



**MOTOROLA**

Cellular Networks

APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

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# Motorola Test Report

**Applicant:** Motorola  
5555 N. Beach Street  
Fort Worth, TX 76137  
USA

**Equipment Under Test:**  
LTE WBR FDD Frame Based Radio @ 700MHz

**In Accordance With:** FCC PART 27, Subpart B  
700MHz Upper Block C  
FCC PART 27, Subpart N  
700MHz Public/Private Partnership  
FCC PART 90, Subpart R  
Regulations Governing the Licensing and Use of  
Frequencies in the 764-776 and 794-806 MHz Bands

**Tested By:** Motorola  
5555 N. Beach Street  
Fort Worth, TX 76137  
USA

**TESTED BY:**

DATE: 15April2010

Melissa A. VanDrie Test Engineer

**APPROVE BY:**

DATE: 15April2010

Jim Morrison Engineering Manager

**Total Pages: 49**



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**Section 1                      Summary of Test Results**

Manufacturer:                  Motorola  
Model No.:                      LTE WBR FDD Frame Based Radio @ 700MHz  
Serial No.:                      550HAA05S2  
General:                        All measurements are traceable to national standards

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 27 and Part 90,

New Submission                       Production Unit

Class II Permissive Change                       Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE: NONE



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NAME OF TEST	PARA. NO.	SPEC. LIMIT	RESULTS
RF Power Output	2.1046	33 dBW + 10log(X/Y) dBW	Complies
Occupied Bandwidth	2.1049	Not Specified	Complies
Spurious Emissions at Antenna Terminals	2.1051	-13 dBm	Complies
Field Strength of Spurious Radiation	2.1053	-13 dBm	Complies
Frequency Stability	2.1055	Must remain within authorized bandwidth	Complies



**Section 2**

**General Equipment Specification**

Power Supply: 27 VDC

Frequency Range: 749 to 765.5MHz (center to center) for 5MHz  
Frequency Range: 751.5 to 763MHz (center to center) for 10MHz

Type(s) of Modulation: F3E (Voice) F1D F2D W7D F9W  
\_\_\_\_\_   X   \_\_\_\_\_

Emissions Designator: 10M0W7D and 5M00W7D

Output Impedance: 50 ohms

RF Power Output: 46dBm Conducted

Selection of Operating Frequency: Selectable by operator

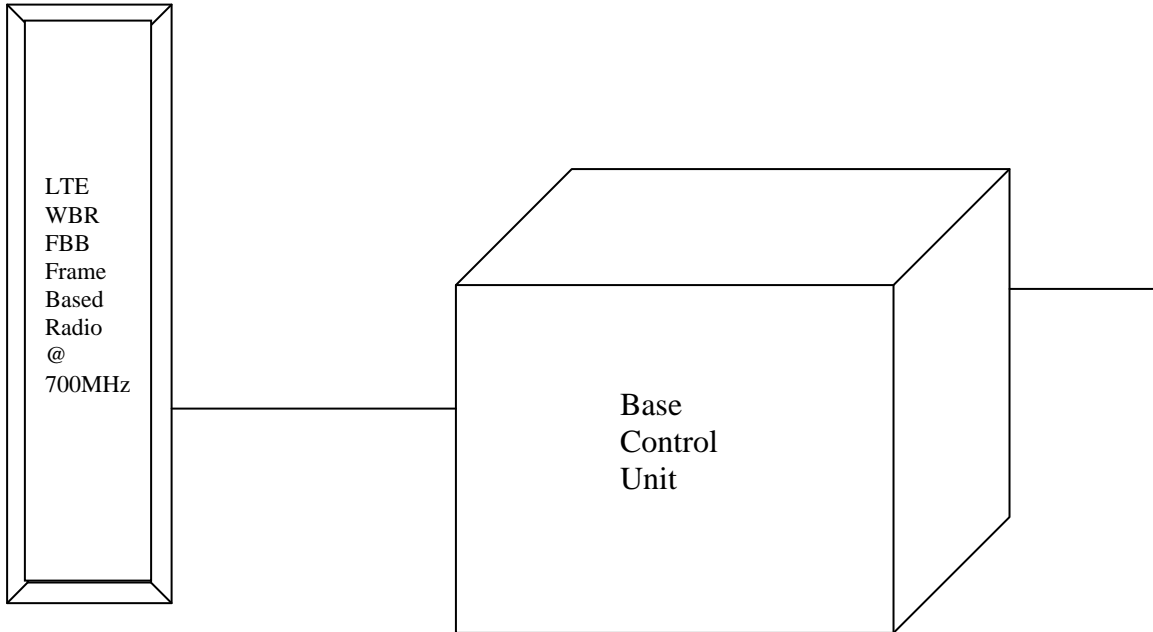
Power Output Adjustment Capability: 28dBm minimum power



**Description of EUT**

The LTE WBR FBB Frame Based Radio @ 700MHz is a Base Station transceiver.

**System Diagram**





**Section 3 RF Power Output**

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: Morrison Jim	DATE: April 14, 2010

Test Result: Complies

Measurement Data: See Tables

Test Equipment: 13, 15, 16

MAX RF POWER OUTPUT

10MHz Mode		
Frequency (MHz)	RMS Power (dBm)	RMS Power (Watts)
751.5	46.12	40.93
763	46.38	43.45

5MHz Mode		
Frequency (MHz)	RMS Power (dBm)	RMS Power (Watts)
749	46.12	40.92
754	45.49	35.40
765.5	45.66	36.81



**Section 4                      Occupied Bandwidth**

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: Morrison Jim	DATE: April 14, 2010

Test Result:                      Complies

Measurement Data:    See Attached Tables and Plots

Test Equipment:            13, 15, 16

OCCUPIED BANDWIDTH

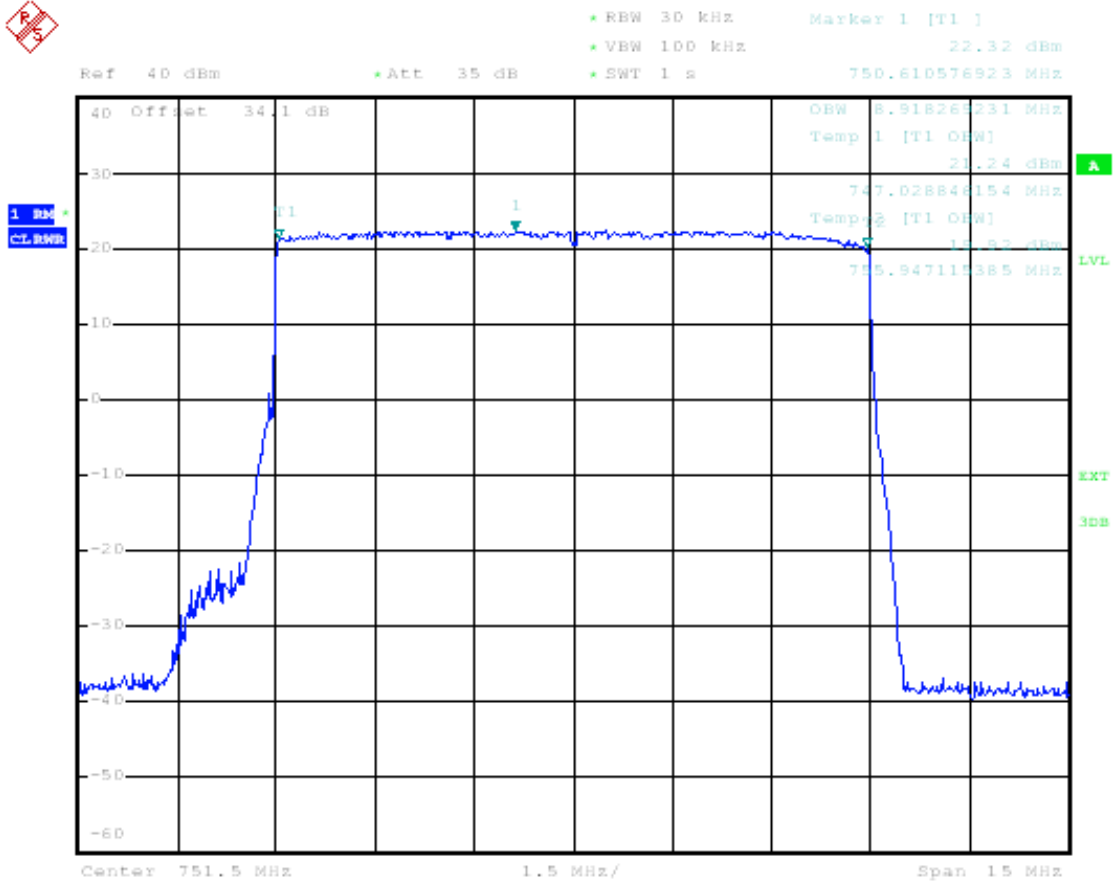
10MHz Mode		
Frequency (MHz)	Occupied BW (MHz)	Maximum Limit (MHz)
751.5	8.92	10
763	8.91	10

5MHz Mode		
Frequency (MHz)	Occupied BW (MHz)	Maximum Limit (MHz)
749	4.49	5
754	4.23	5
765.5	4.38	5





Occupied Bandwidth 751.5 MHz in 10MHz mode



Date: 15. APR. 2010 14:26:21



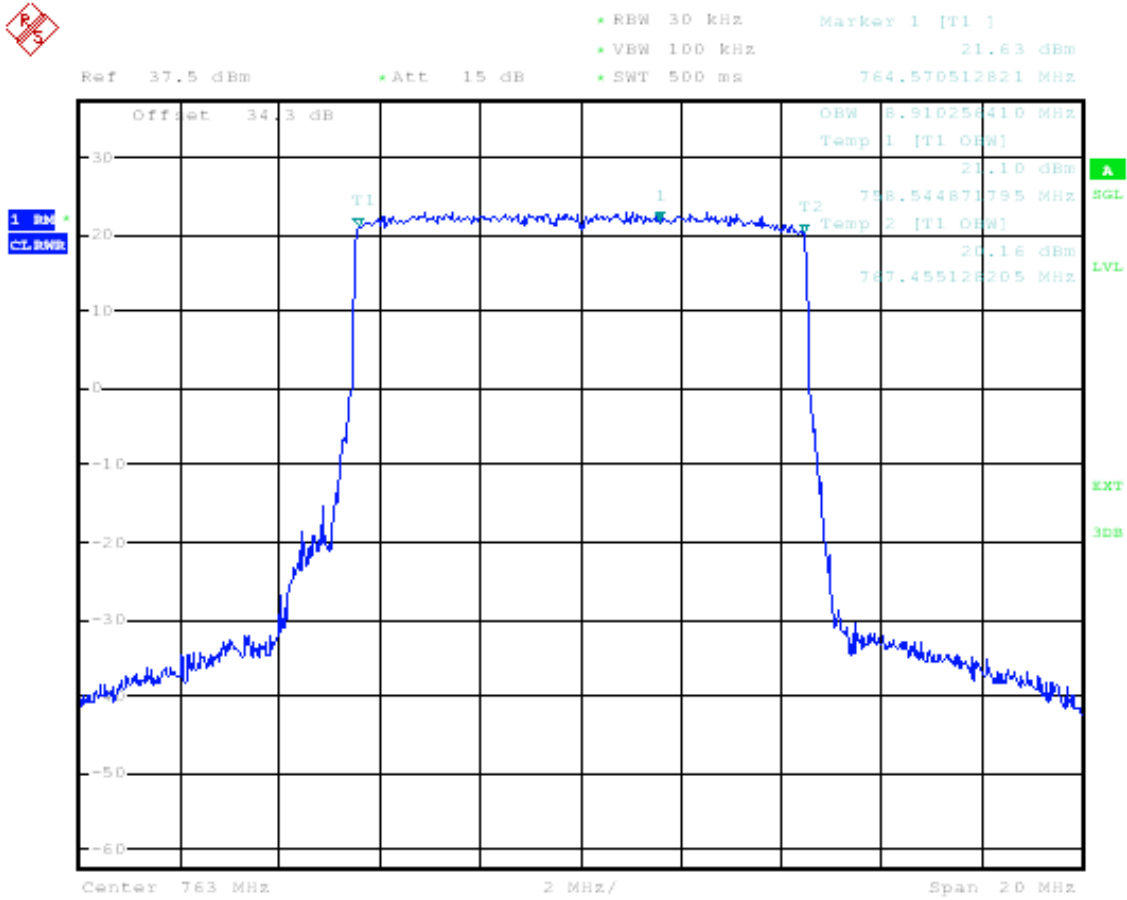
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FCC ID: IHET4KJ1

Occupied Bandwidth 763 MHz in 10MHz mode



Date: 14. APR. 2010 16:48:00



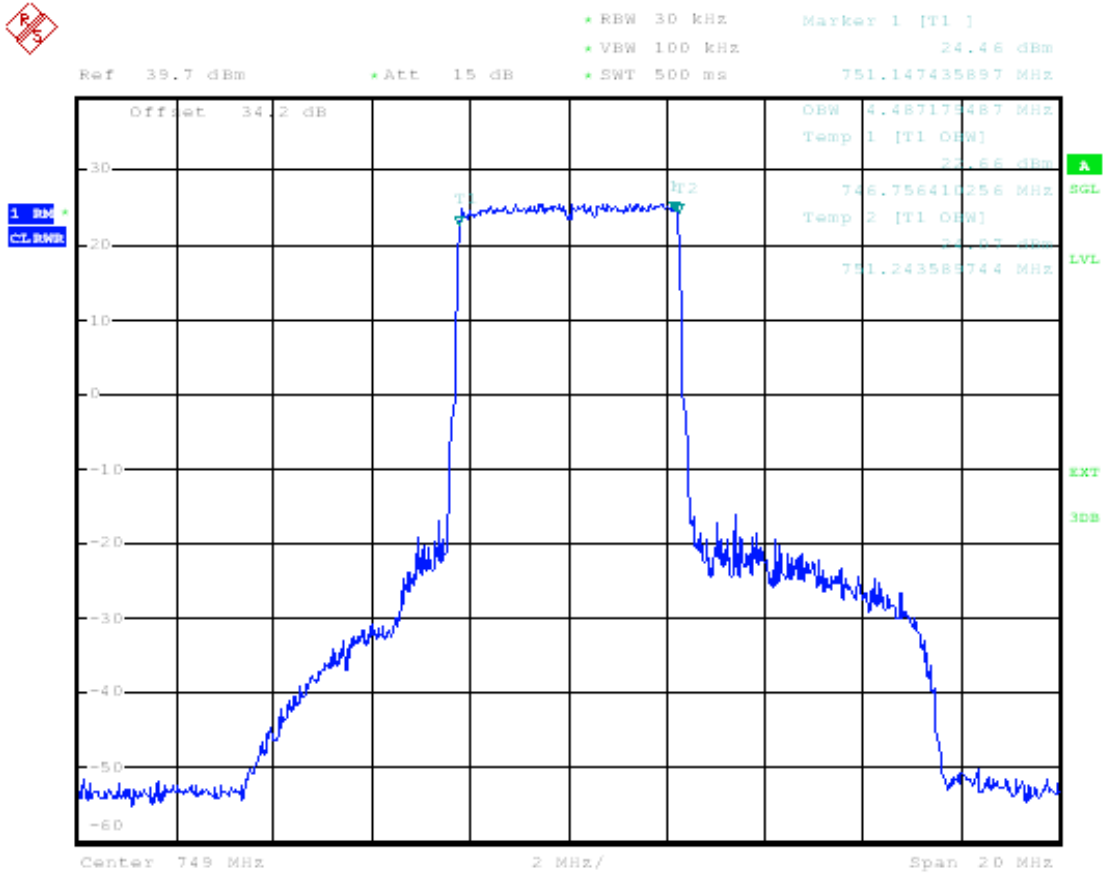
**MOTOROLA**

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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Occupied Bandwidth 749 MHz in 5MHz mode



