**Tested Date:** 2016-04-26 to 2016-05-06

**Issued Date:** 2016-05-06

**Tested By:** Iven Guo / Engineer

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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

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## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: MICA ELECTRONIC CORP /DBA VOCOPRO  
Address of applicant: 1728 CURTISS COURT, LA VERNE, CA

Manufacturer: ENPING ENBAO ELECTRONIC CO.,LTD.  
Address of manufacturer: B3,3 Zone, Enping Park, Industrial Transfer Park of Jiangmen, Guangdong, China

#### General Description of EUT

Product Name:	HANDHELD
Brand Name:	Vocopro
Model No.:	HYBRID-QUAD-H
Adding Model:	/
Rated Voltage:	Battery DC 3V

*Note: The test data is gathered from a production sample provided by the manufacturer.*

#### Technical Characteristics of EUT

Frequency Range:	902.7MHz-910.7MHz
Max. Field Strength:	95.28dBuV/m
Modulation:	FM
Channel Separation:	/
Antenna Type:	Internal antenna
Antenna Gain:	0dBi
Lowest Internal Frequency of EUT:	24.576MHz

## 1.2 Test Standards

The following report is prepared on behalf of the MICA ELECTRONIC CORP /DBA VOCOPRO in accordance with FCC Part 15, Subpart B, Subpart C, and section 15.107, 15.203, 15.205, 15.207, 15.209 and 15.249 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.107, 15.203, 15.205, 15.207, 15.209 and 15.249 of the Federal Communication Commissions rules.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission, should be checked to ensure compliance has been maintained.

## 1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices, and ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

## 1.4 Test Facility

### **FCC – Registration No.: 934118**

Shenzhen SEM.Test Technology Co., Ltd. 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 and the Registration is 934118.

### **Industry Canada (IC) Registration No.: 11464A**

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

### **CNAS Registration No.: L4062**

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2<sup>nd</sup> Road, Bao'an District, Shenzhen, P.R.C (518101).

## 1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	Channel	902.7MHz
TM2	Channel	904.6MHz
TM3	Channel	907.5MHz
TM4	Channel	910.7MHz

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

## 1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Conducted Spurious Emission	Conducted	$\pm 2.17\text{dB}$
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$

## 1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2015-06-17	2016-06-16
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2015-06-17	2016-06-16
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2015-06-17	2016-06-16
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2015-06-17	2016-06-16
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2015-06-17	2016-06-16
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2015-06-17	2016-06-16
SEMT-1042	Horn Antenna	ETS	3117	00086197	2015-06-17	2016-06-16
SEMT-1121	Horn Antenna	ETS	3116B	00088203	2015-06-17	2016-06-16
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2015-06-17	2016-06-16
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2015-06-17	2016-06-16
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2015-06-17	2016-06-16
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2015-06-17	2016-06-16

## 2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§15.207(a)	Conducted Emission	N/A
§15.209(a)(f)	Radiated Spurious Emissions	Compliant
§15.249(a)	Field Strength of Emissions	Compliant
§15.249(d)	Out of Band Emission	Compliant
§15.215 (c)	Emission Bandwidth	Compliant

N/A: not applicable

### **3. Antenna Requirements**

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#### **3.1 Standard Applicable**

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

#### **3.2 Test Result**

This product has an internal antenna, fulfill the requirement of this section.



## 4. Radiated Emissions

### 4.1 Standard Applicable

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of Harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

(d) 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 §15.209, whichever is the lesser attenuation.

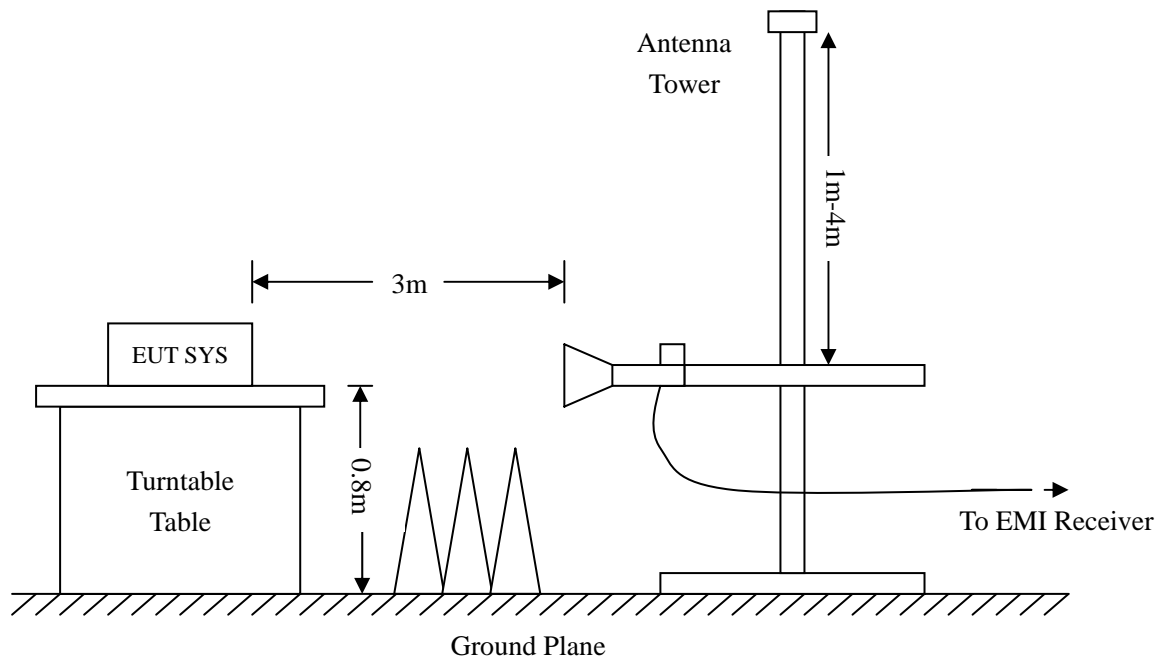
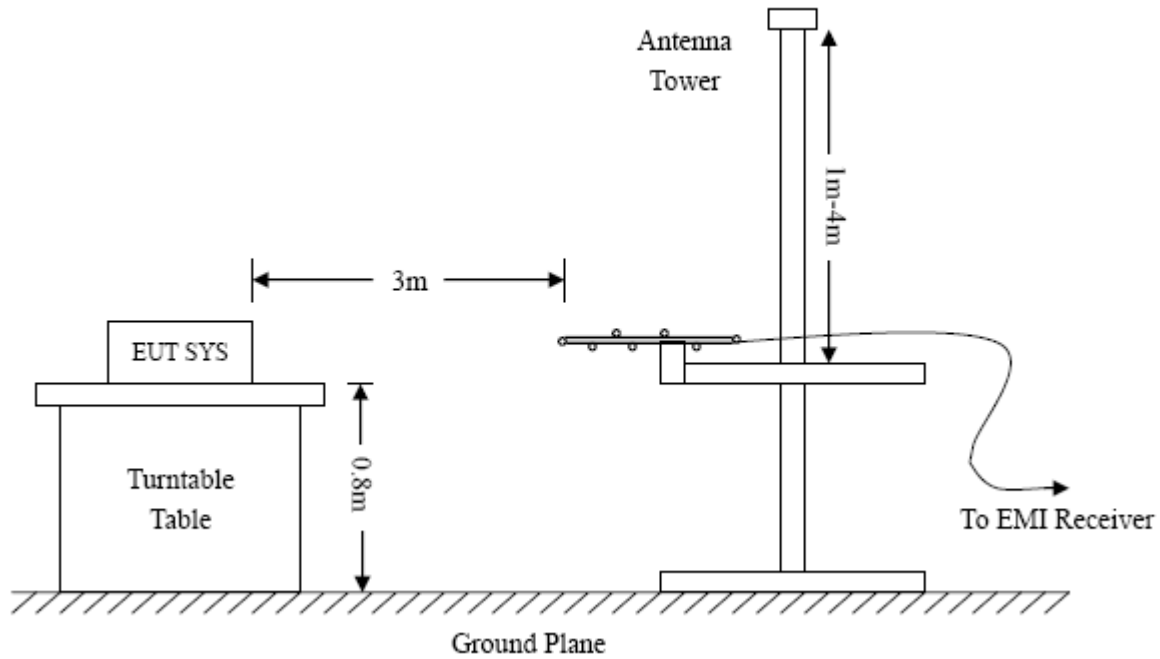
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

### 4.2 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.205 15.249(a) and FCC Part 15.209 Limit.

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

The spacing between the peripherals was 10 cm.



