

## Report on the RF Testing of:

KYOCERA Corporation  
Mobile Phone, Model: EB1136  
FCC ID: JOYEB1136

## In accordance with FCC Part 27 Subpart C

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



Japan

**Add value.  
Inspire trust.**

## COMMERCIAL-IN-CONFIDENCE

Document Number: JPD-TR-22179-0

### SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Hiroaki Suzuki	Deputy Manager of RF Group	Approved Signatory	2022.10.21

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.



### DISCLAIMER AND COPYRIGHT

The results in this report are applicable only to the equipment tested.  
This report shall not be re-produced except in full without the written approval of TÜV SÜD Japan Ltd.  
Client provided data, for which TÜV SÜD Japan Ltd. take no responsibility, which can affect validity of results within this report is clearly identified.

### ACCREDITATION

This test report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the U.S. Government.

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

## Contents

<b>1</b>	<b>Summary of Test</b> .....	<b>3</b>
1.1	Modification history of the test report.....	3
1.2	Standards.....	3
1.3	Test methods.....	3
1.4	Deviation from standards.....	3
1.5	List of applied test(s) of the EUT.....	3
1.6	Test information.....	3
1.7	Test set up.....	3
1.8	Test period.....	3
<b>2</b>	<b>Equipment Under Test</b> .....	<b>4</b>
2.1	EUT information.....	4
2.2	Modification to the EUT.....	5
2.3	Variation of family model(s).....	5
2.4	Description of test mode.....	5
<b>3</b>	<b>Configuration of Equipment</b> .....	<b>6</b>
3.1	Equipment used.....	6
3.2	System configuration.....	6
<b>4</b>	<b>Test Result</b> .....	<b>7</b>
4.1	Effective Radiated Power.....	7
4.2	Peak to Average Ratio.....	11
4.3	Occupied Bandwidth.....	16
4.4	Band Edge Spurious and Harmonic at Antenna Terminals.....	22
4.5	Radiated Emissions and Harmonic Emissions.....	43
4.6	Frequency Stability.....	49
<b>5</b>	<b>Measurement Uncertainty</b> .....	<b>51</b>
<b>6</b>	<b>Laboratory Information</b> .....	<b>52</b>
	<b>Appendix A. Test Equipment</b> .....	<b>53</b>

## 1 Summary of Test

### 1.1 Modification history of the test report

Document Number	Modification History	Issue Date
JPD-TR-22179-0	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

13-September-2022 - 24-September-2022

## 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	EB1136
Serial number	354649890001247, 354649890001254, 354649890001262, 350246240000211, 350246240000229
Trade name	Kyocera
Number of sample(s)	5
EUT condition	Pre-Production
Power rating	Battery: DC 3.8 V
Size	(W) 112.9 mm × (D) 51.3 mm × (H) 18.1 mm
Environment	Indoor and Outdoor use
Terminal limitation	-20°C to 60°C
Hardware version	DMT1
Software version	0.090GC.0015.a
Firmware version	Not applicable
RF Specification	
Frequency of Operation	Up Link LTE Band XII: 699.7-715.3 MHz Down Link LTE Band XII: 729.7-745.3 MHz
Modulation type	QPSK, 16QAM
Emission designator	LTE Band XII: BW 1.4M QPSK: 1M10G7D, 16QAM: 1M10W7D BW 3M QPSK: 2M69G7D, 16QAM: 2M70W7D BW 5M QPSK: 4M53G7D, 16QAM: 4M53W7D BW 10M QPSK: 9M03G7D, 16QAM: 9M01W7D
Effective Radiated Power (E.R.P.)	LTE Band XII: 0.589 W (27.7 dBm)
Antenna type	Internal antenna
Antenna gain	LTE Band XII: -0.58 dBi

## 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: EB1136, Serial Number: 354649890001247, 354649890001254, 354649890001262, 350246240000211, 350246240000229			
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)

EB1136 has model with camera and without camera.

### 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	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 Z-axis, Open, Without camera 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.

### 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	EB1136	354649890001247, 354649890001254, 354649890001262, 350246240000211, 350246240000229	JOYEB1136	EUT

#### 3.2 System configuration

1. Mobile Phone (EUT)
--------------------------

## 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.

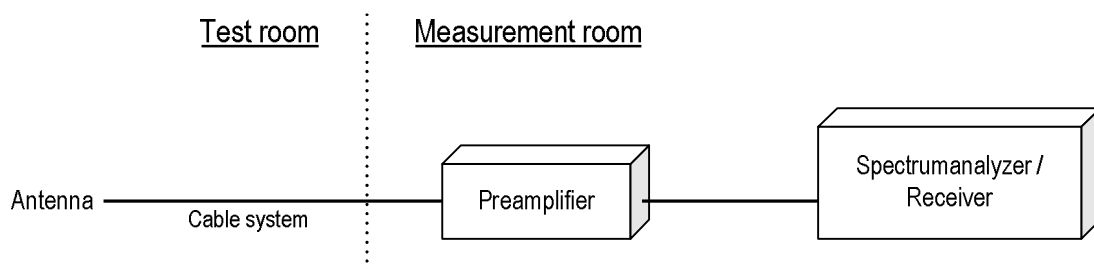
Level of the signal generator is adjusted to the level that is obtained from step 1, and record the emission level of signal generator.

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  $\geq 3 \times$  RBW
- d) Number of sweep points  $\geq 2 \times$  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  $\geq 98\%$ ), 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





**4.1.2 Calculation method**

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

Example:

Limit @ 710MHz : 34.7 dBm  
 Ant. Input = 25.5 dBm Cable loss = 0.7 dB Ant. Gain = -10.1 dBd  
 Result = 25.5 - 0.7 + (-10.1) = 14.7 dBm  
 Margin = 34.7 – 14.7 = 20.0 dB

**4.1.3 Limit**

3 W (34.7 dBm)

**4.1.4 Test data**

Date	: 16~17-September-2022		
Temperature	: 23.4 [°C]		
Humidity	: 59.3 [%]	Test engineer	:
Test place	: 3m Semi-anechoic chamber		<u>Chiaki Kanno</u>
Date	: 17~18-September-2022		
Temperature	: 22.3 [°C]		
Humidity	: 63.3 [%]	Test engineer	:
Test place	: 3m Semi-anechoic chamber		<u>Chiaki Kanno</u>
Date	: 20~21-September-2022		
Temperature	: 21.5 [°C]		
Humidity	: 54.6 [%]	Test engineer	:
Test place	: 3m Semi-anechoic chamber		<u>Chiaki Kanno</u>



**[LTE Band XII - Z-axis, Open, Without camera]****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	-29.1	33.2	0.7	-7.9	26.8	0.479	34.7	7.9
H	707.5	-28.8	33.8	0.7	-8.0	27.3	0.537	34.7	7.4
H	715.3	-29.0	34.2	0.7	-8.0	27.7	0.589	34.7	7.0

**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	-30.0	32.3	0.7	-7.9	25.9	0.389	34.7	8.8
H	707.5	-29.6	33.0	0.7	-8.0	26.5	0.447	34.7	8.2
H	715.3	-30.0	33.2	0.7	-8.0	26.7	0.468	34.7	8.0

**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	-29.1	33.2	0.7	-7.9	26.8	0.479	34.7	7.9
H	707.5	-28.7	33.9	0.7	-8.0	27.4	0.550	34.7	7.3
H	714.5	-29.0	34.1	0.7	-8.0	27.6	0.575	34.7	7.1

**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	-30.0	32.3	0.7	-7.9	25.9	0.389	34.7	8.8
H	707.5	-29.7	32.9	0.7	-8.0	26.4	0.437	34.7	8.3
H	714.5	-30.0	33.1	0.7	-8.0	26.6	0.457	34.7	8.1

**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	-29.5	32.9	0.7	-7.9	26.5	0.447	34.7	8.2
H	707.5	-29.3	33.3	0.7	-8.0	26.8	0.479	34.7	7.9
H	713.5	-29.5	33.5	0.7	-8.0	27.0	0.501	34.7	7.7

**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	-30.6	31.8	0.7	-7.9	25.4	0.347	34.7	9.3
H	707.5	-30.3	32.3	0.7	-8.0	25.8	0.380	34.7	8.9
H	713.5	-30.5	32.5	0.7	-8.0	26.0	0.398	34.7	8.7

**[LTE Band XII - Z-axis, Open, Without camera]****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	-29.5	33.0	0.7	-7.9	26.6	0.457	34.7	8.1
H	707.5	-29.6	33.0	0.7	-8.0	26.5	0.447	34.7	8.2
H	711.0	-29.5	33.2	0.7	-8.0	26.7	0.468	34.7	8.0

**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	-30.6	31.9	0.7	-7.9	25.5	0.355	34.7	9.2
H	707.5	-30.7	31.9	0.7	-8.0	25.4	0.347	34.7	9.3
H	711.0	-30.2	32.5	0.7	-8.0	26.0	0.398	34.7	8.7

## 4.2 Peak to Average Ratio

### 4.2.1 Measurement procedure

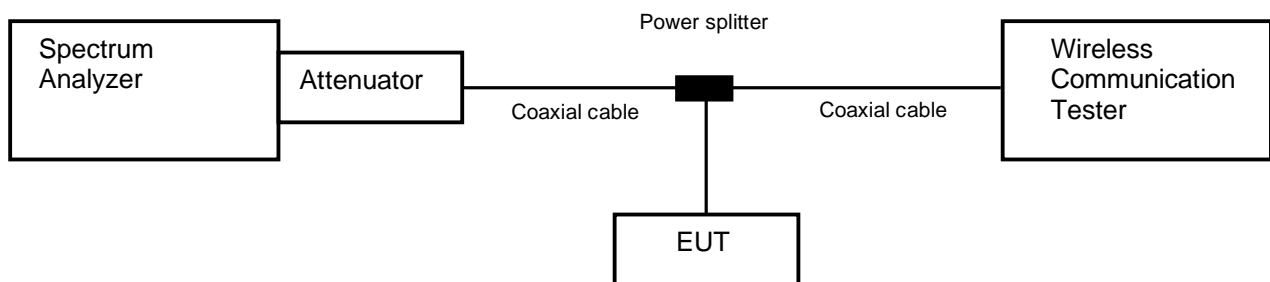
#### [FCC 27.50]

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  $\geq$  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 : 13-September-2022  
 Temperature : 24.1 [°C]  
 Humidity : 41.3 [%]  
 Test place : Shielded room No.4  
 Test engineer : Taiki Watanabe

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	5.23	13.0
				3	15-0	5.37	
				5	25-0	5.46	
				10	50-0	4.58	
			16QAM	1.4	6-0	5.94	
				3	15-0	5.93	
				5	25-0	6.07	
				10	50-0	5.95	