Date: 15. APR. 2010 15:49:37



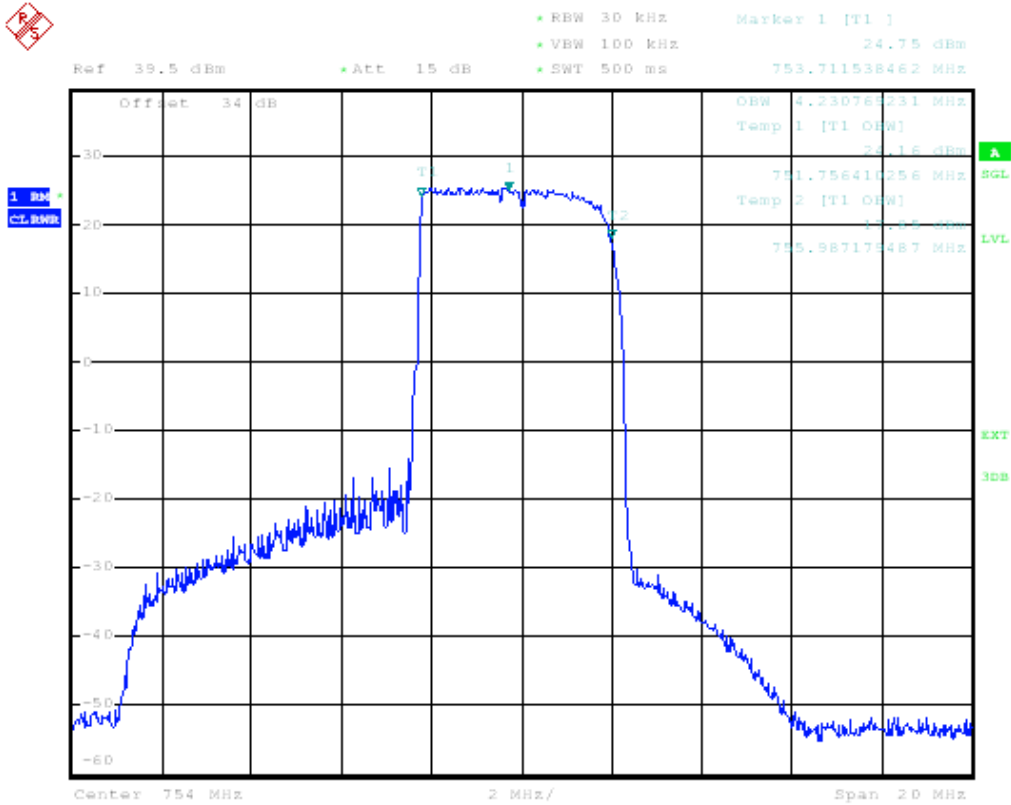
**MOTOROLA**

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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Occupied Bandwidth 754 MHz in 5MHz mode



Date: 15.APR.2010 17:29:34



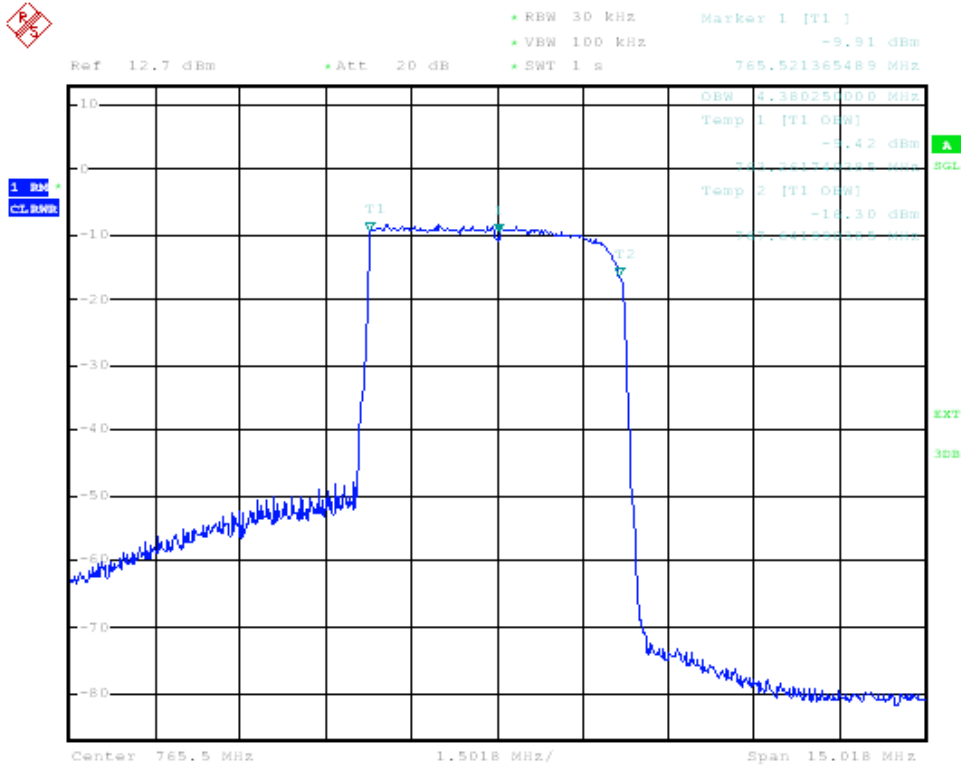
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Occupied Bandwidth 765.5 MHz in 5MHz mode



Date: 15.APR.2010 13:29:41



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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

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**Section 5 Spurious Emissions at Antenna Terminals**

