



## TEST REPORT

Report Number: 100928878MIN-011A  
Project Number: G100928878

Testing performed on the  
WOLC Node

FCC ID: PUU90001  
Industry Canada ID: 10798A- PUU90001

to  
47 CFR Part 15. 247:2010  
RSS- 210, Issue 8, 2010

For  
GE Lighting

Test Performed by:  
Intertek Testing Services NA, Inc.  
7250 Hudson Blvd., Suite 100  
Oakdale, MN 55128 USA

Test Authorized by:  
GE Lighting  
1975 Noble Rd, Bldg 338  
Cleveland, OH 44112 USA

Prepared by: Uri Spector  
Uri Spector

Date: August 16, 2013

Reviewed by: Simon Khazon  
Simon Khazon

Date: August 16, 2013

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## 1.0 GENERAL DESCRIPTION

<b>Model:</b>	WOLC Node
<b>Type of EUT:</b>	Light Controller
<b>Intertek Sample ID:</b>	MIN1212041500-002
<b>FCC ID:</b>	PUU90001
<b>Industry Canada ID:</b>	10798A- PUU90001
<b>Related Submittal(s) Grants:</b>	None
<b>Company:</b>	GE Lighting
<b>Customer:</b>	Mr. Mark Wilbur
<b>Address:</b>	GE Lighting 1975 Noble Rd, Bldg 338 Cleveland, OH 44112
<b>Phone:</b>	(216) 266-3769
<b>Fax:</b>	(216) 606-6599
<b>e-mail:</b>	<a href="mailto:mark.wilbur2@ge.com">mark.wilbur2@ge.com</a>
<b>Test Standards:</b>	<input checked="" type="checkbox"/> 47 CFR, Part 15:2010, §15.247 <input checked="" type="checkbox"/> RSS-210, Issue 8, 2010 <input checked="" type="checkbox"/> RSS-Gen, Issue 3, 2010 <input checked="" type="checkbox"/> 47 CFR, Part 15:2010, §15.107 and §15.109, Class A <input checked="" type="checkbox"/> ICES-003, Issue 5:2012 <input type="checkbox"/> Other <span style="background-color: #cccccc; display: inline-block; width: 50px; height: 1em; vertical-align: middle;"></span>
<b>Type of radio:</b>	<input type="checkbox"/> Stand -alone <input type="checkbox"/> Module <input type="checkbox"/> Hybrid
<b>Date Sample Submitted:</b>	December 10, 2012
<b>Test Work Started:</b>	December 10, 2012
<b>Test Work Completed:</b>	July 15, 2013
<b>Test Sample Conditions:</b>	<input type="checkbox"/> Damaged <input type="checkbox"/> Poor (Usable) <input checked="" type="checkbox"/> Good



1.1 Product Description; Test Facility

<b>Product Description:</b>	Light Controller
<b>Transmitter Type:</b>	<input checked="" type="checkbox"/> FHSS <input type="checkbox"/> Digital Modulation <input type="checkbox"/> WiFi <input type="checkbox"/> Blue Tooth
<b>Operating Frequency Range(s):</b>	From 902 to 928MHz
<b>Number of Channels:</b>	50
<b>Modulation:</b>	GFSK
<b>Emission Designator:</b>	492K5F1D
<b>Antenna(s) Info:</b>	Type: Pigtail Gain: 2 dBi Connector Type: Soldered to the board
<b>Antenna Installation:</b>	<input type="checkbox"/> User <input type="checkbox"/> Professional <input checked="" type="checkbox"/> Factory
<b>Transmitter power configuration:</b>	<input type="checkbox"/> Internal battery <input checked="" type="checkbox"/> External power source <input checked="" type="checkbox"/> 120VAC <input type="checkbox"/> 230VAC <input type="checkbox"/> 400VAC <input type="checkbox"/> [ ] VDC <input type="checkbox"/> Other: [ ] [ ] Amp. <input type="checkbox"/> 50Hz <input checked="" type="checkbox"/> 60Hz
<b>Special Test Arrangement:</b>	None
<b>Test Facility Accreditation:</b>	A2LA (Certificate No. 1427.01)
<b>Test Methodology:</b>	Measurements performed according to the procedures in ANSI C63.10-2009 and FCC Public Notice DA 00-705



### 1.2 EUT Configuration

The equipment under test was operated during the measurement under the following conditions:

- Standby
- Continuous transmissions with hopping function enabled
- Continuous transmissions with hopping function disabled (modulated signal)
- Continuous transmissions with hopping function disabled (un-modulated signal)
- Continuous receiving
- Test program (customer specific)
- [REDACTED]

#### Operating modes of the EUT:

No.	Description
1	Test was performed at low channel, middle channel, and upper channel
2	

#### Cables:

No.	Type	Length	Designation	Note
1	AC Power	6ft	Power Cord	

#### Support equipment/Services:

No.	Item	Description
1	None	

### 1.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

**Normal**

**Temperature:** +15 to +35 ° C

**Humidity:** 20-75 %

**Atmospheric pressure:** 86-106 kPa

**Extreme**

**Temperature:** -20 to +50 ° C

**Supply voltage:** 85% to +115%



#### 1.4 Measurement uncertainty

The expanded uncertainty ( $k = 2$ ) for radiated measurements has been determined to be:

$\pm 4$  dB at 10m and  $\pm 5.4$  dB at 3m

The expanded uncertainty ( $k = 2$ ) for conducted measurements at antenna terminal has been determined to be:

$\pm 1.0$  dB

The expanded uncertainty ( $k = 2$ ) for line conducted measurements has been determined to be:

$\pm 2.6$  dB

#### 1.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured emissions reading on the EMI Receiver.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where: FS = Field Strength in dB( $\mu$ V/m)

RA = Receiver Amplitude in dB( $\mu$ V)

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB( $m^{-1}$ )

AG = Amplifier Gain in dB

Assume a receiver reading of 48.1 dB( $\mu$ V) is obtained. The antenna factor of 7.4 dB( $m^{-1}$ ) and cable factor of 1.6 dB is added and amplifier gain of 16.0 dB is subtracted giving field strength of 41.1 dB( $\mu$ V/m).

$$RA = 48.1 \text{ dB}(\mu\text{V})$$

$$AF = 7.4 \text{ dB}(m^{-1})$$

$$CF = 1.6 \text{ dB}$$

$$AG = 16.0 \text{ dB}$$

$$FS = RA + AF + CF - AG$$

$$FS = 48.1 + 7.4 + 1.6 - 16.0$$

$$FS = 41.1 \text{ dB}(\mu\text{V}/\text{m})$$

#### General notes:



## 2.0 TEST SUMMARY

Referring to the performance criteria and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards.

TEST SPECIFICATION	TEST PARAMETERS	RESULT
15.247(b), (c) / RSS-210 A8.4	Maximum peak output power	Pass
15.247(e) / RSS-210 A8.1	Hopping channel carrier frequencies separation	Pass
15.247(a) / RSS-210 A8.1	20dB bandwidth of the hopping channel	Pass
15.247(e) / RSS-210 A8.1	Number of hopping frequencies	Pass
15.247(e) / RSS-210 A8.1	Average time of occupancy of hopping frequency	Pass
15.247(d) / RSS-210 A8.5	Antenna conducted spurious and band edge emissions	Pass
15.247(d) / RSS-210 A8.5	Radiated spurious emissions	Pass
15.247(i) / RSS- Gen 5.5	RF Exposure Compliance	Pass
15.207 / RSS-Gen 7.2.2	Transmitter Power Line conducted emissions	Pass
15.109 / ICES-003	Receiver/digital device radiated emissions	Pass
15.107 / ICES-003	Digital device conducted emissions	Pass



### 3.0 TEST CONDITIONS AND RESULTS

#### 3.1 Maximum peak output power

Test location:  OATS  Anechoic Chamber  Other

Test result: **Pass**

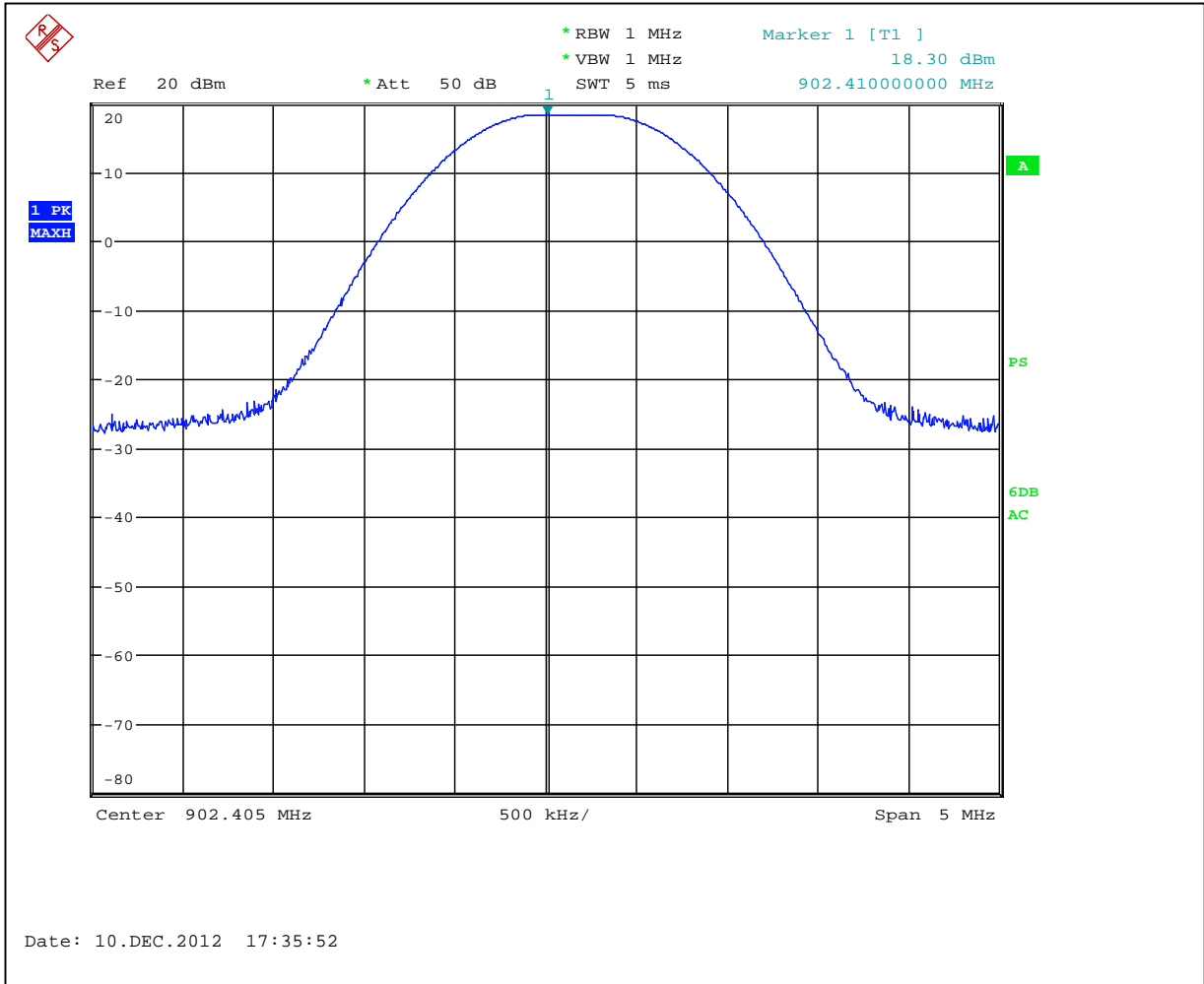
Max. Margin: 11.0dB below the limits

<b>Power Output:</b>	<b>Conducted</b>					
<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 902-928MHz		<input type="checkbox"/> 2400-2483.5MHz		<input type="checkbox"/> 5725-5850MHz	
<b>Low Frequency MHz</b>	<b>Measured power dBm</b>	<b>Attenuation dB</b>	<b>Power at Antenna dBm</b>	<b>Limit dBm</b>	<b>Limit Reduction dB</b>	<b>Margin dB</b>
902.4	18.3	0.7	19.0	30	0	-11.0
<b>Middle Frequency MHz</b>						
915.0	17.6	0.7	18.3	30	0	-11.7
<b>Upper Frequency MHz</b>						
927.4	17.3	0.7	18.0	30	0	-12.7
<b>RBW:</b>	<input checked="" type="checkbox"/> 1MHz <input type="checkbox"/> 3MHz <input type="checkbox"/> 10MHz					
<b>VBW:</b>	<input checked="" type="checkbox"/> 1MHz <input type="checkbox"/> 3MHz <input type="checkbox"/> 10MHz					
<b>Antenna Gain:</b>	<input checked="" type="checkbox"/> < 6dBi <input type="checkbox"/> >6dBi and = <input type="text"/> dBi, Output power reduction = <input type="text"/> dB					

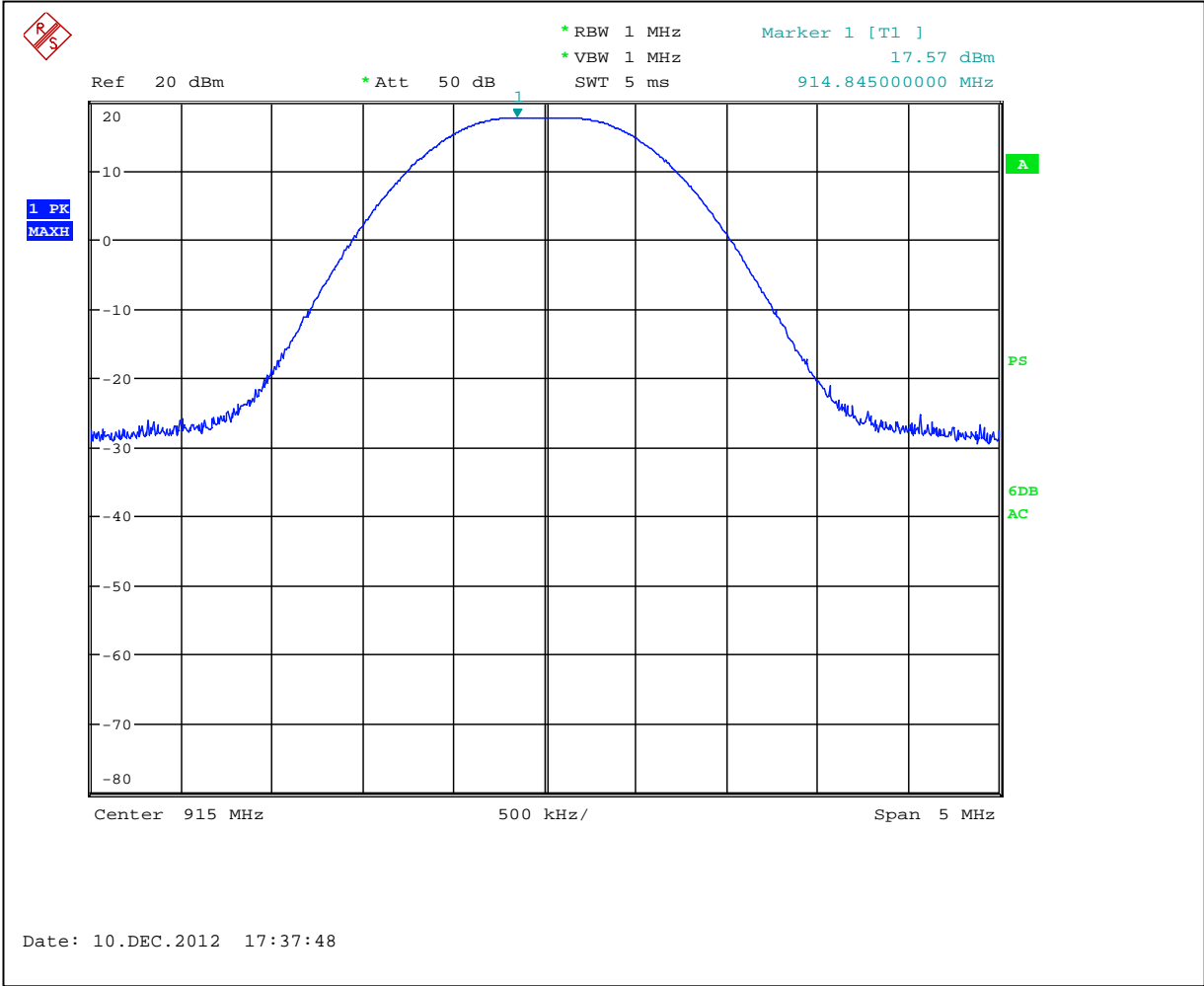
Notes:

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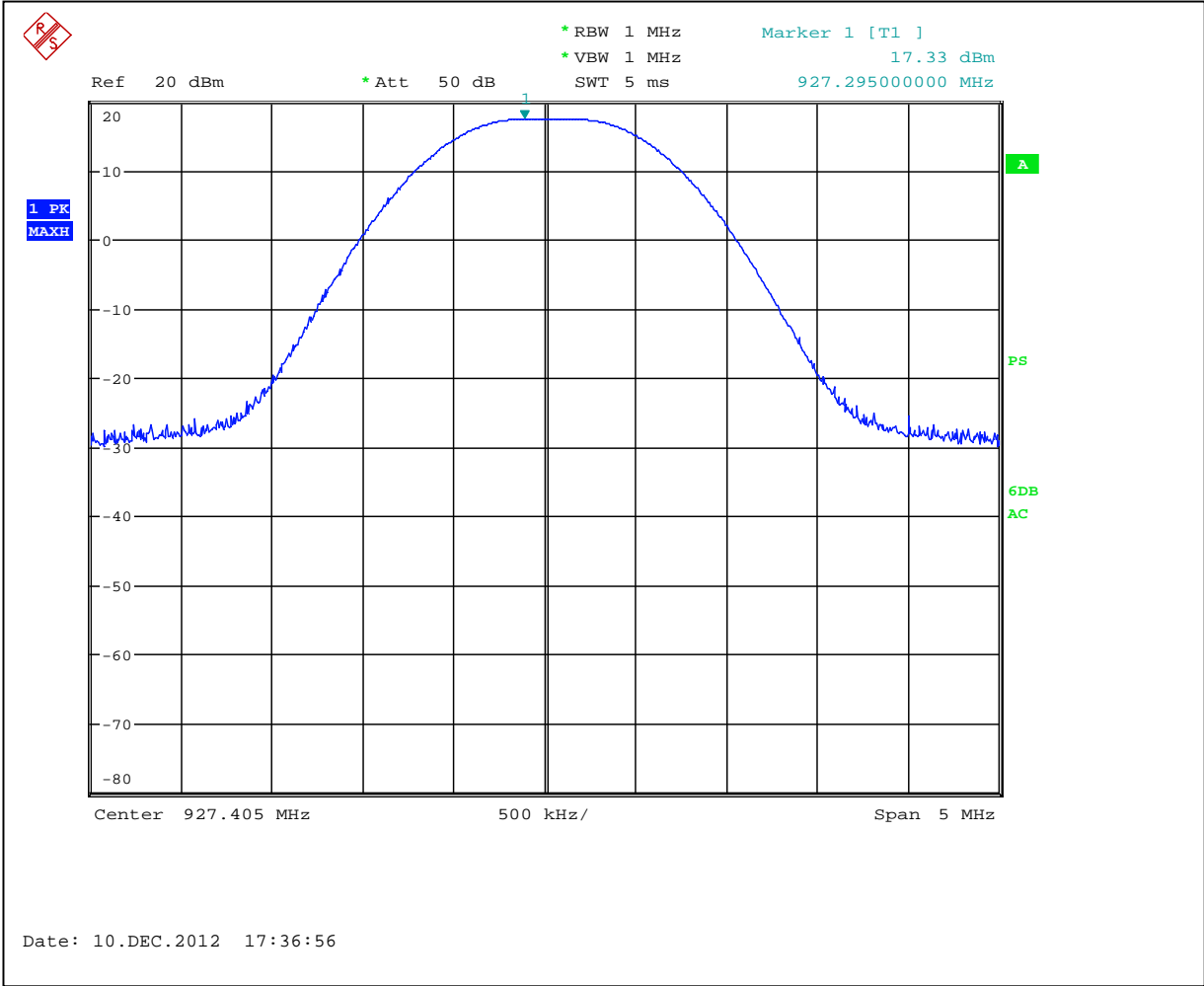