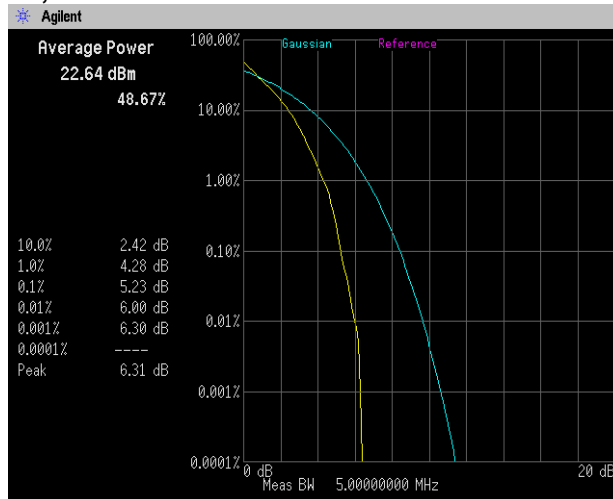


4.2.4 Trace data

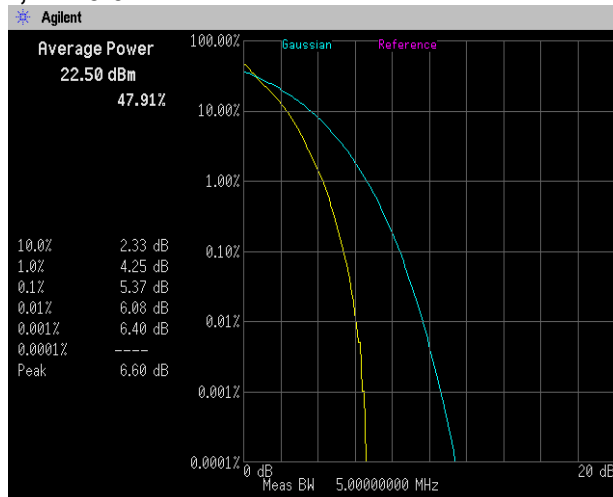
[LTE Band XII]

Channel: 23095

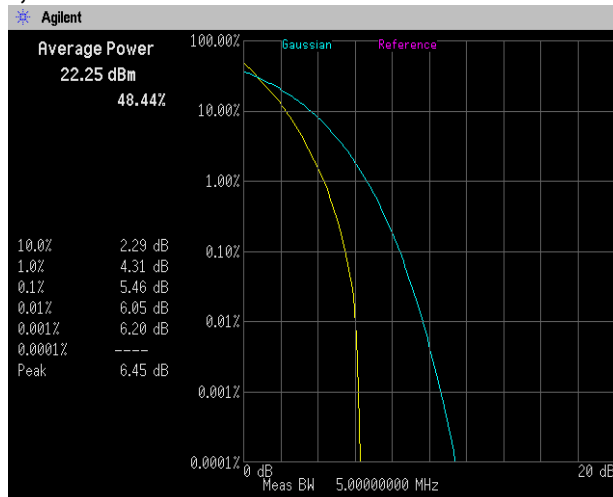
QPSK, BW 1.4MHz, RB6-0



QPSK, BW 3MHz, RB15-0



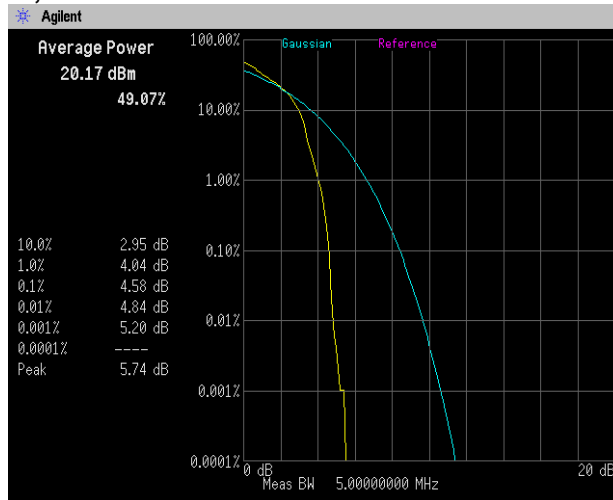
QPSK, BW 5MHz, RB25-0



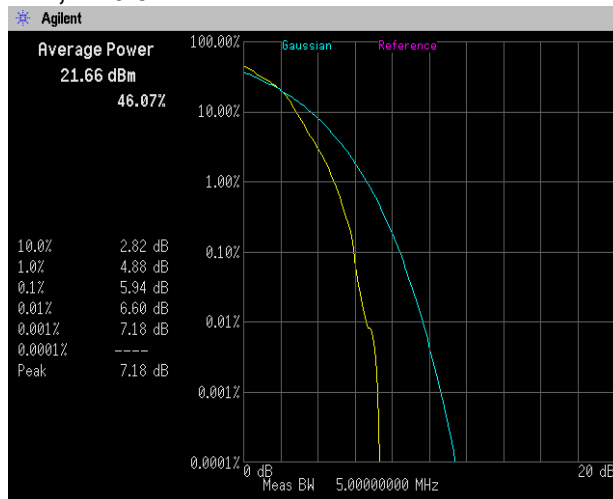
[LTE Band XII]

Channel: 23095

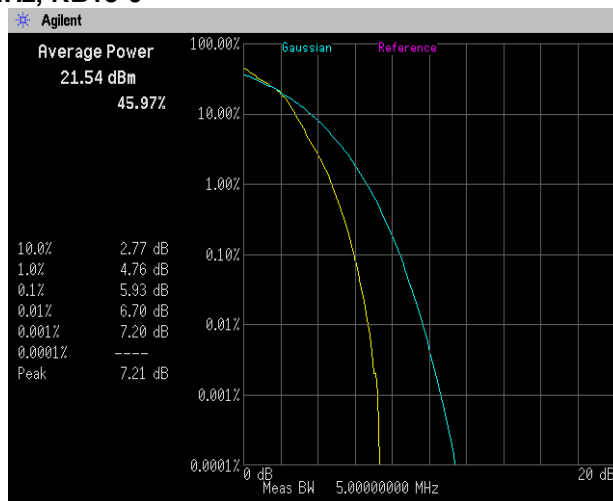
QPSK, BW 10MHz, RB50-0



16QAM, BW 1.4MHz, RB6-0



16QAM, BW 3MHz, RB15-0

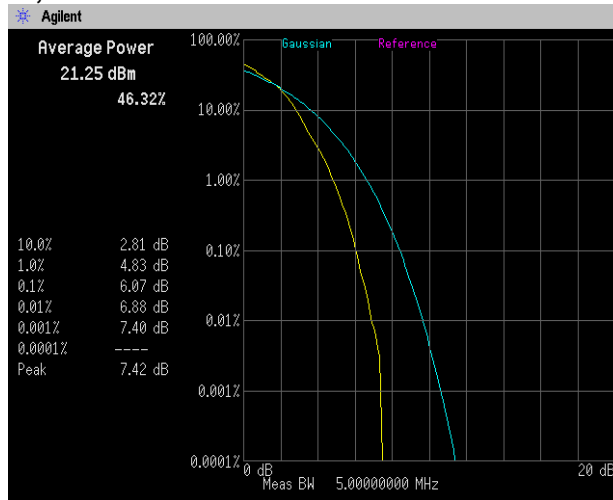




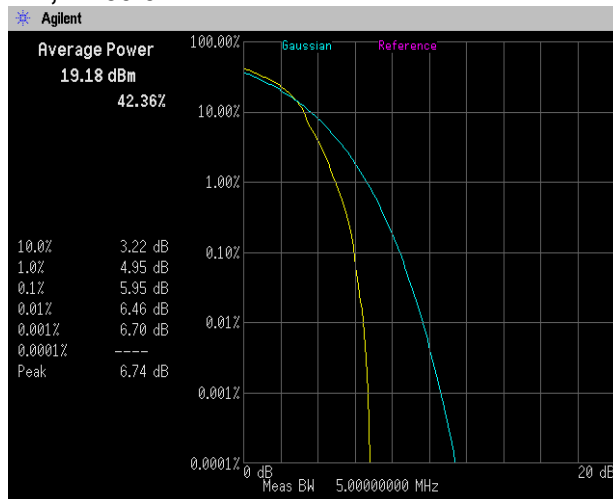
[LTE Band XII]

Channel: 23095

16QAM, BW 5MHz, RB25-0



16QAM, BW 10MHz, RB50-0



### 4.3 Occupied Bandwidth

#### 4.3.1 Measurement procedure

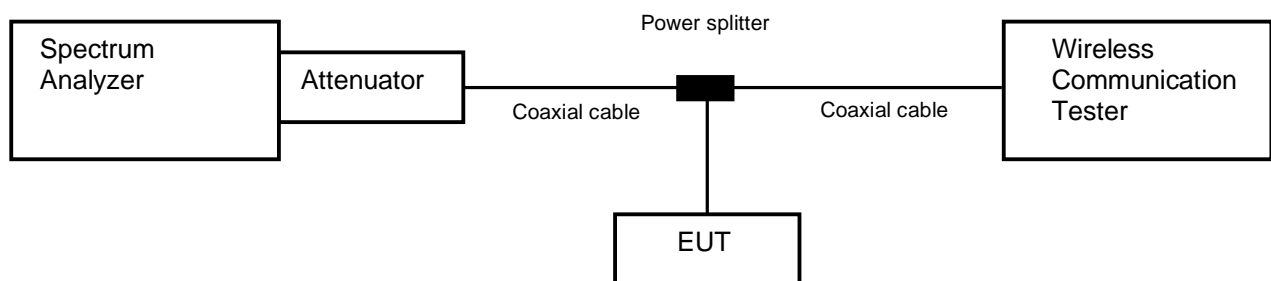
##### [FCC 2.1049]

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  $\geq 3 \times$  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 : 13-September-2022  
 Temperature : 24.1 [°C]  
 Humidity : 41.3 [%]  
 Test place : Shielded room No.4

Test engineer : Taiki Watanabe

Date : 14-September-2022  
 Temperature : 23.9 [°C]  
 Humidity : 54.4 [%]  
 Test place : Shielded room No.4

Test engineer : Kazunori Saito

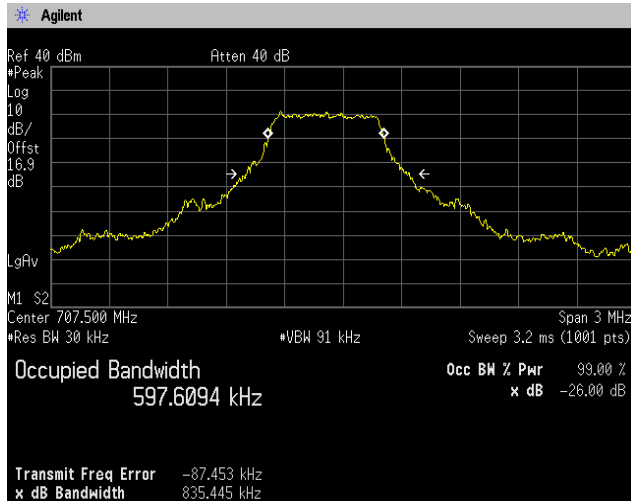
Band	Channel	Frequency [MHz]	Bandwidth [MHz]	Modulation	RB	Test Result [MHz]
LTE Band XII	23095	707.5	1.4	QPSK	3-1	0.5976
					6-0	1.0956
				16QAM	3-1	0.5905
					6-0	1.0969
			3	QPSK	8-4	1.5236
					15-0	2.6938
				16QAM	8-4	1.5065
					15-0	2.7013
			5	QPSK	12-7	2.2972
					25-0	4.5341
				16QAM	12-7	2.2868
					25-0	4.5299
			10	QPSK	25-12	4.6492
					50-0	9.0348
16QAM	25-12	4.6566				
	50-0	9.0069				



