

# FCC Part 15C

## Measurement and Test Report

### For

**MICA ELECTRONIC CORP /DBA VOCOPRO**  
**1728 CURTISS COURT, LA VERNE, CA**

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

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

**Product Description:** BODYPACK

**Tested Model:** HYBRID-QUAD-B

**Report No.:** STR16048016I

**Tested Date:** 2016-04-25 to 2016-05-05

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

**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.

**TABLE OF CONTENTS**

<b>1. GENERAL INFORMATION.....</b>	<b>3</b>
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
1.2 TEST STANDARDS.....	4
1.3 TEST METHODOLOGY.....	4
1.4 TEST FACILITY.....	4
1.5 EUT SETUP AND TEST MODE.....	5
1.6 MEASUREMENT UNCERTAINTY.....	5
1.7 TEST EQUIPMENT LIST AND DETAILS.....	6
<b>2. SUMMARY OF TEST RESULTS.....</b>	<b>7</b>
<b>3. ANTENNA REQUIREMENTS.....</b>	<b>8</b>
3.1 STANDARD APPLICABLE.....	8
3.2 TEST RESULT.....	8
<b>4. RADIATED EMISSIONS.....</b>	<b>9</b>
4.1 STANDARD APPLICABLE.....	9
4.2 TEST PROCEDURE.....	9
4.3 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	11
4.4 ENVIRONMENTAL CONDITIONS.....	11
4.5 SUMMARY OF TEST RESULTS/PLOTS.....	11
<b>5. OUT OF BAND EMISSIONS.....</b>	<b>22</b>
5.1 STANDARD APPLICABLE.....	22
5.2 TEST PROCEDURE.....	22
5.3 ENVIRONMENTAL CONDITIONS.....	22
5.4 SUMMARY OF TEST RESULTS/PLOTS.....	22
<b>6. EMISSION BANDWIDTH.....</b>	<b>24</b>
6.1 STANDARD APPLICABLE.....	24
6.2 TEST PROCEDURE.....	24
6.3 ENVIRONMENTAL CONDITIONS.....	24
6.4 SUMMARY OF TEST RESULTS/PLOTS.....	24

## 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:	BODYPACK
Brand Name:	Vocopro
Model No.:	HYBRID-QUAD-B
Adding Model:	/
Rated Voltage:	Battery DC 3V
<i>Note: The test data is gathered from a production sample provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	915.0MHz-927.2MHz
Max. Field Strength:	93.08dBuV/m
Modulation:	FM
Channel Separation:	/
Antenna Type:	External 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	915.0MHz
TM2	Channel	918.7MHz
TM3	Channel	922.8MHz
TM4	Channel	927.2MHz

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 external antenna, fulfill the requirement of this section.



## 4. Radiated Emissions

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### 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.

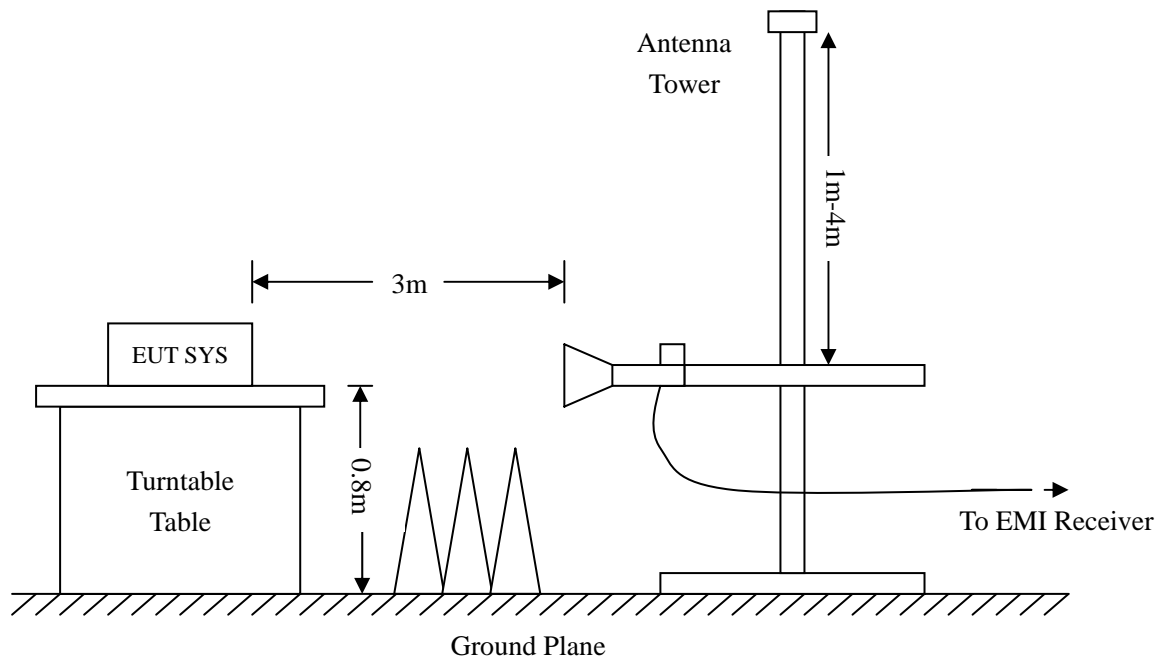
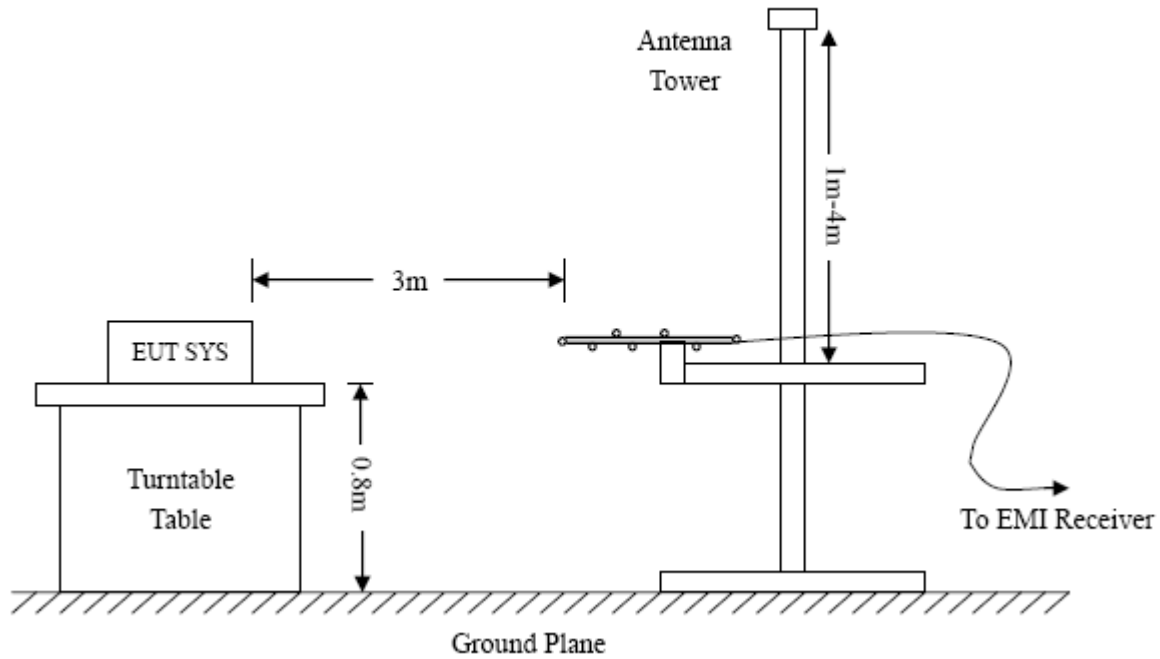
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