Graph 3.1.1



Graph 3.1.2



Graph 3.1.3

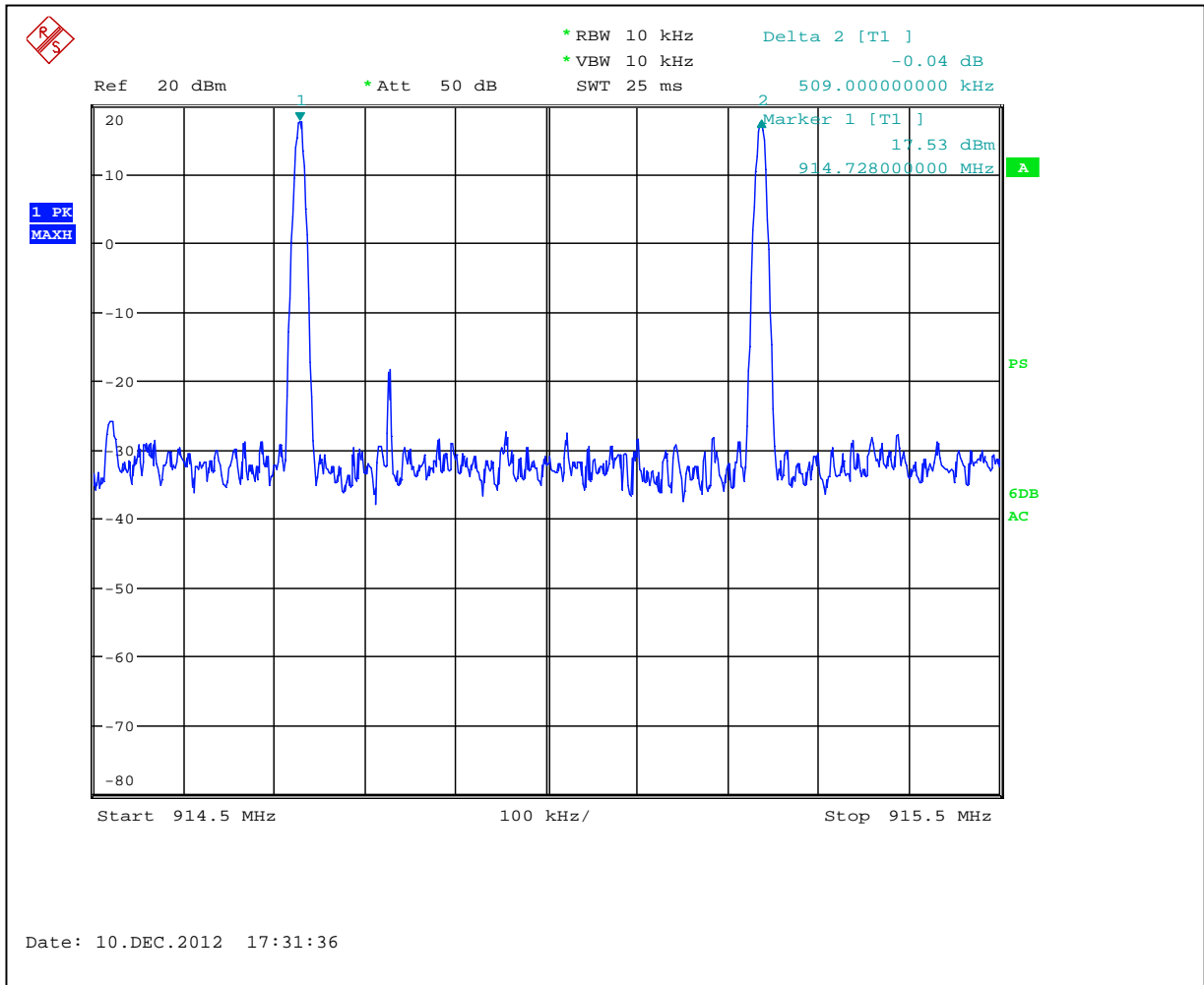


### 3.2 Hopping channel carrier frequencies separation

<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 902-928MHz	<input type="checkbox"/> 2400-2483.5MHz	<input type="checkbox"/> 5725-5850MHz
<b>Measured Separation (kHz)</b>	<b>Limit (kHz)</b>	<b>Result</b>	
509	25	<b>Pass</b>	
<b>Limit:</b>	<input checked="" type="checkbox"/> 25kHz <input type="checkbox"/> 20dB channel bandwidth <input type="checkbox"/> 2/3 of 20dB channel bandwidth		
<b>Span:</b>	kHz		
<b>RBW:</b>	<input type="checkbox"/> 3kHz	<input checked="" type="checkbox"/> 10kHz	<input type="checkbox"/> 100kHz <input type="checkbox"/> other kHz
<b>VBW:</b>	<input type="checkbox"/> 3kHz	<input checked="" type="checkbox"/> 10kHz	<input type="checkbox"/> 100kHz <input type="checkbox"/> other kHz

**Notes:** None

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Graph 3.2.1

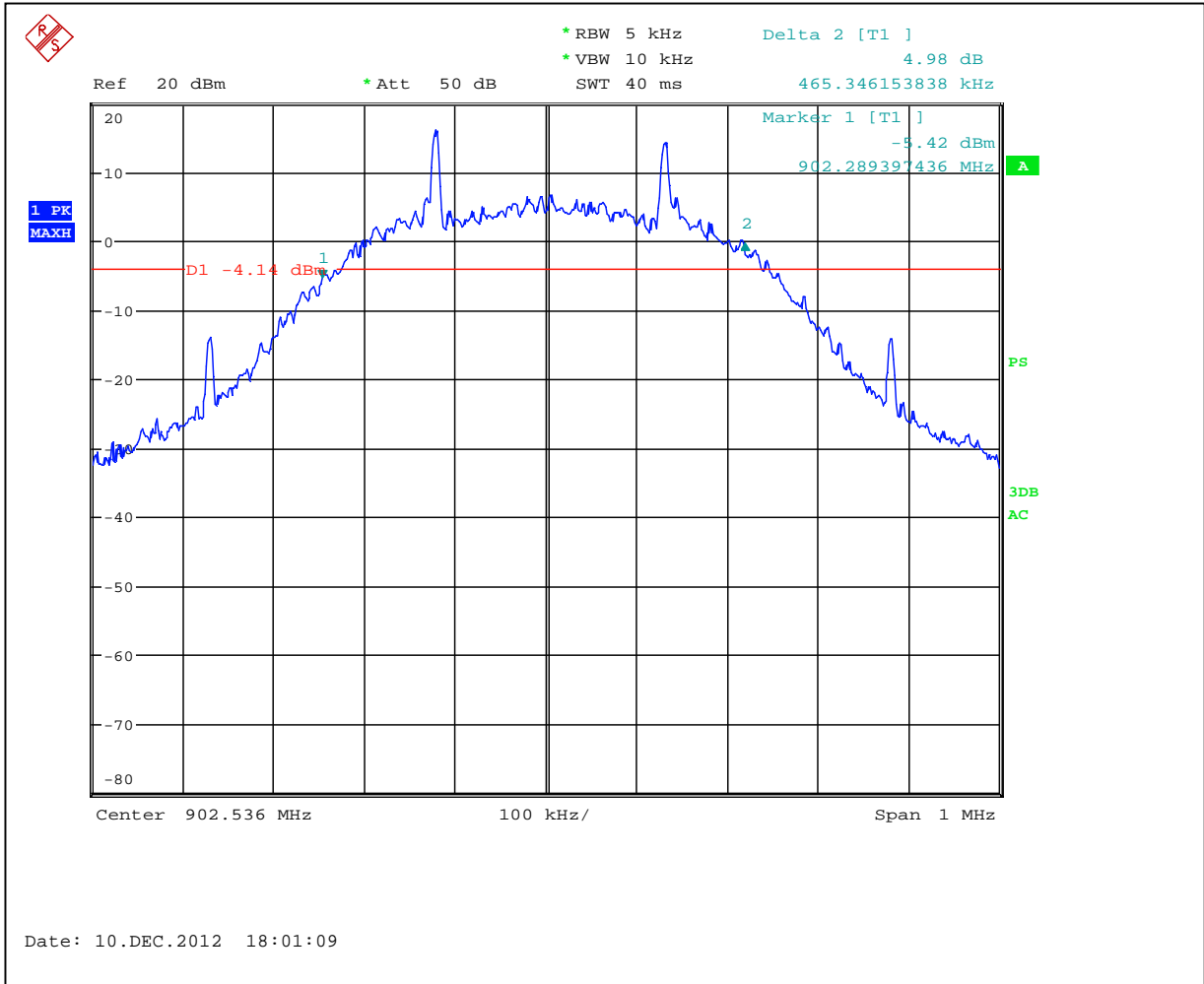


### 3.3 20dB bandwidth of the hopping channel

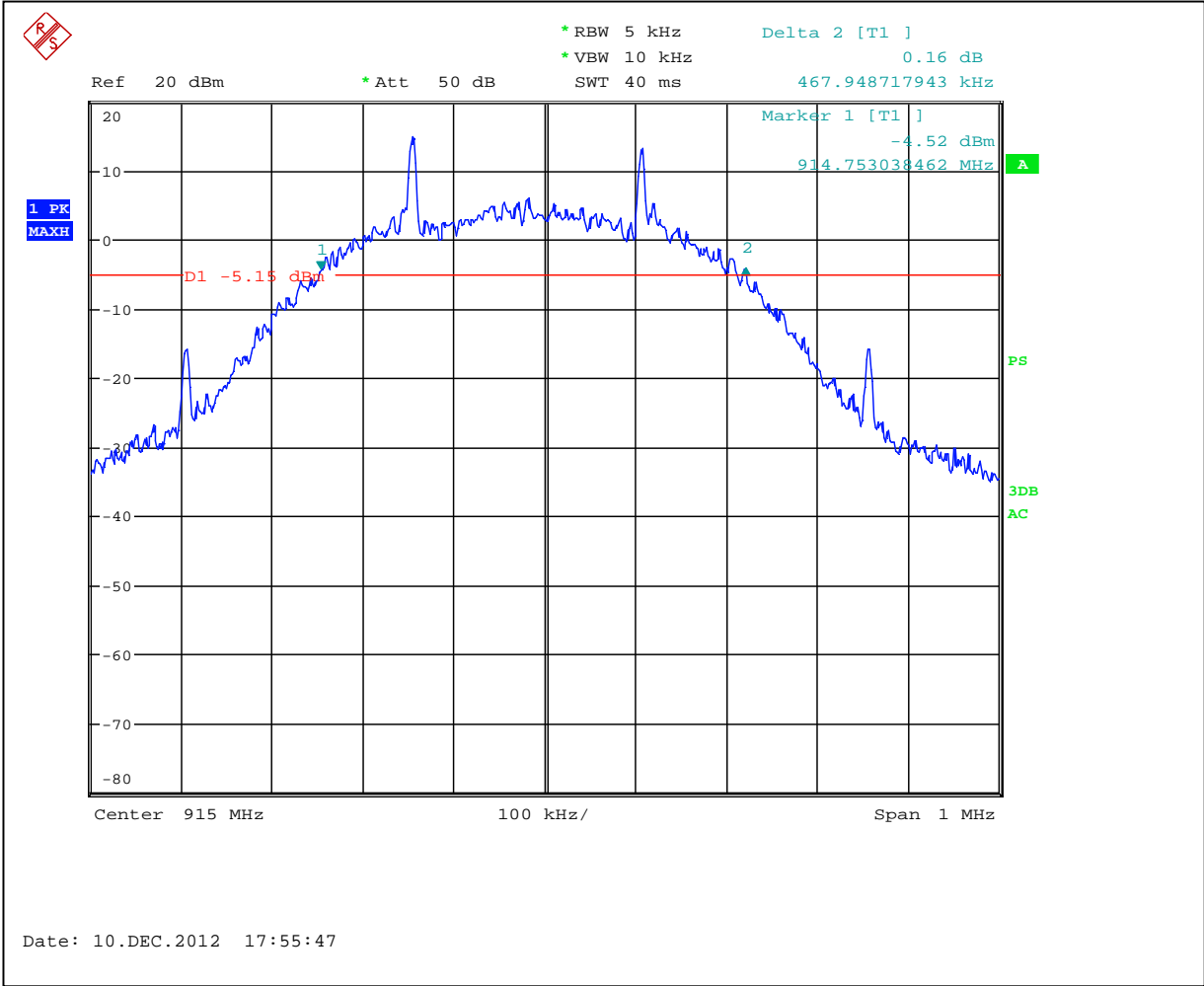
<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 902-928MHz <input type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz			
<b>Low Frequency Channel (kHz)</b>	<b>Middle Frequency Channel (kHz)</b>	<b>Upper Frequency Channel (kHz)</b>	<b>Limit (kHz)</b>	<b>Result</b>
465.3	467.9	492.5	500	<b>Pass</b>
<b>Span:</b>	1MHz			
<b>RBW:</b>	<input type="checkbox"/> 3kHz <input type="checkbox"/> 10kHz <input type="checkbox"/> 100kHz <input checked="" type="checkbox"/> other 5kHz			
<b>VBW:</b>	<input type="checkbox"/> 3kHz <input type="checkbox"/> 10kHz <input type="checkbox"/> 100kHz <input checked="" type="checkbox"/> other 10kHz			

**Notes:**        None

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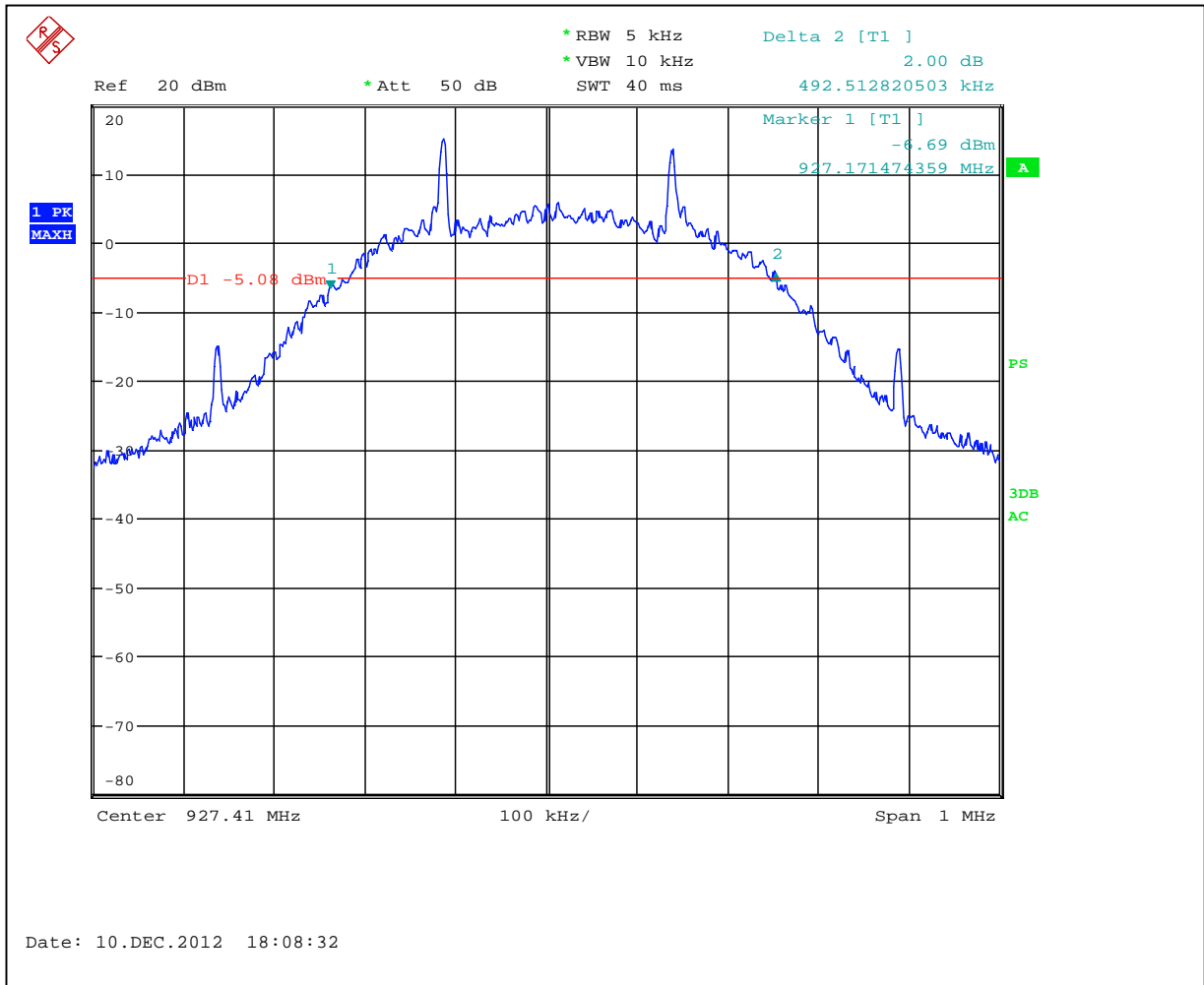


