

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT AND INDUSTRY CANADA RSS 210

OF

Product Name: Here One
Brand Name: HERE01011
Model No.: HERE01011R
Model Difference: N/A
FCC ID: 2AF9A01011R
IC: 20747-01011R
Report No.: ER/2017/10021-01
Issue Date: Sep. 02, 2019
FCC Rule Part: §15.209
IC Rule Part: RSS-210 issue 9 Aug.2016 Annex B
Prepared for Doppler Labs Inc.
611 Broadway Suite 523, New York, 10012,
United States
Prepared by SGS Taiwan Ltd.
Electronics & Communication Laboratory
No.134, Wu Kung Road, New Taipei
Industrial Park, Wuku District, New Taipei
City, Taiwan 24803



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VERIFICATION OF COMPLIANCE

Applicant: Doppler Labs Inc.
611 Broadway Suite 523, New York, 10012, United States

Product Name: Here One

Brand Name: HERE01011

Model No.: HERE01011R

Model Difference: N/A

FCC ID: 2AF9A01011R

IC: 20747-01011R

File Number: ER/2017/10021-01

Date of test: Dec. 20, 2016 ~ Jan. 04, 2017

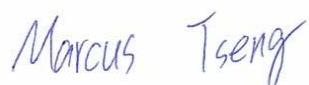
Date of EUT Received: Dec. 20, 2016

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2014 & ANSI C63.10:2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Test By:

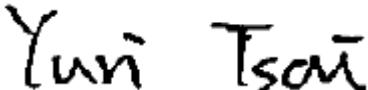


Date:

Sep. 02, 2019

Marcus Tseng / Engineer

Prepared By:

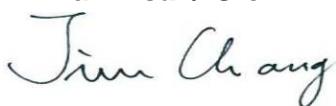


Date:

Sep. 02, 2019

Yuri Tsai / Clerk

Approved By



Date:

Sep. 02, 2019

Jim Chang / Asst. Manager

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Revision History

Report Number	Revision	Description	Effectuated Page	Issue Date	Revised By
ER/2017/10021	Rev.00	Initial creation of document	All	Jan. 11, 2017	Yuri Tsai
ER/2017/10021-01	Rev.01	Add section 1.6 remark and conduction data updated	6,12~13	Sep. 02, 2019	Yuri Tsai

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1. GENERAL INFORMATION

1.1. Product Description

Product Name:	Here One	
Brand Name:	HERE01011	
Model No.:	HERE01011L	
Model Difference:	N/A	
Hardware Version:	102	
Software Version:	1.0	
USB Cable:	Model No.: C712 10M008 266 6, Supplier: Amphenol Mobile Connector Solution	
Charging Case:	Model No.: P0788-LF (842326 1S1P), Supplier: EVE	
Power Supply:	3.7Vdc from Rechargeable Li-Ion Battery or 5V from USB Cable	
	Battery:	Model No.: CP1254 A3, Supplier: Varta

Operating Frequency	10.6MHz
Transmit Power	< 69.54dBuV/m at 3m.
Number of Channels	1
Modulation Type:	8-DPSK
Antenna:	coil antenna
Type of Emission:	512KG1D

The signal is very weak and not able to be capture at all

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1.2. Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.209

IC RSS 210 issue 9 Aug.2016 Annex B

RSS-Gen. issue 4 Nov. 2014

ANSI C63.10:2013

Note:

All test items have been performed and record as per the above standards.

1.3. Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan (TAF code 0513)
FCC Designation Number: TW0001

ISED#: 4620A

1.4. Special Accessories

There are no special accessories used while test was conducted.

1.5. Equipment Modifications

There was no modification incorporated into the EUT.

1.6. Remarks

The original test report ER/2017/10021 will be withdrawn with this test report ER/2017/10021-01 and is no longer valid when the withdrawal occurred.

