



FCC ID: MG3-9900

Test Report #: 4198-1
02/29/2016

EMI TEST REPORT

FCC Part 15 Subpart C (§15.247) – Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

Prepared For:

Universal Electronics, Inc.
201 East Sandpointe Ave, 8th Floor
Santa Ana, CA 92707

Product Name :
EVA BLE Remote Control and QuickSet

Model Name :
URC-9900BC1-001-R

FCC ID : MG3-9900

Application Purpose :
Original

Prepared by:

EMCE Engineering, Inc.
44366 S. Grimmer Blvd.,
Fremont, CA 94538 US

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FCC ID: MG3-9900

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02/29/2016

Revision History

Rev.	Issue Date	Description
1	02/29/2016	Initial Issue



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1.0 GENERAL INFORMATION

Test Laboratory:	EMCE Engineering 44366 S. Grimmer Blvd. Fremont, CA 94538 USA Tel : 510-490-4307, Fax : 510-490-3441 bob@universalcompliance.com
	FCC registration number : 743299
	Test Site : FCC : US5291, IC : 3324A
Applicant Name :	Universal Electronics, Inc. 201 East Sandpointe Ave, 8th Floor Santa Ana, CA 92707
	Contact Person: Jesse Mendez
Application Purpose :	Original
EUT Description	Bluetooth Low Energy Remote
Product Name	EVA BLE Remote Control and QuickSet
Model Name :	URC-9900BC1-001-R
Applied Standards :	FCC 47 CFR §15.209, §15.247
FCC ID :	MG3-9900
IC :	N/A
RF Operating Frequency (ies)	2402 – 2480 MHz
Modulation	GFSK
Emission Designator	1M00F1D
Receipt of EUT :	2/21/2016
Date of Testing :	02/22/2016 – 02/25/2016
Date of Report :	02/29/2016

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

Contents approved:


Name: Bob Cole Title: President



2.0 EUT AND ACCESSORY INFORMATION

<i>EUT</i>				
<i>FCC ID</i>	MG3-9900			
<i>Product Name</i>	EVA BLE Remote Control and QuickSet			
<i>Model name</i>	URC-9900BC1-001-R			
<i>Frequency Range</i>	TX : 2402 – 2480 MHz RX : 2402 – 2480 MHz			
<i>Max. RF Output Power</i>	Peak : -1.49 dBm (0.7096 mW)			
<i>Operating Mode</i>	Bluetooth Low Energy (BLE)			
<i>Modulation Type</i>	GFSK			
<i>Number of Channels</i>	40 Channels			
<i>Manufacturer</i>	Universal Electronics, Inc.			
<i>Power Source</i>	Battery			
<i>Antenna Specification</i>	Printed Strip Antenna - Dipole: Gain = -1.2 dB			
<i>Support Equipment</i>				
<i>Description</i>	<i>Model Number</i>	<i>Serial Number</i>	<i>Manufacturer</i>	<i>Power Cable Description</i>
NONE				
<i>Cable Description</i>				
<i>From</i>	<i>To</i>	<i>Length (Meters)</i>	<i>Shielded (Y/N)</i>	<i>Ferrite Loaded (Y/N)</i>
NONE				



FCC ID: MG3-9900

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4.0 MODIFICATIONS

There were no modifications.



5.0 TEST RESULTS

5.1 CONDUCTED SPURIOUS EMISSIONS

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

TEST RESULTS – 2402 MHz Xmit Frequency

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 •

Customer:	UEI	Date:	2/22/2016
Specification:	EN 300 328 30-26000 Spurious	Time:	3:14:12 PM
Work Order #:	4198	Sequence#:	4
Test Type:	Conducted Emissions	Tested By:	Bob Cole
Equipment:	EVA BLE Remote Control	Battery	
Manufacturer:	Universal Electronics, Inc.		
Model:	URC-9900BC1-001-R		
S/N:	N/A		

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Remote Control*	Universal Electronics, Inc.	URC-9900BC1-001-R	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

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Transducer Legend:

T1=dBuV - dBm conversion

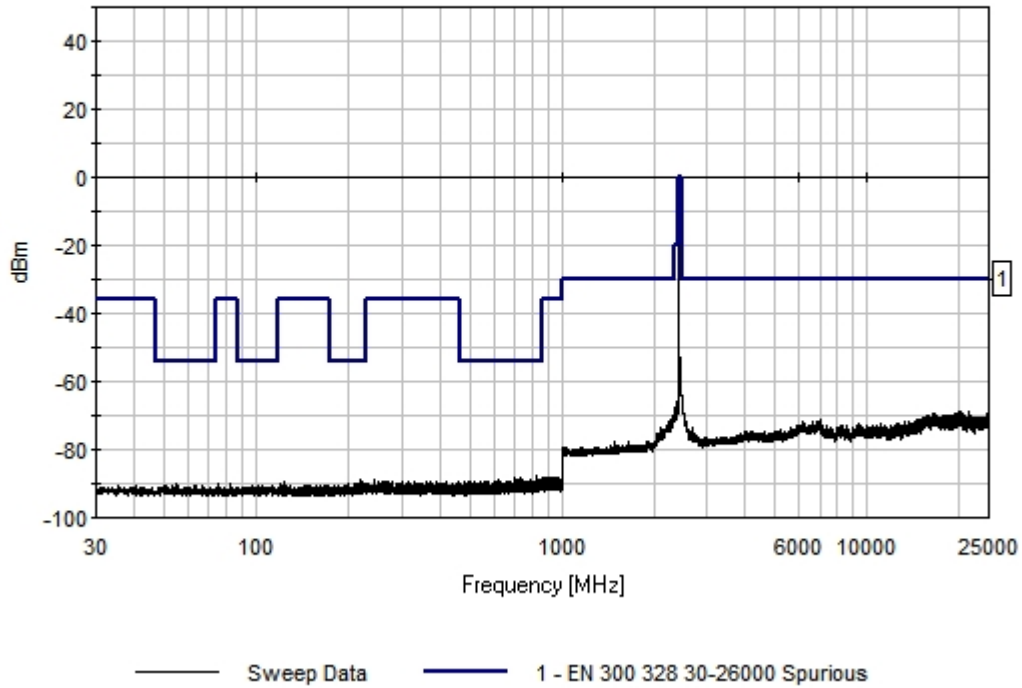
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: Antenna

#	Freq MHz	Rdng dBμV	T1 dB	dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
2	2350.301M	39.2	-107.0				+0.0	-67.8	-30.0	-37.8	Anten
3	2507.214M	39.0	-107.0				+0.0	-68.0	-30.0	-38.0	Anten
4	2290.982M	36.5	-107.0				+0.0	-70.5	-30.0	-40.5	Anten
5	7005.210M	35.7	-107.0				+0.0	-71.3	-30.0	-41.3	Anten



EMCE Engineering Date: 2/22/2016 Time: 3:14:12 PM UEI WO#: 4198
EN 300 328 30-26000 Spurious Test Lead: Antenna Battery Sequence#: 4 Ext ATTN: 0 dB





TEST RESULTS – 2442 MHz Xmit Frequency

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 •

Customer: **UEI**
 Specification: **EN 300 328 30-26000 Spurious**
 Work Order #: **4198** Date: 2/22/2016
 Test Type: **Conducted Emissions** Time: 2:56:51 PM
 Equipment: **EVA BLE Remote Control** Sequence#: 3
 Manufacturer: Universal Electronics, Inc. Tested By: Bob Cole
 Model: URC-9900BC1-001-R Battery
 S/N: N/A

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Remote Control*	Universal Electronics, Inc.	URC-9900BC1-001-R	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

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Transducer Legend:

T1=dBuV - dBm conversion

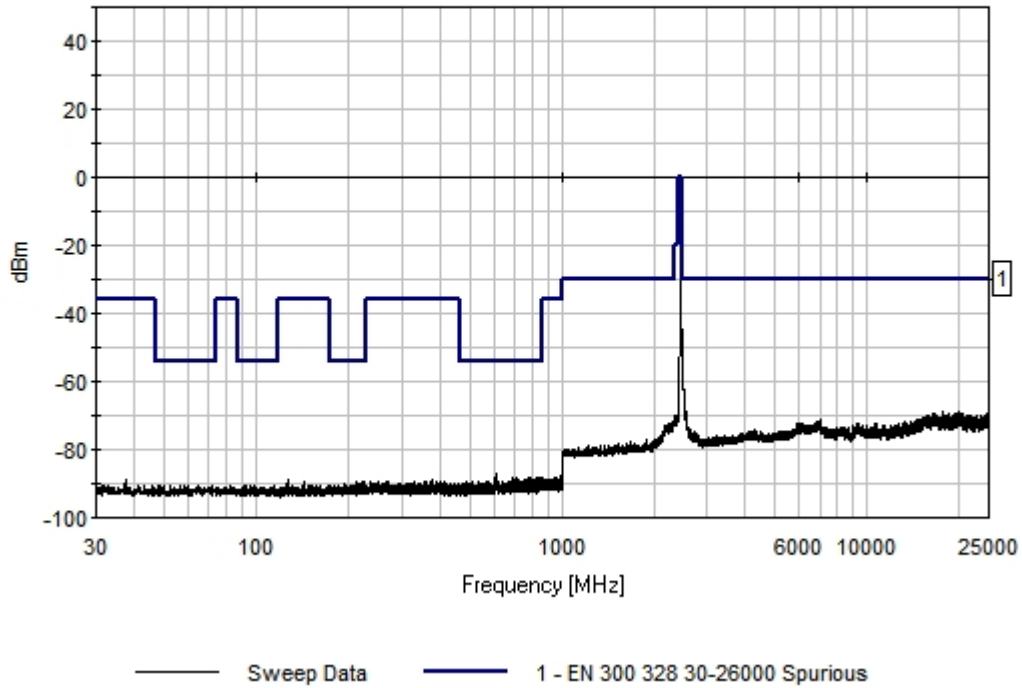
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: Antenna

#	Freq MHz	Rdng dBµV	T1 dB	Reading listed by margin.			Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
2	2502.204M	47.7	-107.0				+0.0	-59.3	-29.4	-29.9	Anten
3	2345.491M	37.2	-107.0				+0.0	-69.8	-30.0	-39.8	Anten



EMCE Engineering Date: 2/22/2016 Time: 2:56:51 PM UEI WO#: 4198
EN 300 328 30-26000 Spurious Test Lead: Antenna Battery Sequence#: 3 Ext ATTN: 0 dB





TEST RESULTS – 2480 MHz Xmit Frequency

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 •

Customer: **UEI**
 Specification: **EN 300 328 30-26000 Spurious**
 Work Order #: **4198** Date: 2/22/2016
 Test Type: **Conducted Emissions** Time: 2:27:37 PM
 Equipment: **EVA BLE Remote Control** Sequence#: 2
 Manufacturer: Universal Electronics, Inc. Tested By: Bob Cole
 Model: URC-9900BC1-001-R Battery
 S/N: N/A

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Remote Control*	Universal Electronics, Inc.	URC-9900BC1-001-R	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

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Transducer Legend:

T1=dBuV - dBm conversion

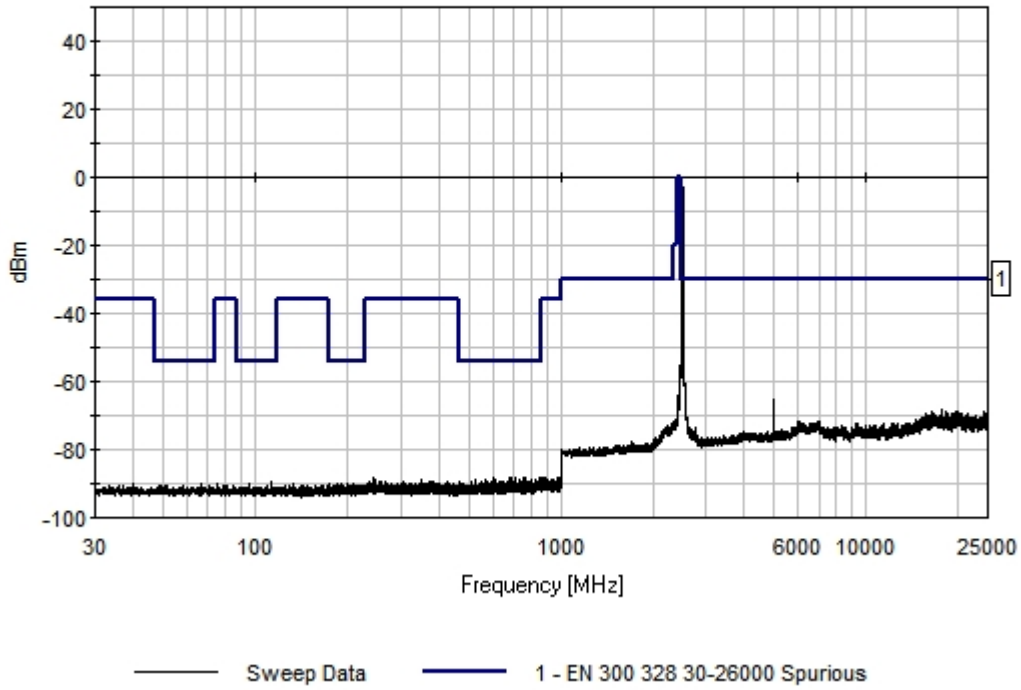
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: Antenna

#	Freq MHz	Rdng dBµV	T1 dB	Dist dB	Corr dB	Spec dBm	Margin dB	Polar Ant
2	4980.164M	41.8	-107.0	+0.0	-65.2	-30.0	-35.2	Anten



EMCE Engineering Date: 2/22/2016 Time: 2:27:37 PM UEI WO#: 4198
EN 300 328 30-26000 Spurious Test Lead: Antenna Battery Sequence#: 2 Ext ATTN: 0 dB





5.2 6 dB BANDWIDTH

LIMIT

§15.247(2)

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

- The transmitter output is connected to the spectrum analyzer
- The RBW is set to 100KHz. The VBW is set to 100KHz. The sweep time is coupled.
- Signal Peak is detected
- Bandwidth is determined at the points 6 dB down from the peak value of the modulated carrier.

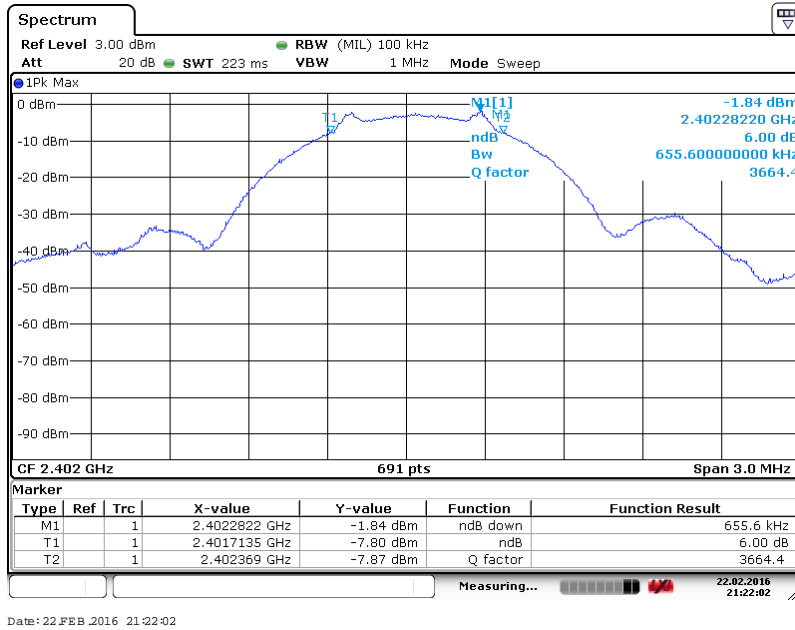
RESULTS

NO non-compliance noted.

