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## FCC PART 15.247 TEST REPORT

### DIGITAL SPREAD SPECTRUM

Applicant	MOTOROLA, INC.
Address	600 NORTH US HWY 45 LIBERTYVILLE IL 60048 USA
FCC ID	IHDP56HJ1
Model Number	i365
Product Description	iDEN MONOLITH PHONE (Non IS, Retractable Antenna)
Date Sample Received	4/23/2008
Date Tested	5/23/2008
Tested By	Richard Block
Approved By	Mario de Aranzeta
Report Number	835AUT8TestReport.doc
Test Results	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**



Testing Certificate # 0955-01



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**GENERAL REMARKS**

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

The test results relate only to the items tested.

**Summary**

The device under test does:

- fulfill the general approval requirements as identified in this test report
- not fulfill the general approval requirements as identified in this test report

**Attestations**

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.



Testing Certificate # 0955-01

I attest that the necessary measurements were made, under my supervision, at:

Timco Engineering Inc.  
849 NW State Road 45  
Newberry, Fl 32669



**Authorized Signatory Name:**

Mario de Aranzeta C.E.T.  
Compliance Engineer/ Lab. Supervisor

**Date:** 6/5/2008

APPLICANT: MOTOROLA, INC.  
MODEL: i365  
FCC ID: IDHP56HJ1  
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**GENERAL INFORMATION**

**DUT Specification**

Applicable Standard	Part 15.247		
DUT Description	iDEN MONOLITH PHONE (Non IS, Retractable Antenna)		
FCC ID	IHDP56HJ1		
Model	i365		
SN	364VJG19YV		
Operating Frequency	TX: 2402 – 2480 MHz		
DUT Power Source	<input type="checkbox"/> 110-120Vac/50- 60Hz		
	<input type="checkbox"/> DC Power		
	<input checked="" type="checkbox"/> Battery Operated Exclusively		
Test Item	<input type="checkbox"/> Prototype	<input checked="" type="checkbox"/> Pre-Production	<input type="checkbox"/> Production
Type of Equipment	<input checked="" type="checkbox"/> Fixed	<input type="checkbox"/> Mobile	<input type="checkbox"/> Portable
Test Facility	Timco Engineering Inc. located at 849 NW State Road 45 Newberry, FL 32669 USA.		
Test Conditions	Temperature: 26°C Relative humidity: 50%		
Test Exercise	The DUT was placed in continuous transmit mode of operation.		

**Test Supporting Equipment**

Supporting Device	Manufacturer	Model / FCC ID	Serial Number
N/A			

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**EMC EQUIPMENT LIST**

<b>Device</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial Number</b>	<b>Cal/Char Date</b>	<b>Due Date</b>
<b>3/10-Meter OATS</b>	<b>TEI</b>	<b>N/A</b>	<b>N/A</b>	<b>Listed 3/20/07</b>	<b>3/19/10</b>
<b>3-Meter OATS</b>	<b>TEI</b>	<b>N/A</b>	<b>N/A</b>	<b>Listed 1/11/06</b>	<b>1/10/09</b>
<b>3-Meter Semi-Anechoic Chamber</b>	<b>Panashield</b>	<b>N/A</b>	<b>N/A</b>	<b>Listed 5/11/07</b>	<b>5/10/10</b>
<b>Antenna: Biconnical</b>	<b>Eaton</b>	<b>94455-1</b>	<b>1057</b>	<b>CAL 1/15/08</b>	<b>1/15/10</b>
<b>Antenna: Biconnical</b>	<b>Eaton</b>	<b>94455-1</b>	<b>1096</b>	<b>CAL 10/11/06</b>	<b>10/11/08</b>
<b>Antenna: Biconnical</b>	<b>Electro-Metrics</b>	<b>BIA-25</b>	<b>1171</b>	<b>CAL 7/18/07</b>	<b>7/18/09</b>
<b>Antenna: Double-Ridged Horn</b>	<b>Electro-Metrics</b>	<b>RGA-180</b>	<b>2319</b>	<b>CAL 7/18/07</b>	<b>7/18/09</b>
<b>LISN</b>	<b>Electro-Metrics</b>	<b>ANS-25/2</b>	<b>2604</b>	<b>CAL 10/5/06</b>	<b>10/5/08</b>
<b>LISN</b>	<b>Electro-Metrics</b>	<b>EM-7820</b>	<b>2682</b>	<b>CAL 7/23/07</b>	<b>7/23/09</b>
<b>Antenna: Log-Periodic</b>	<b>Eaton</b>	<b>96005</b>	<b>1243</b>	<b>CAL 12/13/07</b>	<b>12/13/09</b>
<b>Analyzer Tan Tower Spectrum Analyzer</b>	<b>HP</b>	<b>8566B Opt 462</b>	<b>3138A07786 3144A20661</b>	<b>CAL 11/30/07</b>	<b>11/30/09</b>
<b>Analyzer Tan Tower RF Preselector</b>	<b>HP</b>	<b>85685A</b>	<b>3221A1400</b>	<b>CAL 11/30/07</b>	<b>11/30/09</b>
<b>Analyzer Tan Tower Quasi-Peak Adapter</b>	<b>HP</b>	<b>85650A</b>	<b>3303A01690</b>	<b>CAL 11/30/07</b>	<b>11/30/09</b>
<b>Analyzer Tan Tower Preamplifier</b>	<b>HP</b>	<b>8449B-H02</b>	<b>3008A00372</b>	<b>CAL 11/30/07</b>	<b>11/30/09</b>

