JQA File No. : KL80160355
Issue Date : September 9, 2016

TEST REPORT

Applicant	:	SHARP CORPORATION, Consumer Electronics Company, Communication Systems Division
Address	:	2-13-1, Iida Hachihonmatsu, Higashi-Hiroshima City, Hiroshima, 739-0192, Japan
Products	:	Smart Phone
Model No.	:	SH-02J
Serial No.	:	004401115841278 004401115841302
FCC ID	:	APYHRO00242
Test Standard	:	CFR 47 FCC Rules and Regulations Part 22
Test Results	:	**Passed**
Date of Test	:	August 21 ~ September 1, 2015

ilac-MRA VLAC Lab Accreditation VLAC-001-2

Kousei Shibata
Manager
Japan Quality Assurance Organization
KITA-KANSAI Testing Center
SAITO EMC Branch
7-3-10, Saito-asagi, Ibaraki-shi, Osaka 567-0085, Japan

- The test results in this test report was made by using the measuring instruments which are traceable to national standards of measurement in accordance with ISO/IEC 17025.
- The applicable standard, testing condition and testing method which were used for the tests are based on the request of the applicant.
- The test results presented in this report relate only to the offered test sample.
- The contents of this test report cannot be used for the purposes, such as advertisement for consumers.
- This test report shall not be reproduced except in full without the written approval of JQA.
- VLAC does not approve, certify or warrant the product by this test report.

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DEFINITIONS FOR ABBREVIATION AND SYMBOLS USED IN THIS TEST REPORT

EUT : Equipment Under Test
AE : Associated Equipment
N/A : Not Applicable
N/T : Not Tested

EMC : Electromagnetic Compatibility
EMI : Electromagnetic Interference
EMS : Electromagnetic Susceptibility

☑ - indicates that the listed condition, standard or equipment is applicable for this report.
☐ - indicates that the listed condition, standard or equipment is not applicable for this report.

1 Description of the Equipment Under Test

1. Manufacturer : SHARP CORPORATION, Consumer Electronics Company, Communication Systems Division
   2-13-1, Iida Hachihonmatsu, Higashi-Hiroshima City, Hiroshima, 739-0192, Japan
2. Products : Smart Phone
3. Model No. : SH-02J
4. Serial No. : 004401115841278
   004401115841302
5. Product Type : Pre-production
6. Date of Manufacture : June, 2016
7. Power Rating : 4.0VDC (Lithium-ion Battery UBATIA273AFN1 2700mAh)
8. Grounding : None
9. Transmitting Frequency : Band 5 (824 MHz – 849 MHz)
10. Receiving Frequency : Band 5 (869 MHz – 894 MHz)
11. Emission Designations :

BW (MHz)	QPSK	16QAM
1.4	1M09G7D	1M09D7W
3	2M69G7D	2M68D7W
5	4M47G7D	4M47D7W
10	8M91G7D	8M93D7W

12. Max. RF Output Power :

BW (MHz)	QPSK (W ERP)	16QAM (W ERP)
1.4	0.174	0.123
3	0.170	0.117
5	0.170	0.129
10	0.174	0.132

13. Category : LTE FDD (Band 5)
14. EUT Authorization : Certification
15. Received Date of EUT : August 1, 2016
16. Channel Plan

The carrier spacing is 100 kHz.
The carrier frequency is designated by the absolute frequency channel number (ARFCN).
The carrier frequency is expressed in the equation shown as follows:

Transmitting Frequency (in MHz) = 824.7 + 0.1 × (n – 20407)
where, n : channel number (20407 ≤ n ≤ 20643)

Receiving Frequency (in MHz) = 869.7 + 0.1 × (n – 2407)
where, n : channel number (2407 ≤ n ≤ 2643)

2 Summary of Test Results

Applied Standard : CFR 47 FCC Rules and Regulations Part 22
Subpart H – Cellular Radiotelephone Service

The EUT described in clause 1 was tested according to the applied standard shown above.
Details of the test configuration is shown in clause 6.
The conclusion for the test items of which are required by the applied standard is indicated under the test result.

☑ - The test result was **passed** for the test requirements of the applied standard.

☐ - The test result was **failed** for the test requirements of the applied standard.

☐ - The test result was **not judged** the test requirements of the applied standard.

In the approval of test results,
- Determining compliance with the limits in this report was based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- No deviations were employed from the applied standard.
- No modifications were conducted by JQA to achieve compliance to the limitations.

Reviewed by:

Shigeru Kinoshita
Assistant Manager
JQA KITA-KANSAI Testing Center
SAITO EMC Branch

Tested by:

Shigeru Osawa
Deputy Manager
JQA KITA-KANSAI Testing Center
SAITO EMC Branch

3 Test Procedure

Test Requirements : CFR 47 FCC Rules and Regulations Part 2
§2.1046, §2.1047, §2.1049, §2.1051, §2.1053, §2.1055 and §2.1057

Test Procedure : ANSI/TIA–603-D-2010
FCC KDB 971168 D01 Power Meas License Digital Systems v02r02, released October 17, 2014

4 Test Location

Japan Quality Assurance Organization (JQA)
KITA-KANSAI Testing Center
7-7, Ishimaru, 1-chome, Minoh-shi, Osaka, 562-0027, Japan
SAITO EMC Branch
7-3-10, Saito-asagi, Ibaraki-shi, Osaka 567-0085, Japan

5 Recognition of Test Laboratory

JQA KITA-KANSAI Testing Center SAITO EMC Branch is accredited under ISO/IEC 17025 by following accreditation bodies and the test facility is registered by the following bodies.

VLAC Accreditation No.	:	VLAC-001-2 (Expiry date : March 30, 2018)
VCCI Registration No.	:	A-0002 (Expiry date : March 30, 2018)
BSMI Registration No.	:	SL2-IS-E-6006, SL2-IN-E-6006, SL2-R1/R2-E-6006, SL2-A1-E-6006 (Expiry date : September 14, 2016)
IC Registration No.	:	2079E-3, 2079E-4 (Expiry date : July 16, 2017)

Accredited as conformity assessment body for Japan electrical appliances and material law by METI. (Expiry date : February 22, 2019)

6 Description of Test Setup

6.1 Test Configuration

The equipment under test (EUT) consists of :

	Item	Manufacturer	Model No.	Serial No.	FCC ID
A	Smart Phone	Sharp	SH-02J	004401115841278 *1) 004401115841302 *2)	APYHRO00242
B	AC Adapter	Fujitsu Corporation	05	YKA	N/A
C	Stereo Handsfree	Sharp	SHLDL1	--	N/A

*1) Used for Field Strength of Spurious Emission
*2) Used for Antenna Conducted Emission and Frequency Stability

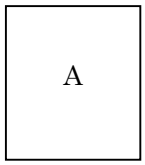
The auxiliary equipment used for testing :
None

Type of Cable:

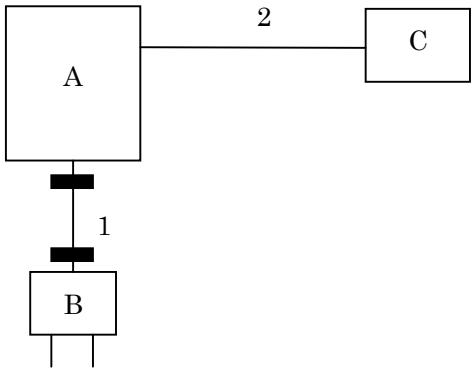
No.	Description	Identification (Manu. etc.)	Connector Shielded	Cable Shielded	Ferrite Core	Length (m)
1	USB conversion cable	--	--	NO	YES	1.2
2	Handsfree Cable	--	--	NO	NO	1.5

6.2 Test Arrangement (Drawings)

a) Single Unit

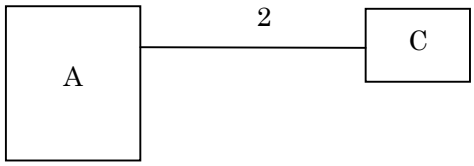


b) AC Adapter used



120VAC 60Hz

c) Earphone used



▌: Ferrite Core

6.3 Operating Condition

Power Supply Voltage : 4.0 VDC (for Battery)
120 VAC, 60 Hz (For AC Adapter)

1. Bandwidth: 1.4 MHz/3 MHz/5 MHz/10 MHz
2. Modulation Type: QPSK/16QAM

The tests were carried under worst condition shown as follows:

Test Item	Bandwidth (MHz)	Modulation	RB Size
RF Power Output	1.4/3/5/10	QPSK/16QAM	1
ERP / EIRP RF Power Output	1.4/3/5/10	QPSK/16QAM	1
Occupied Bandwidth	1.4/3/5/10	QPSK/16QAM	Full
Spurious Emissions at Antenna Terminals	1.4/3/5/10	QPSK	1
Band-Edge Emission	1.4/3/5/10	QPSK/16QAM	1/Full
Field Strength of Spurious Radiation	1.4/3/5/10	QPSK	1

The Radiated Emission test were carried under 3 test configurations shown in clause 6.2.
In all tests, the fully charged battery is used for the EUT.

Other Clock Frequency
19.2MHz, 48MHz, 12MHz, 27.12MHz

The EUT was rotated through three orthogonal axis (X, Y and Z axis) in radiated measurement.
The EUT with temporary antenna port was used in conducted measurement.

RF Output Verification

The tests were conducted at the middle channel.

CH	Frequency (MHz)	BW (MHz)	Mode	RB Allocation	RB Offset	Target MPR	Conducted Avrage Power (dBm)
20525	836.5	1.4	QPSK	1	0	0	22.64
				1	3	0	**22.89**
				1	5	0	22.72
				3	0	0	22.83
				3	2	0	22.83
				3	3	0	22.81
				6	0	1	21.75
			16QAM	1	0	1	21.90
				1	3	1	21.81
				1	5	1	21.77
				3	0	1	21.83
				3	2	1	21.68
				3	3	1	21.82
				6	0	2	20.76

CH	Frequency (MHz)	BW (MHz)	Mode	RB Allocation	RB Offset	Target MPR	Conducted Avrage Power (dBm)
20525	836.5	3	QPSK	1	0	0	**22.88**
				1	8	0	22.77
				1	14	0	22.73
				8	0	1	22.11
				8	4	1	21.85
				8	7	1	21.89
				15	0	1	21.96
			16QAM	1	0	1	21.69
				1	8	1	21.65
				1	14	1	21.77
				8	0	2	20.76
				8	4	2	20.81
				8	7	2	20.89
				15	0	2	20.99

CH	Frequency (MHz)	BW (MHz)	Mode	RB Allocation	RB Offset	Target MPR	Conducted Avrage Power (dBm)
20525	836.5	5	QPSK	1	0	0	22.82
				1	13	0	22.72
				1	24	0	**22.89**
				12	0	1	21.96
				12	7	1	21.97
				12	13	1	21.91
				25	0	1	22.00
			16QAM	1	0	1	21.62
				1	13	1	21.69
				1	24	1	21.62
				12	0	2	21.01
				12	7	2	20.77
				12	13	2	20.66
				25	0	2	20.96

CH	Frequency (MHz)	BW (MHz)	Mode	RB Allocation	RB Offset	Target MPR	Conducted Avrage Power (dBm)
20525	836.5	10	QPSK	1	0	0	22.61
				1	25	0	22.76
				1	49	0	**22.90**
				25	0	1	21.96
				25	13	1	21.97
				25	25	1	21.89
				50	0	1	22.00
			16QAM	1	0	1	21.17
				1	25	1	21.68
				1	49	1	21.16
				25	0	2	20.81
				25	13	2	20.79
				25	25	2	20.95
				50	0	2	21.03

7 Test Requirements

7.0 Summary of the Test Results

Test Item	FCC Specification	Reference of the Test Report	Results	Remarks
RF Power Output	Section 22.913(a)(2)	Section 7.1	Passed	-
ERP / EIRP RF Power Output	Section 22.913(a)(2)	Section 7.2	Passed	-
Modulation Characteristics	-	-	-	-
Occupied Bandwidth	Section 22.917	Section 7.4	Passed	-
Spurious Emissions at Antenna Terminals	Section 22.917	Section 7.5	Passed	-
Band-Edge Emission	Section 22.917	Section 7.6	Passed	-
Field Strength of Spurious Radiation	Section 22.917	Section 7.7	Passed	-
Frequency Stability	Section 22.355	Section 7.8	Passed	-

7.1 RF Power Output (§2.1046)

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.1.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

Transmitter Power of BW: 1.4 MHz(QPSK) is	194.5	mW	at 836.500	MHz
Transmitter Power of BW: 1.4 MHz(16QAM) is	154.9	mW	at 836.500	MHz
Transmitter Power of BW: 3 MHz(QPSK) is	195.9	mW	at 825.500	MHz
Transmitter Power of BW: 3 MHz(16QAM) is	153.8	mW	at 825.500	MHz
Transmitter Power of BW: 5 MHz(QPSK) is	194.5	mW	at 836.500	MHz
Transmitter Power of BW: 5 MHz(16QAM) is	150.0	mW	at 846.500	MHz
Transmitter Power of BW: 10 MHz(QPSK) is	195.0	mW	at 836.500	MHz
Transmitter Power of BW: 10 MHz(16QAM) is	150.7	mW	at 829.000	MHz

Uncertainty of Measurement Results ± 0.9 dB(2σ)

Remarks : _____

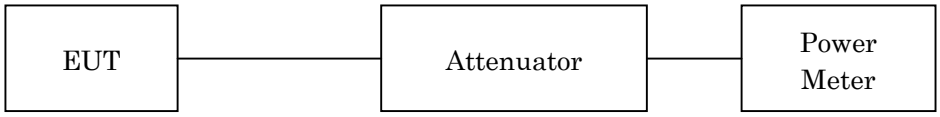
7.1.2 Test Instruments

Shielded Room S4				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Power Meter	N1911A	GB45100291 (B-63)	Agilent	2017/07/10
Power Sensor	N1921A	US44510470 (B-64)	Agilent	2017/07/10
Attenuator	43KC-20	1418003 (D-41)	Anritsu	2017/07/10
RF Cable	SUCOFLEX102	14253/2 (C-52)	HUBER+SUHNER	2017/08/02

NOTE : The calibration interval of the above test instruments is 12 months.

7.1.3 Test Method and Test Setup (Diagrammatic illustration)

The Conducted RF Power Output was measured with a power meter, one attenuator and a short, low loss cable.



7.1.4 Test Data

1-1) BW 1.4MHz(1RB)
Mode: QPSK

(LTE 1.4MHz)QPSK

Test Date: August 21, 2016
Temp.: 26 °C, Humi: 68 %

Transmitting Frequency CH	[MHz]	Correction Factor [dB]	Meter Reading (Average) [dBm]	Results (Average) [dBm]	[mW]
20407	824.700	20.35	2.51	22.86	193.2
20525	836.500	20.35	2.54	22.89	194.5
20643	848.300	20.35	2.48	22.83	191.9

Calculated result at 836.500 MHz, as the maximum level point shown on underline:

	Correction Factor	=	20.35	dB
+)	Meter Reading	=	2.54	dBm
	Result	=	22.89	dBm = 194.5 mW

NOTE : The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.

Mode: 16QAM

(LTE 1.4MHz)16QAM

Test Date: August 21, 2016
Temp.: 26 °C, Humi: 68 %

Transmitting Frequency CH	[MHz]	Correction Factor [dB]	Meter Reading (Average) [dBm]	Results (Average) [dBm]	[mW]
20407	824.700	20.35	1.41	21.76	150.0
20525	836.500	20.35	1.55	21.90	154.9
20643	848.300	20.35	1.50	21.85	153.1

Calculated result at 836.500 MHz, as the maximum level point shown on underline:

	Correction Factor	=	20.35	dB
+)	Meter Reading	=	1.55	dBm
	Result	=	21.90	dBm = 154.9 mW

NOTE : The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.

1-2) BW 3MHz(1RB)
Mode: QPSK

(LTE 3MHz)QPSK

Test Date: August 21, 2016
Temp.: 26 °C, Humi: 68 %

Transmitting Frequency CH	[MHz]	Correction Factor [dB]	Meter Reading (Average) [dBm]	Results (Average) [dBm]	[mW]
20415	825.500	20.35	2.57	22.92	195.9
20525	836.500	20.35	2.53	22.88	194.1
20635	847.500	20.35	2.56	22.91	195.4

Calculated result at 825.500 MHz, as the maximum level point shown on underline:

	Correction Factor	=	20.35	dB
+)	Meter Reading	=	2.57	dBm
	Result	=	22.92	dBm = 195.9 mW

NOTE : The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.

Mode: 16QAM

(LTE 3MHz)16QAM

Test Date: August 21, 2016
Temp.: 26 °C, Humi: 68 %

Transmitting Frequency CH	[MHz]	Correction Factor [dB]	Meter Reading (Average) [dBm]	Results (Average) [dBm]	[mW]
20415	825.500	20.35	1.52	21.87	153.8
20525	836.500	20.35	1.42	21.77	150.3
20635	847.500	20.35	1.47	21.82	152.1

Calculated result at 825.500 MHz, as the maximum level point shown on underline:

	Correction Factor	=	20.35	dB
+)	Meter Reading	=	1.52	dBm
	Result	=	21.87	dBm = 153.8 mW

NOTE : The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.

1-3) BW 5MHz(1RB)
Mode: QPSK

(LTE 5MHz)QPSK

Test Date: August 21, 2016
Temp.: 26 °C, Humi: 68 %

Transmitting Frequency		Correction Factor	Meter Reading (Average)	Results (Average)	
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]
20425	826.500	20.35	2.45	22.80	190.5
20525	836.500	20.35	2.54	22.89	194.5
20625	846.500	20.35	2.52	22.87	193.6

Calculated result at 836.500 MHz, as the maximum level point shown on underline:

	Correction Factor	=	20.35	dB
+)	Meter Reading	=	2.54	dBm
	Result	=	22.89	dBm = 194.5 mW

NOTE : The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.

Mode: 16QAM

(LTE 5MHz)16QAM

Test Date: August 21, 2016
Temp.: 26 °C, Humi: 68 %

Transmitting Frequency		Correction Factor	Meter Reading (Average)	Results (Average)	
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]
20425	826.500	20.35	1.40	21.75	149.6
20525	836.500	20.35	1.34	21.69	147.6
20625	846.500	20.35	1.41	21.76	150.0

Calculated result at 846.500 MHz, as the maximum level point shown on underline:

	Correction Factor	=	20.35	dB
+)	Meter Reading	=	1.41	dBm
	Result	=	21.76	dBm = 150.0 mW

NOTE : The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.

1-4) BW 10MHz(1RB)
Mode: QPSK

(LTE 10MHz)QPSK

Test Date: August 21, 2016
Temp.: 26 °C, Humi: 68 %

Transmitting Frequency CH	[MHz]	Correction Factor [dB]	Meter Reading (Average) [dBm]	Results (Average) [dBm]	[mW]
20450	829.000	20.35	2.49	22.84	192.3
20525	836.500	20.35	2.55	22.90	195.0
20600	844.000	20.35	2.47	22.82	191.4

Calculated result at 836.500 MHz, as the maximum level point shown on underline:

	Correction Factor	=	20.35	dB
+)	Meter Reading	=	2.55	dBm
	Result	=	22.90	dBm = 195.0 mW

NOTE : The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.

Mode: 16QAM

(LTE 10MHz)16QAM

Test Date: August 21, 2016
Temp.: 26 °C, Humi: 68 %

Transmitting Frequency CH	[MHz]	Correction Factor [dB]	Meter Reading (Average) [dBm]	Results (Average) [dBm]	[mW]
20450	829.000	20.35	1.43	21.78	150.7
20525	836.500	20.35	1.33	21.68	147.2
20600	844.000	20.35	1.36	21.71	148.3

Calculated result at 829.000 MHz, as the maximum level point shown on underline:

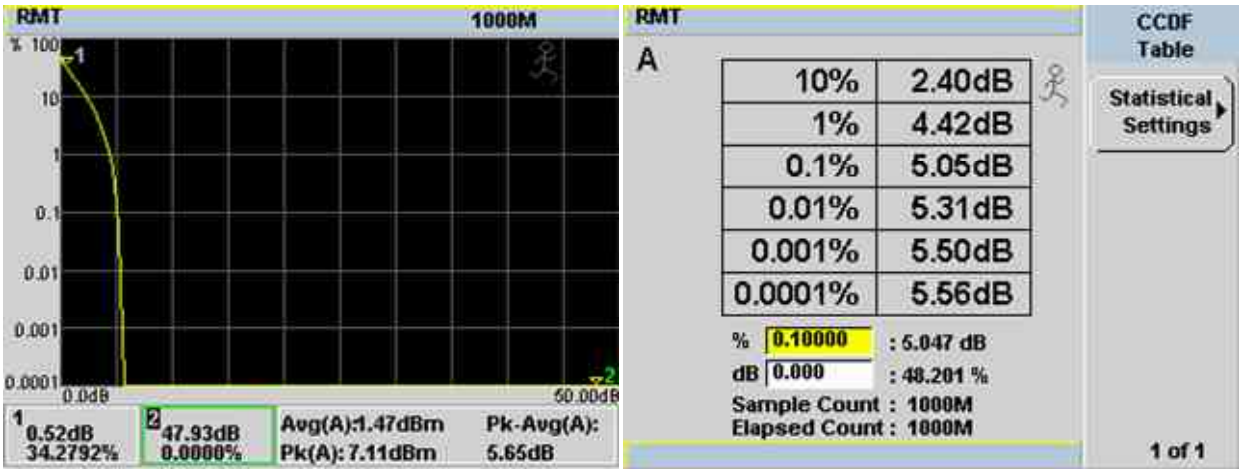
	Correction Factor	=	20.35	dB
+)	Meter Reading	=	1.43	dBm
	Result	=	21.78	dBm = 150.7 mW

NOTE : The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.

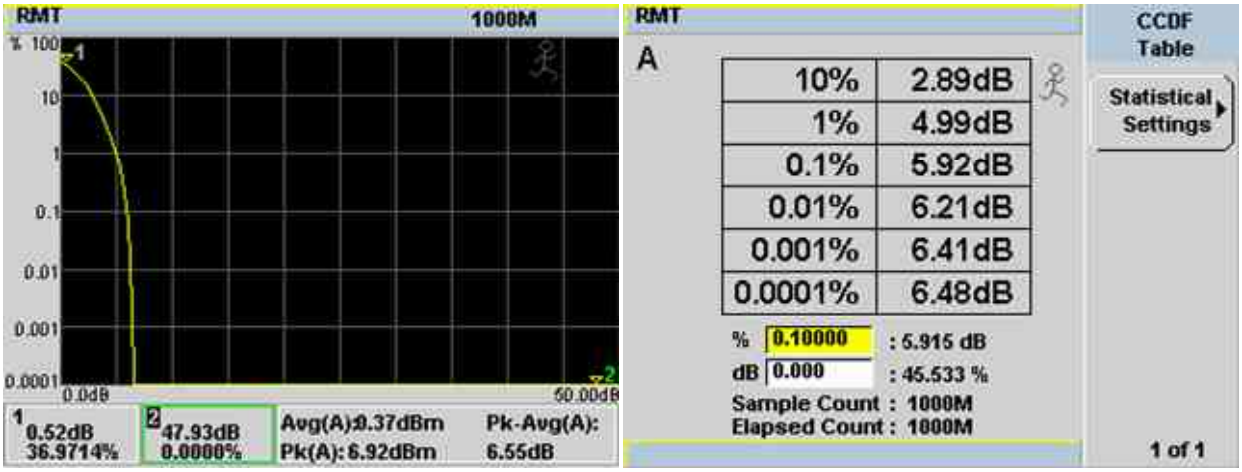
2) CCDF

Channel	Frequency (MHz)	BW (MHz)	Peak to Average Factor(CCDF 0.1%) [dB]		
			QPSK	16QAM	Limit
20525	836.50	1.4	5.05	5.92	--
20525	836.50	3	5.11	5.94	--
20525	836.50	5	5.04	5.87	--
20525	836.50	10	5.14	5.90	--

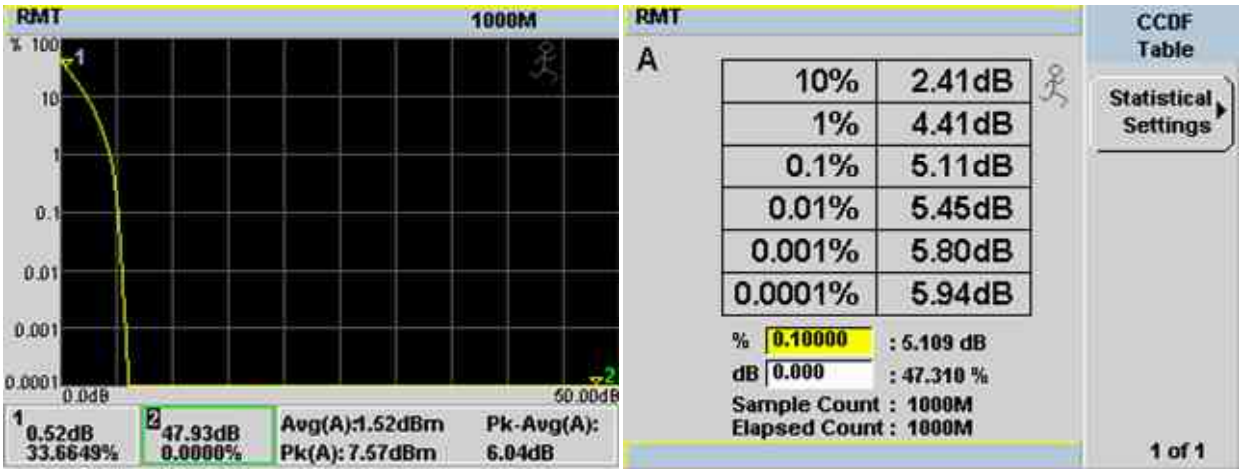
BW 1.4MHz QPSK



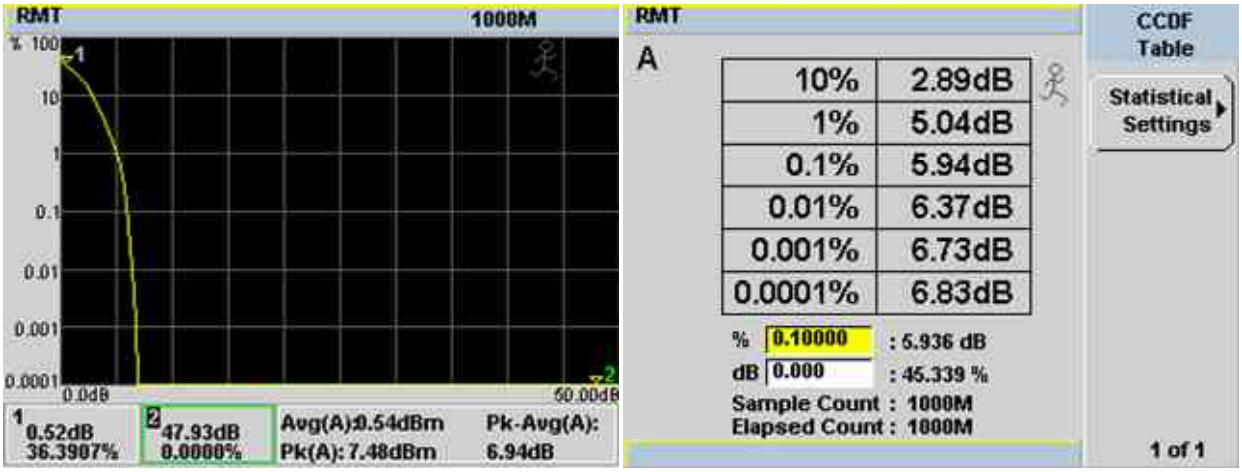
BW 1.4MHz 16QAM



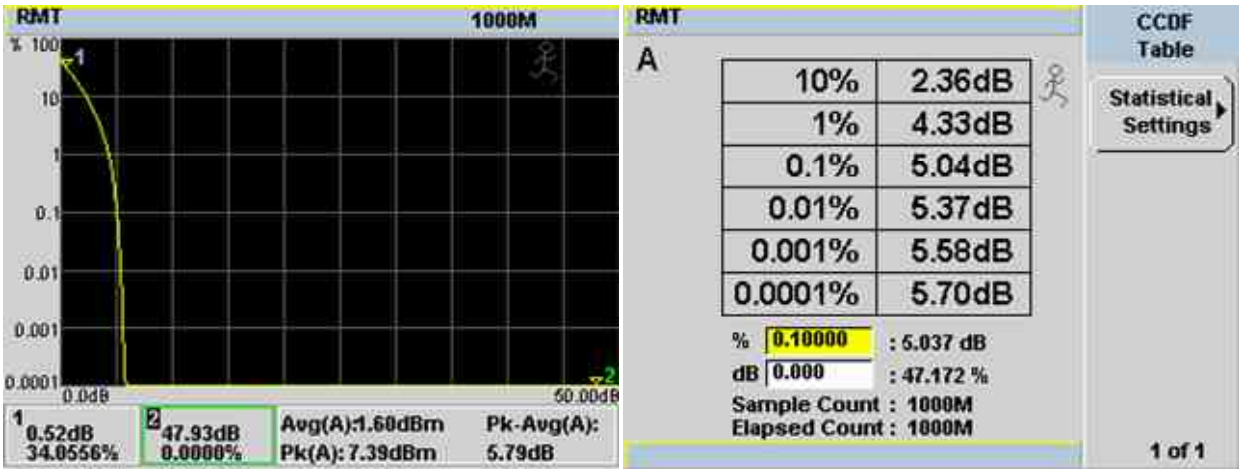
BW 3MHz QPSK



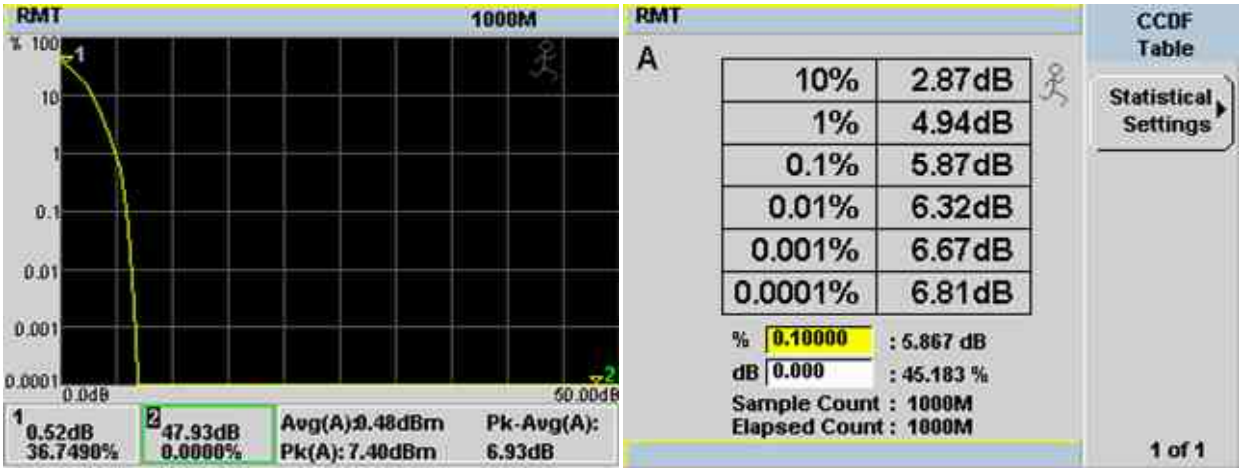
BW 3MHz 16QAM



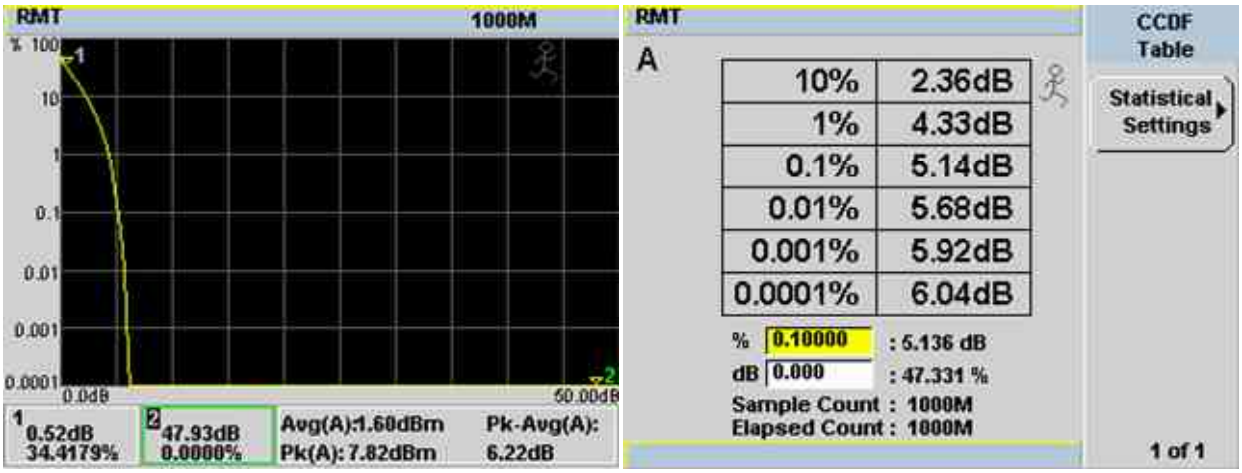
BW 5MHz QPSK



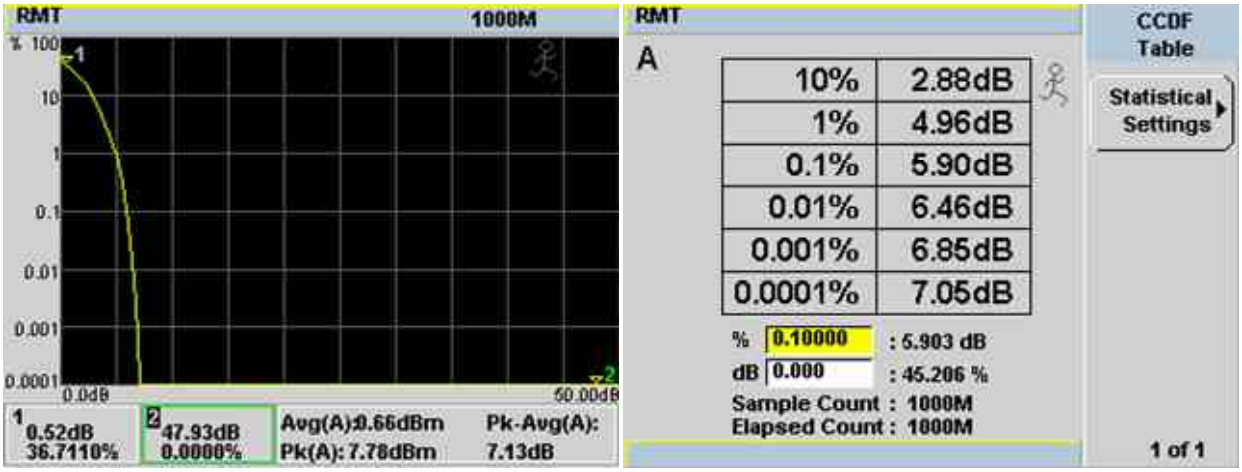
BW 5MHz 16QAM



BW 10MHz QPSK



BW 10MHz 16QAM



7.2 ERP / EIRP RF Power Output

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.2.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

Min. Limit Margin 16.1 dB at 836.500 MHz

Uncertainty of Measurement Results ± 1.6 dB(2σ)

Remarks : The maximum ERP is 0.174 W at 836.500 MHz (BW 1.4MHz/10MHz, QPSK). X-axis position.

7.2.2 Test Instruments

Anechoic Chamber A2				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Test Receiver	ESU 26	100170 (A-6)	Rohde & Schwarz	2017/04/27
Signal Generator	E8257D	MY45140309 (B-39)	Agilent	2017/08/08
Power Meter	N1911A	GB45100291 (B-63)	Agilent	2017/07/10
Power Sensor	N1921A	US44510470 (B-64)	Agilent	2017/07/10
Log-periodic Antenna	UHALP9108-A1	0694 (C-31)	Schwarzbeck	2017/05/18
Attenuator (TX)	2-10	BA6214 (D-79)	Weinschel	2016/11/19
Dipole Antenna (TX)	KBA-611	0-248-2 (C-20)	Kyoritsu	2017/05/24

NOTE : The calibration interval of the above test instruments is 12 months.

7.2.3 Test Method and Test Setup (Diagrammatic illustration)

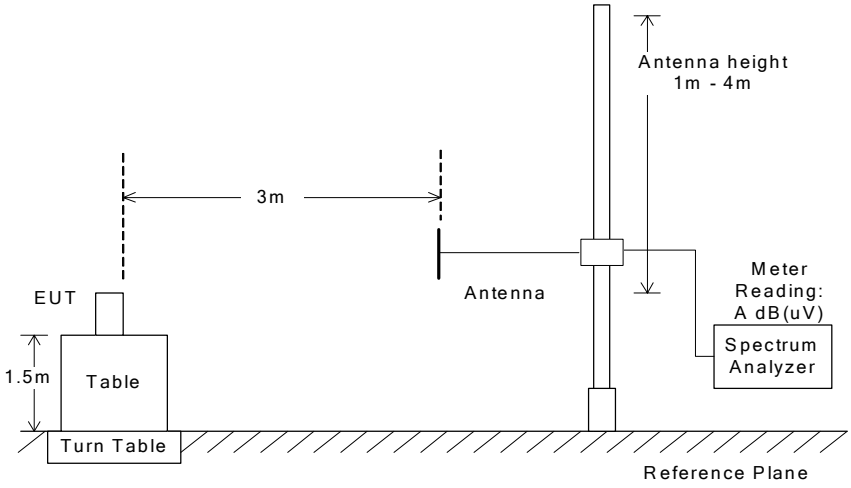
Step 1:
In order to obtain the maximum emission, the EUT was placed at the height 1.5 m on the non-conducted support and was varying at three orthogonal axes, at the distance 3 m from the receiving antenna and rotated around 360 degrees.
The receiving antenna height was varied from 1 m to 4 m.
The EUT on the table was placed to be maximum emission against at the receiving antenna polarized (vertical and horizontal).
Then the meter reading of the spectrum analyzer at the maximum emission was A dB(μV).

Step 2:
The EUT was replaced to substitution antenna at the same polarized under the same condition as step 1.
The RF power was fed to the transmitting antenna through the RF amplifier from the signal generator.
In order to obtain the maximum emission level, the height of the receiving antenna was varied from 1 m to 4 m.
The level of maximum emission was A dB(μV), same as the recorded level in the step 1.
Then the RF power into the substitution horn antenna was P (dBm).

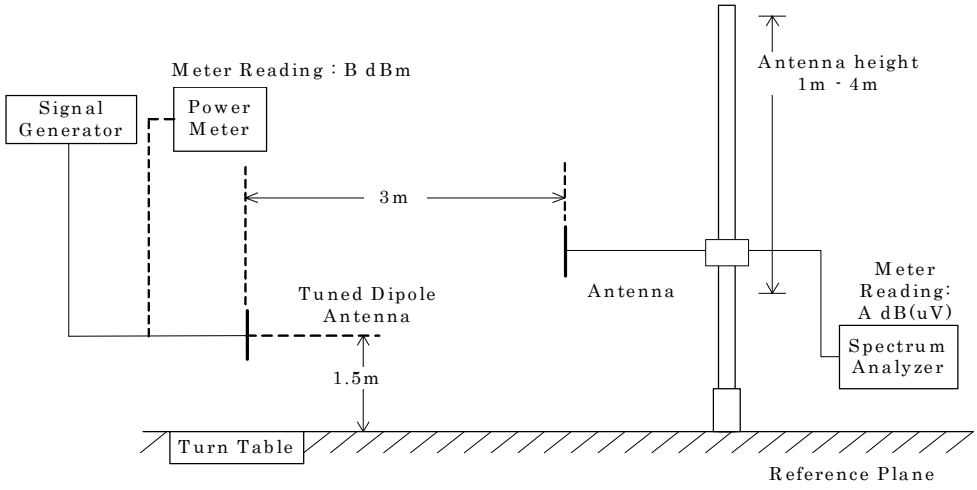
The ERP/EIRP output power was calculated in the following equation.

ERP (dBm) = P (dBm) – Balun loss of the tuned dipole antenna (dB) + Cable loss (dB)
EIRP (dBm) = P (dBm) + Gh (dBi)
where, Gh (dBi) : Gain of the substitution horn antenna.