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2. System Test Configuration

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3. Test Procedure

2.3.1 Conducted Emissions (Not apply in the report)

The EUT is placed on a turn table which is 0.8 m above ground plan. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Radiated Emissions

The EUT is placed on a turn table which is 0.8 m above ground plan. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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2.4. Limitation

(1) Conducted Emission

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency range MHz	Limits dB (uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note

- 1.The lower limit shall apply at the transition frequencies
- 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

(2) Radiated Emission

- 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:
- In the emission table above, the tighter limit applies at the band edges.
- The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other Sections within this Part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

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Frequency (MHz)	Field strength $\mu\text{V/m}$	Distance (m)
0.009-0.490	2400/F(KHz)	300
0.490-1.705	24000/F(KHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

2.5. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	N/A					

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3. Summary of Test Results

FCC / IC Rules	Description Of Test	Result
§15.207	Conducted Emission	N/A
§15.209 (a) / RSS-GEN Issue 4	Fieldstrength of harmonics and spurious	Compliant
§15.35 (c) / RSS-GEN Issue 4 § 6.10	Timing of the transmitter (Duty cycle correction factor)	Compliant
§ 15.209 / RSS-Gen issue 4 §6.6	Bandwidth of the modulated carrier	Compliant

4. Description of test modes

The EUT has been tested under continuous operating condition. The Frequency 10.6MHz was chosen for testing.

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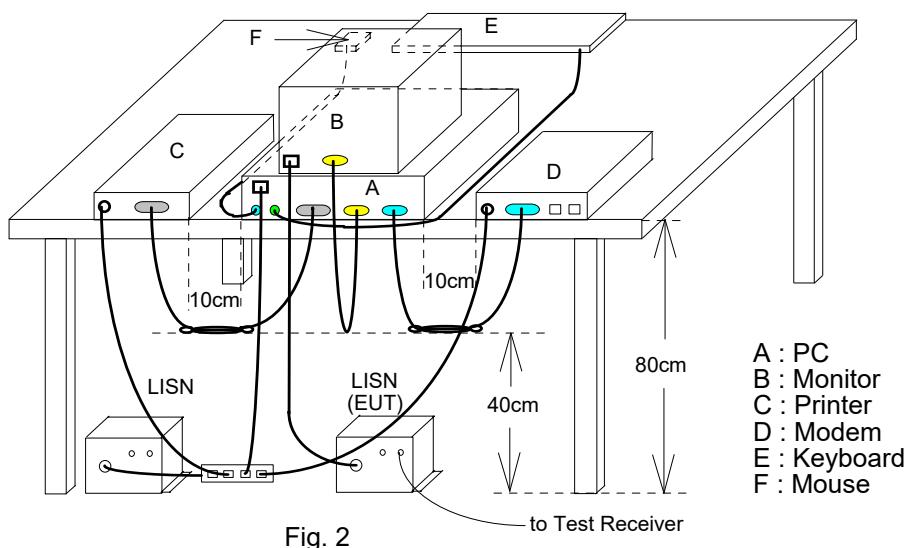
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5. Conducted Emissions Test

5.1. Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

5.2. Test SET-UP (Block Diagram of Configuration)



5.3. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI7	100760	05/10/2016	05/09/2017
LISN	Rolf-Heine	NNB-2/16Z	99012	05/16/2016	05/15/2017
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	05/16/2016	05/15/2017
Coaxial Cables	N/A	WK CE Cable	N/A	11/26/2016	11/25/2017

5.4. Measurement Result:

Note: Refer to next page for measurement data and plots.

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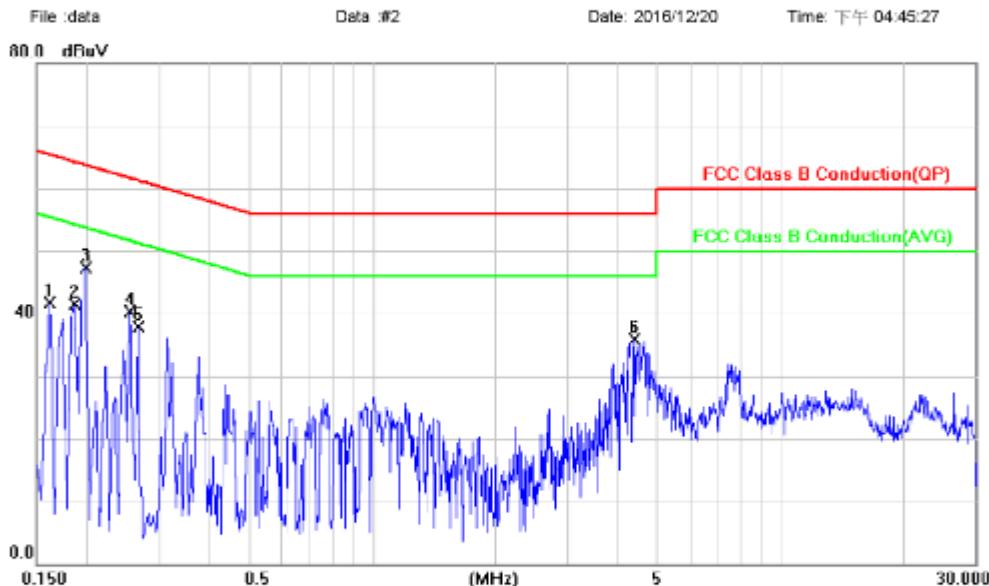
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation mode			Test By:	Nick
Temperature:	20 °C	Humidity:	58 %		