Graph 3.3.1



Graph 3.3.2





Graph 3.3.3

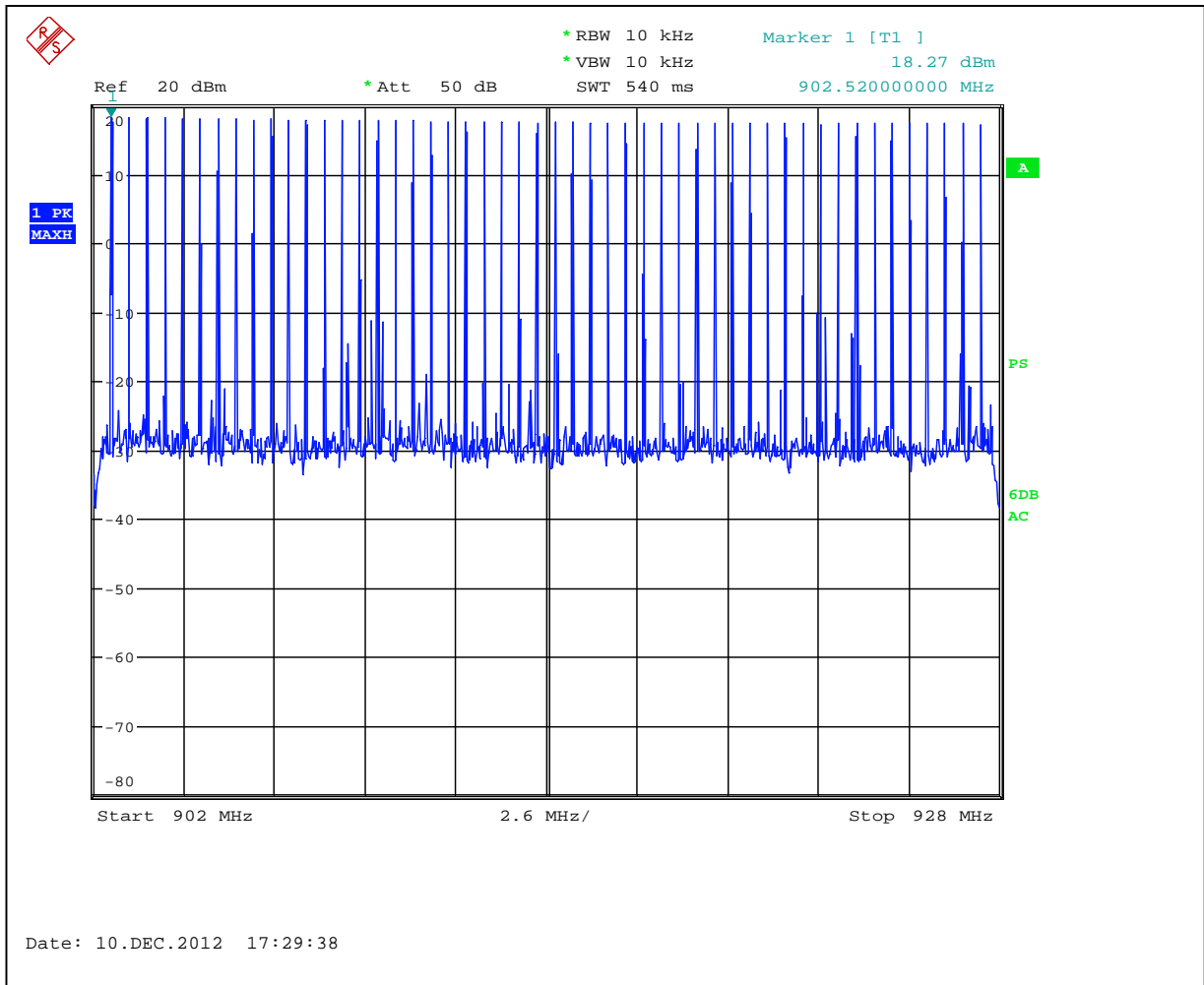


### 3.4 Number of hopping frequencies

<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 902-928MHz <input type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz	
<b>Measured Number</b>	<b>Requirements</b>	<b>Result</b>
50	25	<b>Pass</b>
<b>Channel 20dB Bandwidth:</b>	<input type="checkbox"/> <250kHz <input checked="" type="checkbox"/> ≥250kHz	

**Notes:**        None

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Graph 3.4.1



### 3.5 Average time of occupancy of hopping frequency

<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 902-928MHz <input type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz		
<b>Measured / Calculated Time sec</b>	<b>Period sec</b>	<b>Limit sec</b>	<b>Result</b>
0.384	10	0.4	Pass
<b>Period:</b>	<input checked="" type="checkbox"/> 10s <input type="checkbox"/> 20s <input type="checkbox"/> 30s <input checked="" type="checkbox"/> 0.4s multiplied by the channel number		
<b>Channel 20dB Bandwidth:</b>	<input type="checkbox"/> <250kHz <input checked="" type="checkbox"/> ≥250kHz		

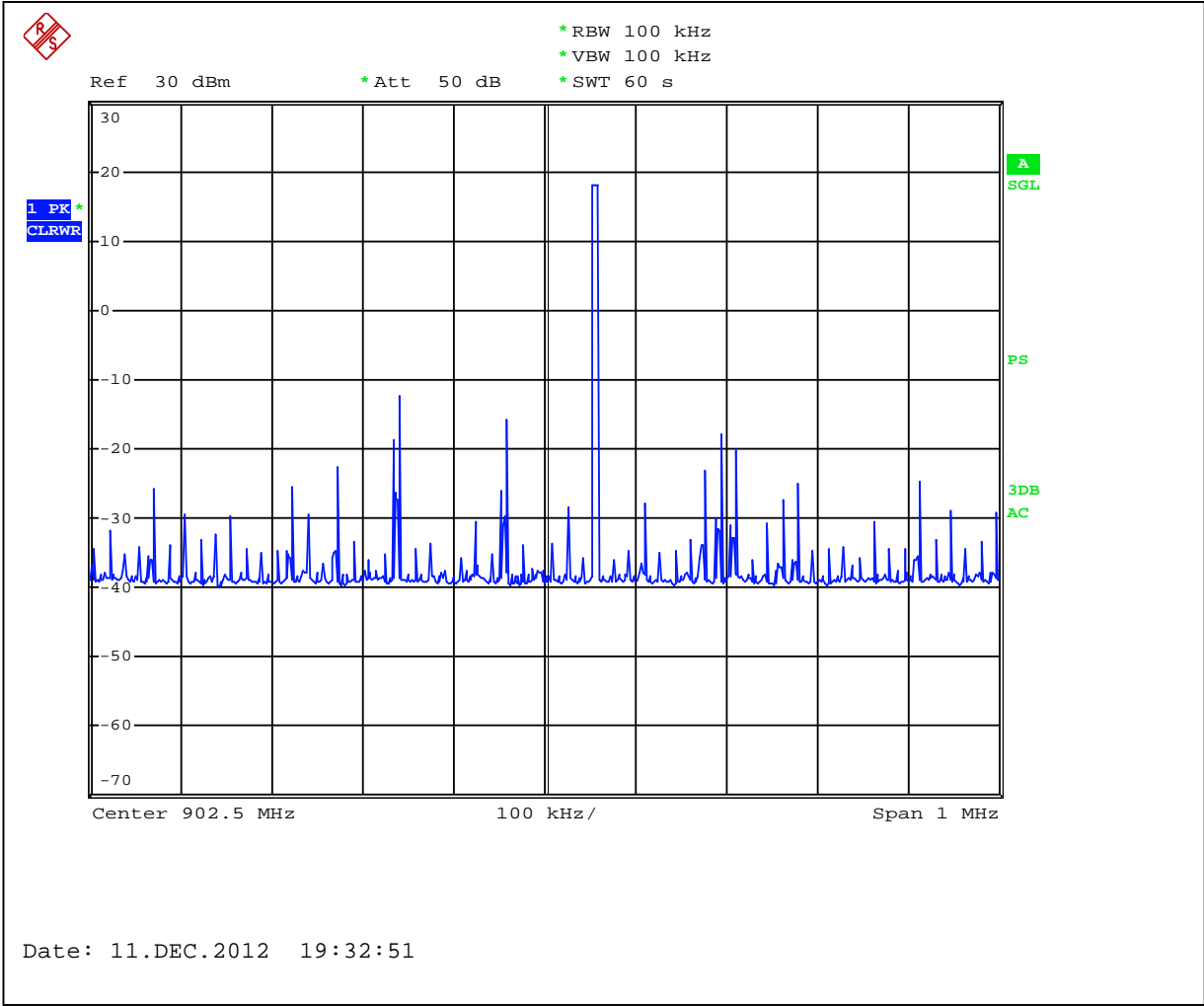
Time of occupancy calculation:

The minimum measured repetition of the channel occupancy (repetition) = 1 time in 60 sec  
Single occupancy duration (single duration) = 0.384 sec  
Period = 10 sec

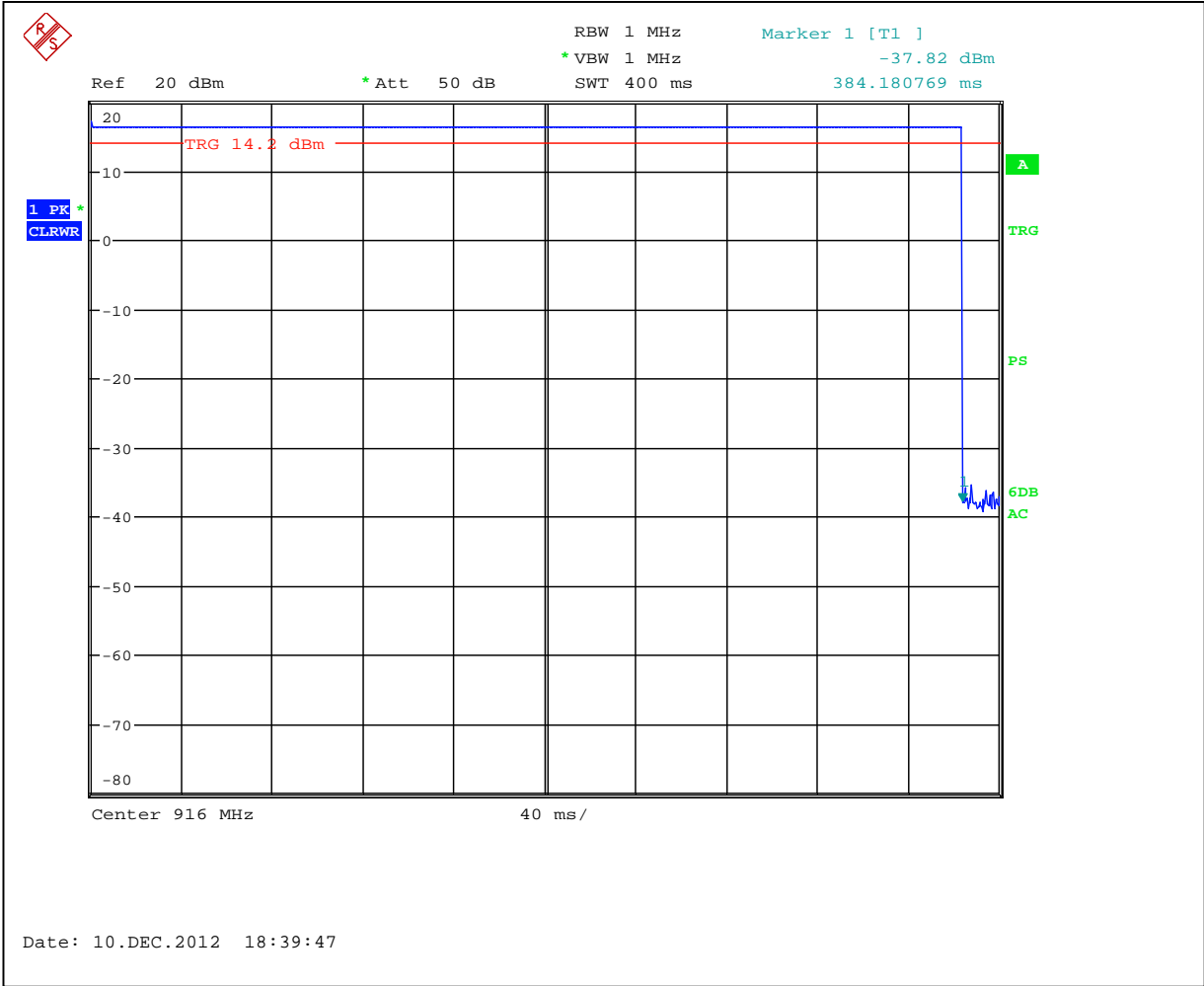
Time of occupancy = (single duration) x (repetition) = 0.384 x 1 = 0.384 sec

**Notes:**        None

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Graph 3.5.1



**Note:** No video trigger delay was set

**Graph 3.5.2**

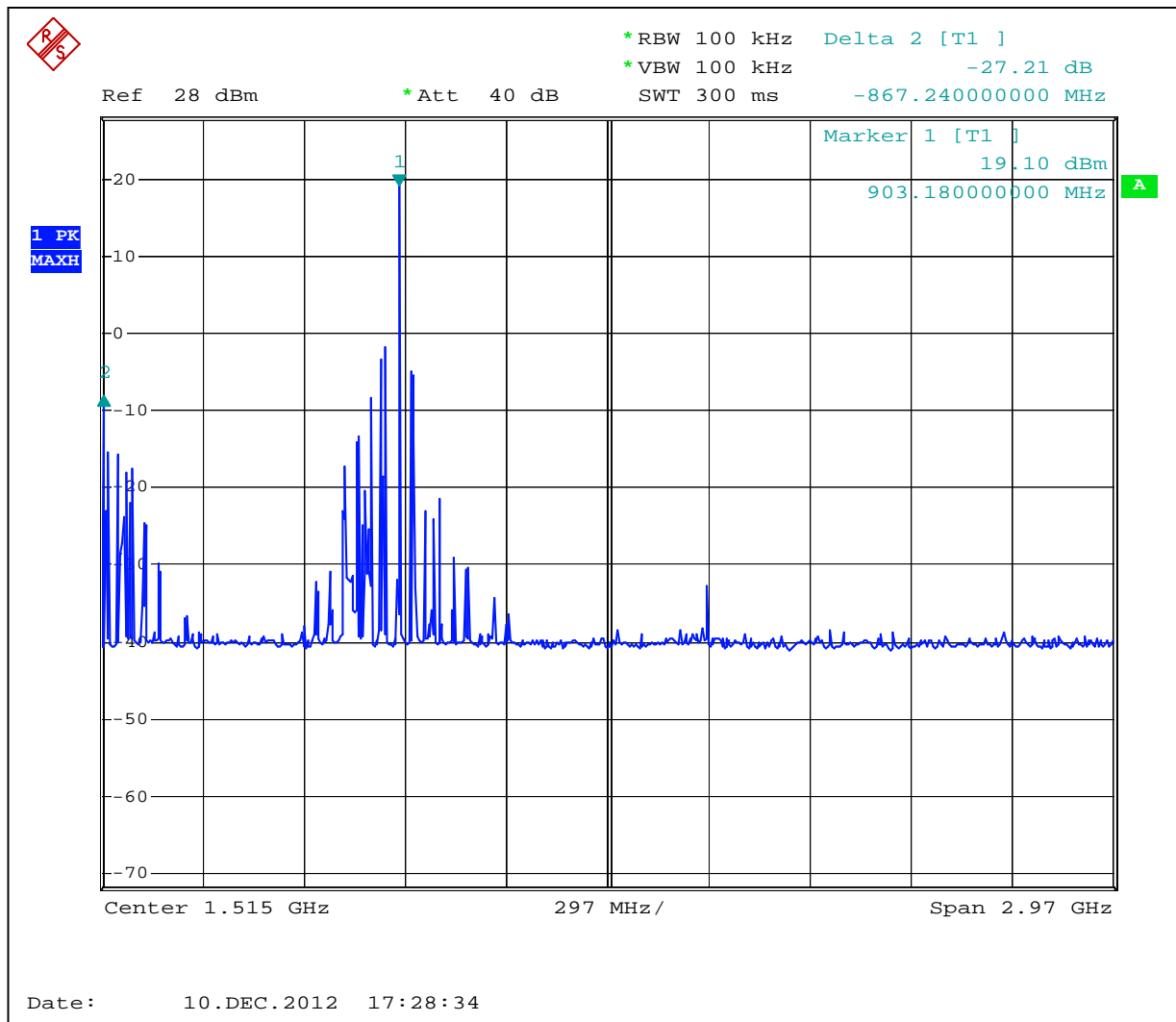


3.6 Antenna conducted spurious emissions

<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 902-928MHz	<input type="checkbox"/> 2400-2483.5MHz	<input type="checkbox"/> 5725-5850MHz
	<b>Minimum Measured Attenuation dB</b>	<b>Minimum Allowed Attenuation dB</b>	<b>Margin dB</b>
<b>Low Frequency Channel</b>	27.2	20	-7.2
<b>Middle Frequency Channel</b>	24.2	20	-4.2
<b>Upper Frequency Channel</b>	25.8	20	-5.8
<b>Analyzer Settings:</b>	<input checked="" type="checkbox"/> RBW=100KHz		
<b>Minimum Allowed Attenuation:</b>	<input checked="" type="checkbox"/> 20dB <input type="checkbox"/> 30dB (for digital systems with conducted power measured using RMS averaging over a time interval)		

