Report on the RF Testing of:

KYOCERA Corporation
Mobile Phone, Model: EB1157
FCC ID: JOYEB1157

In accordance with FCC Part 27 Subpart C

Japan

Add value.
Inspire trust.

Prepared for: KYOCERA Corporation
Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku
Yokohama-shi, Kanagawa, Japan
Phone: +81-45-943-6253 Fax: +81-45-943-6314

COMMERCIAL-IN-CONFIDENCE

Document Number: JPD-TR-23085-0

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Hiroaki Suzuki	Deputy Manager of RF Group	Approved Signatory	2023.08.18

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Japan Ltd. document control rules.

EXECUTIVE SUMMARY - Result: Complied
A sample(s) of this product was tested and the result above was confirmed in accordance with FCC Part 27 Subpart C.

ACCREDITED
Certificate #3686.03

TÜV SÜD Japan Ltd.
Yonezawa Testing Center
5-4149-7 Hachimanpara,
Yonezawa-shi, Yamagata,
992-1128 Japan

Phone: +81 (0) 238 28 2881
www.tuvsud.com/ja-jp

Japan

Contents

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1 Summary of Test

1.1 Modification history of the test report

Document Number	Modification History	Issue Date
JPD-TR-23085-0	First Issue	Refer to the cover page

1.2 Standards

CFR47 FCC Part 27 Subpart C

1.3 Test methods

KDB 971168 D01 Power Meas License Digital Systems v03r01
ANSI/TIA/EIA 603-E-2016
ANSI C63.26-2015

1.4 Deviation from standards

None

1.5 List of applied test(s) of the EUT

Test item section	Test item	Condition	Result	Remark
2.1046	Conducted Output Power	Conducted	PASS	*1
27.50	Effective Radiated Power	Radiated	PASS	-
27.50	Peak to Average Ratio	Conducted	PASS	-
2.1049	Occupied Bandwidth	Conducted	PASS	-
27.53 2.1051	Band Edge Spurious and Harmonic at Antenna Terminal	Conducted	PASS	-
27.53 2.1053	Radiated emissions and Harmonic Emissions	Radiated	PASS	-
27.54 2.1055	Frequency Stability	Conducted	PASS	-

*1: Refer to RF Exposure Report (Test Report SAR)

1.6 Test information

None

1.7 Test set up

Table-top

1.8 Test period

22-June-2023 - 27-July-2023

Japan

2 Equipment Under Test

All information in this chapter was provided by the applicant.

2.1 EUT information

Applicant	KYOCERA Corporation Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku Yokohama-shi, Kanagawa, Japan Phone: +81-45-943-6253 Fax: +81-45-943-6314
Equipment Under Test (EUT)	Mobile Phone
Model number	EB1157
Serial number	358018240001222, 358018240001032, 358018240001040
Trade name	Kyocera
Number of sample(s)	3
EUT condition	Pre-Production
Power rating	Battery: DC 3.87 V
Size	(W) 75 mm × (D) 14.6 mm × (H) 154 mm
Environment	Indoor and Outdoor use
Terminal limitation	-20 ˚C to 60 ˚C
Hardware version	Pre-Production
Software version	0.130RI
Firmware version	Not applicable
RF Specification	
Frequency of Operation	Up Link LTE Band XII: 699.0-716.0 MHz Down Link LTE Band XII: 729.0-746.0 MHz
Modulation type	LTE Band XII: QPSK, 16QAM, 64QAM
Emission designator	LTE Band XII: BW 1.4M QPSK: 1M10G7D, 16QAM: 1M10W7D, 64QAM: 1M10W7D BW 3M QPSK: 2M72G7D, 16QAM: 2M72W7D, 64QAM: 2M72W7D BW 5M QPSK: 4M53G7D, 16QAM: 4M53W7D, 64QAM: 4M53W7D BW 10M QPSK: 9M00G7D, 16QAM: 9M00W7D, 64QAM: 8M98W7D
Effective Radiated Power (E.R.P.)	LTE Band XII: 0.166 W (22.1 dBm)
Antenna type	Internal antenna
Antenna gain	LTE Band XII: -4.6 dBi

Japan

2.2 Modification to the EUT

The table below details modifications made to the EUT during the test project.

Modification State	Description of Modification	Modification fitted by	Date of Modification
Model: EB1157, Serial Number: 358018240001222, 358018240001032, 358018240001040			
0	As supplied by the applicant	Not Applicable	Not Applicable

2.3 Variation of family model(s)

2.3.1 List of family model(s)

Not applicable

2.3.2 Reason for selection of EUT

Not applicable

2.4 Description of test mode

The EUT had been tested under operating condition.
There are three channels have been tested as following:

Band	Modulation	Bandwidth [MHz]	Channel	Frequency [MHz]
LTE Band XII	QPSK, 16QAM, 64QAM	1.4	23017, 23095, 23173	699.7, 707.5, 715.3
		3	23025, 23095, 23165	700.5, 707.5, 714.5
		5	23035, 23095, 23155	701.5, 707.5, 713.5
		10	23060, 23095, 23130	704.0, 707.5, 711.0

The field strength of spurious emissions was measured at each position of all three axis X, Y and Z to compare the level, and the maximum noise.
The worst emission was found in X-axis (LTE Band XII), and the worst case recorded.
Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports.

Japan

3 Configuration of Equipment

Numbers assigned to equipment on the diagram in “3.2 System configuration” correspond to the list in “3.1 Equipment used”.
This test configuration is based on the manufacture’s instruction.
Cabling and setup(s) were taken into consideration and test data was taken under worse case condition.

3.1 Equipment used

No.	Equipment	Company	Model No.	Serial No.	FCC ID/DoC	Comment
1	Mobile Phone	KYOCERA	EB1157	358018240001222, 358018240001032, 358018240001040	JOYEB1157	EUT

3.2 System configuration

1. Mobile Phone (EUT)

Japan

4 Test Result

4.1 Effective Radiated Power

4.1.1 Measurement procedure

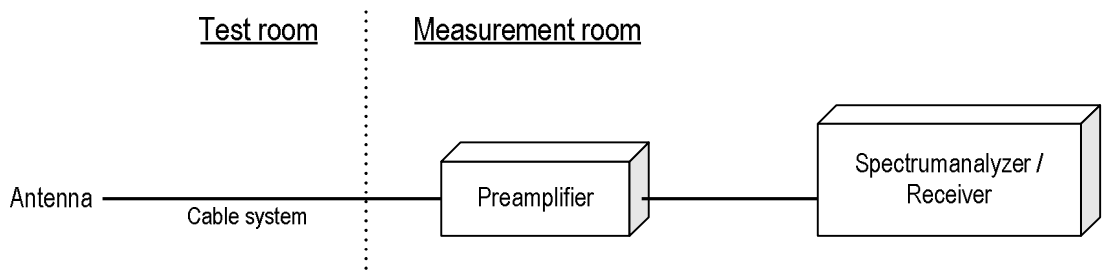
[FCC 27.50]

<Step 1>
The EUT and support equipment are placed on a 1 meter x 1 meter surface, 0.8 meter height styrene foam table. Radiated emission measurements are performed at 3 meter distance with the broadband antenna (Log periodic antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1 to 4 meters and stopped at height producing the maximum emission. The bandwidth of the spectrum analyzer is set to 1 MHz. The turntable is rotated by 360 degrees and stopped at azimuth of producing the maximum emission.

<Step 2>
The substitution antenna is replaced by the transmitter antenna (EUT).
The frequency of the signal generator is adjusted to the measurement frequency.
Level of the signal generator is adjusted to the level that is obtained from step 1, and record the emission level of signal generator.

The spectrum analyzer is set to;
a) Span = 1.5 times the OBW
b) RBW = 1-5% of the expected OBW, not to exceed 1 MHz
c) VBW ≥ 3 x RBW
d) Number of sweep points ≥ 2 x span / RBW
e) Sweep time = auto-couple
f) Detector = RMS (power averaging)
g) If the EUT can be configured to transmit continuously (i.e., burst duty cycle ≥ 98%), then set the trigger to free run.
h) If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle < 98 %), then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Ensure that the sweep time is less than or equal to the transmission burst duration.
i) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with the band limits set equal to the OBW band edges.
If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

- Test configuration



Japan

4.1.2 Calculation method

Result (ERP) = S.G Reading - Cable loss + Antenna Gain
Margin = Limit – Result (ERP)

Example:
Limit @ 707.5 MHz : 34.7 dBm
Ant. Input = 15.0 dBm Cable loss = 1.1 dB Ant. Gain = 8.0 dBd
Result = 15.0 – 1.1 + 8.0 = 21.9 dBm
Margin = 34.7 – 21.9 = 8.1 dB

4.1.3 Limit

3 W (34.7 dBm)

4.1.4 Test data

Date : 22-June-2023
Temperature : 22.1 [˚C]
Humidity : 56.2 [%] Test engineer :
Test place : 3m Semi-anechoic chamber Chiaki Kanno

Date : 23-June-2023
Temperature : 21.6 [˚C]
Humidity : 61.3 [%] Test engineer :
Test place : 3m Semi-anechoic chamber Chiaki Kanno

[LTE Band XII]
QPSK, BW 1.4MHz

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBd]	Result [dBm]	Result [W]	Limit [dBm]	Margin [dB]
H	699.7	-33.6	27.8	1.0	-5.7	21.1	0.129	34.77	13.7
H	707.5	-33.1	28.7	1.0	-5.7	22.0	0.158	34.77	12.8
H	715.3	-33.1	28.7	1.0	-5.8	21.9	0.155	34.77	12.9

16QAM, BW 1.4MHz

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBd]	Result [dBm]	Result [W]	Limit [dBm]	Margin [dB]
H	699.7	-34.2	27.2	1.0	-5.7	20.5	0.112	34.77	14.3
H	707.5	-33.6	28.2	1.0	-5.7	21.5	0.141	34.77	13.3
H	715.3	-33.5	28.3	1.0	-5.8	21.5	0.141	34.77	13.3

Japan

64QAM, BW 1.4MHz

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBd]	Result [dBm]	Result [W]	Limit [dBm]	Margin [dB]
H	699.7	-35.1	26.3	1.0	-5.7	19.6	0.091	34.77	15.2
H	707.5	-34.5	27.3	1.0	-5.7	20.6	0.115	34.77	14.2
H	715.3	-34.8	27.0	1.0	-5.8	20.2	0.105	34.77	14.6

QPSK, BW 3MHz

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBd]	Result [dBm]	Result [W]	Limit [dBm]	Margin [dB]
H	700.5	-33.8	27.7	1.0	-5.7	21.0	0.126	34.77	13.8
H	707.5	-33.0	28.8	1.0	-5.7	22.1	0.162	34.77	12.7
H	714.5	-32.8	28.9	1.0	-5.8	22.1	0.162	34.77	12.7

16QAM, BW 3MHz

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBd]	Result [dBm]	Result [W]	Limit [dBm]	Margin [dB]
H	700.5	-34.6	26.9	1.0	-5.7	20.2	0.105	34.77	14.6
H	707.5	-33.7	28.1	1.0	-5.7	21.4	0.138	34.77	13.4
H	714.5	-33.8	28.0	1.0	-5.8	21.2	0.132	34.77	13.6

64QAM, BW 3MHz

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBd]	Result [dBm]	Result [W]	Limit [dBm]	Margin [dB]
H	700.5	-35.3	26.2	1.0	-5.7	19.5	0.089	34.77	15.3
H	707.5	-34.8	27.0	1.0	-5.7	20.3	0.107	34.77	14.5
H	714.5	-34.7	27.1	1.0	-5.8	20.3	0.107	34.77	14.5

QPSK, BW 5MHz

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBd]	Result [dBm]	Result [W]	Limit [dBm]	Margin [dB]
H	701.5	-33.0	28.3	1.0	-5.7	21.6	0.145	34.77	13.2
H	707.5	-32.8	28.8	1.0	-5.7	22.1	0.162	34.77	12.7
H	713.5	-33.2	28.1	1.0	-5.8	21.3	0.135	34.77	13.5

16QAM, BW 5MHz

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBd]	Result [dBm]	Result [W]	Limit [dBm]	Margin [dB]
H	701.5	-34.2	27.2	1.0	-5.7	20.5	0.112	34.77	14.3
H	707.5	-33.9	27.7	1.0	-5.7	21.0	0.126	34.77	13.8
H	713.5	-33.9	27.8	1.0	-5.8	21.0	0.126	34.77	13.8

Japan

64QAM, BW 5MHz

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBd]	Result [dBm]	Result [W]	Limit [dBm]	Margin [dB]
H	701.5	-35.0	26.4	1.0	-5.7	19.7	0.093	34.77	15.1
H	707.5	-34.5	27.2	1.0	-5.7	20.5	0.112	34.77	14.3
H	713.5	-35.0	26.6	1.0	-5.8	19.8	0.095	34.77	15.0

QPSK, BW 10MHz

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBd]	Result [dBm]	Result [W]	Limit [dBm]	Margin [dB]
H	704.0	-33.3	28.1	1.0	-5.7	21.4	0.138	34.77	13.4
H	707.5	-33.0	28.6	1.0	-5.7	21.9	0.155	34.77	12.9
H	711.0	-33.2	28.5	1.0	-5.8	21.8	0.151	34.77	13.0

16QAM, BW 10MHz

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBd]	Result [dBm]	Result [W]	Limit [dBm]	Margin [dB]
H	704.0	-34.0	27.4	1.0	-5.7	20.7	0.117	34.77	14.1
H	707.5	-33.6	28.0	1.0	-5.7	21.3	0.135	34.77	13.5
H	711.0	-33.7	28.0	1.0	-5.8	21.3	0.135	34.77	13.5

64QAM, BW 10MHz

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBd]	Result [dBm]	Result [W]	Limit [dBm]	Margin [dB]
H	704.0	-35.5	25.9	1.0	-5.7	19.2	0.083	34.77	15.6
H	707.5	-34.8	26.8	1.0	-5.7	20.1	0.102	34.77	14.7
H	711.0	-35.5	26.1	1.0	-5.8	19.4	0.087	34.77	15.4

4.2 Peak to Average Ratio

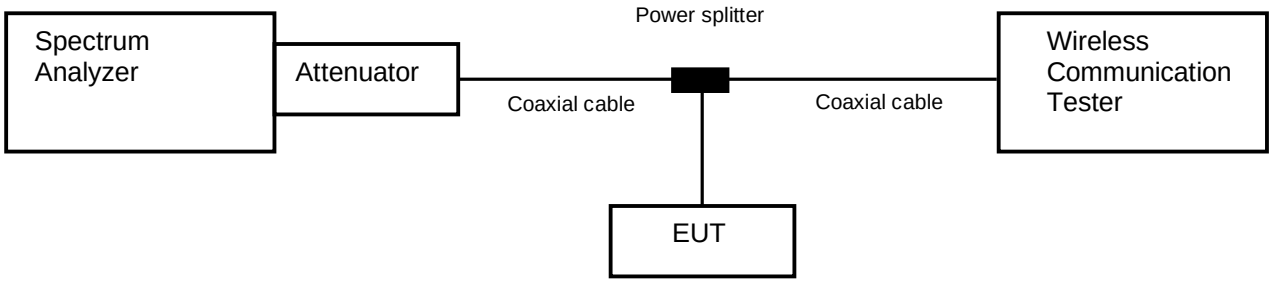
4.2.1 Measurement procedure

[FCC 27.50]

The peak to average ratio was measured with a spectrum analyzer connected to the antenna terminal.

The spectrum analyzer is set to;
a) Power Stat CCDF mode
b) Set resolution / measurement bandwidth ≥ signal's occupied bandwidth.
c) Set the number of counts to a value that stabilizes the measured CCDF curve.
d) Set the measurement interval as follows:
   1) For continuous transmissions, set to 1ms.
   2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst duration.
e) Record the maximum PAPR level associated with a probability of 0.1%.