### 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

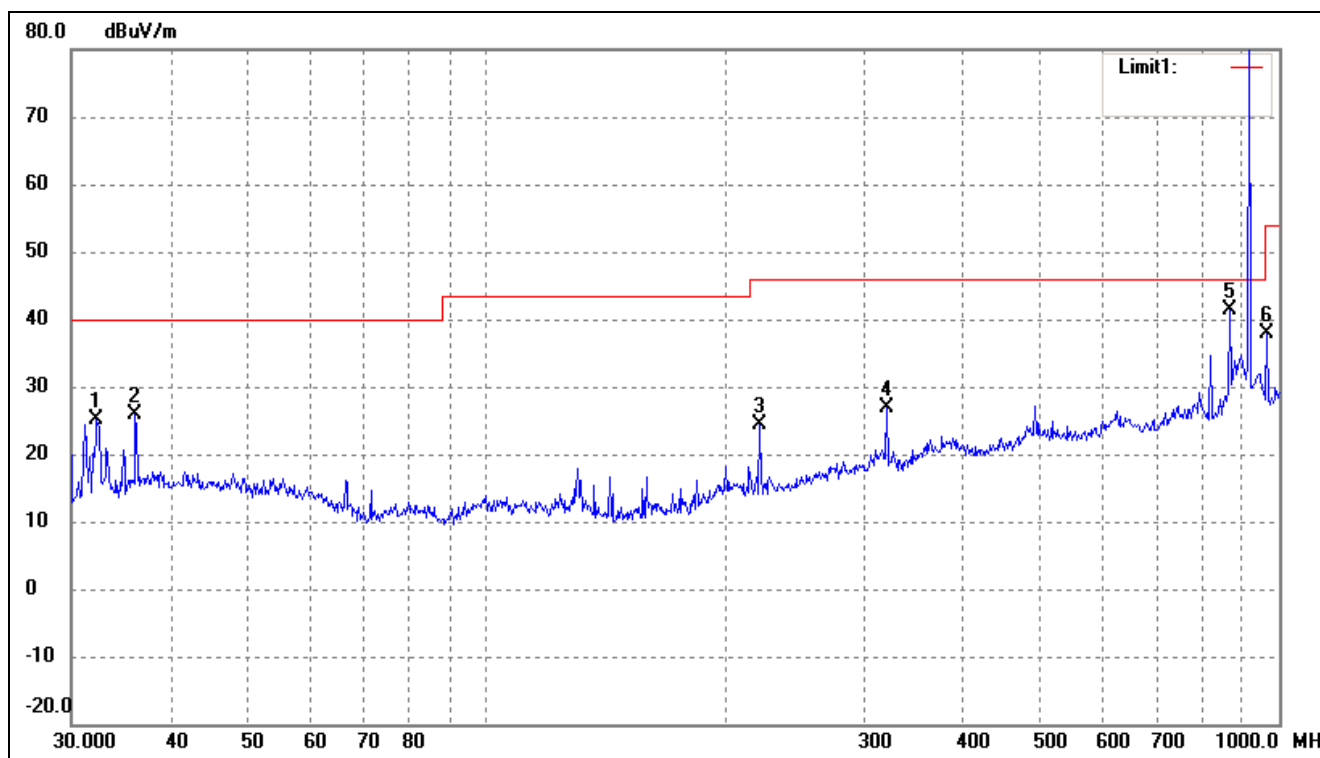
According to the data below, the [FCC Part 15.205](#), [15.209](#) and [15.249](#) standards, and had the worst margin of:

**-1.750 dB at 875.2470 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.*

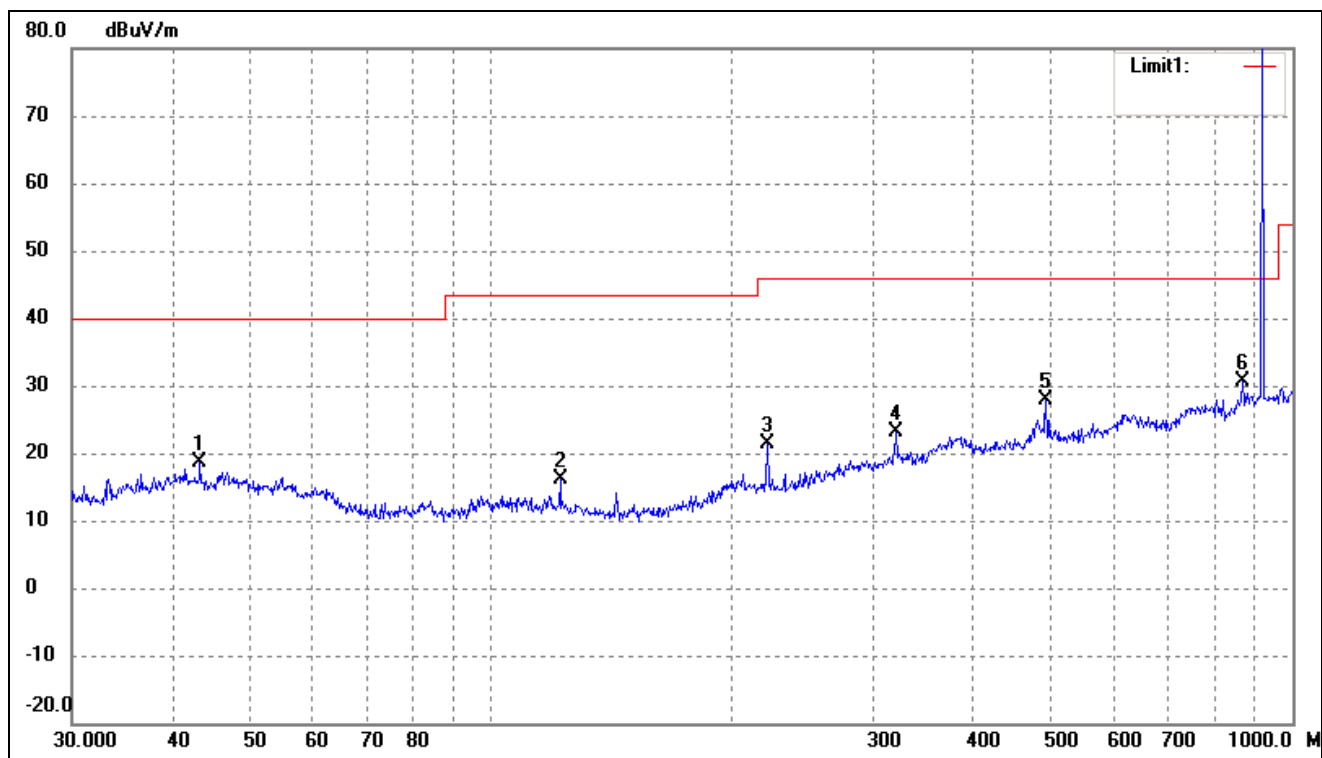
### Plot of Radiated Emissions Test Data (30MHz to 1GHz)

