ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name:	**Mobile UHF Reader**
Brand Name:	**Marson**
Model No.:	**MR11A7, MR11A7U**
Model Difference:	**N/A**
FCC ID:	**IRJ-MR11A7**
Report No.:	**E2/2016/A0087**
Issue Date:	**Dec. 19, 2016**
FCC Rule Part:	**§15.247, Cat: DSS**
Prepared for:	**Marson Technology Co., Ltd. 9F, No.108-3, Mincyuan Rd., Sindian Dist., New Taipei City 23141 Taiwan**
Prepared by:	**SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333**

VERIFICATION OF COMPLIANCE

Applicant:	Marson Technology Co., Ltd. 9F, No.108-3, Mincyuan Rd., Sindian Dist., New Taipei City 23141 Taiwan
Product Name:	Mobile UHF Reader
Brand Name:	Marson
Model No.:	MR11A7, MR11A7U
Model Difference:	N/A
FCC ID:	IRJ-MR11A7
File Number:	E2/2016/A0087
Date of test:	Nov. 18, 2016 ~ Nov. 30, 2016
Date of EUT Received:	Oct. 21, 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 C63.10:2013 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:	Jazz Huang	***Date:***	Dec. 19, 2016
	Jazz Huang / Asst. Supervisor		
Prepared By:	Allen Tsai	***Date:***	Dec. 19, 2016
	Allen Tsai / Engineer		
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	Jim Chang / Asst. Manager		

Version

Report Number	Revision	Description	Issue Date
E2/2016/A0087	Rev.00	Initial creation of document	Dec. 19, 2016

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1 GENERAL INFORMATION

1.1 Product description

General:

Product Name:	Mobile UHF Reader	
Brand Name:	Marson	
Model No.:	MR11A7, MR11A7U	
Model Difference:	N/A	
Product SW/HW version:	N/A/ N/A	
Power Supply:	3.7Vdc from Power Li-on Battery	
	Battery:	Model No.:1400-90020G Supplier: Helix Co.Ltd.

RFID:

Frequency Range:	902.25 – 927.75MHz
Channel number:	52 channels
Modulation type:	ASK-DSB, PR-ASK
Transmit Power:	20.85 dBm (Peak)
Dwell Time:	<= 0.4s
Operating Mode:	Point-to-Point
Antenna Designation:	Patch Antenna , Gain:-0.63dBi

This test report applies for RFID function.

	CH	Freq.	CH	Freq.	CH	Freq.
Channel List	[51]	902250	[37]	911250	[11]	920250
	[0]	902750	[17]	911750	[36]	920750
	[1]	903250	[13]	912250	[7]	921250
	[46]	903750	[24]	912750	[25]	921750
	[32]	904250	[44]	913250	[21]	922250
	[8]	904750	[10]	913750	[49]	922750
	[28]	905250	[47]	914250	[30]	923250
	[39]	905750	[12]	914750	[27]	923750
	[4]	906250	[29]	915250	[6]	924250
	[33]	906750	[5]	915750	[41]	924750
	[15]	907250	[26]	916250	[34]	925250
	[31]	907750	[48]	916750	[19]	925750
	[38]	908250	[2]	917250	[9]	926250
	[14]	908750	[16]	917750	[18]	926750
	[45]	909250	[42]	918250	[20]	927250
	[40]	909750	[23]	918750	[50]	927750
	[3]	910250	[35]	919250	[11]	920250
	[22]	910750	[43]	919750	[36]	920750

1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC Public Notice DA 00-705 Measurement Guidelines

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.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333 (TAF code 0513)

FCC Registration Numbers are: 735305

1.4 Special Accessories

There is no special accessory used while test was conducted.

1.5 Equipment Modifications

There was no modification incorporated into the EUT.

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

The EUT is a placed on as 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 a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plan. For emission measurements above 1 GHz, the table height shall be 1.5 m. 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 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.

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Following shows an offset computation example with cable loss 1dB and splitter 0dB splitter. Offset = RF cable loss (dB) =10 + 0.5 = 10.5(dB)

2.5 Configuration of Tested System

Fig. 2-1 Radiated & Conducted (Antenna Port) Emission Configuration

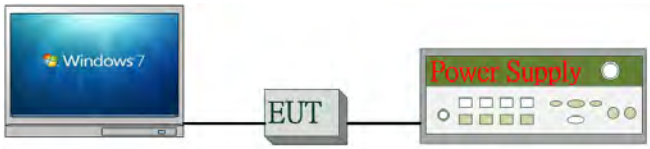


Fig 2-2 Conduction Emission

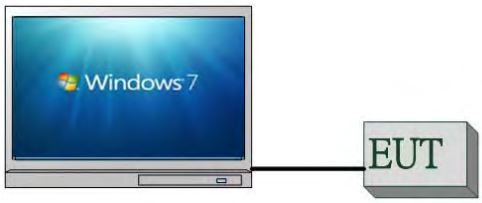


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	NFC Test Soft-ware	N/A	N/A	N/A	N/A	N/A
2.	DC Power Supply	Agilent	E3640A	KR93300208	N/A	Unshielded
3.	Notebook	Lenovo	L420	LR-7HXZA	Shielded	Unshielded

3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.247(b)(2)	Peak Output Power	Compliant
§15.247(a)(1)(i)	20dB Bandwidth	Compliant
§15.247(d)	100 kHz Bandwidth Of Frequency Band Edges	Compliant
$15.247(d) §15.209(a) (f)	Spurious Emission	Compliant
§15.247(a)(1)	Frequency Separation	Compliant
§15.247(a)(1)(i)	Number of hopping frequency	Compliant
§15.247(a)(1)(i)	Time of Occupancy	Compliant
§15.203	Antenna Requirement	Compliant

4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel Low, Mid and High with highest rated data rate were chosen as worst case for full testing. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for Bluetooth Transmitter for channel Low, Mid and High the worst case E2 position was reported.

Channel Low: channel 51 at 902.25MHz
Channel Mid: channel 12 at 914.75MHz
Channel High: channel 50 at 927.75MHz

5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Peak Output Power	+/- 0.84 dB
20dB Bandwidth	+/- 51.33 Hz
100 KHz Bandwidth Of Frequency Band Edges	+/- 0.84 dB
Frequency Separation	+/- 51.33 Hz
Number of hopping frequency	+/- 51.33 Hz
Time of Occupancy	+/- 51.33 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

Radiated Spurious Emission:

.Measurement uncertainty (Polarization : **Vertical**)	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Measurement uncertainty (Polarization : **Horizontal**)	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

6 CONDUCTED EMISSION TEST

6.1 Standard Applicable

According to §15.207, frequency within 150 kHz to 30MHz shall not exceed the limit table as below.

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.		

6.2 Measurement Equipment Used:

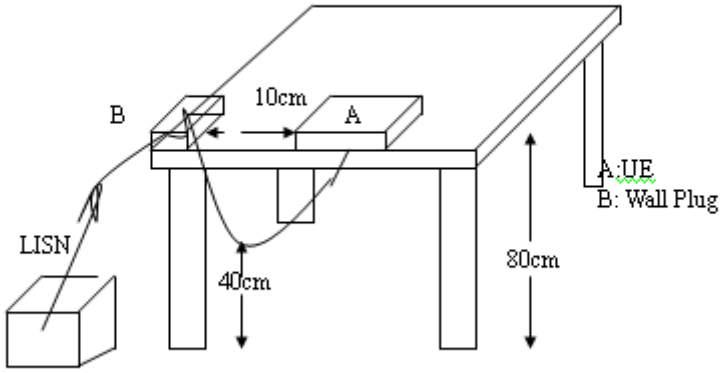
Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMI Test Receiver	R&S	ESCI 7	100950	12/09/2015	12/08/2016
Coaxial Cables	N/A	N30N30-1042-150cm	N/A	02/07/2016	02/06/2017
LISN	Schwarzbeck	NSLK 8127	8127-648	03/11/2016	03/10/2017
Test Software	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

6.3 EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI 63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.

3. The LISN was connected with 120Vac/60Hz power source.

6.4 Test SET-UP (Block Diagram of Configuration)



6.5 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.

6.6 Measurement Result

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI 63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

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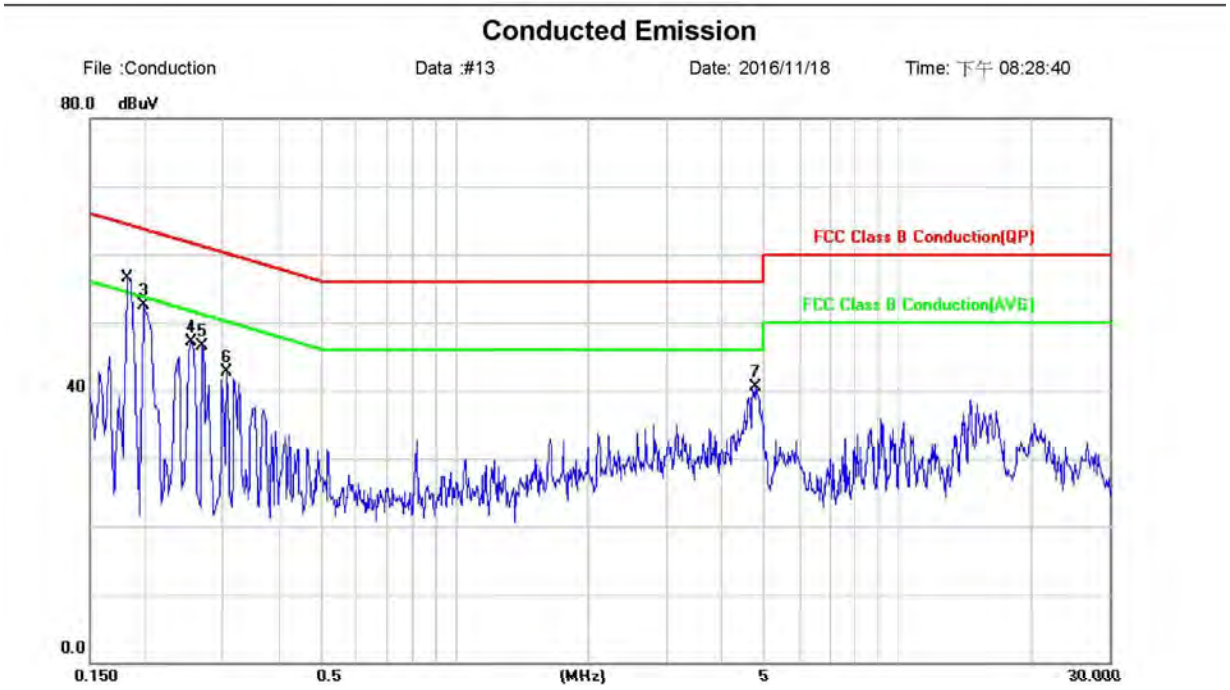
AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	operation mode	Test By:	Jazz
Model No.:	N/A		

Site : Conduction Room
Limit: FCC Class B Conduction(QP)
Mode:
Note:

Phase: L1
Power: AC 120V/60Hz

Temperature: 23 ℃
Humidity: 65 %



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1820	33.60	19.71	53.31	64.39	-11.08	QP	
2		0.1820	16.60	19.71	36.31	54.39	-18.08	AVG	
3		0.1980	32.81	19.71	52.52	63.69	-11.17	peak	
4		0.2540	27.37	19.75	47.12	61.63	-14.51	peak	
5		0.2700	26.67	19.76	46.43	61.12	-14.69	peak	
6		0.3060	22.84	19.77	42.61	60.08	-17.47	peak	
7		4.7900	20.62	19.97	40.59	56.00	-15.41	peak	

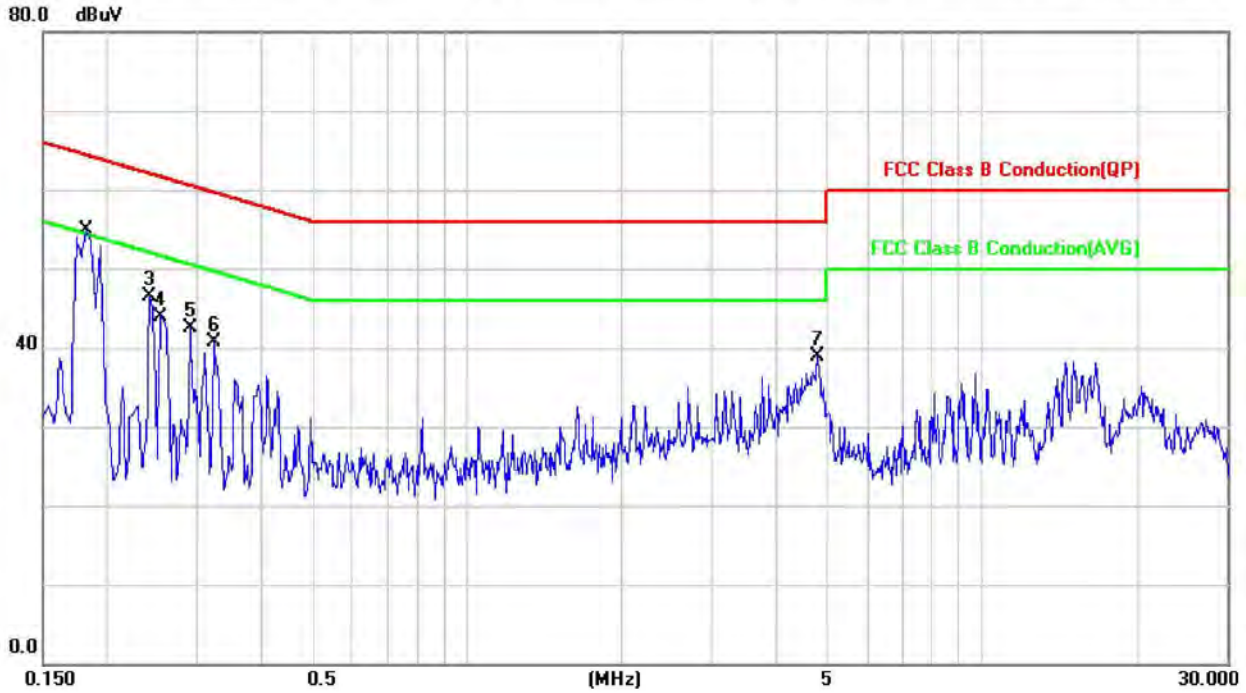
Site : Conduction Room
Limit: FCC Class B Conduction(QP)
Mode:
Note:

Phase: N
Power: AC 120V/60Hz

Temperature: 23 ℃
Humidity: 65 %

Conducted Emission

File :Conduction Data :#14 Date: 2016/11/18 Time: 下午 08:31:50



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1820	32.50	19.72	52.22	64.39	-12.17	QP	
2		0.1820	15.50	19.72	35.22	54.39	-19.17	AVG	
3		0.2420	26.74	19.75	46.49	62.03	-15.54	peak	
4		0.2540	24.19	19.76	43.95	61.63	-17.68	peak	
5		0.2900	22.78	19.78	42.56	60.52	-17.96	peak	
6		0.3220	20.97	19.79	40.76	59.66	-18.90	peak	
7		4.8100	18.95	19.99	38.94	56.00	-17.06	peak	

7 PEAK OUTPUT POWER MEASUREMENT

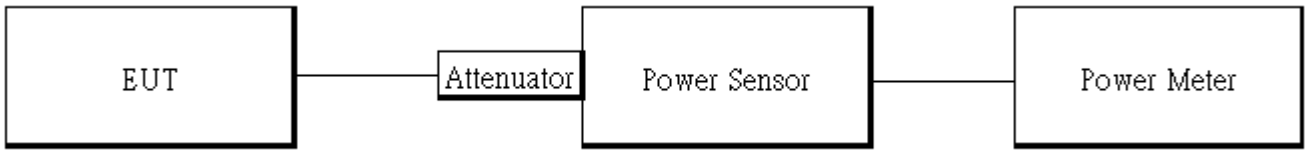
7.1 Standard Applicable

According to §15.247(b)(2), for frequency hopping systems operating in the 902-928 MHz band employing at least 50 hopping channels, The Limit: 1Watt. For systems employing less than 50 hopping channels, The Limit: 0.25 Watts. But at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

7.2 Measurement Equipment Used

Conducted Emission Test Site					
Name of Equip-ment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Power Meter	Anritsu	ML2496A	1326001	06/23/2016	06/22/2017
Power Sensor	Anritsu	MA2411B	1315048	06/23/2016	06/22/2017
Power Sensor	Anritsu	MA2411B	1315049	06/23/2016	06/22/2017
Coaxial Cable 30cm	WOKEN	00100A1F1A195C	RF01	12/13/2015	12/12/2016
DC Block	PASTERNACK	PE8210	RF29	12/13/2015	12/12/2016
Splitter	RF-LAMBAD	RFLT2W1G18G	RF35	12/13/2015	12/12/2016
Attenuator	WOKEN	218FS-10	RF23	12/13/2015	12/12/2016

7.3 Test Set-up:



7.4 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Max Hold, Detector = Peak, RBW >=20dB bandwidth)
4. Record the max. reading.
5. Repeat above procedures until all default test channel is completed.