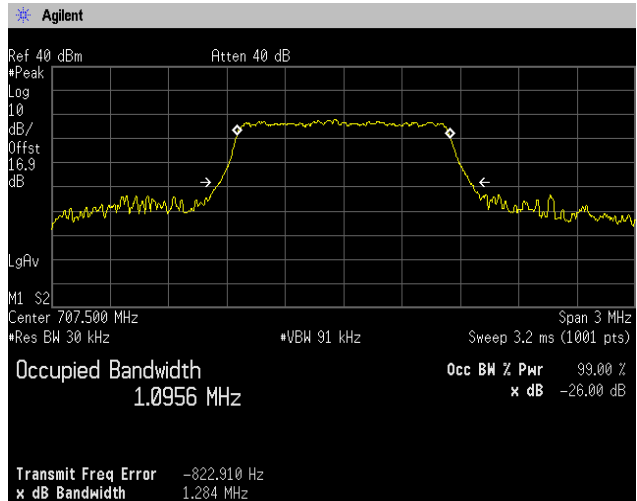
### 4.3.4 Trace data

[LTE Band XII]  
Channel: 23095

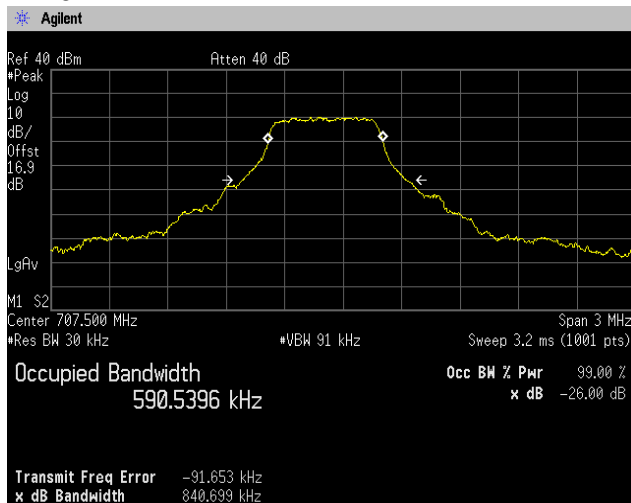
QPSK, BW 1.4MHz  
RB3-1



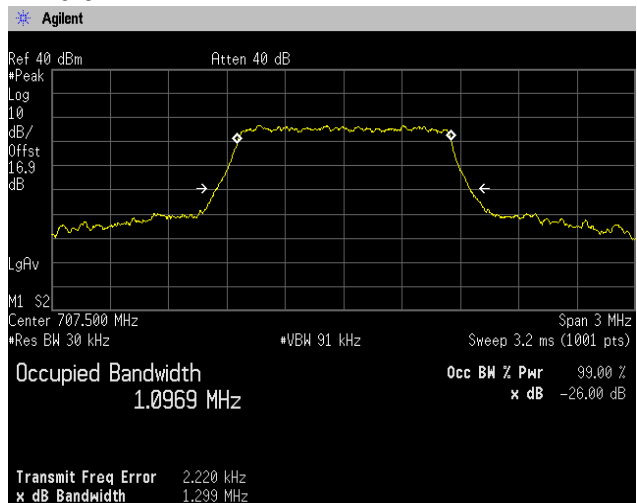
RB6-0



16QAM, BW 1.4MHz  
RB3-1



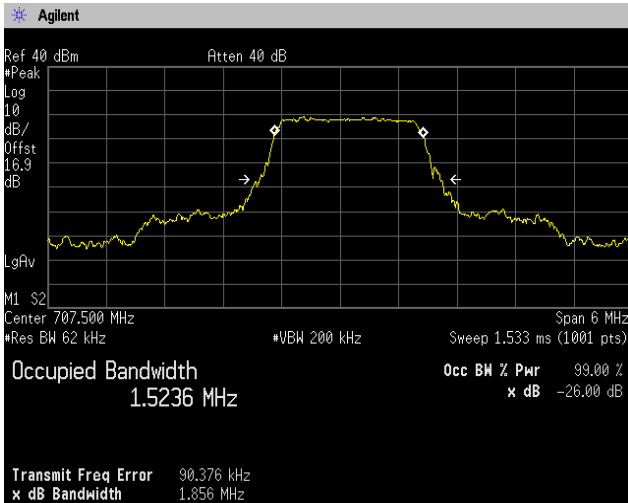
RB6-0



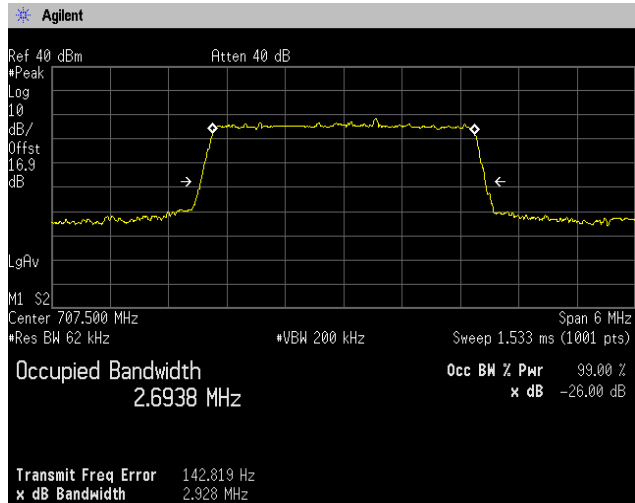


[LTE Band XII]  
Channel: 23095

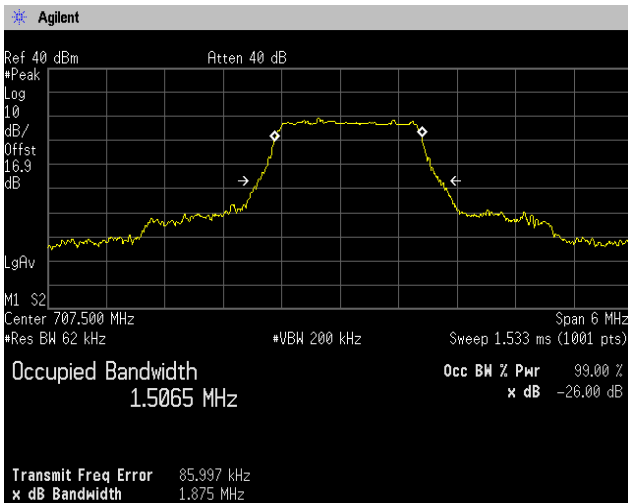
QPSK, BW 3MHz  
RB8-4



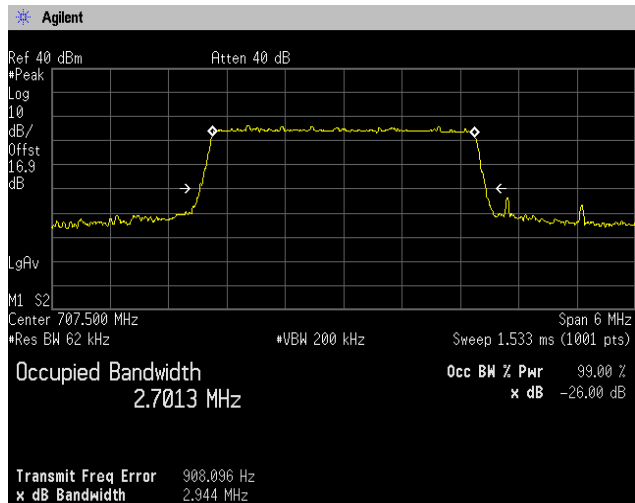
RB15-0



16QAM, BW 3MHz  
RB8-4



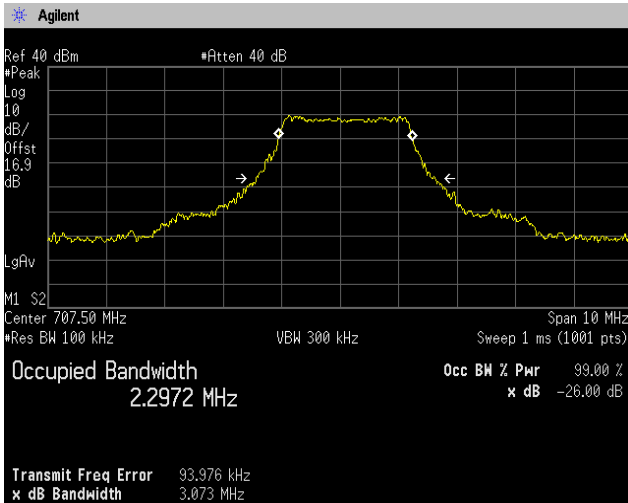
RB15-0



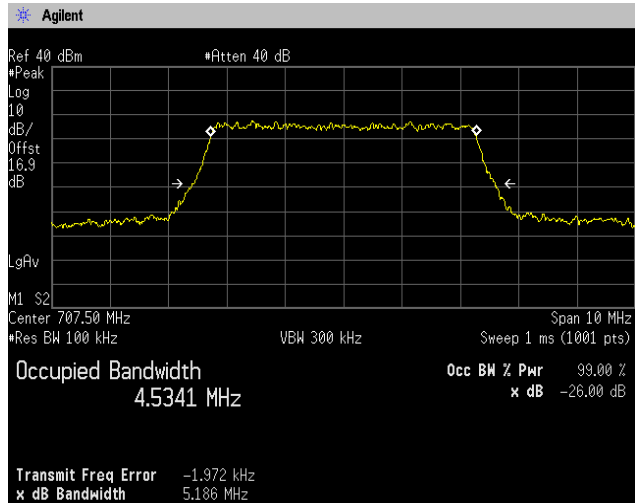


[LTE Band XII]  
Channel: 23095

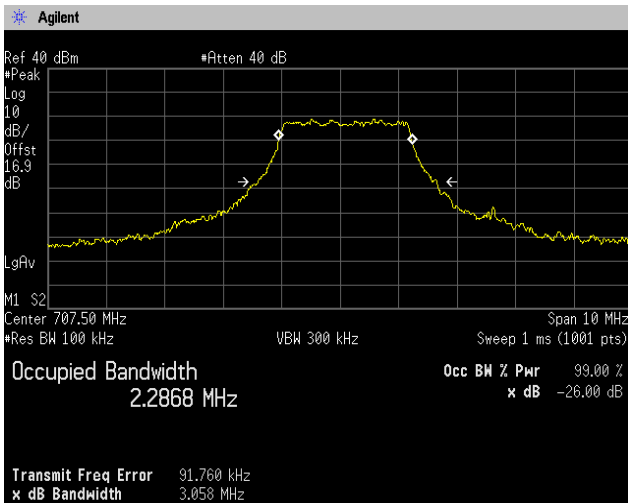
QPSK, BW 5MHz  
RB12-7



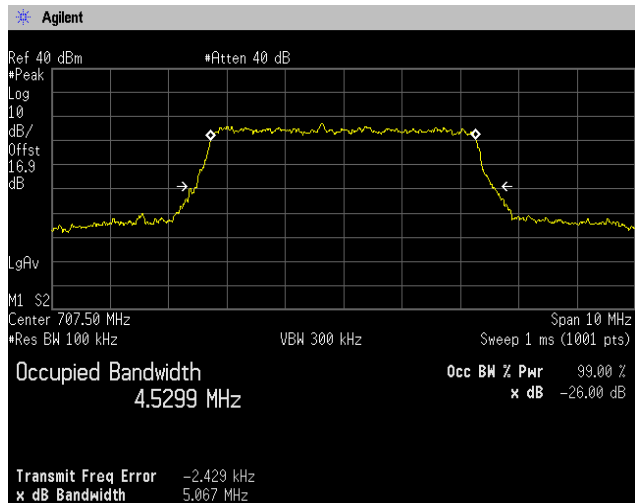
RB25-0



16QAM, BW 5MHz  
RB12-7



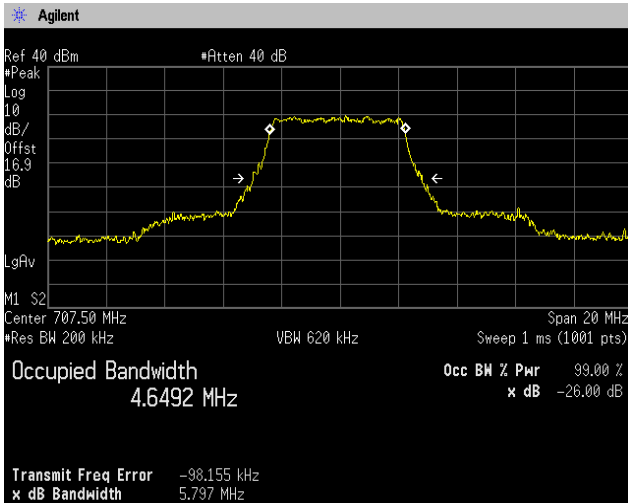
RB25-0



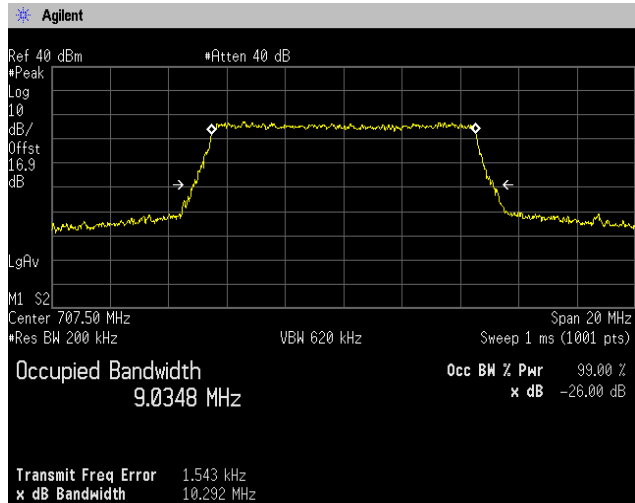


[LTE Band XII]  
Channel: 23095

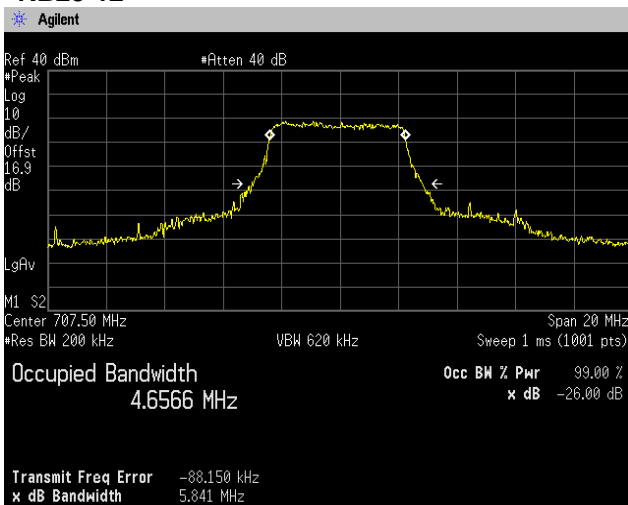
QPSK, BW 10MHz  
RB25-12



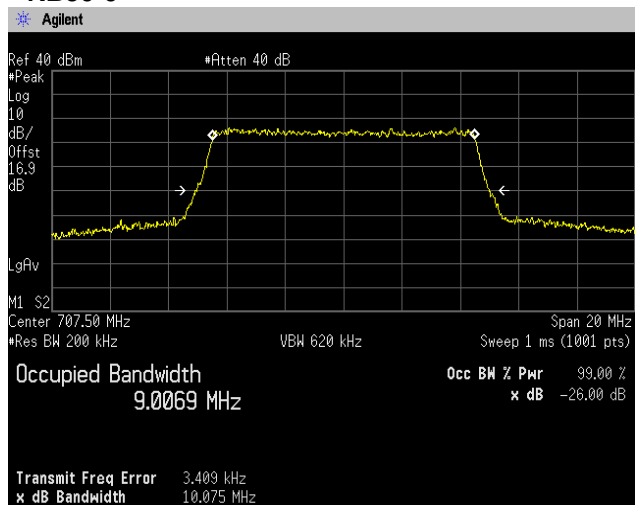
RB50-0



16QAM, BW 10MHz  
RB25-12



RB50-0



#### 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;

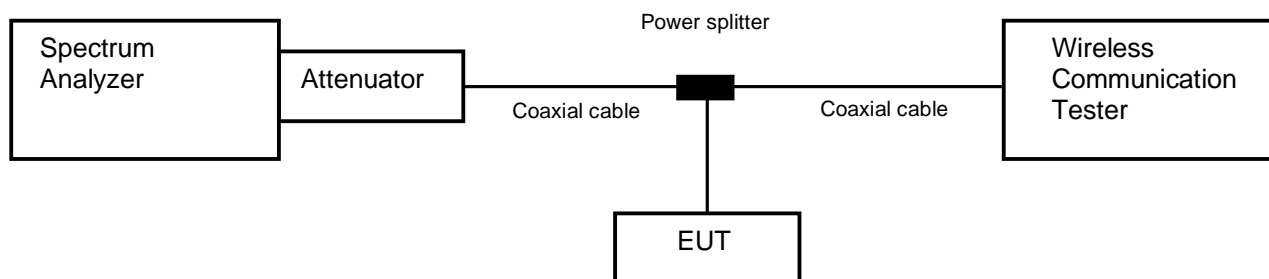
