

# Intentional Radiator Test Report

## Test Standards: FCC Part 15 (Subpart C – Intentional Radiators)

Prepared For:  
**Integrated Technology**  
**366 Mangels Avenue**  
**San Francisco, CA 94127**

Equipment Under Test:  
**Digital Wireless Microphone**

Model:  
**DM536A**

Prepared by:



**44366 S. Grimmer Blvd.  
Fremont, CA 94538  
USA**

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## 1.0 CUSTOMER INFORMATION

<b>Test Laboratory:</b>	EMCE Engineering 44366 S. Grimmer Blvd. Fremont, CA 94538 USA
<b>FCC registration number</b>	Tel: 510-490-4307 Fax: 510-490-3441 <a href="mailto:bob@universalcompliance.com">bob@universalcompliance.com</a> 743299
<b>Customer:</b>	Socket Communications, Inc. 366 Mangels Avenue San Francisco, CA 94127
	Tel: 510-744-2700 Fax: 510-744-2701
<b>Contact Person:</b>	Scott Chan
<b>Receipt of EUT:</b>	3/07/09
<b>Test plan reference:</b>	FCC Part 2, 15 (15.247)
<b>FCC ID:</b>	FCC ID: NK5DM536A
<b>IC #:</b>	
<b>Date of testing:</b>	3/07/09 – 4/17/09
<b>Date of Report:</b>	4/28/09

*The tests listed in this report have been completed to demonstrate compliance to the CFR 47 Section 15.247.*

Contents approved:


Name: Bob Cole
Title: President

## 2.0 EUT AND ACCESSORY INFORMATION

### EUT description

The EUT is an Integrated Technology Lab, **Digital Wireless Microphone, M/N: DM536A**.

### Model Numbers Represented

DM536A

### EUT and accessories

The table below lists all EUTs and accessories used in the tests. Later in this report, only numbers in the last column are used to refer to the devices in each test.

### Software

The computers were equipped with test software provided by the customer. The software was used to control the EUT in the tests.

	Name	Type	S/N	Number
EUT	DM536A	Digital Wireless Microphon	N/A	E0001
Accessories				
Software				

## *EUT Information*

Product Specification	Description
Model Name	DM536A
Type of Modulation	DTS
Number of Channels	6
Operating Frequency Range	903..5 – 926.4 MHz
Type of Equipment	Portable
Extreme Operating Temperature Range	-20 C – 55 C
Extreme Operating Voltage Range	N/A
Type of Antenna	External Trace – Soldered to PCB
Antenna Gain (dBi)	-3.0
Transmitter Method of Frequency Generation	Synthesized
Transmitter Aggregate Data Rate	>250kbps
Transmitter Duty Type	Intermittant
Continuous Operation for Testing Purposes?	Yes
Transmit Emissions Designator	65K0F1A

### 3.0 SUMMARY OF TEST RESULTS

CFR 47, 15.247:2007 Section	RSS 210 Issue 7:2007 Section	Description	Results
15.203	N/A	Antenna Requirement	PASSED
15.205	N/A	Restricted Band of Operation	N/A
15.207a	N/A	Conducted Emission Voltage	N/A
15.247a(1)	N/A	Channel Separation	N/A
15.247a(1)	N/A	Occupied Bandwidth	PASSED
15.247a(2)	N/A	Bandwidth	PASSED
15.247a(1)	N/A	Number of Hopping Channels	N/A
15.247a(1)	N/A	Time of Occupancy	N/A
15.247b	N/A	Output Power	PASSED
15.247c	N/A	Antenna Gain >6 dB	N/A
15.247d	N/A	Conducted Spurious Emissions	N/A
15.247d: 15.209	N/A	Radiated Spurious Emissions	PASSED
15.247e	N/A	Power Spectral Density	PASSED
15.247f	N/A	Hybrid System Requirement	N/A
15.247g	N/A	Hopping Capability	N/A
15.247h	N/A	Hopping Coordination Requirement	N/A
15.247i	N/A	RF Exposure Requirement	PASSED
	N/A	Receiver Spurious Emissions	N/A

PASS                    The EUT passed that particular test.  
FAIL                    The EUT failed that particular test.  
N/A                    Not Applicable due to product type.

## 4.0 STANDARDS AND MEASUREMENT METHODS

The tests were performed in guidance of CFR 47 section 15.247, FCC Public Notice DA 00-705 (March 30, 2000), FCC Report & Order 97-114 (April 10, 1997), Industry Canada RSS-210 Issue 7, and ANSI C63.4 (2003). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method". For the test equipment, see device list in the end of this test.

### 4.1 Selection of operation mode for tests

Before tests, several operation modes, and modulation patterns were tried. The worst case was selected for each test and those results reported.

## 5.0 TEST SETUPS

To fulfill all requirements for the testing, total of two different test setups were used. One EUT was used, unmodified for radiated tests.

SMA connector added in place of internal antenna for Antenna Conducted measurements.

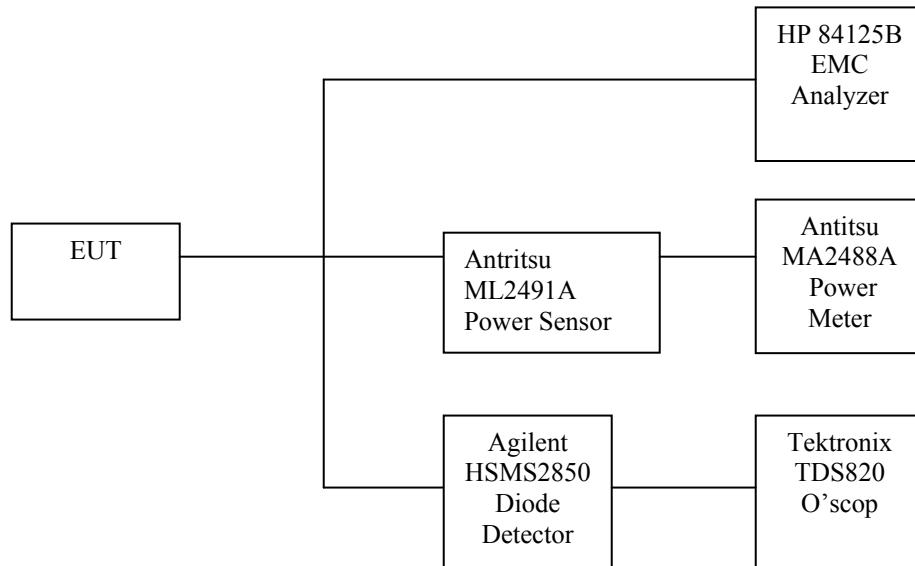
### Setup A (Antenna Conducted measurements)

#### Operational description

### ANTENNA CONDUCTED EMISSIONS MEASUREMENTS

The EUT was connected to the Laptop Computer through the serial port (COM1), the antenna bypassed and the SMA Cable connected to the Spectrum Analyzer. This setup was used for the **PEAK POWER OUTPUT, POWER DENSITY, 20 dB BW, BAND-EDGE COMPLIANCE, and RESTRICTED BAND** measurements.

#### Block Diagram



The solid lines are coaxial cables and the dashed lines are either EUT insertion to the test board or control cables between test setup devices. The measurement results were adjusted with the attenuation of the coaxial cable.

## Setup B (Radiated measurements)

### Operational description

## RADIATED EMISSIONS MEASUREMENTS

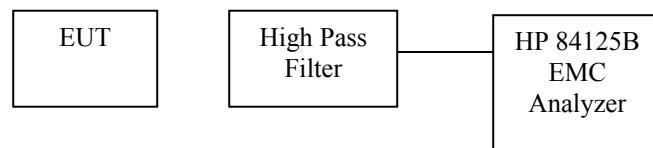
This setup was used in radiated emissions measurements.

The EUT was tested in 3 orthogonal orientations.

Worst case data is presented.

THIS SETUP USED FOR **RADIATED SPURIOUS EMISSIONS**

### *Block diagram*



Note: The high – pass filter is used for the Radiated Spurious emissions above 928 MHz. A pass-thru connector is used for Radiated Spurious emissions measurements from 30 MHz – 902 MHz.

The solid lines are coaxial cables and the dashed lines are either EUT insertion to the test board or control cables between test setup devices.

## 6.0 ENGINEERING EVALUATION RESULTS

### 6.1 Antenna Requirement

Requirement(s): CFR47, 15.203:

An intentional radiator shall be designed such that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna requirement must meet one of the following:

- Antenna must be permanently attached to the device.
- Antenna must use unique type of connector to attach to the device.
- Device must be professionally installed. Installer shall be responsible for insuring the correct antenna is installed with the device.

**The antenna is soldered directly to the PCB. It is an aluminum trace wrapped around a plastic cylinder to maintain proper impedance.**

**Antenna Gain (max) is -3.0 in the 902 - 928 MHz band.**

## 6.2 Conducted Emissions Voltage

Requirement(s): CFR47, 15.207a

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

CFR47, 15.207c Waives the requirement for battery powered devices:

Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

### *AC Line Conducted Emissions Measurement 150 kHz – 30 MHz*

<b>EUT</b>	DM536A
<b>Test setup</b>	
<b>Temp, Humidity, Air Pressure</b>	
<b>Date of Measurement</b>	
<b>Measured by</b>	Bob Cole
<b>Result</b>	

### **CLASS B LIMIT**

<b>Frequency Band (MHz)</b>	<b>EN 55022 B Limit (dB<math>\mu</math>V/m)</b>	<b>Detector</b>
0.15 – 0.5	66 to 56	QP
0.5 – 5.0	56	QP
5.0 – 30.0	60	QP

### ***Not Applicable – Battery Powered EUT***

## 5.3 Channel Separation

Requirement(s): 15.247(a)(1), RSS 210(A8.2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

### *CF Separation*

<b>EUT</b>	<b>DIGITAL WIRELESS MICROPHONE</b>
<b>Test setup</b>	A (conducted – hopping enabled)
<b>Temp, Humidity, Air Pressure</b>	
<b>Date of Measurement</b>	
<b>Measured by</b>	Bob Cole
<b>Result</b>	

- The EUT was set to low, mid, and high channels at maximum RF Power output. The spectrum analyzer was connected directly to the antenna output.
- Conducted Emissions Measurement Uncertainty: The uncertainty of the measurement with a confidence factor of approx. 95% (normal distribution) with a coverage factor of 2, in the range of 30 MHz – 26.2 GHz, is +/- 1.5 dB