7.5 Measurement Result

UHF mode (Peak):

CH	Freq. (MHz)	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	902.25	20.09	102.094	1000
26	914.75	20.46	111.173	1000
52	927.75	**20.85**	121.619	1000

UHF mode (Average):

CH	Freq. (MHz)	Max. Output include tune up tolerance Power (dBm)	Output Power (mW)	Limit (mW)
0	902.25	16.24	42.073	1000
26	914.75	17.72	59.156	1000
52	927.75	18.12	64.863	1000

NOTE: cable loss as 10.5dB that offsets in the Power meter

8 20dB BANDWIDTH

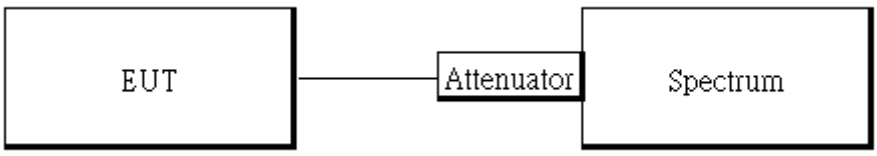
8.1 Standard Applicable

According to §15.247(a)(1)(i), for frequency hopping systems operating in the 902 MHz-928 MHz : if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies.

8.2 Measurement Equipment Used

Conducted Emission Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2016	04/13/2017
Coaxial Cable 30cm	WOKEN	00100A1F1A195C	RF01	12/13/2015	12/12/2016
DC Block	PASTERNACK	PE8210	RF29	12/13/2015	12/12/2016
Attenuator	WOKEN	218FS-10	RF23	12/13/2015	12/12/2016
DC Power Supply	Agilent	E3640A	MY53140006	05/04/2016	05/03/2017

8.3 Test Set-up



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=3 kHz, VBW = 10 kHz, Span= 500kHz, 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 procedures until all test default channel is completed

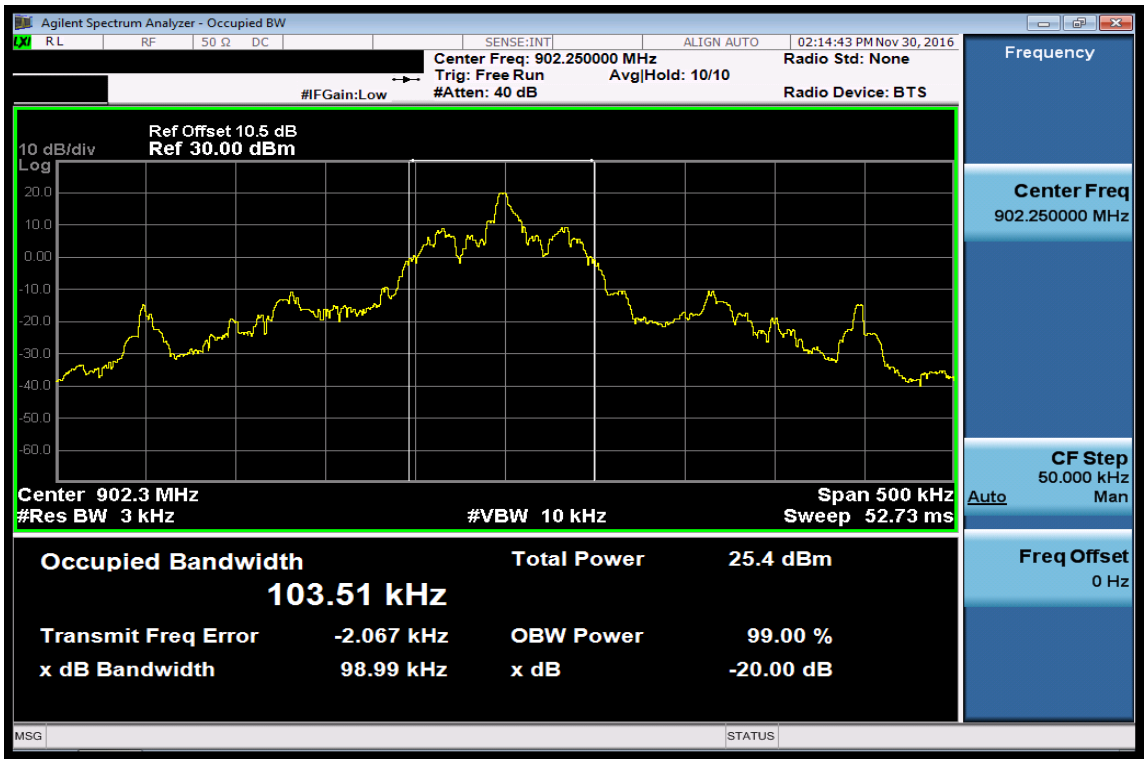
NOTE: cable loss as 10.5dB that offsets in the spectrum

8.5 Measurement Result:

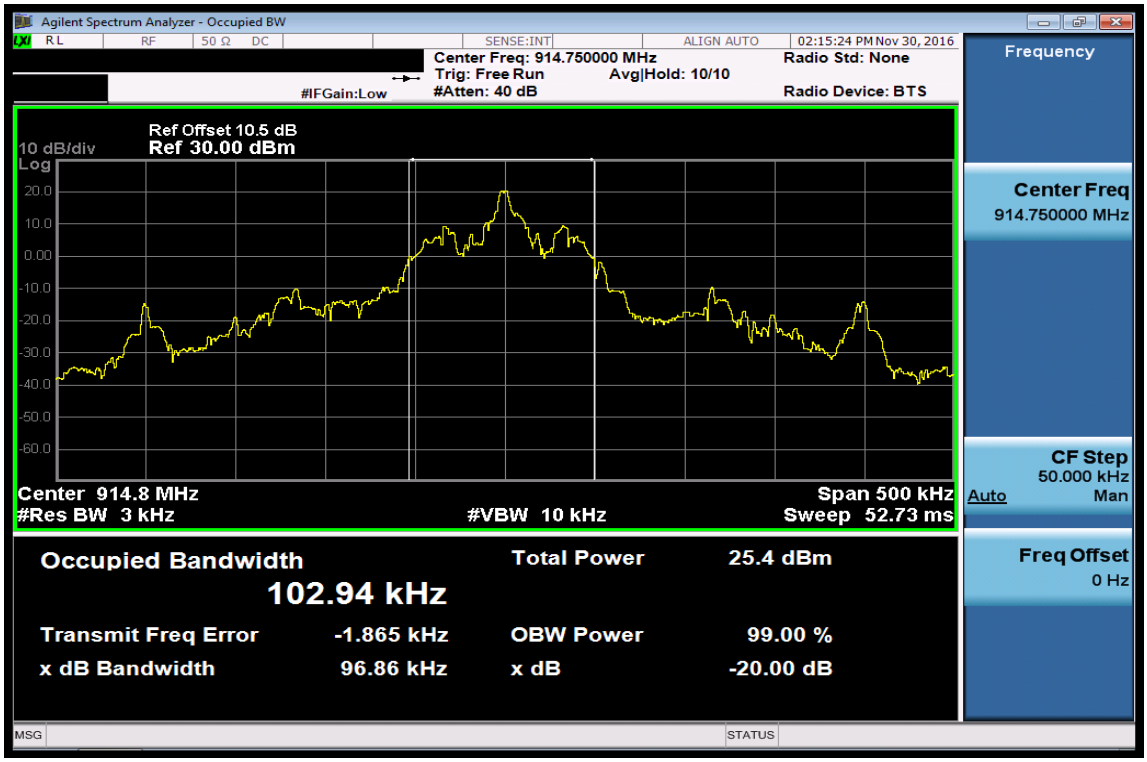
UHF

CH	20 dB BW (KHz)	2/3 BW (KHz)
Low	98.99	65.99
Mid	96.86	64.57
High	96.37	64.25

20dB Band Width Test Data CH-Low



20dB Band Width Test Data CH-Mid



20dB Width Test Data CH-High

9 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

9.1 Standard Applicable

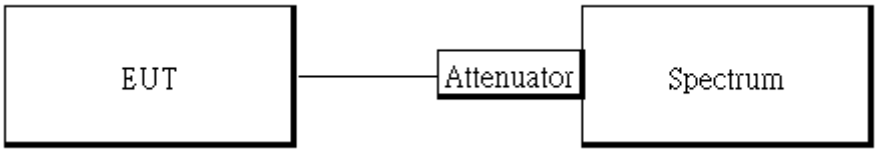
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

9.2 Measurement Equipment Used

9.2.1 Conducted Emission at antenna port:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2016	04/13/2017
Coaxial Cable 30cm	WOKEN	00100A1F1A 195C	RF01	12/12/2016	12/11/2017
DC Block	PASTERNACK	PE8210	RF29	12/12/2015	12/11/2016
Attenuator	WOKEN	218FS-10	RF23	12/12/2015	12/11/2016

9.3 Test SET-UP:



9.4 Measurement Procedure

Conducted Band Edge:

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set center frequency of spectrum analyzer = operating frequency.

5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Sweep = auto
6. Mark Peak, 902MHz and 928MHz and record the max. level.
7. Repeat above procedures until all frequency measured were complete.

Conducted Spurious Emission:

1. To connect Antenna Port of EUT to Spectrum.
2. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
3. Set RBW = 100 kHz & VBW = 300 kHz, Detector =Peak, Sweep = Auto
4. Allow trace to fully stabilize.
5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
   Repeat above procedures until all default test channel measured were complete.

9.5 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	

9.6 Measurement Result : Out-Of-Band EMISSION:

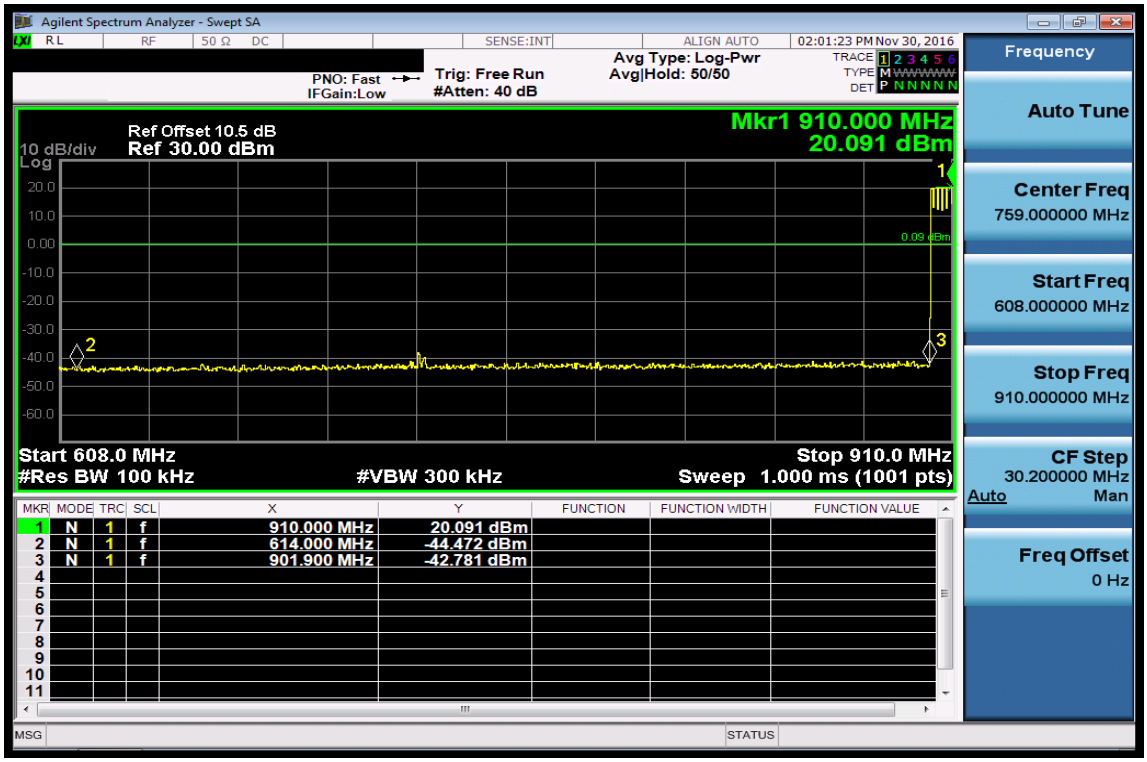
Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

NOTE: cable loss as 10.5dB that offsets in the spectrum

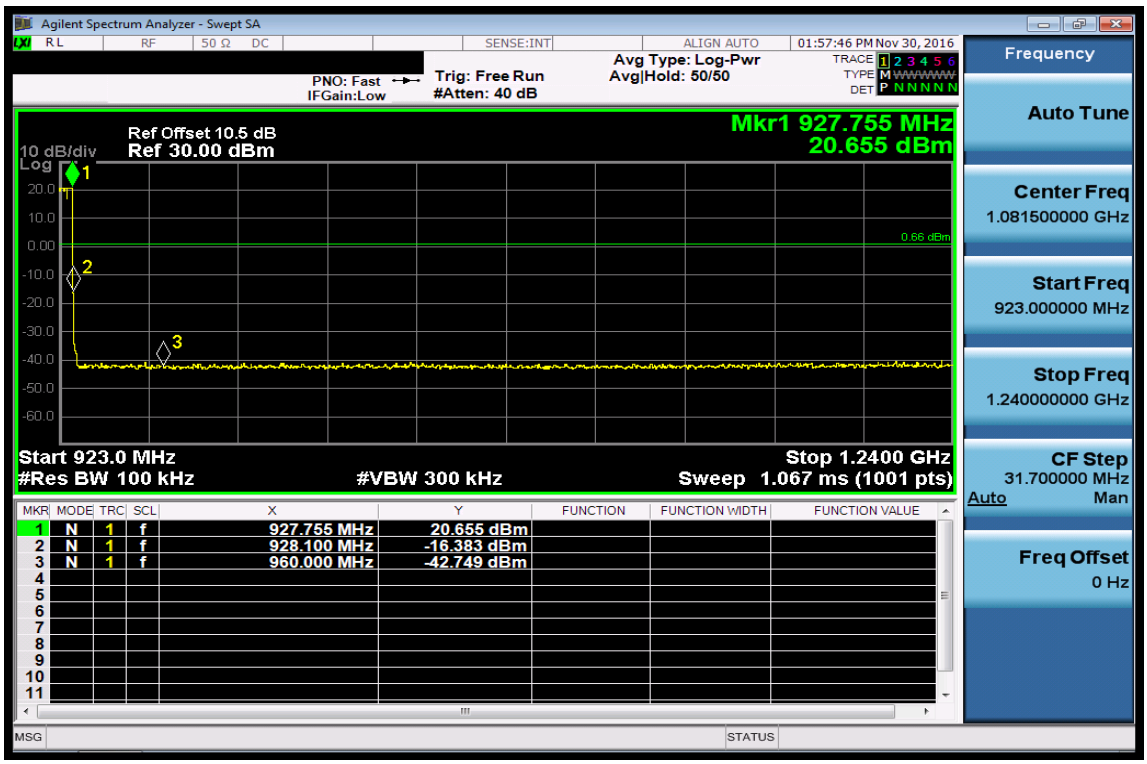
NOTE: the occurrence of the spike on the conducted emission is the signal of the fundamental emission.