Frequency :9kHz-30MHz  
 RBW=10KHz,  
 VBW =30KHz  
 Sweep time= Auto  
 Trace = max hold  
 Detector function = peak

Frequency :30MHz-1GHz  
 RBW=120KHz,  
 VBW=300KHz  
 Sweep time= Auto  
 Trace = max hold  
 Detector function = peak, QP

Frequency :Above 1GHz  
 RBW=1MHz,  
 VBW=3MHz(Peak), 10Hz(AV)  
 Sweep time= Auto  
 Trace = max hold  
 Detector function = peak, AV

### 4.3 Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB $\mu$ V means the emission is 6dB $\mu$ V below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15C Limit}$$

### 4.4 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	60 %
ATM Pressure:	1012 mbar

### 4.5 Summary of Test Results/Plots

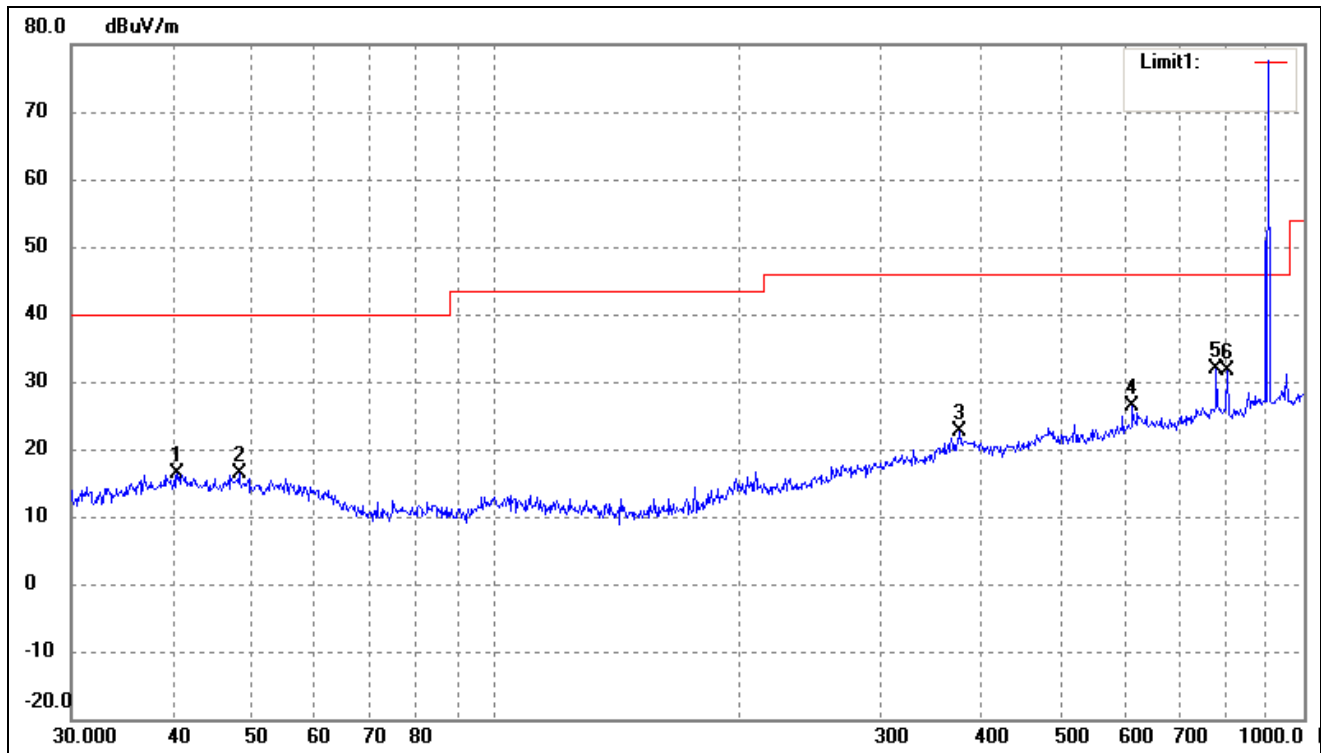
According to the data below, the FCC Part 15.205, 15.209 and 15.249 standards, and had the worst margin of:

**-4.87 dB at 810.2654 in the Vertical polarization, TM3 mode, 9 kHz to 25 GHz, 3Meters**

*Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

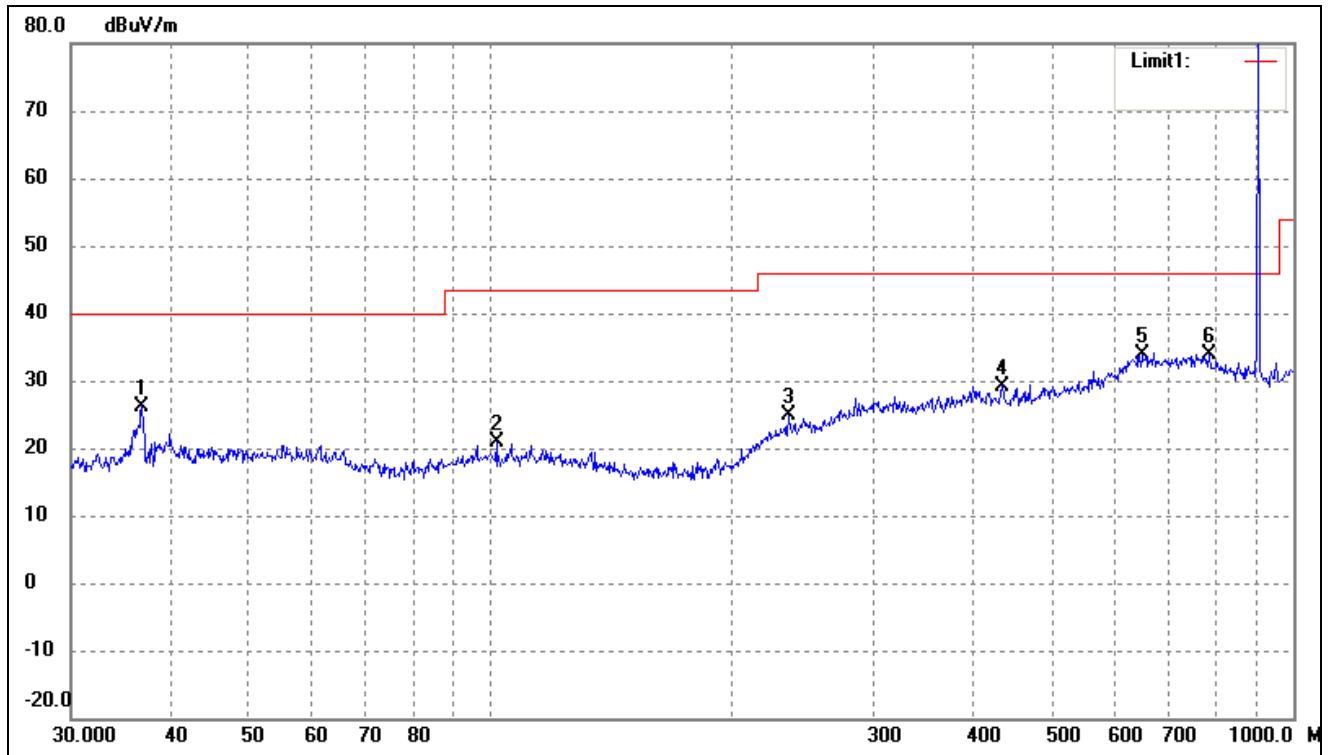
### Plot of Radiated Emissions Test Data (30MHz to 1GHz)