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**TEST PROCEDURES**

**Radiation Interference:** ANSI C63.4-2003 using a spectrum analyzer, a preselector, a quasi-peak adapter, and an appropriate antenna. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100 kHz with an appropriate sweep speed and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3 MHz above 1 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The spectrum was searched to at least the tenth (10) harmonic of the fundamental.

**Formula Of Conversion Factors:** The field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer plus the coax loss. The antenna correction factors are stated in terms of dB. The gain of the preselector was accounted for in the spectrum analyzer meter reading.

Example:

Freq (MHz)	Meter Reading	+ ACF	+ CL = FS
33	20 dBuV	+ 10.36 dB	+ 0.5 = 30.86 dBuV/m @ 3m

**Power Line Conducted Interference:** The procedure used was ANSI C63.4-2003 using a 50uH LISN. Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed. The spectrum was scanned from 0.15 to 30 MHz.

**Occupied Bandwidth:** A small sample of the transmitter output was fed into the spectrum analyzer and the attached plot was printed. The vertical scale is set to -10 dBm per division.

**Bandwidth 6.0dB:** The measurements were made with the spectrum analyzer's resolution bandwidth (RBW)=1 MHz and the video bandwidth (VBW) =3 MHz and the span set as shown on plot.

**Power Output:** The RF power output was measured at the antenna feed point using a peak power meter.

**Antenna Conducted Emissions:** The RBW=100 kHz, VBW=300 kHz and the span set to 10 MHz and the spectrum was scanned from 30 MHz to the 10<sup>th</sup> Harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = 3 MHz and the span to 50 MHz.

**ANSI C63.4-2003 10.1 Measurement Procedures:** The DUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The DUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

## RADIATION INTERFERENCE

Rules Part No.: 15.247, 15.209

### Requirements:

Frequency	Limits
Part 15.209	
9 to 490 kHz	2400/F (kHz) $\mu\text{V}/\text{m}$ @ 300 meters
490 to 1705 kHz	24000/F (kHz) $\mu\text{V}/\text{m}$ @ 30 meters
1705 kHz to 30 MHz	29.54 dB $\mu\text{V}/\text{m}$ @ 30 meters
30 – 88	40.0 dB $\mu\text{V}/\text{m}$ @ 3 meters
80 – 216	43.5 dB $\mu\text{V}/\text{m}$ @ 3 meters
216 – 960	46.0 dB $\mu\text{V}/\text{m}$ @ 3 meters
Above 960	54.0 dB $\mu\text{V}/\text{m}$ @ 3 meters
Part 15.247	
Fundamental 902 – 928 MHz	127.37 dB $\mu\text{V}/\text{m}$ @ 3 meters
Fundamental 2.4 – 2.4835 MHz	127.37 dB $\mu\text{V}/\text{m}$ @ 3 meters
Harmonics	54.0 dB $\mu\text{V}/\text{m}$ @ 3 meters

Any emissions that fall in the restricted bands (15.205) must be less than or equal to 54 dB $\mu\text{V}/\text{m}$ . Spurious emissions not in a restricted band must be 20 dBc. Harmonics were checked through the 10<sup>th</sup> harmonic.

