RADIO TEST REPORT

Report No:STS1809094W02

Issued for

Fortin Auto Radio Inc.

9855 Rue Colbert, Anjou, QC H1J 1Z9, Canada

Product Name:	EVO LORA-BT
Brand Name:	FORTIN
Model Name:	ANT900-BT
Series Model:	N/A
FCC ID:	2ACKU-ANT900-BT
IC:	12084A-ANT900BT
Test Standard:	FCC Part 15.247
	RSS-247 ISSUE 2 FEB 2017 RSS-GEN ISSUE 5 Apr 2018

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TEST RESULT CERTIFICATION

Applicant's name ..... :	Fortin Auto Radio Inc.
Address ..... :	9855 Rue Colbert, Anjou, QC H1J 1Z9, Canada
Manufacture's Name ..... :	Fortin Auto Radio Inc.
Address ..... :	9855 Rue Colbert, Anjou, QC H1J 1Z9, Canada

Product description

Product Name ..... :	EVO LORA-BT
Brand Name ..... :	FORTIN
Model Name ..... :	ANT900-BT
Series Model ..... :	N/A
Test Standards ..... :	FCC Part15.247
	RSS-247 Issue 2, February 2017
Test procedure ..... :	ANSI C63.10-2013

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC/IC requirements. And it is applicable only to the tested sample identified in the report.
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Date of Test ..... :	
Date (s) of performance of tests ..... :	28 Aug. 2018~ 08 Oct. 2018
Date of Issue ..... :	10 Oct. 2018
Test Result ..... :	**Pass**

Testing Engineer : Chris chen
(Chris chen)

Technical Manager : Sean she
(Sean she)

Authorized Signatory : Vita Li
(Vita Li)

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STS APPROVAL

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	10 Oct. 2018	STS1809094W02	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:
558074 D01 15.247 Meas Guidance v05

FCC Part 15.247,Subpart C RSS-247 Issue 2			
Standard Section	Test Item	Judgment	Remark
15.207 RSS-Gen 8.8	Conducted Emission	PASS	--
15.247 (a)(2) RSS-247 5.2 a) RSS-Gen 6.7	6dB&99% Bandwidth	PASS	--
15.247 (b)(3) RSS-247 5.4 d)	Output Power	PASS	--
15.247(d)/ 15.209/15.205 RSS-247 5.5 RSS-GEN 8.9 8.10	Radiated Spurious Emission	PASS	--
15.247 (d) RSS-247 Issue 2 5.5	Conducted Spurious & Band Edge Emission	PASS	--
15.247 (e) RSS-247 5.2 b)	Power Spectral Density	PASS	--
15.203 RSS-Gen 6.8	Antenna Requirement	PASS	--
RSS-Gen 6.11 8.11	Frequency Stability	PASS	--

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

(2) All tests are according to ANSI C63.10-2013

1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.
Add. : 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
CNAS Registration No.: L7649; FCC Registration No.: 625569
IC Registration No.: 12108A; A2LA Certificate No.: 4338.01;

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	±2.88dB
2	Conducted Emission (150KHz-30MHz)	±2.67dB
3	RF power,conducted	±0.71dB
4	Spurious emissions,conducted	±0.63dB
5	All emissions,radiated (9KHz-30MHz)	±3.02dB
6	All emissions,radiated (30MHz-200MHz)	±3.80dB
7	All emissions,radiated (200MHz-1000MHz)	±3.97dB
8	All emissions,radiated(>1G)	±3.03dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

<table>
<tr><td>Product Name</td><td>EVO LORA-BT</td></tr>
<tr><td>Trade Name</td><td>FORTIN</td></tr>
<tr><td>Model Name</td><td>ANT900-BT</td></tr>
<tr><td>Series Model</td><td>N/A</td></tr>
<tr><td>Model Difference</td><td>N/A</td></tr>
<tr><td>Product Description</td><td>The EUT is a EVO LORA-BT
<table>
<tr><td>Operation Frequency:</td><td>910~918 MHz</td></tr>
<tr><td>Modulation Type:</td><td>Digital</td></tr>
<tr><td>Radio Technology:</td><td>LORA</td></tr>
<tr><td>Number Of Channel:</td><td>4</td></tr>
<tr><td>Antenna Designation:</td><td>Please see Note 3.</td></tr>
<tr><td>Antenna Gain (dBi)</td><td>0 dBi</td></tr>
</table></td></tr>
<tr><td>Channel List</td><td>Please refer to the Note 2.</td></tr>
<tr><td>Power Rating</td><td>Input:DC 12V</td></tr>
<tr><td>Hardware version number</td><td>X1</td></tr>
<tr><td>Software version number</td><td>V1</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the User's Manual</td></tr>
</table>

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2.

Channel List	
Channel	Frequency (MHz)
01	910
02	912
03	916
04	918

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	FORTIN	ANT900-BT	Integral Ant	N/A	0	ANT

2.2 DESCRIPTION OF THE TEST MODES

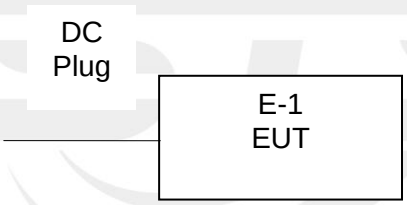
For conducted test items and radiated spurious emissions
Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively..

Worst Mode	Description	Data/Modulation
Mode 1	TX CH01(910MHz)	1 MHz/DIGITAL
Mode 2	TX CH02(912MHz)	1 MHz/DIGITAL
Mode 3	TX CH03(916MHz)	1 MHz/DIGITAL
Mode 4	TX CH04(918MHz)	1 MHz/DIGITAL

Note:
The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
N/A	N/A	N/A	N/A	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
N/A	N/A	N/A	N/A	N/A

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 EQUIPMENTS LIST

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESCI	102086	2017.10.15	2018.10.14
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2018.11.01
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1343	2017.10.27	2018.10.26
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	N/A	2018.03.11	2019.03.10
Temperature & Humitidy	HH660	Mieo	N/A	2017.10.15	2018.10.14
Temperature & Humitidy	HH660	Mieo	N/A	2017.10.15	2018.10.14
Pre-mplifier (0.1M-3GHz)	EM	EM330	60538	2018.03.11	2019.03.10
PreAmplifier (1G-26.5GHz)	Agilent	8449B	60538	2017.10.15	2018.10.14
Passive Loop (9K--30MHz)	ZHNAN	ZN3090C	16035	2018.03.11	2019.03.10
Low frequency cable	EM	R01	N/A	2018.03.11	2019.03.10
Low frequency cable	EM	R06	N/A	2018.03.11	2019.03.10
High frequency cable	SCHWARZBECK	R04	N/A	2018.03.11	2019.03.10
High frequency cable	SCHWARZBECK	R02	N/A	2018.03.11	2019.03.10
Semi-anechoic chamber	Changling	966	N/A	2017.10.15	2018.10.14
trun table	EM	SC100_1	60531	N/A	N/A
Antnna mast	EM	SC100	N/A	N/A	N/A
Max-full Antenna Corp	MF	MFA-440H	N/A	N/A	N/A
Programmable power supply	Agilent	E3642A	MY40002025	2017.10.13	2018.10.12
Temperature& Humidity test chamber	Safety test	AG80L	171200018	2018.03.09	2019.03.08

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2017.10.15	2018.10.14
LISN	R&S	ENV216	101242	2017.10.15	2018.10.14
conduction Cable	EM	C01	N/A	2018.03.11	2019.03.10
Temperature & Humitidy	Mieo	HH660	N/A	2017.10.15	2018.10.14

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2017.10.15	2018.10.14
Power Meter	R&S	NRP	100510	2017.10.15	2018.10.14
Spectrum Analyzer	Agilent	N9020A	MY51110105	2018.03.08	2019.03.07
Signal Analyzer	Agilent	N9020A	MY49100060	2017.10.15	2018.10.14

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

operating frequency band. In case the emission fall within the restricted band specified on Part 207(a) and RSS-Gen Issue 5 limit in the table below has to be followed.

FREQUENCY (MHz)	Conducted Emission limit (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

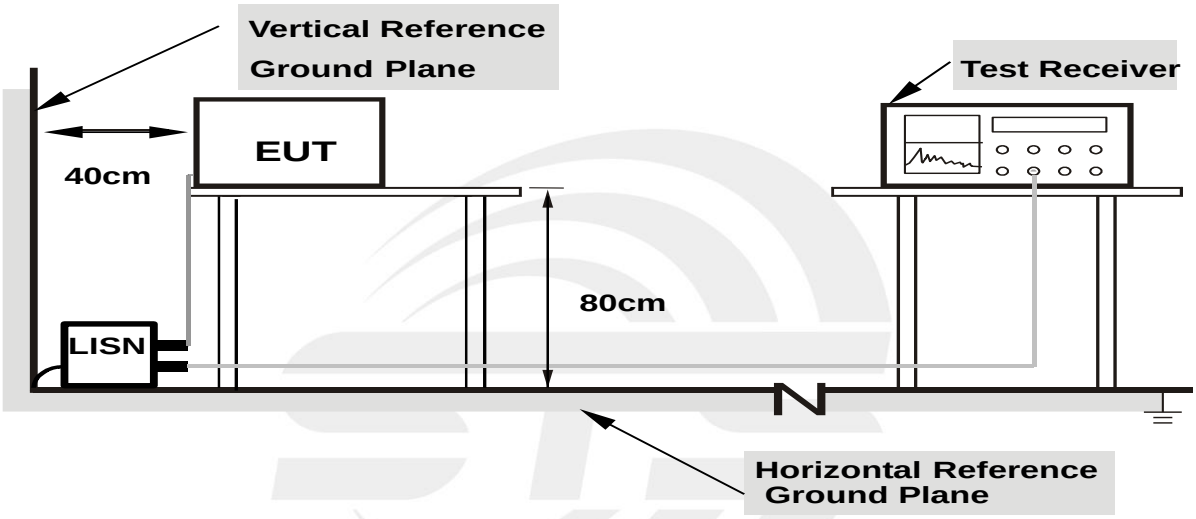
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.2 TEST PROCEDURE

a. The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.5 TEST RESULTS

Temperature:	26 ℃	Relative Humidity:	64%
Test Voltage:	N/A	Phase:	L/N
Test Mode:	N/A		

Note: The EUT is power by DC, this test item is not apply.

4. RADIATED EMISSION MEASUREMENT

4.1 RADIATED EMISSION LIMITS

in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) and RSS-247 Issue 2 limit in the table and according to ANSI C63.10-2013 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (Frequency Range 9kHz-1000MHz)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

For Radiated Emission

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/RMS
Start Frequency	1000 MHz(Peak/RMS)
Stop Frequency	10th carrier hamonic(Peak/RMS)
RB / VB (emission in restricted band)	1 MHz / 3 MHz

For Band edge

Spectrum Parameter	Setting
Detector	Peak/RMS
Start/Stop Frequency	Lower Band Edge: 2300 to 2403 MHz Upper Band Edge: 2479 to 2500 MHz
RB / VB (emission in restricted band)	1 MHz / 3 MHz

Receiver Parameter	Setting
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.2 TEST PROCEDURE

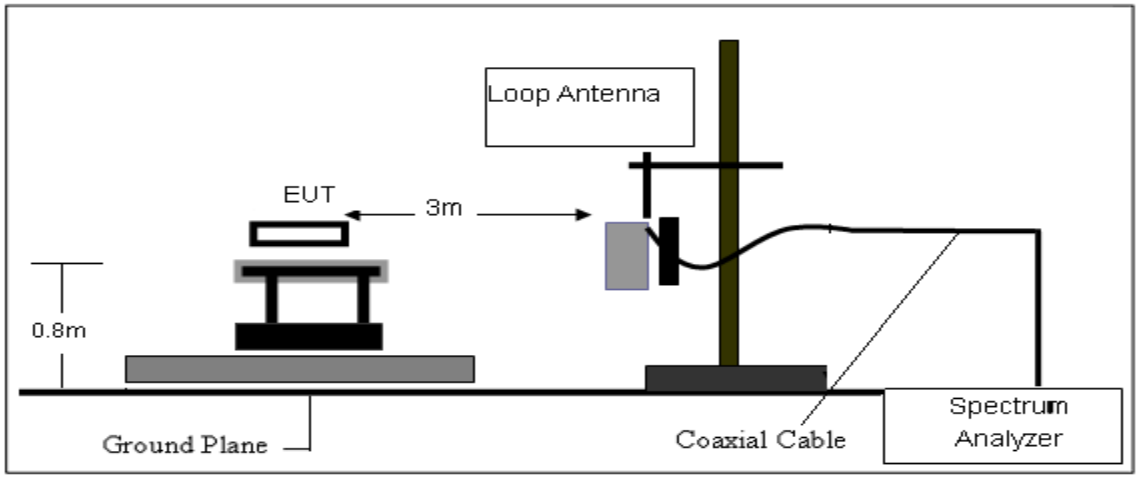
a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
b. The EUT was placed on the top of a rotating table 0.8 meters(above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarizations of the antenna are set to make the measurement
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