EUT: *HANDHELD*  
 Tested Model: *HYBRID-QUAD-H*  
 Operating Condition: *Transmitting Channel (902.7MHz)*  
 Comment: *DC 3.0V*  
 Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	40.5591	24.13	-7.70	16.43	40.00	-23.57	264	100	peak
2	48.3318	24.61	-8.21	16.40	40.00	-23.60	113	100	peak
3	375.9385	24.94	-2.33	22.61	46.00	-23.39	287	100	peak
4	614.2142	25.58	0.83	26.41	46.00	-19.59	185	100	peak
5	779.6068	28.94	2.88	31.82	46.00	-14.18	178	100	peak
6	804.6028	29.92	1.81	31.73	46.00	-14.27	168	100	peak

Test Specification: Vertical

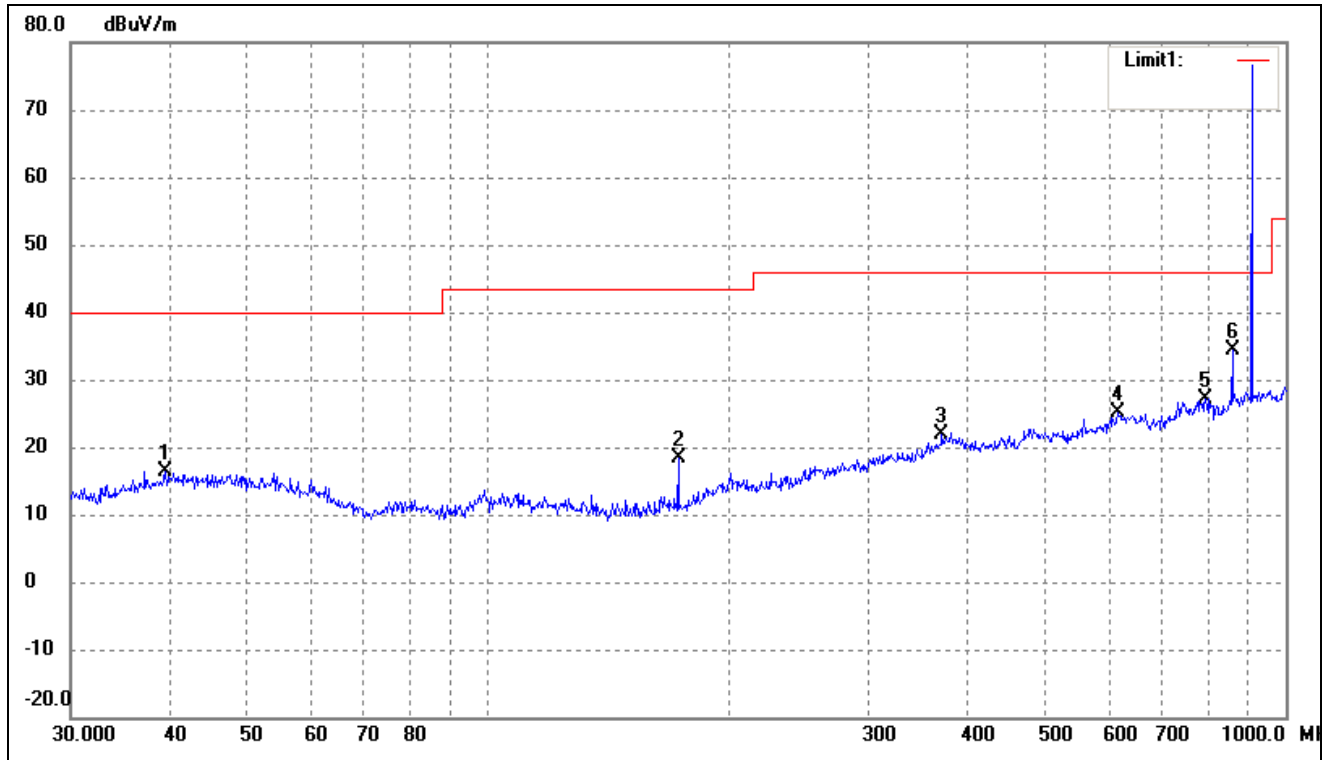


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	36.7662	21.80	4.45	26.25	40.00	-13.75	264	100	peak
2	101.6443	15.88	4.91	20.79	43.50	-22.71	113	100	peak
3	234.9909	16.16	8.61	24.77	46.00	-21.23	287	100	peak
4	434.0651	16.94	12.31	29.25	46.00	-16.75	185	100	peak
5	647.3856	15.87	17.90	33.77	46.00	-12.23	178	100	peak
6	785.0935	17.18	16.65	33.83	46.00	-12.17	168	100	peak

Operating Condition: Transmitting Channel (904.6MHz)