**Test Data:** All values are peak unless noted.  
Items mark with an \* designate a frequency in a restricted band.

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
2,402.0	2,402.00	58.8	H	3.18	32.25	94.23	33.15
2,402.0	2,402.00	59.3	V	3.18	32.25	94.73	32.65
2,402.0	4,804.00	10.2	H	4.90	34.10	49.20	4.80
2,402.0	4,804.00	11.1	V	4.90	34.10	50.10	3.90
2,402.0	7,206.00	5.1	V	5.72	36.04	46.86	27.87
2,402.0	7,206.00	5.7	H	5.72	36.04	47.46	27.27
2,402.0	9,608.00	4.5	H	6.78	36.71	47.99	26.74
2,402.0	9,608.00	5.0	V	6.78	36.71	48.49	26.24
2,402.0	12,010.00	3.9	V	7.81	38.71	50.42	3.58
2,402.0	12,010.00	4.8	H	7.81	38.71	51.32	2.68
2,441.0	2,441.00	58.9	V	3.21	32.35	94.46	32.92
2,441.0	2,441.00	59.1	H	3.21	32.35	94.66	32.72
2,441.0	4,882.00	10.1	H	4.94	34.10	49.14	4.86
2,441.0	4,882.00	12.1	V	4.94	34.10	51.14	2.86
2,441.0	7,323.00	4.9	V	5.79	36.06	46.75	7.25
2,441.0	7,323.00	6.3	H	5.79	36.06	48.15	5.85
2,441.0	9,764.00	4.5	V	6.83	36.86	48.19	26.47
2,441.0	9,764.00	5.1	H	6.83	36.86	48.79	25.87
2,441.0	12,205.00	3.9	H	7.94	38.86	50.70	3.30

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**TEST DATA CONTD.**

<b>Tuned Frequency MHz</b>	<b>Emission Frequency MHz</b>	<b>Meter Reading dBuV</b>	<b>Ant. Polarity</b>	<b>Coax Loss dB</b>	<b>Correction Factor dB/m</b>	<b>Field Strength dBuV/m</b>	<b>Margin dB</b>
2,441.0	12,205.00	3.9	V	7.94	38.86	50.70	3.30
2,480.0	2,480.00	60.7	V	3.24	32.45	96.39	30.99
2,480.0	2,480.00	61.3	H	3.24	32.45	96.99	30.39
2,480.0	4,960.00	7.9	V	4.98	34.10	46.98	7.02
2,480.0	4,960.00	9.4	H	4.98	34.10	48.48	5.52
2,480.0	7,440.00	6.9	H	5.86	36.09	48.85	5.15
2,480.0	7,440.00	8.1	V	5.86	36.09	50.05	3.95
2,480.0	9,920.00	5.3	H	6.88	37.02	49.20	27.79
2,480.0	9,920.00	7.0	V	6.88	37.02	50.90	26.09
2,480.0	12,400.00	4.5	V	8.08	39.02	51.60	2.40
2,480.0	12,400.00	4.6	H	8.08	39.02	51.70	2.30

\*Harmonics were checked through the 10<sup>th</sup> harmonic\*

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## BLUETOOTH MODULATION TEST