9.7 Measurement Result: 100 kHz BANDWIDTH OF BNAD EDGE:

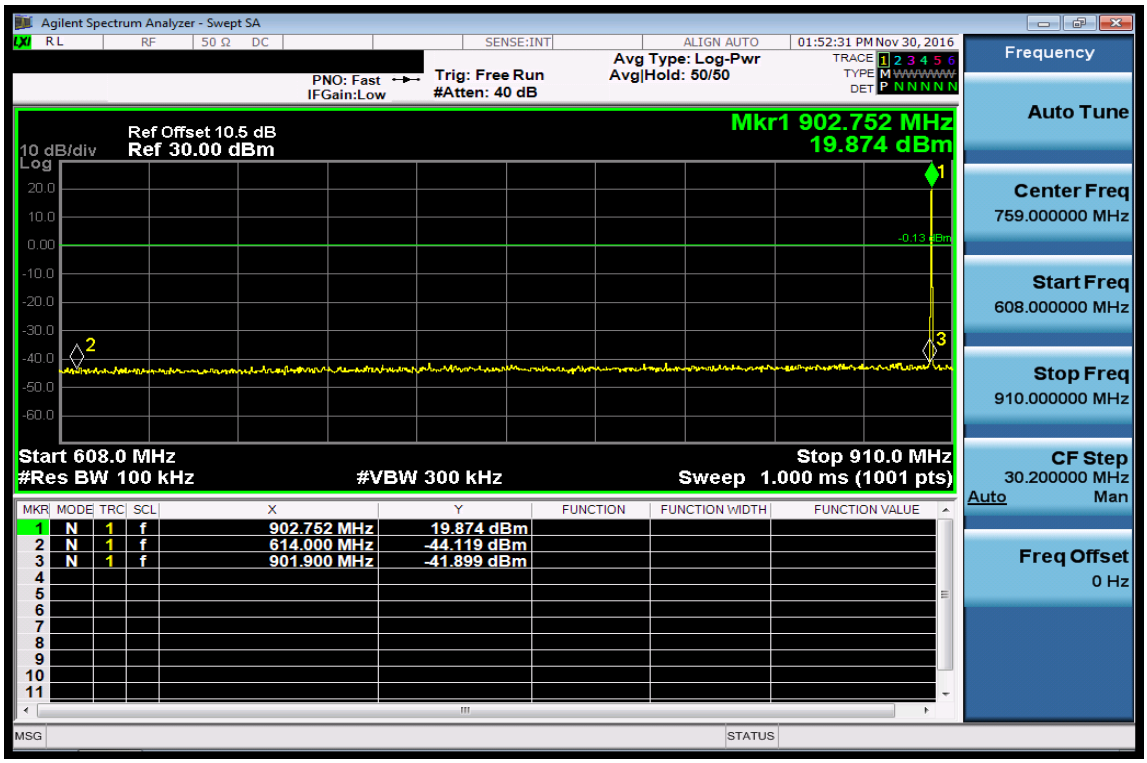
Band Edges Test Data CH-Low (Hopping mode)



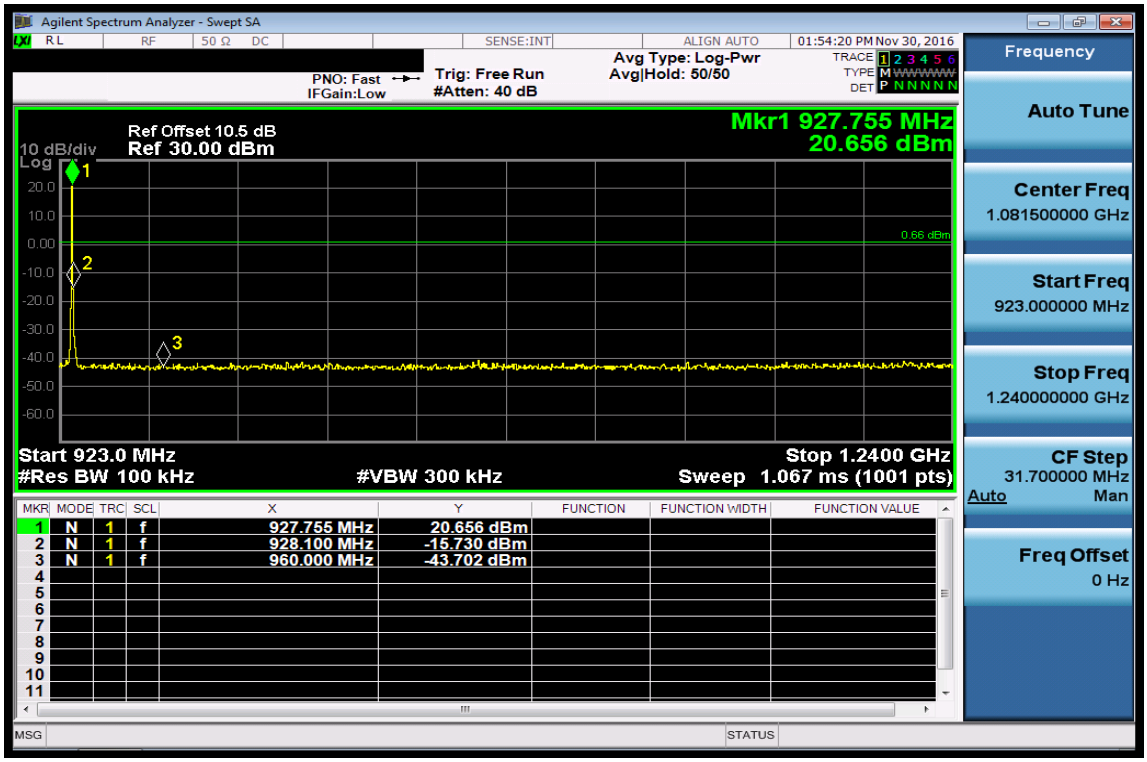
Band Edges Test Data CH-High



Band Edges Test Data CH-Low (Non-Hopping mode)