– Side View –



(a)EUT



(b) Substitution Half-wave Dipole Antenna

7.2.4 Test Data

1-1) BW 1.4MHz(1RB)
Mode: QPSK

(LTE 1.4MHz)QPSK

Test Date: August 23, 2016
Temp.: 26 °C, Humi: 70 %

1. Measurement Results

Transmitting Frequency		Emission Measurement [dB(uV)]		Substitution Measurement [dB(uV)]		Supplied Power to Substitution Antenna	Balun Loss of Substitution Antenna
CH	[MHz]	Hori. (Mh)	Vert. (Mv)	Hori. (Msh)	Vert. (Msv)	[dBm]	[dB]
20407	824.700	96.0	93.1	67.3	66.0	- 5.0	1.7
20525	836.500	95.9	92.4	66.7	65.7	- 5.0	1.8
20643	848.300	95.3	92.2	66.8	64.8	- 5.0	1.9

2. Calculation Results

Transmitting Frequency		Average ERP [dBm]		Maximum Average ERP	Limits	Margin
CH	[MHz]	Hori. (ERPh)	Vert. (ERPv)	[W]	[dBm]	[dB]
20407	824.700	22.0	20.4	0.158	38.5	+16.5
20525	836.500	22.4	19.9	0.174	38.5	+16.1
20643	848.300	21.6	20.5	0.145	38.5	+16.9

Calculated result at 836.500 MHz, as the worst point shown on underline:

	Emission Measurment (Mh)	=	95.9 dB(uV)
	Substitution Measurement (Msh)	=	-66.7 dB(uV)
	Supplied Power to Substitution Antenna	=	-5.0 dBm
+)	Balun Loss of Substitution Antenna	=	-1.8 dB
	Result (ERPh)	=	22.4 dBm = 0.174 W

Minimum Margin: 38.5 - 22.4 = 16.1 (dB)

NOTE : Setting of measuring instrument(s) :

Detector Function
RMS

1-2) BW 1.4MHz(1RB)
Mode: 16QAM

(LTE 1.4MHz)16QAM

Test Date: August 23, 2016
Temp.: 26 °C, Humi: 70 %

1. Measurement Results

CH	Transmitting Frequency [MHz]	Emission Measurement [dB(uV)] Hori. (Mh)	Emission Measurement [dB(uV)] Vert. (Mv)	Substitution Measurement [dB(uV)] Hori. (Msh)	Substitution Measurement [dB(uV)] Vert. (Msv)	Supplied Power to Substitution Antenna [dBm]	Balun Loss of Substitution Antenna [dB]
20407	824.700	94.6	91.7	67.3	66.0	- 5.0	1.7
20525	836.500	94.4	90.9	66.7	65.7	- 5.0	1.8
20643	848.300	93.9	90.8	66.8	64.8	- 5.0	1.9

2. Calculation Results

CH	Transmitting Frequency [MHz]	Average ERP [dBm] Hori. (ERPh)	Average ERP [dBm] Vert. (ERPv)	Maximum Average ERP [W]	Limits [dBm]	Margin [dB]
20407	824.700	20.6	19.0	0.115	38.5	+17.9
20525	836.500	20.9	18.4	0.123	38.5	+17.6
20643	848.300	20.2	19.1	0.105	38.5	+18.3

Calculated result at 836.500 MHz, as the worst point shown on underline:

	Emission Measurment (Mh)	=	94.4 dB(uV)
	Substitution Measurement (Msh)	=	-66.7 dB(uV)
	Supplied Power to Substitution Antenna	=	-5.0 dBm
+)	Balun Loss of Substitution Antenna	=	-1.8 dB
	Result (ERPh)	=	20.9 dBm = 0.123 W

Minimum Margin: 38.5 - 20.9 = 17.6 (dB)

NOTE : Setting of measuring instrument(s) :

Detector Function
RMS

2-1) BW 3MHz(1RB)
Mode: QPSK

(LTE 3MHz)QPSK

Test Date: August 23, 2016
Temp.: 26 °C, Humi: 70 %

1. Measurement Results

CH	Transmitting Frequency [MHz]	Emission Measurement [dB(uV)] Hori. (Mh)	Emission Measurement [dB(uV)] Vert. (Mv)	Substitution Measurement [dB(uV)] Hori. (Msh)	Substitution Measurement [dB(uV)] Vert. (Msv)	Supplied Power to Substitution Antenna [dBm]	Balun Loss of Substitution Antenna [dB]
20415	825.500	96.1	93.0	67.4	66.0	- 5.0	1.7
20525	836.500	95.8	92.1	66.7	65.7	- 5.0	1.8
20635	847.500	95.3	92.2	66.8	64.8	- 5.0	1.9

2. Calculation Results

CH	Transmitting Frequency [MHz]	Average ERP [dBm] Hori. (ERPh)	Average ERP [dBm] Vert. (ERPv)	Maximum Average ERP [W]	Limits [dBm]	Margin [dB]
20415	825.500	22.0	20.3	0.158	38.5	+16.5
20525	836.500	22.3	19.6	0.170	38.5	+16.2
20635	847.500	21.6	20.5	0.145	38.5	+16.9

Calculated result at 836.500 MHz, as the worst point shown on underline:

	Emission Measurment (Mh)	=	95.8 dB(uV)
	Substitution Measurement (Msh)	=	-66.7 dB(uV)
	Supplied Power to Substitution Antenna	=	-5.0 dBm
+)	Balun Loss of Substitution Antenna	=	-1.8 dB
	Result (ERPh)	=	22.3 dBm = 0.170 W

Minimum Margin: 38.5 - 22.3 = 16.2 (dB)

NOTE : Setting of measuring instrument(s) :

Detector Function
RMS

2-2) BW 3MHz(1RB)
Mode: 16QAM

(LTE 3MHz)16QAM

Test Date: August 23, 2016
Temp.: 26 °C, Humi: 70 %

1. Measurement Results

CH	Transmitting Frequency [MHz]	Emission Measurement [dB(uV)] Hori. (Mh)	Emission Measurement [dB(uV)] Vert. (Mv)	Substitution Measurement [dB(uV)] Hori. (Msh)	Substitution Measurement [dB(uV)] Vert. (Msv)	Supplied Power to Substitution Antenna [dBm]	Balun Loss of Substitution Antenna [dB]
20415	825.500	94.8	91.7	67.4	66.0	- 5.0	1.7
20525	836.500	94.2	90.5	66.7	65.7	- 5.0	1.8
20635	847.500	93.7	90.6	66.8	64.8	- 5.0	1.9

2. Calculation Results

CH	Transmitting Frequency [MHz]	Average ERP [dBm] Hori. (ERPh)	Average ERP [dBm] Vert. (ERPv)	Maximum Average ERP [W]	Limits [dBm]	Margin [dB]
20415	825.500	20.7	19.0	0.117	38.5	+17.8
20525	836.500	20.7	18.0	0.117	38.5	+17.8
20635	847.500	20.0	18.9	0.100	38.5	+18.5

Calculated result at 825.500 MHz, as the worst point shown on underline:

	Emission Measurment (Mh)	=	94.8 dB(uV)
	Substitution Measurement (Msh)	=	-67.4 dB(uV)
	Supplied Power to Substitution Antenna	=	-5.0 dBm
+)	Balun Loss of Substitution Antenna	=	-1.7 dB
	Result (ERPh)	=	20.7 dBm = 0.117 W

Minimum Margin: 38.5 - 20.7 = 17.8 (dB)

NOTE : Setting of measuring instrument(s) :

Detector Function
RMS

3-1) BW 5MHz(1RB)
Mode: QPSK

(LTE 5MHz)QPSK

Test Date: August 23, 2016
Temp.: 26 °C, Humi: 70 %

1. Measurement Results

CH	Transmitting Frequency [MHz]	Emission Measurement [dB(uV)] Hori. (Mh)	Emission Measurement [dB(uV)] Vert. (Mv)	Substitution Measurement [dB(uV)] Hori. (Msh)	Substitution Measurement [dB(uV)] Vert. (Msv)	Supplied Power to Substitution Antenna [dBm]	Balun Loss of Substitution Antenna [dB]
20425	826.500	96.2	93.0	67.3	65.9	- 5.0	1.7
20525	836.500	95.8	92.2	66.7	65.7	- 5.0	1.8
20625	846.500	95.4	92.2	66.9	64.9	- 5.0	1.9

2. Calculation Results

CH	Transmitting Frequency [MHz]	Average ERP [dBm] Hori. (ERPh)	Average ERP [dBm] Vert. (ERPv)	Maximum Average ERP [W]	Limits [dBm]	Margin [dB]
20425	826.500	22.2	20.4	0.166	38.5	+16.3
20525	836.500	22.3	19.7	0.170	38.5	+16.2
20625	846.500	21.6	20.4	0.145	38.5	+16.9

Calculated result at 836.500 MHz, as the worst point shown on underline:

	Emission Measurment (Mh)	=	95.8 dB(uV)
	Substitution Measurement (Msh)	=	-66.7 dB(uV)
	Supplied Power to Substitution Antenna	=	-5.0 dBm
+)	Balun Loss of Substitution Antenna	=	-1.8 dB
	Result (ERPh)	=	22.3 dBm = 0.170 W

Minimum Margin: 38.5 - 22.3 = 16.2 (dB)

NOTE : Setting of measuring instrument(s) :

Detector Function
RMS

3-2) BW 5MHz(1RB)
Mode: 16QAM

(LTE 5MHz)16QAM

Test Date: August 23, 2016
Temp.: 26 °C, Humi: 70 %

1. Measurement Results

CH	Transmitting Frequency [MHz]	Emission Measurement [dB(uV)] Hori. (Mh)	Emission Measurement [dB(uV)] Vert. (Mv)	Substitution Measurement [dB(uV)] Hori. (Msh)	Substitution Measurement [dB(uV)] Vert. (Msv)	Supplied Power to Substitution Antenna [dBm]	Balun Loss of Substitution Antenna [dB]
20425	826.500	95.1	91.9	67.3	65.9	- 5.0	1.7
20525	836.500	94.1	90.5	66.7	65.7	- 5.0	1.8
20625	846.500	93.9	90.7	66.9	64.9	- 5.0	1.9

2. Calculation Results

CH	Transmitting Frequency [MHz]	Average ERP [dBm] Hori. (ERPh)	Average ERP [dBm] Vert. (ERPv)	Maximum Average ERP [W]	Limits [dBm]	Margin [dB]
20425	826.500	21.1	19.3	0.129	38.5	+17.4
20525	836.500	20.6	18.0	0.115	38.5	+17.9
20625	846.500	20.1	18.9	0.102	38.5	+18.4

Calculated result at 826.500 MHz, as the worst point shown on underline:

	Emission Measurment (Mh)	=	95.1 dB(uV)
	Substitution Measurement (Msh)	=	-67.3 dB(uV)
	Supplied Power to Substitution Antenna	=	-5.0 dBm
+)	Balun Loss of Substitution Antenna	=	-1.7 dB
	Result (ERPh)	=	21.1 dBm = 0.129 W

Minimum Margin: 38.5 - 21.1 = 17.4 (dB)

NOTE : Setting of measuring instrument(s) :

Detector Function
RMS

4-1) BW 10MHz(1RB)
Mode: QPSK

(LTE 10MHz)QPSK

Test Date: August 23, 2016
Temp.: 26 °C, Humi: 70 %

1. Measurement Results

CH	Transmitting Frequency [MHz]	Emission Measurement [dB(uV)] Hori. (Mh)	Emission Measurement [dB(uV)] Vert. (Mv)	Substitution Measurement [dB(uV)] Hori. (Msh)	Substitution Measurement [dB(uV)] Vert. (Msv)	Supplied Power to Substitution Antenna [dBm]	Balun Loss of Substitution Antenna [dB]
20450	829.000	96.2	93.0	67.2	65.9	- 5.0	1.8
20525	836.500	95.9	92.2	66.7	65.7	- 5.0	1.8
20600	844.000	95.7	92.2	66.7	65.0	- 5.0	1.9

2. Calculation Results

CH	Transmitting Frequency [MHz]	Average ERP [dBm] Hori. (ERPh)	Average ERP [dBm] Vert. (ERPv)	Maximum Average ERP [W]	Limits [dBm]	Margin [dB]
20450	829.000	22.2	20.3	0.166	38.5	+16.3
20525	836.500	22.4	19.7	0.174	38.5	+16.1
20600	844.000	22.1	20.3	0.162	38.5	+16.4

Calculated result at 836.500 MHz, as the worst point shown on underline:

	Emission Measurment (Mh)	=	95.9 dB(uV)
	Substitution Measurement (Msh)	=	-66.7 dB(uV)
	Supplied Power to Substitution Antenna	=	-5.0 dBm
+)	Balun Loss of Substitution Antenna	=	-1.8 dB
	Result (ERPh)	=	22.4 dBm = 0.174 W

Minimum Margin: 38.5 - 22.4 = 16.1 (dB)

NOTE : Setting of measuring instrument(s) :

Detector Function
RMS

4-2) BW 10MHz(1RB)
Mode: 16QAM

(LTE 10MHz)16QAM

Test Date: August 23, 2016
Temp.: 26 °C, Humi: 70 %

1. Measurement Results

CH	Transmitting Frequency [MHz]	Emission Measurement [dB(uV)] Hori. (Mh)	Emission Measurement [dB(uV)] Vert. (Mv)	Substitution Measurement [dB(uV)] Hori. (Msh)	Substitution Measurement [dB(uV)] Vert. (Msv)	Supplied Power to Substitution Antenna [dBm]	Balun Loss of Substitution Antenna [dB]
20450	829.000	95.2	92.0	67.2	65.9	- 5.0	1.8
20525	836.500	94.4	90.7	66.7	65.7	- 5.0	1.8
20600	844.000	94.7	91.2	66.7	65.0	- 5.0	1.9

2. Calculation Results

CH	Transmitting Frequency [MHz]	Average ERP [dBm] Hori. (ERPh)	Average ERP [dBm] Vert. (ERPv)	Maximum Average ERP [W]	Limits [dBm]	Margin [dB]
20450	829.000	21.2	19.3	0.132	38.5	+17.3
20525	836.500	20.9	18.2	0.123	38.5	+17.6
20600	844.000	21.1	19.3	0.129	38.5	+17.4

Calculated result at 829.000 MHz, as the worst point shown on underline:

	Emission Measurment (Mh)	=	95.2 dB(uV)
	Substitution Measurement (Msh)	=	-67.2 dB(uV)
	Supplied Power to Substitution Antenna	=	-5.0 dBm
+)	Balun Loss of Substitution Antenna	=	-1.8 dB
	Result (ERPh)	=	21.2 dBm = 0.132 W

Minimum Margin: 38.5 - 21.2 = 17.3 (dB)

NOTE : Setting of measuring instrument(s) :

Detector Function
RMS

7.3 Modulation Characteristics (§2.1047)

For the requirements, ☐ - Applicable [☐ - Tested. ☐ - Not tested by applicant request.]
☑ - Not Applicable

7.4 Occupied Bandwidth (§2.1049)

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.4.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

The 99% Bandwidth of BW: 1.4 MHz(QPSK) is	1.09	MHz	at	824.7/836.5/848.3	MHz
The 99% Bandwidth of BW: 1.4 MHz(16QAM) is	1.09	MHz	at	824.7/836.5/848.3	MHz
The 99% Bandwidth of BW: 3 MHz(QPSK) is	2.69	MHz	at	825.5	MHz
The 99% Bandwidth of BW: 3 MHz(16QAM) is	2.68	MHz	at	825.5/836.5/847.5	MHz
The 99% Bandwidth of BW: 5 MHz(QPSK) is	4.47	MHz	at	826.5/836.5/846.5	MHz
The 99% Bandwidth of BW: 5 MHz(16QAM) is	4.47	MHz	at	826.5	MHz
The 99% Bandwidth of BW: 10 MHz(QPSK) is	8.91	MHz	at	829.0	MHz
The 99% Bandwidth of BW: 10 MHz(16QAM) is	8.93	MHz	at	829.0	MHz

The 26dB Bandwidth of BW: 1.4 MHz(QPSK) is	1.27	MHz	at	848.3	MHz
The 26dB Bandwidth of BW: 1.4 MHz(16QAM) is	1.27	MHz	at	848.3	MHz
The 26dB Bandwidth of BW: 3 MHz(QPSK) is	2.95	MHz	at	825.5/836.5	MHz
The 26dB Bandwidth of BW: 3 MHz(16QAM) is	2.93	MHz	at	825.5/847.5	MHz
The 26dB Bandwidth of BW: 5 MHz(QPSK) is	4.93	MHz	at	826.5	MHz
The 26dB Bandwidth of BW: 5 MHz(16QAM) is	4.87	MHz	at	826.5	MHz
The 26dB Bandwidth of BW: 10 MHz(QPSK) is	9.73	MHz	at	829.0	MHz
The 26dB Bandwidth of BW: 10 MHz(16QAM) is	9.74	MHz	at	844.0	MHz

Uncertainty of Measurement Results	± 0.9	%(2σ)

Remarks :

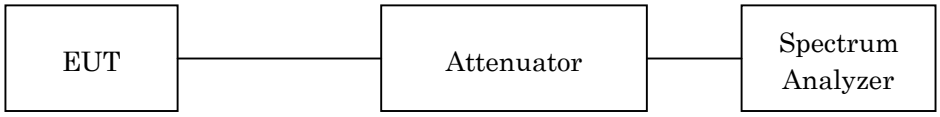
7.4.2 Test Instruments

Shielded Room S4				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Spectrum Analyzer	E4446A	US44300388 (A-39)	Agilent	2017/08/02
Attenuator	43KC-20	1418003 (D-41)	Anritsu	2017/07/10
RF Cable	SUCOFLEX102	14253/2 (C-52)	HUBER+SUHNER	2017/08/02

NOTE : The calibration interval of the above test instruments is 12 months.

7.4.3 Test Method and Test Setup (Diagrammatic illustration)

The test system is shown as follows:



The setting of the spectrum analyzer are shown as follows:

LTE Bandwidth	**1.4 MHz**	**3 MHz**	**5 MHz**	**10 MHz**
Res. Bandwidth	20 kHz	30 kHz	51 kHz	100 kHz
Video Bandwidth	62 kHz	100 kHz	160 kHz	300 kHz
Span	3 MHz	6 MHz	10 MHz	20 MHz
Sweep Time	AUTO	AUTO	AUTO	AUTO
Trace	Maxhold	Maxhold	Maxhold	Maxhold

7.4.4 Test Data

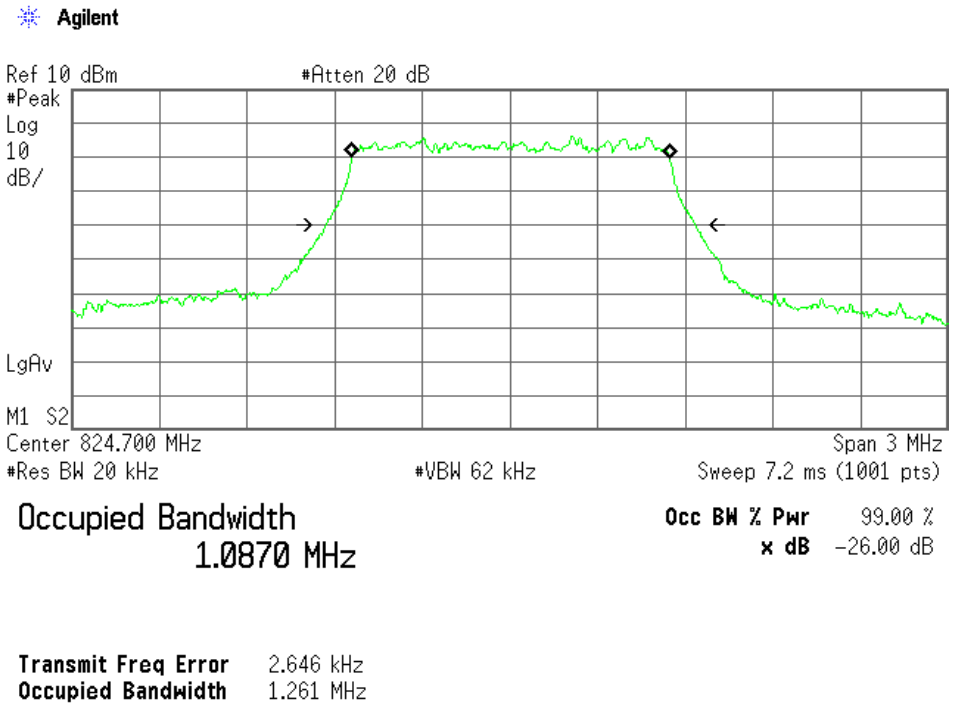
The resolution bandwidth was set to about 1 – 5 % of emission bandwidth, -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

Test Date :August 21, 2016
Temp.:26°C, Humi:68%

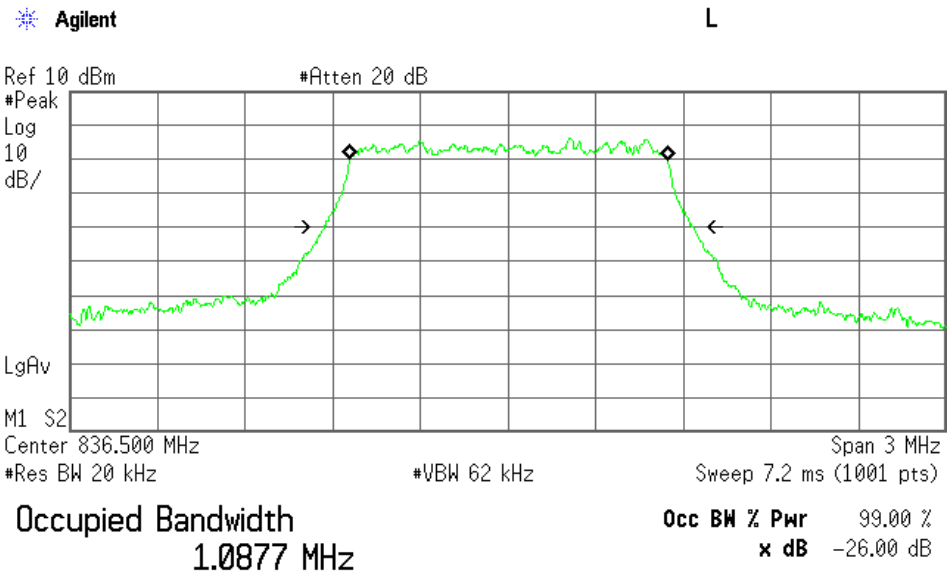
1-1) BW 1.4MHz(Full RB)
Mode: QPSK

Channel	Frequency (MHz)	99% Bandwidth (MHz)	-26dBc Bandwidth (MHz)
20407	824.70	1.09	1.26
20525	836.50	1.09	1.26
20643	848.30	1.09	1.27

Low Channel

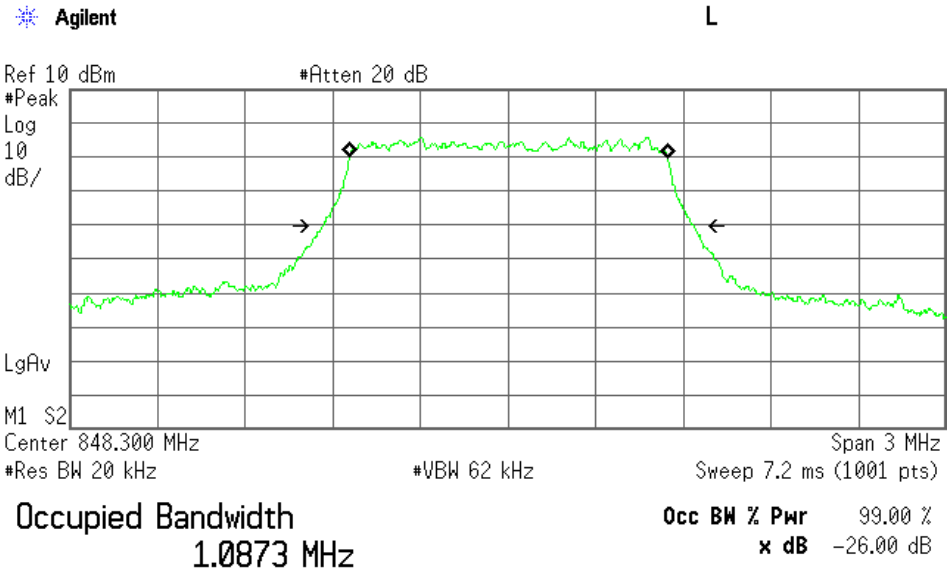


Middle Channel



Transmit Freq Error	2.512 kHz
Occupied Bandwidth	1.263 MHz

High Channel

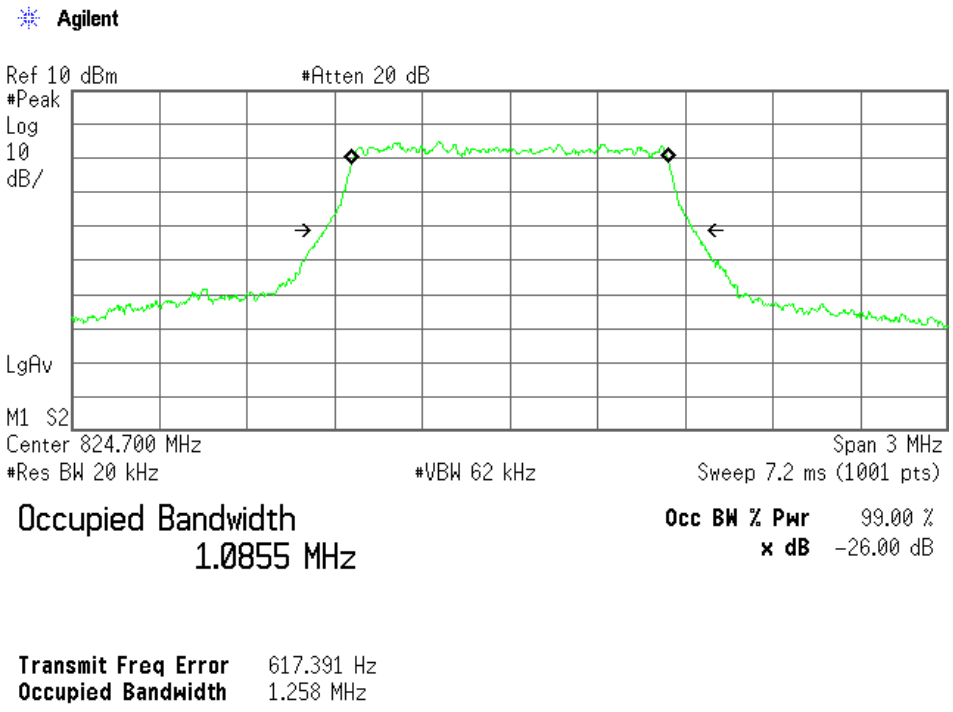


Transmit Freq Error	1.717 kHz
Occupied Bandwidth	1.268 MHz

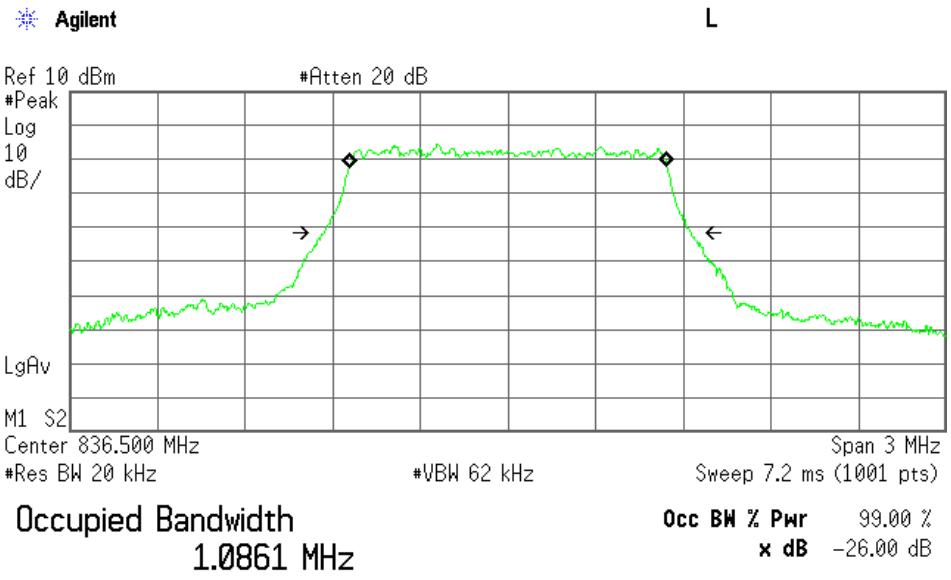
1-2) BW 1.4MHz(Full RB)
Mode: 16QAM

Channel	Frequency (MHz)	99% Bandwidth (MHz)	-26dBc Bandwidth (MHz)
20407	824.70	1.09	1.26
20525	836.50	1.09	1.26
20643	848.30	1.09	1.27

Low Channel

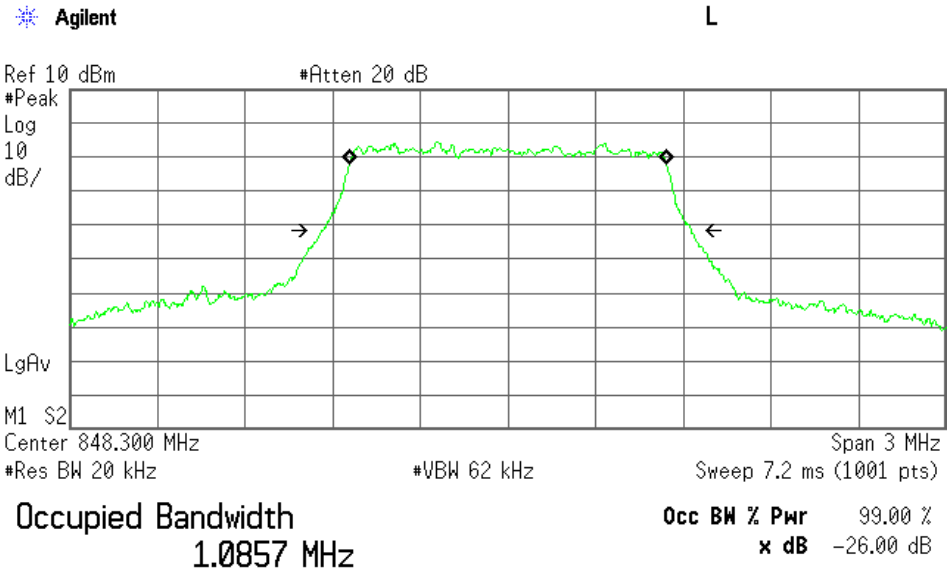


Middle Channel



Transmit Freq Error -150.104 Hz
Occupied Bandwidth 1.259 MHz

High Channel

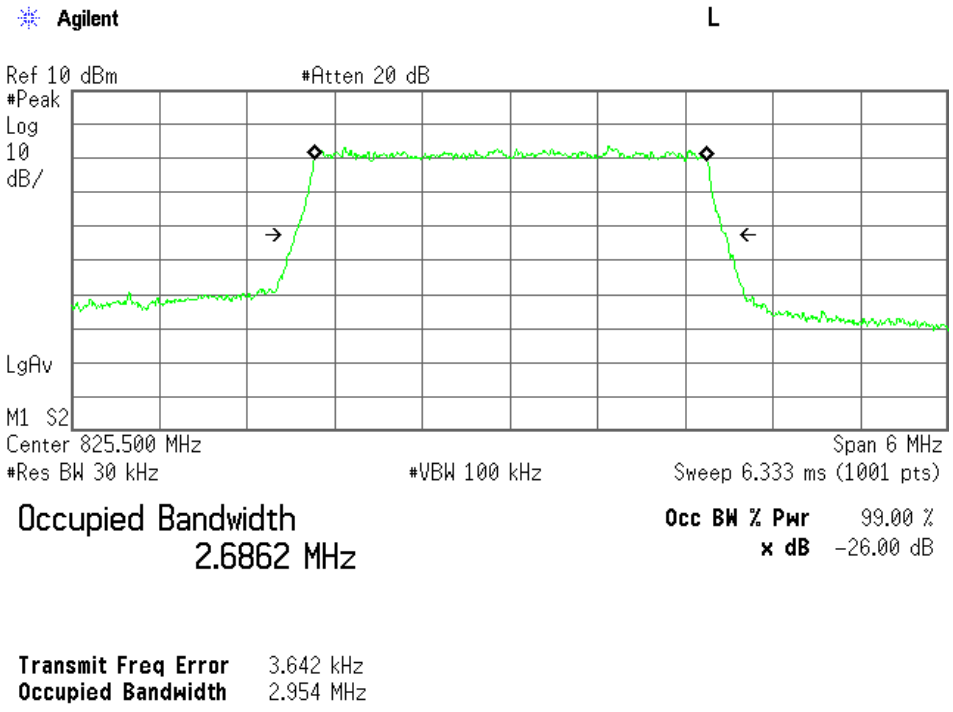


Transmit Freq Error -902.905 Hz
Occupied Bandwidth 1.266 MHz

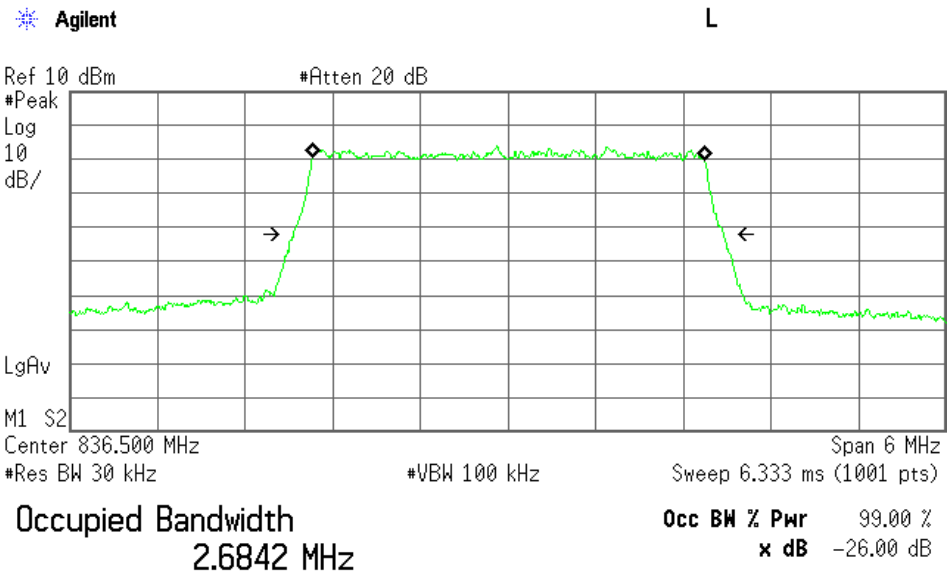
2-1) BW 3MHz(Full RB)
Mode: QPSK

Channel	Frequency (MHz)	99% Bandwidth (MHz)	-26dBc Bandwidth (MHz)
20415	825.50	2.69	2.95
20525	836.50	2.68	2.95
20635	847.50	2.68	2.94

Low Channel

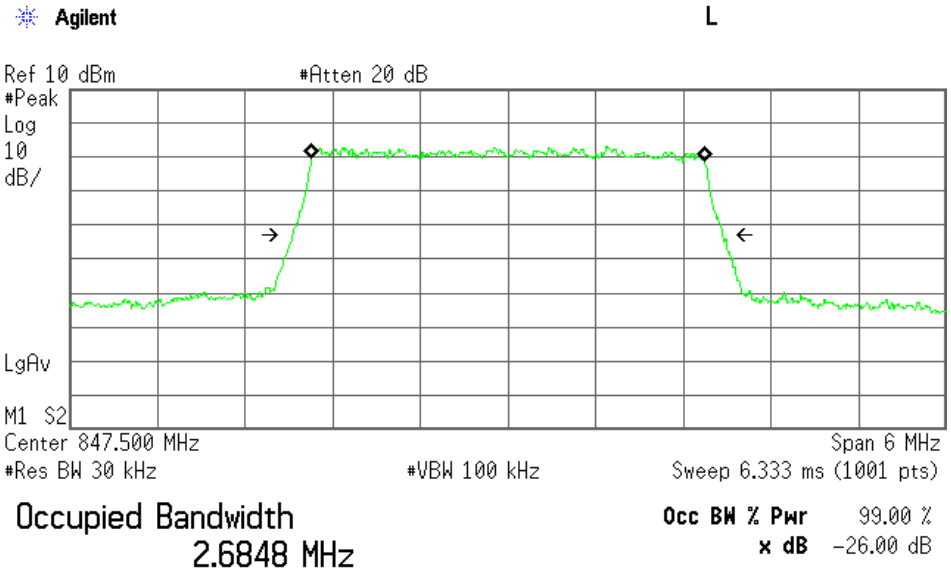


Middle Channel



Transmit Freq Error 3.021 kHz
Occupied Bandwidth 2.945 MHz

High Channel

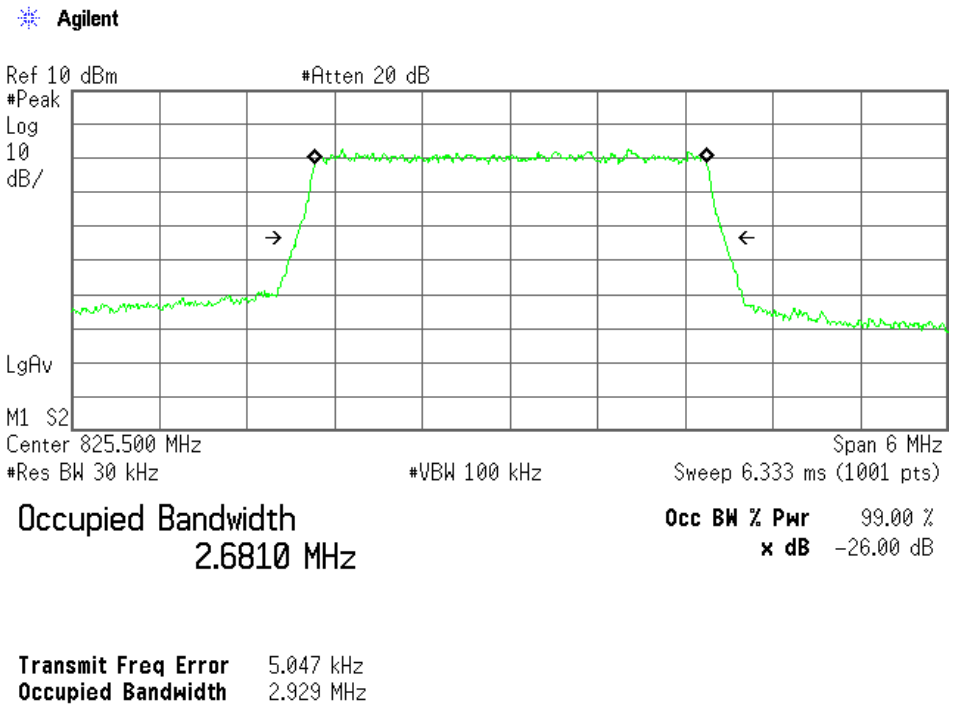


Transmit Freq Error 465.941 Hz
Occupied Bandwidth 2.943 MHz

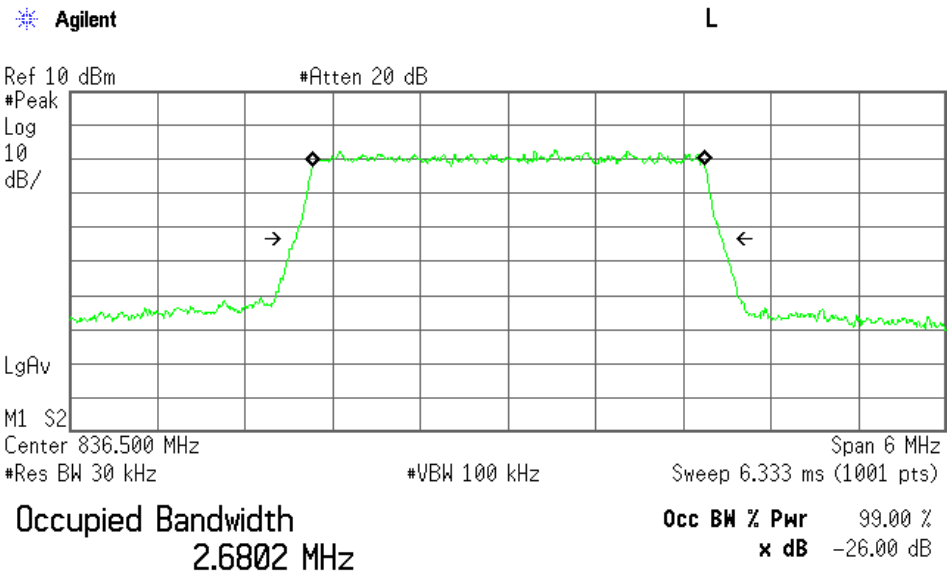
2-2) BW 3MHz(Full RB)
Mode: 16QAM

Channel	Frequency (MHz)	99% Bandwidth (MHz)	-26dBc Bandwidth (MHz)
20415	825.50	2.68	2.93
20525	836.50	2.68	2.92
20635	847.50	2.68	2.93