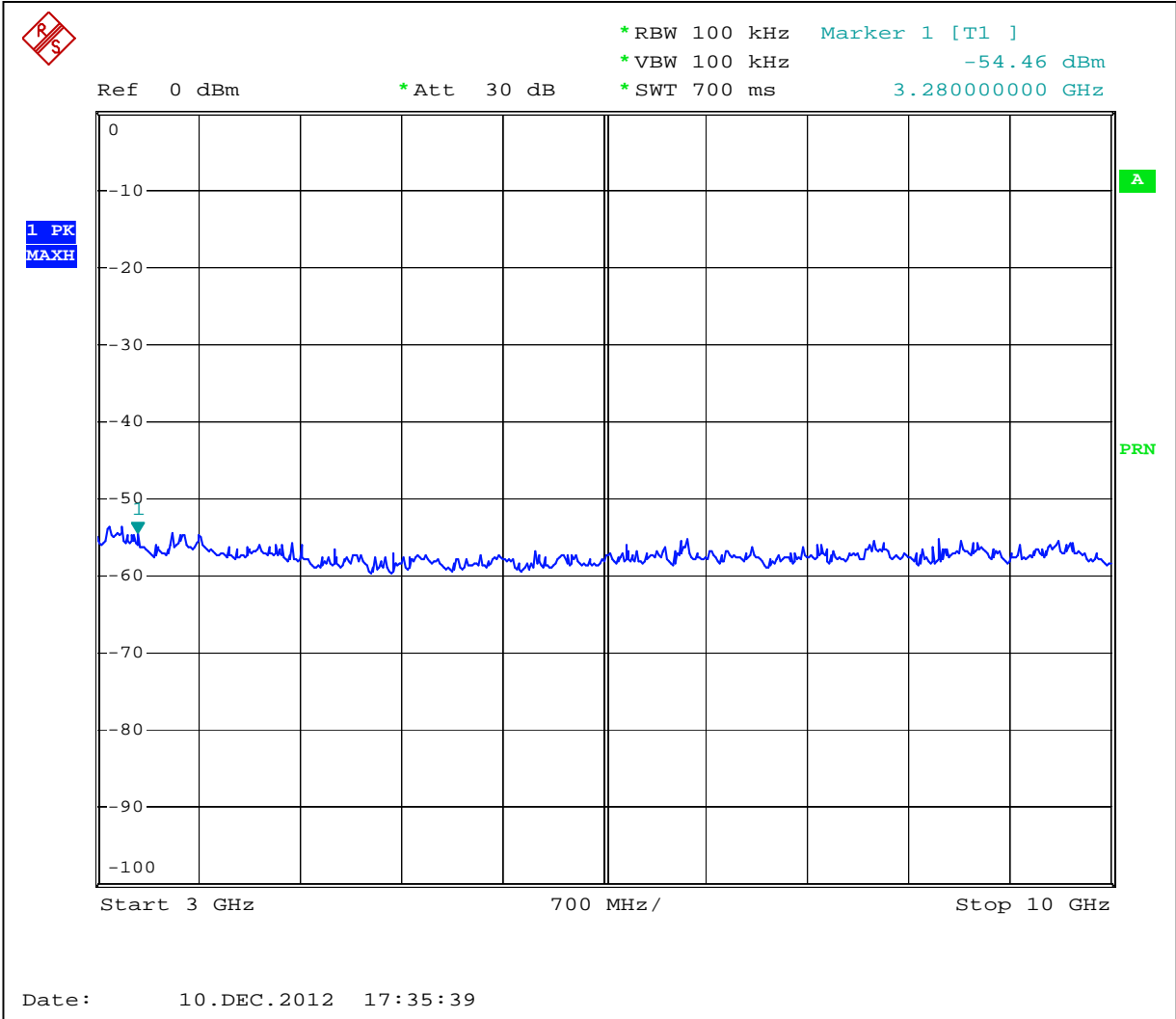
Notes: None

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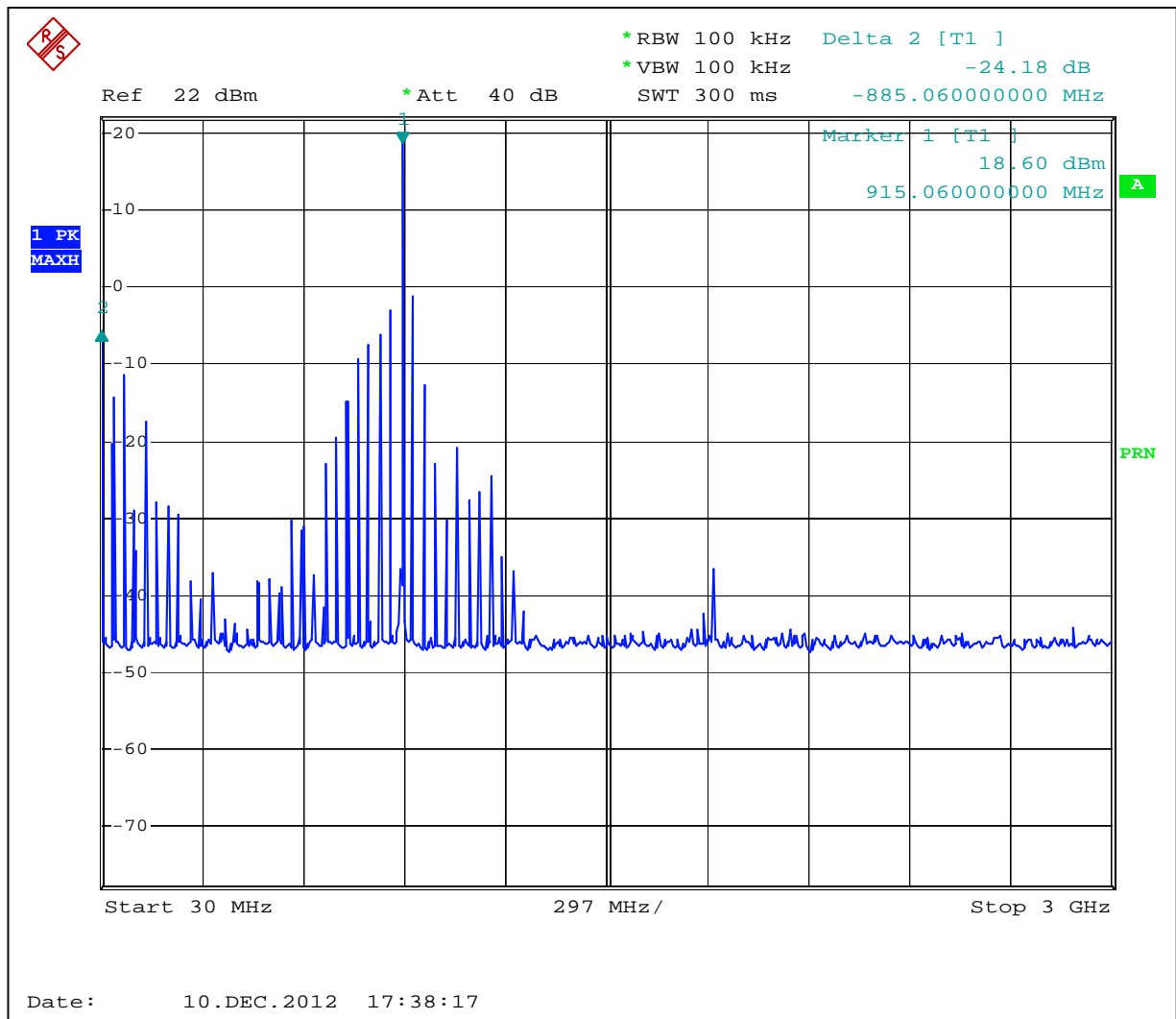