### CENTER FREQUENCY SEPARATION LIMITS

EUT Channel	Limit	Test results (MHz)
2402 - 2403		
2441 - 2442		
2479 - 2480		

*Not Applicable – DTS Device*

## 5.4 6 dB Bandwidth

### *6 dB Bandwidth*

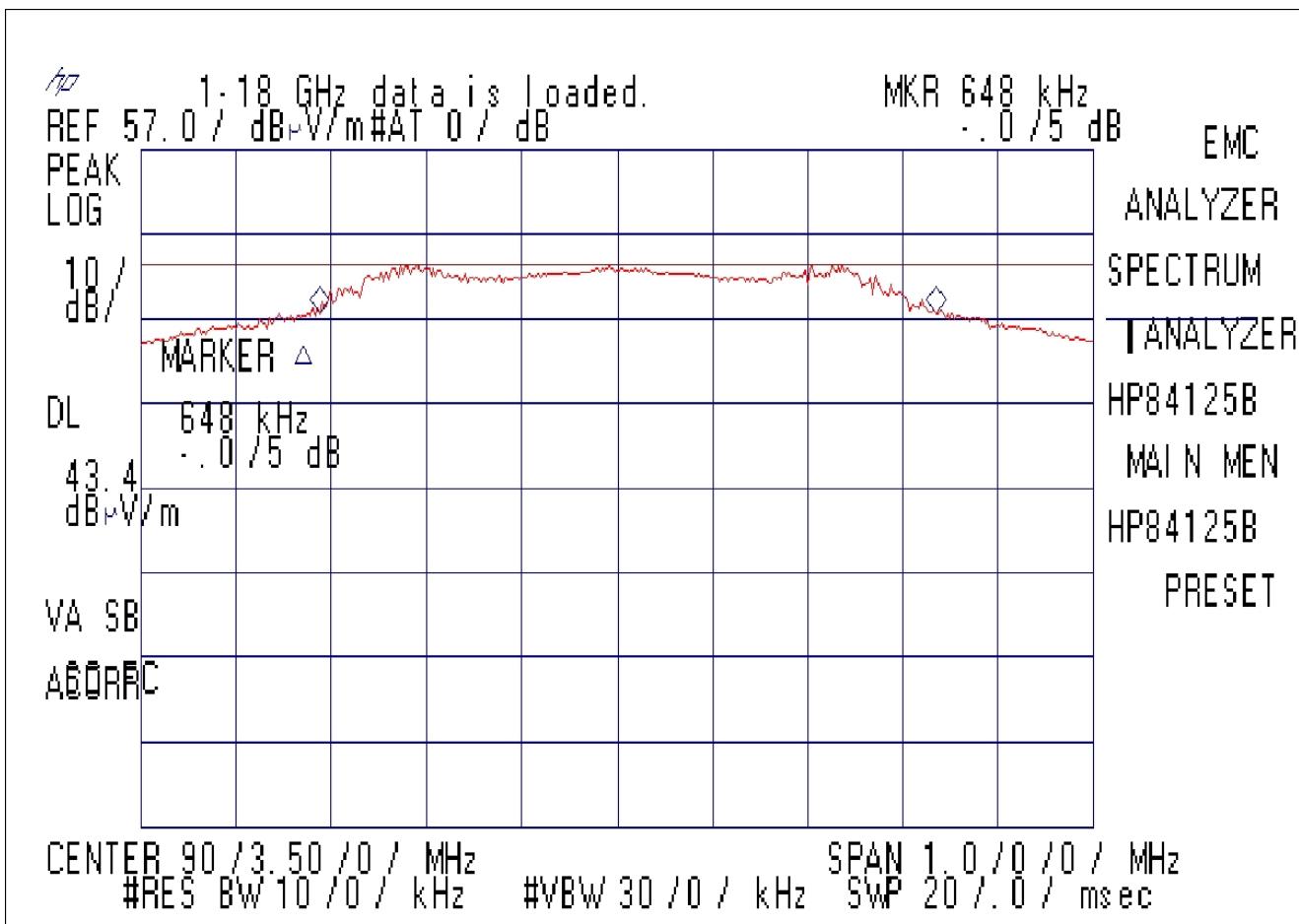
<b>EUT</b>	<b>DM536A</b>
<b>Test setup</b>	A (conducted)
<b>Temp, Humidity, Air Pressure</b>	58° F, 30.98
<b>Date of Measurement</b>	4/10/09
<b>Measured by</b>	Bob Cole
<b>Result</b>	PASSED

### *6 dB BANDWIDTH LIMITS*

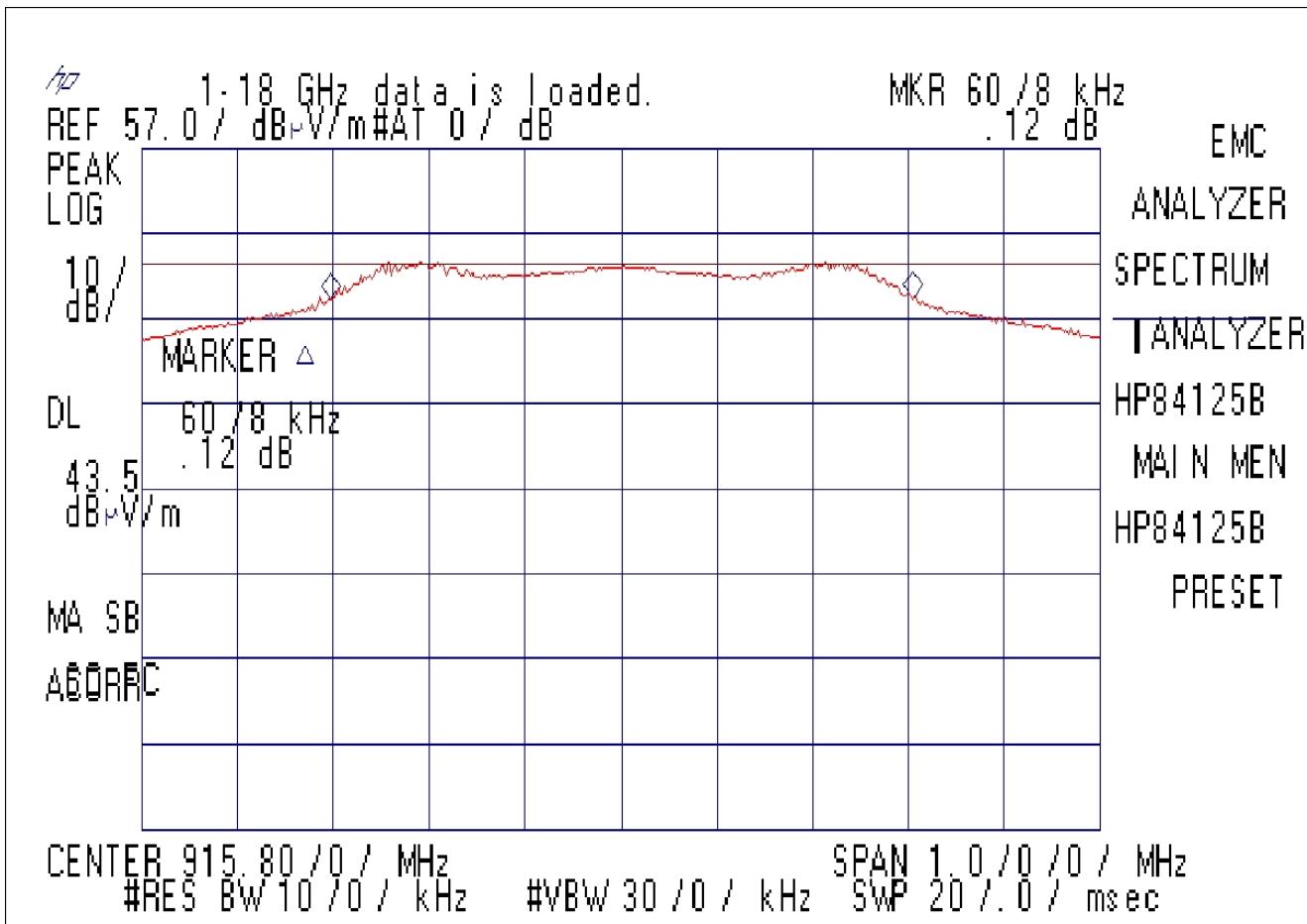
<b>EUT Channel</b>	<b>Limit (kHz)</b>	<b>Test results (kHz)</b>
903.5	>500 kHz	648.0
915.8	>500 kHz	608.0
926.4	>500 kHz	730.0

*Measurement BW: RBW = 100 kHz, VBW = 300 kHz*

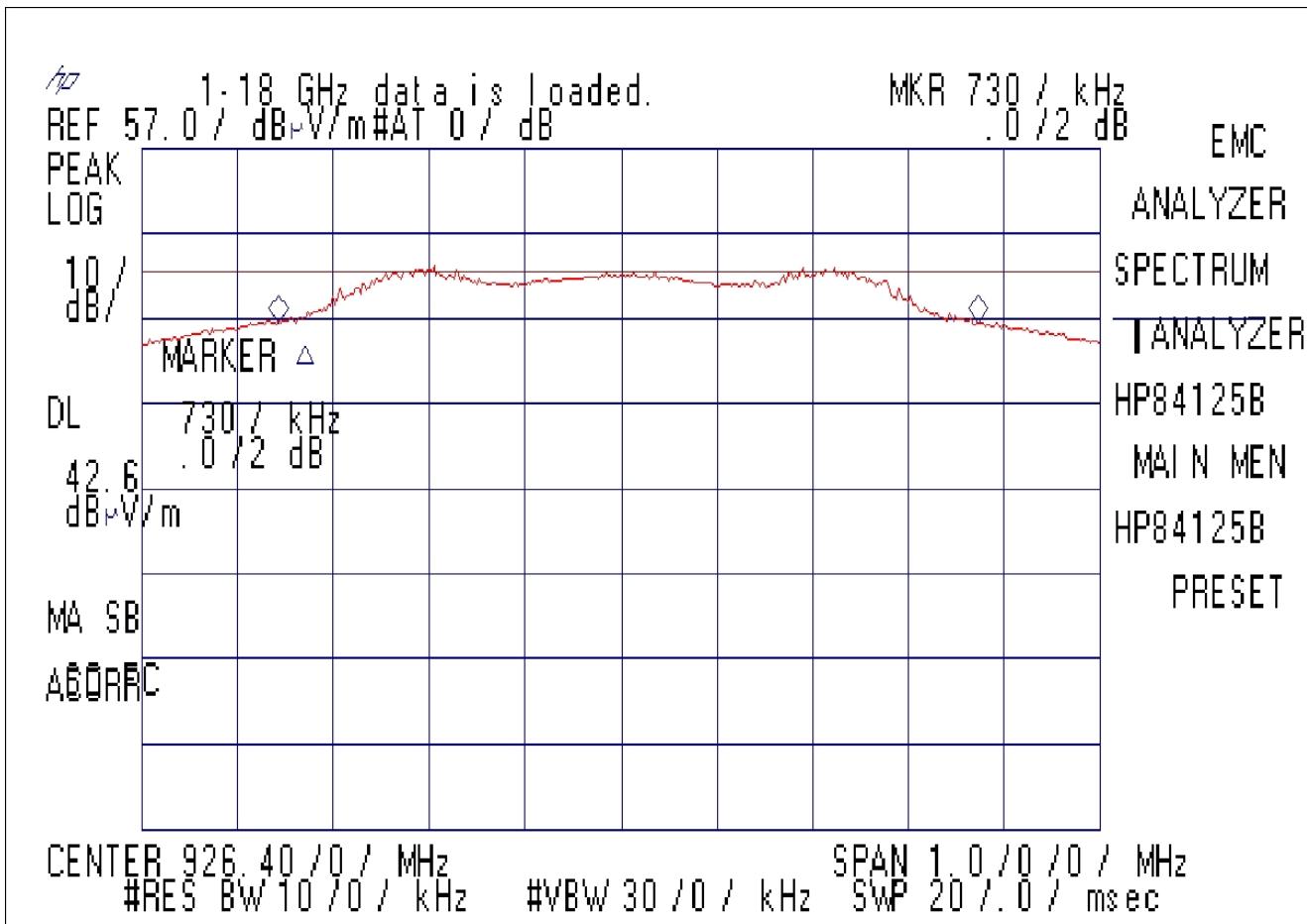
## 6 dB BW 903.5 MHz



*6dB BW 915.8 MHz*



*6dB BW 926.4 MHz*



## 5.5 Number of Hopping Frequencies

Requirement(s): CFR47, 15.247(a)(1)(iii), RSS210(A8.1)

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### *Number of Hopping Frequencies*

<b>EUT</b>	<b>DM536A</b>
<b>Test setup</b>	A (conducted – hopping enabled)
<b>Temp, Humidity, Air Pressure</b>	
<b>Date of Measurement</b>	
<b>Measured by</b>	Bob Cole
<b>Result</b>	

#### Limits and results

#### NUMBER OF HOPPING FREQUENCIES

EUT Channel	Limit (MHz)	Test results (MHz)
2-80	>/= 15	79

*Not Applicable – DTS Device*

## 5.6 Time of Occupancy

Requirement(s): CFR47, 15.247(a)(1)(iii), RSS210(A8.1)

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### *Time of Occupancy*

<b>EUT</b>	<b>DM536A</b>
<b>Test setup</b>	N/A
<b>Temp, Humidity, Air Pressure</b>	N/A
<b>Date of Measurement</b>	N/A
<b>Measured by</b>	Bob Cole
<b>Result</b>	

#### Limits and results

### *Time of Occupancy*

<b>EUT Channel</b>	<b>Limit</b>	<b>Test results</b>
2	400 ms per 30 second of operation	PASSED <i>See description that follows</i>

***Not Applicable – DTS Device***

## 5.7 Peak Output Power

Requirement(s): CFR47, 15.247(b)(1), RSS210(A8.4)

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

### *Peak Output Power*

<b>EUT</b>	<b>DM536A</b>
<b>Test setup</b>	A (conducted)
<b>Temp, Humidity, Air Pressure</b>	67° F, 30.97
<b>Date of Measurement</b>	4/1/09
<b>Measured by</b>	Bob Cole
<b>Result</b>	PASSED