NAME OF TEST: Spurious Emissions at Antenna Terminals PARA. NO.: 2.1051

TESTED BY: Morrison Jim

DATE: April 14, 2010

Test Result: Complies

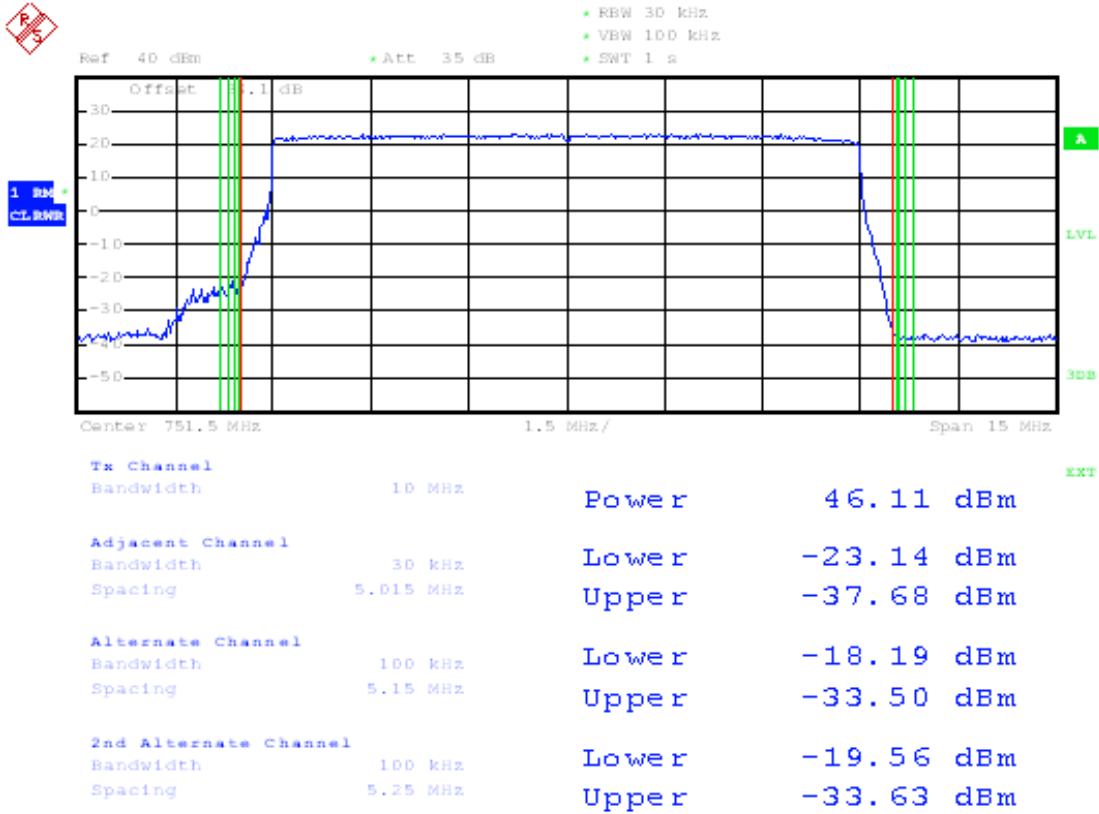
Measurement Data: See Attached Plots

Test Equipment: 13, 15, 16, 17

SPURIOUS EMISSIONS AT ANTENNA TERMINALS



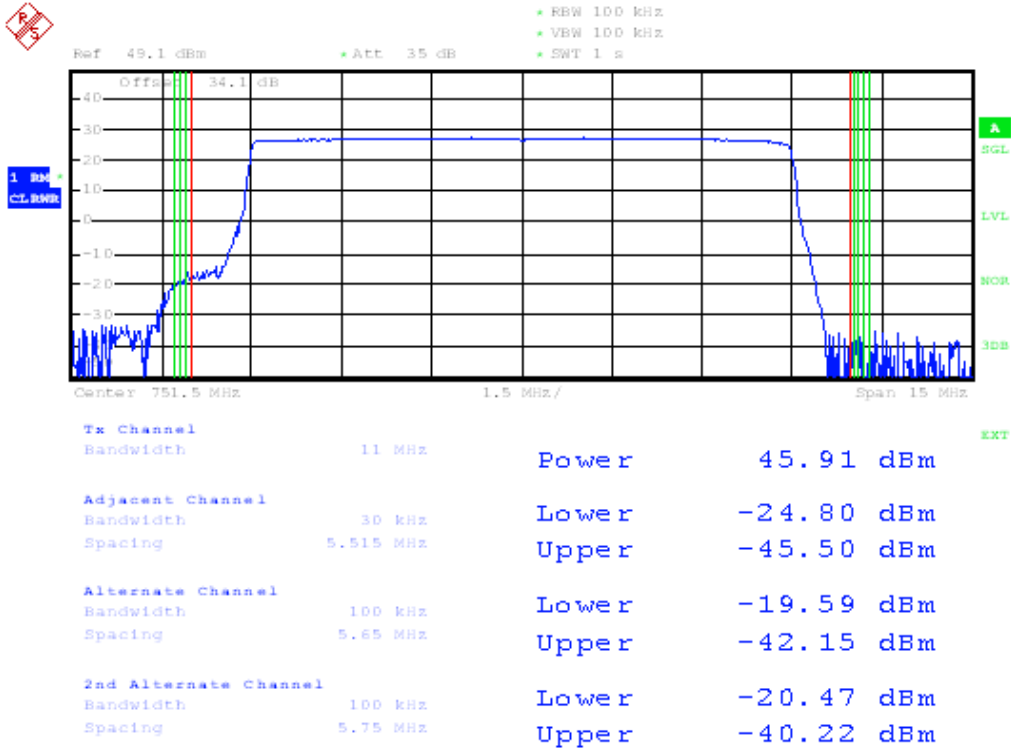
Lower Band Edge 10MHz



Date: 15. APR. 2010 14:25:48



Additional Band Edge 10MHz

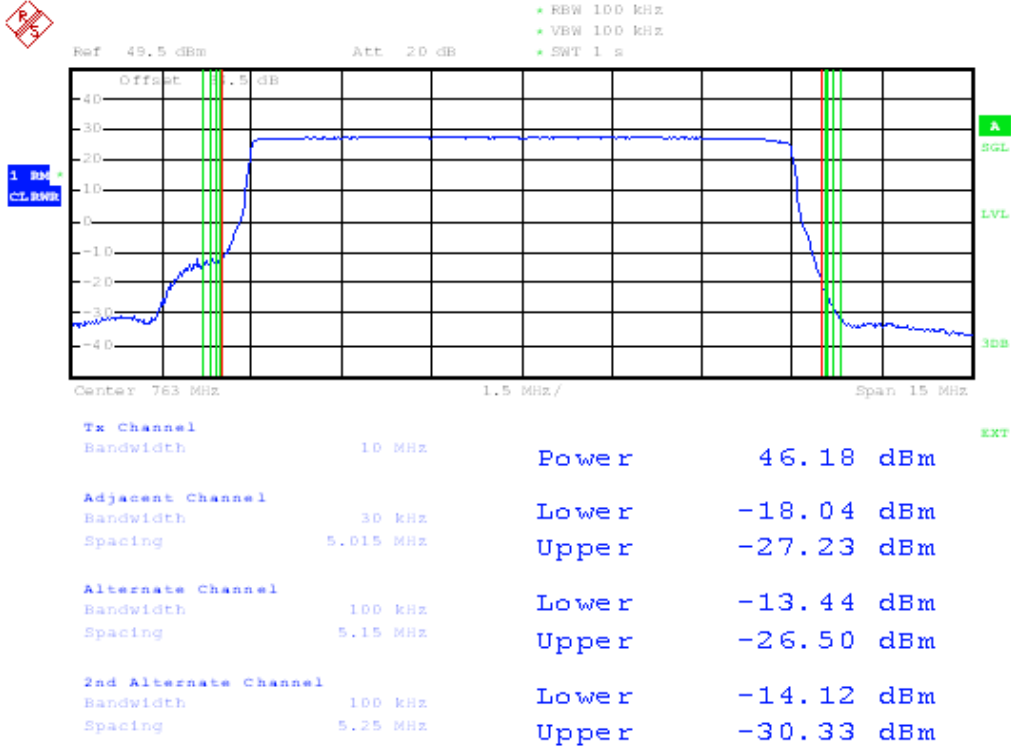


Date: 27.APR.2010 08:05:08





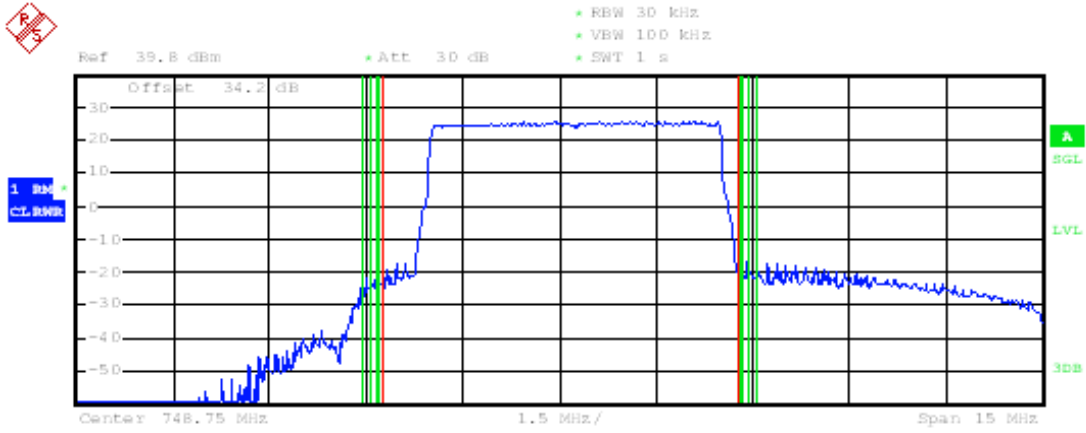
Upper Band Edge 10MHz



Date: 14.APR.2010 17:08:29



Lower Band Edge 5MHz

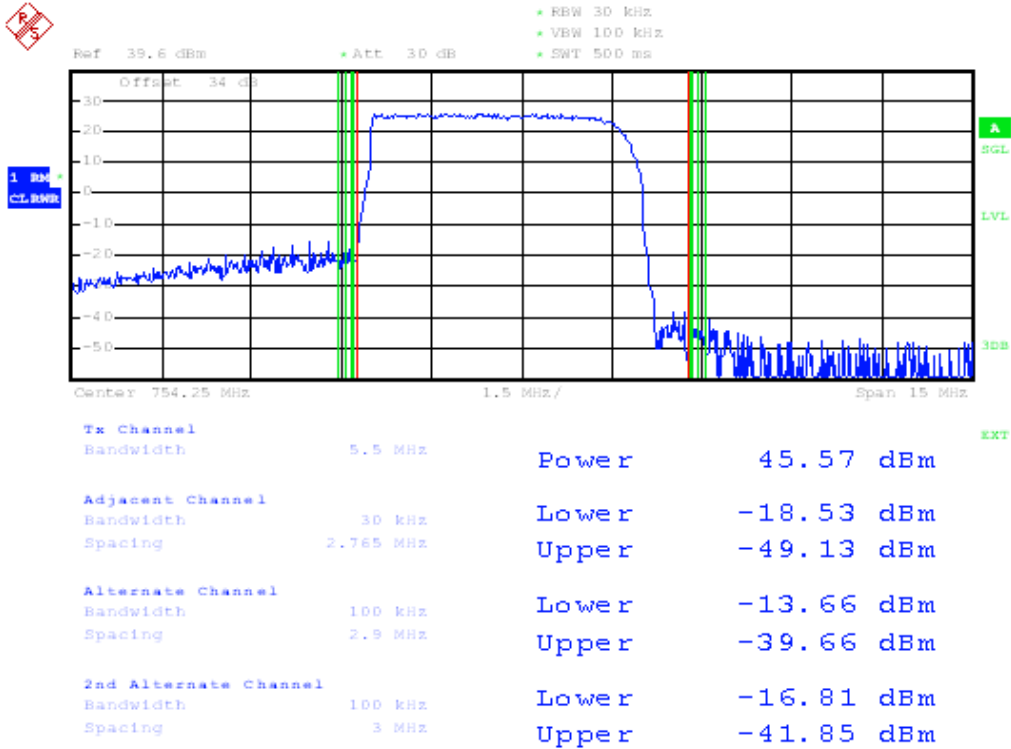


<b>Tx Channel</b>					
Bandwidth	5.5 MHz	Power	46.19 dBm		
<b>Adjacent Channel</b>		Lower	-23.80 dBm		
Bandwidth	30 kHz	Upper	-19.40 dBm		
Spacing	2.765 MHz				
<b>Alternate Channel</b>		Lower	-19.15 dBm		
Bandwidth	100 kHz	Upper	-14.78 dBm		
Spacing	2.9 MHz				
<b>2nd Alternate Channel</b>		Lower	-20.17 dBm		
Bandwidth	100 kHz	Upper	-15.48 dBm		
Spacing	3 MHz				

Date: 15.APR.2010 18:03:37



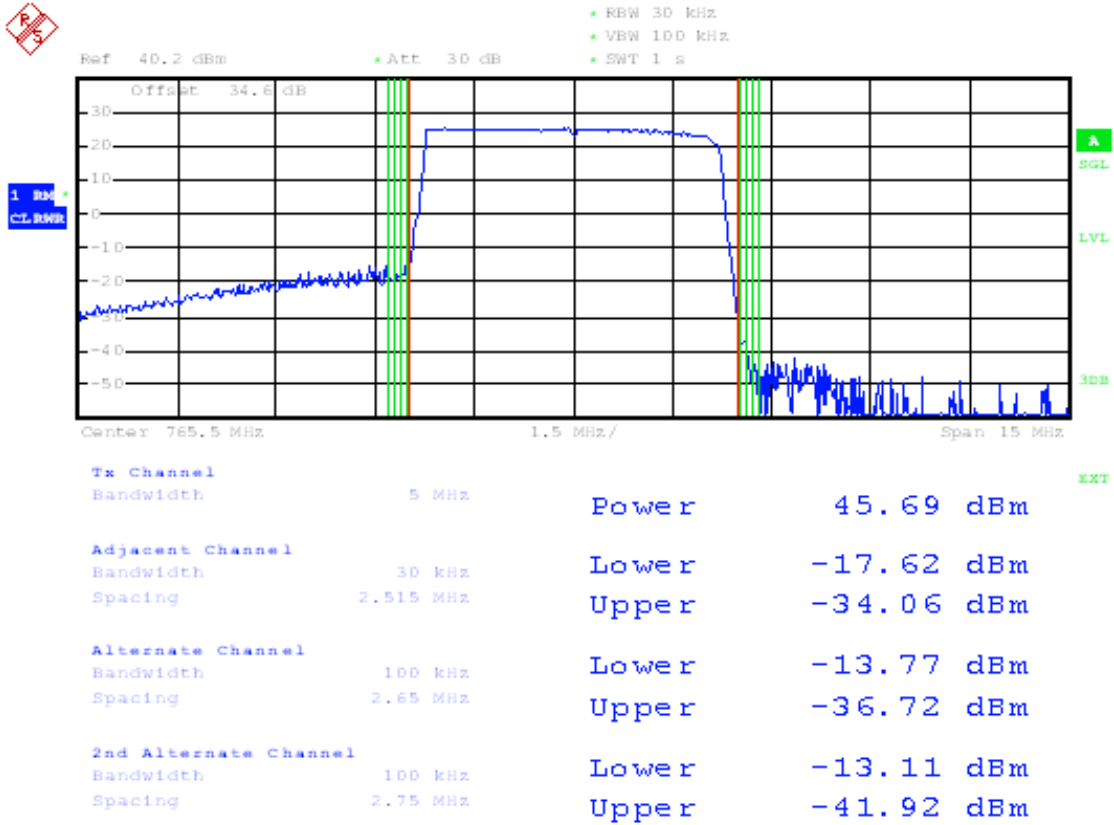
Additional Band Edge 5MHz



Date: 15. APR. 2010 17:25:44



Upper Band Edge 5MHz



Date: 15. APR. 2010 12:58:26



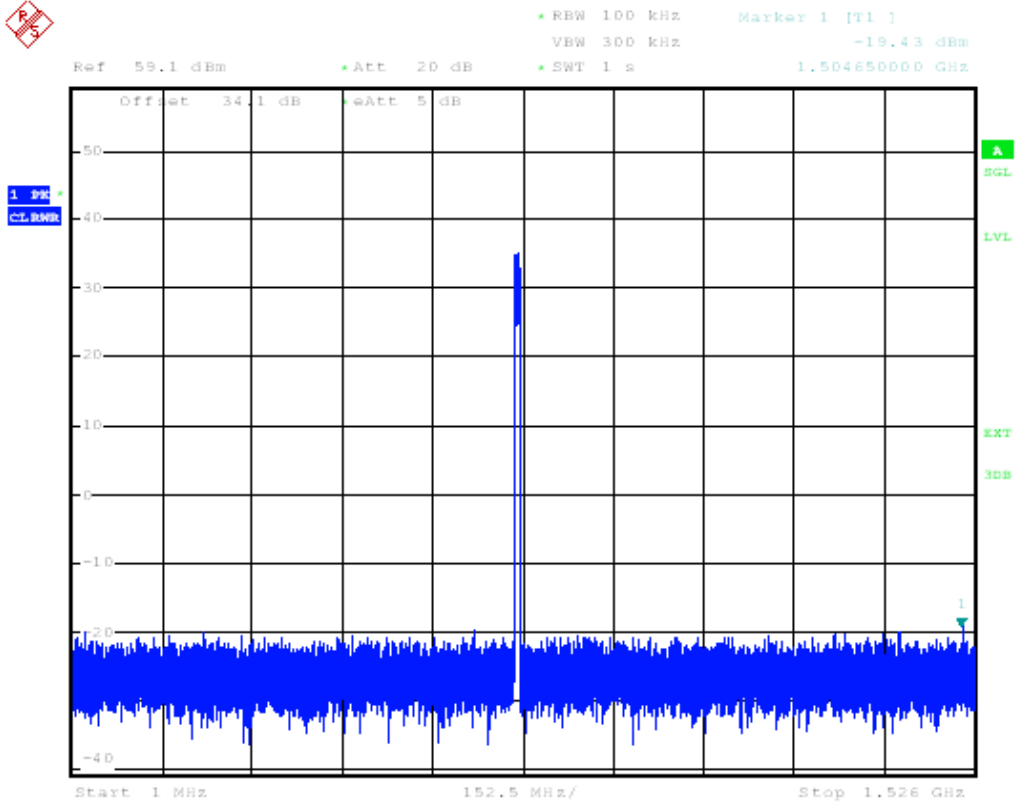
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Low Channel 10MHz Spurious 1MHz to 1.526GHz



Date: 15.APR.2010 14:28:39



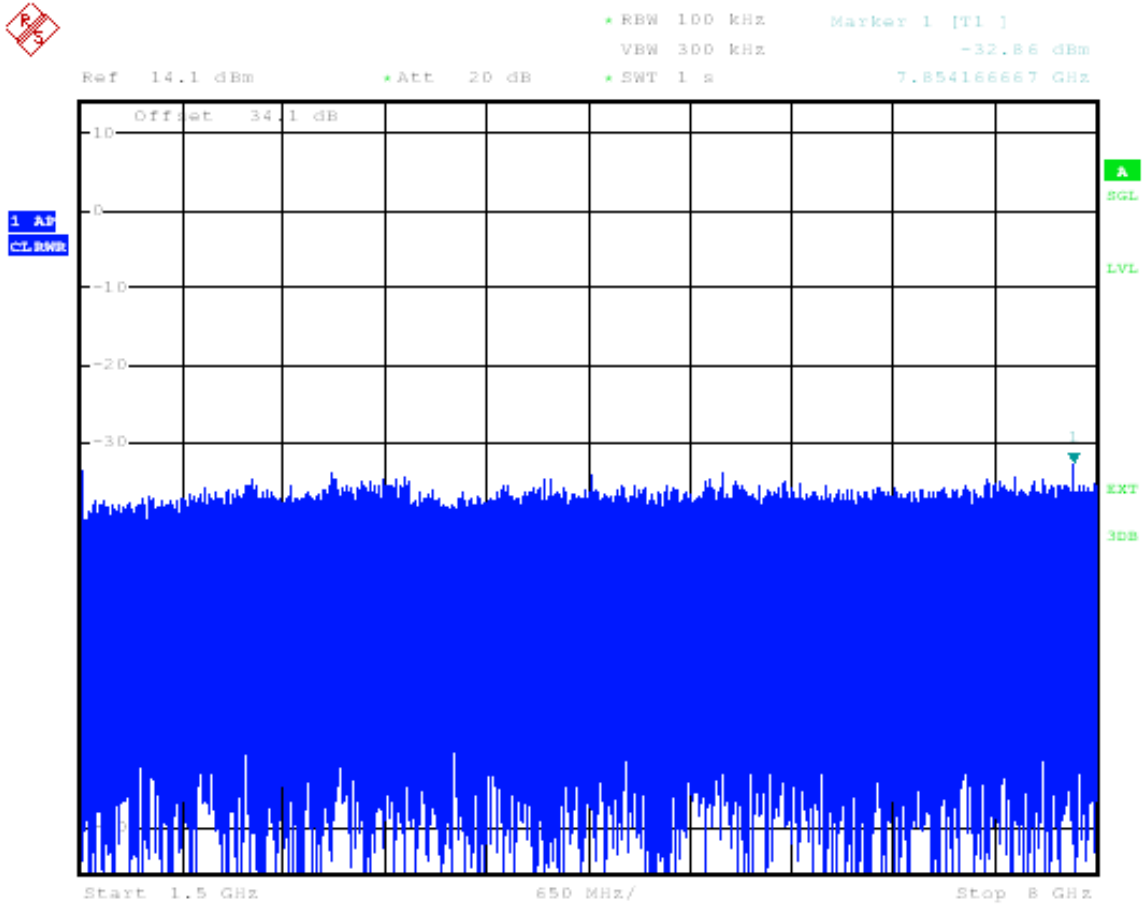
**MOTOROLA**

Cellular Networks

APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Low Channel 10MHz Spurious 1.5GHz to 8GHz