Graph 3.6.1

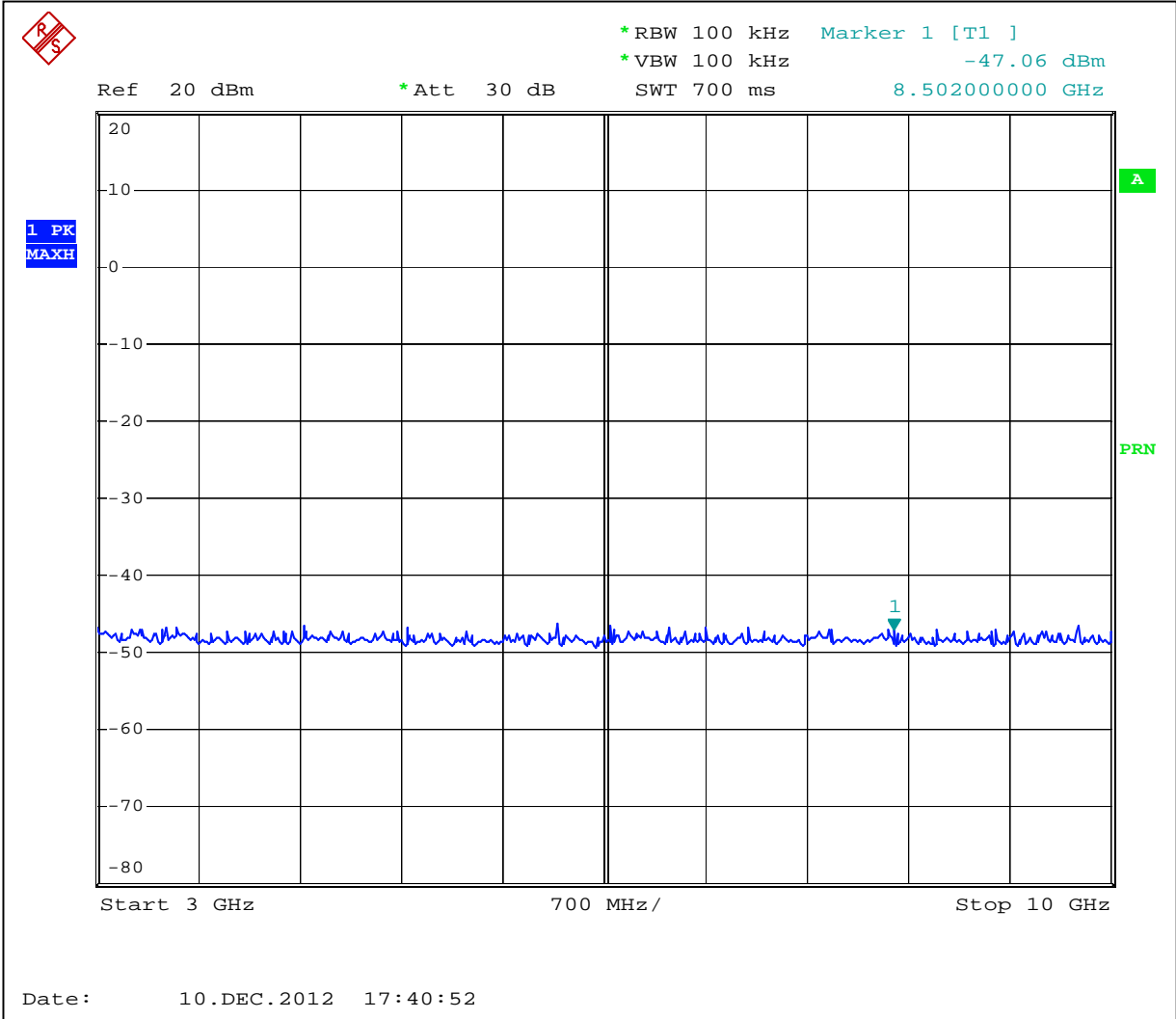




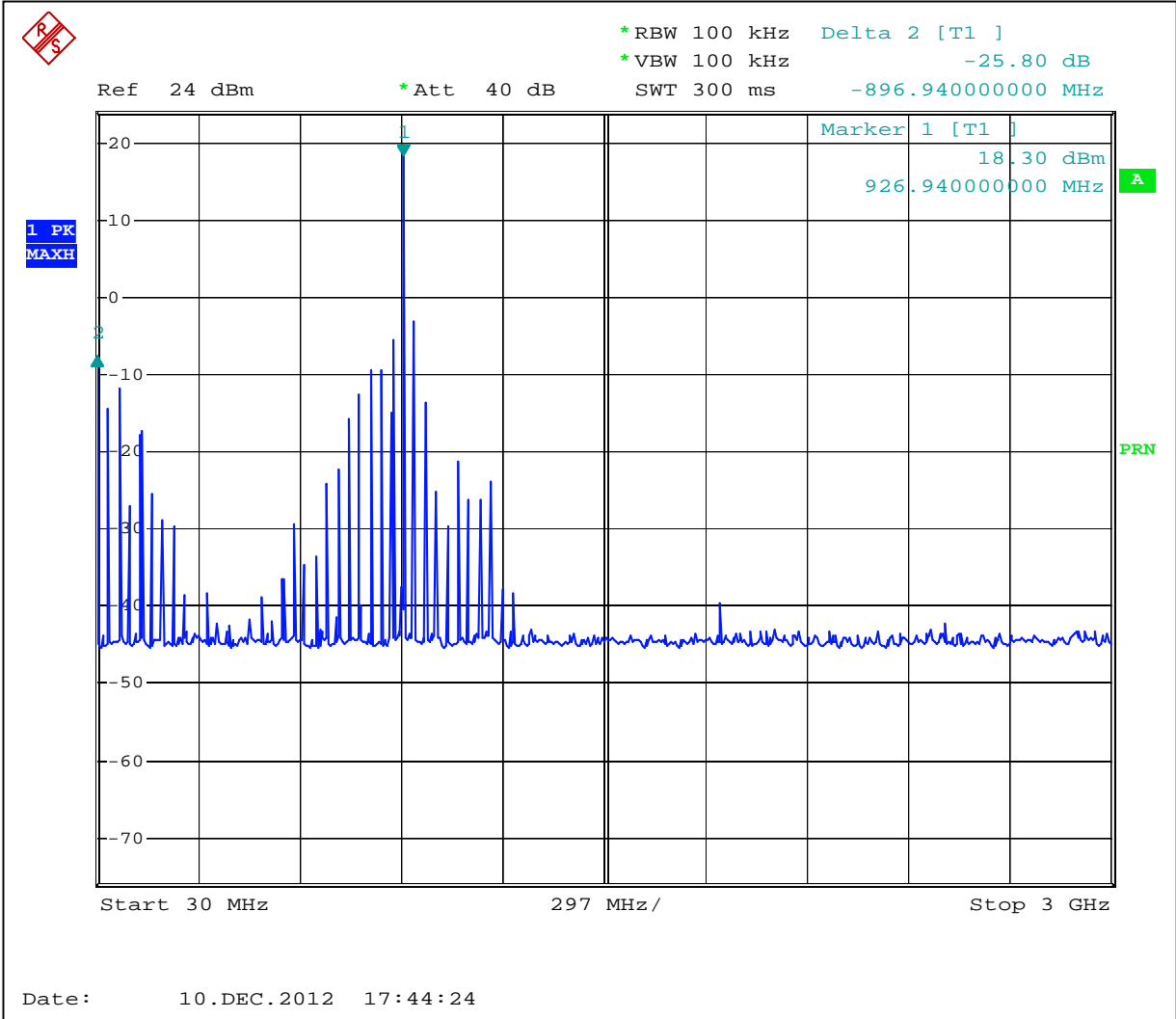
Graph 3.6.2



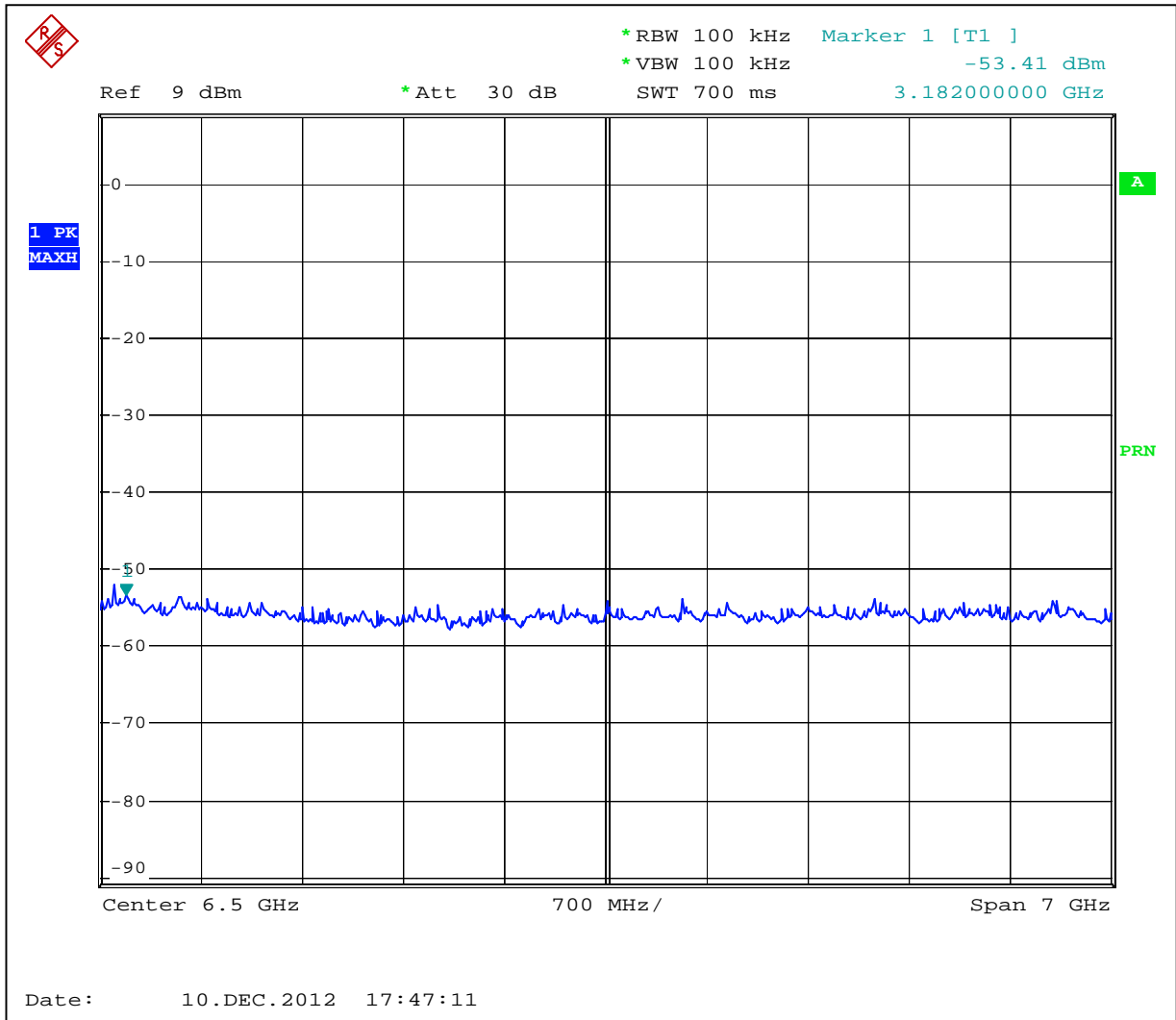
Graph 3.6.3



Graph 3.6.4



Graph 3.6.5



Graph 3.6.6



### 3.6.1 Antenna conducted band edge compliance

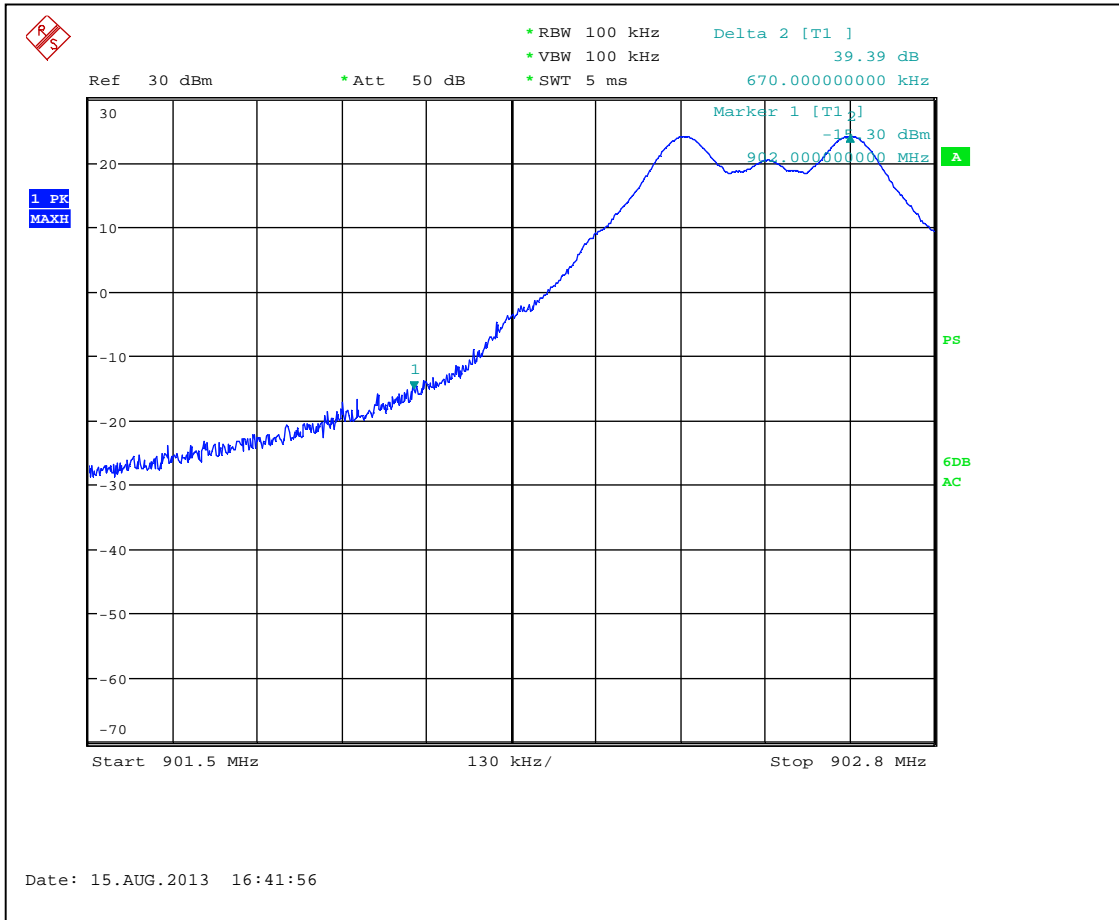
#### Hopping disabled

<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 902-928MHz <input type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz		
	<b>Minimum Measured Attenuation dB</b>	<b>Minimum Allowed Attenuation dB</b>	<b>Margin dB</b>
<b>Low Frequency Channel (902MHz)</b>	39.4	20	-19.4
<b>Upper Frequency Channel (928MHz)</b>	39.0	20	-19.0
<b>Analyzer Settings:</b>	<input checked="" type="checkbox"/> RBW=100KHz		
<b>Minimum Allowed Attenuation:</b>	<input checked="" type="checkbox"/> 20dB <input type="checkbox"/> 30dB (for digital systems with conducted power measured using RMS averaging over a time interval)		

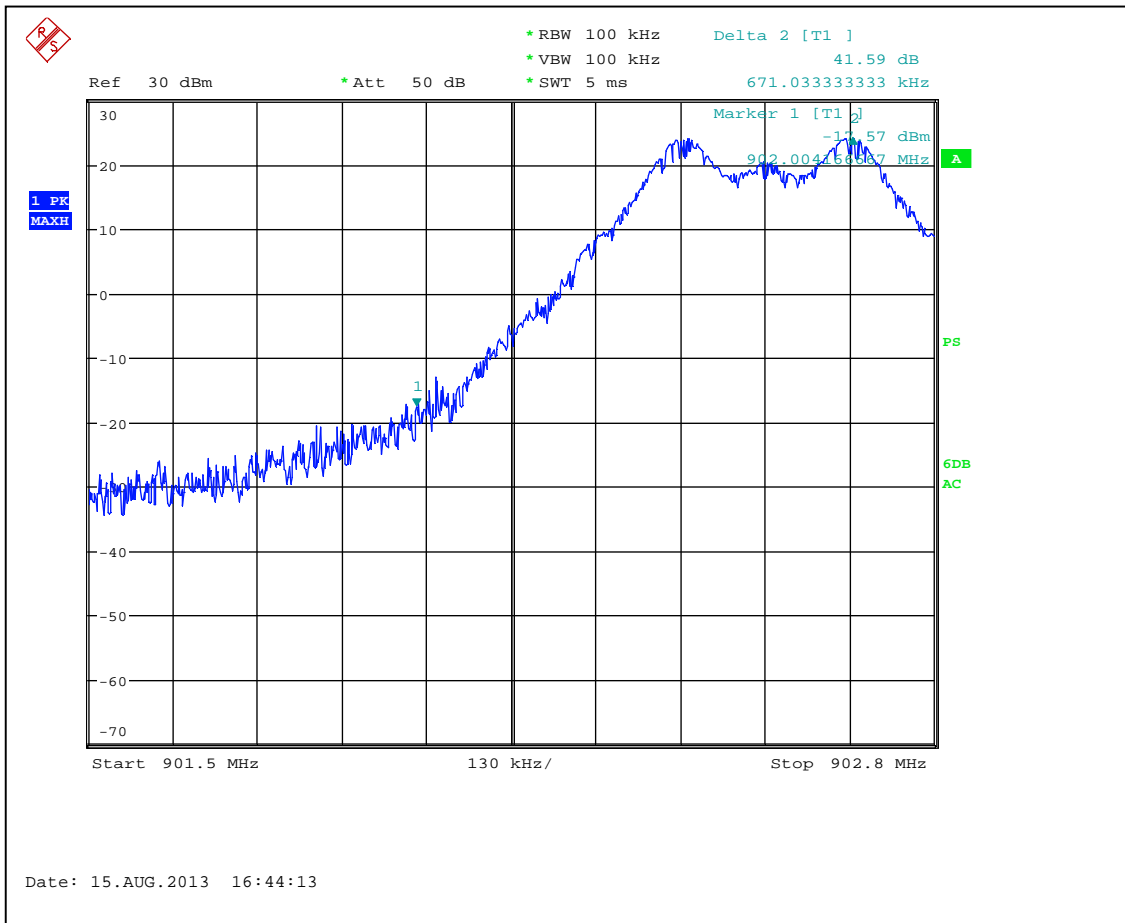
#### Hopping enabled

<b>Frequency Range:</b>	<input checked="" type="checkbox"/> 902-928MHz <input type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz		
	<b>Minimum Measured Attenuation dB</b>	<b>Minimum Allowed Attenuation dB</b>	<b>Margin dB</b>
<b>Low Frequency Channel (902MHz)</b>	41.6	20	-21.6
<b>Upper Frequency Channel (928MHz)</b>	41.8	20	-21.8
<b>Analyzer Settings:</b>	<input checked="" type="checkbox"/> RBW=100KHz		
<b>Minimum Allowed Attenuation:</b>	<input checked="" type="checkbox"/> 20dB <input type="checkbox"/> 30dB (for digital systems with conducted power measured using RMS averaging over a time interval)		

**Notes:**        Graphs 3.6.4 and 3.6.5 show Band-edge compliance for low frequency channel. Graphs 3.6.6 and 3.6.7 show Band-edge compliance for high frequency channel.

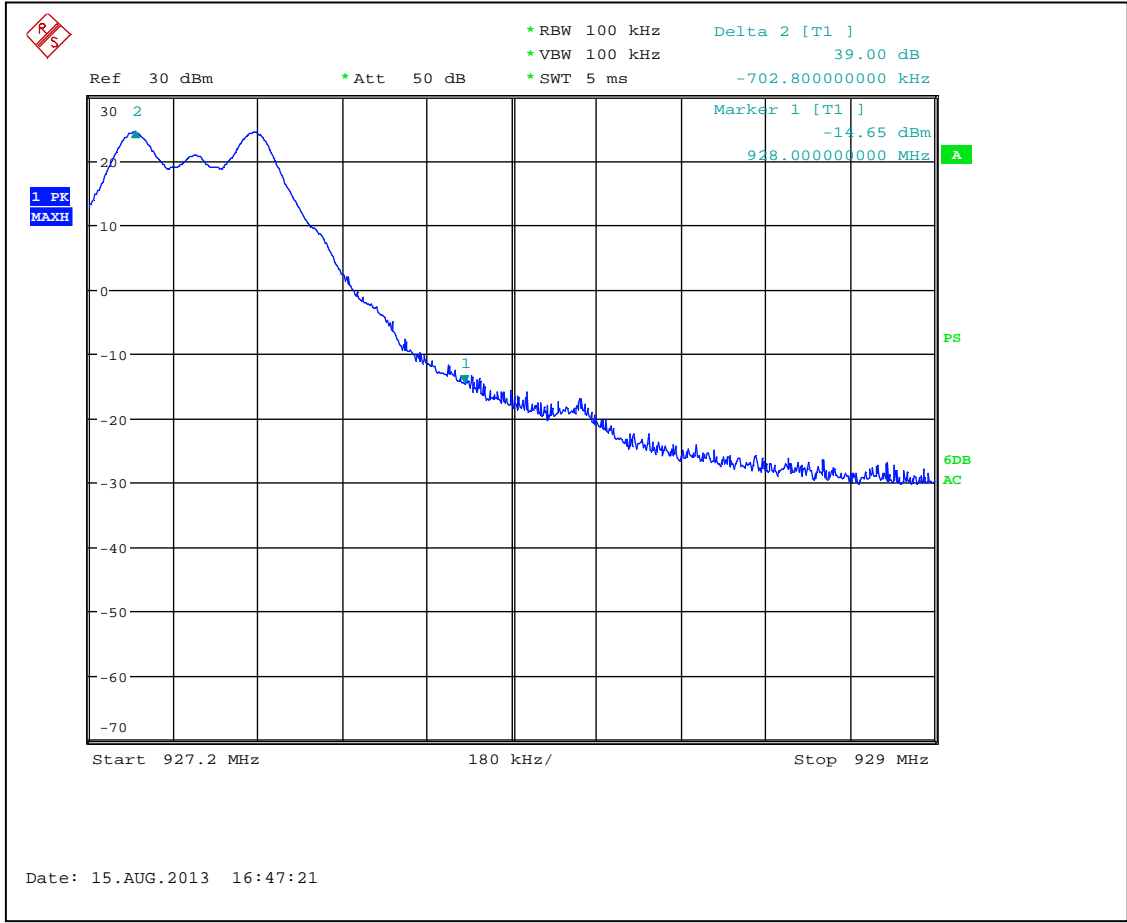


Graph 3.6.4 (hopping disabled)

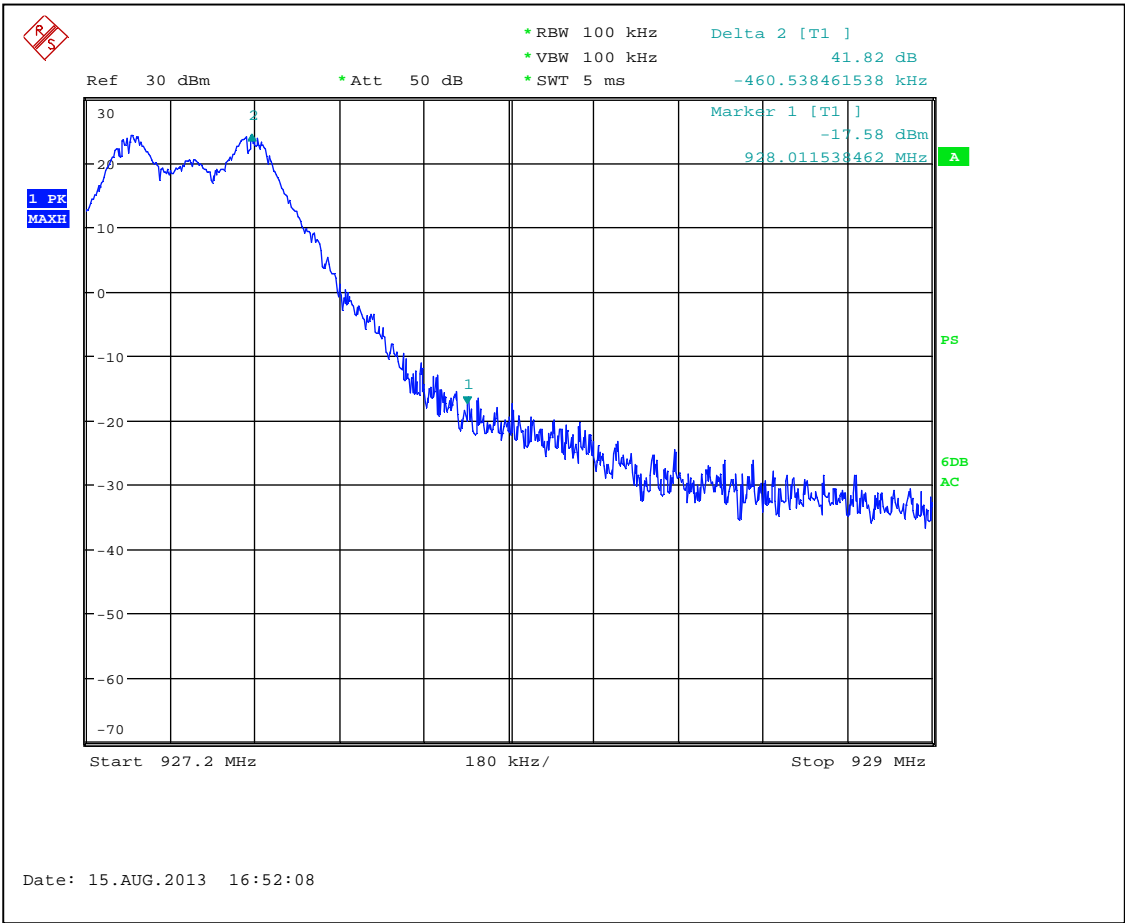


Graph 3.6.5 (hopping enabled)





Graph 3.6.6 (hopping disabled)



Graph 3.6.7 (hopping enabled)



**3.7 Radiated spurious emissions**

**Test location:**  OATS  Anechoic Chamber  Other

**Test distance:**  10 meters  3 meters

**Frequency Range:** 30MHz-10GHz

**Test result:** **Pass**

**Max. Margin:** 1.8dB below the limits

<b>Date:</b>	December 12, 2012	<b>Result: Pass</b>
<b>Tested by:</b>	Uri Spector	
<b>Standard:</b>	FCC part 15.247(d)	
<b>Test Point:</b>	Enclosure	
<b>Operation mode:</b>	See page 5	
<b>Note:</b>	Fundamental frequency and harmonics outside restricted band of operation per FCC 15.205 are excluded from the tables.	

**Table 3.7.1**

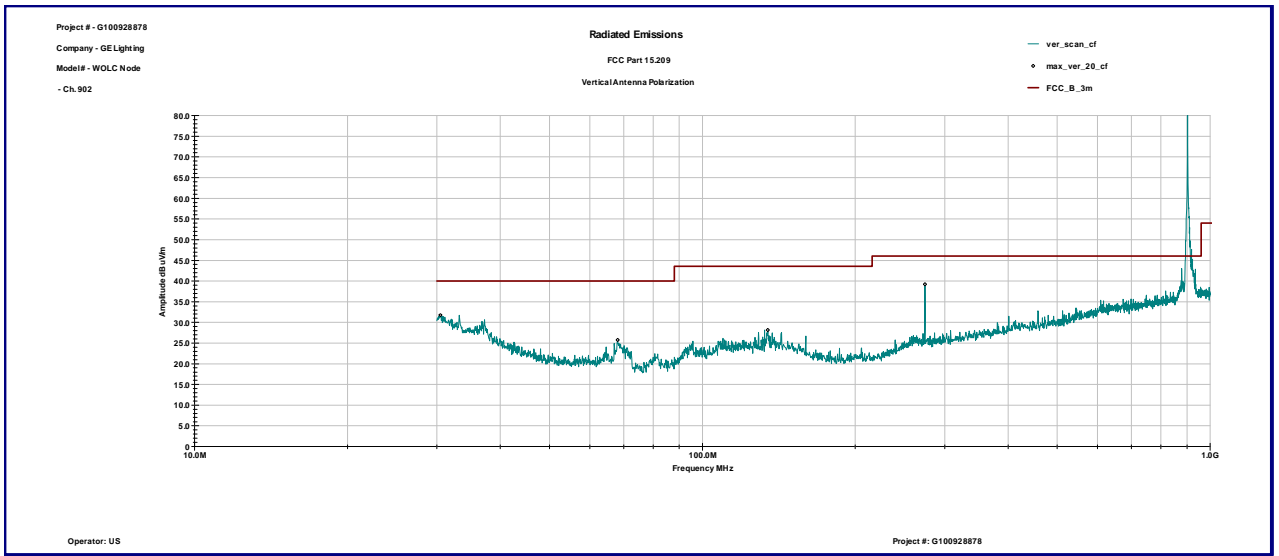
Frequency	Ant. Polarity	Peak Reading dBµV	Total C.F. dB1/m	Total at 3m dBµV/m	Limit dBµV/m	Margin dB
<b>Channel 902</b>						
30.485 MHz	V	11.8	19.9	31.8	40.0	-8.2
68.065 MHz	V	18.6	7.1	25.8	40.0	-14.2
134.47 MHz	V	14.5	13.7	28.2	43.5	-15.4
274.28 MHz	V	23.8	15.4	39.2	46.0	-6.8
30.831 MHz	H	12.0	19.7	31.7	40.0	-8.3
110.89 MHz	H	12.8	13.6	26.4	43.5	-17.2
<b>Channel 915</b>						
31.247 MHz	V	12.8	19.5	32.2	40.0	-7.8
69.11 MHz	V	19.0	7.2	26.3	40.0	-13.8
132.53 MHz	V	14.9	13.8	28.6	43.5	-14.9
274.28 MHz	V	24.2	15.4	39.6	46.0	-6.4
30.069 MHz	H	11.5	20.2	31.7	40.0	-8.3
112.83 MHz	H	13.0	13.7	26.7	43.5	-16.9
<b>Channel 928</b>						
30.208 MHz	V	11.7	20.1	31.8	40.0	-8.2
70.005 MHz	V	18.3	7.3	25.6	40.0	-14.4
132.53 MHz	V	14.6	13.8	28.4	43.5	-15.2
274.28 MHz	V	23.6	15.4	39.1	46.0	-6.9
30.0 MHz	H	11.1	20.2	31.4	40.0	-8.6
123.73 MHz	H	12.1	14.0	26.1	43.5	-17.5



