

## EMC TEST REPORT



NVLAP Lab Code 200033-0

### Standard(s):

47 CFR FCC Part 15.247:2012  
RSS 210, Issue 8, 2010  
FCC ID: DGFBCSDG5H1  
IC ID: 458A-BCSDG5H1

**Product:** 3M™ Drive Thru Headset G5  
**Model:** G5H1  
**3M Division:** BCSD

**Report Number:** RE1306011-1  
**Report Issue Date:** October 30, 2013

### Report Prepared By:

Signature: \_\_\_\_\_

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**Tested By:**  
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## 1.0 Test Summary

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

	Section FCC 15C/RSS 210	Scope of Test	Result	Comments
4.1	15/107/15.207/RSS-Gen	Conducted Emissions	N/A	Battery Operated
4.2	15.109/15.209/RSS-Gen	Radiated Emissions	pass	
4.3	15.247(a)(1)/A8.1(b)	Carrier Frequency Separation	pass	
4.4	15.247(a)(1)/A8.1(d)	Number of Hopping Frequencies	pass	
4.5	15.247(a)(1)/A8.1(d)	Time of Occupancy (Dwell Time)	pass	
4.6	15.247(a)(1)/A8.1(a)	20dB Bandwidth	pass	
4.7	15.247(b)(3)/A8.4	Band-edge Compliance	pass	
4.8	15.247(c)/A8.5	Conducted Output Power	pass	
4.9	15.247(c)/A8.5	Spurious Conducted and Radiated Emissions	pass	
4.10	15.247(2)(h)(i)/RSS102	RF Exposure Compliance	pass	

**Note:**

## 1.1 Measurement Uncertainty

The measured value related to the corresponding limit will be used to decide whether the equipment meets the requirements. The measurement uncertainty figures were calculated and correspond to a coverage factor of k=2, providing a confidence level of respectively 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Radiated emissions	5.20 dB
Conducted emissions	3.60 dB
Harmonics and Flicker	3.32 dB



## 2.0 Equipment Description

2.1	Equipment Under Test	
<b>Description:</b>	3M™ Drive Thru Headset G5, Model G5H1 works with the 3M™ Wireless Communication System intended to provide 2-way radio-frequency audio communication in quick service drive through restaurants and convenience stores.	
<b>Model(s):</b>	G5H1	
<b>Serial number:</b>	N/A	
<b>Client Contact:</b>	Michael Campbell	
<b>Phone:</b>	651-736-3091	
<b>3M Division:</b>	Building & Commercial Services Division	
<b>Modifications:</b>	None	
<b>Frequency Range (MHz) :</b>	2401 – 2480MHz	█
<b>Modulation Type:</b>	FHSS	█
<b>Channel No.:</b>	>75	█
<b>Output Power ERP (dBm)</b>	18.5	█
<b>Antenna Type :</b>	2dBi Monopol	
<b>Equipment Category:</b>	<input type="checkbox"/> General <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Indoor Use	
<b>Rated Power:</b>	Voltage: <input type="checkbox"/> 120VAC <input type="checkbox"/> 230VAC <input checked="" type="checkbox"/> 3.8 VDC Frequency: <input type="checkbox"/> 50Hz <input type="checkbox"/> 60Hz Current: <input type="checkbox"/> █	
<b>Test Dates:</b>	08/19-09/03/2013	
<b>Received Date:</b>	08/16/2013	
<b>Received Conditions:</b>	<input type="checkbox"/> Poor <input checked="" type="checkbox"/> Good <input checked="" type="checkbox"/> Prototype <input type="checkbox"/> Production	

### 3.0 EUT Configuration

#### 3.1 Support Equipment

No.	Product Type	Manufacturer	Model	Comments
1	Regulated Power Supply	LAMBDA	LQD-421	
2				

#### 3.2 Cables

No.	Name	Type	Length	Shielding	Comments
1					
2					

#### 3.3 Operating Condition of EUT

Operation Modes	
<input type="checkbox"/>	Stand by
<input checked="" type="checkbox"/>	Continuous Monitored Operation
<input type="checkbox"/>	Continuous Unmonitored Operation
<input type="checkbox"/>	

#### 3.4 Exercising of EUT

No.	Description of EUT Exercising
1	Transmitting at lowest, middle and highest channels of operation with un-modulated carrier
2	Transmitting with hopping channels enabled
3	Transmitting un-modulated carrier at maximum rated RF output power

#### 4.0 Test Conditions and Results

<b>4.1</b>	<b>Conducted Emissions Data</b>			
<b>Method:</b>	The AMN was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.			
<b>Test Verification:</b> <input checked="" type="checkbox"/>		Laboratory Ambient Temperature		[ ] °C
		Relative Humidity		[ ] %
<b>Reference Standard:</b>		<input type="checkbox"/> ANSI C63.4:2003 <input type="checkbox"/> ANSI C63.4:2009 <input type="checkbox"/> ANSI C63.10:2009 <input type="checkbox"/> FCC Part 15.107/ICES 003 <input type="checkbox"/> FCC Part 15.247/RSS 210 <input type="checkbox"/> [ ]		<b>Measurement Point</b> <input type="checkbox"/> Mains <input type="checkbox"/> Telecommunication ports <input type="checkbox"/> [ ]
<b>Frequency Range:</b>		<input type="checkbox"/> 150KHz to 30KHz <input type="checkbox"/> [ ]		
<b>Nominal Voltage:</b>		<input type="checkbox"/> 120VAC <input type="checkbox"/> 230VAC <input type="checkbox"/> [ ]		
<b>Tested By:</b>		[ ]	<b>Date:</b> [ ]	
<b>Limits</b>				
Frequency (MHz)	Limit dB (µV)			
	Quasi-Peak	Average	Result	Comments
0.15 to 0.50	66 to 56	56 to 46	<b>N/A</b>	
0.50 to 5	56	46	<b>N/A</b>	
5 to 30	60	50	<b>N/A</b>	
<b>Modifications:</b>	[ ]			
<b>Note:</b>	Headset is battery operated			



4.2		Radiated Emissions Data		
<b>Method:</b>	Measurements were made in a 3-meter semi-anechoic chamber that complies to CISPR 16. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.			
<b>Test Verification:</b> <input checked="" type="checkbox"/>	Laboratory Ambient Temperature	23°C		
	Relative Humidity	35%		
<b>Reference Standard:</b>	<input type="checkbox"/> ANSI C63.4:2003 <input checked="" type="checkbox"/> ANSI C63.4:2009 <input type="checkbox"/> ANSI C63.10:2009 <input checked="" type="checkbox"/> FCC Part 15.109/ICES 003 <input type="checkbox"/> FCC Part 15.247/RSS 210 <input checked="" type="checkbox"/> FCC Part 15.209	<b>Measurement Distance</b>		
<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 30 MHz TO 2000 MHz <input type="checkbox"/>	<input checked="" type="checkbox"/> 3 Meters <input type="checkbox"/>		
<b>Nominal Voltage:</b>	<input type="checkbox"/> 120VAC <input type="checkbox"/> 230VAC <input checked="" type="checkbox"/> 3.8VDC			
<b>Tested By:</b>	Mike Schultz	<b>Date:</b> 08/27/2013		
Limits				
Frequency (MHz)	Limit dB (µV/m)			
	Quasi-Peak	Average	Distance	Results
0.009-0.490		2400/F(KHz)	300	N/A
0.490-1.705	24000/F(KHz)		30	N/A
1.705-30	29.5		30	N/A
30 to 88	40		3	pass
88-216	43.5		3	pass
216-960	46		3	pass
Above 960		54	3	pass

<b>Modifications:</b>	
<b>Note:</b>	For emission in the restricted bands, the limit of 15.209 was used.

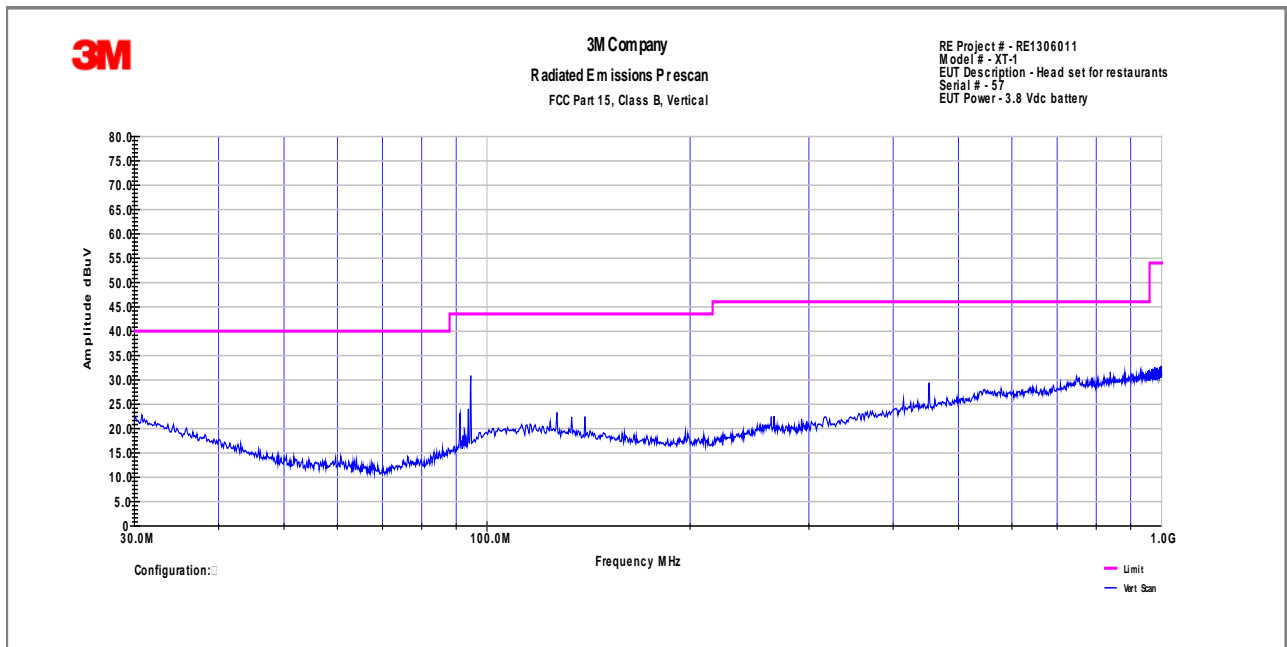
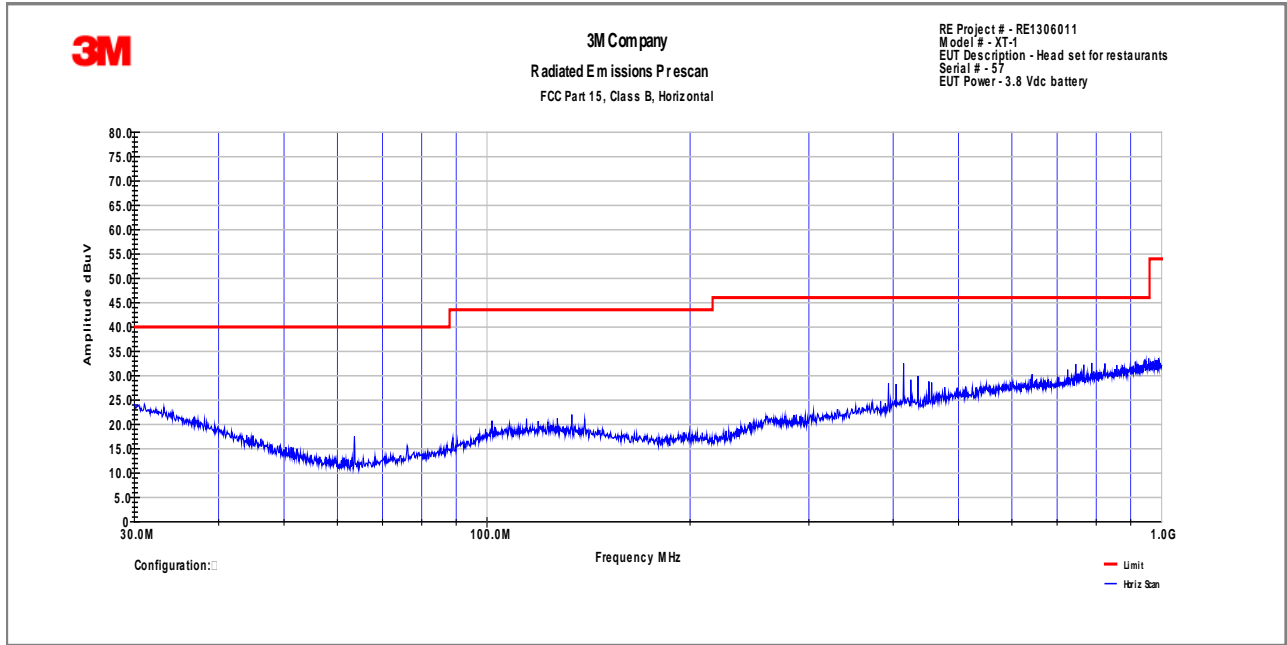