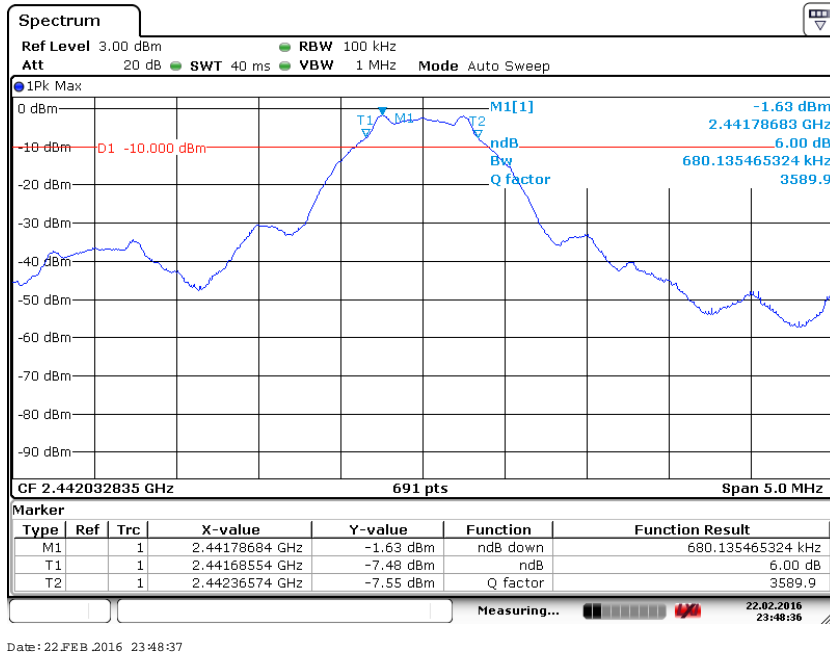
Operating Frequency (MHz)	6dB Bandwidth (KHz)	Limit (KHz)	Result
2402	655	>500	PASS
2442	680	>500	PASS
2480	680	>500	PASS



2402 MHz

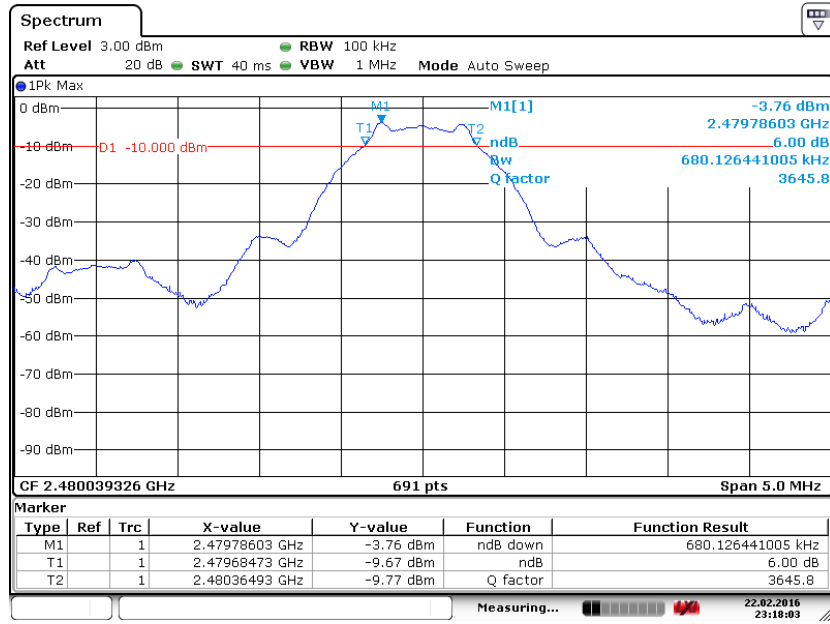


2442 MHz





2480 MHz



Date: 22.FEB.2016 23:18:03



5.3 CONDUCTED MAXIMUM PEAK OUTPUT POWER

LIMIT

§15.247(d)

1 Watt / 30dBm / 137 dBuV (50 Ohms conversion)

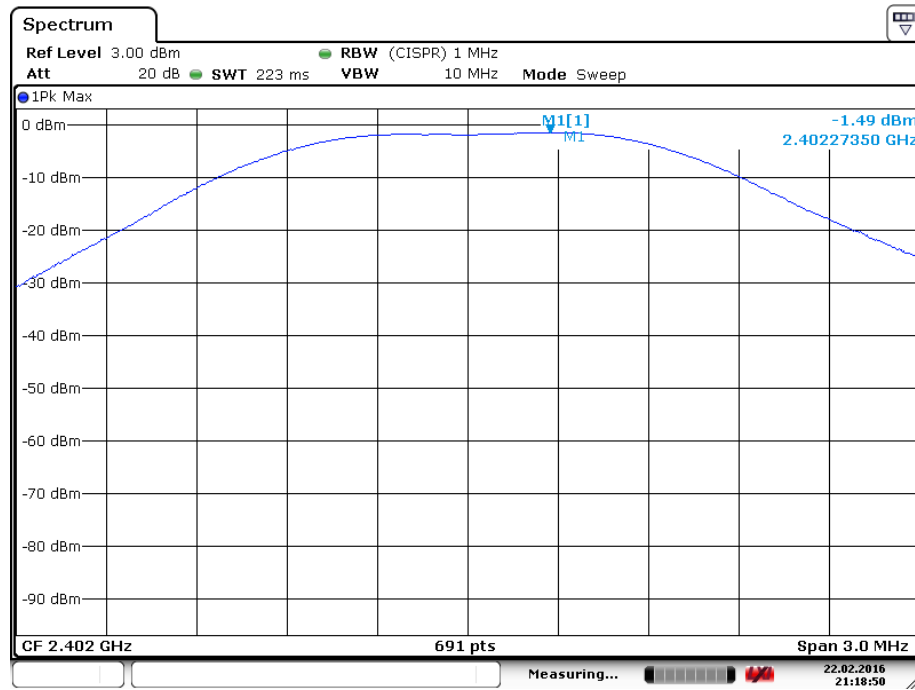
TEST PROCEDURE

The transmitter output to the antenna is connected to a spectrum analyzer. The RBW / VBW is set to 1. The sweep time is coupled and the span is set to 5 MHz.

Peak Output Power

Frequency (MHz)	Peak Output Power(dBm)	Limit (dBm)	Results
2402	-1.49	20	PASS
2442	-1.52	20	PASS
2480	-3.15	20	PASS