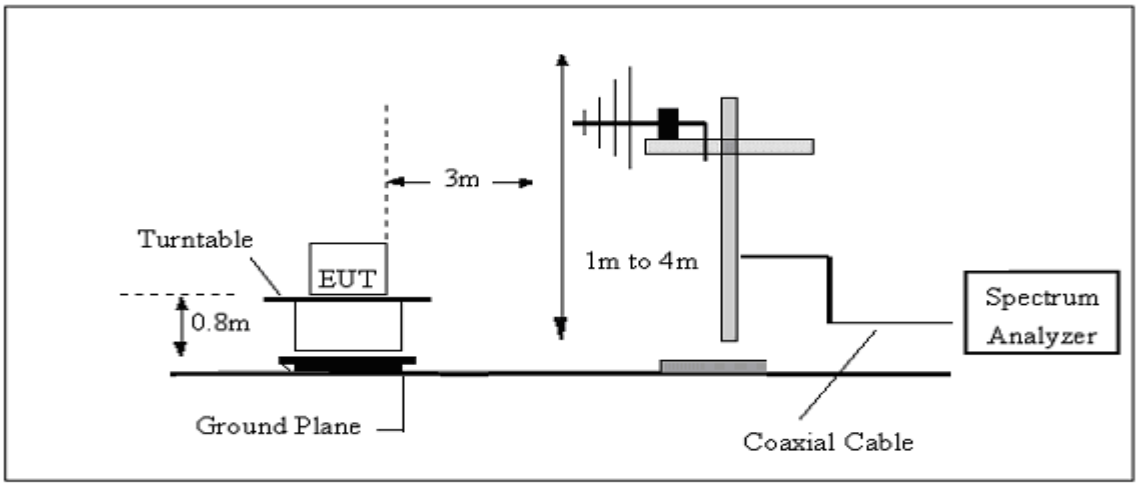
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

4.3 TEST SETUP

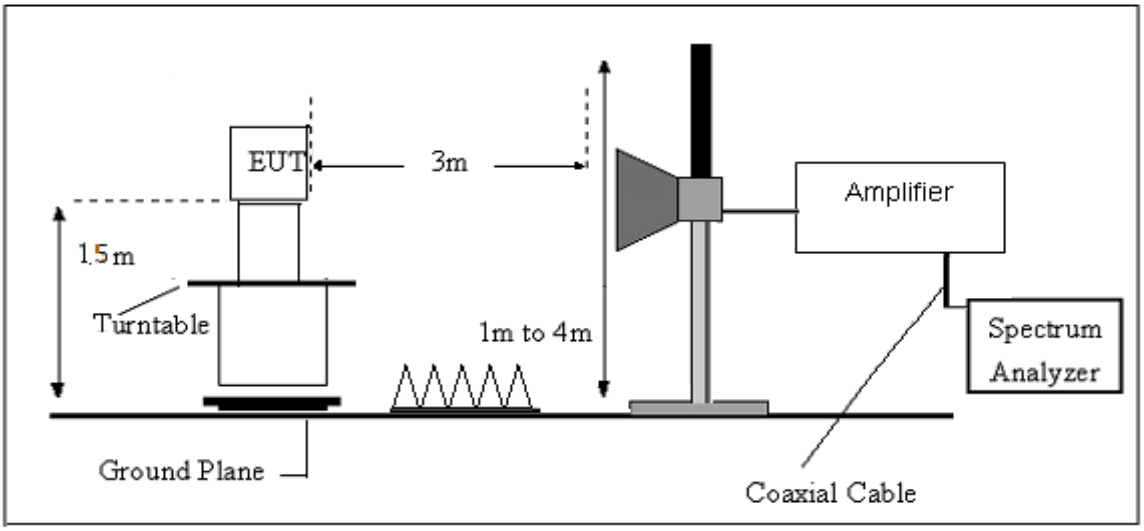
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



4.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

4.5 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

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

Factor=AF+CL-AG

4.6 TEST RESULTS

(Between 9KHz – 30 MHz)

Temperature:	25.7 ℃	Relative Humidtity:	54%
Test Voltage:	DC 12V	Polarization:	--
Test Mode:	--		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

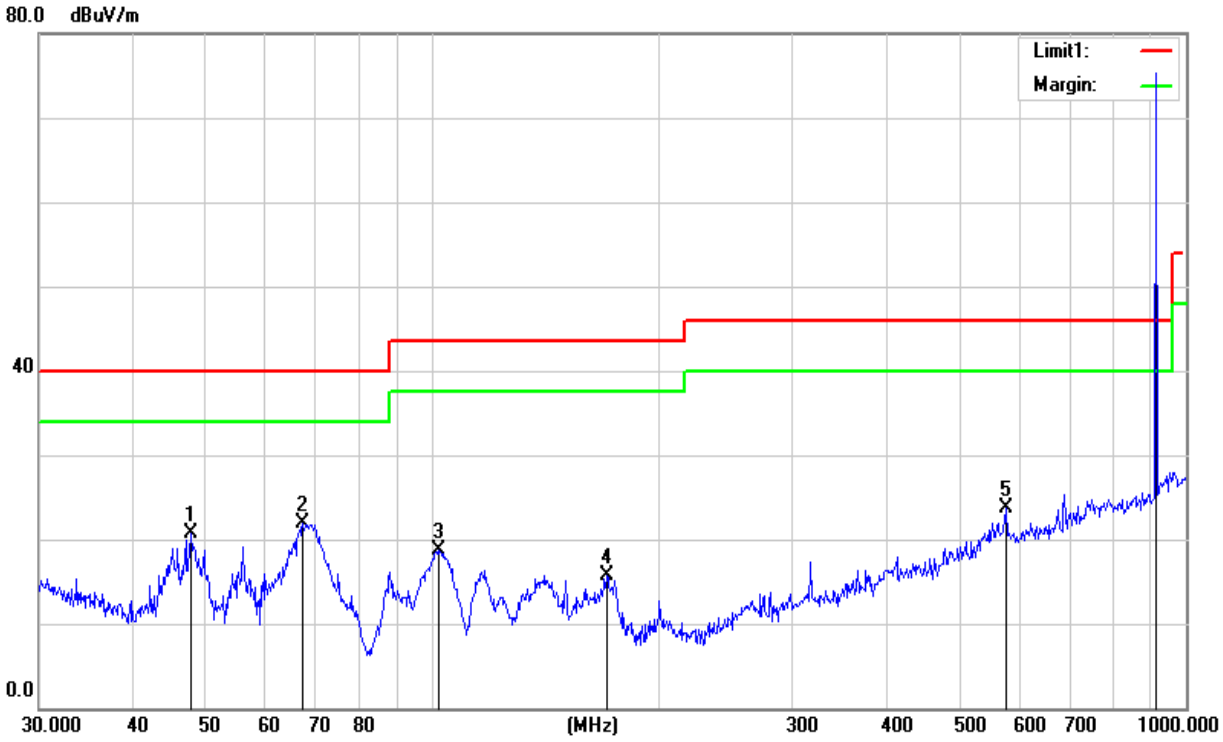
Limit line = specific limits(dBuv) + distance extrapolation factor.

(30MHz -1000MHz)

Temperature:	25.7 ℃	Relative Humidity:	54%
Test Voltage:	DC 12V	Phase:	Horizontal
Test Mode:	Mode1/2/3/4(Mode 2-1M worst mode)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
47.8260	41.03	-20.36	20.67	40.00	-19.33	QP
67.2022	46.00	-24.17	21.83	40.00	-18.17	QP
101.6443	37.84	-19.05	18.79	43.50	-24.71	QP
170.1948	35.13	-19.33	15.80	43.50	-27.70	QP
576.6443	30.46	-6.69	23.77	46.00	-22.23	QP

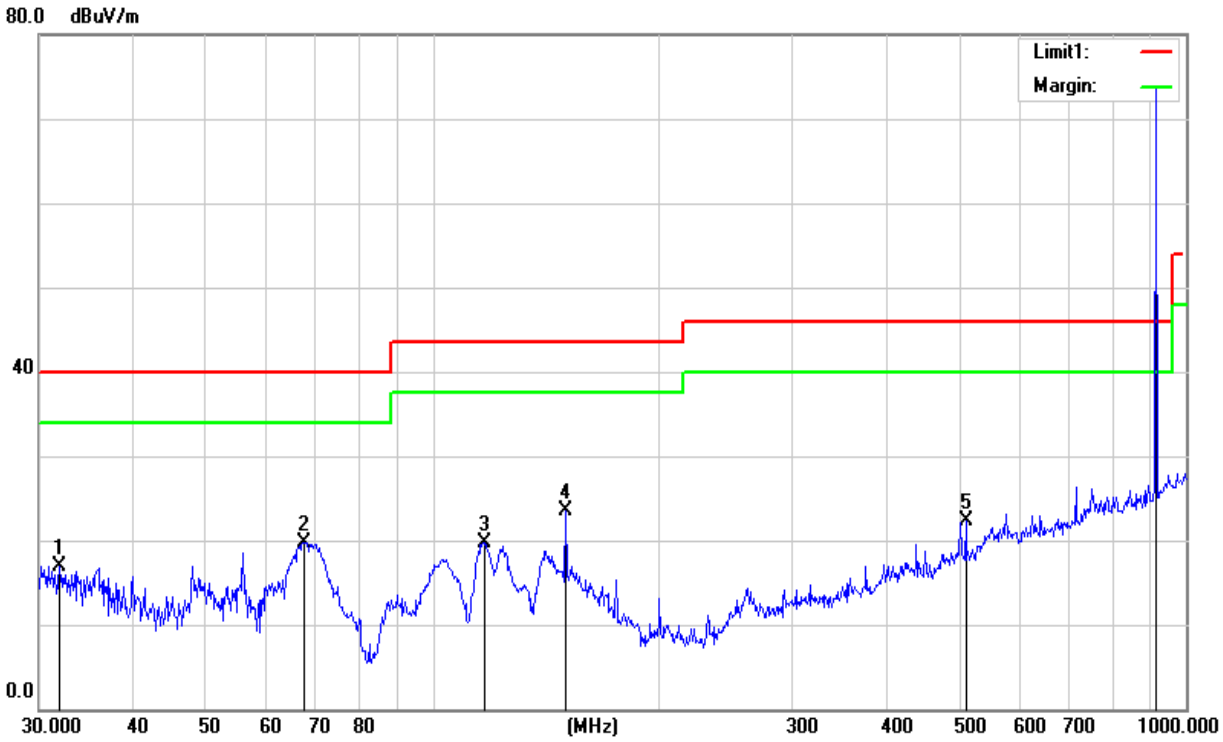
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	25.7 ℃	Relative Humidity:	54%
Test Voltage:	DC 12V	Phase:	Vertical
Test Mode:	Mode1/2/3/4(Mode 2-1M worst mode)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
31.9546	29.17	-12.20	16.97	40.00	-23.03	QP
67.4382	43.93	-24.16	19.77	40.00	-20.23	QP
117.3603	37.60	-17.86	19.74	43.50	-23.76	QP
150.0108	41.43	-17.97	23.46	43.50	-20.04	QP
510.0436	31.23	-8.88	22.35	46.00	-23.65	QP