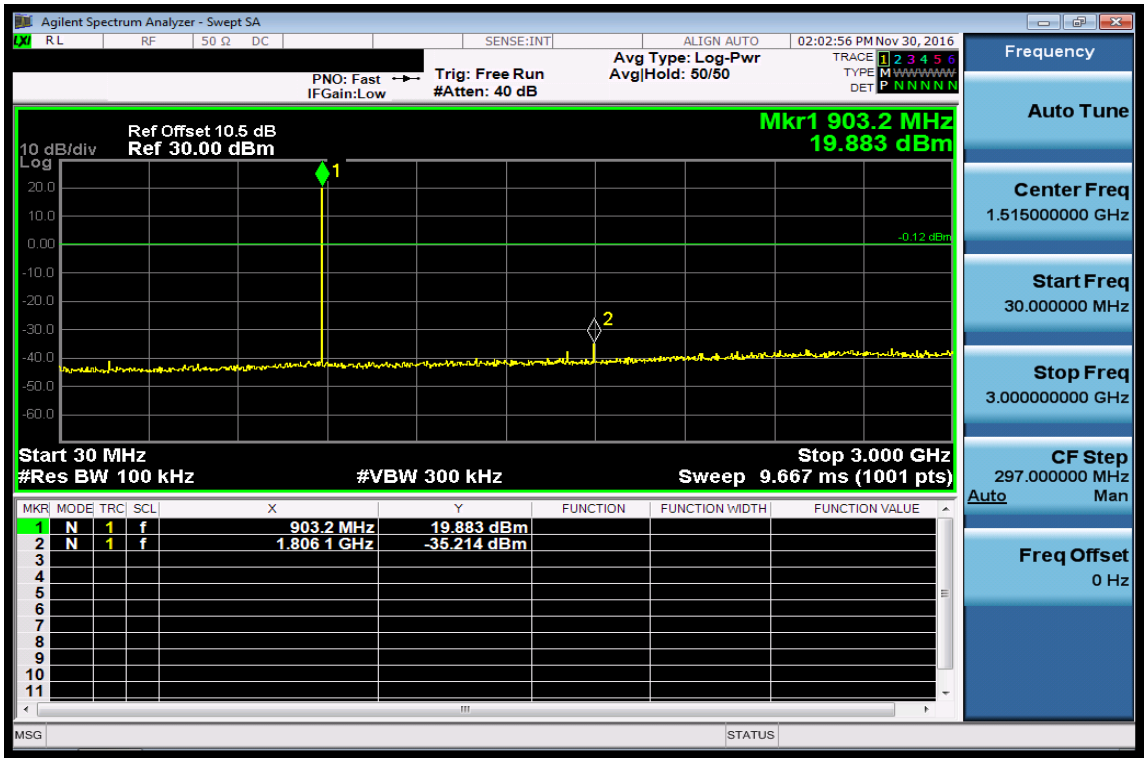


Band Edges Test Data CH-High

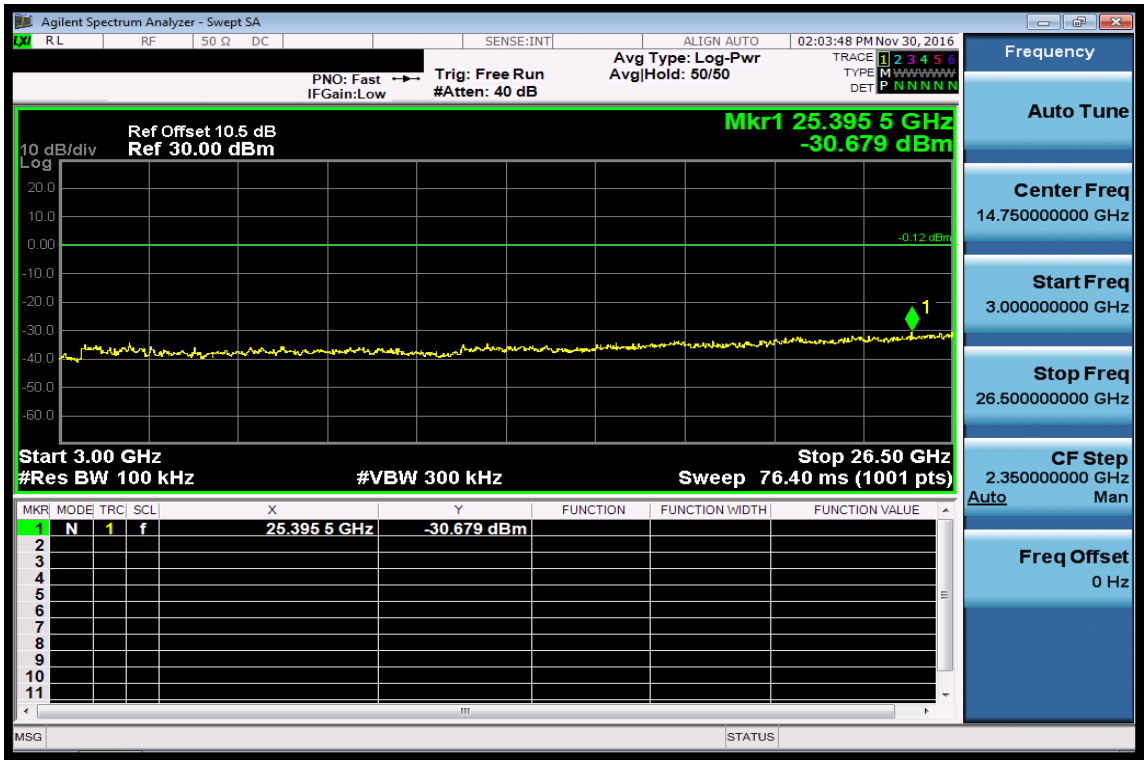


9.8 Measurement Result: Conducted Spurious Emission Measurement Result

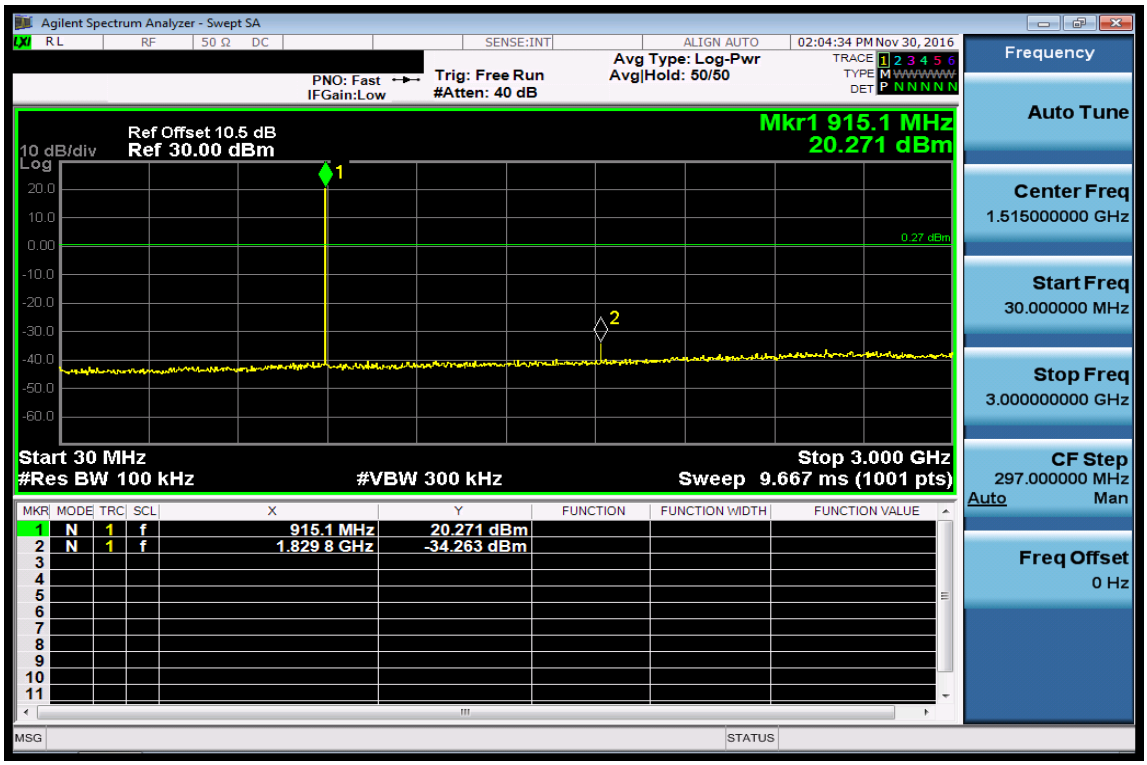
Ch Low 30MHz – 1GHz



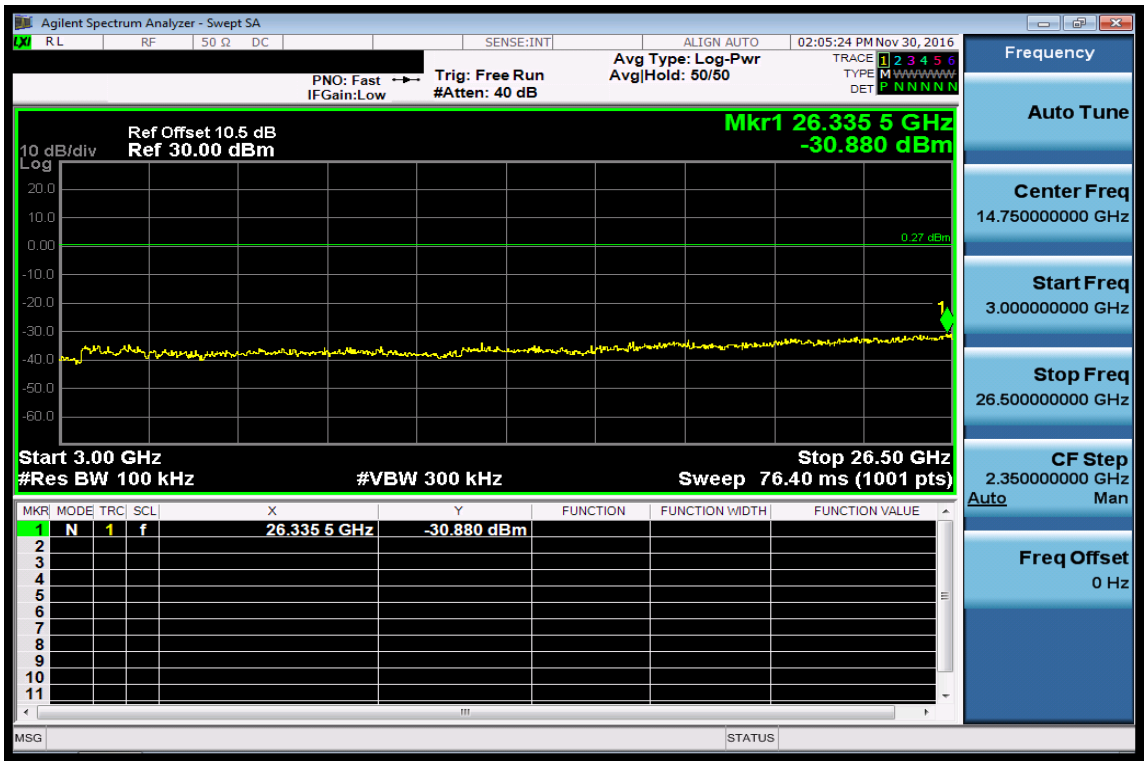
Ch Low 3GHz – 12.5GHz



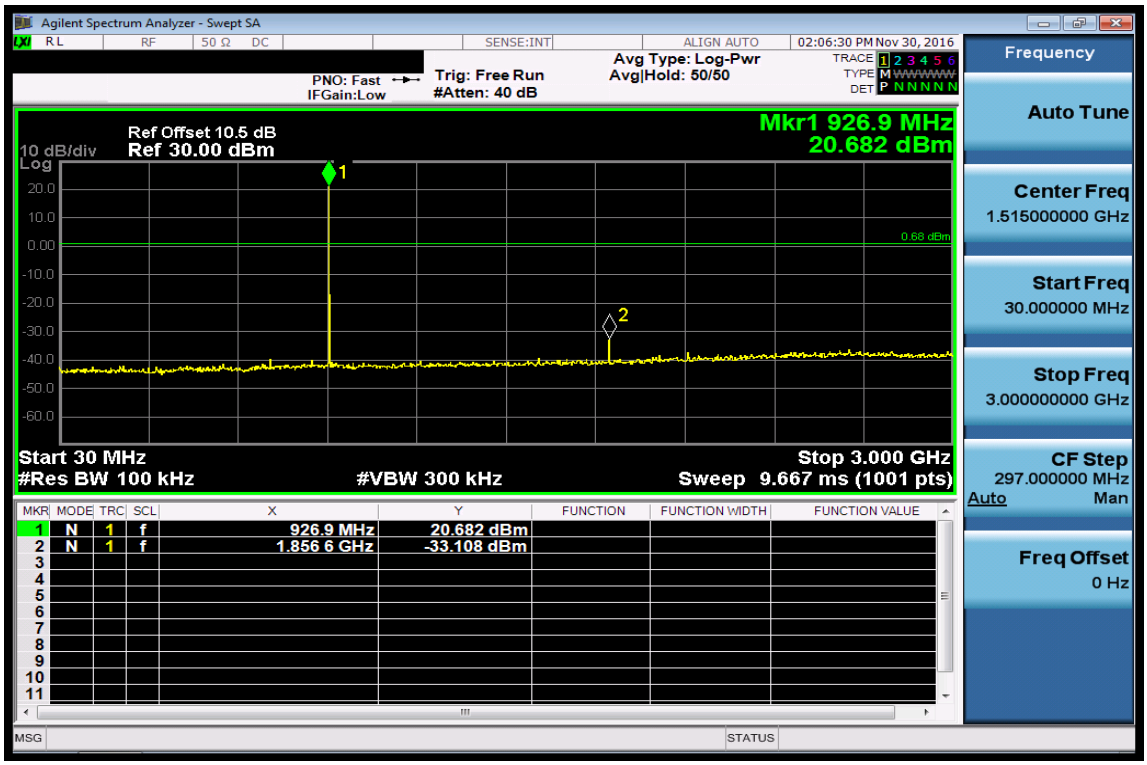
Ch Mid 30MHz – 1GHz



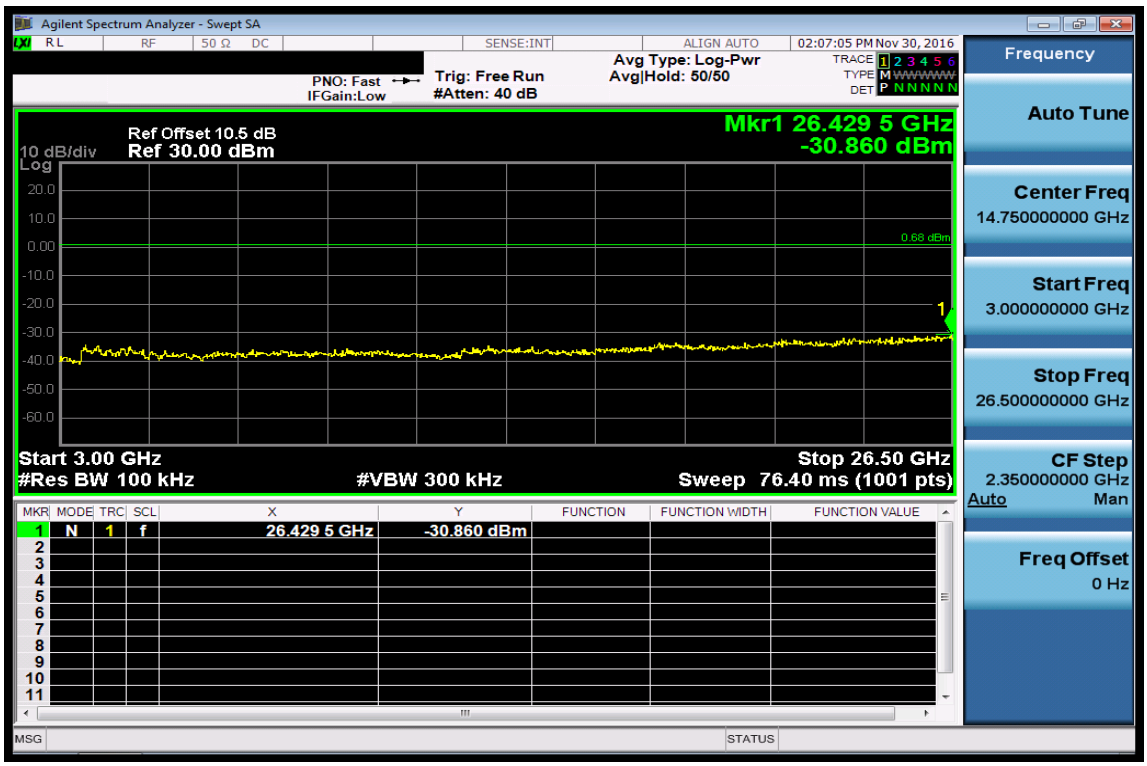
Ch Mid 3GHz – 12.5GHz



Ch High 30MHz – 1GHz



Ch High 3GHz –12.5GHz



10 SPURIOUS RADIATED EMISSION TEST

10.1 Standard Applicable

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. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 limit as below.

And according to §15.33(a) (1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
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

Note:

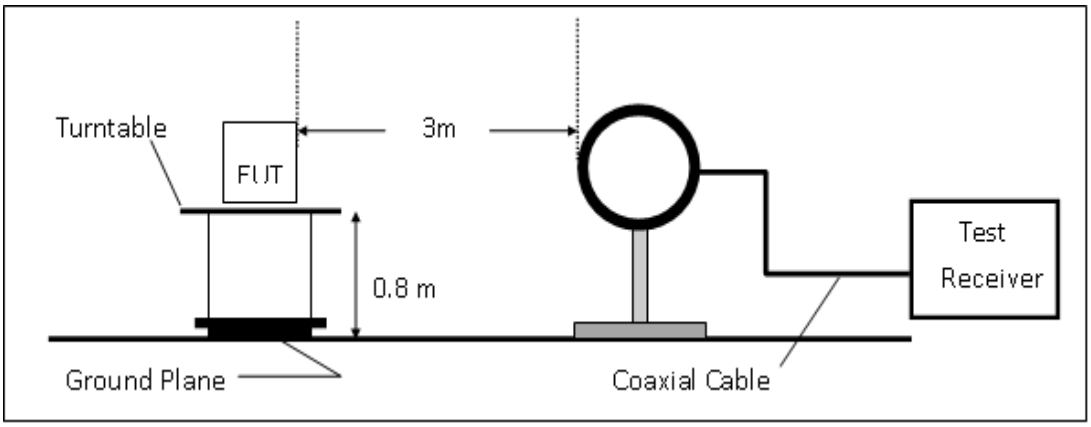
1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBμV/m) = 20 log Emission level (dBμV/m)

10.2 Measurement Equipment Used:

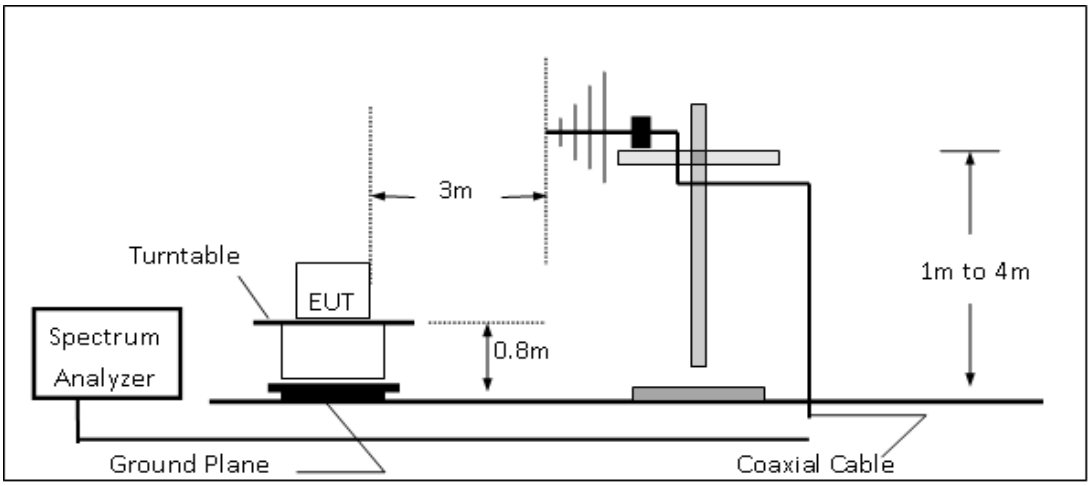
966 Chamber					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
EMI Test Receiver	R&S	ESU 40	100363	04/12/2016	04/11/2017
Loop Antenna	ETS-Lindgren	6502	00143303	12/23/2015	12/22/2016
Broadband Antenna	TESEQ	CBL 6112D	35240	11/03/2016	11/02/2017
Horn Antenna	ETS-Lindgren	3117	00143272	12/16/2015	12/15/2016
Horn Antenna	Schwarzbeck	BBHA9170	185	07/18/2016	07/17/2017
Pre Amplifier	EMC Instruments	EMC330	980096	12/12/2015	12/11/2016
Pre Amplifier	EMC Instruments	EMC0011830	980199	12/12/2015	12/11/2016
Pre Amplifier	R&S	SCU-18	10204	12/12/2015	12/11/2016
Pre Amplifier	R&S	SCU-26	100780	12/12/2015	12/11/2016
Coaxial Cable	Huber+Suhner	RG 214/U	966Rx 9K-30M	12/12/2015	12/11/2016
Coaxial Cable	Huber+Suhner	RG 214/U SUCOFLEX 104	966Rx 30M-3G	12/12/2015	12/11/2016
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	966Rx 1G-18G	12/12/2015	12/11/2016
Coaxial Cable	Huber+Suhner	mini 141-12 SUCOFLEX 104	966Rx 18G-40G	12/12/2015	12/11/2016
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	966Tx 30M-18G	12/12/2015	12/11/2016
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	966Tx 18G-40G	12/12/2015	12/11/2016
Attenuator	WOKEN	218FS-10	RF27	12/12/2015	12/11/2016
Site NSA	SGS	966 Chamber C	SAC-C	03/04/2016	03/03/2017
Site VSWR	SGS	966 Chamber C	SAC-C	03/04/2016	03/03/2017
DC Power Supply	HOLA	DP-3003	D7070035	05/04/2016	05/03/2017
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.
Test Software	World-Pallas	Dr. E	V 3.0 Lite	N.C.R.	N.C.R.

10.3 Test SET-UP:

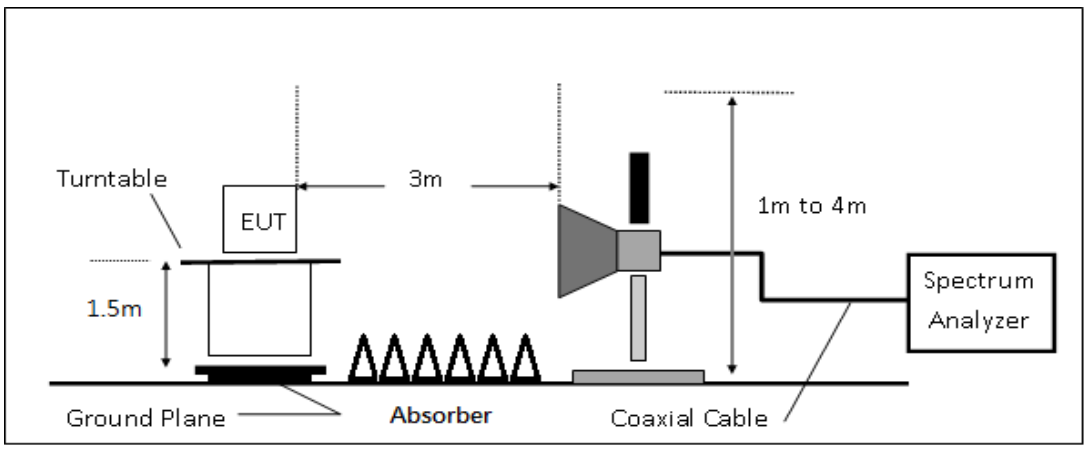
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency form 30MHz to 1000MHz



(C) Radiated Emission Test Set-UP Frequency Over 1 GHz



10.4 Measurement Procedure:

Radiated Emission:

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plan.
3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
5. Use the follow spectrum analyzer setting:
   (1) Span = wide enough to fully capture the emission being measured
   (2) RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz, VBW ≥ RBW, Sweep = auto, Detector function = peak, Trace = max hold
   (3) For average measurement: use duty cycle correction factor method per 15.35(c)
   Duty Cycle = On time/100 milliseconds
   On time = N1*L1=N2*L2+…+N(n-1)*LN(n-1)+N(n)*L(n)
   Where N1 is number of type 1 pulses, L1 is length of type 1 pulses, etc.
   Average Emission Level = Peak Emission Level + 20*log (duty Cycle)
6. When 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.
7. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
8. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
   Repeat above procedures until all frequency of the interest measured were complete.

