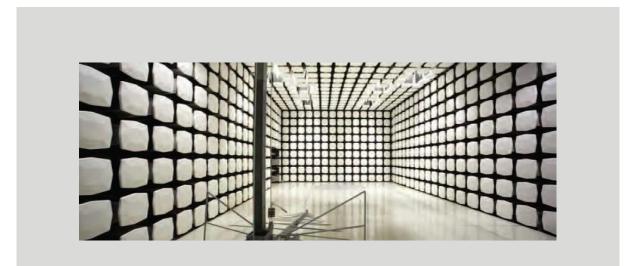


Uber Technologies Inc. **FF01** FCC 15.247:2016 **Bluetooth Low Energy Radio Module**

Report # SYNA0203.2 Rev 01



(R) TESTING

NVLAP Lab Code: 200629-0

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America. This Report shall not be reproduced, except in full without written approval of the laboratory.

CERTIFICATE OF TEST



Last Date of Test: November 29, 2016 Uber Technologies Inc. Model: FF01

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2016	ANSI C63.10:2013

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Per FCC 15.207 this test is not required for a device intended for use only in a vehicle and which will not be connected to the AC mains.
6.5, 6.6, 11.12.1, 11.13.2	Spurious Radiated Emissions	Yes	Pass	
11.6	Duty Cycle	Yes	Pass	
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.1.1	Output Power	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:

all

Rod Munro, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

REVISION HISTORY



Revision Number	Description	Date	Page Number
01	Replaced SRE data to include measurements with USB port populated	11/29/16	38-40

ACCREDITATIONS AND AUTHORIZATIONS



United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with ISED.

European Union

European Commission – Validated by the European Commission as a Notified Body under the R&TTE Directive.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIP / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

SCOPE

For details on the Scopes of our Accreditations, please visit: <u>http://www.nwemc.com/accreditations/</u> http://gsi.nist.gov/global/docs/cabs/designations.html

MEASUREMENT UNCERTAINTY



Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

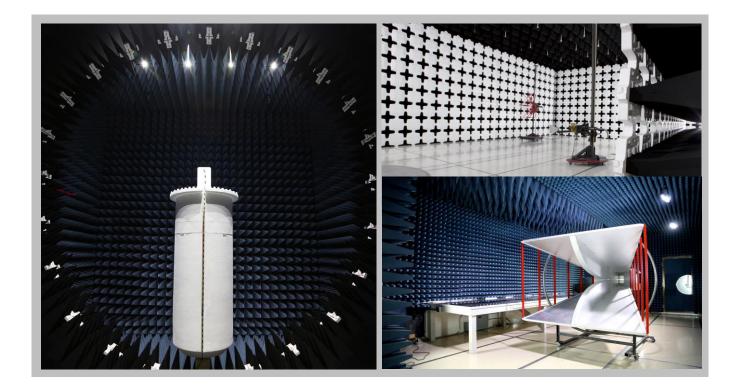
Test	+ MU	<u>- MU</u>
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

FACILITIES



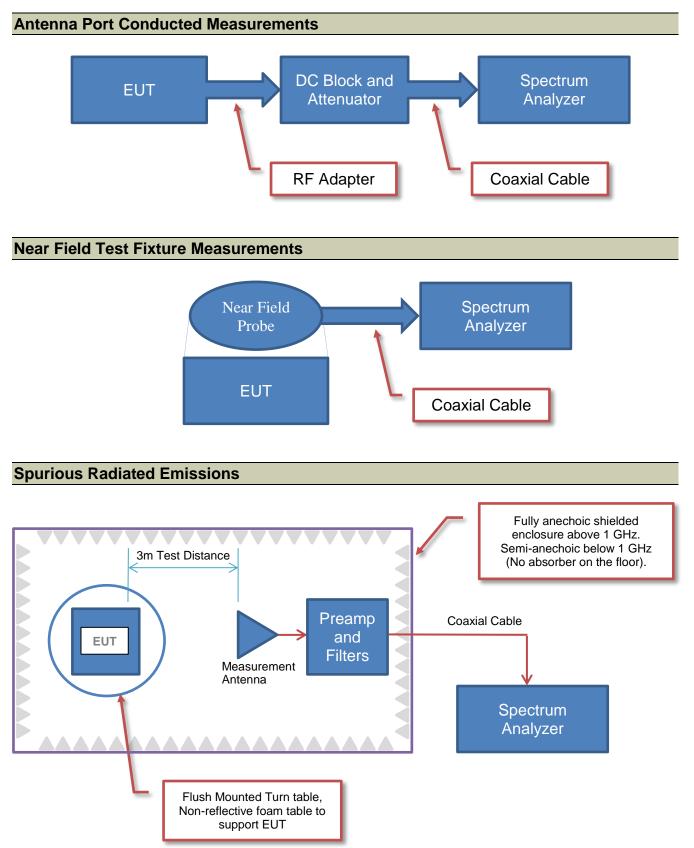


California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 98011 (425)984-6600	
	NVLAP					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0	
	Innovation, Science and Economic Development Canada					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-2	2834G-1	2834F-1	
		BS	МІ			
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R	
		VC	CI			
A-0029	A-0109	N/A	A-0108	A-0201	A-0110	
	Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157	



Test Setup Block Diagrams





PRODUCT DESCRIPTION



Company Name:	Uber Technologies Inc.
Address:	1455 Market Street
City, State, Zip:	San Francisco, CA 94103
	Nikhil Goel of Uber Technologies Inc.
Test Requested By:	and
	Charles Manry of Synapse Product Development LLC
Model:	FF01
First Date of Test:	November 01, 2016
Last Date of Test:	November 01, 2016
Receipt Date of Samples:	November 29, 2016
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Client and Equipment Under Test (EUT) Information

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Consumer electronics device that is mounted inside an automobile that displays a logo by using a set of color programmable Light Emitting Diodes (LED), backlighting semi-transparent light diffusing disk. The LED's are controlled via the commands from the User's smartphone running an application. The commands are sent to the device by using the device's Nordic (nFR51822) Bluetooth Low Energy radio (BLE) radio using a customer designed Inverted F Antenna (IFA) as an integrated trace on the PCB.