### For TX iDEN 800 MHz band

Bluetooth Signal set to hopping, Tx discrete frequency

	Frequency		Code	Peak	Horizontal		Peak	Vertical		Limit	Margin		
	Bluetooth	TX			Freq	Reading		E-Field	Freq			Reading	E-Field
	MHz	MHz			MHz	dBuV		dBuV/m	MHz			dBuV	dBuV/m
fbt-ftx	hopping	806.025	A	1612	12	<b>43.30</b>	1612	12.3	<b>43.60</b>	54	<b>10.40</b>		
		816.025	B	1632	8.9	<b>40.34</b>	1632	14.2	<b>45.64</b>	54	<b>8.36</b>		
		825.025	C	1650	9	<b>40.58</b>	1650	14.9	<b>46.48</b>	54	<b>7.52</b>		
fbt+ftx	hopping	806.025	D	3224	17	<b>53.49</b>	3224	14.3	<b>50.79</b>	54	<b>0.51</b>		
		816.025	E	3264	16.4	<b>52.94</b>	3264	14.2	<b>50.74</b>	54	<b>1.06</b>		
		825.025	F	3300	15.8	<b>52.39</b>	3300	13.2	<b>49.79</b>	54	<b>1.61</b>		

hopping = 2402 to 2480 MHz

### For TX iDEN 800 MHz band

Bluetooth and TX signals set to discrete values

	Frequency		Code	Peak	Horizontal		Peak	Vertical		Limit	Margin		
	Bluetooth	TX			Freq	Reading		E-Field	Freq			Reading	E-Field
	MHz	MHz			MHz	dBuV		dBuV/m	MHz			dBuV	dBuV/m
fbt-ftx	2441	825.025	G	1616	6.6	<b>38.43</b>	1616	7.5	<b>39.03</b>	54	<b>14.97</b>		
	2402	825.025	H	1577	6.4	<b>37.45</b>	1577	7.6	<b>38.15</b>	54	<b>15.85</b>		
	2480	825.025	I	1655	7	<b>38.91</b>	1655	6.8	<b>38.41</b>	54	<b>15.59</b>		
fbt+ftx	2441	825.025	G	3266	7.3	<b>43.94</b>	3266	6.6	<b>43.14</b>	54	<b>10.06</b>		
	2402	825.025	H	3277	6.6	<b>43.15</b>	3277	6.8	<b>43.35</b>	54	<b>10.65</b>		
	2480	825.025	I	3305	4.9	<b>41.49</b>	3305	4.6	<b>42.39</b>	54	<b>11.61</b>		

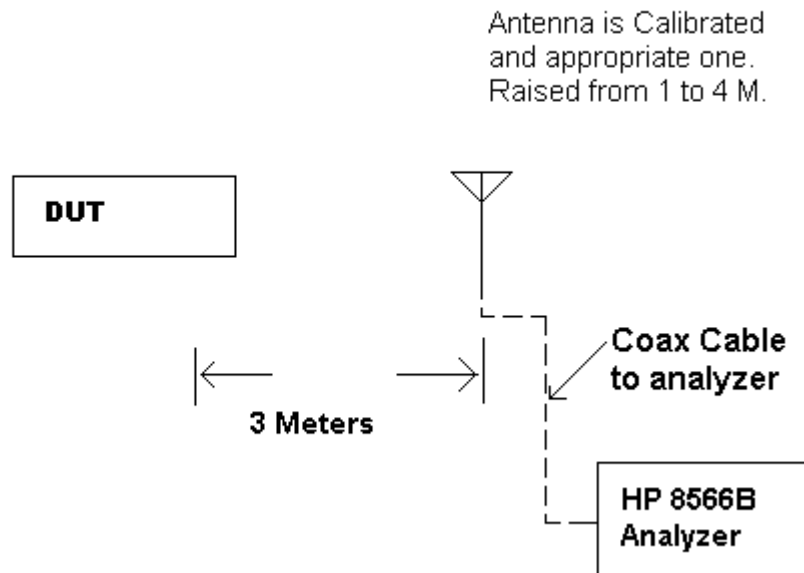
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## Method of Measuring Radiated Spurious Emissions