EUT: BODYPACK  
 Tested Model: HYBRID-QUAD-B  
 Operating Condition: Transmitting Channel (915.0MHz)  
 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	32.2925	34.77	-9.72	25.05	40.00	-14.95	264	100	peak
2	36.1272	34.56	-8.74	25.82	40.00	-14.18	113	100	peak
3	221.3921	33.15	-8.80	24.35	46.00	-21.65	287	100	peak
4	319.9370	31.39	-4.62	26.77	46.00	-19.23	185	100	peak
5	866.0879	38.48	2.99	41.47	46.00	-4.53	178	100	peak
6	965.5421	34.13	3.67	37.80	54.00	-16.20	168	100	peak

Test Specification: Vertical

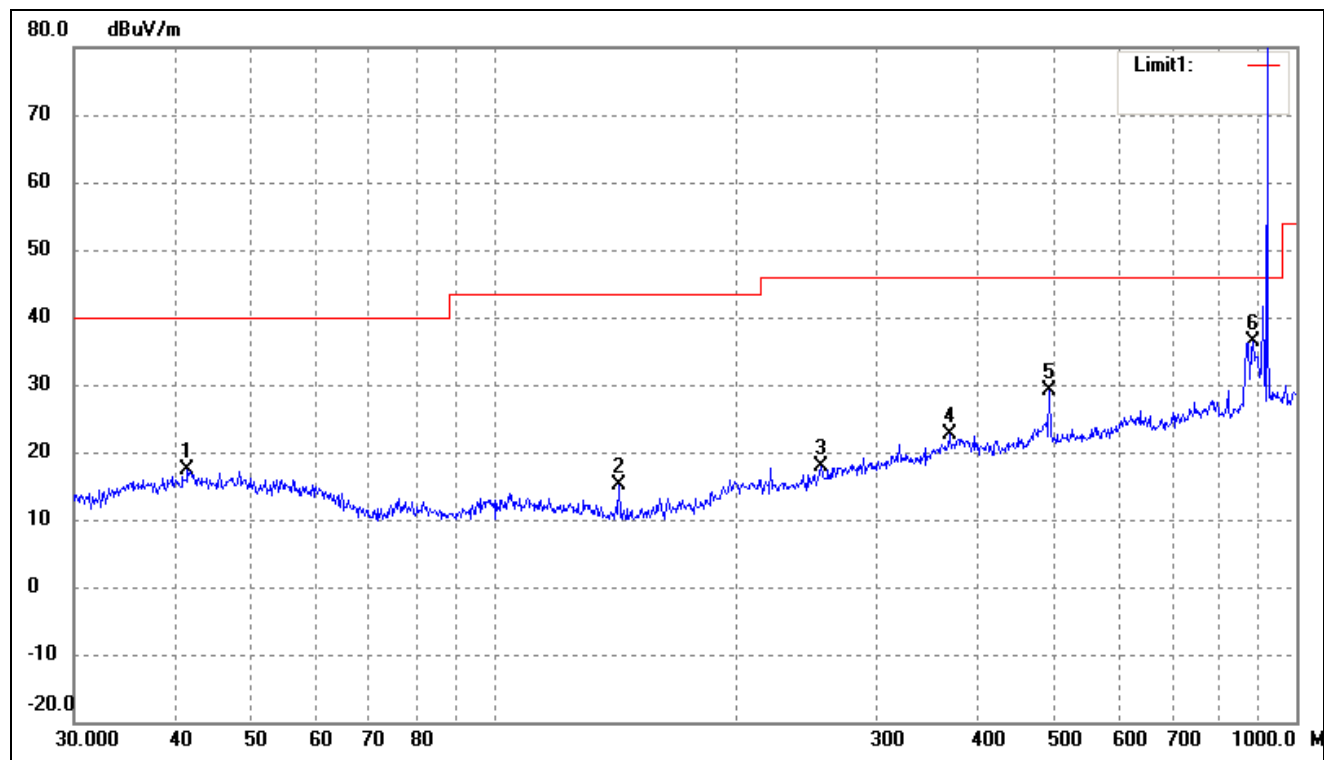


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	43.3534	26.55	-7.89	18.66	40.00	-21.34	264	100	peak
2	121.9755	27.63	-11.55	16.08	43.50	-27.42	113	100	peak
3	221.3921	30.28	-8.80	21.48	46.00	-24.52	287	100	peak
4	319.9370	27.81	-4.62	23.19	46.00	-22.81	185	100	peak
5	492.4685	29.55	-1.76	27.79	46.00	-18.21	178	100	peak
6	866.0879	27.56	2.99	30.55	46.00	-15.45	168	100	peak

Operating Condition: Transmitting Channel (918.7MHz)