<Band Edge>

- a) Span was set large enough so as to capture all out of band emissions near the band edge
- b)  $RBW \geq 1\%$  of the emission bandwidth or  $2\%$  of the emission bandwidth
- c)  $VBW \geq 3 \times RBW$
- d) Detector = RMS
- e) Trace mode = Max hold
- f) Sweep time = auto-couple
- g) Number of sweep point  $\geq 2 \times \text{span} / RBW$

<Spurious Emissions>

- a)  $RBW = 1\text{MHz}$  &  $VBW \geq 3 \times RBW$
- b) Detector = Peak
- c) Trace mode = Max hold
- d) Sweep time = auto-couple
- e) Number of sweep point  $\geq 2 \times \text{span} / RBW$

- Test configuration



##### 4.4.2 Limit

-13 dBm or less

###### [27.53(g)]

For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.



**4.4.3 Measurement result**

Date : 14-September-2022  
 Temperature : 23.9 [°C]  
 Humidity : 54.4 [%]  
 Test place : Shielded room No.4

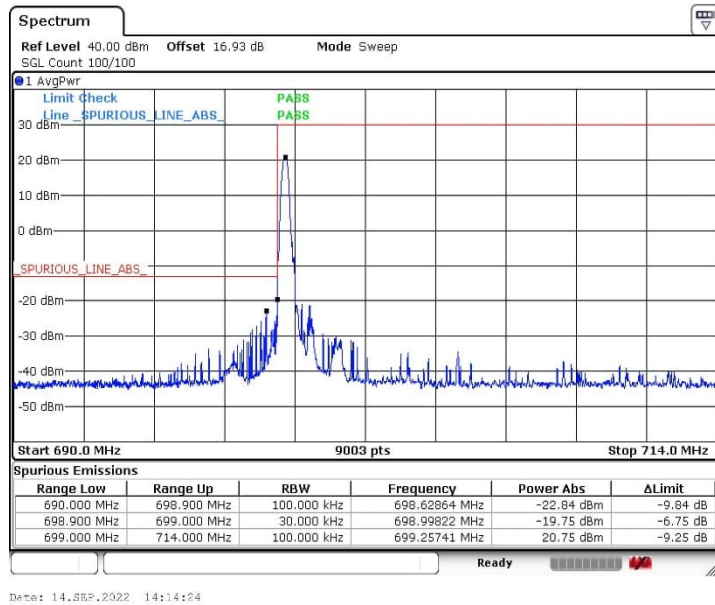
Test engineer : Kazunori Saito

Band	Modulation	Bandwidth [MHz]	Channel	Frequency [MHz]	Limit [dBm]	Results	
LTE Band XII	QPSK, 16QAM	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