- Test configuration



4.2.2 Limit

13 dB or less

Japan

4.2.3 Measurement result

Date : 26-July-2023
Temperature : 23.6 [˚C]
Humidity : 55.9 [%] Test engineer :
Test place : Shielded room No.4 Kazunori Saito

Date : 27-July-2023
Temperature : 23.5 [˚C]
Humidity : 53.0 [%] Test engineer :
Test place : Shielded room No.4 Kazunori Saito

Band	Channel	Frequency [MHz]	Modulation	Bandwidth [MHz]	RB	Peak to Average Power Ratio [dB]	Limit [dB]
LTE Band XII	23095	707.5	QPSK	1.4	6-0	4.42	13.0
				3	15-0	4.55	
				5	25-0	4.42	
				10	50-0	4.61	
			16QAM	1.4	6-0	5.38	
				3	15-0	5.55	
				5	25-0	5.51	
				10	50-0	6.06	
			64QAM	1.4	6-0	6.27	
				3	15-0	6.19	
				5	25-0	6.24	
				10	50-0	6.48	

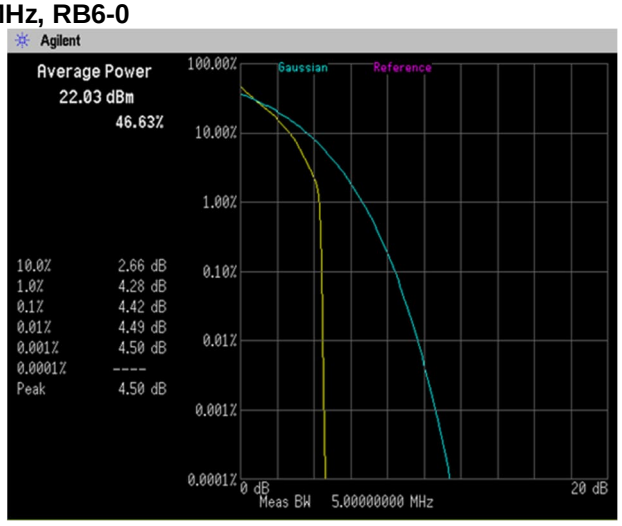
Japan

4.2.4 Trace data

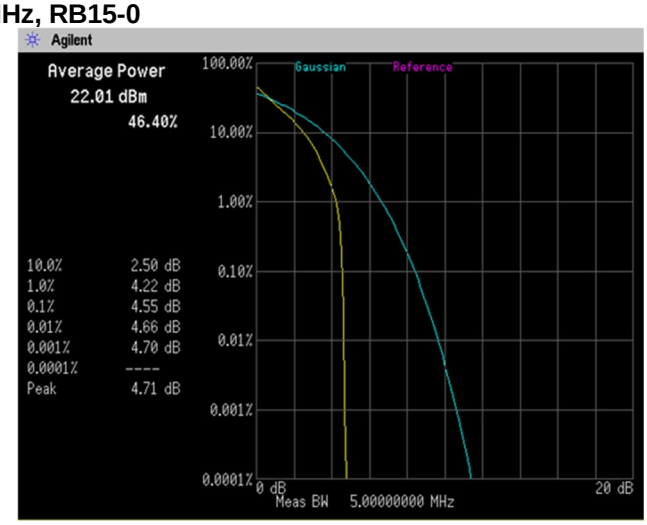
[LTE Band XII]

Channel: 23095

QPSK, BW 1.4MHz, RB6-0

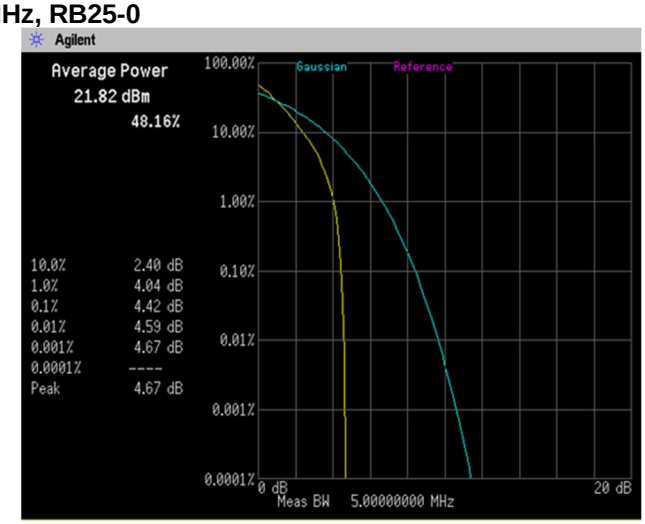


QPSK, BW 3MHz, RB15-0

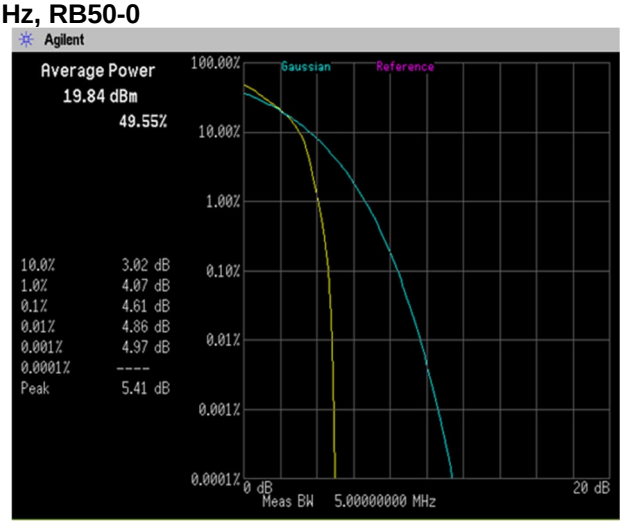


Japan

Channel: 23095
QPSK, BW 5MHz, RB25-0

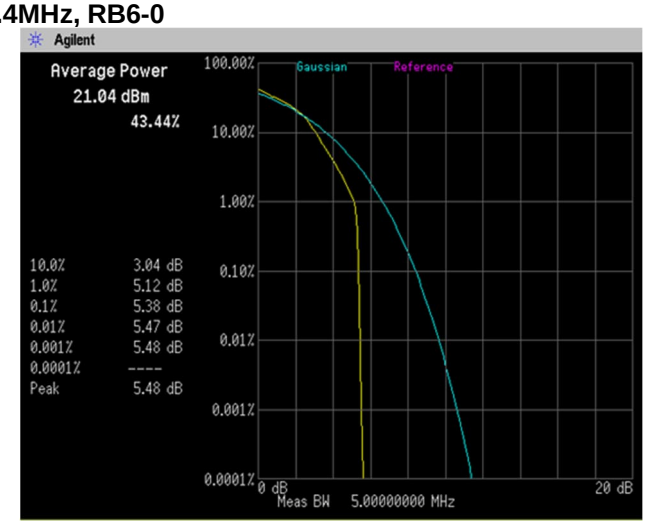


QPSK, BW 10MHz, RB50-0

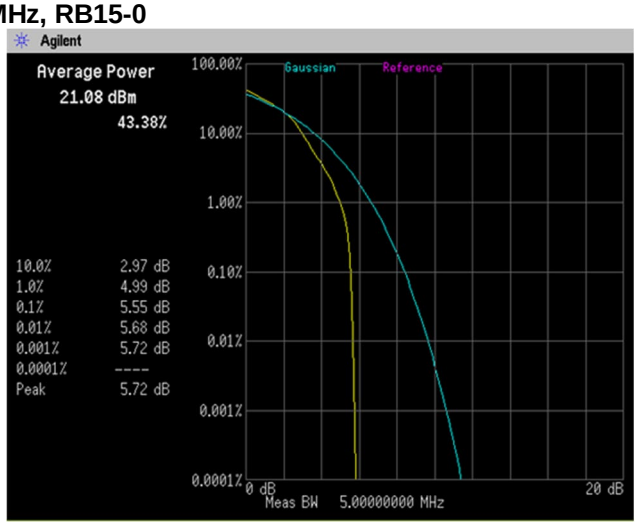


Japan

Channel: 23095
16QAM, BW 1.4MHz, RB6-0

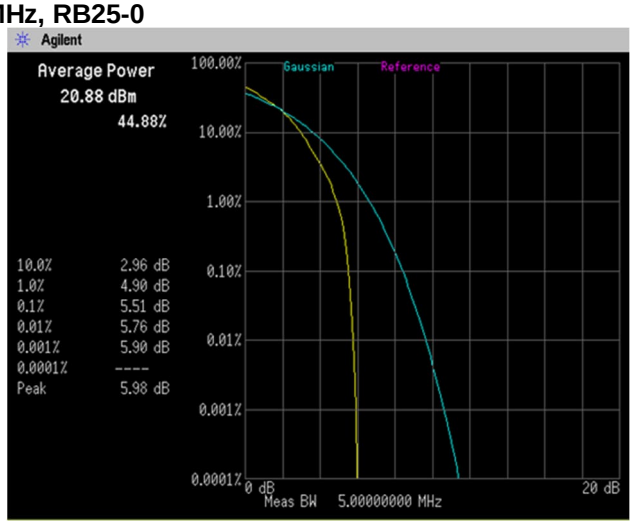


16QAM, BW 3MHz, RB15-0

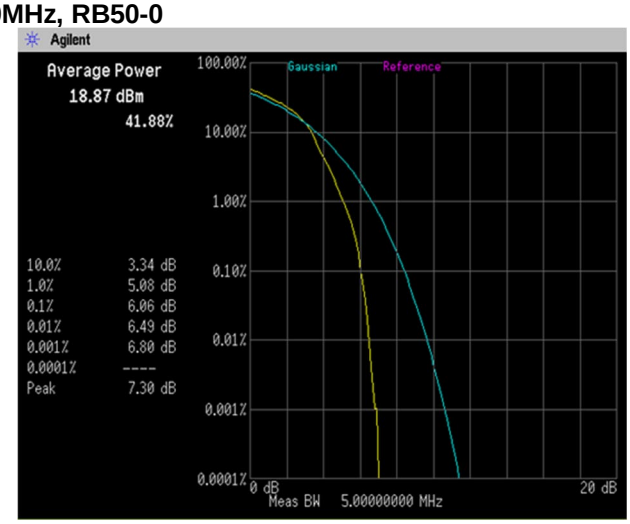


Japan

Channel: 23095
16QAM, BW 5MHz, RB25-0

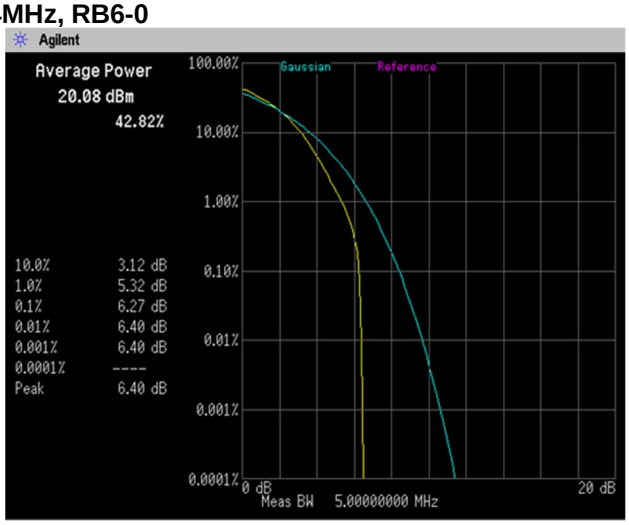


16QAM, BW 10MHz, RB50-0

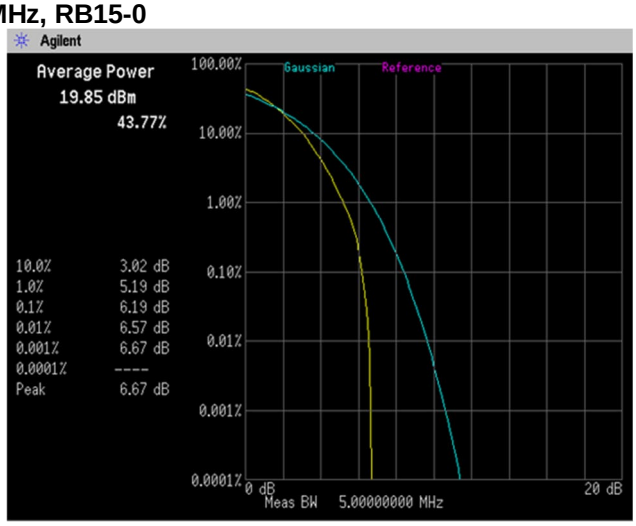


Japan

Channel: 23095
64QAM, BW 1.4MHz, RB6-0

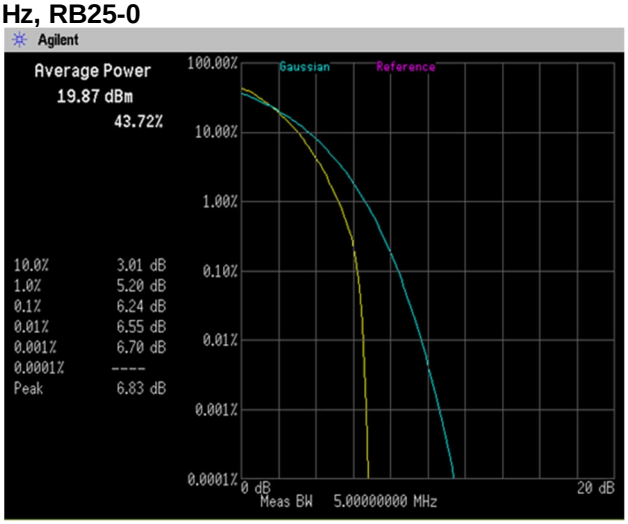


64QAM, BW 3MHz, RB15-0

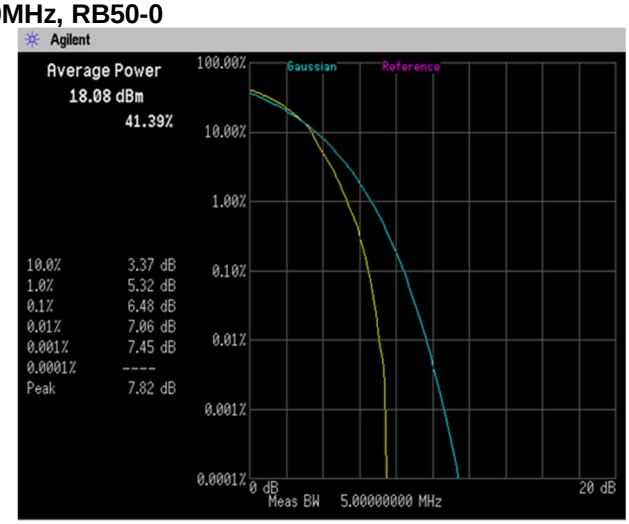


Japan

Channel: 23095
64QAM, BW 5MHz, RB25-0



64QAM, BW 10MHz, RB50-0



Japan

4.3 Occupied Bandwidth

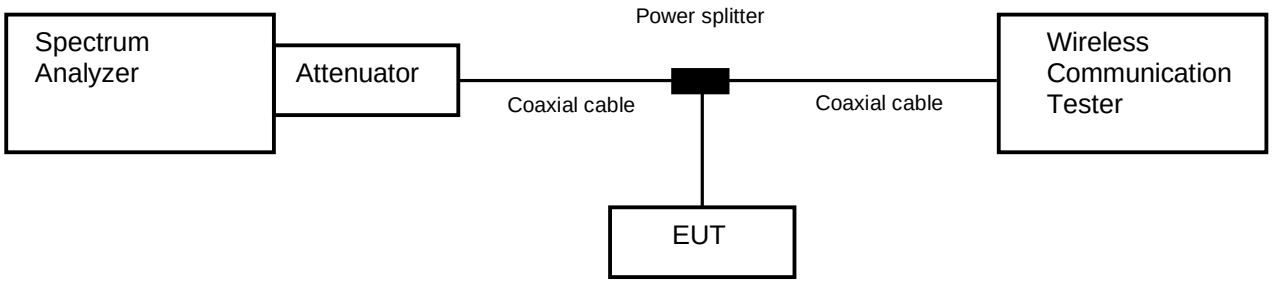
4.3.1 Measurement procedure

[FCC 2.1049]

The Occupied bandwidth was measured with a spectrum analyzer connected to the antenna terminal.