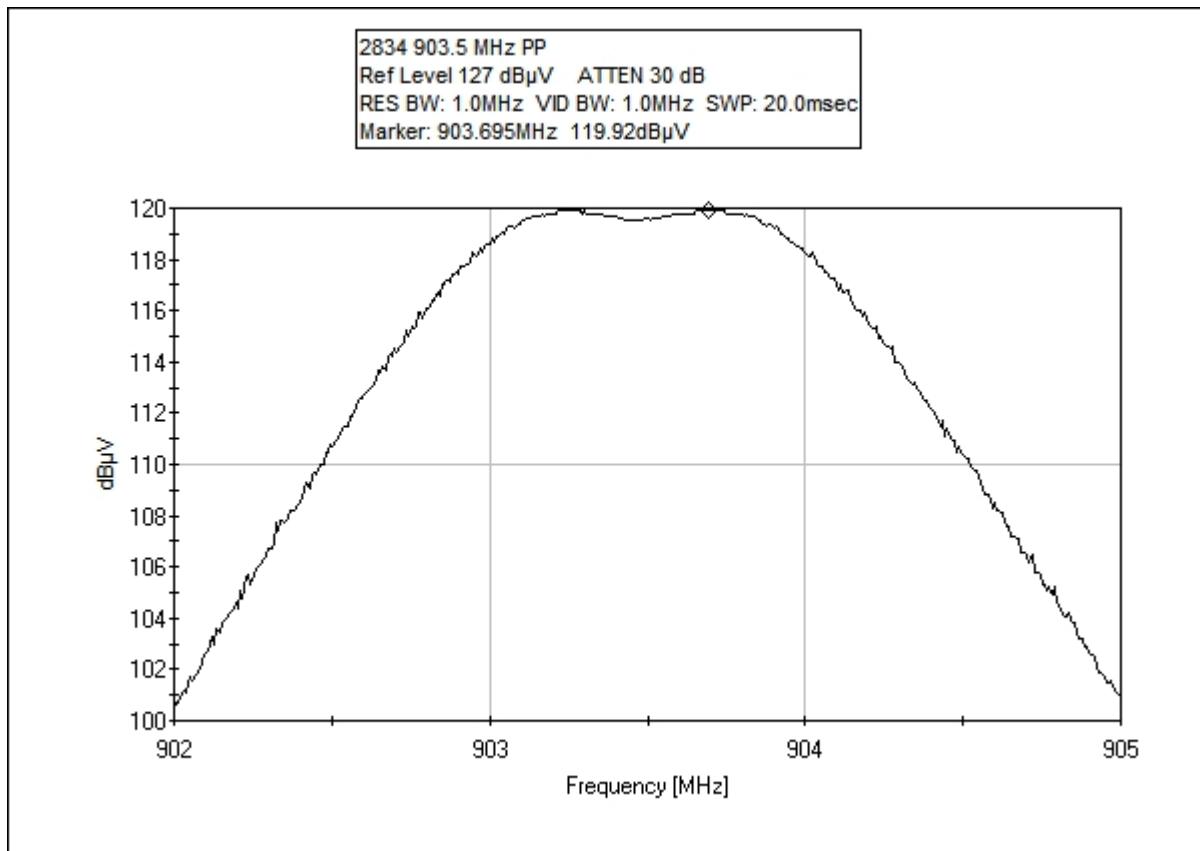
- The EUT was set to low, mid, and high channels at maximum RF Power output. The spectrum analyzer was connected directly to the antenna output.
- Conducted Emissions Measurement Uncertainty: The uncertainty of the measurement with a confidence factor of approx. 95% (normal distribution) with a coverage factor of 2, in the range of 30 MHz – 26.2 GHz, is +/- 1.5 dB

### PEAK OUTPUT POWER

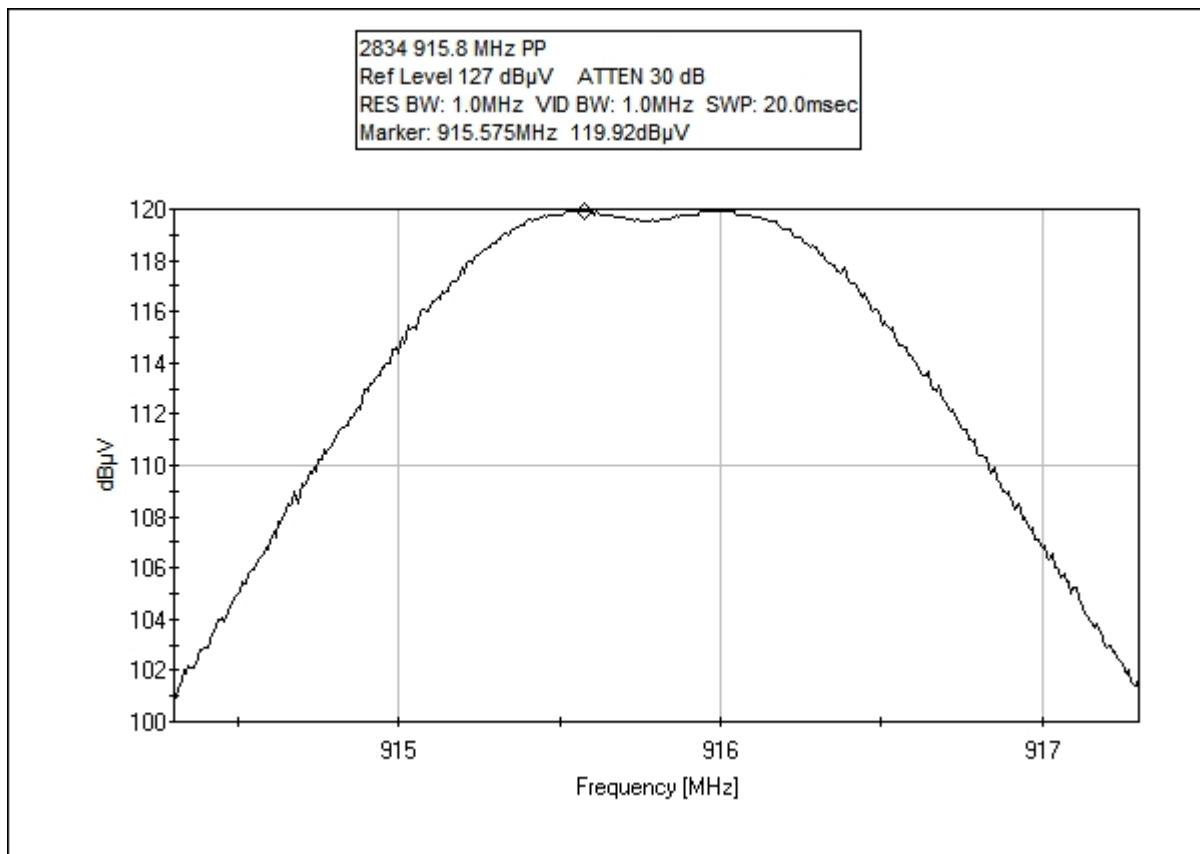
EUT Channel Info	Limit (dBm)	Test results (dBm)
903.5	30.0	12.92
915.8	30.0	12.92
926.4	30.0	13.34

Note: 0 dBm = 107 dbuV

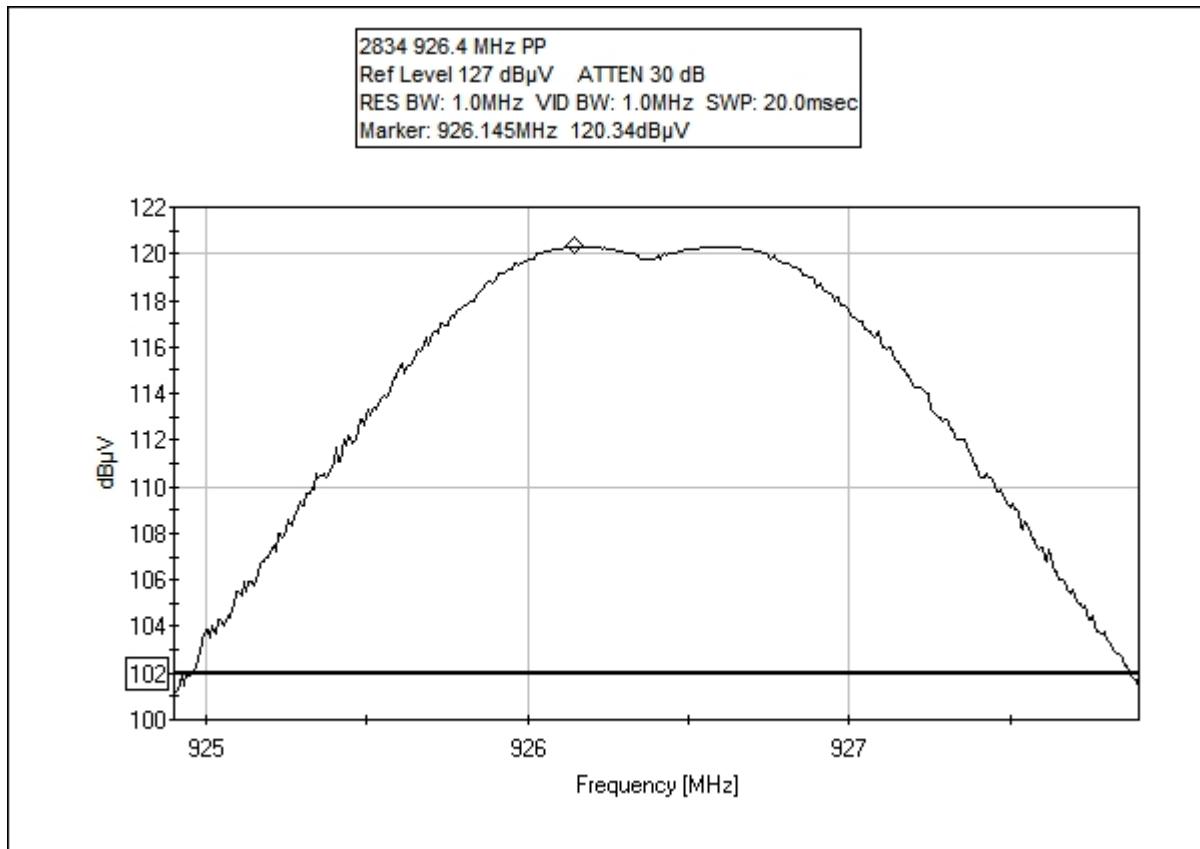
## Peak Output Power – 903.5 MHz



## Peak Output Power – 915.8 MHz



*Peak Output Power – 926.4 MHz*



## 5.8 ANTENNA CONDUCTED SPURIOUS EMISSIONS

Requirement: CFR47, 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

*Transmit Frequency = 903.5 MHz*

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **Integrated Technology**  
 Specification: **FCC 15.247 dBm Cond Spurious High 2483.5 - 25000 MHz 1 - 10 G**  
 Work Order #: **2834** Date: 5/6/2009  
 Test Type: **Conducted Emissions** Time: 11:56:33 AM  
 Equipment: **Digital Wireless Microphone** Sequence#: 3  
 Manufacturer: Integrated Technology Tested By: Bob Cole  
 Model: DM536A 120V 60Hz  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B Spectrum Analyzer	2856A93846	08/20/2008	08/20/2009	004
HP 85650A Quasi Peak Adapter	3145A01673	10/15/2008	10/15/2009	003

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Digital Wireless Microphone*	Integrated Technology	DM536A	

**Support Devices:**

Function	Manufacturer	Model #	S/N

**Test Conditions / Notes:**

RBW = 100 kHz VBW = 300 kHz Xmit = 903.5 MHz
--

**Transducer Legend:**

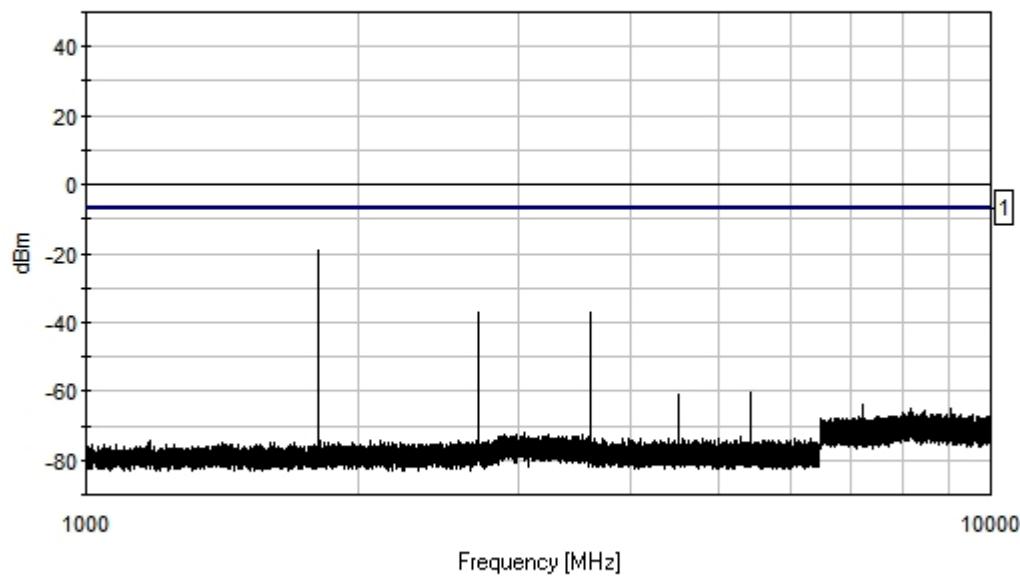
T1=dBuV - dBm 50 ohm conversion
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Ext Attn: 0 dB