Site: Conduction Room
 Phase: **L1**
 Temperature: 25 °C
 Limit: FCC Class B Conduction(QP)
 Power: AC 120V/60Hz
 Humidity: 85 %
 Mode: Operation mode
 Note:

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dB			
1		0.1620	41.55	0.07	41.62	65.36	-23.74	peak	
2		0.1860	41.36	0.08	41.44	64.21	-22.77	peak	
3 *		0.1980	47.26	0.08	47.34	63.69	-16.35	peak	
4		0.2540	40.26	0.09	40.35	61.63	-21.28	peak	
5		0.2660	37.90	0.09	37.99	61.24	-23.25	peak	
6		4.3820	35.60	0.26	35.86	56.00	-20.14	peak	

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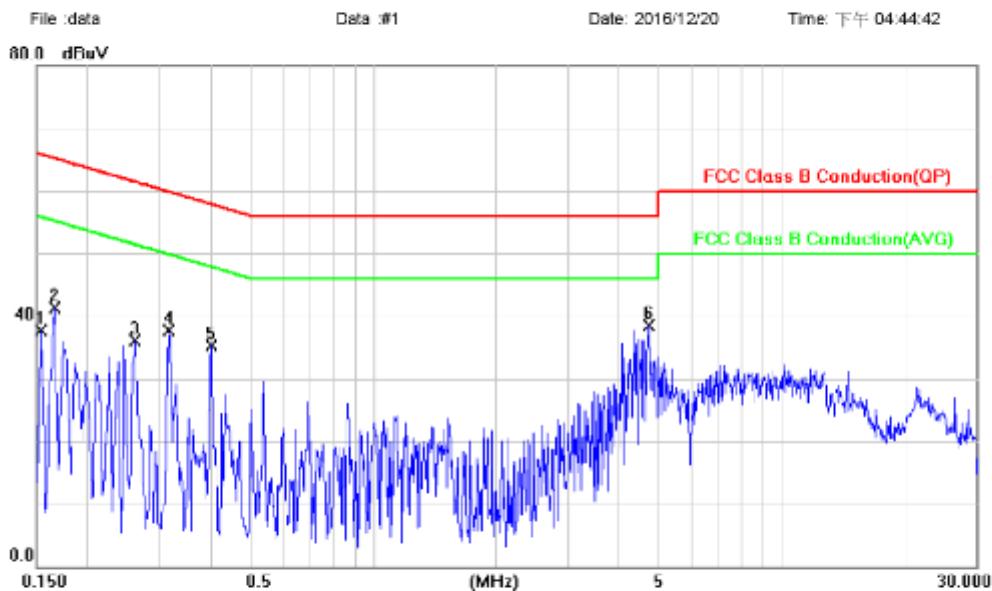
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Site: Conduction Room
Limit: FCC Class B Conduction(QP)
Mode: Operation mode
Note: Power: AC 120V/60Hz
Temperature: 25 °C
Humidity: 85 %

Conducted Emission



No.	Mk.	Reading Freq. MHz	Level dBuV	Correct Factor	Measure- ment dBuV	Limit dB	Over Detector	Comment
1		0.1540	37.72	0.07	37.79	65.78	-27.99	peak
2		0.1660	41.16	0.07	41.23	65.16	-23.93	peak
3		0.2620	35.94	0.09	36.03	61.37	-25.34	peak
4		0.3180	37.71	0.09	37.80	59.76	-21.96	peak
5		0.4020	35.11	0.10	35.21	57.81	-22.60	peak
6 *		4.7380	38.23	0.27	38.50	56.00	-17.50	peak

