

Test Report #: 4190-1 02/20/2016

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.

RSS-247 Issue 1 Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices

Prepared For:

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

Product Name : BLE and Infrared remote control

> Model Name : 9700BC0-001-R

FCC ID : MG3-9700 IC: 2575A-9700

Application Purpose : Original

Prepared by:

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

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Test Report #: 4190-1 02/20/2016

Revision History

Rev.	Issue Date	Description				
1	02/20/2016	Initial Issue				



Test Report #: 4190-1 02/20/2016

TABLE OF CONTENTS

1.	GENERAL INFORMATION	4
2.	EUT DESCRIPTION	5
3.	SUMMARY OF TEST RESULTS	6
4.	MODIFICATIONS	7
5.	TEST RESULTS	8
6.	TEST EQUIPMENT	26



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	BLE and Infrared remote control - Bluetooth Low Energy
Product Name	BLE and Infrared remote control
Model Name :	9700BC0-001-R
Applied Standards :	FCC 47 CFR §15.209, §15.247
	IC RSS 247 Issue 1
FCC ID :	MG3-9700
IC :	IC:3375B-RC1
RF Operating Frequency (ies)	2402 – 2480 MHz
Modulation	GFSK
Emission Designator	2M47F1D
Receipt of EUT :	01/25/2016
Date of Testing :	01/26/2016 - 02/14/2016
Date of Report :	02/20/2016

The tests listed in this report have been completed to demonstrated compliance to the CFR 47 Section 15.247, and RSS 247 Issue 1.

Contents approved:

(0 0

Name: Bob Cole Title: President

Page 4 of 31



2.0 EUT AND ACCESSORY INFORMATION

EUT									
FCC ID		MG3-9700							
Product Name		В	BLE and Infrared	rem	ote control				
Model name			9700BC0-	001	-R				
Frequency Range			TX:2402-2 RX:2402-2	248(248() MHz) MHz				
Max. RF Output Power			Peak : -1.43 dBm	า (0.	719 mW)				
Operating Mode			Bluetooth Low E	ner	gy (BLE)				
Modulation Type			GFS	K					
Number of Channels			40 Char	nnel	S				
Manufacturer			Universal Elect	tron	ics, Inc.				
Power Source			Batte	ery					
Antenna Specification		E	Broadcom Lifted S Gain = -1.2 dB @	Strip @ 24	o Antenna: 441 MHz				
	Support	Equip	oment						
Description	Model Number	S	erial Number	Manufacturer		Power Cable Description			
NONE									
	Cable L	Descri	ption						
From	То		Length (Meters)		Shielded (Y/N)	Ferrite Loaded (Y/N)			
NONE									



3.0 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

Test S	tandard		Result (Pass / Fail)				
FCC 47 CFR Part 15	RSS 247 Issue 1, RSS-Gen, Issue 4	Description					
15.205, 15.209 15.247	5.5	Radiated Spurious Emissions, Radiated Restricted Bandedge	Pass				
15.247(a)(2)	5.2	6dB Bandwidth	Pass				
15.247(6)(3)	5.4 (4)	Conducted Maximum Peak Output Power	Pass				
15.247(e)	5.2	Power Spectral Density	Pass				
15.247(d)	5.5	Conducted Bandedge (Out of Band Emissions)	Pass				
15.207	N/A	AC Power line Conducted Emissions	N/A				
N/A	RSS-GEN 4.6.1	99% Bandwidth	PASS				
ANSI C63.4: 2014 / FCC KDB 558074 D01 DTS Meas Guidance v03r03 dated June 09, 2015 PS: All measurement uncertainties are not taken into consideration for all presented test result.							

PASS	The EUT passed that particular test.
FAIL	The EUT failed that particular test.
N/A	Not Applicable – No IC Application



Test Report #: 4190-1 02/20/2016



There were no modifications.