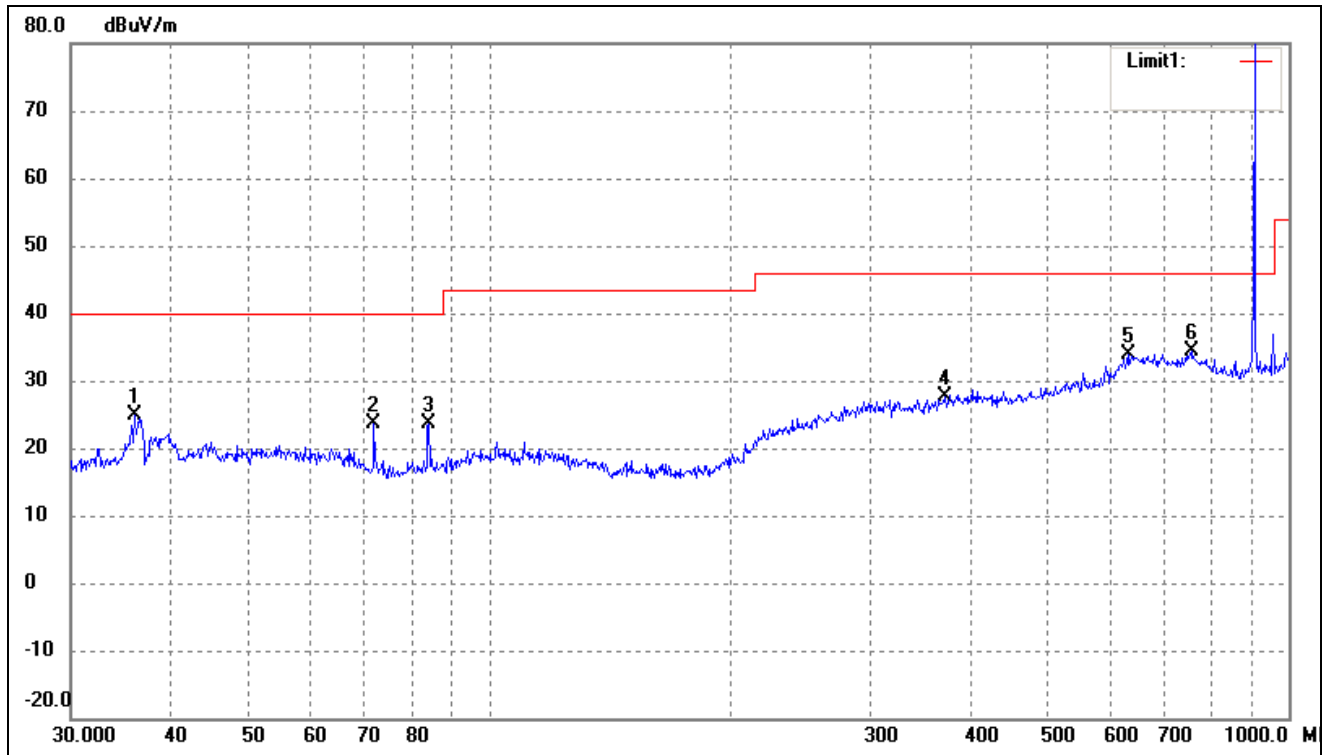
Comment: DC 3.0V

Test Specification: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	39.4372	24.09	-7.82	16.27	40.00	-23.73	162	100	peak
2	173.2051	30.08	-11.68	18.40	43.50	-25.10	200	100	peak
3	370.7023	24.39	-2.63	21.76	46.00	-24.24	158	100	peak
4	616.3718	24.09	0.99	25.08	46.00	-20.92	127	100	peak
5	793.3960	24.98	2.23	27.21	46.00	-18.79	169	100	peak
6	857.0247	31.57	2.78	34.35	46.00	-11.65	169	100	peak

Test Specification: Vertical

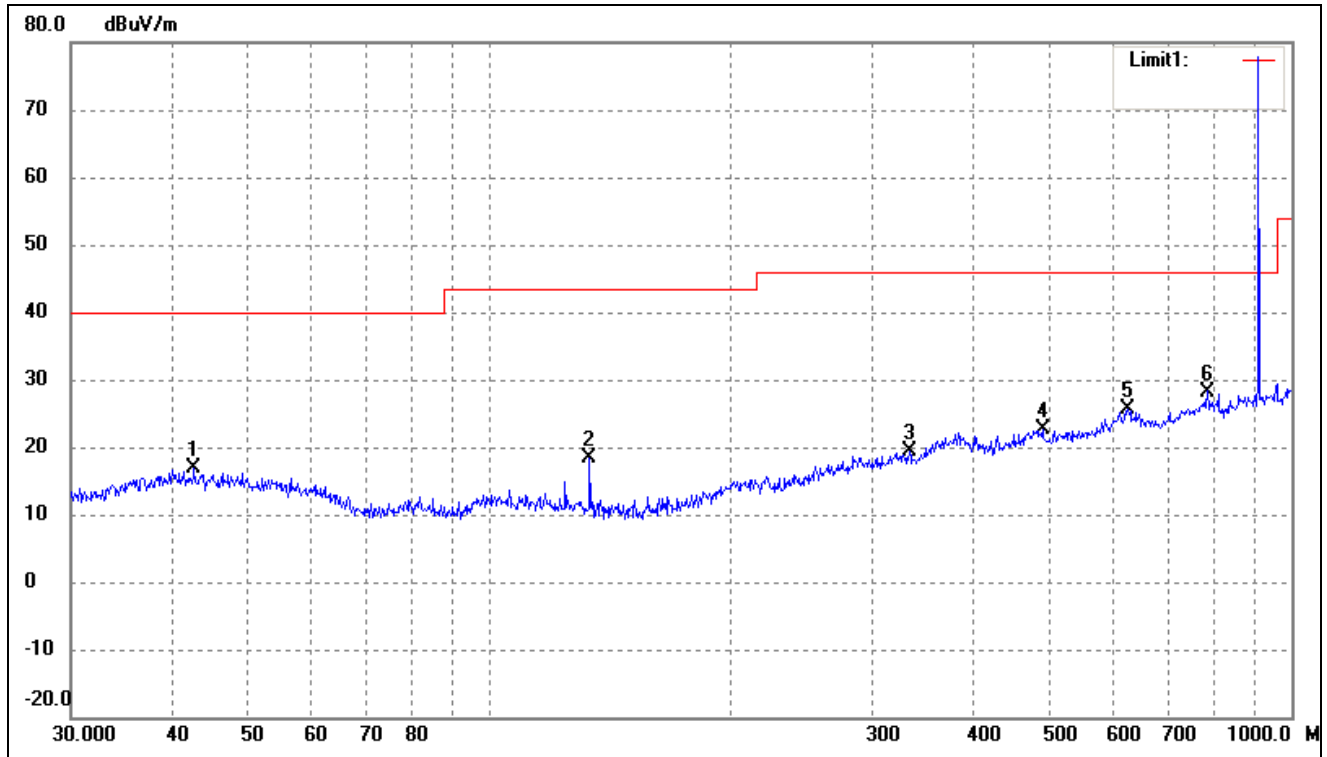


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	36.0007	20.45	4.33	24.78	40.00	-15.22	240	100	peak
2	71.8320	21.01	2.65	23.66	40.00	-16.34	187	100	peak
3	84.1100	21.31	2.41	23.72	40.00	-16.28	220	100	peak
4	372.0045	15.76	11.84	27.60	46.00	-18.40	198	100	peak
5	629.4772	16.11	17.70	33.81	46.00	-12.19	125	100	peak
6	758.0408	16.08	18.23	34.31	46.00	-11.69	145	100	peak

Operating Condition: Transmitting Channel (907.5MHz)