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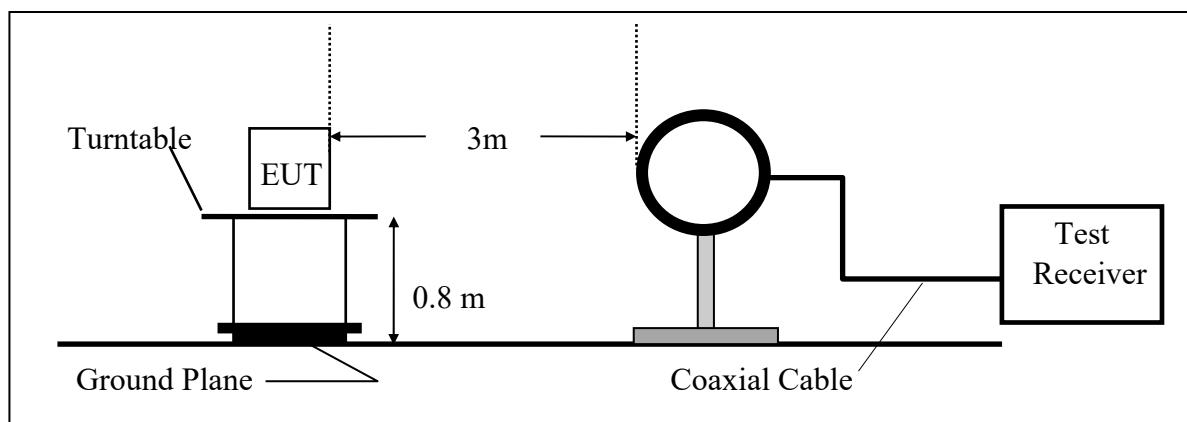
6. Radiated Emission Test

6.1. Measurement Procedure

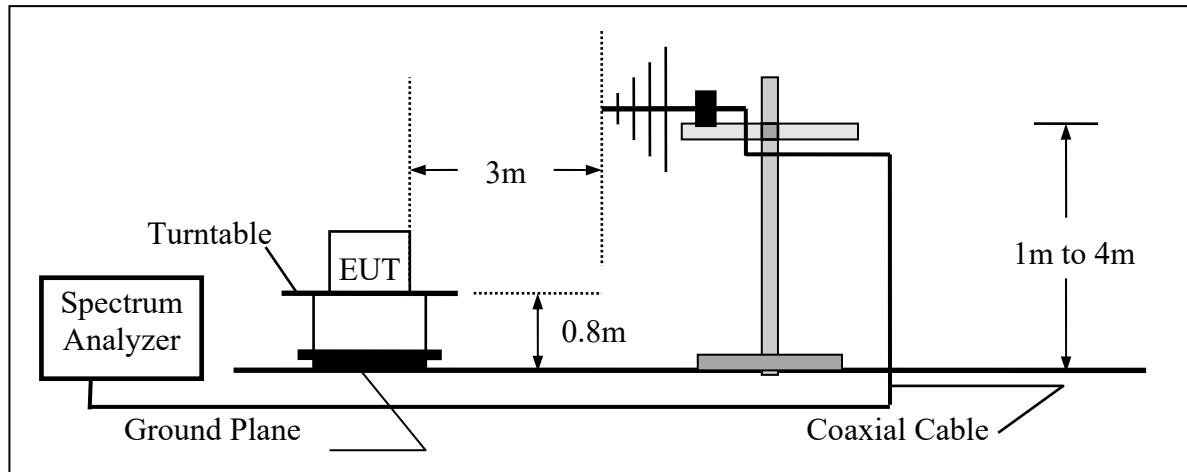
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