Low Channel

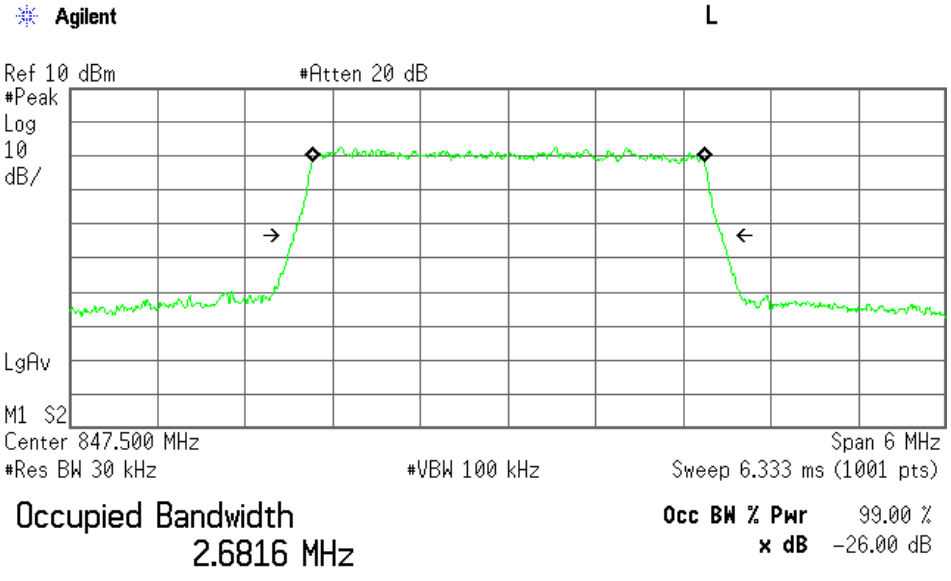


Middle Channel



Transmit Freq Error 3.792 kHz
Occupied Bandwidth 2.921 MHz

High Channel

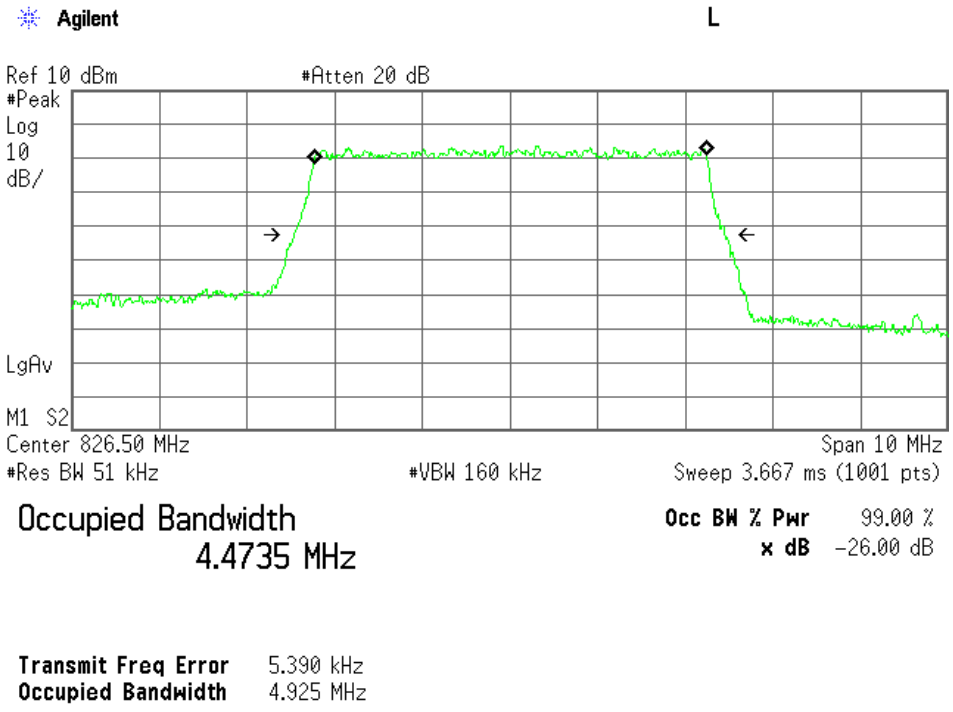


Transmit Freq Error 1.617 kHz
Occupied Bandwidth 2.930 MHz

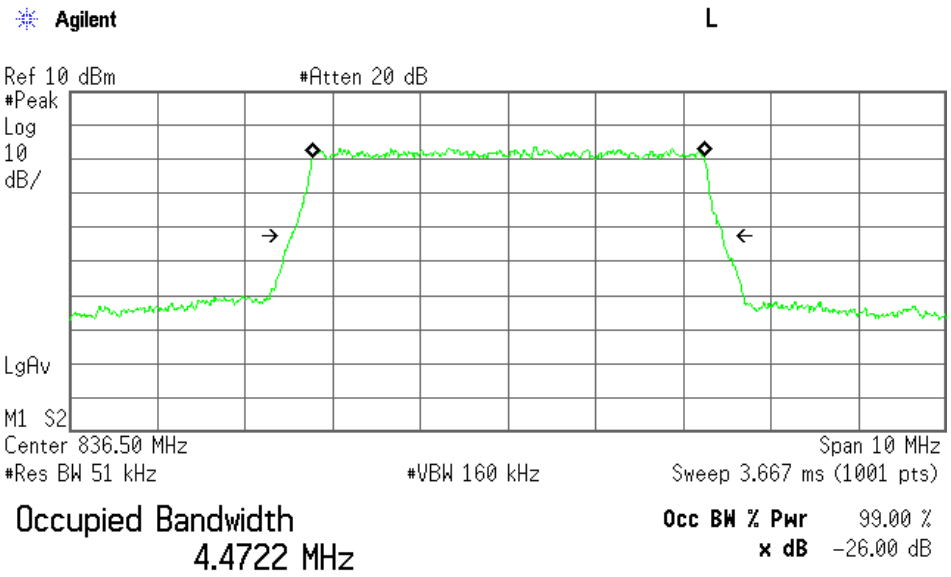
3-1) BW 5MHz(Full RB)
Mode: QPSK

Channel	Frequency (MHz)	99% Bandwidth (MHz)	-26dBc Bandwidth (MHz)
20425	826.50	4.47	4.93
20525	836.50	4.47	4.91
20625	846.50	4.47	4.89

Low Channel

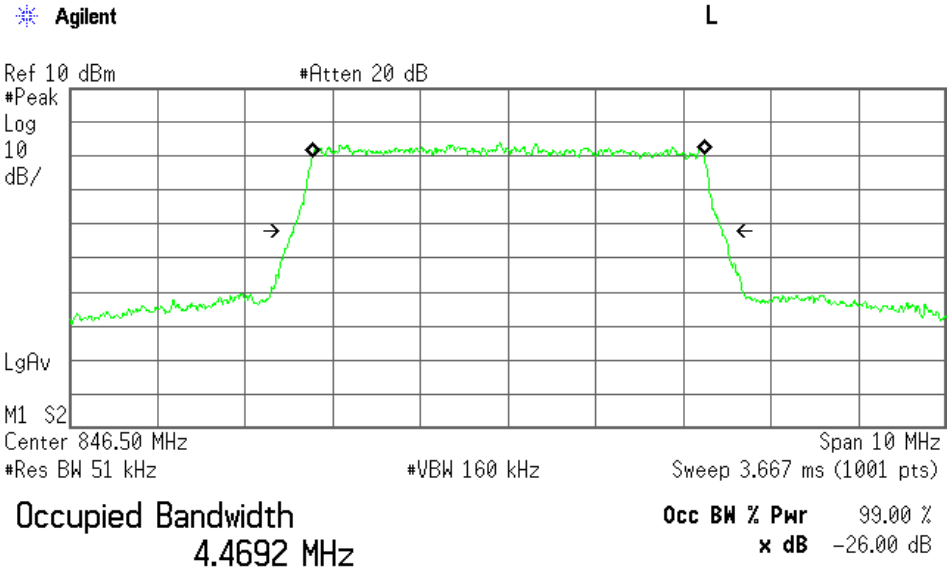


Middle Channel



Transmit Freq Error 4.138 kHz
Occupied Bandwidth 4.912 MHz

High Channel

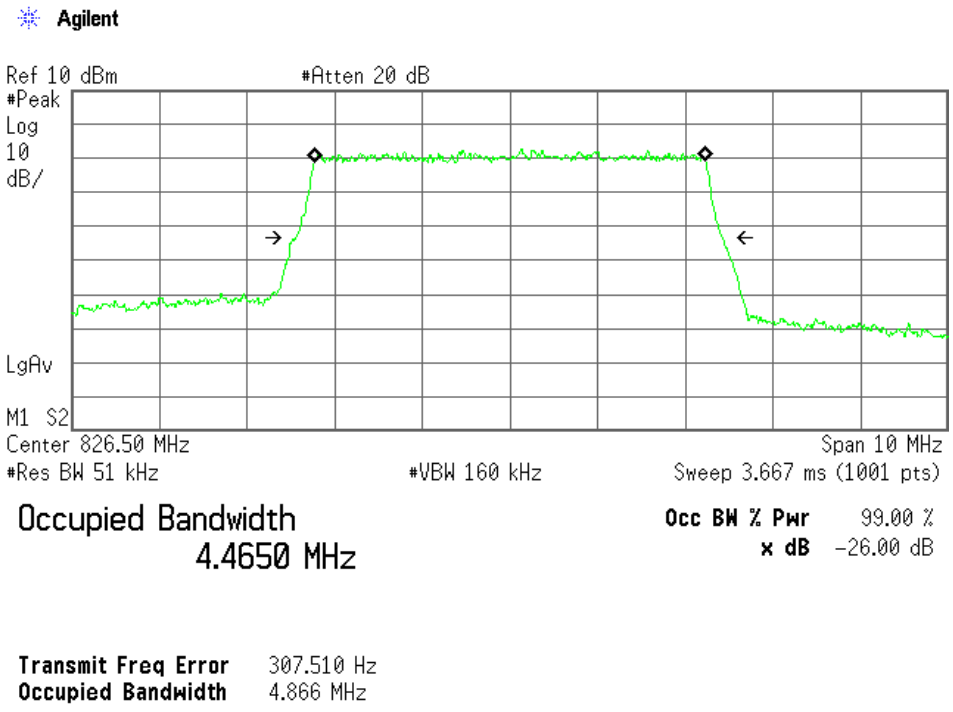


Transmit Freq Error 905.753 Hz
Occupied Bandwidth 4.890 MHz

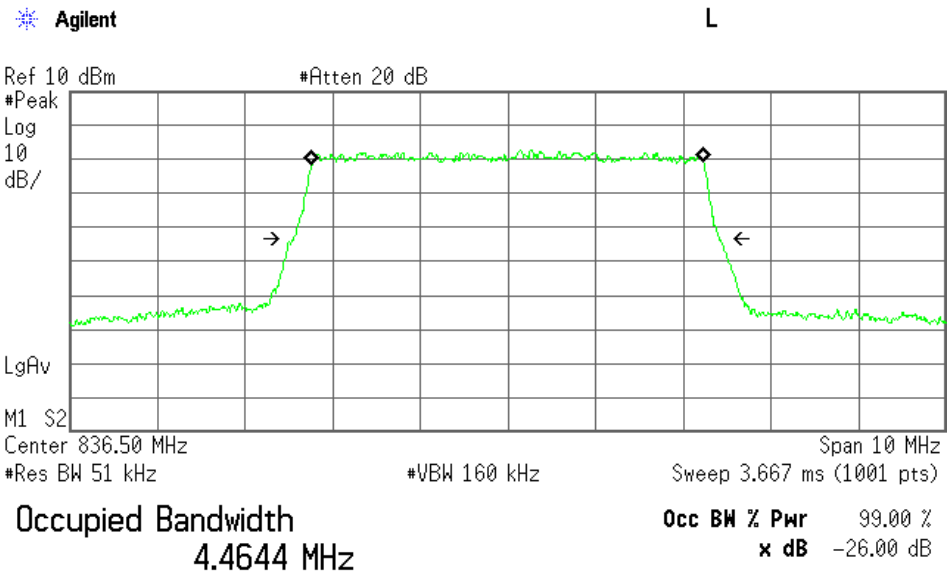
3-2) BW 5MHz(Full RB)
Mode: 16QAM

Channel	Frequency (MHz)	99% Bandwidth (MHz)	-26dBc Bandwidth (MHz)
20425	826.50	4.47	4.87
20525	836.50	4.46	4.86
20625	846.50	4.46	4.85

Low Channel

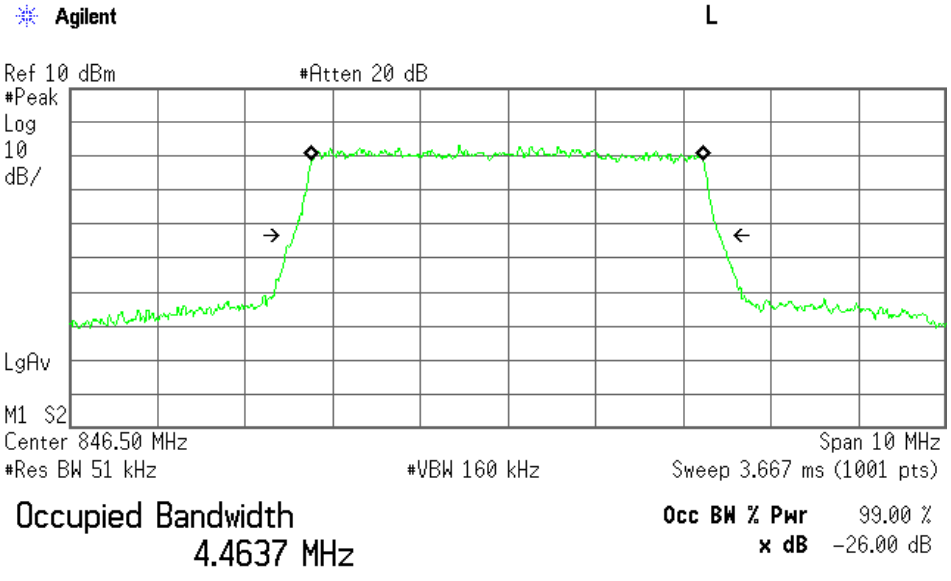


Middle Channel



Transmit Freq Error -3.348 kHz
Occupied Bandwidth 4.860 MHz

High Channel

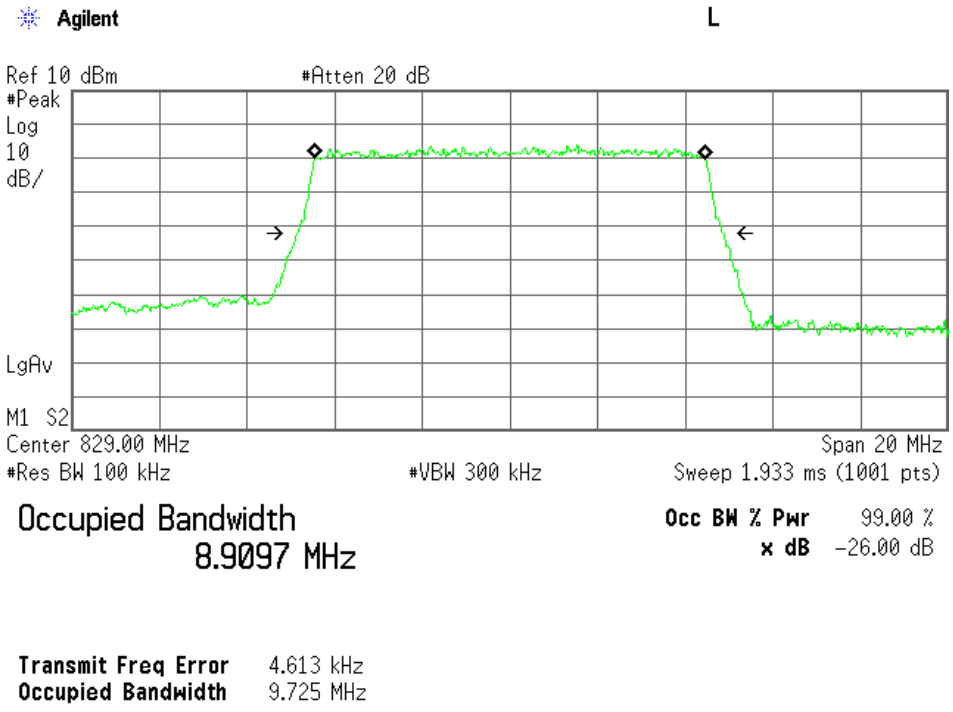


Transmit Freq Error -6.162 kHz
Occupied Bandwidth 4.852 MHz

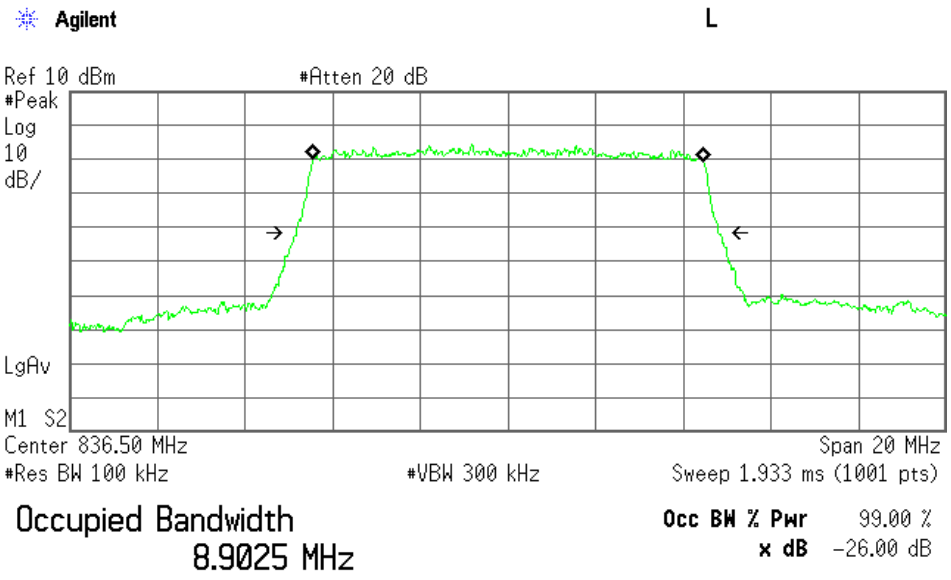
4-1) BW 10MHz(Full RB)
Mode: QPSK

Channel	Frequency (MHz)	99% Bandwidth (MHz)	-26dBc Bandwidth (MHz)
20450	829.00	8.91	9.73
20525	836.50	8.90	9.63
20600	844.00	8.90	9.71

Low Channel

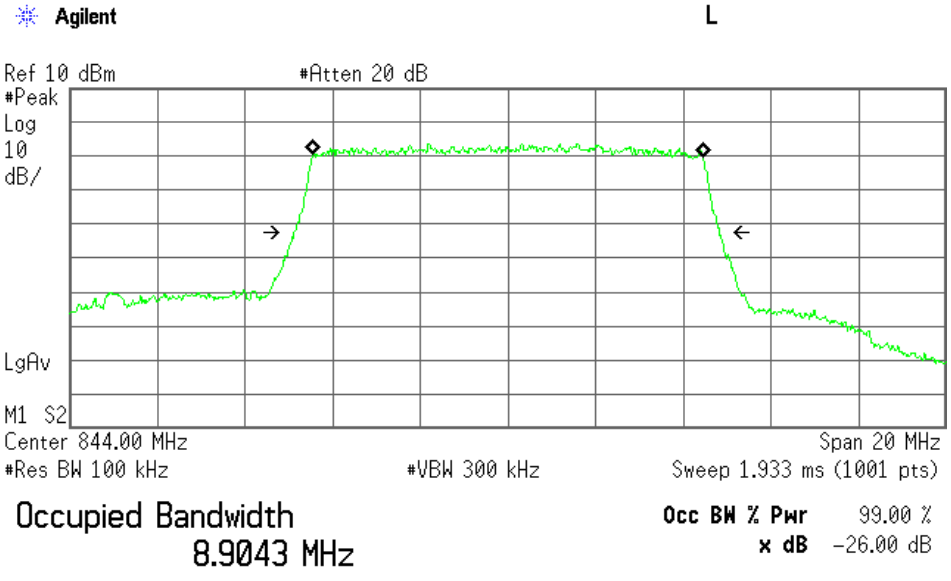


Middle Channel



Transmit Freq Error 2.900 kHz
Occupied Bandwidth 9.633 MHz

High Channel

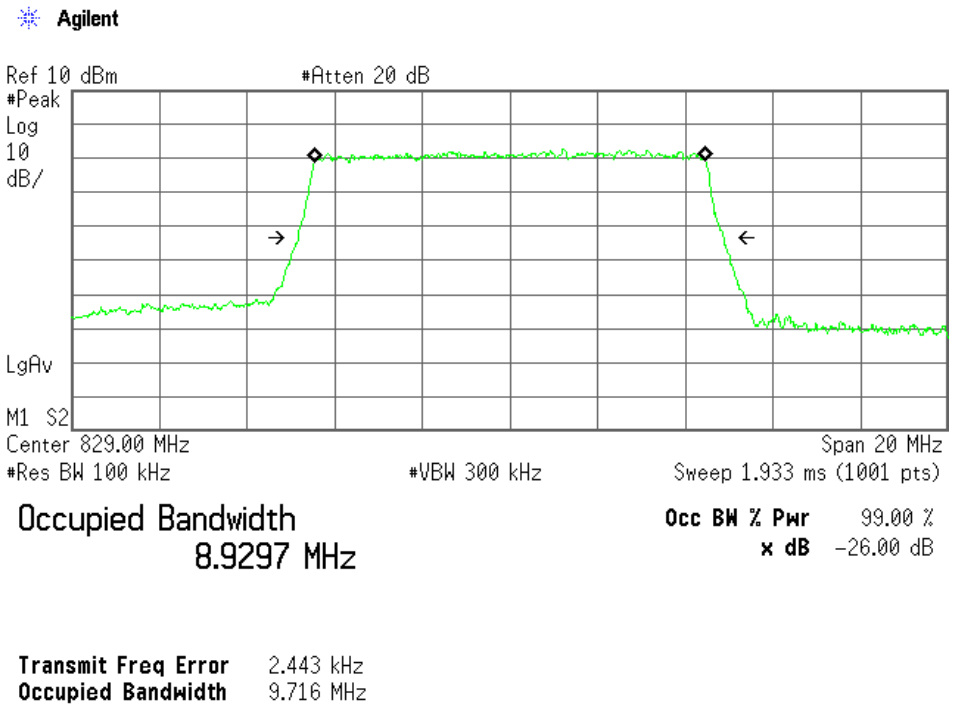


Transmit Freq Error -8.222 kHz
Occupied Bandwidth 9.712 MHz

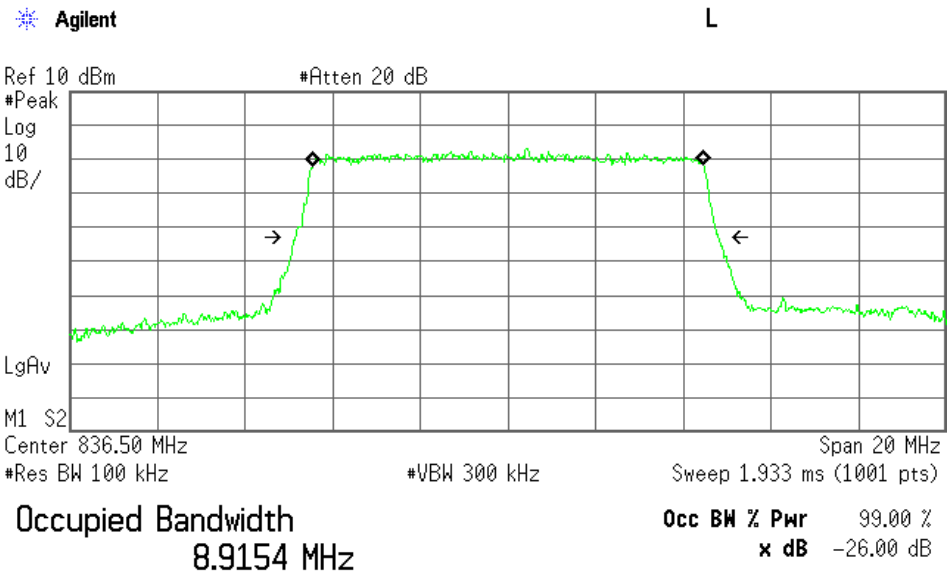
4-2) BW 10MHz(Full RB)
Mode: 16QAM

Channel	Frequency (MHz)	99% Bandwidth (MHz)	-26dBc Bandwidth (MHz)
20450	829.00	8.93	9.72
20525	836.50	8.92	9.65
20600	844.00	8.91	9.74

Low Channel

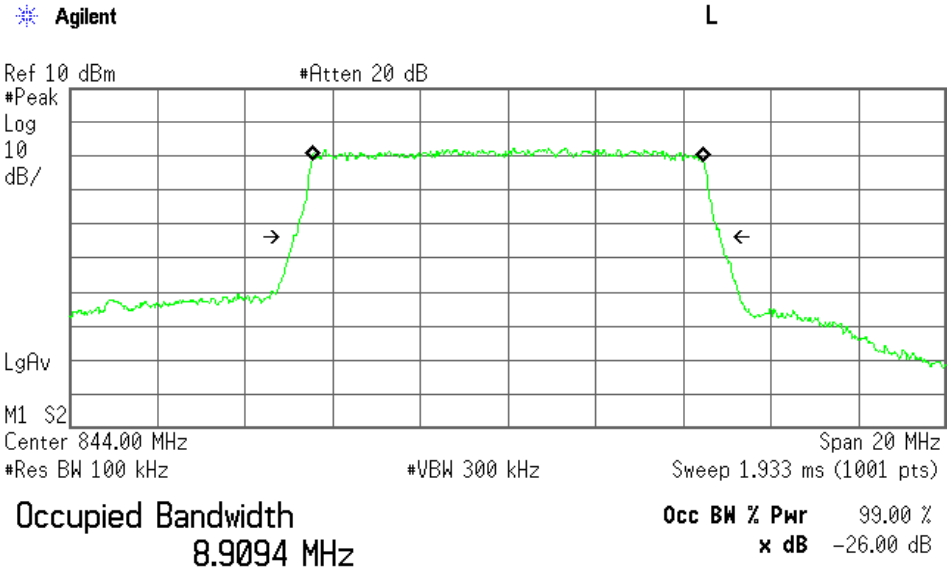


Middle Channel



Transmit Freq Error	-803.834 Hz
Occupied Bandwidth	9.651 MHz

High Channel



Transmit Freq Error	-4.480 kHz
Occupied Bandwidth	9.737 MHz

7.5 Spurious Emissions at Antenna Terminals (§2.1051)

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.5.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

Min. Limit Margin >34.8 dB at 8365/8440/8465 MHz
at 8475/8483 MHz

Uncertainty of Measurement Results

9 kHz – 1 GHz	± 1.4	dB(2σ)
1 GHz – 18 GHz	± 1.7	dB(2σ)
18 GHz – 40 GHz	± 2.3	dB(2σ)

Remarks :

7.5.2 Test Instruments

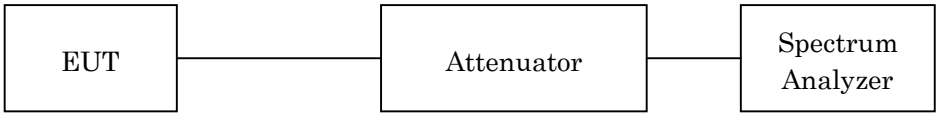
Shielded Room S4				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Spectrum Analyzer	E4446A	US44300388 (A-39)	Agilent	2017/08/02
Attenuator	43KC-20	1418003 (D-41)	Anritsu	2017/07/10
RF Cable	SUCOFLEX102	14253/2 (C-52)	HUBER+SUHNER	2017/08/02
High Pass Filter	HPM50108	010 (D-94)	MICRO-TRONICS	2017/02/17

NOTE : The calibration interval of the above test instruments is 12 months.

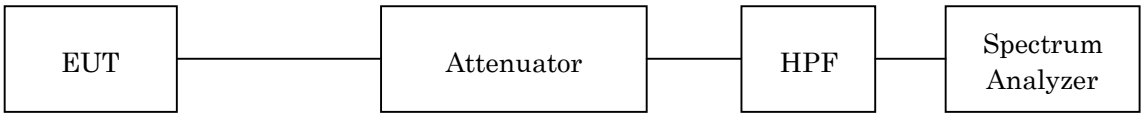
7.5.3 Test Method and Test Setup (Diagrammatic illustration)

The Antenna Conducted Emission was measured with a spectrum analyzer. The test system is shown as follows:

a) Frequency Range: 9 kHz – 1.2 GHz



b) Frequency Range: 1.2 GHz – 10 GHz



The setting of the spectrum analyzer are shown as follows:

Frequency Range	9 kHz - 150 kHz	150 kHz - 30 MHz	30 MHz - 10 GHz
Res. Bandwidth	200 Hz	10 kHz	1 MHz
Video Bandwidth	1 kHz	30 kHz	3 MHz
Sweep Time	AUTO	AUTO	AUTO
Trace	Maxhold	Maxhold	Maxhold

7.5.4 Test Data

1) BW 1.4MHz(1RB)

(LTE 1.4MHz)

Test Date: August 21, 2016
Temp.: 26 °C, Humi: 68 %

Transmitting Frequency CH	[MHz]	Measured Frequency [MHz]	Corr. Factor [dB]	Meter Readings [dBm]	Limits [dBm]	Results [dBm]	Margin [dB]	Remarks
20407	824.700	1649.400	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		2474.100	21.3	< -70.0	-13.0	< -48.7	> +35.7	C
		3298.800	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4123.500	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4948.200	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		5772.900	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		6597.600	21.8	< -70.0	-13.0	< -48.2	> +35.2	C
		7422.300	21.9	< -70.0	-13.0	< -48.1	> +35.1	C
		8247.000	22.1	< -70.0	-13.0	< -47.9	> +34.9	C
20525	836.500	1673.000	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		2509.500	21.2	< -70.0	-13.0	< -48.8	> +35.8	C
		3346.000	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4182.500	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		5019.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		5855.500	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		6692.000	21.8	< -70.0	-13.0	< -48.2	> +35.2	C
		7528.500	22.0	< -70.0	-13.0	< -48.0	> +35.0	C
		8365.000	22.2	< -70.0	-13.0	< -47.8	> +34.8	C
20643	848.300	1696.600	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		2544.900	21.2	< -70.0	-13.0	< -48.8	> +35.8	C
		3393.200	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4241.500	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		5089.800	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		5938.100	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		6786.400	21.8	< -70.0	-13.0	< -48.2	> +35.2	C
		7634.700	22.0	< -70.0	-13.0	< -48.0	> +35.0	C
		8483.000	22.2	< -70.0	-13.0	< -47.8	> +34.8	C

Calculated result at 8365.0 MHz, as the worst point shown on underline:

	Corr. Factor	=	22.2 dB
+)	Meter Reading	=	<-70.0 dBm
	Result	=	<-47.8 dBm

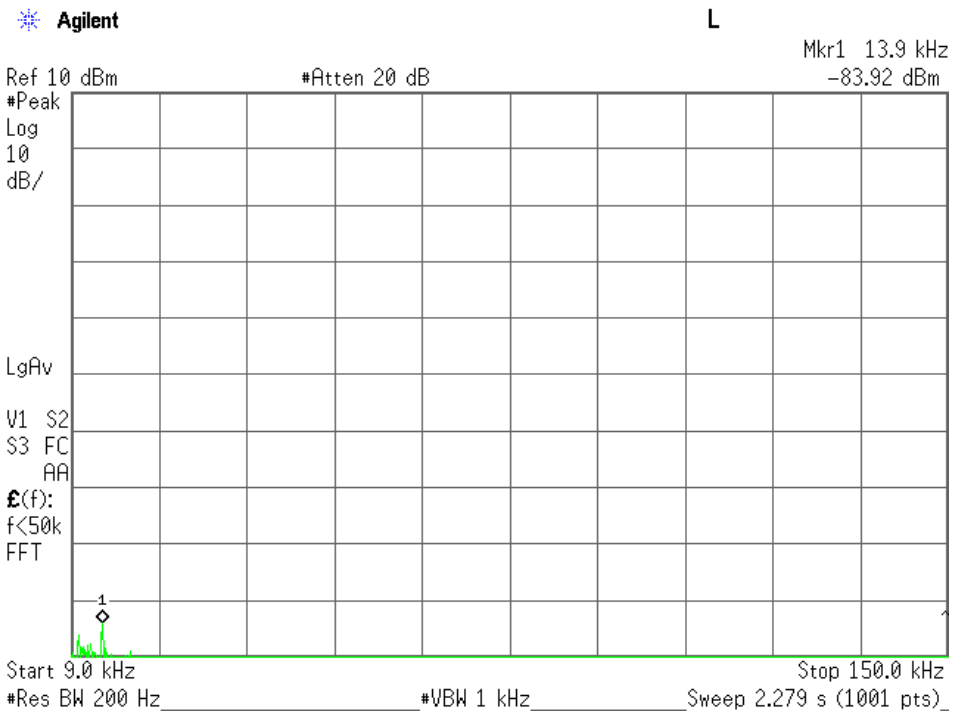
Minimum Margin: -13.0 - (<-47.8) = >34.8 (dB)

NOTES

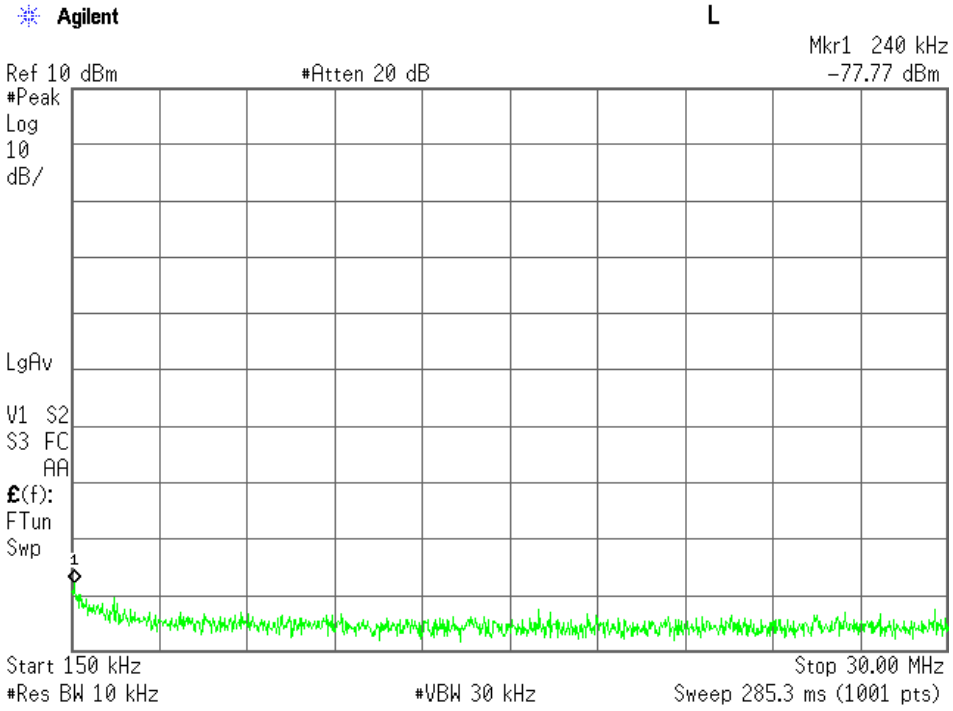
1. The spectrum was checked from 9 kHz to 10 GHz.
2. Applied limits : -13.0 [dBm] = 10log(TP[mW]) - (43 + 10log(tp[W])) = 10log(TP[mW]) - (43 + (10 log(TP[mW]) - 30))
   where, tp[W] = TP[mW] / 1000 : Transmitter power at anttena terminal
3. The correction factor is shown as follows:
   Corr. Factor [dB] = Cable Loss + Pad Att. [dB] (9 kHz - 1.2 GHz)
   Corr. Factor [dB] = Cable Loss + Pad Att. + High Pass Filter Loss [dB] (over 1.2 GHz)
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. Setting of measuring instrument(s) :

	Detector Function	RES B.W.	V.B.W.	Sweep Time
A	Peak	200 Hz	1 kHz	AUTO
B	Peak	10 kHz	30 kHz	AUTO
C	Peak	1 MHz	3 MHz	AUTO

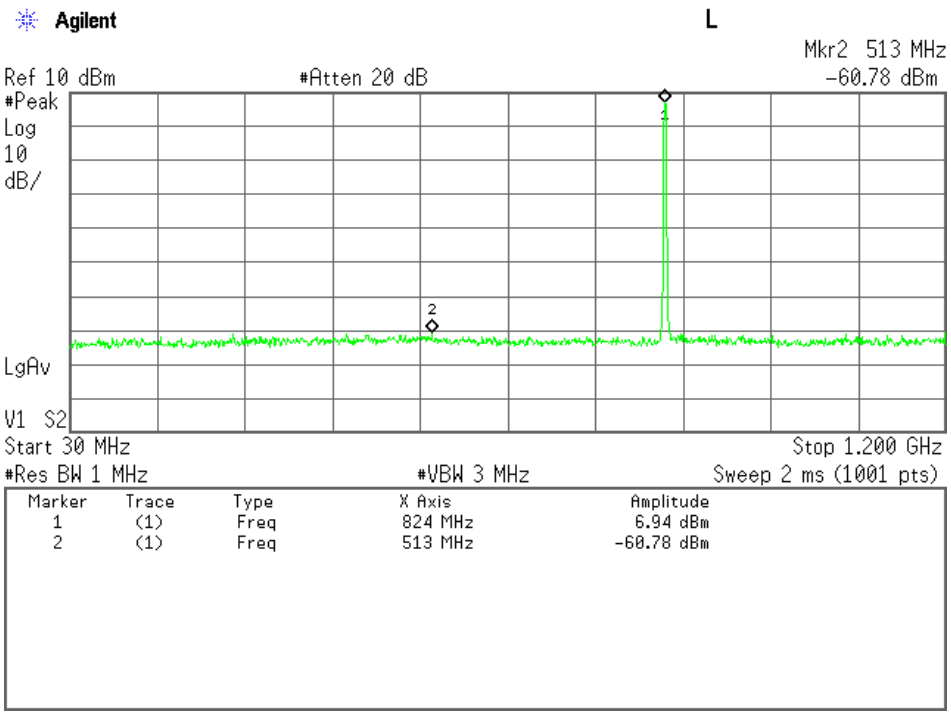
Low Channel, Out-Of-Band Emissions (9 kHz – 150 kHz)



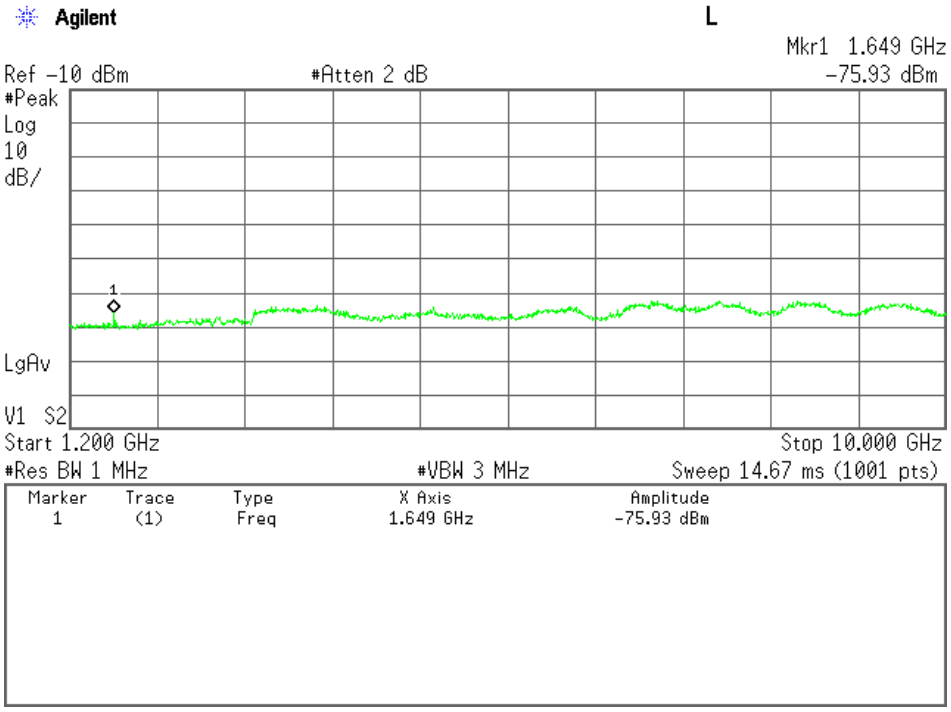
Low Channel, Out-Of-Band Emissions (150 kHz – 30 MHz)



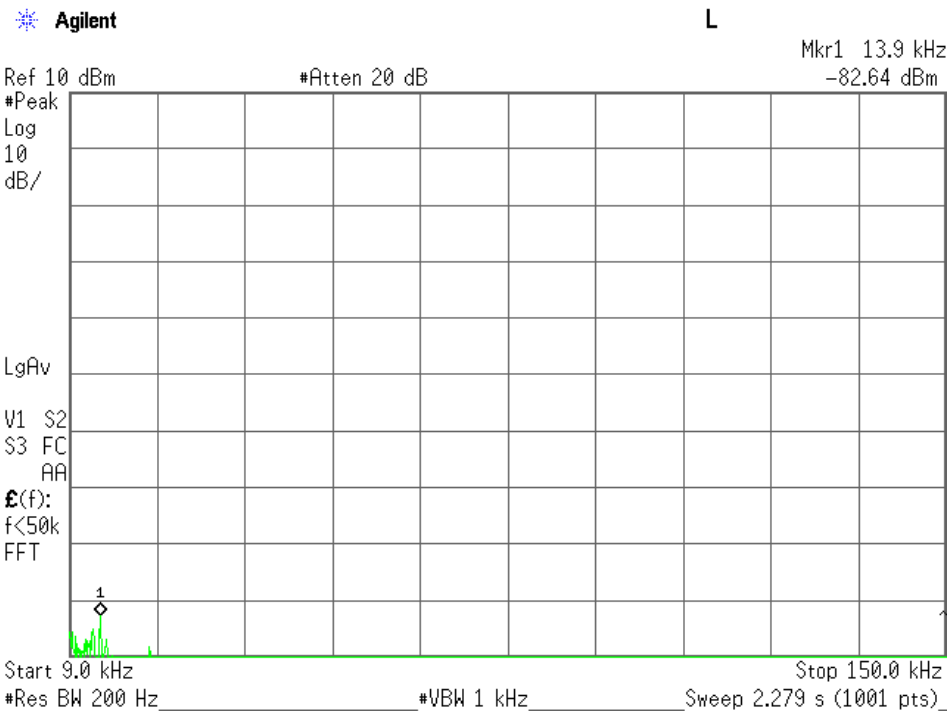
Low Channel, Out-Of-Band Emissions (30 MHz – 1.2 GHz)



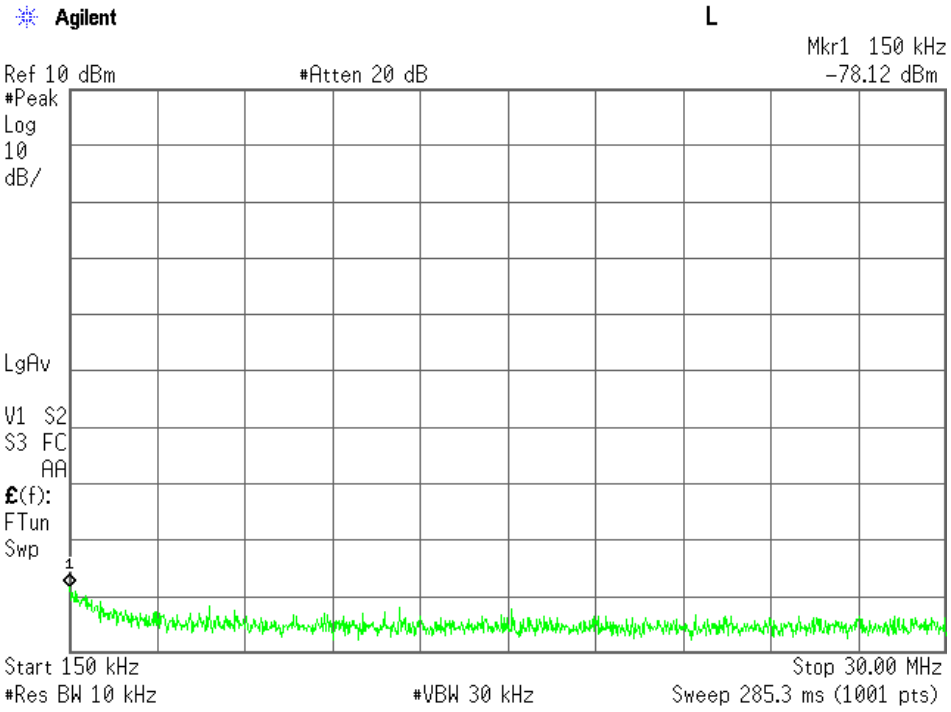
Low Channel, Out-Of-Band Emissions (1.2 GHz – 10 GHz)