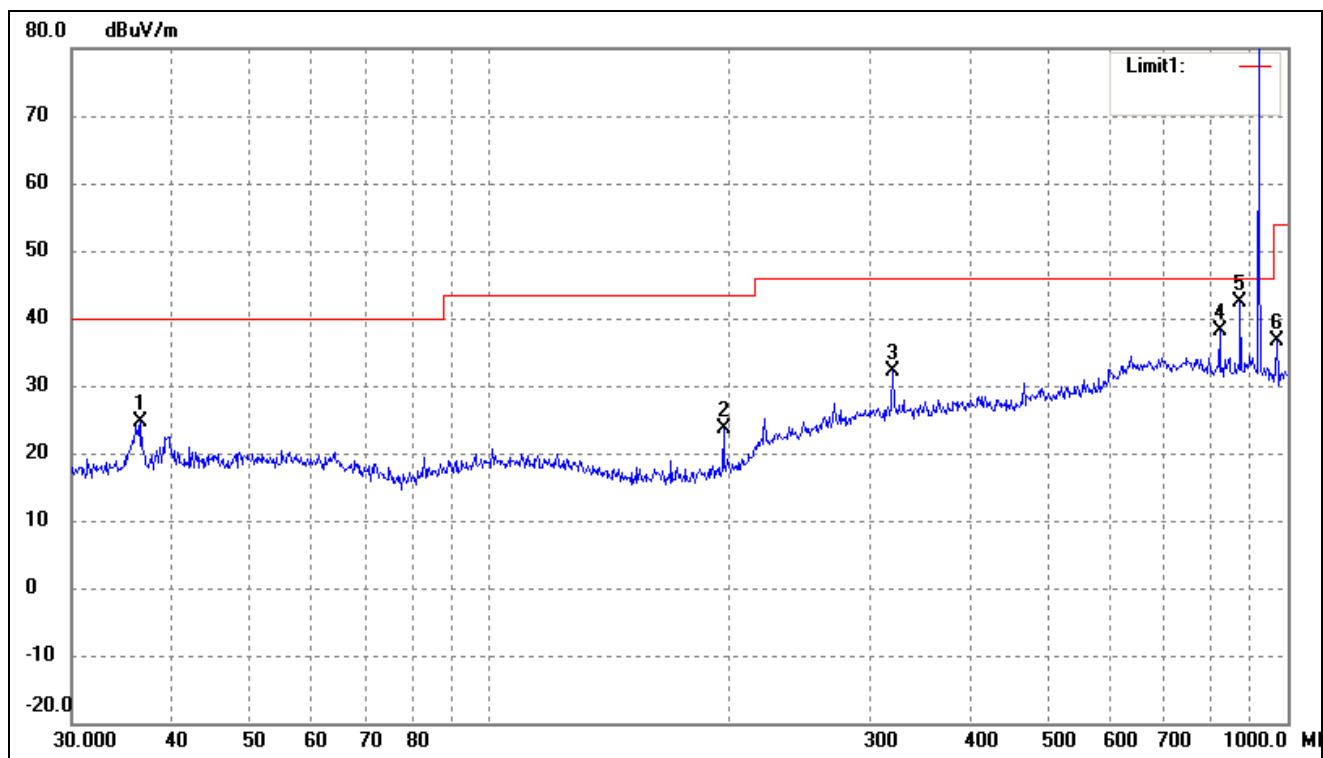
Comment: DC 3.0V

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	41.5670	25.06	-7.77	17.29	40.00	-22.71	162	100	peak
2	143.3261	27.59	-12.51	15.08	43.50	-28.42	200	100	peak
3	255.6231	25.02	-7.24	17.78	46.00	-28.22	158	100	peak
4	369.4047	25.30	-2.71	22.59	46.00	-23.41	127	100	peak
5	492.4685	30.99	-1.76	29.23	46.00	-16.77	169	100	peak
6	884.5029	33.24	3.15	36.39	46.00	-9.61	169	100	peak

Test Specification: Vertical

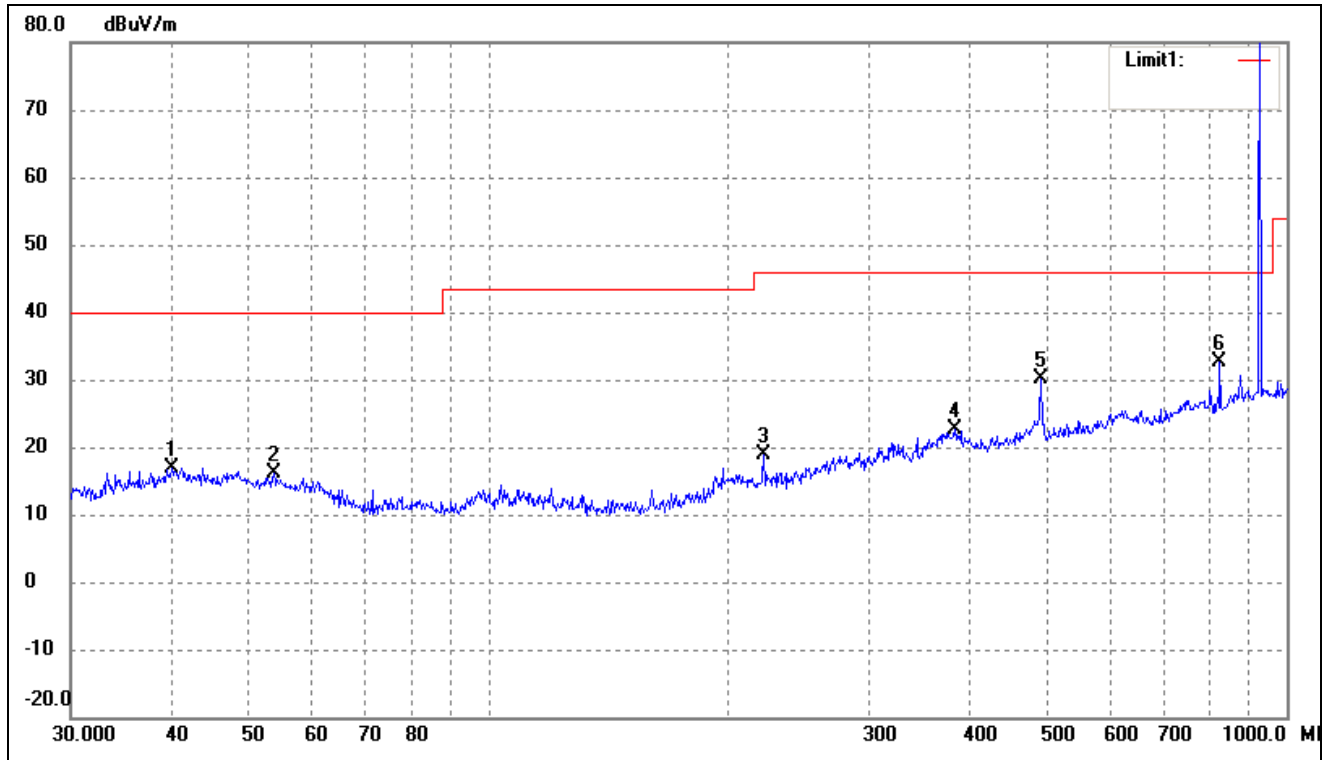


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	36.6375	20.15	4.44	24.59	40.00	-15.41	240	100	peak
2	196.5098	20.42	3.20	23.62	43.50	-19.88	187	100	peak
3	319.9370	20.18	11.95	32.13	46.00	-13.87	220	100	peak
4	821.7104	22.39	15.70	38.09	46.00	-7.91	198	100	peak
5	872.1832	26.27	16.02	42.29	46.00	-3.71	125	100	peak
6	968.9338	21.89	14.76	36.65	54.00	-17.35	145	100	peak

Operating Condition: Transmitting Channel (922.8MHz)