Frequency (MHz)	Pol.	QP Reading dB $\mu$ V/m	Total CF dB	Net at 3 m dB $\mu$ V/m	Limit (dB $\mu$ V/m)	Margin dB
30.731	V	-3.91	22.61	18.7	40	-21.3
64.64	H	-2.77	9.74	6.98	40	-33.02
93.534	H	-2.58	13.97	11.39	43.52	-32.13
95.554	H	-2.64	14.45	11.8	43.52	-31.72
418.14	H	-2.04	22.18	20.13	46.02	-25.89
430.65	H	-2.04	21.84	19.8	46.02	-26.22
<b>Notes</b>	Total CF = Antenna Factor + Cable Factor - AMP Gain					





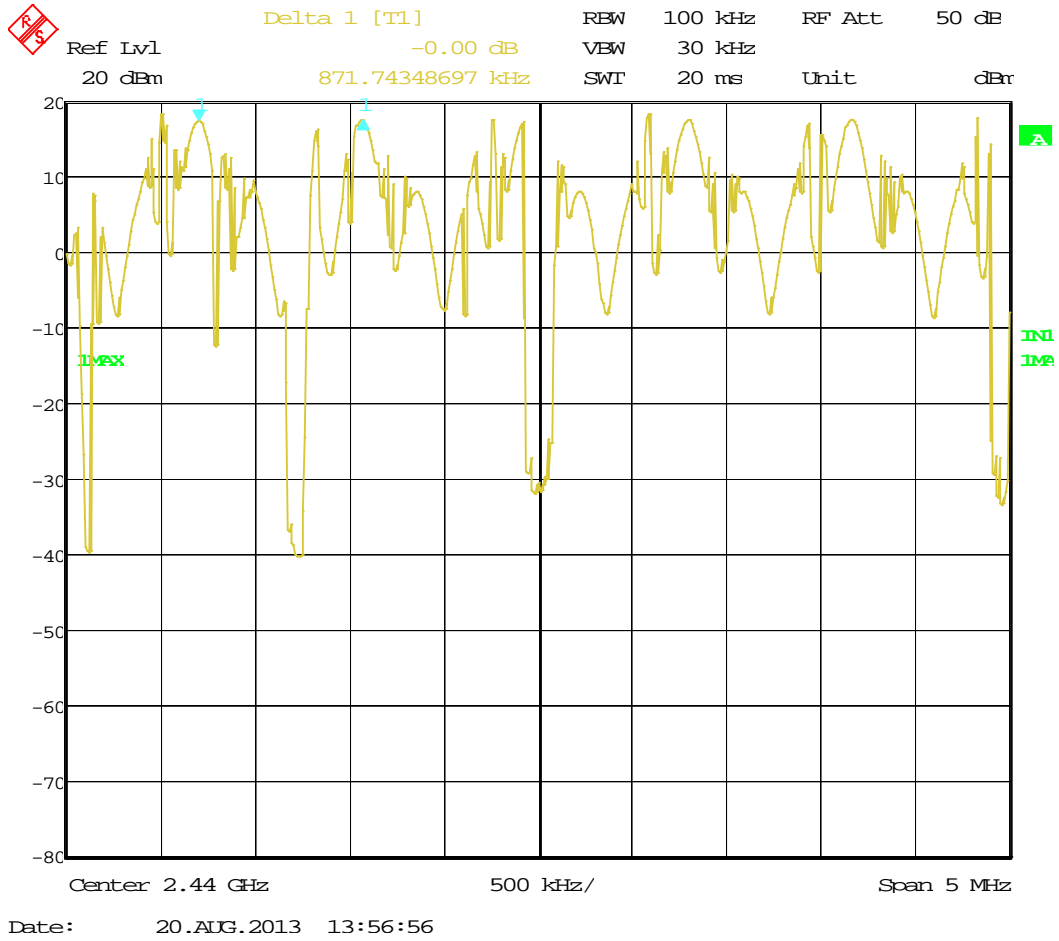
Test Set Up Photo



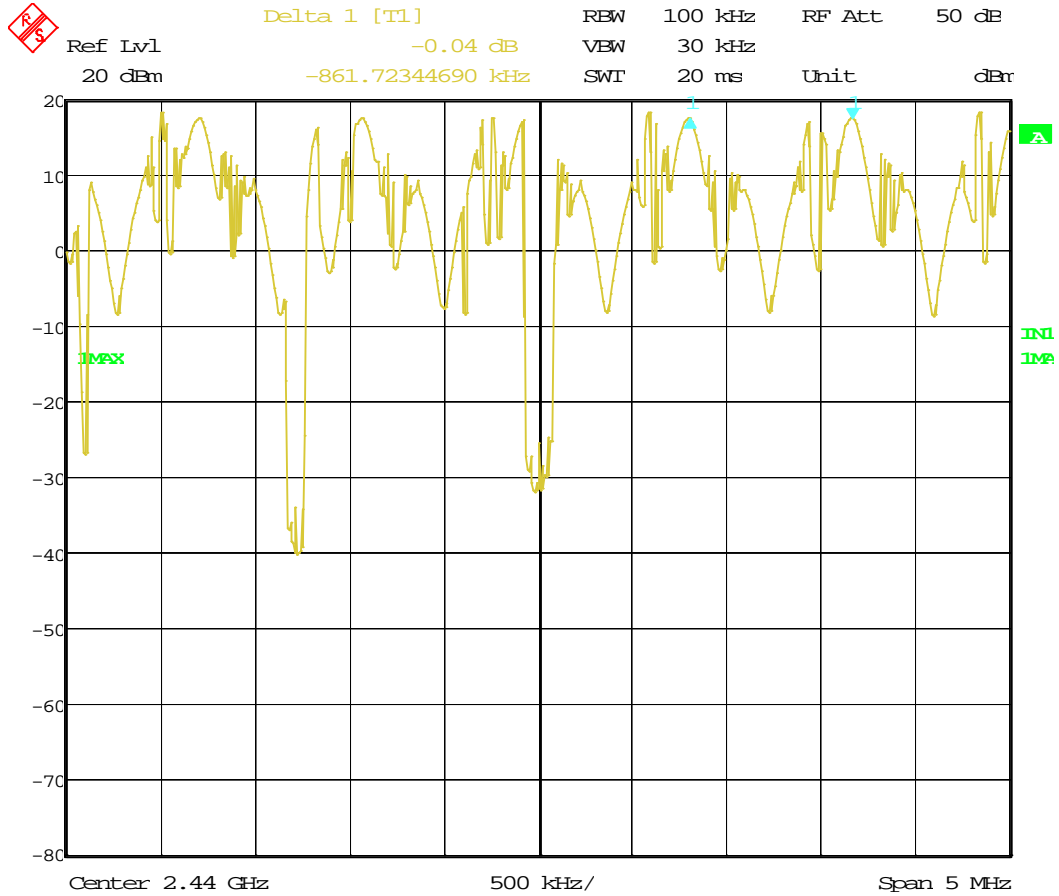


<b>4.3 Carrier Frequency Separation</b>					
<b>Method:</b>	The measurements were made with transmitter set to transmit a continuously with hopping function enabled.				
	<table border="1"> <tr> <td>Laboratory Ambient Temperature</td> <td>23°C</td> </tr> <tr> <td>Relative Humidity</td> <td>35%</td> </tr> </table>	Laboratory Ambient Temperature	23°C	Relative Humidity	35%
Laboratory Ambient Temperature	23°C				
Relative Humidity	35%				
<b>Reference Standard:</b>	<input type="checkbox"/> ANSI C63.4:2003 <input type="checkbox"/> ANSI C63.4:2009 <input checked="" type="checkbox"/> ANSI C63.10:2009 <input type="checkbox"/> FCC Part 15.109/ICES 003 <input checked="" type="checkbox"/> FCC Part 15.247/RSS 210 <input type="checkbox"/> FCC Part 15.209				
<b>Measurement Point</b>	<input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated <input type="checkbox"/> <span style="background-color: #cccccc; display: inline-block; width: 20px; height: 10px;"></span>				
<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 2401-2480MHz				
<b>Antenna Gain:</b>	<input checked="" type="checkbox"/> 2dBi				
<b>Limit</b>	<table border="1"> <tr> <td><input checked="" type="checkbox"/> &gt;25KHz</td> <td>871.KHz</td> </tr> <tr> <td><input checked="" type="checkbox"/> &gt;20dB Bandwidth <input checked="" type="checkbox"/> 671KHz</td> <td><span style="background-color: #cccccc; display: inline-block; width: 40px; height: 15px;"></span></td> </tr> </table>	<input checked="" type="checkbox"/> >25KHz	871.KHz	<input checked="" type="checkbox"/> >20dB Bandwidth <input checked="" type="checkbox"/> 671KHz	<span style="background-color: #cccccc; display: inline-block; width: 40px; height: 15px;"></span>
<input checked="" type="checkbox"/> >25KHz	871.KHz				
<input checked="" type="checkbox"/> >20dB Bandwidth <input checked="" type="checkbox"/> 671KHz	<span style="background-color: #cccccc; display: inline-block; width: 40px; height: 15px;"></span>				
<b>Nominal Voltage:</b>	<input type="checkbox"/> 230VAC <input checked="" type="checkbox"/> 3.8VDC				
<b>Tested By:</b>	Yuriy Litvinov <b>Date:</b> 08/20/2013				

<b>Note:</b>	<span style="background-color: #cccccc; display: inline-block; width: 40px; height: 15px;"></span>
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### Carrier Frequency Separation