Date: 15. APR. 2010 14:29:38



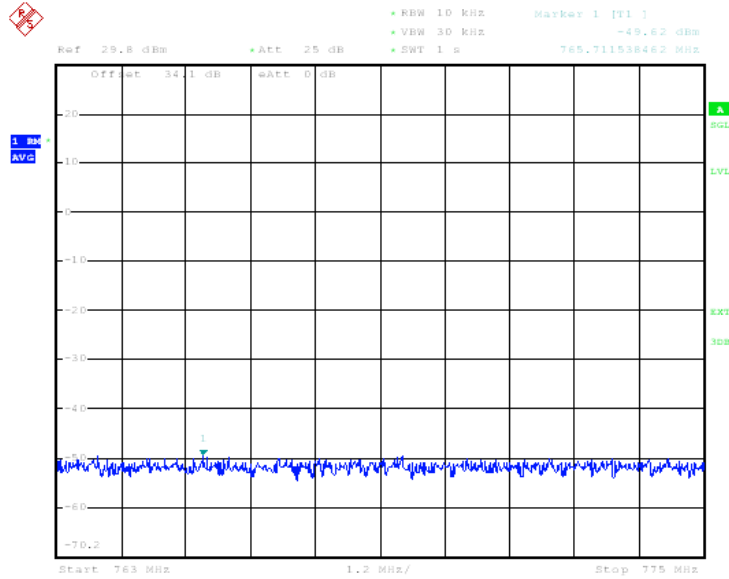
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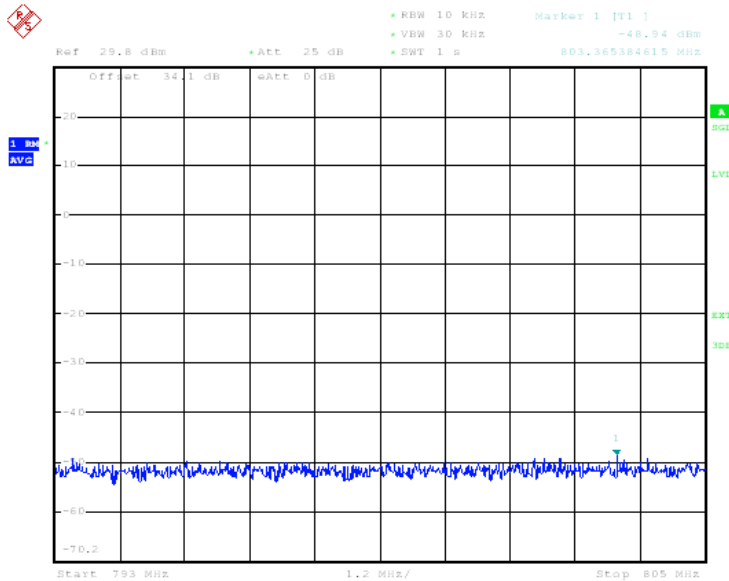
APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

### Low Channel 10MHz Public Safety



Date: 15. APR. 2010 14:58:04



Date: 15. APR. 2010 14:57:25



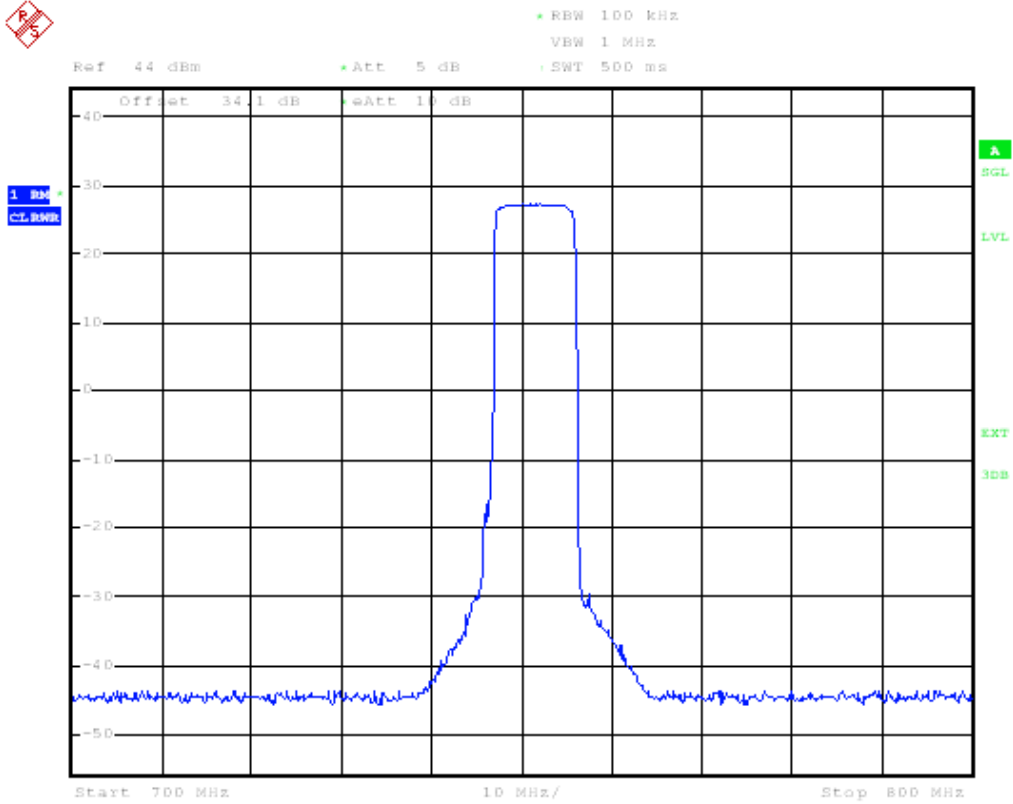
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Additional Channel 10MHz Spurious 700MHz - 800MHz



Date: 27. APR. 2010 07:54:10





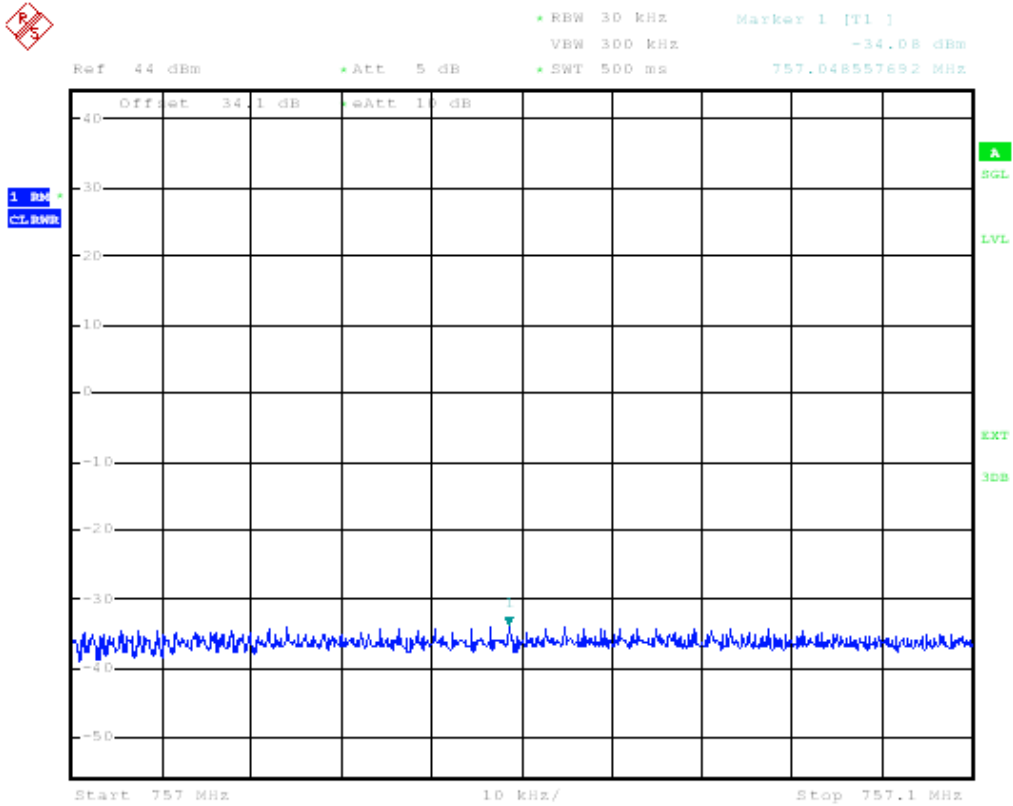
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Additional Channel 10MHz Zoom 757MHz (30k RBW)



Date: 27.APR.2010 07:58:18



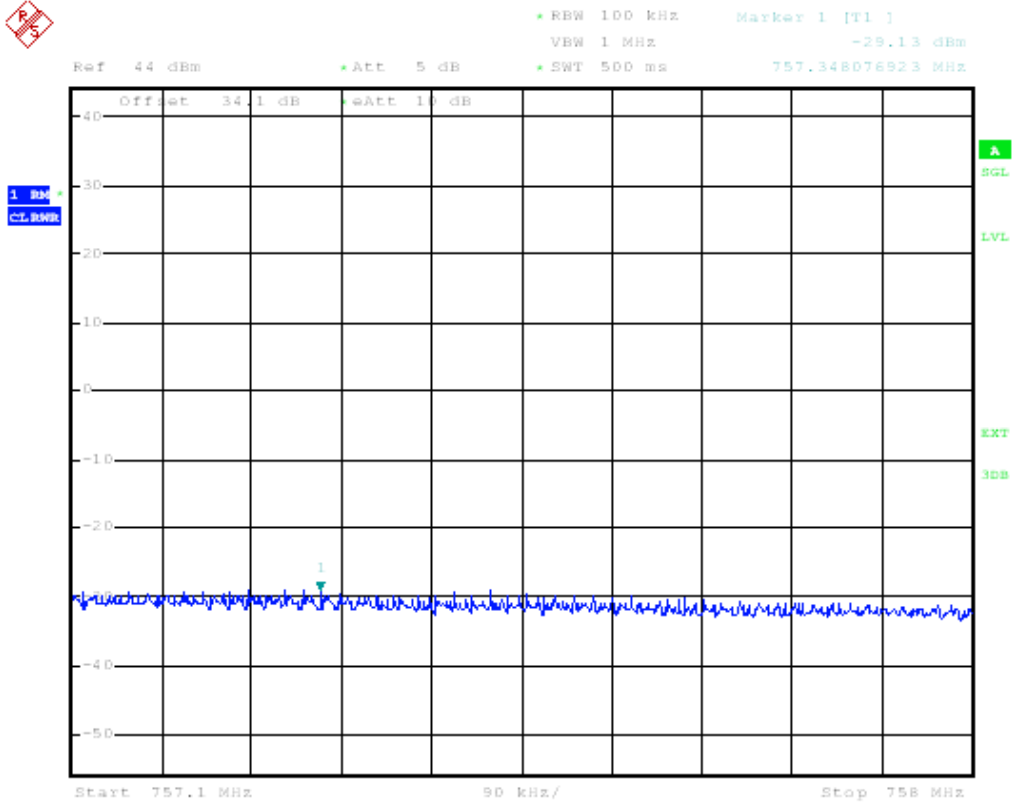
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Additional Channel 10MHz 757MHz – 758MHz (100k RBW)



Date: 27. APR. 2010 07:56:11



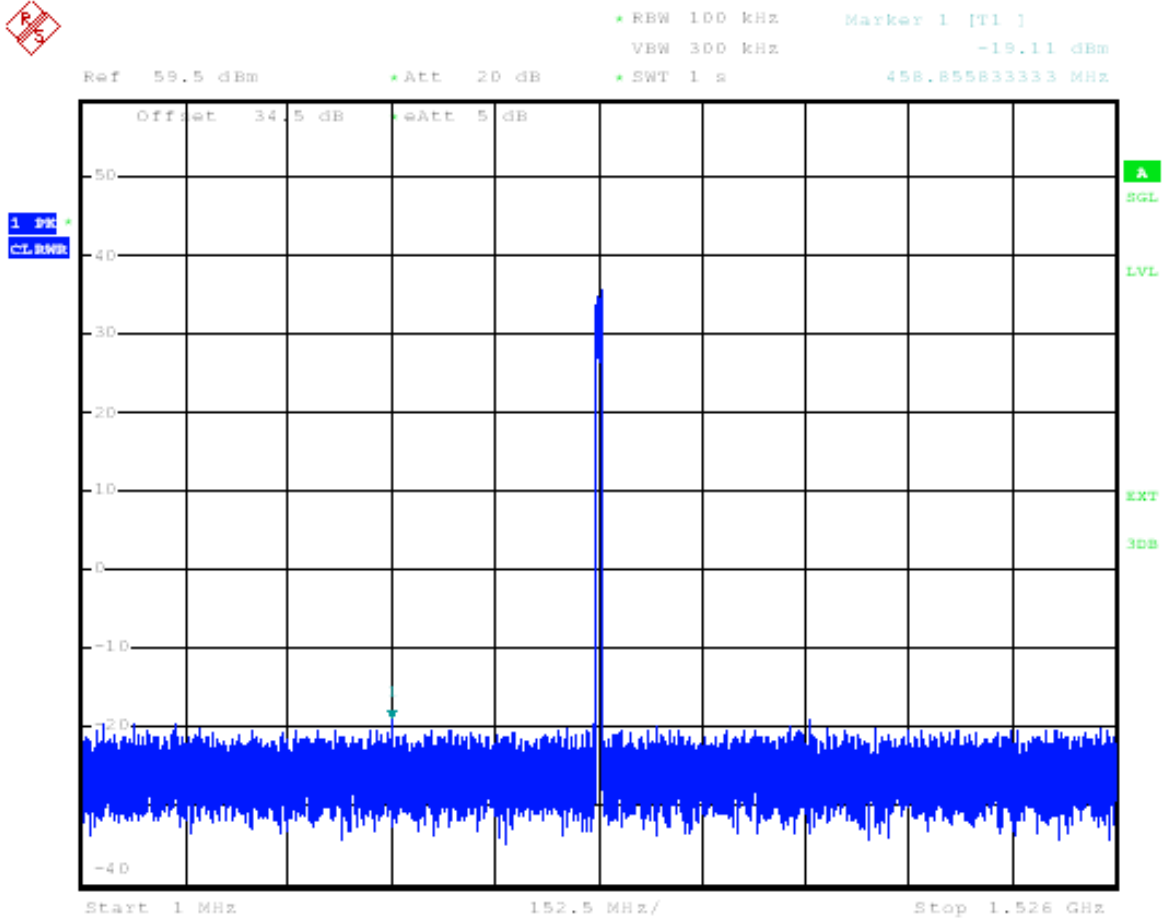
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