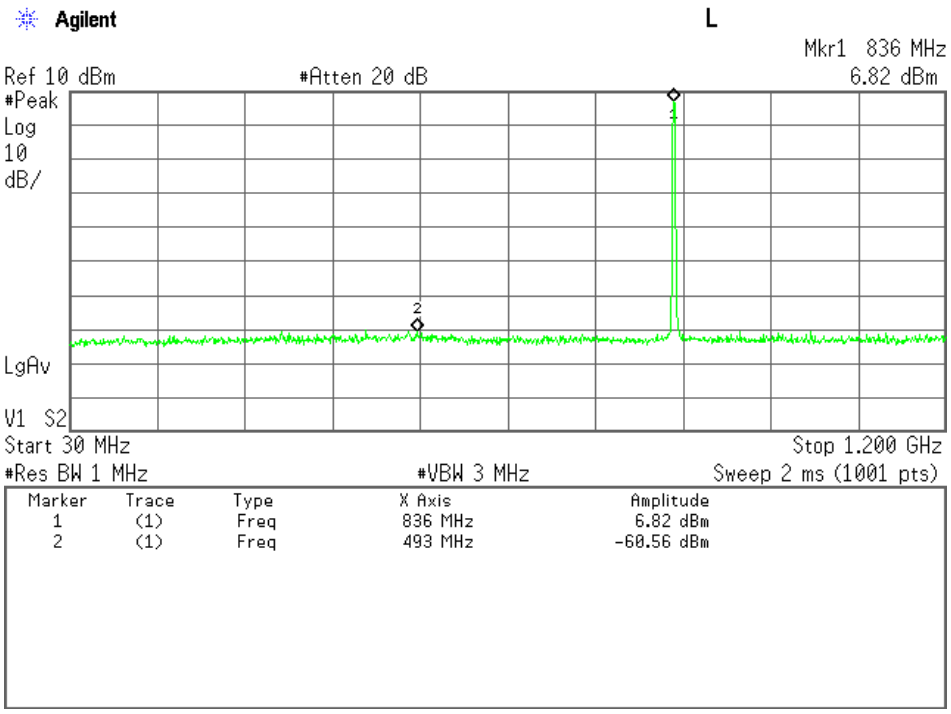
Middle Channel, Out-Of-Band Emissions (9 kHz – 150 kHz)



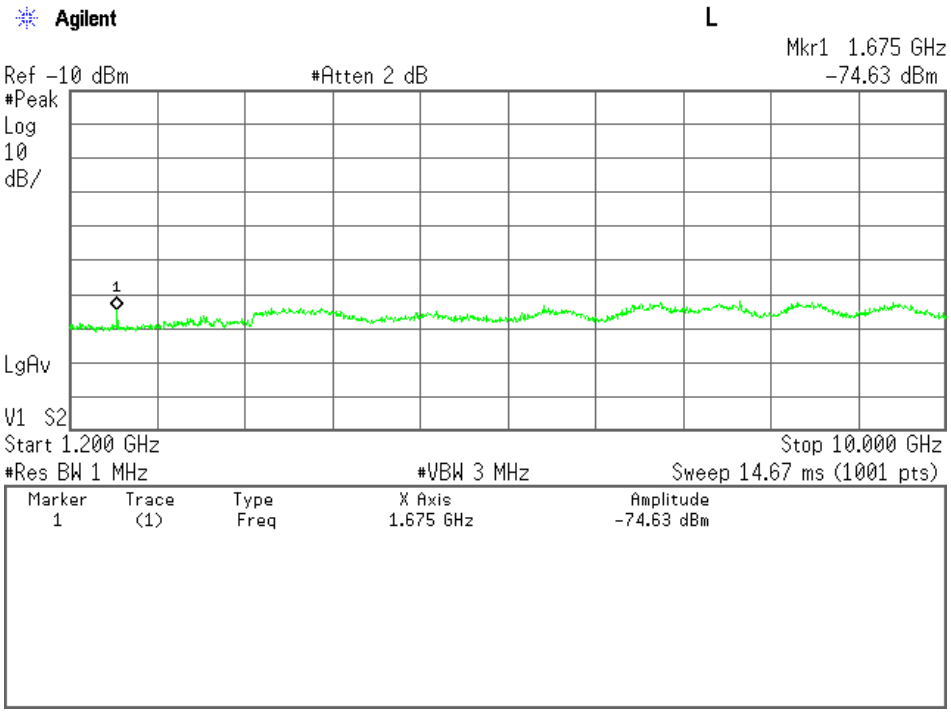
Middle Channel, Out-Of-Band Emissions (150 kHz – 30 MHz)



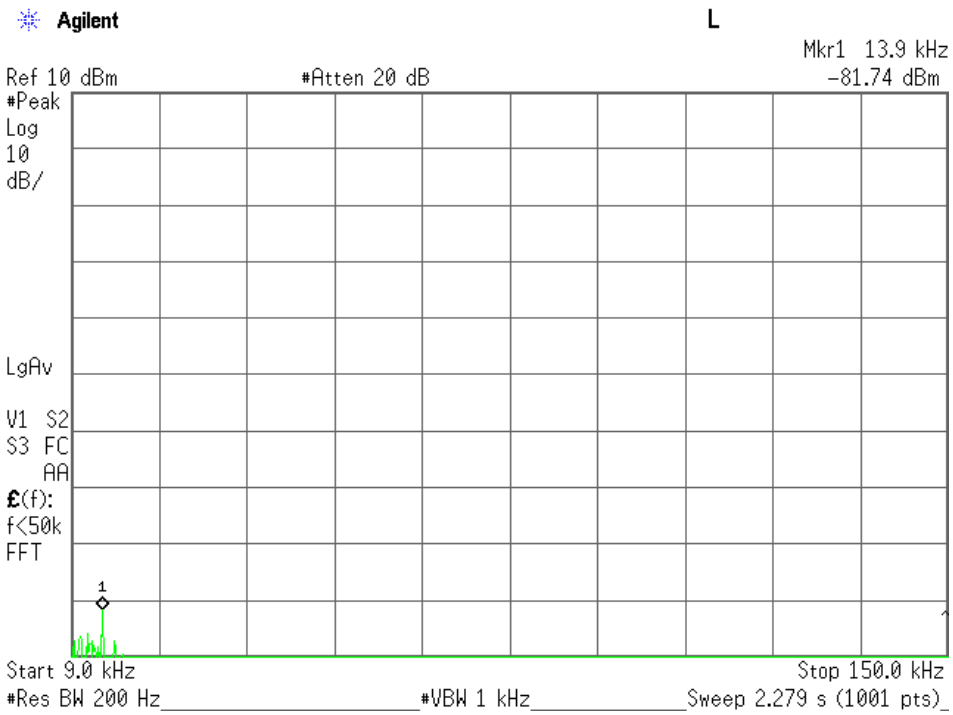
Middle Channel, Out-Of-Band Emissions (30 MHz – 1.2 GHz)



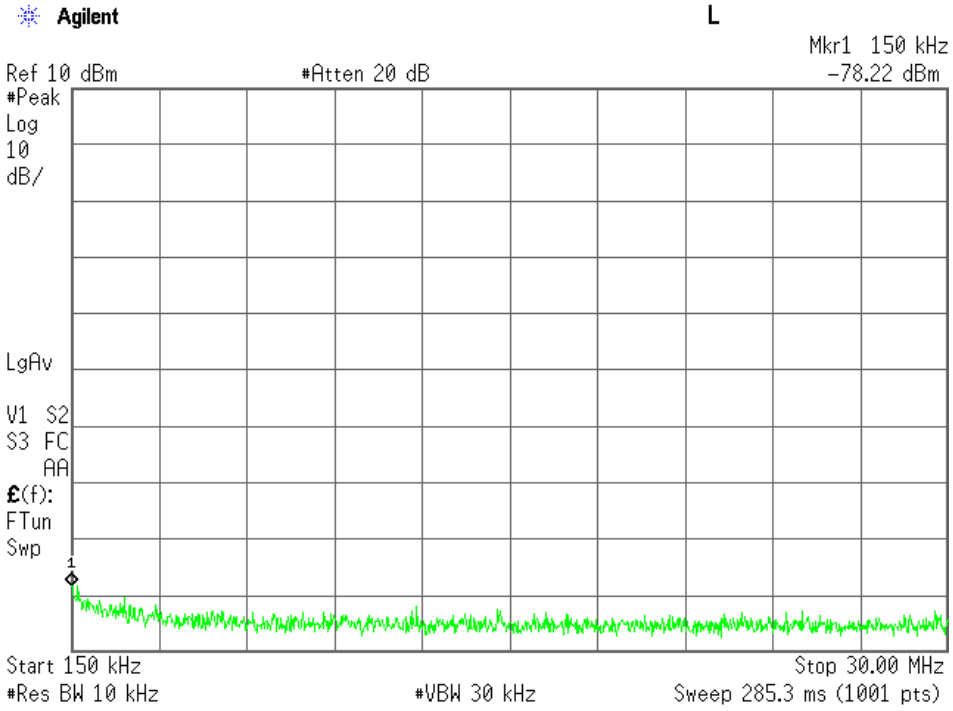
Middle Channel, Out-Of-Band Emissions (1.2 GHz – 10 GHz)



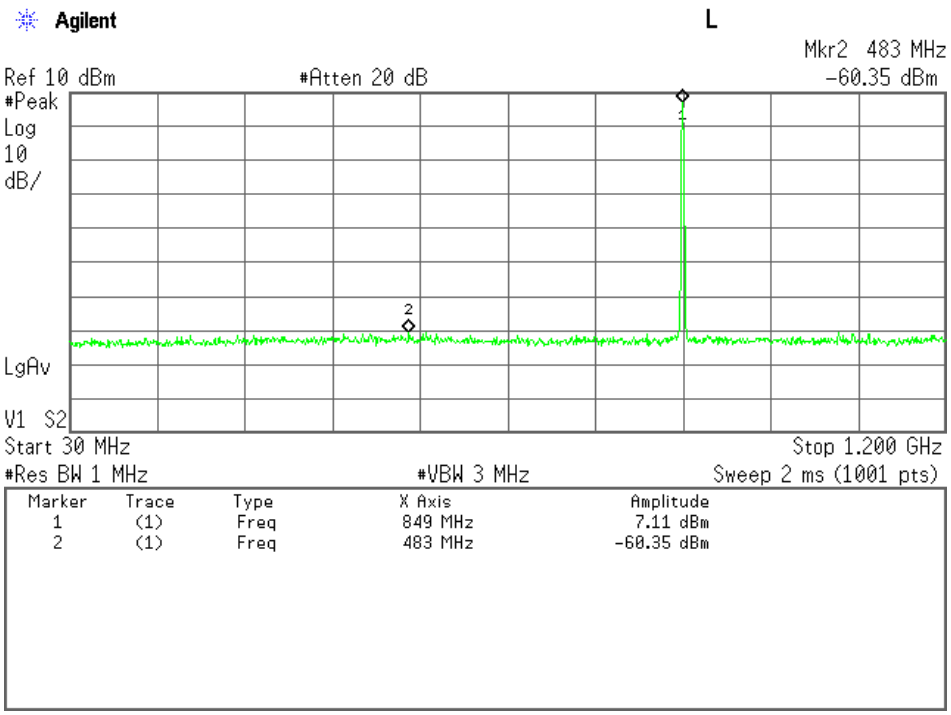
High Channel, Out-Of-Band Emissions (9 kHz – 150 kHz)



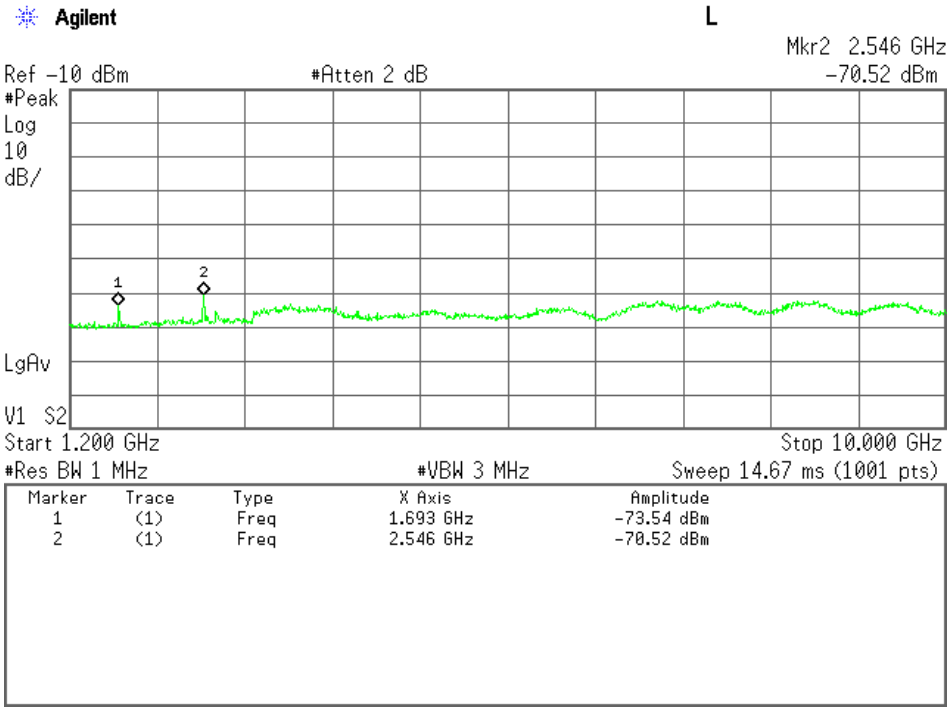
High Channel, Out-Of-Band Emissions (150 kHz – 30 MHz)



High Channel, Out-Of-Band Emissions (30 MHz – 1.2 GHz)



High Channel, Out-Of-Band Emissions (1.2 GHz – 10 GHz)



2) BW 3MHz(1RB)

(LTE 3MHz)

Test Date: August 21, 2016
Temp.: 26 °C, Humi: 68 %

Transmitting Frequency CH	[MHz]	Measured Frequency [MHz]	Corr. Factor [dB]	Meter Readings [dBm]	Limits [dBm]	Results [dBm]	Margin [dB]	Remarks
20415	825.500	1651.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		2476.500	21.3	< -70.0	-13.0	< -48.7	> +35.7	C
		3302.000	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4127.500	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4953.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		5778.500	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		6604.000	21.8	< -70.0	-13.0	< -48.2	> +35.2	C
		7429.500	21.9	< -70.0	-13.0	< -48.1	> +35.1	C
		8255.000	22.1	< -70.0	-13.0	< -47.9	> +34.9	C
20525	836.500	1673.000	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		2509.500	21.2	< -70.0	-13.0	< -48.8	> +35.8	C
		3346.000	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4182.500	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		5019.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		5855.500	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		6692.000	21.8	< -70.0	-13.0	< -48.2	> +35.2	C
		7528.500	22.0	< -70.0	-13.0	< -48.0	> +35.0	C
		8365.000	22.2	< -70.0	-13.0	< -47.8	> +34.8	C
20635	847.500	1695.000	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		2542.500	21.2	< -70.0	-13.0	< -48.8	> +35.8	C
		3390.000	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4237.500	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		5085.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		5932.500	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		6780.000	21.8	< -70.0	-13.0	< -48.2	> +35.2	C
		7627.500	22.0	< -70.0	-13.0	< -48.0	> +35.0	C
		8475.000	22.2	< -70.0	-13.0	< -47.8	> +34.8	C

Calculated result at 8365.0 MHz, as the worst point shown on underline:

	Corr. Factor	=	22.2 dB
+)	Meter Reading	=	<-70.0 dBm
	Result	=	<-47.8 dBm

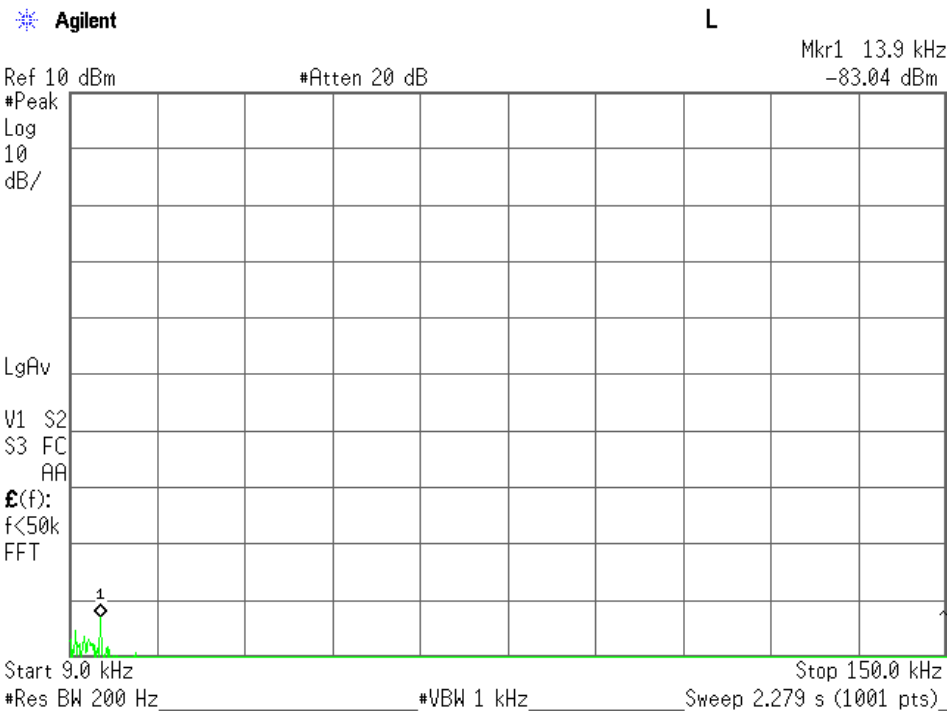
Minimum Margin: -13.0 - (<-47.8) = >34.8 (dB)

NOTES

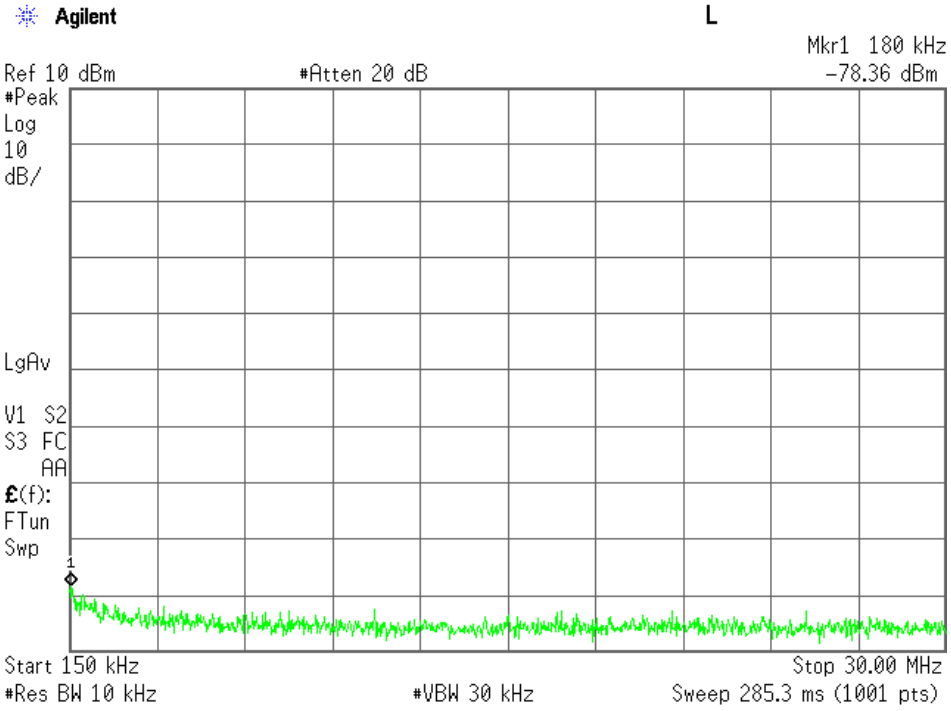
1. The spectrum was checked from 9 kHz to 10 GHz.
2. Applied limits : -13.0 [dBm] = 10log(TP[mW]) - (43 + 10log(tp[W])) = 10log(TP[mW]) - (43 + (10 log(TP[mW]) - 30))
   where, tp[W] = TP[mW] / 1000 : Transmitter power at anttena terminal
3. The correction factor is shown as follows:
   Corr. Factor [dB] = Cable Loss + Pad Att. [dB] (9 kHz - 1.2 GHz)
   Corr. Factor [dB] = Cable Loss + Pad Att. + High Pass Filter Loss [dB] (over 1.2 GHz)
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. Setting of measuring instrument(s) :

	Detector Function	RES B.W.	V.B.W.	Sweep Time
A	Peak	200 Hz	1 kHz	AUTO
B	Peak	10 kHz	30 kHz	AUTO
C	Peak	1 MHz	3 MHz	AUTO

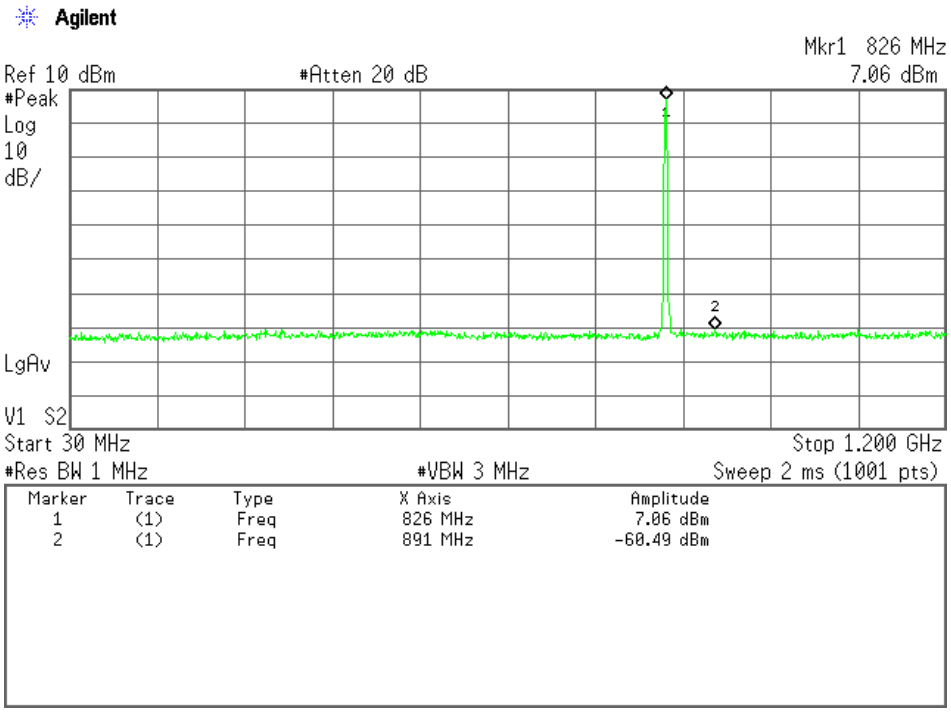
Low Channel, Out-Of-Band Emissions (9 kHz – 150 kHz)



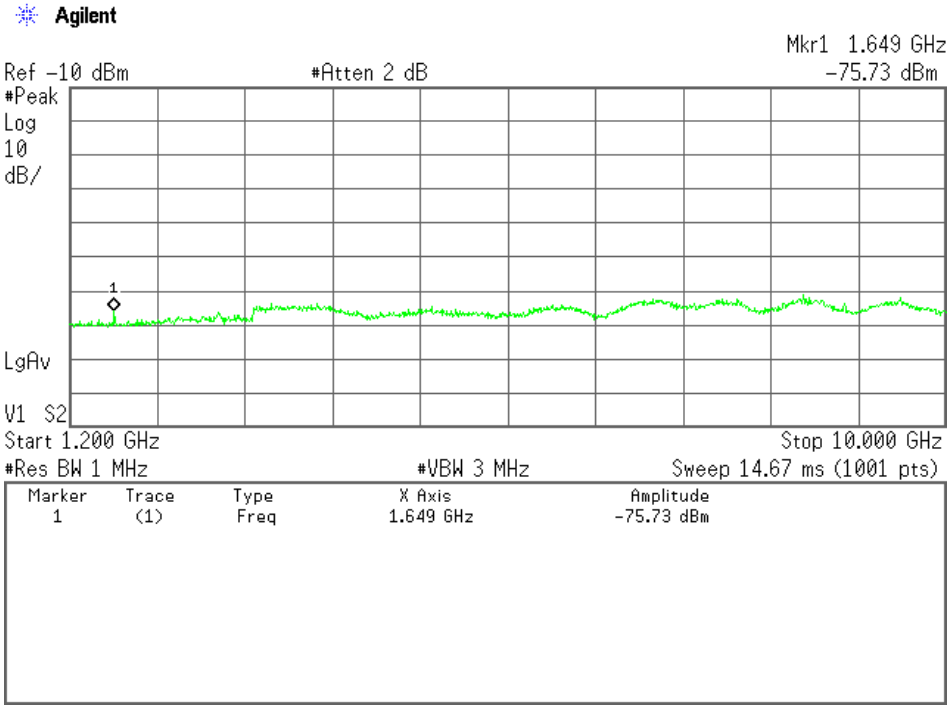
Low Channel, Out-Of-Band Emissions (150 kHz – 30 MHz)



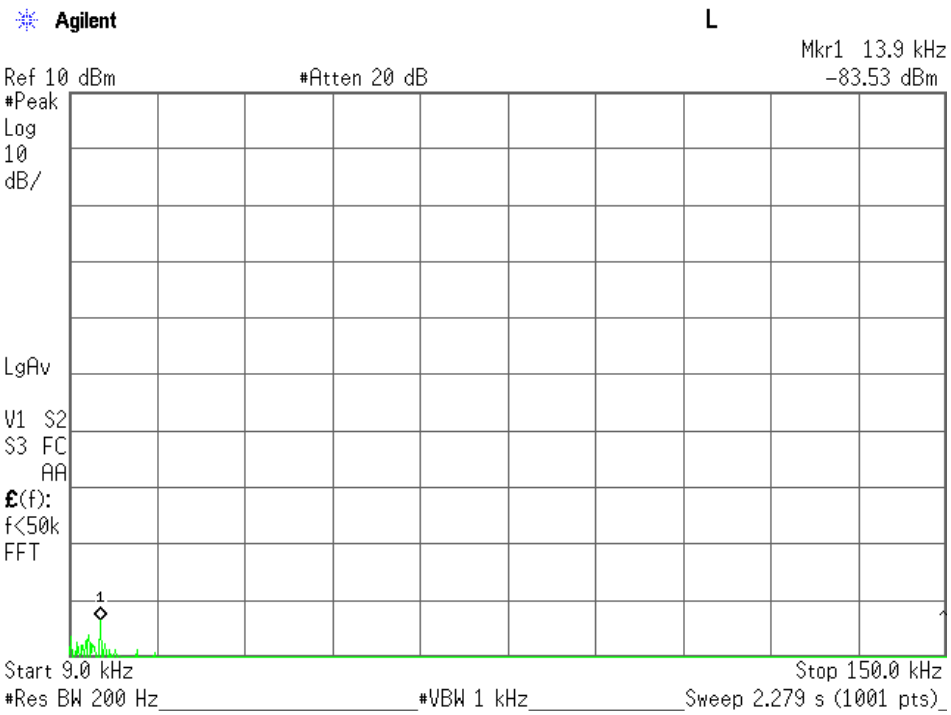
Low Channel, Out-Of-Band Emissions (30 MHz – 1.2 GHz)



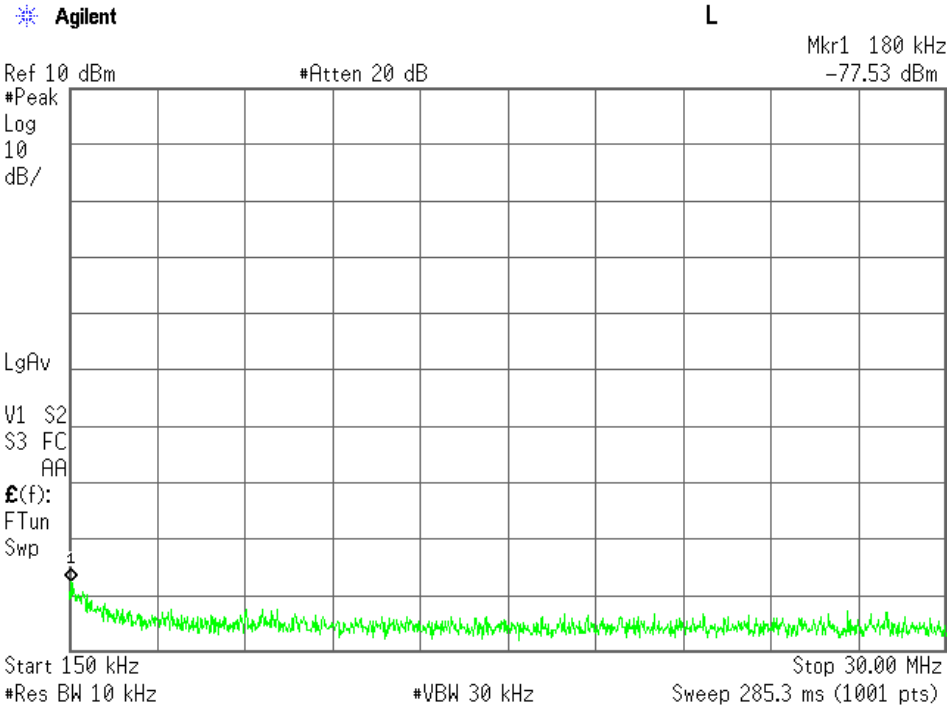
Low Channel, Out-Of-Band Emissions (1.2 GHz – 10 GHz)



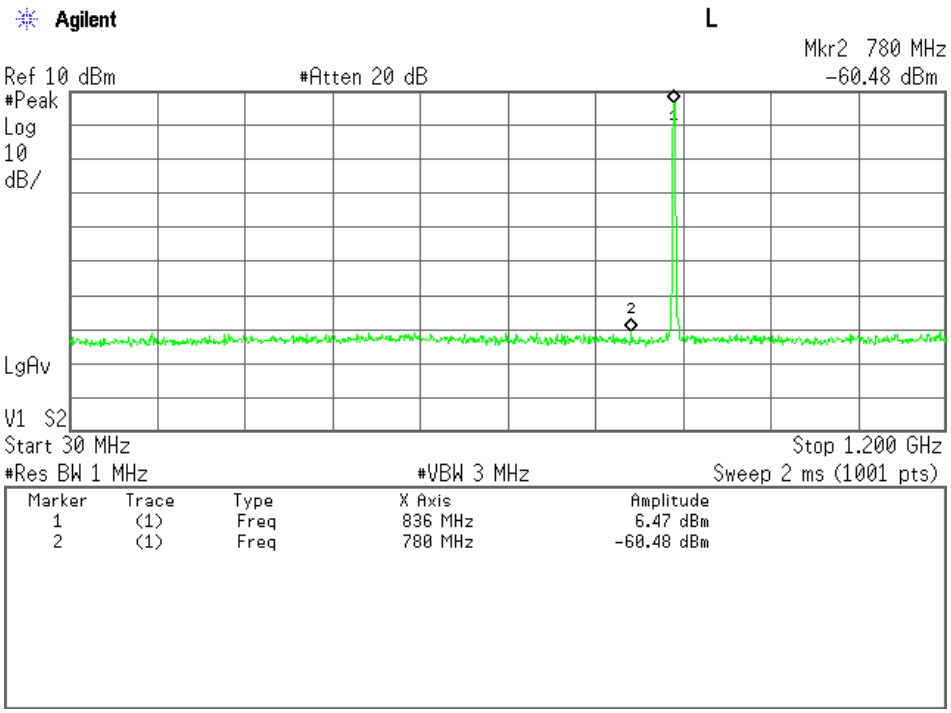
Middle Channel, Out-Of-Band Emissions (9 kHz – 150 kHz)



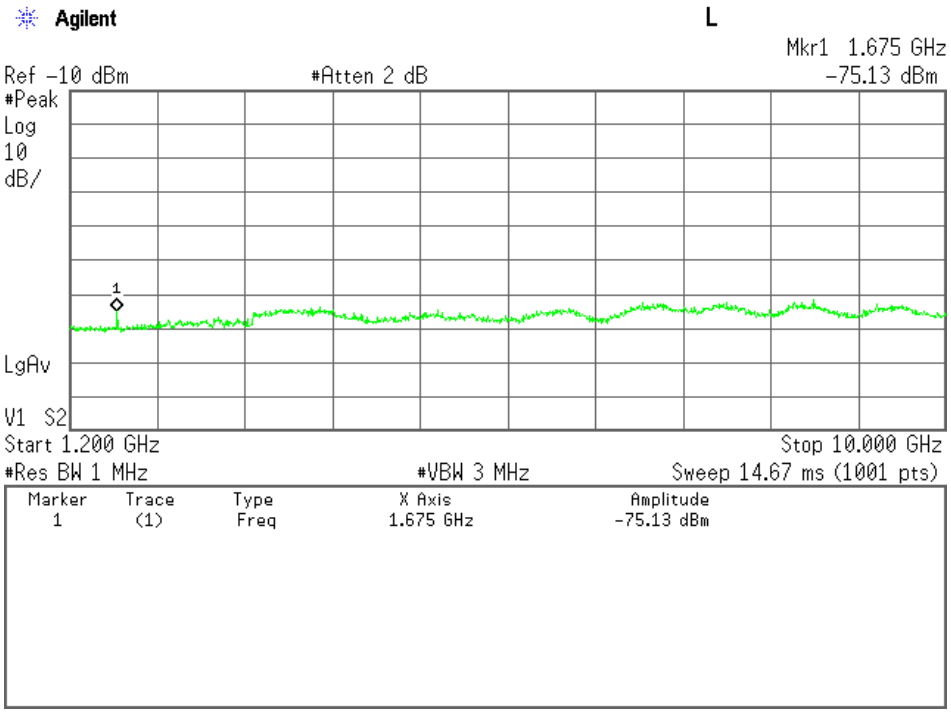
Middle Channel, Out-Of-Band Emissions (150 kHz – 30 MHz)



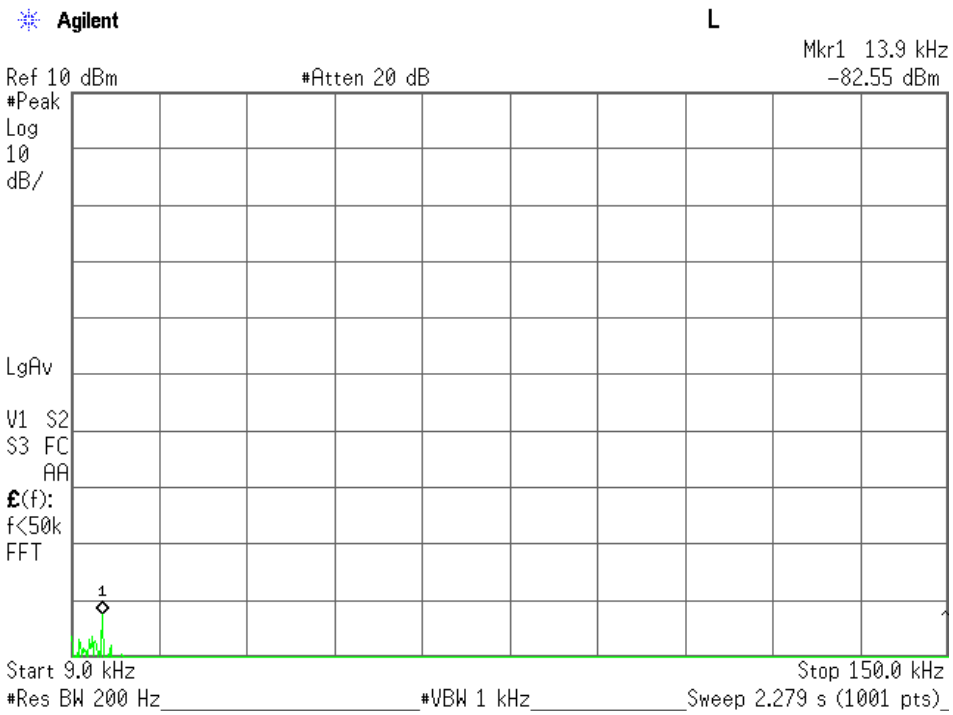
Middle Channel, Out-Of-Band Emissions (30 MHz – 1.2 GHz)



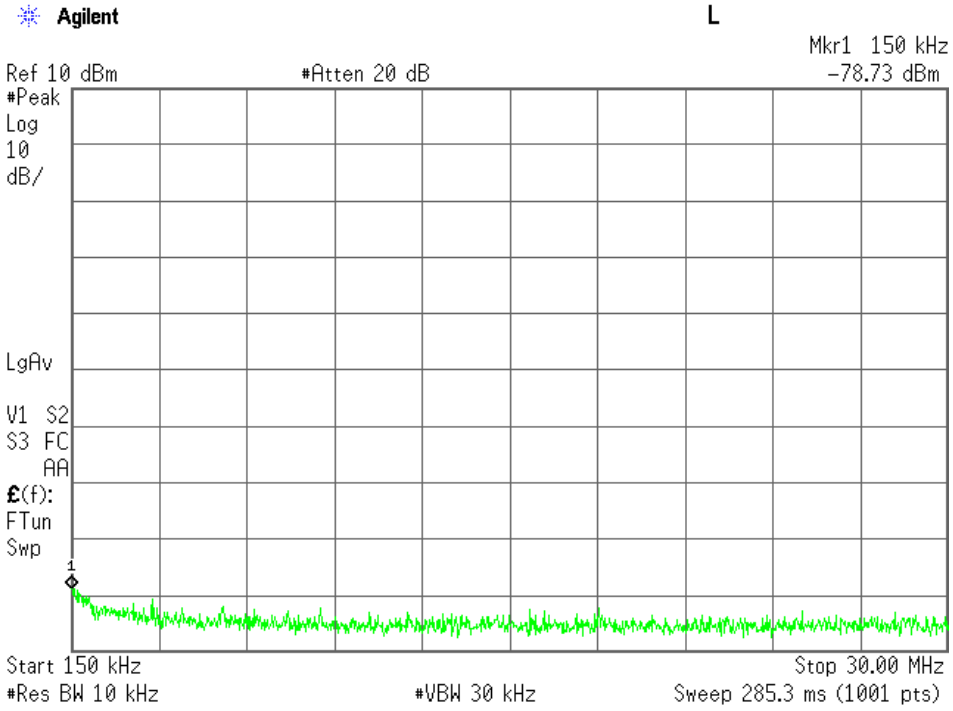
Middle Channel, Out-Of-Band Emissions (1.2 GHz – 10 GHz)



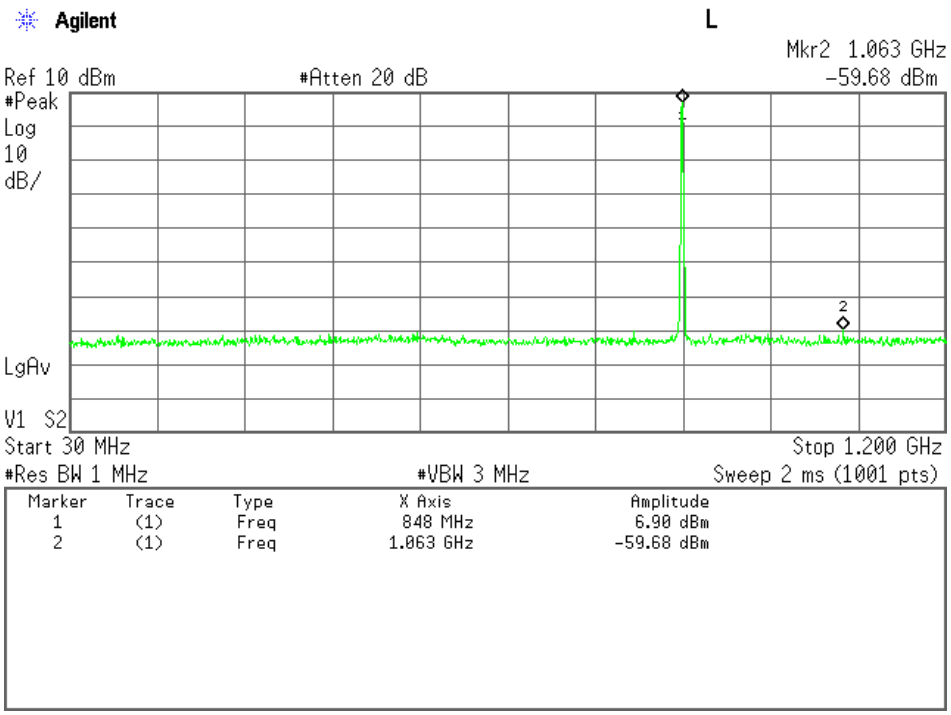
High Channel, Out-Of-Band Emissions (9 kHz – 150 kHz)