Test Report #: 4190-1 02/20/2016

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: Specification: Work Order #: Test Type: Equipment: Manufacturer: Model: S/N: Test Equipment:	UEI EN 300 3 4190 Conducto Remote C Universal 9700BC0 N/A	28 30-260 ed Emissic Control Electronic -001-R	00 Spu ons cs, Inc.	ırious		Date Time Sequence# Tested By	e: 1/3) e: 1:14 f: 4 7: Bol Bat	0/2016 4:12 PM b Cole ttery		
Function	S/N			Calibration	Data	Cal Di	10 Date	2	Asset #	
FSV40-B160 Sign Analyzer	al 1014	58		03/28/2015	5	03/28/	2017		755	
EMITest Measurement Software	v4.01	Build 195	5	05/01/2014	1	05/01/	2017		610	
Equipment Unde	r Test (* =	EUT):								
Function	· · · · ·	Manufact	ırer		Model	#		S/N		
Remote Control*		Universal	Electro	onics, Inc.	9700B0	C0-001-R		N/A		
Support Devices:										
Function		Manufact	urer		Model	#		S/N		
Test Conditions /	Notes:									
Arris remote										
Transducer Lege	nd:									
T1=dBuV - dBm d	conversion				÷					
Ext Attn: 0 dE	3									
Measurement Dat	<i>a:</i>]	Reading lia	sted by	margin.		r	Fest Le	ead: Anter	nna	
# Freq	Rdng	T1				Dist	Corr	Spec	e Margin	Polar
MHz	dBµV	dB	dB	dB	dB	Table	dBm	dBn	n dB	Ant
1 2402.011N	1 105.8	-107.0				+0.0	-1.2	0.0) -1.2	Anten

EMCE Engineering, Inc., 44366 S. Grimmer Blvd., Fremont, CA 94538 Pa Tel:510-490-4307 Fax: 510-490-3441 e-mail: <u>bob@universalcompliance.com</u> Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of Accreditation under Lab Code 200092-0



Test Report #: 4190-1 02/20/2016

EMCE Engineering Date: 1/30/2016 Time: 1:14:12 PM UEI WO#: 4190 EN 300 328 30-26000 Spurious Test Lead: Antenna Battery Sequence#: 4 Ext ATTN: 0 dB





Test Report #: 4190-1 02/20/2016

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 Spt	irious			
Work Order #:	4190		Date:	1/30/2016	
Test Type:	Conducted Emissions		Time:	3:44:08 PM	
Equipment:	Remote Control		Sequence#:	3	
Manufacturer:	Universal Electronics, Inc.		Tested By:	Bob Cole	
Model:	9700BC0-001-R			Battery	
S/N:	N/A				
Test Equipment:					
Function	S/N	Calibration Date	Cal Due	Date	Asset #
FSV40-B160 Sign	al 101468	03/28/2015	03/28/20	17	755
Analyzer					
EMITest	v4.01 Build 195	05/01/2014	05/01/20	17	610
Measurement					
Software					
Equipment Under	<i>r Test</i> (* = EUT):				

Function	Manufacturer	Model #	S/N
Remote Control*	Universal Electronics, Inc.	9700BC0-001-R	N/A
Support Devices:			

Support Devices.			
Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Transducer Legend:

T1=dBuV - dBm conversion

EXL.	Aun: 0 ud										
Measu	rement Data:	R	eading lis	ted by ma	rgin.		Test Lead: Antenna				
#	Freq	Rdng	T1				Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBm	dBm	dB	Ant
1	2441.209M	104.1	-107.0				+0.0	-2.9	0.0	-2.9	Anten
2	2501.148M	49.9	-107.0				+0.0	-57.1	-29.4	-27.7	Anten
3	2347.337M	41.6	-107.0				+0.0	-65.4	-30.0	-35.4	Anten



Test Report #: 4190-1 02/20/2016

EMCE Engineering Date: 1/30/2016 Time: 3:44:08 PM UEI WO#: 4190 EN 300 328 30-26000 Spurious Test Lead: Antenna Battery Sequence#: 3 Ext ATTN: 0 dB