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit



(1GHz-25GHz)Restricted band and Spurious emission Requirements

Low Channel

Frequency (MHz)	Reading (dBμV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Corrected Factor （dB）	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
Low Channel (910 MHz)										
1099.74	68.55	46.30	3.70	24.30	-18.30	50.25	74.00	-23.75	Pk	Vertical
1099.74	56.70	46.30	3.70	24.30	-18.30	38.40	54.00	-15.60	AV	Vertical
1100.09	68.46	46.30	3.70	24.30	-18.30	50.16	74.00	-23.84	Pk	Horizontal
1100.09	56.57	46.30	3.70	24.30	-18.30	38.27	54.00	-15.73	AV	Horizontal
1516.94	65.05	44.90	4.19	25.00	-15.71	49.34	74.00	-24.66	Pk	Vertical
1516.94	56.11	44.90	4.19	25.00	-15.71	40.40	54.00	-13.60	AV	Vertical
1517.10	65.38	44.90	4.19	25.00	-15.71	49.67	74.00	-24.33	Pk	Horizontal
1517.10	57.33	44.90	4.19	25.00	-15.71	41.62	54.00	-12.38	AV	Horizontal
1820.04	65.16	44.10	5.30	25.00	-13.80	51.36	74.00	-22.64	Pk	Vertical
1820.04	55.59	44.10	5.30	25.00	-13.80	41.79	54.00	-12.21	AV	Vertical
1819.88	64.30	44.10	5.30	25.00	-13.80	50.50	74.00	-23.50	Pk	Horizontal
1819.88	54.36	44.10	5.30	25.00	-13.80	40.56	54.00	-13.44	AV	Horizontal
2144.94	62.50	43.80	5.40	25.90	-12.50	50.00	74.00	-24.00	Pk	Vertical
2144.94	52.26	43.80	5.40	25.90	-12.50	39.76	54.00	-14.24	AV	Vertical
2145.11	62.86	43.80	5.40	25.90	-12.50	50.36	74.00	-23.64	Pk	Horizontal
2145.11	49.65	43.80	5.40	25.90	-12.50	37.15	54.00	-16.85	AV	Horizontal
2729.88	67.52	44.40	6.20	27.60	-10.60	56.92	74.00	-17.08	Pk	Vertical
2729.88	50.39	44.40	6.20	27.60	-10.60	39.79	54.00	-14.21	AV	Vertical
2729.90	64.78	44.40	6.20	27.60	-10.60	54.18	74.00	-19.82	Pk	Horizontal
2729.90	50.11	44.40	6.20	27.60	-10.60	39.51	54.00	-14.49	AV	Horizontal
3265.01	62.28	44.70	6.70	28.20	-9.80	52.48	74.00	-21.52	Pk	Vertical
3265.01	50.88	44.70	6.70	28.20	-9.80	41.08	54.00	-12.92	AV	Vertical
3265.05	63.41	44.70	6.70	28.20	-9.80	53.61	74.00	-20.39	Pk	Horizontal
3265.05	50.96	44.70	6.70	28.20	-9.80	41.16	54.00	-12.84	AV	Horizontal
3999.78	64.54	44.20	7.90	29.70	-6.60	57.94	74.00	-16.06	Pk	Vertical
3999.78	47.86	44.20	7.90	29.70	-6.60	41.26	54.00	-12.74	AV	Vertical
4000.03	67.86	44.20	7.90	29.70	-6.60	61.26	74.00	-12.74	Pk	Horizontal
4000.03	48.53	44.20	7.90	29.70	-6.60	41.93	54.00	-12.07	AV	Horizontal
7221.87	55.28	43.50	11.40	35.50	3.40	58.68	74.00	-15.32	Pk	Vertical
7221.87	38.17	43.50	11.40	35.50	3.40	41.57	54.00	-12.43	AV	Vertical
7222.07	56.17	43.50	11.40	35.50	3.40	59.57	74.00	-14.43	Pk	Horizontal
7222.07	38.15	43.50	11.40	35.50	3.40	41.55	54.00	-12.45	AV	Horizontal

8124.13	53.90	44.20	12.00	37.00	4.80	58.70	74.00	-15.30	Pk	Vertical
8124.13	37.88	44.20	12.00	37.00	4.80	42.68	54.00	-11.32	AV	Vertical
8124.23	54.59	44.20	12.00	37.00	4.80	59.39	74.00	-14.61	Pk	Horizontal
8124.23	38.04	44.20	12.00	37.00	4.80	42.84	54.00	-11.16	AV	Horizontal
9104.97	53.52	45.00	12.57	37.40	4.97	58.49	74.00	-15.51	Pk	Vertical
9104.97	41.18	45.00	12.57	37.40	4.97	46.15	54.00	-7.85	AV	Vertical
9104.88	52.88	45.00	12.57	37.40	4.97	57.85	74.00	-16.15	Pk	Horizontal
9104.88	39.45	45.00	12.57	37.40	4.97	44.42	54.00	-9.58	AV	Horizontal
9930.06	49.36	43.60	14.33	39.50	10.20	59.56	74.00	-14.44	Pk	Vertical
9930.06	34.28	43.60	14.33	39.50	10.20	44.48	54.00	-9.52	AV	Vertical
9929.98	52.55	43.60	14.33	39.50	10.20	62.75	74.00	-11.25	Pk	Horizontal
9929.98	35.42	43.60	14.33	39.50	10.20	45.62	54.00	-8.38	AV	Horizontal

Mid Channel

Frequency (MHz)	Reading (dBμV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Corrected Factor （dB）	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
Mid Channel (912 MHz)										
1099.91	67.64	46.30	3.70	24.30	-18.30	49.34	74.00	-24.66	Pk	Vertical
1099.91	56.54	46.30	3.70	24.30	-18.30	38.24	54.00	-15.76	AV	Vertical
1100.11	68.15	46.30	3.70	24.30	-18.30	49.85	74.00	-24.15	Pk	Horizontal
1100.11	56.36	46.30	3.70	24.30	-18.30	38.06	54.00	-15.94	AV	Horizontal
1516.88	65.55	44.90	4.19	25.00	-15.71	49.84	74.00	-24.16	Pk	Vertical
1516.88	56.20	44.90	4.19	25.00	-15.71	40.49	54.00	-13.51	AV	Vertical
1517.14	66.26	44.90	4.19	25.00	-15.71	50.55	74.00	-23.45	Pk	Horizontal
1517.14	57.59	44.90	4.19	25.00	-15.71	41.88	54.00	-12.12	AV	Horizontal
1824.20	64.55	44.10	5.30	25.00	-13.80	50.75	74.00	-23.25	Pk	Vertical
1824.20	55.46	44.10	5.30	25.00	-13.80	41.66	54.00	-12.34	AV	Vertical
1824.02	64.98	44.10	5.30	25.00	-13.80	51.18	74.00	-22.82	Pk	Horizontal
1824.02	53.54	44.10	5.30	25.00	-13.80	39.74	54.00	-14.26	AV	Horizontal
2144.91	62.26	43.80	5.40	25.90	-12.50	49.76	74.00	-24.24	Pk	Vertical
2144.91	52.80	43.80	5.40	25.90	-12.50	40.30	54.00	-13.70	AV	Vertical
2144.96	62.85	43.80	5.40	25.90	-12.50	50.35	74.00	-23.65	Pk	Horizontal
2144.96	50.34	43.80	5.40	25.90	-12.50	37.84	54.00	-16.16	AV	Horizontal
2735.93	67.45	44.40	6.20	27.60	-10.60	56.85	74.00	-17.15	Pk	Vertical
2735.93	51.37	44.40	6.20	27.60	-10.60	40.77	54.00	-13.23	AV	Vertical
2735.84	65.59	44.40	6.20	27.60	-10.60	54.99	74.00	-19.01	Pk	Horizontal
2735.84	50.57	44.40	6.20	27.60	-10.60	39.97	54.00	-14.03	AV	Horizontal
3264.82	62.27	44.70	6.70	28.20	-9.80	52.47	74.00	-21.53	Pk	Vertical
3264.82	51.19	44.70	6.70	28.20	-9.80	41.39	54.00	-12.61	AV	Vertical
3264.82	63.38	44.70	6.70	28.20	-9.80	53.58	74.00	-20.42	Pk	Horizontal
3264.82	51.13	44.70	6.70	28.20	-9.80	41.33	54.00	-12.67	AV	Horizontal
3999.82	64.93	44.20	7.90	29.70	-6.60	58.33	74.00	-15.67	Pk	Vertical
3999.82	48.40	44.20	7.90	29.70	-6.60	41.80	54.00	-12.20	AV	Vertical
3999.80	68.13	44.20	7.90	29.70	-6.60	61.53	74.00	-12.47	Pk	Horizontal
3999.80	49.11	44.20	7.90	29.70	-6.60	42.51	54.00	-11.49	AV	Horizontal
7317.97	55.60	43.50	11.40	35.50	3.40	59.00	74.00	-15.00	Pk	Vertical
7317.97	38.39	43.50	11.40	35.50	3.40	41.79	54.00	-12.21	AV	Vertical
7318.01	55.45	43.50	11.40	35.50	3.40	58.85	74.00	-15.15	Pk	Horizontal
7318.01	38.58	43.50	11.40	35.50	3.40	41.98	54.00	-12.02	AV	Horizontal
8124.21	54.35	44.20	12.00	37.00	4.80	59.15	74.00	-14.85	Pk	Vertical

8124.21	37.38	44.20	12.00	37.00	4.80	42.18	54.00	-11.82	AV	Vertical
8124.00	54.05	44.20	12.00	37.00	4.80	58.85	74.00	-15.15	Pk	Horizontal
8124.00	38.72	44.20	12.00	37.00	4.80	43.52	54.00	-10.48	AV	Horizontal
9146.77	53.57	45.00	12.57	37.40	4.97	58.54	74.00	-15.46	Pk	Vertical
9146.77	40.74	45.00	12.57	37.40	4.97	45.71	54.00	-8.29	AV	Vertical
9146.79	52.76	45.00	12.57	37.40	4.97	57.73	74.00	-16.27	Pk	Horizontal
9146.79	38.42	45.00	12.57	37.40	4.97	43.39	54.00	-10.61	AV	Horizontal
9930.21	49.54	43.60	14.33	39.50	10.20	59.74	74.00	-14.26	Pk	Vertical
9930.21	33.44	43.60	14.33	39.50	10.20	43.64	54.00	-10.36	AV	Vertical
9930.03	51.98	43.60	14.33	39.50	10.20	62.18	74.00	-11.82	Pk	Horizontal
9930.03	36.29	43.60	14.33	39.50	10.20	46.49	54.00	-7.51	AV	Horizontal

Mid Channel

Frequency (MHz)	Reading (dBμV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Corrected Factor （dB）	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
Mid Channel (916 MHz)										
1099.88	67.82	46.30	3.70	24.30	-18.30	49.52	74.00	-24.48	Pk	Vertical
1099.88	57.50	46.30	3.70	24.30	-18.30	39.20	54.00	-14.80	AV	Vertical
1100.05	67.92	46.30	3.70	24.30	-18.30	49.62	74.00	-24.38	Pk	Horizontal
1100.05	56.67	46.30	3.70	24.30	-18.30	38.37	54.00	-15.63	AV	Horizontal
1516.94	65.86	44.90	4.19	25.00	-15.71	50.15	74.00	-23.85	Pk	Vertical
1516.94	56.81	44.90	4.19	25.00	-15.71	41.10	54.00	-12.90	AV	Vertical
1517.04	66.00	44.90	4.19	25.00	-15.71	50.29	74.00	-23.71	Pk	Horizontal
1517.04	58.09	44.90	4.19	25.00	-15.71	42.38	54.00	-11.62	AV	Horizontal
1830.25	64.53	44.10	5.30	25.00	-13.80	50.73	74.00	-23.27	Pk	Vertical
1830.25	54.54	44.10	5.30	25.00	-13.80	40.74	54.00	-13.26	AV	Vertical
1829.92	65.45	44.10	5.30	25.00	-13.80	51.65	74.00	-22.35	Pk	Horizontal
1829.92	53.81	44.10	5.30	25.00	-13.80	40.01	54.00	-13.99	AV	Horizontal
2144.83	62.50	43.80	5.40	25.90	-12.50	50.00	74.00	-24.00	Pk	Vertical
2144.83	53.62	43.80	5.40	25.90	-12.50	41.12	54.00	-12.88	AV	Vertical
2144.98	62.69	43.80	5.40	25.90	-12.50	50.19	74.00	-23.81	Pk	Horizontal
2144.98	49.59	43.80	5.40	25.90	-12.50	37.09	54.00	-16.91	AV	Horizontal
2745.02	67.12	44.40	6.20	27.60	-10.60	56.52	74.00	-17.48	Pk	Vertical
2745.02	51.54	44.40	6.20	27.60	-10.60	40.94	54.00	-13.06	AV	Vertical
2744.83	65.76	44.40	6.20	27.60	-10.60	55.16	74.00	-18.84	Pk	Horizontal
2744.83	50.65	44.40	6.20	27.60	-10.60	40.05	54.00	-13.95	AV	Horizontal
3265.07	62.78	44.70	6.70	28.20	-9.80	52.98	74.00	-21.02	Pk	Vertical
3265.07	50.90	44.70	6.70	28.20	-9.80	41.10	54.00	-12.90	AV	Vertical
3264.84	63.13	44.70	6.70	28.20	-9.80	53.33	74.00	-20.67	Pk	Horizontal
3264.84	51.34	44.70	6.70	28.20	-9.80	41.54	54.00	-12.46	AV	Horizontal
3999.98	64.32	44.20	7.90	29.70	-6.60	57.72	74.00	-16.28	Pk	Vertical
3999.98	47.09	44.20	7.90	29.70	-6.60	40.49	54.00	-13.51	AV	Vertical
3999.97	67.35	44.20	7.90	29.70	-6.60	60.75	74.00	-13.25	Pk	Horizontal
3999.97	48.56	44.20	7.90	29.70	-6.60	41.96	54.00	-12.04	AV	Horizontal
7317.90	55.42	43.50	11.40	35.50	3.40	58.82	74.00	-15.18	Pk	Vertical
7317.90	39.18	43.50	11.40	35.50	3.40	42.58	54.00	-11.42	AV	Vertical
7318.03	55.81	43.50	11.40	35.50	3.40	59.21	74.00	-14.79	Pk	Horizontal
7318.03	38.15	43.50	11.40	35.50	3.40	41.55	54.00	-12.45	AV	Horizontal
8124.17	54.52	44.20	12.00	37.00	4.80	59.32	74.00	-14.68	Pk	Vertical