Measurement Data:		Reading listed by margin.				Test Lead: Antenna				
#	Freq MHz	Rdng dB $\mu$ V	T1 dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	1806.605M	87.7	-107.0			+0.0	-19.3	-7.0	-12.3	Anten
2	2710.063M	70.0	-107.0			+0.0	-37.0	-7.0	-30.0	Anten

3	3614.877M	69.8	-107.0	+0.0	-37.2	-7.0	-30.2	Anten
4	2711.118M	69.0	-107.0	+0.0	-38.0	-7.0	-31.0	Anten
5	3613.070M	68.3	-107.0	+0.0	-38.7	-7.0	-31.7	Anten
6	5419.685M	46.9	-107.0	+0.0	-60.1	-7.0	-53.1	Anten
7	4516.377M	46.2	-107.0	+0.0	-60.8	-7.0	-53.8	Anten
8	4518.787M	45.6	-107.0	+0.0	-61.4	-7.0	-54.4	Anten
9	5422.396M	44.6	-107.0	+0.0	-62.4	-7.0	-55.4	Anten
10	7229.915M	42.9	-107.0	+0.0	-64.1	-7.0	-57.1	Anten

EMCE Engineering Date: 5/6/2009 Time: 11:56:33 AM Integrated Technology WO#: 2834  
FCC 15.247 dBm Cond Spurious High 2483.5 - 25000 MHz  
1 - 10 G Test Lead: Antenna 120V 60Hz Sequence#: 3



— Sweep Data — 1 - FCC 15.247 dBm Cond Spurious High 2483.5 - 25000 MHz 1 - 10 G

## Transmit Frequency = 915.8 MHz

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **Integrated Technology**  
 Specification: **FCC 15.247 dBm Cond Spurious High 2483.5 - 25000 MHz 1 - 10 G**  
 Work Order #: **2834** Date: **5/6/2009**  
 Test Type: **Conducted Emissions** Time: **3:21:25 PM**  
 Equipment: **Digital Wireless Microphone** Sequence#: **4**  
 Manufacturer: Integrated Technology Tested By: **Bob Cole**  
 Model: **DM536A** **120V 60Hz**  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B Spectrum Analyzer	2856A93846	08/20/2008	08/20/2009	004
HP 85650A Quasi Peak Adapter	3145A01673	10/15/2008	10/15/2008	003
HP 85685A RF Preselector	35076A01550	08/20/2008	08/20/2009	002
HP Transient Limiter	3107A02941	10/01/2008	10/01/2009	006
EMCO 3810-2 LISN	4576	10/01/2008	10/01/2009	007

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Digital Wireless Microphone*	Integrated Technology	DM536A	

**Support Devices:**

Function	Manufacturer	Model #	S/N

**Test Conditions / Notes:**

RBW = 100 kHz VBW = 300 kHz Xmit = 915.8 MHz

**Transducer Legend:**

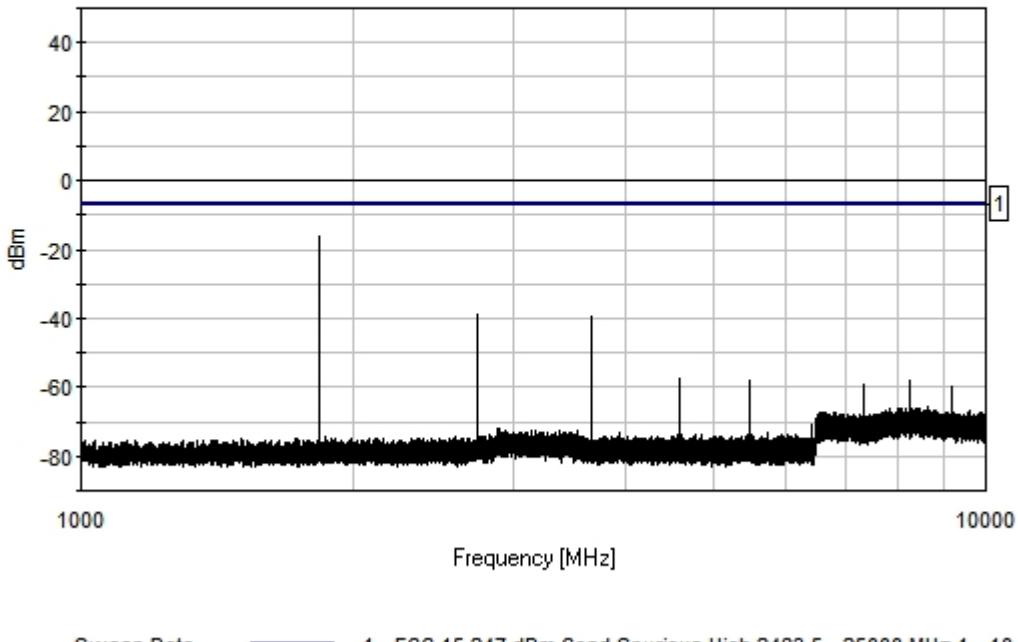
T1=dBuV - dBm 50 ohm conversion

Ext Attn: 0 dB

Measurement Data:					Test Lead: Antenna				
#	Freq MHz	Rdng dB $\mu$ V	T1 dB	Margin dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	1831.760M	90.5	-107.0		+0.0	-16.5	-7.0	-9.5	Anten
2	2747.268M	68.3	-107.0		+0.0	-38.7	-7.0	-31.7	Anten
3	3663.228M	67.7	-107.0		+0.0	-39.3	-7.0	-32.3	Anten
4	4579.038M	49.7	-107.0		+0.0	-57.3	-7.0	-50.3	Anten
5	5494.998M	49.2	-107.0		+0.0	-57.8	-7.0	-50.8	Anten
6	8242.276M	48.8	-107.0		+0.0	-58.2	-7.0	-51.2	Anten

7	7326.466M	48.0	-107.0	+0.0	-59.0	-7.0	-52.0	Anten
8	9157.935M	47.0	-107.0	+0.0	-60.0	-7.0	-53.0	Anten
9	8618.843M	41.6	-107.0	+0.0	-65.4	-7.0	-58.4	Anten
10	8016.336M	41.1	-107.0	+0.0	-65.9	-7.0	-58.9	Anten

EMCE Engineering Date: 5/6/2009 Time: 3:21:25 PM Integrated Technology WO#: 2834  
FCC 15.247 dBm Cond Spurious High 2483.5 - 25000 MHz  
1 - 10 G Test Lead: Antenna 120V 60Hz Sequence#: 4



## Transmit Frequency = 926.4 MHz

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **Integrated Technology**  
 Specification: **FCC 15.247 dBm Cond Spurious High 2483.5 - 25000 MHz 1 - 10 G**  
 Work Order #: **2834** Date: 5/6/2009  
 Test Type: **Conducted Emissions** Time: 3:34:57 PM  
 Equipment: **Digital Wireless Microphone** Sequence#: 5  
 Manufacturer: Integrated Technology Tested By: Bob Cole  
 Model: DM536A 120V 60Hz  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B Spectrum Analyzer	2856A93846	08/20/2008	08/20/2009	004
HP 85650A Quasi Peak Adapter	3145A01673	10/15/2008	10/15/2008	003
HP 85685A RF Preselector	35076A01550	08/20/2008	08/20/2009	002
HP Transient Limiter	3107A02941	10/01/2008	10/01/2009	006
EMCO 3810-2 LISN	4576	10/01/2008	10/01/2009	007

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Digital Wireless Microphone*	Integrated Technology	DM536A	

**Support Devices:**

Function	Manufacturer	Model #	S/N

**Test Conditions / Notes:**

RBW = 100 kHz VBW = 300 kHz Xmit = 926.4 MHz

**Transducer Legend:**

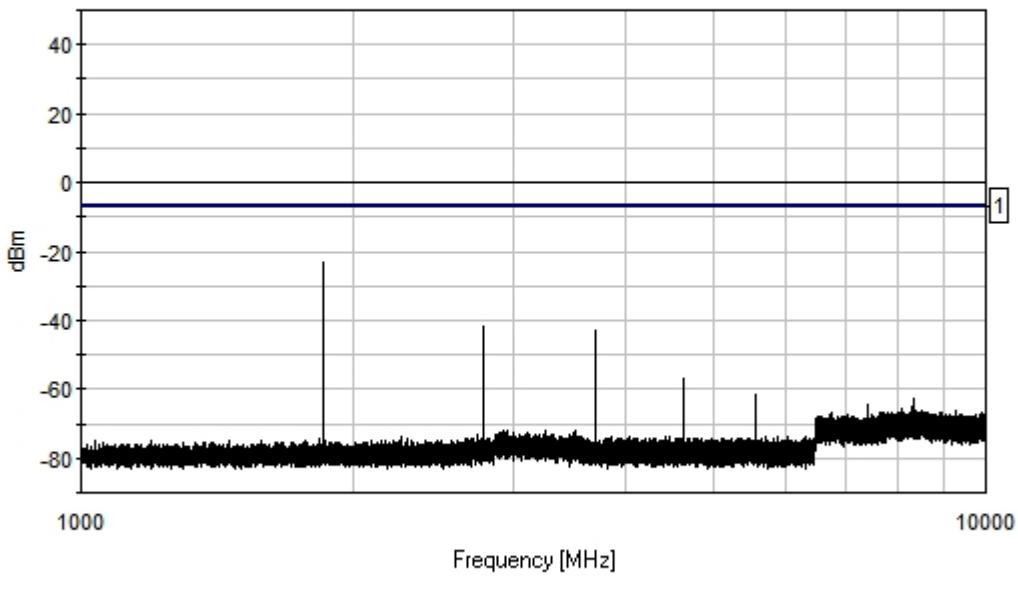
T1=dBuV - dBm 50 ohm conversion

Ext Attn: 0 dB

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	dB	dB	Dist Table	Test Lead: Antenna			
							Corr dBm	Spec dBm	Margin dB	
1	1852.245M	83.6	-107.0			+0.0	-23.4	-7.0	-16.4	Anten
2	2780.105M	65.0	-107.0			+0.0	-42.0	-7.0	-35.0	Anten
3	3706.609M	63.9	-107.0			+0.0	-43.1	-7.0	-36.1	Anten
4	2778.900M	63.8	-107.0			+0.0	-43.2	-7.0	-36.2	Anten
5	3704.801M	63.5	-107.0			+0.0	-43.5	-7.0	-36.5	Anten
6	3704.349M	55.0	-107.0			+0.0	-52.0	-7.0	-45.0	Anten
7	4633.113M	50.4	-107.0			+0.0	-56.6	-7.0	-49.6	Anten

8	4630.854M	48.1	-107.0	+0.0	-58.9	-7.0	-51.9	Anten
9	2777.845M	47.5	-107.0	+0.0	-59.5	-7.0	-52.5	Anten
10	5560.069M	45.5	-107.0	+0.0	-61.5	-7.0	-54.5	Anten

EMCE Engineering Date: 5/6/2009 Time: 3:34:57 PM Integrated Technology WO#: 2834  
FCC 15.247 dBm Cond Spurious High 2483.5 - 25000 MHz  
1 - 10 G Test Lead: Antenna 120V 60Hz Sequence#: 5



## 5.9 Radiated Emissions – Restricted Bands

Requirement(s): CFR47, 15.247(d), 15.209, RSS210(2.2, A8.5)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. **In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).**

### *Restricted Band Measurements*

<b>EUT</b>	<b>DM536A</b>
<b>Test setup</b>	B (Radiated)
<b>Temp, Humidity, Air Pressure</b>	68° F, 30.02
<b>Date of Measurement</b>	
<b>Measured by</b>	Bob Cole
<b>Result</b>	PASSED

Restricted Band Measurements were taken, using a Peak detector, over the frequency band of 30 - 1000 MHz, and using an Average Detector over the bands of 1000 – 10000 MHz, in both horizontal and vertical polarizations. All measurements were repeated with the EUT operating at 903.5, 915.8, and 926.4 MHz. Worst case data is presented in this report.