6.2. Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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6.3. Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI7	100760	05/10/2016	05/09/2017
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/29/2016	01/28/2017
Loop Antenna	ETS-Lindgren	6502	143303	09/20/2016	09/19/2017
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/19/2016	12/18/2017
Horn Antenna	Schwarzbeck	BBHA9120D	1441	08/01/2016	07/31/2017
Pre-Amplifier	Agilent	8447D	2944A07676	01/02/2016	01/01/2017
Pre-Amplifier	EMC Instruments Corp.	EMC012653 0	980038	01/02/2016	01/01/2017
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	ChamPro	AM-BS-4500 -B	060776-ABS	N.C.R	N.C.R
Controller	ChamPro	EM1000	60776	N.C.R	N.C.R
Low Loss Cable	Huber Suhner	966_RX	9	01/02/2016	01/01/2017
3m Site NSA	SGS	966 chamber	N/A	07/01/2016	06/30/2017
Low Loss Cable	Huber Suhner	966_TX	1	01/02/2016	01/01/2017
Horn Antenna	Schwarzbeck	BBHA9170	184	12/12/2016	12/11/2017
Pre-Amplifier	EMC Instruments Corp.	EMC184045	980135	01/02/2016	01/01/2017

6.4. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

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

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

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6.5. Measurement Result

Below 30MHz:

Operation Mode : IFMI Test Date : 12/27/2016
Fundamental Frequency : 10.6 MHz Temp. / Humi. : 22 deg_C / 61 RH
Operation Band : Tx Test Engineer : Kane
EUT Pol. : E2 Plane Measurement Antenna Pol. : VERTICAL

Actual FS(dB μ V/m) = SPA. Reading level(dB μ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB μ V/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Decotor Mode	Actual	Spectrum	Factor dB	Limit @3m dBuV/m	Margin dB
			Reading Level dB μ V/m	FS dB μ V/m			
10.66	F	Peak	35.76	24.40	11.36	69.54	-33.78
11.80	S	Peak	22.31	10.92	11.39	69.54	-47.23
12.80	S	Peak	22.12	10.71	11.42	69.54	-47.42
16.46	S	Peak	21.08	9.58	11.50	69.54	-48.46
19.46	S	Peak	21.61	10.04	11.57	69.54	-47.93
23.86	S	Peak	20.96	10.48	10.48	69.54	-48.58
28.04	S	Peak	21.28	11.78	9.49	69.54	-48.26

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Operation Mode : IFMI Test Date : 12/27/2016
Fundamental Frequency : 10.6 MHz Temp. / Humi. : 22 deg_C / 61 RH
Operation Band : Tx Test Engineer : Kane
EUT Pol. : E2 Plane Measurement Antenna Pol. : HORIZONTAL

Actual FS(dB μ V/m) = SPA. Reading level(dB μ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB μ V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Decetor Mode	Actual Reading Level dB μ V/m	Spectrum FS dB μ V/m	Factor dB	Limit @3m	Margin
						dBuV/m	dB
10.62	F	Peak	35.74	24.39	11.35	69.54	-33.80
12.14	S	Peak	22.30	10.90	11.40	69.54	-47.24
16.30	S	Peak	21.64	10.14	11.50	69.54	-47.90
19.50	S	Peak	21.68	10.11	11.57	69.54	-47.86
21.90	S	Peak	19.69	8.69	11.01	69.54	-49.85
24.86	S	Peak	20.07	9.84	10.23	69.54	-49.47
27.40	S	Peak	21.44	11.80	9.64	69.54	-48.10

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Above 30MHz:

Operation Mode : IFMI Test Date : 12/27/2016
Fundamental Frequency : 10.6 MHz Temp. / Humi. : 22 deg_C / 61 RH
Operation Band : Tx Test Engineer : Kane
EUT Pol. : E2 Plane Measurement Antenna Pol. : VERTICAL

Actual FS(dB μ V/m) = SPA. Reading level(dB μ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB μ V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Decetor Mode QP/AV/PK	Actual Reading Level dB μ V/m	Spectrum FS		Factor dB	Limit @3m dB μ V/m	Margin dB
				dB μ V/m	dB			
47.46	S	Peak	19.06	26.90	-7.85	40.00	-20.94	
146.40	S	Peak	18.51	26.55	-8.04	43.50	-24.99	
221.09	S	Peak	16.68	25.91	-9.23	46.00	-29.32	
364.65	S	Peak	23.09	27.78	-4.68	46.00	-22.91	
544.10	S	Peak	26.35	27.95	-1.60	46.00	-19.65	
742.95	S	Peak	29.35	27.08	2.28	46.00	-16.65	

