

APPLICATION FOR CERTIFICATION

On Behalf of

COBAN Technologies, Inc.

G4 Fusion

Model No. : SYSFS-01

FCC ID : ZPJ-FUSIONG1-WMG1

Brand : COBAN

Prepared for : COBAN Technologies, Inc.
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TABLE OF CONTENTS

Description	Page
TEST REPORT CERTIFICATION	4
1. GENERAL INFORMATION	5
1.1. Description of Device (EUT).....	5
1.2. Tested Supporting System Details.....	6
1.3. Description of Test Facility	6
1.4. Measurement Uncertainty.....	7
2. CONDUCTED EMISSION MEASUREMENT	8
3. RADIATED EMISSION MEASUREMENT	9
3.1. Test Equipment.....	9
3.2. Test Setup	9
3.3. Radiated Emission Limits (§15.209)	11
3.4. Operating Condition of EUT	11
3.5. Test Procedure	12
3.6. Test Results.....	13
4. 6dB BANDWIDTH MEASUREMENT	20
4.1. Test Equipment.....	20
4.2. Block Diagram of Test Setup.....	20
4.3. Specification Limits [§15.247(a)(2)]	20
4.4. Operating Condition of EUT	20
4.5. Test Procedure	20
4.6. Test Results.....	21
5. MAXIMUM PEAK OUTPUT POWER MEASUREMENT	24
5.1. Test Equipment.....	24
5.2. Block Diagram of Test Setup.....	24
5.3. Specification Limits (§15.247(b)-(3)).....	24
5.4. Operating Condition of EUT	24
5.5. Test Procedure	24
5.6. Test Results.....	25
6. EMISSION LIMITATIONS MEASUREMENT	26
6.1. Test Equipment.....	26
6.2. Block Diagram of Test Setup.....	26
6.3. Specification Limits (§15.247(c)).....	26
6.4. Operating Condition of EUT	26
6.5. Test Procedure	26
6.6. Test Results.....	27
7. BAND EDGES MEASUREMENT	33
7.1. Test Equipment.....	33
7.2. Block Diagram of Test Setup.....	33
7.3. Specification Limits [§15.247(c)].....	33
7.4. Operating Condition of EUT	33
7.5. Test Procedure	33
7.6. Test Results.....	34
8. POWER SPECTRAL DENSITY MEASUREMENT	35
8.1. Test Equipment.....	35
8.2. Block Diagram of Test Setup.....	35
8.3. Specification Limits [§15.247(d)].....	35
8.4. Operating Condition of EUT	35
8.5. Test Procedure	35

8.6. Test Results..... 36

9. DEVIATION TO TEST SPECIFICATIONS..... 39

10. PHOTOGRAPHS..... 40

10.1. Photos of Radiated Measurement at Semi-Anechoic Chamber 40

10.2. Photo of Section RF Conducted Measurement 41

TEST REPORT CERTIFICATION

Applicant : COBAN Technologies, Inc.
Manufacturer : AltaSec Technology Corporation
EUT Description : G4 Fusion
FCC ID : **ZPJ-FUSIONG1-WMG1**
(A) Model No. : SYSFS-01
(B) Serial No. : N/A
(C) Brand : COBAN
(D) Power Supply : DC 12V (Powered by Notebook PC)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C, Oct. 2012
And ANSI C63.4:2003

(FCC 47 CFR Part 15C, §15.205 and §15.207 and §15.209 and §15.247)

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limit.

The measurement results are contained in this test report and AUDIX Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the requirements of FCC Part 15 standard.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test: Nov. 11 ~ 13, 2013

Date of Report: Nov. 14, 2013

Producer: Annie Yu
(Annie Yu/Administrator)

Signatory: Ben Cheng
(Ben Cheng/Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product	G4 Fusion
Model Number	SYSFS-01
Serial Number	N/A
FCC ID	ZPJ-FUSIONG1-WMG1
Brand Name	COBAN
Applicant	COBAN Technologies, Inc. 11375 W. Sam Houston Pkwy.5., Suite 800 Houston, TX7703
Manufacturer	AltaSec Technology Corporation 12F -5, No.75, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan
Fundamental Range	902MHz ~ 928MHz
Frequency Channel	19 channels
Radio Technology	OQPSK
Data Transfer Rate	40 Kbs
Antenna Type	Monopole Antenna
Antenna Gain	3.58dBi
SSD Card	#1 Transcend, M/N TS64GMSA630I #2 Apacer, M/N APSDM064GM5AN-CCMW
Cable	Shielded, Detachable, 1.0m (26 Pin)
Cable	RS232 Cable: Shielded, Detachable, 0.2m D-Sub: Shielded, Detachable, 0.4m Power Cable: Shielded, Detachable, 0.4
Date of Receipt of Sample	Nov. 06, 2013
Date of Test	Nov. 13, 2013

1.2. Tested Supporting System Details

1.2.1. NOTEBOOK PC

Model Number : ZL5
Serial Number : N/A
Manufacturer : acer
AC Adapter : LITEON, M/N PA-1650-02
DC Cord: Non-Shielded, Undetachable, 1.8m
AC Power Cord : Non-Shielded, Detachable, 1.8m

1.2.2. DC POWER SUPPLY

Model Number : 3303A
Serial Number : 721773X
Manufacturer : TOP WARD
Power Cord : Non-Shielded, Detachable, 1.8m

1.3. Description of Test Facility

Name of Firm : **AUDIX Technology Corporation**
EMC Department
No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan, R.O.C.

Test Site : **Semi-Anechoic Chamber &**
(Semi-AC) No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan, R.O.C.
May 11, 2012 Renewal on
Federal Communication Commission
Registration Number: 90993

NVLAP Lab. Code : 200077-0

TAF Accreditation No : 1724

1.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Radiation Test (Distance: 3m)	30MHz~300MHz	± 2.91dB
	300MHz~1000MHz	± 2.74dB
	Above 1GHz	± 5.02dB

Remark : Uncertainty = $ku_c(y)$

Test Item	Uncertainty
6dB Bandwidth	± 0.05kHz
Maximum peak output power	± 0.33dBm
Band edges	± 0.13dB
Power spectral density	± 0.13dB
Emission Limitations	± 0.13dB

2. CONDUCTED EMISSION MEASUREMENT

【The EUT only employs battery power for operation, no conductive emission limits are required according to FCC Part 15 Section §15.207】

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

The following test equipment was used during the radiated emission measurement:

3.1.1. For Frequency Range 30MHz~1000MHz (at Semi-Anechoic Chamber)

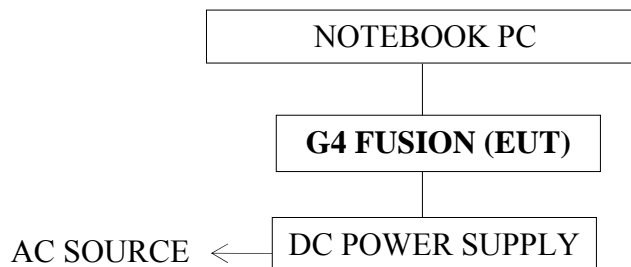
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Jul. 30, 13'	Jul. 29, 14'
2.	Test Receiver	R & S	ESCS30	100338	Jul. 01, 13'	Jun. 30, 14'
3.	Amplifier	HP	8447D	2944A06305	Feb. 19, 13'	Feb. 18, 14'
4.	Bilog Antenna	TESEQ	CBL6112D	33821	Aug. 08, 13'	Aug. 07, 14'

3.1.2. For Frequency Above 1GHz (at Semi-Anechoic Chamber)

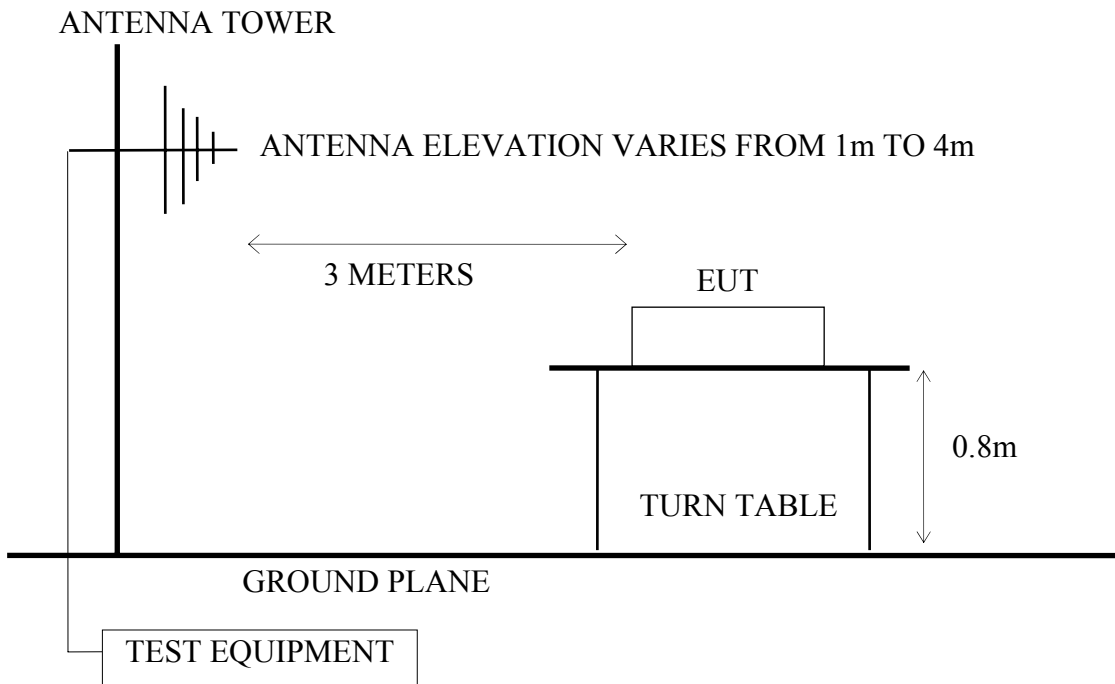
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Jul. 30, 13'	Jul. 29, 14'
2.	Test Receiver	R & S	ESCS30	100338	Jul. 01, 13'	Jun. 30, 14'
3.	Pre-Amplifier	HP	8449B	3008A02676	Mar. 01, 13'	Feb. 28, 14'
4.	1G High-Pass Filter	Microwave Circuits	H1G013G1	459777	Feb. 14, 13'	Feb. 13, 14'
5.	High Frequency Fixed Attenuators	JFW	50HF-020-SMA	1	Oct. 31, 13'	Jun. 01, 14'
6.	Band Reject Filter	Wainwright	WRCGV880/915-860/935-60/8SS	9	Oct. 24, 13'	Oct. 23 14'
7.	Horn Antenna	EMCO	3115	9112-3775	May 07, 13'	May 06, 14'