The spectrum analyzer is set to;
a) RBW = 1-5% of the expected OBW & VBW ≥ 3 x RBW
b) Detector = Peak
c) Trace mode = Max hold
d) Sweep time = auto-couple

- Test configuration



4.3.2 Limit

None

4.3.3 Measurement result

Date	:	26-July-2023			
Temperature	:	23.6 [˚C]			
Humidity	:	55.9 [%]	Test engineer	:	
Test place	:	Shielded room No.4			Kazunori Saito

Date	:	27-July-2023			
Temperature	:	23.5 [˚C]			
Humidity	:	53.0 [%]	Test engineer	:	
Test place	:	Shielded room No.4			Kazunori Saito

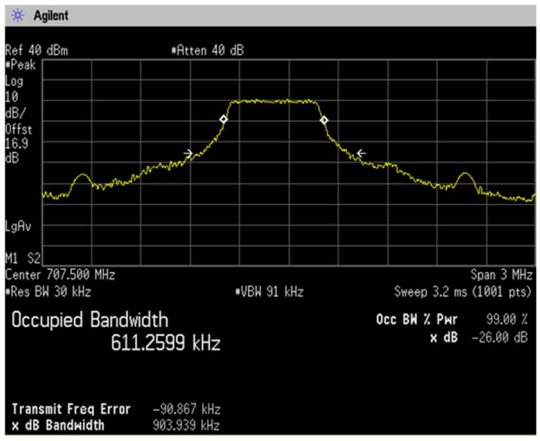
Band	Channel	Frequency [MHz]	Bandwidth [MHz]	Modulation	RB	Test Result [MHz]
LTE Band XII	23095	707.5	1.4	QPSK	3-1	0.6113
					6-0	1.1040
				16QAM	3-1	0.6289
					6-0	1.1009
				64QAM	3-1	0.6080
					6-0	1.1039
			3	QPSK	8-4	1.5542
					15-0	2.7235
				16QAM	8-4	1.5752
					15-0	2.7228
				64QAM	8-4	1.5467
					15-0	2.7242
			5	QPSK	12-7	2.3139
					25-0	4.5258
				16QAM	12-7	2.3523
					25-0	4.5338
				64QAM	12-7	2.3323
					25-0	4.5339
			10	QPSK	25-12	4.7355
					50-0	8.9964
				16QAM	25-12	4.7353
					50-0	8.9960
				64QAM	25-12	4.6816
					50-0	8.9829