Comment: DC 3.0V

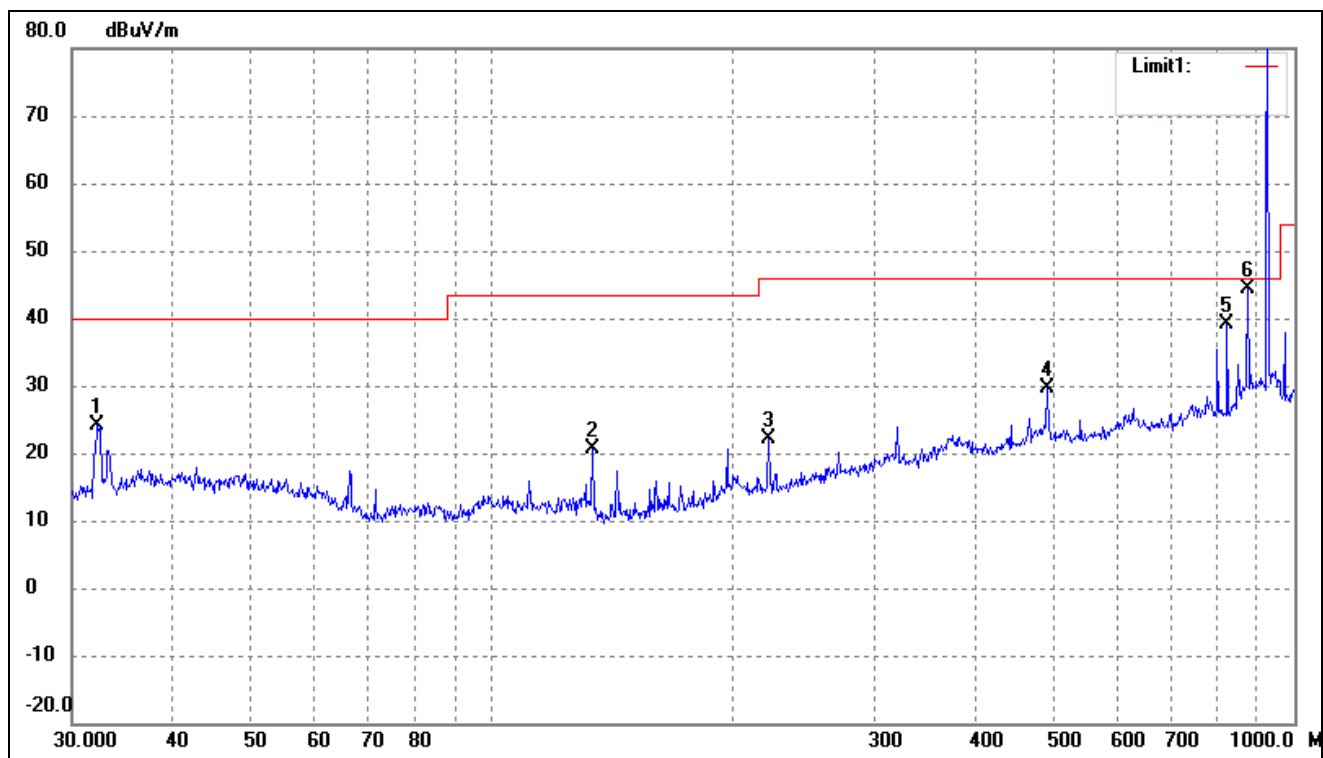
Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	40.1347	24.57	-7.68	16.89	40.00	-23.11	162	100	peak
2	53.8818	24.86	-8.81	16.05	40.00	-23.95	200	100	peak
3	221.3921	27.76	-8.80	18.96	46.00	-27.04	147	100	peak
4	383.9318	24.90	-2.30	22.60	46.00	-23.40	158	100	peak
5	492.4685	31.89	-1.76	30.13	46.00	-15.87	169	100	peak
6	824.5968	30.91	1.61	32.52	46.00	-13.48	182	100	peak



Test Specification: Vertical

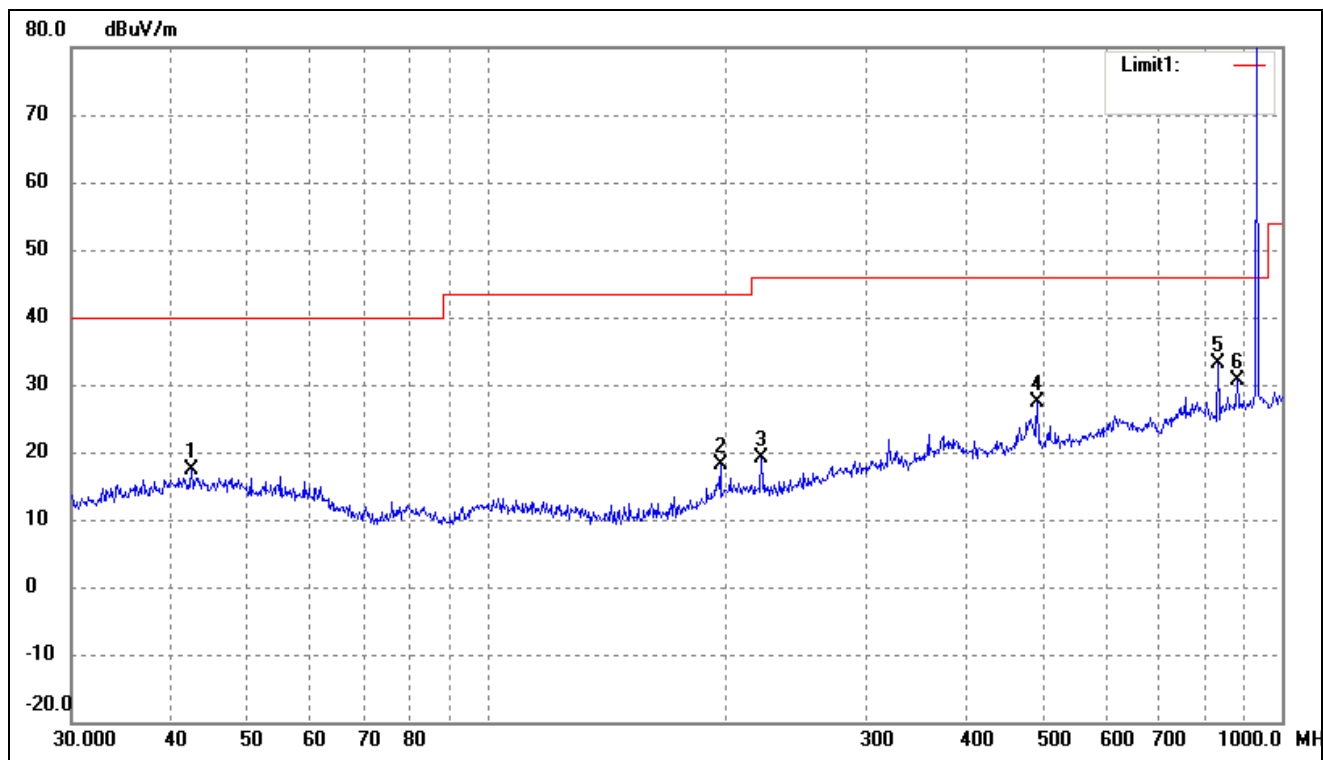


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	32.2925	33.78	-9.72	24.06	40.00	-15.94	240	100	peak
2	133.6188	32.78	-12.20	20.58	43.50	-22.92	187	100	peak
3	221.3921	30.82	-8.80	22.02	46.00	-23.98	220	100	peak
4	492.4685	31.45	-1.76	29.69	46.00	-16.31	148	100	peak
5	824.5968	37.46	1.61	39.07	46.00	-6.93	152	100	peak
6	875.2470	41.21	3.09	44.30	46.00	-1.70	168	100	peak

Operating Condition: Transmitting Channel (927.2MHz)