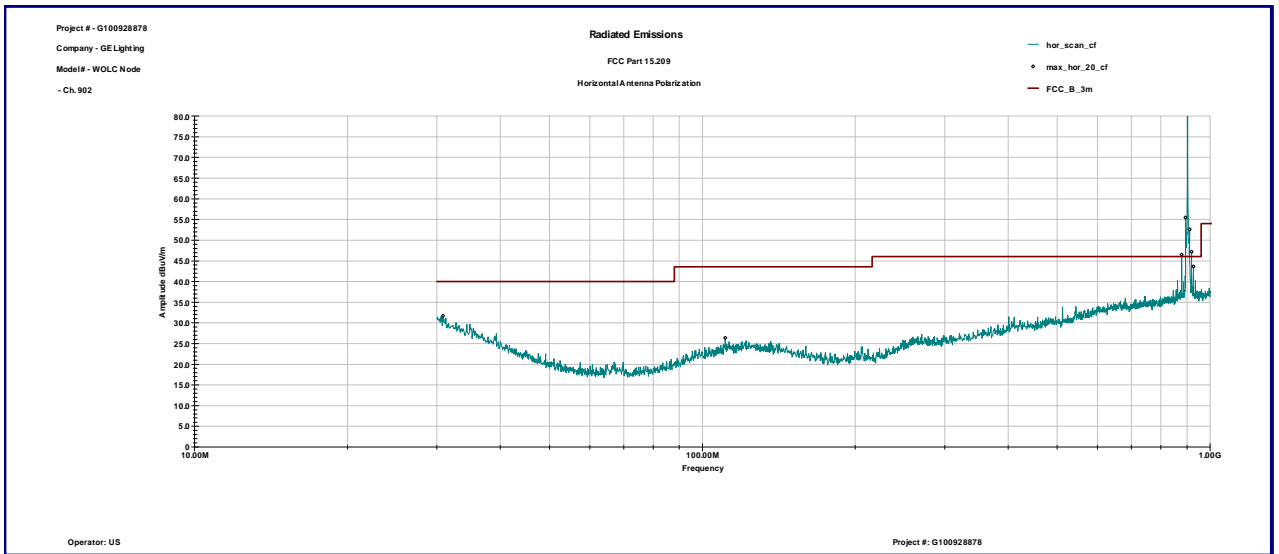
**Table 3.7.2**

Frequency MHz	Antenna Polarity	Peak Reading dBμV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBμV/m	Limit dBμV/m	Margin dB
<b>Channel 902</b>							
2.746 GHz	V	53.6	32.5	40.4	45.7	54.0	-8.3
3.6595 GHz	V	52.9	35.5	40.3	48.1	54.0	-5.9
4.5775 GHz	V	49.8	36.9	39.4	47.3	54.0	-6.7
2.746 GHz	H	53.2	32.4	40.4	45.2	54.0	-8.7
3.6595 GHz	H	51.1	35.2	40.3	46.0	54.0	-8.0
4.573 GHz	H	50.4	36.8	39.4	47.7	54.0	-6.3
<b>Channel 915</b>							
2.746 GHz	V	54.9	32.5	40.4	47.0	54.0	-7.0
3.6595 GHz	V	53.2	35.5	40.3	48.5	54.0	-5.5
4.573 GHz	V	49.4	36.9	39.4	46.8	54.0	-7.2
2.746 GHz	H	60.2	32.4	40.4	52.2	54.0	-1.8
3.6595 GHz	H	51.0	35.2	40.3	46.0	54.0	-8.0
4.573 GHz	H	50.6	36.8	39.4	47.9	54.0	-6.0
<b>Channel 928</b>							
2.7865 GHz	V	53.3	32.7	40.5	45.5	54.0	-8.5
3.709 GHz	V	55.3	35.7	40.2	50.7	54.0	-3.3
4.636 GHz	V	53.8	37.0	39.3	51.5	54.0	-2.5
2.7865 GHz	H	52.5	32.6	40.5	44.6	54.0	-9.4
3.709 GHz	H	51.3	35.4	40.2	46.4	54.0	-7.6
4.6405 GHz	H	51.6	36.9	39.3	49.2	54.0	-4.8