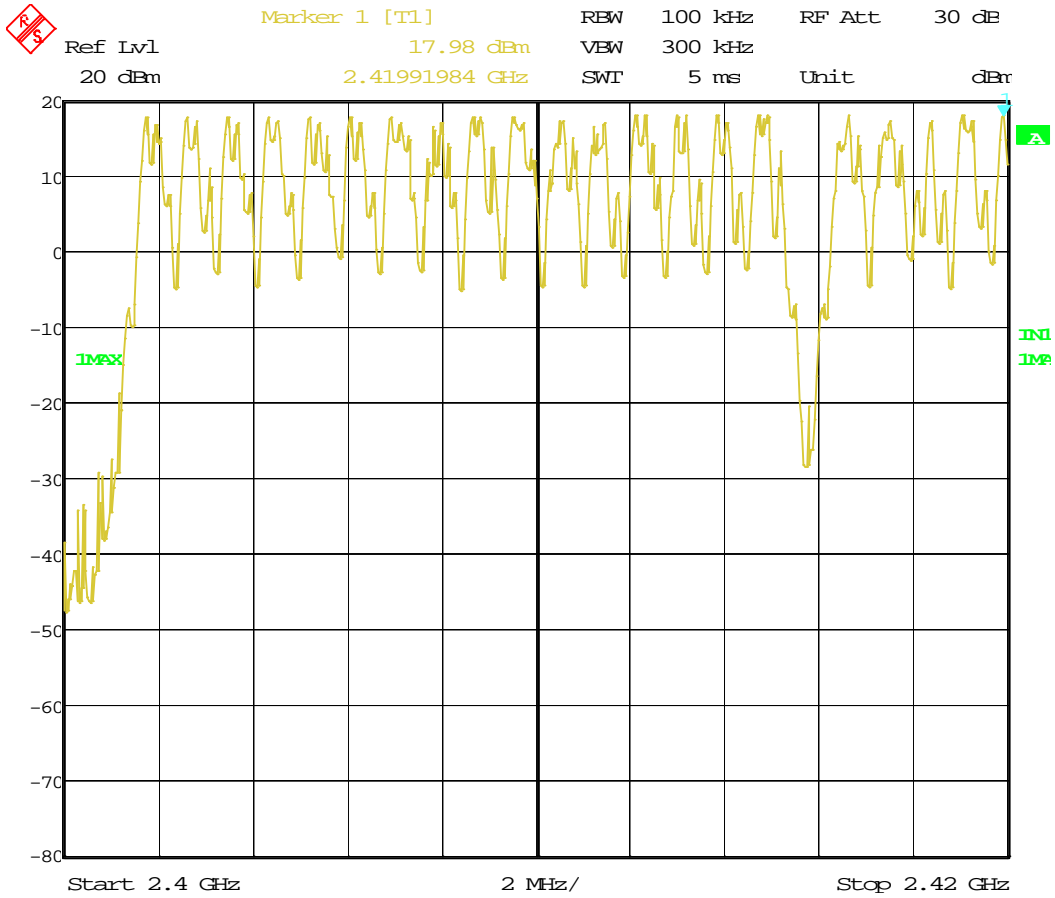
Date: 20.AUG.2013 13:57:36

### Carrier Frequency Separation



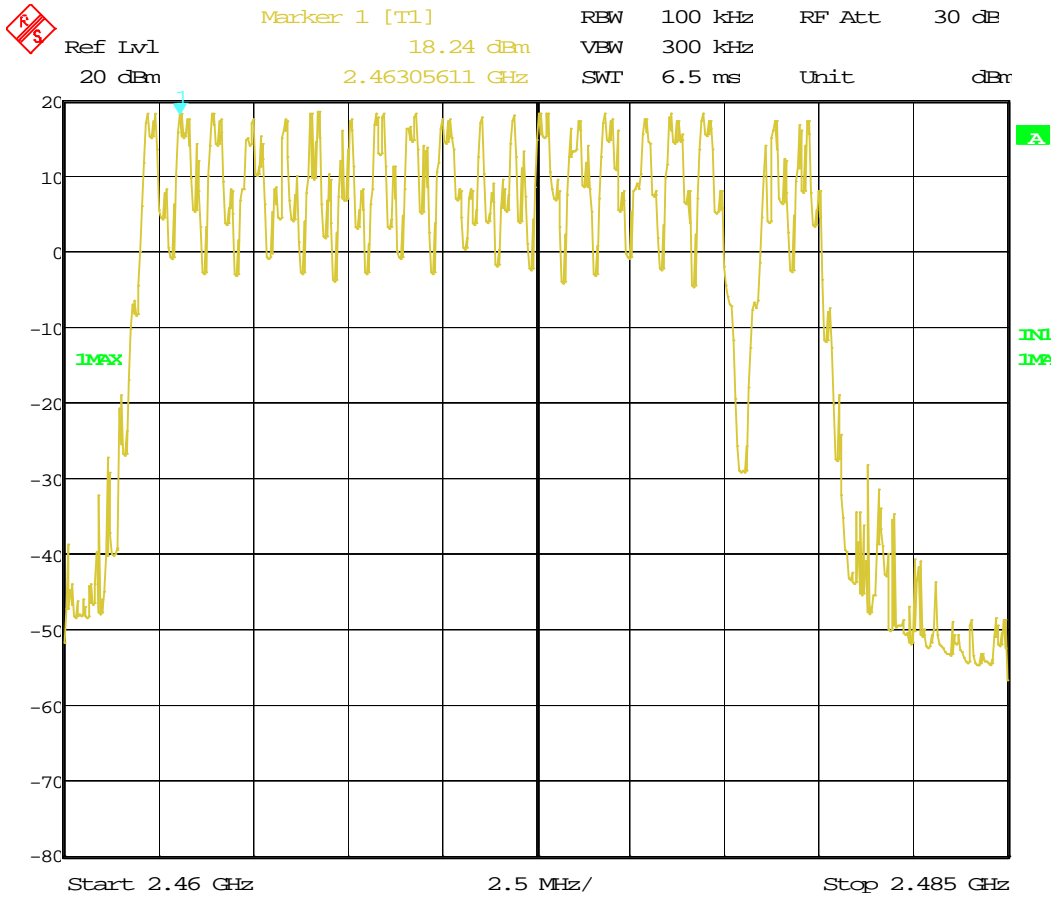
4.4		Number of Hopping Frequencies	
<b>Method:</b>	The measurements were made with transmitter set to transmit a continuously with hopping function enabled.		
	Laboratory Ambient Temperature	23°C	
	Relative Humidity	35%	
<b>Reference Standard:</b>	<input type="checkbox"/> ANSI C63.4:2003 <input type="checkbox"/> ANSI C63.4:2009 <input checked="" type="checkbox"/> ANSI C63.10:2009 <input type="checkbox"/> FCC Part 15.109/ICES 003 <input checked="" type="checkbox"/> FCC Part 15.247/RSS 210 <input type="checkbox"/> FCC Part 15.209	<b>Measurement Point</b> <input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated <input type="checkbox"/>	
<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 2401-2480MHz		
<b>Antenna Gain:</b>	<input checked="" type="checkbox"/> 2dBi		<b>Result</b>
<b>Limit</b>	<input checked="" type="checkbox"/> >15 Hopping Channels		75
<b>Nominal Voltage:</b>	<input type="checkbox"/> 230VAC <input checked="" type="checkbox"/> 3.8VDC		
<b>Tested By:</b>	Yuriy Litvinov	<b>Date:</b> 08/20/2013	

<b>Note:</b>	
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Date: 20.AUG.2013 14:37:13

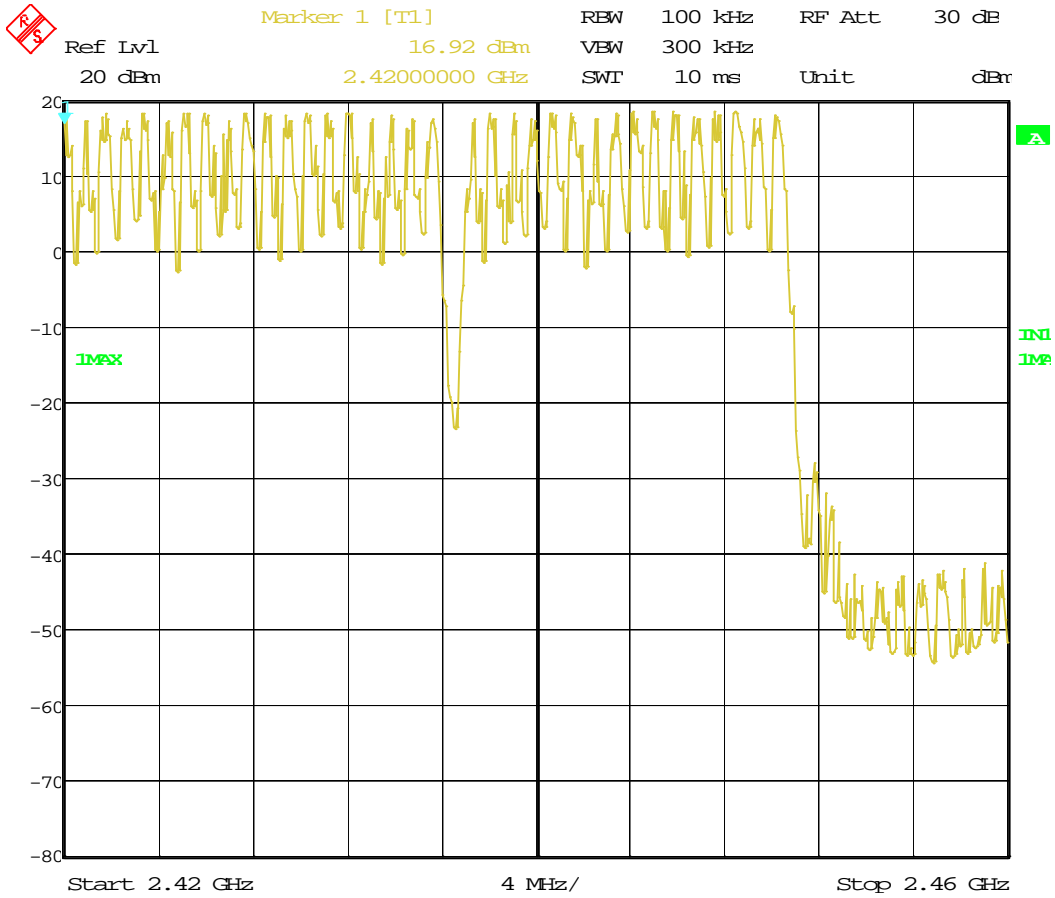
Low Section



Date: 20.AUG.2013 14:52:07

High Section





Date: 20.AUG.2013 14:44:52

Mid Section

<b>4.5</b>	<b>Time of Occupancy</b>		
<b>Method:</b>	The measurements were made with transmitter set to transmit continuously with hopping function enabled.		
	Laboratory Ambient Temperature	23°C	
	Relative Humidity	35%	
<b>Reference Standard:</b>	<input type="checkbox"/> ANSI C63.4:2003 <input type="checkbox"/> ANSI C63.4:2009 <input checked="" type="checkbox"/> DA 00-705 <input type="checkbox"/> FCC Part 15.109/ICES 003 <input checked="" type="checkbox"/> FCC Part 15.247/RSS 210 <input type="checkbox"/> FCC Part 15.209	<b>Measurement Point</b> <input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated <input type="checkbox"/> <span style="background-color: #cccccc; display: inline-block; width: 20px; height: 10px;"></span>	
<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 2401-2480MHz		
<b>Antenna Gain:</b>	<input checked="" type="checkbox"/> 2dBi	<b>Results</b>	
<b>Limit (dwell time)</b>	<input checked="" type="checkbox"/> <0.4 sec within a period of 0.4 sec x N hopping channels	801.6 µs/channel	
<b>Nominal Voltage:</b>	<input type="checkbox"/> 230VAC <input checked="" type="checkbox"/> 3.8VDC		
<b>Tested By:</b>	Yuriy Litvinov	<b>Date:</b> 08/20/2013	

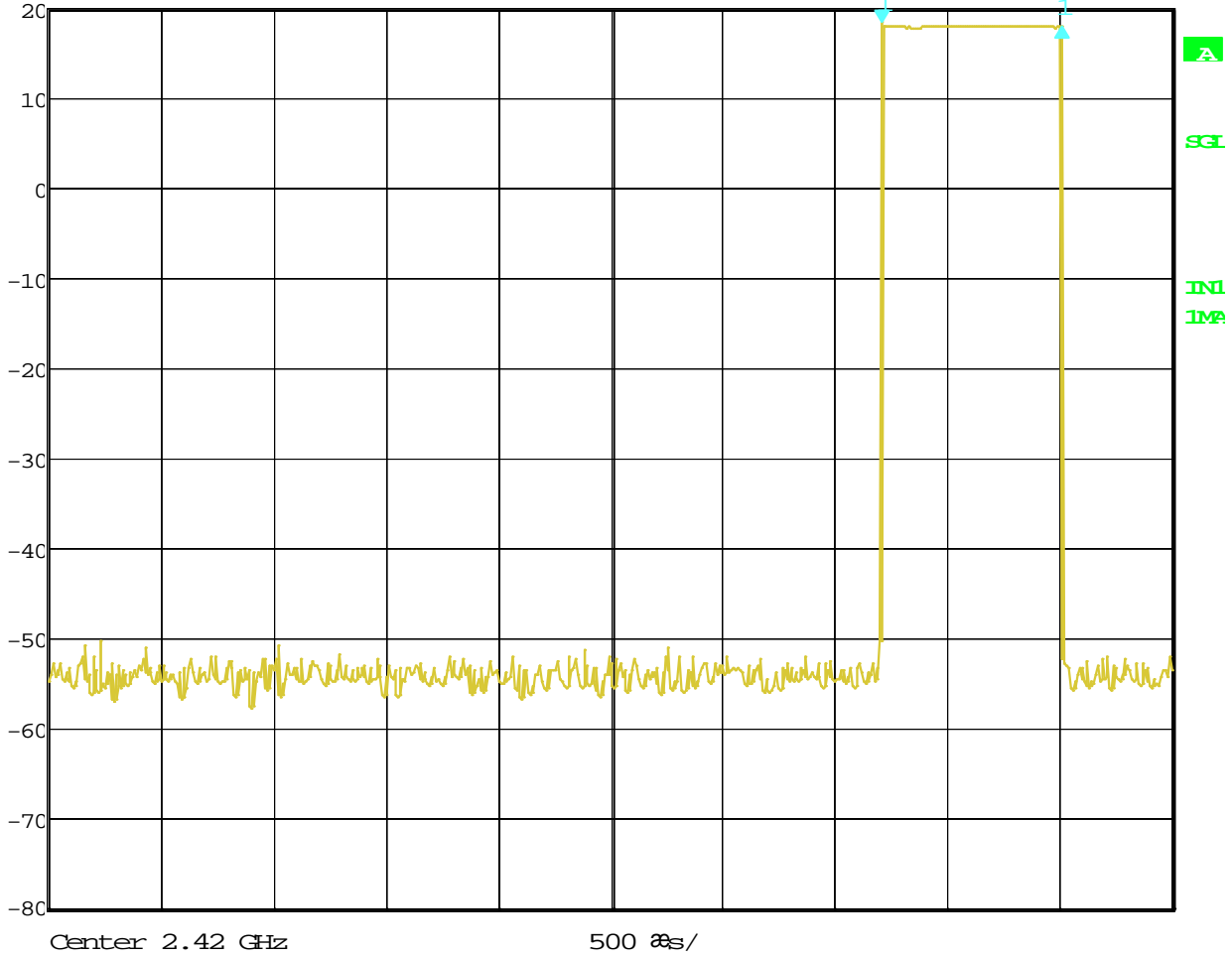
<b>Note:</b>	The timing by channel is 833 µs. During 75 channels x 0.4 s = 30sec, 30sec/10ms = 3000 hops in 30sec. Using 75 channels the unit will occupy a given channel 40 times, 3000/75=40 times in 30sec, then 40 x 833 µs = 33.32 ms, thus the average time of occupancy on any channel is less than 40 ms within a period of 0.4sec.
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Delta 1 [T1]