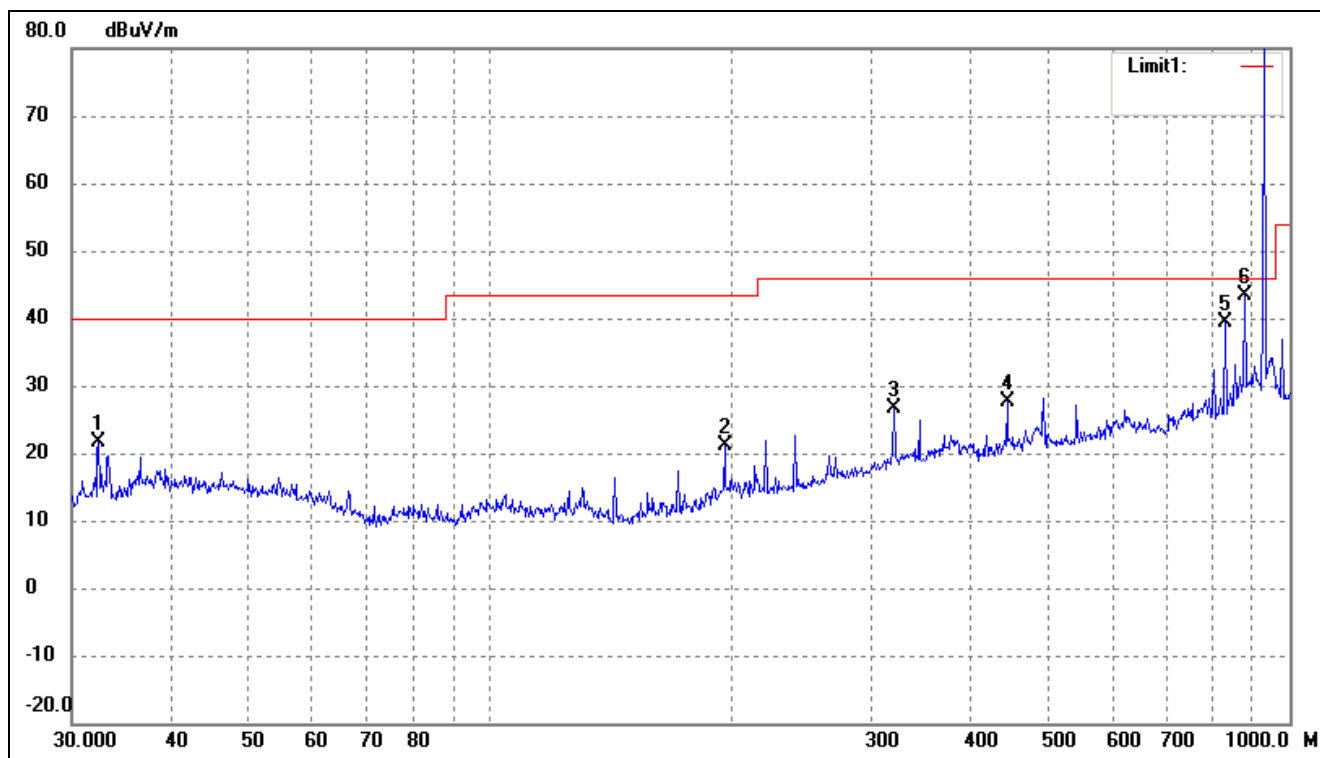
Comment: DC 3.0V

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	42.4508	25.11	-7.83	17.28	40.00	-22.72	162	100	peak
2	196.5098	27.26	-9.12	18.14	43.50	-25.36	200	100	peak
3	221.3921	27.82	-8.80	19.02	46.00	-26.98	147	100	peak
4	492.4685	29.11	-1.76	27.35	46.00	-18.65	158	100	peak
5	830.4002	31.40	1.73	33.13	46.00	-12.87	169	100	peak
6	878.3214	27.47	3.12	30.59	46.00	-15.41	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	31.40	-9.69	21.71	40.00	-18.29	240	100	peak
2	196.5098	30.21	-9.12	21.09	43.50	-22.41	187	100	peak
3	319.9370	31.19	-4.62	26.57	46.00	-19.43	220	100	peak
4	443.2943	30.63	-2.89	27.74	46.00	-18.26	148	100	peak
5	830.4002	37.57	1.73	39.30	46.00	-6.70	152	100	peak
6	878.3214	40.16	3.12	43.28	46.00	-2.72	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 (915.0 MHz)									
915.00	80.49	PK	259	1.5	H	3.35	83.84	114	-30.16
915.00	88.07	PK	126	1.4	V	3.35	91.42	114	-22.58
915.00	82.72	AV	128	1.4	H	3.35	86.07	94	-7.93
915.00	87.97	AV	224	1.6	V	3.35	91.32	94	-2.68
1830.00	48.21	PK	210	1.5	H	5.51	53.72	74	-20.28
1830.00	48.4	PK	163	1.3	V	5.51	53.91	74	-20.09
1830.00	45.5	AV	164	1.6	H	5.51	51.01	54	-2.99
1830.00	44.75	AV	171	1.3	V	5.51	50.26	54	-3.74
2745.00	44.49	PK	205	1.4	H	7.64	52.13	74	-21.87
2745.00	45.88	PK	125	1.5	V	7.64	53.52	74	-20.48
2745.00	38.79	AV	217	1.4	H	7.64	46.43	54	-7.57
2745.00	40.83	AV	304	1.8	V	7.64	48.47	54	-5.53
3660.00	39.04	PK	143	1.5	H	8.86	47.9	74	-26.1
3660.00	37.67	PK	251	1.5	V	8.86	46.53	74	-27.47
3660.00	34.37	AV	246	1.4	H	8.86	43.23	54	-10.77
3660.00	31.66	AV	300	1.4	V	8.86	40.52	54	-13.48
Channel (918.7 MHz)									
918.70	84.73	PK	179	1.6	H	3.63	88.36	114	-25.64
918.70	86.86	PK	127	1.7	V	3.63	90.49	114	-23.51
918.70	84.50	AV	212	1.5	H	3.63	88.13	94	-5.87
918.70	89.03	AV	310	1.6	V	3.63	92.66	94	-1.34
1837.56	47.78	PK	183	1.5	H	5.51	53.29	74	-20.71
1837.56	49.71	PK	158	1.5	V	5.51	55.22	74	-18.78
1837.56	44.5	AV	200	1.6	H	5.51	50.01	54	-3.99
1837.56	46.27	AV	179	1.5	V	5.51	51.78	54	-2.22
2756.34	44.42	PK	137	1.4	H	7.65	52.07	74	-21.93
2756.34	42.49	PK	217	1.7	V	7.65	50.14	74	-23.86
2756.34	43.32	AV	205	1.4	H	7.65	50.97	54	-3.03
2756.34	39.87	AV	260	1.7	V	7.65	47.52	54	-6.48
3675.12	36.02	PK	165	1.8	H	8.89	44.91	74	-29.09
3675.12	37.84	PK	305	1.7	V	8.89	46.73	74	-27.27
3675.12	35.66	AV	295	1.4	H	8.89	44.55	54	-9.45
3675.12	33.24	AV	199	1.6	V	8.89	42.13	54	-11.87
Channel (922.8 MHz)									
922.80	80.15	PK	203	1.7	H	3.75	83.90	114	-30.10
922.80	86.66	PK	253	1.4	V	3.75	90.41	114	-23.59