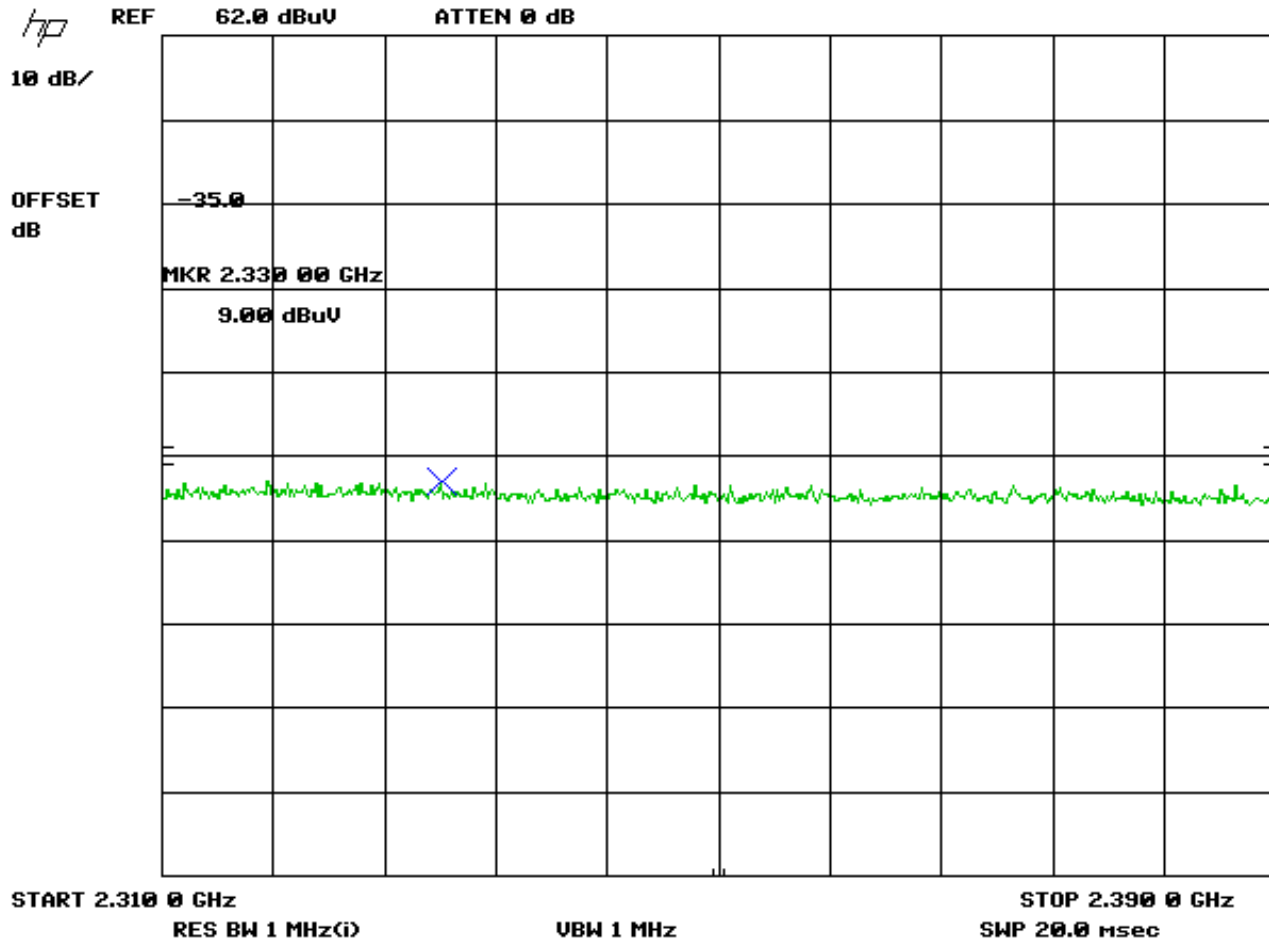


**METHOD OF MEASUREMENT:** The procedure used was ANSI STANDARD C63.4-2003 & the FCC/OET Guidance on Measurements for Direct Sequence Spread Spectrum Systems – Public Notice 54797 Dated July 12, 1995.