Comment: DC 3.0V

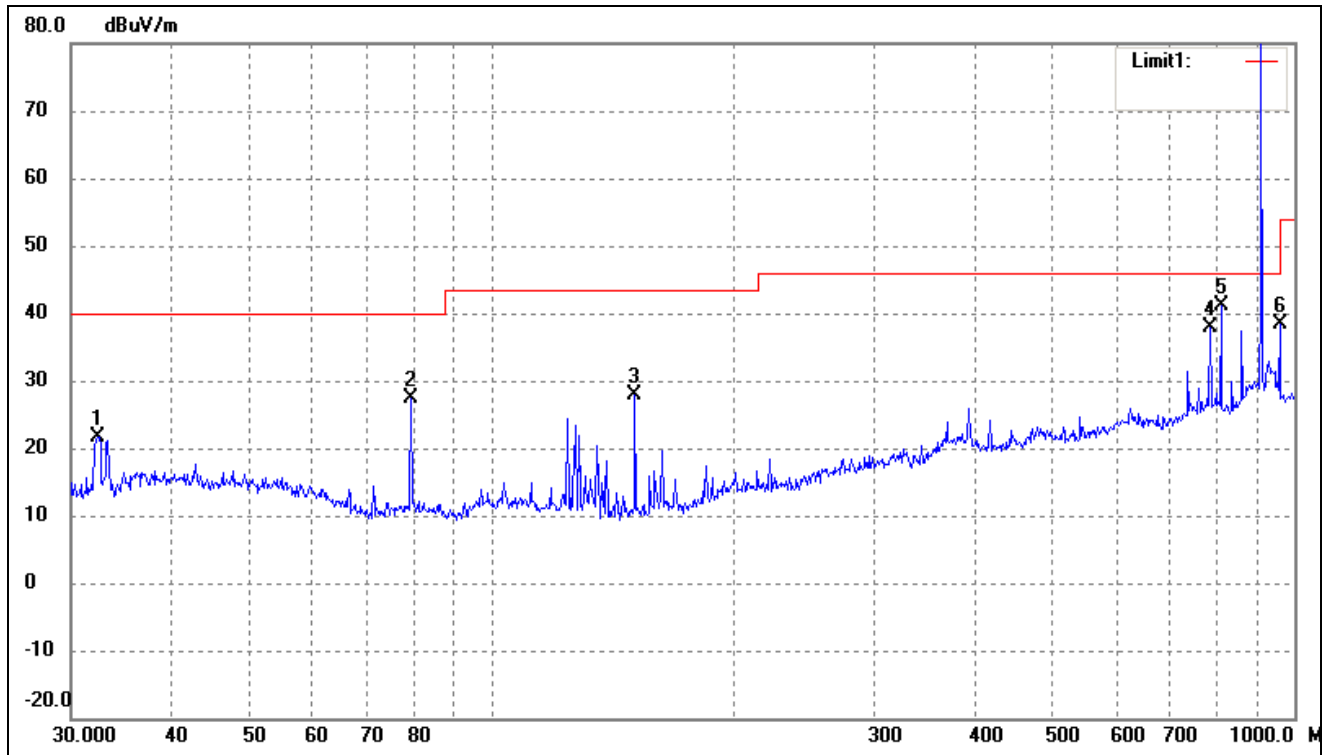
Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	42.7496	24.68	-7.84	16.84	40.00	-23.16	162	100	peak
2	133.1511	30.55	-12.17	18.38	43.50	-25.12	200	100	peak
3	333.6867	24.37	-4.88	19.49	46.00	-26.51	147	100	peak
4	489.0269	24.11	-1.56	22.55	46.00	-23.45	158	100	peak
5	625.0780	24.60	1.11	25.71	46.00	-20.29	169	100	peak
6	785.0935	25.60	2.65	28.25	46.00	-17.75	182	100	peak



Test Specification: Vertical

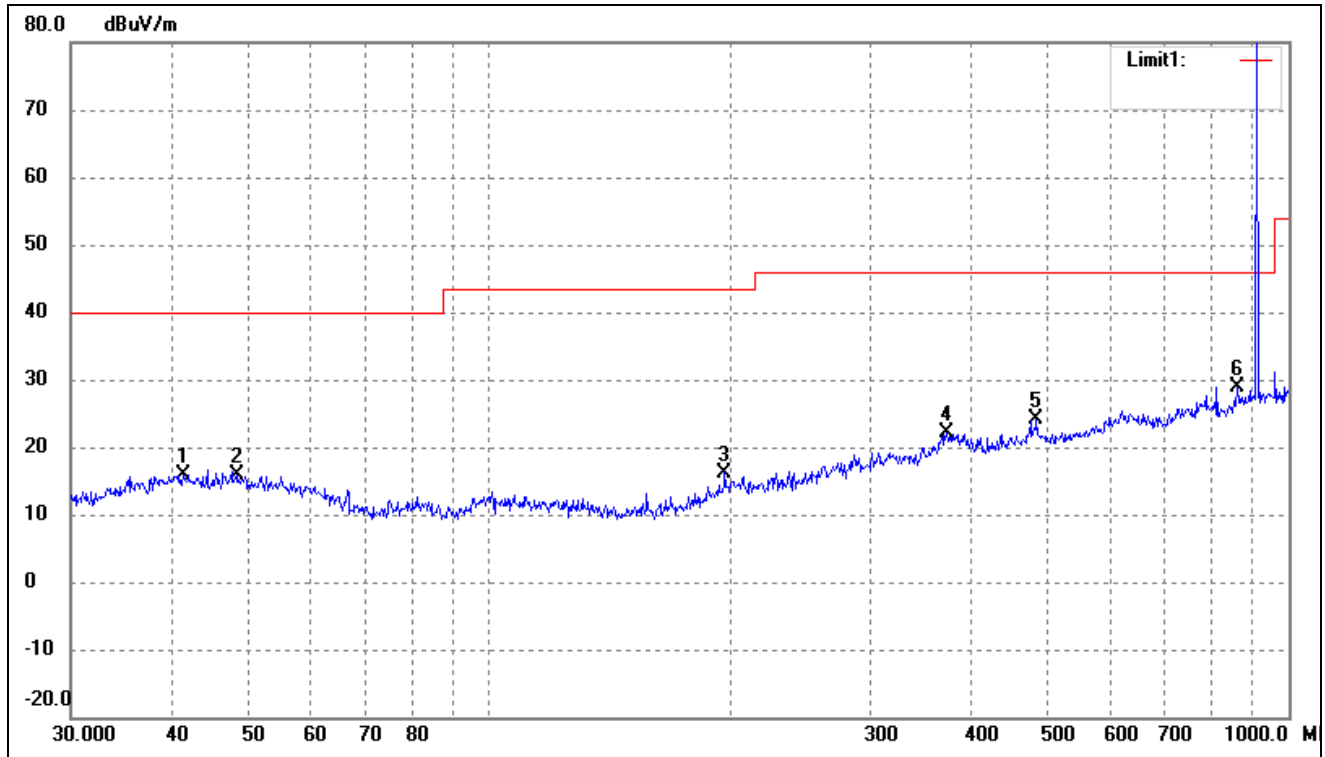


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	32.4059	31.33	-9.69	21.64	40.00	-18.36	240	100	peak
2	79.5209	39.45	-12.03	27.42	40.00	-12.58	187	100	peak
3	151.0666	40.20	-12.41	27.79	43.50	-15.71	220	100	peak
4	785.0935	35.31	2.65	37.96	46.00	-8.04	148	100	peak
5	810.2654	39.43	1.70	41.13	46.00	-4.87	152	100	peak
6	958.7943	34.83	3.63	38.46	46.00	-7.54	168	100	peak

Operating Condition: Transmitting Channel (910.7MHz)