922.80	84.36	AV	120	1.4	H	3.75	88.11	94	-5.89
922.80	88.89	AV	209	1.6	V	3.75	92.64	94	-1.36
1845.60	50.36	PK	293	1.5	H	5.53	55.89	74	-18.11
1845.60	47.72	PK	129	1.8	V	5.53	53.25	74	-20.75
1845.60	45.57	AV	239	1.6	H	5.53	51.1	54	-2.90
1845.60	46.89	AV	244	1.6	V	5.53	52.42	54	-1.58
2768.40	38.55	PK	148	1.5	H	7.66	46.21	74	-27.79
2768.40	47.3	PK	191	1.5	V	7.66	54.96	74	-19.04
2768.40	40.85	AV	176	1.4	H	7.66	48.51	54	-5.49
2768.40	38.82	AV	250	1.3	V	7.66	46.48	54	-7.52
3691.20	37.76	PK	272	1.7	H	8.93	46.69	74	-27.31
3691.20	35.62	PK	182	1.5	V	8.93	44.55	74	-29.45
3691.20	34.26	AV	288	1.5	H	8.93	43.19	54	-10.81
3691.20	32.56	AV	181	1.5	V	8.93	41.49	54	-12.51
<b>Channel (927.2 MHz)</b>									
927.20	82.46	PK	165	1.7	H	3.88	86.34	114	-27.66
927.20	89.20	PK	284	1.4	V	3.88	93.08	114	-20.92
927.20	84.71	AV	196	1.5	H	3.88	88.59	94	-5.41
927.20	88.61	AV	232	1.8	V	3.88	92.49	94	-1.51
1854.40	47.03	PK	139	1.7	H	5.57	52.60	74	-21.40
1854.40	50.15	PK	277	1.8	V	5.57	55.72	74	-18.28
1854.40	45.8	AV	112	1.5	H	5.57	51.37	54	-2.63
1854.40	46.96	AV	257	1.3	V	5.57	52.53	54	-1.47
2781.60	45.1	PK	281	1.7	H	7.69	52.79	74	-21.21
2781.60	46.53	PK	115	1.6	V	7.69	54.22	74	-19.78
2781.60	36.68	AV	271	1.5	H	7.69	44.37	54	-9.63
2781.60	40.57	AV	234	1.4	V	7.69	48.26	54	-5.74
3708.80	42.39	PK	290	1.8	H	8.98	51.37	74	-22.63
3708.80	37.88	PK	272	1.7	V	8.98	46.86	74	-27.14
3708.80	35.89	AV	164	1.5	H	8.98	44.87	54	-9.13
3708.80	31.7	AV	221	1.5	V	8.98	40.68	54	-13.32

*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

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### 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

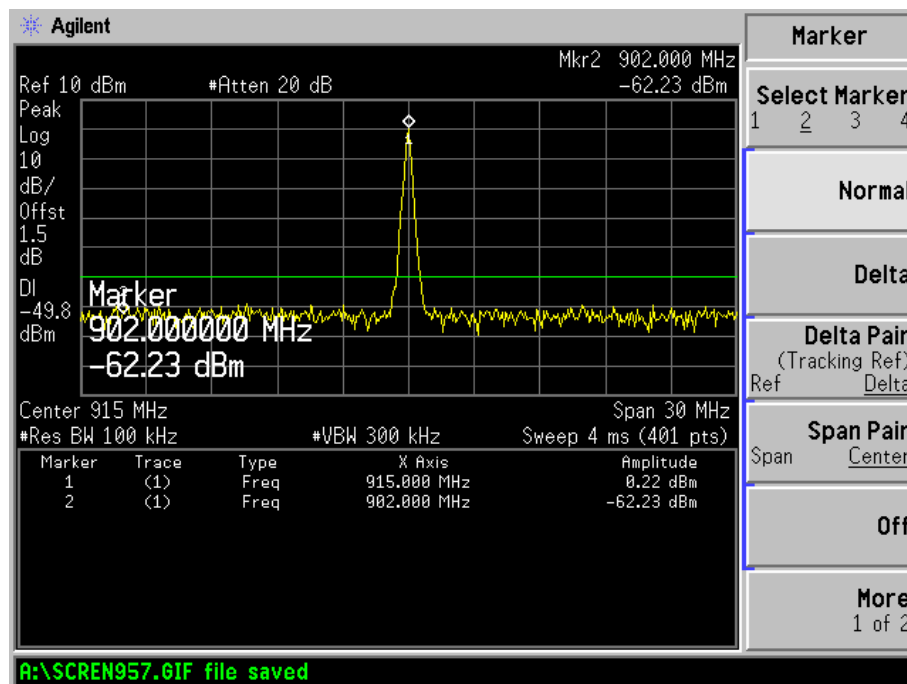
Temperature:	24 °C
Relative Humidity:	60 %
ATM Pressure:	1012 mbar

### 5.4 Summary of Test Results/Plots

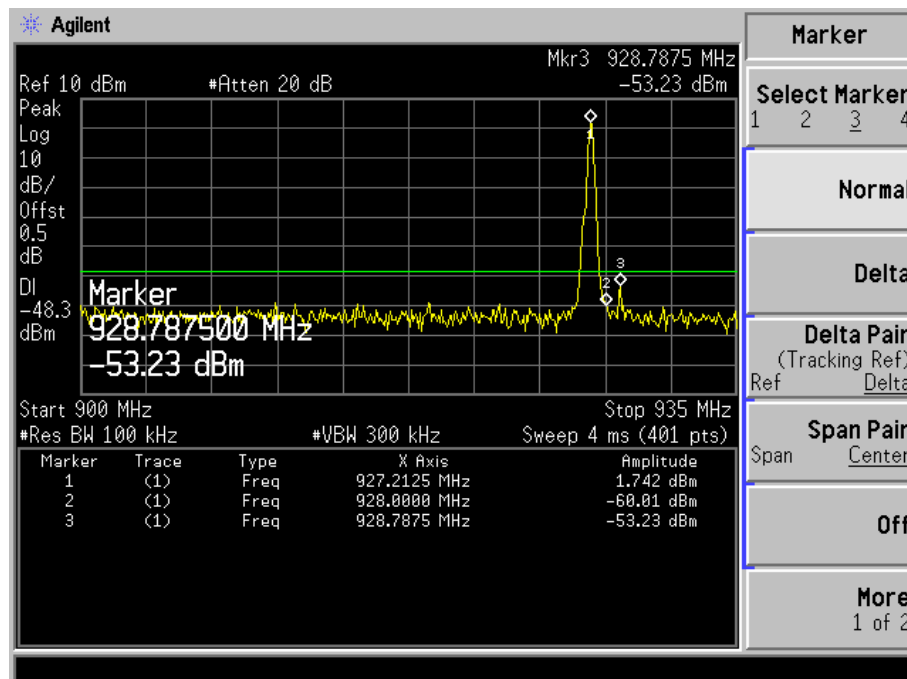
The edge emissions are below the FCC 15.209 Limits or complies with the 15.249 requirements.

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

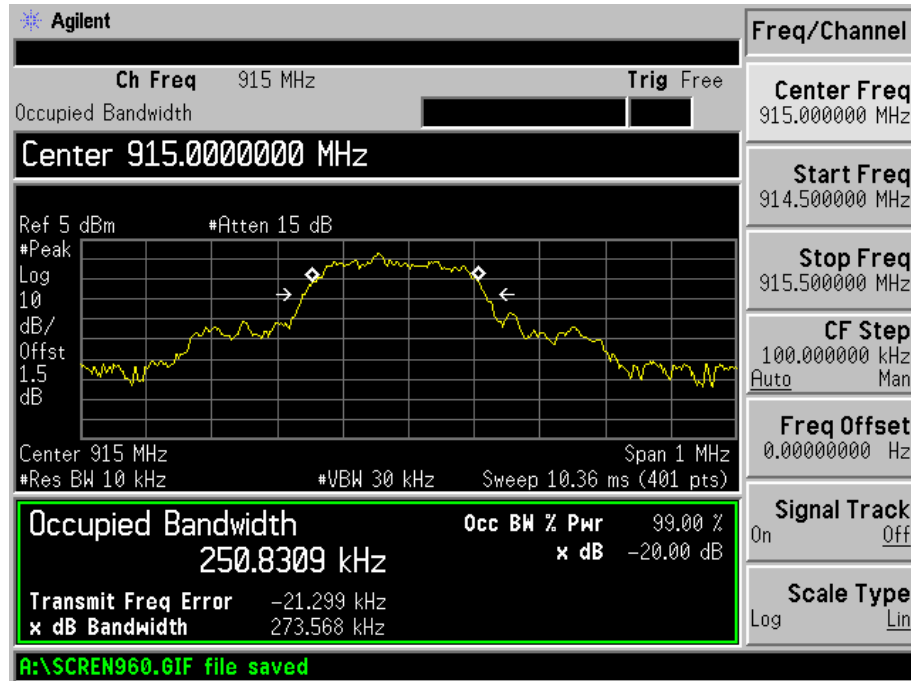
### 6.4 Summary of Test Results/Plots

Frequency MHz	20dB Bandwidth kHz	99% Bandwidth kHz
915.0	273.568	250.8309
918.7	274.937	246.2788
922.8	276.155	251.3204
927.2	285.820	253.1340