High Channel 10MHz Spurious 1MHz to 1.526GHz



Date: 14. APR. 2010 20:06:49



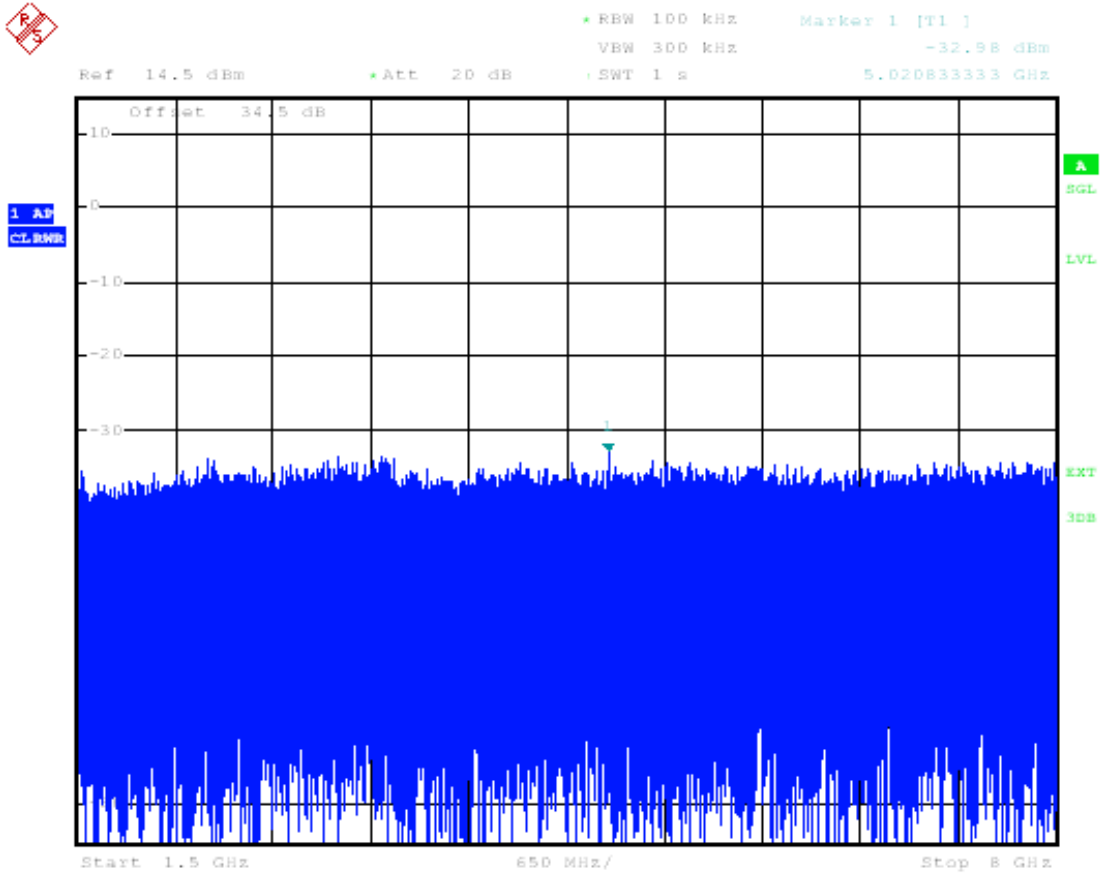
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

High Channel 10MHz Spurious 1.5GHz to 26GHz



Date: 14. APR. 2010 20:25:00



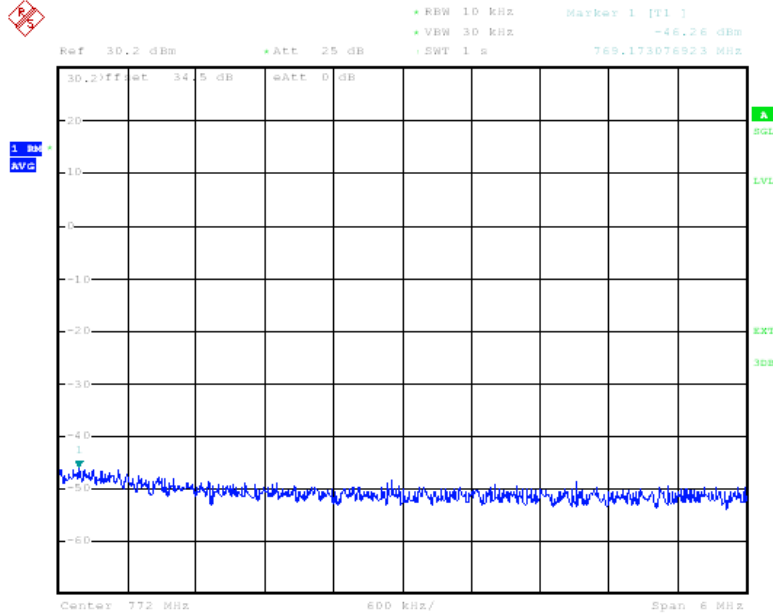
**MOTOROLA**

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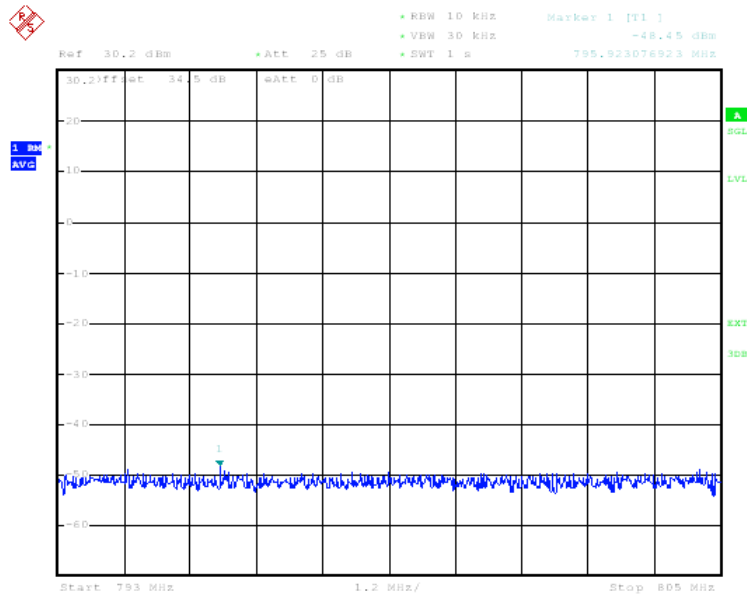
APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

### High Channel 10MHz Public Safety



Date: 14. APR. 2010 22:31:18



Date: 14. APR. 2010 22:37:12



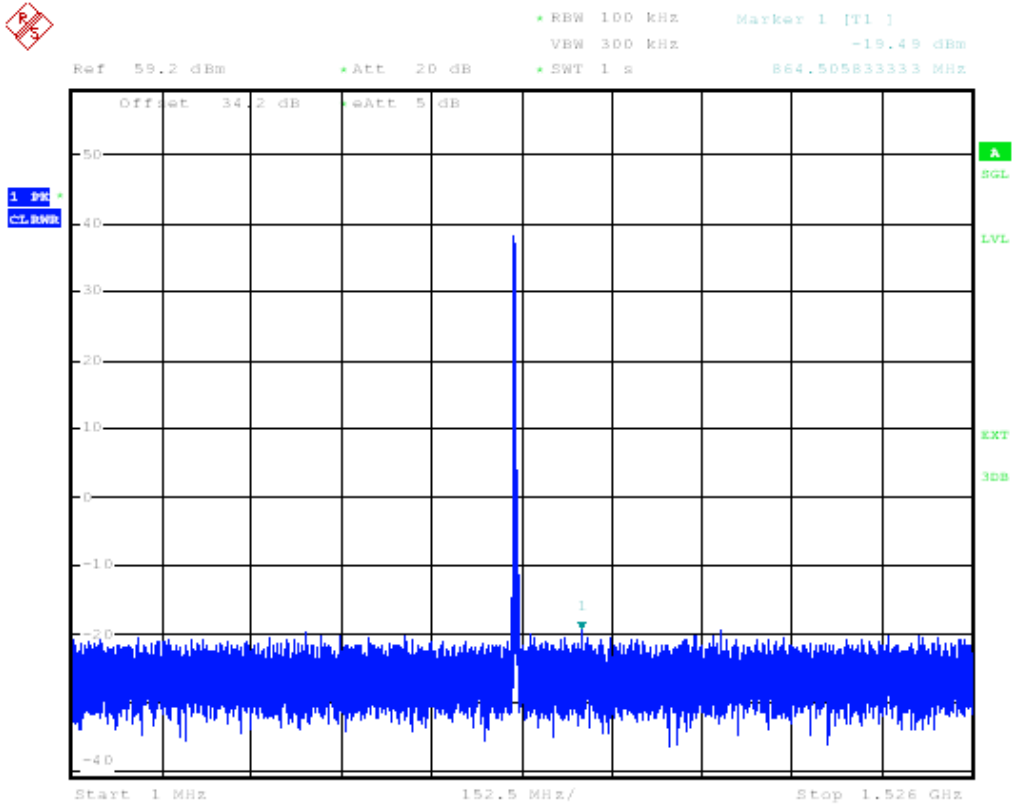
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Low Channel 5MHz Spurious 1MHz to 1.526GHz



Date: 15. APR. 2010 15:51:09



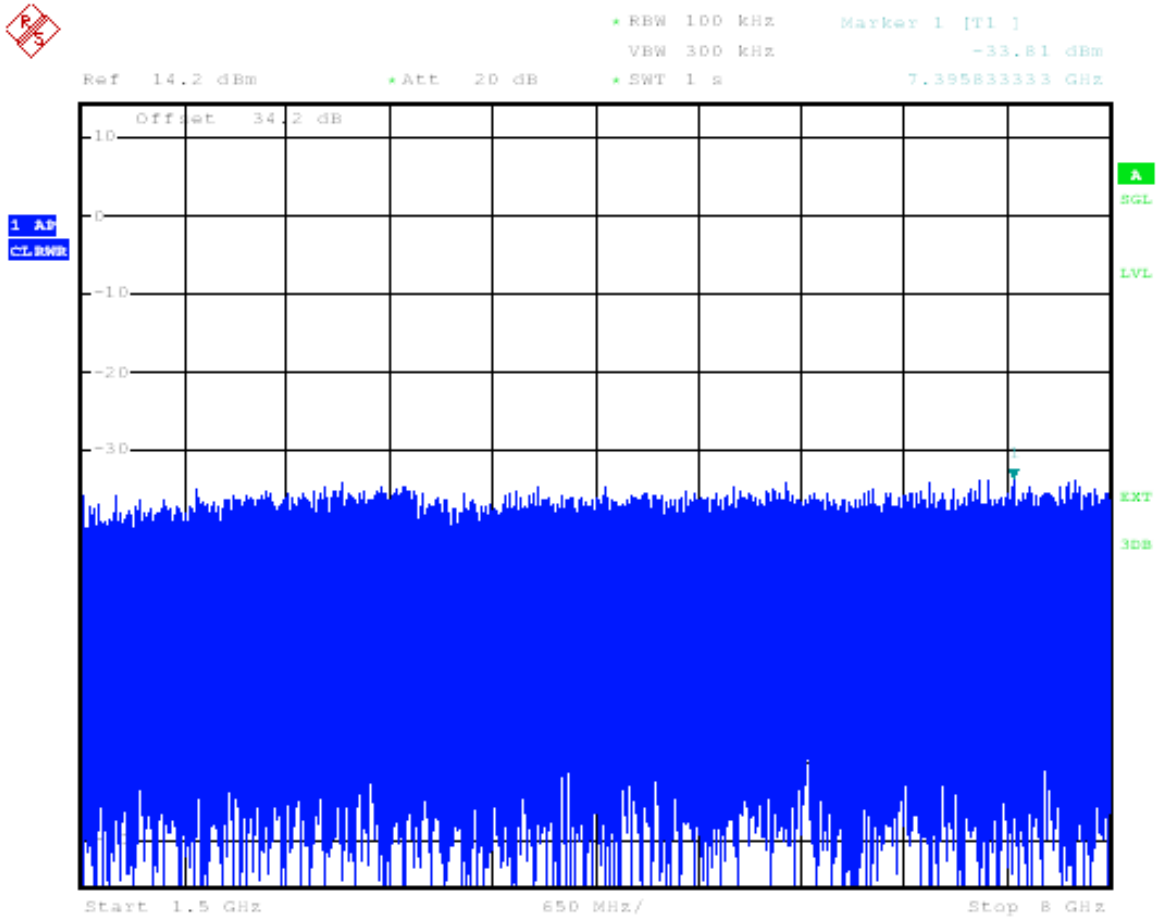
**MOTOROLA**

Cellular Networks

APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Low Channel 5MHz Spurious 1.5GHz to 8GHz