4.3.4 Trace data

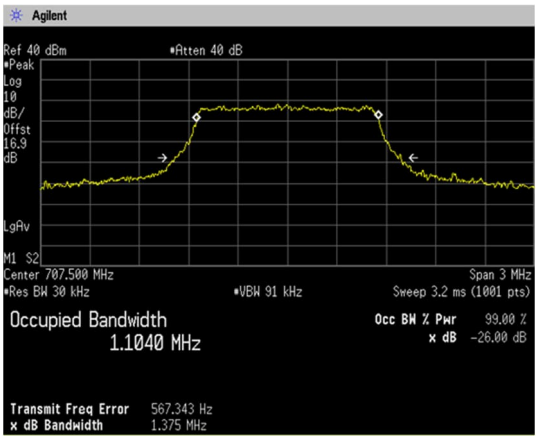
[LTE Band XII]
Channel: 23095

QPSK, BW 1.4MHz

RB3-1

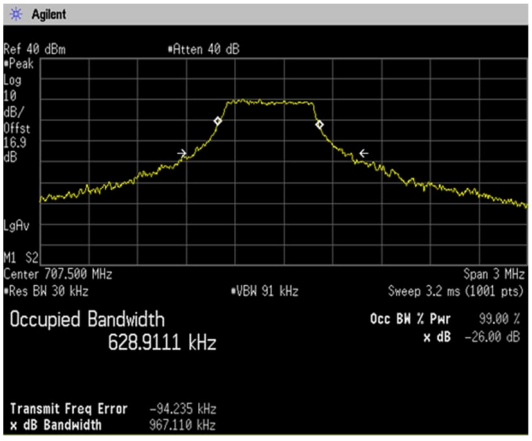


RB6-0

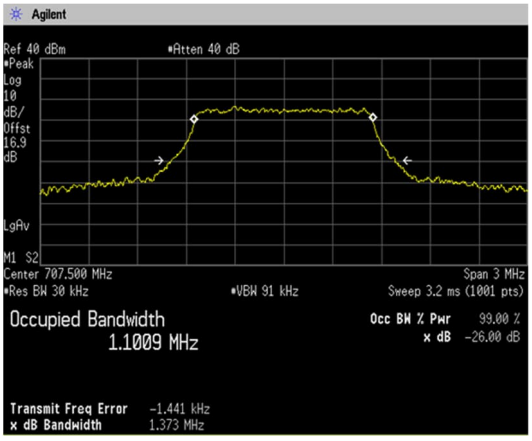


16QAM, BW 1.4MHz

RB3-1

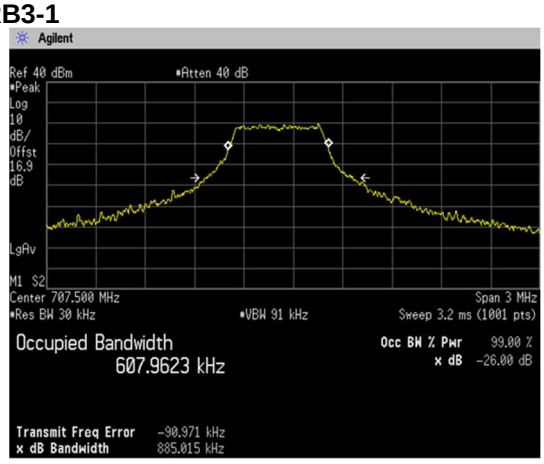


RB6-0

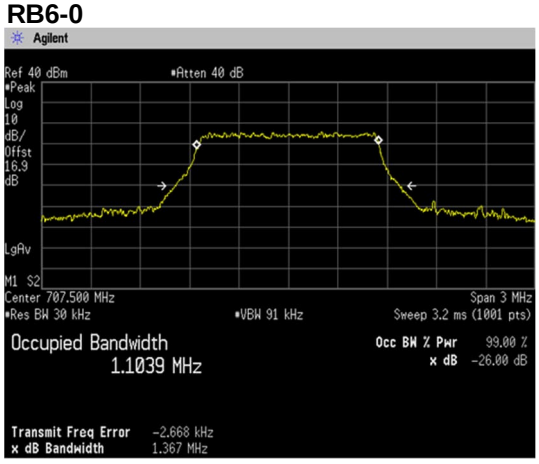


64QAM, BW 1.4MHz

RB3-1

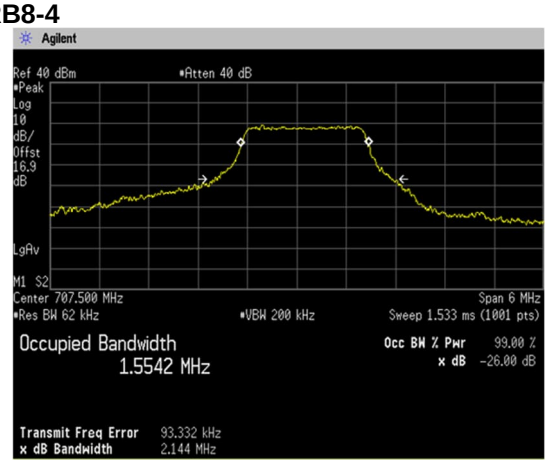


RB6-0

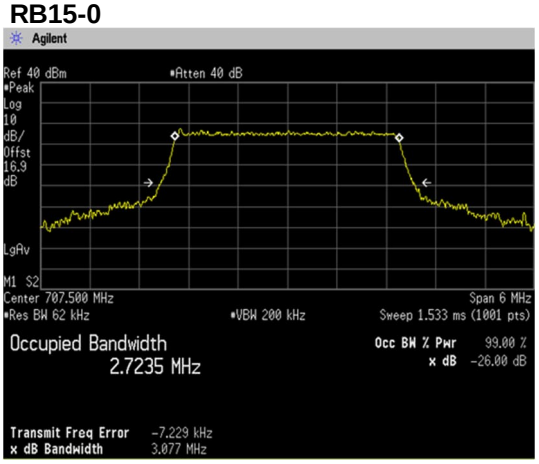


QPSK, BW 3MHz

RB8-4

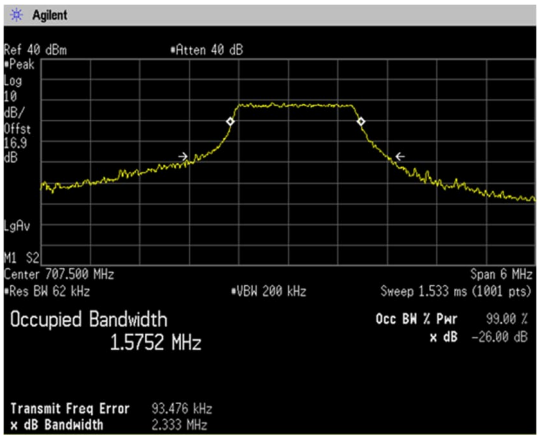


RB15-0

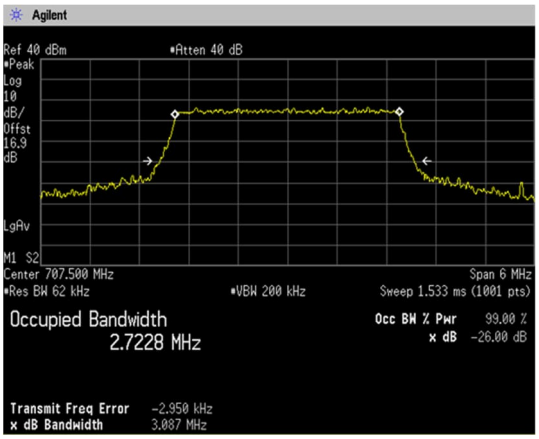


16QAM, BW 3MHz

RB8-4

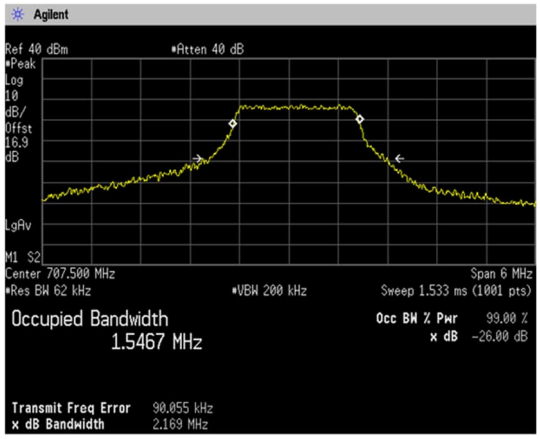


RB15-0

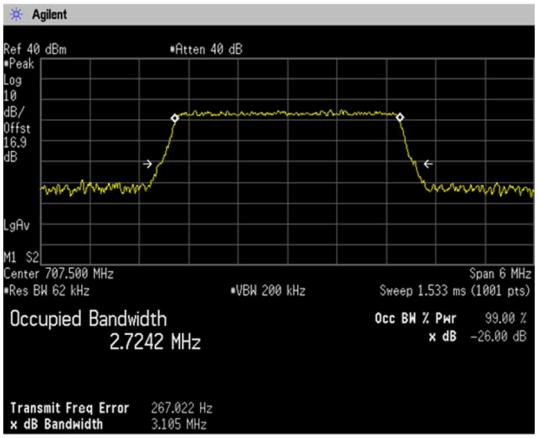


64QAM, BW 3MHz

RB8-4



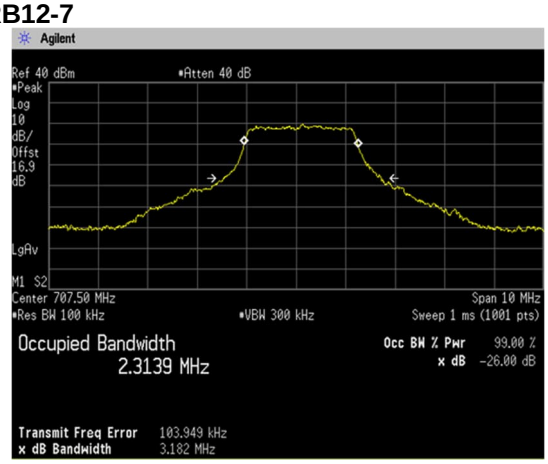
RB15-0



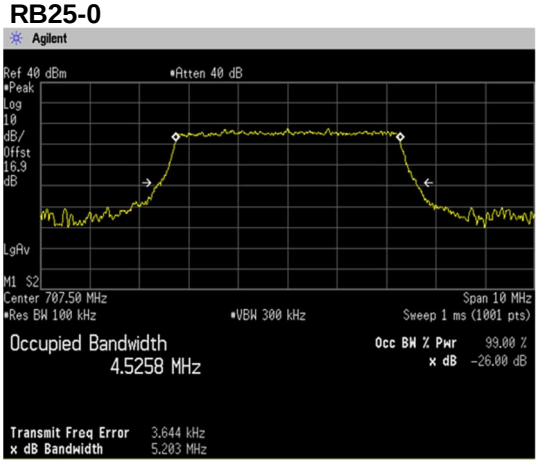
Japan

QPSK, BW 5MHz

RB12-7

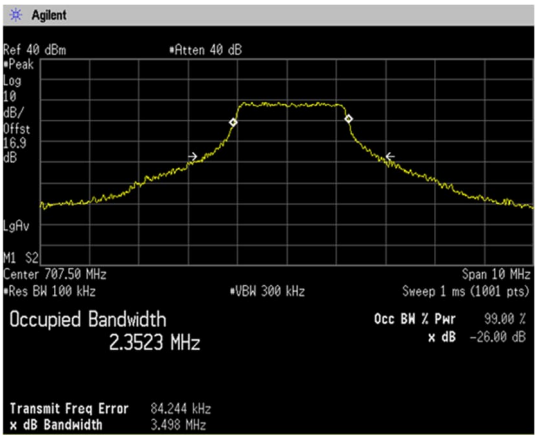


RB25-0

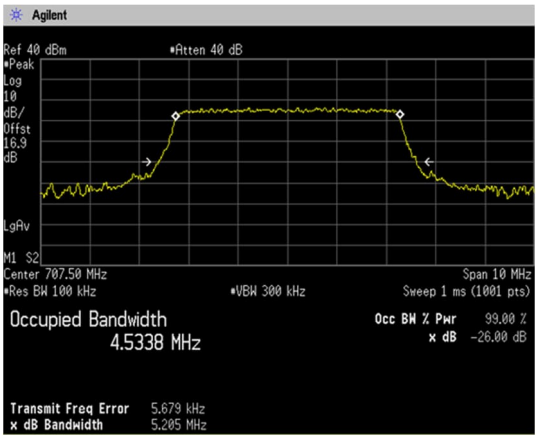


16QAM, BW 5MHz

RB12-7

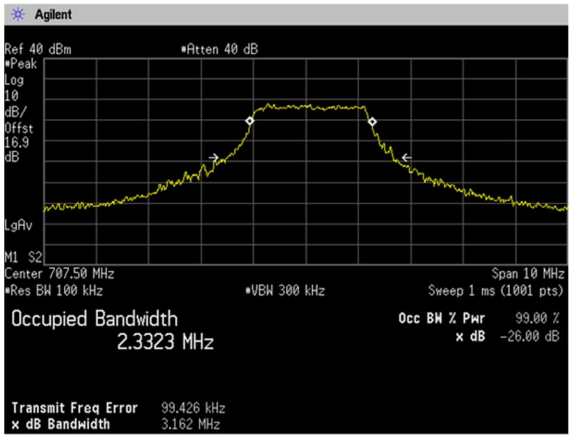


RB25-0

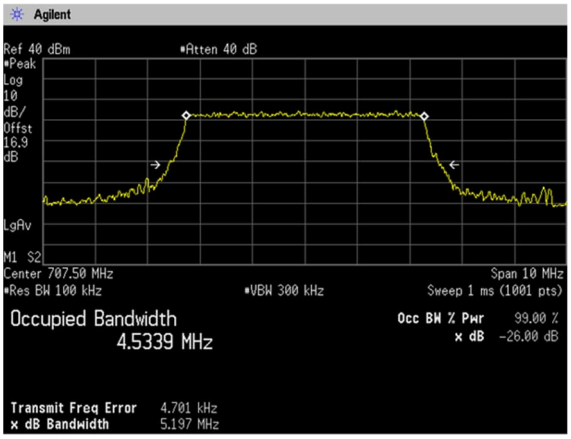


64QAM, BW 5MHz

RB12-7

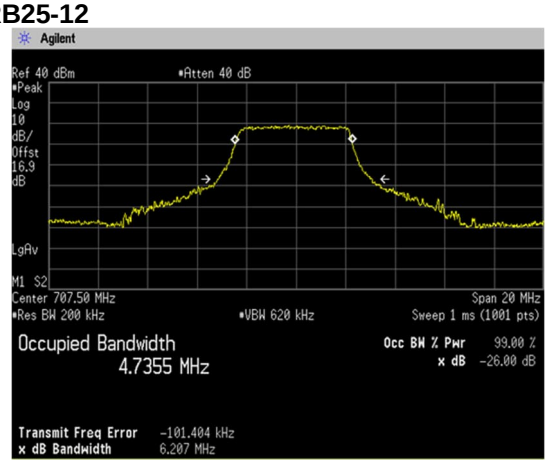


RB25-0

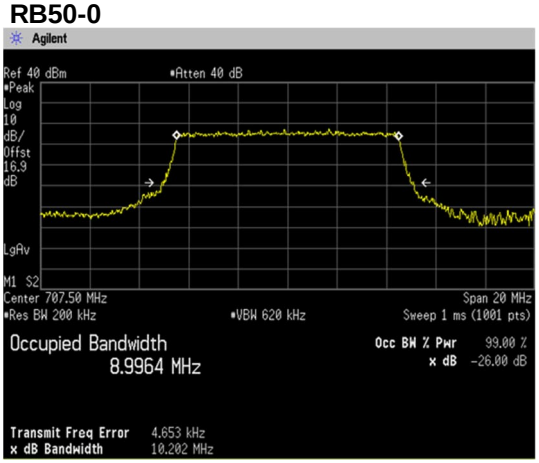


QPSK, BW 10MHz

RB25-12

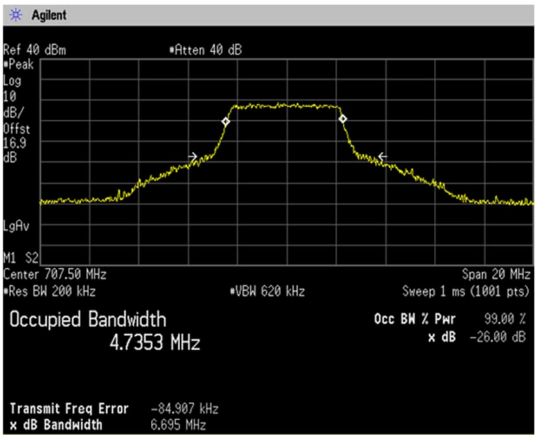


RB50-0

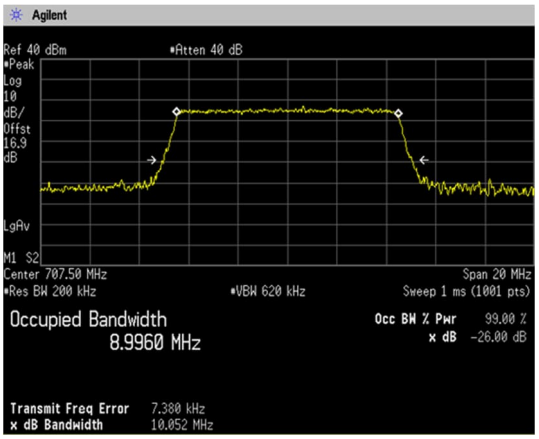


16QAM, BW 10MHz

RB25-12

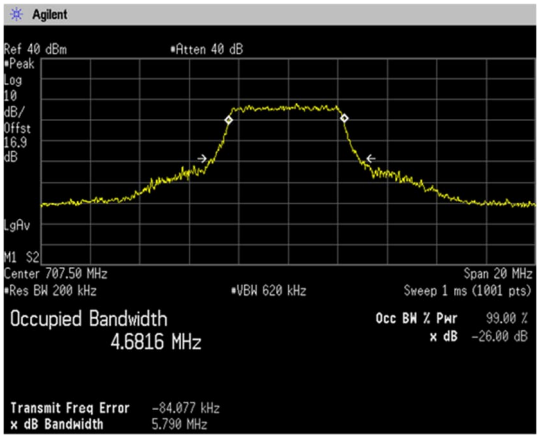


RB50-0

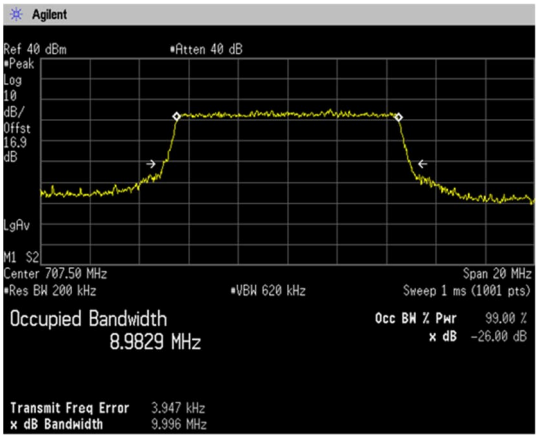


64QAM, BW 10MHz

RB25-12



RB50-0



Japan

4.4 Band Edge Spurious and Harmonic at Antenna Terminals

4.4.1 Measurement procedure

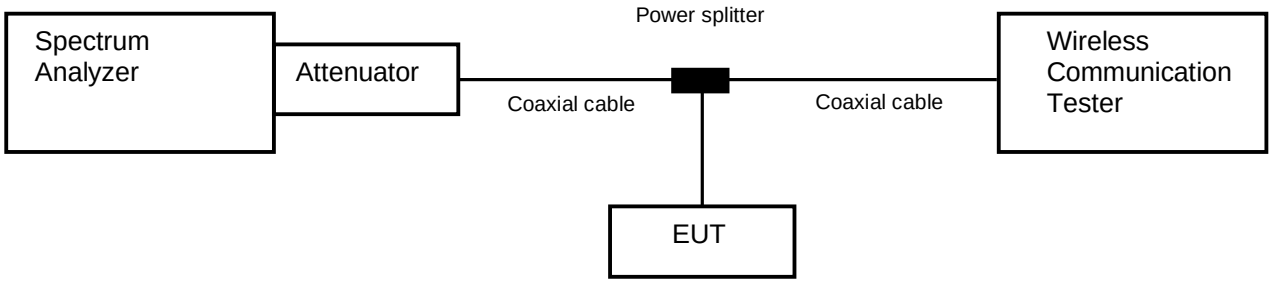
[FCC 27.53, 2.1051]

The band edge spurious and harmonic was measured with a spectrum analyzer connected to the antenna terminal.

The spectrum analyzer is set to;
<Band Edge>
a) Span was set large enough so as to capture all out of band emissions near the band edge
b) RBW ≥ 1% of the emission bandwidth or 2% of the emission bandwidth
c) VBW ≥ 3 x RBW
d) Detector = RMS
e) Trace mode = Max hold
f) Sweep time = auto-couple
g) Number of sweep point ≥ 2 x span / RBW

<Spurious Emissions>
a) RBW = 1MHz & VBW ≥ 3 x RBW
b) Detector = Peak
c) Trace mode = Max hold
d) Sweep time = auto-couple
e) Number of sweep point ≥ 2 x span / RBW

- Test configuration



4.4.2 Limit

-13 dBm or less

Japan

4.4.3 Measurement result

Date : 26-July-2023
Temperature : 23.6 [˚C]
Humidity : 55.9 [%]
Test place : Shielded room No.4
Test engineer : Kazunori Saito

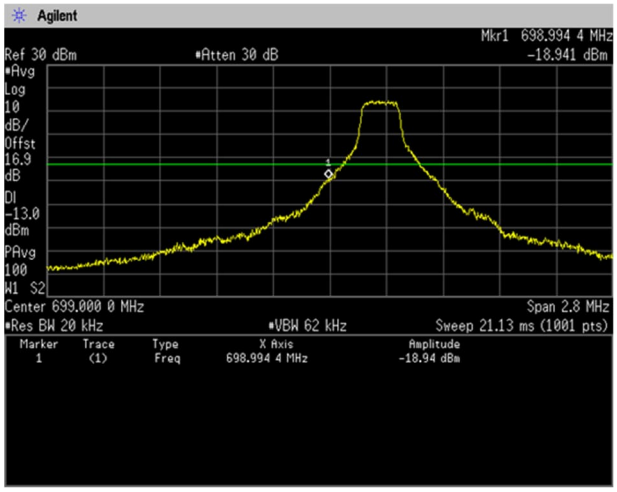
Band	Modulation	Bandwidth [MHz]	Channel	Frequency [MHz]	Limit [dBm]	Results	
LTE Band XII	QPSK, 16QAM, 64QAM	1.4	23017	699.7	-13.0	See the trace data	PASS
			23173	715.3	-13.0	See the trace data	PASS
		3	23025	700.5	-13.0	See the trace data	PASS
			23165	714.5	-13.0	See the trace data	PASS
		5	23035	701.5	-13.0	See the trace data	PASS
			23155	713.5	-13.0	See the trace data	PASS
		10	23060	704.0	-13.0	See the trace data	PASS
			23130	711.0	-13.0	See the trace data	PASS

Japan

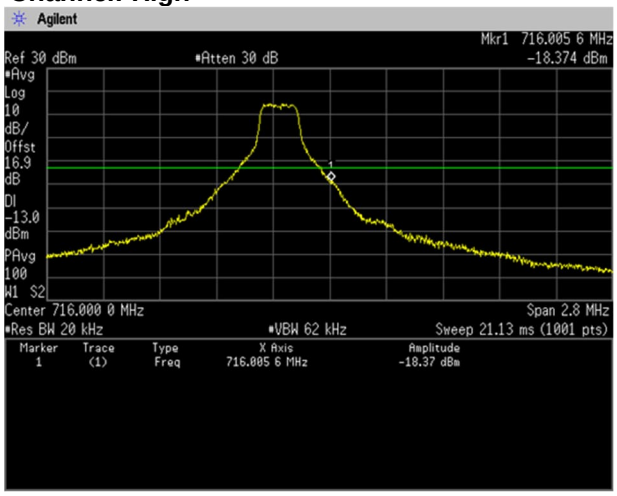
4.4.4 Trace data

[LTE Band XII]
(Band Edge)