#### 4.4.4 Trace data

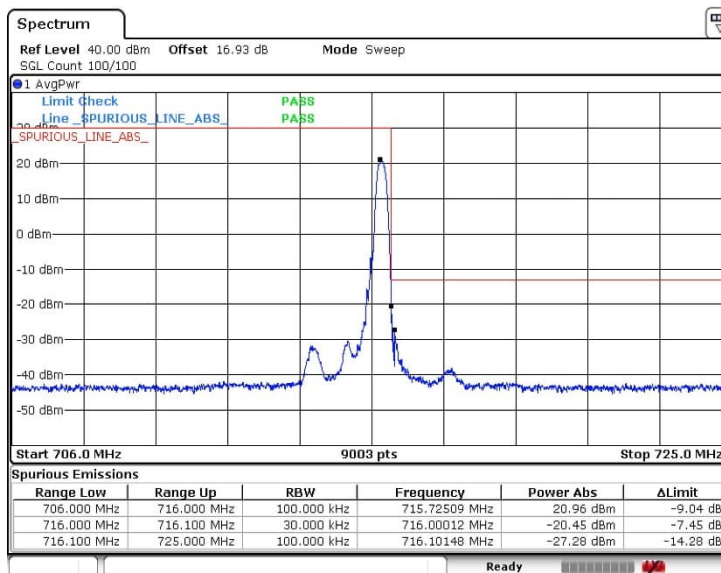
##### Band Edge

[LTE Band XII]  
 QPSK, BW 1.4MHz, RB1-0  
 Channel: Low



Date: 14.SEP.2022 14:14:24

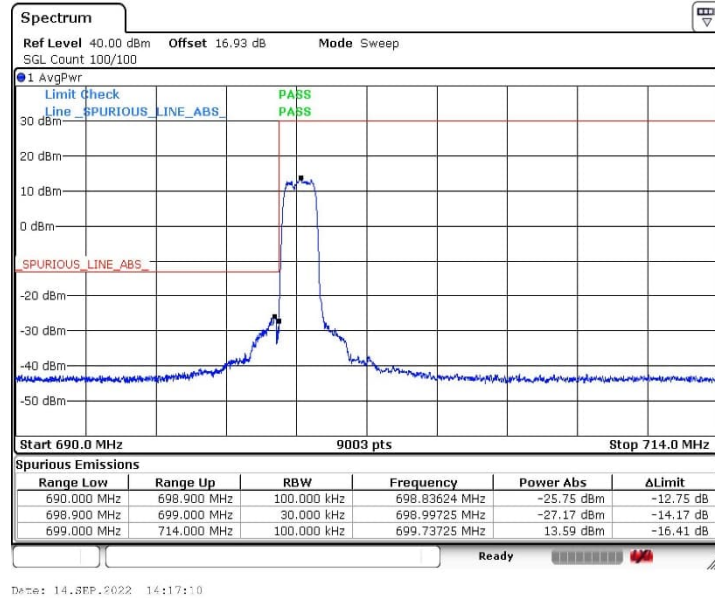
QPSK, BW 1.4MHz, RB1-5  
 Channel: High



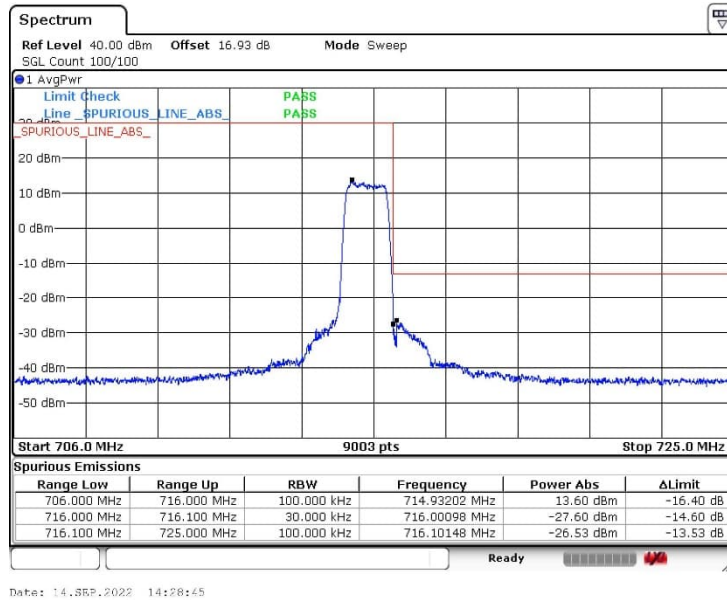
Date: 14.SEP.2022 14:27:35



**[LTE Band XII]  
QPSK, BW 1.4MHz, RB6-0  
Channel: Low**

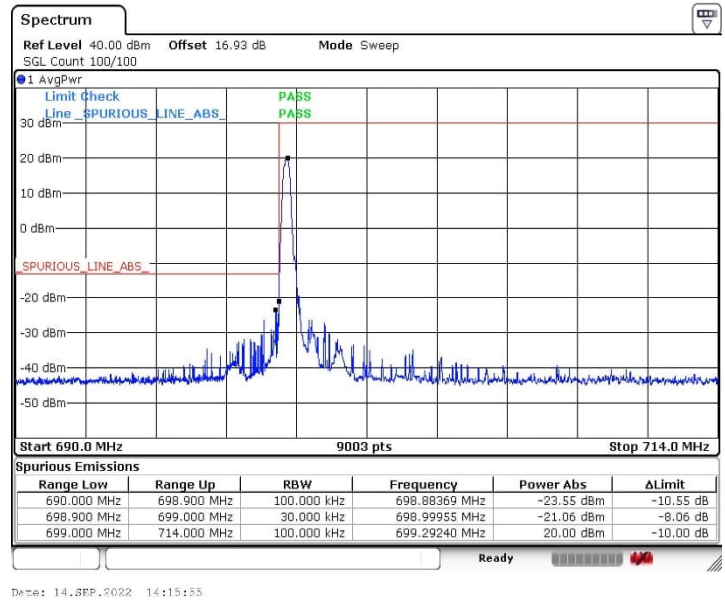


**QPSK, BW 1.4MHz, RB6-0  
Channel: High**

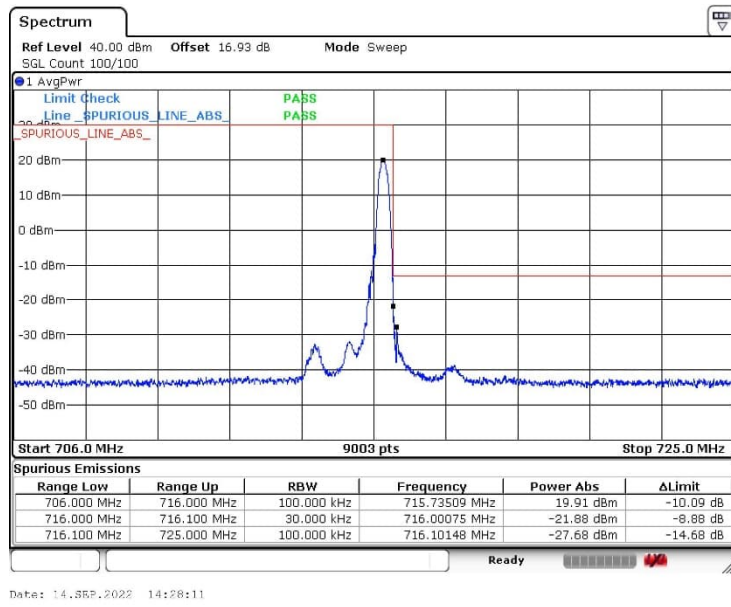




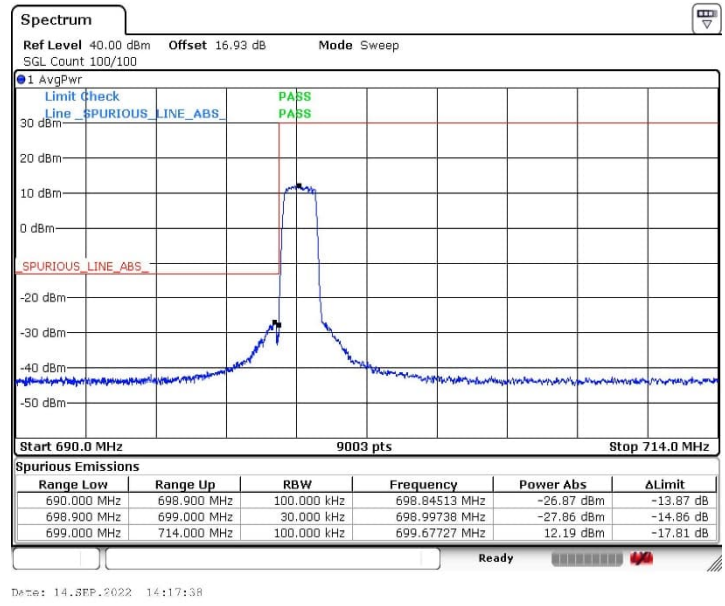
**[LTE Band XII]  
16QAM, BW 1.4MHz, RB1-0  
Channel: Low**



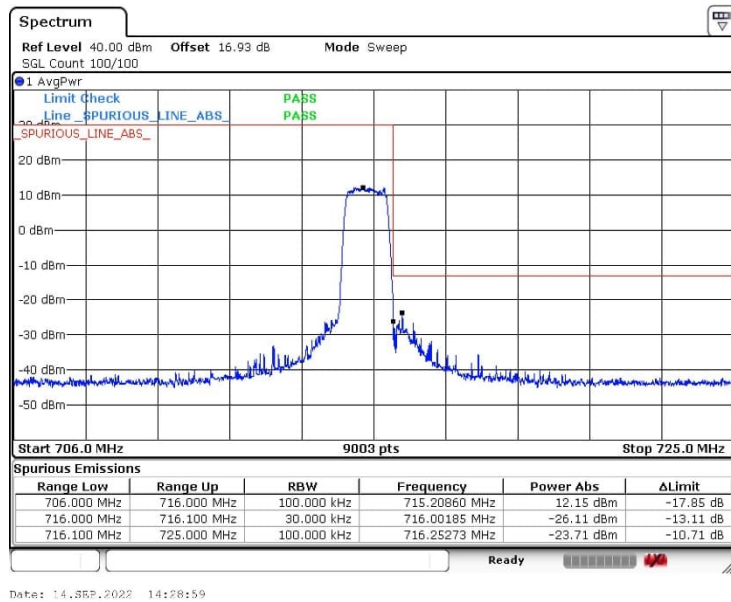
**16QAM, BW 1.4MHz, RB1-5  
Channel: High**