10.5 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	

The limit of the emission level is expressed in dBuV/m, which converts 20*log(uV/m)

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

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

10.6 Test Results of Radiated Spurious Emissions form 9 KHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

10.7 Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

Note: For the tabular table as presents below,

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

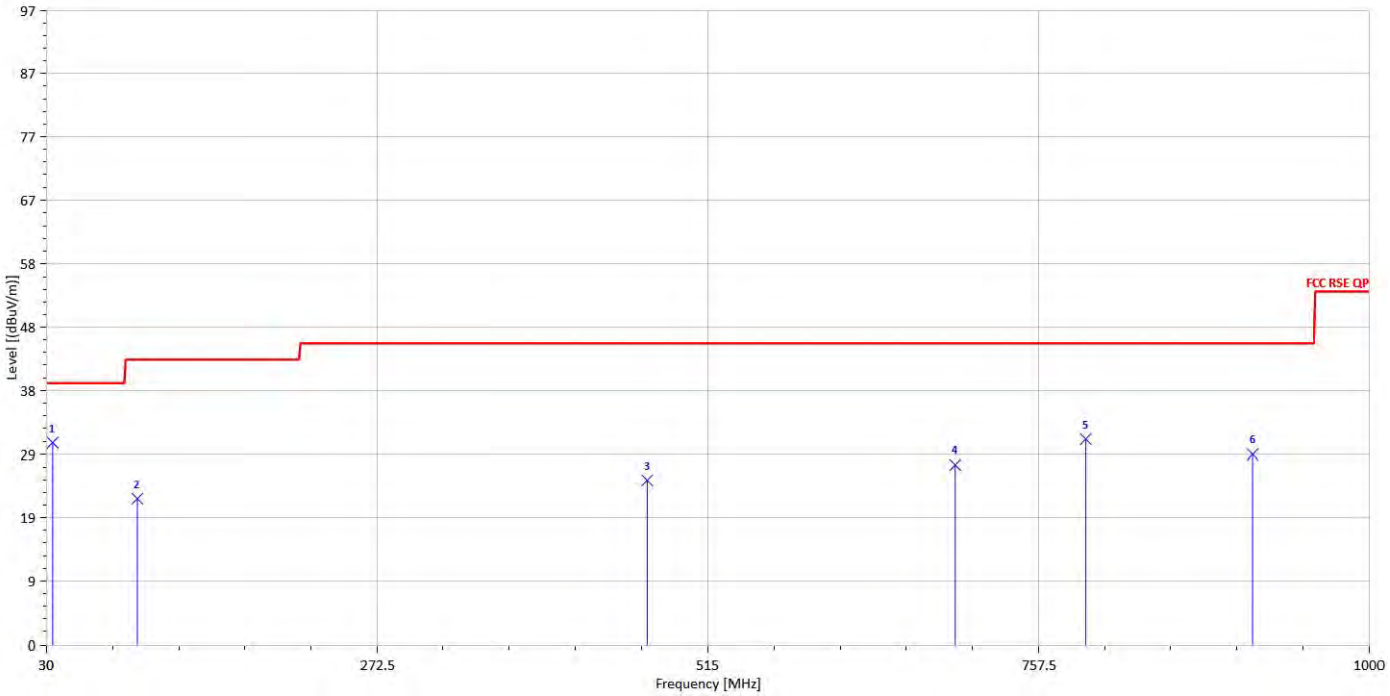
"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor

10.7.1 Radiated Spurious Emission Measurement Result:

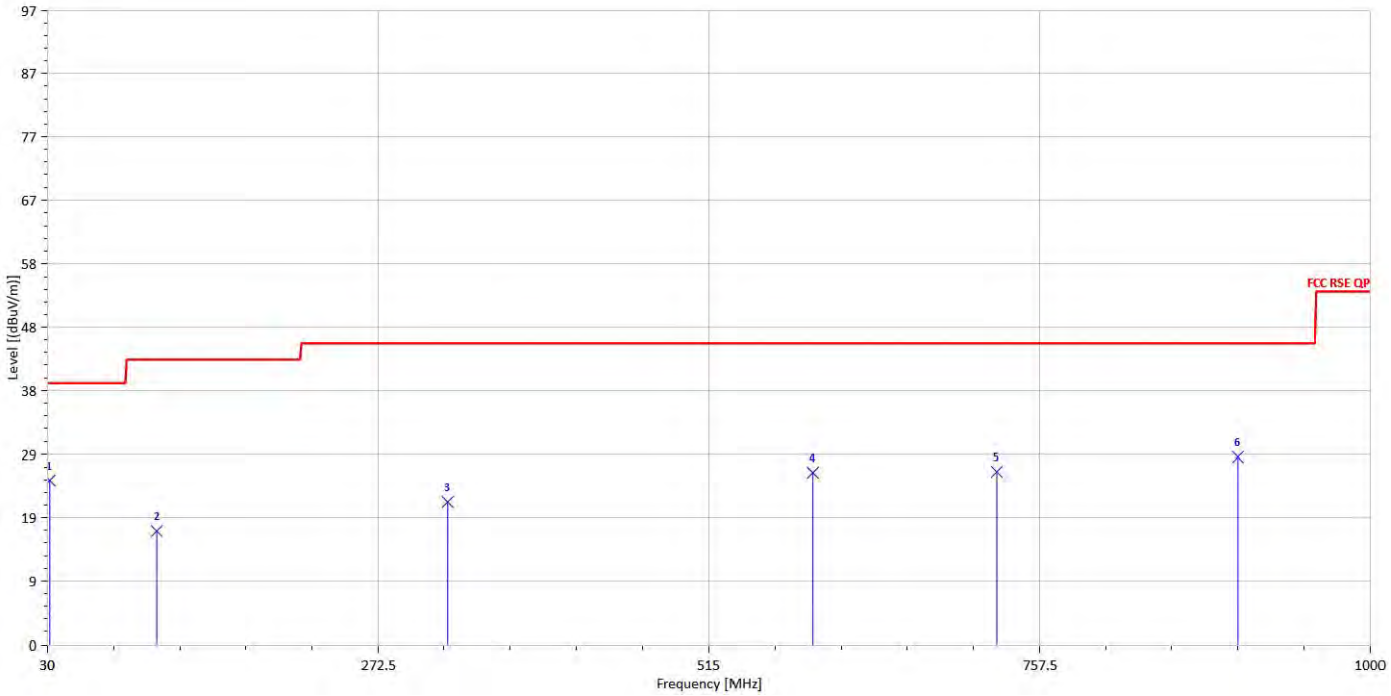
For Frequency form 30MHz to 1000MHz

Operation Mode :	UHF	Test Date :	2016/11/18
Fundamental Frequency :	902.25 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Pony
EUT Pol. :	E1	Measurement Antenna Pol. :	Vertical



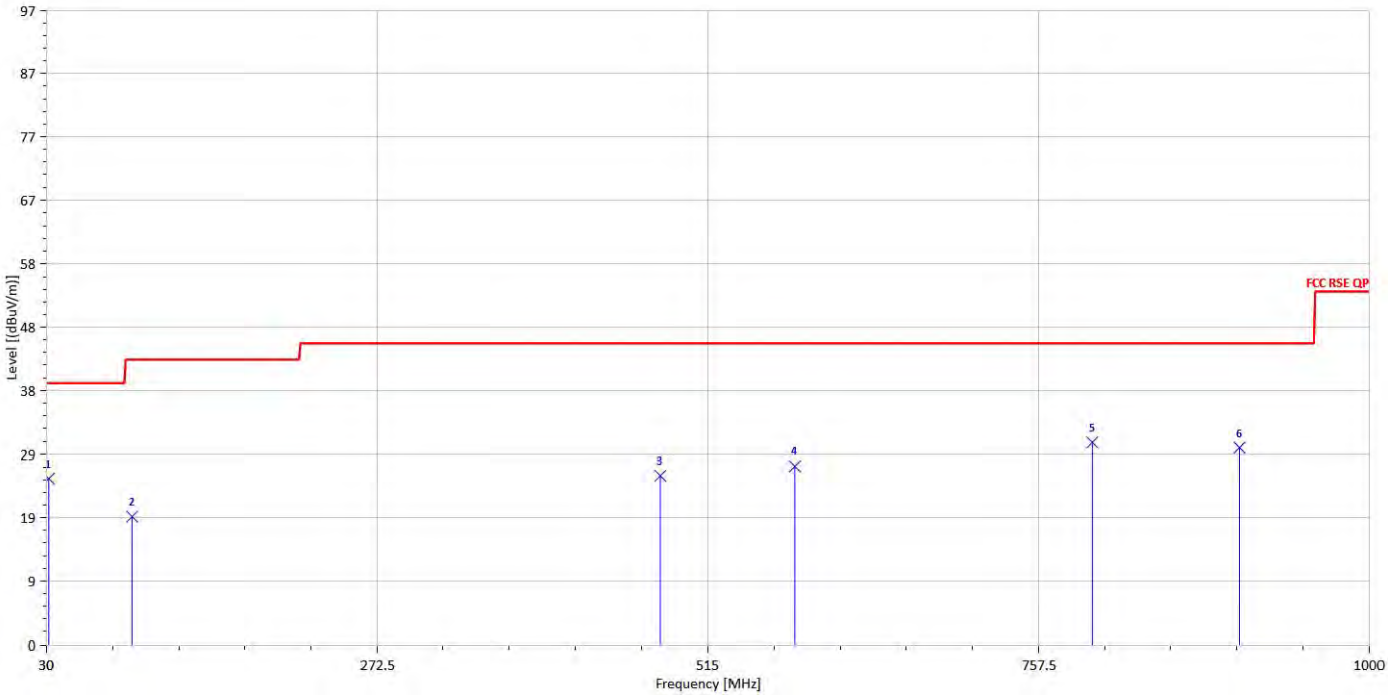
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
34.85	S	Peak	40.60	-9.78	30.82	40	-9.18
96.93	S	Peak	40.58	-18.27	22.31	43.5	-21.19
470.38	S	Peak	32.97	-7.85	25.12	46	-20.88
696.39	S	Peak	32.60	-5.10	27.50	46	-18.50
792.42	S	Peak	35.55	-4.18	31.37	46	-14.63
914.64	S	Peak	30.73	-1.68	29.04	46	-16.96

Operation Mode :	UHF	Test Date :	2016/11/18
Fundamental Frequency :	902.25 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Pony
EUT Pol. :	E1	Measurement Antenna Pol. :	Horizontal



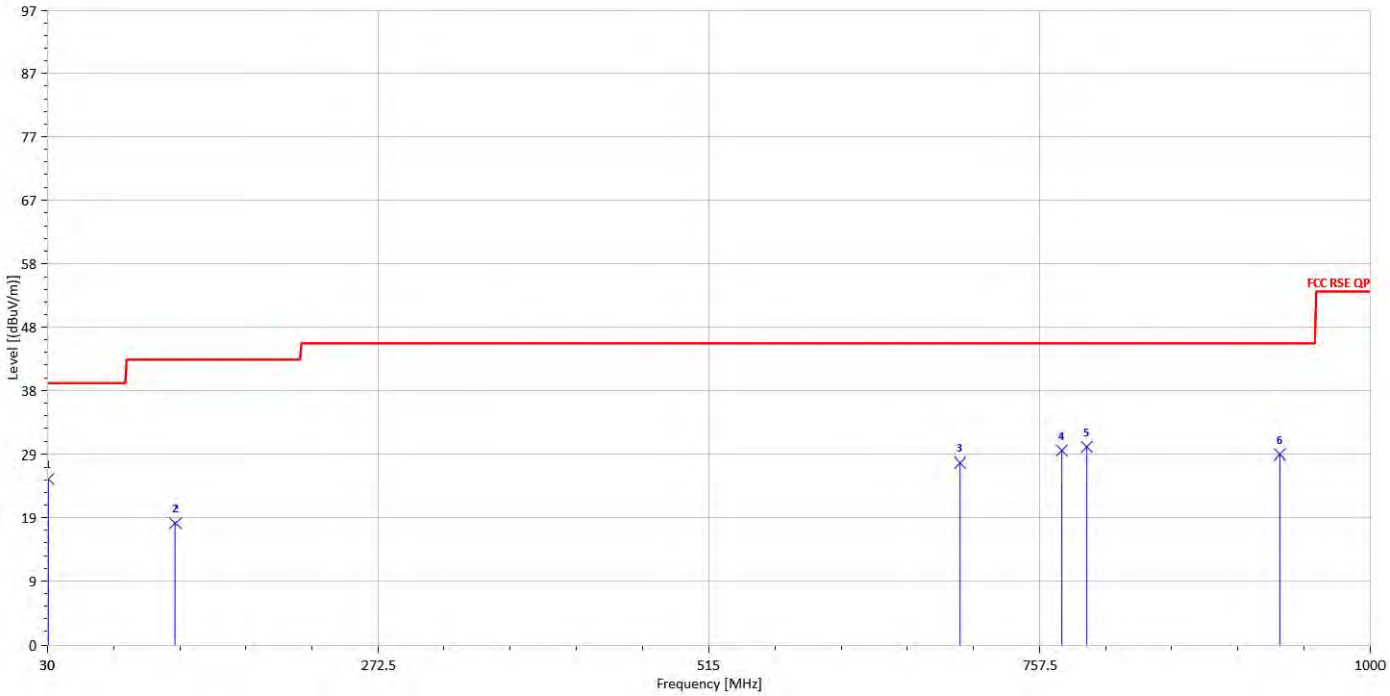
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
31.94	S	Peak	33.34	-8.22	25.12	40	-14.88
110.51	S	Peak	33.74	-16.43	17.31	43.5	-26.19
323.91	S	Peak	33.66	-11.87	21.80	46	-24.20
591.63	S	Peak	32.47	-6.16	26.31	46	-19.69
726.46	S	Peak	31.43	-4.98	26.45	46	-19.55
903.00	S	Peak	30.58	-1.92	28.66	46	-17.34

Operation Mode :	UHF	Test Date :	2016/11/18
Fundamental Frequency :	914.75 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Mid	Test Engineer :	Pony
EUT Pol. :	E1	Measurement Antenna Pol. :	Vertical