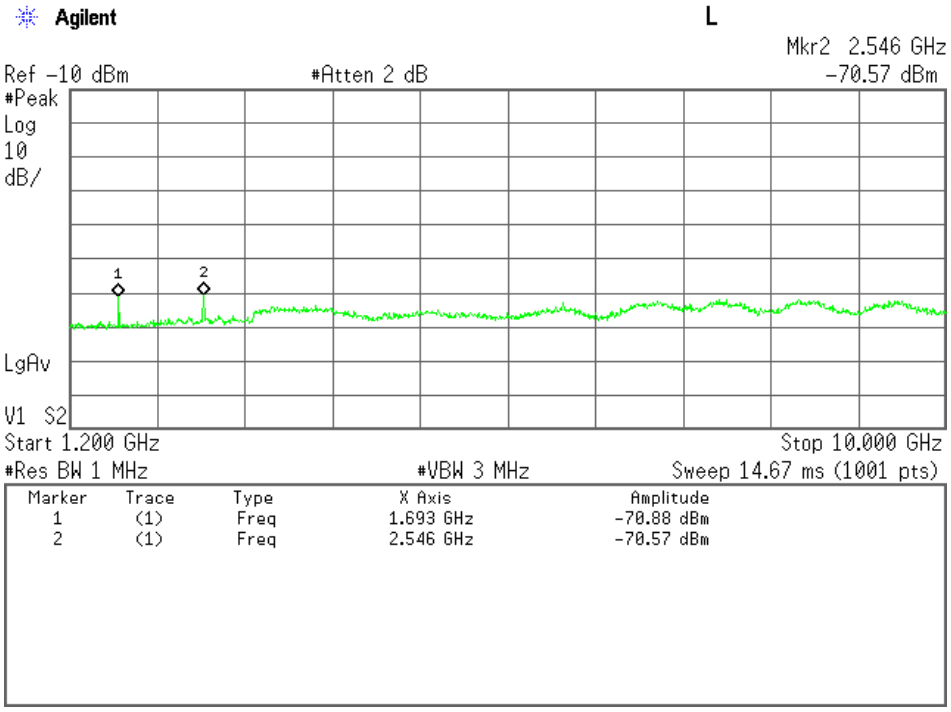
High Channel, Out-Of-Band Emissions (150 kHz – 30 MHz)



High Channel, Out-Of-Band Emissions (30 MHz – 1.2 GHz)



High Channel, Out-Of-Band Emissions (1.2 GHz – 10 GHz)



3) BW 5MHz(1RB)

(LTE 5MHz)

Test Date: August 21, 2016
Temp.: 26 °C, Humi: 68 %

Transmitting Frequency CH	[MHz]	Measured Frequency [MHz]	Corr. Factor [dB]	Meter Readings [dBm]	Limits [dBm]	Results [dBm]	Margin [dB]	Remarks
20425	826.500	1653.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		2479.500	21.3	< -70.0	-13.0	< -48.7	> +35.7	C
		3306.000	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4132.500	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4959.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		5785.500	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		6612.000	21.8	< -70.0	-13.0	< -48.2	> +35.2	C
		7438.500	21.9	< -70.0	-13.0	< -48.1	> +35.1	C
		8265.000	22.1	< -70.0	-13.0	< -47.9	> +34.9	C
20525	836.500	1673.000	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		2509.500	21.2	< -70.0	-13.0	< -48.8	> +35.8	C
		3346.000	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4182.500	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		5019.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		5855.500	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		6692.000	21.8	< -70.0	-13.0	< -48.2	> +35.2	C
		7528.500	22.0	< -70.0	-13.0	< -48.0	> +35.0	C
		8365.000	22.2	< -70.0	-13.0	< -47.8	> +34.8	C
20625	846.500	1693.000	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		2539.500	21.2	< -70.0	-13.0	< -48.8	> +35.8	C
		3386.000	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4232.500	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		5079.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		5925.500	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		6772.000	21.8	< -70.0	-13.0	< -48.2	> +35.2	C
		7618.500	22.0	< -70.0	-13.0	< -48.0	> +35.0	C
		8465.000	22.2	< -70.0	-13.0	< -47.8	> +34.8	C

Calculated result at 8365.0 MHz, as the worst point shown on underline:

	Corr. Factor	=	22.2 dB
+)	Meter Reading	=	<-70.0 dBm
	Result	=	<-47.8 dBm

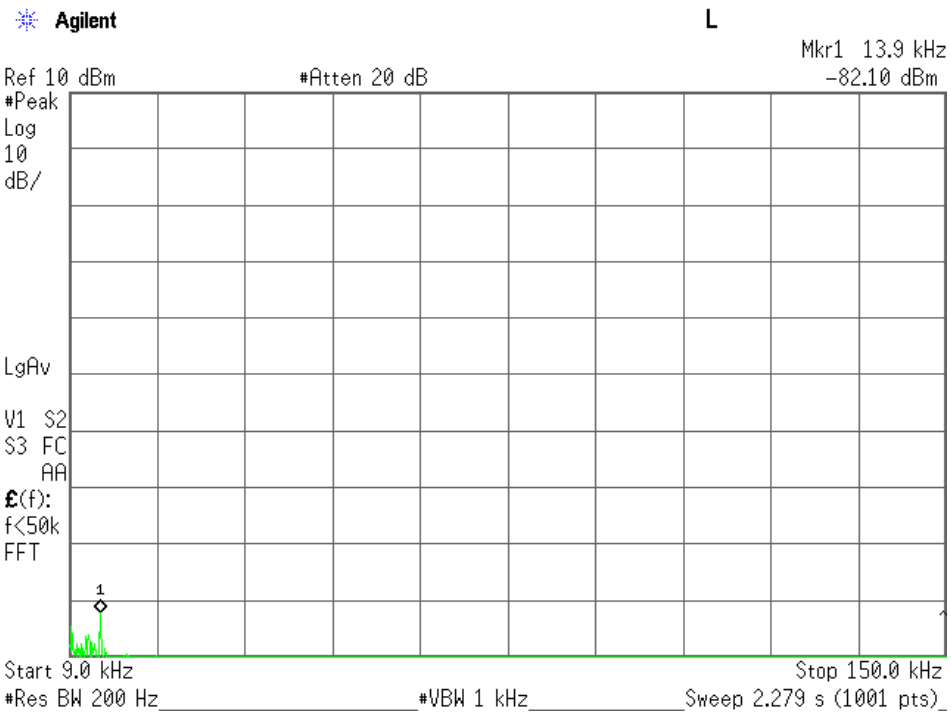
Minimum Margin: -13.0 - (<-47.8) = >34.8 (dB)

NOTES

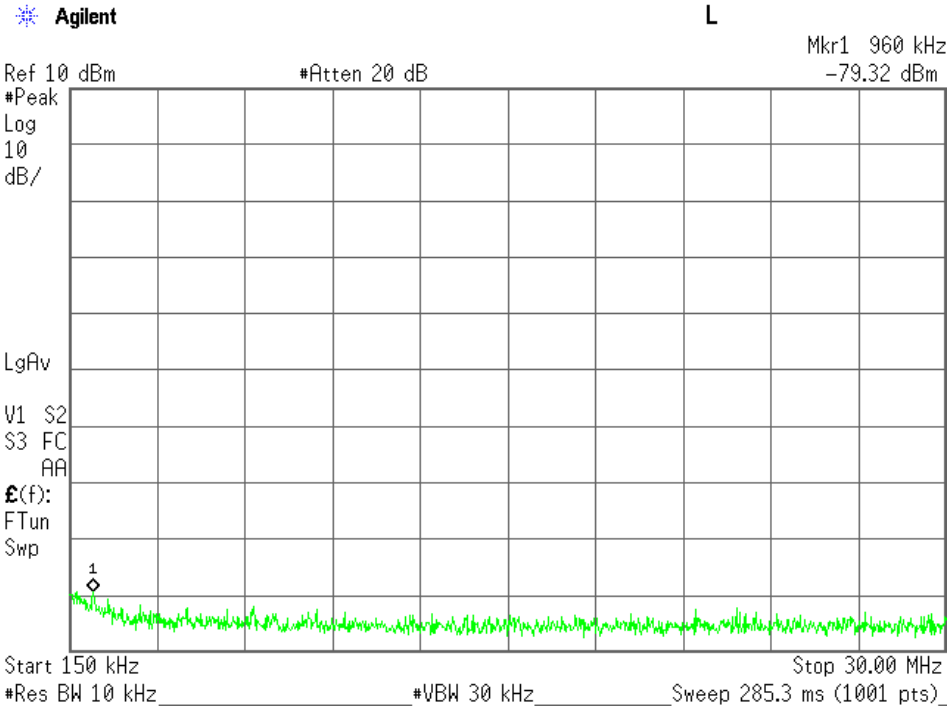
1. The spectrum was checked from 9 kHz to 10 GHz.
2. Applied limits : -13.0 [dBm] = 10log(TP[mW]) - (43 + 10log(tp[W])) = 10log(TP[mW]) - (43 + (10 log(TP[mW]) - 30))
   where, tp[W] = TP[mW] / 1000 : Transmitter power at anttena terminal
3. The correction factor is shown as follows:
   Corr. Factor [dB] = Cable Loss + Pad Att. [dB] (9 kHz - 1.2 GHz)
   Corr. Factor [dB] = Cable Loss + Pad Att. + High Pass Filter Loss [dB] (over 1.2 GHz)
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. Setting of measuring instrument(s) :

	Detector Function	RES B.W.	V.B.W.	Sweep Time
A	Peak	200 Hz	1 kHz	AUTO
B	Peak	10 kHz	30 kHz	AUTO
C	Peak	1 MHz	3 MHz	AUTO

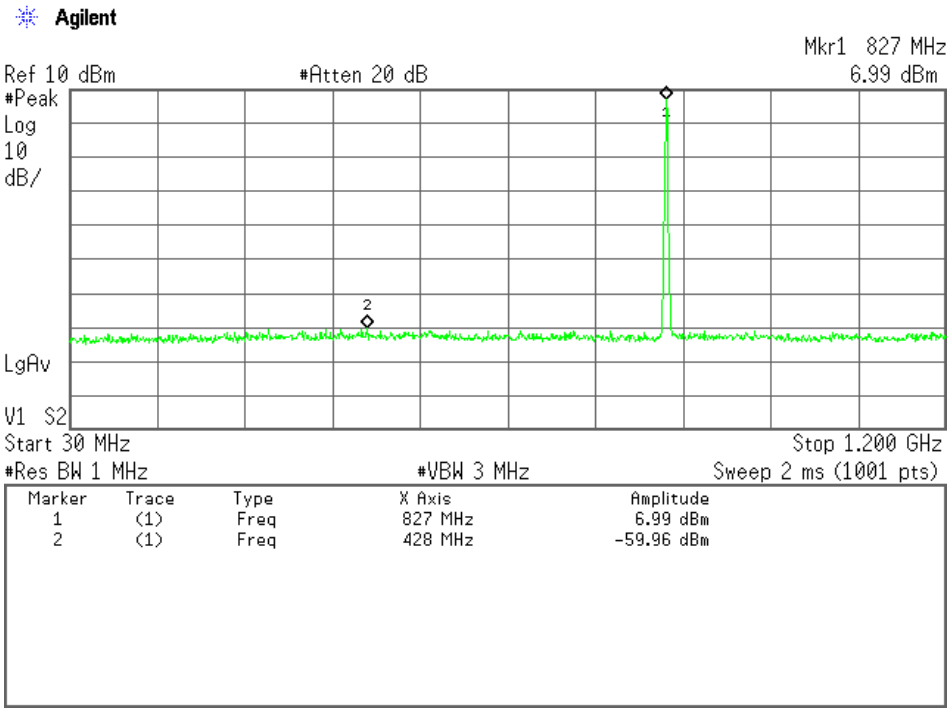
Low Channel, Out-Of-Band Emissions (9 kHz – 150 kHz)



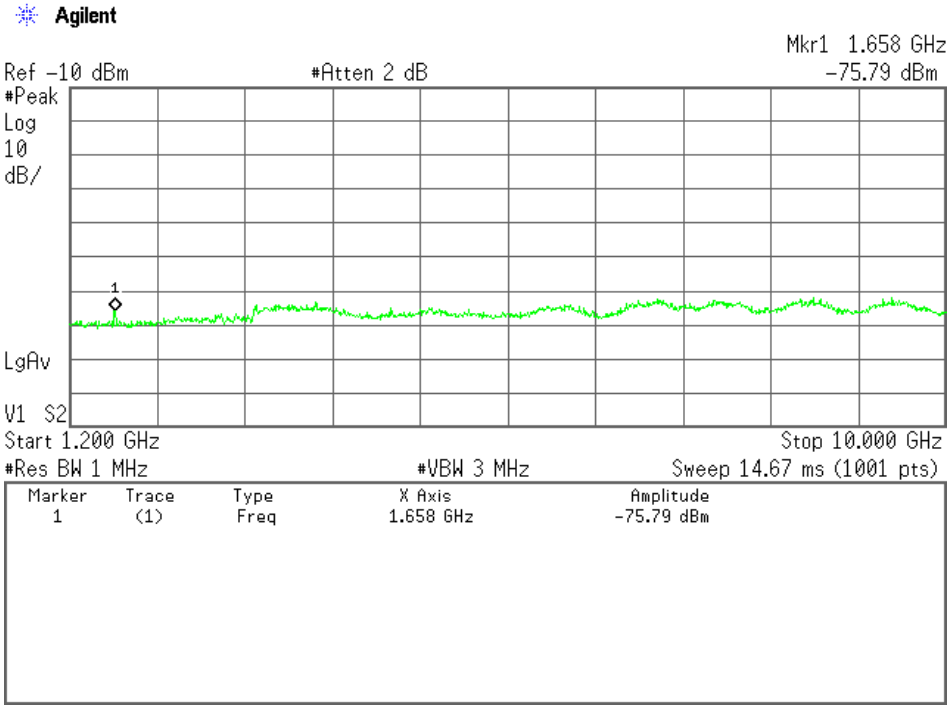
Low Channel, Out-Of-Band Emissions (150 kHz – 30 MHz)



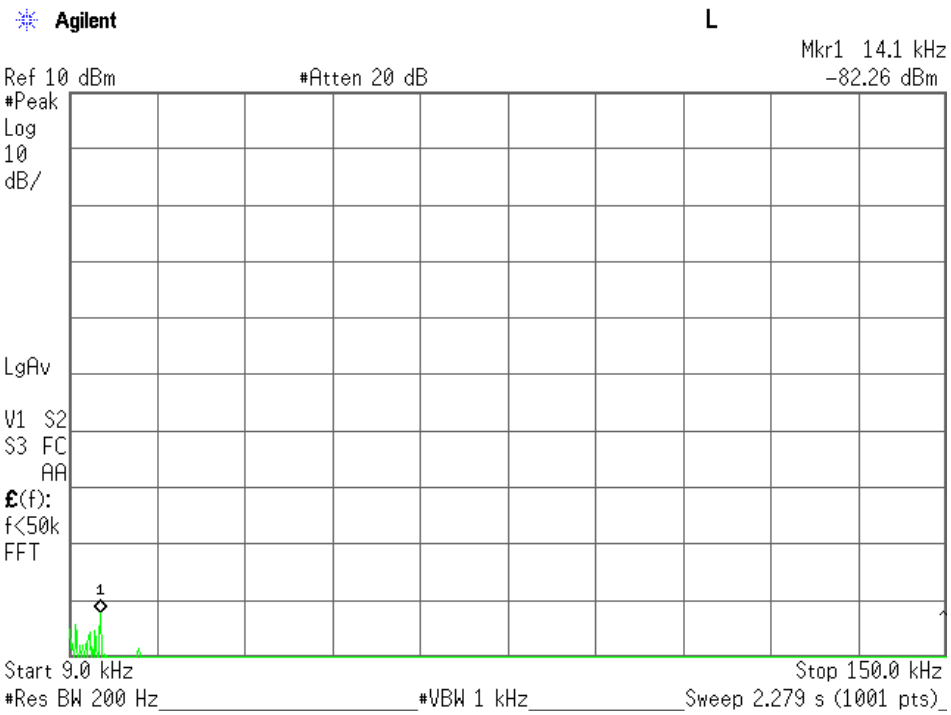
Low Channel, Out-Of-Band Emissions (30 MHz – 1.2 GHz)



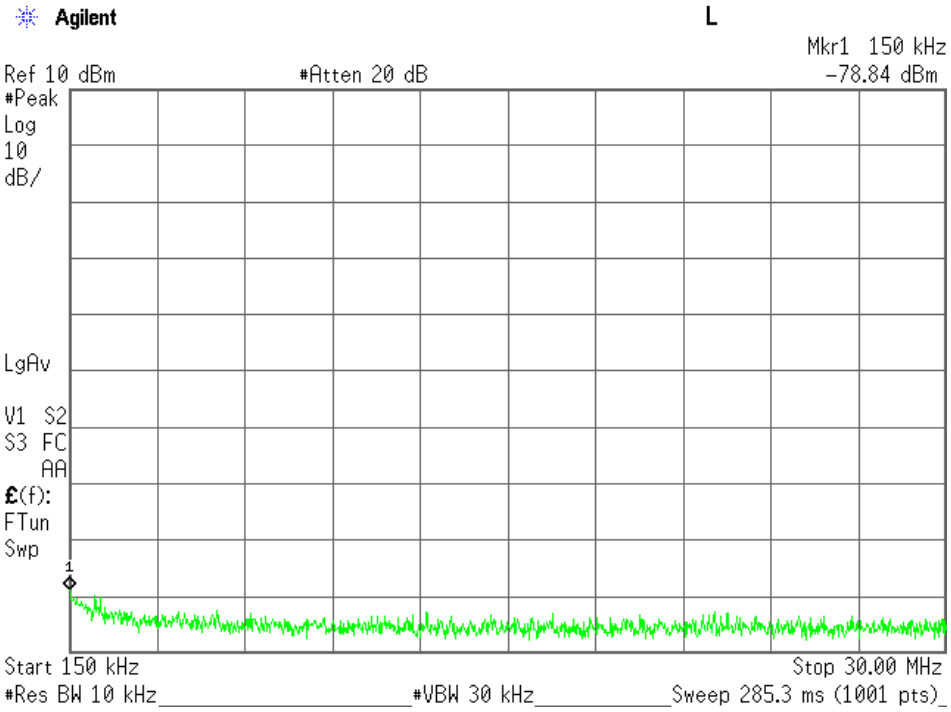
Low Channel, Out-Of-Band Emissions (1.2 GHz – 10 GHz)



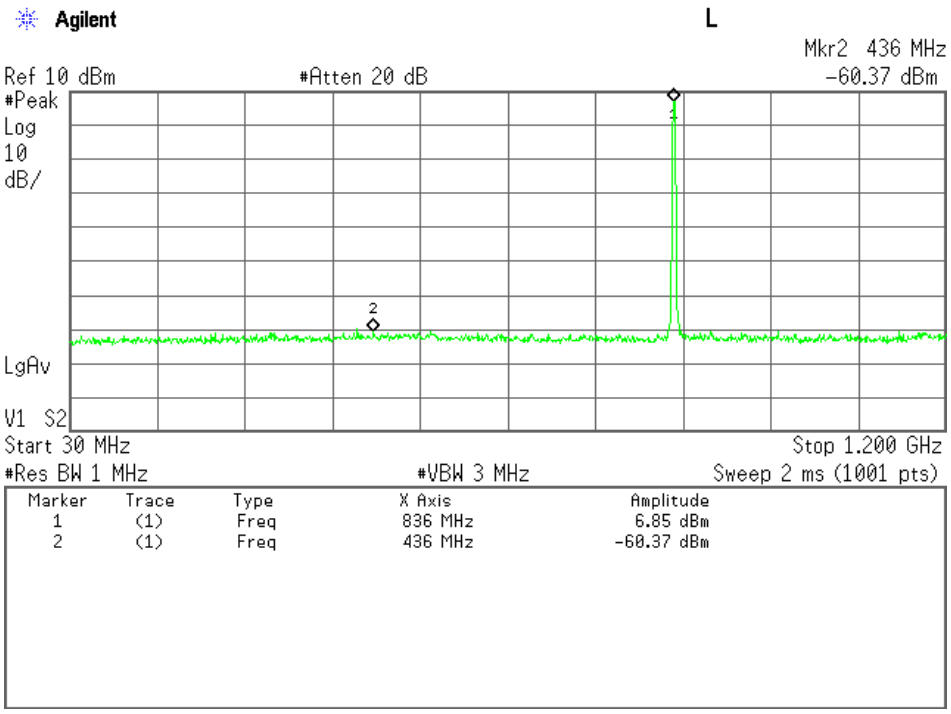
Middle Channel, Out-Of-Band Emissions (9 kHz – 150 kHz)



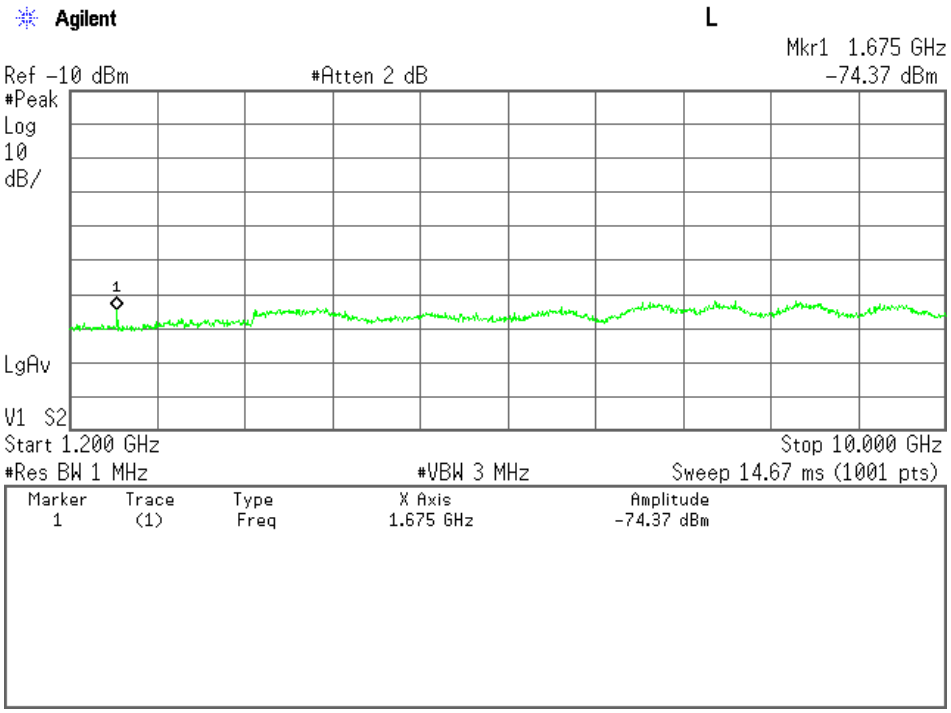
Middle Channel, Out-Of-Band Emissions (150 kHz – 30 MHz)



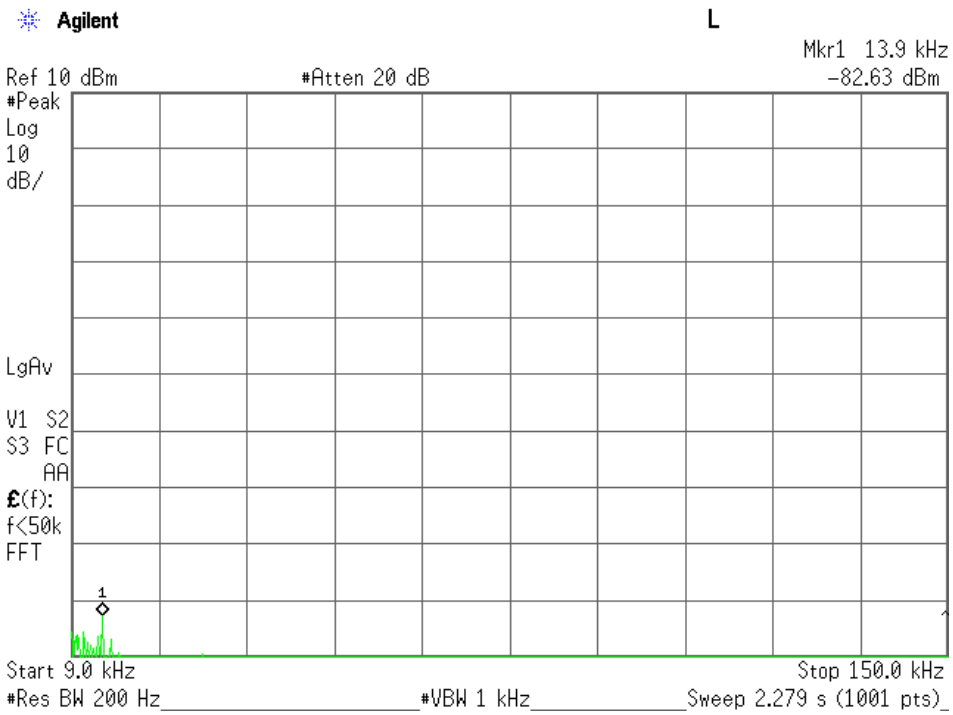
Middle Channel, Out-Of-Band Emissions (30 MHz – 1.2 GHz)



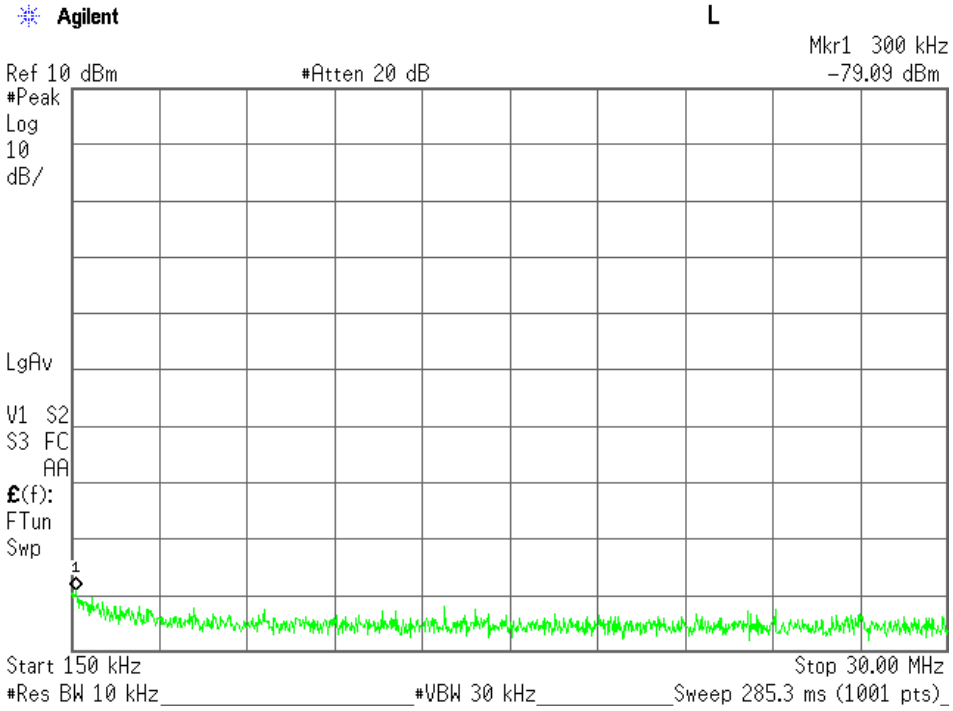
Middle Channel, Out-Of-Band Emissions (1.2 GHz – 10 GHz)



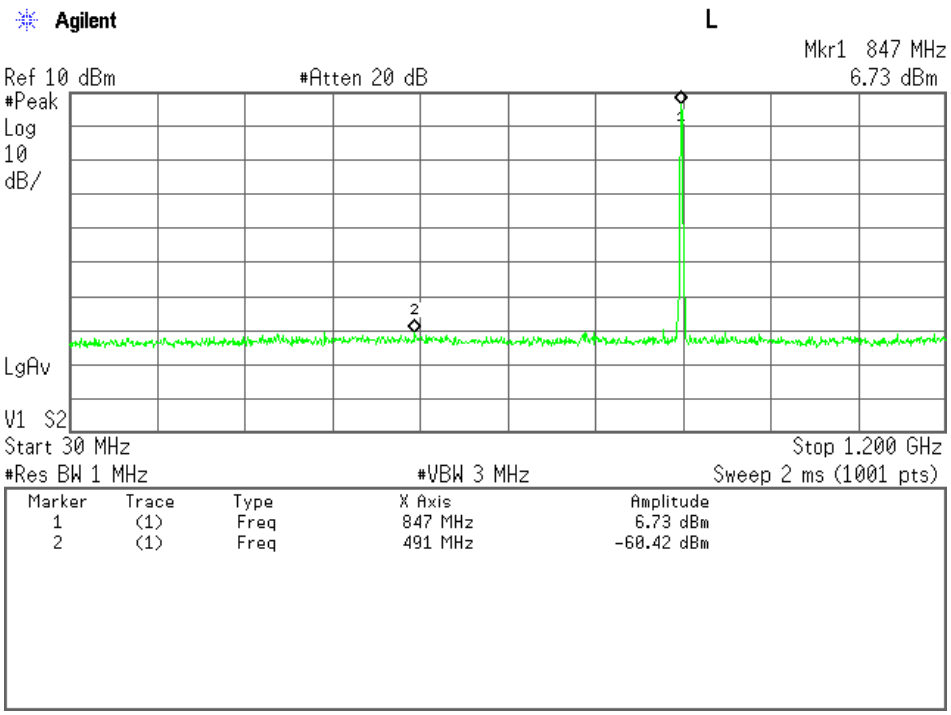
High Channel, Out-Of-Band Emissions (9 kHz – 150 kHz)



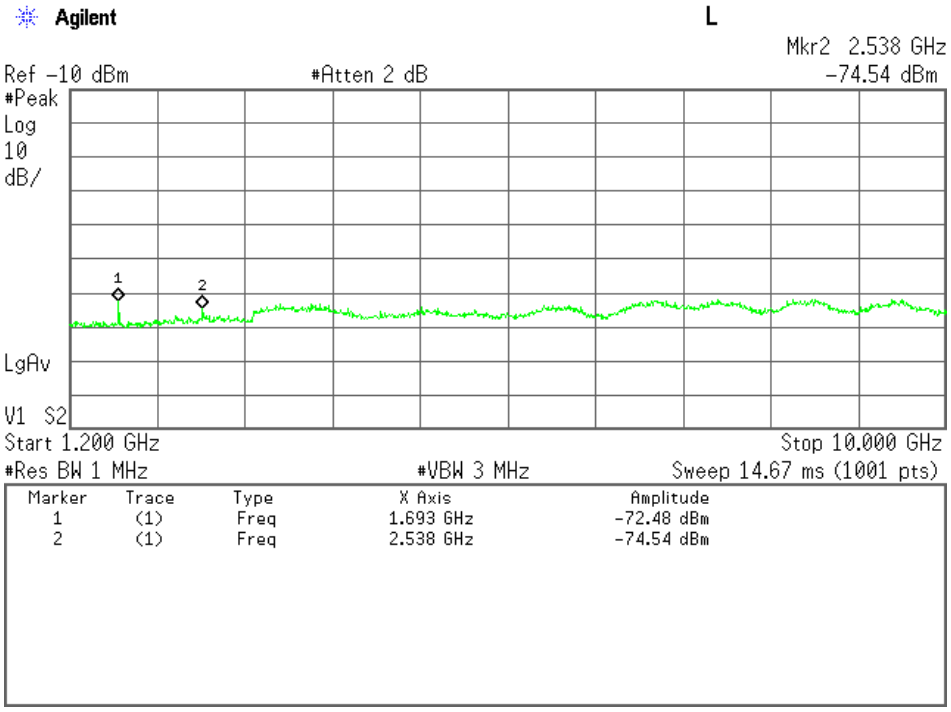
High Channel, Out-Of-Band Emissions (150 kHz – 30 MHz)



High Channel, Out-Of-Band Emissions (30 MHz – 1.2 GHz)



High Channel, Out-Of-Band Emissions (1.2 GHz – 10 GHz)



4) BW 10MHz(1RB)

(LTE 10MHz)

Test Date: August 21, 2016
Temp.: 26 °C, Humi: 68 %

CH	Transmitting Frequency [MHz]	Measured Frequency [MHz]	Corr. Factor [dB]	Meter Readings [dBm]	Limits [dBm]	Results [dBm]	Margin [dB]	Remarks
20450	829.000	1658.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		2487.000	21.3	< -70.0	-13.0	< -48.7	> +35.7	C
		3316.000	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4145.000	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		4974.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		5803.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		6632.000	21.8	< -70.0	-13.0	< -48.2	> +35.2	C
		7461.000	22.0	< -70.0	-13.0	< -48.0	> +35.0	C
		8290.000	22.1	< -70.0	-13.0	< -47.9	> +34.9	C
20525	836.500	1673.000	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		2509.500	21.2	< -70.0	-13.0	< -48.8	> +35.8	C
		3346.000	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4182.500	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		5019.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		5855.500	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		6692.000	21.8	< -70.0	-13.0	< -48.2	> +35.2	C
		7528.500	22.0	< -70.0	-13.0	< -48.0	> +35.0	C
		8365.000	22.2	< -70.0	-13.0	< -47.8	> +34.8	C
20600	844.000	1688.000	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		2532.000	21.2	< -70.0	-13.0	< -48.8	> +35.8	C
		3376.000	21.4	< -70.0	-13.0	< -48.6	> +35.6	C
		4220.000	21.5	< -70.0	-13.0	< -48.5	> +35.5	C
		5064.000	21.6	< -70.0	-13.0	< -48.4	> +35.4	C
		5908.000	21.7	< -70.0	-13.0	< -48.3	> +35.3	C
		6752.000	21.8	< -70.0	-13.0	< -48.2	> +35.2	C
		7596.000	22.0	< -70.0	-13.0	< -48.0	> +35.0	C
		8440.000	22.2	< -70.0	-13.0	< -47.8	> +34.8	C

Calculated result at 8365.0 MHz, as the worst point shown on underline:

	Corr. Factor	=	22.2 dB
+)	Meter Reading	=	<-70.0 dBm
	Result	=	<-47.8 dBm

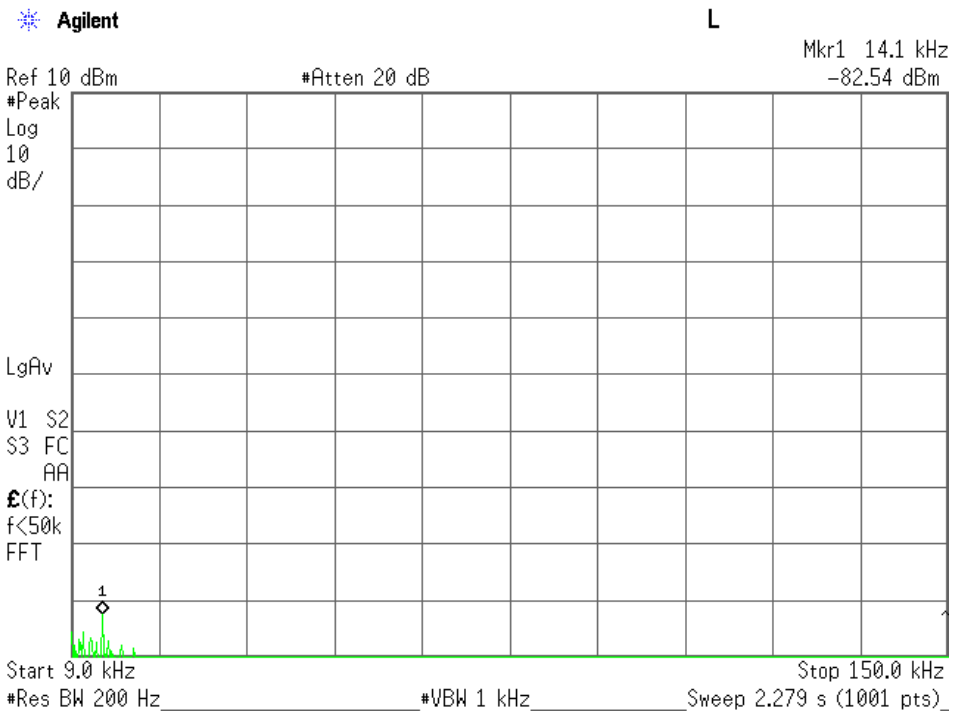
Minimum Margin: -13.0 - (<-47.8) = >34.8 (dB)

NOTES

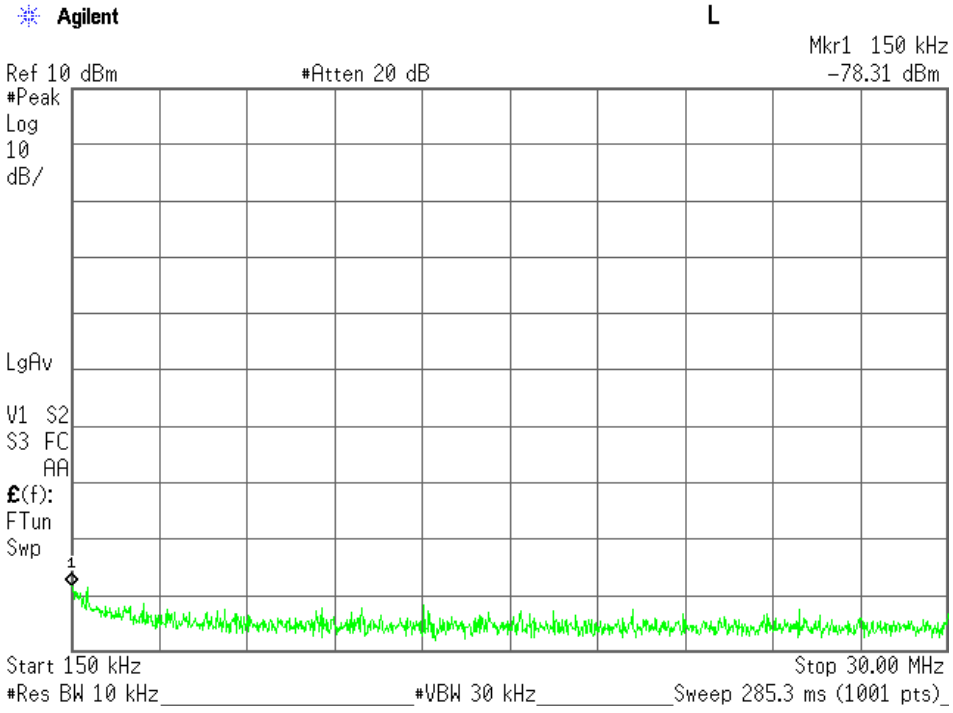
1. The spectrum was checked from 9 kHz to 10 GHz.
2. Applied limits : -13.0 [dBm] = 10log(TP[mW]) - (43 + 10log(tp[W])) = 10log(TP[mW]) - (43 + (10 log(TP[mW]) - 30))
   where, tp[W] = TP[mW] / 1000 : Transmitter power at anttena terminal
3. The correction factor is shown as follows:
   Corr. Factor [dB] = Cable Loss + Pad Att. [dB] (9 kHz - 1.2 GHz)
   Corr. Factor [dB] = Cable Loss + Pad Att. + High Pass Filter Loss [dB] (over 1.2 GHz)
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. Setting of measuring instrument(s) :

	Detector Function	RES B.W.	V.B.W.	Sweep Time
A	Peak	200 Hz	1 kHz	AUTO
B	Peak	10 kHz	30 kHz	AUTO
C	Peak	1 MHz	3 MHz	AUTO

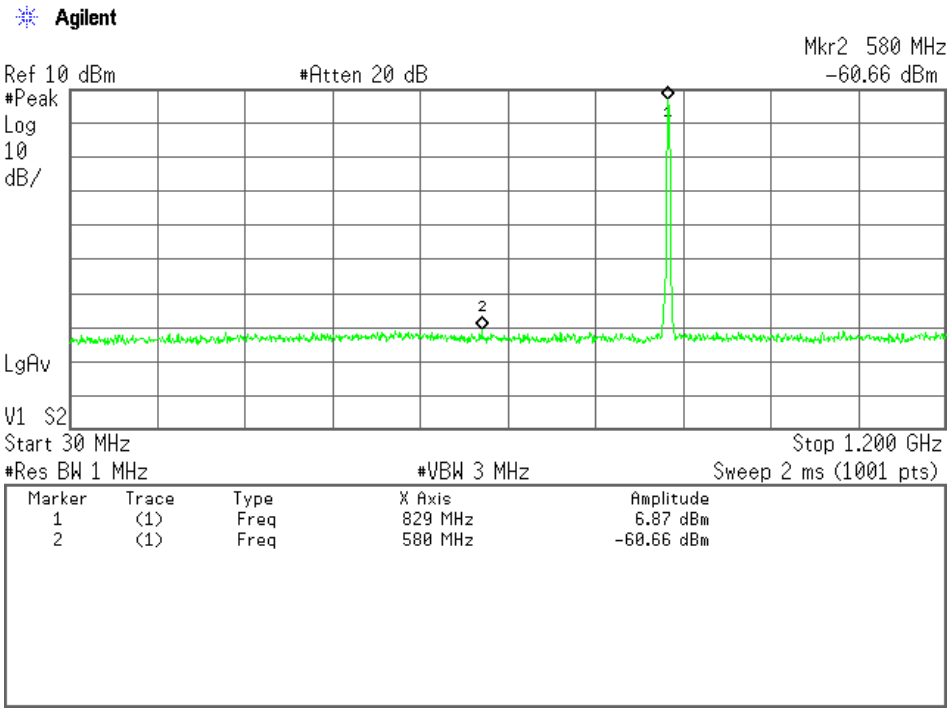
Low Channel, Out-Of-Band Emissions (9 kHz – 150 kHz)