## **RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND**

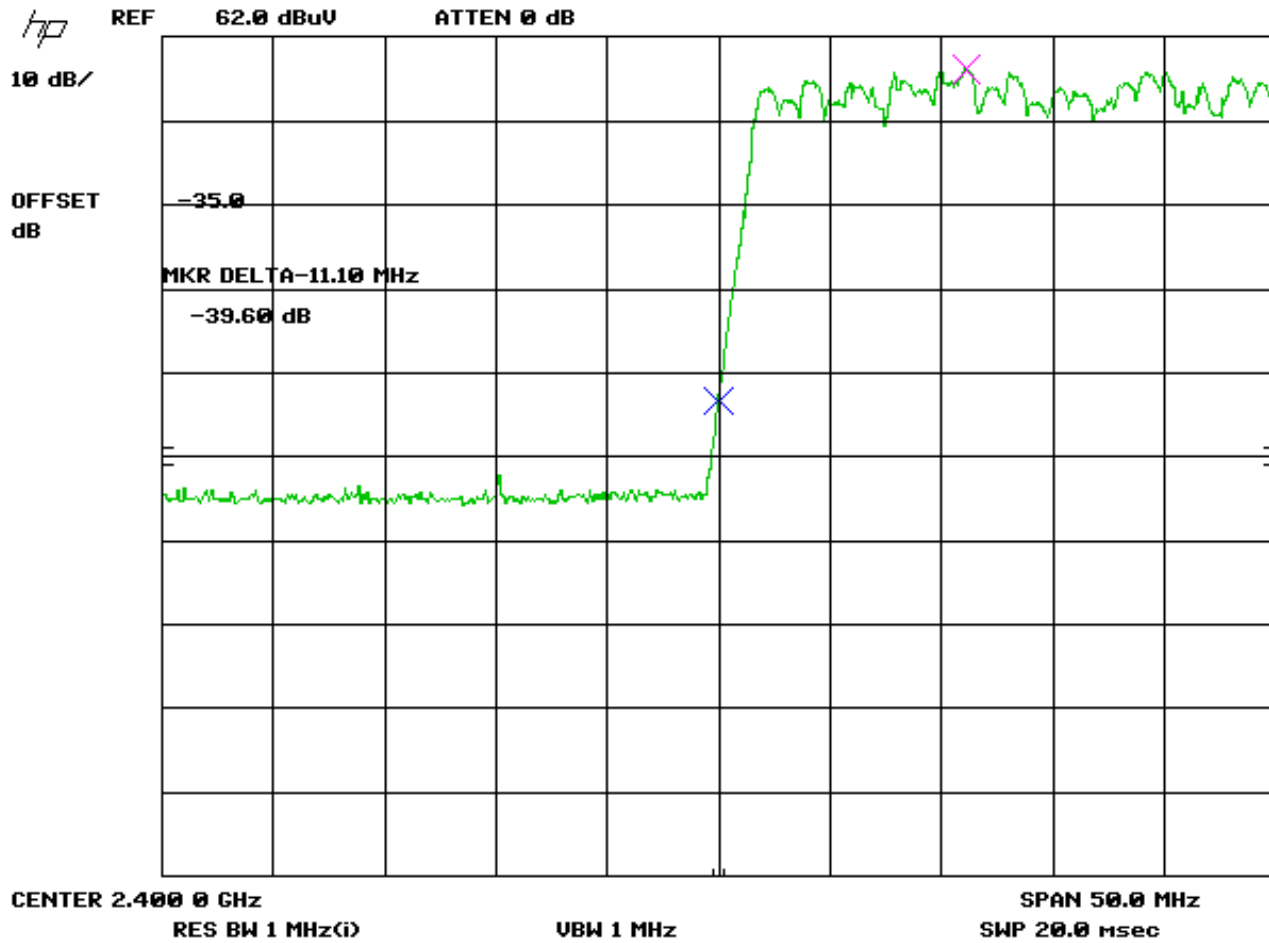
**Requirements:** Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m).