3.2. Test Setup

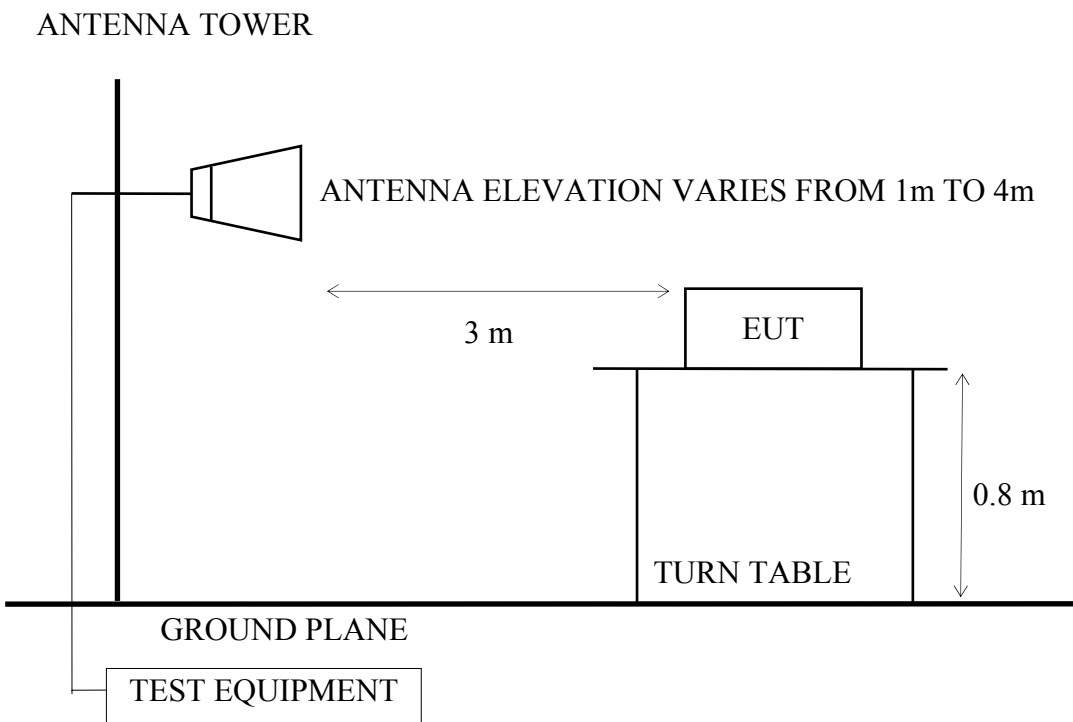
3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 30-1000MHz



3.2.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz



3.3. Radiated Emission Limits (§15.209)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Above 1000	3	74.0 $\text{dB}\mu\text{V/m}$ (Peak) 54.0 $\text{dB}\mu\text{V/m}$ (Average)	

- Remark :
- (1) Emission level ($\text{dB}\mu\text{V/m}$) = 20 log Emission level ($\mu\text{V/m}$)
 - (2) The tighter limit applies at the edge between two frequency bands.
 - (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
 - (4) The limits in this table are based on CFR 47 Part 15.205(a)(b) and Part 15.209 (a).
 - (5) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35(b) and Part 15.205(b) & Part 15.209(e) and Part 15.207(c).

3.4. Operating Condition of EUT

- 3.4.1. Set up the EUT (G4 Fusion) via Notebook PC and simulator as shown on 3.2.
- 3.4.2. To turn on the power of all equipments.
- 3.4.3. The EUT was set by the Notebook PC using test program “serialport_utility 2.2.3.0124”.
- 3.4.4. The EUT was set to continuously transmit signals at 904.2MHz、 915MHz and 925.8MHz during testing.

3.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated bilog antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4-2003 regulation.

The bandwidth of the R&S Test Receiver was set at 120kHz. (For 30MHz to 1000MHz)

The resolution bandwidth and video bandwidth of test spectrum analyzer is 1MHz for peak detection (PK) at frequency above 1GHz.

The resolution bandwidth of test spectrum analyzer is 1MHz and the video bandwidth is 10Hz for average detection (AV) at frequency above 1GHz.

The frequency range from 30MHz to 10GHz (Up to 10th harmonics from fundamental frequency) was checked. 30MHz to 1000MHz was measured with Quasi-Peak detector. Pursuant to ANSI 4.2.2, peak detector is an alternate option for frequency from 30MHz to 1000MHz.

For emissions above 1GHz were measured with peak and average detectors, and performed measurement in 1 m distance for frequency range from 5500MHz up to 10000MHz where there is no emission be found.

Pursuant to ANSI C63.4 8.3.1.2, when peak value complies with the average limit, we didn't perform measurement in average detector.

3.6. Test Results

PASSED.

(All emissions not reported for there is no emission be found.)

EUT : G4 Fusion M/N : SYSFS-01

Test Date : Nov. 13, 2013 Temperature : 26 Humidity : 54%

For Frequency Range 30MHz~1000MHz:

The EUT with following test modes were performed during this section testing and all the test results are listed in section 3.6.1.

Mode	Frequency	Test Mode	Reference Test Data	
			Horizontal	Vertical
1.	904.2MHz	Transmit	# 5	# 6
2.	915MHz		# 3	# 4
3.	925.8MHz		# 1	# 2

* Above all final readings were measured with Peak detector.

For Frequency Range above 1GHz:

The EUT with following test modes was performed during this section testing and all the test results are listed in section 3.6.2.

Mode	Frequency	Test Mode	Reference Test Data	
			Horizontal	Vertical
1.	904.2MHz	Transmit	# 1	# 6
2.	915MHz		# 1	# 6
3.	925.8MHz		# 1	# 6

Note: 1. Above all final readings were measured with Peak detector.

2. The emissions (up to 25GHz) not reported are too low to be measured.

3.6.1. For 30-1000MHz Frequency Range Measurement Results

Frequency: 904.2MHz

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m CBL6112D 33821
 Limit : 30M-1G
 Env. / Ins. : 28°C / 54% N9030A(140)
 EUT : G4 Fusion M/N:SYSFS-01
 Power Rating : DC 12V
 Test Mode : (904.2MHz)

Data no. : 5
 Ant. pol. : HORIZONTAL
 Engineer : Johnny_hsueh

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	144.46	11.47	2.60	25.07	39.14	48.50	4.36	Peak
2	216.24	10.66	3.20	27.56	41.42	46.00	4.58	Peak
3	368.53	15.75	4.60	15.11	35.46	46.00	10.54	Peak
4	494.63	17.72	6.40	11.51	35.63	46.00	10.37	Peak
5	647.89	19.48	6.30	8.02	33.80	46.00	12.20	Peak
6	800.18	20.60	6.90	13.76	41.26	46.00	4.74	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m CBL6112D 33821
 Limit : 30M-1G
 Env. / Ins. : 28°C / 54% N9030A(140)
 EUT : G4 Fusion M/N:SYSFS-01
 Power Rating : DC 12V
 Test Mode : (925.8MHz)

Data no. : 6
 Ant. pol. : VERTICAL
 Engineer : Johnny_hsueh

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	110.51	12.22	2.20	20.84	35.26	48.50	8.24	Peak
2	216.24	10.66	3.20	25.26	39.12	46.00	6.88	Peak
3	368.53	15.75	4.60	12.22	32.57	46.00	13.43	Peak
4	498.37	16.96	5.30	12.25	34.51	46.00	11.49	Peak
5	576.11	18.76	6.40	9.55	34.71	46.00	11.29	Peak
6	800.18	20.60	6.90	7.64	35.14	46.00	10.86	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Frequency: 915MHz

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m CBL6112D 33821
 Limit : 30M-1G
 Env. / Ins. : 26°C / 54% N9030A(140)
 EUT : G4 Fusion M/N:SYSFS-01
 Power Rating : DC 12V
 Test Mode : (915MHz)

Data no. : 3
 Ant. pol. : HORIZONTAL
 Engineer : Johnny_hsueh

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	144.46	11.47	2.60	28.44	42.51	48.50	0.99	Peak
2	216.24	10.66	3.20	28.32	42.18	46.00	3.82	Peak
3	377.26	15.96	4.60	18.75	39.31	46.00	6.69	Peak
4	494.63	17.72	6.40	12.10	36.22	46.00	9.78	Peak
5	800.18	20.60	6.90	13.03	40.53	46.00	5.47	Peak
6	923.37	21.84	7.40	12.36	41.60	46.00	4.40	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m CBL6112D 33821
 Limit : 30M-1G
 Env. / Ins. : 26°C / 54% N9030A(140)
 EUT : G4 Fusion M/N:SYSFS-01
 Power Rating : DC 12V
 Test Mode : (915MHz)

Data no. : 4
 Ant. pol. : VERTICAL
 Engineer : Johnny_hsueh

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	59.10	7.23	1.60	27.68	36.51	40.00	3.49	Peak
2	216.24	10.66	3.20	27.78	41.64	46.00	4.36	Peak
3	368.53	15.75	4.60	12.80	33.15	46.00	12.85	Peak
4	438.37	16.96	5.30	11.16	33.42	46.00	12.58	Peak
5	576.11	18.76	6.40	9.32	34.48	46.00	11.52	Peak
6	800.18	20.60	6.90	7.59	35.09	46.00	10.91	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Frequency: 925.8MHz

Site no. : Audix NO.1 Chamber Data no. : 1
 Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : HORIZONTAL
 Limit : 30M-1G
 Env. / Ins. : 28°C / 54% N9030A(140) Engineer : Johnny_hsueh
 EUT : G4 Fusion M/N:SYSFS-01
 Power Rating : DC 12V
 Test Mode : (925.8MHz)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	149.49	11.52	2.50	27.09	41.11	49.50	2.39	Peak
2	216.24	10.66	3.20	28.76	42.62	46.00	3.38	Peak
3	368.53	15.75	4.60	19.01	39.36	46.00	6.64	Peak
4	647.89	19.48	6.30	9.88	35.66	46.00	10.34	Peak
5	800.18	20.60	6.90	13.74	41.24	46.00	4.76	Peak
6	909.97	21.64	7.40	11.72	40.76	46.00	5.24	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Site no. : Audix NO.1 Chamber Data no. : 2
 Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : VERTICAL
 Limit : 30M-1G
 Env. / Ins. : 28°C / 54% N9030A(140) Engineer : Johnny_hsueh
 EUT : G4 Fusion M/N:SYSFS-01
 Power Rating : DC 12V
 Test Mode : (925.8MHz)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	58.13	7.46	1.60	27.82	36.88	40.00	3.12	Peak
2	216.24	10.66	3.20	27.35	41.21	46.00	4.79	Peak
3	368.53	15.75	4.60	12.55	32.90	46.00	13.10	Peak
4	800.18	20.60	6.90	7.72	35.22	46.00	10.78	Peak
5	800.18	20.60	6.90	7.72	35.22	46.00	10.78	Peak
6	909.97	21.64	7.40	6.72	35.76	46.00	10.24	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