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Operation Mode : IFMI Test Date : 12/27/2016
Fundamental Frequency : 10.6 MHz Temp. / Humi. : 22 deg_C / 61 RH
Operation Band : Tx Test Engineer : Kane
EUT Pol. : E2 Plane Measurement Antenna Pol. : HORIZONTAL

Actual FS(dB μ V/m) = SPA. Reading level(dB μ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB μ V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Decetor Mode	Actual	Spectrum	Factor dB	Limit @3m	Margin
			Reading Level dB μ V/m	FS dB μ V/m		dB μ V/m	dB
47.46	S	Peak	19.58	27.43	-7.85	40.00	-20.42
225.94	S	Peak	17.16	26.26	-9.10	46.00	-28.84
340.40	S	Peak	21.33	26.43	-5.10	46.00	-24.67
544.10	S	Peak	25.57	27.17	-1.60	46.00	-20.43
741.01	S	Peak	29.18	27.02	2.16	46.00	-16.82
904.94	S	Peak	30.43	25.53	4.90	46.00	-15.57

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7. Timing of the transmitter (Duty cycle correction factor)

7.1. Limits:

FCC CFR Part SUBCLAUSE § 15.35 (c) Unless otherwise specified, e.g. Section 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

IC RSS-GEN Issue 4 Section 6.10 When the field strength (or envelope power) is not constant or it is in pulses, and an average detector is specified to be used, the value of field strength or power shall be determined by averaging over one complete pulse train, including blanking intervals within the pulse train, as long as the pulse train does not exceed 0.1 seconds. In cases where the pulse train exceeds 0.1 second, the average value of field strength or output power shall be determined during a 0.1 second interval during which the field strength or power is at its maximum value.

The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

7.2. Measurement Result

Refer to next page for measurement chart.

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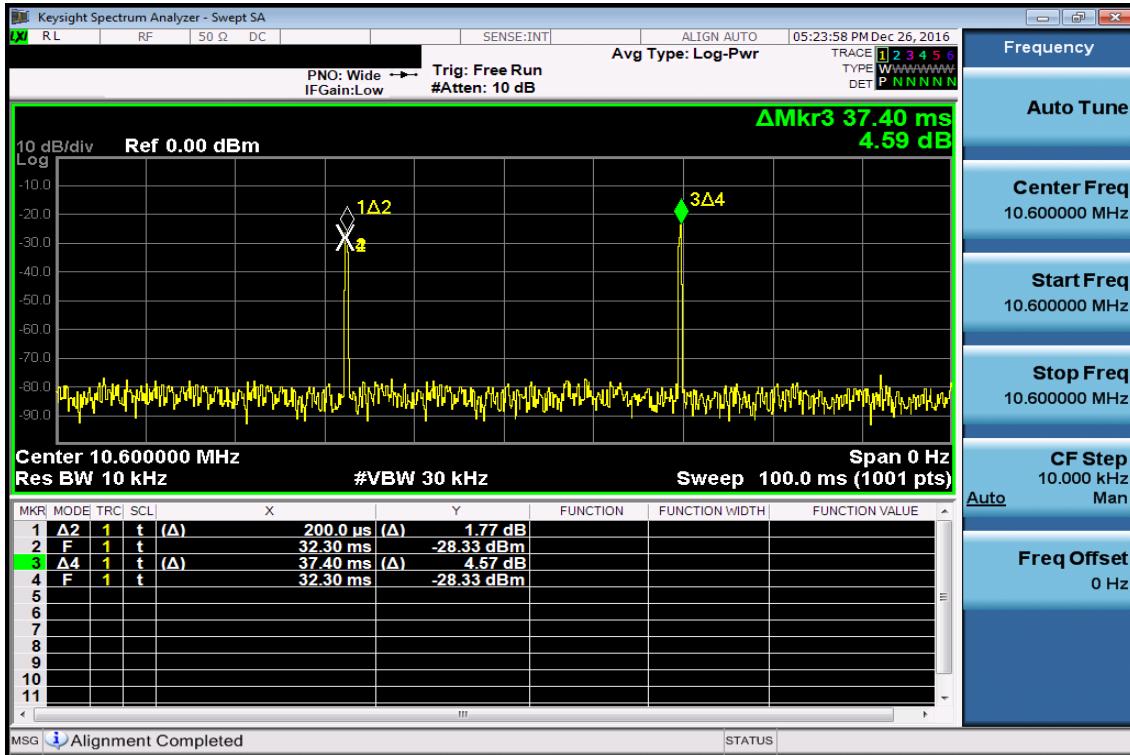
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8. Bandwidth of the modulated carrier

8.1. Standard Applicable:

For 99% Bandwidth

RSS-Gen issue 4 §6.6, The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

Note: Video averaging is not permitted.