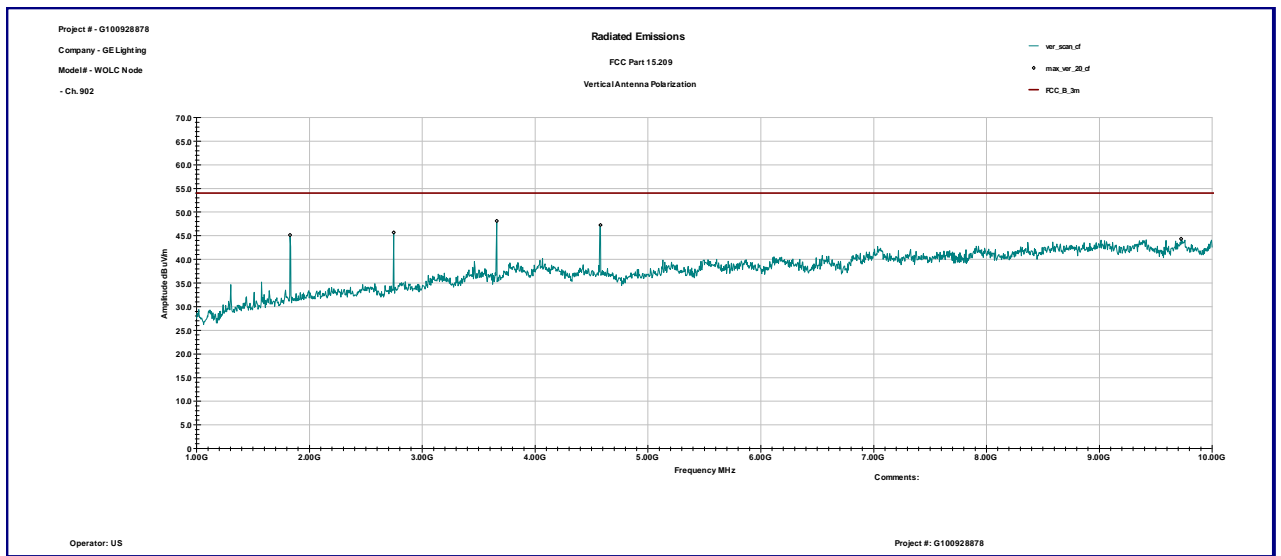
**Comment:**



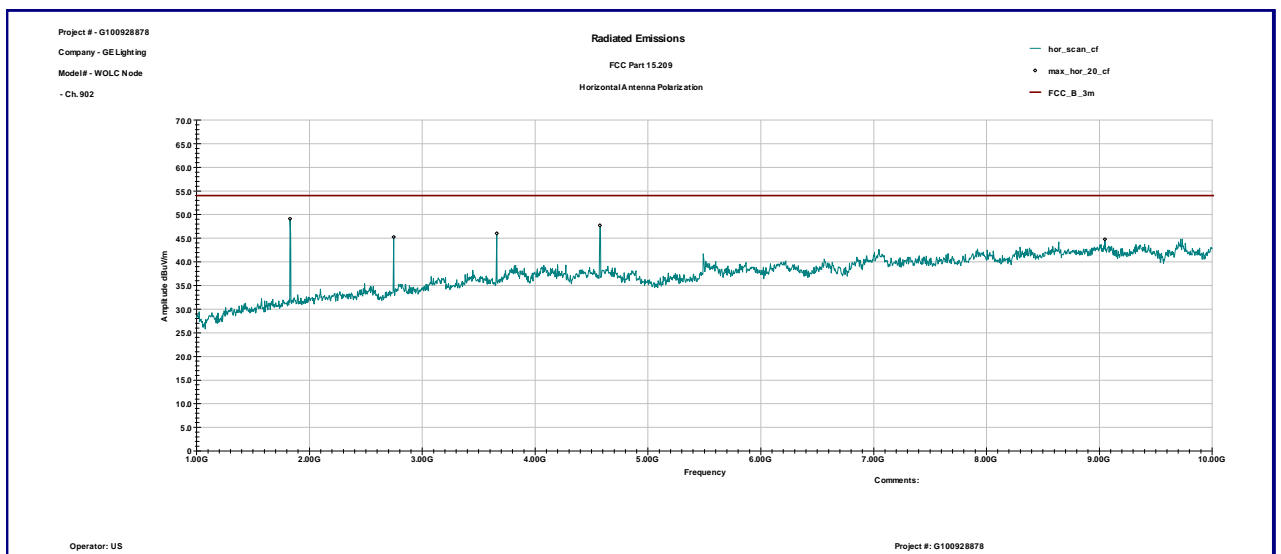
Graph 3.7.1



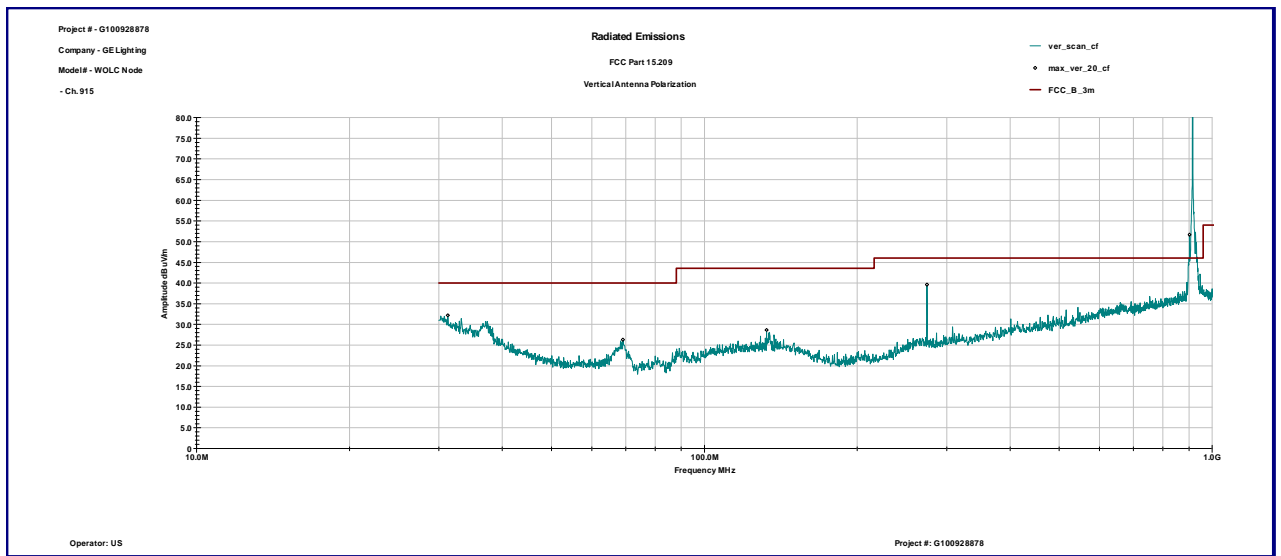
Graph 3.7.2



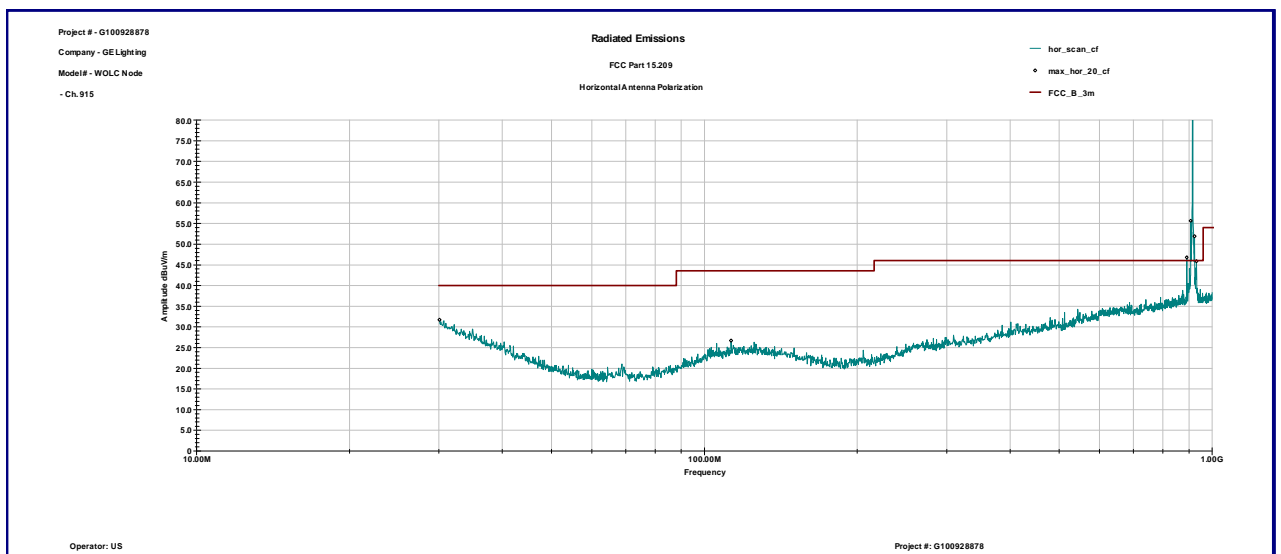
Graph 3.7.3



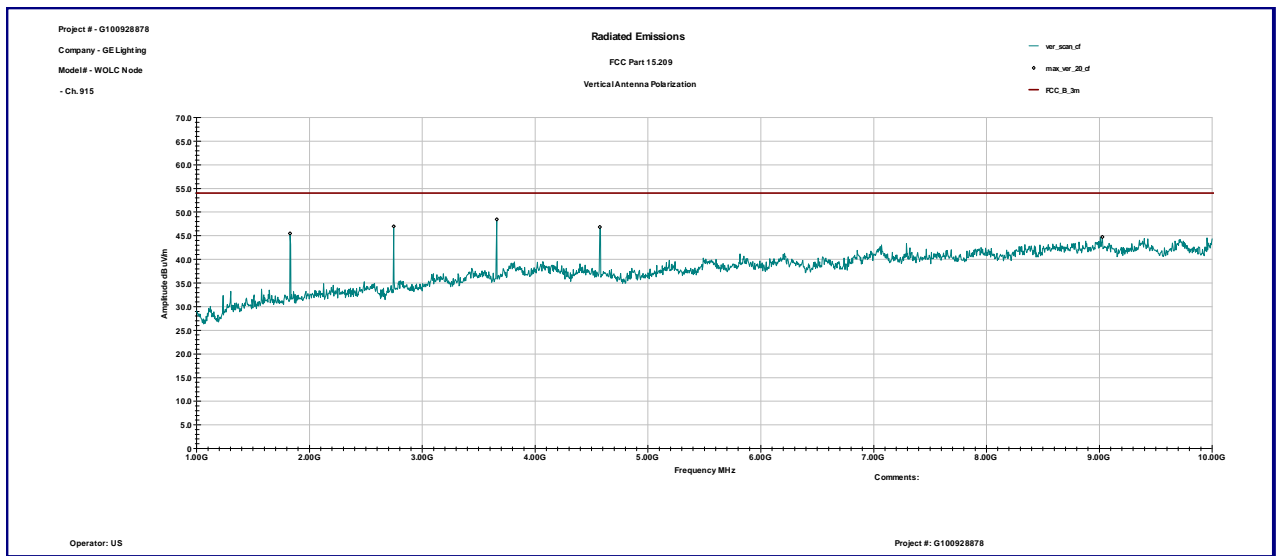
Graph 3.7.4



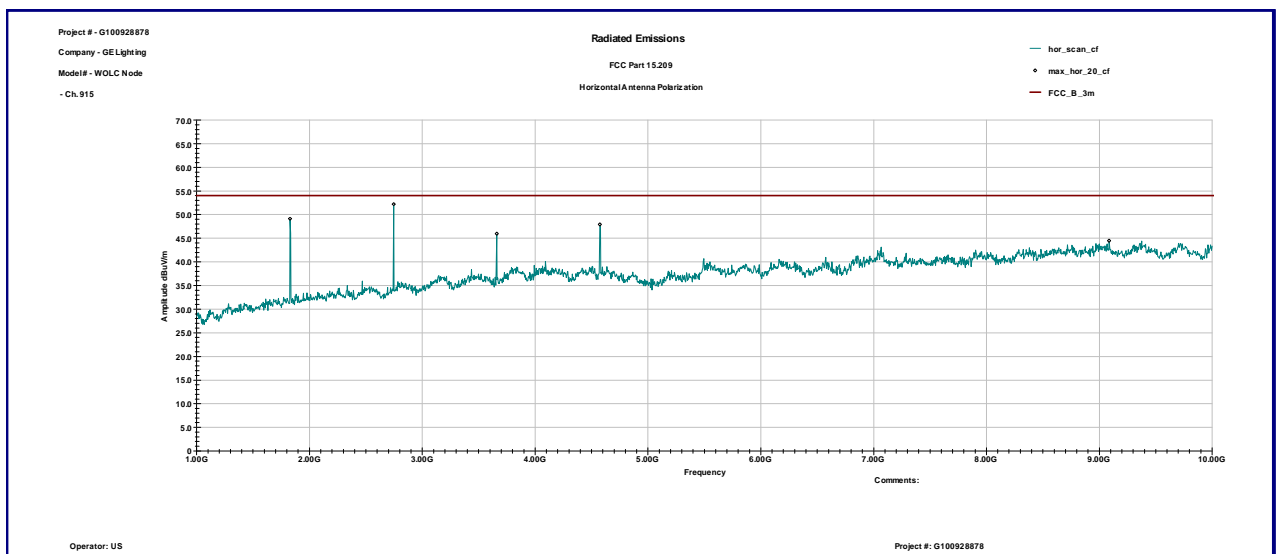
Graph 3.7.5



Graph 3.7.6

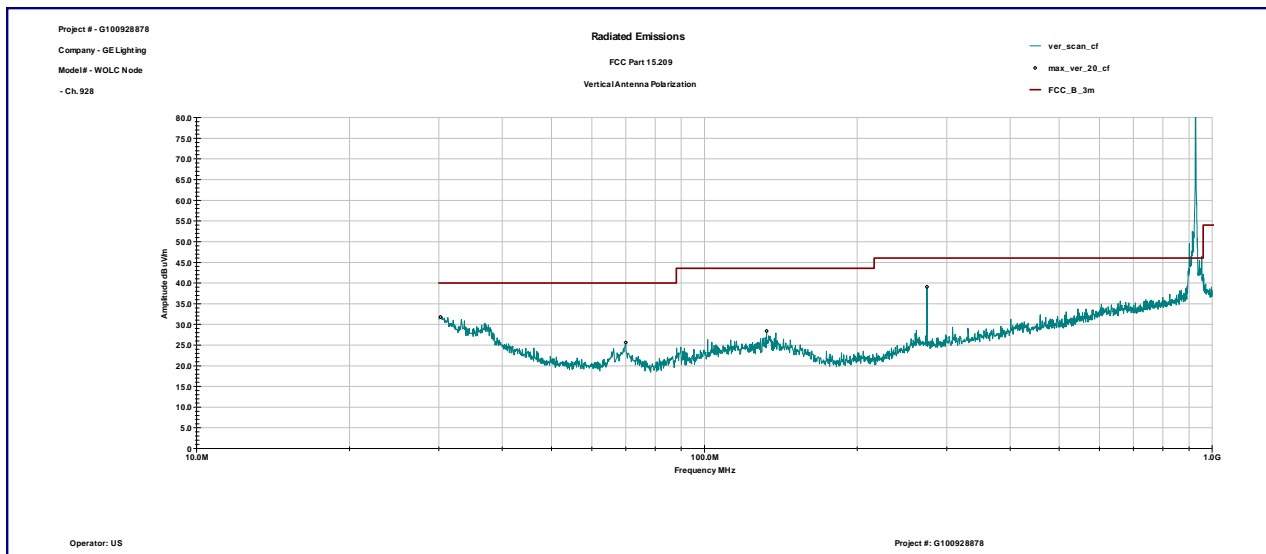


Graph 3.7.7

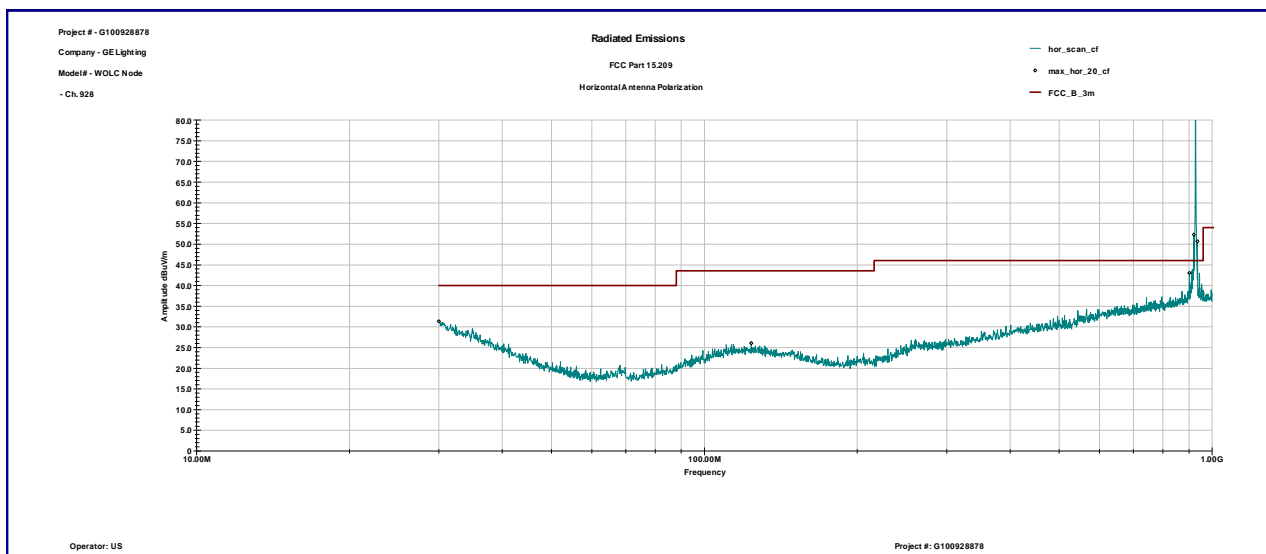


Graph 3.7.8

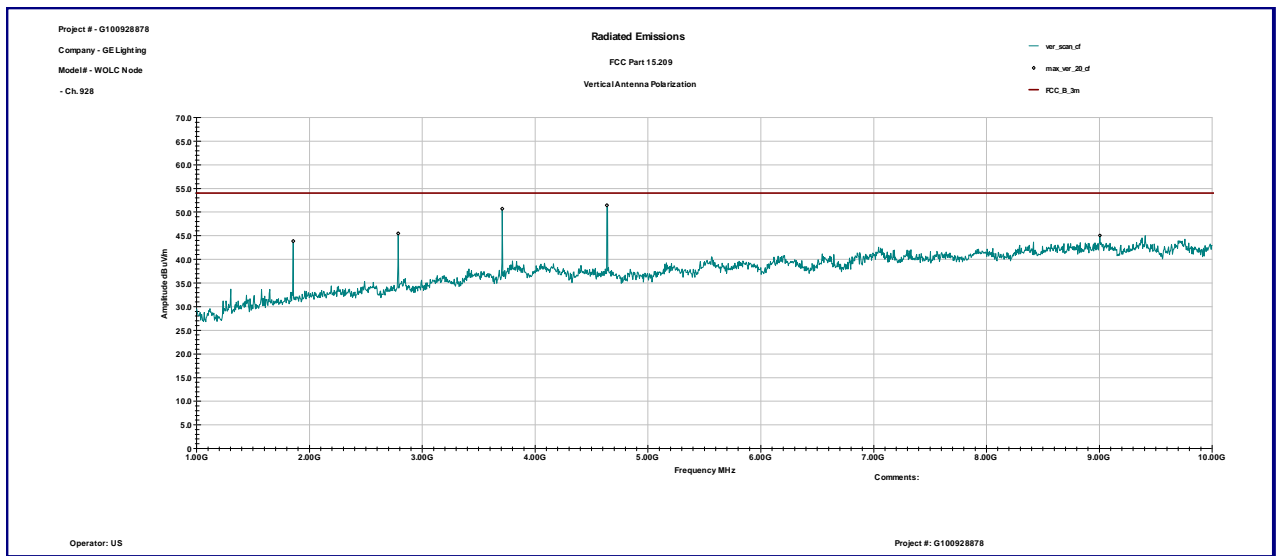




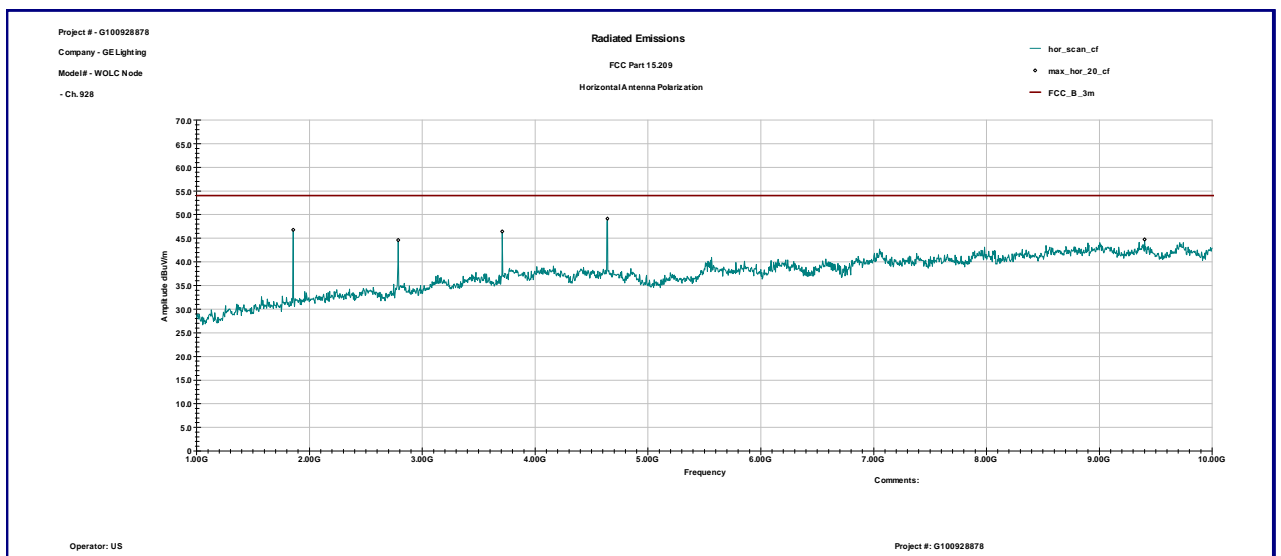
Graph 3.7.9



Graph 3.7.10



Graph 3.7.11



Graph 3.7.12



### 3.8 RF Exposure Compliance

The maximum measured antenna conducted power, P is 19dBm

The antenna gain, G is 2dBi

The maximum EIRP power = P + G  
ERP = 19+ 2= 21dBm, or 0.126W

The limits for Maximum Permissible Exposure (MPE) for transmitter operating at 902-928MHz, MPE is  
 $928/1500 = 0.619\text{mW/cm}^2$ , or  $6.2\text{W/m}^2$

The Power Density, S is related to EIRP with the equation:

$S = \text{EIRP} / 4\pi D^2$ , where D is the safe separation distance and = 0.2m, or 20cm

$S = 0.128 / 4\pi 0.2^2$ ,

$S = 0.254\text{mW/cm}^2$ , or below the Maximum Permissible Exposure (MPE) of  $6.2\text{W/m}^2$





<b>Date:</b>	December 13, 2012	<b>Result: Pass</b>
<b>Tested by:</b>	Uri Spector	
<b>Standard:</b>	FCC Part 15.207	
<b>Test Point:</b>	AC Power Line	
<b>Operation mode:</b>	See page 5	
<b>Note:</b>	None	

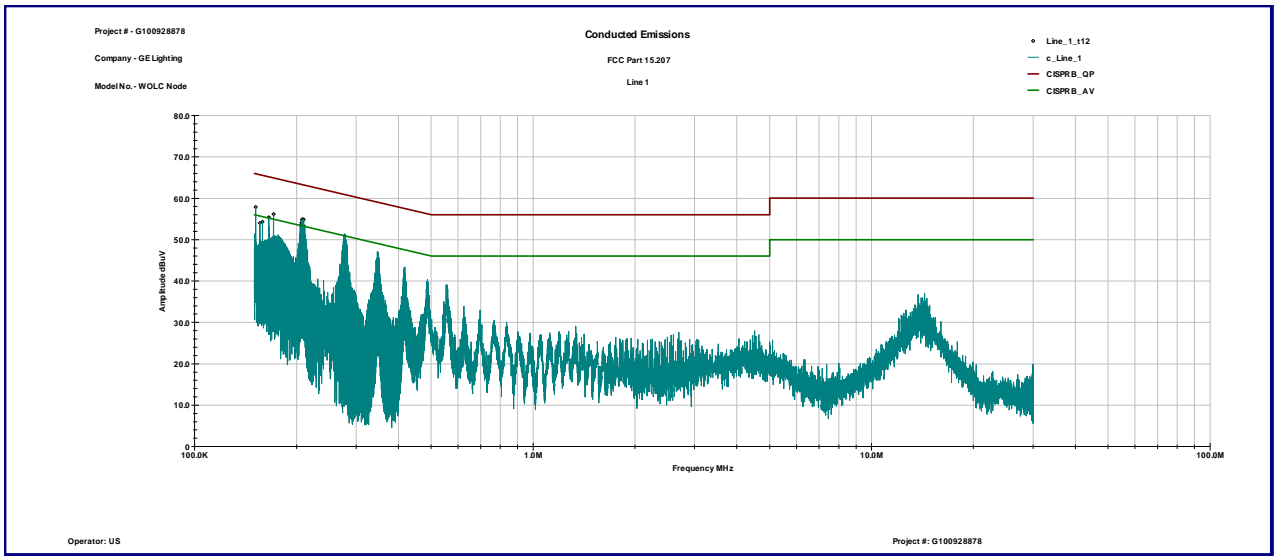
**Table 3.9.1**

**Line 1**

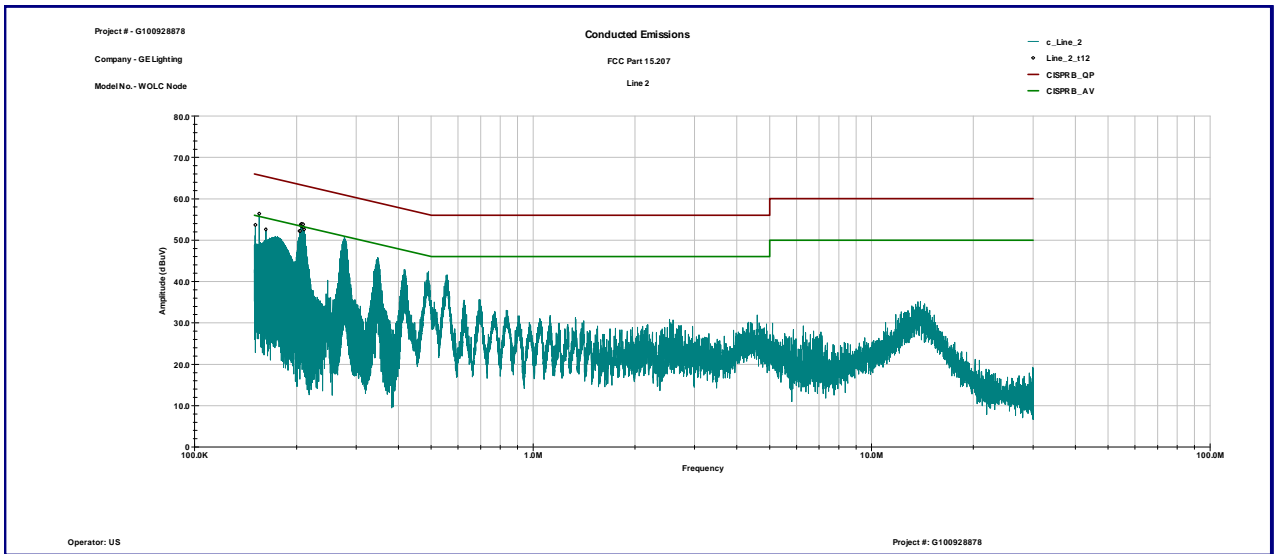
Frequency MHz	QP dB $\mu$ V	AVG dB $\mu$ V	Cable Loss dB	QP Lim dB $\mu$ V	AVG Lim dB $\mu$ V	QP Margin dB	AVG Margin dB
0.151	47.0	28.0	0.1	65.9	55.9	-18.9	-27.9
0.171	44.2	24.5	0.1	64.9	54.9	-20.6	-30.3
0.210	52.0	34.0	0.1	63.2	53.2	-11.1	-19.1
0.279	48.0	29.1	0.1	60.8	50.8	-12.7	-21.6
0.348	42.9	25.1	0.1	59.0	49.0	-16.0	-23.8
0.418	38.9	24.0	0.1	57.5	47.5	-18.4	-23.3

**Line 2**

Frequency MHz	QP dB $\mu$ V	AVG dB $\mu$ V	Cable Loss dB	QP Lim dB $\mu$ V	AVG Lim dB $\mu$ V	QP Margin dB	AVG Margin dB
0.155	43.8	26.0	0.1	65.7	55.7	-21.8	-29.6
0.207	51.7	33.0	0.1	63.3	53.3	-11.5	-20.2
0.276	47.6	32.0	0.1	60.9	50.9	-13.2	-18.8
0.348	41.5	26.3	0.1	59.0	49.0	-17.4	-22.6
0.417	39.0	28.0	0.1	57.5	47.5	-18.4	-19.4
0.557	37.7	30.8	0.2	56.0	46.0	-18.1	-15.0



Graph 3.9.1



Graph 3.9.2





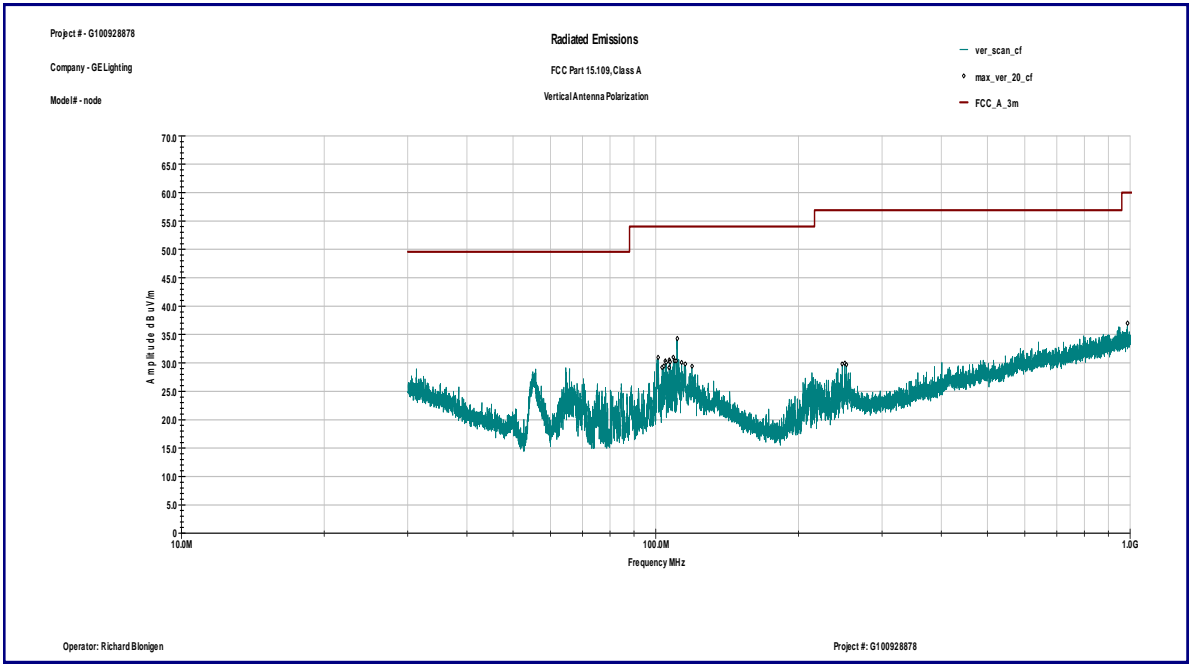
<b>Date:</b>	July 15, 2013	<b>Result: Pass</b>
<b>Tested by:</b>	Richard Blonigen	
<b>Standard:</b>	FCC Part 15.109, Class A	
<b>Test Point:</b>	Enclosure	
<b>Operation mode:</b>	See page 5	
<b>Note:</b>	None	