Normal operation is when the device is powered by its internal battery. It has a USB port that is solely used to charge this battery. No data is passed via the device's USB port as wiring to support that function is not present in the device. The operation and behavior of the device is identical when either powered by its internal battery, or when the device's internal battery is being recharged via the USB port. A 12VDC to USB charger and USB cable are provided with the unit. The provided USB charger accessory is a 12 V input automotive (cigarette lighter) manufactured by Bracketron Incorporated; Model number is BT2-920-3.

Testing Objective:

To demonstrate compliance of the Bluetooth radio to FCC 15.247 requirements.

CONFIGURATIONS



Configuration SYNA0203-3

Software/Firmware Running during test		
Description	Version	
A2 Firmware	None	

EUT					
Description	Manufacturer	Model/Part Number	Serial Number		
LED Display Unit	Uber Technologies Inc.	FF01	A2M12		

Configuration SYNA0209-5

Software/Firmware Running during test		
Description	Version	
EV Firmware	None	

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
LED Display Unit	Uber Technologies Inc.	FF01	J000045

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	11/1/2016	Duty Cycle	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	11/1/2016	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	11/1/2016	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	11/1/2016	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	11/1/2016	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	11/1/2016	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.
7	11/29/2016	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.



Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIA	4/6/2016	4/6/2018
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	6/7/2016	6/7/2017
Attenuator	Fairview Microwave	SA4014-20	ΤKV	3/4/2016	3/4/2017
Block - DC	Fairview Microwave	SD3379	AMU	5/6/2016	5/6/2017
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	6/8/2016	6/8/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

There is no compliance requirement to be met by this test, so therefore no Pass / Fail criteria.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, burst gating may have been used during some of the other tests in this report to only take the measurement during the burst duration.



	FF01								Work Order:		
Serial Number:	: A2M12								Date:	11/01/16	
Customer:	Uber Technologies Inc.							Temperature: 21.7 °C			
Attendees:	Charles Manry								Humidity:	48.2% RH	
Project:	Kitt-A2							Barometric Pres.: 1015 mbar			
	Matthew Barnes				Powe	er: Battery			Job Site:	NC02	
TEST SPECIFICAT	IONS					Test Method					
FCC 15.247:2016						ANSI C63.10:2013					
COMMENTS											
LED White Level 9	0%. All LED's on. 0dBm c	utput power.									
	M TEST STANDARD		Signature	Ma	Aar W	Bur					
DEVIATIONS FROM	M TEST STANDARD		Signature	Ma	Aew W			Number of	Value	Limit	
DEVIATIONS FROM None Configuration #	M TEST STANDARD		Signature	Ma	Aaw W	Pulse Width	Period	Number of Pulses	(%)	(%)	Results
DEVIATIONS FROM	M TEST STANDARD		Signature	Ma	Aew W						Results N/A
DEVIATIONS FROM None Configuration #	M TEST STANDARD 3 2402 MHz		Signature	Ma	Aew W	Pulse Width	Period		(%)	(%)	
DEVIATIONS FROM None Configuration # BLE, Low Channel,	M TEST STANDARD 3 2402 MHz 2402 MHz		Signature	Ma	Aew W	Pulse Width 431.9 us	Period 625.1 us		(%) 69.1	(%) N/A	N/A
DEVIATIONS FROM None Configuration # SLE, Low Channel, BLE, Low Channel,	M TEST STANDARD 3 2402 MHz 2402 MHz 2442 MHz		Signature	Ma	Alew W	Pulse Width 431.9 us N/A	Period 625.1 us N/A		(%) 69.1 N/A	(%) N/A N/A	N/A N/A
DEVIATIONS FROM None Configuration # BLE, Low Channel, BLE, Low Channel, BLE, Mid Channel, 2	M TEST STANDARD 3 2402 MHz 2402 MHz 2442 MHz 2442 MHz		Signature	Ma	Aau W	Pulse Width 431.9 us N/A 432.2 us	Period 625.1 us N/A 625.1 us		(%) 69.1 N/A 69.1	(%) N/A N/A N/A	N/A N/A N/A



				BLE, Lo	w Channel, 240	2 MHz		
				522, 20	Number of	Value	Limit	
			Pulse Width	Period	Pulses	(%)	(%)	Results
			431.9 us	625.1 us	1	69.1	N/A	N/A
🗾 Keysig LXI RL	ht Spec	trum / RF	Analyzer - Northwest EMC, Inc 50 Ω DC		BE:INT	ALIGN OFF	Log-Pwr	01:16:04 AM Nov 02, 2016 TRACE 12:34.5
					Trig: Video #Atten: 10 dB			
5 dB/di Log r	v	Ref Ref	Offset 21.67 dB f 5.00 dBm			1		Mkr3 998.7 µs -9.55 dBm
0.00								
-5.00					3			
-10.0			∳[
-15.0								
-20.0								
-25.0								
-30.0								
-35.0				2	6			
-40.0				Y				
Conto	- 2.4	020	00000 GHz					Span 0 Hz
Res B	W 3.	.0 M	Hz	#VBW				.000 ms (8192 pts)
MKR MO			X 272.6	Y O 54 dD	FUNCTION	FUNCTION WIDTH	FUNCT	ION VALUE
1 N 2 N 3 N 4 5	1	t	373.6 א 373.6 805.5 א 805.5 998.7 א	s -9.54 dB s -39.70 dB s -9.55 dB	m			
6 7 8 9								
11								-
•					m			•
MSG						STATUS		
				BLE, Lo	w Channel, 240			
					Number of	Value	Limit	
			Pulse Width	Period	Pulses	(%)	(%)	Results
			N/A	N/A	5	N/A	N/A	N/A

			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A

RL RF 50 Ω DC		SENSE:INT	ALIGN OFF	01:16:40 AM Nov 02, 201
	PNO: Fast ↔→→ IFGain:Low	Trig: Video #Atten: 10 dB	#Avg Type: Log-Pwr	TRACE 1 2 3 4 5 TYPE WWWWW DET P P P P P
Ref Offset 21.67 dB dB/div Ref 5.00 dBm				
1.0				
.0				
.0				
.0				
.0				
.0				
.0				
enter 2.402000000 GHz es BW 3.0 MHz	#VB	N 30 kHz	Swee	Span 0 H p 2.813 ms (8192 pts
	"vb.		STATUS	p = 210 10 m3 (0132 pt