8124.17	38.62	44.20	12.00	37.00	4.80	43.42	54.00	-10.58	AV	Vertical
8124.05	54.69	44.20	12.00	37.00	4.80	59.49	74.00	-14.51	Pk	Horizontal
8124.05	38.56	44.20	12.00	37.00	4.80	43.36	54.00	-10.64	AV	Horizontal
9146.91	53.59	45.00	12.57	37.40	4.97	58.56	74.00	-15.44	Pk	Vertical
9146.91	40.42	45.00	12.57	37.40	4.97	45.39	54.00	-8.61	AV	Vertical
9146.85	52.27	45.00	12.57	37.40	4.97	57.24	74.00	-16.76	Pk	Horizontal
9146.85	38.28	45.00	12.57	37.40	4.97	43.25	54.00	-10.75	AV	Horizontal
9930.22	48.68	43.60	14.33	39.50	10.20	58.88	74.00	-15.12	Pk	Vertical
9930.22	34.33	43.60	14.33	39.50	10.20	44.53	54.00	-9.47	AV	Vertical
9929.97	51.47	43.60	14.33	39.50	10.20	61.67	74.00	-12.33	Pk	Horizontal
9929.97	35.83	43.60	14.33	39.50	10.20	46.03	54.00	-7.97	AV	Horizontal

High Channel

Frequency (MHz)	Reading (dBμV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Corrected Factor （dB）	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
High Channel (918 MHz)										
1099.91	68.10	46.30	3.70	24.30	-18.30	49.80	74.00	-24.20	Pk	Vertical
1099.91	56.56	46.30	3.70	24.30	-18.30	38.26	54.00	-15.74	AV	Vertical
1100.34	68.42	46.30	3.70	24.30	-18.30	50.12	74.00	-23.88	Pk	Horizontal
1100.34	57.05	46.30	3.70	24.30	-18.30	38.75	54.00	-15.25	AV	Horizontal
1516.92	66.11	44.90	4.19	25.00	-15.71	50.40	74.00	-23.60	Pk	Vertical
1516.92	56.63	44.90	4.19	25.00	-15.71	40.92	54.00	-13.08	AV	Vertical
1517.13	65.20	44.90	4.19	25.00	-15.71	49.49	74.00	-24.51	Pk	Horizontal
1517.13	58.09	44.90	4.19	25.00	-15.71	42.38	54.00	-11.62	AV	Horizontal
1836.21	65.17	44.10	5.30	25.00	-13.80	51.37	74.00	-22.63	Pk	Vertical
1836.21	54.34	44.10	5.30	25.00	-13.80	40.54	54.00	-13.46	AV	Vertical
1835.82	65.00	44.10	5.30	25.00	-13.80	51.20	74.00	-22.80	Pk	Horizontal
1835.82	54.39	44.10	5.30	25.00	-13.80	40.59	54.00	-13.41	AV	Horizontal
2144.91	62.96	43.80	5.40	25.90	-12.50	50.46	74.00	-23.54	Pk	Vertical
2144.91	52.95	43.80	5.40	25.90	-12.50	40.45	54.00	-13.55	AV	Vertical
2145.13	63.36	43.80	5.40	25.90	-12.50	50.86	74.00	-23.14	Pk	Horizontal
2145.13	49.12	43.80	5.40	25.90	-12.50	36.62	54.00	-17.38	AV	Horizontal
2753.86	66.80	44.40	6.20	27.60	-10.60	56.20	74.00	-17.80	Pk	Vertical
2753.86	51.14	44.40	6.20	27.60	-10.60	40.54	54.00	-13.46	AV	Vertical
2754.03	65.92	44.40	6.20	27.60	-10.60	55.32	74.00	-18.68	Pk	Horizontal
2754.03	51.07	44.40	6.20	27.60	-10.60	40.47	54.00	-13.53	AV	Horizontal
3265.12	63.08	44.70	6.70	28.20	-9.80	53.28	74.00	-20.72	Pk	Vertical
3265.12	51.01	44.70	6.70	28.20	-9.80	41.21	54.00	-12.79	AV	Vertical
3264.94	62.70	44.70	6.70	28.20	-9.80	52.90	74.00	-21.10	Pk	Horizontal
3264.94	50.80	44.70	6.70	28.20	-9.80	41.00	54.00	-13.00	AV	Horizontal
3999.90	64.77	44.20	7.90	29.70	-6.60	58.17	74.00	-15.83	Pk	Vertical
3999.90	47.52	44.20	7.90	29.70	-6.60	40.92	54.00	-13.08	AV	Vertical
3999.87	68.03	44.20	7.90	29.70	-6.60	61.43	74.00	-12.57	Pk	Horizontal
3999.87	48.27	44.20	7.90	29.70	-6.60	41.67	54.00	-12.33	AV	Horizontal
7421.93	55.81	43.50	11.40	35.50	3.40	59.21	74.00	-14.79	Pk	Vertical
7421.93	38.73	43.50	11.40	35.50	3.40	42.13	54.00	-11.87	AV	Vertical
7422.02	55.72	43.50	11.40	35.50	3.40	59.12	74.00	-14.88	Pk	Horizontal
7422.02	37.92	43.50	11.40	35.50	3.40	41.32	54.00	-12.68	AV	Horizontal
8124.20	54.26	44.20	12.00	37.00	4.80	59.06	74.00	-14.94	Pk	Vertical

8124.20	37.84	44.20	12.00	37.00	4.80	42.64	54.00	-11.36	AV	Vertical
8124.21	54.54	44.20	12.00	37.00	4.80	59.34	74.00	-14.66	Pk	Horizontal
8124.21	38.65	44.20	12.00	37.00	4.80	43.45	54.00	-10.55	AV	Horizontal
9276.86	52.72	45.00	12.57	37.40	4.97	57.69	74.00	-16.31	Pk	Vertical
9276.86	41.01	45.00	12.57	37.40	4.97	45.98	54.00	-8.02	AV	Vertical
9276.80	53.19	45.00	12.57	37.40	4.97	58.16	74.00	-15.84	Pk	Horizontal
9276.80	38.31	45.00	12.57	37.40	4.97	43.28	54.00	-10.72	AV	Horizontal
9930.22	49.20	43.60	14.33	39.50	10.20	59.40	74.00	-14.60	Pk	Vertical
9930.22	33.36	43.60	14.33	39.50	10.20	43.56	54.00	-10.44	AV	Vertical
9930.15	51.71	43.60	14.33	39.50	10.20	61.91	74.00	-12.09	Pk	Horizontal
9930.15	35.42	43.60	14.33	39.50	10.20	45.62	54.00	-8.38	AV	Horizontal

Note:

1) Factor = Antenna Factor + Cable Loss – Pre-amplifier.

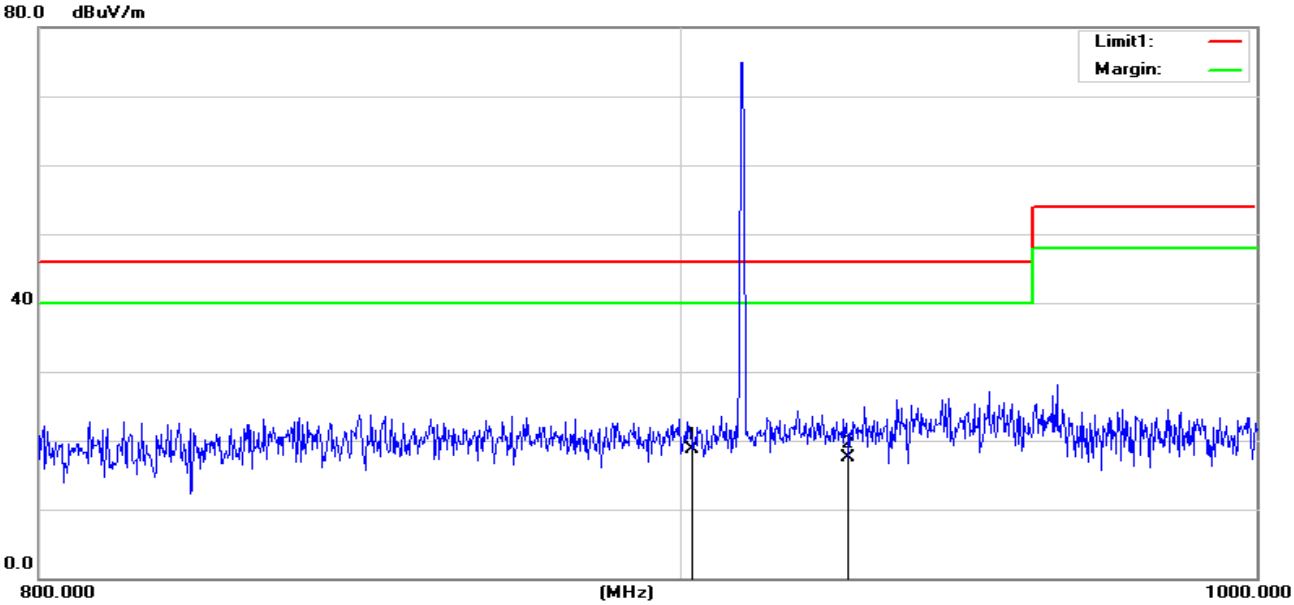
Emission Level = Reading + Factor

2) The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

4.6 TEST RESULTS (Restricted Bands Requirements)

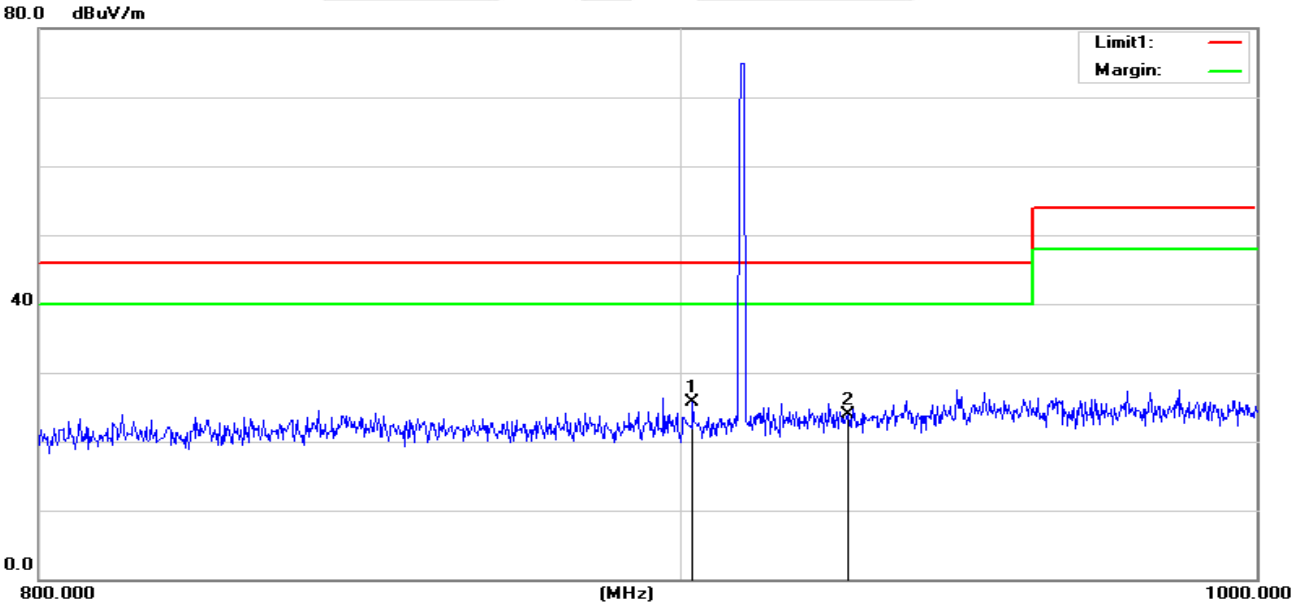
DIGITAL-Low

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	902.0000	20.99	-2.20	18.79	46.00	-27.21	peak
2	928.0000	18.80	-1.23	17.57	46.00	-28.43	peak