Date: 15. APR. 2010 15:52:04



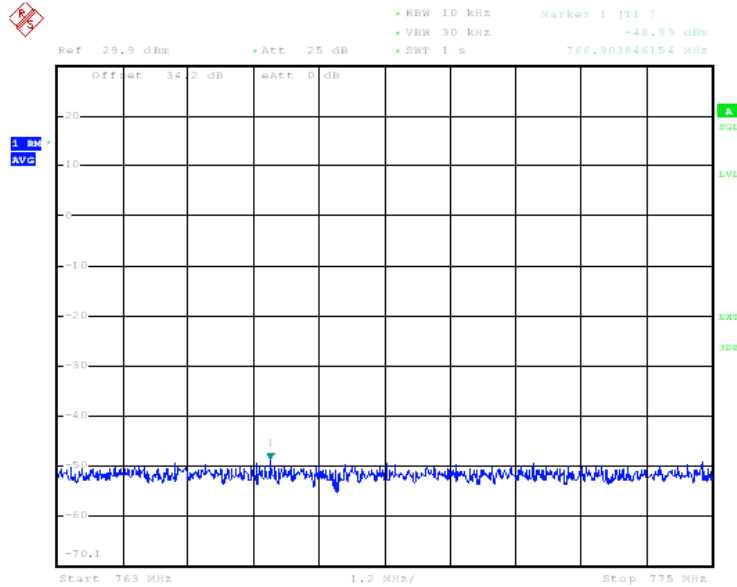
**MOTOROLA**

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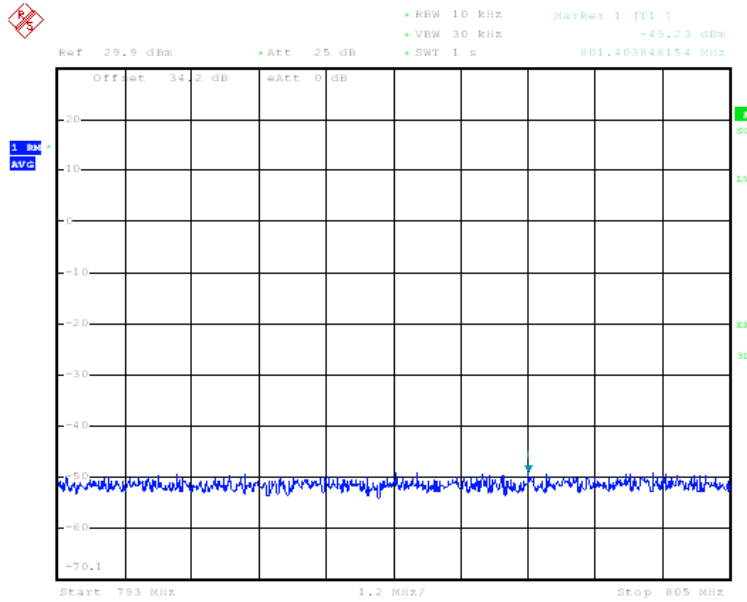
APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Low Channel 5MHz Public Safety



Date: 15. APR. 2010 15:53:05



Date: 15. APR. 2010 15:53:45





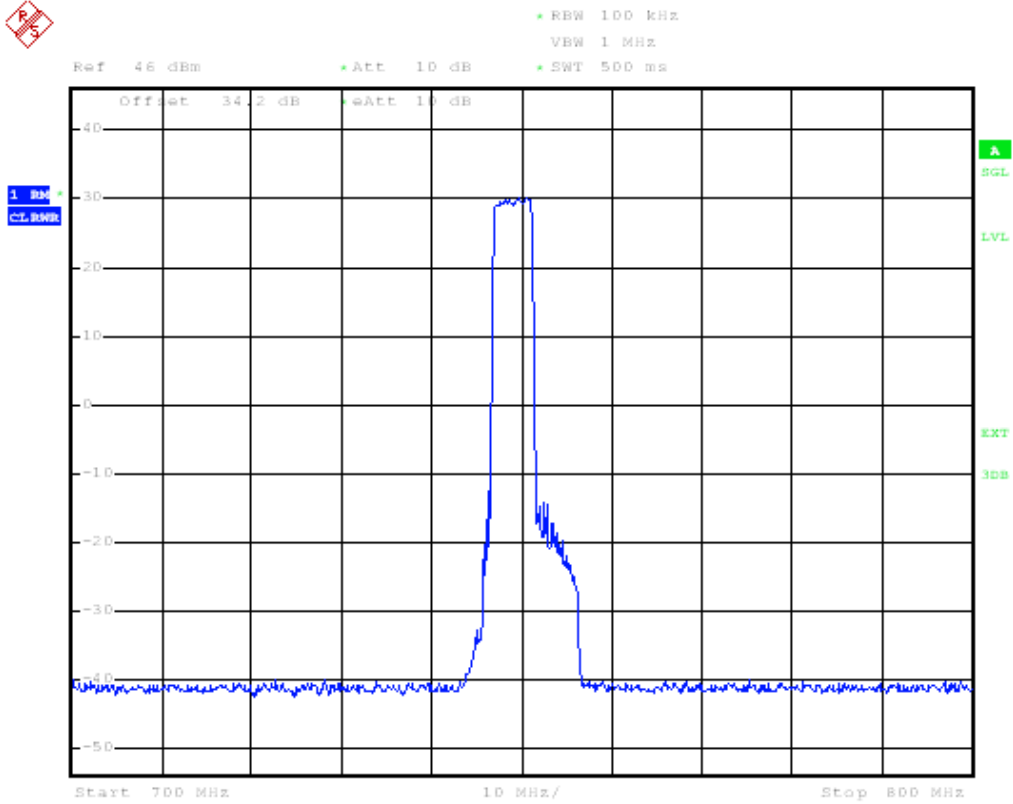
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Additional Low Channel 5MHz Spurious 700MHz – 800MHz



Date: 27. APR. 2010 08:49:18



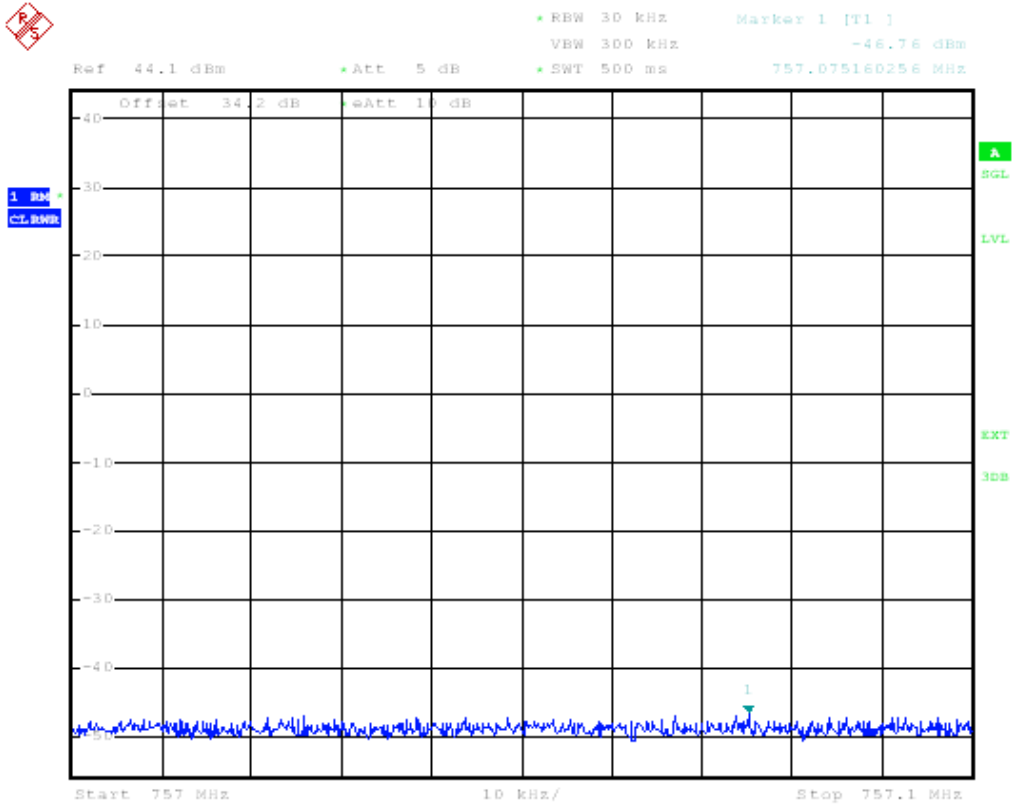
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Additional Low Channel 5MHz Spurious 757MHz (30k RBW)



Date: 27.APR.2010 08:50:48



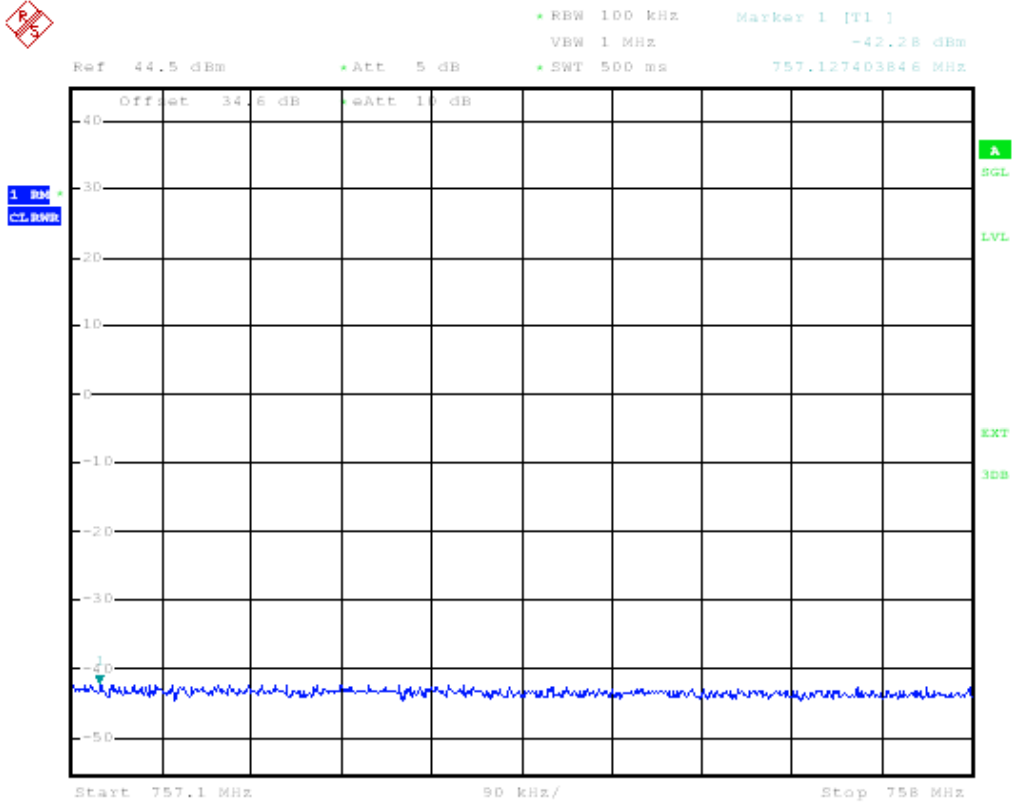
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Additional Low Channel 5MHz Spurious 757MHz – 758MHz (100k RBW)



Date: 27. APR. 2010 08:53:03



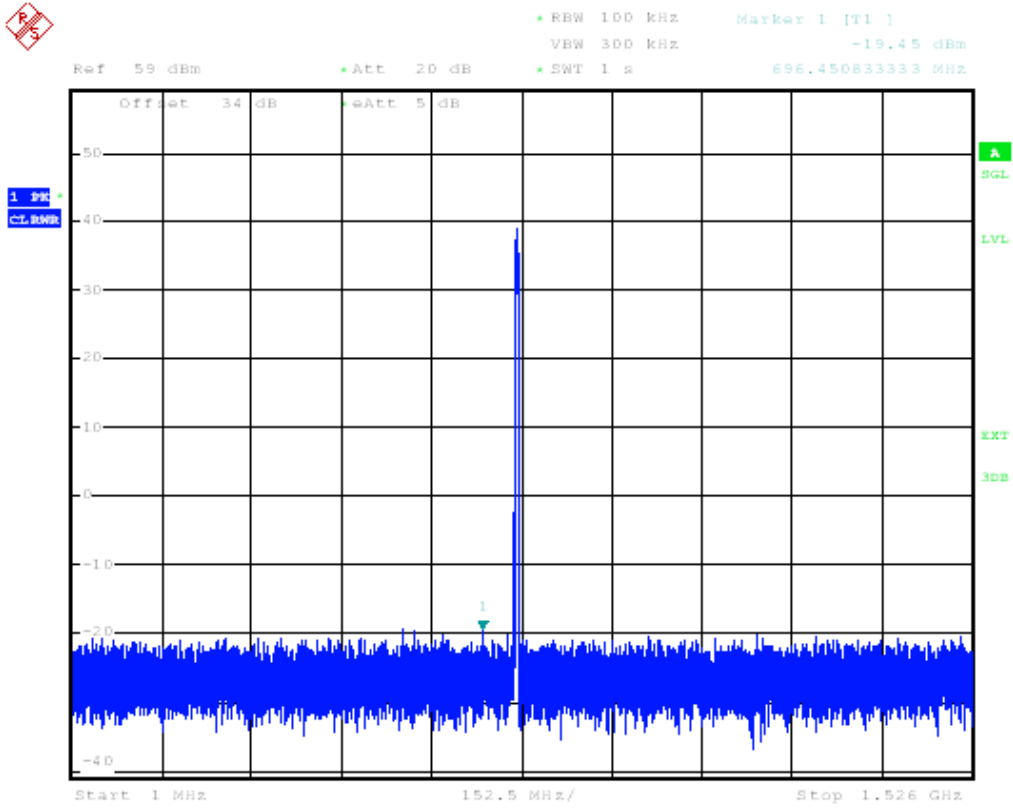
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Additional (Mid) Channel 5MHz Spurious 1MHz to 1.526GHz