RBW 1 MHz RF Att 30 dB  
VBW 3 MHz  
SWT 5 ms Unit dBr

Ref Lvl -0.53 dB  
20 dBm 801.603206  $\mu$ s

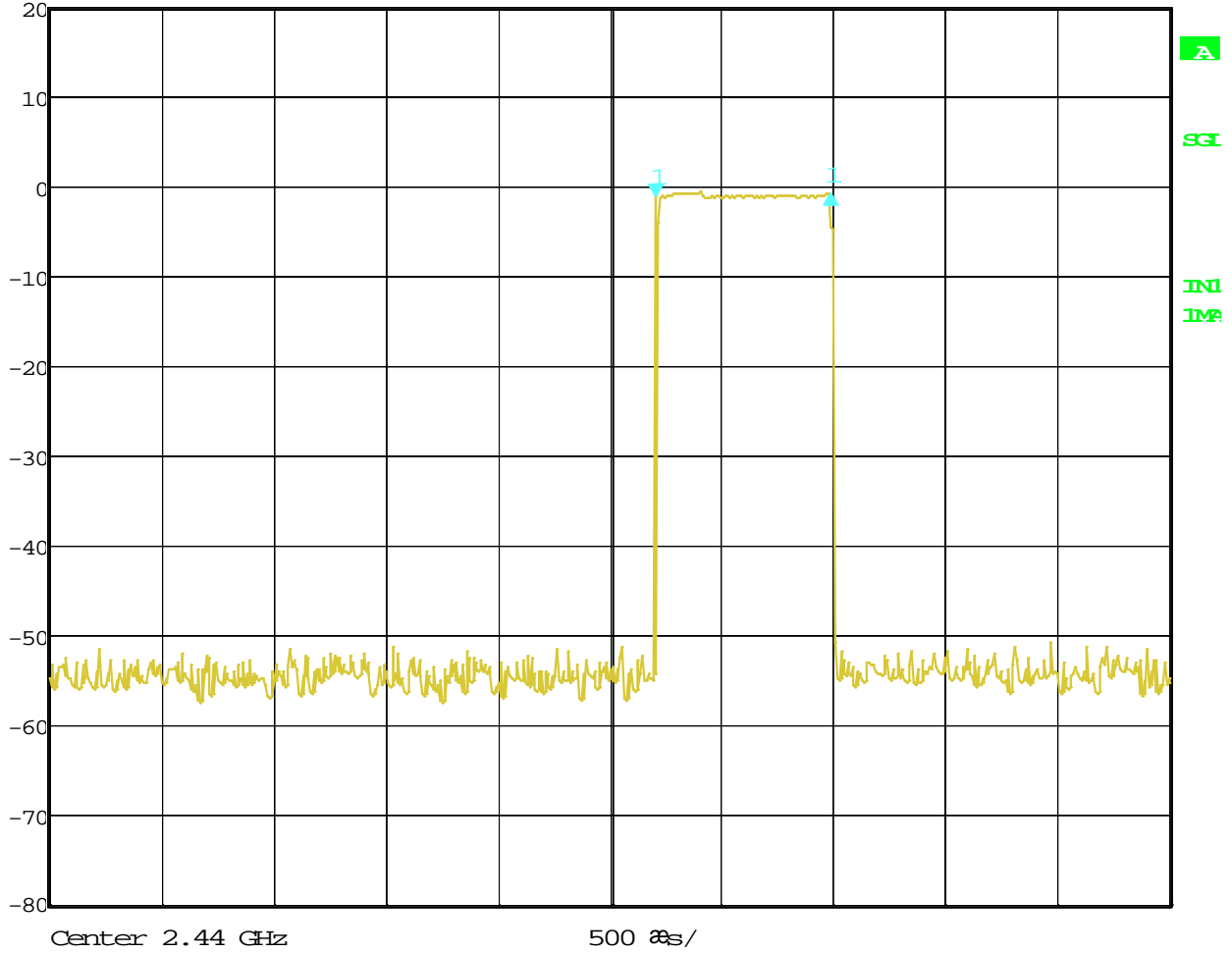


Date: 20.AUG.2013 15:00:11

**Dwell time low channel**



Delta 1 [T1]      RBW    1 MHz    RF Att    30 dB  
Ref Lvl                    0.15 dB    VBW    3 MHz  
20 dBm                    781.563126  $\mu$ s    SWI    5 ms    Unit    dBm

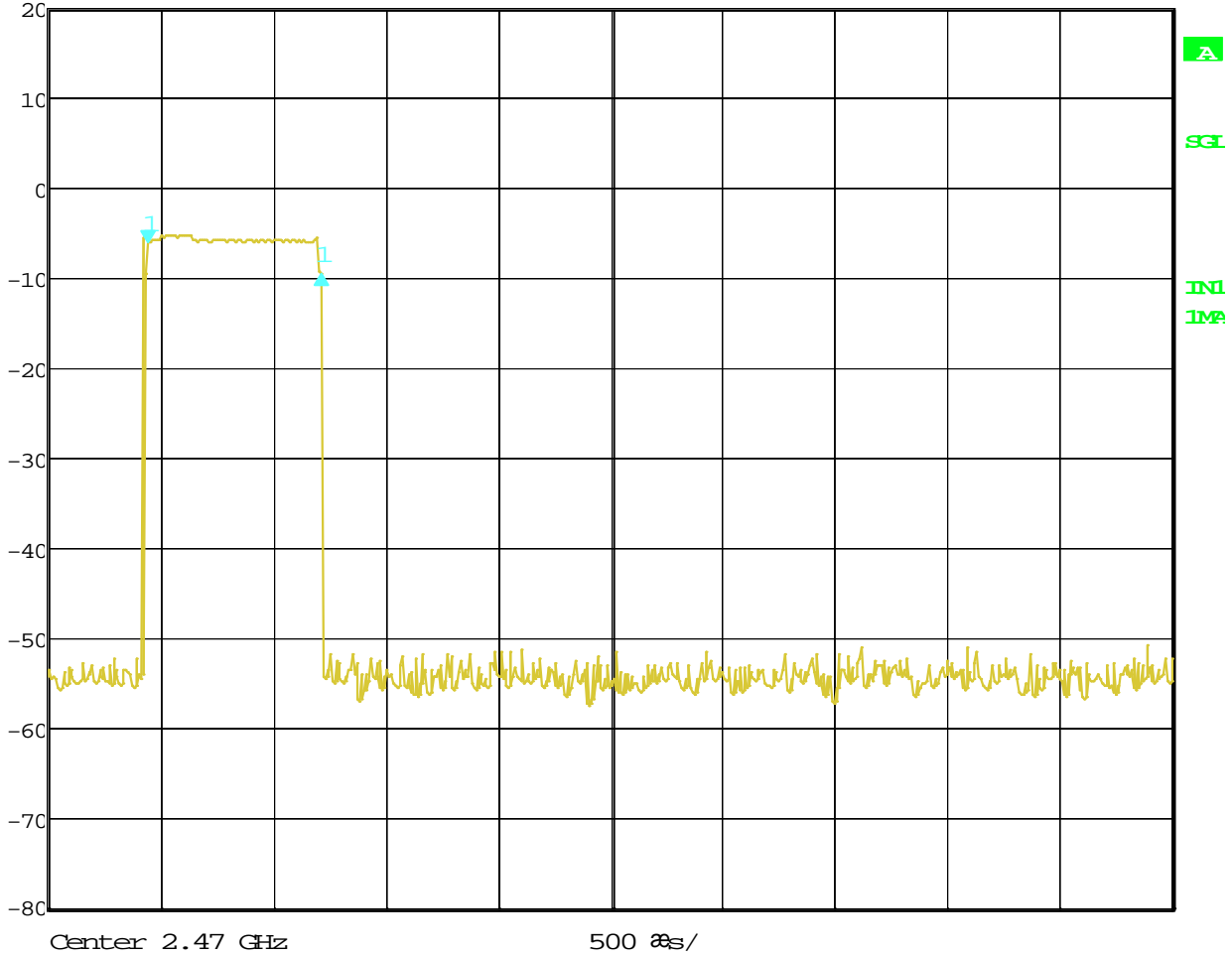


Date:      20.AUG.2013    14:55:49

**Dwell time mid channel**



Delta 1 [T1]      RBW    1 MHz    RF Att    30 dB  
Ref Lvl                    -3.61 dB    VBW    3 MHz  
20 dBm                    771.543086  $\mu$ s    SWT    5 ms    Unit    dBm



Date: 20.AUG.2013 15:04:39

Dwell time high channel

<b>4.6</b>	<b>20dB Bandwidth</b>		
<b>Method:</b>	The measurements were made with transmitter set to transmit continuously un-modulated signal at low, mid and high channels.		
	Laboratory Ambient Temperature	23°C	
	Relative Humidity	35%	
<b>Reference Standard:</b>	<input type="checkbox"/> ANSI C63.4:2003 <input type="checkbox"/> ANSI C63.4:2009 <input checked="" type="checkbox"/> DA 00-705 <input type="checkbox"/> FCC Part 15.109/ICES 003 <input checked="" type="checkbox"/> FCC Part 15.247/RSS 210 <input type="checkbox"/> FCC Part 15.209	<b>Measurement Point</b>	
		<input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated <input type="checkbox"/> <span style="background-color: #cccccc; display: inline-block; width: 20px; height: 10px;"></span>	
<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 2401-2480MHz		
<b>Antenna Gain:</b>	<input checked="" type="checkbox"/> 2dBi		RBW ≥ 1% of the 20 dB bandwidth VBW ≥ RBW
<b>Nominal Voltage:</b>	<input type="checkbox"/> 230VAC <input checked="" type="checkbox"/> 3.8VDC		
<b>Tested By:</b>	Yuriy Litvinov		<b>Date:</b> 08/20/2013

<b>Note:</b>	
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Channels Frequency (MHz)	20 dB Bandwidth (KHz)	Results
2401	681.4	<b>pass</b>
2440	671.6	<b>pass</b>
2480	671.3	<b>pass</b>



UNCAL

Delta 1 [T1]