Test Report #: 4190-1 02/20/2016

TEST RESULTS – 2480 MHz Xmit Frequency

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

Customer:	UEI									
Specification:	EN 300 32	8 30-2600	0 Spu	rious						
Work Order #:	4190					Date	e: 1/3	0/2016		
Test Type:	Conducted	d Emissior	ıs			Time	e: 6:0	2:35 PM		
Equipment:	Remote C	ontrol				Sequence	# : 2			
Manufacturer:	Universal l	Electronics	, Inc.			Tested By	y: Bol	o Cole		
Model:	9700BC0-0	001-R					Bat	tery		
S/N:	N/A									
Test Equipment:									<u>.</u>	
Function	S/N			Calibration	n Date	Cal D	ue Date	e	Asset #	
FSV40-B160 Sign	al 10146	8		03/28/2015	5	03/28/	2017		755	
Analyzer										
EMITest	v4.01	Build 195		05/01/2014	4	05/01/	2017		610	
Measurement										
Software										
Equipment Unde	er Test (* =	EUT):			_					
Function	Ν	Manufactur	rer		Model	#		S/N		
Remote Control*	I	Universal E	Electro	onics, Inc. 9700BC0-001-R N/A						
Support Devices:	,									
Function	ľ	Manufactur	rer		Model	#		S/N		
Test Conditions	Notes:									
Arris BLE Remote	9									
Transducer Lege	end:									
T1=dBuV - dBm	conversion									
Ext Attn: 0 dI	3									
Measurement Da	ta: R	eading list	ed by	margin.			Test Le	ead: Ante	nna	
# Freq	Rdng	T1				Dist	Corr	Spec	c Margin	Polar
MHz	dBµV	dB	dB	dB	dB	Table	dBm	dBn	n dB	Ant
1 2480.1511	A 102.3	-107.0				+0.0	-4.7	0.0	0 -4.7	Anten
2 4980.3011	A 38.2	-107.0				+0.0	-68.8	-30.	0 -38.8	Anten



Test Report #: 4190-1 02/20/2016

EMCE Engineering Date: 1/30/2016 Time: 6:02:35 PM UEI WO#: 4190 EN 300 328 30-26000 Spurious Test Lead: Antenna Battery Sequence#: 2 Ext ATTN: 0 dB





Test Report #: 4190-1 02/20/2016

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	674	>500	PASS
2442	680	>500	PASS
2480	680	>500	PASS



Test Report #: 4190-1 02/20/2016

2402 MHz

Spect	rum											
Ref Le	vel	13.00 dBm	ı		RBW 10)0 kHz						
Att		30 dE	3 🖷 SWT 2	20 ms 😑 🎙	/BW	1 MHz	Mode	Auto	Sweep)		
😑 1Pk Ma	эx											
10 dBm-								—M1	[1]			6.61 dBm
				T1	\rightarrow		-141		~T	2	2.40	199420 GHz
0 dBm—				- V	_			nd	в	Z		6.00 dB
				-				BW			674.40	0000000 kHz
-10 dBm		01 -10.00	0 dBm					Q1	actor_		<u> </u>	3561.8
		1	1									
-20 dBm	-+										_	
-30 dBm	⊢		-									_
-40 dBm) 		_		_							
-50 dBm	\rightarrow				_							
-60 dBm	⊢				_							
-70 dBm) — 		-									-
-80 dBm) — 											
CF 2.40	32 G	Hz				691	pts				Sp	an 2.0 MHz
Marker												
Туре	Ref	Trc	X-val	ue	Y-	value		Funct	ion	Fi	unction Resu	ilt
M1		1	2.4019	9942 GHz		6.61 dB	m	ndB	down			674.4 kHz
T1		1	2.4016	5527 GHz		0.65 dB	m		ndB			6.00 dB
T2		1	2.4023	3271 GHz		0.60 dB	m	Qf	actor			3561.8
][]						Meas	uring			22.12.2015 00:24:52

Date: 22.DEC .2015 00:24:52

2442 MHz



Date:22.FEB.2016 23:48:37

Page 15 of 31



Test Report #: 4190-1 02/20/2016

2480 MHz

Spect	rum										
Ref Le	vel 1	13.00 dBi	n	😑 R	BW 100 kHz						
Att		30 d	B 👄 SWT 20	ms 👄 🗸	BW 1 MHz	Mode	a Auto Swee	эр			
⊖1Pk M	ах										
10 dBm				T1 ~~		+41	M1[1]	т2		2.47	7.51 dBm 999130 GHz
0 dBm-			+	-Br	-		ndB	R.	~	680 200	6.00 dB
-10 dBn)1 -10.00	00 dBm				Q facto	r	\sim	1	3646.1
20 d 8n	-+		/								
-30 dBn	n										
-40 dBn	n										
-50 dBn	n										
-60 dBn	n-+-										
-70 dBn	n										
-80 dBn	n										
CF 2.4	8 GHz	z		L	691	pts				Spa	an 2.0 MHz
Marker											
Туре	Ref	Trc	X-value	e	Y-value		Function	1	Fund	tion Resul	t
M1		1	2,47999	13 GHz	7.51 dE	m	ndB down				680.2 kHz
T1		1	2.47964	98 GHz	1.49 dE	m	ndB				6.00 dB
T2		1	2.480	33 GHz	1.62 dE	lm	Q factor				3646.1
][]					Measuring	🔳		444	22.12.2015 00:26:46