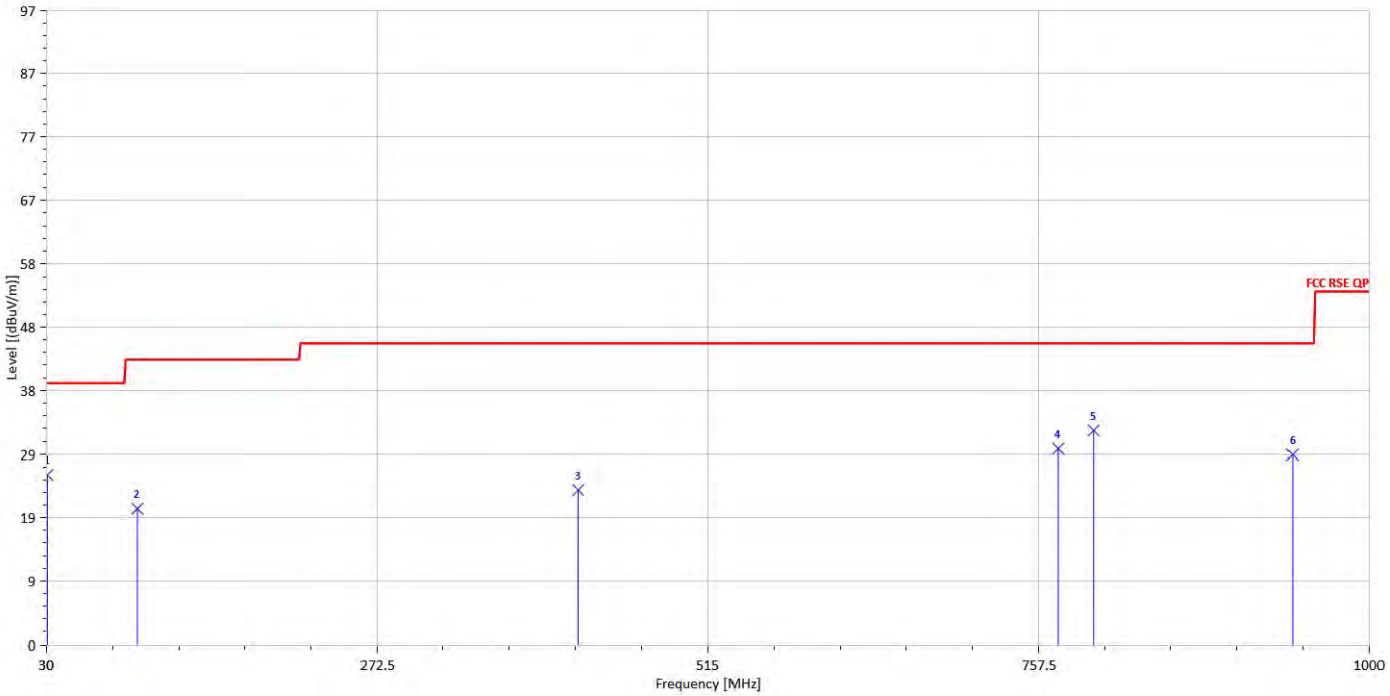
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
31.94	S	Peak	33.62	-8.22	25.40	40	-14.60
93.05	S	Peak	38.49	-18.95	19.54	43.5	-23.96
480.08	S	Peak	33.64	-7.81	25.83	46	-20.17
579.02	S	Peak	33.66	-6.38	27.29	46	-18.71
797.27	S	Peak	34.87	-4.01	30.86	46	-15.14
904.94	S	Peak	31.72	-1.67	30.05	46	-15.95

Operation Mode :	UHF	Test Date :	2016/11/18
Fundamental Frequency :	914.75 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Mid	Test Engineer :	Pony
EUT Pol. :	E1	Measurement Antenna Pol. :	Horizontal



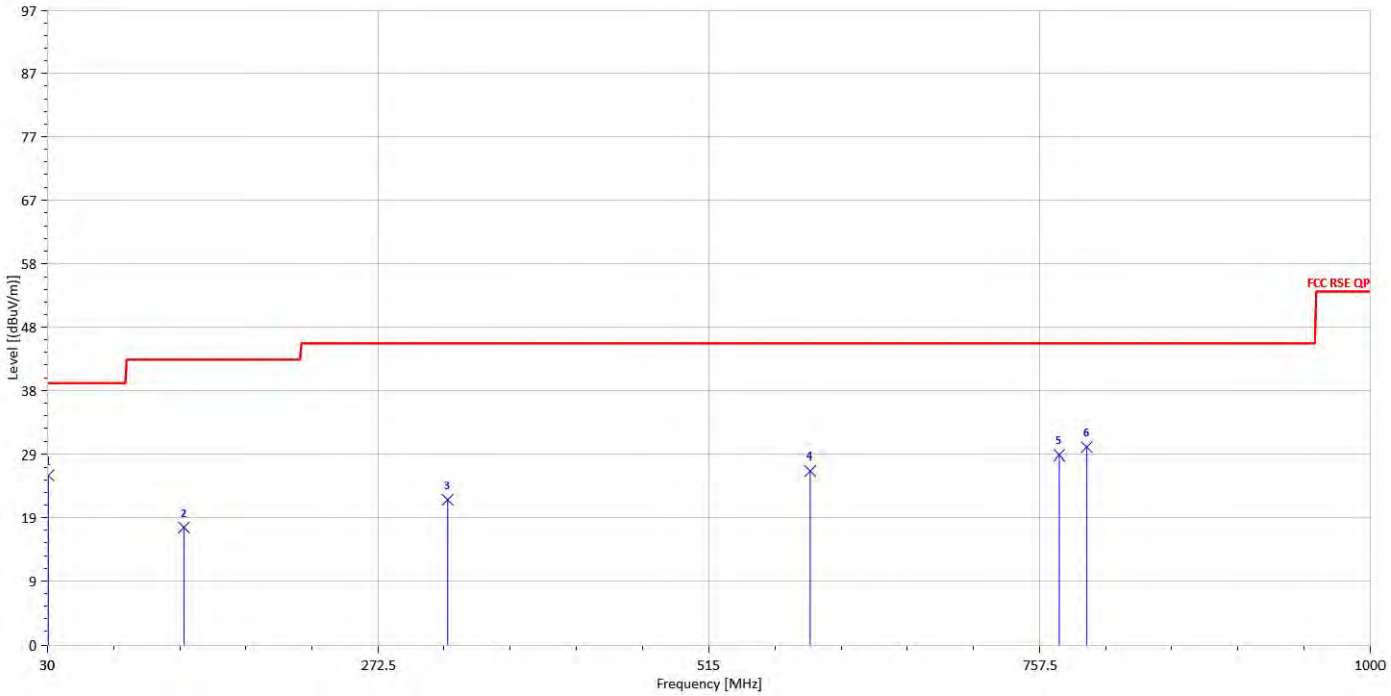
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
30.97	S	Peak	33.05	-7.70	25.35	40	-14.65
124.09	S	Peak	34.27	-15.75	18.52	43.5	-24.98
699.30	S	Peak	32.92	-5.09	27.83	46	-18.17
773.99	S	Peak	34.32	-4.72	29.61	46	-16.39
792.42	S	Peak	34.34	-4.18	30.16	46	-15.84
934.04	S	Peak	30.62	-1.58	29.04	46	-16.96

Operation Mode :	UHF	Test Date :	2016/11/18
Fundamental Frequency :	927.75 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Pony
EUT Pol. :	E1	Measurement Antenna Pol. :	Vertical



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
30.97	S	Peak	33.66	-7.70	25.96	40	-14.04
96.93	S	Peak	39.03	-18.27	20.76	43.5	-22.74
419.94	S	Peak	32.73	-9.10	23.64	46	-22.36
772.05	S	Peak	34.32	-4.41	29.92	46	-16.08
798.24	S	Peak	36.61	-3.91	32.70	46	-13.30
943.74	S	Peak	30.91	-1.89	29.02	46	-16.98

Operation Mode :	UHF	Test Date :	2016/11/18
Fundamental Frequency :	927.75 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Pony
EUT Pol. :	E1	Measurement Antenna Pol. :	Horizontal

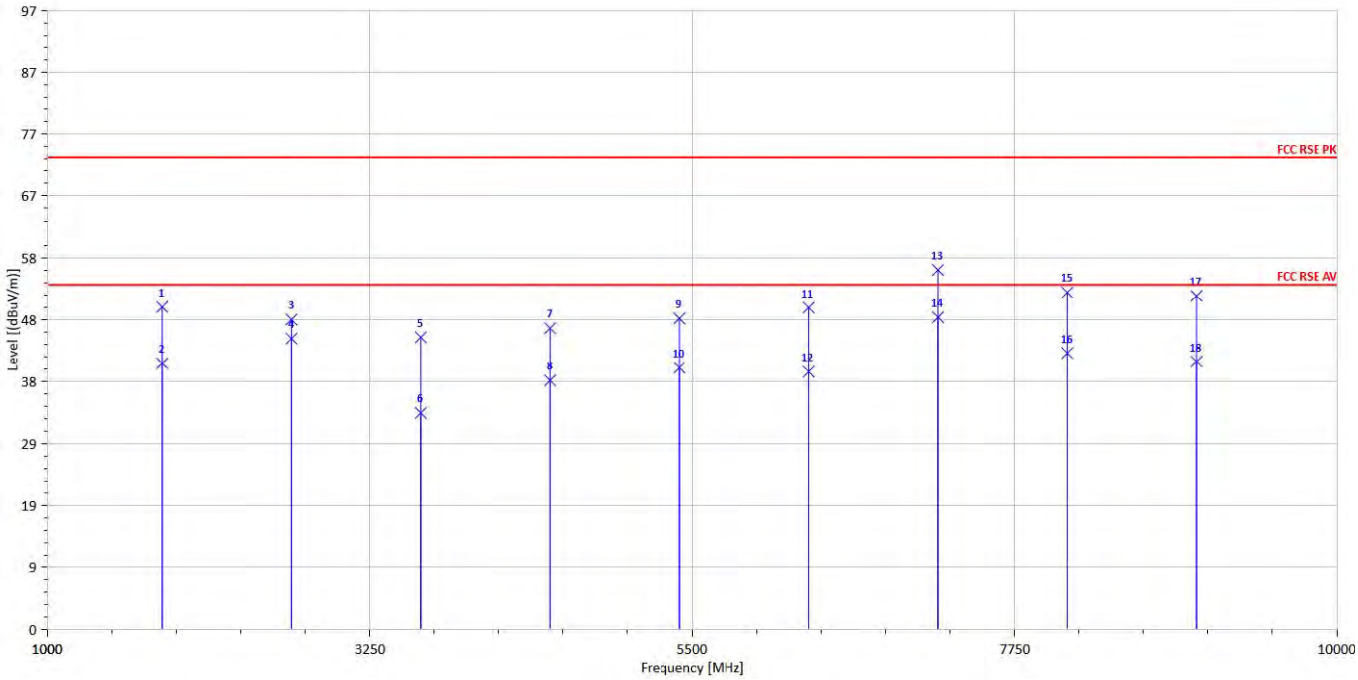


Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
30.97	S	Peak	33.62	-7.70	25.92	40	-14.08
129.91	S	Peak	33.54	-15.67	17.87	43.5	-25.63
323.91	S	Peak	34.01	-11.87	22.14	46	-23.86
589.69	S	Peak	32.99	-6.42	26.57	46	-19.43
772.05	S	Peak	33.34	-4.41	28.93	46	-17.07
792.42	S	Peak	34.31	-4.18	30.13	46	-15.87

10.7.2 Radiated Spurious Emission Measurement Result:

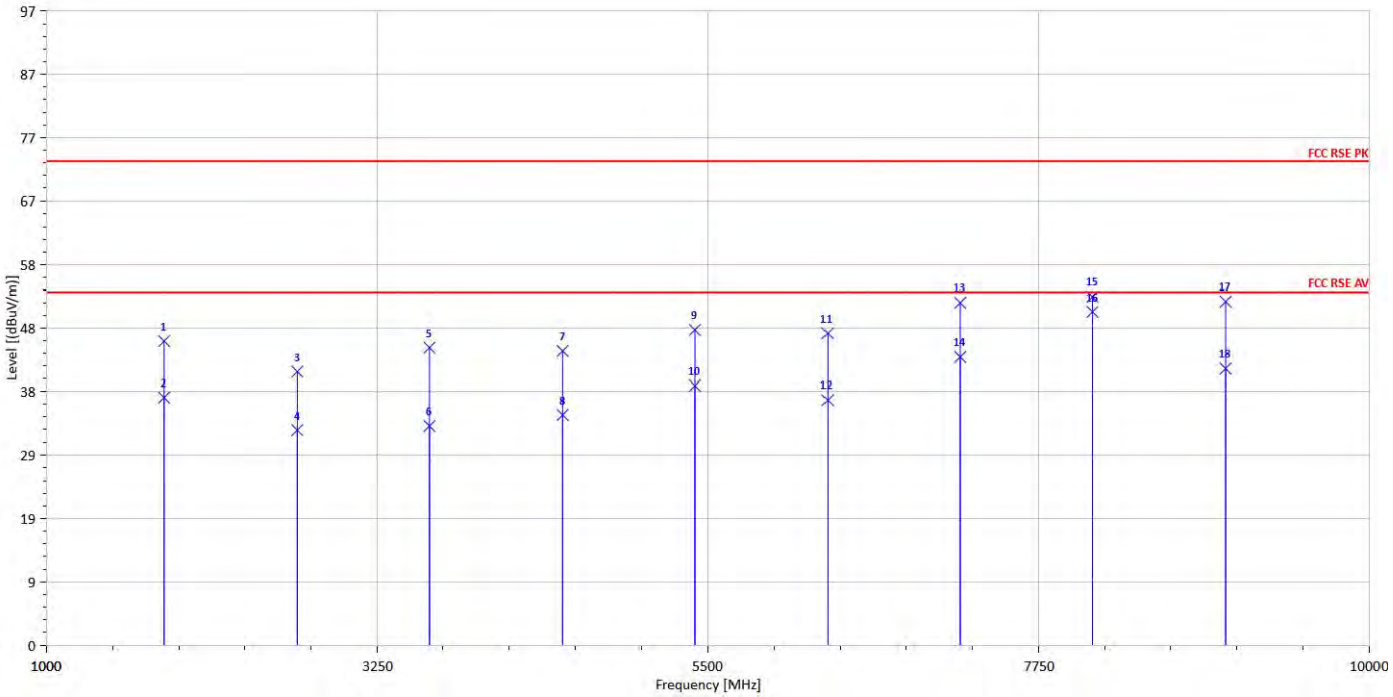
For Frequency above 1 GHz

Operation Mode :	UHF	Test Date :	2016/11/29
Fundamental Frequency :	902.25 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E1	Measurement Antenna Pol. :	Vertical



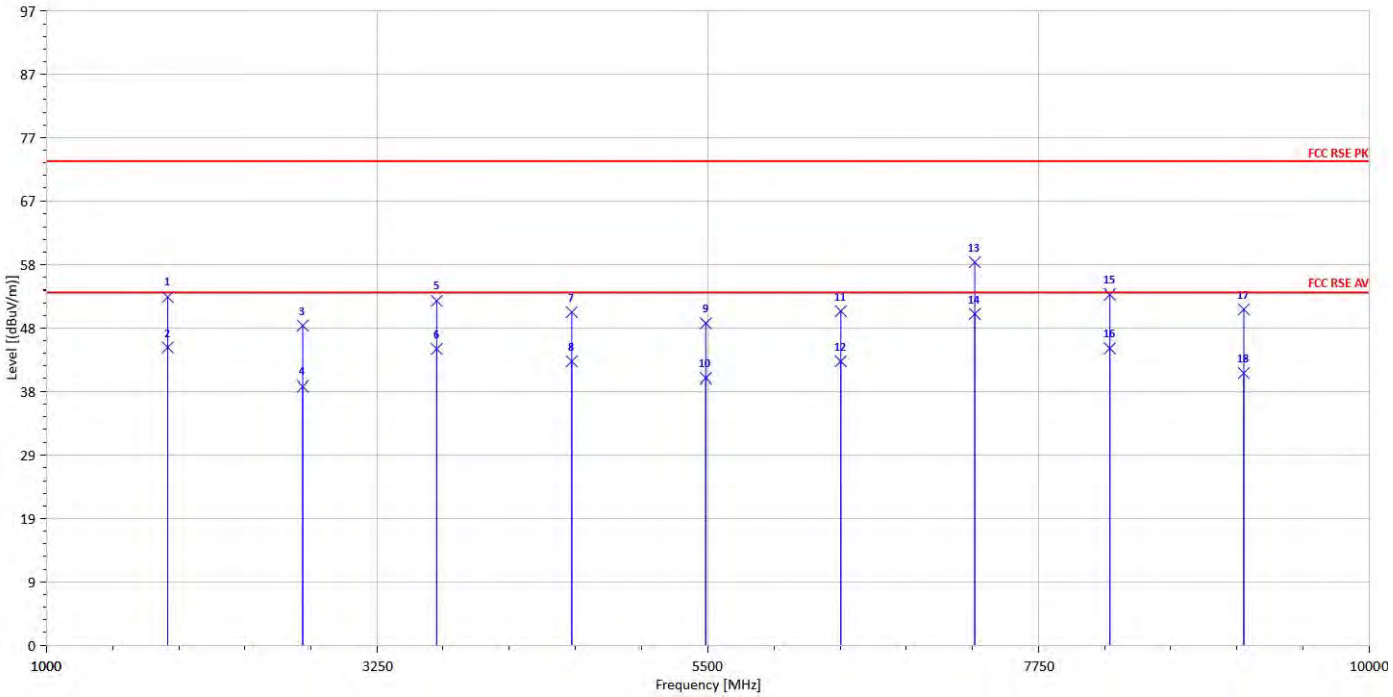
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
1804.50	H	Peak	51.82	-1.32	50.50	74	-23.50
1804.50	H	Average	43.00	-1.32	41.68	54	-12.32
2706.75	H	Peak	46.37	2.16	48.53	74	-25.47
2706.75	H	Average	43.41	2.16	45.57	54	-8.43
3609.00	H	Peak	41.10	4.66	45.76	74	-28.24
3609.00	H	Average	29.29	4.66	33.95	54	-20.05
4511.25	H	Peak	40.19	7.00	47.19	74	-26.81
4511.25	H	Average	32.00	7.00	39.00	54	-15.00
5413.50	H	Peak	39.83	8.86	48.69	74	-25.31
5413.50	H	Average	32.12	8.86	40.98	54	-13.02
6315.75	H	Peak	38.91	11.49	50.40	74	-23.60
6315.75	H	Average	28.87	11.49	40.36	54	-13.64
7218.00	H	Peak	41.75	14.56	56.31	74	-17.69
7218.00	H	Average	34.33	14.56	48.89	54	-5.11
8120.25	H	Peak	36.42	16.39	52.81	74	-21.19
8120.25	H	Average	26.91	16.39	43.30	54	-10.70
9022.50	H	Peak	34.69	17.57	52.26	74	-21.74
9022.50	H	Average	24.39	17.57	41.96	54	-12.04