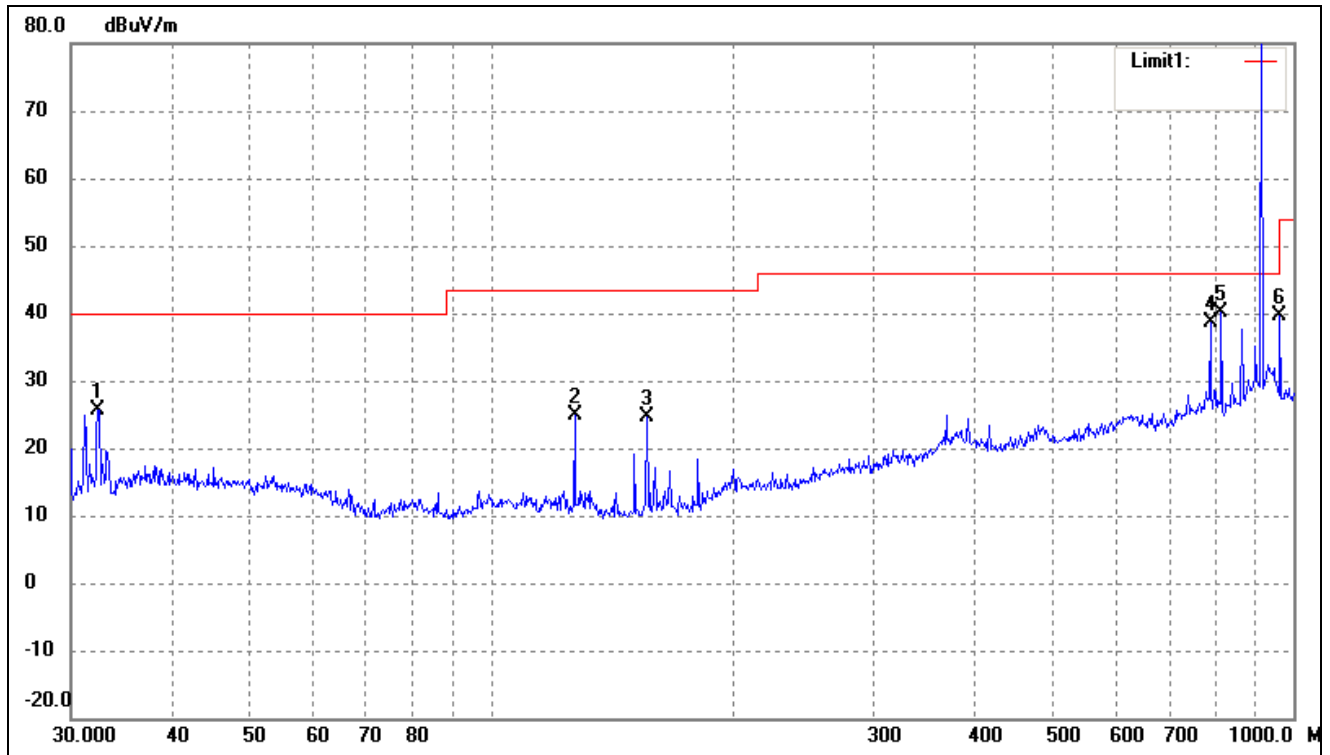
Comment: DC 3.0V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	41.4215	23.69	-7.76	15.93	40.00	-24.07	162	100	peak
2	48.3318	23.98	-8.21	15.77	40.00	-24.23	200	100	peak
3	197.2001	25.28	-9.03	16.25	43.50	-27.25	147	100	peak
4	373.3112	24.60	-2.47	22.13	46.00	-23.87	158	100	peak
5	483.9094	25.42	-1.27	24.15	46.00	-21.85	169	100	peak
6	863.0562	25.86	2.97	28.83	46.00	-17.17	182	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	32.4059	35.41	-9.69	25.72	40.00	-14.28	240	100	peak
2	127.2176	36.82	-11.84	24.98	43.50	-18.52	187	100	peak
3	156.4578	36.86	-12.32	24.54	43.50	-18.96	220	100	peak
4	787.8513	36.24	2.51	38.75	46.00	-7.25	148	100	peak
5	813.1116	38.50	1.65	40.15	46.00	-5.85	152	100	peak
6	962.1623	36.04	3.61	39.65	54.00	-14.35	168	100	peak

*Spurious Emissions Above 1GHz*

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/15.205/15.209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit	Margin
								(dBμV/m)	(dB)
Channel (902.7MHz)									
902.70	84.84	PK	142	1.5	H	3.19	88.03	114	-25.97
902.70	90.02	PK	268	1.6	V	3.19	93.21	114	-20.79
902.70	82.07	AV	126	1.6	H	3.19	85.26	94	-8.74
902.70	89.19	AV	293	1.5	V	3.19	92.38	94	-1.62
1805.40	51.84	PK	218	1.6	H	4.94	56.78	74	-17.22
1805.40	49.65	PK	202	1.3	V	4.94	54.59	74	-19.41
1805.40	45.97	AV	121	1.5	H	4.94	50.91	54	-3.09
1805.40	46.34	AV	125	1.4	V	4.94	51.28	54	-2.72
2708.10	41.61	PK	217	1.5	H	7.58	49.19	74	-24.81
2708.10	47.79	PK	304	1.4	V	7.58	55.37	74	-18.63
2708.10	39.89	AV	153	1.7	H	7.58	47.47	54	-6.53
2708.10	37.86	AV	306	1.6	V	7.58	45.44	54	-8.56
3610.80	40.61	PK	278	1.4	H	8.85	49.46	74	-24.54
3610.80	39.8	PK	192	1.7	V	8.85	48.65	74	-25.35
3610.80	35.25	AV	142	1.3	H	8.85	44.10	54	-9.90
3610.80	33.56	AV	289	1.6	V	8.85	42.41	54	-11.59
Channel (904.6 MHz)									
904.60	84.18	PK	131	1.7	H	3.27	87.45	114	-26.55
904.60	92.01	PK	118	1.8	V	3.27	95.28	114	-18.72
904.60	85.00	AV	229	1.7	H	3.27	88.27	94	-5.73
904.60	89.34	AV	131	1.8	V	3.27	92.61	94	-1.39
1809.20	50.52	PK	224	1.8	H	4.94	55.46	74	-18.54
1809.20	50.01	PK	200	1.4	V	4.94	54.95	74	-19.05
1809.20	45.08	AV	160	1.8	H	4.94	50.02	54	-3.98
1809.20	46.41	AV	167	1.7	V	4.94	51.35	54	-2.65
2713.80	45.51	PK	234	1.3	H	7.58	53.09	74	-20.91
2713.80	45.54	PK	164	1.8	V	7.58	53.12	74	-20.88
2713.80	38.17	AV	263	1.6	H	7.58	45.75	54	-8.25
2713.80	39.36	AV	269	1.7	V	7.58	46.94	54	-7.06
3618.40	43.67	PK	266	1.6	H	8.86	52.53	74	-21.47
3618.40	36.6	PK	292	1.4	V	8.86	45.46	74	-28.54
3618.40	35.63	AV	303	1.7	H	8.86	44.49	54	-9.51
3618.40	32.11	AV	136	1.6	V	8.86	40.97	54	-13.03
Channel (907.5 MHz)									
907.50	83.87	PK	143	1.5	H	3.34	87.21	114	-26.79
907.50	90.03	PK	177	1.6	V	3.34	93.37	114	-20.63