*Restricted Band Spurious Radiated Emissions*  
*30 - 1000 MHz*  
**PEAK DETECTOR (Meets Quasi-Peak Limits)**

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **Integrated Technology**  
Specification: **FCC 15.209 25-1000**  
Work Order #: **2832** Date: **4/29/2009**  
Test Type: **Radiated Scan** Time: **12:08:47 PM**  
Equipment: **Digital Wireless Microphone** Sequence#: **1**  
Manufacturer: Integrated Technology Tested By: **Bob Cole**  
Model: **DM536A**  
S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 84125B RF	2542A11087	08/20/2008	08/20/2009	001
<b>Measurement System</b>				
HP 85650A Quasi Peak Adapter	3145A01673	10/15/2008	10/15/2008	003

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Digital Wireless Microphone*	Integrated Technology	DM536A	

**Support Devices:**

Function	Manufacturer	Model #	S/N

**Test Conditions / Notes:**

RBW = 100 kHz VBW = 100 kHz
-----------------------------

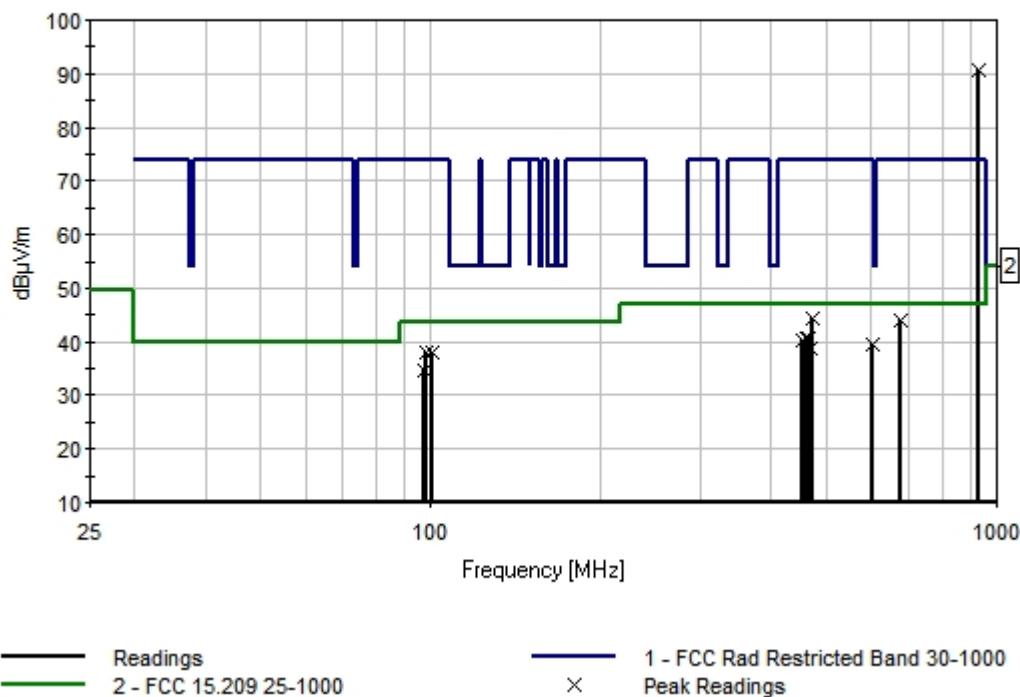
**Transducer Legend:**

T1=25' LMR #001	T2=AH SAS-200/543 S/N: 199
T3=AH Log P SAS-200_510 S-N853	T4=8447 Pre-Amp Asset 377

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters											
#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	926.456M	94.1	+0.9	+0.0	+22.5	+26.9	+0.0	90.6	47.0	<b>XMit Freq</b>	Horiz
2	471.413M	53.2	+0.3	+0.0	+17.7	+27.0	+0.0	44.2	47.0	-2.8	Vert
3	675.361M	50.2	+0.7	+0.0	+20.1	+27.1	+0.0	43.9	47.0	-3.1	Horiz
4	98.535M	55.9	+0.1	+8.9	+0.0	+26.9	+0.0	38.0	43.5	-5.5	Horiz
5	100.343M	55.7	+0.1	+9.1	+0.0	+26.9	+0.0	38.0	43.5	-5.5	Vert
6	461.622M	49.8	+0.3	+0.0	+17.5	+27.0	+0.0	40.6	47.0	-6.4	Vert

EMCE Engineering Date: 4/29/2009 Time: 12:08:47 PM Integrated Technology WO#: 2832  
FCC 15.209 25-1000 Test Distance: 3 Meters Sequence#: 1



*Restricted Band Spurious Radiated Emissions*  
*1 - 10 GHz*  
*AVERAGE DETECTOR*

*Transmit Frequency = 903.5 MHz*

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **Integrated Technology**  
Specification: **FCC Rad Restricted Band 1 - 10 GHz**  
Work Order #: **2832** Date: **4/29/2009**  
Test Type: **Radiated Scan** Time: **3:27:41 PM**  
Equipment: **Digital Wireless Microphone** Sequence#: **4**  
Manufacturer: Integrated Technology Tested By: **Bob Cole**  
Model: **DM536A**  
S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 84125B RF	2542A11087	08/20/2008	08/20/2009	001
<b>Measurement System</b>				
HP 85650A Quasi Peak Adapter	3145A01673	10/15/2008	10/15/2009	003

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Digital Wireless Microphone*	Integrated Technology	DM536A	

**Support Devices:**

Function	Manufacturer	Model #	S/N
----------	--------------	---------	-----

**Test Conditions / Notes:**

RBW = 1 MHz VBW = 10 Hz Xmit = 903.5 MHz
--

**Transducer Legend:**

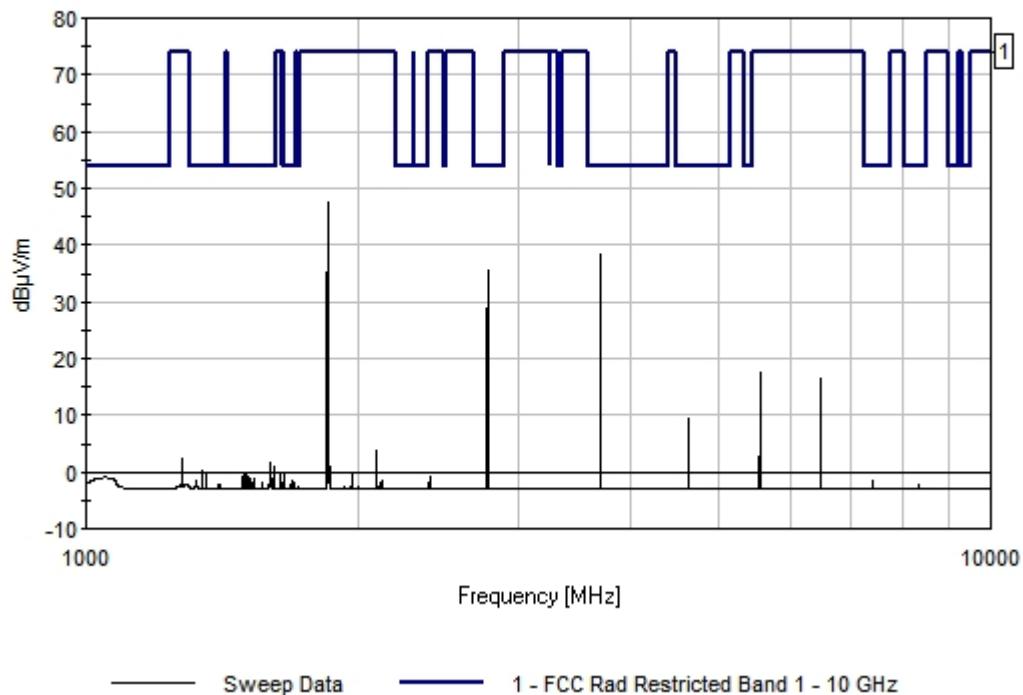
--

Ext Attn: 0 dB

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.			Test Distance: 3 Meters				
			dB	dB	dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	3700.734M	38.2				+0.0	38.2	54.0	-15.8	Vert
2	2777.394M	35.5				+0.0	35.5	54.0	-18.5	Vert
3	4631.606M	9.3				+0.0	9.3	54.0	-44.7	Vert
4	1596.481M	1.8				+0.0	1.8	54.0	-52.2	Vert

5	1614.556M	1.0	+0.0	1.0	54.0	-53.0	Vert
6	1601.000M	0.5	+0.0	0.5	54.0	-53.5	Vert

EMCE Engineering Date: 4/29/2009 Time: 3:27:41 PM Integrated Technology WO#: 2832  
FCC Rad Restricted Band 1 - 10 GHz Test Distance: 3 Meters Sequence#: 4



## Transmit Frequency = 915.8 MHz

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **Integrated Technology**  
 Specification: **FCC Rad Restricted Band 1 - 10 GHz**  
 Work Order #: **2832** Date: **5/7/2009**  
 Test Type: **Radiated Scan** Time: **10:46:19 AM**  
 Equipment: **Digital Wireless Microphone** Sequence#: **6**  
 Manufacturer: Integrated Technology Tested By: Bob Cole  
 Model: **XXXX**  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 84125B RF	2542A11087	08/20/2008	08/20/2009	001
<b>Measurement System</b>				
HP 85650A Quasi Peak Adapter	3145A01673	10/15/2008	10/15/2008	003

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Digital Wireless Microphone*	Integrated Technology	XXXX	

**Support Devices:**

Function	Manufacturer	Model #	S/N

**Test Conditions / Notes:**

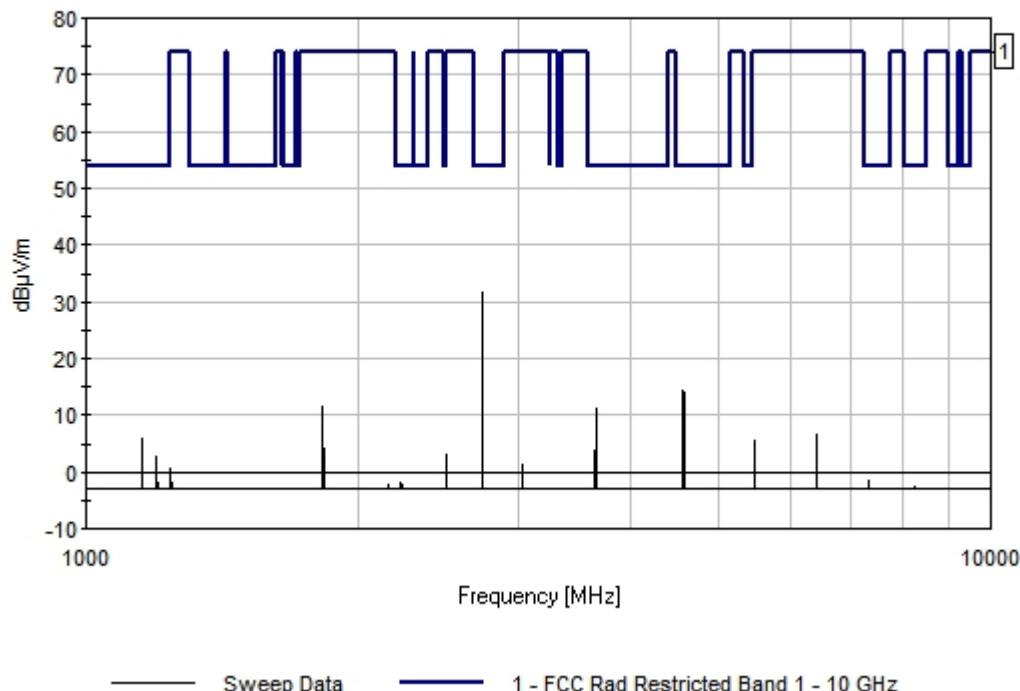
Xmit Freq = 915.8 MHz

**Transducer Legend:**

Ext Attn: 0 dB

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.		Test Distance: 3 Meters				
			dB	dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	2744.256M	31.6			+0.0	31.6	54.0	-22.4	Vert
2	4574.369M	14.2			+0.0	14.2	54.0	-39.8	Vert
3	3658.559M	11.2			+0.0	11.2	54.0	-42.8	Vert
4	1153.639M	5.9			+0.0	5.9	54.0	-48.1	Vert
5	1195.815M	2.8			+0.0	2.8	54.0	-51.2	Vert
6	7318.785M	-1.5			+0.0	-1.5	54.0	-55.5	Vert