Operation Mode :	UHF	Test Date :	2016/11/29
Fundamental Frequency :	902.25 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E1	Measurement Antenna Pol. :	Horizontal



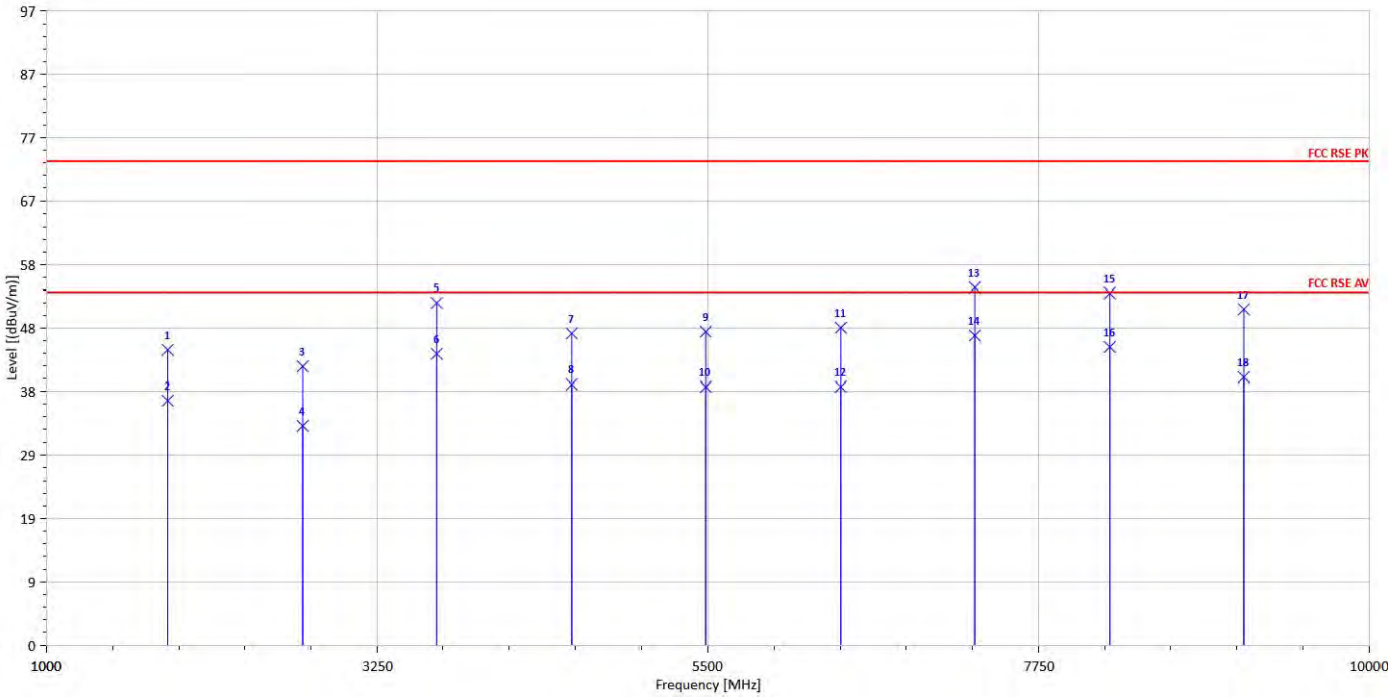
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
1804.50	H	Peak	47.83	-1.32	46.51	74	-27.49
1804.50	H	Average	39.24	-1.32	37.92	54	-16.08
2706.75	H	Peak	39.64	2.16	41.80	74	-32.20
2706.75	H	Average	30.74	2.16	32.90	54	-21.10
3609.00	H	Peak	40.84	4.66	45.50	74	-28.50
3609.00	H	Average	28.87	4.66	33.53	54	-20.47
4511.25	H	Peak	37.99	7.00	44.99	74	-29.01
4511.25	H	Average	28.25	7.00	35.25	54	-18.75
5413.50	H	Peak	39.36	8.86	48.22	74	-25.78
5413.50	H	Average	30.85	8.86	39.71	54	-14.29
6315.75	H	Peak	36.23	11.49	47.72	74	-26.28
6315.75	H	Average	26.03	11.49	37.52	54	-16.48
7218.00	H	Peak	37.84	14.56	52.40	74	-21.60
7218.00	H	Average	29.50	14.56	44.06	54	-9.94
8120.25	H	Peak	36.94	16.39	53.33	74	-20.67
8120.25	H	Average	34.62	16.39	51.01	54	-2.99
9022.50	H	Peak	35.01	17.57	52.58	74	-21.42
9022.50	H	Average	24.70	17.57	42.27	54	-11.73

Operation Mode :	UHF	Test Date :	2016/11/29
Fundamental Frequency :	914.75 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Mid	Test Engineer :	Ashton
EUT Pol. :	E1	Measurement Antenna Pol. :	Vertical



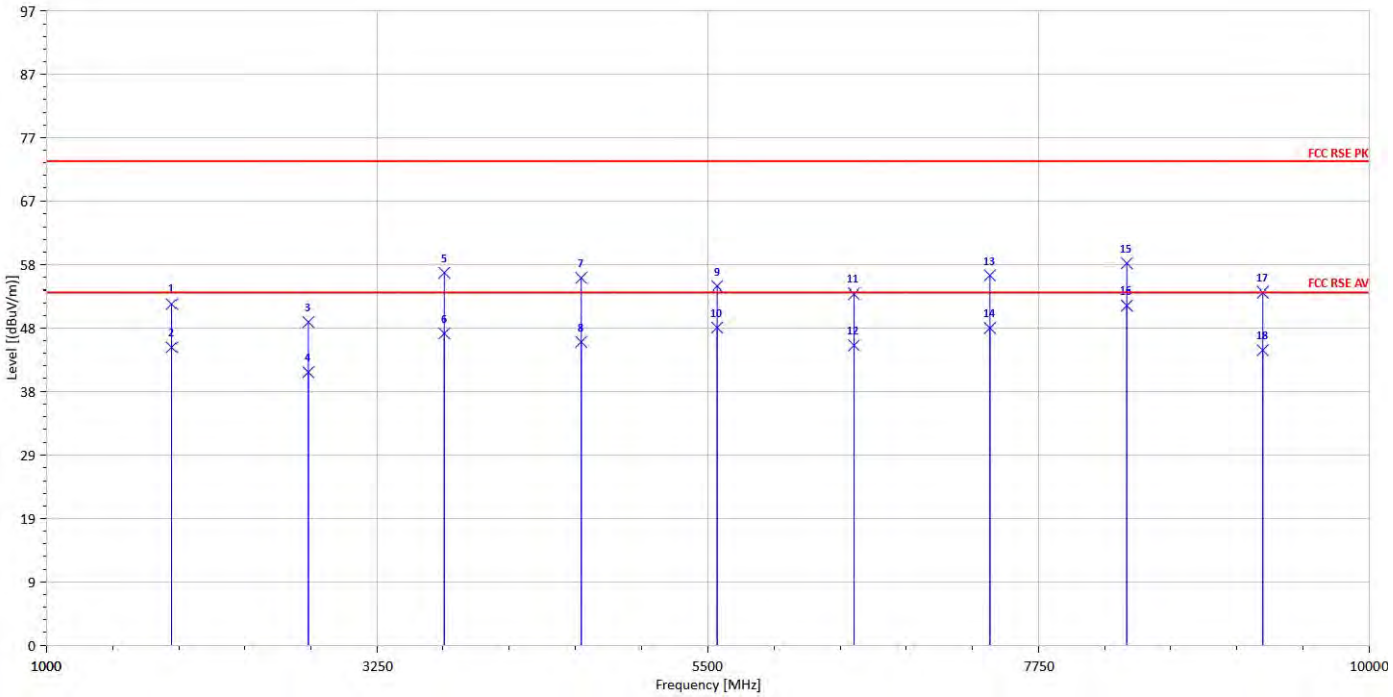
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
1829.50	H	Peak	54.59	-1.28	53.31	74	-20.69
1829.50	H	Average	46.80	-1.28	45.52	54	-8.48
2744.25	H	Peak	46.62	2.27	48.89	74	-25.11
2744.25	H	Average	37.34	2.27	39.61	54	-14.39
3659.00	H	Peak	48.23	4.48	52.71	74	-21.29
3659.00	H	Average	40.80	4.48	45.28	54	-8.72
4573.75	H	Peak	43.91	7.06	50.97	74	-23.03
4573.75	H	Average	36.32	7.06	43.38	54	-10.62
5488.50	H	Peak	40.22	9.03	49.25	74	-24.75
5488.50	H	Average	31.79	9.03	40.82	54	-13.18
6403.25	H	Peak	39.52	11.61	51.13	74	-22.87
6403.25	H	Average	31.77	11.61	43.38	54	-10.62
7318.00	H	Peak	43.88	14.66	58.54	74	-15.46
7318.00	H	Average	36.04	14.66	50.70	54	-3.30
8232.75	H	Peak	37.54	16.13	53.67	74	-20.33
8232.75	H	Average	29.26	16.13	45.39	54	-8.61
9147.50	H	Peak	33.92	17.48	51.40	74	-22.60
9147.50	H	Average	24.08	17.48	41.56	54	-12.44

Operation Mode :	UHF	Test Date :	2016/11/29
Fundamental Frequency :	914.75 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Mid	Test Engineer :	Ashton
EUT Pol. :	E1	Measurement Antenna Pol. :	Horizontal



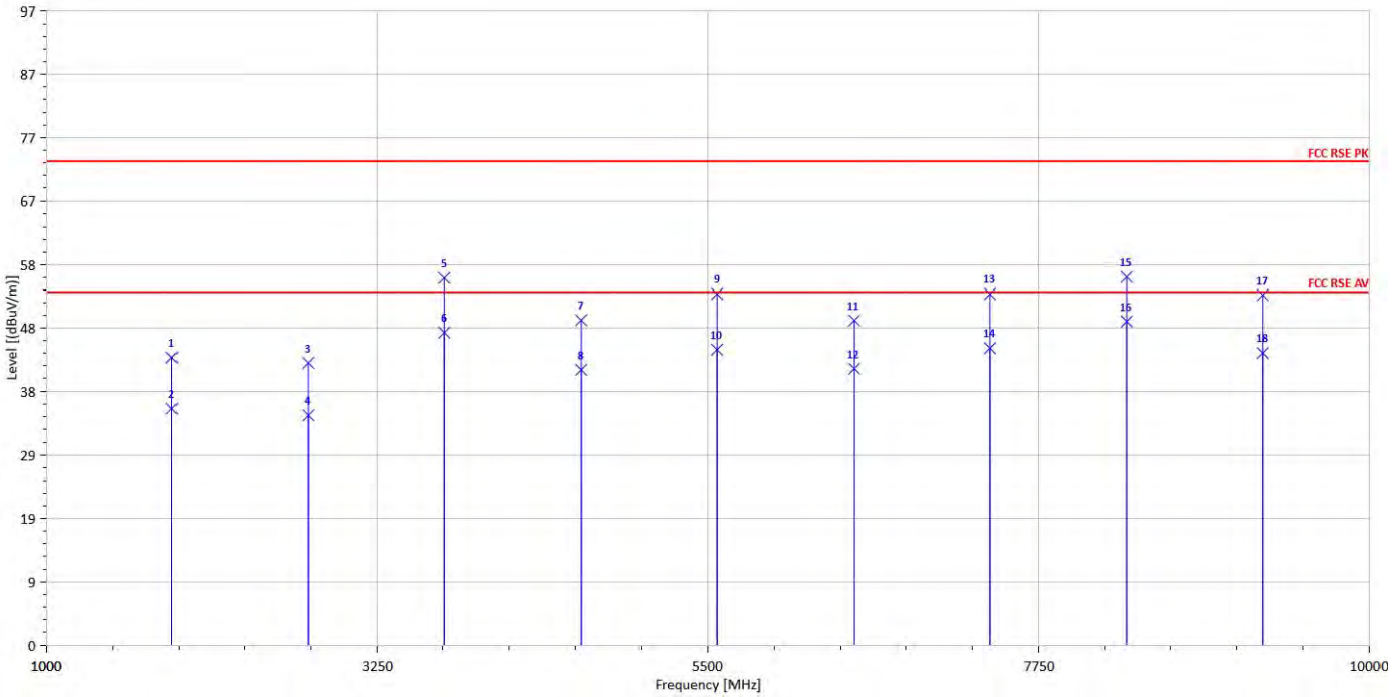
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
1829.50	H	Peak	46.43	-1.28	45.15	74	-28.85
1829.50	H	Average	38.71	-1.28	37.43	54	-16.57
2744.25	H	Peak	40.34	2.27	42.61	74	-31.39
2744.25	H	Average	31.28	2.27	33.55	54	-20.45
3659.00	H	Peak	47.91	4.48	52.39	74	-21.61
3659.00	H	Average	40.06	4.48	44.54	54	-9.46
4573.75	H	Peak	40.63	7.06	47.69	74	-26.31
4573.75	H	Average	32.83	7.06	39.89	54	-14.11
5488.50	H	Peak	38.93	9.03	47.96	74	-26.04
5488.50	H	Average	30.51	9.03	39.54	54	-14.46
6403.25	H	Peak	36.96	11.61	48.57	74	-25.43
6403.25	H	Average	27.93	11.61	39.54	54	-14.46
7318.00	H	Peak	40.03	14.66	54.69	74	-19.31
7318.00	H	Average	32.70	14.66	47.36	54	-6.64
8232.75	H	Peak	37.72	16.13	53.85	74	-20.15
8232.75	H	Average	29.47	16.13	45.60	54	-8.40
9147.50	H	Peak	33.92	17.48	51.40	74	-22.60
9147.50	H	Average	23.49	17.48	40.97	54	-13.03