Date: 15. APR. 2010 17:32:49



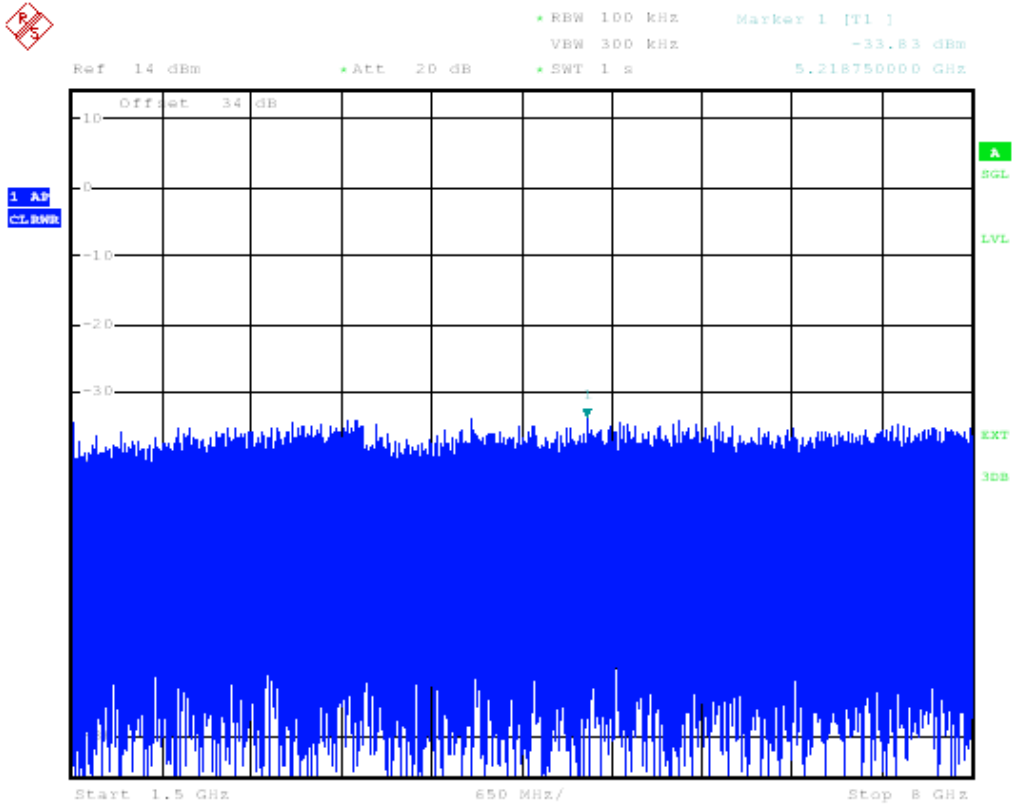
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Additional (Mid) Channel 5MHz Spurious 1.5GHz to 8GHz



Date: 15. APR. 2010 17:33:42



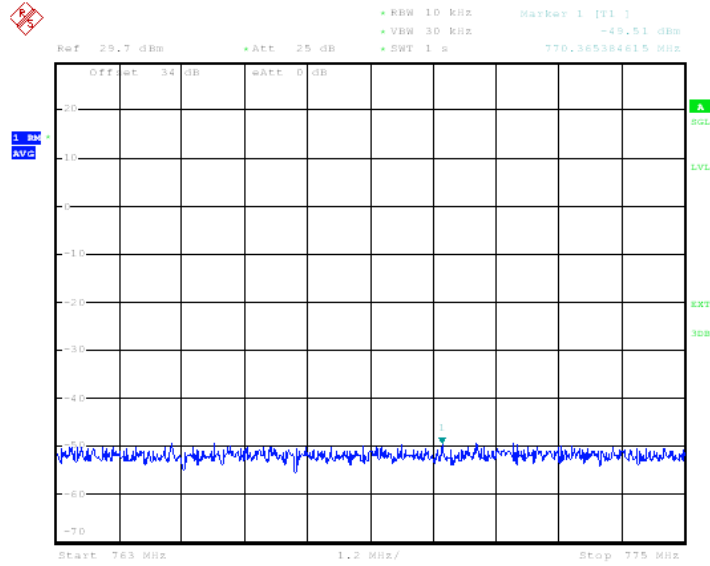
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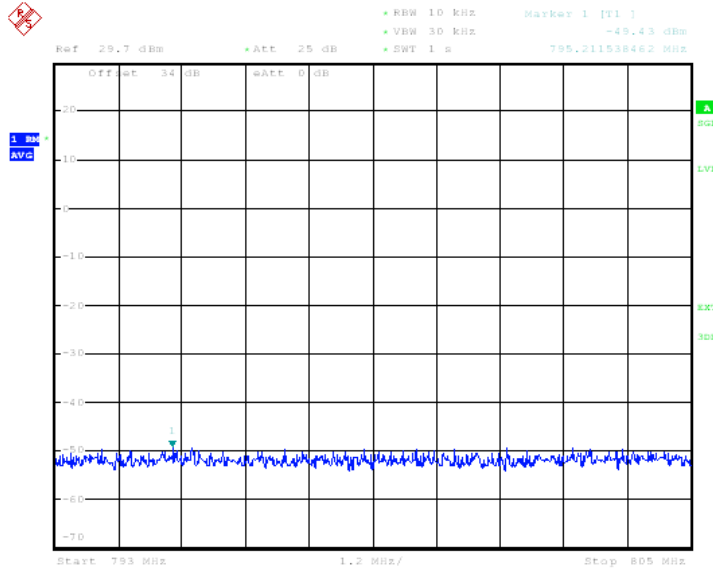
APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Additional (Mid) Channel 5MHz Public Safety



Date: 15.APR.2010 17:34:31



Date: 15.APR.2010 17:35:25



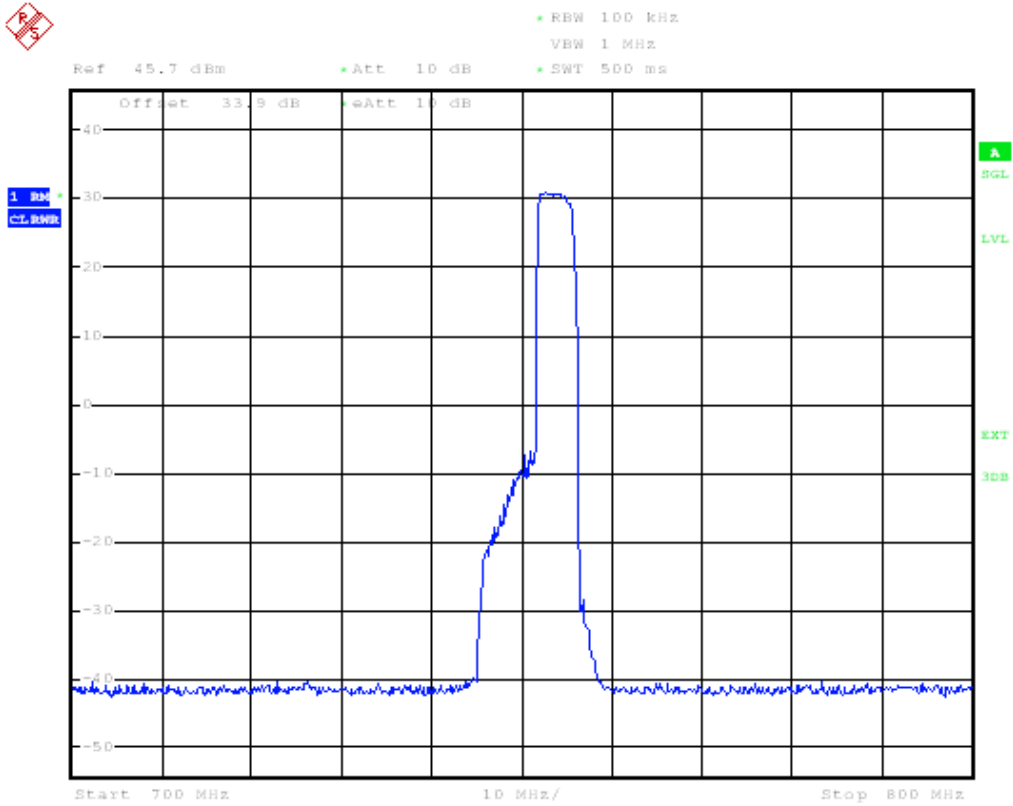
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Additional High Channel 5MHz Spurious 700MHz – 800MHz



Date: 27. APR. 2010 08:34:42



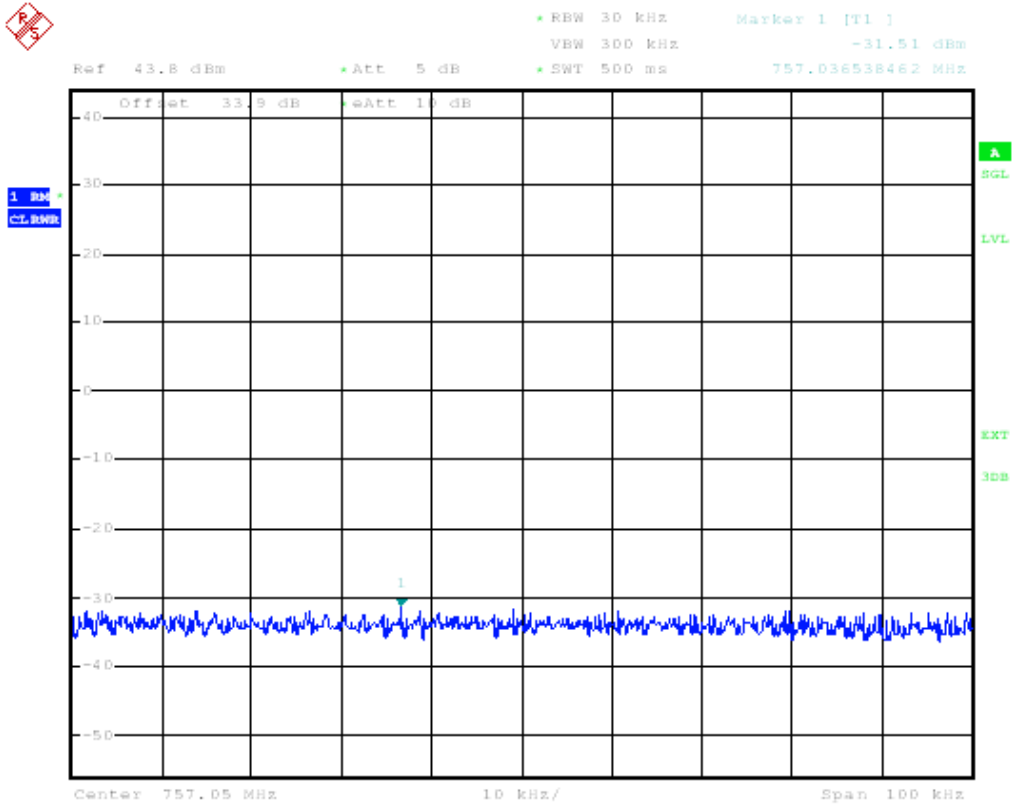
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Additional High Channel 5MHz Spurious 757MHz (30k RBW)



Date: 27. APR. 2010 08:33:47





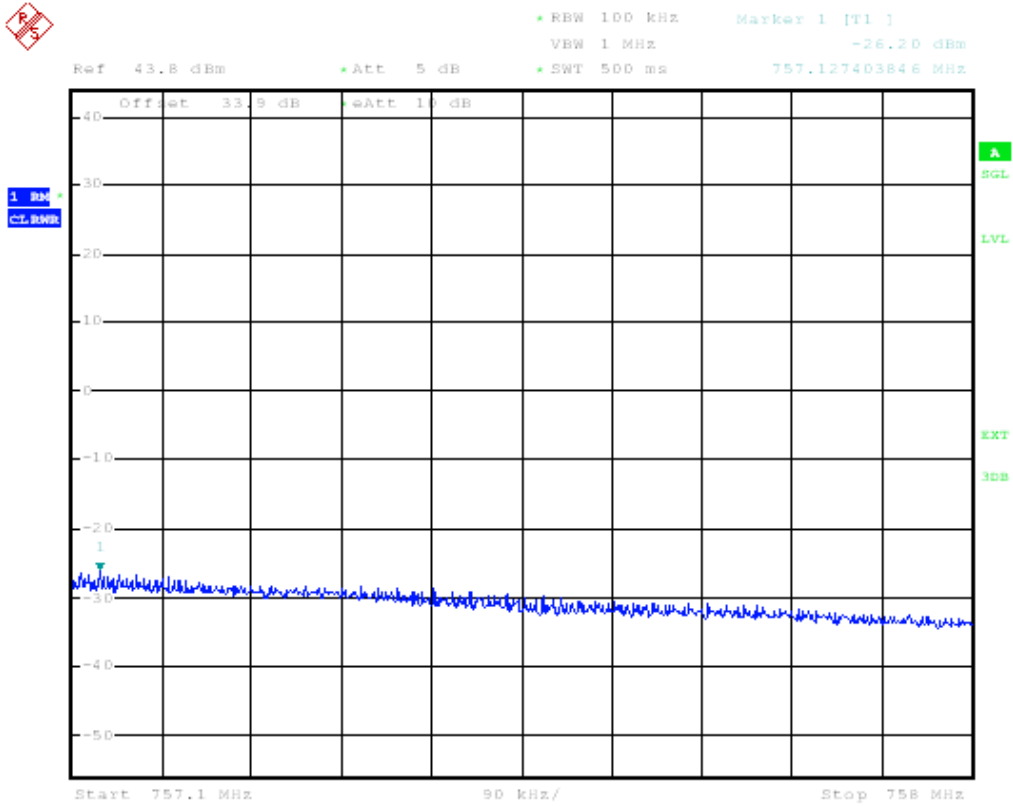
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

Additional High Channel 5MHz Spurious 757MHz – 758MHz (100k RBW)



Date: 27. APR. 2010 08:31:54



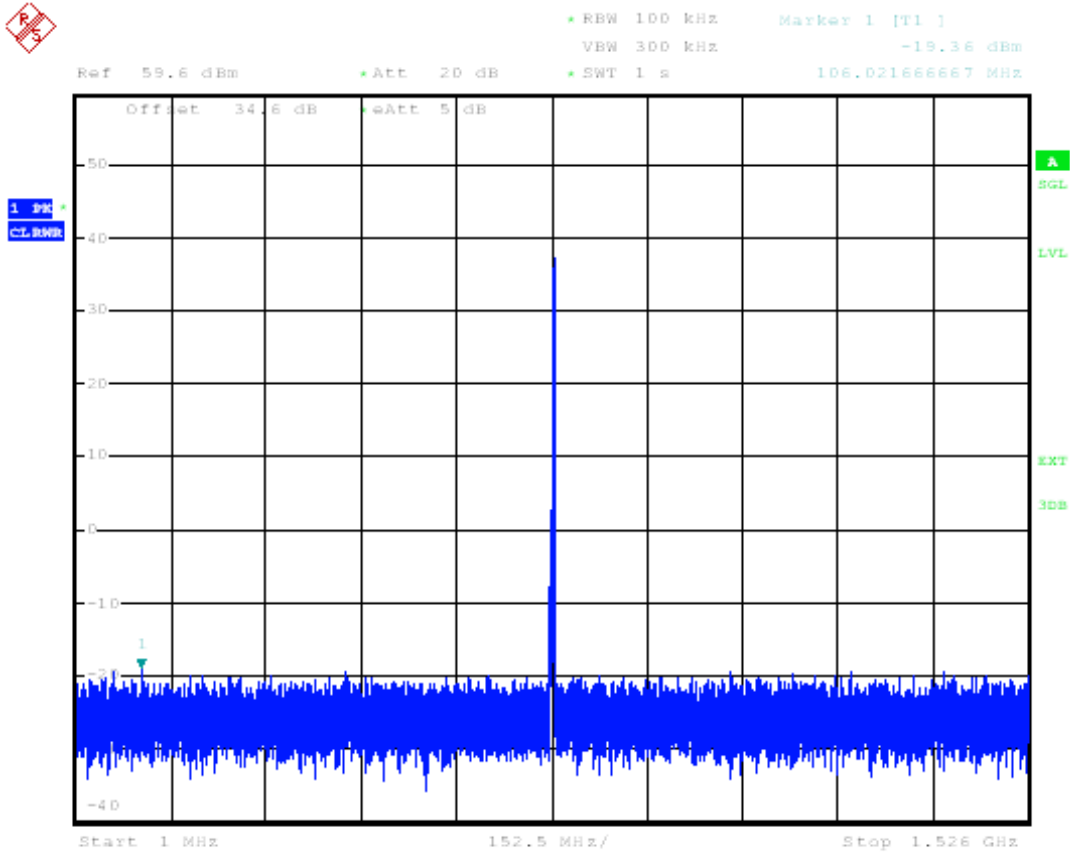
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