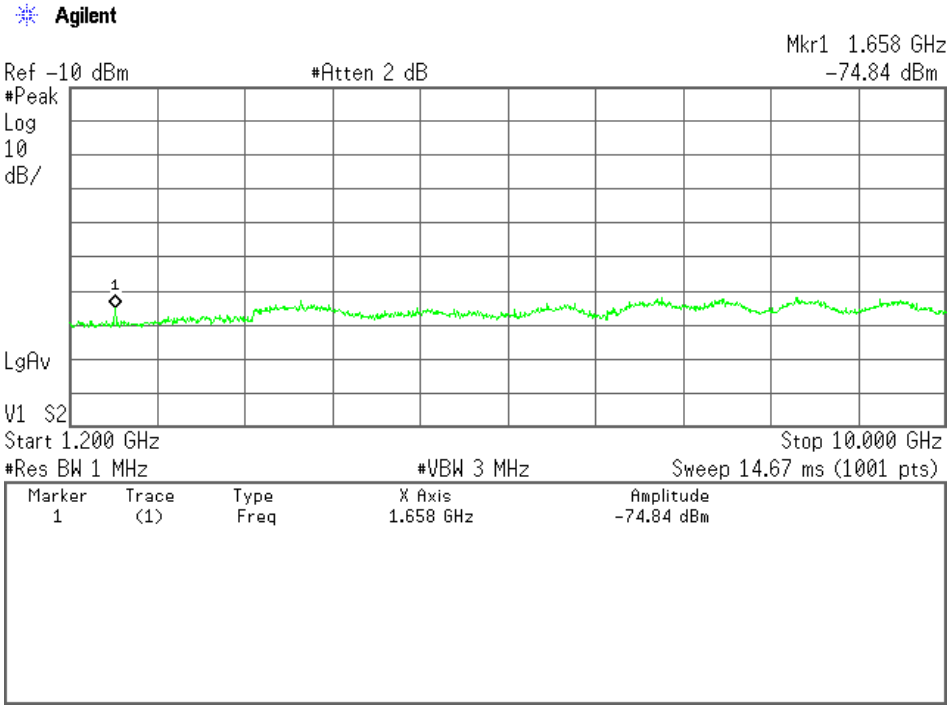
Low Channel, Out-Of-Band Emissions (150 kHz – 30 MHz)



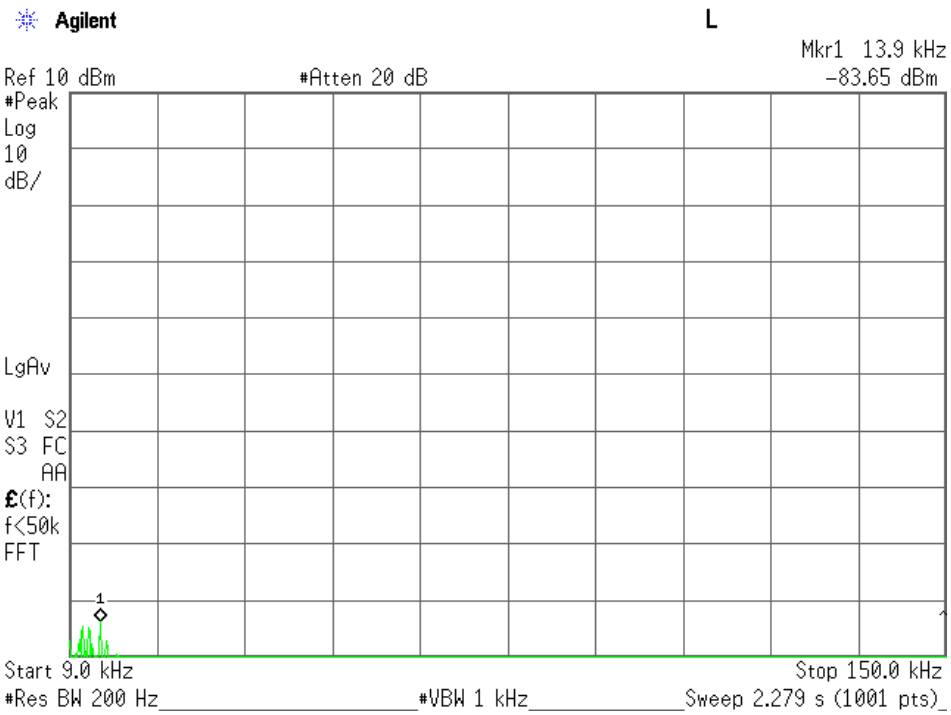
Low Channel, Out-Of-Band Emissions (30 MHz – 1.2 GHz)



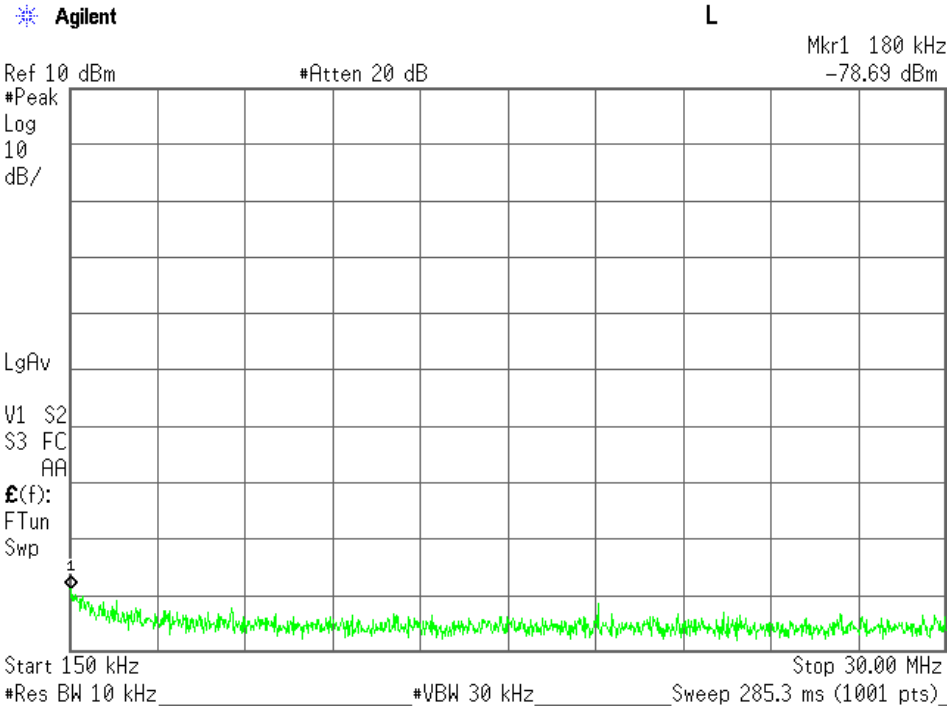
Low Channel, Out-Of-Band Emissions (1.2 GHz – 10 GHz)



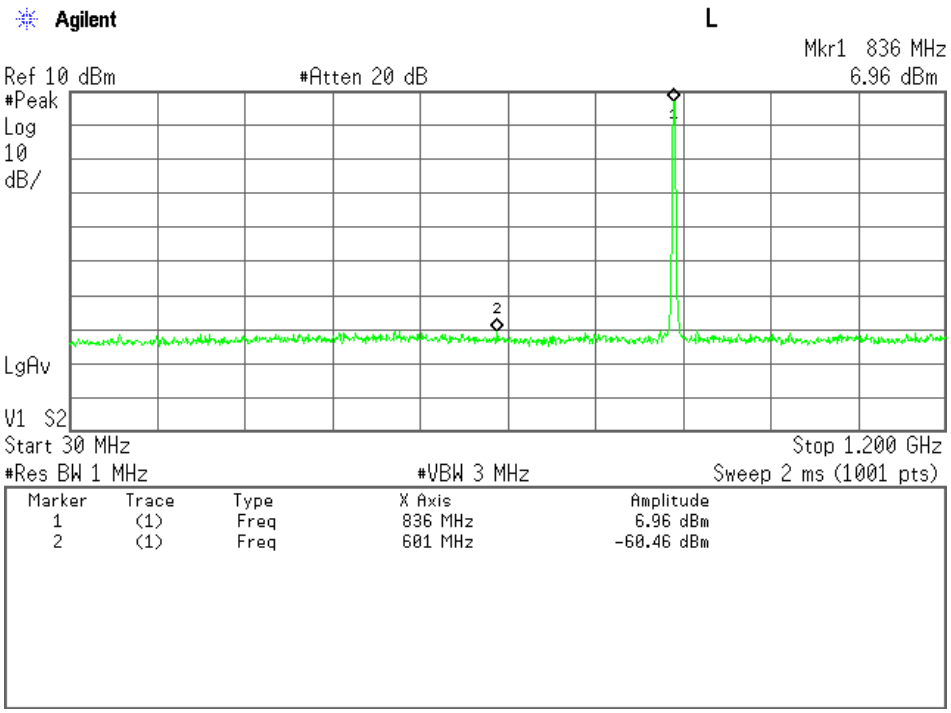
Middle Channel, Out-Of-Band Emissions (9 kHz – 150 kHz)



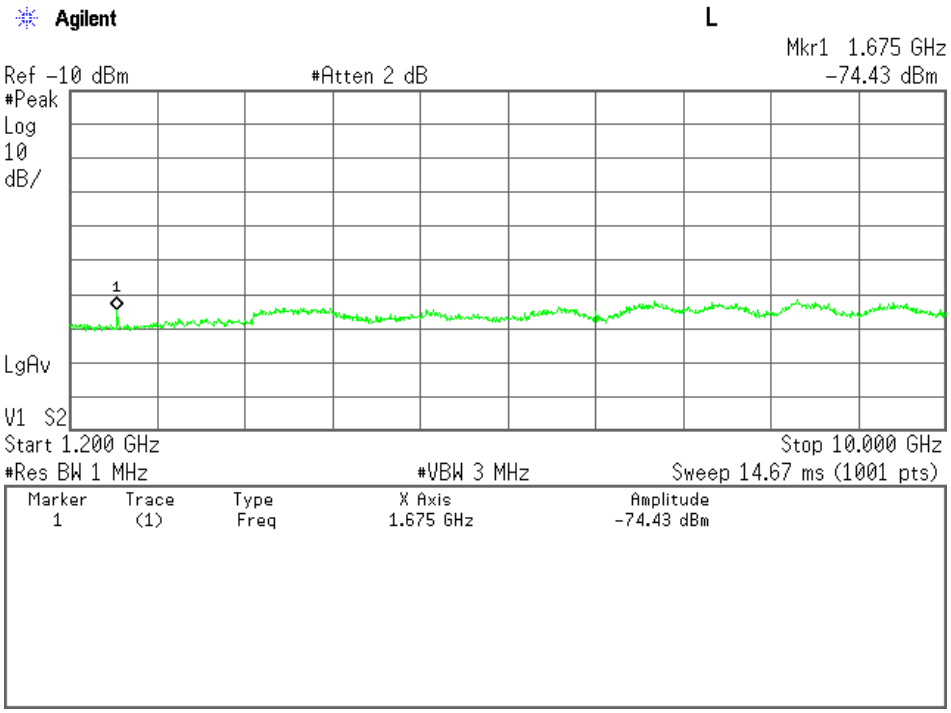
Middle Channel, Out-Of-Band Emissions (150 kHz – 30 MHz)



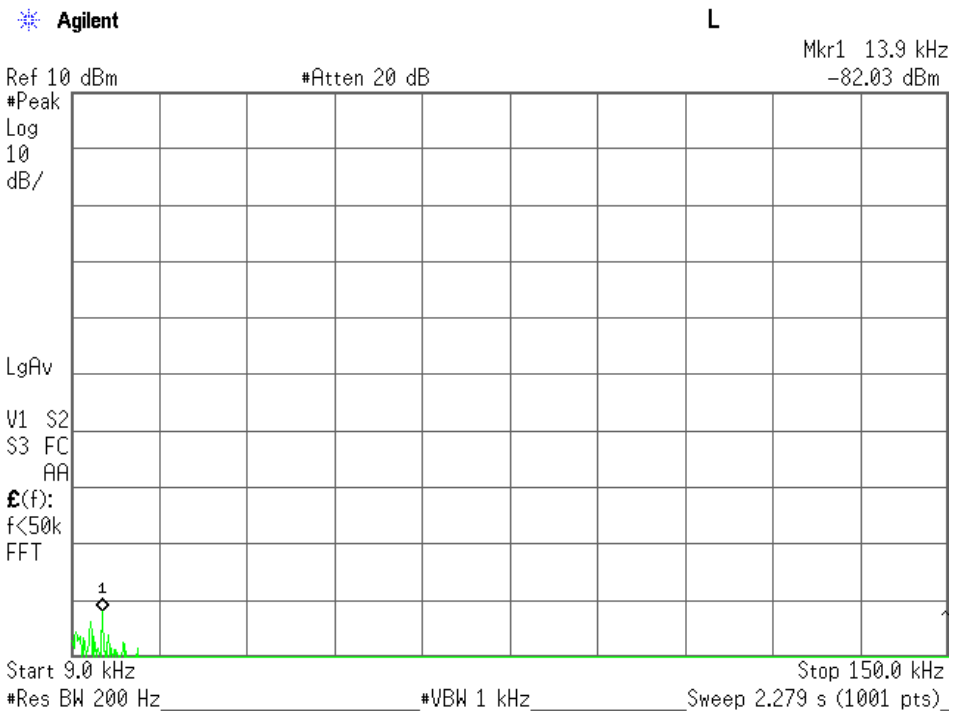
Middle Channel, Out-Of-Band Emissions (30 MHz – 1.2 GHz)



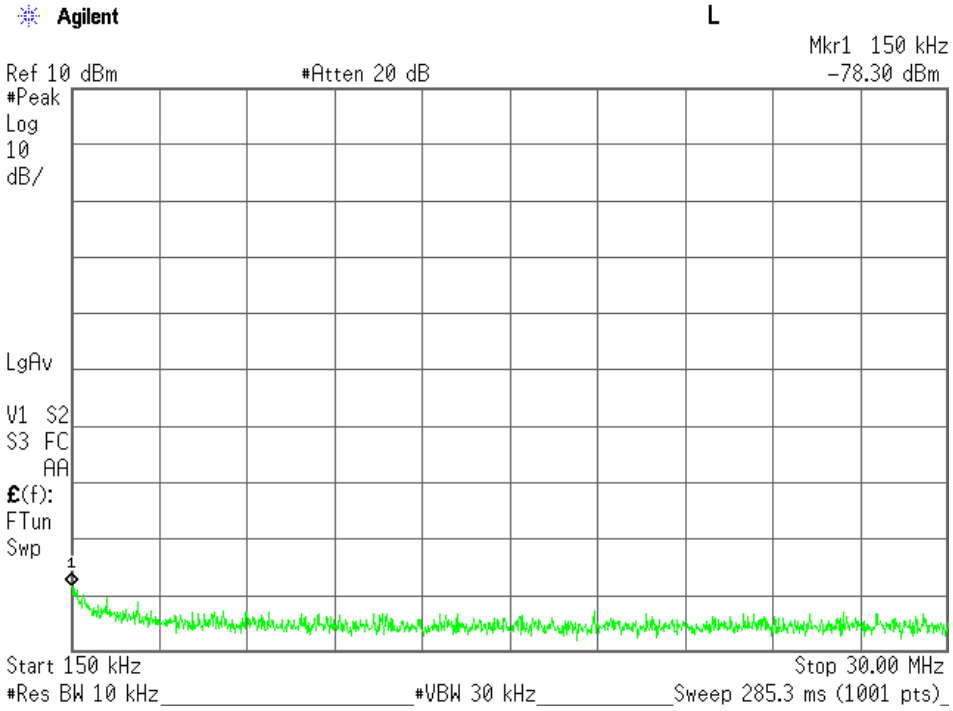
Middle Channel, Out-Of-Band Emissions (1.2 GHz – 10 GHz)



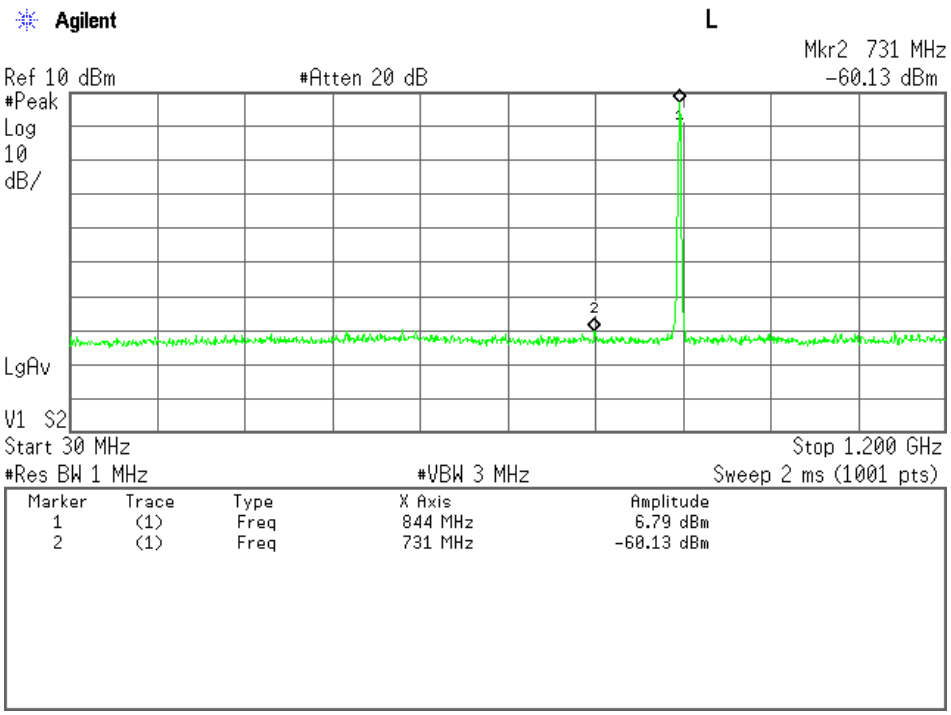
High Channel, Out-Of-Band Emissions (9 kHz – 150 kHz)



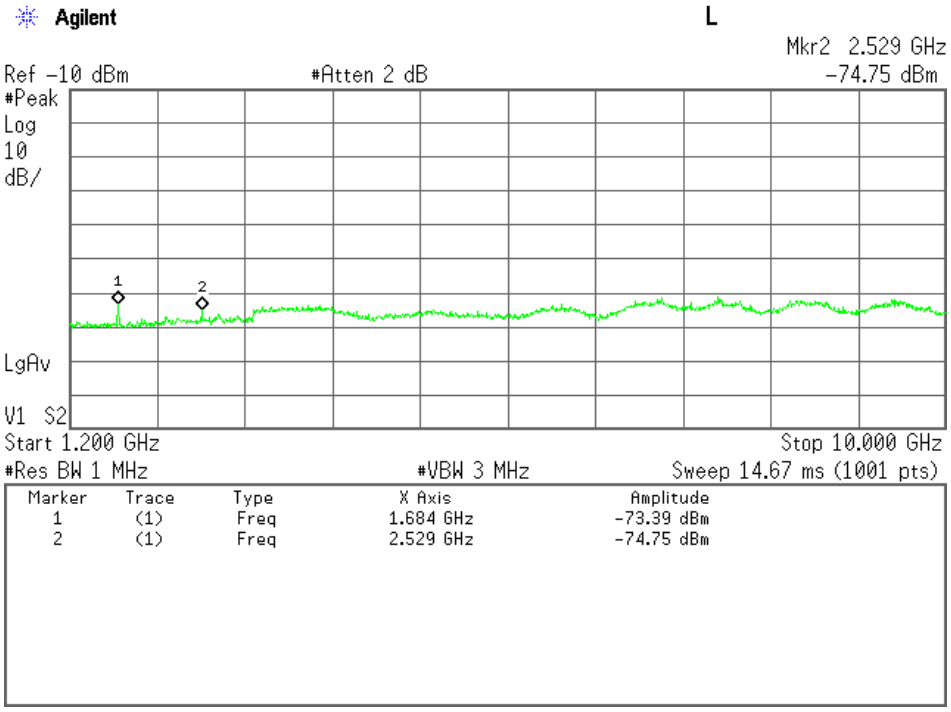
High Channel, Out-Of-Band Emissions (150 kHz – 30 MHz)



High Channel, Out-Of-Band Emissions (30 MHz – 1.2 GHz)



High Channel, Out-Of-Band Emissions (1.2 GHz – 10 GHz)



7.6 Band-Edge Emission (§2.1051)

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.6.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

Min. Limit Margin 10.0 dB at 824.0 MHz

The Band-Edge level is -23.0 dBm at 824.0 MHz

Uncertainty of Measurement Results ± 1.4 dB(2σ)

Remarks : BW 3MHz/5 MHz QPSK

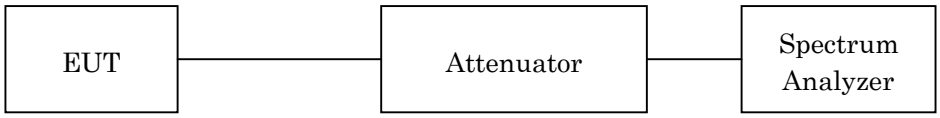
7.6.2 Test Instruments

Shielded Room S4				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Spectrum Analyzer	E4446A	US44300388 (A-39)	Agilent	2017/08/02
Attenuator	43KC-20	1418003 (D-41)	Anritsu	2017/07/10
RF Cable	SUCOFLEX102	14253/2 (C-52)	HUBER+SUHNER	2017/08/02

NOTE : The calibration interval of the above test instruments is 12 months.

7.6.3 Test Method and Test Setup (Diagrammatic illustration)

The test system is shown as follows:



The setting of the spectrum analyzer are shown as follows:

LTE Bandwidth	1.4 MHz	3 MHz	5 MHz	10 MHz
Band-Edge Frequency	824 MHz / 849 MHz			
Res. Bandwidth	20 kHz	30 kHz	51 kHz	100 kHz
Video Bandwidth	62 kHz	100 kHz	160 kHz	300 kHz
Span	5 MHz	10 MHz	20 MHz	20 MHz
Sweep Time	100 ms			
Detector	Power Average(RMS)			
Trace	Average			

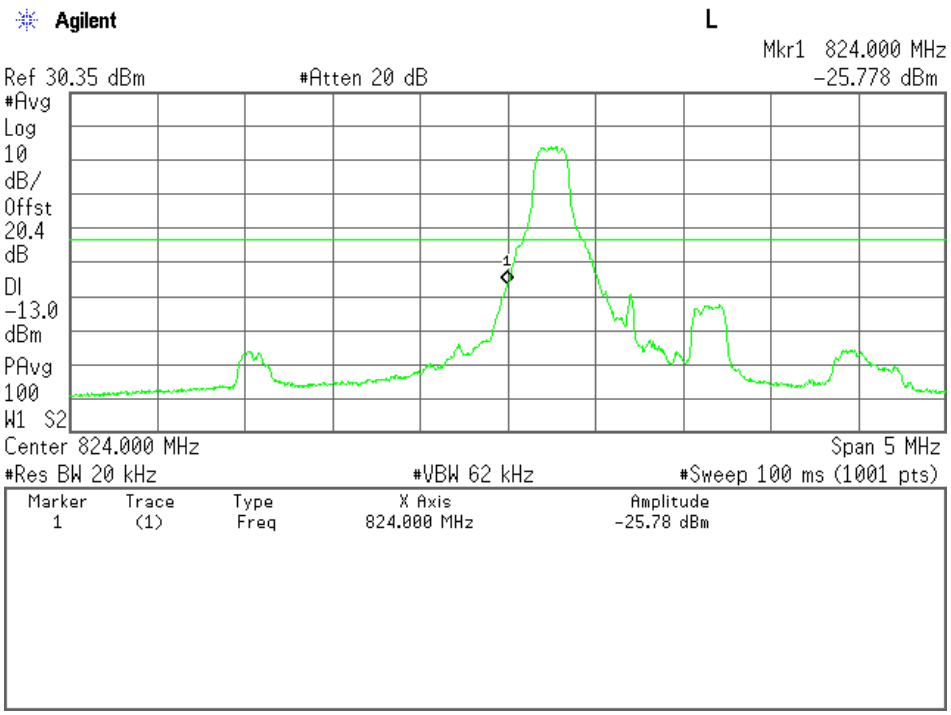
7.6.4 Test Data

Test Date :August 21, 2016
Temp.:26°C, Humi:68%

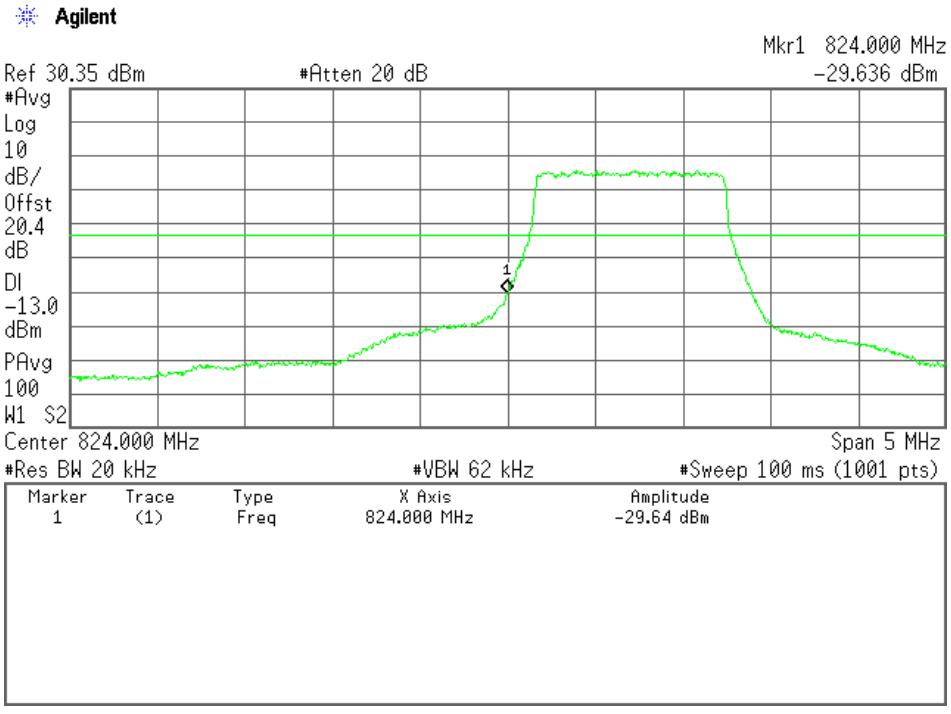
1-1) BW 1.4MHz
Mode: QPSK

Channel	Frequency (MHz)	Band-Edge Frequency (MHz)	Level (dBm)	Limits (dBm)	Margin (dB)
20407	824.70	824.0	-25.8 (at 824.0 MHz)	-13.0	+12.8
20643	848.30	849.0	-25.9 (at 849.0 MHz)	-13.0	+12.9

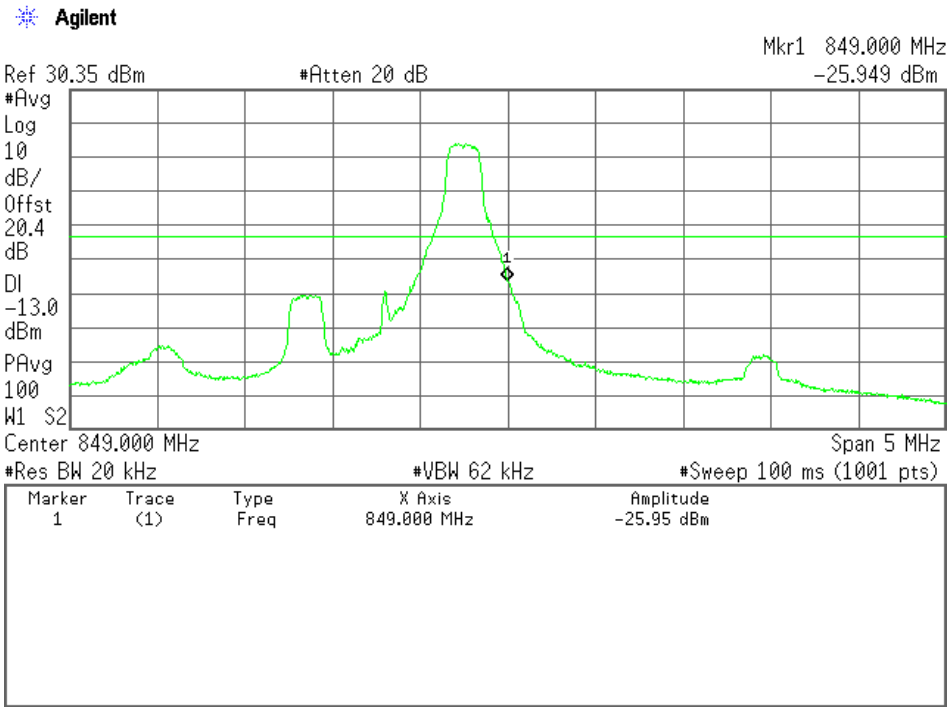
Low Channel(1RB Offset 0), Band-Edge Emission



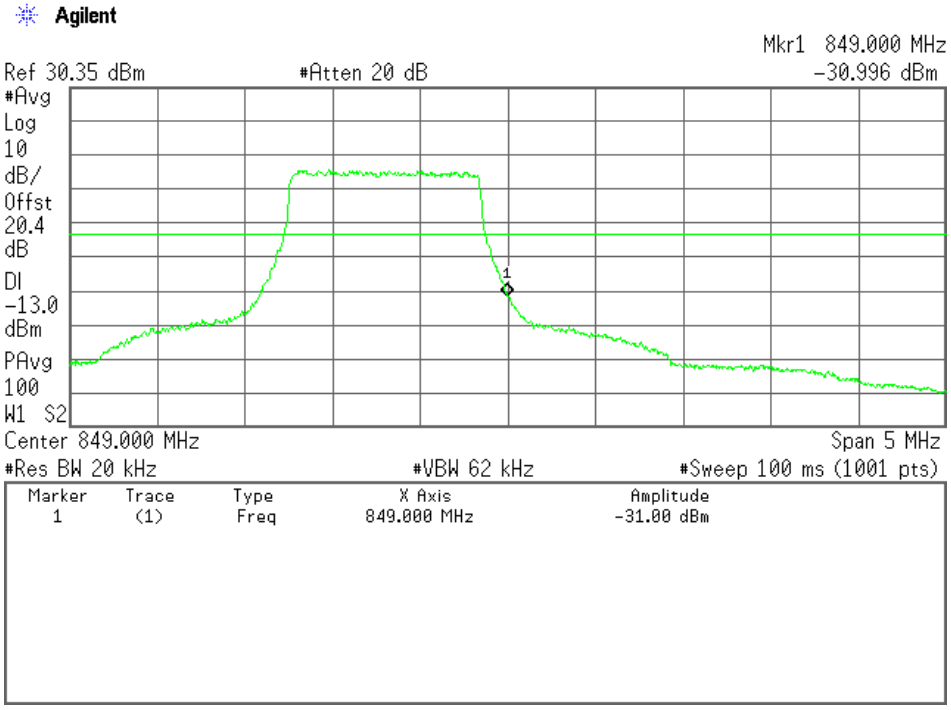
Low Channel(Full RB), Band-Edge Emission



High Channel(1RB Offset Max), Band-Edge Emission



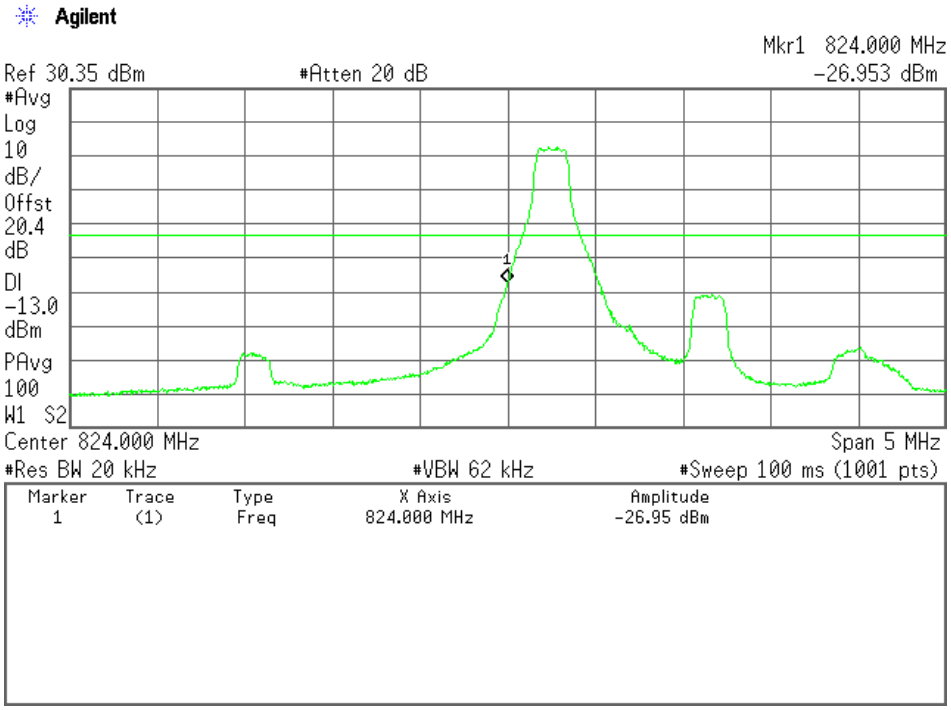
High Channel(Full RB), Band-Edge Emission



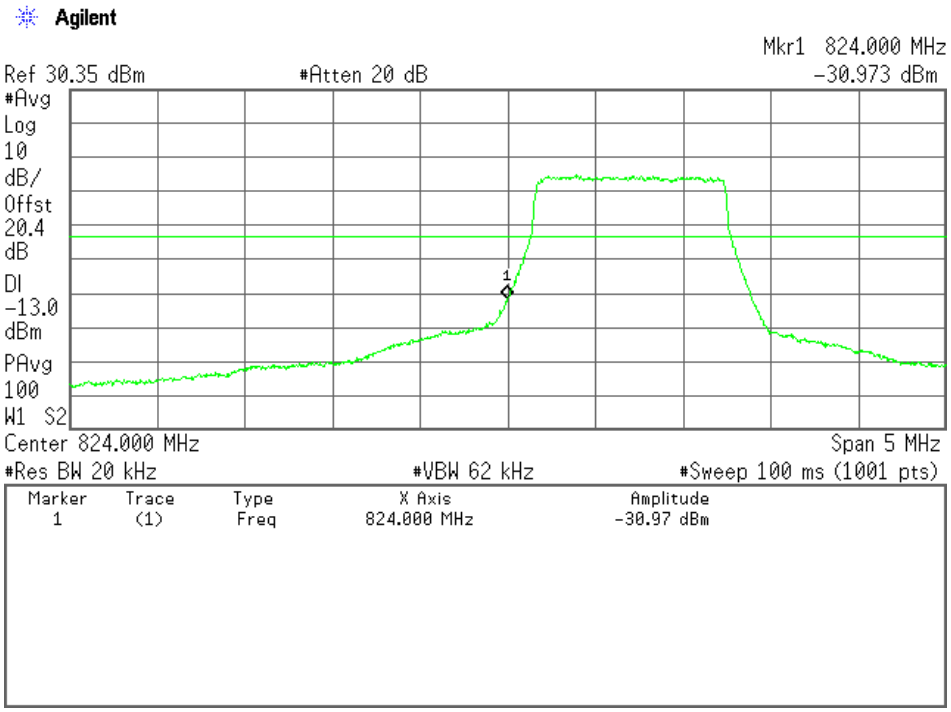
1-2) BW 1.4MHz
Mode:16 QAM

Channel	Frequency (MHz)	Band-Edge Frequency (MHz)	Level (dBm)	Limits (dBm)	Margin (dB)
20407	824.70	824.0	-27.0 (at 824.0 MHz)	-13.0	+14.0
20643	848.30	849.0	-27.6 (at 849.0 MHz)	-13.0	+14.6

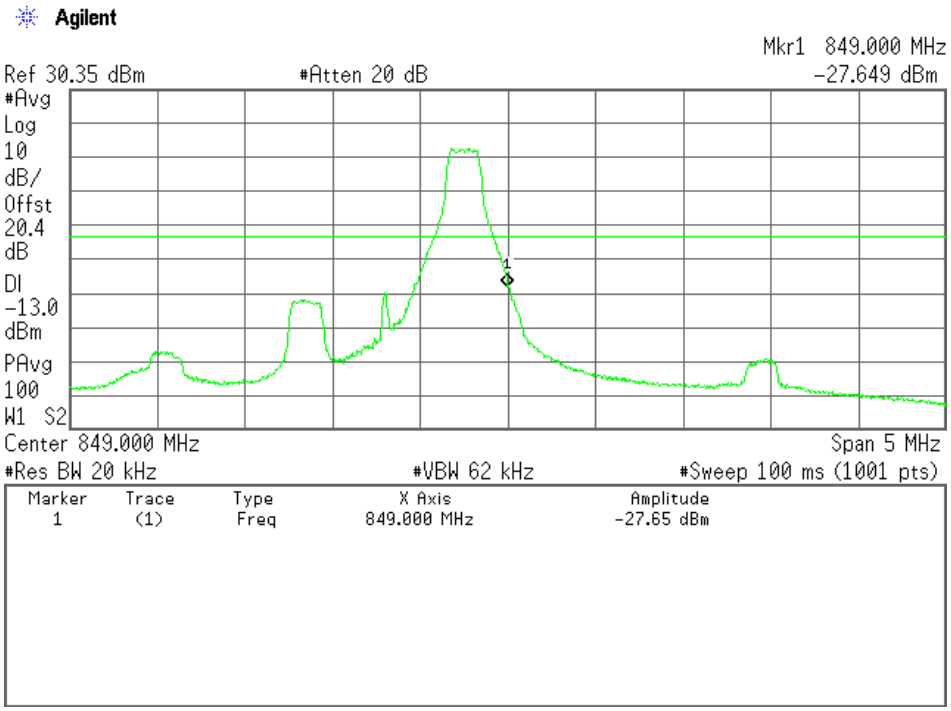
Low Channel(1RB Offset 0), Band-Edge Emission



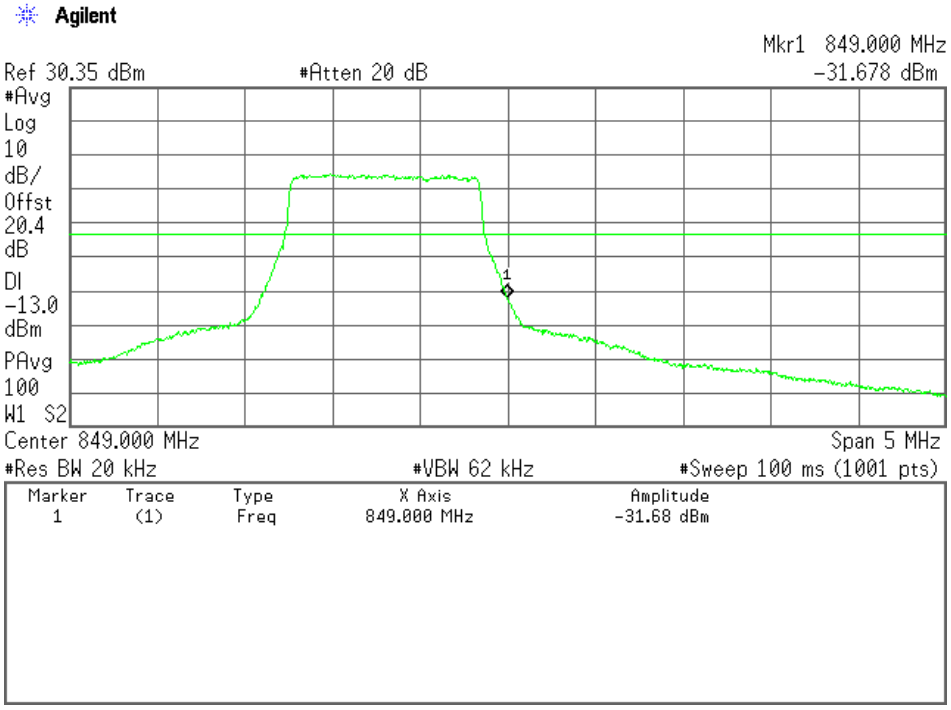
Low Channel(Full RB), Band-Edge Emission