Operation Mode :	UHF	Test Date :	2016/11/29
Fundamental Frequency :	927.75 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol. :	E1	Measurement Antenna Pol. :	Vertical



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
1855.50	H	Peak	53.30	-1.08	52.22	74	-21.78
1855.50	H	Average	46.62	-1.08	45.54	54	-8.46
2783.25	H	Peak	46.77	2.66	49.44	74	-24.56
2783.25	H	Average	39.04	2.66	41.70	54	-12.30
3711.00	H	Peak	52.36	4.55	56.91	74	-17.09
3711.00	H	Average	43.15	4.55	47.70	54	-6.30
4638.75	H	Peak	48.94	7.18	56.12	74	-17.88
4638.75	H	Average	39.20	7.18	46.38	54	-7.62
5566.50	H	Peak	45.39	9.46	54.85	74	-19.15
5566.50	H	Average	39.13	9.46	48.59	54	-5.41
6494.25	H	Peak	41.64	12.11	53.75	74	-20.25
6494.25	H	Average	33.74	12.11	45.85	54	-8.15
7422.00	H	Peak	40.72	15.80	56.52	74	-17.48
7422.00	H	Average	32.72	15.80	48.52	54	-5.48
8349.75	H	Peak	41.68	16.70	58.38	74	-15.62
8349.75	H	Average	35.28	16.70	51.98	54	-2.02
9277.50	H	Peak	36.16	17.81	53.97	74	-20.03
9277.50	H	Average	27.29	17.81	45.10	54	-8.90

Operation Mode :	UHF	Test Date :	2016/11/29
Fundamental Frequency :	927.75 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol. :	E1	Measurement Antenna Pol. :	Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
1855.50	H	Peak	45.03	-1.08	43.95	74	-30.05
1855.50	H	Average	37.29	-1.08	36.21	54	-17.79
2783.25	H	Peak	40.46	2.66	43.12	74	-30.88
2783.25	H	Average	32.53	2.66	35.19	54	-18.81
3711.00	H	Peak	51.60	4.55	56.15	74	-17.85
3711.00	H	Average	43.25	4.55	47.80	54	-6.20
4638.75	H	Peak	42.53	7.18	49.71	74	-24.29
4638.75	H	Average	34.89	7.18	42.07	54	-11.93
5566.50	H	Peak	44.26	9.46	53.72	74	-20.28
5566.50	H	Average	35.71	9.46	45.17	54	-8.83
6494.25	H	Peak	37.55	12.11	49.66	74	-24.34
6494.25	H	Average	30.12	12.11	42.23	54	-11.77
7422.00	H	Peak	37.91	15.80	53.71	74	-20.29
7422.00	H	Average	29.60	15.80	45.40	54	-8.60
8349.75	H	Peak	39.61	16.70	56.31	74	-17.69
8349.75	H	Average	32.81	16.70	49.51	54	-4.49
9277.50	H	Peak	35.74	17.81	53.55	74	-20.45
9277.50	H	Average	26.84	17.81	44.65	54	-9.35

11 FREQUENCY SEPARATION

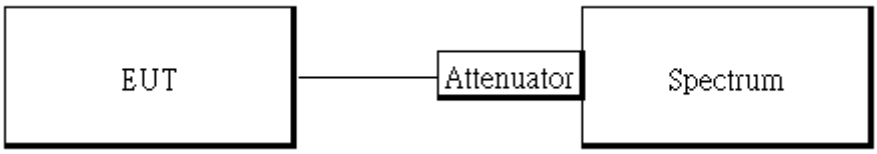
11.1 Standard Applicable

Frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25 kHz or the 2/3*20dB bandwidth of the hopping channel, whichever is greater.

11.2 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2016	04/13/2017
Coaxial Cable 30cm	WOKEN	00100A1F1A195C	RF01	12/13/2015	12/12/2016
DC Block	PASTERNACK	PE8210	RF29	12/13/2015	12/12/2016
Attenuator	WOKEN	218FS-10	RF23	12/13/2015	12/12/2016

11.3 Test Set-up:



11.4 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set center frequency of spectrum analyzer = middle of hopping channel.
5. Set the spectrum analyzer as RBW, VBW=100 kHz, Adjust Span to 1.5MHz, Sweep = auto.
6. Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

11.5 Measurement Result:

Channel separation (MHz)	Limit	Result
1	>=25 kHz or 20dB bandwidth	PASS

Note: Refer to next page for plots.

Frequency Separation Test Data

12 NUMBER OF HOPPING FREQUENCY

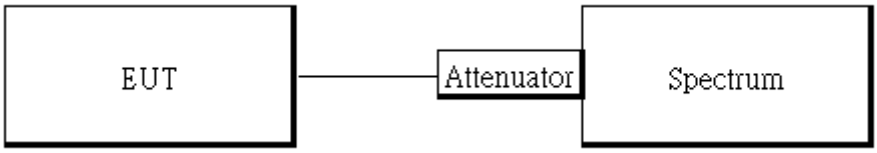
12.1 Standard Applicable

According to §15.247(a)(1)(i), For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

12.2 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2016	04/13/2017
Coaxial Cable 30cm	WOKEN	00100A1F1A 195C	RF01	12/13/2015	12/12/2016
DC Block	PASTERNACK	PE8210	RF29	12/13/2015	12/12/2016
Attenuator	WOKEN	218FS-10	RF23	12/13/2015	12/12/2016

12.3 Test Set-up:



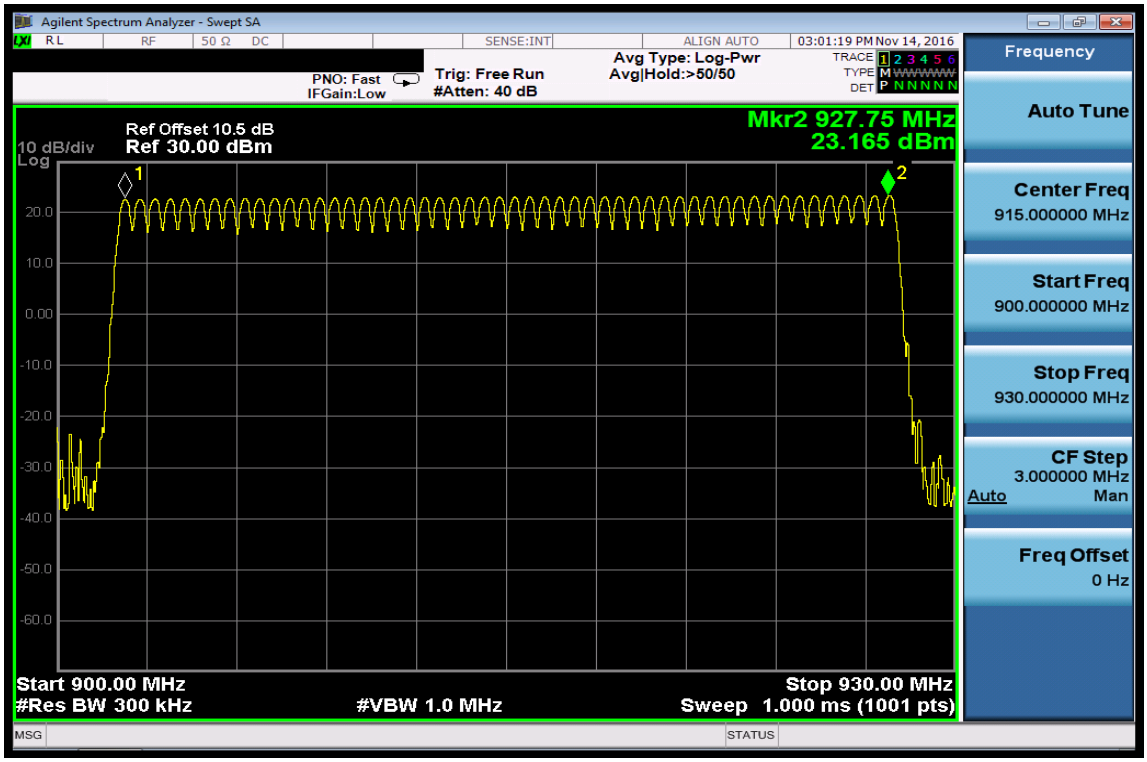
12.4 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set spectrum analyzer Start=900MHz, Stop = 930MHz, Sweep = auto.
5. Set the spectrum analyzer as RBW=300 kHz, VBW= 1MHz., Detector = Peak
6. Max hold, view and count how many channel in the band.

12.5 Measurement Result:

Channel Number

900 MHz – 930 MHz



13 TIME OF OCCUPANCY (DWELL TIME)

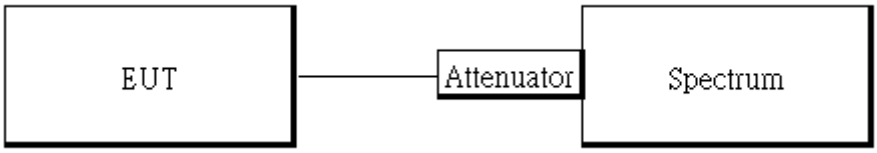
13.1 Standard Applicable

According to §15.247(a)(1)(i), Frequency hopping systems operating in the 902MHz-928MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within a period of 20 seconds.

13.2 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2016	04/13/2017
Coaxial Cable 30cm	WOKEN	00100A1F1A195C	RF01	12/13/2015	12/12/2016
DC Block	PASTERNACK	PE8210	RF29	12/13/2015	12/12/2016
Attenuator	WOKEN	218FS-10	RF23	12/13/2015	12/12/2016

13.3 Test Set-up:



13.4 Measurement Procedure:

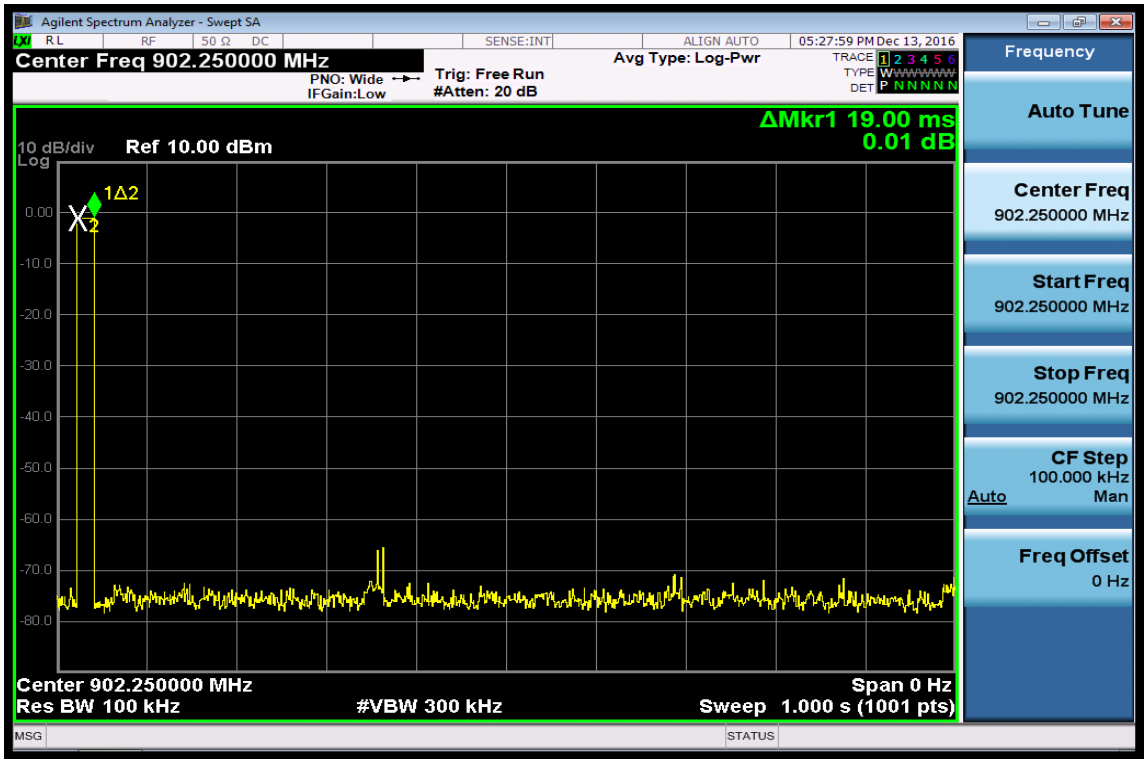
1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set center frequency of spectrum analyzer = operating frequency.
5. Set the spectrum analyzer as RBW, VBW=100KHz, 300KHz, Span = 0Hz, Detector = Peak, Adjust Sweep = 50ms.
6. Repeat above procedures until all frequency of the interest measured were complete.

13.5 Tabular Result of the Measurement:

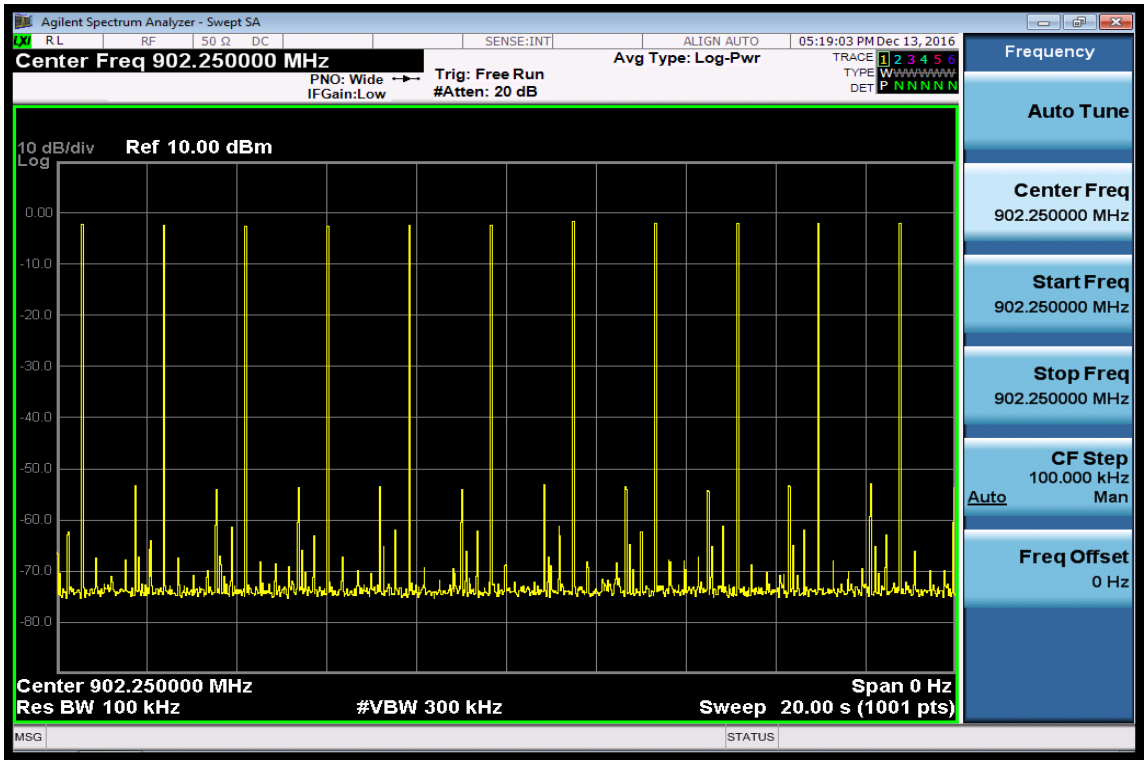
Number of transmission in a 20s	Length of transmission time (ms):	Measurement Result (ms):	Limit (ms):
11	19	209	400ms

13.6 Measurement Result:

Length of transmission time



Number of transmission in a 20s



14 ANTENNA REQUIREMENT

14.1 Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

14.2 Antenna Connected Construction

An embedded-in antenna design is used.

The antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

~ End of Report ~