A peak, or peak hold, may be used in place of the sampling detector as this may produce a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold may be necessary to determine the occupied bandwidth if the device is not transmitting continuously.

The trace data points are recovered and are directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded.

The difference between the two recorded frequencies is the 99% occupied bandwidth.

8.2. Measurement Equipment Used:

Refer to section 7.2 for details.

8.3. Test Set-up:

Refer to section 7.3 for details.

8.4. Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=10 kHz (1 % of 20 dB Bandwidth.), VBW = 30 kHz, Span= 3MHz, Sweep=auto, Detector = Peak, and Max hold for 20dB Bandwidth test.
4. Mark the peak frequency and -20dB (upper and lower) frequency and Turn on the 99% bandwidth function, max reading.
5. Repeat above procedure for 99% Bandwidth, but set RBW to 1% of the span, and detector = peak.
6. Repeat above procedures until all test default channel is completed

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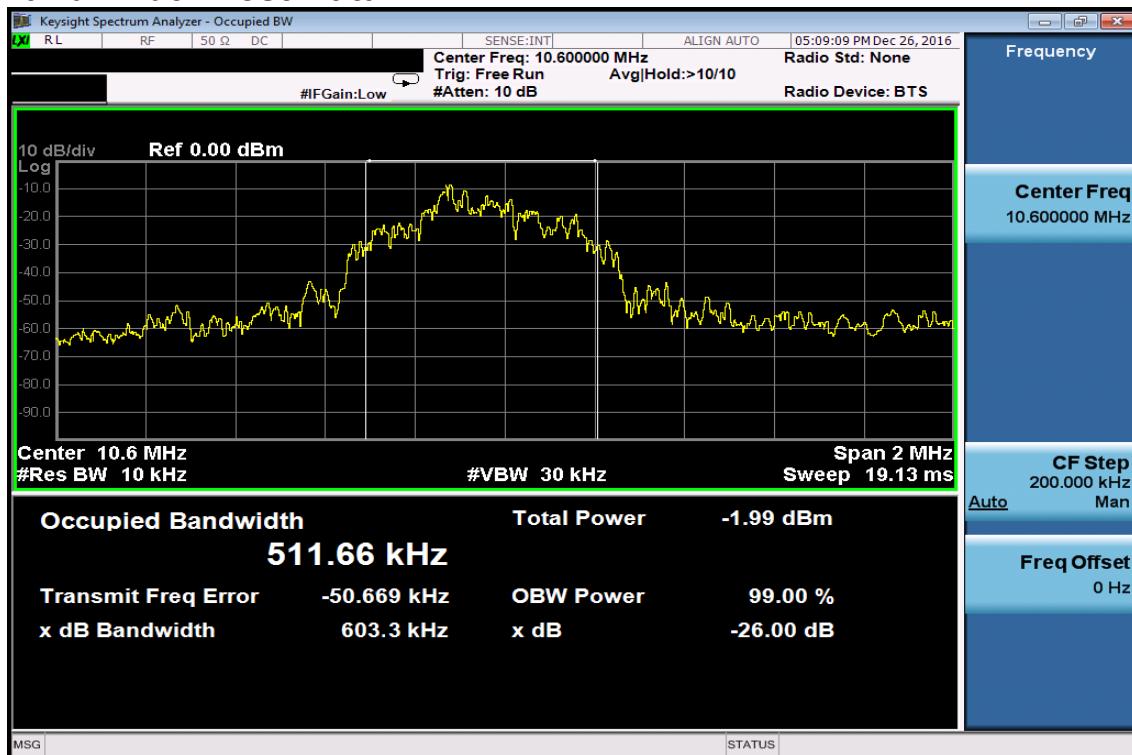
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8.5. Measurement Result:

99% Bandwidth:

Frequency MHz	99%Bandwidth (MHz)
10.6	0.512

99% Band Width Test Data



~ End of Report

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