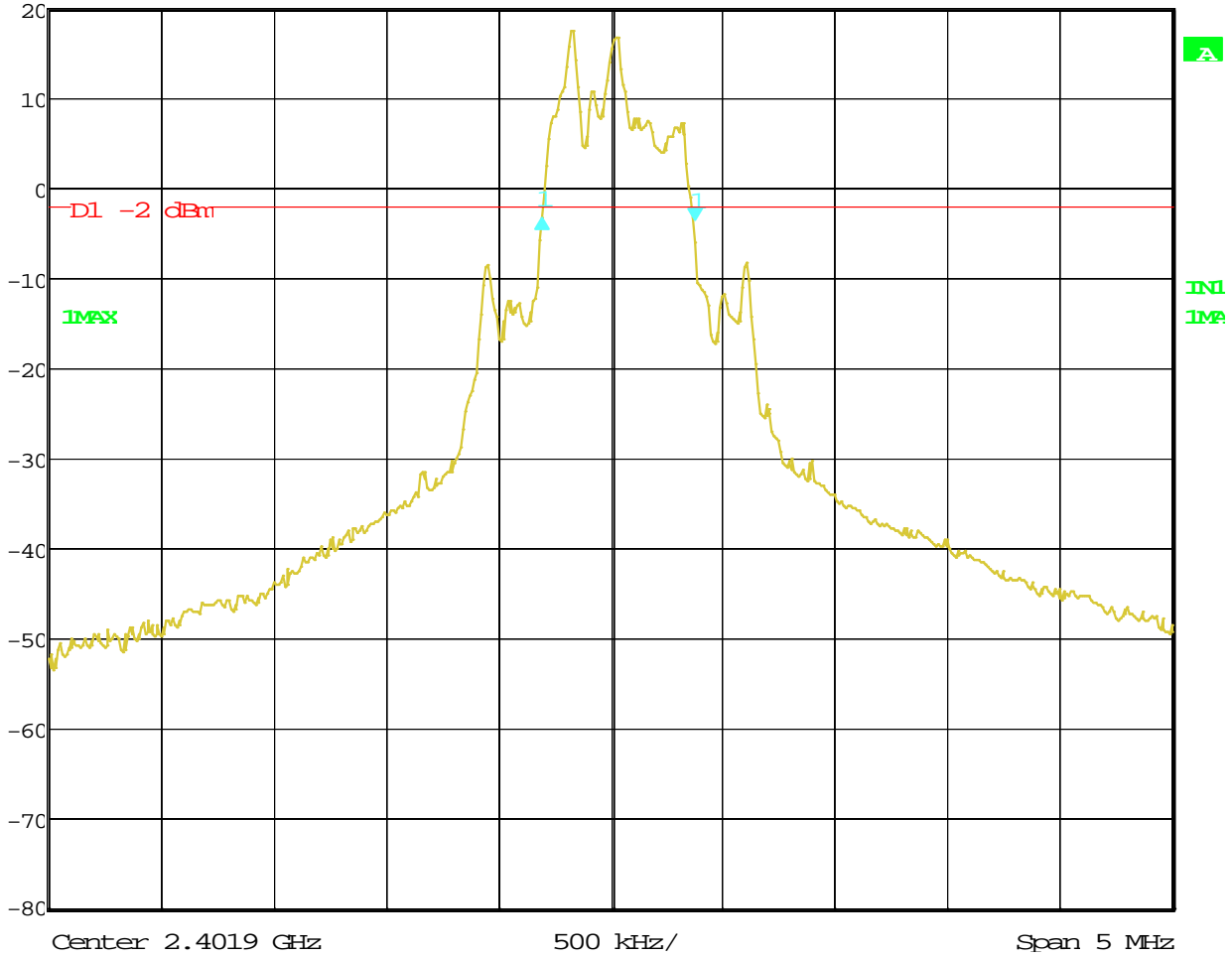
RBW 30 kHz RF Att 30 dB

Ref Lvl 0.35 dB

VBW 30 kHz

20 dBm -681.36272545 kHz

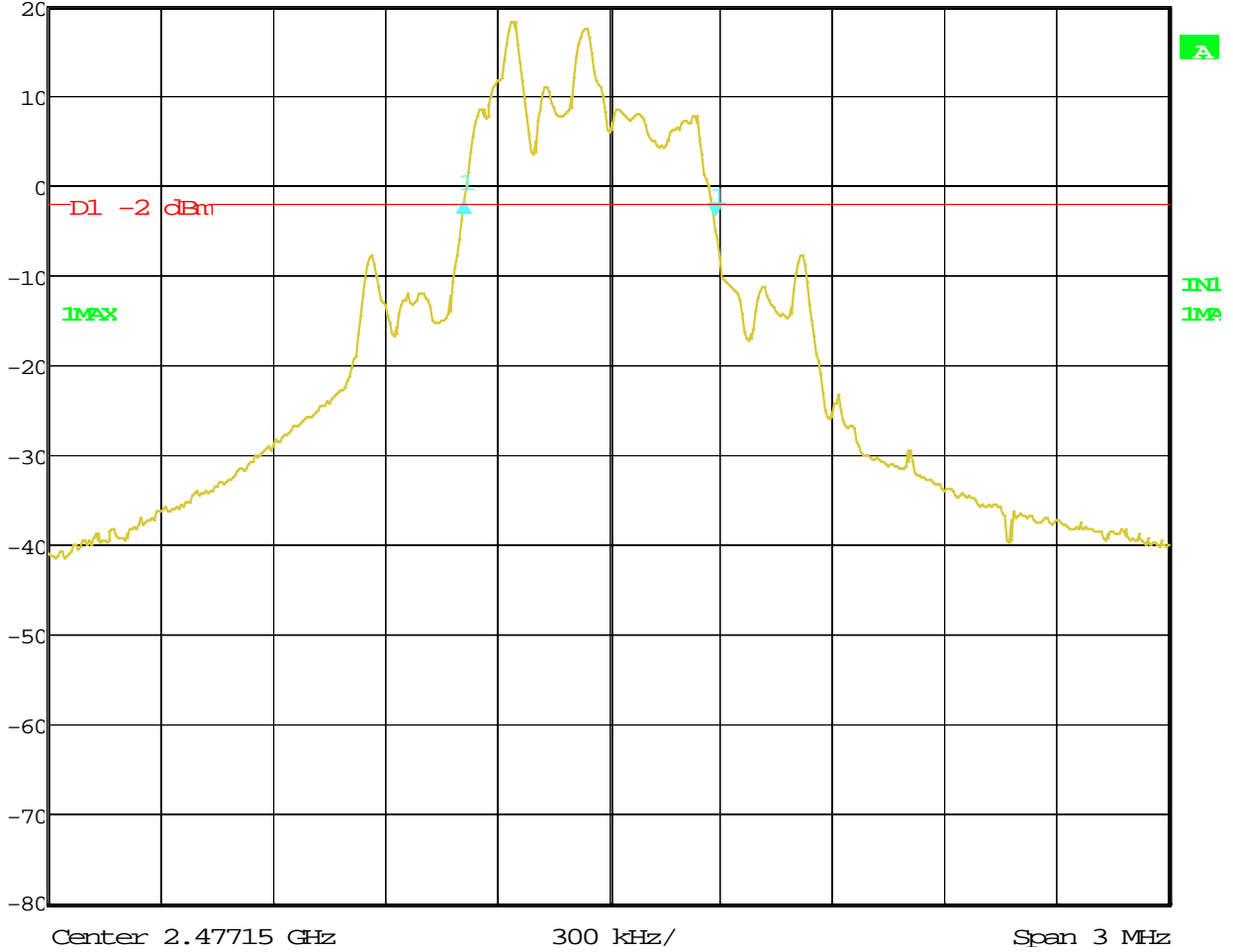
SWT 10 ms Unit dBm



Date: 20.AUG.2013 13:19:22



Delta 1 [T1] RBW 30 kHz RF Att 30 dB  
Ref Lvl 1.32 dB VBW 30 kHz  
20 dBm -671.64328657 kHz SWI 10 ms Unit dBm



Date: 20.AUG.2013 13:29:09





UNCAL

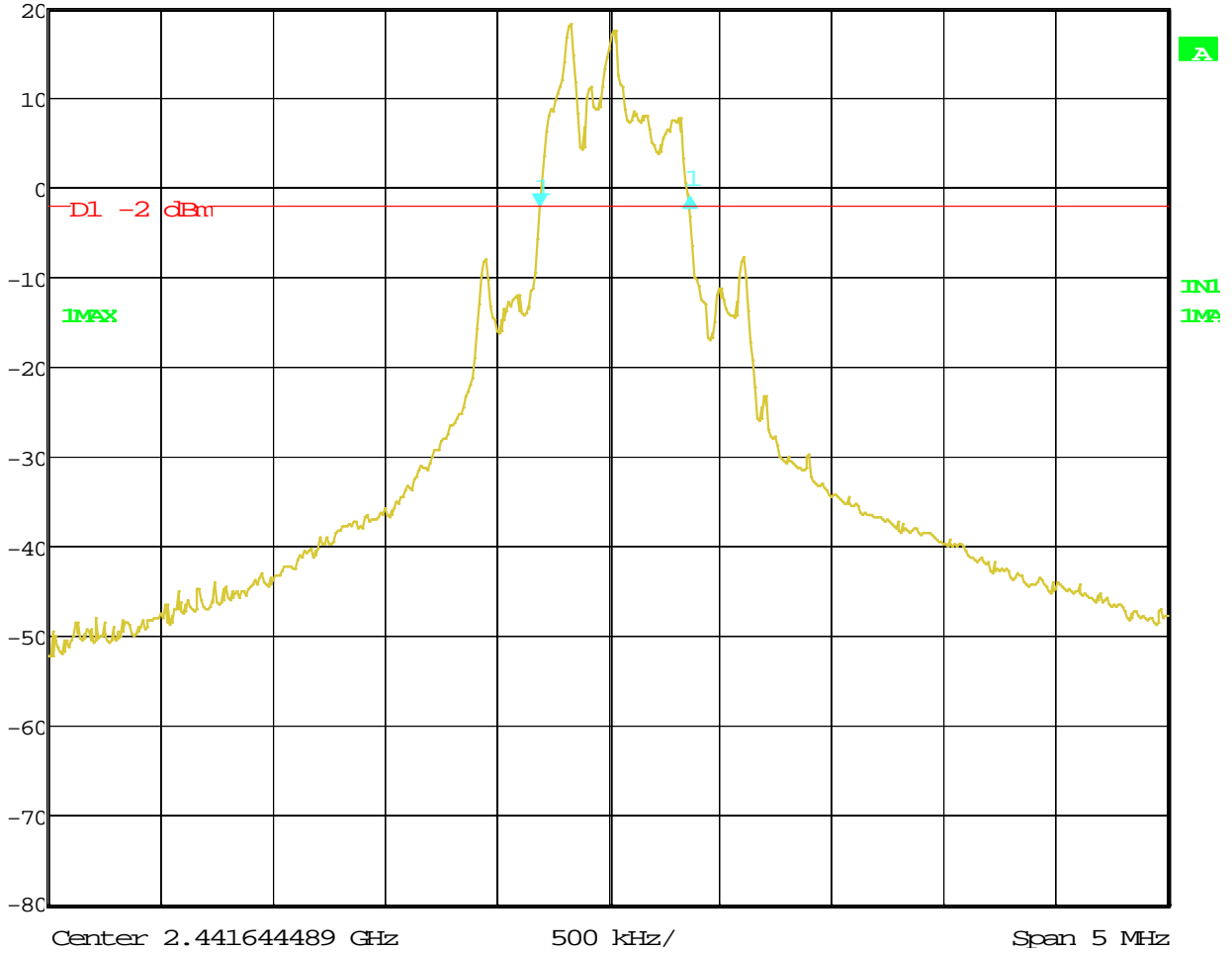
Delta 1 [T1]

RBW 30 kHz RF Att 30 dB

Ref Lvl 1.16 dB

VBW 30 kHz

20 dBm 671.34268537 kHz SWI 10 ms Unit dBm



Date: 20.AUG.2013 13:25:10



<b>4.7</b>	<b>Band-Edge Compliance</b>		
<b>Method:</b>	The measurements were made with transmitter set to transmit continuously with un-modulated signal and hopping enabled at low and high channels.		
	Laboratory Ambient Temperature	23°C	
	Relative Humidity	35%	
<b>Reference Standard:</b>	<input type="checkbox"/> ANSI C63.4:2003 <input type="checkbox"/> ANSI C63.4:2009 <input checked="" type="checkbox"/> DA 00-705 <input type="checkbox"/> FCC Part 15.109/ICES 003 <input checked="" type="checkbox"/> FCC Part 15.247/RSS 210 <input type="checkbox"/> FCC Part 15.209	<b>Measurement Point</b> <input type="checkbox"/> Conducted <input type="checkbox"/> Radiated <input type="checkbox"/>	
<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 2401-2480MHz		
<b>Antenna Gain:</b>	<input checked="" type="checkbox"/> 2dBi	<b>Results</b>	
<b>Limit</b>	<input checked="" type="checkbox"/> >20dBc <input type="checkbox"/> FCC Part 15.209	>55dBc	
<b>Nominal Voltage:</b>	<input type="checkbox"/> 230VAC <input checked="" type="checkbox"/> 3.8VDC		
<b>Tested By:</b>	Yuriy Litvinov	<b>Date:</b> 08/20/2013	

<b>Note:</b>	
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Delta 1 [T1]

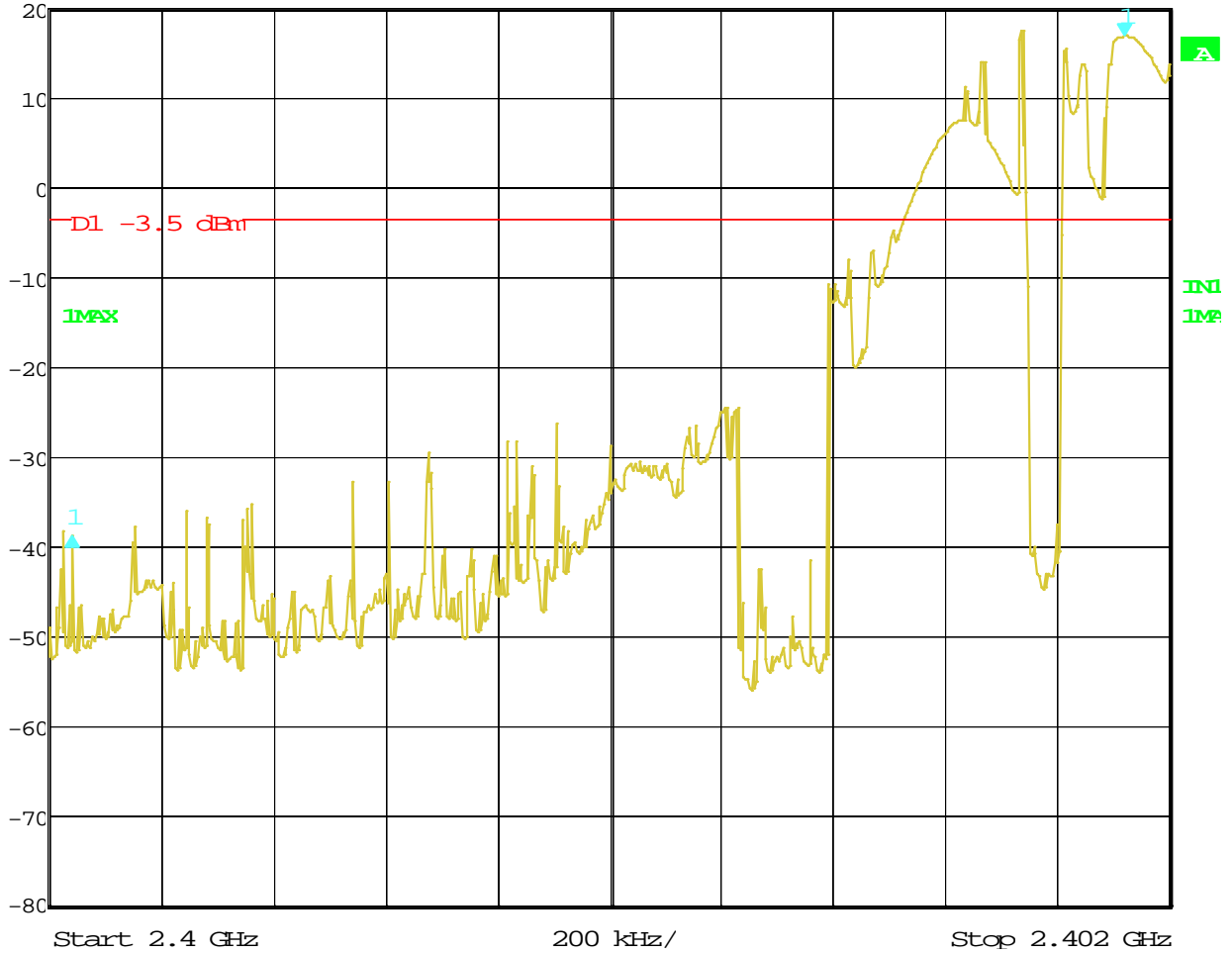
RBW 100 kHz RF Att 30 dB

Ref Lvl -55.69 dB

VBW 100 kHz

20 dBm -1.87975952 MHz

SWT 5 ms Unit dBm



Date: 20.AUG.2013 15:43:10



Delta 1 [T1]