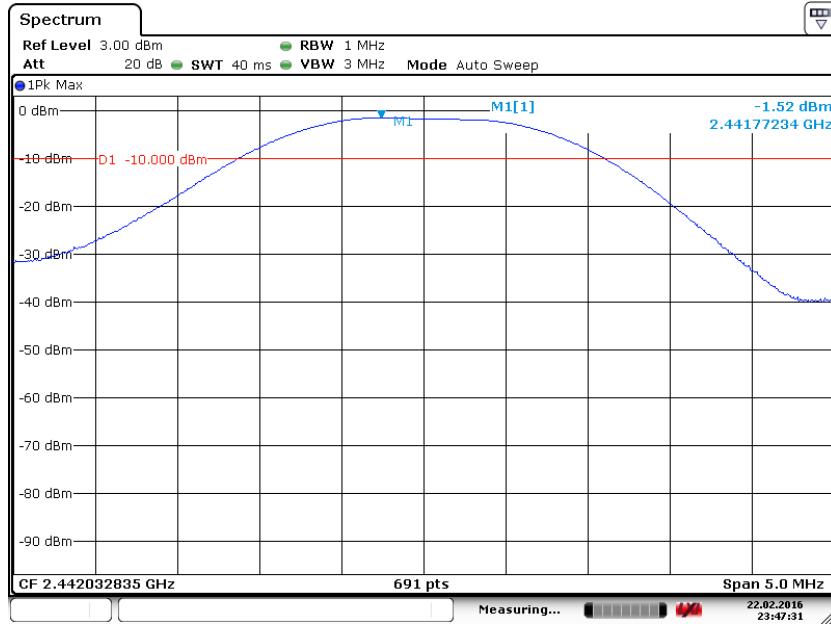
2402 MHz



Date: 22.FEB.2016 21:18:50

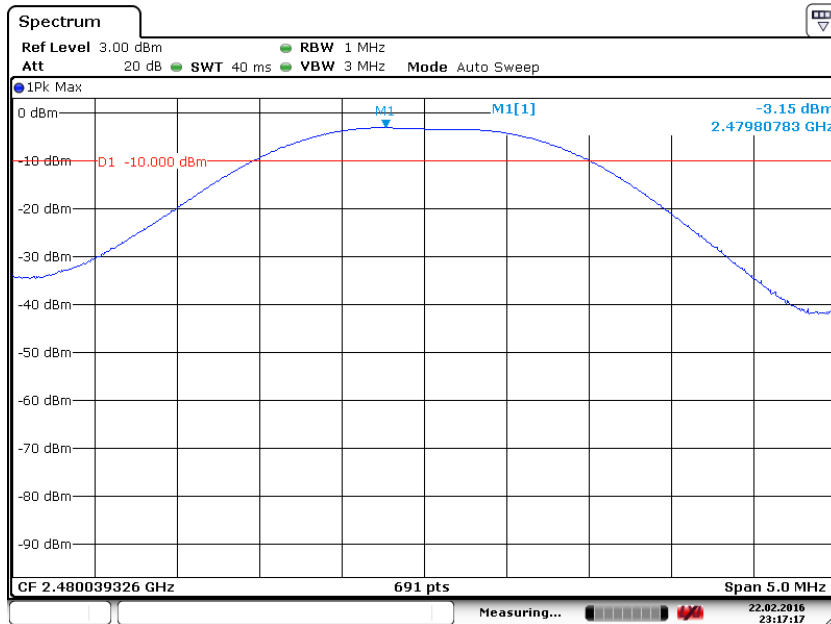


2442 MHz



Date: 22.FEB.2016 23:47:31

2480 MHz



Date: 22.FEB.2016 23:17:18



5.4 POWER SPECTRAL DENSITY

LIMIT

§15.247 (e)

8 dBm

TEST PROCEDURE

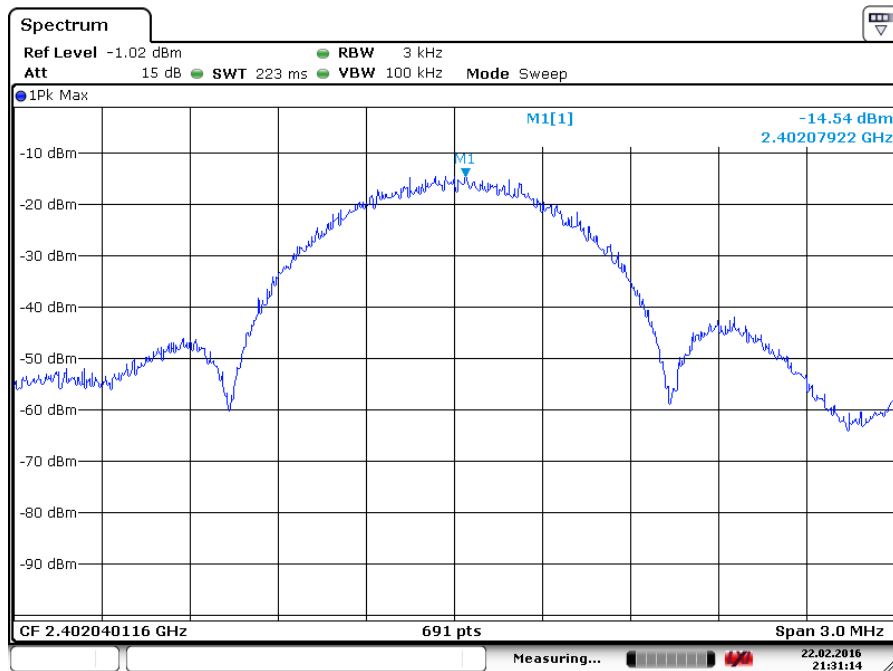
The transmitter antenna output is connected to a spectrum analyzer. The RBW is set to 3 KHz and the VBW is set to 10 KHz .

RESULTS

NO non-compliance noted.

Frequency (MHz)	PSD (dBm)	Limit (dBm)	Result
2402	-14.54	8.0	PASS
2442	-13.19	8.0	PASS
2480	-15.40	8.0	PASS