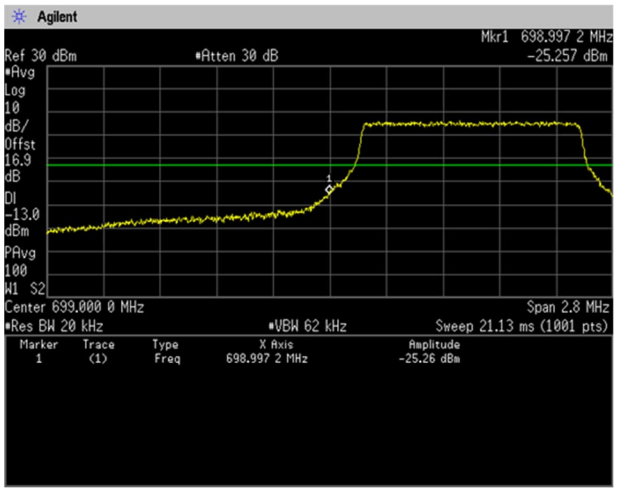
QPSK, BW 1.4MHz, RB1-0
Channel: Low



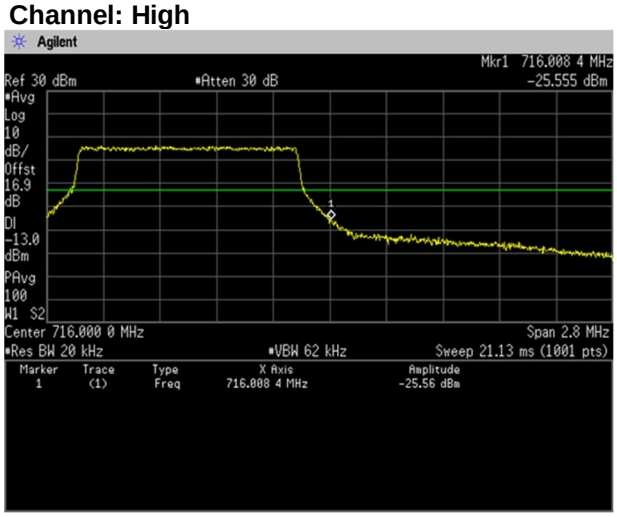
QPSK, BW 1.4MHz, RB1-5
Channel: High



QPSK, BW 1.4MHz, RB6-0
Channel: Low

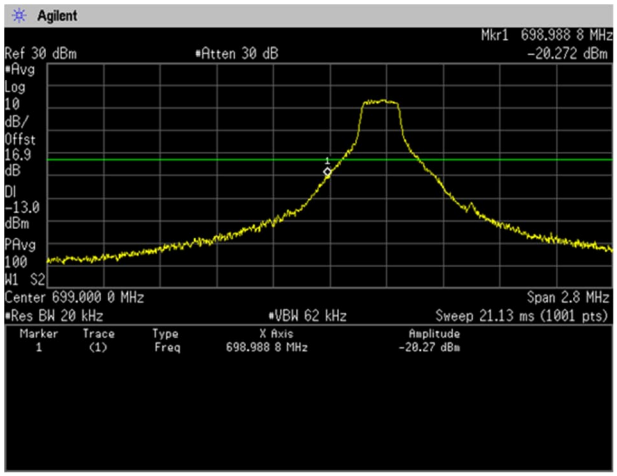


Channel: High

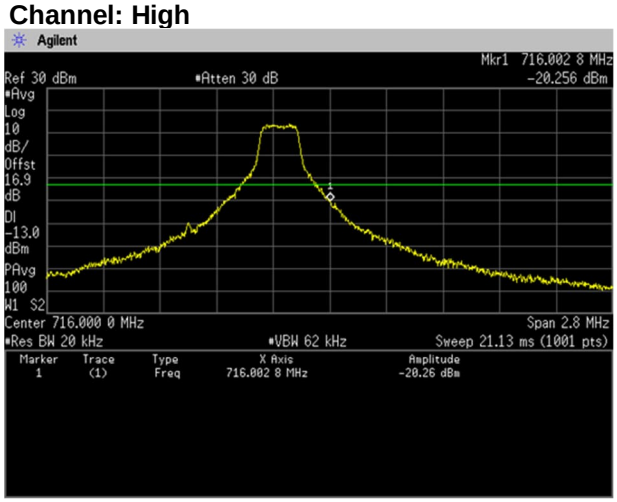


Japan

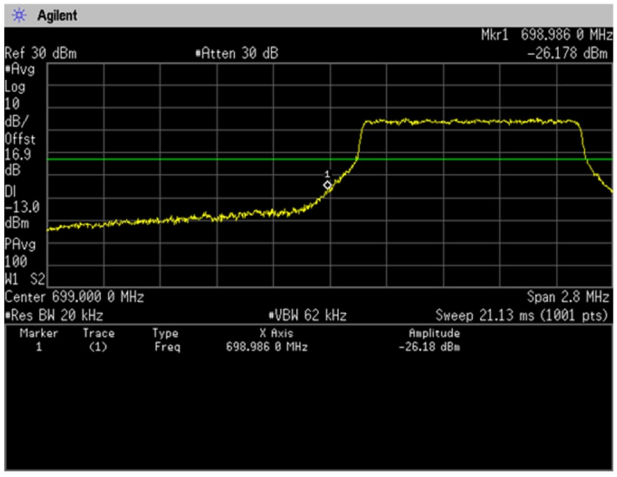
16QAM, BW 1.4MHz, RB1-0
Channel: Low



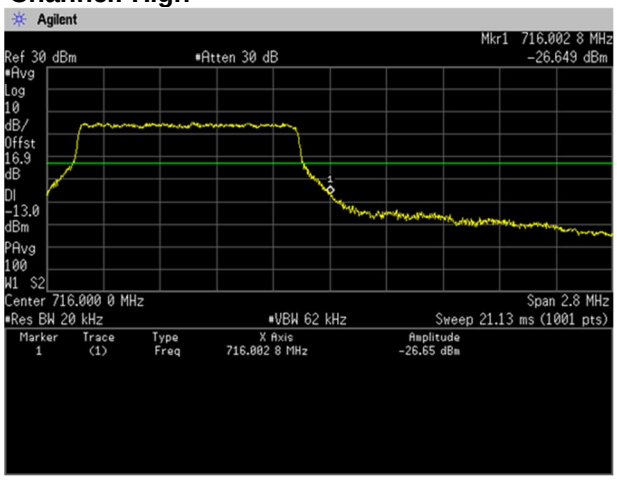
16QAM, BW 1.4MHz, RB1-5
Channel: High



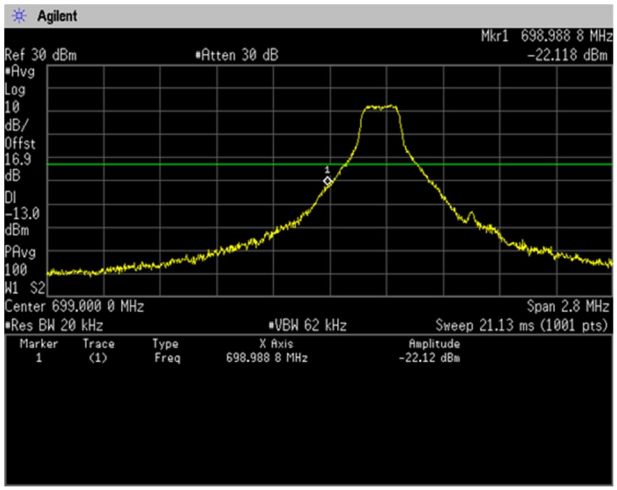
16QAM, BW 1.4MHz, RB6-0
Channel: Low



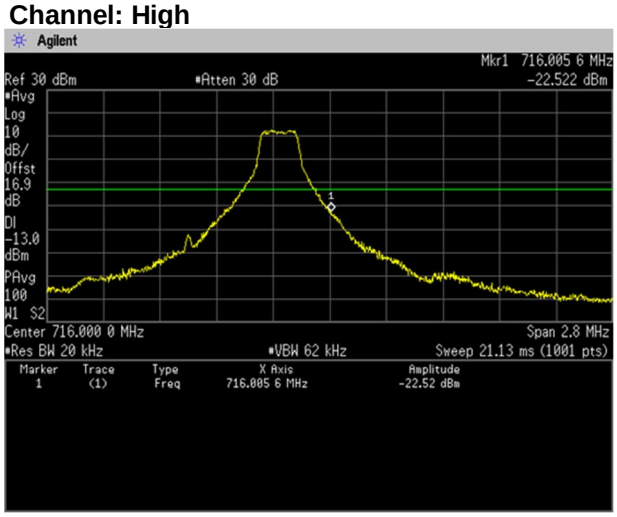
Channel: High



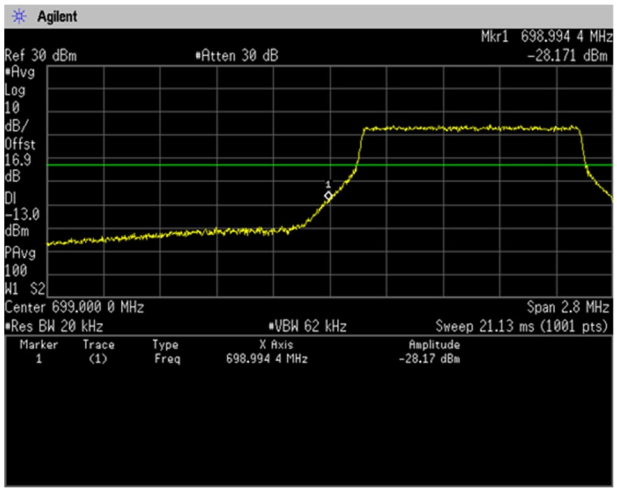
64QAM, BW 1.4MHz, RB1-0
Channel: Low



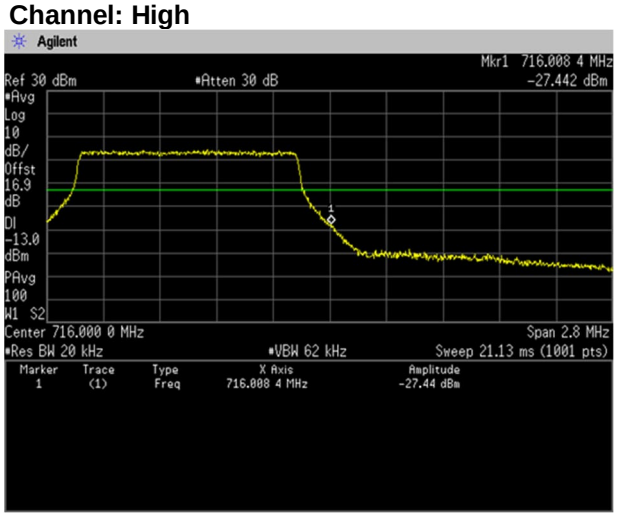
64QAM, BW 1.4MHz, RB1-5
Channel: High



64QAM, BW 1.4MHz, RB6-0
Channel: Low

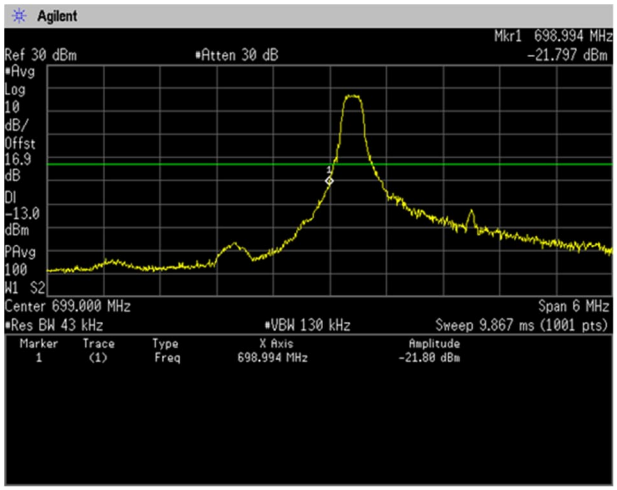


Channel: High

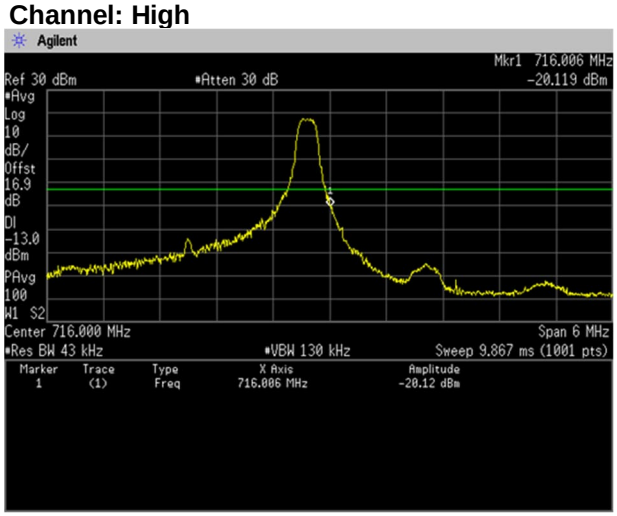


Japan

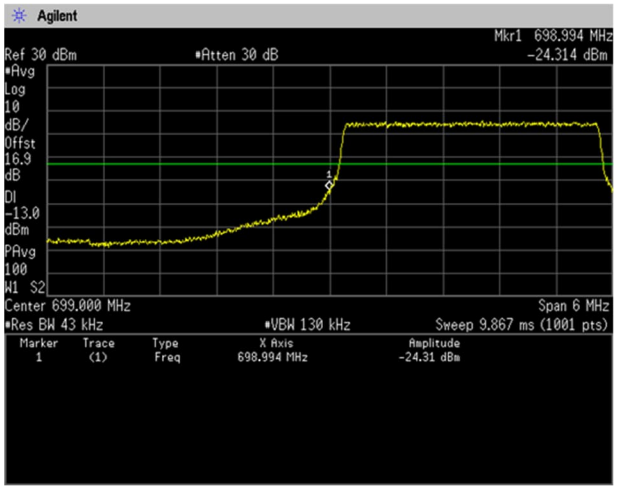
QPSK, BW 3MHz, RB1-0
Channel: Low



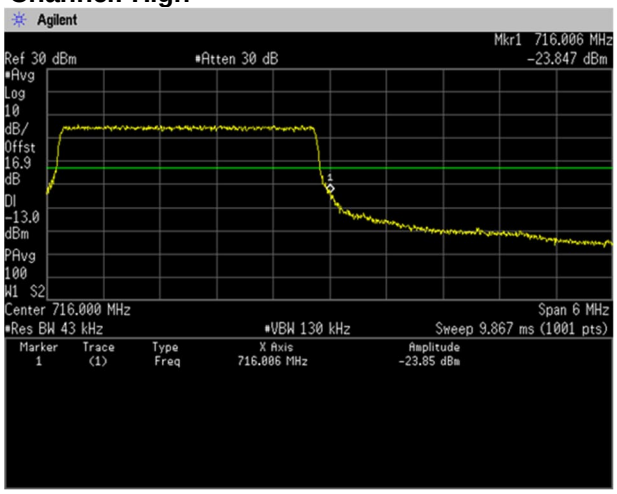
QPSK, BW 3MHz, RB1-14
Channel: High



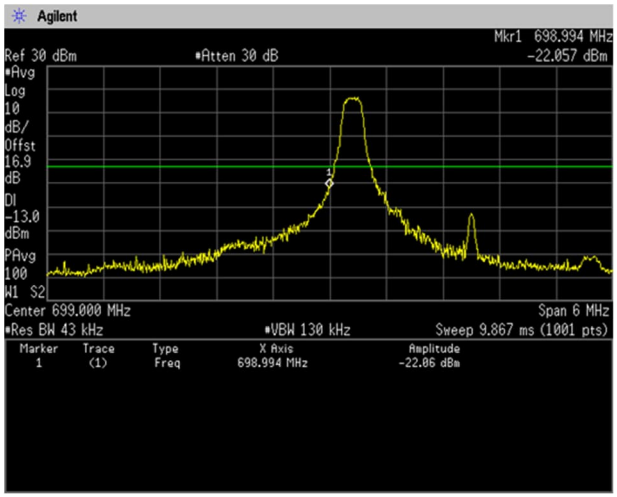
QPSK, BW 3MHz, RB15-0
Channel: Low



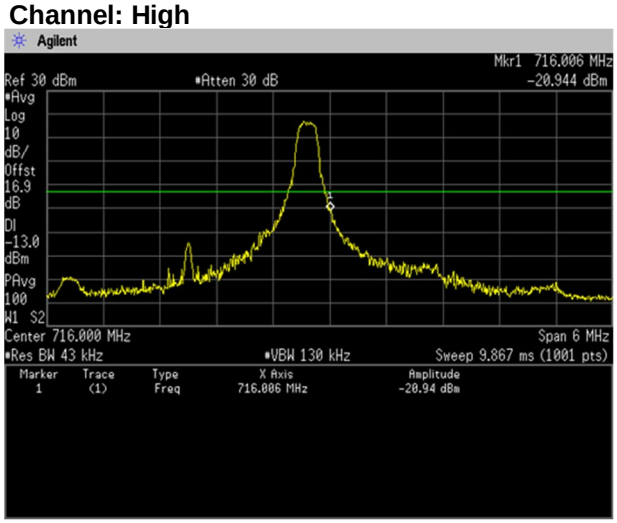
Channel: High



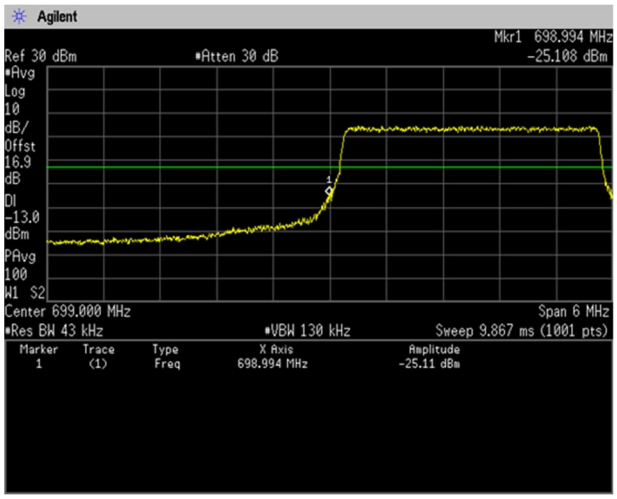
16QAM, BW 3MHz, RB1-0
Channel: Low



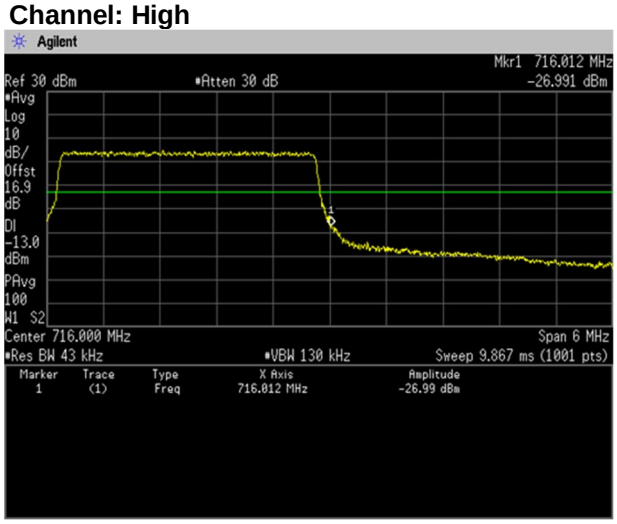
16QAM, BW 3MHz, RB1-14
Channel: High



16QAM, BW 3MHz, RB15-0
Channel: Low

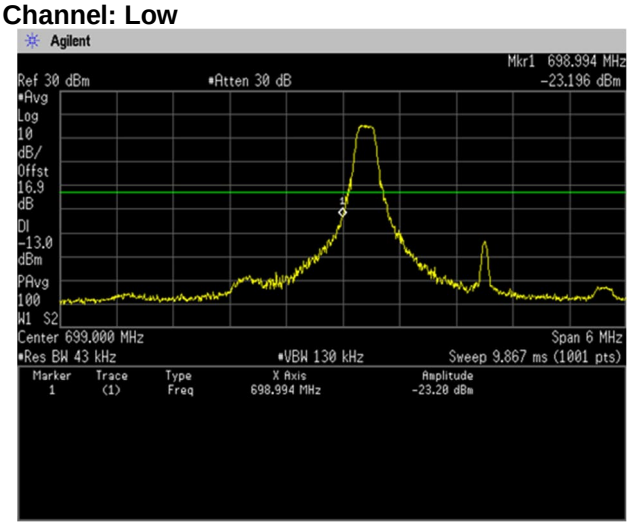


Channel: High

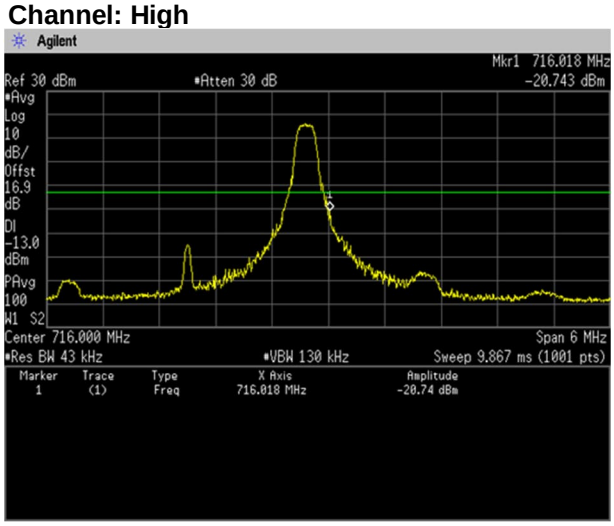


Japan

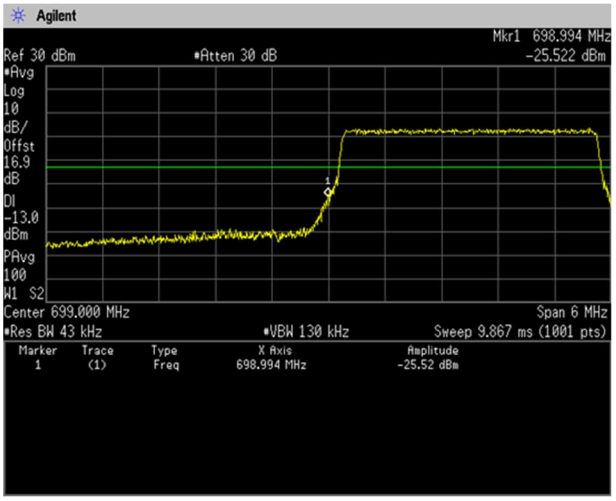
64QAM, BW 3MHz, RB1-0
Channel: Low



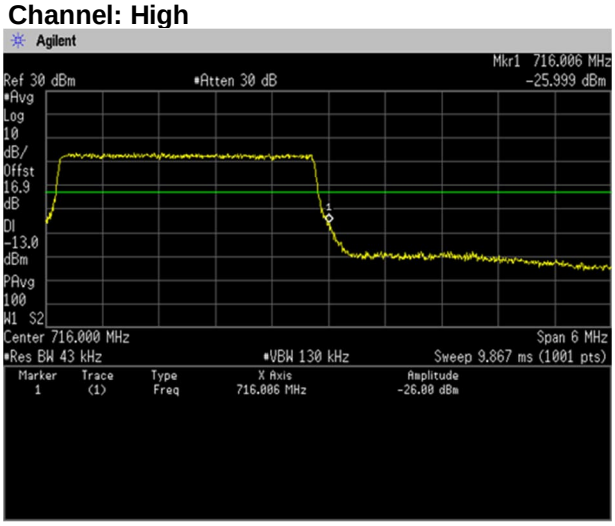