EMCE Engineering Date: 5/7/2009 Time: 10:46:19 AM Integrated Technology WO#: 2832  
FCC Rad Restricted Band 1 - 10 GHz Test Distance: 3 Meters Sequence#: 6



## Transmit Frequency = 926.4 MHz

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **Integrated Technology**  
 Specification: **FCC Rad Restricted Band 1 - 10 GHz**  
 Work Order #: **2832** Date: **4/29/2009**  
 Test Type: **Radiated Scan** Time: **3:27:41 PM**  
 Equipment: **Digital Wireless Microphone** Sequence#: **4**  
 Manufacturer: Integrated Technology Tested By: **Bob Cole**  
 Model: **XXXX**  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 84125B RF	2542A11087	08/20/2008	08/20/2009	001
<b>Measurement System</b>				
HP 85650A Quasi Peak Adapter	3145A01673	10/15/2008	10/15/2008	003

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Digital Wireless Microphone*	Integrated Technology	XXXX	

**Support Devices:**

Function	Manufacturer	Model #	S/N

**Test Conditions / Notes:**

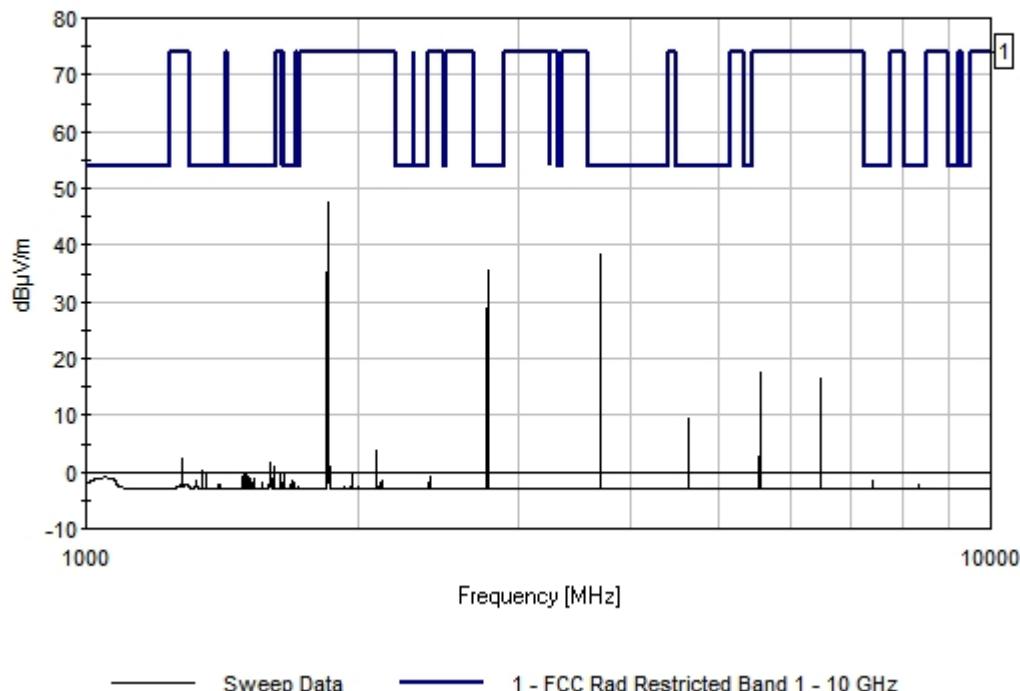
Xmit Freq = 924.6 MHz

**Transducer Legend:**

Ext Attn: 0 dB

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.		Test Distance: 3 Meters				
			dB	dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	3700.734M	38.2			+0.0	38.2	54.0	-15.8	Vert
2	2777.394M	35.5			+0.0	35.5	54.0	-18.5	Vert
3	1848.028M	47.7			+0.0	47.7	74.0	-26.3	Vert
4	4631.606M	9.3			+0.0	9.3	54.0	-44.7	Vert
5	1596.481M	1.8			+0.0	1.8	54.0	-52.2	Vert
6	1614.556M	1.0			+0.0	1.0	54.0	-53.0	Vert

EMCE Engineering Date: 4/29/2009 Time: 3:27:41 PM Integrated Technology WO#: 2832  
FCC Rad Restricted Band 1 - 10 GHz Test Distance: 3 Meters Sequence#: 4



*Peak Spurious Radiated Emissions*  
*1 – 10 GHz*  
**PEAK DETECTOR**

Requirement: CFR 47, 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

*Transmit Frequency = 903.5 MHz*

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **Integrated Technology**  
Specification: **FCC 1- 18 G PK Limit**  
Work Order #: **2832** Date: 4/29/2009  
Test Type: **Radiated Scan** Time: 4:00:26 PM  
Equipment: **Digital Wireless Microphone** Sequence#: 5  
Manufacturer: Integrated Technology Tested By: Bob Cole  
Model: DM536A  
S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 84125B RF	2542A11087	08/20/2008	08/20/2009	001
<b>Measurement System</b>				
HP 85650A Quasi Peak Adapter	3145A01673	10/15/2008	10/15/2009	003

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Digital Wireless Microphone*	Integrated Technology	DM536A	

**Support Devices:**

Function	Manufacturer	Model #	S/N

**Test Conditions / Notes:**

RBW = 1 MHz VBW = 1 MHz Xmit = 903.5 MHz
--

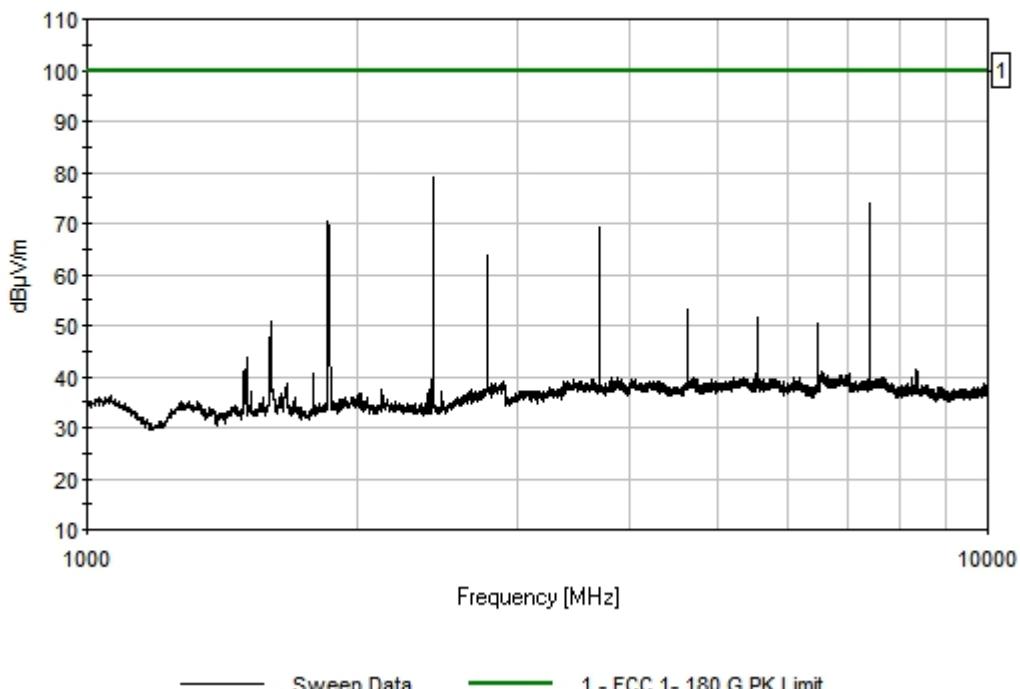
**Transducer Legend:**

Ext Attn: 0 dB
----------------

<b>Measurement Data:</b>		Reading listed by margin.	Test Distance: 3 Meters				
#	Freq	Rdng	Dist	Corr	Spec	Margin	Polar

	MHz	dB $\mu$ V	dB	dB	dB	Table	dB $\mu$ V/m	dB $\mu$ V/m	dB	Ant
1	2418.902M	78.9				+0.0	78.9	100.0	-21.1	Vert
2	7388.073M	73.8				+0.0	73.8	100.0	-26.2	Vert
3	1852.546M	70.2				+0.0	70.2	100.0	-29.8	Vert
4	3705.253M	69.2				+0.0	69.2	100.0	-30.8	Vert
5	2781.912M	63.9				+0.0	63.9	100.0	-36.1	Vert
6	4633.113M	53.0				+0.0	53.0	100.0	-47.0	Vert

EMCE Engineering Date: 4/29/2009 Time: 4:00:26 PM Integrated Technology WO#: 2832  
FCC 1- 180 G PK Limit Test Distance: 3 Meters Sequence#: 5



## Transmit Frequency = 915.8 MHz

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **Integrated Technology**  
 Specification: **FCC 1- 180 G PK Limit**  
 Work Order #: **2832** Date: **5/7/2009**  
 Test Type: **Radiated Scan** Time: **11:32:36 AM**  
 Equipment: **Digital Wireless Microphone** Sequence#: **6**  
 Manufacturer: Integrated Technology Tested By: Bob Cole  
 Model: **XXXX**  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 84125B RF	2542A11087	08/20/2008	08/20/2009	001
<b>Measurement System</b>				
HP 85650A Quasi Peak Adapter	3145A01673	10/15/2008	10/15/2008	003

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Digital Wireless Microphone*	Integrated Technology	XXXX	

**Support Devices:**

Function	Manufacturer	Model #	S/N
<b>Test Conditions / Notes:</b>			

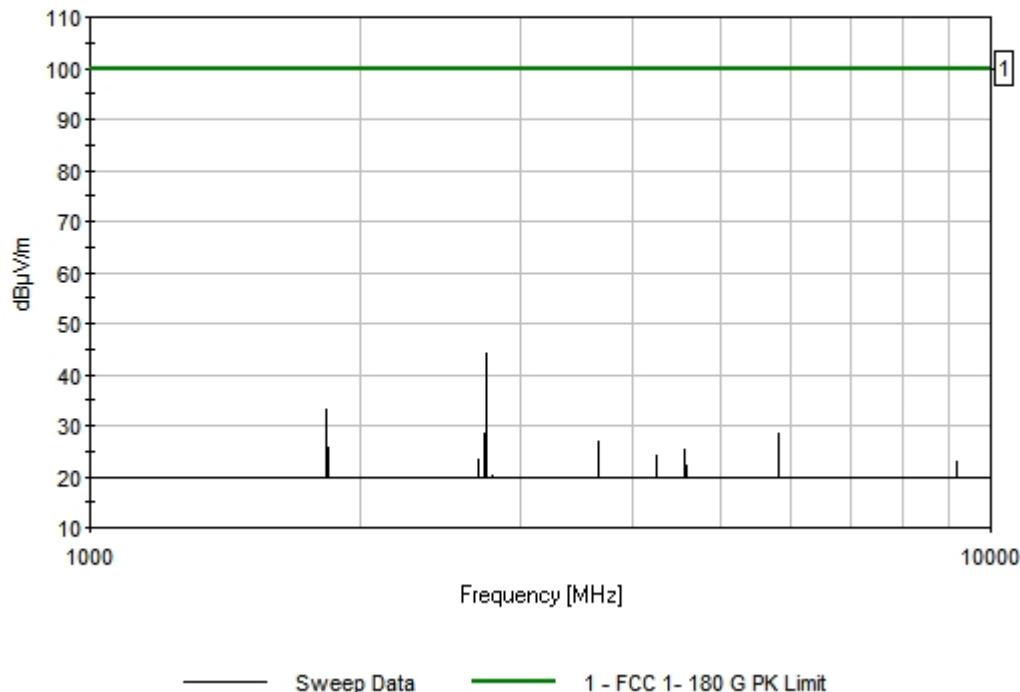
RBW = 1 MHz VBW = 1 MHz Xmit = 915.8 MHz

**Transducer Legend:**

Ext Attn: 0 dB
----------------

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.			Test Distance: 3 Meters				
			dB	dB	dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	2750.281M	44.1				+0.0	44.1	100.0	-55.9	Vert
2	3663.078M	27.0				+0.0	27.0	100.0	-73.0	Vert
3	4580.394M	25.2				+0.0	25.2	100.0	-74.8	Vert
4	4252.027M	24.0				+0.0	24.0	100.0	-76.0	Vert
5	2700.574M	23.2				+0.0	23.2	100.0	-76.8	Vert
6	9160.947M	23.1				+0.0	23.1	100.0	-76.9	Vert