2402 MHz



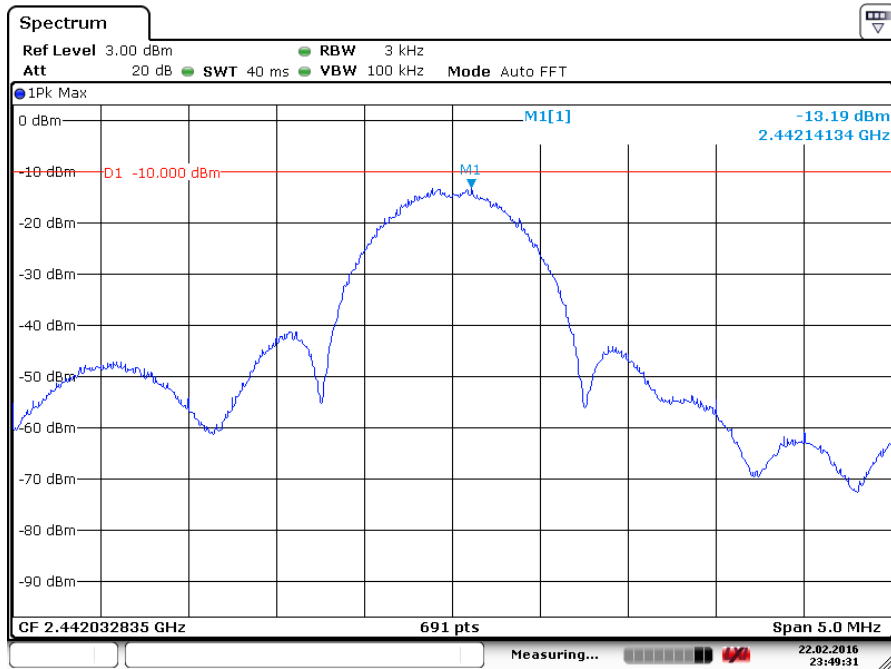
Date: 22 FEB 2016 21:31:15



FCC ID: MG3-9900

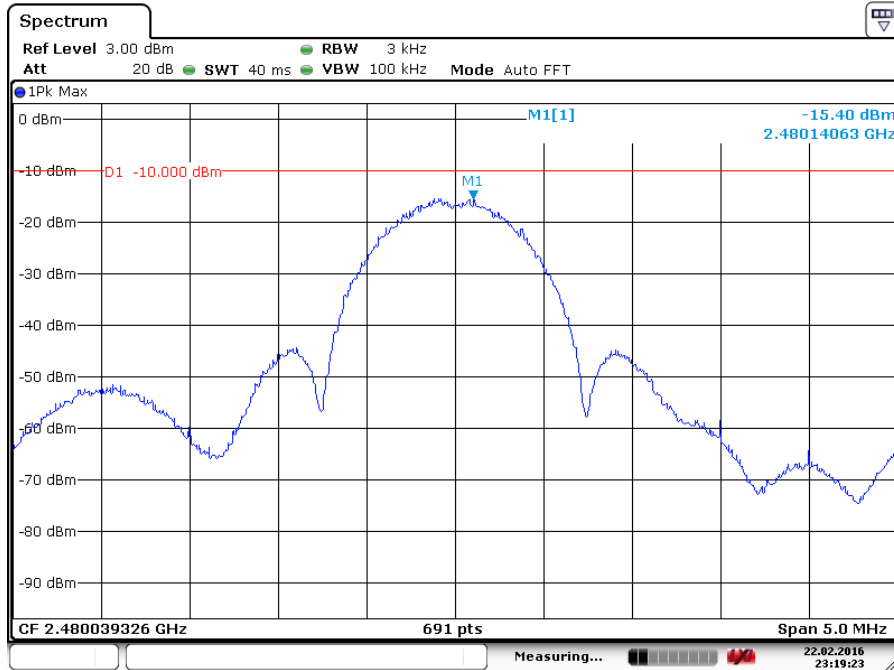
Test Report #: 4198-1
02/29/2016

2442 MHz



Date: 22.FEB.2016 23:49:31

2480 MHz



Date: 22.FEB.2016 23:19:23



5.5 CONDUCTED BANDEDGE

Conducted Bandedge

LIMIT

15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

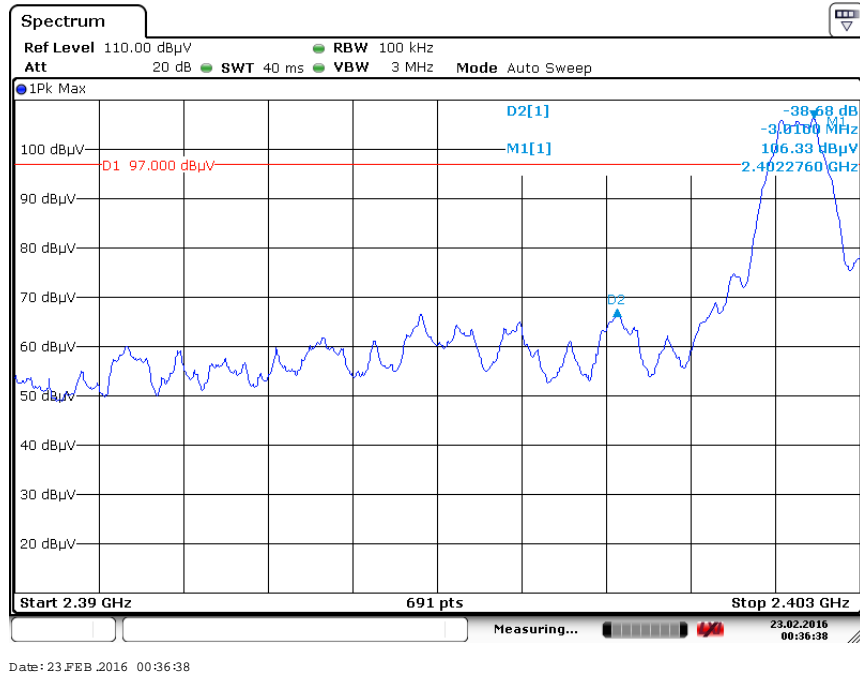
TEST PROCEDURE

Transmitter antenna output connected to spectrum analyzer. Analyzer span is set to show Peak in band, as well as out of band peaks.

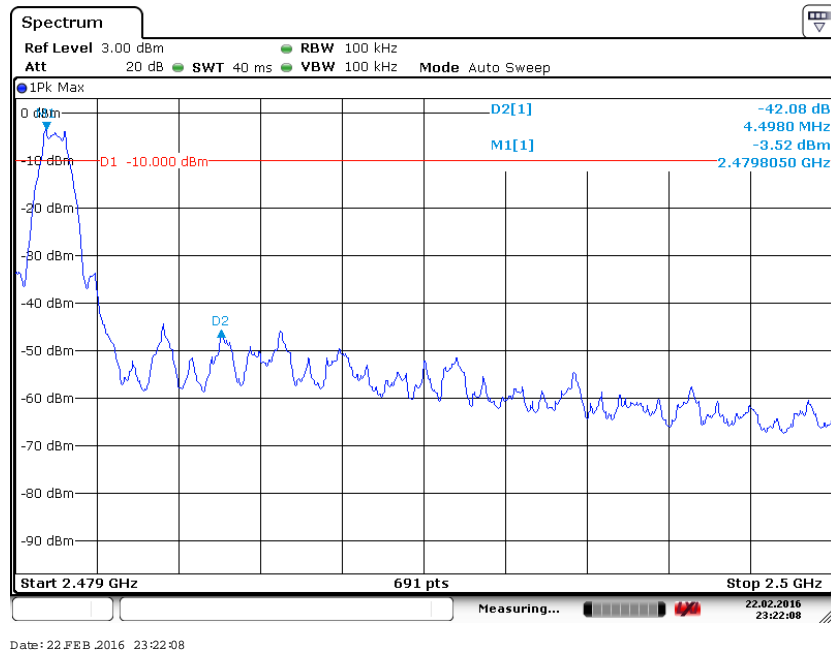
Bandedge Frequency(MHz)	Measured(dBc)	Limit (dBc)	Result
2402	35.6	>20	PASS
2480	42.0	>20	PASS



2400 MHz Bandedge



2483.5 MHz Bandedge





5.6 RADIATED SPURIOUS EMISSIONS – BANDEDGE

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

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			



2402 MHZ Bandedge

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 •

Customer: **UEI**
 Specification: **15.247 2390-2400 ave**
 Work Order #: **4198** Date: 2/23/2016
 Test Type: **Radiated Scan** Time: 11:07:08
 Equipment: **EVA BLE Remote Control** Sequence#: 1
 Manufacturer: Universal Electronics, Inc. Tested By: Bob Cole
 Model: URC-9900BC1-001-R
 S/N: N/A

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Remote Control*	Universal Electronics, Inc.	URC-9900BC1-001-R	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

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Transducer Legend:

T1=25' LMR #001	T2=8449B Preamp
T3=A.H. SAS-200/571 Horn	

Ext Attn: 0 dB

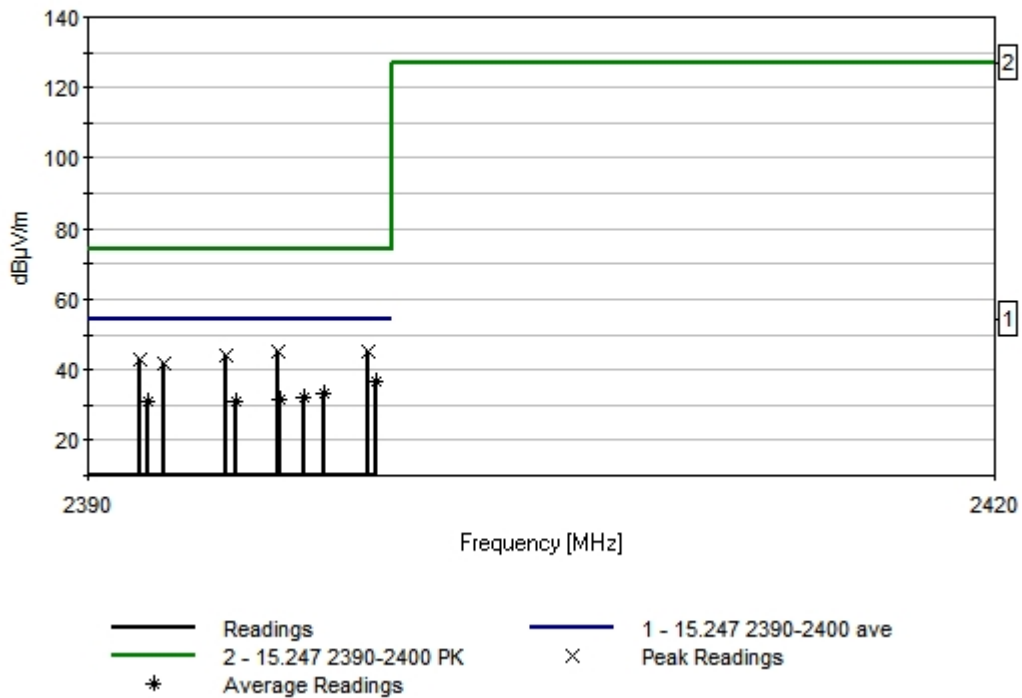
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	Dist Table dB	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	2399.472M	36.2	+1.3	+30.1	+29.2	+0.0	36.6	54.0	-17.4	Vert
	Ave									
2	2397.808M	33.0	+1.3	+30.1	+29.2	+0.0	33.4	54.0	-20.6	Vert
	Ave									
^	2397.750M	45.9	+1.3	+30.1	+29.2	+0.0	46.3	74.0	-27.7	Vert
	Ave									
4	2397.098M	31.8	+1.3	+30.1	+29.1	+0.0	32.1	54.0	-21.9	Vert
	Ave									
5	2396.346M	31.4	+1.3	+30.1	+29.1	+0.0	31.7	54.0	-22.3	Vert
	Ave									
6	2391.975M	30.7	+1.3	+30.1	+29.1	+0.0	31.0	54.0	-23.0	Vert
	Ave									
7	2394.855M	30.7	+1.3	+30.1	+29.1	+0.0	31.0	54.0	-23.0	Vert
	Ave									
8	2396.245M	44.7	+1.3	+30.1	+29.1	+0.0	45.0	74.0	-29.0	Vert
	Ave									
9	2399.240M	44.6	+1.3	+30.1	+29.2	+0.0	45.0	74.0	-29.0	Vert
	Ave									



10	2394.522M	43.7	+1.3	+30.1	+29.1	+0.0	44.0	74.0	-30.0	Vert
11	2391.715M	42.9	+1.3	+30.1	+29.1	+0.0	43.2	74.0	-30.8	Vert
12	2392.525M	41.4	+1.3	+30.1	+29.1	+0.0	41.7	74.0	-32.3	Vert

EMCE Engineering Date: 2/23/2016 Time: 11:07:08 UEIWO#: 4198
15.247 2390-2400 ave Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB





2480 MHz Bandedge

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 •

Customer: **UEI**
 Specification: **15.247 2483.5 - 2500 Average**
 Work Order #: **4198** Date: 2/23/2016
 Test Type: **Radiated Scan** Time: 11:39:08
 Equipment: **Remote Control** Sequence#: 2
 Manufacturer: Universal Electronics, Inc. Tested By: Bob Cole
 Model: EVA BLE
 S/N: N/A

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Remote Control*	Universal Electronics, Inc.	EVA BLE	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

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Transducer Legend:

T1=25' LMR #001	T2=8449B Preamp
T3=A.H. SAS-200/571 Horn	

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2484.969M	35.9	+1.4	+30.2	+29.3		+0.0	36.4	54.0	-17.6	Vert
	Ave										
2	2487.858M	34.7	+1.4	+30.2	+29.3		+0.0	35.2	54.0	-18.8	Vert
	Ave										
3	2490.675M	33.4	+1.4	+30.2	+29.3		+0.0	33.9	54.0	-20.1	Vert
	Ave										
4	2494.018M	31.9	+1.4	+30.2	+29.3		+0.0	32.4	54.0	-21.6	Vert
	Ave										
5	2495.929M	31.7	+1.4	+30.2	+29.3		+0.0	32.2	54.0	-21.8	Vert
	Ave										
6	2499.057M	31.4	+1.4	+30.2	+29.3		+0.0	31.9	54.0	-22.1	Vert
	Ave										
7	2487.667M	46.3	+1.4	+30.2	+29.3		+0.0	46.8	74.0	-27.2	Vert
	Ave										
8	2490.198M	46.0	+1.4	+30.2	+29.3		+0.0	46.5	74.0	-27.5	Vert
	Ave										

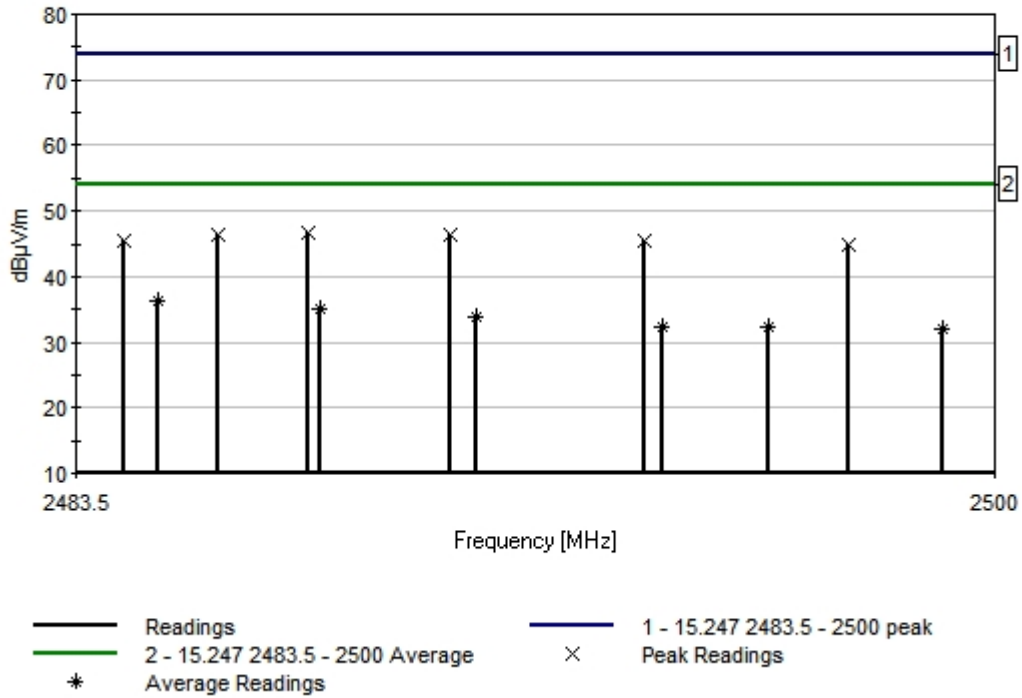


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9	2486.043M	46.0	+1.4	+30.2	+29.3	+0.0	46.5	74.0	-27.5	Vert
10	2484.348M	45.1	+1.4	+30.2	+29.3	+0.0	45.6	74.0	-28.4	Vert
11	2493.684M	45.0	+1.4	+30.2	+29.3	+0.0	45.5	74.0	-28.5	Vert
12	2497.385M	44.4	+1.4	+30.2	+29.3	+0.0	44.9	74.0	-29.1	Vert

EMCE Engineering Date: 2/23/2016 Time: 11:39:08 UEI WO#: 4198
15.247 2483.5 - 2500 Average Test Distance: 3 Meters Sequence#: 2 Ext ATTN: 0 dB