High Channel(1RB Offset Max), Band-Edge Emission



High Channel(Full RB), Band-Edge Emission

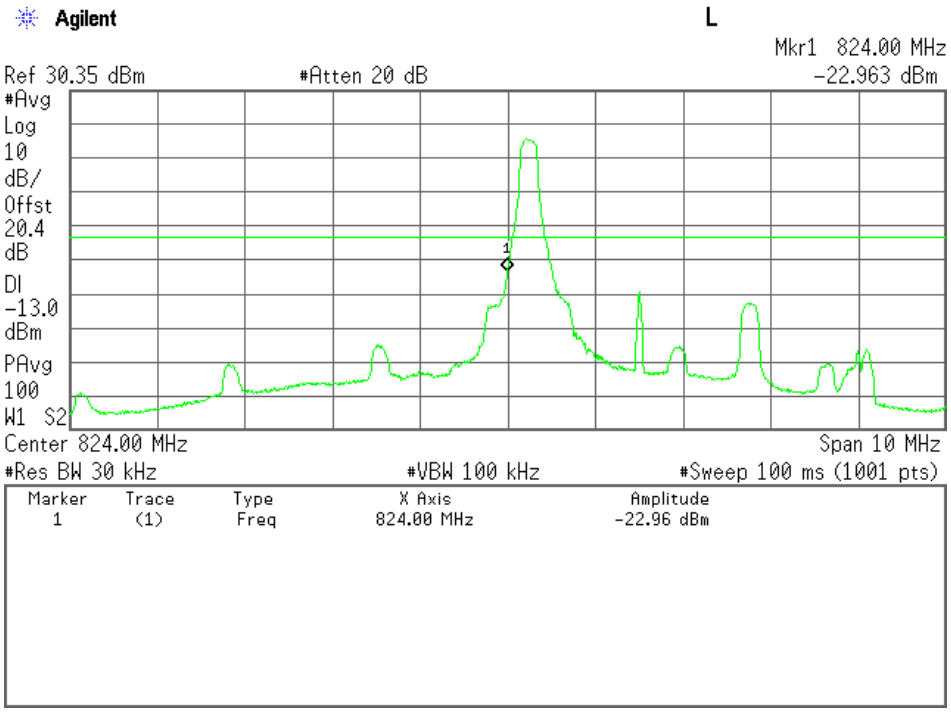


2-1) BW 3MHz

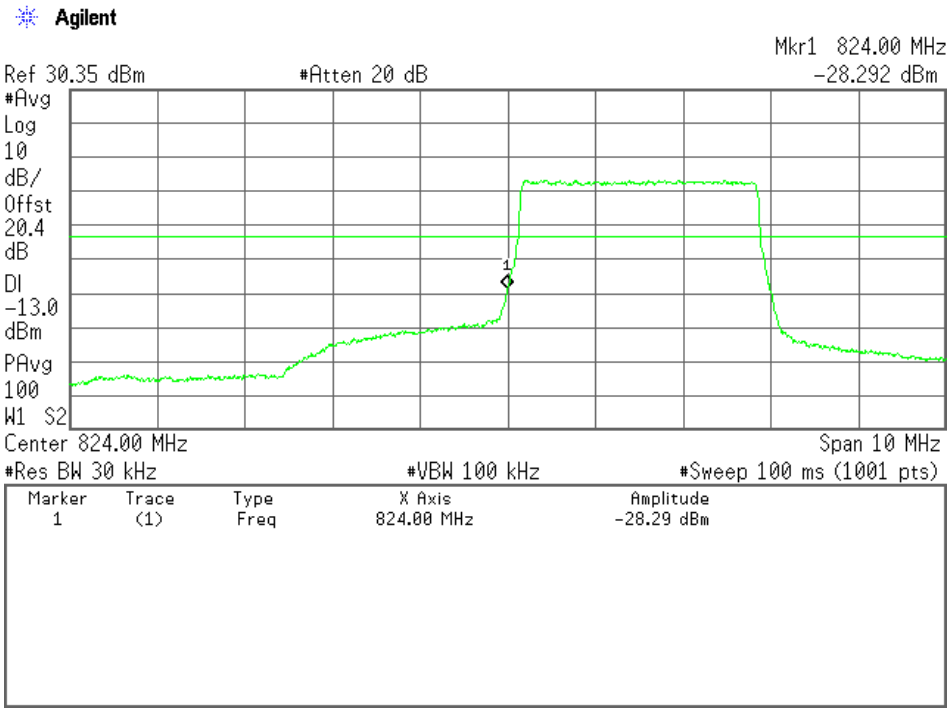
Mode: QPSK

Channel	Frequency (MHz)	Band-Edge Frequency (MHz)	Level (dBm)	Limits (dBm)	Margin (dB)
20415	825.50	824.0	-23.0 (at 824.0 MHz)	-13.0	+10.0
20635	847.50	849.0	-23.4 (at 849.0 MHz)	-13.0	+10.4

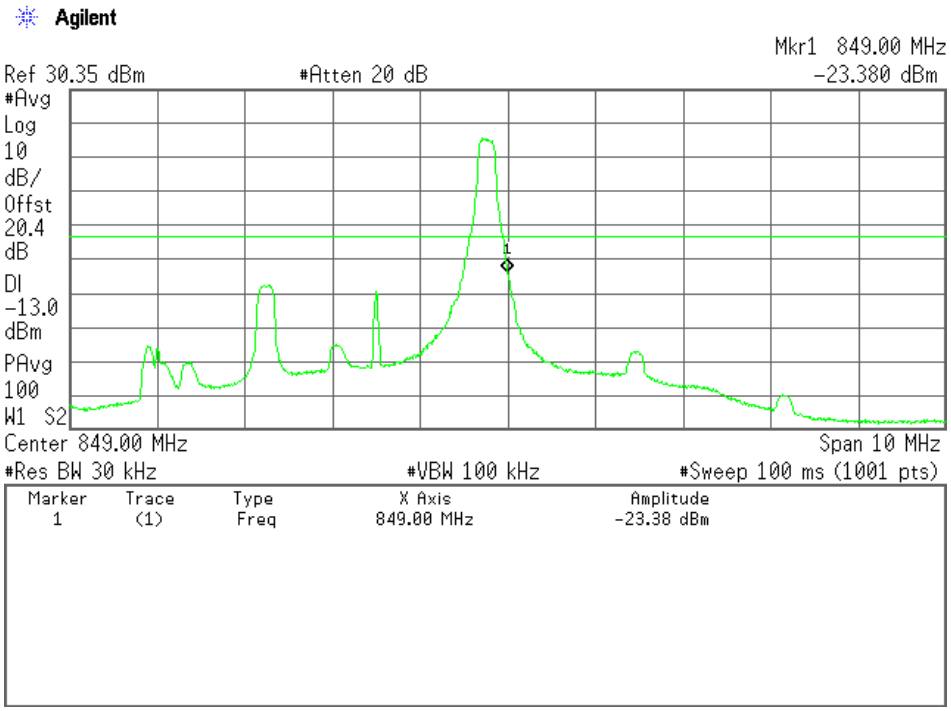
Low Channel(1RB Offset 0), Band-Edge Emission



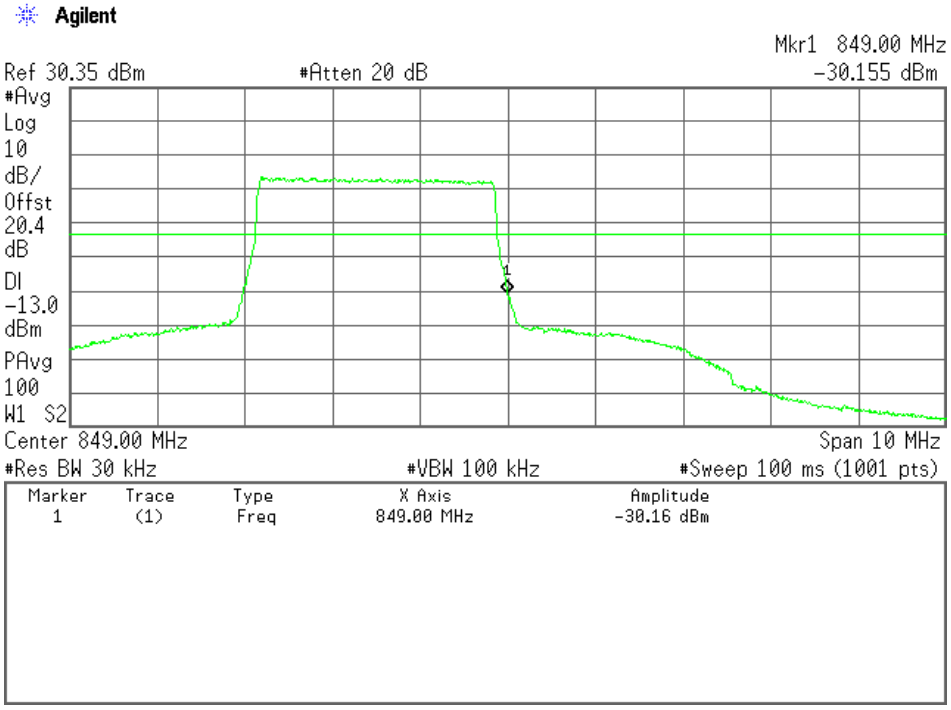
Low Channel(Full RB), Band-Edge Emission



High Channel(1RB Offset Max), Band-Edge Emission



High Channel(Full RB), Band-Edge Emission

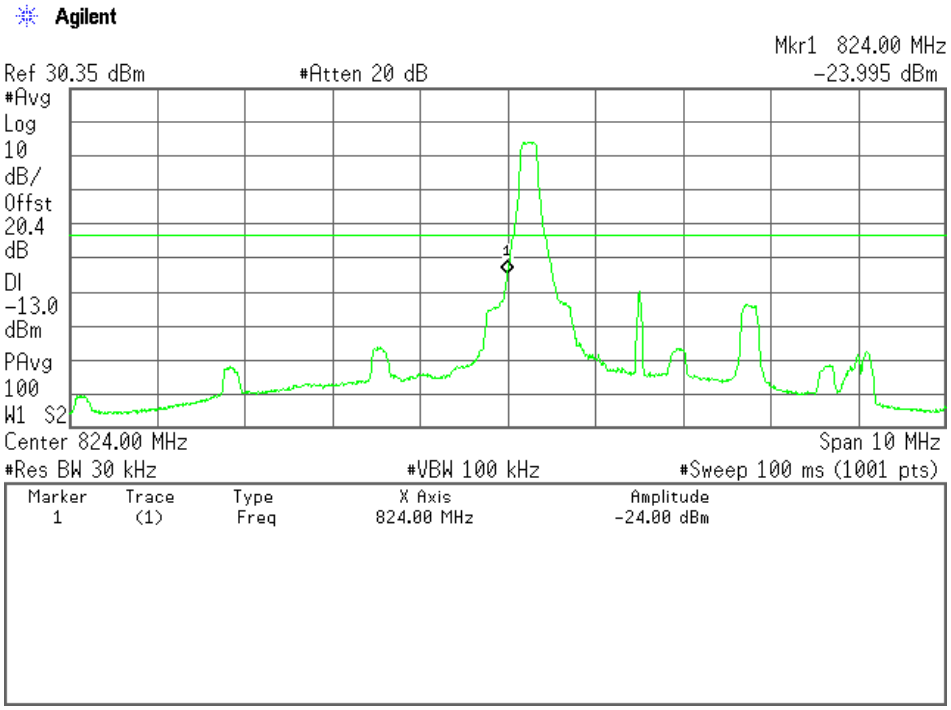


2-2) BW 3MHz

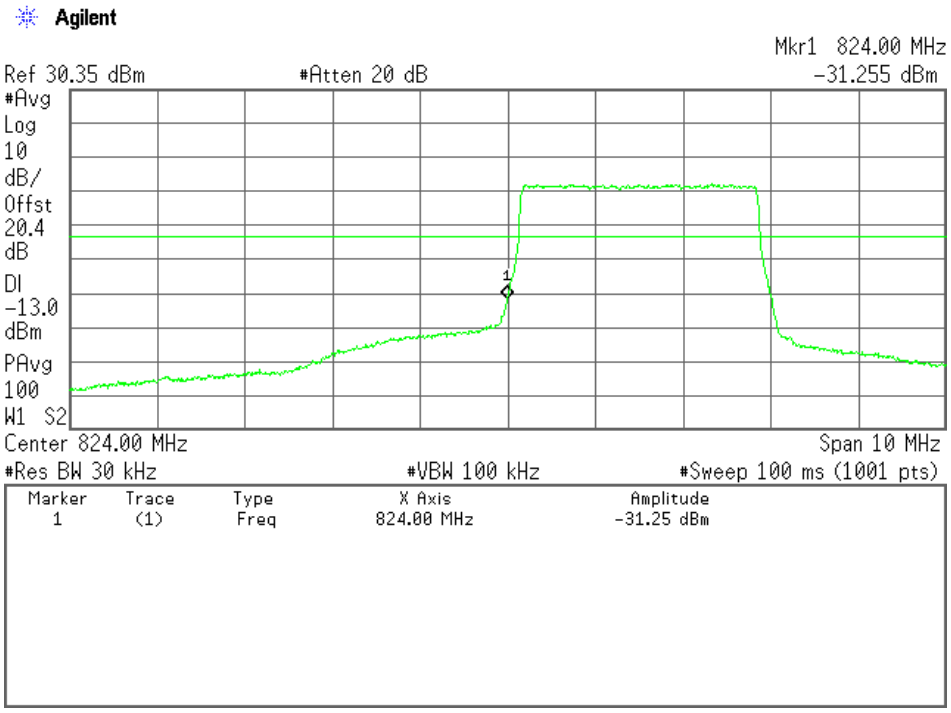
Mode:16 QAM

Channel	Frequency (MHz)	Band-Edge Frequency (MHz)	Level (dBm)	Limits (dBm)	Margin (dB)
20415	825.50	824.0	-24.0 (at 824.0 MHz)	-13.0	+11.0
20635	847.50	849.0	-24.8 (at 849.0 MHz)	-13.0	+11.8

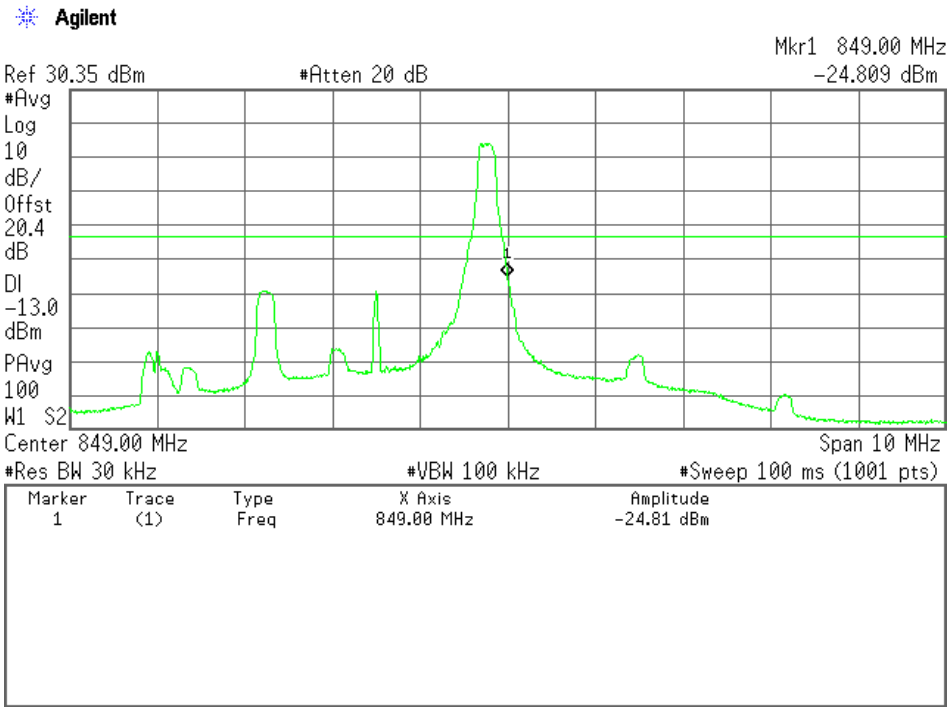
Low Channel(1RB Offset 0), Band-Edge Emission



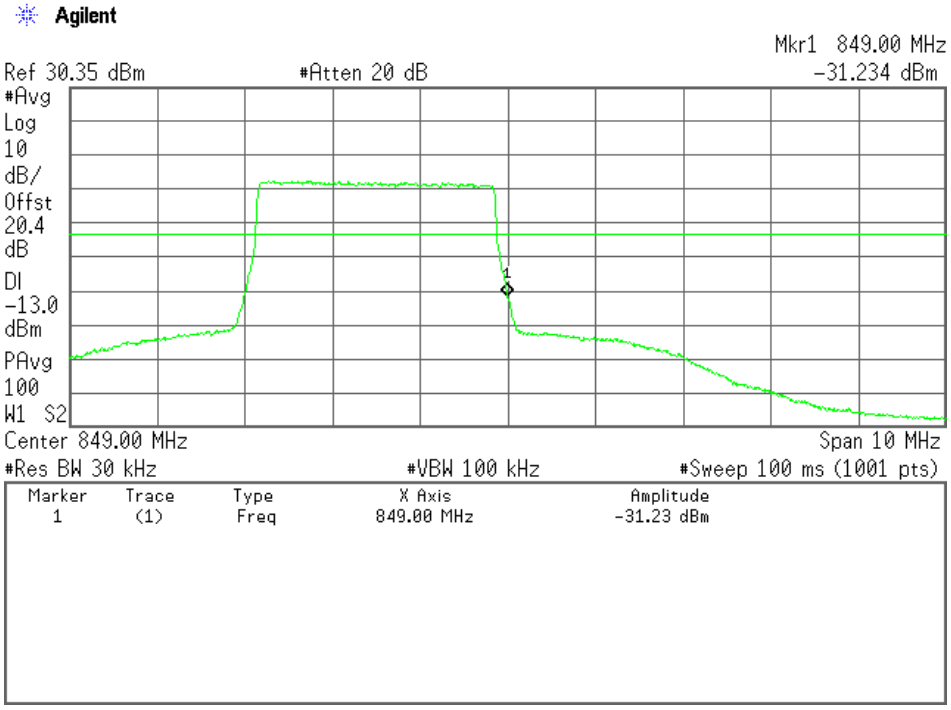
Low Channel(Full RB), Band-Edge Emission



High Channel(1RB Offset Max), Band-Edge Emission



High Channel(Full RB), Band-Edge Emission

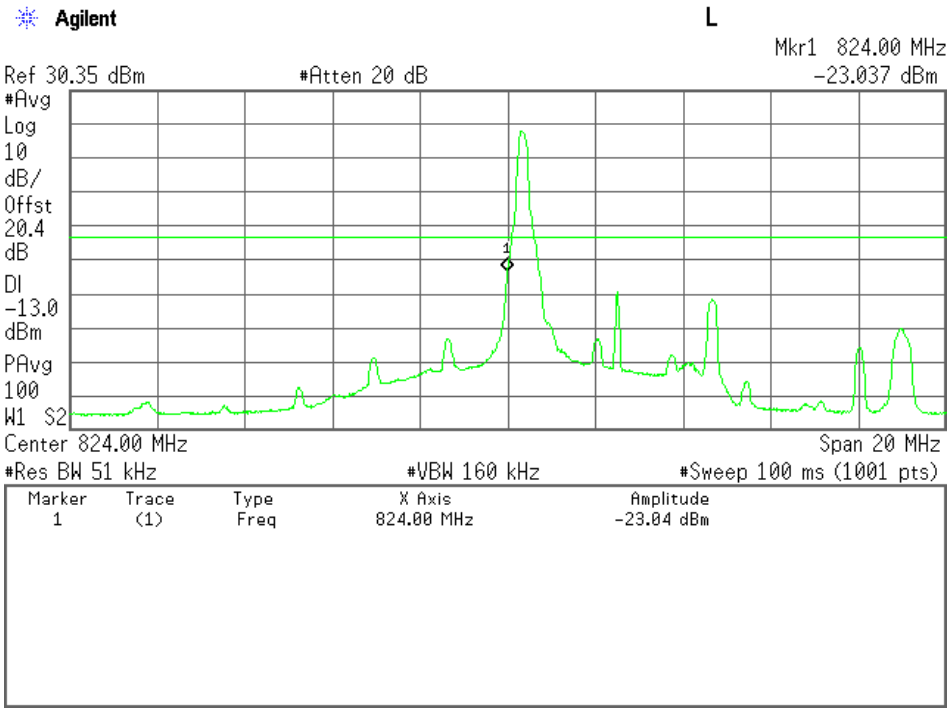


3-1) BW 5MHz

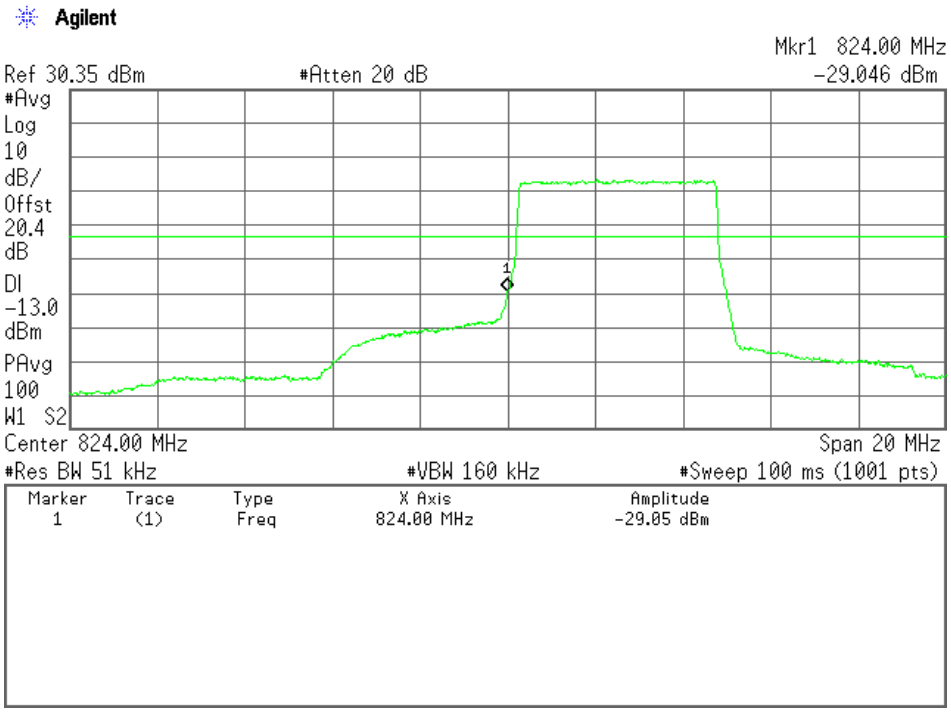
Mode: QPSK

Channel	Frequency (MHz)	Band-Edge Frequency (MHz)	Level (dBm)	Limits (dBm)	Margin (dB)
20425	826.50	824.0	-23.0 (at 824.0 MHz)	-13.0	+10.0
20625	846.50	849.0	-23.4 (at 849.0 MHz)	-13.0	+10.4

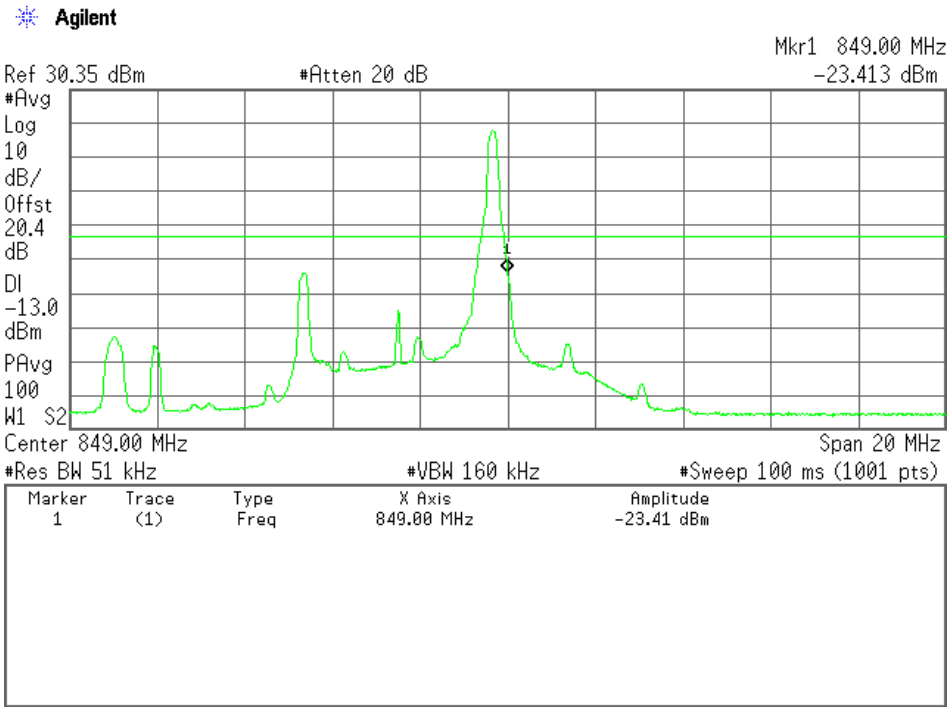
Low Channel(1RB Offset 0), Band-Edge Emission



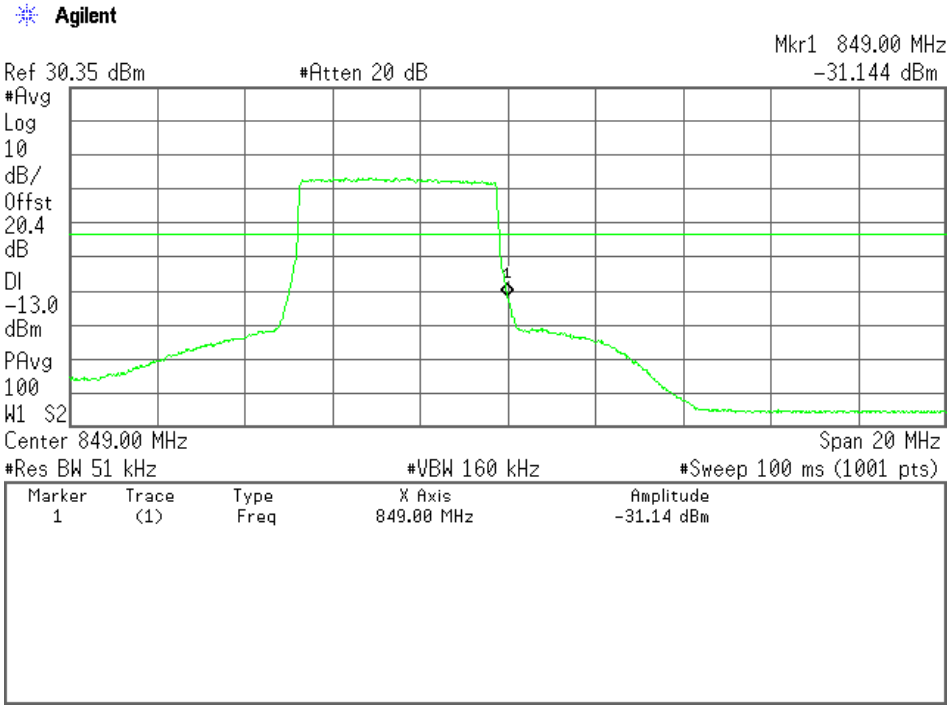
Low Channel(Full RB), Band-Edge Emission



High Channel(1RB Offset Max), Band-Edge Emission



High Channel(Full RB), Band-Edge Emission

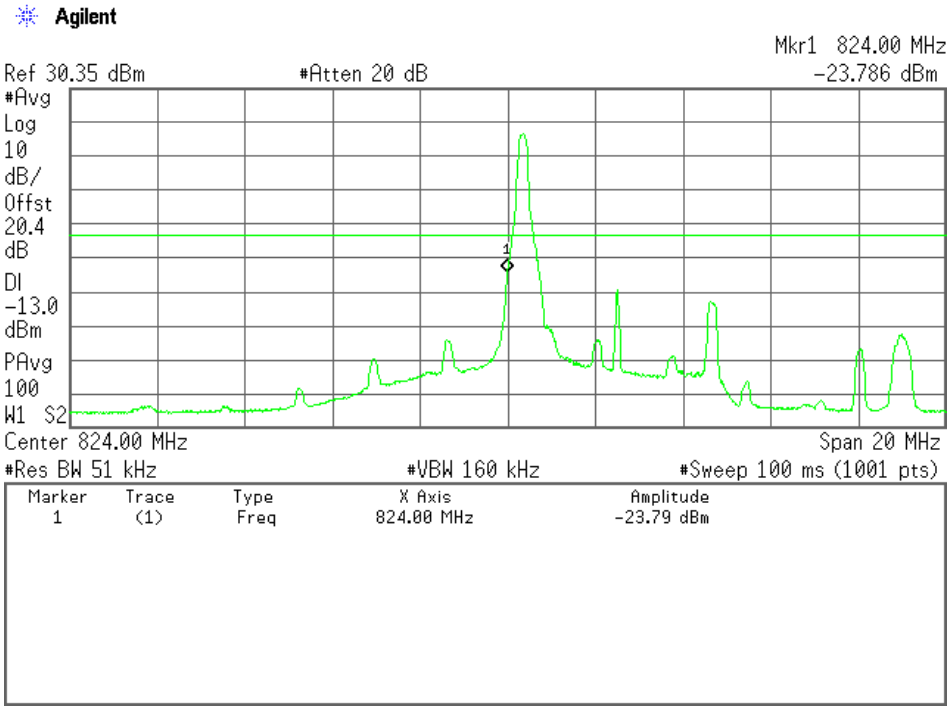


3-2) BW 5MHz

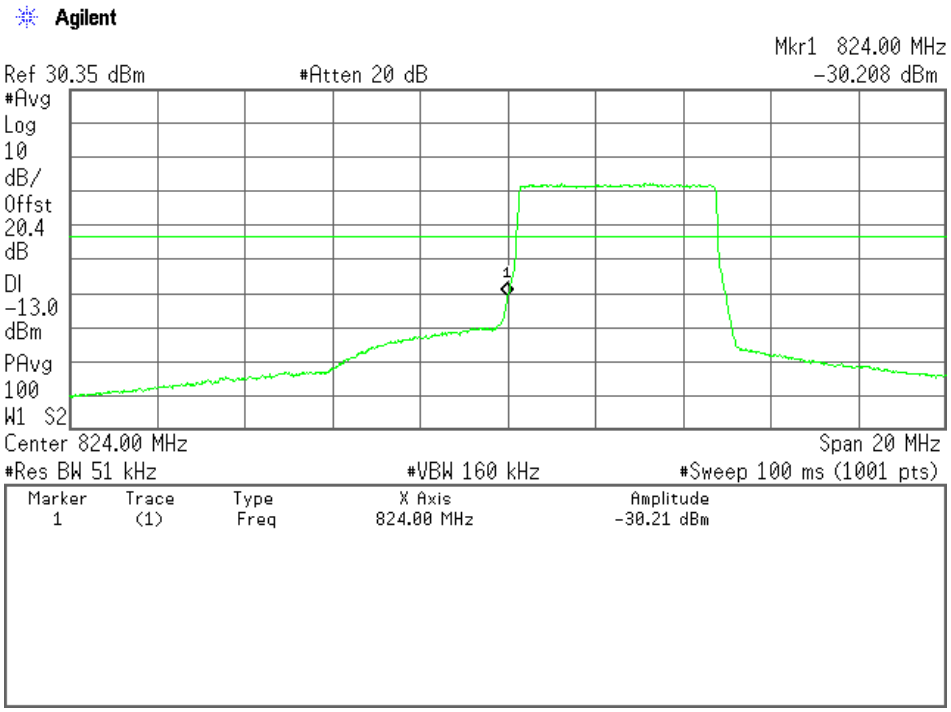
Mode:16 QAM

Channel	Frequency (MHz)	Band-Edge Frequency (MHz)	Level (dBm)	Limits (dBm)	Margin (dB)
20425	826.50	824.0	-23.8 (at 824.0 MHz)	-13.0	+10.8
20625	846.50	849.0	-23.7 (at 849.0 MHz)	-13.0	+10.7

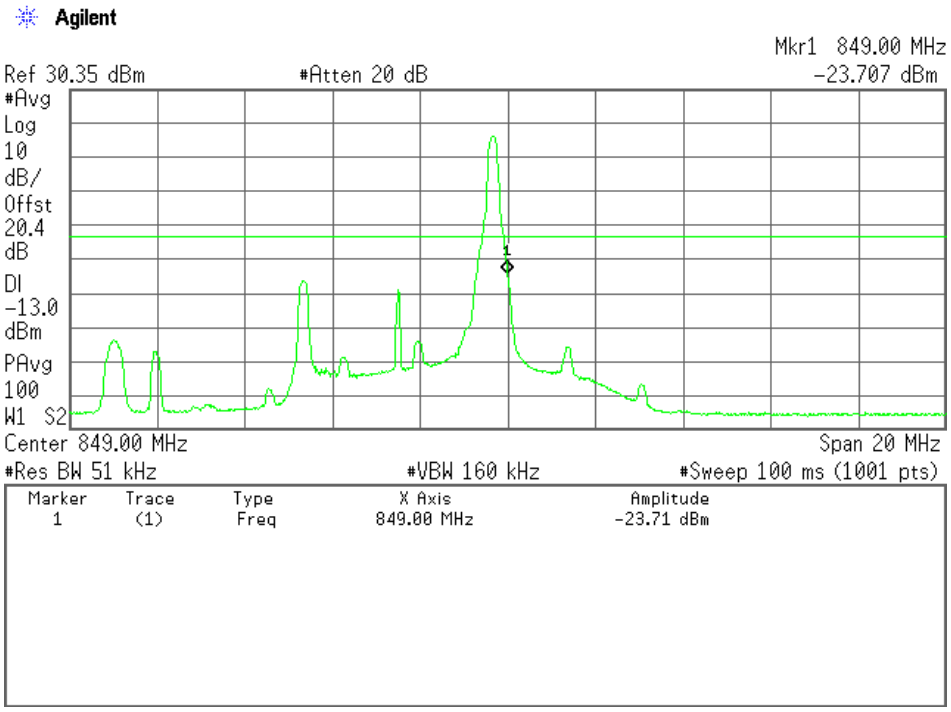
Low Channel(1RB Offset 0), Band-Edge Emission



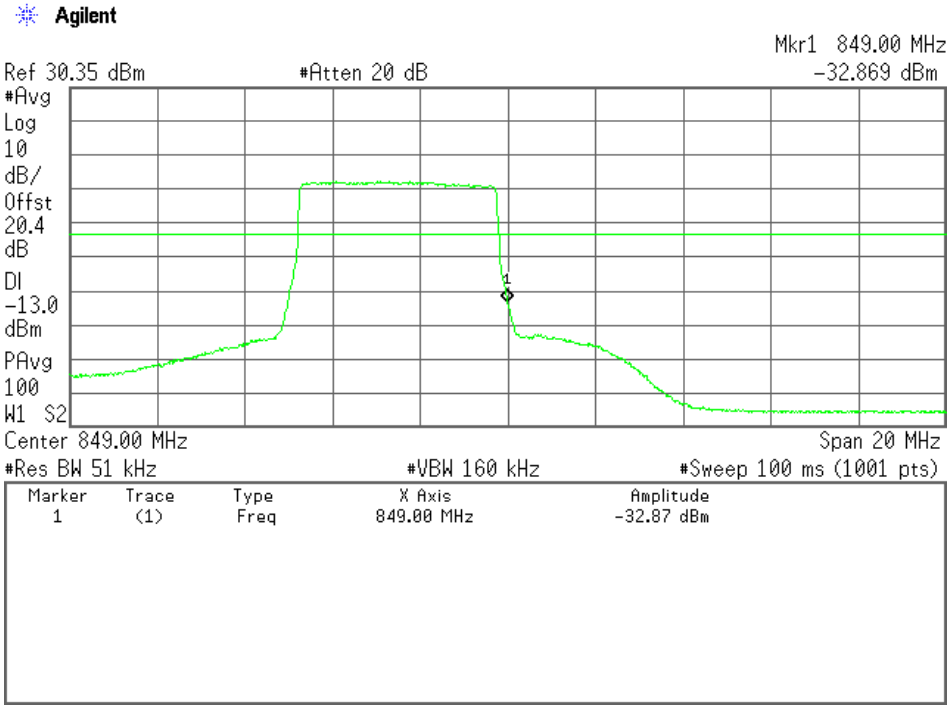
Low Channel(Full RB), Band-Edge Emission



High Channel(1RB Offset Max), Band-Edge Emission



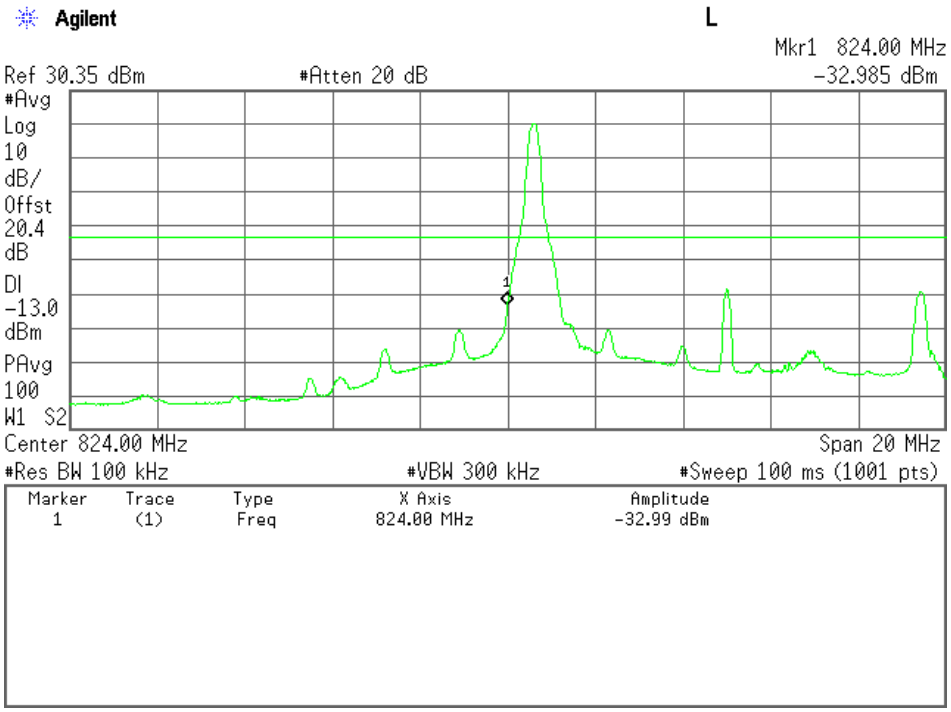
High Channel(Full RB), Band-Edge Emission



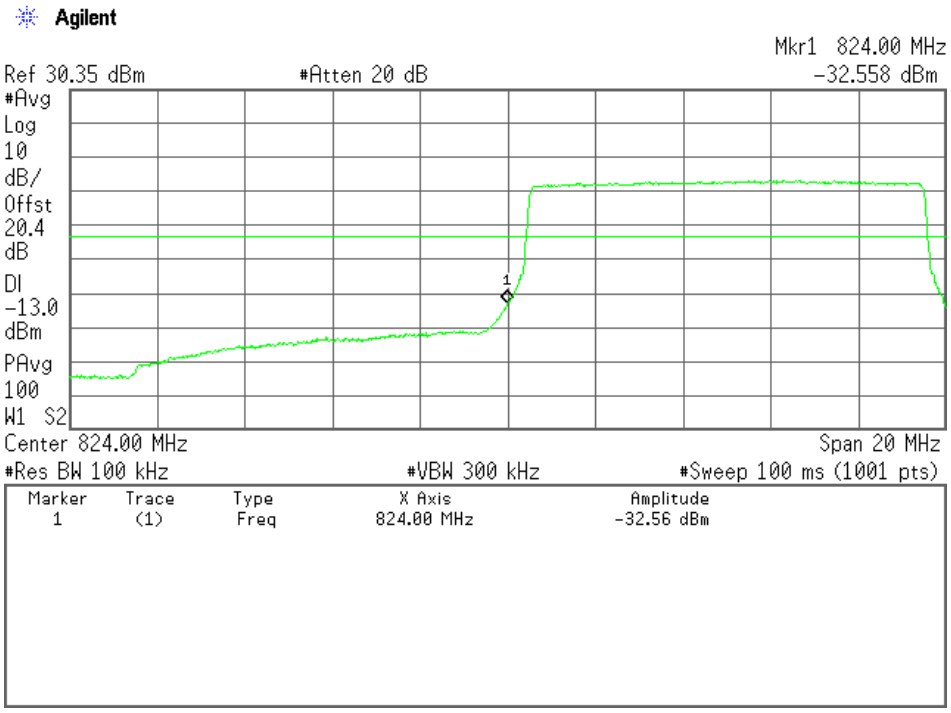
4-1) BW 10MHz
Mode: QPSK

Channel	Frequency (MHz)	Band-Edge Frequency (MHz)	Level (dBm)	Limits (dBm)	Margin (dB)
20450	829.00	824.0	-32.6 (at 824.0 MHz)	-13.0	+19.6
20600	844.00	849.0	-33.2 (at 849.0 MHz)	-13.0	+20.2

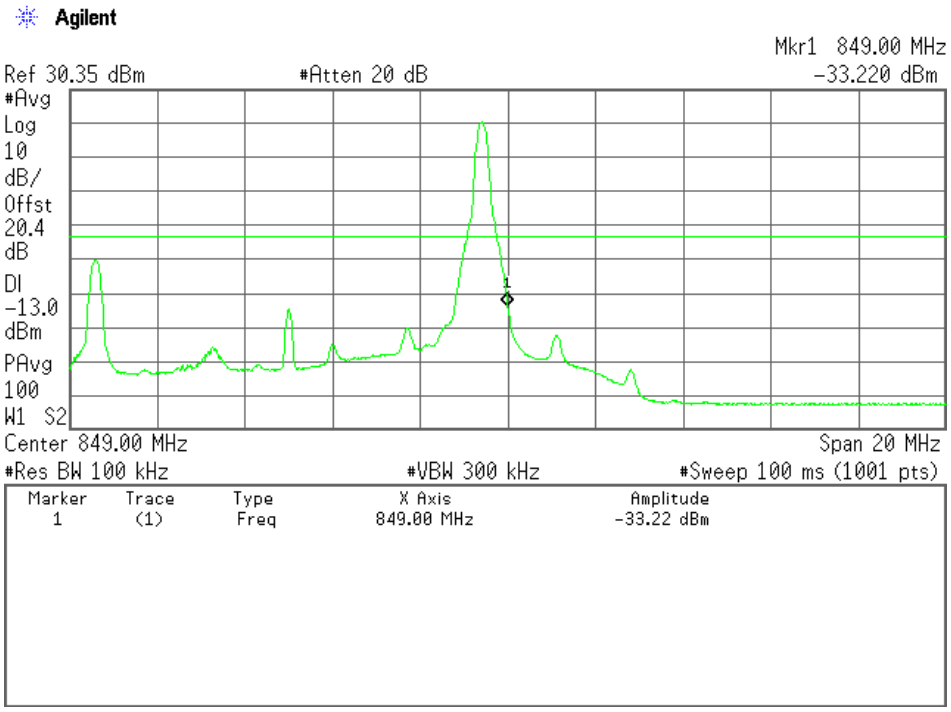
Low Channel(1RB Offset 0), Band-Edge Emission