			I Channel, 2442 Number of	2 MHZ Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	432.2 us	625.1 us	1	69.1	N/A	N/A
Dig Keysight Spectrum Analyzer	- Northwert EMC Inc	a cique que que que autor				
	50 Ω DC	SENSE	INT	ALIGN OFF		01:24:29 AM Nov 02, 2016
			ig Delay-1.000 m ig: Video	s #Avg Type	e: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW
			tten: 10 dB			DET PPPPP
						Mkr3 998.4 µs
5 dB/div Ref 5.0	t 21.67 dB					-9.76 dBm
Log	Jabin					
0.00						
-5.00	<u></u> {1		3			
-10.0	Ψ		Y			
-15.0						
-20.0						
-25.0						
-30.0			ĺ			
-35.0	β	2				
-40.0						
Center 2.44200000	0 GHz			L		Span 0 Hz
Res BW 3.0 MHz		#VBW 3	0 kHz		Sweep 2	2.000 ms (8192 pts)
MKR MODE TRC SCL	x	Y	FUNCTION	FUNCTION WIDTH	FUNCT	FION VALUE
1 N 1 t 2 N 1 t	<u>373.3 µ</u> 805.5 µ					
3 N 1 t	998.4 µ					
4 5						
6						
7						
9						
10						
			m			4
				contraction of the second second second second		
MSG				STATUS		

			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A

	r - Northwest EMC, In 50 Ω DC		ENSE:INT	ALIGN OFF	01:25:53 AM Nov 02, 201
	50 H DC	PNO: Fast +++ IFGain:Low	Trig: Video #Atten: 10 dB	#Avg Type: Log-Pwr	TRACE 1 2 3 4 5 TYPE WWWW DET P P P P P
Ref Offse dB/div Ref 5.0	et 21.67 dB 0 dBm				
.00					
.00					
).0					
5.0					
).0					
5.0					
).0					
5.0					
).0					
enter 2.44200000 es BW 3.0 MHz	00 GHz	#VB\	№ 30 kHz	Swe	Span 0 H ep 2.813 ms (8192 pt
3				STATUS	



		_			BLE,	High (Channel, 24	80 MHz			
						N	umber of	Value	Limit		
				Pulse Width	Period		Pulses	(%)	(%)	R	esults
				432.9 us	625.1 us		1	69.3	N/A		N/A
🗾 Keysig LXI R L	ht Sp			- Northwest EMC, Inc 50 Ω DC	PNO: Fast +++	Trig	Delay-1.000 n Video	ALIGN OFF	pe: Log-Pwr	01:35	11 AM Nov 02, 2016 TRACE 1 2 3 4 5 TYPE WWWWW DET P P P P P
5 dB/di	v	Re Re	f Offse ef 4.00	t 21.67 dB) dBm	IFGain:Low	#Att	en: 10 dB			Mkr -1	3 998.7 µs I0.52 dBm
Log											
-1.00											
-6.00				()							
-11.0											
-16.0											
-21.0											
-26.0 —											
-31.0											
-36.0				لیم		, <mark>2</mark>	- <u></u>		r	1	
-41.0					Y				<u>}</u> {		
Cente	r 2.	480		0 GHz							Span 0 Hz
Res B					#VBV	V 30 I	κHz		Sweep	2.000 n	ns (8192 pts)
MKR MO				x	Y		FUNCTION	FUNCTION WIDTH	FL	INCTION VALUE	L
1 N 2 N		1 t 1 t		<u>373.6 µ</u> 806.5 µ	s -10.52 c s -40.50 c	IBm IBm					
3 N		i t		998.7 µ	-10.52	lBm					
4 5											
6 7											
8											
10											
11							III				+
MSG								STATUS			
					BLE,	High	Channel, 24	30 MHz			
						· ·	umber of	Value	Limit		
_				Pulse Width	Period	-	Pulses	(%)	(%)	R	esults
				N/A	N/A	1	5	N/A	N/A	1	N/A

RL	RF 50 Ω	DC	PNO: Fast + IFGain:Low	SENSE:INT Trig: Video #Atten: 10 d	ALIGN OFF #Avg Type: Lo	01:35:37 AM Nov 02, 20: Dg-Pwr TRACE 1 2 3 4 5 TYPE WWWWW DET P P P P
dB/div	Ref Offset 21.0 Ref 4.00 dB	67 dB Im				
19						
.00						
.00						
1.0						
5.0						
1.0						
5.0						
1.0						
		<u>لر</u>				
6.0						
1.0						
enter 2.	480000000 G 3.0 MHz	Hz	#\	'BW 30 kHz		Span 0 H Sweep 2.813 ms (8192 pt
es Bw ,	3.U WIHZ		#V	BW JU KHZ	STATUS	Sweep 2.813 ms (8192 p



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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIA	4/6/2016	4/6/2018
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	6/7/2016	6/7/2017
Attenuator	Fairview Microwave	SA4014-20	ΤKV	3/4/2016	3/4/2017
Block - DC	Fairview Microwave	SD3379	AMU	5/6/2016	5/6/2017
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	6/8/2016	6/8/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was set to the channels and modes listed in the datasheet.

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.

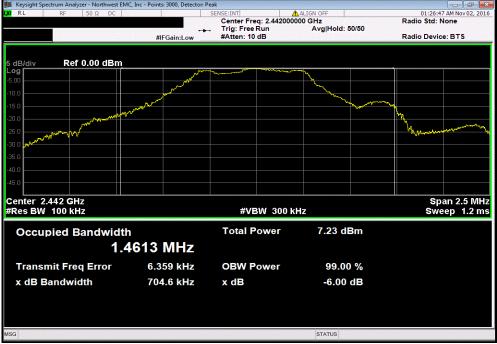


EUT:	FF01				Work Order:	SYNA0203	
Serial Number:	A2M12				Date:	11/01/16	
Customer:	Uber Technologies Inc.				Temperature:	21.7 °C	
Attendees:	Charles Manry				Humidity:	48.2% RH	
Project:	Kitt-A2				Barometric Pres.:	1014 mbar	
Tested by:	Matthew Barnes		Powe	r: Battery	Job Site:	NC02	
TEST SPECIFICAT	IONS			Test Method			
FCC 15.247:2016				ANSI C63.10:2013			
COMMENTS				-			
LED White Level 90	0%. All LED's on. 0dBm output	t power.					
DEVIATIONS FROM	I TEST STANDARD						
None							
Configuration #	3	Signature	Hew W	how			
						Limit	
					Value	(≥)	Result
BLE, Low Channel, 2	2402 MHz				696.494 kHz	500 kHz	Pass
BLE, Mid Channel, 2	2442 MHz				704.599 kHz	500 kHz	Pass
BLE, High Channel,	2480 MHz				706.074 kHz	500 kHz	Pass