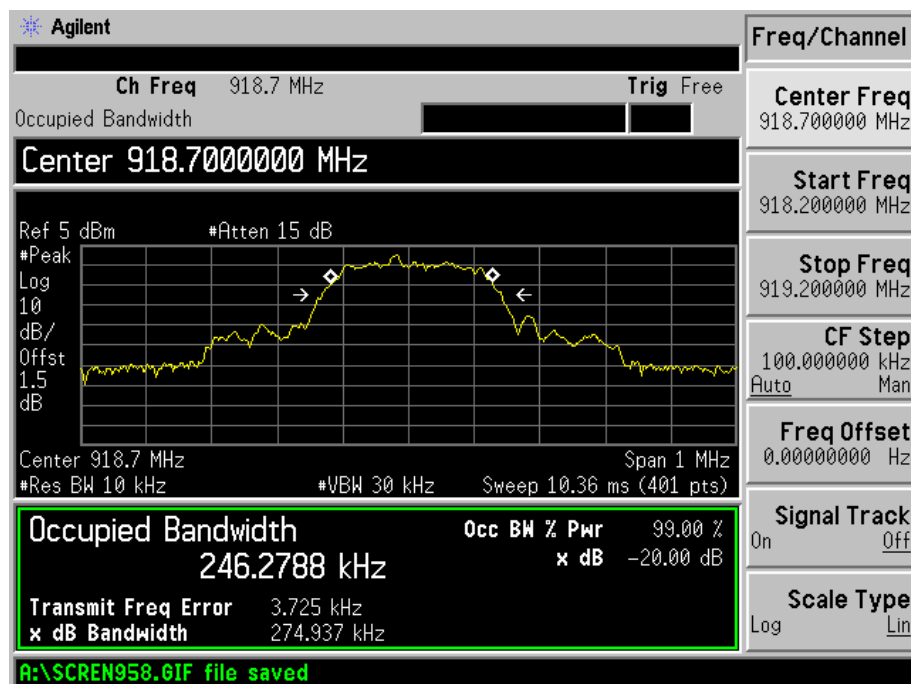


Please refer to the following test plots

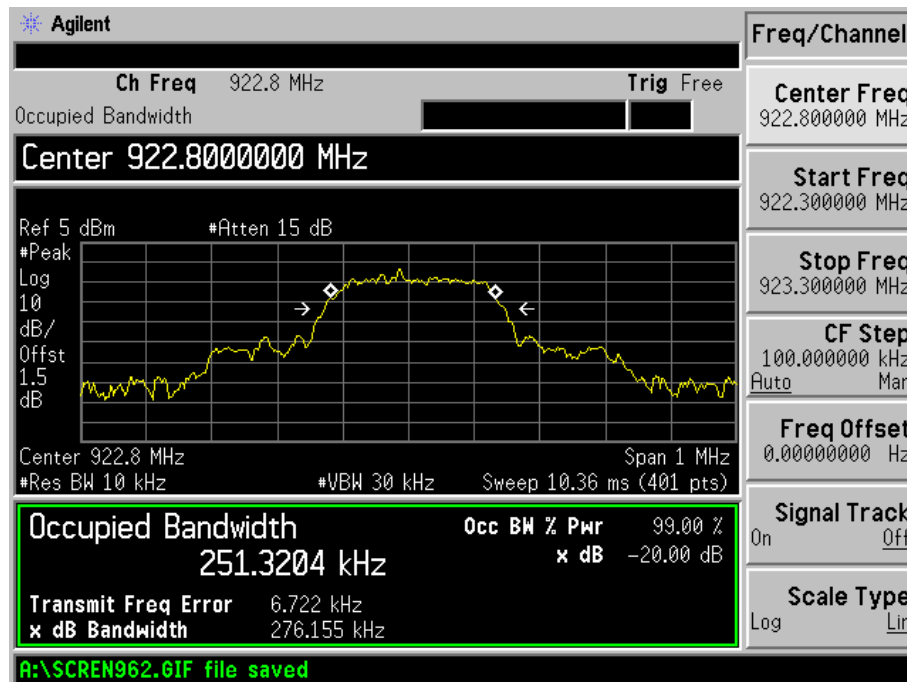
Channel 915.0MHz:



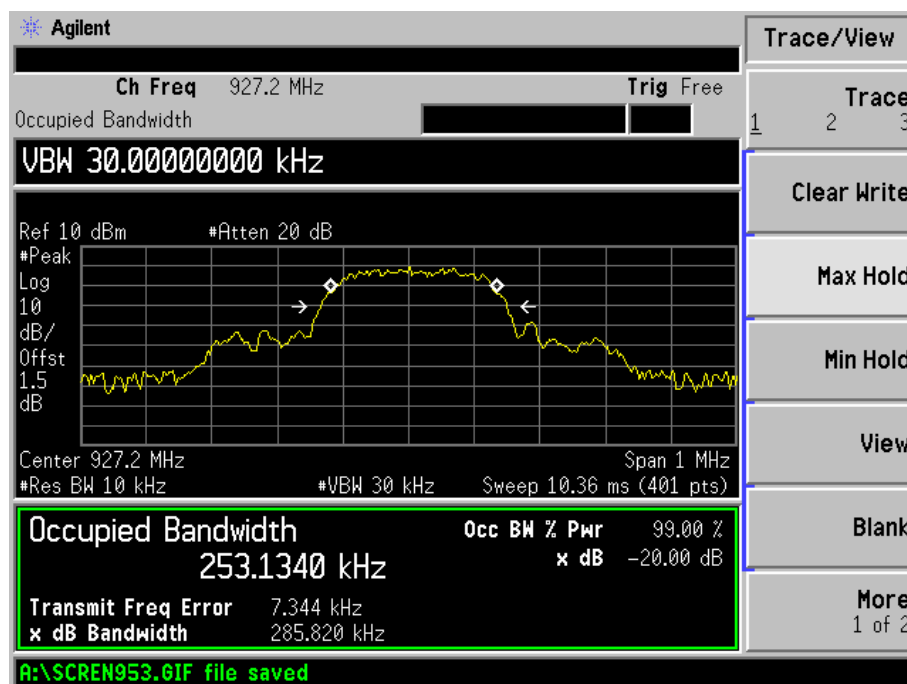
Channel 918.7MHz:



Channel 922.8MHz:



Channel 927.2MHz:



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