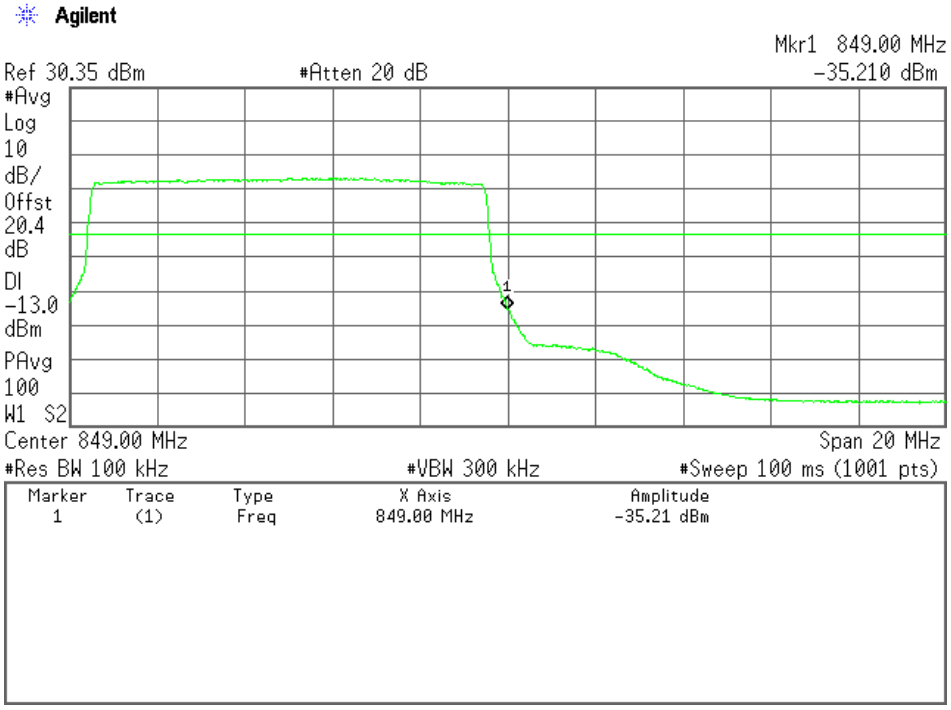
Low Channel(Full RB), Band-Edge Emission



High Channel(1RB Offset Max), Band-Edge Emission



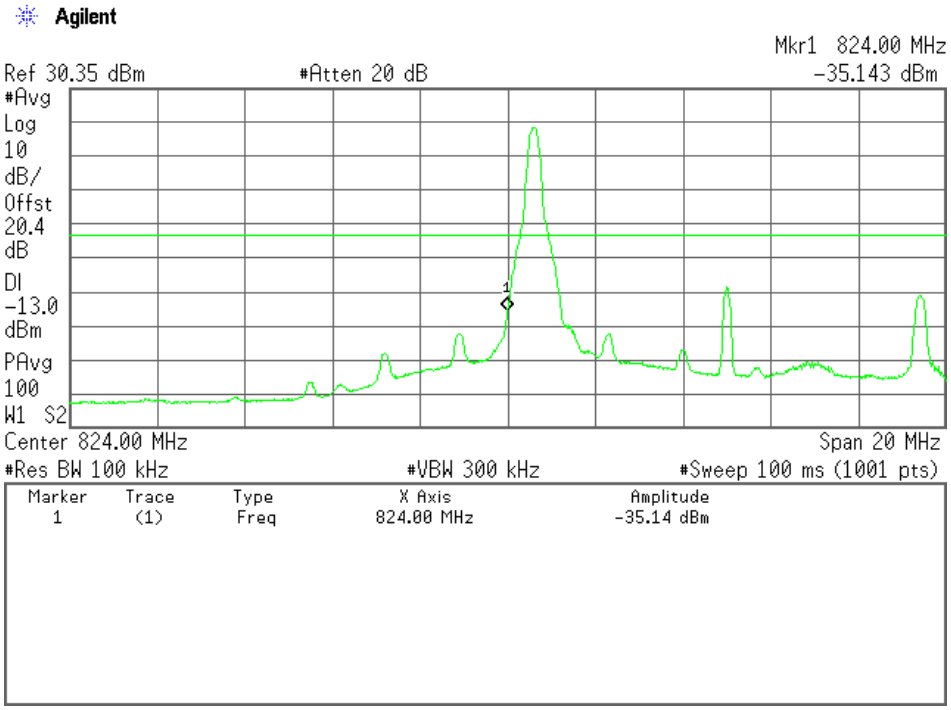
High Channel(Full RB), Band-Edge Emission



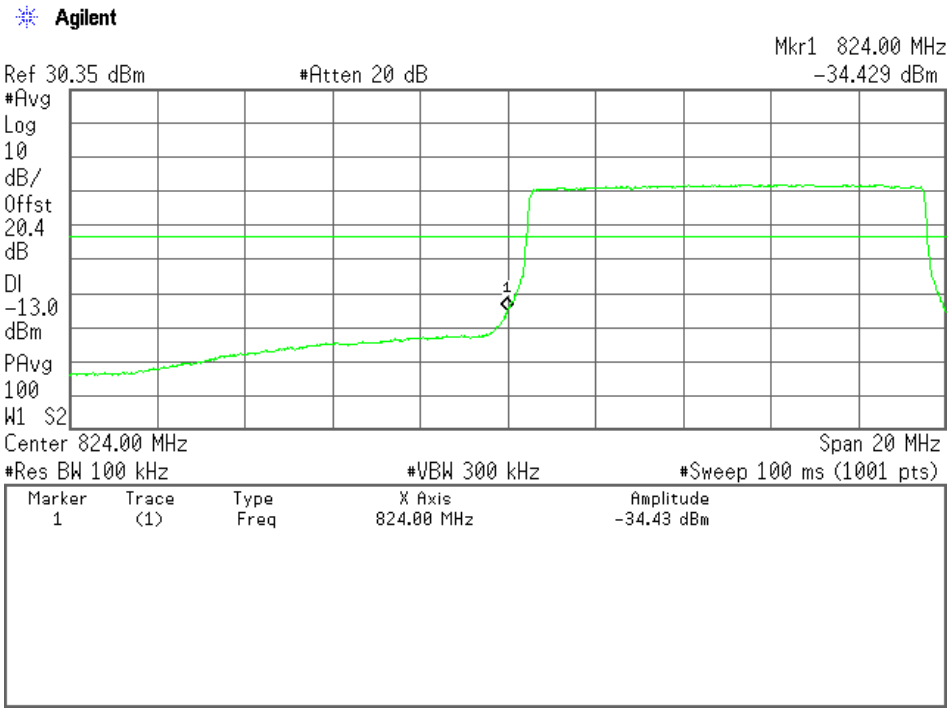
4-2) BW 10MHz
Mode:16 QAM

Channel	Frequency (MHz)	Band-Edge Frequency (MHz)	Level (dBm)	Limits (dBm)	Margin (dB)
20450	829.00	824.0	-34.4 (at 824.0 MHz)	-13.0	+21.4
20600	844.00	849.0	-35.2 (at 849.0 MHz)	-13.0	+22.2

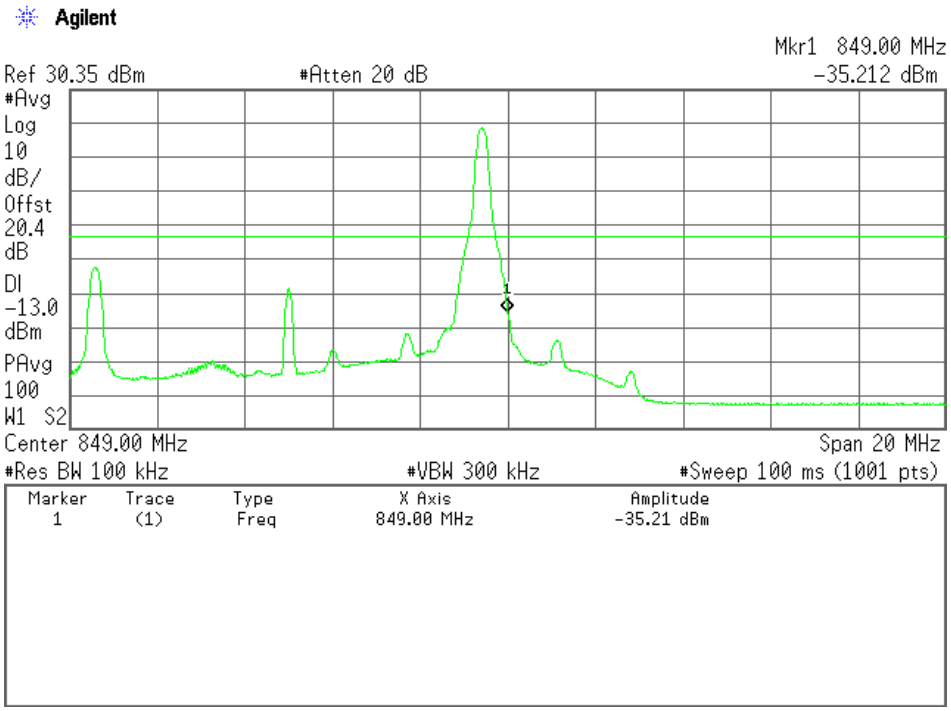
Low Channel(1RB Offset 0), Band-Edge Emission



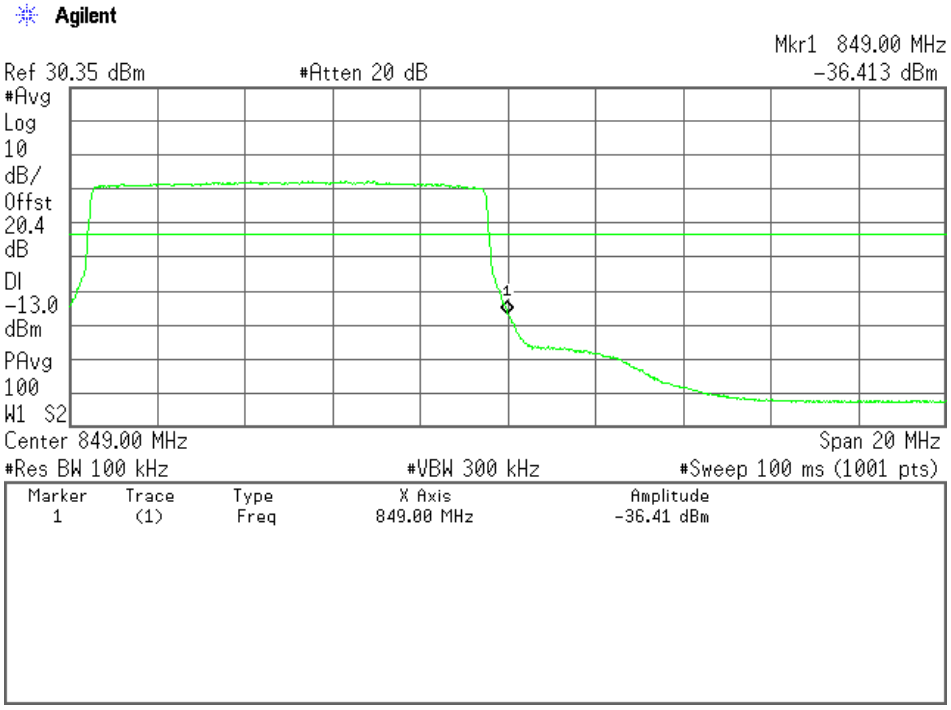
Low Channel(Full RB), Band-Edge Emission



High Channel(1RB Offset Max), Band-Edge Emission



High Channel(Full RB), Band-Edge Emission



7.7 Field Strength of Spurious Radiation (§2.1053)

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.7.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

Min. Limit Margin >29.5 dB at 8290/8365/8440 MHz

Uncertainty of Measurement Results 30 MHz – 1000 MHz ± 1.6 dB(2σ)
1 GHz – 18 GHz ± 1.8 dB(2σ)

Remarks :

7.7.2 Test Instruments

Anechoic Chamber A2				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Test Receiver	ESU 26	100170 (A-6)	Rohde & Schwarz	2017/04/27
Signal Generator	E8257D	MY45140309 (B-39)	Agilent	2017/08/08
Power Meter	N1911A	GB45100291 (B-63)	Agilent	2017/07/10
Power Sensor	N1921A	US44510470 (B-64)	Agilent	2017/07/10
Biconical Antenna	VHA9103/BBA9106	2355 (C-30)	Schwarzbeck	2017/05/18
Log-periodic Antenna	UHALP9108-A1	0694 (C-31)	Schwarzbeck	2017/05/18
Dipole Antenna (TX)	KBA-511A	0-273-2 (C-17)	Kyoritsu	2017/05/24
Dipole Antenna (TX)	KBA-611	0-248-2 (C-20)	Kyoritsu	2017/05/24
RF Cable	S 10162 B-11 etc.	--- (H-4)	HUBER+SUHNER	2017/04/03
Pre-Amplifier	TPA0118-36	1010 (A-37)	TOYO	2017/05/17
Horn Antenna	91888-2	562 (C-41-1)	EATON	2017/06/12
Horn Antenna	91889-2	568 (C-41-2)	EATON	2017/06/12
Horn Antenna	3160-04	9903-1053 (C-55)	EMCO	2017/06/13
Horn Antenna	3160-05	9902-1061 (C-56)	EMCO	2017/06/13
Horn Antenna	3160-06	9712-1045 (C-57)	EMCO	2017/06/13
Horn Antenna	3160-07	9902-1113 (C-58)	EMCO	2017/06/13
Attenuator	2-10	AW7937 (D-40)	Weinschel	2016/10/12
Attenuator	54A-10	W5713 (D-29)	Weinschel	2017/08/02
Attenuator	2-10	BA6214 (D-79)	Weinschel	2016/11/19
RF Cable	SUCOFLEX102E	6683/2E (C-70)	HUBER+SUHNER	2016/11/19
RF Cable	SUCOFLEX104	267479/4 (C-66)	HUBER+SUHNER	2017/01/06
RF Cable	SUCOFLEX104	267414/4 (C-67)	HUBER+SUHNER	2017/01/06
High Pass Filter	HPM50108	010 (D-94)	MICRO-TRONICS	2017/02/17

NOTE : The calibration interval of the above test instruments is 12 months.

7.7.3 Test Method and Test Setup (Diagrammatic illustration)

Step 1) The spurious radiation for transmitter were measured at the distance 3 m away from the EUT which was placed on a non-conducted support 0.8 m in height and was varying at three orthogonal axes. The receiving antenna was oriented for vertical polarization and varied from 1 m to 4 m until the maximum emission level was detected on the measuring instrument. The EUT was rotated 360 degrees until the maximum emission was received. The measurement was also repeated with the receiving antenna in the horizontal polarization.
This test was carried out using the half-wave dipole antenna for up to 1GHz and using the horn antenna for above 1 GHz.

Step 2)

A) Up to 1 GHz
The ERP measurement was carried out with according to Step 2 in Clause 7.2.3. Then the RF power in the substitution antenna half-wave dipole antenna for up to 1 GHz and the substitution horn antenna for above 1 GHz.

The ERP is calculated in the following equation.

ERP (dBm) = P (dBm) – (Balun Loss of the half-wave dipole Ant. (dB)) + Cable Loss (dB)

B) Above 1 GHz
The ERP is calculated from the maximum emission level by the following formula.

$$\frac{e^2}{120\pi} = \frac{eirp}{4\pi d^2} \quad \text{----(Eq.1)}$$

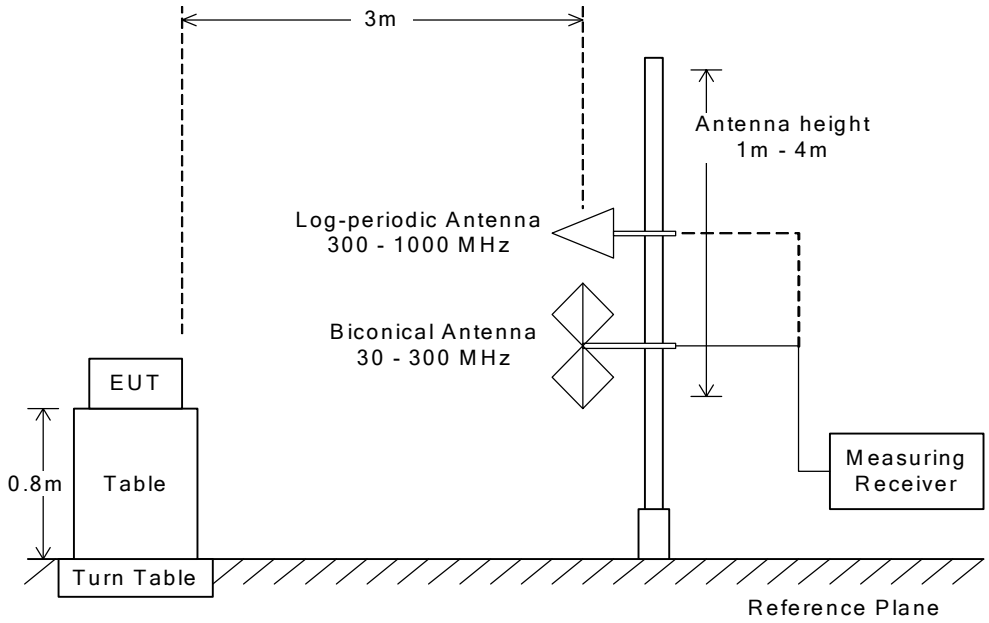
$$erp = eirp - Gd \quad \text{----(Eq.2)}$$

Where, $e[V/m]$: : Field Strength at measuring distance(d=3m)
$eirp[W]$: Equivalent Isotropic Radiated Power
$erp[W]$: Effective Radiated Power
$Gd(dBi)$: Gain of the substitution half-wave dipole antenna(2.15dBi)

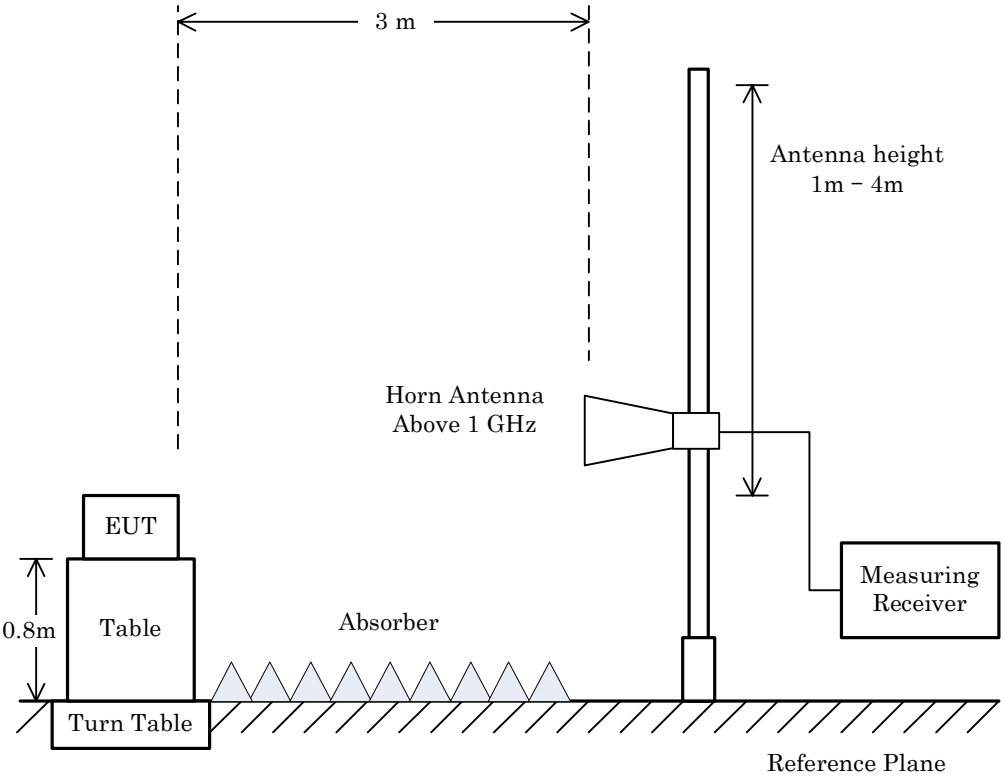
$$eirp = \frac{(de)^2}{30} = \frac{3}{10}e^2$$
$$\therefore 10\log(eirp) = 20\log(e) + 10\log(3/10) = 20\log(e) - 5.23$$
$$10\log(eirp) = EIRP[dBm] - 30$$
$$20\log(e) = E[dB(\mu V/m)] - 120$$
$$\therefore EIRP = E - 120 + 30 - 5.23 = E - 95.23$$
$$\therefore ERP[dBm] = EIRP - 2.15 = E - 97.38$$

The respective calculated ERP of the spurious and harmonics were compared with the ERP of fundamental frequency by specified attenuation limits, $43+10\log_{10}$ (TP in watt)[dB]. Where, TP = Transmitter power at the ANT OUT under test configuration as the hands free unit used.

Radiated Emission 30 MHz to 1000 MHz

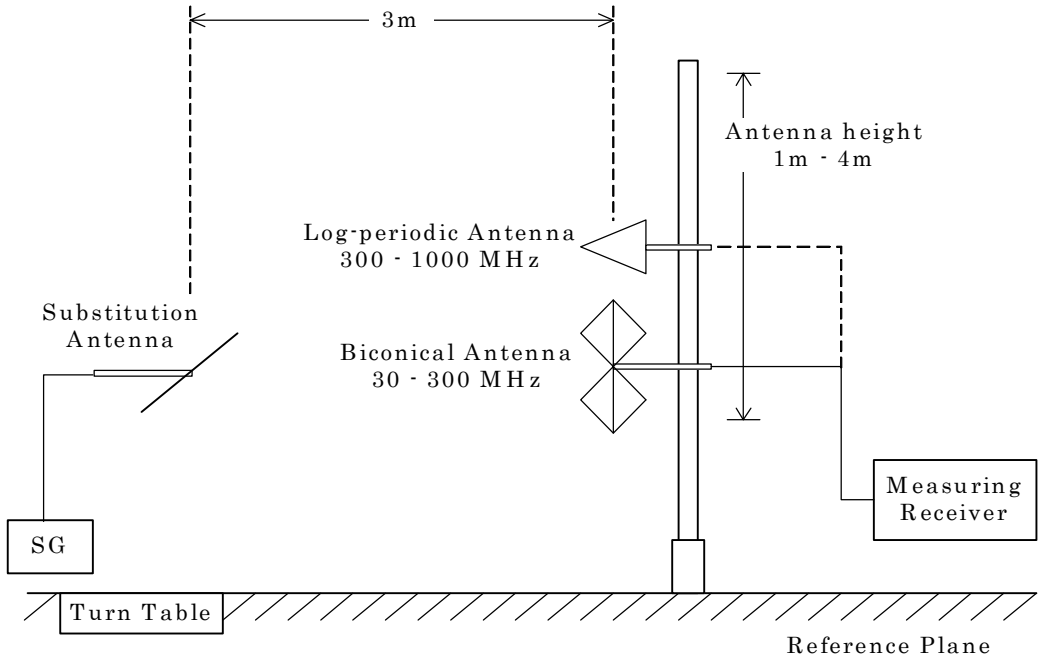


Radiated Emission above 1 GHz



NOTE
The antenna height is scanned depending on the EUT's size and mounting height.

Radiated Emission 30 to 1000 MHz – Substitution Method



7.7.4 Test Data

1) BW 1.4MHz(1RB)

(LTE 1.4MHz)

Test Date: August 22, 2016
Temp.: 25 °C, Humi: 73 %

Test Configuration : Single Unit

Transmitting Frequency CH	Transmitting Frequency [MHz]	Measured Frequency [MHz]	ERP [dBm] Hori.	ERP [dBm] Vert.	Limits [dBm]	Margin [dB]	Remarks
20407	824.700	1649.400	-55.6	-56.0	-13.0	+42.6	C
		2474.100	-51.5	-52.0	-13.0	+38.5	C
		3298.800	< -55.0	< -55.0	-13.0	> +42.0	C
		4123.500	< -48.8	< -48.8	-13.0	> +35.8	C
		4948.200	< -48.0	< -48.0	-13.0	> +35.0	C
		5772.900	< -47.4	< -47.4	-13.0	> +34.4	C
		6597.600	< -45.2	< -45.2	-13.0	> +32.2	C
		7422.300	< -45.8	< -45.8	-13.0	> +32.8	C
		8247.000	< -42.6	< -42.6	-13.0	> +29.6	C
20525	836.500	1673.000	-53.7	-54.2	-13.0	+40.7	C
		2509.500	-52.3	-52.4	-13.0	+39.3	C
		3346.000	< -54.8	< -54.8	-13.0	> +41.8	C
		4182.500	< -48.7	< -48.7	-13.0	> +35.7	C
		5019.000	< -47.8	< -47.8	-13.0	> +34.8	C
		5855.500	< -45.0	< -45.0	-13.0	> +32.0	C
		6692.000	< -45.3	< -45.3	-13.0	> +32.3	C
		7528.500	< -45.9	< -45.9	-13.0	> +32.9	C
		8365.000	< -42.5	< -42.5	-13.0	> +29.5	C
20643	848.300	1696.600	-44.1	-44.9	-13.0	+31.1	C
		2544.900	< -55.9	< -55.9	-13.0	> +42.9	C
		3393.200	< -54.6	< -54.6	-13.0	> +41.6	C
		4241.500	< -48.8	< -48.8	-13.0	> +35.8	C
		5089.800	< -47.6	< -47.6	-13.0	> +34.6	C
		5938.100	< -45.0	< -45.0	-13.0	> +32.0	C
		6786.400	< -45.3	< -45.3	-13.0	> +32.3	C
		7634.700	< -45.9	< -45.9	-13.0	> +32.9	C
		8483.000	< -42.6	< -42.6	-13.0	> +29.6	C

Calculated result at 8365.0 MHz, as the worst point shown on underline:
Minimum Margin: -13.0 - (<-42.5) = >29.5 (dB)

NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 30 MHz to the tenth harmonic of the highest fundamental frequency.
3. All emissions not reported were more than 20 dB below the applied limits.
4. Applied limits : -13.0 [dBm] = 10log(TP[mW]) - (43 + 10log(tp[W])) = 10log(TP[mW]) - (43 + (10 log(TP[mW]) - 30))
   where, tp[W] = TP[mW] / 1000 : Transmitter power at anttena terminal
5. The symbol of "<" means "or less".
6. The symbol of ">" means "more than".
7. Setting of measuring instrument(s) :

	Detector Function	RES B.W.	V.B.W.	Sweep Time
A	Peak	10 kHz	30 kHz	20 msec.
B	Peak	100 kHz	300 kHz	20 msec.
C	Peak	1 MHz	3 MHz	20 msec.

2) BW 3MHz(1RB)

(LTE 3MHz)

Test Date: August 22, 2016
Temp.: 25 °C, Humi: 73 %

Test Configuration : Single Unit

CH	Transmitting Frequency [MHz]	Measured Frequency [MHz]	ERP [dBm] Hori.	ERP [dBm] Vert.	Limits [dBm]	Margin [dB]	Remarks
20415	825.500	1651.000	-55.7	-55.9	-13.0	+42.7	C
		2476.500	-51.2	-51.5	-13.0	+38.2	C
		3302.000	< -54.9	< -54.9	-13.0	> +41.9	C
		4127.500	< -48.8	< -48.8	-13.0	> +35.8	C
		4953.000	< -48.0	< -48.0	-13.0	> +35.0	C
		5778.500	< -47.4	< -47.4	-13.0	> +34.4	C
		6604.000	< -45.2	< -45.2	-13.0	> +32.2	C
		7429.500	< -45.8	< -45.8	-13.0	> +32.8	C
		8255.000	< -42.6	< -42.6	-13.0	> +29.6	C
20525	836.500	1673.000	-54.1	-54.8	-13.0	+41.1	C
		2509.500	-51.9	-52.5	-13.0	+38.9	C
		3346.000	< -54.8	< -54.8	-13.0	> +41.8	C
		4182.500	< -48.7	< -48.7	-13.0	> +35.7	C
		5019.000	< -47.8	< -47.8	-13.0	> +34.8	C
		5855.500	< -45.0	< -45.0	-13.0	> +32.0	C
		6692.000	< -45.3	< -45.3	-13.0	> +32.3	C
		7528.500	< -45.9	< -45.9	-13.0	> +32.9	C
		8365.000	< -42.5	< -42.5	-13.0	> +29.5	C
20635	847.500	1695.000	-46.3	-46.4	-13.0	+33.3	C
		2542.500	-51.5	-51.2	-13.0	+38.2	C
		3390.000	< -54.6	< -54.6	-13.0	> +41.6	C
		4237.500	< -48.8	< -48.8	-13.0	> +35.8	C
		5085.000	< -47.6	< -47.6	-13.0	> +34.6	C
		5932.500	< -45.0	< -45.0	-13.0	> +32.0	C
		6780.000	< -45.3	< -45.3	-13.0	> +32.3	C
		7627.500	< -45.9	< -45.9	-13.0	> +32.9	C
		8475.000	< -42.6	< -42.6	-13.0	> +29.6	C

Calculated result at 8365.0 MHz, as the worst point shown on underline:
Minimum Margin: -13.0 - (<-42.5) = >29.5 (dB)

NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 30 MHz to the tenth harmonic of the highest fundamental frequency.
3. All emissions not reported were more than 20 dB below the applied limits.
4. Applied limits : -13.0 [dBm] = 10log(TP[mW]) - (43 + 10log(tp[W])) = 10log(TP[mW]) - (43 + (10 log(TP[mW]) - 30))
   where, tp[W] = TP[mW] / 1000 : Transmitter power at anttena terminal
5. The symbol of "<" means "or less".
6. The symbol of ">" means "more than".
7. Setting of measuring instrument(s) :

	Detector Function	RES B.W.	V.B.W.	Sweep Time
A	Peak	10 kHz	30 kHz	20 msec.
B	Peak	100 kHz	300 kHz	20 msec.
C	Peak	1 MHz	3 MHz	20 msec.

3) BW 5MHz(1RB)

(LTE 5MHz)

Test Date: August 22, 2016
Temp.: 25 °C, Humi: 73 %

Test Configuration : Single Unit

CH	Transmitting Frequency [MHz]	Measured Frequency [MHz]	ERP [dBm] Hori.	ERP [dBm] Vert.	Limits [dBm]	Margin [dB]	Remarks
20425	826.500	1653.000	-54.4	-55.1	-13.0	+41.4	C
		2479.500	-55.1	-55.1	-13.0	+42.1	C
		3306.000	< -54.9	< -54.9	-13.0	> +41.9	C
		4132.500	< -48.8	< -48.8	-13.0	> +35.8	C
		4959.000	< -48.0	< -48.0	-13.0	> +35.0	C
		5785.500	< -47.4	< -47.4	-13.0	> +34.4	C
		6612.000	< -45.2	< -45.2	-13.0	> +32.2	C
		7438.500	< -45.8	< -45.8	-13.0	> +32.8	C
		8265.000	< -42.6	< -42.6	-13.0	> +29.6	C
20525	836.500	1673.000	-53.6	-53.9	-13.0	+40.6	C
		2509.500	-51.8	-53.1	-13.0	+38.8	C
		3346.000	< -54.8	< -54.8	-13.0	> +41.8	C
		4182.500	< -48.7	< -48.7	-13.0	> +35.7	C
		5019.000	< -47.8	< -47.8	-13.0	> +34.8	C
		5855.500	< -45.0	< -45.0	-13.0	> +32.0	C
		6692.000	< -45.3	< -45.3	-13.0	> +32.3	C
		7528.500	< -45.9	< -45.9	-13.0	> +32.9	C
		8365.000	< -42.5	< -42.5	-13.0	> +29.5	C
20625	846.500	1693.000	-46.9	-47.6	-13.0	+33.9	C
		2539.500	-52.0	-53.0	-13.0	+39.0	C
		3386.000	< -54.6	< -54.6	-13.0	> +41.6	C
		4232.500	< -48.8	< -48.8	-13.0	> +35.8	C
		5079.000	< -47.6	< -47.6	-13.0	> +34.6	C
		5925.500	< -45.0	< -45.0	-13.0	> +32.0	C
		6772.000	< -45.3	< -45.3	-13.0	> +32.3	C
		7618.500	< -45.9	< -45.9	-13.0	> +32.9	C
		8465.000	< -42.6	< -42.6	-13.0	> +29.6	C

Calculated result at 8365.0 MHz, as the worst point shown on underline:
Minimum Margin: -13.0 - (<-42.5) = >29.5 (dB)

NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 30 MHz to the tenth harmonic of the highest fundamental frequency.
3. All emissions not reported were more than 20 dB below the applied limits.
4. Applied limits : -13.0 [dBm] = 10log(TP[mW]) - (43 + 10log(tp[W])) = 10log(TP[mW]) - (43 + (10 log(TP[mW]) - 30))
   where, tp[W] = TP[mW] / 1000 : Transmitter power at anttena terminal
5. The symbol of "<" means "or less".
6. The symbol of ">" means "more than".
7. Setting of measuring instrument(s) :

	Detector Function	RES B.W.	V.B.W.	Sweep Time
A	Peak	10 kHz	30 kHz	20 msec.
B	Peak	100 kHz	300 kHz	20 msec.
C	Peak	1 MHz	3 MHz	20 msec.

4) BW 10MHz(1RB)

(LTE 10MHz)

Test Date: August 22, 2016
Temp.: 25 °C, Humi: 73 %

Test Configuration : Single Unit

Transmitting Frequency CH	Transmitting Frequency [MHz]	Measured Frequency [MHz]	ERP [dBm] Hori.	ERP [dBm] Vert.	Limits [dBm]	Margin [dB]	Remarks
20450	829.000	1658.000	-54.4	-53.8	-13.0	+40.8	C
		2487.000	-50.4	-51.4	-13.0	+37.4	C
		3316.000	< -54.9	< -54.9	-13.0	> +41.9	C
		4145.000	< -48.7	< -48.7	-13.0	> +35.7	C
		4974.000	< -48.0	< -48.0	-13.0	> +35.0	C
		5803.000	< -47.4	< -47.4	-13.0	> +34.4	C
		6632.000	< -45.2	< -45.2	-13.0	> +32.2	C
		7461.000	< -45.8	< -45.8	-13.0	> +32.8	C
		8290.000	< -42.5	< -42.5	-13.0	> +29.5	C
20525	836.500	1673.000	-53.9	-54.1	-13.0	+40.9	C
		2509.500	-51.8	-52.5	-13.0	+38.8	C
		3346.000	< -54.8	< -54.8	-13.0	> +41.8	C
		4182.500	< -48.7	< -48.7	-13.0	> +35.7	C
		5019.000	< -47.8	< -47.8	-13.0	> +34.8	C
		5855.500	< -45.0	< -45.0	-13.0	> +32.0	C
		6692.000	< -45.3	< -45.3	-13.0	> +32.3	C
		7528.500	< -45.9	< -45.9	-13.0	> +32.9	C
		8365.000	< -42.5	< -42.5	-13.0	> +29.5	C
20600	844.000	1688.000	-48.7	-48.9	-13.0	+35.7	C
		2532.000	-53.3	-53.2	-13.0	+40.2	C
		3376.000	< -54.7	< -54.7	-13.0	> +41.7	C
		4220.000	< -48.8	< -48.8	-13.0	> +35.8	C
		5064.000	< -47.6	< -47.6	-13.0	> +34.6	C
		5908.000	< -44.9	< -44.9	-13.0	> +31.9	C
		6752.000	< -45.3	< -45.3	-13.0	> +32.3	C
		7596.000	< -45.9	< -45.9	-13.0	> +32.9	C
		8440.000	< -42.5	< -42.5	-13.0	> +29.5	C

Calculated result at 8290.0 MHz, as the worst point shown on underline:
Minimum Margin: -13.0 - (<-42.5) = >29.5 (dB)

NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 30 MHz to the tenth harmonic of the highest fundamental frequency.
3. All emissions not reported were more than 20 dB below the applied limits.
4. Applied limits : -13.0 [dBm] = 10log(TP[mW]) - (43 + 10log(tp[W])) = 10log(TP[mW]) - (43 + (10 log(TP[mW]) - 30))
   where, tp[W] = TP[mW] / 1000 : Transmitter power at anttena terminal
5. The symbol of "<" means "or less".
6. The symbol of ">" means "more than".
7. Setting of measuring instrument(s) :

	Detector Function	RES B.W.	V.B.W.	Sweep Time
A	Peak	10 kHz	30 kHz	20 msec.
B	Peak	100 kHz	300 kHz	20 msec.
C	Peak	1 MHz	3 MHz	20 msec.

7.8 Frequency Stability (§2.1055)

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.8.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

The Frequency Stability level is +/-0.01 ppm at 836.500 MHz

Uncertainty of Measurement Results ± 0.03 ppm(2σ)

Remarks : _____

7.8.2 Test Instruments

Shielded Room S4				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Base Station Simulator	MT8820C	6200918329 (B-5)	Anritsu	2017/02/22
Environmental Chamber	SH-641	92010990 (F-32)	ESPEC	2017/07/13
DC Voltage Meter	2011	02247S (B-33)	YOKOGAWA	2017/04/05
DC Power Supply	NL035-10	35883293 (F-4)	TAKASAGO	N/A

NOTE : The calibration interval of the above test instruments is 12 months.

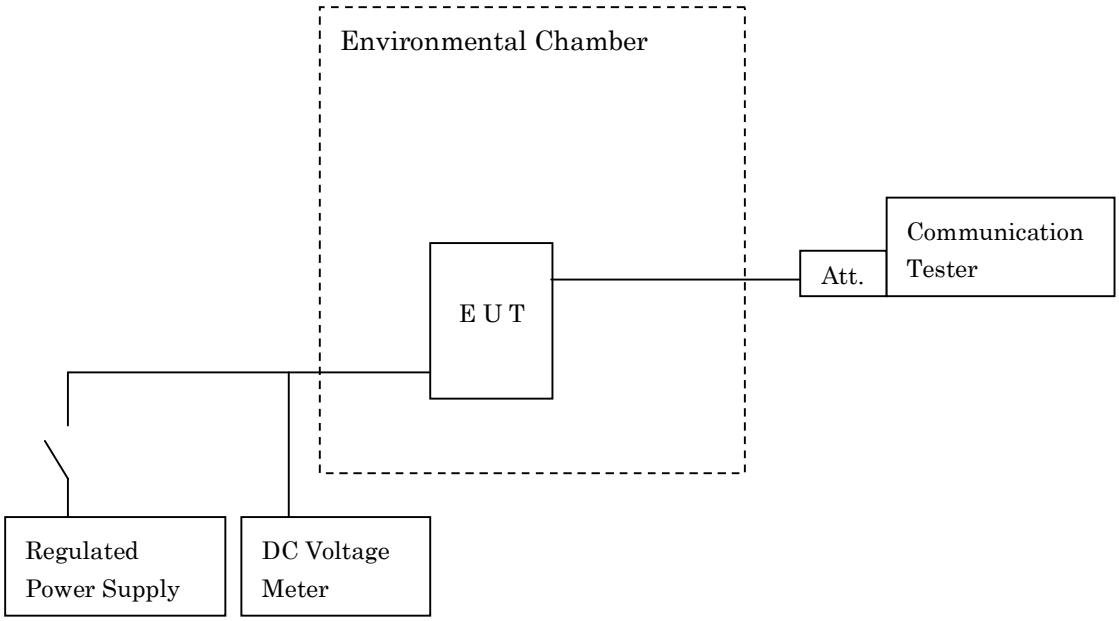
7.8.3 Test Method and Test Setup (Diagrammatic illustration)

Frequency Stability versus Temperature

The EUT was placed in an environmental chamber and was tested in the range from –30 to +50 degrees Celsius. The EUT was stabilized at each temperature. The power (4.0VDC) supplied was applied to the transmitter and allowed to stabilize for 10 minutes. The transmitting frequency was measured at startup and 2 minutes, 5 minutes and 10 minutes after startup. This procedure was repeated from –30 to +50 degrees Celsius at the interval of 10 degrees.

Frequency Stability versus Power Supply Voltage

The EUT was placed in an environmental chamber and was tested at the temperature of +20 degrees Celsius. The EUT was stabilized at the temperature. The power (4.0VDC) and the power (3.7VDC, the ending voltage) was applied to the EUT allowed to stabilize for 10 minutes. The transmitting frequency was measured at startup and 2 minutes, 5 minutes and 10 minutes after startup.



7.8.4 Test Data

(LTE)

Test Date: August 30, 2016
- September 1, 2016

1. Frequency Stability Measurement versus Temperature

Transmitting Frequency : 836.500 MHz (20525 ch)
DC Supply Voltage : 4.0 VDC

Ambient Temperature [°C]	Deviation [ppm] Startup	2 minutes	5 minutes	10 minutes	Limits [ppm]	Margin [ppm]
-30	+ 0.01	+ 0.01	- 0.01	+ 0.01	2.50	2.49
-20	- 0.01	- 0.01	- 0.01	- 0.01	2.50	2.49
-10	+ 0.01	+ 0.01	+ 0.00	+ 0.01	2.50	2.49
0	+ 0.00	+ 0.00	+ 0.00	+ 0.00	2.50	2.50
10	+ 0.00	+ 0.01	+ 0.00	+ 0.00	2.50	2.49
20	- 0.01	+ 0.00	+ 0.00	+ 0.00	2.50	2.49
30	- 0.01	- 0.01	+ 0.00	- 0.01	2.50	2.49
40	- 0.01	- 0.01	- 0.01	- 0.01	2.50	2.49
50	- 0.01	- 0.01	- 0.01	- 0.01	2.50	2.49

2. Frequency Stability Measurement versus Power Supply Voltage

Transmitting Frequency : 836.500 MHz (20525 ch)
Ambient Temperature: : 20 °C

DC Supply Voltage [V]	Deviation [ppm] Startup	2 minutes	5 minutes	10 minutes	Limits [ppm]	Margin [ppm]
4.0	- 0.01	+ 0.00	+ 0.00	+ 0.00	2.50	2.49
3.7(Ending)	+ 0.01	+ 0.00	+ 0.00	+ 0.00	2.50	2.49

Test condition example as the maximum deviation point shown on underline:
Ambient Temperature : -30 °C / Startup
DC Supply Voltage : 4 VDC

NOTE : The measurement were made after all of components of the oscillator sufficiently stabilized at each temperature.