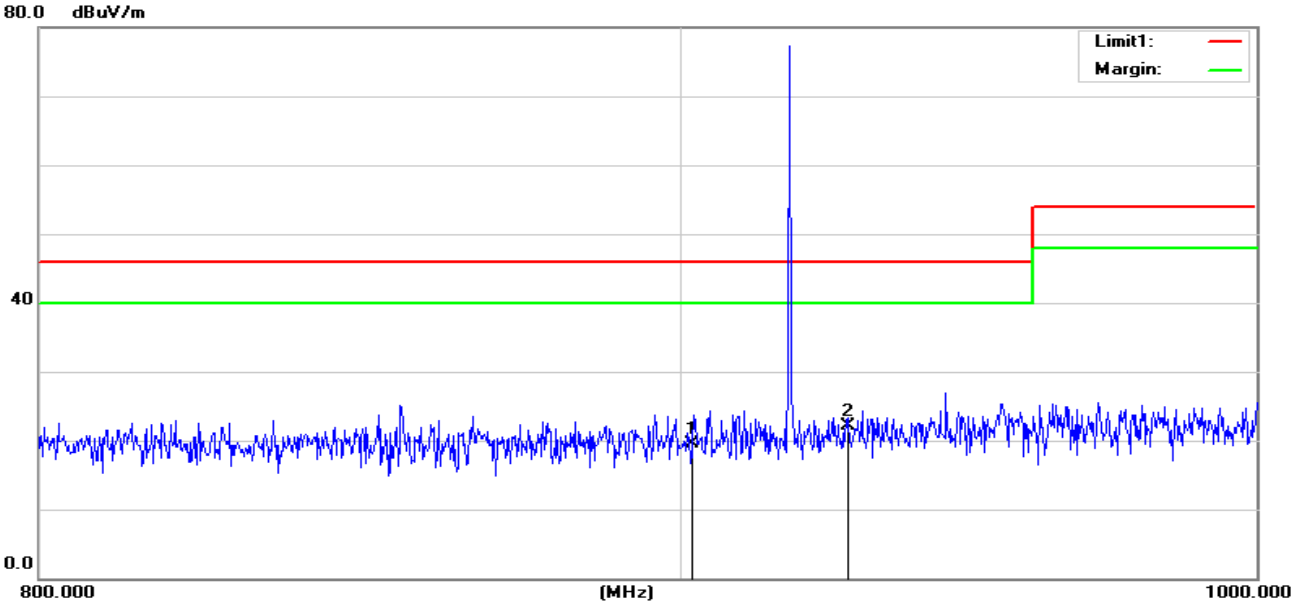
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	902.0000	27.87	-2.20	25.67	46.00	-20.33	peak
2	928.0000	25.06	-1.23	23.83	46.00	-22.17	peak

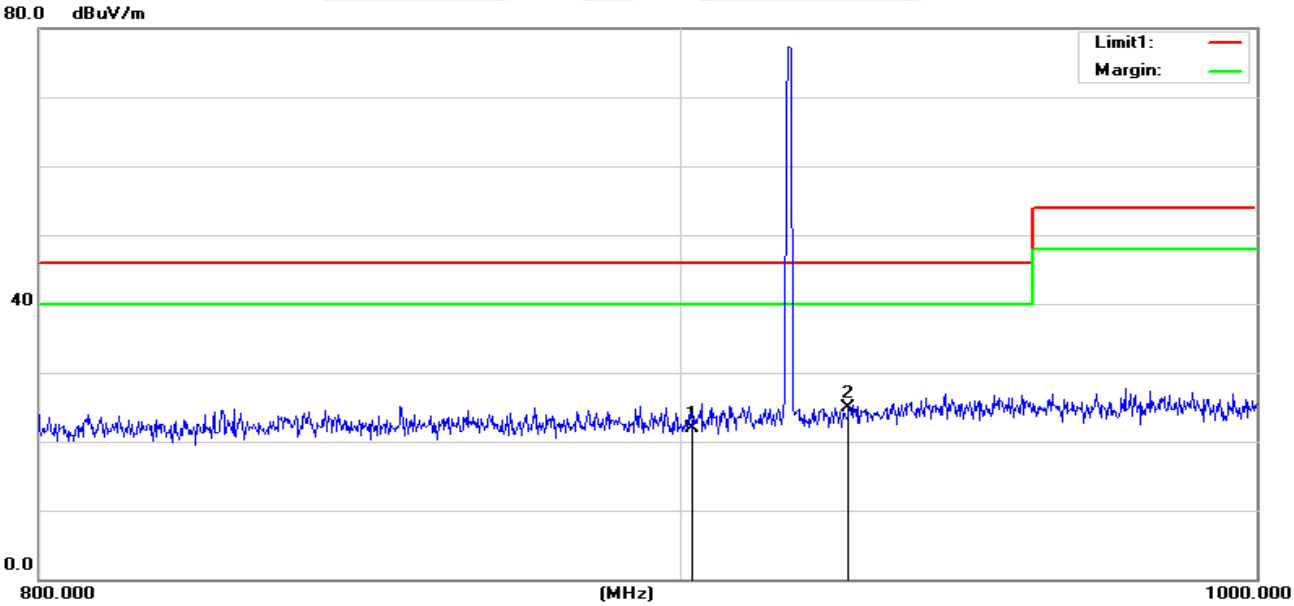
DIGITAL-High

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	902.0000	21.75	-2.20	19.55	46.00	-26.45	peak
2	928.0000	23.27	-1.23	22.04	46.00	-23.96	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	902.0000	24.05	-2.20	21.85	46.00	-24.15	peak
2	928.0000	26.22	-1.23	24.99	46.00	-21.01	peak

5. CONDUCTED SPURIOUS & BAND EDGE EMISSION

5.1 REQUIREMENT

According to FCC section 15.247(d) and RSS-247 Issue 2, in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

.

For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2300 – 2403 MHz Upper Band Edge: 2479 – 2500 MHz
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

5.3 TEST SETUP

The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50 Ohm; the path loss as the factor is calibrated to correct the reading. Make the measurement with the spectrum analyzer's resolution bandwidth(RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

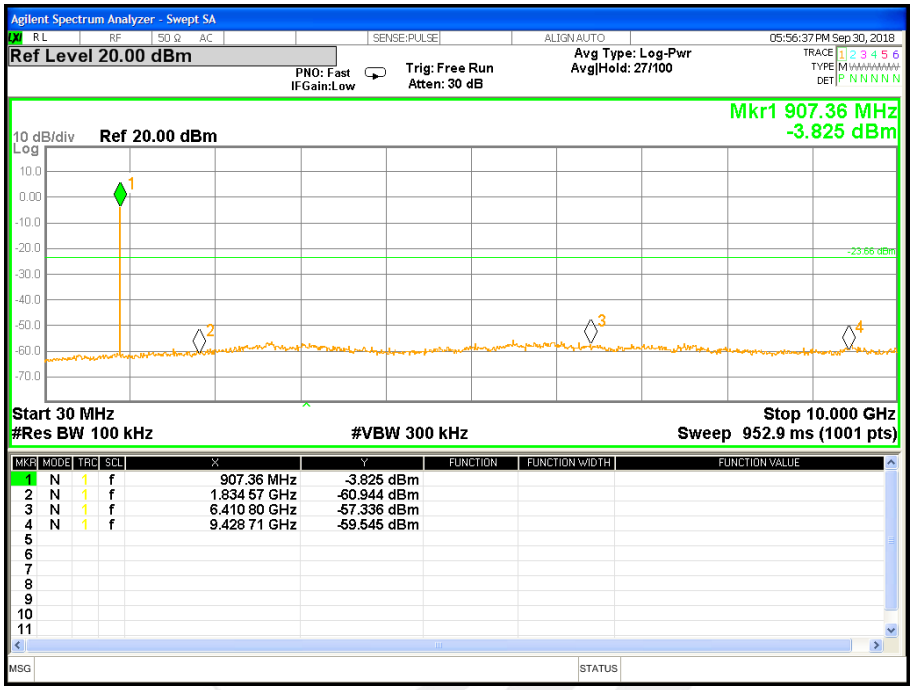
5.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

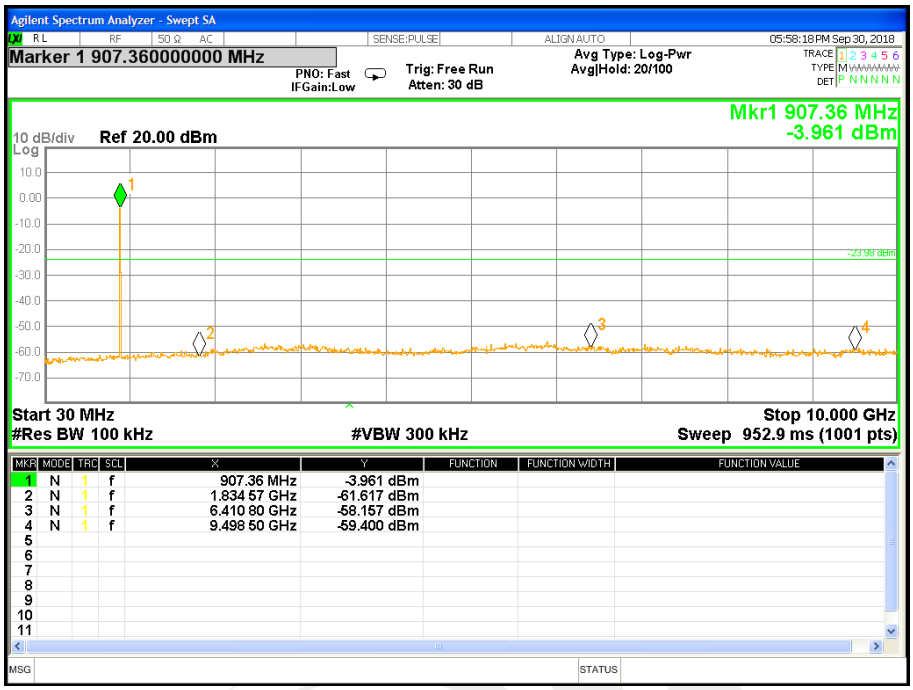
5.5 TEST RESULTS

Temperature:	25 ℃	Relative Humidity:	50%
Test Voltage:	DC 12V	Test Mode:	TX Mode /CH01, CH02, CH03, CH04