RBW 100 kHz RF Att 30 dB

Ref Lvl

-66.23 dB

VBW 100 kHz

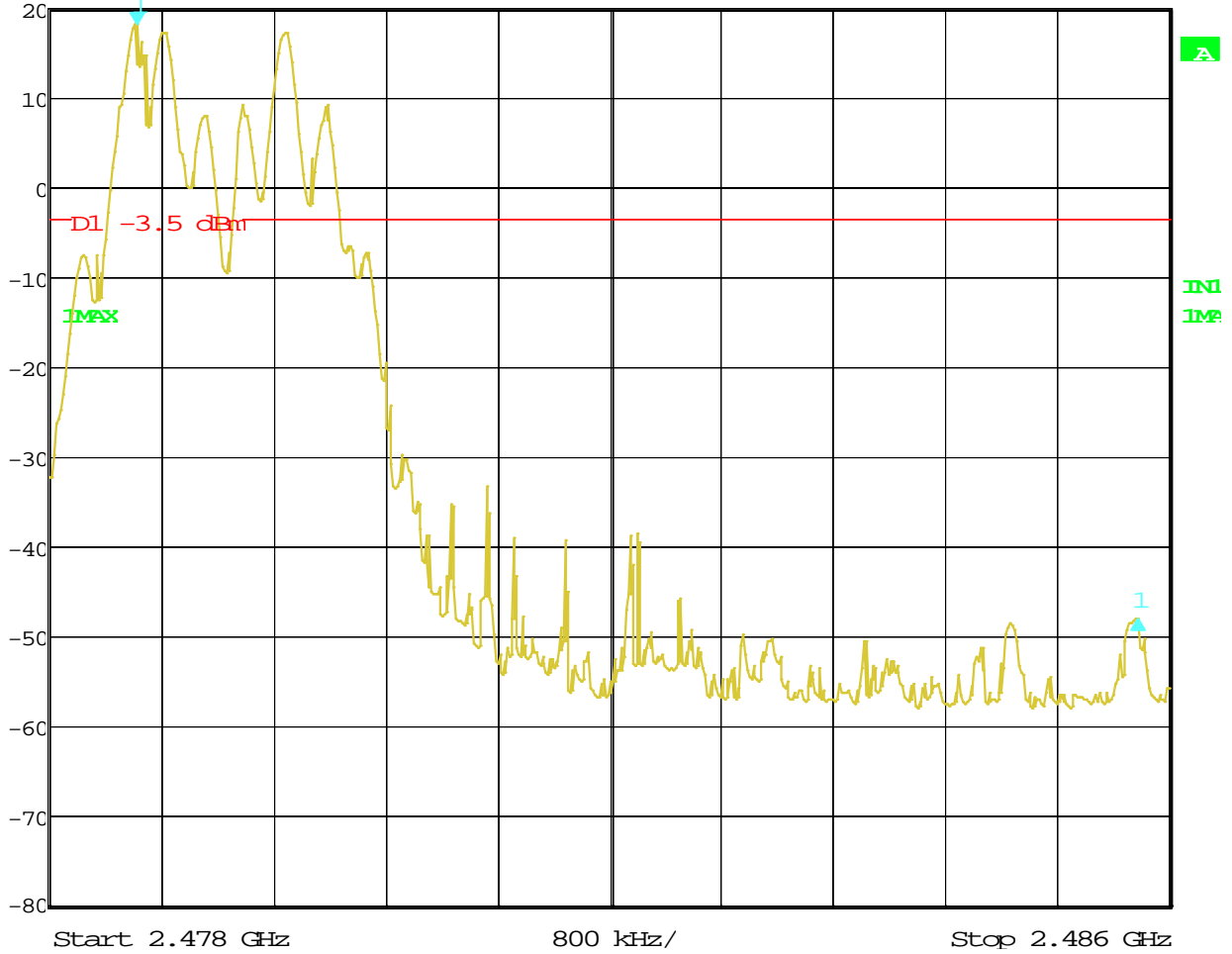
20 dBm

7.15030060 MHz

SWT 5 ms

Unit

dBm



Date: 20.AUG.2013 15:46:13



4.8		Conducted Output Power	
<b>Method:</b>	Measurements was performed with an un-modulated carrier at the highest power level at which the transmitter is intended to operate. The transmitter was configured to operate lowest, middle and highest power channels and connected to an antenna port. The carrier or mean power delivered to antenna was measured under normal test conditions. The conducted power was adjusted to take into account the gain of the antenna and stated as EIRP.		
	Laboratory Ambient Temperature	23°C	
	Relative Humidity	55%	
<b>Reference Standard:</b>	<input type="checkbox"/> ANSI C63.4:2003 <input type="checkbox"/> ANSI C63.4:2009 <input checked="" type="checkbox"/> ANSI C63.10:2009 <input type="checkbox"/> FCC Part 15.109/ICES 003 <input checked="" type="checkbox"/> FCC Part 15.247/RSS 210 <input type="checkbox"/> FCC Part 15.209	<b>Measurement Point</b> <input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated <input type="checkbox"/>	
<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 2401-2480MHz		
<b>Antenna Gain:</b>	<input checked="" type="checkbox"/> 2dBi		
<b>Limit</b>	>75 Hopping Channels		<75 Hopping Channels
	<input checked="" type="checkbox"/> 30dBm <input type="checkbox"/>	<input type="checkbox"/> -9dBm <input type="checkbox"/>	
<b>Nominal Voltage:</b>	<input type="checkbox"/> 230VAC <input checked="" type="checkbox"/> 3.8VDC		
<b>Tested By:</b>	Yuriy Litvinov	<b>Date:</b> 08/20/2013	

Channels Frequency (MHz)	Peak Power (dBm)	Correction Factor (dB)	Total Power (dBm)	Results
2402	17.5	0.5	18.0	pass
2440	18.11	0.5	18.61	pass
2477	18.14	0.5	18.64	pass

<b>Note:</b>	EIRP= PdBm + CFdBm + AdBi = 18.14+0.5+2=20.64dBm(116mW)
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Marker 1 [T1]

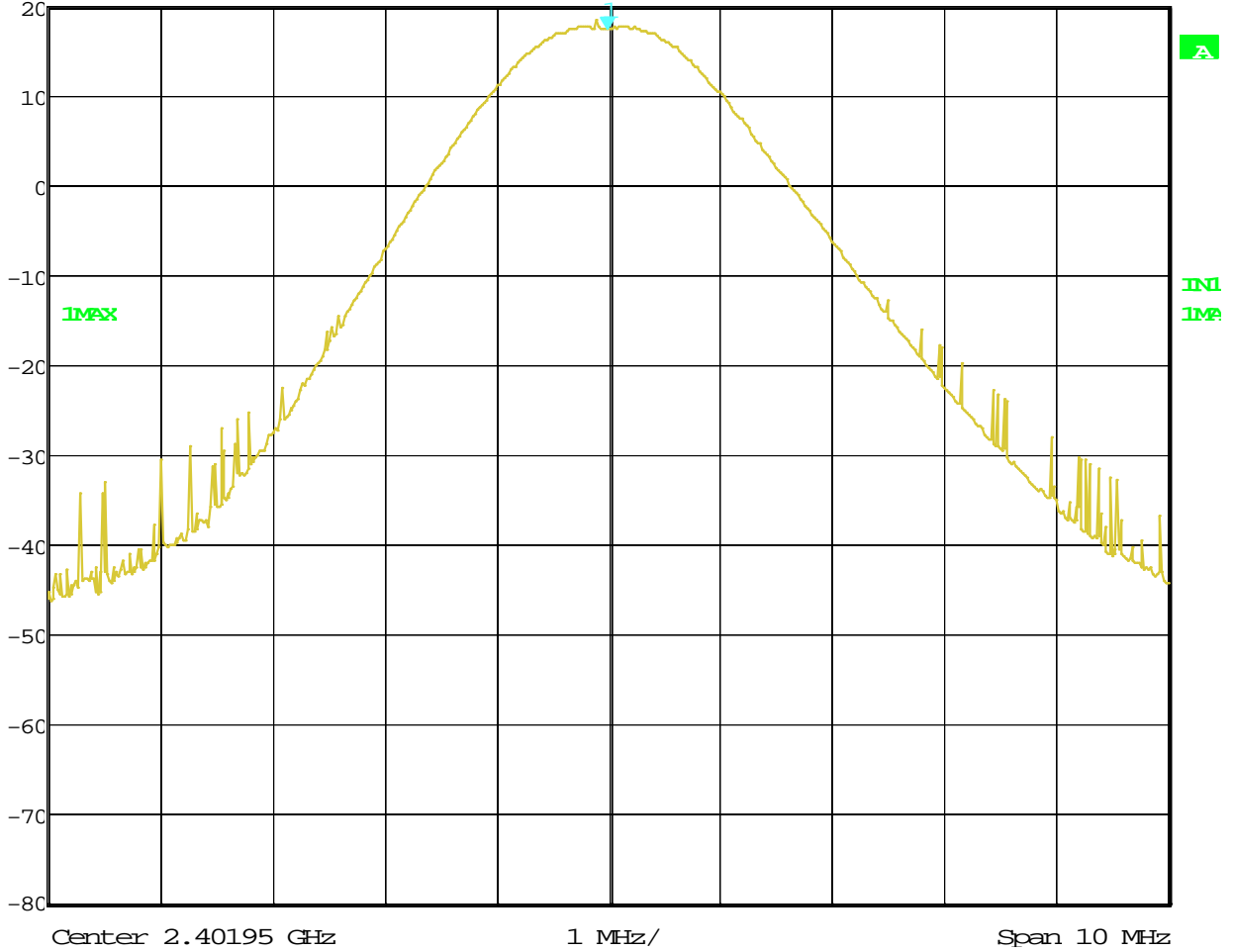
RBW 1 MHz RF Att 30 dB

Ref Lvl 17.49 dBm

VBW 3 MHz

20 dBm 2.40193958 GHz

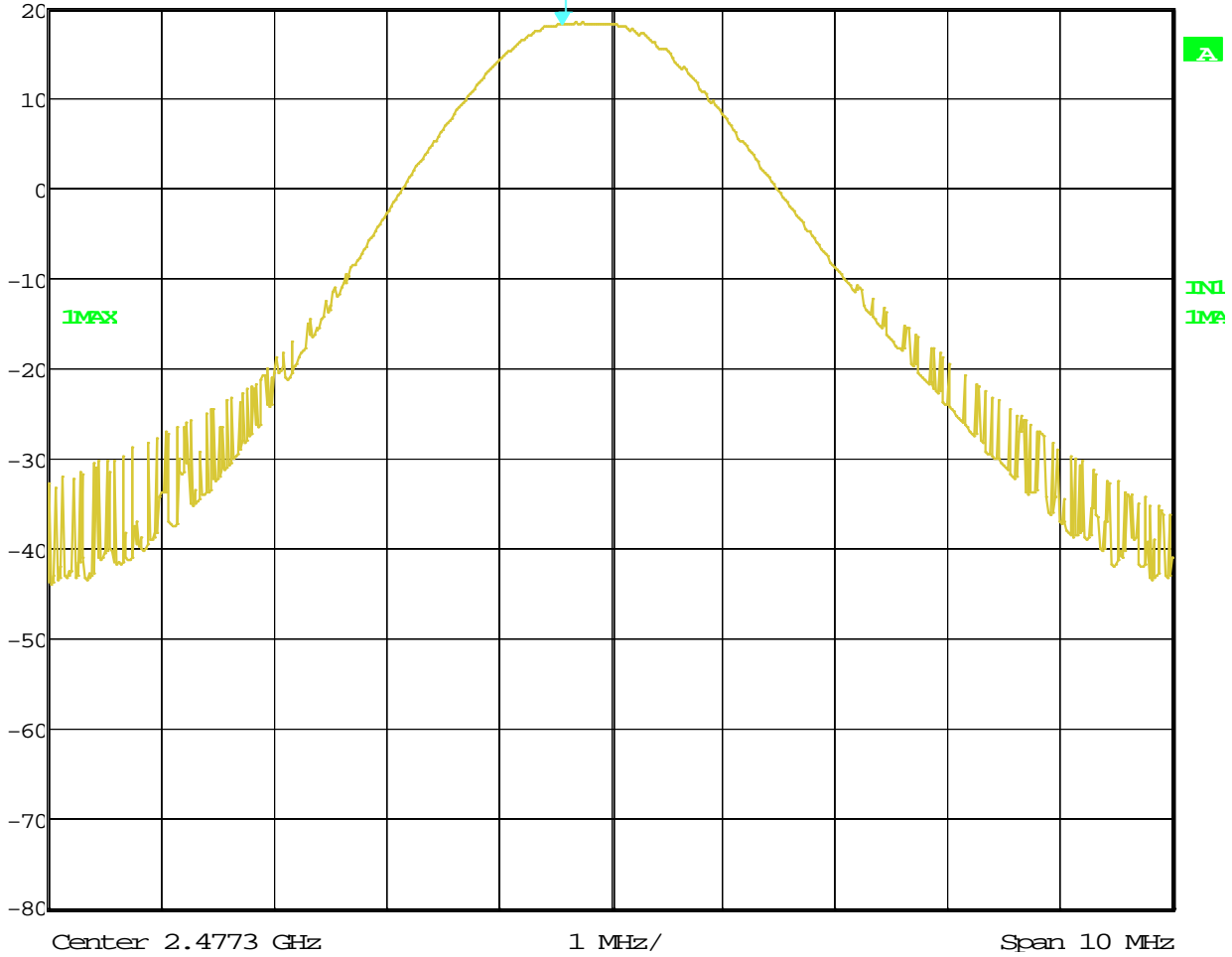
SWT 5 ms Unit dBm



Date: 20.AUG.2013 15:11:08



Marker 1 [T1] RBW 1 MHz RF Att 30 dB  
18.11 dBm VBW 3 MHz  
20 dBm Ref Lvl 2.47686914 GHz SWI 5 ms Unit dBm