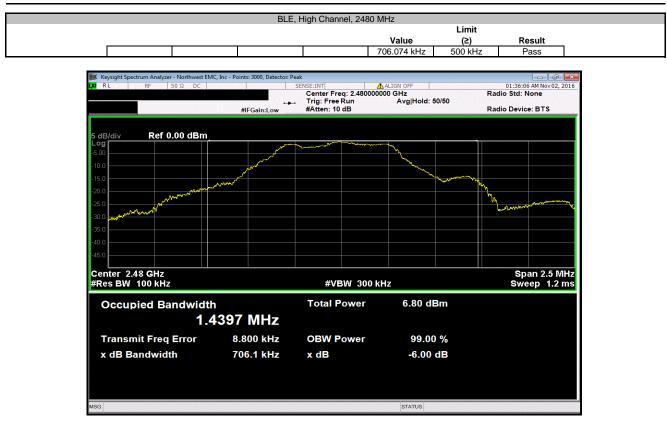
Report No. SYNA0203.2 Rev 01













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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIA	4/6/2016	4/6/2018
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	6/7/2016	6/7/2017
Attenuator	Fairview Microwave	SA4014-20	ΤKV	3/4/2016	3/4/2017
Block - DC	Fairview Microwave	SD3379	AMU	5/6/2016	5/6/2017
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	6/8/2016	6/8/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio..

De Facto EIRP Limit: The EUT meets the de facto EIRP limit of +36 dBm.



EUT: FF	-01				Work Order	: SYNA0203	
Serial Number: A2	2M12				Date	: 11/01/16	
Customer: Ut	per Technologies Inc.				Temperature	21.8 °C	
Attendees: Ch	narles Manry				Humidity	: 48% RH	
Project: Ki	tt-A2				Barometric Pres.	: 1015 mbar	
Tested by: Ma	atthew Barnes		Power:	Battery	Job Site	NC02	
TEST SPECIFICATION	IS			Test Method			
FCC 15.247:2016				ANSI C63.10:2013			
COMMENTS							
	. All LED's on. 0dBm ou	itput power.					
DEVIATIONS FROM T	EST STANDARD						
None							
Configuration #	3	Signature	after W	kan			
						Limit	
					Value	(<)	Result
BLE, Low Channel, 240	2 MHz				1.042 mW	1 W	Pass
BLE, Mid Channel, 2442	2 MHz				989.54 uW	1 W	Pass
BLE, High Channel, 248	30 MHz				894.4 uW	1 W	Pass



			BLE, Low Cha	nnel, 2402 M	Ηz			
						Limit		
				1	.042 mW	(<) 1 W	Resul Pass	τ
Keysight Spectrum Ar		C, Inc	SENSE:INT	<u></u>	ALIGN OFF		01:17:47 AM	Nov 02, 2016
		PNO: F	ast 🛶 Trig: Fre	e Run	#Avg Type: Avg Hold: 1	Log-Pwr 00/100	TRACE TYPE DET	1 2 3 4 5 6 MWWWWW P P P P P P
Def		IFGain:L	.ow #Atten: *			Mk	r1 2.401 75	and the second se
5 dB/div Ref	Offset 21.67 dB 3.499 mW	1					1.04	20 mW
			1					
1.11 mW							the second s	
350 μW								the second second
111 µW								
25.0 .444								
35.0 μW								
11.1 μW								
3.50 μW								
1.11 µW								
350 nVV								
111 nW								
Center 2.40200							Span 4.5	00 MHz
#Res BW 2.4 M			#VBW 8.0 MHz			#Sweep	73.39 ms (1	000 mH2 000 pts)
MSG					STATUS			
			BLE, Mid Char	nel, 2442 Mi	Ηz	1.1		
			BLE, Mid Chai		Value	Limit (<)	Resul	t
			BLE, Mid Char				Resul	
🚺 Keysight Spectrum Ar		C, Inc		9	Value 89.54 uW	(<)	Pass	
Keysight Spectrum Ar	nalyzer - Northwest EM 50 Ω DC		SENSE:INT	9	Value 89.54 uW	(<) 1 W	Pass	Nov 02, 2016
			SENSE:INT	9 e Run	Value 89.54 uW	(<) 1 W Log-Pwr 00/100	Pass 01:29:03 AM TRACE TYPE DET	Nov 02, 2016 2 3 4 5 6 MWWWW P P P P P P
K RL RF	50 Ω DC	PNO: F	SENSE:INT	9 e Run	Value 89.54 uW	(<) 1 W Log-Pwr 00/100	Pass 01:29:03 AM TRACE TYPE DET r1 2.441 7 6	Nov 02, 2016 2 3 4 5 6 MWWWW P P P P P P
XX RL RF		PNO: F	sense:INT ast ← Trig: Fre ow #Atten: *	9 e Run	Value 89.54 uW	(<) 1 W Log-Pwr 00/100	Pass 01:29:03 AM TRACE TYPE DET r1 2.441 7 6	Nov 02, 2016 2 3 4 5 6 M P P P P P P 4 GHz
K RL RF	50 Ω DC	PNO: F	SENSE:INT	9 e Run	Value 89.54 uW	(<) 1 W Log-Pwr 00/100	Pass 01:29:03 AM TRACE TYPE DET r1 2.441 7 6	Nov 02, 2016 2 3 4 5 6 M P P P P P P 4 GHz
IX RL RF Ref C 5 dB/div Ref	50 Ω DC	PNO: F	sense:INT ast ← Trig: Fre ow #Atten: *	9 e Run	Value 89.54 uW	(<) 1 W Log-Pwr 00/100	Pass 01:29:03 AM TRACE TYPE DET r1 2.441 7 6	Nov 02, 2016 2 3 4 5 6 M P P P P P P 4 GHz
LXI RL RF C 5 dB/div Ref Log 1.11 mW 350 µW	50 Ω DC	PNO: F	sense:INT ast ← Trig: Fre ow #Atten: *	9 e Run	Value 89.54 uW	(<) 1 W Log-Pwr 00/100	Pass 01:29:03 AM TRACE TYPE DET r1 2.441 7 6	Nov 02, 2016 2 3 4 5 6 M P P P P P P 4 GHz
DX RL RF C dB/div Ref Log 1.11 mW	50 Ω DC	PNO: F	sense:INT ast ← Trig: Fre ow #Atten: *	9 e Run	Value 89.54 uW	(<) 1 W Log-Pwr 00/100	Pass 01:29:03 AM TRACE TYPE DET r1 2.441 7 6	Nov 02, 2016 2 3 4 5 6 M P P P P P P 4 GHz
LXI RL RF C 5 dB/div Ref Log 1.11 mW 350 µW	50 Ω DC	PNO: F	sense:INT ast ← Trig: Fre ow #Atten: *	9 e Run	Value 89.54 uW	(<) 1 W Log-Pwr 00/100	Pass 01:29:03 AM TRACE TYPE DET r1 2.441 7 6	Nov 02, 2016 2 3 4 5 6 M P P P P P P 4 GHz