**[LTE Band XII]  
16QAM, BW 1.4MHz, RB6-0  
Channel: Low**

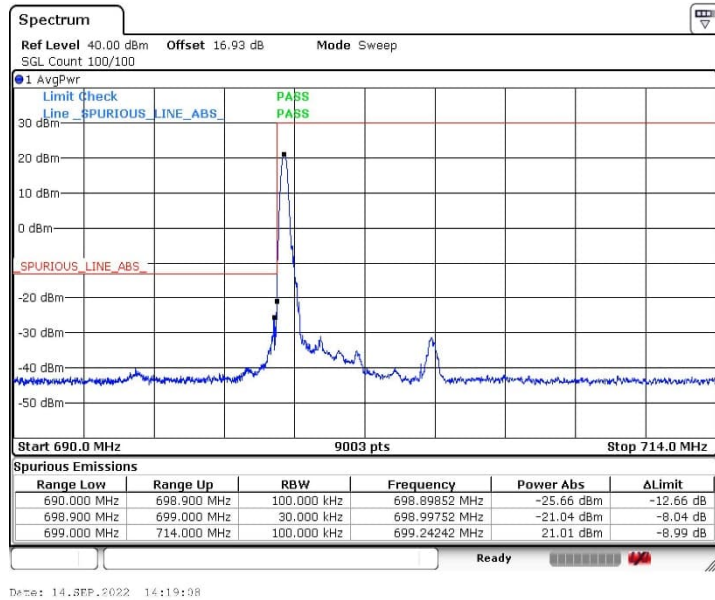


**16QAM, BW 1.4MHz, RB6-0  
Channel: High**

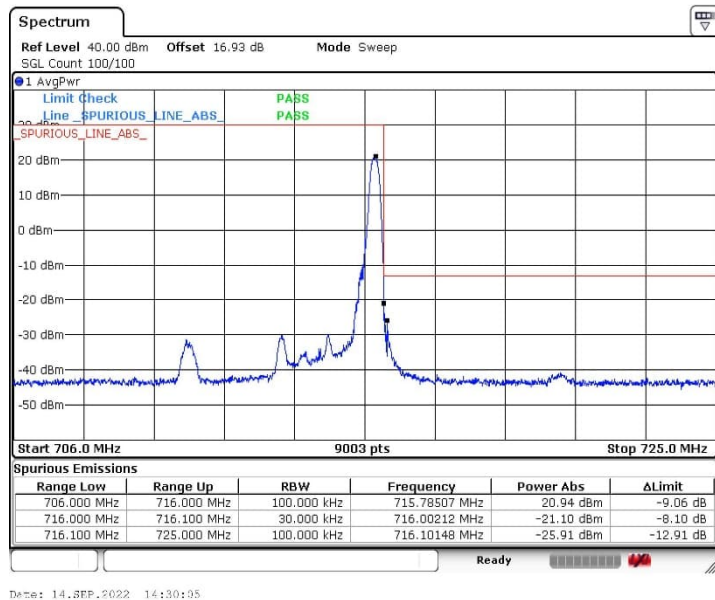




**[LTE Band XII]  
QPSK, BW 3MHz, RB1-0  
Channel: Low**

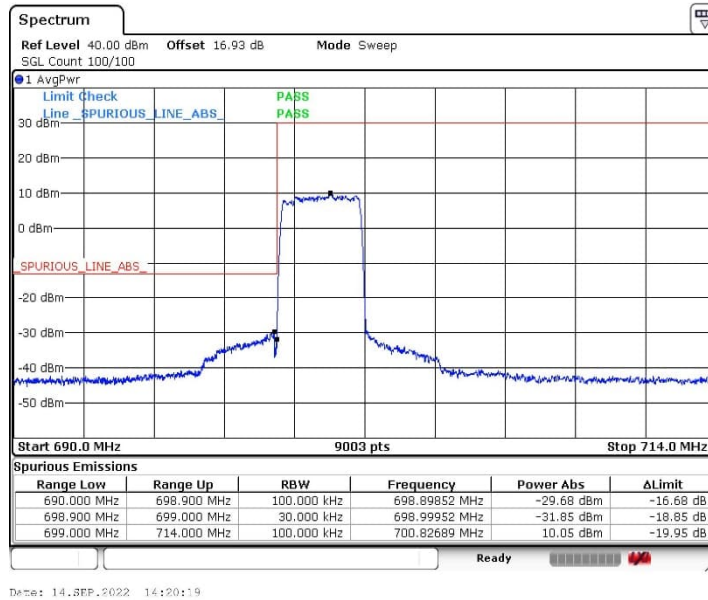


**QPSK, BW 3MHz, RB1-14  
Channel: High**

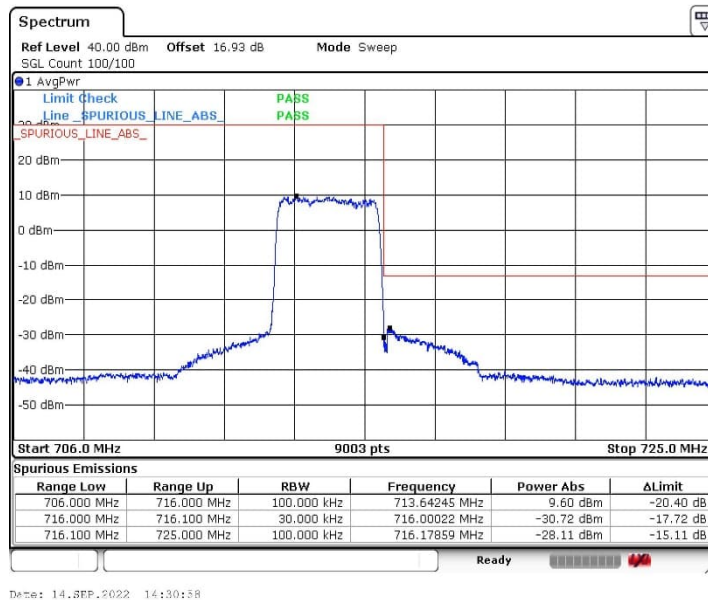




**[LTE Band XII]  
QPSK, BW 3MHz, RB15-0  
Channel: Low**

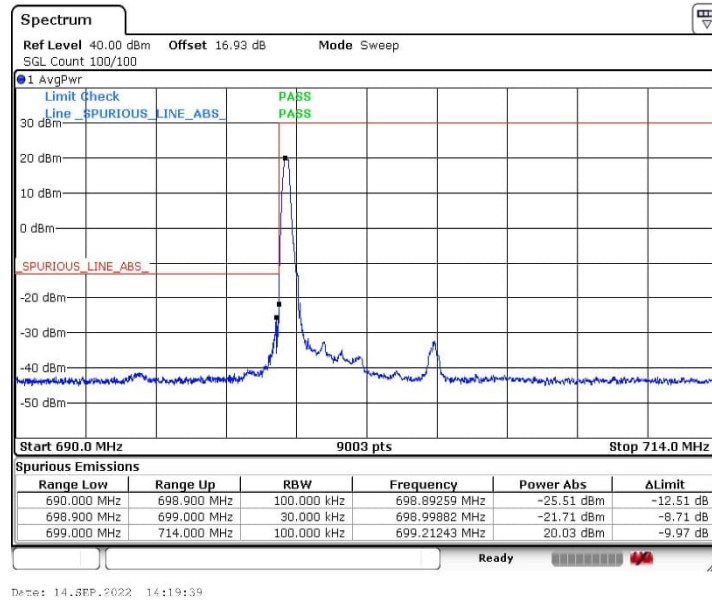


**QPSK, BW 3MHz, RB15-0  
Channel: High**

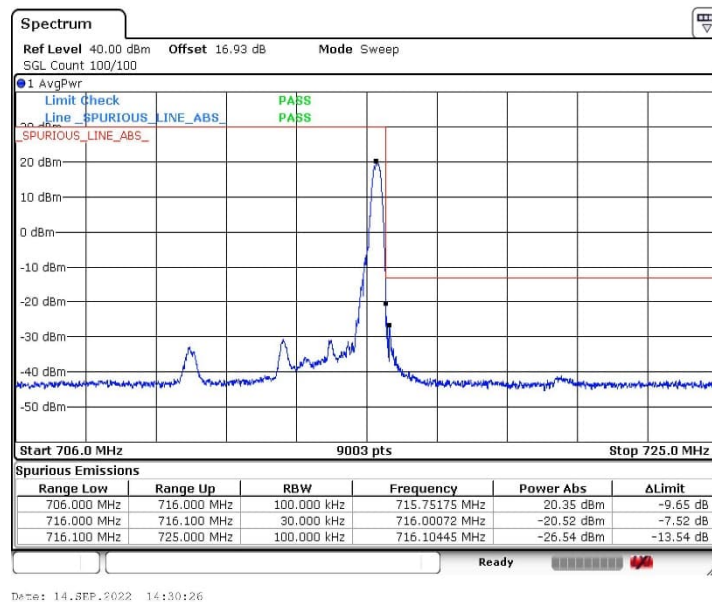




**[LTE Band XII]  
16QAM, BW 3MHz, RB1-0  
Channel: Low**

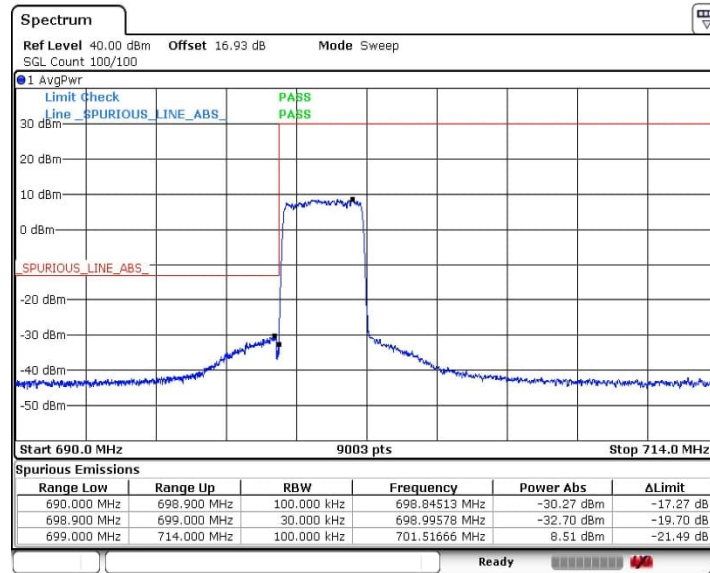


**16QAM, BW 3MHz, RB1-14  
Channel: High**



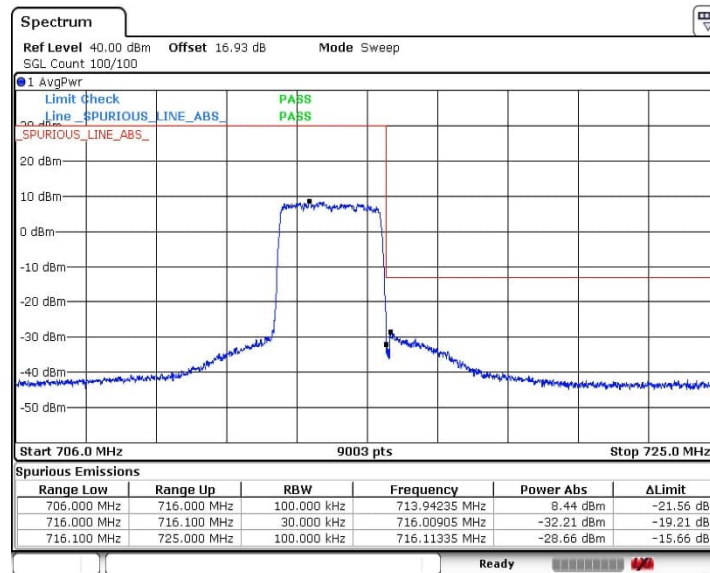


**[LTE Band XII]  
16QAM, BW 3MHz, RB15-0  
Channel: Low**



Date: 14\_SEP.2022 14:20:38

**16QAM, BW 3MHz, RB15-0  
Channel: High**

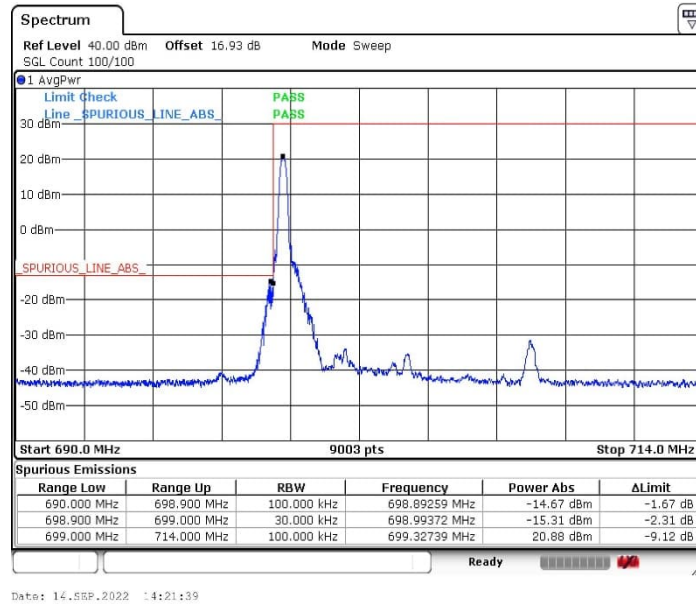


Date: 14\_SEP.2022 14:31:14

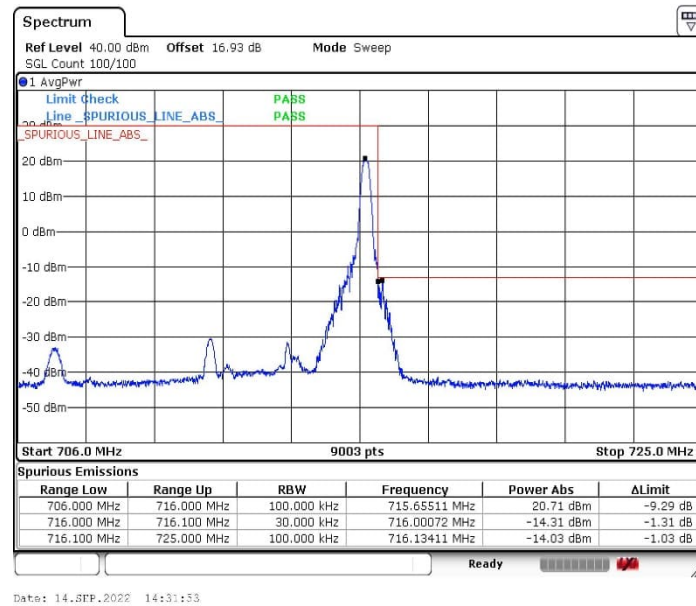




**[LTE Band XII]  
QPSK, BW 5MHz, RB1-0  
Channel: Low**



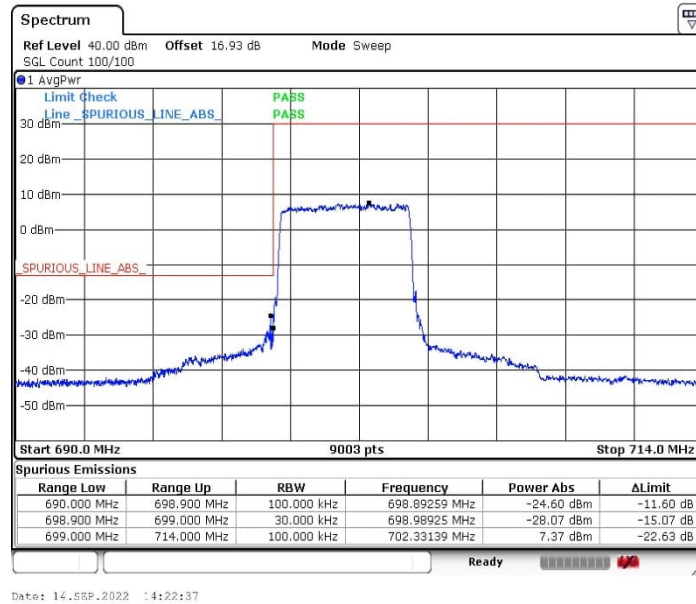
**QPSK, BW 5MHz, RB1-24  
Channel: High**