Date: 20.AUG.2013 15:14:48



Marker 1 [T1]

RBW 1 MHz RF Att 30 dB

Ref Lvl

18.14 dBm

VBW 3 MHz

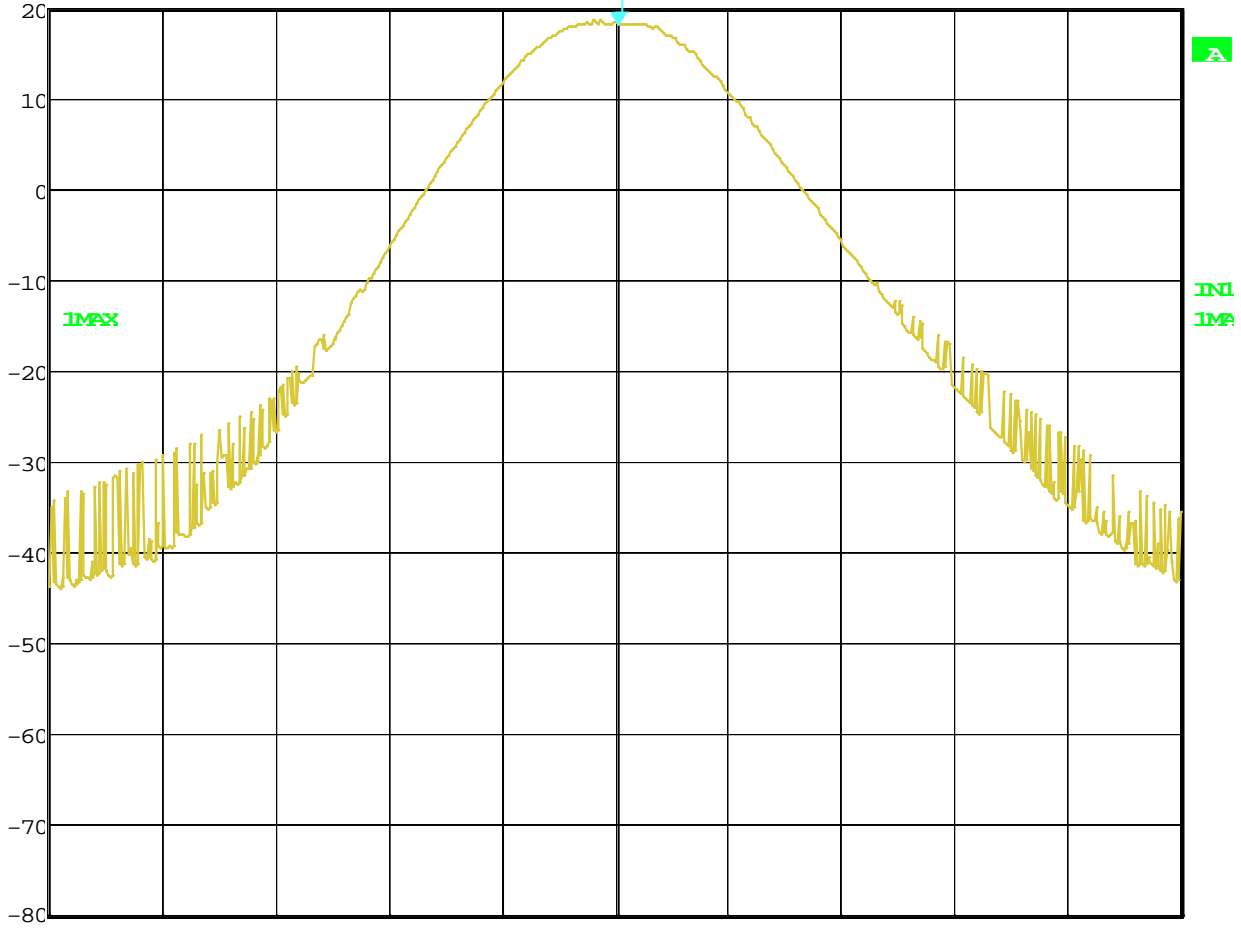
20 dBm

2.44173006 GHz

SWT 5 ms

Unit

dBm



Center 2.4417 GHz

1 MHz/

Span 10 MHz

Date: 20.AUG.2013 15:12:53





4.9		Transmitter spurious emissions		
<b>Method:</b>	The measurements were made with transmitter set to transmit continuously with un-modulated signal and hopping enabled at low and high channels. The level of spurious emissions was measured as conducted spurious emission and radiated power that falls in a restricted band.			
	EUT was rotated through three orthogonal axes to determine which attitude (orientation) and arrangement produces the highest emission relative to the limit; the attitude and headset arrangement that produces the highest emission relative to the limit was used in making final radiated emission measurements.			
		Laboratory Ambient Temperature		23°C
		Relative Humidity		35%
<b>Reference Standard:</b>	<input type="checkbox"/> ANSI C63.4:2003 <input checked="" type="checkbox"/> ANSI C63.4:2009 <input checked="" type="checkbox"/> DA 00-705 <input type="checkbox"/> FCC Part 15.109/ICES 003 <input checked="" type="checkbox"/> FCC Part 15.247/RSS 210 <input checked="" type="checkbox"/> FCC Part 15.209		<b>Measurement Point</b>	
			<input checked="" type="checkbox"/> Conducted <input checked="" type="checkbox"/> Radiated	
<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 2401-2480MHz			
<b>Limit</b>	<input checked="" type="checkbox"/> >20dBc		<b>Restricted Band</b>	
	<input type="checkbox"/> FCC Part 15.209		<input checked="" type="checkbox"/> 15.205	
<b>Nominal Voltage:</b>	<input type="checkbox"/> 230VAC <input checked="" type="checkbox"/> 3.8VDC			
<b>Tested By:</b>	Mike Schultz		<b>Date:</b> 08/20/2013	
<b>Limits</b>				
Frequency (MHz)	Limit dB (µV/m)			
	Quasi-Peak	Average	Distance	Results
0.009-0.490		2400/F(KHz)	300	<b>N/A</b>
0.490-1.705	24000/F(KHz)		30	<b>N/A</b>
1.705-30	29.5		30	<b>N/A</b>
30 to 88	40		3	<b>pass</b>
88-216	43.5		3	<b>pass</b>
216-960	46		3	<b>pass</b>
Above 960		54	3	<b>pass</b>

<b>Note:</b>	No spurious emissions conducted or radiated were detected in the frequency range above 12GHz.
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Pol.	Frequency (MHz)	Peak dB $\mu$ V/m	AVG dB $\mu$ V/m	Total CF dB	Net at 3 m dB $\mu$ V/m.	PK Limit dB $\mu$ V/m	AVG Limit dB $\mu$ V/m	AVG Margin dB
H	4804.00	64.30	31.8	-0.2	31.6	74.0	54	-22.3
V	4804.00	68.80	31.4	0.0	31.4	74.0	54	-22.6
H	7206.00	51.09	28.5	4.3	32.8	74.0	54	-25.5
V	7206.00	49.50	28.2	4.4	32.6	74.0	54	-25.8
H	1201.25	48.60	26.3	11.0	37.3	74.0	54	-27.7
V	1201.25	50.37	25.8	11.1	36.9	74.0	54	-28.2
<b>Notes</b>		Total CF = Antenna Factor + Cable Factor - AMP Gain						
		Low Channel. Average readings obtained with the 10Hz VBW						

Pol.	Frequency (MHz)	Peak dB $\mu$ V/m	AVG dB $\mu$ V/m	Total CF dB	Net at 3 m dB $\mu$ V/m.	PK Limit dB $\mu$ V/m	AVG Limit dB $\mu$ V/m	AVG Margin dB
H	4883.26	66.09	30.9	-0.1	30.8	74.0	54	-23.1
V	4883.26	70.21	31.4	0.1	31.5	74.0	54	-22.6
H	7324.47	42.97	27.3	11.0	38.3	74.0	54	-26.7
V	7324.47	43.10	26.7	11.0	37.7	74.0	54	-27.3
H	12208.15	41.80	25.3	11.0	36.3	74.0	54	-28.7
V	12208.15	40.16	25.04	11.0	36.0	74.0	54	-29.0
<b>Notes</b>		Total CF = Antenna Factor + Cable Factor - AMP Gain						
		Mid Channel. Average readings obtained with the 10Hz VBW						

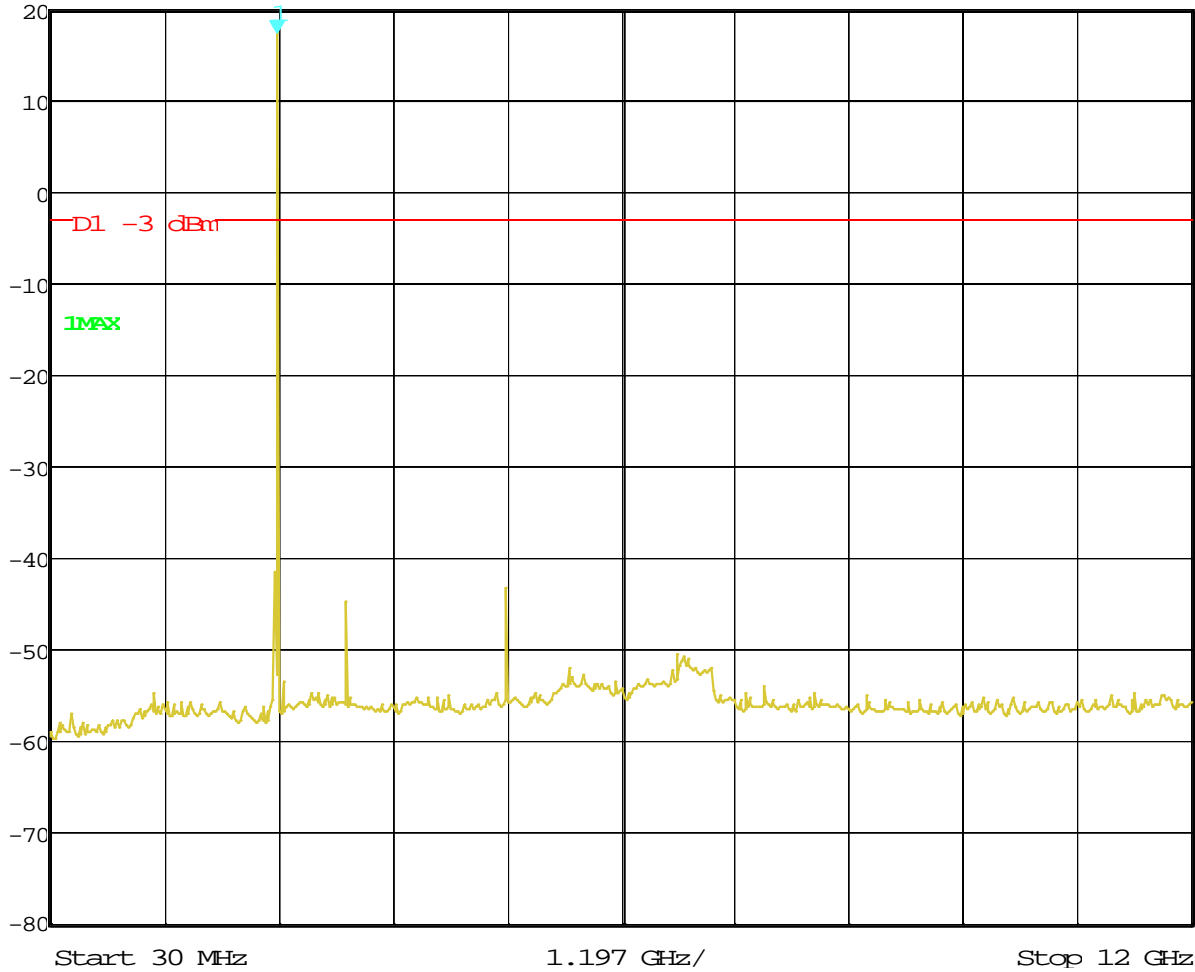
Pol.	Frequency (MHz)	Peak dB $\mu$ V/m	AVG dB $\mu$ V/m	Total CF dB	Net at 3 m dB $\mu$ V/m.	PK Limit dB $\mu$ V/m	AVG Limit dB $\mu$ V/m	AVG Margin dB
H	4954.22	67.68	30.8	1.0	31.8	74.0	54	-23.2
V	4954.22	72.70	31.3	0.2	31.5	74.0	54	-22.7
H	7431.33	55.70	28.7	11.0	39.7	74.0	54	-25.4
V	7431.33	58.13	29.2	11.0	40.2	74.0	54	-24.8
H	12385.55	45.60	25.2	11.0	36.2	74.0	54	-28.8
V	12385.55	44.92	25.3	11.0	36.3	74.0	54	-28.7
<b>Notes</b>		Total CF = Antenna Factor + Cable Factor - AMP Gain						
		High Channel. Average readings obtained with the 10Hz VBW						