907.50	84.19	AV	175	1.5	H	3.34	87.53	94	-6.47
907.50	89.37	AV	150	1.6	V	3.34	92.71	94	-1.29
1815.00	50.76	PK	264	1.5	H	4.96	55.72	74	-18.28
1815.00	51.2	PK	249	1.4	V	4.96	56.16	74	-17.84
1815.00	44.38	AV	134	1.7	H	4.96	49.34	54	-4.66
1815.00	44.26	AV	251	1.7	V	4.96	49.22	54	-4.78
2722.50	38.41	PK	146	1.6	H	7.62	46.03	74	-27.97
2722.50	46.56	PK	160	1.4	V	7.62	54.18	74	-19.82
2722.50	39.56	AV	273	1.5	H	7.62	47.18	54	-6.82
2722.50	36.56	AV	162	1.8	V	7.62	44.18	54	-9.82
3630.00	36.45	PK	207	1.3	H	8.93	45.38	74	-28.62
3630.00	37.38	PK	270	1.5	V	8.93	46.31	74	-27.69
3630.00	35.32	AV	160	1.4	H	8.93	44.25	54	-9.75
3630.00	33.69	AV	209	1.3	V	8.93	42.62	54	-11.38
<b>Channel (910.7 MHz)</b>									
910.70	82.65	PK	262	1.6	H	3.42	86.07	114	-27.93
910.70	90.13	PK	256	1.6	V	3.42	93.55	114	-20.45
910.70	81.37	AV	211	1.4	H	3.42	84.79	94	-9.21
910.70	89.12	AV	187	1.4	V	3.42	92.54	94	-1.46
1821.40	48.97	PK	233	1.3	H	5.16	54.13	74	-19.87
1821.40	47.4	PK	279	1.5	V	5.16	52.56	74	-21.44
1821.40	44.85	AV	264	1.7	H	5.16	50.01	54	-3.99
1821.40	45.12	AV	254	1.4	V	5.16	50.28	54	-3.72
2732.10	39.49	PK	215	1.5	H	7.63	47.12	74	-26.88
2732.10	46.69	PK	126	1.4	V	7.63	54.32	74	-19.68
2732.10	38.75	AV	209	1.7	H	7.63	46.38	54	-7.62
2732.10	36.23	AV	198	1.7	V	7.63	43.86	54	-10.14
3642.80	41.14	PK	257	1.8	H	9.01	50.15	74	-23.85
3642.80	35.1	PK	161	1.6	V	9.01	44.11	74	-29.89
3642.80	35.58	AV	240	1.4	H	9.01	44.59	54	-9.41
3642.80	31.36	AV	298	1.5	V	9.01	40.37	54	-13.63

*Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 3<sup>th</sup> Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.  
The measurements greater than 20dB below the limit from 9kHz to 30MHz..*

## 5. Out of Band Emissions

### 5.1 Standard Applicable

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 §15.209, whichever is the lesser attenuation.

### 5.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

### 5.3 Environmental Conditions

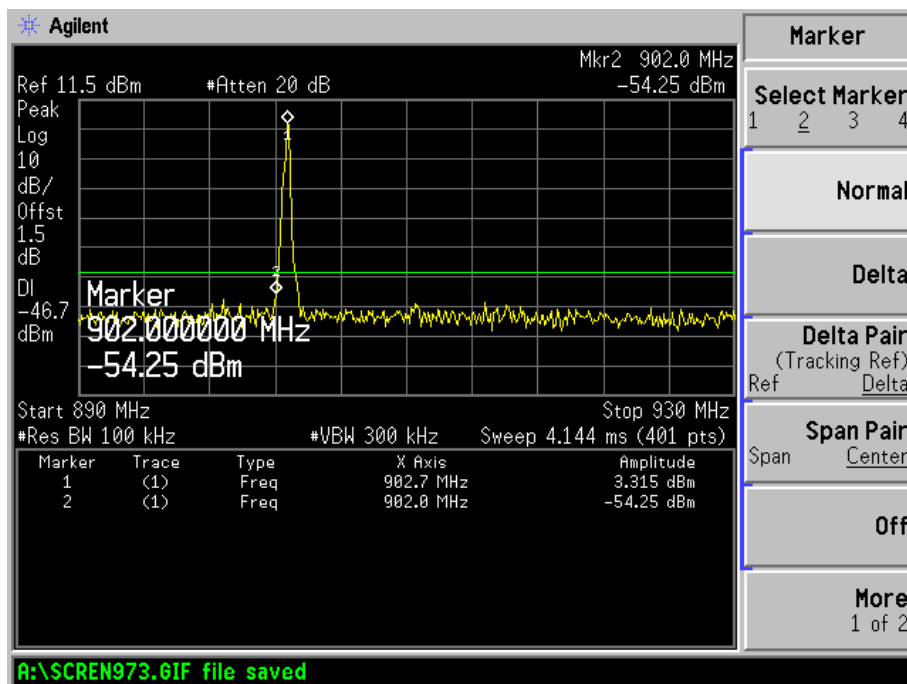
Temperature:	24 °C
Relative Humidity:	60 %
ATM Pressure:	1012 mbar

### 5.4 Summary of Test Results/Plots

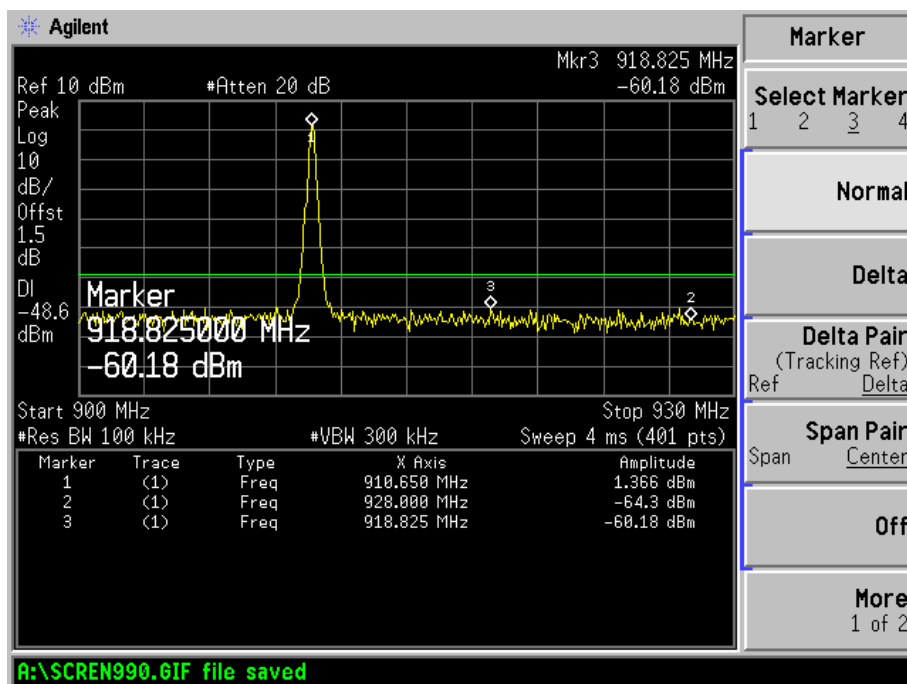
The edge emissions are below the FCC 15.209 Limits or complies with the 15.249 requirements.

Please refer to the test plots as below.

### Band edge -Left Side



### Band edge -Right Side



## 6. Emission Bandwidth

### 6.1 Standard Applicable

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

### 6.2 Test Procedure

According to the ANSI 63.4-2014, the emission bandwidth test method as follows.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Set span = 1MHz, centered on a transmitting channel

RBW  $\geq$  1% 20dB Bandwidth, VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down and 99% bandwidth of the emission.