3.6.2. For Above 1GHz Frequency Range Measurement Results

Frequency: 904.2MHz

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m 3115(4927)
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 26*C / 54% N9030A(140)
 EUT : G4 Fusion M/N:SYSFS-01
 Power Rating : DC 12V
 Test Mode : (904.2MHz)

Data no. : 1
 Ant. pol. : HORIZONTAL
 Engineer : Johnny_hsueh

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	1808.08	26.90	6.85	17.21	50.96	54.00	3.04	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m 3115(4927)
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 26*C / 54% N9030A(140)
 EUT : G4 Fusion M/N:SYSFS-01
 Power Rating : DC 12V
 Test Mode : (904.2MHz)

Data no. : 6
 Ant. pol. : VERTICAL
 Engineer : Johnny_hsueh

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	1808.08	26.90	6.85	17.40	51.15	54.00	2.85	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Frequency: 915MHz

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m 3115(4927)
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 28*C / 54% N9030A(140)
 EUT : G4 Fusion M/N:SYSFS-01
 Power Rating : DC 12V
 Test Mode : (915MHz)

Data no. : 1
 Ant. pol. : HORIZONTAL
 Engineer : Johnny_hsueh

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	1829.92	26.97	6.74	15.91	49.62	54.00	4.38	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m 3115(4927)
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 28*C / 54% N9030A(140)
 EUT : G4 Fusion M/N:SYSFS-01
 Power Rating : DC 12V
 Test Mode : (915MHz)

Data no. : 6
 Ant. pol. : VERTICAL
 Engineer : Johnny_hsueh

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	1829.92	26.97	6.74	16.81	50.32	54.00	3.68	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Frequency: 925.8MHz

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m 3115(4927)
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 28*C / 54% N9030A(140)
 EUT : G4 Fusion M/N:SYSFS-01
 Power Rating : DC 12V
 Test Mode : (925.8MHz)

Data no. : 1
 Ant. pol. : HORIZONTAL
 Engineer : Johnny_hsueh

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	1851.76	27.03	6.62	16.30	49.95	54.00	4.05	Peak
2	2777.68	29.66	6.90	11.21	47.77	54.00	6.23	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m 3115(4927)
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 28*C / 54% N9030A(140)
 EUT : G4 Fusion M/N:SYSFS-01
 Power Rating : DC 12V
 Test Mode : (925.8MHz)

Data no. : 6
 Ant. pol. : VERTICAL
 Engineer : Johnny_hsueh

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	1851.76	27.03	6.62	15.46	49.11	54.00	4.89	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

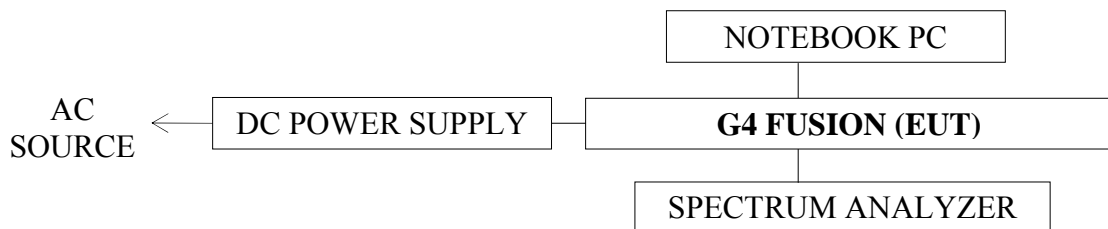
4. 6dB BANDWIDTH MEASUREMENT

4.1. Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Jul. 30, 13'	Jul. 29, 14'

4.2. Block Diagram of Test Setup



4.3. Specification Limits [§15.247(a)(2)]

The minimum 6dB bandwidth shall be at least 500kHz.

4.4. Operating Condition of EUT

Test program Serialport_utility 2.2.3.0124 is used for enabling the EUT transmitting continuing.

4.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer using 100kHz RBW and ≥ 300 kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

The measurement guideline was according to KDB 558074 D01 V03

4.6. Test Results

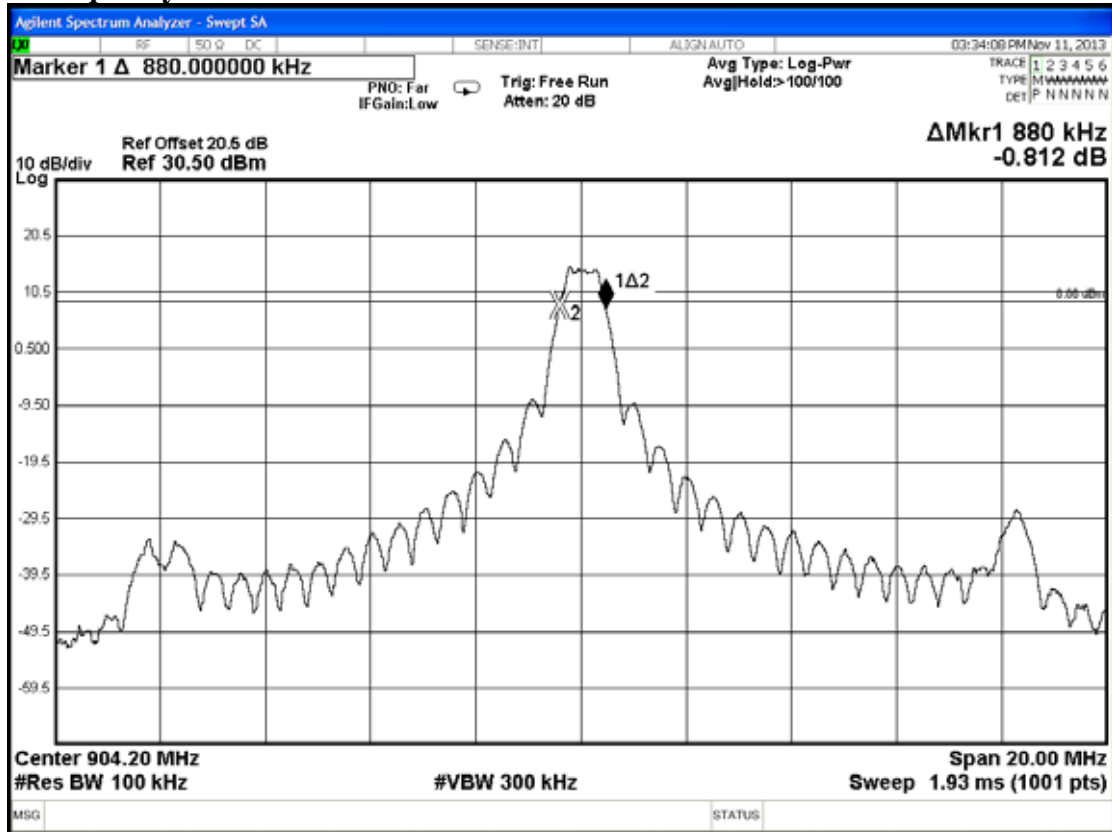
PASSED. All the test results are attached in next pages.

(Test Date : Nov. 11, 2013 Temperature : 25 Humidity : 55%)

Mode	Frequency	6dB Bandwidth
1.	904.2MHz	0.880MHz
2.	915MHz	0.880MHz
3.	925.8MHz	0.880MHz

[Limit: least 500kHz]

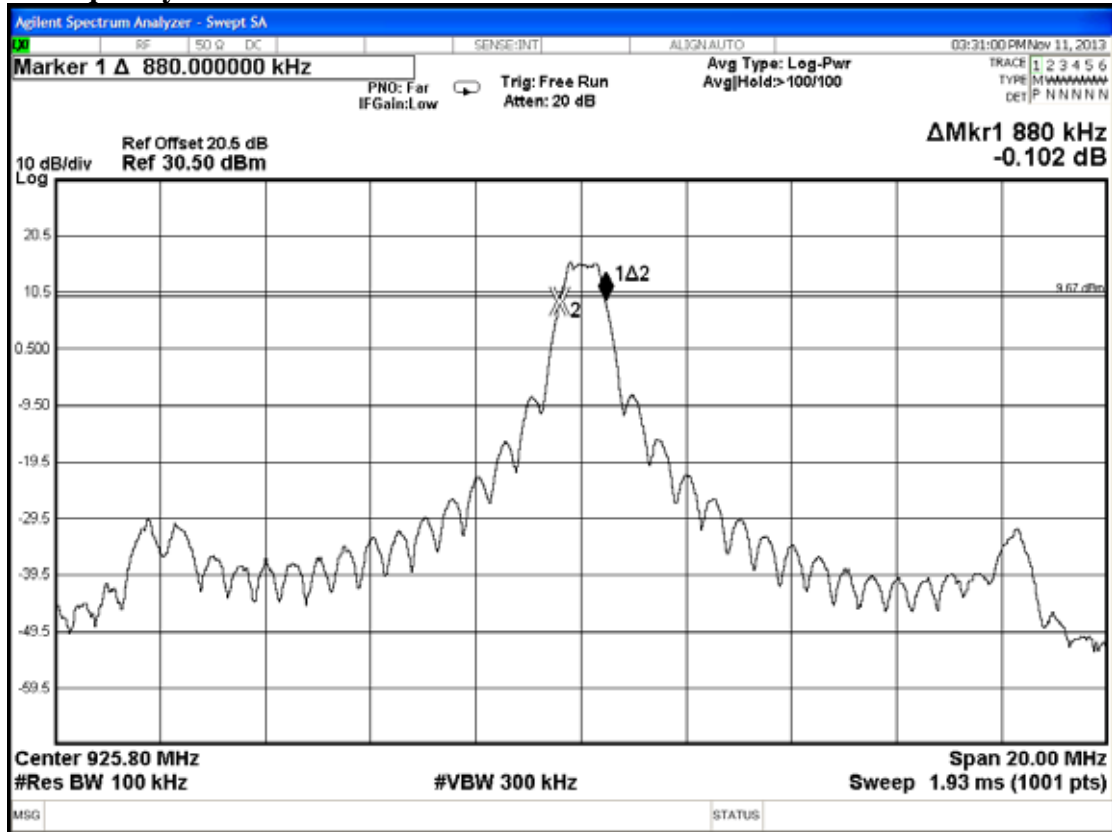
Frequency: 904.2MHz



Frequency: 915MHz



Frequency: 925.8MHz



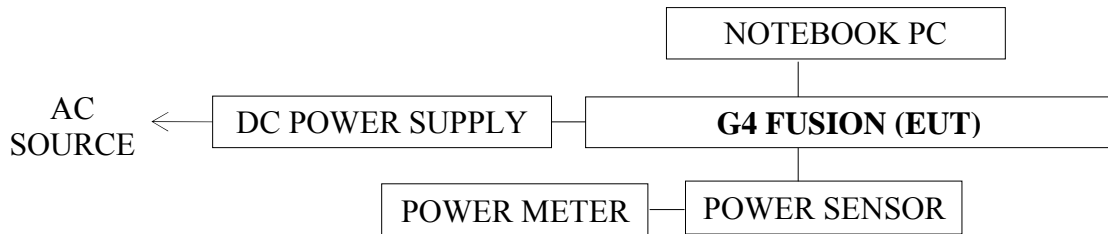
5. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

5.1. Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Power Meter	Anritsu	ML2495A	1145008	Oct. 23, 13'	Oct. 22, 14'
2.	Power Sensor	Anritsu	MA2411B	1126096	Oct. 23, 13'	Oct. 22, 14'

5.2. Block Diagram of Test Setup



5.3. Specification Limits (§15.247(b)-(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz & 5725-5850MHz is : 1Watt. (30dBm)

5.4. Operating Condition of EUT

Test program Serialport_utility 2.2.3.0124 is used for enabling the EUT transmitting continuing.