Ref Lvl  
20 dBm

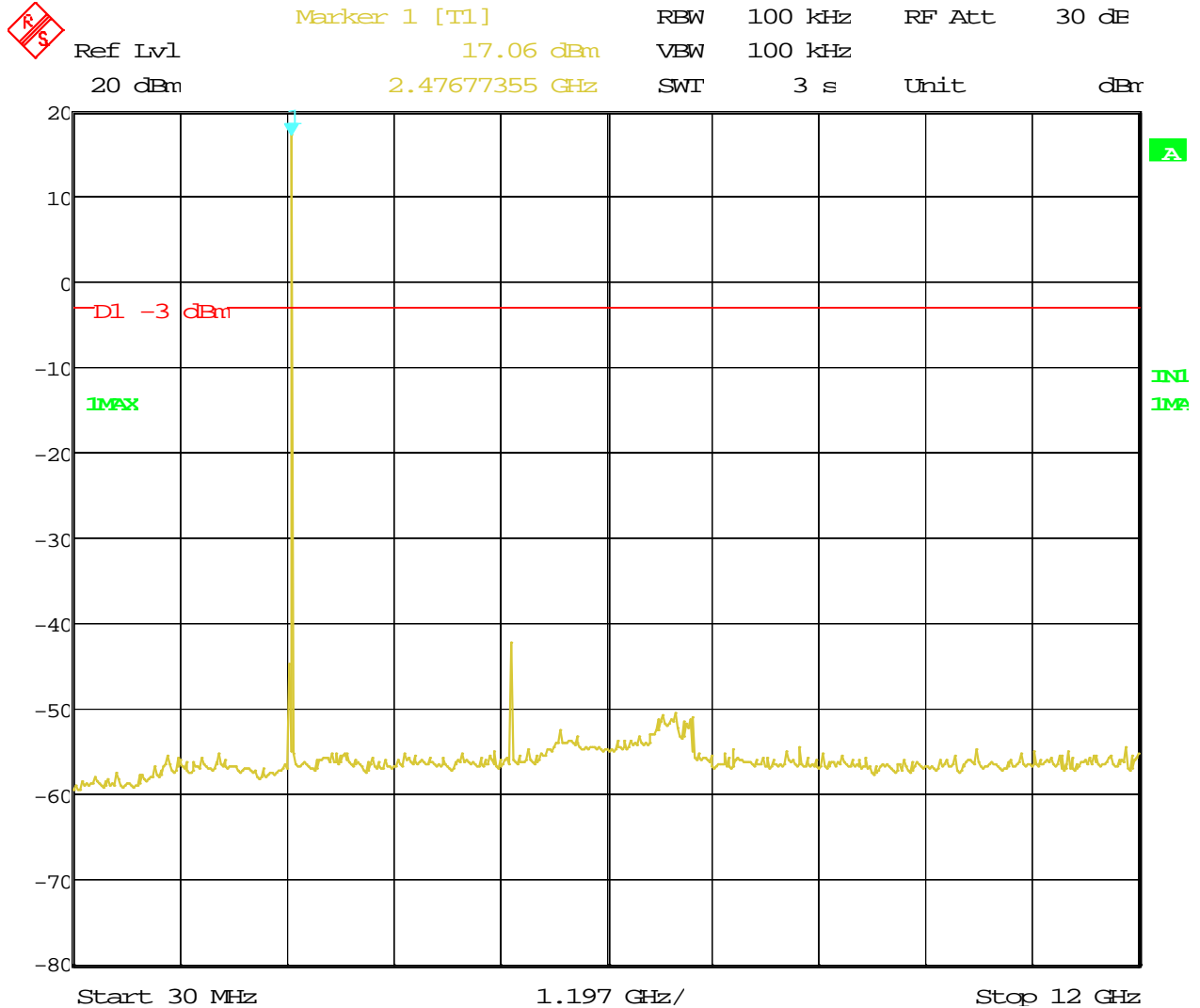
Marker 1 [T1]  
17.44 dBm  
2.40480962 GHz

RBW 100 kHz RF Att 30 dB  
VBW 100 kHz  
SWT 3 s Unit dBm



Date: 20.AUG.2013 15:26:46

**Conducted Spurious Emissions low channel**



Date: 20.AUG.2013 15:29:34

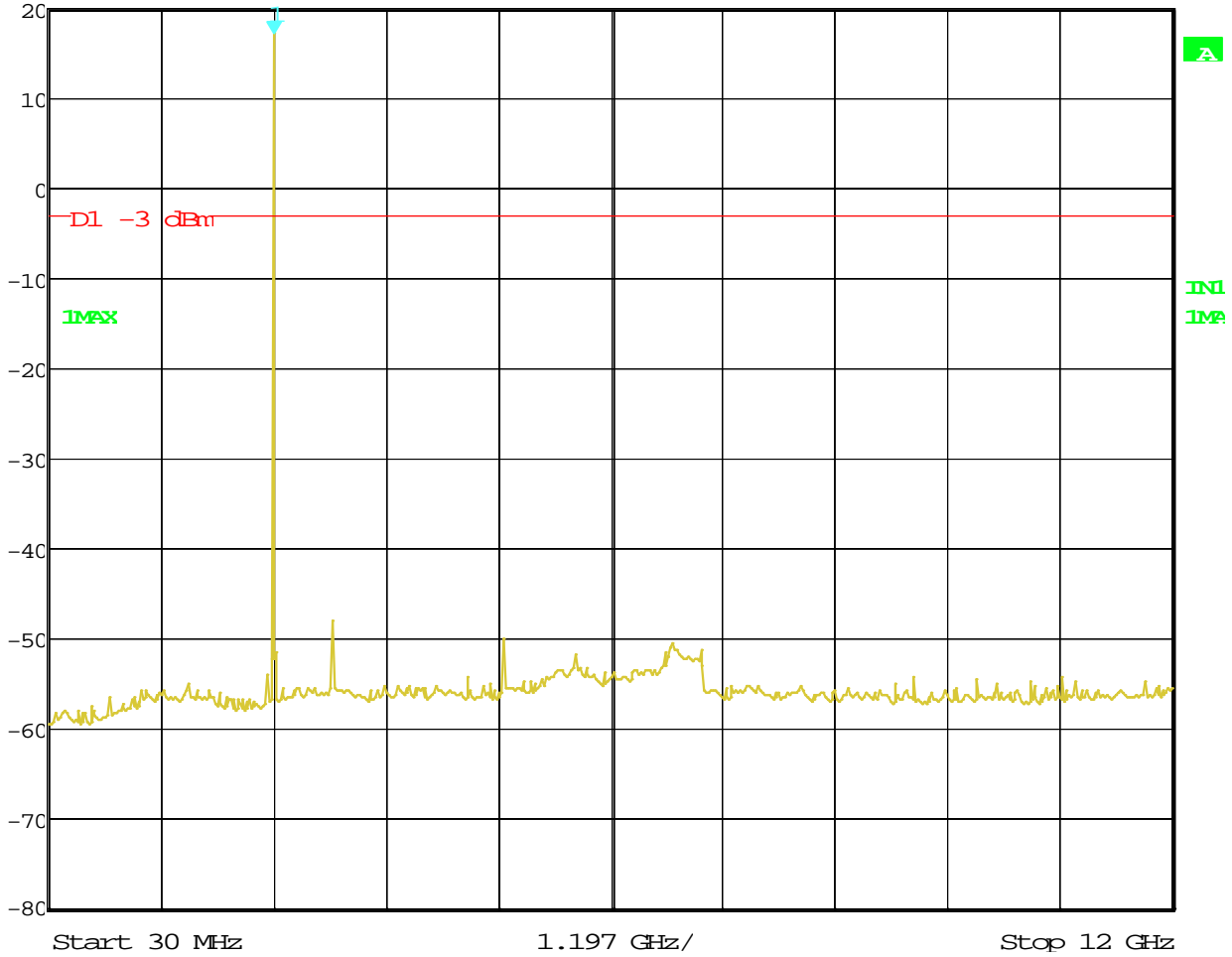
### Conducted Spurious Emissions High channel



Ref Lvl  
20 dBm

Marker 1 [T1]  
17.18 dBm  
2.42879760 GHz

RBW 100 kHz RF Att 30 dB  
VBW 100 kHz  
SWT 3 s Unit dBm



Date: 20.AUG.2013 15:28:31

### Conducted Spurious Emissions mid channel



**SEMS Regulatory  
Engineering**

**Report Number:**  
RE1306011-1  
**Date:** October 30, 2013

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**Test Set Up Photo**



4.10 RF Exposure Compliance	
Reference Standard:	<input checked="" type="checkbox"/> IEEE Std 1528a <input checked="" type="checkbox"/> RSS 102, Issue 4 <input checked="" type="checkbox"/> KDB 447498 <input type="checkbox"/> KDB [REDACTED] <input checked="" type="checkbox"/> FCC Parts 2.1091 and 2.1093 <input type="checkbox"/> OET 65
Frequency Range:	<input checked="" type="checkbox"/> 2401-2480MHz
Antenna Separation Distance	>25mm
Duty Cycle	7.63%
Time-Averaged Output power (EIRP)	8.85 mW
<b>SAR Test Exclusion Threshold for 100MHz – 6GHz @25mm</b>	
FCC	48mW
IC NOTICE 2013-DRS0911	52mW

Note:	There active transmission is 736µs within a 833us slot a 10ms period, the duty cycle will be around 7.36%. To be absolutely accurate the headset does transmit an extended preamble which add a further 16bits (total of 440bits at 576 Kbits/s every 10ms) thus taking the figure of duty cycle to 7.63%.
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5.0		Test Equipment			
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Due	Check
Biconilog Antenna	Schaffner	CBL6112B	27491	10/2013	<input checked="" type="checkbox"/>
Horn Antenna	AH Systems	SAS 571		10/2013	<input checked="" type="checkbox"/>
Loop Antenna	EMCO	ALR25M		10/2013	<input type="checkbox"/>
Pre-Amplifier	HP	8447D	2944A08064	10/2013	<input type="checkbox"/>
Pre-Amplifier	HP	83017A	1581	10/2013	<input type="checkbox"/>
EMI Receiver	Rohde & Schwarz	ESIB 40	100235	10/2013	<input checked="" type="checkbox"/>
EMI Receiver	Agilent	E4448A	1530975	10/2013	<input type="checkbox"/>
LISN	EMCO	3825-2	1039	10/2013	<input type="checkbox"/>
LISN	TESEQ	NNB51	1130	05/2014	<input type="checkbox"/>
Harmonic/Flicker Source	Cal. Instruments	C4-5001iX	57162	10/2013	<input type="checkbox"/>
Amplifier	AR	250W1000AM	14354	10/2013	<input type="checkbox"/>
Amplifier	AR	25S1G4A	4003	10/2013	<input type="checkbox"/>
Signal Generator	HP	8656A	2326A05125	10/2013	<input type="checkbox"/>
Signal Generator	Agilent	E8257D	160895	10/2013	<input type="checkbox"/>
Field Probe	AR	FL7006	25019	10/2013	<input type="checkbox"/>
Field Monitor	AR	FM2000	14292	10/2013	<input type="checkbox"/>
AC CDN	Schaffner	M316,	21937	10/2013	<input type="checkbox"/>
Current Injection Coil	A.H. Systems	ICP-200/521	149	10/2013	<input type="checkbox"/>
RF Conducted System	TESEQ	NSG 4070-75	1141	10/2013	<input type="checkbox"/>
ESD Generator	KeyTek	MZ-15/EC	609325	10/2013	<input type="checkbox"/>
EFT/Surge Generator	ThermoFisher	EMC Pro Plus	1146	10/2013	<input type="checkbox"/>
EMF Meter	NARDA	ELT400	1139	10/2013	<input type="checkbox"/>
Absorbing Clamp	Rhode & Schwarz	MDS-21	1001	10/2013	<input type="checkbox"/>
EMC Software	ETS-Lindgren	TILE 6		05/2014	<input checked="" type="checkbox"/>

6.0		Report revision history		
Revision Level	Date	Report Number	Notes	
0	10/30/2013	RE1306011-1	Original Issue	





# Certificate of Conformity

## *3M EMC Laboratory*

SEMS Global Regulatory Engineering  
Building 76-01-01  
St. Paul, MN 55144-1000, USA

MANUFACTURER'S NAME	3M COMPANY
NAME OF EQUIPMENT	3M™ Drive Thru Headset G5
MODEL NUMBER(S)	G5H1
TEST REPORT NUMBER	RE1306011-1
DATE OF ISSUE	October 30, 2013

Referring to the performance criteria and operating mode during the tests specified in this report the equipment complies with the essential requirements herein specified:

47 CFR Part 15 – Subpart C – Intentional Radiator

FCC Part 15.247

License-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

RSS 210, Issue 8, 2010

Comments:



NVLAP Lab Code 200033-0

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Yuriy Litvinov  
Lead EMC Engineer