Date:22.DEC.2015 00:26:46



Test Report #: 4190-1 02/20/2016

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	-1.43	20	PASS
2442	-2.06	20	PASS
2480	-1.60	20	PASS

2402 MHz



Date: 29 JAN 2016 01:39:05



Test Report #: 4190-1 02/20/2016

2442 MHz



2480 MHz



Page 18 of 31



Test Report #: 4190-1 02/20/2016

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	-12.38	8.0	PASS
2442	-13.04	8.0	PASS
2480	-12.62	8.0	PASS

2402 MHz



Page 19 of 31



Test Report #: 4190-1 02/20/2016

2442 MHz



2480 MHz



Page 20 of 31



Test Report #: 4190-1 02/20/2016

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.

2400 MHz Bandedge



Date: 29 JAN .2016 02:03:46



Test Report #: 4190-1 02/20/2016

2483.5 MHz Bandedge



Date: 29 JAN .2016 02:24:18



Test Report #: 4190-1 02/20/2016

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			

RESULTS

Bandedge Frequency(MHz)	Measured(dBc)	Limit (dBc)	Result
2402	52.16	>20	PASS
2480	50.87	>20	PASS

Page 23 of 31



Test Report #: 4190-1 02/20/2016

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 Report #: 4190-1 02/20/2016

TEST CONFIGURATION

[30 MHz - 1 GHz]



[Above 1 GHz]



Page 25 of 31



Test Report #: 4190-1 02/20/2016

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 dBuV/m



MEASUREMENT UNCERTAINTY

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

Input Quantity Uncertainty of x _i			U(x)	Ci	C _i u (x _{i)}
	dB	Probability	dB		dB
		Distribution			
·	1.0.1	Function			0.4
Receiver	+/- 0.1	K = 1	0.1	1	0.1
Reading	./ 0.4		0.05	4	0.05
Attenuation,	+/- 0.1	K = 2	0.05	1	0.05
Antenna -					
Antonno	1/20	K - 2	1.0	1	1.0
Factor	T /- 2.0	rx = 2	1.0	1	1.0
		Receiver (Corrections		
Sine Wave	+/- 1 0	K = 1	0.5	1	0.5
Voltage	17 1.0		0.0	•	0.0
Pulse	+/- 1.5	Rectangular	0.87	1	0.87
Amplitude	.,	. to o tan ganan	0.01		
Response					
Pulse Rep	+/- 1.5	Rectangular	0.87	1	0.87
Rate		C C			
Response					
Noise Floor	+/- 0.5	K = 2	0.25	1	0.25
Proximity					
Mismatch	+/- 0.9	U shaped	0.67	1	0.67
Antenna –					
Receiver					
·		Antenna C	Corrections		
AF Freq	+/- 0.3	Rectangular	0.17	1	0.17
Interpolation					
AF Height	+/- 0.5	Rectangular	0.29	1	0.29
Deviations	./ 0.2	Destancylar	0.47	4	0.47
Balance	+/- 0.3	Rectangular			0.17
Sito	1/20	Sile Col		1	0.02
Importactions	+/- 3.0	Rectangular	1.22	1	0.02
Soparation	1/01	Poetongular	0.06	1	0.06
distance	- /- U. I	Rectanyulal	0.00		0.00
Table Height	±/- 0 1	K - 2	0.05	1	0.05
Total Ma	asurement Lince	rtainty - Radiated	l Emissione @ 1	0 Meters	4 80
		$2U_{c}(E) = 4.89$			т.03