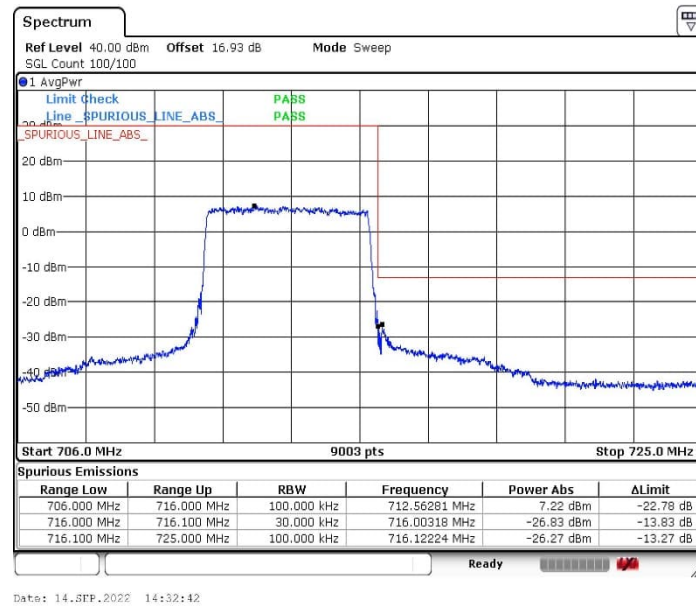




**[LTE Band XII]  
QPSK, BW 5MHz, RB25-0  
Channel: Low**

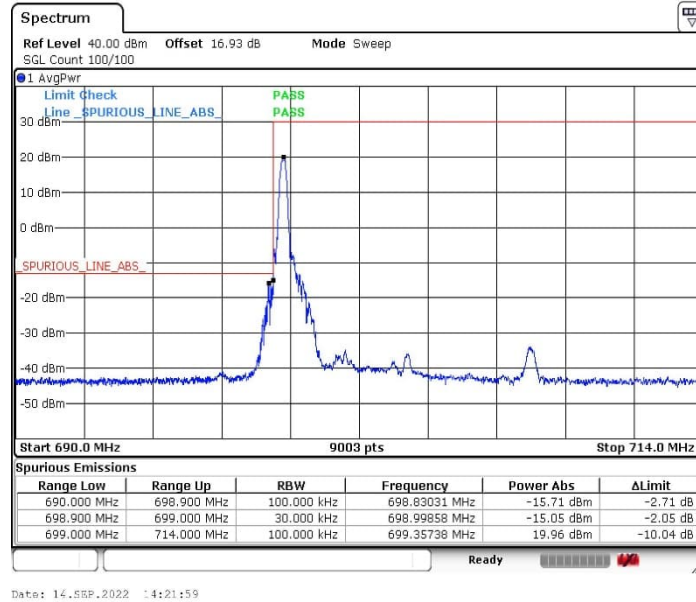


**QPSK, BW 5MHz, RB25-0  
Channel: High**

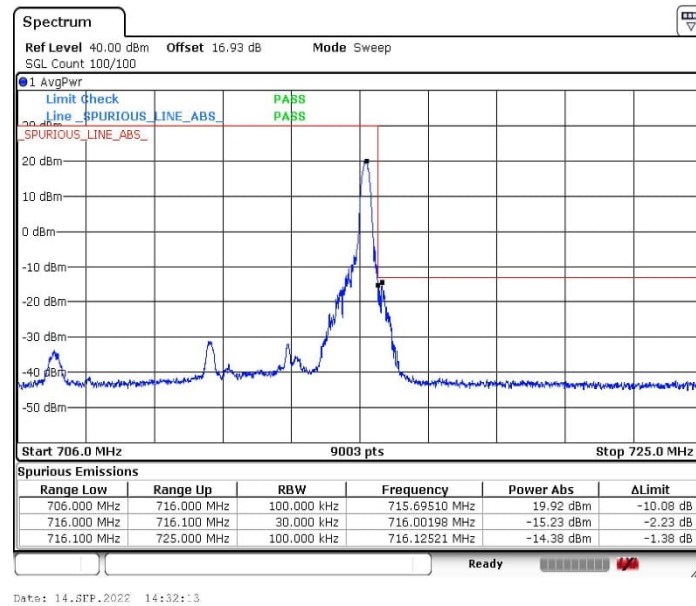




**[LTE Band XII]  
16QAM, BW 5MHz, RB1-0  
Channel: Low**

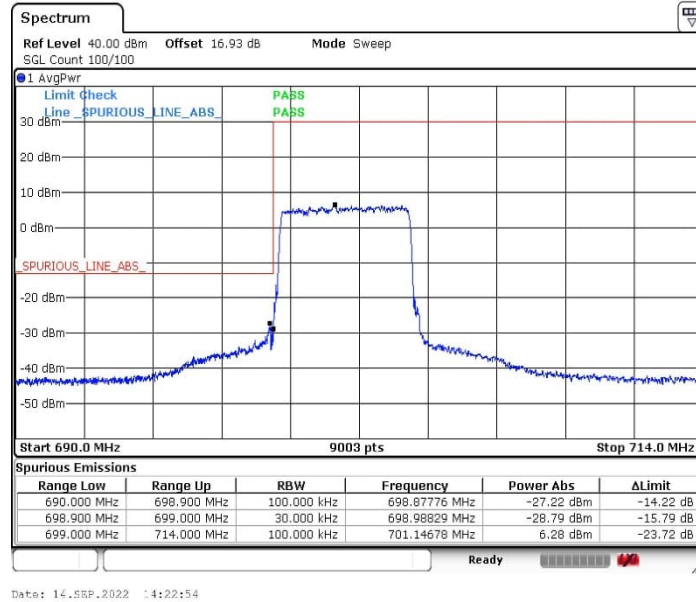


**16QAM, BW 5MHz, RB1-24  
Channel: High**

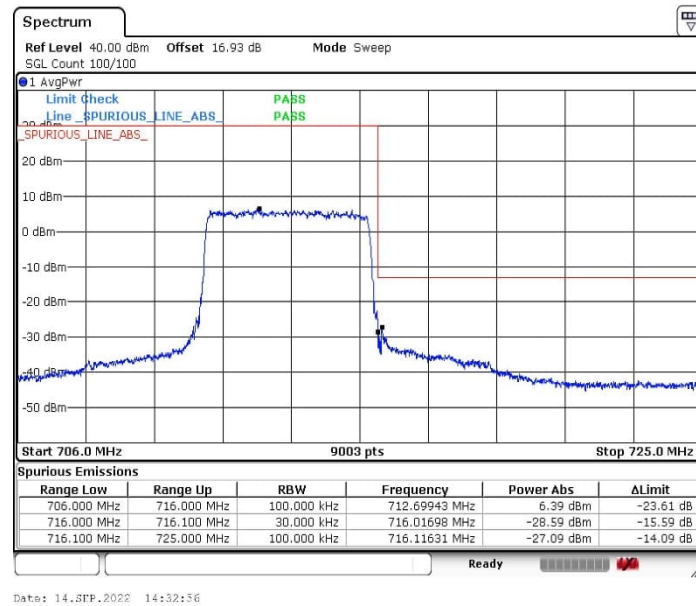




**[LTE Band XII]  
16QAM, BW 5MHz, RB25-0  
Channel: Low**

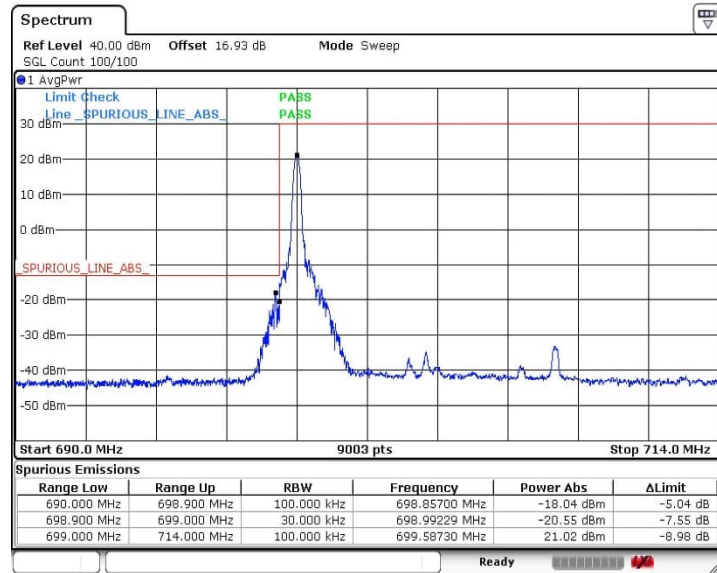


**16QAM, BW 5MHz, RB25-0  
Channel: High**



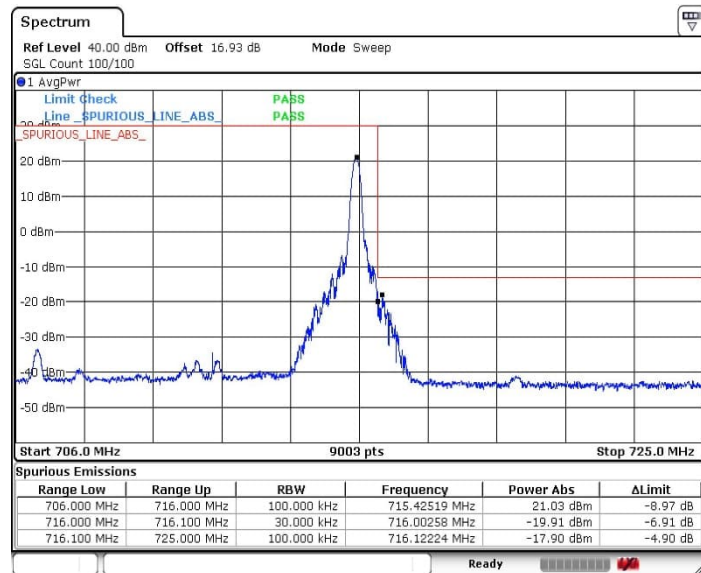


**[LTE Band XII]  
QPSK, BW 10MHz, RB1-0  
Channel: Low**



Date: 14\_SEP\_2022 14:24:28

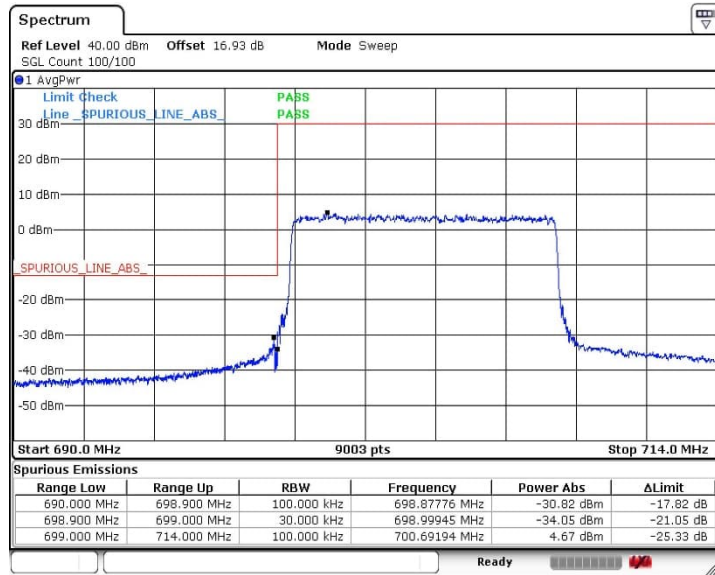
**QPSK, BW 10MHz, RB1-49  
Channel: High**