#VBW 8.0 MHz

SG

Center 2.442000 GHz #Res BW 2.4 MHz Span 4.500 MHz #Sweep 73.39 ms (1000 pts)

STATUS



	BLE,	High Channel, 24	80 MHz	1.1	
			Value	Limit	Desult
I				(<) 1 W	Result
			894.4 uW	1 VV	Pass
Keysight Spectrum Analyzer - Northwest EMC, Inc					
LX RL RF 50Ω DC	S	ENSE:INT	ALIGN OFF #Avg Type: I	og-Pwr	01:36:45 AM Nov 02, 2016 TRACE 1 2 3 4 5 6
	PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 10 dB	Avg Hold: 10	0/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P P
Ref Offset 21.67 dB				Mkr1	2.479 723 GHz
5 dB/div Ref 3.499 mW					894.40 μW
Log					
		1			
1.11 mW					
350 μW					and the second sec
111 μW					
35.0 μW					
11.1 µW					
3.50 μW					
1 11 .007					
1.11 µW					
350 nW					
111 nW					
Center 2.480000 GHz					Span 4.500 MHz 3.39 ms (1000 pts)
#Res BW 2.4 MHz	#VBW	8.0 MHz		#Sweep 7	3.39 ms (1000 pts)



Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIA	4/6/2016	4/6/2018
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	6/7/2016	6/7/2017
Attenuator	Fairview Microwave	SA4014-20	ΤKV	3/4/2016	3/4/2017
Block - DC	Fairview Microwave	SD3379	AMU	5/6/2016	5/6/2017
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	6/8/2016	6/8/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

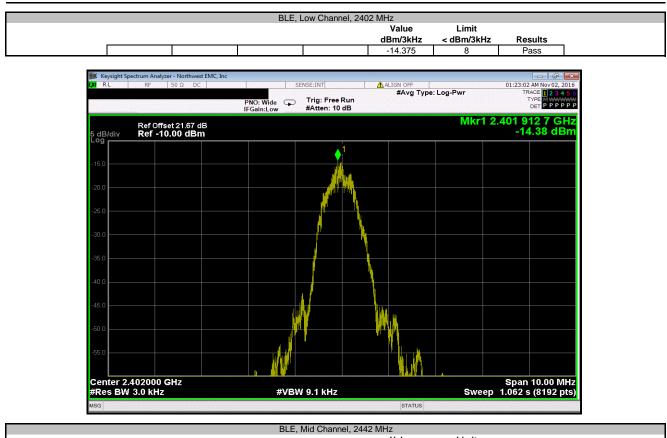
Per the procedure outlined in ANSI C63.10 the peak power spectral density was measured in a 3 kHz RBW.



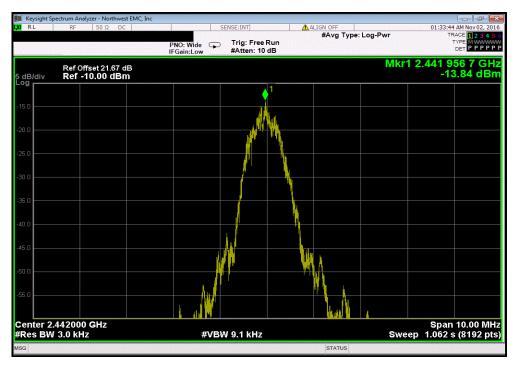
EUT:	FF01			Work Order:	SYNA0203	
Serial Number:	A2M12			Date:	11/01/16	
Customer:	Uber Technologies Inc.			Temperature:	21.8 °C	
Attendees:	Charles Manry			Humidity:	47.9% RH	
Project:	Kitt-A2			Barometric Pres.:	1015 mbar	
Tested by:	Matthew Barnes		Power: Battery	Job Site:	NC02	
TEST SPECIFICAT	IONS		Test Method			
FCC 15.247:2016			ANSI C63.10:2013			
COMMENTS						
LED White Level 90	0%. All LED's on. 0dBm output power.					
1						
	I TEST STANDARD					
DEVIATIONS FROM	I TEST STANDARD					
	3	gnature Madew	W Burn			
None Configuration #	3 Si	gnature MaAew	W Bar	Value dBm/3kHz	Limit < dBm/3kHz	Results
None	3 Si	gnature MarAew	W Bur			Results Pass
None Configuration #	3 Sá 2402 MHz	gnature Madew	W Bours	dBm/3kHz	< dBm/3kHz	

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		Value	Limit	
		dBm/3kHz	< dBm/3kHz	Results
		-13.837	8	Pass







BAND EDGE COMPLIANCE



Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIA	4/6/2016	4/6/2018
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	6/7/2016	6/7/2017
Attenuator	Fairview Microwave	SA4014-20	ΤKV	3/4/2016	3/4/2017
Block - DC	Fairview Microwave	SD3379	AMU	5/6/2016	5/6/2017
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	6/8/2016	6/8/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