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



Test Report #: 4190-1 02/20/2016

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

Test Lo	ocation:	EMC	'E Engi	ineering	•44366	S. Grimme	r Blvd • I	Fremont,	CA 94538	•		
Custon Specifi Work (Test Ty Equipm Manufa Model: S/N:	ner: cation: Drder #: ype: nent: acturer:	UEI FCC 4186 Radi Rem Univ T30 N/A	ated So ote Con ersal E	9 30 - 250 can ntrol lectronic:	000 Li	mits		Da Tir Sequenc Tested I	ate: 1/31/ ne: 12.39 e#: 1 By: Bob (2016 9.36 PM Cole		
Test E	Equipment:											
Functio	on	S	S/N			Calibratio	n Date	Cal	Due Date	As	sset #	
FSV40	-B160 Signa	al 1	01468			03/28/201	5	03/2	8/2017	75	5	
Analyz	zer											
EMCO	3115 Horn	9	9065-50)57		05/20/201	5	05/2	0/2016	60	8	
HP 844	49B Preamp	3	3008A0	02190		05/15/201	5	05/1	5/2016	74	9	
EMITe Measur Softwa	est rement re	١	74.01 B	uild 195		05/01/201	4	05/0	1/2017	61	0	
Equip	ment Under	r Test	$t (* = \mathbf{E})$	UT):								
Functio	on		M	lanufactu	rer		Model #	ŧ		S/N		
Remote	e Control*		Universal Electro			onics, Inc.	T30			N/A		
Suppo	ort Devices:											
Functio	on		М	lanufactu	rer		Model #	ŧ		S/N		
Test C	Conditions /	Notes	s:									
Trans	ducer Leger	nd:										
T1=844	47 Pre-Amp	Asse	et 377				T2=25'	LMR #0	01			
T3=844	49B Preamp)					T4=Sun	ol 1GHz	JB6 S/N	A42610		
T5=A.]	H. SAS-200,	/571]	Horn									
Ext A	Attn: 0 dB											
Measu	rement Data	a:	Re	ading lis	ted by	margin.		Τe	est Distanc	e: 3 Meters	5	
#	Freq	Ro	dng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB	βµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	4884.820M	1	33.9	+0.0	+2.	6 +30.2	+0.0	+0.0	41.2	54.0	-12.8	Vert
	Ave			+34.9				62		2442 Xmit	Į	212
2	1078.920M	1	40.5	+0.0	+0.	9 +29.4	+0.0	+0.0	39.6	54.0	-14.4	Vert
	Ave			+27.6				27		2442 Xmit		151
3	4804.780M	1	31.0	+0.0	+2.	6 +30.3	+0.0	+0.0	38.0	54.0	-16.0	Vert
	Ave			+34.7				92		2402 Xmit		197
4	1511.040M	1	38.2	+0.0	+1.1	2 +29.7	+0.0	+0.0	38.0	54.0	-16.0	Vert
	Ave			+28.3				99		2480 Xmit	t	208

EMCE Engineering, Inc., 44366 S. Grimmer Blvd., Fremont, CA 94538PagTel:510-490-4307 Fax: 510-490-3441 e-mail: bob@universalcompliance.comAccredited by the National Voluntary Laboratory Accreditation Program for the specific scope ofAccreditation under Lab Code 200092-0

Page 28 of 31



Test Report #: 4190-1 02/20/2016

5 480.110M	34.2	+27.1	+0.7	+0.0	+20.5	+0.0	28.3	47.0	-18.7	Vert
QP		+0.0				92		2480 Xmit		180
6 288.140M	33.3	+26.9	+0.3	+0.0	+16.7	+0.0	23.4	54.0	-30.6	Vert
QP		+0.0				181		2402 Xmit		142

EMCE Engineering Date: 1/31/2016 Time: 12.39.36 PM UEIWO#: 4186 FCC 15.209 30 - 25000 Limits Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB





Test Report #: 4190-1 02/20/2016

5.7 99% BANDWIDTH

LIMITS

None – For information purposes only

Frequency	99% BW	Limit	Result
(MHz)	(MHz)	(MHz)	
2442	2.467	N/A	PASS



Date: 29 JAN .2016 02:59:07



6.0 TEST EQUIPMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE	CAL. DUE DATE
Signal Analyzer Rohde-Schwarz	FSV40	1321.3008K40- 101424-TU	3/28/15	3/28/17
Pre-Amplifier(100KHz-1.3GHz) Hewlett-Packard	8447D	2443A03587	5/1/15	5/1/17
BiConiLog Antenna Sunol Sciences	JB6	1090	2/12/15	2/12/17
RF Signal Cable EMCE	25' LMR	N/A	8/10 /15	8/10 /17
RF Signal Cable EMCE	100' LMR	N/A	8/1 /15	8/1 /17