5.5. Test Procedure

The transmitter output was connected to the power sensor and record the reading of power meter.

The measurement guideline was according to KDB 558074 D01 V03

5.6. Test Results

PASSED. All the test results are listed below.

(Test Date : Nov. 11, 2013 Temperature : 25 Humidity : 55%)

Mode	Frequency	Peak Output Power (dBm)
1.	904.2MHz	16.45
2.	915MHz	16.41
3.	925.8MHz	18.04

[Limit: 1Watt. (30dBm)]

6. EMISSION LIMITATIONS MEASUREMENT

6.1. Test Equipment

The following test equipment was used during the emission limitations test :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Monitor	Agilent	N9030A-544	US51350140	Jul. 30, 13'	Jul. 29, 14'

6.2. Block Diagram of Test Setup

The same as section.4.2

6.3. Specification Limits (§15.247(c))

6.3.1. The highest level should be at least 20 dB below that in the 100kHz bandwidth.

6.3.2. The reference level for determining limit of emission limitations is according to the value measured indicated in plots at section 6.6.

6.4. Operating Condition of EUT

Test program Serialport_utility 2.2.3.0124 is used for enabling the EUT transmitting continuing.

6.5. Test Procedure

The RF output of EUT was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100kHz RBW and 100kHz VBW.

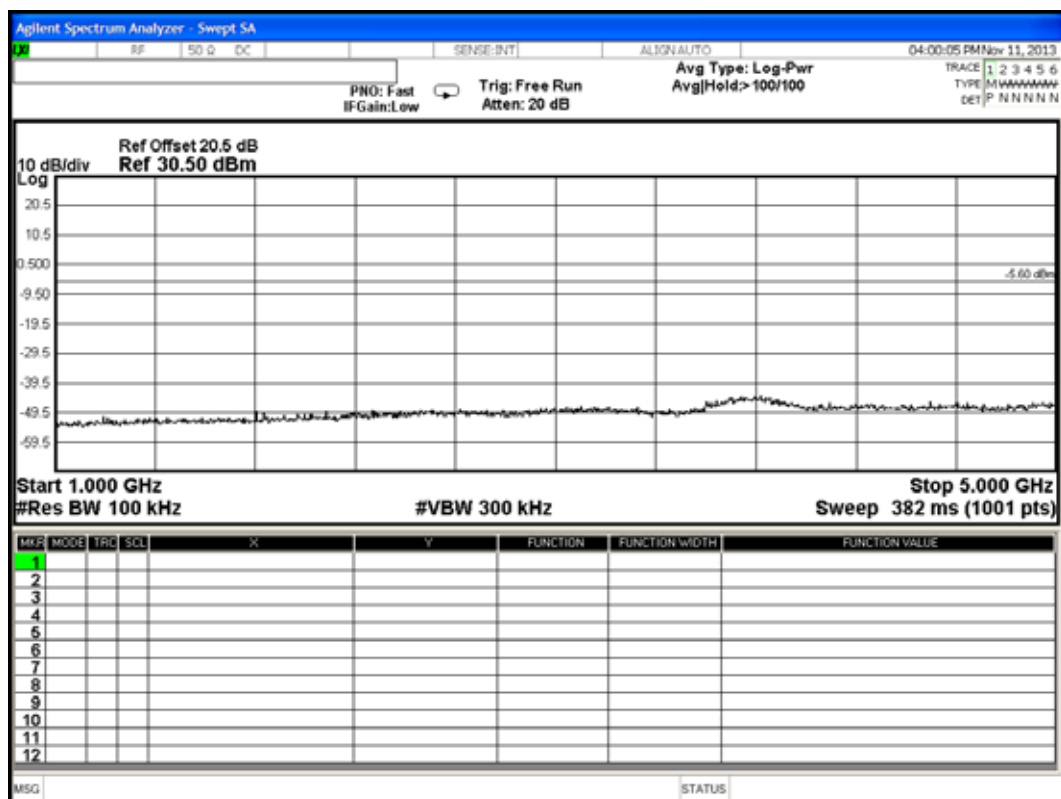
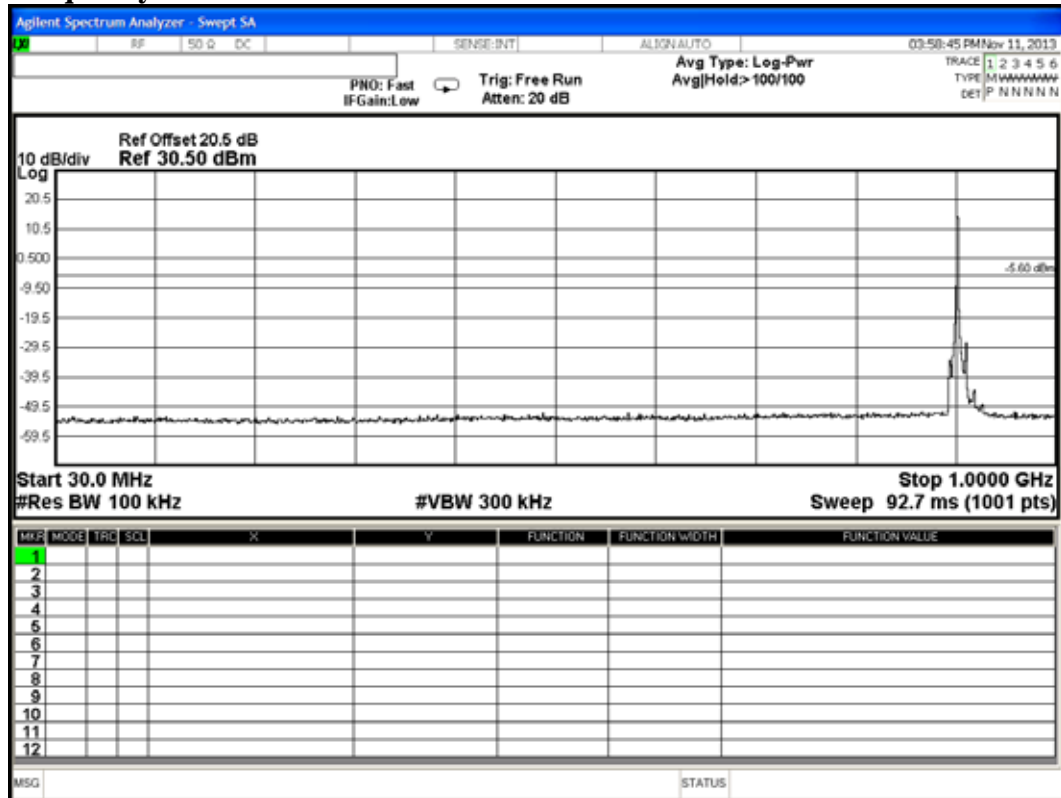
The measurement guideline was according to KDB 558074 D01 V03.

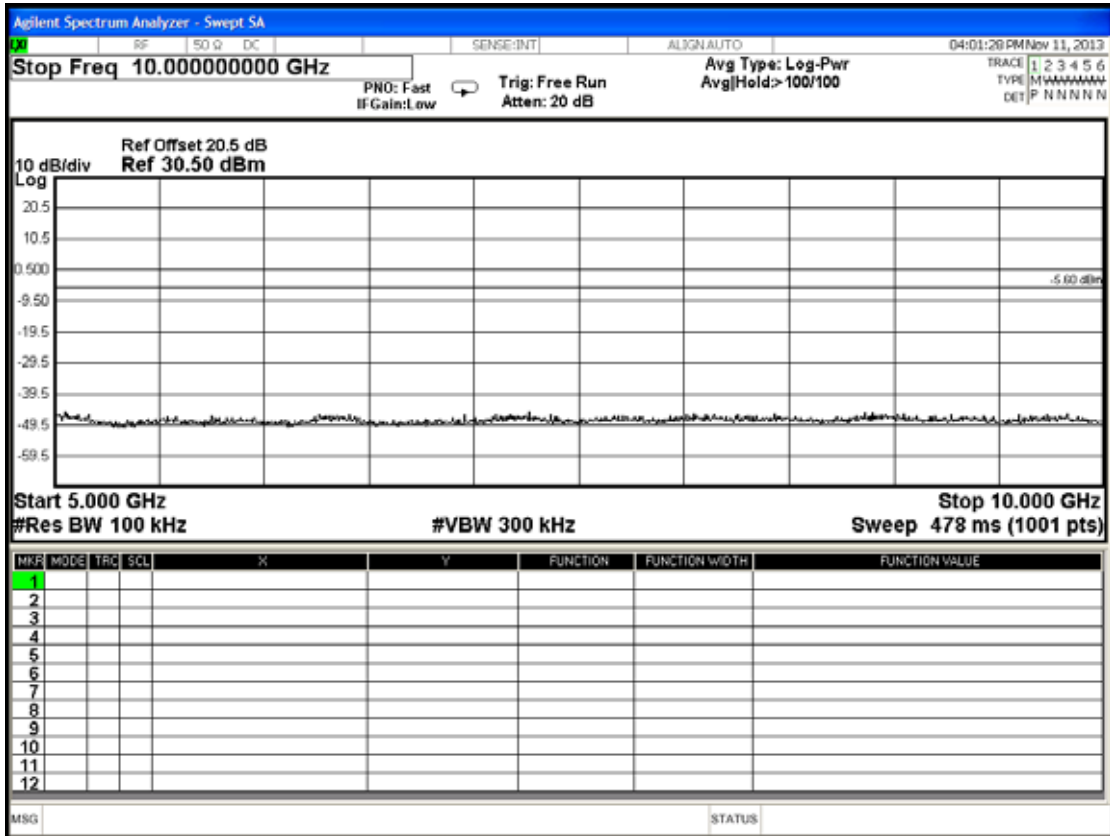
6.6. Test Results

PASSED. The testing data was attached in the next pages.