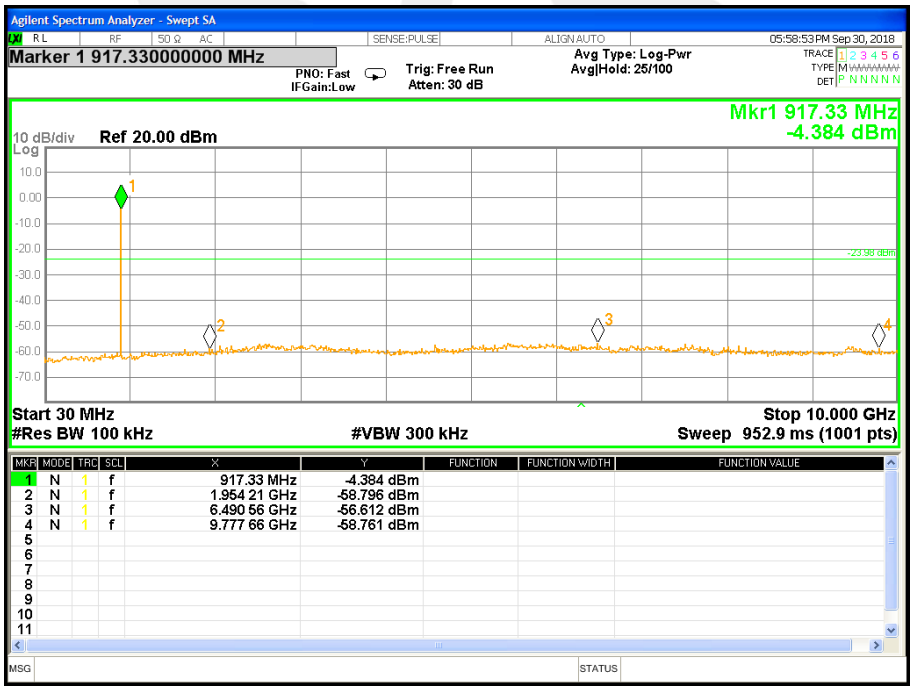
01 CH



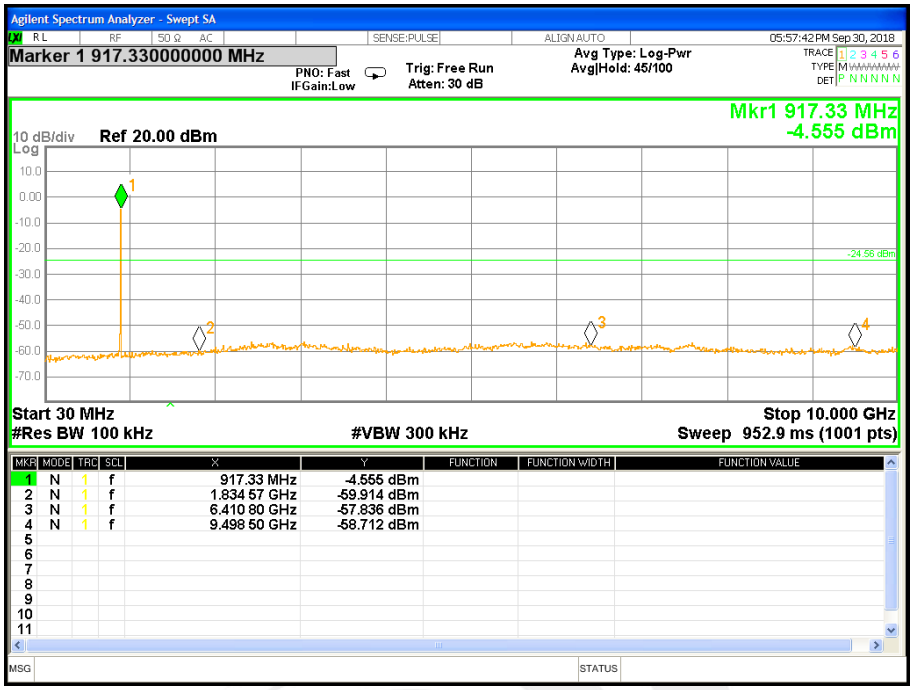
02 CH


Agilent Spectrum Analyzer - Swept SA
Marker 1 907.360000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
05:58:18 PM Sep 30, 2018
Mkr1 907.36 MHz
-3.961 dBm
10 dB/div
Log
Ref 20.00 dBm
-23.98 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 952.9 ms (1001 pts)
1 N 1 f 907.36 MHz -3.961 dBm
2 N 1 f 1.834 57 GHz -61.617 dBm
3 N 1 f 6.410 80 GHz -58.157 dBm
4 N 1 f 9.498 50 GHz -59.400 dBm

03 CH


Agilent Spectrum Analyzer - Swept SA
Marker 1 917.330000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 25/100
05:58:53 PM Sep 30, 2018
Mkr1 917.33 MHz
-4.384 dBm
10 dB/div
Log
Ref 20.00 dBm
-23.98 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 952.9 ms (1001 pts)
1 N 1 f 917.33 MHz -4.384 dBm
2 N 1 f 1.954 21 GHz -58.796 dBm
3 N 1 f 6.490 56 GHz -56.612 dBm
4 N 1 f 9.777 66 GHz -58.761 dBm

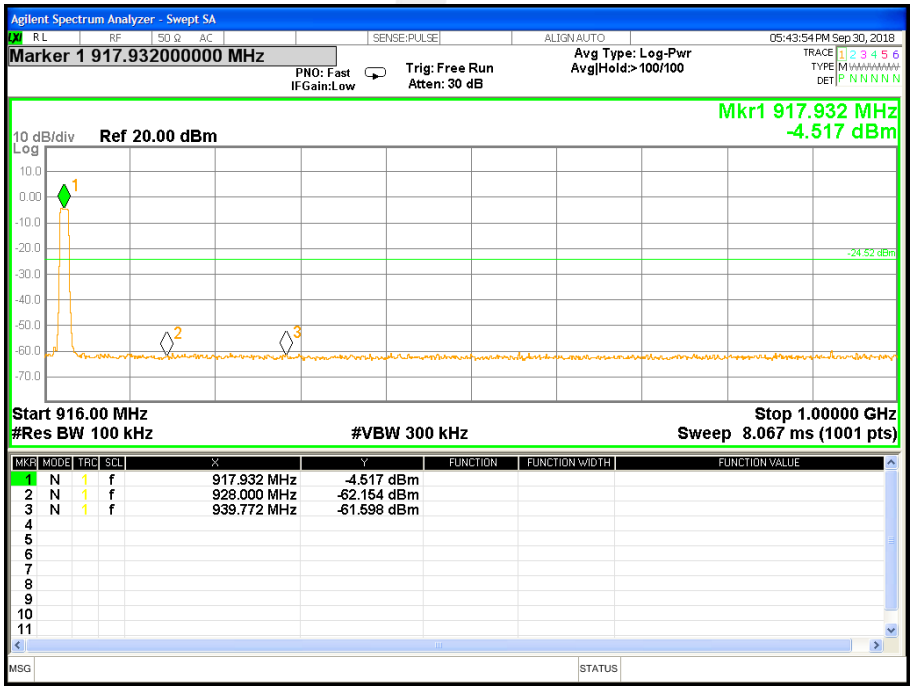
04 CH


Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
05:57:42 PM Sep 30, 2018
Marker 1 917.330000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 45/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 917.33 MHz
-4.555 dBm
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-24.56 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 952.9 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 917.33 MHz -4.555 dBm
2 N 1 f 1.834 57 GHz -59.914 dBm
3 N 1 f 6.410 80 GHz -57.836 dBm
4 N 1 f 9.498 50 GHz -58.712 dBm
5
6
7
8
9
10
11
MSG
STATUS

For Band edge

01 CH

04 CH



6. POWER SPECTRAL DENSITY TEST

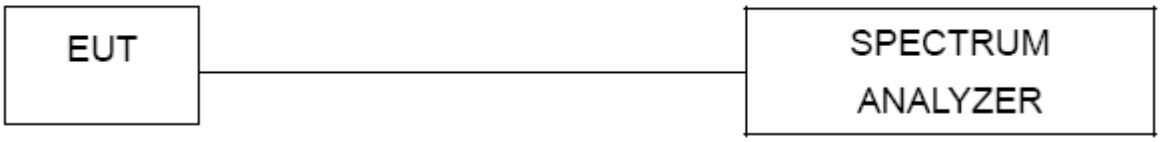
6.1 APPLIED PROCEDURES / LIMIT

FCC Part 15.247,Subpart C RSS-247 Issue 2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e) RSS-247 Issue 2	Power Spectral Density	≤8 dBm (RBW≥3KHz)	902-928	PASS

6.2 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW to: 100 kHz ≥ RBW ≥ 3 kHz.
4. Set the VBW ≥ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

6.3 TEST SETUP



6.4 EUT OPERATION CONDITIONS

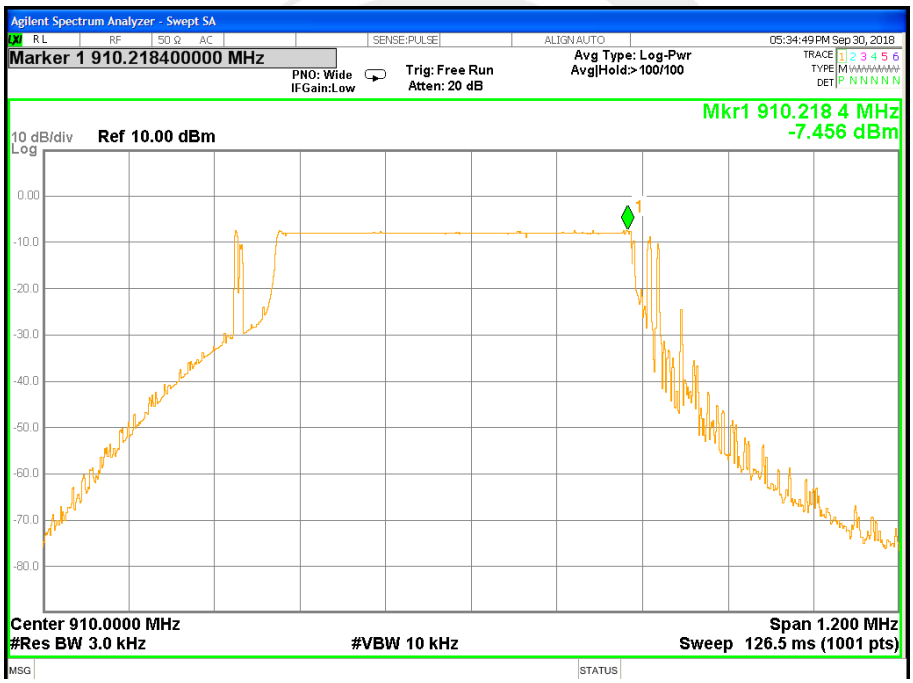
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

6.5 TEST RESULTS

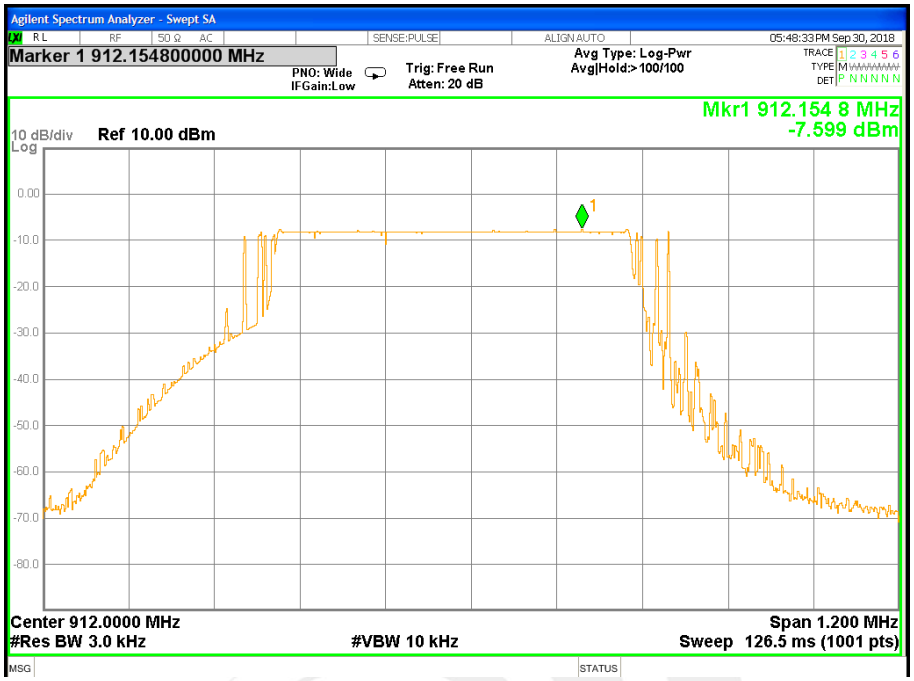
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX Mode /CH01, CH02, CH03, CH04

Frequency	Power Density (dBm/3kHz)	Limit (dBm/3KHz)	Result
910MHz	-7.456	≤8	PASS
912 MHz	-7.599	≤8	PASS
916 MHz	-7.892	≤8	PASS
918 MHz	-8.113	≤8	PASS