BAND EDGE COMPLIANCE



EUT:	FF01				Work Order:	SYNA0203	
Serial Number:	A2M12				Date:	11/01/16	
Customer:	Uber Technologies Inc.				Temperature:	21.6 °C	
Attendees:	Charles Manry					48.3% RH	
Project:	Kitt-A2				Barometric Pres.:	1014 mbar	
Tested by:	Matthew Barnes		Power: Battery		Job Site:	NC02	
TEST SPECIFICATI	ONS		Test Method	l			
FCC 15.247:2016			ANSI C63.10	:2013			
COMMENTS							
LED White Level 90	אין LED's on. 0dBm ou ווווייט אין	tput power.					
DEVIATIONS FROM	I TEST STANDARD						
None							
Configuration #	3	Signature	after W Perro				
					Value	Limit	
					(dBc)	≤ (dBc)	Result
BLE, Low Channel, 2	2402 MHz				-38.17	-20	Pass
BLE, High Channel,	2480 MHz				-34.72	-20	Pass

BAND EDGE COMPLIANCE





(dBc) ≤ (dBc) Result
04.70 Doub
-34.72 -20 Pass





Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIA	4/6/2016	4/6/2018
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	6/7/2016	6/7/2017
Attenuator	Fairview Microwave	SA4014-20	TKV	3/4/2016	3/4/2017
Block - DC	Fairview Microwave	SD3379	AMU	5/6/2016	5/6/2017
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	6/8/2016	6/8/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.



EUT:	: FF01			Work Order:	SYNA0203	
Serial Number:					11/01/16	
	Uber Technologies Inc.			Temperature:		
	Charles Manry				47.9% RH	
Project:	: Kitt-A2			Barometric Pres.:	1015 mbar	
Tested by:	: Matthew Barnes		Power: Battery	Job Site:	NC02	
EST SPECIFICAT	IONS		Test Method			
CC 15.247:2016			ANSI C63.10:2013			
COMMENTS						
ED White Level 90	0%. All LED's on. 0dBm output	power.				
EVIATIONS FROM	M TEST STANDARD					
	M TEST STANDARD					
DEVIATIONS FROM	M TEST STANDARD		-11. 2			
None			Mana, 10) Kons			
	M TEST STANDARD	Sinnature	Master W Bar			
None		Signature		Max Value	Limit	
None		Signature	Frequency	Max Value (dBc)	Limit ≤ (dBc)	Result
None Configuration #	3	Signature		Max Value (dBc) N/A	Limit ≤(dBc) N/A	Result N/A
None Configuration # BLE, Low Channel, :	3 2402 MHz	Signature	Frequency Range	(dBc)	≤ (dBc)	
None	3 2402 MHz 2402 MHz	Signature	Frequency Range Fundamental	(dBc) N/A	≤ (dBc) N/A	N/A
None Configuration # BLE, Low Channel, ; BLE, Low Channel, ; BLE, Low Channel, ;	3 2402 MHz 2402 MHz 2402 MHz	Signature	Frequency Range Fundamental 30 MHz - 12.5 GHz	(dBc) N/A -43.6	≤ (dBc) N/A -20	N/A Pass
Configuration # SLE, Low Channel, BLE, Low Channel, BLE, Low Channel, 2 BLE, Mid Channel, 2	3 2402 MHz 2402 MHz 2402 MHz 2402 MHz 2422 MHz	Signature	Frequency Range Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz	(dBc) N/A -43.6 -51.41	≤ (dBc) N/A -20 -20	N/A Pass Pass
Ione Configuration # BLE, Low Channel, BLE, Low Channel, BLE, Mid Channel, 2 BLE, Mid Channel, 2	3 2402 MHz 2402 MHz 2402 MHz 2402 MHz 2442 MHz 2442 MHz	Signature	Frequency Range Fundamental 30 MHz - 12.5 GHz 12.5 GHz Fundamental	(dBc) N/A -43.6 -51.41 N/A	≤ (dBc) N/A -20 -20 N/A	N/A Pass Pass N/A
None Configuration # BLE, Low Channel, BLE, Low Channel, 3 BLE, Mid Channel, 2 BLE, Mid Channel, 2 BLE, Mid Channel, 2	3 2402 MHz 2402 MHz 2402 MHz 2402 MHz 2442 MHz 2442 MHz 2442 MHz	Signature	Frequency Range Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz Fundamental 30 MHz - 12.5 GHz	(dBc) N/A -43.6 -51.41 N/A -41.06	≤ (dBc) N/A -20 -20 N/A -20	N/A Pass Pass N/A Pass
None Configuration # BLE, Low Channel, 1 BLE, Low Channel, 1	3 2402 MHz 2402 MHz 2402 MHz 2442 MHz 2442 MHz 2442 MHz 2442 MHz 2440 MHz	Signature	Frequency Range Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz	(dBc) N/A -43.6 -51.41 N/A -41.06 -51.52	≤ (dBc) N/A -20 -20 N/A -20 -20	N/A Pass Pass N/A Pass Pass





Frequency	Max Value	Limit	
Range	(dBc)	≤ (dBc)	Result
30 MHz - 12.5 GHz	-43.6	-20	Pass

RL	trum Analyzer - North RF 50 Ω			S	ENSE:INT		ALIGN OFF		01:19:1	3 AM Nov 02, 20
	10 30 32		PNO: Fast IFGain:Low		Trig: Free #Atten: 10	Run	#Avg Type	Log-Pwr	т	RACE 1 2 3 4 5 TYPE MWWW DET P P P P F
0 dB/div	Ref Offset 21.67 Ref 10.00 dE	7 dB Sm							Mkr1 2.3 -4	10 6 GH 3.52 dBi
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tart 30 M	Hz								Stop	12.500 GH
Res BW 1			#	VBV	V 300 kHz			Sw	eep 1.192	s (8192 pt
3							STATUS			