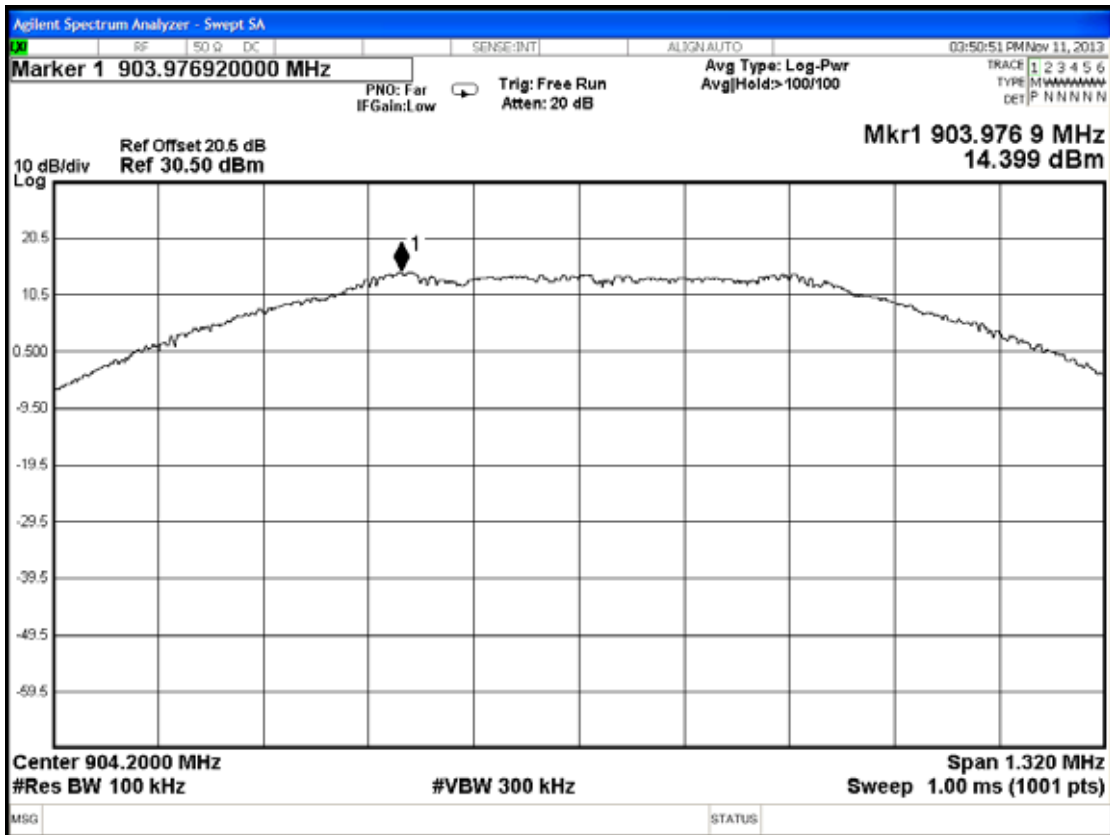
(Test Date : Nov. 11, 2013 Temperature : 25 Humidity : 55%)

Frequency: 904.2MHz

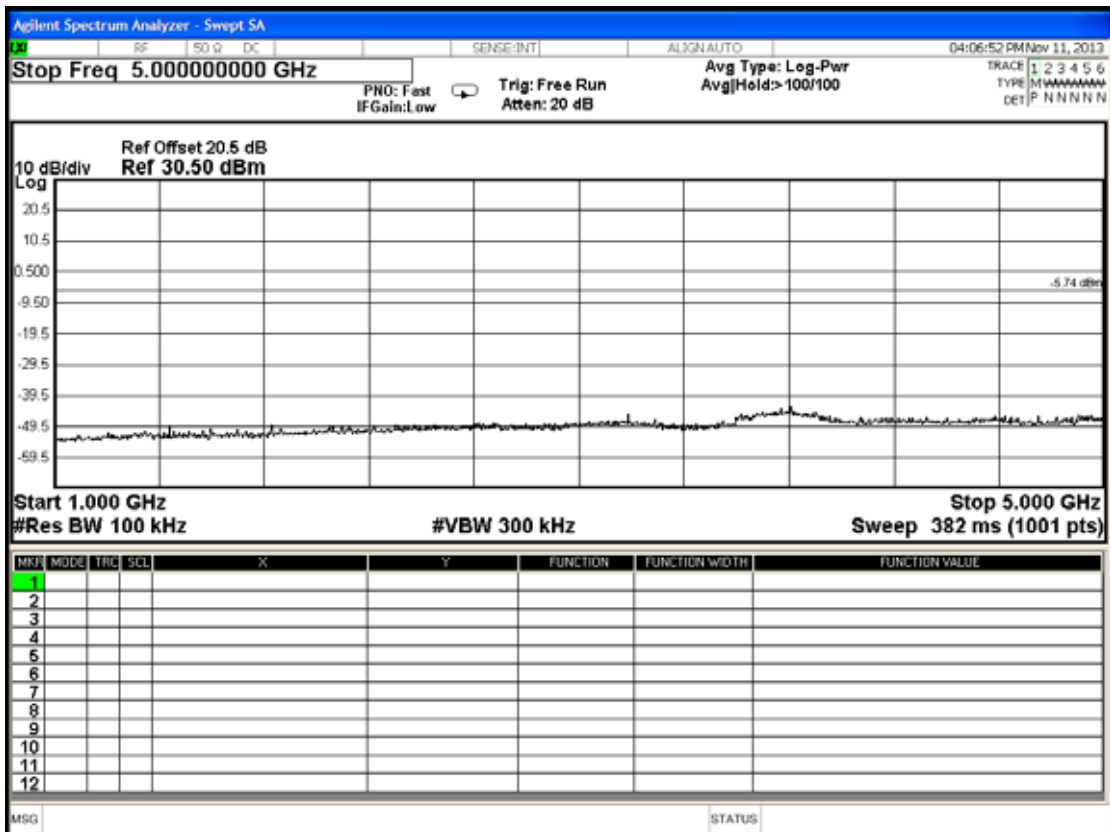
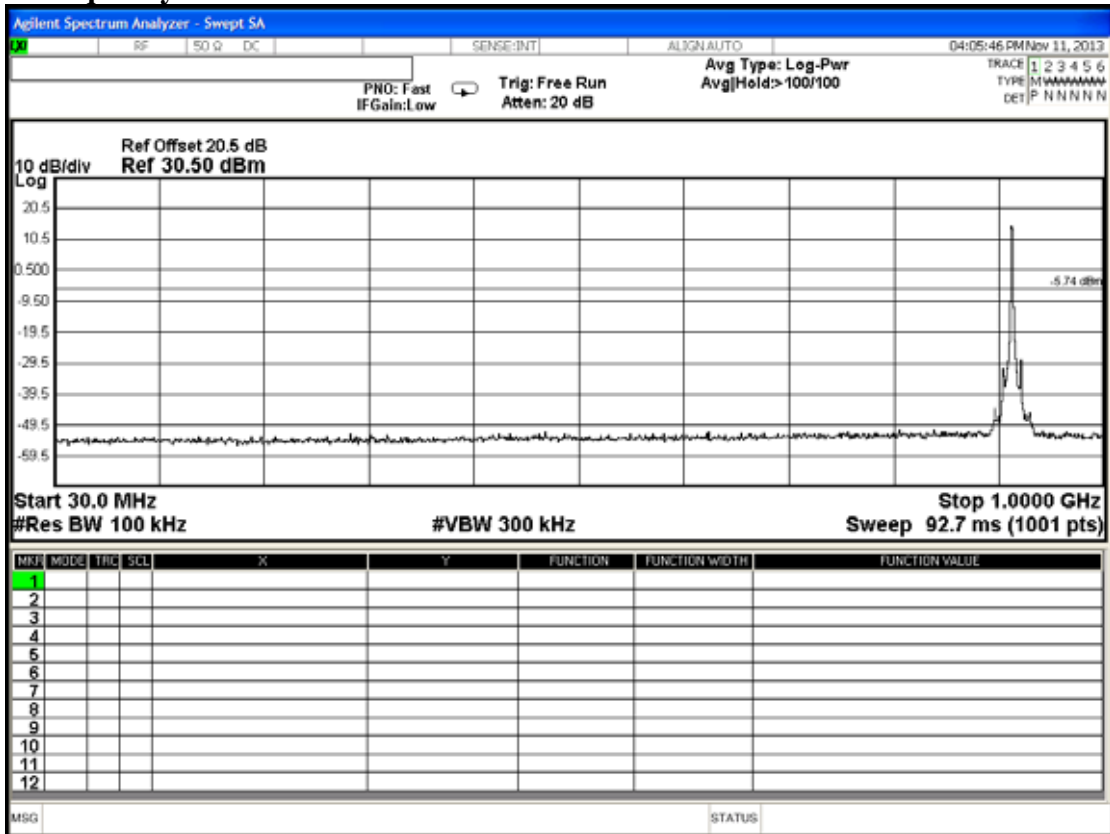


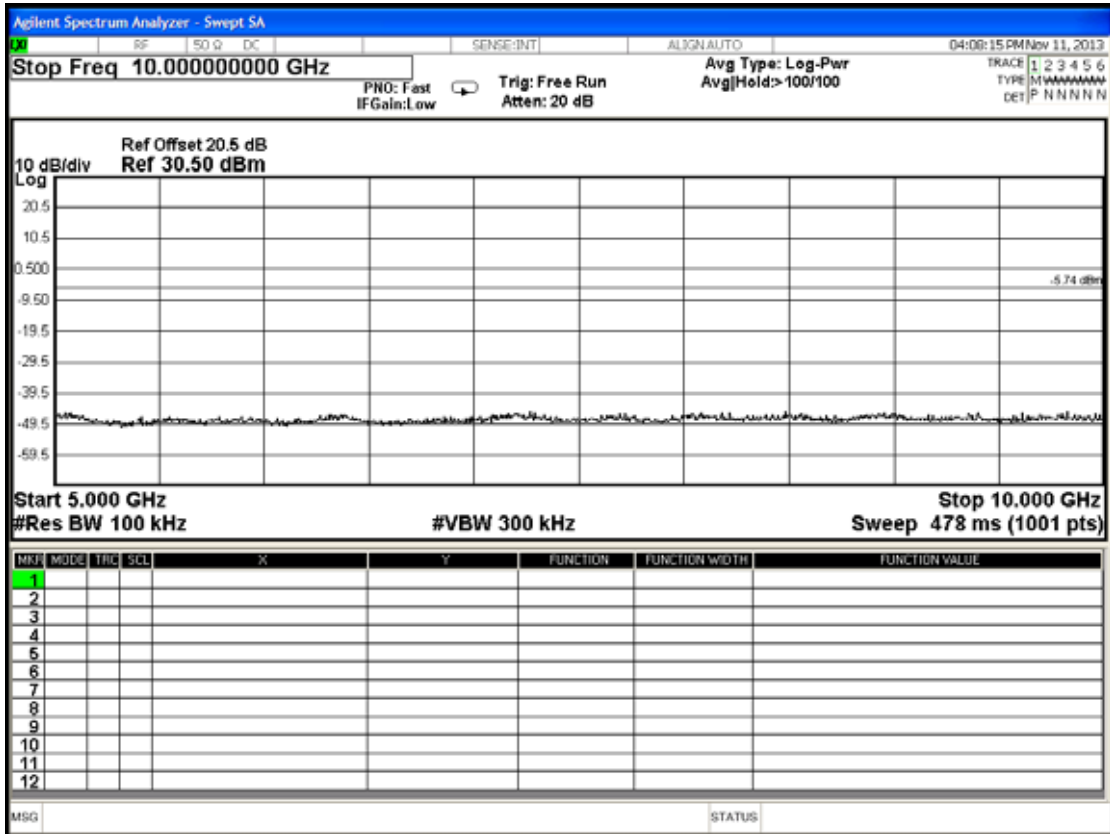


Reference Level:

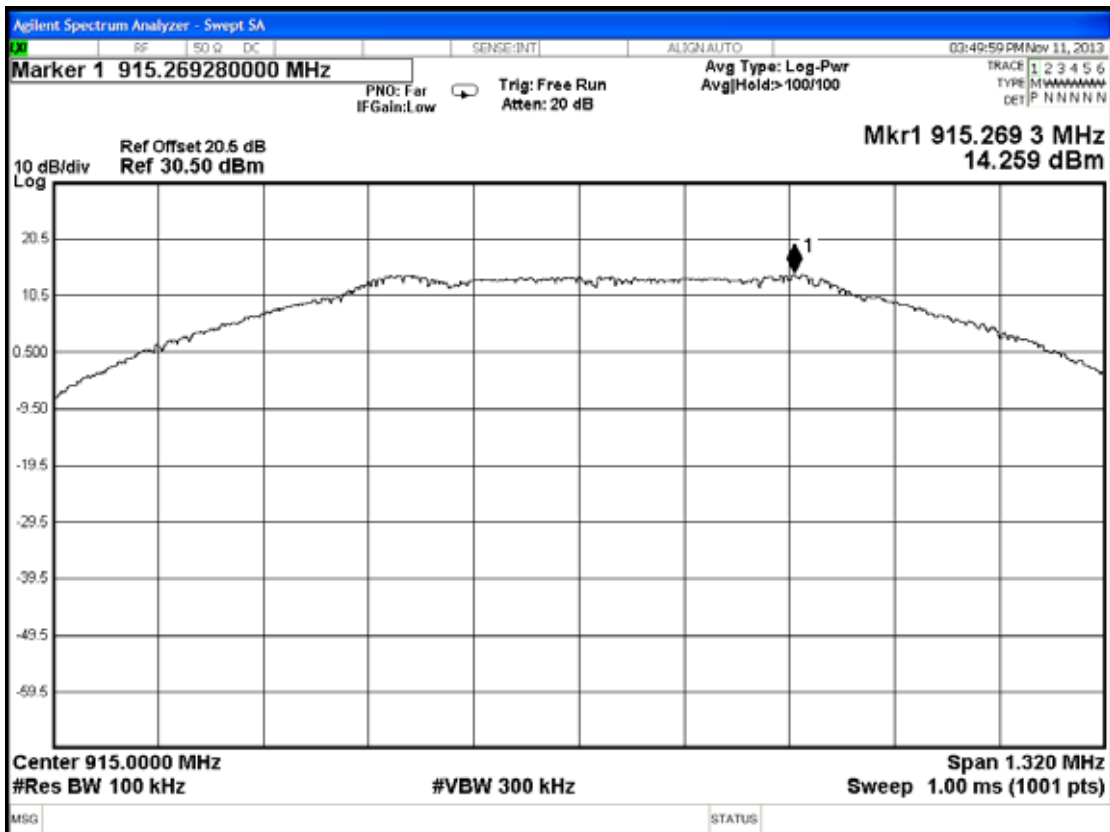


Frequency: 915MHz

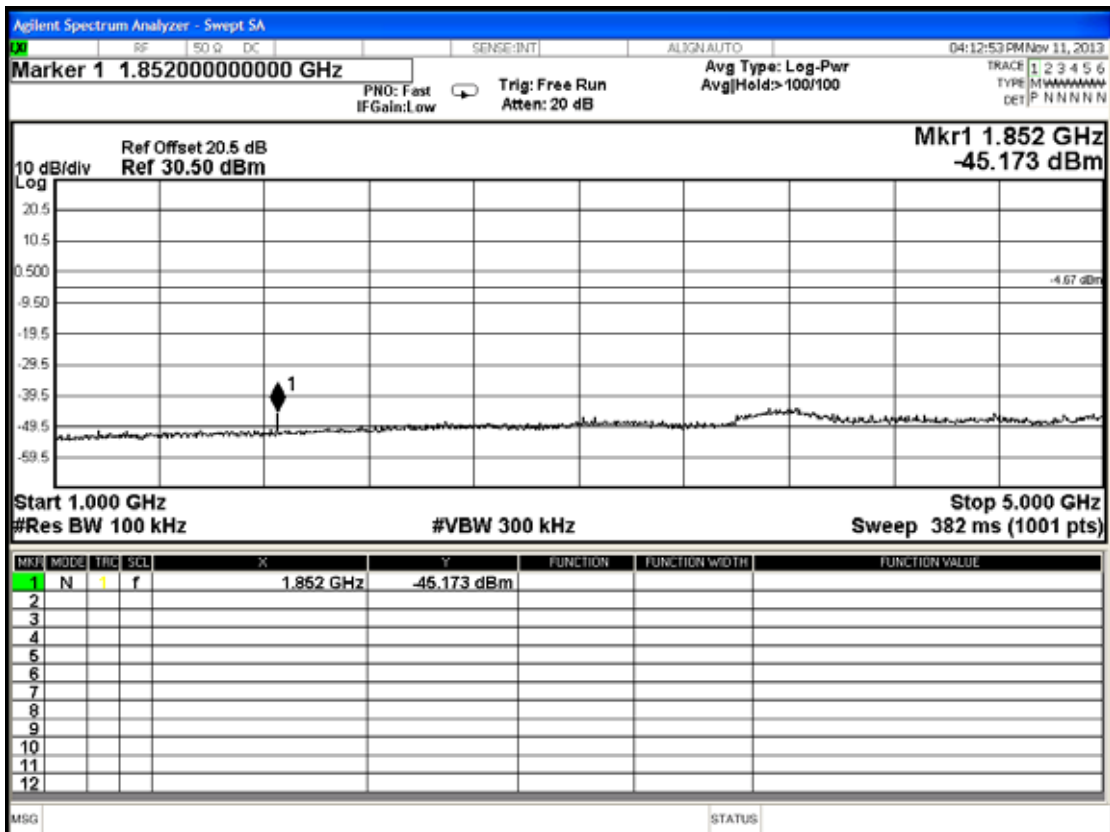
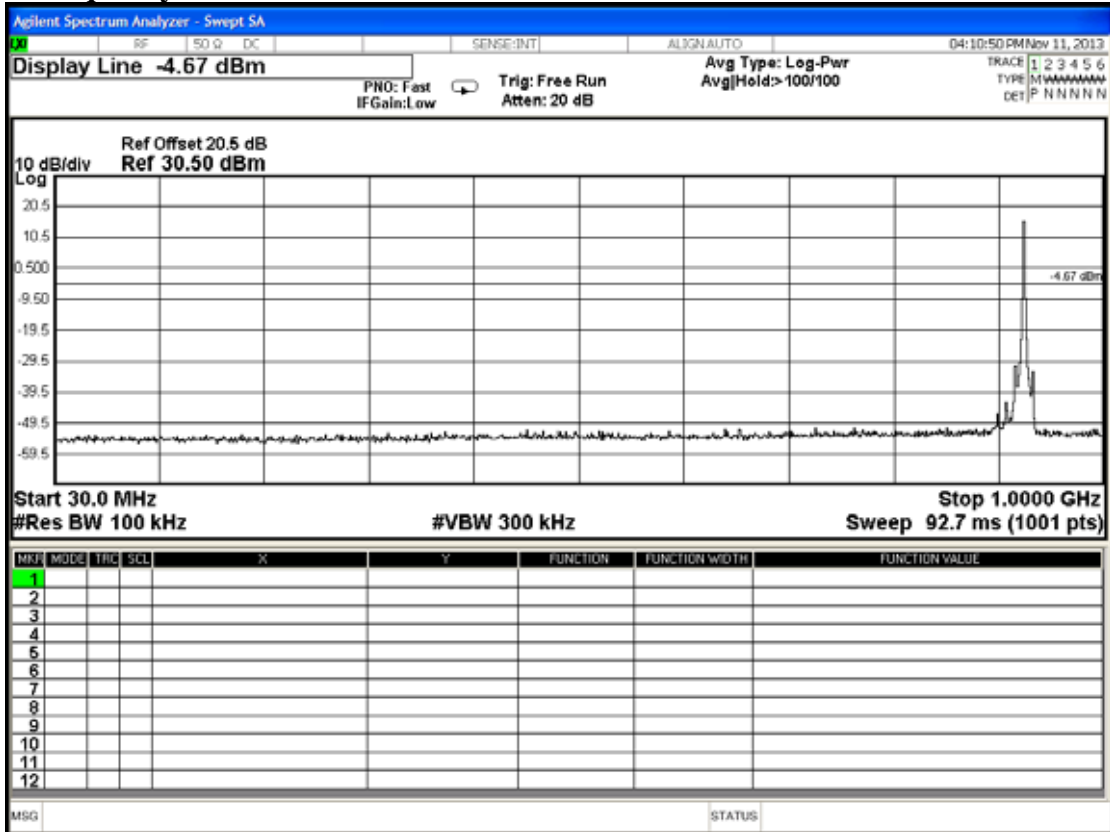