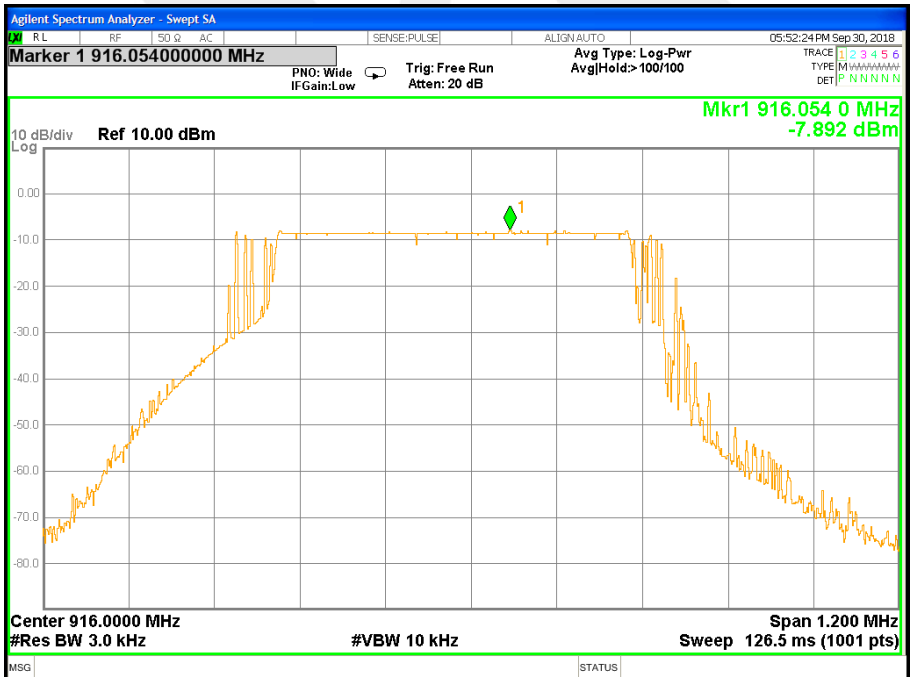
TX CH01



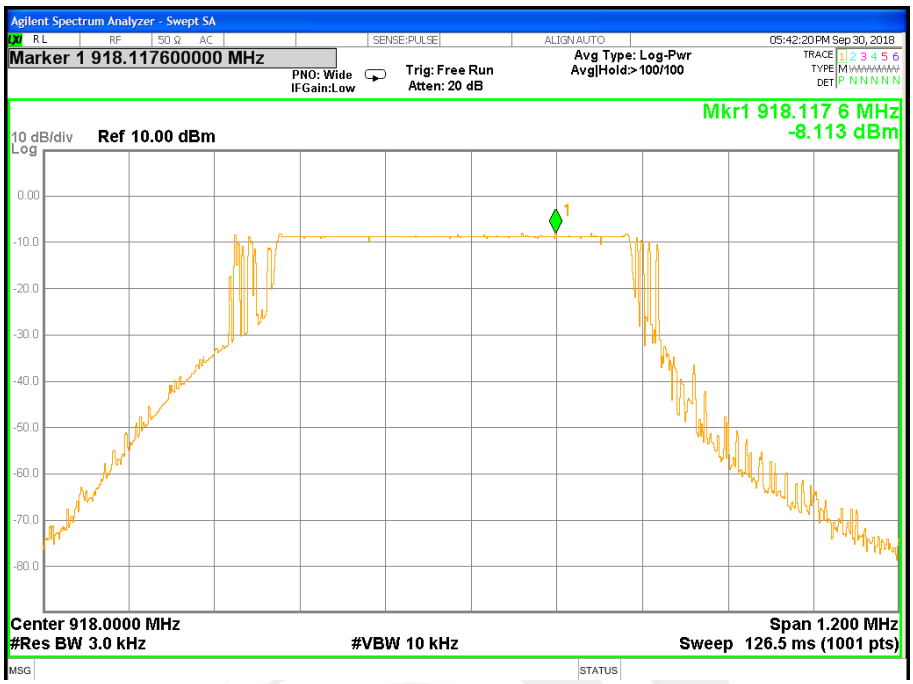
TX CH02



TX CH03



TX CH04


Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
05:42:20 PM Sep 30, 2018
Marker 1 918.117600000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 918.117 6 MHz
-8.113 dBm
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 918.0000 MHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 1.200 MHz
Sweep 126.5 ms (1001 pts)
MSG
STATUS

7. BANDWIDTH TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part 15.247,Subpart C RSS-247 Issue 2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2) RSS-247 Issue 2	6dB Bandwidth	>= 500KHz	902-928	PASS
RSS-Gen Clause 6.7	99% Bandwidth	For reporting purposes only.	902-928	PASS

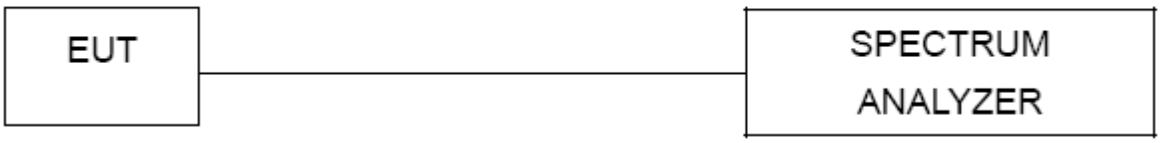
7.2 TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	For 6 dB Bandwidth :100K For 99% Bandwidth :1% to 5% of the occupied bandwidth
VBW	For 6dB Bandwidth : ≥3 × RBW For 99% Bandwidth : approximately 3×RBW
Trace	Max hold
Sweep	Auto

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB and 99% relative to the maximum level measured in the fundamental emission.

7.3 TEST SETUP



7.4 EUT OPERATION CONDITIONS

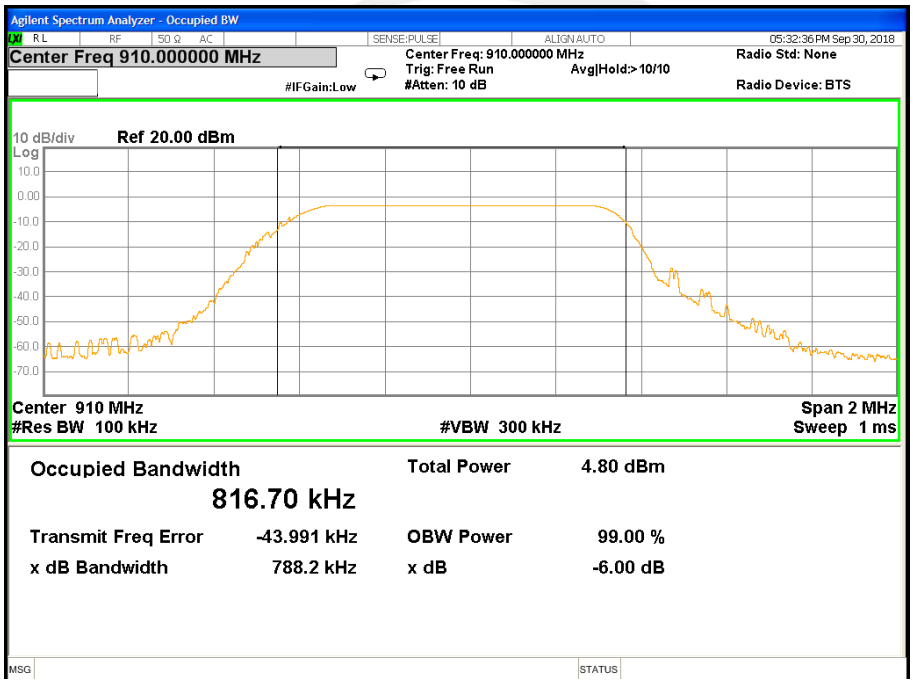
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

7.5 TEST RESULTS

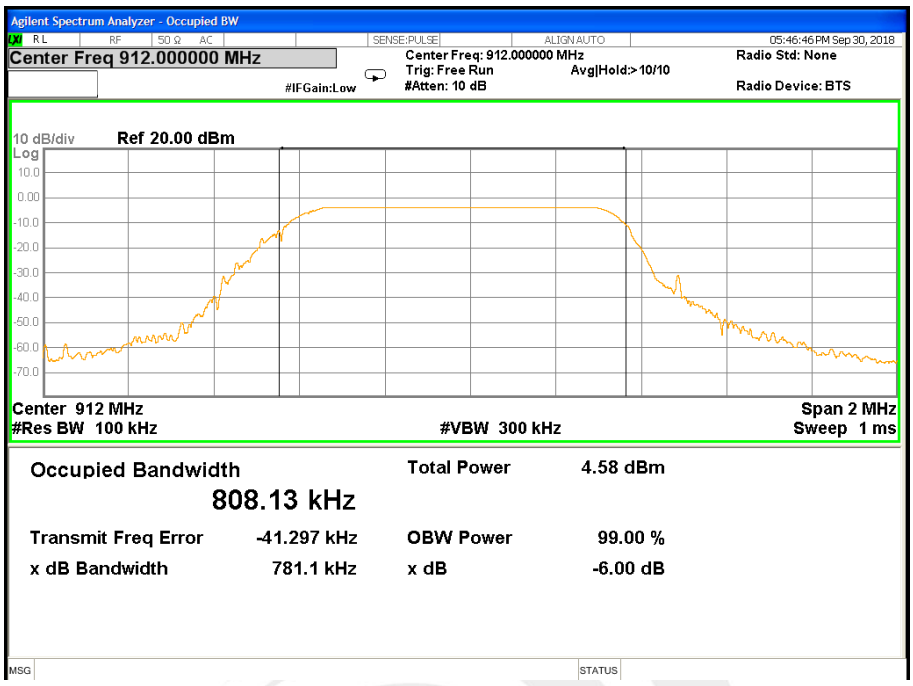
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX Mode /CH01, CH02, CH03, CH04

Frequency	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Channel Separation (MHz)	Result
910 MHz	0.788	0.667	>=500KHz	PASS
912 MHz	0.781	0.668	>=500KHz	PASS
916 MHz	0.774	0.662	>=500KHz	PASS
918 MHz	0.783	0.656	>=500KHz	PASS