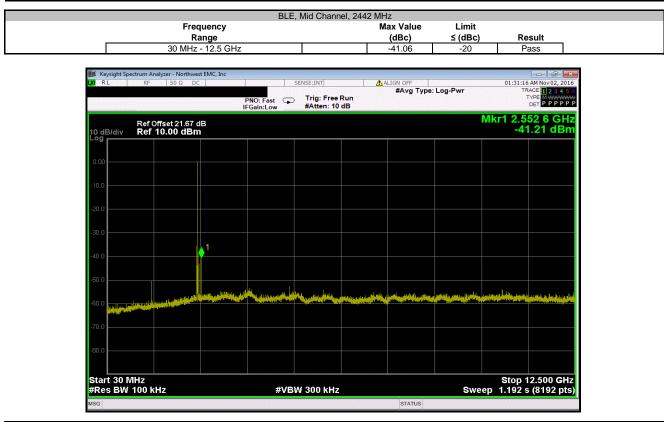


	_	BLE	, Low Channel, 2			
	Frequency			Max Value	Limit	
	Range		- T	(dBc)	<u>≤ (dBc)</u>	Result
I	12.5 GHz - 25 GH	ΗZ		-51.41	-20	Pass
📜 Keysight Spectrum A	nalyzer - Northwest EMC, Inc					
LXI RL RF	50 Ω DC		SENSE:INT	ALIGN OFF		01:20:45 AM Nov 02, 2016
		PNO: Fast G	Trig: Free Run #Atten: 10 dB	#Avg Type:	Log-Pwr	TRACE 123456 TYPE MWWWW DET PPPPP
Ref (10 dB/div Ref	Offset 21.67 dB 10.00 dBm				Mkr	1 24.160 7 GHz -51.33 dBm
	10.00 dBill					
0.00						
10.0						
-10.0						
-20.0						
-20.0						
-30.0						
-40.0						
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-50.0					and the second state of th	
	and the second secon	والمراجع والمراجع والمراجع		a la dista da contra dista dista da contra di		
-60.0						
-70.0						
-80.0						
Start 12.500 GH	H7					Stop 25.000 GHz
#Res BW 100 k		#VB	W 300 kHz		Sweep	1.195 s (8192 pts)
MSG				STATUS		
		RIE	Mid Channel 2	2442 MHz		
	Frequency	BLE	, Mid Channel, 2	442 MHz Max Value	Limit	

	BLE,	Mid Channel, 244	2 MHz		
Frequency			Max Value	Limit	
Range			(dBc)	≤ (dBc)	Result
Fundament	1		N/A	N/A	N/A

RL	trum Analyzer - Northwest RF 50 Ω DC	Elvic, file	SENSE:INT	ALIGN OFF	01:30:18 AM Nov 02, 20
		PNO: Wide C IFGain:Low		#Avg Type: Log-Pwr	TRACE 1 2 3 4 TYPE MWWW DET P P P P
dB/div	Ref Offset 21.67 di Ref 10.00 dBm	В		Mkr	1 2.441 989 38 GH -0.15 dB
			↓ 1		
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	menter and the second	boll and the second sec			
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nter 2.44	42000 GHz				Span 2.000 Mi
es BW 1	00 kHz	#V	BW 300 kHz	Swee	Span 2.000 Mi ep 1.092 ms (8192 p
				STATUS	





	BLE, I	Vid Channel, 2442 MHz			
	Frequency	Max Value	Limit		
	Range	(dBc)	≤ (dBc)	Result	
[12.5 GHz - 25 GHz	-51.52	-20	Pass	

RL		RF	50 Ω	DC			S	ENSE:INT		A AI	IGN OFF		01:32	:59 AM Nov 02, 20
					PN IFG	O: Fast ain:Low		Trig: Free I #Atten: 10			#Avg Type:	Log-Pwr		TRACE 1 2 3 4 TYPE MWWW DET P P P P
0			fset 21.6 0.00 di										Mkr1 24	.565 1 GH 51.67 dB
0 dB ^{og} r		Rei I	0.00 ai									I		
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0.0														
0.0														
0.0														
art	12.50	0 GH											Stor	o 25.000 Gł
	BW 1					#	VBV	V 300 kHz				Sv	veep 1.19	5 s (8192 pi
G											STATUS			





Frequency	Max Va	alue Limi [.]	t
Range	(dBo	:) ≤ (dB	c) Result
30 MHz - 12.5 GHz	-44.1	4 -20	Pass

RL RF	lyzer - Northwest EMC, Inc 50 Ω DC		SENSE:INT	ALIGN OFF		01:38:17 A	📼 🛛 🗗 🔚
		PNO: Fast 🖵 IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type:	Log-Pwr	TYI	E 1 2 3 4 5 E M WWW F P P P P F
	ffset 21.67 dB I 0.00 dBm				Ν	/kr1 2.55 -44.	2 6 GH 71 dB
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art 30 MHz			W 300 kHz		Current	Stop 12	.500 GI
tes BW 100 kl	12	#VB	W 300 KHZ	STATUS	Swee	p 1.192.s(8192 p



	BLE,	High Chann					
Frequency			М	ax Value	Limit		
Range				(dBc)	≤ (dBc)		sult
12.5 GHz - 25 G	Hz			-51.15	-20	P	ass
W Keysight Spectrum Analyzer - Northwest EMC, Inc							
LX/ RL RF 50Ω DC		SENSE:INT	<u>∧</u>	LIGN OFF		01:39:37	AM Nov 02, 2016
	PNO: Fast	Trig: Free F	Run	#Avg Type	: Log-Pwr	TR	ACE 1 2 3 4 5 6 TYPE M WWWWW DET P P P P P
	IFGain:Low	#Atten: 10 d					DET PPPPP
Ref Offset 21.67 dB					M	kr1 23.7	56 3 GHz
10 dB/div Ref 10.00 dBm						-51	1.72 dBm
0.00							
-10.0							
-20.0							
-30.0							
-40.0							
							1
-50.0						واستنبا المحي	las del atol a tarte tare
ومقتول والمتحاذ الأفري والمتحاطة فصرعوه والمتألفة ومحمد والمتحد	and a second and a second deather						a state and second in the second
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-70.0							
-80.0							
Start 12.500 GHz	1					Stop 2	25.000 GHz
#Res BW 100 kHz	#VB	W 300 kHz			Swee	ep 1.19 <u>5 s</u>	s (8192 pts)
				STATUS			

SPURIOUS RADIATED EMISSIONS



Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

CHANNEL OF OPERATION

Low Channel 0, 2402 MHz
Middle Channel 20, 2442 MHz
High Channel 39, 2480 MHz
POWER SETTINGS INVESTIGATED
Battery only and Charging mode via USB

CONFIGURATIONS INVESTIGATED

SYNA0209 - 5

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz

Stop Frequency 26.5 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	ESM Cable Corp.	KMKM-72	EVY	10/17/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	10/17/2016	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D00100800-32-13P	AVF	7/11/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	3/11/2016	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Attenuator	Coaxicom	3910-20	AXZ	5/18/2016	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	3/11/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	3/11/2016	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2/3/2016	24 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFD	5/18/2016	12 mo
Cable	N/A	Bilog Cables	EVA	3/11/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	3/11/2016	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	6/30/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/22/2016	12 mo

TEST DESCRIPTION

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector PK = Peak Detector AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements at the edges of the allowable band may be presented in an alternative method as provided for in the ANSI C63.10 Marker-Delta method. This method involves performing an in-band fundamental measurement followed by a screen capture of the fundamental and out-of-band emission using reduced measurement instrumentation bandwidths. The amplitude delta measured on this screen capture is applied to the fundamental emission value to show the out-of-band emission level as applied to the limit.