64QAM, BW 3MHz, RB1-14
Channel: High



64QAM, BW 3MHz, RB15-0
Channel: Low

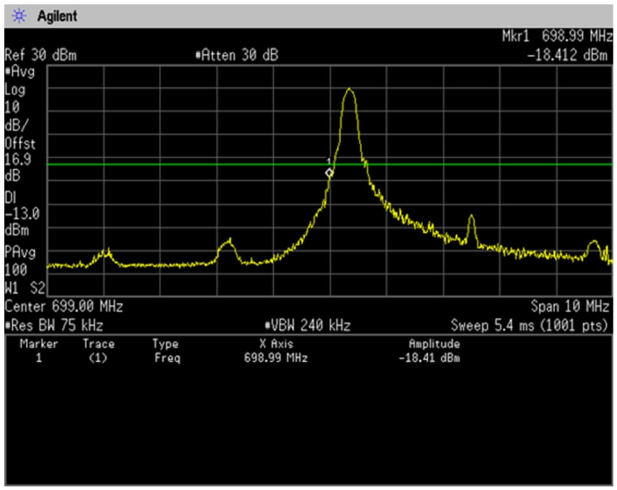


Channel: High

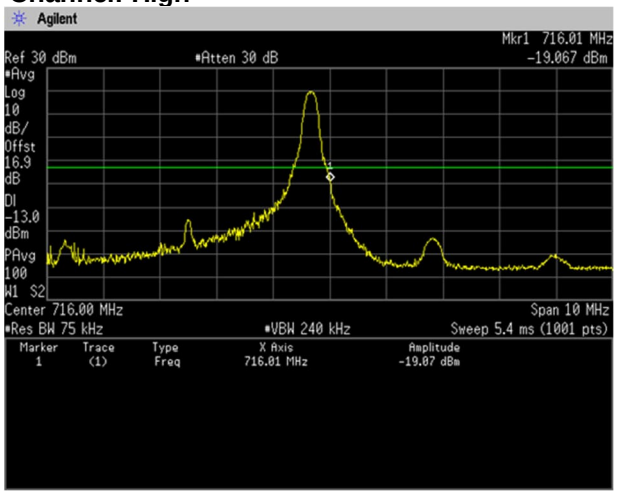


Japan

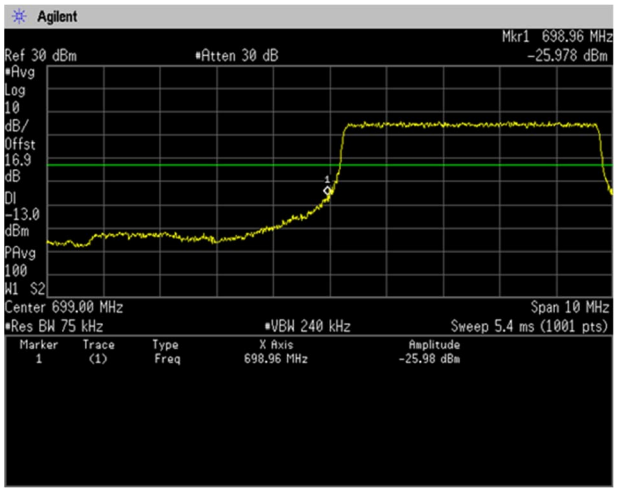
QPSK, BW 5MHz, RB1-0
Channel: Low



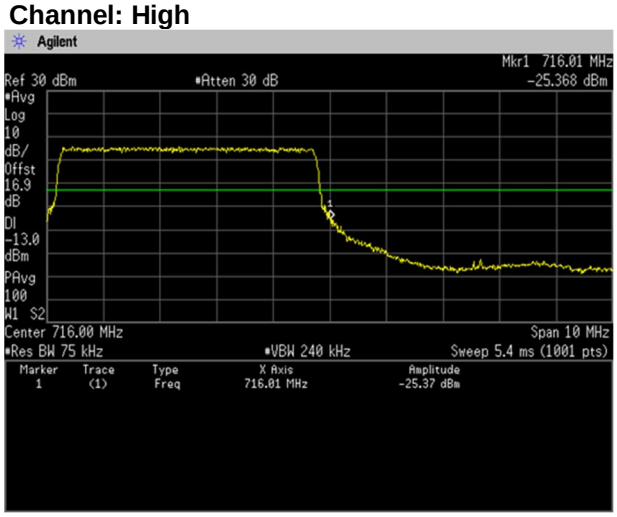
QPSK, BW 5MHz, RB1-24
Channel: High



QPSK, BW 5MHz, RB25-0
Channel: Low

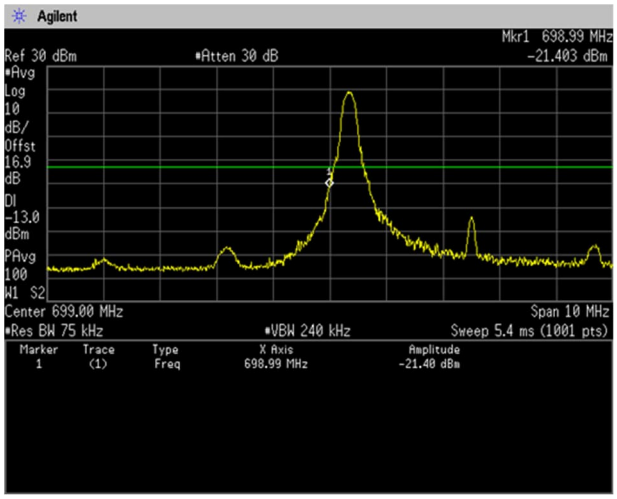


Channel: High

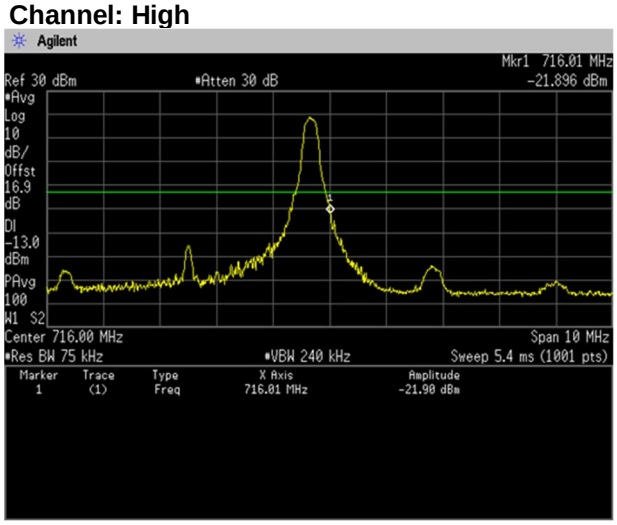


Japan

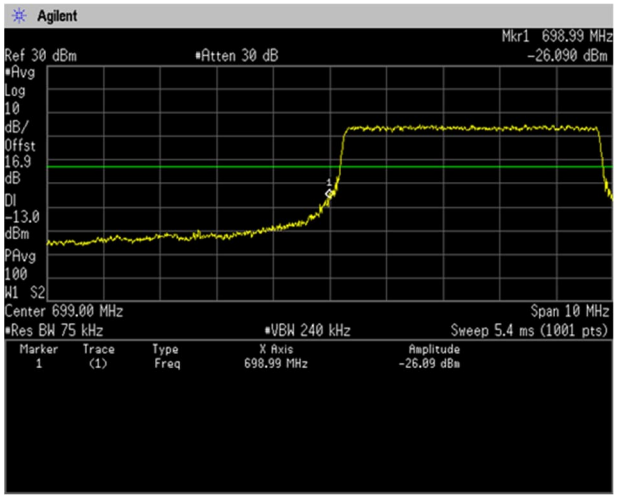
16QAM, BW 5MHz, RB1-0
Channel: Low



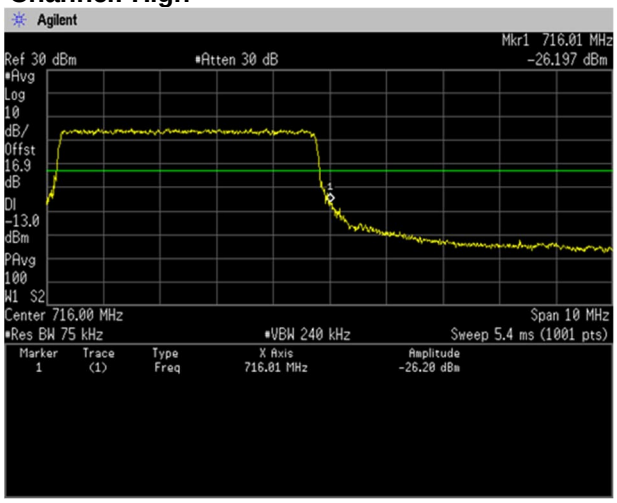
16QAM, BW 5MHz, RB1-24
Channel: High



16QAM, BW 5MHz, RB25-0
Channel: Low

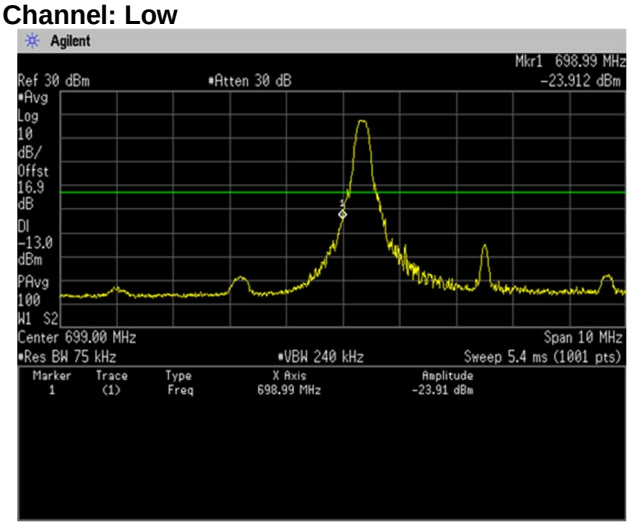


Channel: High

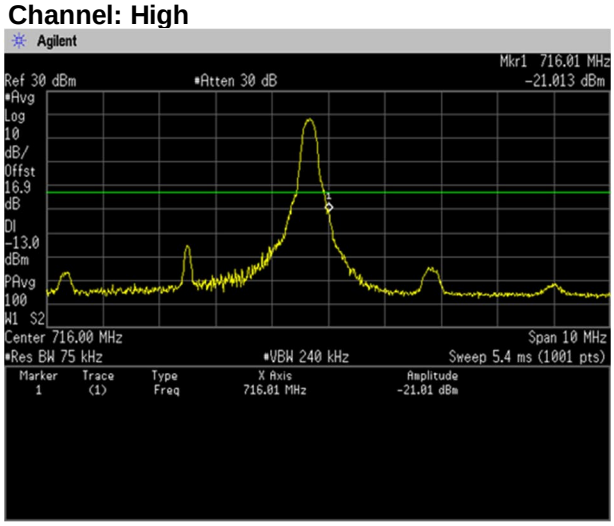


Japan

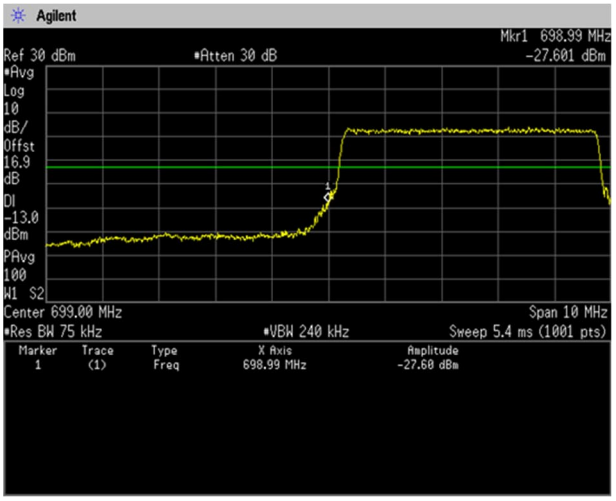
64QAM, BW 5MHz, RB1-0
Channel: Low



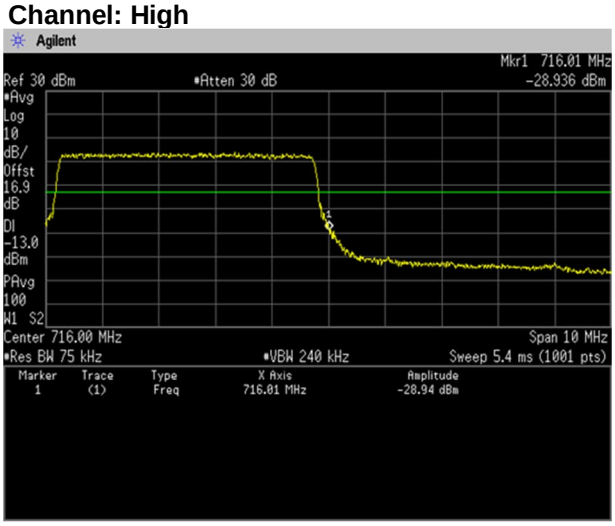
64QAM, BW 5MHz, RB1-24
Channel: High



64QAM, BW 5MHz, RB25-0
Channel: Low

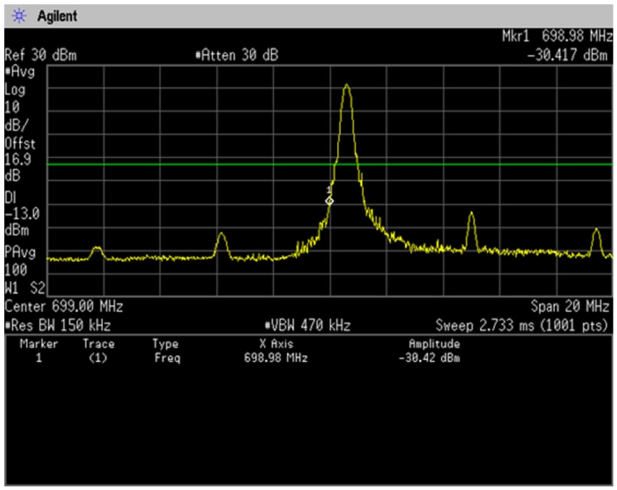


Channel: High

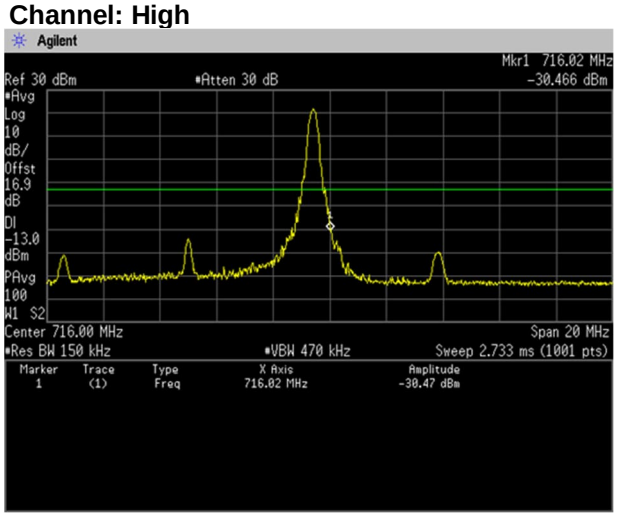


Japan

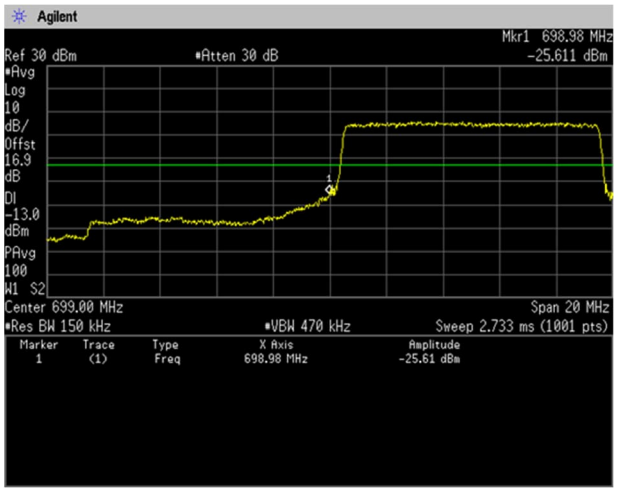
QPSK, BW 10MHz, RB1-0
Channel: Low



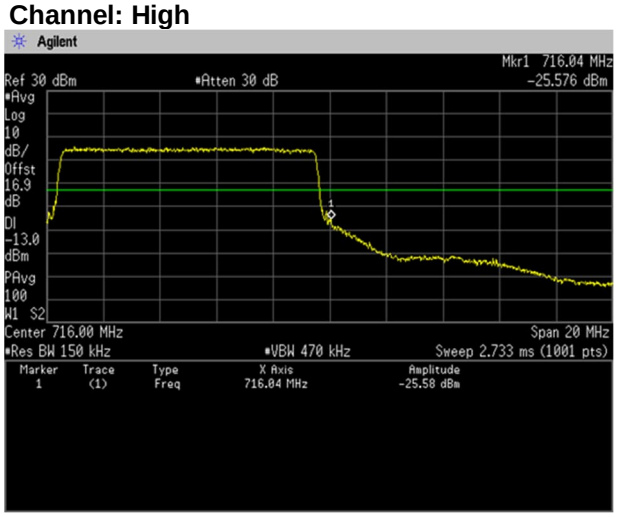
QPSK, BW 10MHz, RB1-49
Channel: High



QPSK, BW 10MHz, RB50-0
Channel: Low

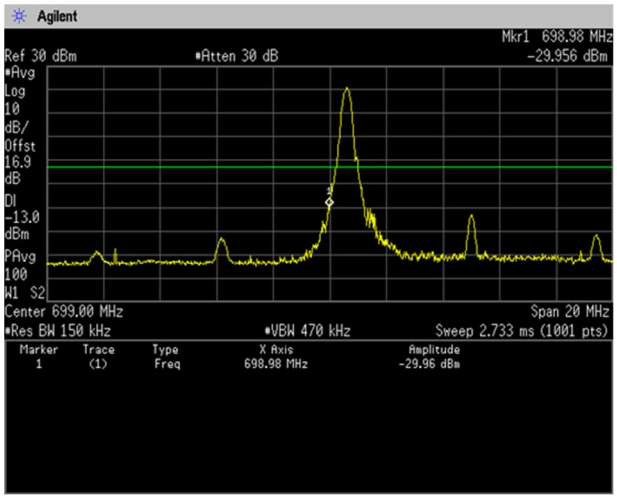


Channel: High

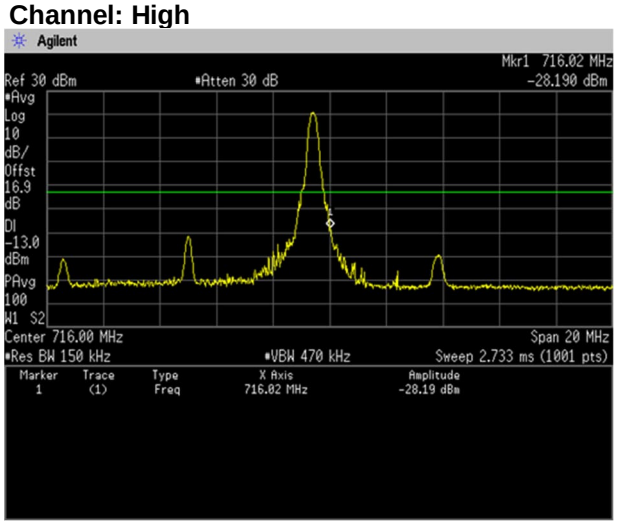


Japan

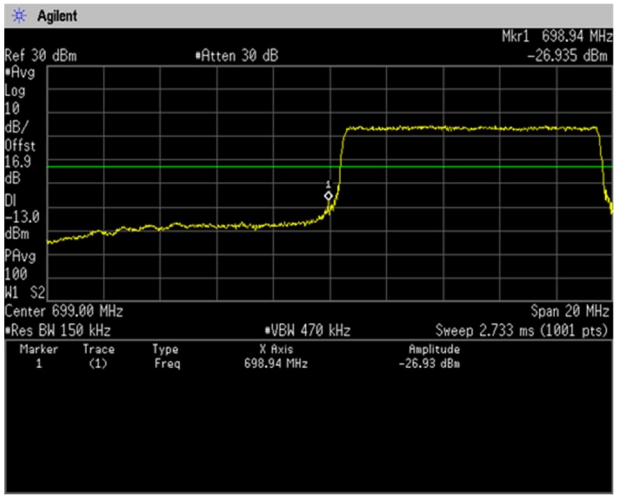
16QAM, BW 10MHz, RB1-0
Channel: Low



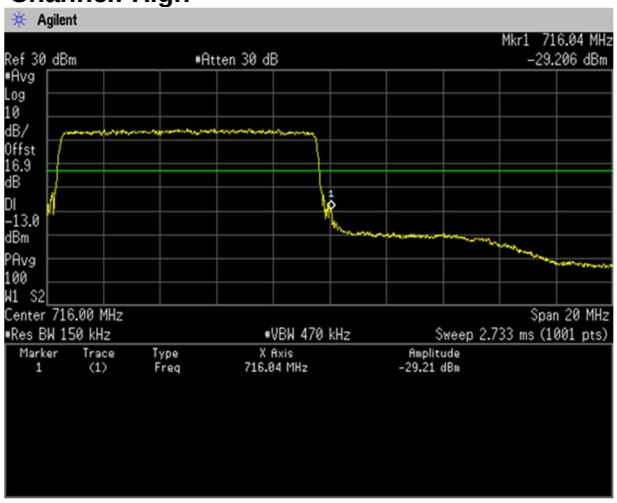
16QAM, BW 10MHz, RB1-49
Channel: High



16QAM, BW 10MHz, RB50-0
Channel: Low

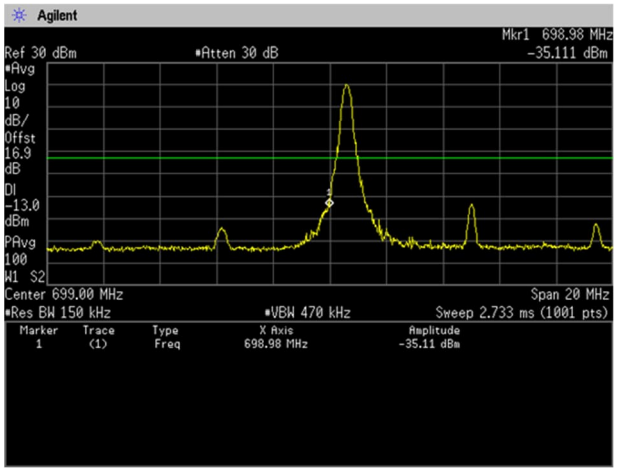