EMCE Engineering Date: 5/7/2009 Time: 11:32:36 AM Integrated Technology WO#: 2832  
FCC 1- 180 G PK Limit Test Distance: 3 Meters Sequence#: 6



## Transmit Frequency = 926.4 MHz

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **Integrated Technology**  
 Specification: **FCC 1- 180 G PK Limit**  
 Work Order #: **2832** Date: **4/29/2009**  
 Test Type: **Radiated Scan** Time: **4:00:26 PM**  
 Equipment: **Digital Wireless Microphone** Sequence#: **5**  
 Manufacturer: Integrated Technology Tested By: Bob Cole  
 Model: **XXXX**  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 84125B RF	2542A11087	08/20/2008	08/20/2009	001
<b>Measurement System</b>				
HP 85650A Quasi Peak Adapter	3145A01673	10/15/2008	10/15/2008	003

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Digital Wireless Microphone*	Integrated Technology	XXXX	

**Support Devices:**

Function	Manufacturer	Model #	S/N
<b>Test Conditions / Notes:</b>			

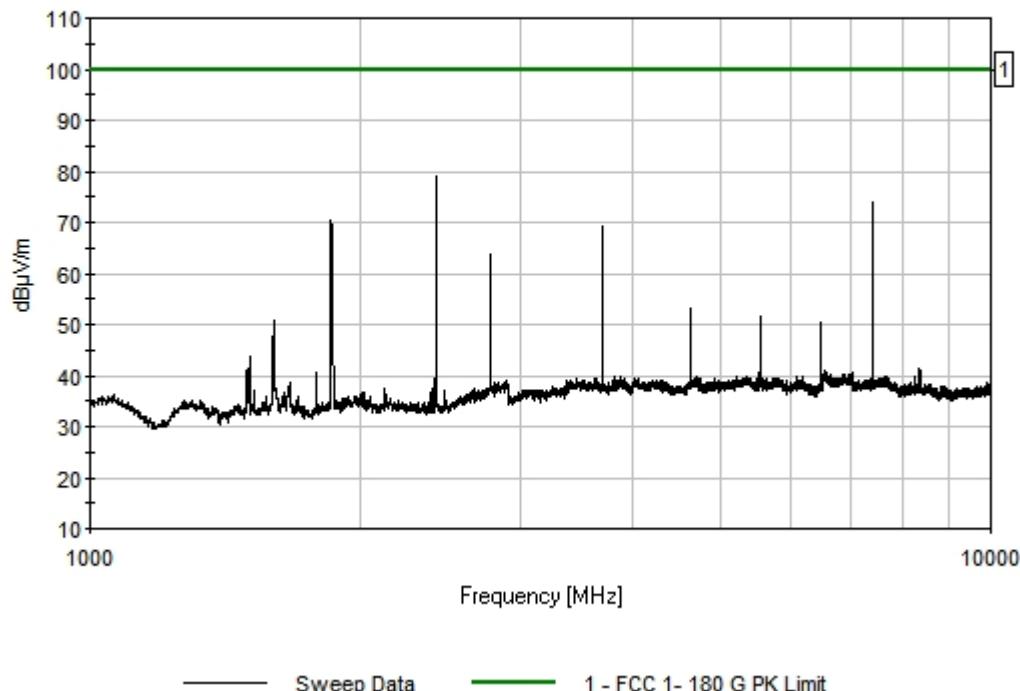
RBW = 1 MHz VBW = 1 MHz Xmit = 926.4 MHz

**Transducer Legend:**

Ext Attn: 0 dB
----------------

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.		Test Distance: 3 Meters				
			dB	dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	2418.902M	78.9			+0.0	78.9	100.0	-21.1	Vert
2	7388.073M	73.8			+0.0	73.8	100.0	-26.2	Vert
3	1852.546M	70.2			+0.0	70.2	100.0	-29.8	Vert
4	3705.253M	69.2			+0.0	69.2	100.0	-30.8	Vert
5	2781.912M	63.9			+0.0	63.9	100.0	-36.1	Vert
6	4633.113M	53.0			+0.0	53.0	100.0	-47.0	Vert

EMCE Engineering Date: 4/29/2009 Time: 4:00:26 PM Integrated Technology WO#: 2832  
FCC 1- 180 G PK Limit Test Distance: 3 Meters Sequence#: 5



## 5.10 Power Spectral Density

Requirement(s): CFR47, 15.247(e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

### *Power Spectral Density*

<b>EUT</b>	<b>DM536A</b>
<b>Test setup</b>	A (conducted)
<b>Temp, Humidity, Air Pressure</b>	67° F, 30.97
<b>Date of Measurement</b>	5/15/09
<b>Measured by</b>	Bob Cole
<b>Result</b>	PASSED

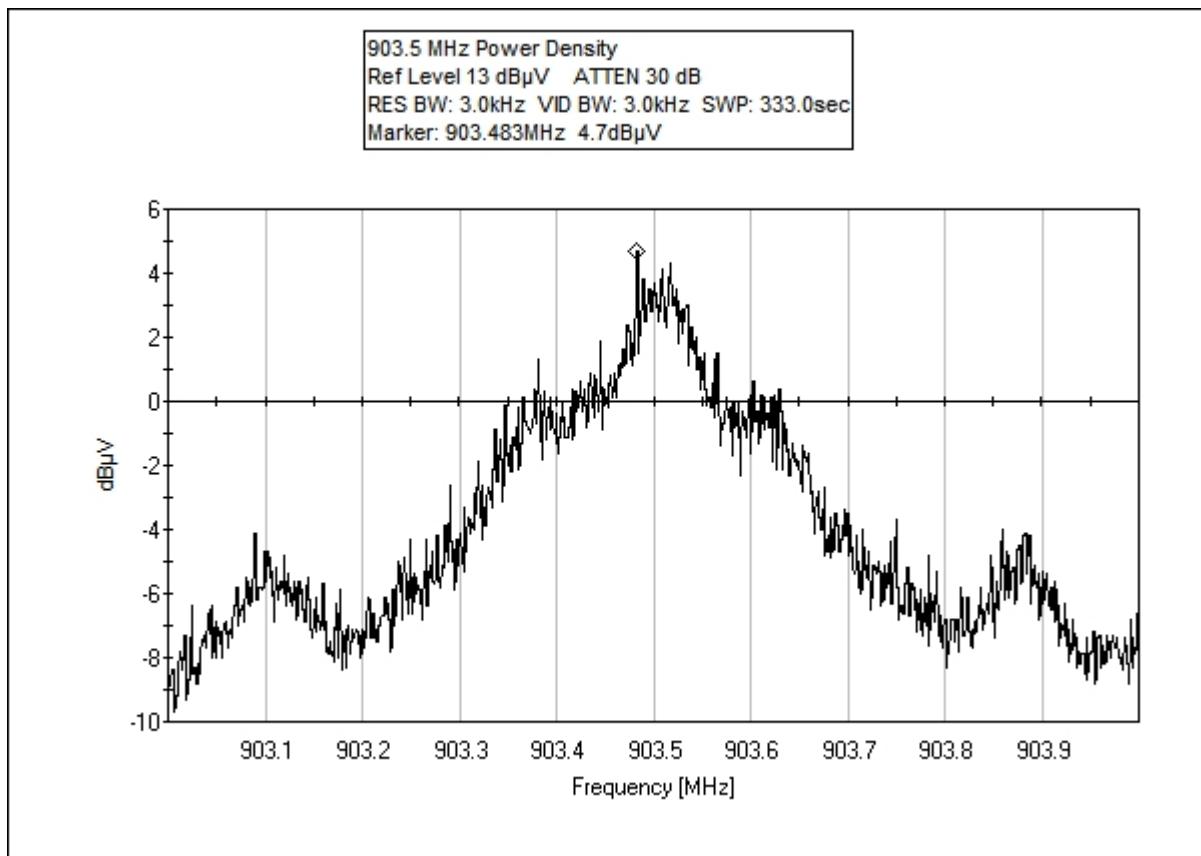
- The EUT was set to low, mid, and high channels at maximum RF Power output. The spectrum analyzer was connected directly to the antenna output.
- Conducted Emissions Measurement Uncertainty: The uncertainty of the measurement with a confidence factor of approx. 95% (normal distribution) with a coverage factor of 2, in the range of 30 MHz – 26.2 GHz, is +/- 1.5 dB

### POWER SPECTRAL DENSITY

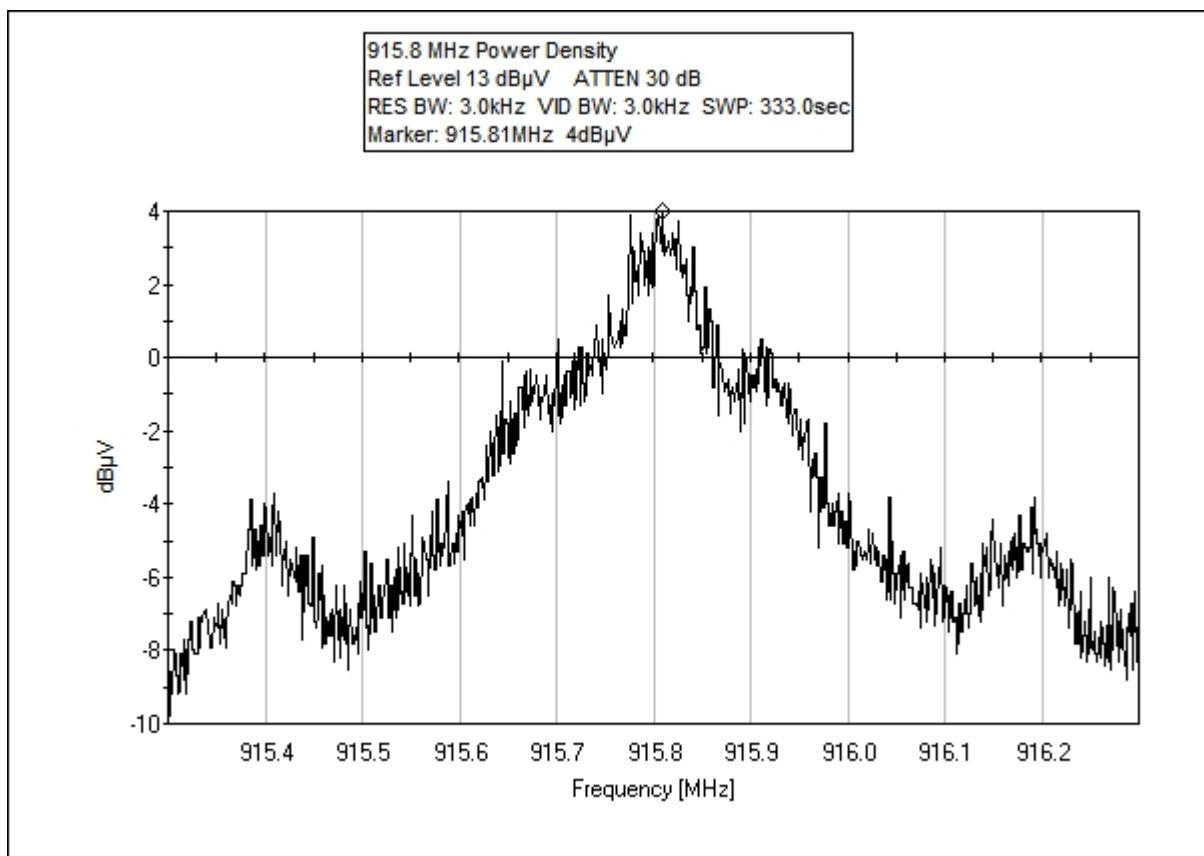
<b>EUT Channel Info</b>	<b>Limit (dBm)</b>	<b>Test results (dBm)</b>
903.5	8.0	4.7
915.8	8.0	4.0
926.4	8.0	3.9