### 6.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

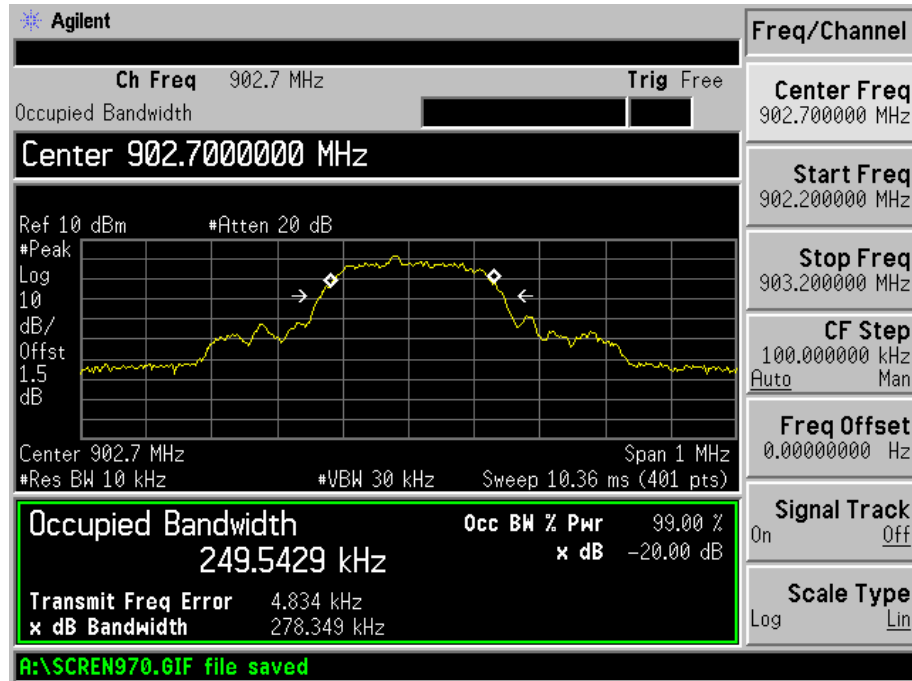
### 6.4 Summary of Test Results/Plots

Frequency MHz	20dB Bandwidth kHz	99% Bandwidth kHz
902.7	278.349	249.5429
904.6	281.873	250.5490
907.5	280.668	251.4241
910.7	277.698	253.4021

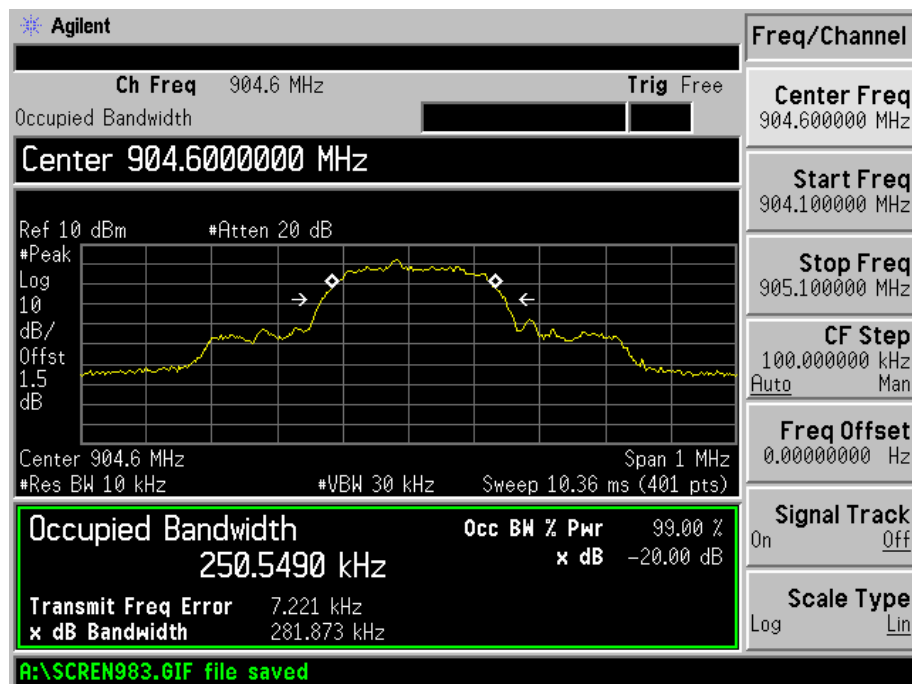


Please refer to the following test plots

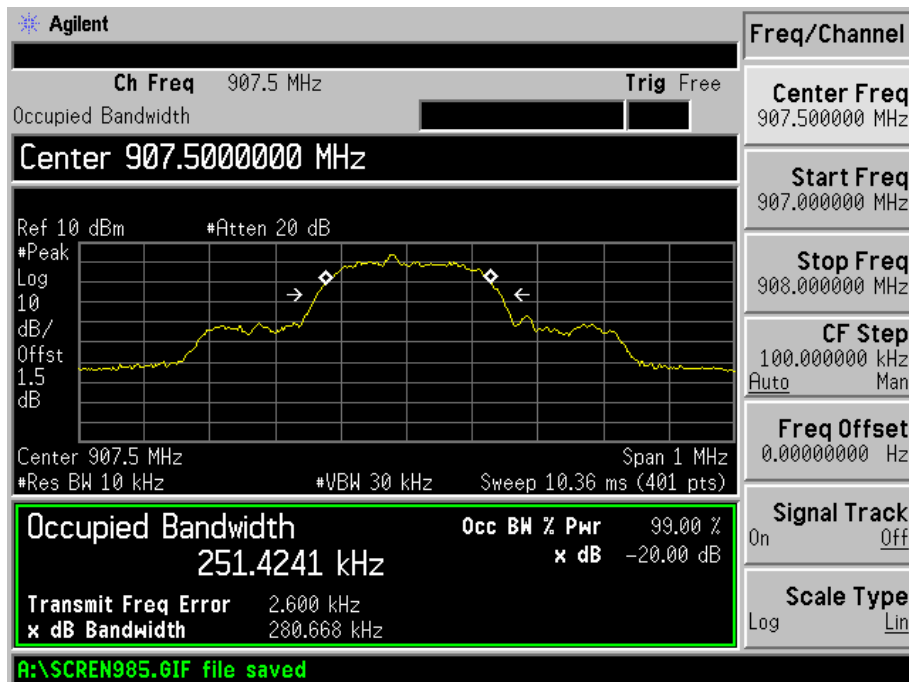
Channel 902.7MHz:



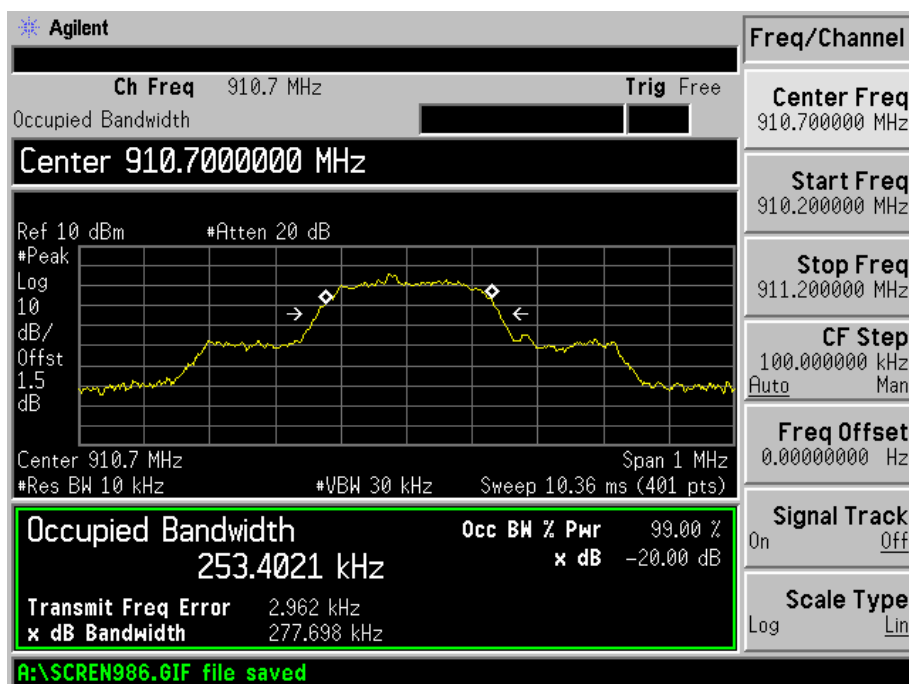
Channel 904.6MHz:



Channel 907.5MHz:



Channel 910.7MHz:



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