High Channel 5MHz Spurious 1MHz to 1.526GHz



Date: 15. APR. 2010 13:08:25



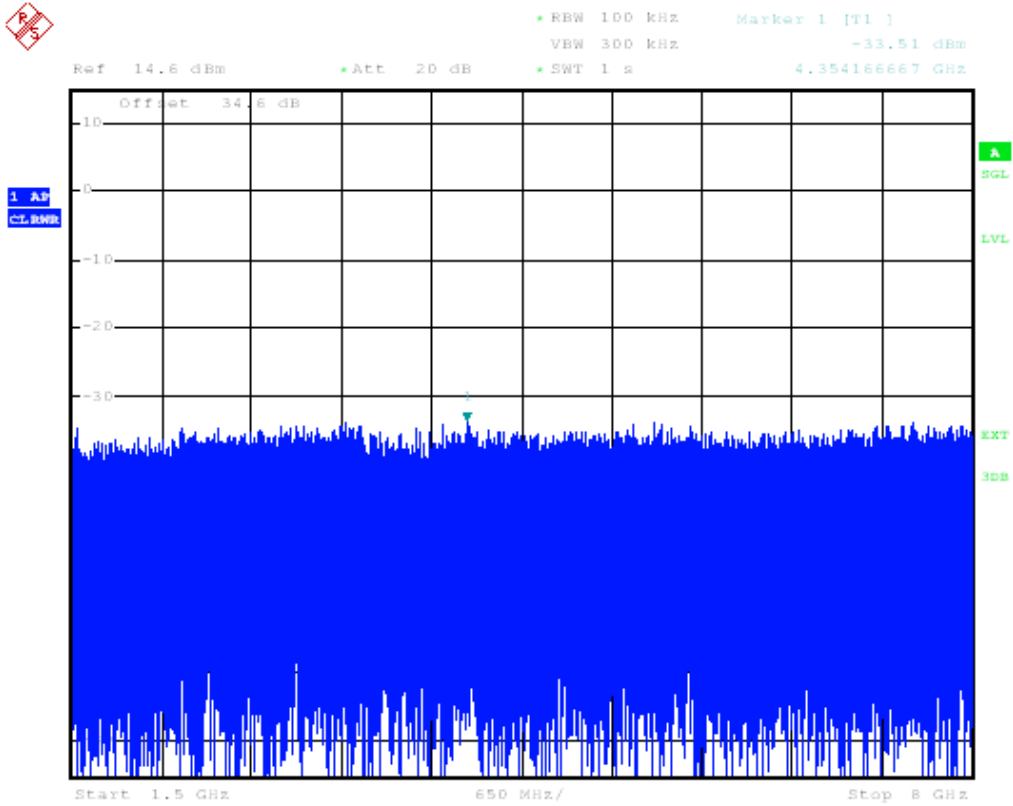
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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

High Channel 5MHz Spurious 1.5GHz to 8GHz



Date: 15. APR. 2010 13:07:09



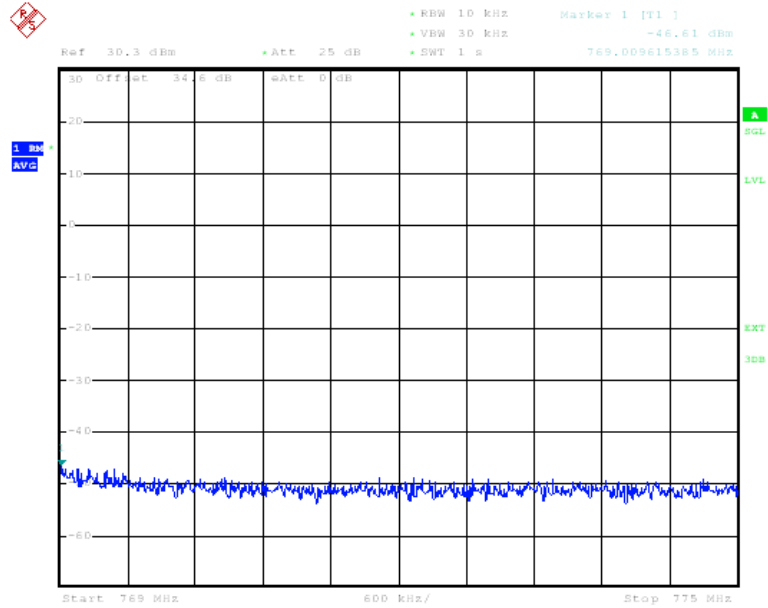
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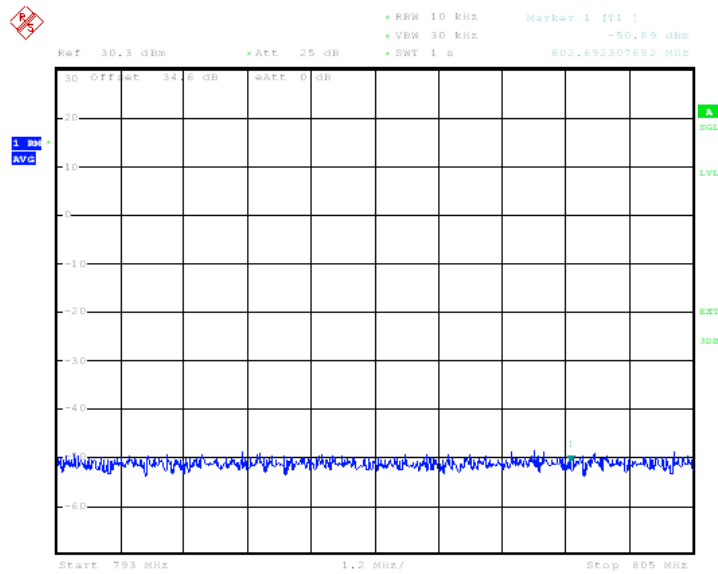
APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

### High Channel 5MHz Public Safety



Date: 15. APR. 2010 13:12:50



Date: 15. APR. 2010 13:15:28



**Section 6                      Field Strength of Spurious**

NAME OF TEST: Field Strength of Spurious	PARA. NO.: 2.1053
TESTED BY: Morrison, Jim	DATE: 11/22/2009

Test Result:                      Complies

Measurement Data:    See Attached Table

Test Equipment:            1-12,14

**FIELD STRENGTH OF SPURIOUS**

The spectrum was searched from 30MHz to the 10<sup>th</sup> harmonic of the carrier

SPUR FREQUENCY (MHz)	DISTANCE MEASURED (meters)	WORST CASE SPUR LEVEL MEASURED (dBuV/meter)	WORST CASE SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT (dBm)
5323.500 (Vert)	3	61.917	-33.31	-13



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APPLICANT: MOTOROLA

FCC ID: IHET4KJ1

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**Section 7                      Frequency Stability**

NAME OF TEST: Frequency Stability	PARA. NO.: 2.1055
TESTED BY: VanDrie Melissa	DATE: April 14, 2010

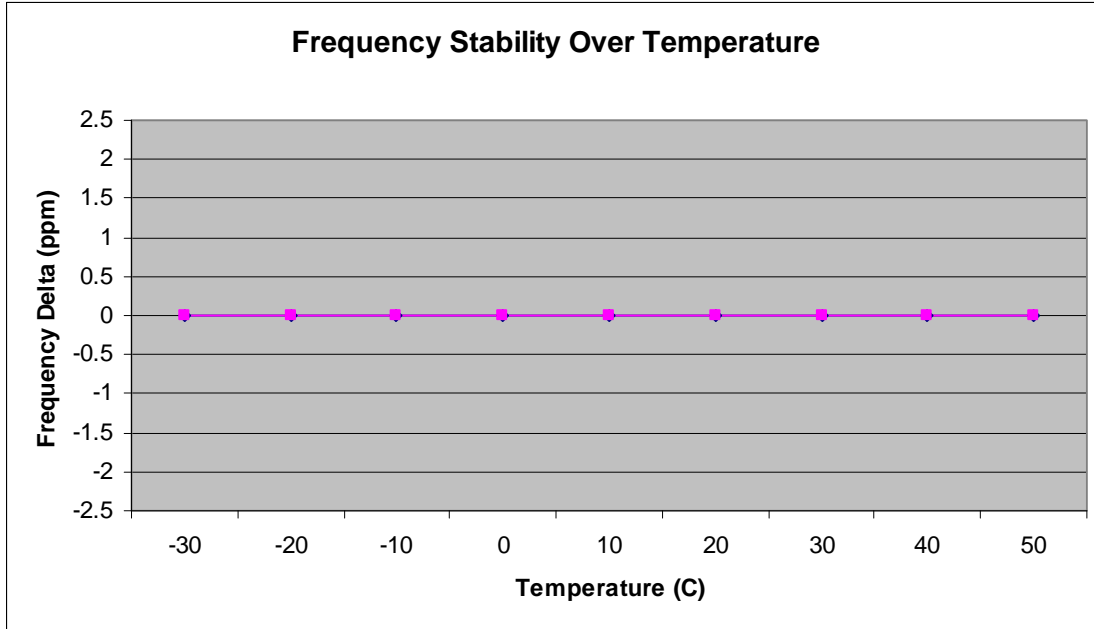
Test Result:                      Complies

Measurement Data:              See Plots

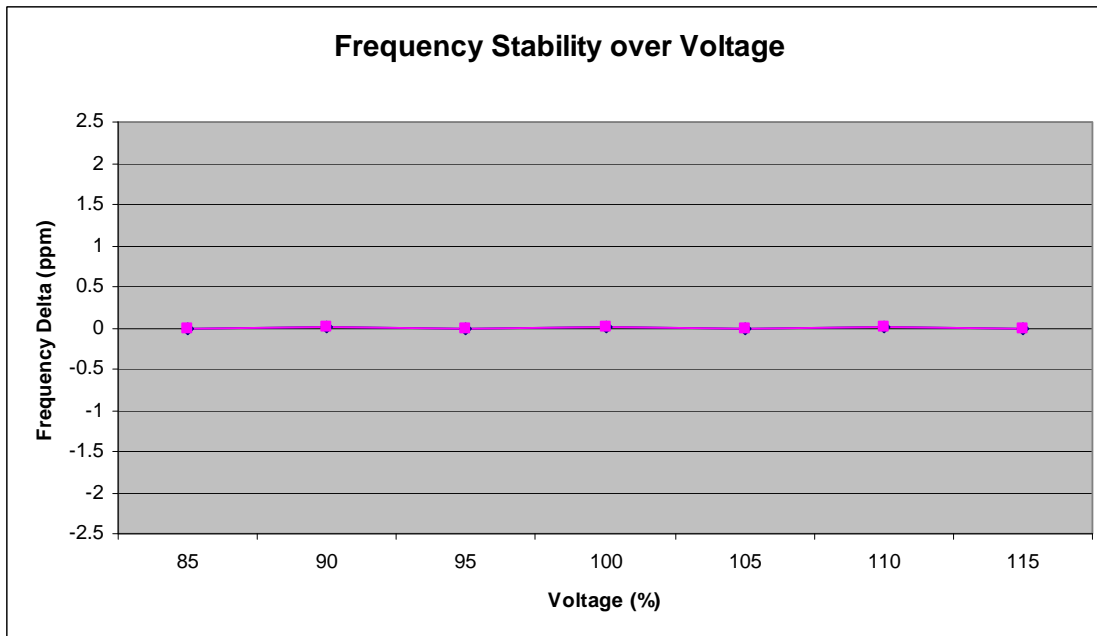
Test Equipment:                  13, 15, 16



FREQUENCY STABILITY OVER TEMPERATURE



FREQUENCY STABILITY OVER VOLTAGE





**Section 8 Test Equipment List**

Item #	Motorola ID	Description	Model	Serial No.	Cal Date	Cal Due Date
1	118938	Pre-Amp	HP83006A	3950M0013 6	N/A	N/A
2	118937	Pre-Amp	HP83006A	3950M0013 5	N/A	N/A
3	505082	Antenna, Log Periodic	EMCO 3146	9303-3597	7/13/2009	7/13/2010
4	500301	Antenna, Biconnical	EMCO 3104C	8905-3974	7/13/2009	7/13/2010
5	502512	Antenna, Double Ridged Guide	EMCO 3115	2021	7/13/2009	7/13/2010
6	112019	Spectrum Analyzer	HP8593EM	3628A00164	4/27/2009	4/27/2010
7	508768	Power Meter	HP438A	3513U03967	4/27/2009	4/27/2010
8	116232	Power Sensor	HP8481A	2702A61832	4/27/2009	4/27/2010
9	509002	Signal Generator	HP83712A	3429A00422	4/28/2009	4/28/2010
10	N/A	Cable, Heliax 1/2" - 100 feet	Andrew	N/A	N/A	N/A
11	N/A	Cable, Coax - 6 feet	Microcoax	N/A	N/A	N/A
12	N/A	Cable, Coax - 6 feet	Microcoax	N/A	N/A	N/A
13	N/A	Cable, Coax - 6 feet	Microcoax	N/A	N/A	N/A
14	N/A	Cable, Reel - 20 feet	Emco	N/A	N/A	N/A
15	122804	Spectrum Analyzer	FSQ26	200123	1/19/2010	1/22/2011
16	N/A	Attenuator, 20dB	Wienschel	N/A	N/A	N/A
17	N/A	Low Pass Filter	Teledyne	N/A	N/A	N/A