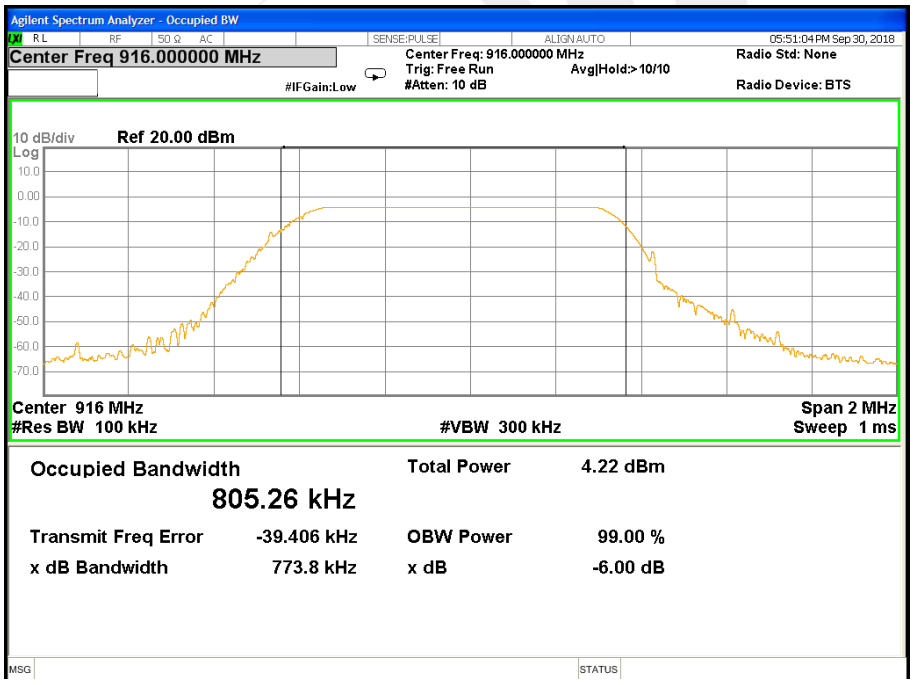
6dB Bandwidth TX CH 01



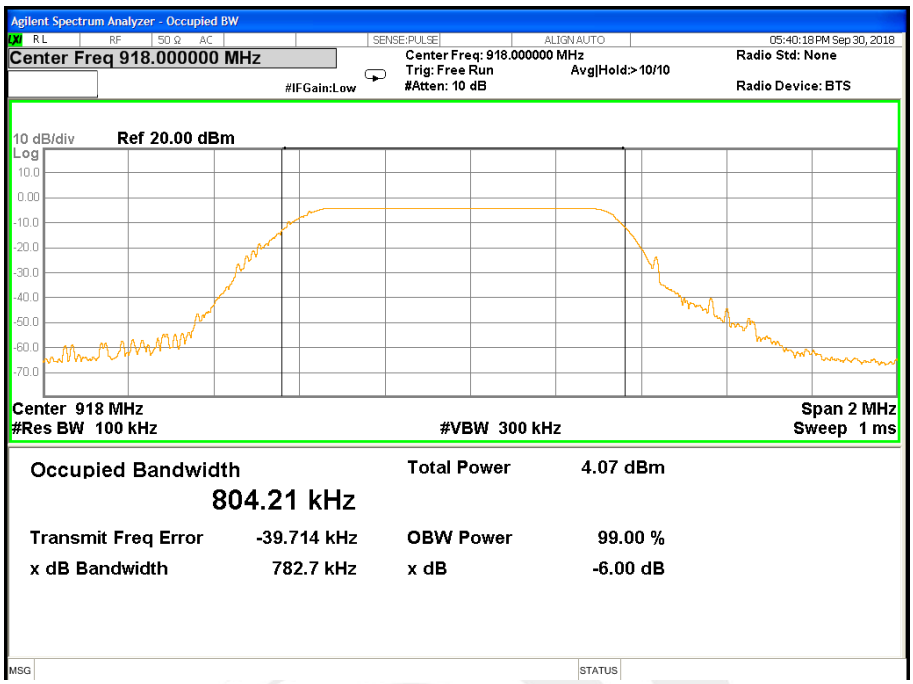
6dB Bandwidth TX CH 02



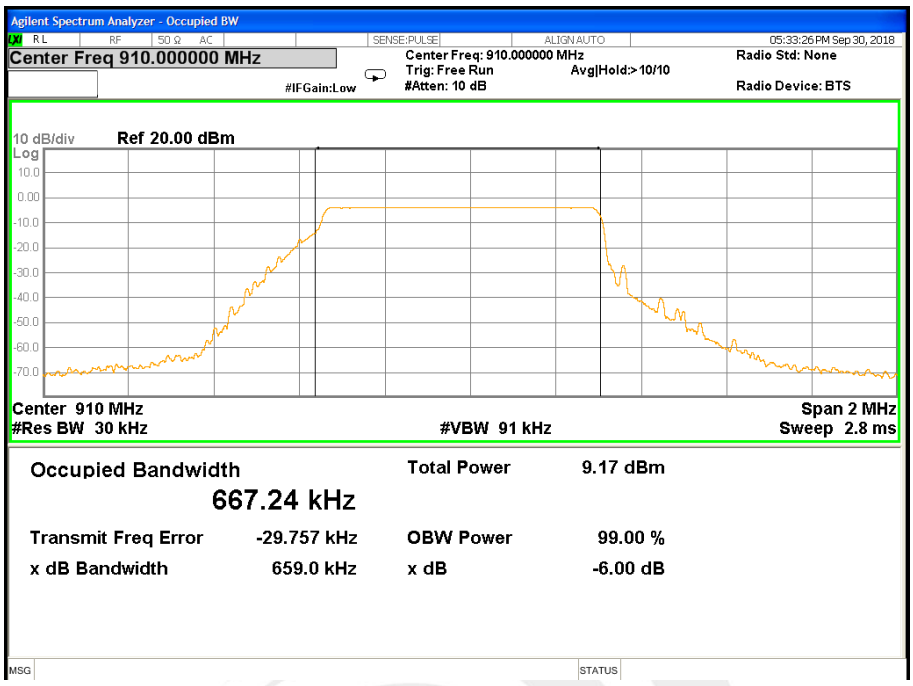
6dB Bandwidth TX CH 03



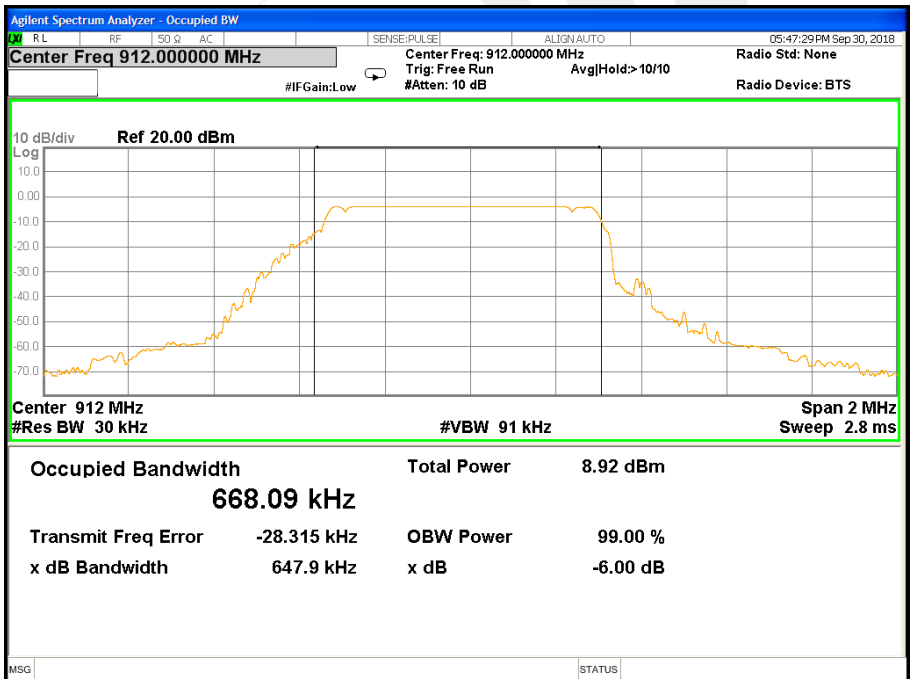
6dB Bandwidth TX CH 04



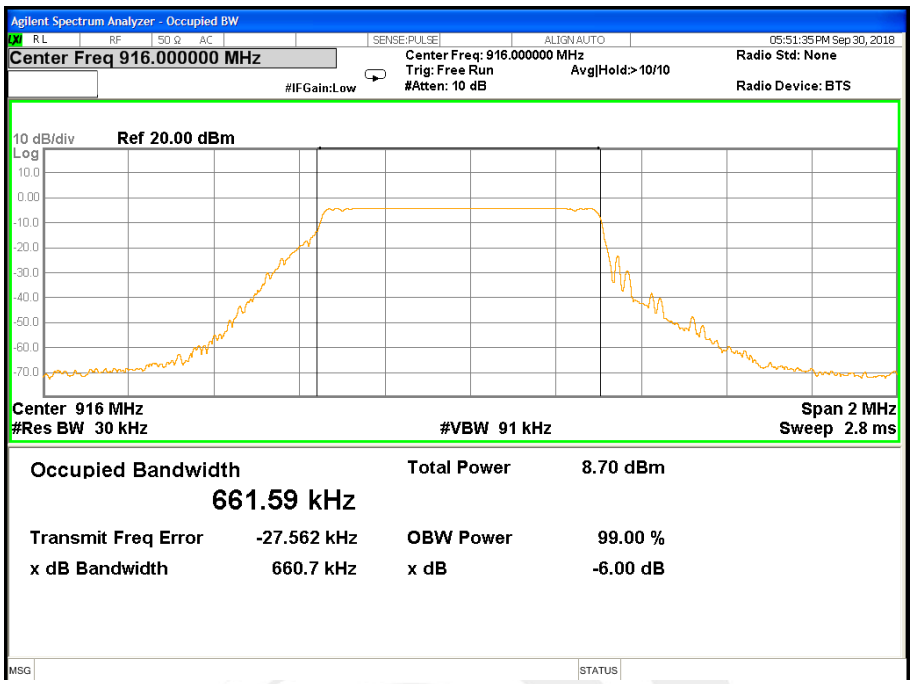
99% Bandwidth TX CH 01



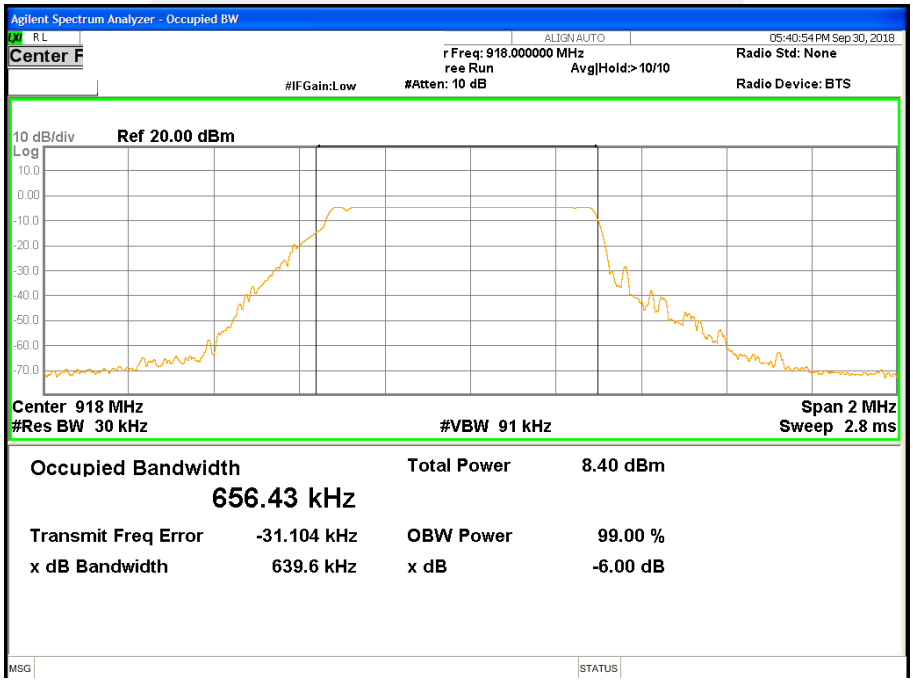
99% Bandwidth TX CH 02



99% Bandwidth TX CH 03



99% Bandwidth TX CH 04



8. PEAK OUTPUT POWER TEST

8.1 APPLIED PROCEDURES / LIMIT

FCC Part 15.247,Subpart C RSS-247 Issue 2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3) RSS 247 Issue 2	Output Power	1 watt or 30dBm	902-928	PASS

8.2 TEST PROCEDURE

a. The EUT was directly connected to the Power Meter

8.3 TEST SETUP

8.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

8.5 TEST RESULTS

Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX Mode /CH01, CH02, CH03, CH04

TX Mode				
Test Channel	Frequency	Conducted Output Power		LIMIT
	(MHz)	Peak (dBm)	AVG (dBm)	dBm
CH01	910	1.66	-0.25	30
CH02	912	1.38	-0.33	30
CH03	916	1.05	-0.68	30
CH04	918	0.93	-0.82	30

9. ANTENNA REQUIREMENT

9.1 STANDARD REQUIREMENT

15.203 and RSS-Genlssue 5 requirement: For intentional device, according to 15.203 and RSS-Genlssue 5: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

9.2 EUT ANTENNA

The EUT antenna is Integral Antenna. It comply with the standard requirement.

10.FREQUENCY STABILITY

10.1 LIMITS

The frequency tolerance of the carrier signal shall be maintained within +/-0.02% of the operating frequency over a temperature variation of -30 degrees to 50 degrees C at normal supply voltage,and for a variation in primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees.

10.2 TEST PROCEDURE

1.The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2.Turn the EUT on and couple its output to spectrum analyzer.
3.Turn the EUT off and set the chamber to the highest temperature specified.
4.Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize,turn the EUT on and measure the operating frequency after 2,5,and 10 minutes.
5.Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6.The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes.The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

10.3 TEST RESULT

Channel 02 (912MHz)

Voltage vs. Frequency Stability

Voltage vs. Frequency Stability Voltage(V)	Measurement Frequency(MHz)
13.8	912.0027
12	912.0023
10.2	912.0025
Max.Deviation(MHz)	0.0027
Max.Deviation(ppm)	2.96

Rated working voltage:DC 12V

Temperature vs. Frequency Stability

Temperature(℃)	Measurement Frequency(MHz)
-30	912.0033
-20	912.0030
-10	912.0024
0	912.0027
10	912.0025
20	912.0027
30	912.0031
40	912.0023
50	912.0031
Max.Deviation(MHz)	0.0033
Max.Deviation(ppm)	3.62

11. EUT TEST PHOTO

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※