Channel: High

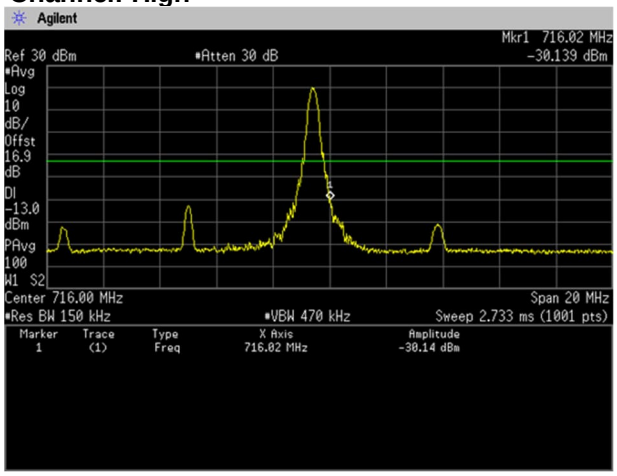


Japan

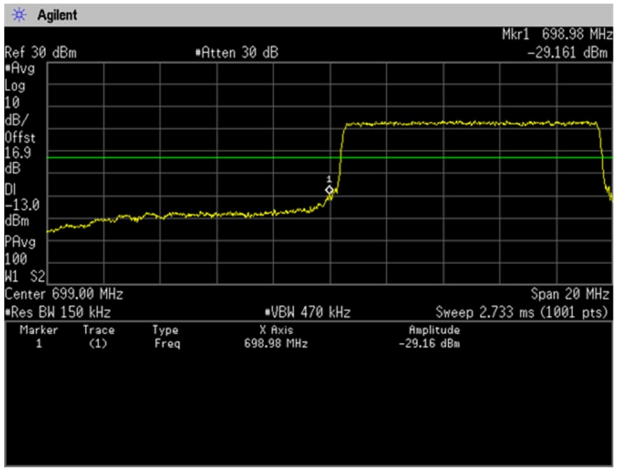
64QAM, BW 10MHz, RB1-0
Channel: Low



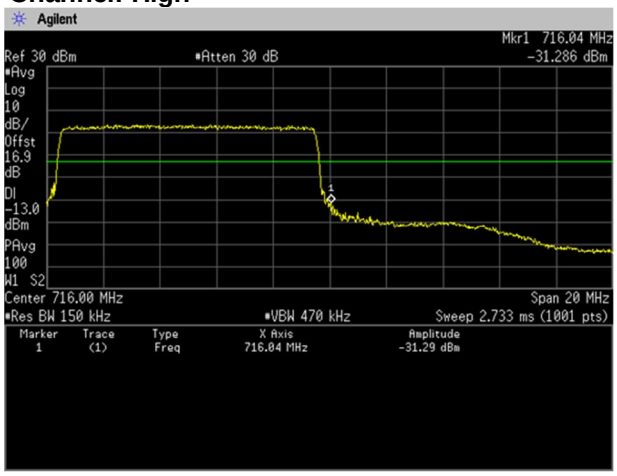
64QAM, BW 10MHz, RB1-49
Channel: High



64QAM, BW 10MHz, RB50-0
Channel: Low

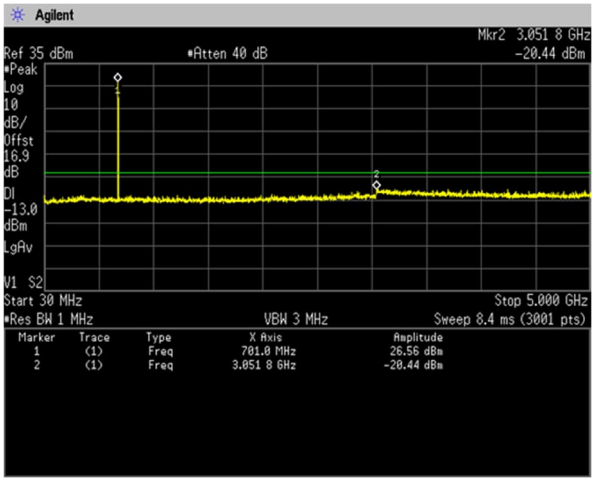


Channel: High

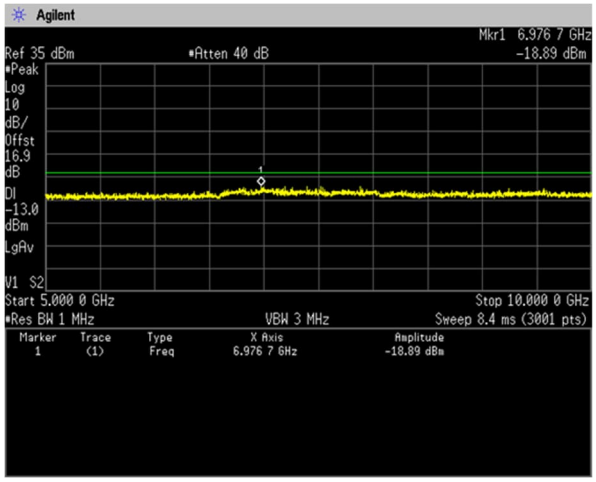


(Spurious Emissions)
Note: Conducted spurious test was measured in the worst case of Effective Radiated Power.

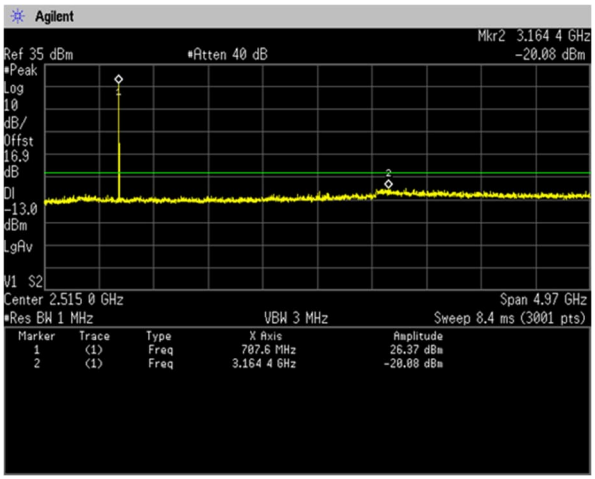
QPSK, BW 3MHz
Channel: 23025
30MHz-5GHz



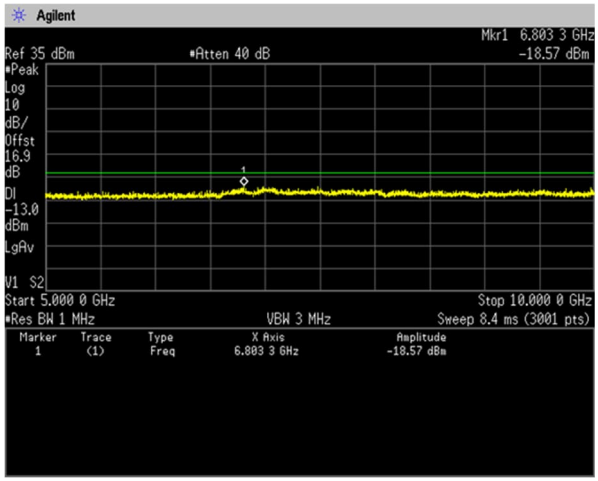
5GHz-10GHz



QPSK, BW 3MHz
Channel: 23095
30MHz-5GHz



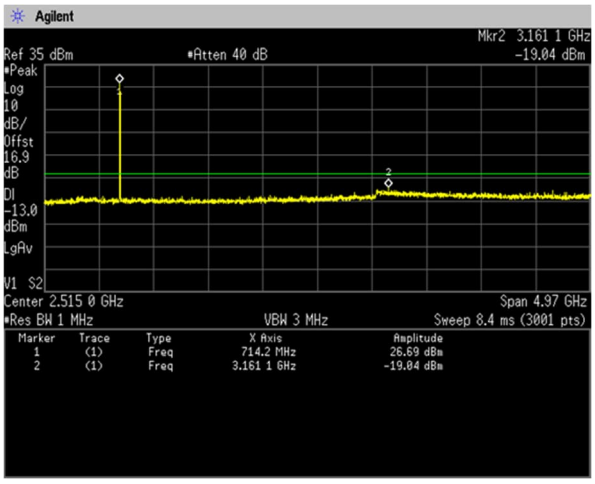
5GHz-10GHz



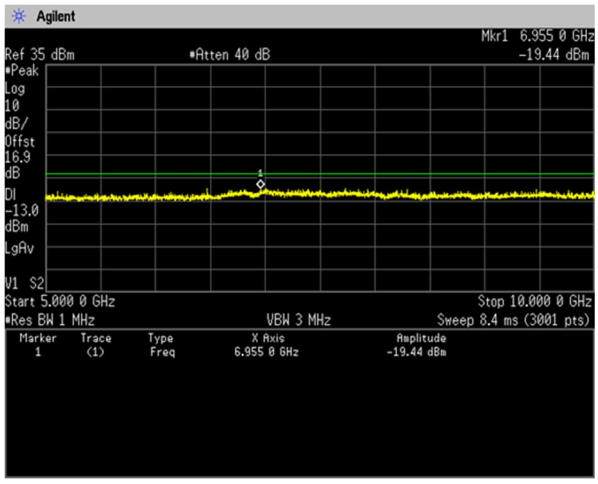
Japan

QPSK, BW 3MHz
Channel: 23165

30MHz-5GHz



5GHz-10GHz



Japan

4.5 Radiated Emissions and Harmonic Emissions

4.5.1 Measurement procedure

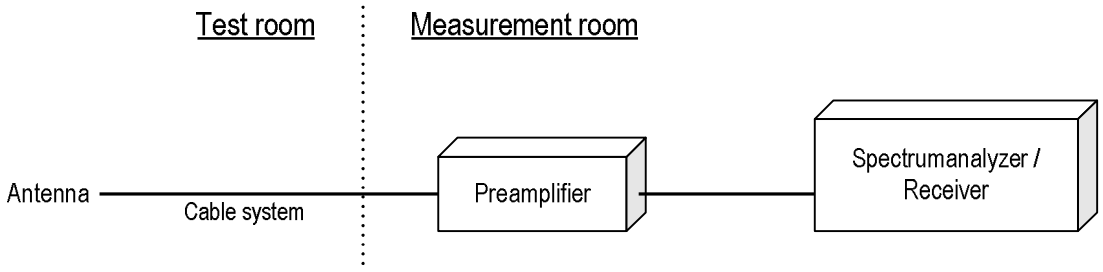
[FCC 27.53, 2.1053]

<Step 1>
The EUT and support equipment are placed on a 1 meter x 1 meter surface, 0.8 meter height (Below 1GHz) or 0.6 meter x 0.6 meter surface, 1.5 meter height (Above 1GHz) styrene foam table. Radiated emission measurements are performed at 3 meter distance with the broadband antenna (Biconical antenna, Log periodic antenna and double ridged guide antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1 to 4 meters and stopped at height producing the maximum emission.
The bandwidth of the spectrum analyzer is set to 1 MHz. The turntable is rotated by 360 degrees and stopped at azimuth of producing the maximum emission. The frequency is investigated up to 20GHz.