*Note: 0 dBm = 107 dB<sub>uv</sub>*

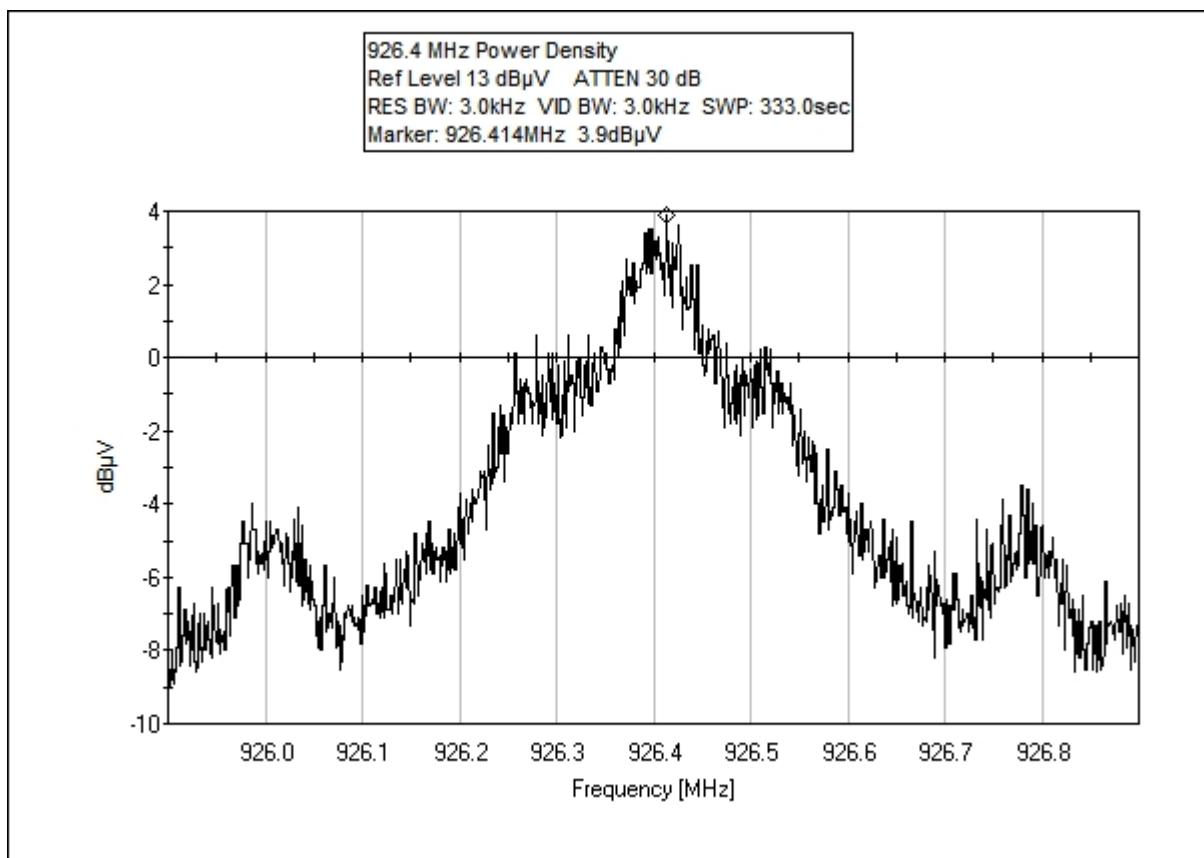
## 903.5 MHz Power Density



## 915.8 MHz Power Density



## 926.4 MHz Power Density



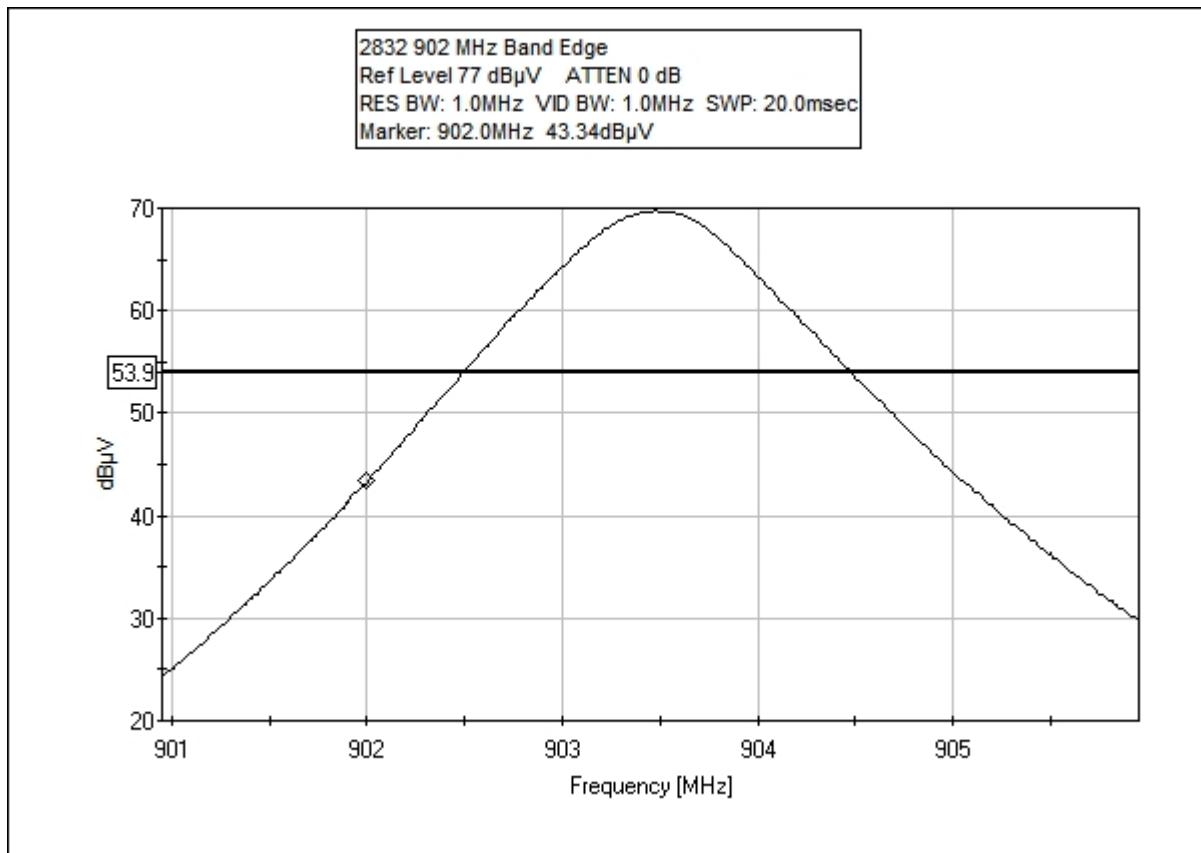
## 5.11 Band Edge

### Requirement:

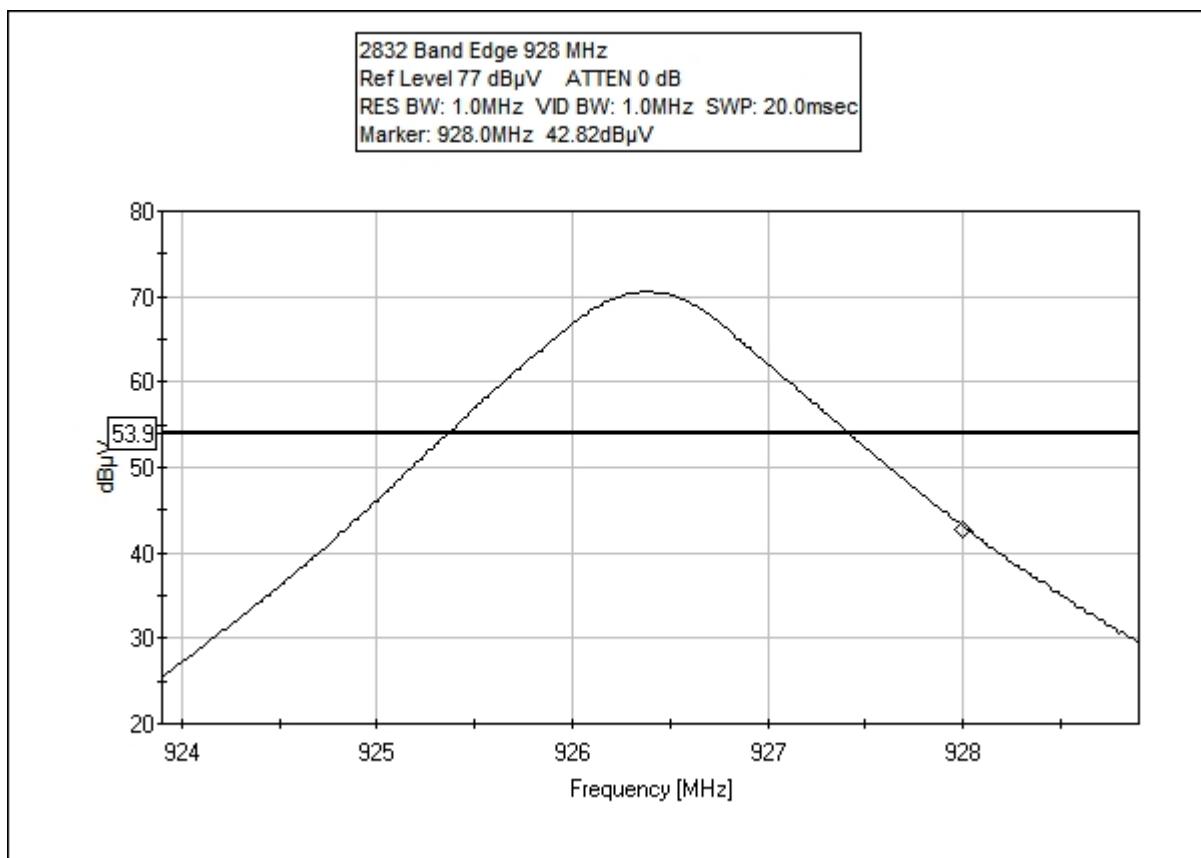
Any signals outside the band of 902 – 928 MHz shall meet the limits specified in 15.209.

EUT Channel Info	Limit (dB <sub>u</sub> V/M @ 3 M)	Test results (dB <sub>u</sub> V/M)
902	46	43.34
928	46	42.82

*902 MHz Band Edge  
43.34 dB*



*902 MHz Band Edge  
42.82 dB*



## 5.12 Receive Mode Emissions Measurement

Requirement(s): RSS Gen (4.8)

The receiver shall be operated in the normal receive mode near the mid-point of the band over which the receiver is designed to operate.

Unless otherwise specified in the applicable RSS, the radiated emission measurement is the standard measurement method (with the device's antenna in place) to measure receiver spurious emissions.

Radiated emission measurements are to be performed using a calibrated open-area test site. As an alternative, the conducted measurement method may be used when the antenna is detachable. In such a case, the receiver spurious signal may be measured at the antenna port. If the receiver is super-regenerative, stabilize it by coupling to it an unmodulated carrier on the receiver frequency (antenna conducted measurement) or by transmitting an unmodulated carrier on the receiver frequency from an antenna in the proximity of the receiver (radiated measurement). Taking care not to overload the receiver, vary the amplitude and frequency of the stabilizing signal to obtain the highest level of the spurious emissions from the receiver. For either method, the search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tuneable or local oscillator frequency, whichever is the higher, without exceeding 40 GHz.

### ***RECEIVE MODE EMISSIONS MEASUREMENT 30 - 1000 MHz***

***Not Applicable – No Receive Mode Function***

## 7.0 TEST EQUIPMENT

Antenna Conducted Measurements:

Equipment	Type	Manufacturer	Calibration Due Date
Spectrum Analyzer	8593EM	Hewlett-Packard	8/20/09
Oscilloscope	TDS820	Tektronix	8/20/09
Peak Power Meter	Anritsu	2488A	11/1/09
Power Sensor	Anritsu	MA2491A	11/1/09
Coaxial cable	SMA Male – Reverse SMA Male (Length = 20 cm)	Own	10/1/09

Spurious RF radiated emissions:

Equipment	Type	Manufacturer	Calibration Due Date
EMI Analyzer System	84125B	Hewlett-Packard	8/20/09
Spectrum Analyzer	8593EM	Hewlett-Packard	8/20/09
Pre-Amp	83051A	Hewlett-Packard	7/4/09
Pre-Amp	83017A	Hewlett-Packard	7/4/09
High Pass Filter	9701	CMT	7/4/09
Horn Antenna	3115	EMCO	7/4/09
Cable		Hewlett Packard	7/4/09

Note: The HP 84125B EMC Analyzer System is calibrated as a system, including the analyzer, pre-amps, filters, and cable.

EN 55022 (AC powerline conducted emissions)

Equipment	Type	Manufacturer	Calibration Due Date
Spectrum analyzer	8566B	Hewlett-Packard	8/20/09
LISN	3810/2	EMCO	10/1/09
Coaxial cable	N Type – BNC (5 Meters)	Own	10/1/09