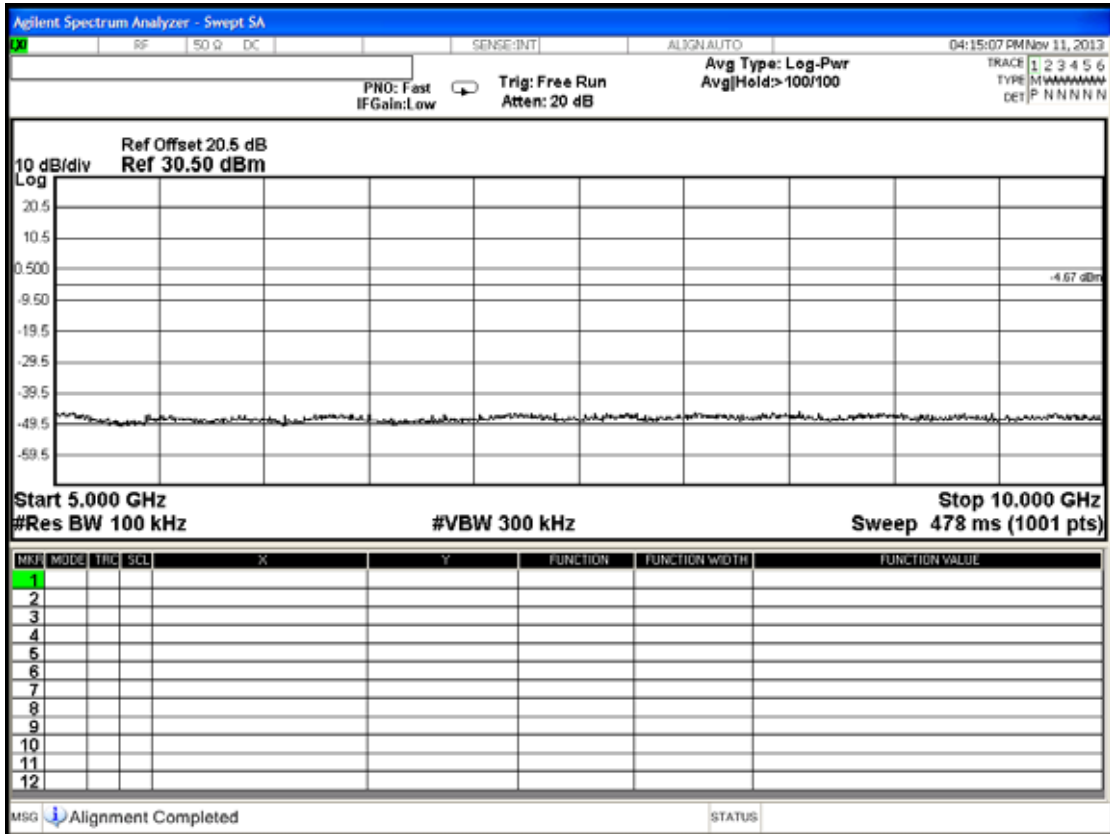


Reference Level:

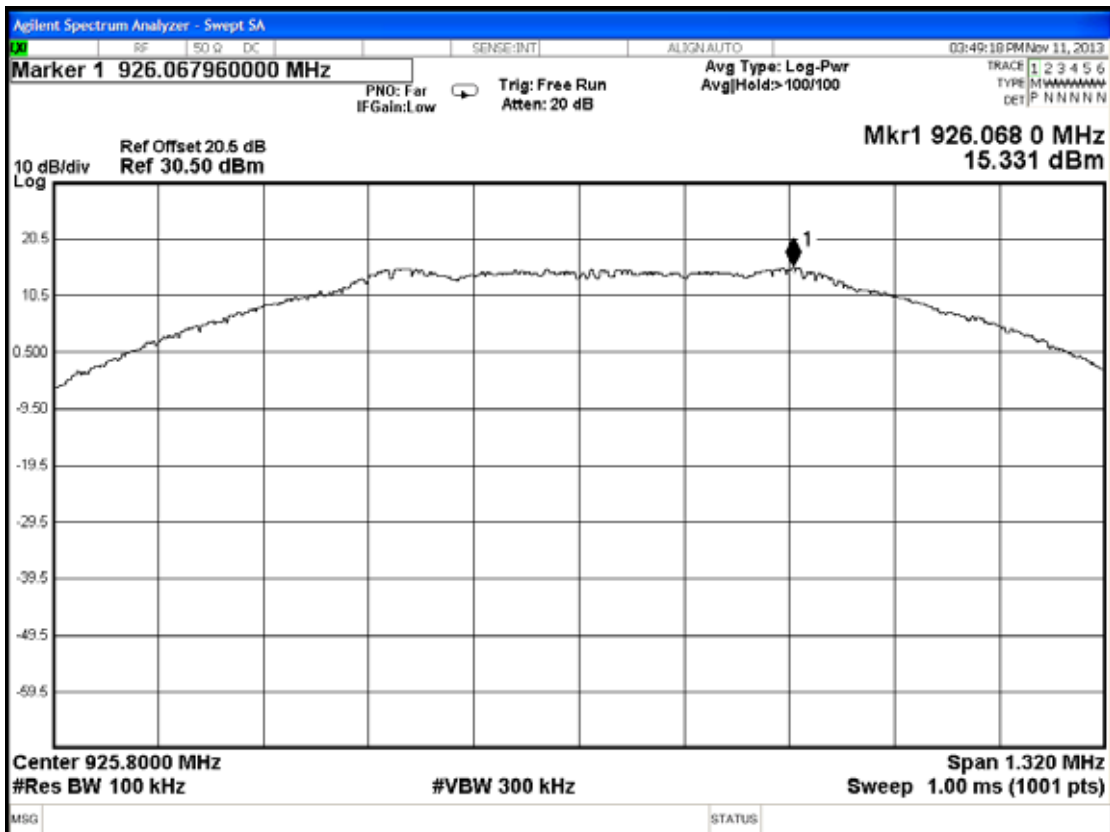


Frequency: 925.8MHz





Reference Level:



7. BAND EDGES MEASUREMENT

7.1. Test Equipment

The following test equipment was used during the band edges measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Jul. 30, 13'	Jul. 29, 14'

7.2. Block Diagram of Test Setup

The same as section.4.2.

7.3. Specification Limits [§15.247(c)]

7.3.1. The highest level should be at least 20 dB below that in the 100kHz bandwidth.

7.3.2. The reference level for determining limit of emission limitations is according to the value measured indicated in plots at section 8.6.

7.4. Operating Condition of EUT

Test program Serialport_utility 2.2.3.0124 is used for enabling the EUT transmitting continuing.

7.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. Set both RBW=100 kHz and VBW to 300kHz with suitable frequency span including 100kHz bandwidth from band edge.

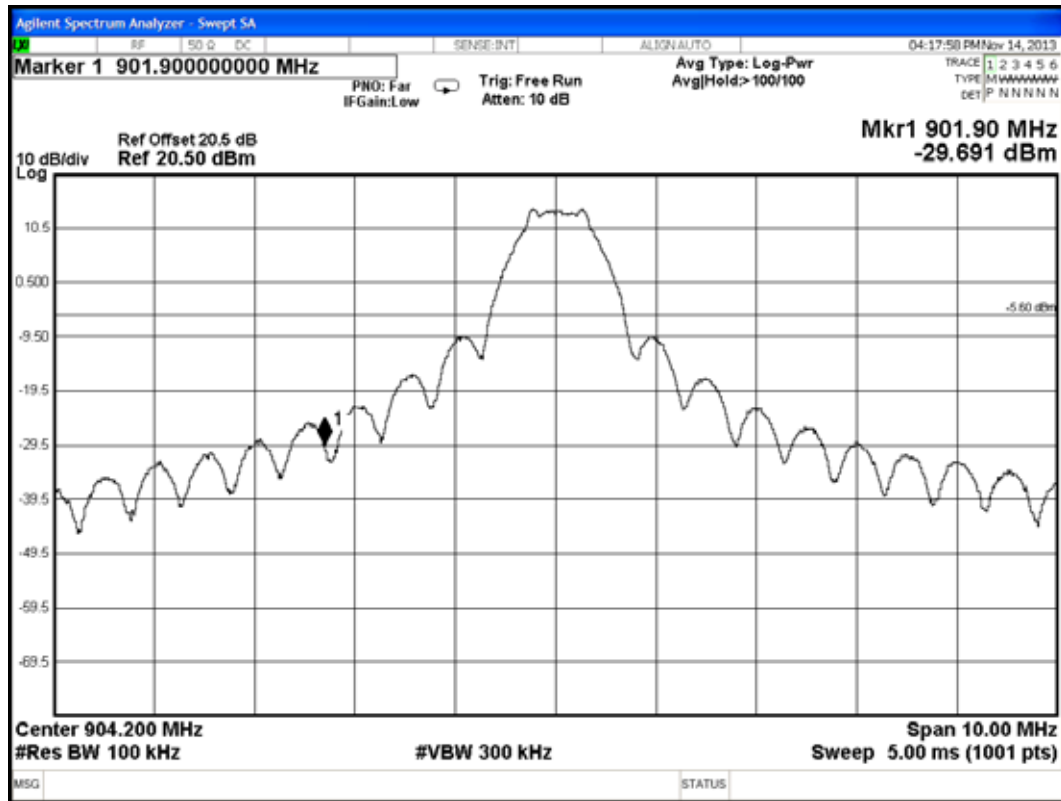
The measurement guideline was according to KDB 558074 D01 V03.

7.6. Test Results

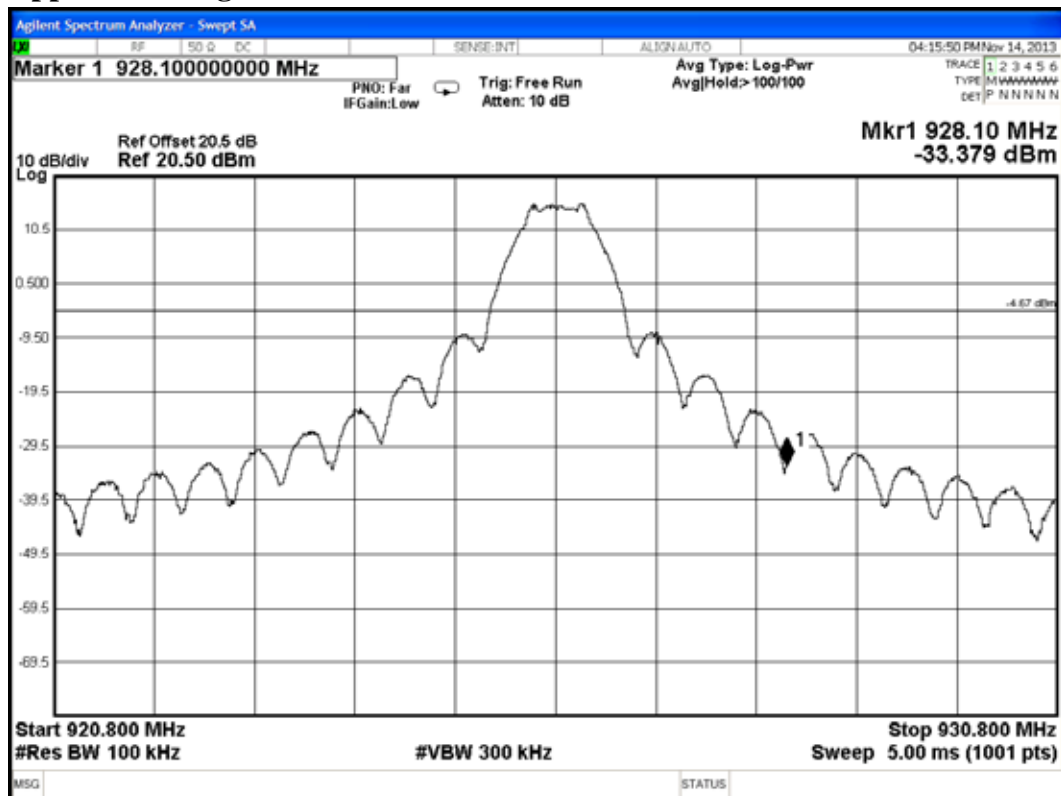
PASSED. All the test results are attached in next pages.