5.7 TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

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

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

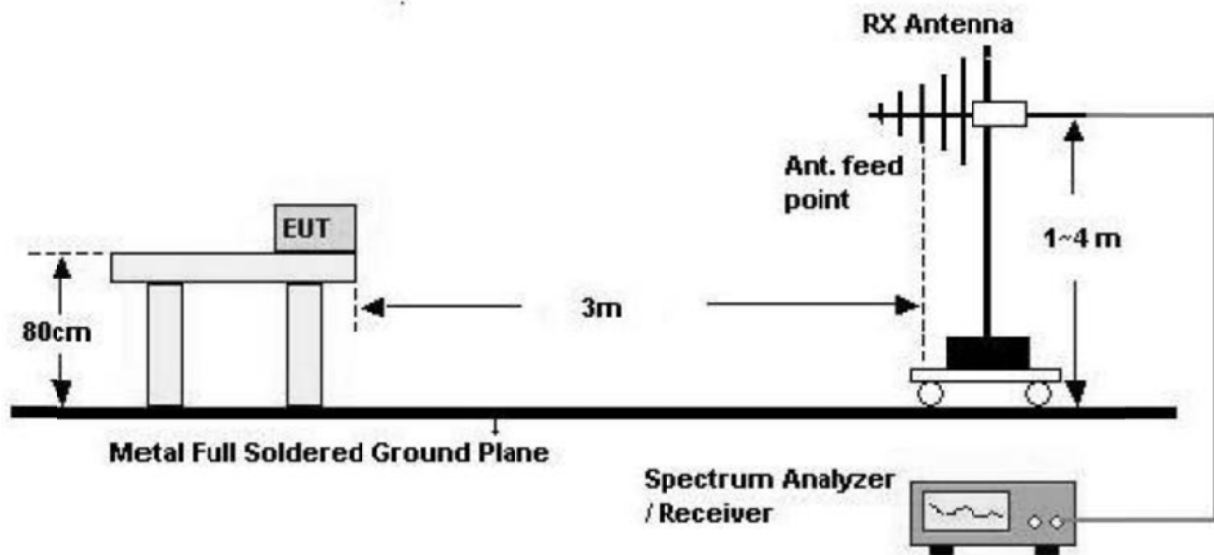
§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table ;

Frequency (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

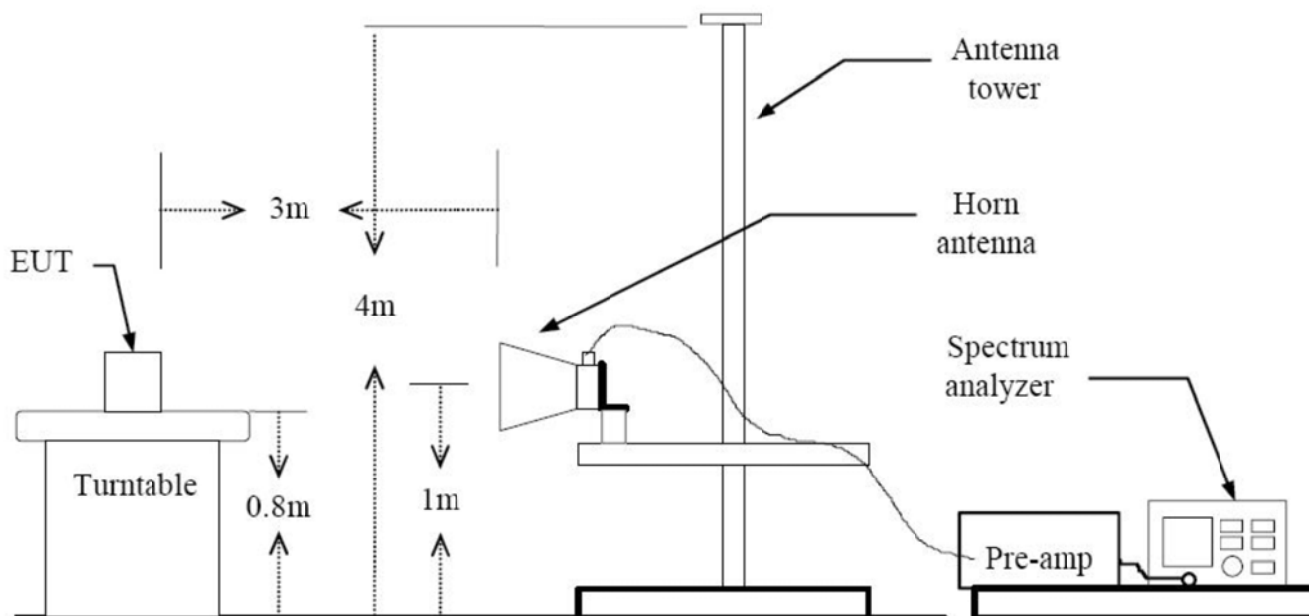
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., Sections 15.231 and 15.241

TEST CONFIGURATION

[30 MHz - 1 GHz]



[Above 1 GHz]





TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4 The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 KHz for peak detection measurements or 120 KHz or quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and VBW of 10 Hz for average measurements.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

RESULTS:

NO non-compliance noted.

Note

1. The antenna is manipulated through typical positions, polarity and length during the testing
2. The frequency range was scanned from 30 MHz to 1 GHz and the worst-case emissions are reported.
3. There is detected level above reference noise floor spectrum analyzer.

FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor.
The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dBuV is obtained. The Antenna Factor of 7.4 dB/m and a Cable Factor of 1.1 dB is added. The 30 dBuV/m value is mathematically converted to its corresponding level in uV/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dBuV/m}$$



MEASUREMENT UNCERTAINTY

**Measurement Uncertainty Budget
Radiated Emissions @ 10 Meters
Per CISRP 16-4-2**

Input Quantity	Uncertainty of x_i		U(x) dB	C_i	$C_i u(x_i)$ dB
	dB	Probability Distribution Function			
Receiver Reading	+/- 0.1	K = 1	0.1	1	0.1
Attenuation, Antenna - receiver	+/- 0.1	K = 2	0.05	1	0.05
Antenna Factor	+/- 2.0	K = 2	1.0	1	1.0
Receiver Corrections					
Sine Wave Voltage	+/- 1.0	K = 1	0.5	1	0.5
Pulse Amplitude Response	+/- 1.5	Rectangular	0.87	1	0.87
Pulse Rep Rate Response	+/- 1.5	Rectangular	0.87	1	0.87
Noise Floor Proximity	+/- 0.5	K = 2	0.25	1	0.25
Mismatch Antenna – Receiver	+/- 0.9	U shaped	0.67	1	0.67
Antenna Corrections					
AF Freq Interpolation	+/- 0.3	Rectangular	0.17	1	0.17
AF Height Deviations	+/- 0.5	Rectangular	0.29	1	0.29
Balance	+/- 0.3	Rectangular	0.17	1	0.17
Site Corrections					
Site Imperfections	+/- 3.0	Rectangular	1.22	1	0.82
Separation distance	+/- 0.1	Rectangular	0.06	1	0.06
Table Height	+/- 0.1	K = 2	0.05	1	0.05
Total Measurement Uncertainty - Radiated Emissions @ 10 Meters $2U_c(E) = 4.89$					4.89



Transmit Frequencies 2402 / 2442 / 2480 MHz were examined and maximized. Worst case data is presented:

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 •

Customer: **UEI**
Specification: **FCC 15.209 30 - 25000 Limits**
Work Order #: **4198** Date: 2/24/2016
Test Type: **Radiated Scan** Time: 09.16.32 AM
Equipment: **EVA BLE Remote Control** Sequence#: 1
Manufacturer: Universal Electronics, Inc. Tested By: Bob Cole
Model: URC-9900BC1-001-R
S/N: N/A

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
FSV40-B160 Signal Analyzer	101468	03/28/2015	03/28/2017	755
EMCO 3115 Horn	9065-5057	05/20/2015	05/20/2016	608
HP 8449B Preamp	3008A02190	05/15/2015	05/15/2016	749
EMITest Measurement Software	v4.01 Build 195	05/01/2014	05/01/2017	610

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Remote Control*	Universal Electronics, Inc.	URC-9900BC1-001-R	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

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Transducer Legend:

T1=8447 Pre-Amp Asset 377	T2=25' LMR #001
T3=8449B Preamp	T4=Sunol 1GHz JB6 S/N A42610
T5=A.H. SAS-200/571 Horn	