**Table 3.10.1**

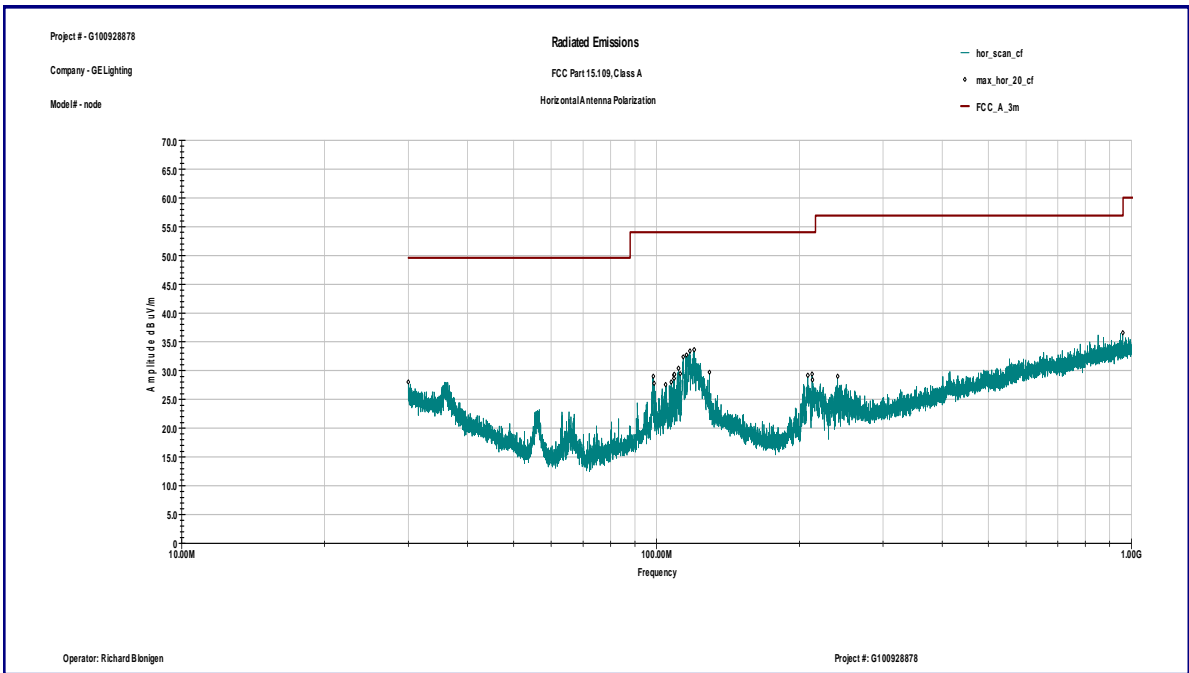
Frequency	Ant. Polarity	Peak Reading dB $\mu$ V	Total C.F. dB1/m	Total at 3m dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB
101.14 MHz	V	18.4	12.6	31.0	54.0	-23.0
103.14 MHz	V	16.4	12.8	29.2	54.0	-24.8
103.96 MHz	V	16.5	12.9	29.4	54.0	-24.6
104.74 MHz	V	17.3	13.0	30.3	54.0	-23.7
108.85 MHz	V	17.5	13.5	31.0	54.0	-23.0
109.45 MHz	V	16.8	13.5	30.4	54.0	-23.6
110.32 MHz	V	16.8	13.6	30.3	54.0	-23.6
111.01 MHz	V	20.7	13.6	34.3	54.0	-19.7
113.35 MHz	V	16.4	13.7	30.1	54.0	-23.9
30.012 MHz	H	7.7	20.3	28.0	49.5	-21.5
111.23 MHz	H	16.8	13.6	30.4	54.0	-23.6
113.79 MHz	H	18.7	13.7	32.4	54.0	-21.6
115.66 MHz	H	19.0	13.7	32.7	54.0	-21.3
117.58 MHz	H	19.6	13.8	33.4	54.0	-20.6
120.02 MHz	H	19.7	13.9	33.6	54.0	-20.4
959.4 MHz	H	10.7	25.9	36.5	56.9	-20.4

Frequency MHz	Antenna Polarity	Peak Reading dB $\mu$ V	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB
4.645 GHz	V	40.6	37.0	39.3	38.2	60.0	-21.8
2.458 GHz	H	47.4	31.4	40.4	38.4	60.0	-21.7
2.462 GHz	H	46.5	31.4	40.4	37.5	60.0	-22.5
2.466 GHz	H	49.3	31.4	40.4	40.4	60.0	-19.7
2.489 GHz	H	49.8	31.5	40.3	41.0	60.0	-19.0
4.65 GHz	H	40.4	36.9	39.3	38.0	60.0	-22.1

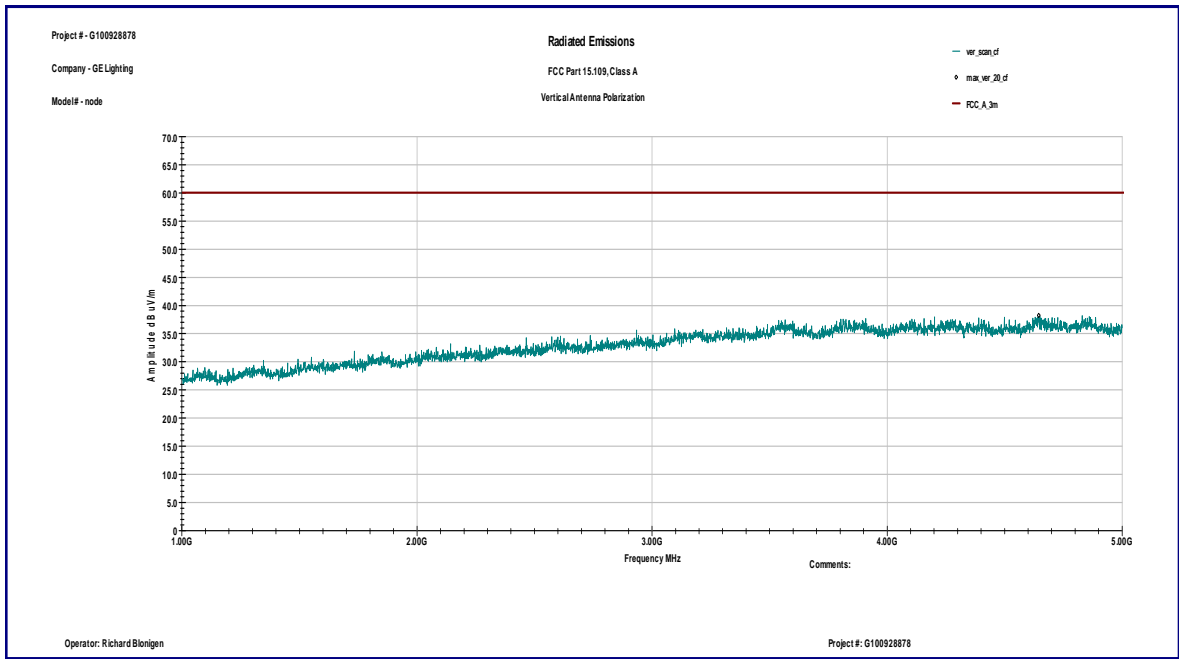




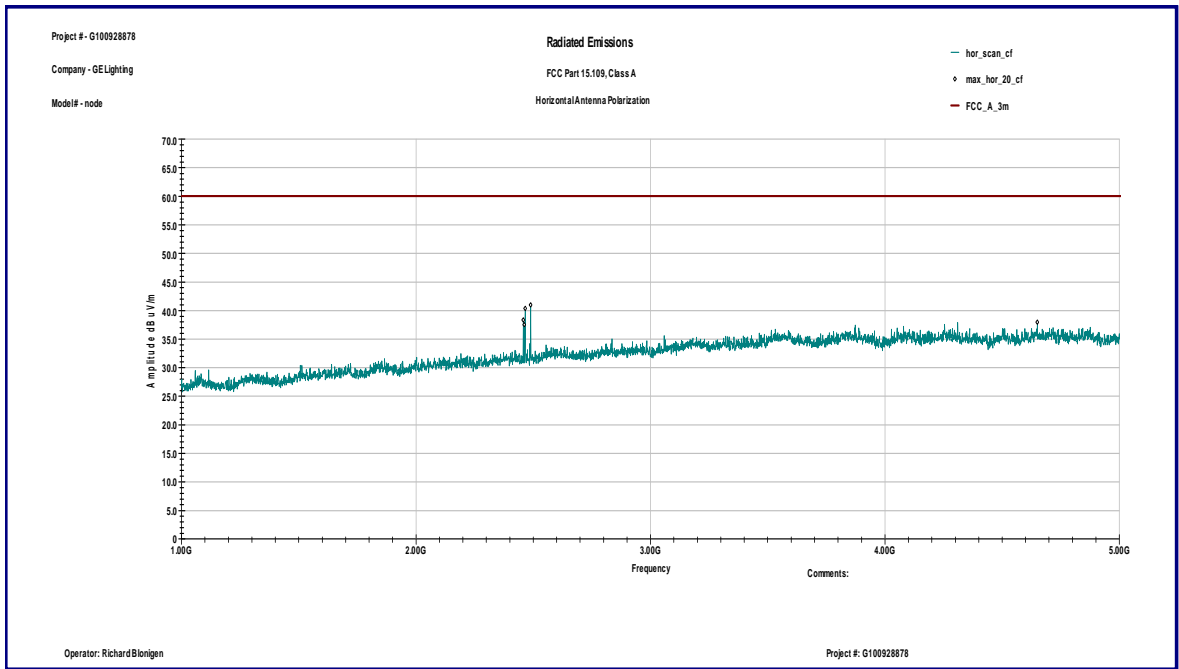
Graph 3.10.1



Graph 3.10.2



Graph 3.10.3



Graph 3.10.4





<b>Date:</b>	July 15, 2013	<b>Result: Pass</b>
<b>Tested by:</b>	Richard Blonigen	
<b>Standard:</b>	FCC Part 15.107, Class A	
<b>Test Point:</b>	Line 1 and Line 2	
<b>Operation mode:</b>	See page 5	
<b>Note:</b>	None	

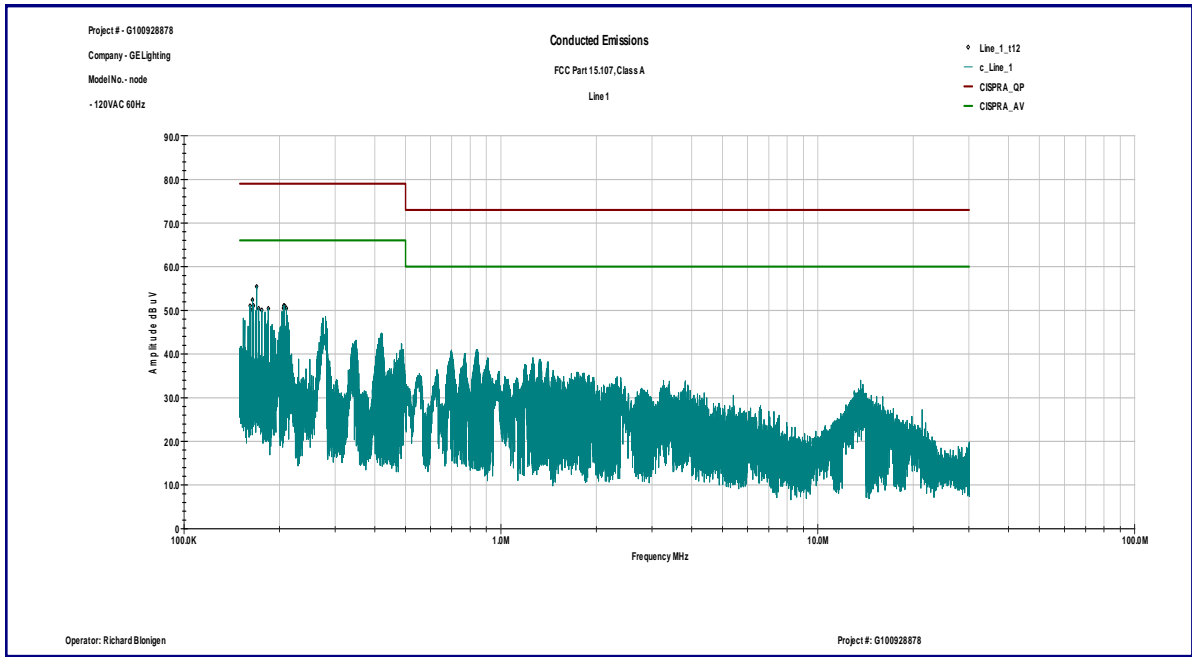
**Table 3.11.1**

**Line 1**

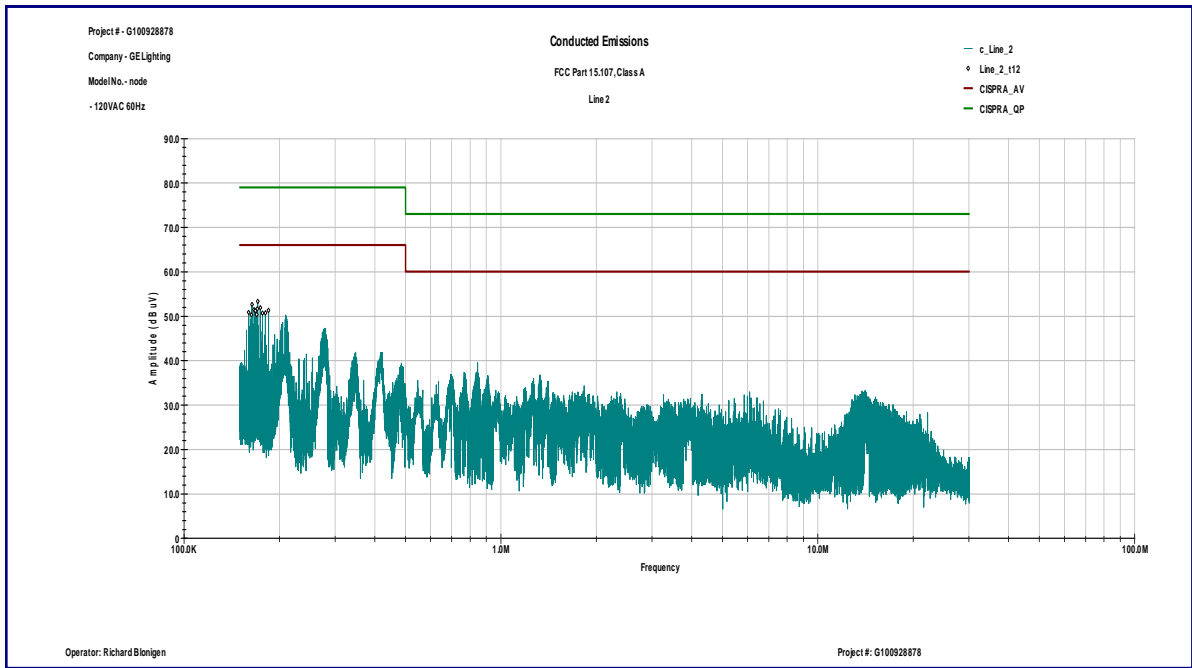
Frequency	Peak dB $\mu$ V	QP Limit dB $\mu$ V	AVG Limit dB $\mu$ V	QP Margin dB	AVG Margin dB
161.81 KHz	51.0	79.0	66.0	-28.0	-15.0
164.37 KHz	50.1	79.0	66.0	-28.9	-15.9
164.6 KHz	52.4	79.0	66.0	-26.6	-13.6
165.69 KHz	51.1	79.0	66.0	-27.9	-14.9
169.57 KHz	55.4	79.0	66.0	-23.6	-10.6
172.14 KHz	50.4	79.0	66.0	-28.6	-15.6
176.06 KHz	50.0	79.0	66.0	-29.0	-16.0
184.68 KHz	50.4	79.0	66.0	-28.6	-15.6
206.25 KHz	50.5	79.0	66.0	-28.5	-15.5
206.59 KHz	51.1	79.0	66.0	-27.9	-14.9
207.91 KHz	51.0	79.0	66.0	-28.0	-15.0
210.6 KHz	50.5	79.0	66.0	-28.6	-15.6

**Line 2**

Frequency	Peak dB $\mu$ V	QP Limit dBmV	AVG Limit dBmV	QP Margin dB	AVG Margin dB
160.1 KHz	50.9	79.0	66.0	-28.2	-15.2
163.24 KHz	50.3	79.0	66.0	-28.7	-15.7
163.98 KHz	52.6	79.0	66.0	-26.4	-13.4
166.55 KHz	51.5	79.0	66.0	-27.5	-14.5
167.83 KHz	51.2	79.0	66.0	-27.8	-14.8
169.73 KHz	50.4	79.0	66.0	-28.6	-15.6
170.43 KHz	51.7	79.0	66.0	-27.3	-14.3
171.01 KHz	53.3	79.0	66.0	-25.7	-12.7
174.31 KHz	51.9	79.0	66.0	-27.1	-14.1
176.95 KHz	50.7	79.0	66.0	-28.3	-15.3
180.88 KHz	50.7	79.0	66.0	-28.3	-15.3
184.8 KHz	51.3	79.0	66.0	-27.7	-14.7



Graph 3.11.1



Graph 3.11.2



#### 4.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	CAL DUE	USED
Spectrum Analyzer	R & S	FSP 40	100024	12559	11/29/2013	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	ESU	100398	25283	12/19/2013	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	ESCI	100358	12909	07/02/2013	<input checked="" type="checkbox"/>
Bicono-Log Antenna	Teseq	CBL6112D	32859	25289	08/09/2013	<input checked="" type="checkbox"/>
Horn Antenna	EMCO	3115	9507-4513	9936	05/16/2013	<input checked="" type="checkbox"/>
Horn Antenna	EMCO	3115	6579	15580	07/19/2013	<input type="checkbox"/>
Waveguide Horn Antenna	EMCO	3116	9904-2423	9705	11/07/2013	<input type="checkbox"/>
LISN	Fischer Custom Communications	FCC-LISN-2 MOD.SD	316	9945	07/17/2013	<input checked="" type="checkbox"/>
LISN	Solar Electronics	9252-50-R-24-BNC	068545	MIN-0060	02/07/2014	<input checked="" type="checkbox"/>
System	Quantum Change	TILE! Instrument Control	Ver. 3.4.K.29	15259	VBU	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	ESU	100398	25283	12/19/2013	<input checked="" type="checkbox"/>