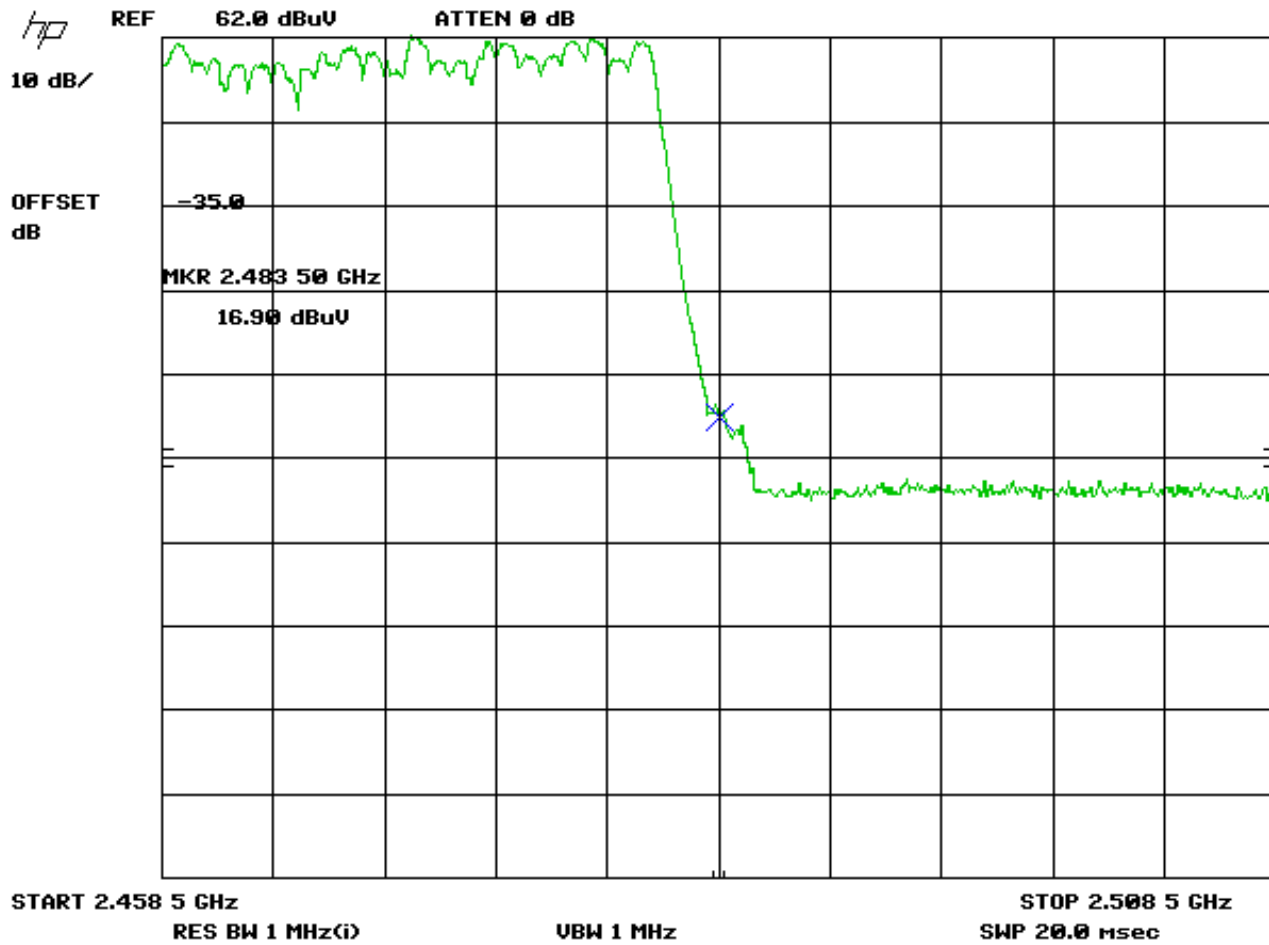
**Test Procedure:** An in band field strength measurement of the fundamental Emission using the RBW and detector function required by C63.4-2000 and FCC Rules. The procedure was repeated with an average detector and a plot made. The calculated field strength in the adjacent restricted band is presented below.



Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBuV/m	Margin dB
2,330.0	2,330.00	9.0	H	3.13	32.06	44.19	9.81

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Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBuV/m	Margin dB
2,483.5	2,483.50	16.9	H	3.24	32.46	52.60	1.40

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**RADIATED EMISSIONS TEST SET UP PHOTO**



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