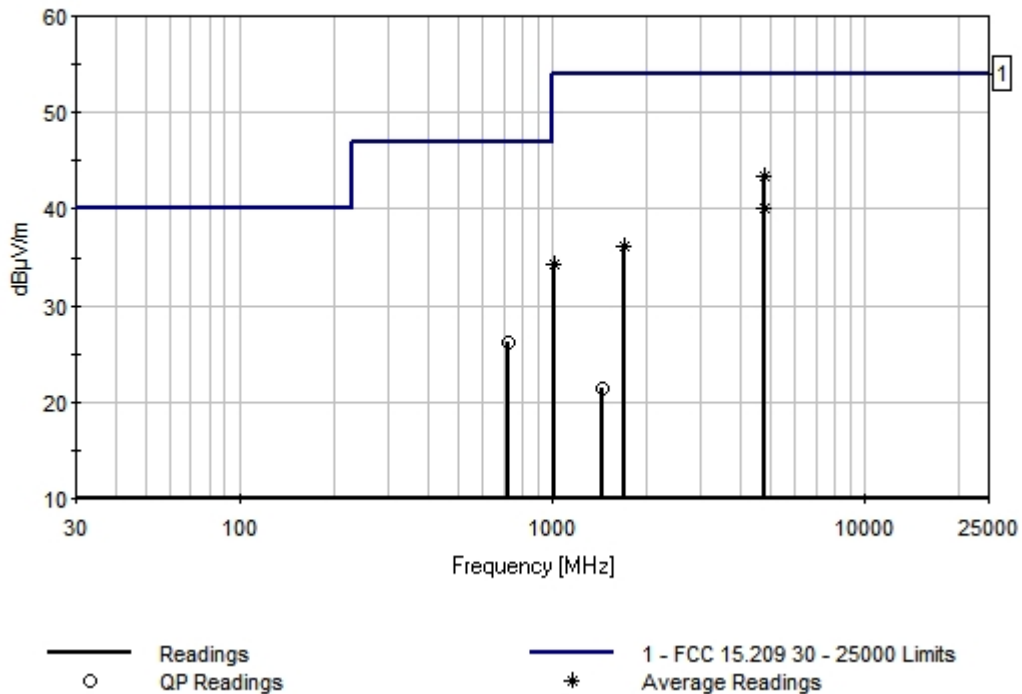
Ext Attn: 0 dB



Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	4804.725M Ave	36.2	+0.0 +34.9	+2.6	+30.2	+0.0	+0.0 188	43.5	54.0 2442 Xmit	-10.5	Vert 196
2	4804.780M Ave	33.0	+0.0 +34.7	+2.6	+30.3	+0.0	+0.0 92	40.0	54.0 2402 Xmit	-14.0	Horiz 197
3	1704.117M Ave	37.0	+0.0 +27.6	+0.9	+29.4	+0.0	+0.0 98	36.1	54.0 2442 Xmit	-17.9	Vert 172
4	1011.224M Ave	34.5	+0.0 +28.3	+1.2	+29.7	+0.0	+0.0 151	34.3	54.0 2480 Xmit	-19.7	Vert 148
5	726.119M QP	32.1	+27.1 +0.0	+0.7	+0.0	+20.5	+0.0 172	26.2	47.0 2480 Xmit	-20.8	Horiz 144
6	1452.093M QP	31.4	+26.9 +0.0	+0.3	+0.0	+16.7	+0.0 277	21.5	54.0 2442 Xmit	-32.5	Horiz 170

EMCE Engineering Date: 2/24/2016 Time: 09:16:32 AM UEI WO#: 4198
FCC 15.209 30 - 25000 Limits Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB



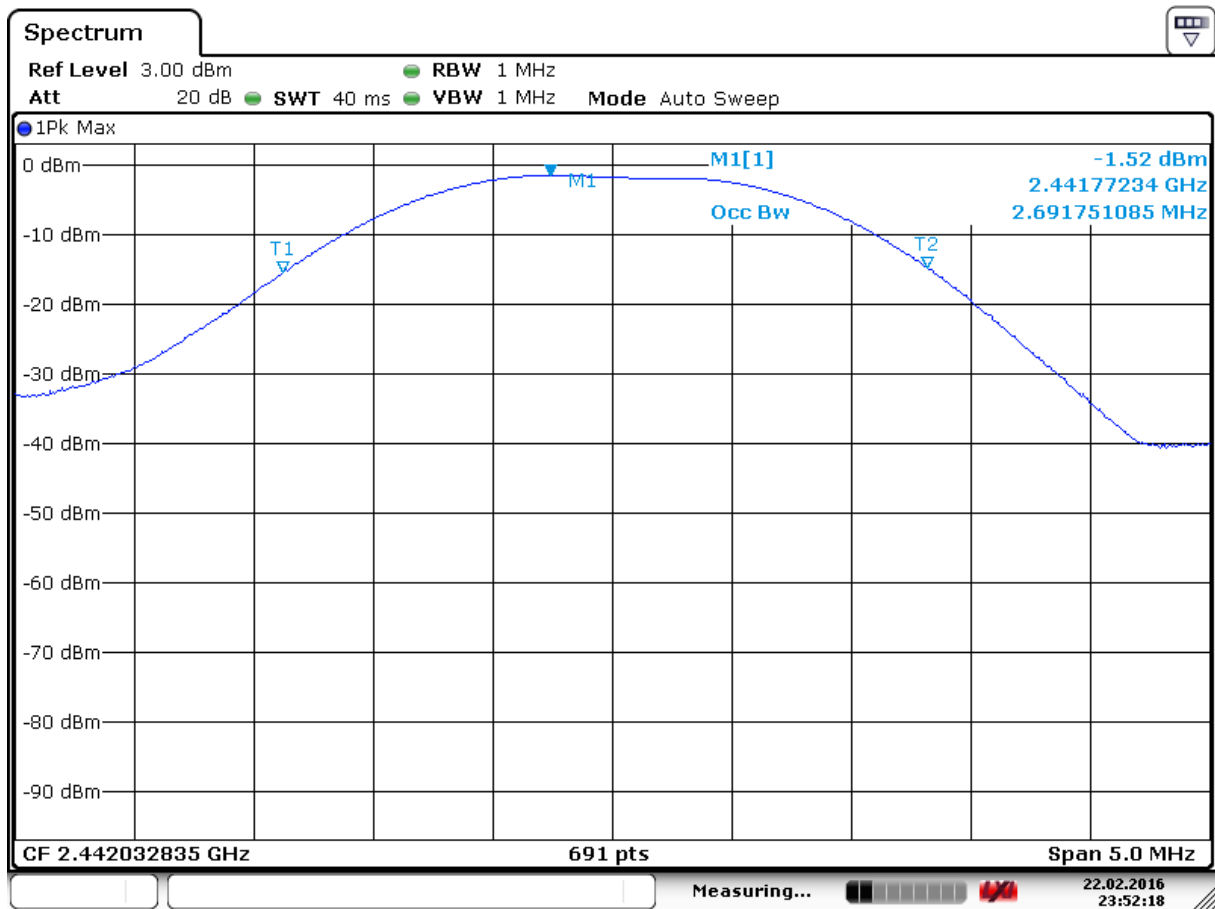


5.7 99% BANDWIDTH

LIMITS

None – For information purposes only

Frequency (MHz)	99% BW (MHz)	Limit (MHz)	Result
2442	2.691	N/A	PASS



Date: 22.FEB.2016 23:52:18



6.0 TEST EQUIPMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE	CAL. DUE DATE
Signal Analyzer Rohde-Schwarz	FSV40	1321.3008K40-101424-TU	3/10/14	3/10/16
Pre-Amplifier(100KHz-1.3GHz) Hewlett-Packard	8447D	2443A03587	5/1/14	5/1/16
BiConiLog Antenna Sunol Sciences	JB6	1090	2/12/14	2/12/16
RF Signal Cable EMCE	25' LMR	N/A	8/10 /15	8/10 /16
RF Signal Cable EMCE	100' LMR	N/A	8/1 /15	8/1 /16