(Test Date : Nov. 11, 2013 Temperature : 25 Humidity : 55%)

Below Band edge



Upper Band edge



8. POWER SPECTRAL DENSITY MEASUREMENT

8.1. Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Jul. 30, 13'	Jul. 29, 14'

8.2. Block Diagram of Test Setup

The same as section.4.2.

8.3. Specification Limits [§15.247(d)]

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band.

8.4. Operating Condition of EUT

Test program Serialport_utility 2.2.3.0124 is used for enabling the EUT transmitting continuing.

8.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 100kHz RBW and ≥ 300 kHz VBW, set sweep time = Auto.

The measurement guideline was according to KDB 558074 D01 V03

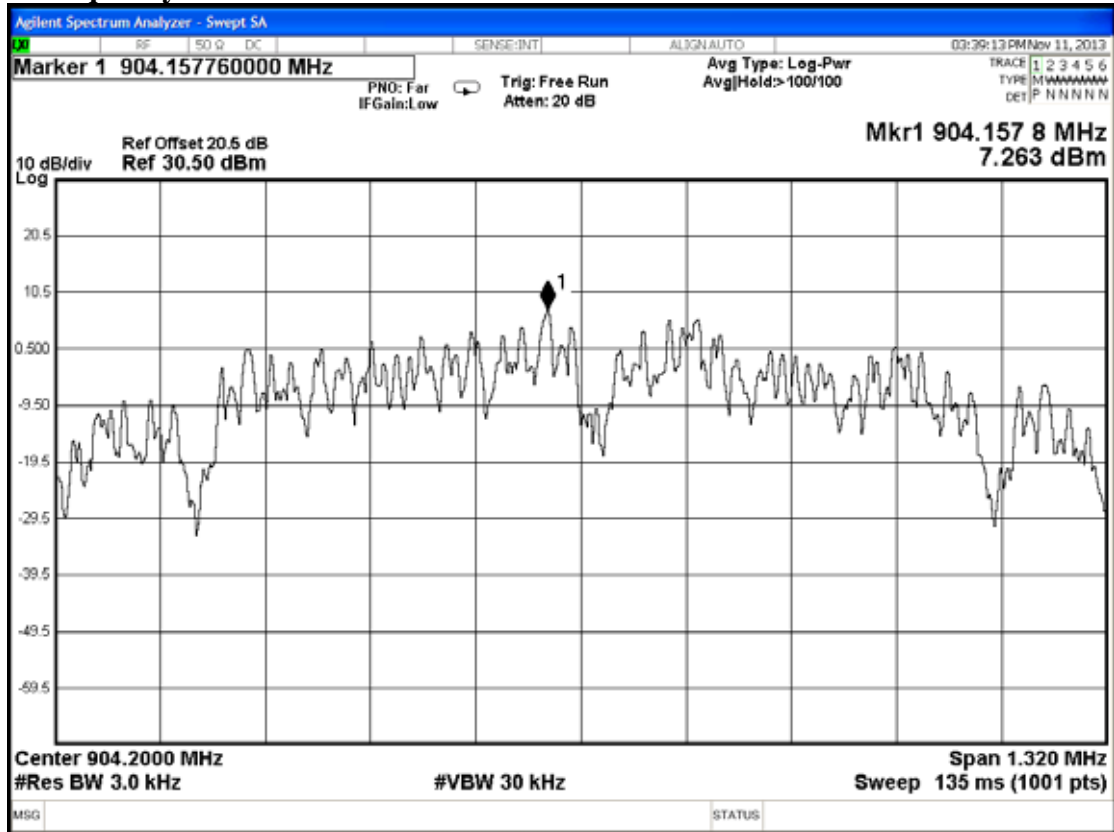
8.6. Test Results

PASSED. All the test results are attached in next pages.

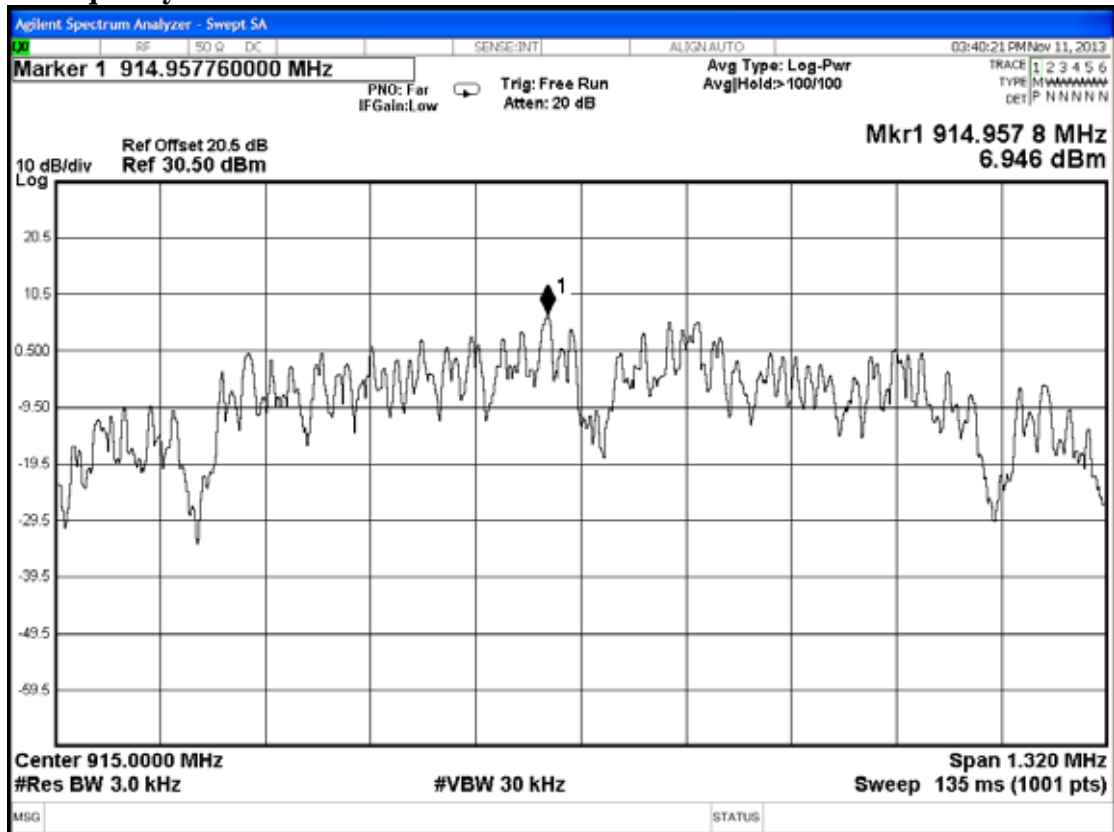
(Test Date : Nov. 11, 2013 Temperature : 25 Humidity : 55%)

Mode	Frequency	Power Spectral Density (dBm)	Limit (dBm)
1.	904.2MHz	7.263	8
2.	915MHz	6.946	8
3.	925.8MHz	7.638	8

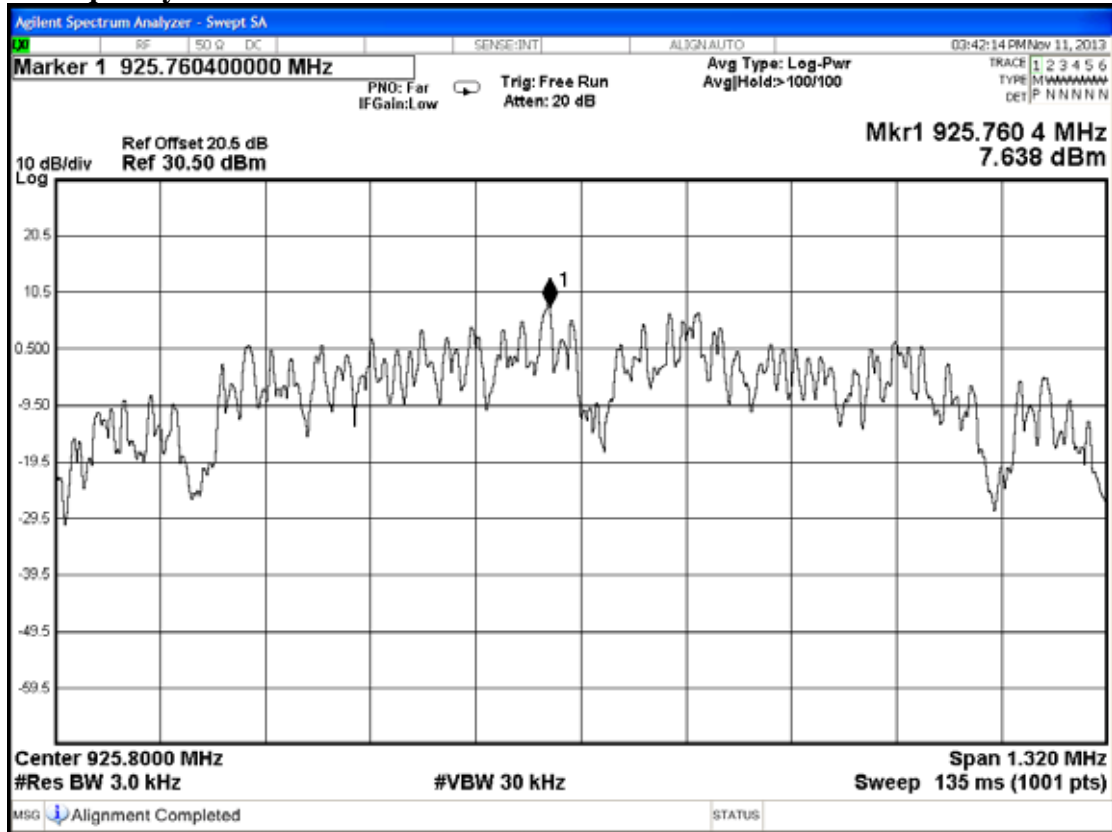
Frequency: 904.2MHz



Frequency: 915MHz



Frequency: 925.8MHz



9. DEVIATION TO TEST SPECIFICATIONS

【NONE】

10. PHOTOGRAPHS

10.1. Photos of Radiated Measurement at Semi-Anechoic Chamber

10.1.1. Frequency Below 1GHz



10.1.2. Frequency Above 1GHz



10.2. Photo of Section RF Conducted Measurement