SPURIOUS RADIATED EMISSIONS



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	k Order		YNA02					Date			9/16		Ro	-0	2	1		5	D	1	2	
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	ob Site		EV01					midity		39.79				1. The second					6			
Serial N			J00004	15		Baro	metric	Pres.		1018	mbar			Tes	ted b	by: J	eff A	lcoke	e and	Rod	Pelo	quir
		FF01																				
Config	uration	: 5																				
	stomer				Inc.																	
Att	endees	Charle	s Manı	ry																		
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Operatin	g Mode	Transr	nit, Log	jo on, v	white	level	90.															
Dev	/iations																					
Con	nments		ommen	ts for E	EUT o	orienta	ation a	nd tra	nsmit	freque	ncy and	channe	əl									
st Specifi											Test M											
C 15.247:	2016										ANSI C	63.10:	2013									_
Run #	25	Tes	t Dista	nce (n	n)	3	A	ntenr	na Hei	ight(s)		1 t	o 4(m	1)			Res	sults		Ρ	ass	
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)
2484.247	30.7	-1.1	1.0	0.0	3.0	20.0	Horz	AV	0.0	49.6	54.0	-4.4
2484.107	30.6	-1.1	3.1	138.0	3.0	20.0	Horz	AV	0.0	49.5	54.0	-4.5
2484.197	30.6	-1.1	1.0	49.0	3.0	20.0	Vert	AV	0.0	49.5	54.0	-4.5
2484.733	30.6	-1.1	3.9	81.0	3.0	20.0	Vert	AV	0.0	49.5	54.0	-4.5
2484.377	30.6	-1.1	1.7	194.0	3.0	20.0	Horz	AV	0.0	49.5	54.0	-4.5
2483.887	30.6	-1.1	1.0	280.0	3.0	20.0	Vert	AV	0.0	49.5	54.0	-4.5
2388.067	30.8	-1.6	3.7	311.0	3.0	20.0	Vert	AV	0.0	49.2	54.0	-4.8
2389.593	30.7	-1.6	1.0	149.0	3.0	20.0	Horz	AV	0.0	49.1	54.0	-4.9
2485.177	42.4	-1.1	1.7	194.0	3.0	20.0	Horz	PK	0.0	61.3	74.0	-12.7
2483.647	42.0	-1.1	3.1	138.0	3.0	20.0	Horz	PK	0.0	60.9	74.0	-13.1
2484.793	41.8	-1.1	1.0	0.0	3.0	20.0	Horz	PK	0.0	60.7	74.0	-13.3
2483.797	41.4	-1.1	1.0	49.0	3.0	20.0	Vert	PK	0.0	60.3	74.0	-13.7
2484.490	41.4	-1.1	3.9	81.0	3.0	20.0	Vert	PK	0.0	60.3	74.0	-13.7
2483.990	41.4	-1.1	1.0	280.0	3.0	20.0	Vert	PK	0.0	60.3	74.0	-13.7
2389.900	41.8	-1.6	1.0	149.0	3.0	20.0	Horz	PK	0.0	60.2	74.0	-13.8
2388.907	41.7	-1.6	3.7	311.0	3.0	20.0	Vert	PK	0.0	60.1	74.0	-13.9

SPURIOUS RADIATED EMISSIONS



					44/00/46	1 -		0		
Work Order:				Date: 11/2		Rel	1 7	2 Ker		
Project			Т	Temperature: 2		- my	he Re	- cong		
Job Site:			_	Humidity:	39.7% RH	U		0		
Serial Number:		J000045	Baron	metric Pres.:	1018 mbar	Tested b	y: Jeff Alcoke an	coke and Rod Peloqu		
	EUT	: FF01								
	guration									
		Uber Technologie	es, Inc.							
		Charles Manry								
EU	T Power:			•.						
Operatir	ng Mode	Logo on, white le	vel 90, Trans	mit						
De	viations	None								
			or Transmit ch	annel, frequenc	y and EUT orie	ntation. Charging via US	B investigated in	worst case		
Co	mments	orientation.								
	ications	Test Method								
; 15.247	2016				ANSI	C63.10:2013				
Run #	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
Run #	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80 —	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80 70 60	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80 70 60 50	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80 70 60 50	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80 70 60 50	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80 70 60 50	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		
80 - 70 - 60 - 50 - 40 - 30 - 20 - 10 -	30	Test Distance	(m) 3	Antenna H	eight(s)	1 to 4(m)	Results Image: Constraint of the second s	Pass		
80	30		(m) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass		

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)
4803.980	44.3	9.0	3.5	302.0	3.0	0.0	Vert	AV	0.0	53.3	54.0	-0.7
4803.980	44.1	9.0	3.0	249.0	3.0	0.0	Horz	AV	0.0	53.1	54.0	-0.9
4803.890	43.5	9.0	2.6	344.0	3.0	0.0	Horz	AV	0.0	52.5	54.0	-1.5
4803.905	43.3	9.0	1.2	194.0	3.0	0.0	Horz	AV	0.0	52.3	54.0	-1.7
4803.960	42.9	9.0	2.4	105.0	3.0	0.0	Vert	AV	0.0	51.9	54.0	-2.1
4959.950	41.7	9.4	3.5	141.0	3.0	0.0	Vert	AV	0.0	51.1	54.0	-2.9
4883.925	41.8	9.2	3.6	314.0	3.0	0.0	Vert	AV	0.0	51.0	54.0	-3.0
4803.960	41.1	9.0	1.0	247.0	3.0	0.0	Vert	AV	0.0	50.1	54.0	-3.9
4883.970	40.7	9.2	3.1	53.0	3.0	0.0	Horz	AV	0.0	49.9	54.0	-4.1
4804.025	40.7	9.0	1.0	139.0	3.0	0.0	Vert	AV	0.0	49.7	54.0	-4.3