<Step 2>
The substitution antenna is replaced by the transmitter antenna (EUT).
The frequency of the signal generator is adjusted to the measurement frequency.
Level of the signal generator is adjusted to the level that is obtained from step 1, and record the emission level of signal generator.

The spectrum analyzer is set to;
a) RBW = 100 kHz for below 1GHz and 1MHz for above 1GHz / VBW ≥ 3 x RBW
b) Detector = Peak
c) Trace mode = Max hold
d) Sweep time = auto-couple

- Test configuration



Japan

4.5.2 Calculation method

Result (EIRP) = Ant. Input - Cable loss + Antenna Gain
Margin = Limit – Result (EIRP)

Example:
Limit @ 1420 MHz: -13.0 dBm
Ant. Input = -55.6 dBm Cable loss = 1.0dB Ant. Gain = 5.9 dBi
Result = -55.6 - 1.0 + 5.9 = -50.7 dBm
Margin = -13.0 - (-50.7) = 37.7 dB

4.5.3 Limit

-13 dBm or less

4.5.4 Test data

Date : 22-June-2023
Temperature : 22.1 [˚C]
Humidity : 56.2 [%] Test engineer :
Test place : 3m Semi-anechoic chamber Chiaki Kanno

Date : 23-June-2023
Temperature : 21.6 [˚C]
Humidity : 61.3 [%] Test engineer :
Test place : 3m Semi-anechoic chamber Tadahiro Seino

[LTE Band XII]
QPSK, BW 1.4MHz
Channel: 23017

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1399.4	-55.9	-56.0	1.0	4.4	-52.6	-13.0	39.6

Channel: 23095

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1415.0	-56.0	-56.5	1.0	4.7	-52.8	-13.0	39.8

Channel: 23173

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1430.6	-55.9	-56.4	1.0	5.0	-52.5	-13.0	39.5

16QAM, BW 1.4MHz
Channel: 23017

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1399.4	-56.2	-56.3	1.0	4.4	-52.9	-13.0	39.9

Channel: 23095

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1415.0	-56.1	-56.6	1.0	4.7	-52.9	-13.0	39.9

Channel: 23173

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1430.6	-56.4	-56.9	1.0	5.0	-53.0	-13.0	40.0

64QAM, BW 1.4MHz
Channel: 23017

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1399.4	-56.5	-56.6	1.0	4.4	-53.2	-13.0	40.2

Channel: 23095

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1415.0	-56.1	-56.6	1.0	4.7	-52.9	-13.0	39.9

Channel: 23173

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1430.6	-56.6	-57.1	1.0	5.0	-53.2	-13.0	40.2

QPSK, BW 3MHz
Channel: 23025

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1401.0	-56.0	-55.8	1.0	4.5	-52.4	-13.0	39.4

Channel: 23095

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1415.0	-56.1	-56.6	1.0	4.7	-52.9	-13.0	39.9

Channel: 23165

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1429.0	-56.2	-56.3	1.0	4.9	-52.4	-13.0	39.4

16QAM, BW 3MHz
Channel: 23025

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1401.0	-56.4	-56.2	1.0	4.5	-52.8	-13.0	39.8

Channel: 23095

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1415.0	-56.3	-56.8	1.0	4.7	-53.1	-13.0	40.1

Channel: 23165

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1429.0	-56.5	-56.6	1.0	4.9	-52.7	-13.0	39.7

64QAM, BW 3MHz
Channel: 23025

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1401.0	-56.5	-56.3	1.0	4.5	-52.9	-13.0	39.9

Channel: 23095

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1415.0	-56.6	-57.1	1.0	4.7	-53.4	-13.0	40.4

Channel: 23165

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1429.0	-56.7	-56.8	1.0	4.9	-52.9	-13.0	39.9

QPSK, BW 5MHz
Channel: 23035

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1403.0	-55.8	-55.7	1.0	4.5	-52.2	-13.0	39.2

Channel: 23095

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1415.0	-55.8	-56.3	1.0	4.7	-52.6	-13.0	39.6

Channel: 23155

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1427.0	-55.9	-56.1	1.0	4.9	-52.2	-13.0	39.2

16QAM, BW 5MHz
Channel: 23035

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1403.0	-56.1	-56.0	1.0	4.5	-52.5	-13.0	39.5

Channel: 23095

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1415.0	-56.1	-56.6	1.0	4.7	-52.9	-13.0	39.9

Channel: 23155

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1427.0	-56.5	-56.7	1.0	4.9	-52.8	-13.0	39.8

64QAM, BW 5MHz
Channel: 23035

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1403.0	-56.2	-56.1	1.0	4.5	-52.6	-13.0	39.6

Channel: 23095

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1415.0	-56.4	-56.9	1.0	4.7	-53.2	-13.0	40.2

Channel: 23155

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1427.0	-56.6	-56.8	1.0	4.9	-52.9	-13.0	39.9

QPSK, BW 10MHz
Channel: 23060

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1408.0	-56.1	-56.2	1.0	4.6	-52.7	-13.0	39.7

Channel: 23095

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1415.0	-55.9	-56.4	1.0	4.7	-52.7	-13.0	39.7

Channel: 23130

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1422.0	-56.0	-56.1	1.0	4.8	-52.3	-13.0	39.3

16QAM, BW 10MHz
Channel: 23060

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1408.0	-56.4	-56.5	1.0	4.6	-53.0	-13.0	40.0

Channel: 23095

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1415.0	-56.3	-56.8	1.0	4.7	-53.1	-13.0	40.1

Channel: 23130

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1422.0	-56.3	-56.4	1.0	4.8	-52.6	-13.0	39.6

64QAM, BW 10MHz
Channel: 23060

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1408.0	-56.7	-56.8	1.0	4.6	-53.3	-13.0	40.3

Channel: 23095

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1415.0	-56.6	-57.1	1.0	4.7	-53.4	-13.0	40.4

Channel: 23130

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	1422.0	-56.4	-56.5	1.0	4.8	-52.7	-13.0	39.7

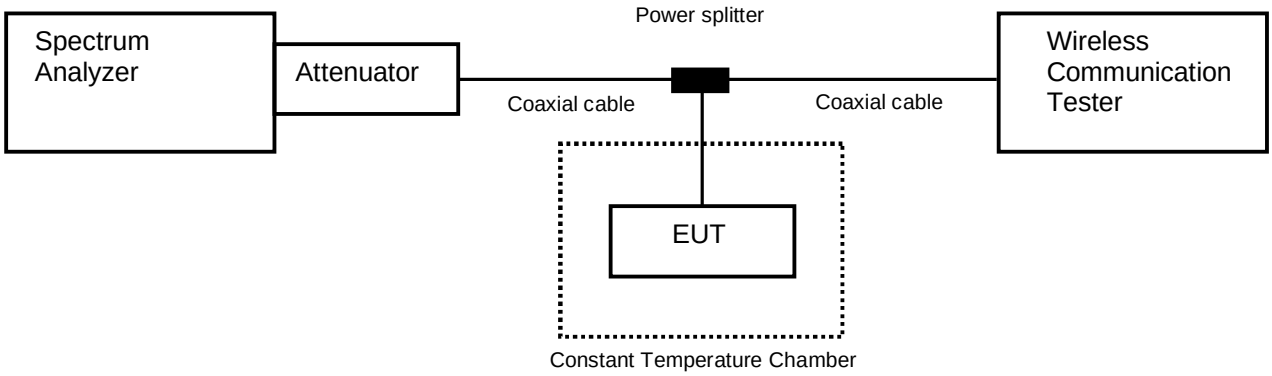
4.6 Frequency Stability

4.6.1 Measurement procedure

[FCC 27.54, 2.1055]

The EUT was placed of an inside of a constant temperature chamber as the temperature in the chamber was varied between -30˚C and +50˚C. The temperature was incremented by 10˚C intervals and the unit was allowed to stabilize at each measurement. The frequency drift was measured with the normal Temperature and voltage tolerance and it is presented as the ppm unit.

- Test configuration



4.6.2 Limit

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.6.3 Measurement result

Date	:	27-July-2023		
Temperature	:	23.5 [˚C]		
Humidity	:	53.0 [%]	Test engineer	:
Test place	:	Shielded room No.4		Kazunori Saito

[LTE Band XII]
QPSK, BW 10MHz, RB 50-0
Channel: 23790

Power Supply [V]	Temperature [°C]	Measurements Frequency [Hz]	Frequency Tolerance [ppm]	Result
3.87	25(Ref.)	707,500,002	0.00000	Pass
	50	707,499,996	-0.00831	Pass
	40	707,499,998	-0.00601	Pass
	30	707,500,003	0.00123	Pass
	20	707,499,994	-0.01151	Pass
	10	707,499,992	-0.01387	Pass
	0	707,500,003	0.00168	Pass
	-10	707,500,004	0.00277	Pass
	-20	707,500,003	0.00123	Pass
	-30	707,500,004	0.00239	Pass
3.48	25	707,499,997	-0.00677	Pass
4.26	25	707,499,998	-0.00595	Pass

Calculation;
Frequency Tolerance (ppm) = Measurements Frequency (Hz) – Reference Frequency (Hz) / Reference Frequency (Hz) x 1000000

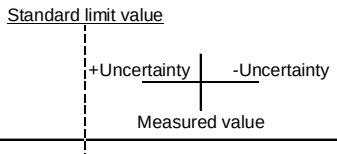
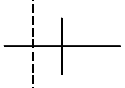
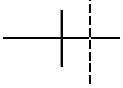
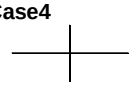
Japan

5 Measurement Uncertainty

The reported measurement uncertainty is based on a value obtained by multiplying standard uncertainty by coverage factor of k=2, and a level of confidence becomes 95 %.

3m Semi Anechoic Chamber	
Test item	**Measurement uncertainty**
Conducted emission, AMN (9 kHz – 150 kHz)	±3.7 dB
Conducted emission, AMN (150 kHz – 30 MHz)	±3.3 dB
Radiated emission (9kHz – 30 MHz)	±3.8 dB
Radiated emission (30 MHz – 1000 MHz)	±5.4 dB
Radiated emission (1 GHz – 6 GHz)	±4.6 dB
Radiated emission (6 GHz – 18 GHz)	±4.7 dB
Radiated emission (18 GHz – 40 GHz)	±6.4 dB
Radio Frequency	$\pm 1.3 * 10^{-8}$
RF power, conducted	±0.7 dB
Adjacent channel power	±1.5 dB
Temperature	±0.6 °C
Humidity	±1.2 %
Voltage (DC)	±0.4 %
Voltage (AC, <10kHz)	±0.2 %

Measurement uncertainty of not listed immunity tests is considered to suffice because requirements of relevant standards are met.

Judge	**Measured value and standard limit value**
PASS	**Case1**  Even if it takes uncertainty into consideration, a standard limit value is fulfilled.
	Case2  Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.
FAIL	**Case3**  Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.
	Case4  Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.

Japan

6 Laboratory Information

Testing was performed and the report was issued at:

TÜV SÜD Japan Ltd. Yonezawa Testing Center

Address: 5-4149-7 Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan
Phone: +81-238-28-2881

Accreditation and Registration
A2LA
Certificate #3686.03

VLAC
Accreditation No.: VLAC-013

BSMI
Laboratory Code: SL2-IN-E-6018, SL2-A1-E-6018

Innovation, Science and Economic Development Canada
ISED#: 4224A

VCCI Council
Registration number: A-0166

Japan

Appendix A. Test Equipment

Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	30-Sep-2023	05-Sep-2022
Attenuator	HUBER+SUHNER	6810.19.A	N/A(S450)	31-Dec-2023	19-Dec-2022
Microwave cable	Junkosha Inc.	MWX221/1m	N/A(S400)	31-Mar-2024	16-Mar-2023
Power divider	Keysight	11636B	MY51359874	30-Sep-2023	28-Sep-2022
Wideband Radio Frequency Tester	ROHDE&SCHWARZ	CMW500	116338	31-Aug-2023	04-Aug-2022
Temperature and humidity chamber	ESPEC	PL1KP	14007261	30-Sep-2023	02-Sep-2022

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESW44	103171	30-Sep-2023	20-Sep-2022
Preamplifier	SONOMA	310	372170	30-Sep-2023	15-Sep-2022
Biconical antenna	Schwarzbeck	VHBB9124/BBA9106	1145	30-Jun-2023	28-Jun-2022
Log periodic antenna	Schwarzbeck	VUSLP9111B	346	30-Nov-2023	16-Nov-2022
Attenuator	TOYO Connector	NA-PJ-6/6dB	N/A(S541)	30-Sep-2023	28-Sep-2022
Attenuator	TAMAGAWA.ELEC	CFA-10/3dB	N/A(S503)	31-Jul-2023	14-Jul-2022
Preamplifier	TSJ	MLA-100M18-B02-40	1929118	31-Dec-2023	22-Dec-2022
Attenuator	AEROFLEX	26A-10	081217-08	31-Dec-2023	19-Dec-2022
Double ridged guide antenna	ETS LINDGREN	3117	00052315	30-Jun-2024	22-Jun-2023
Attenuator	HUBER+SUHNER	6803.17.B	N/A(2340)	31-Dec-2023	22-Dec-2022
Double ridged guide antenna	A.H.Systems Inc.	SAS-574	469	31-Aug-2023	19-Aug-2022
Preamplifier	TSJ	MLA-1840-B03-35	1240332	31-Aug-2023	19-Aug-2022
Notch Filter	Micro-Tronics	BRM50706	003	31-Jul-2024	19-Jul-2023
Signal generator	ROHDE&SCHWARZ	SMB100A	177525	31-Dec-2023	16-Dec-2022
RF power amplifier	R&K	CGA020M602-2633R	B40240	30-Jun-2024	21-Jun-2023
Attenuator	HUBER+SUHNER	6820.19.A	N/A(2399)	30-Sep-2023	28-Sep-2022
Microwave cable	HUBER+SUHNER	SUCOFELX102/2m	31648	31-Mar-2024	16-Mar-2023
Dipole antenna	Schwarzbeck	VHAP	1020	31-Jul-2023	05-Jul-2022
Dipole antenna	Schwarzbeck	UHAP	994	31-Jul-2023	05-Jul-2022
Double ridged guide antenna	ETS LINDGREN	3117	00218815	31-Dec-2023	19-Dec-2022
Wideband Radio Frequency Tester	ROHDE&SCHWARZ	CMW500	126079	31-Aug-2023	15-Aug-2022
Wideband Radio Frequency Tester	ROHDE&SCHWARZ	CMW500	116338	31-Aug-2023	04-Aug-2022
Microwave cable	HUBER+SUHNER	SUCOFLEX104/9m	800690/4	31-Oct-2023	26-Oct-2022
		SUCOFLEX104/1m	my24610/4	31-Dec-2023	19-Dec-2022
		SUCOFLEX104/9m	2001099/4	31-Dec-2023	22-Dec-2022
		SUCOFLEX104/1m	MY32976/4	31-Dec-2023	22-Dec-2022
		SUCOFLEX104/2m	SN MY28404/4	31-Dec-2023	19-Dec-2022
		SUCOFLEX104/7m	41625/6	31-Dec-2023	22-Dec-2022
PC	DELL	OPTIPLEX9010	00186-228-073-851	N/A	N/A
Software	TOYO Technica	ES10/RE-AJ	Ver.2023.01.001	N/A	N/A
Absorber	RIKEN	PFP30	N/A	N/A	N/A
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-NSA)	31-May-2024	28-May-2023
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-SVSWR)	31-May-2024	29-May-2023

*: The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.