Date: 14\_SEP\_2022 14:33:40

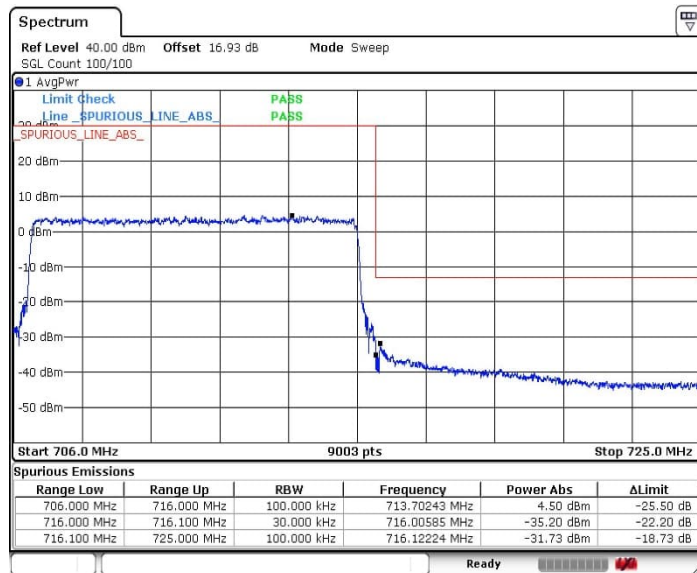


**[LTE Band XII]  
QPSK, BW 10MHz, RB50-0  
Channel: Low**



Date: 14\_SEP\_2022 14:25:16

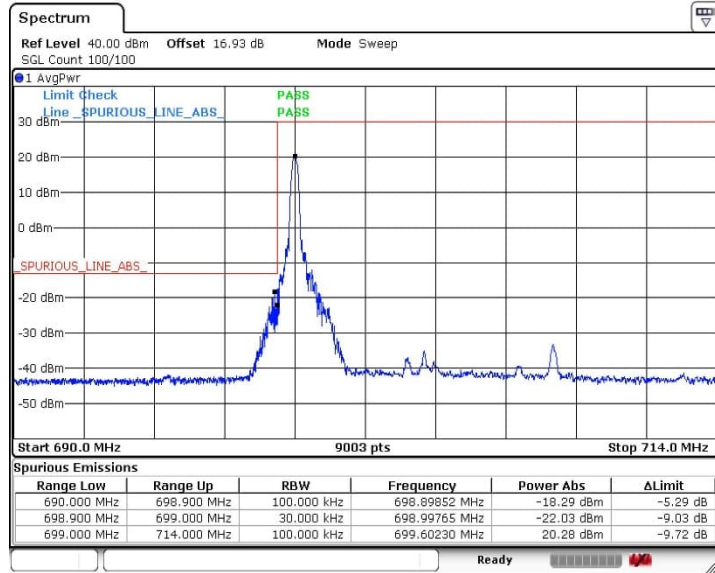
**QPSK, BW 10MHz, RB50-0  
Channel: High**



Date: 14\_SEP\_2022 14:34:44

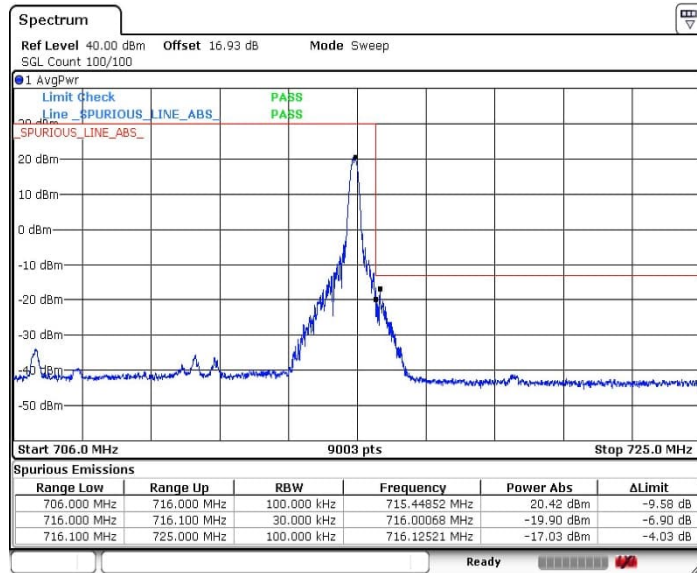


**[LTE Band XII]  
16QAM, BW 10MHz, RB1-0  
Channel: Low**



Date: 14\_SEP.2022 14:24:41

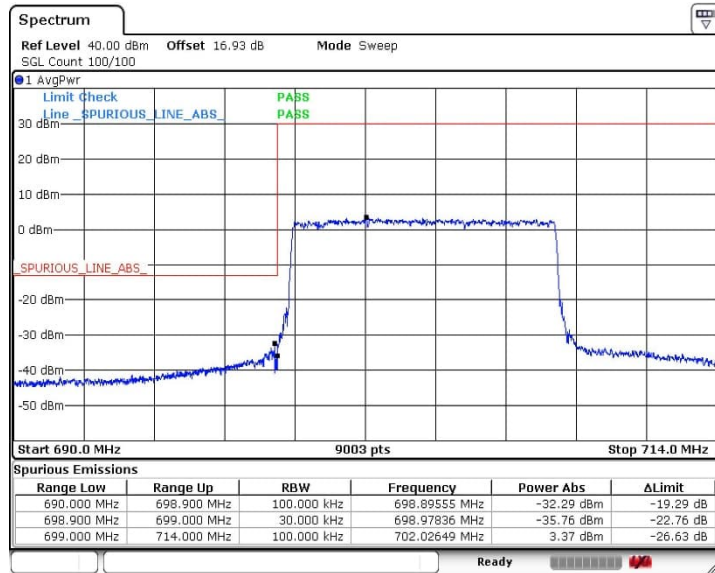
**16QAM, BW 10MHz, RB1-49  
Channel: High**



Date: 14\_SEP.2022 14:33:57

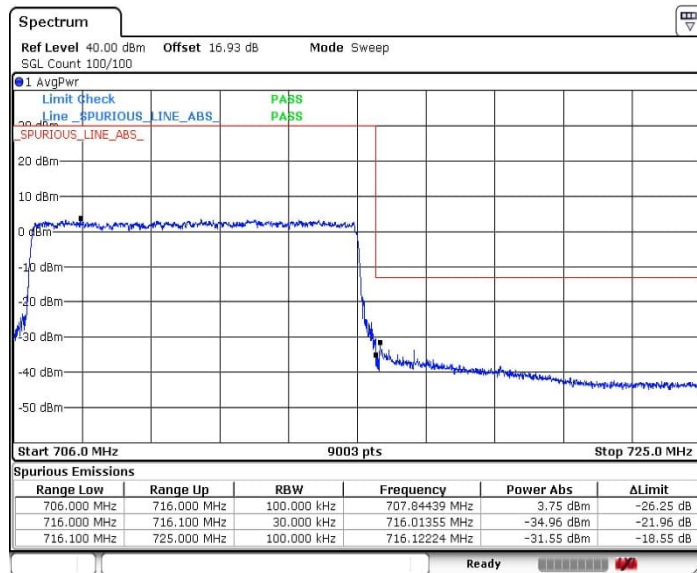


**[LTE Band XII]  
16QAM, BW 10MHz, RB50-0  
Channel: Low**



Date: 14\_SEP.2022 14:25:31

**16QAM, BW 10MHz, RB50-0  
Channel: High**



Date: 14\_SEP.2022 14:35:18

**Spurious Emissions**

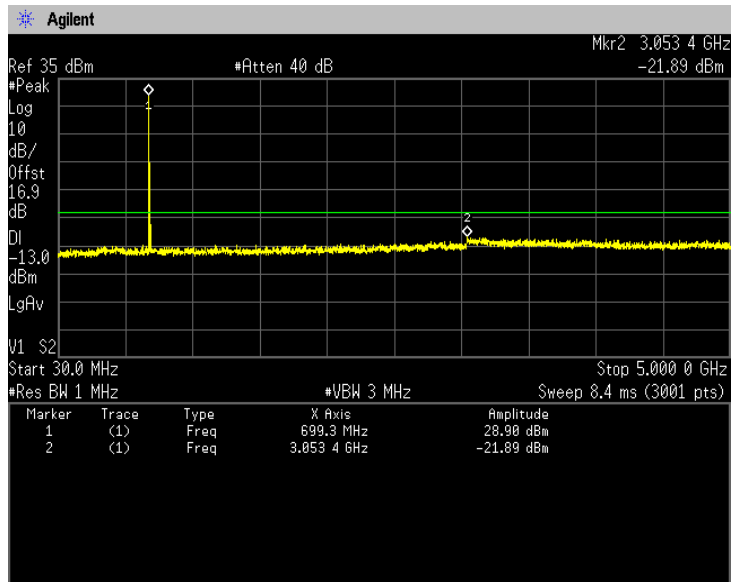
**Note: Conducted spurious test was measured in the worst case of Effective Radiated Power.**

**[LTE Band XII]**

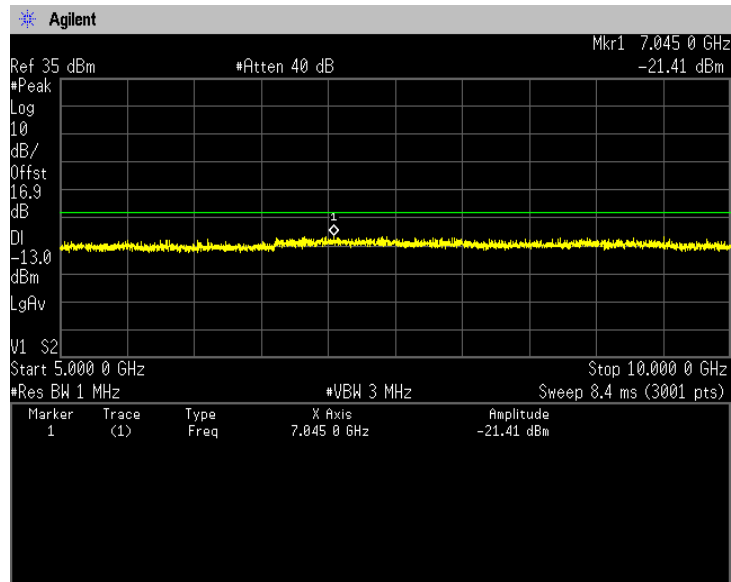
**QPSK, BW 1.4MHz, RB1-3**

**Channel: 23017**

**30MHz-5GHz**



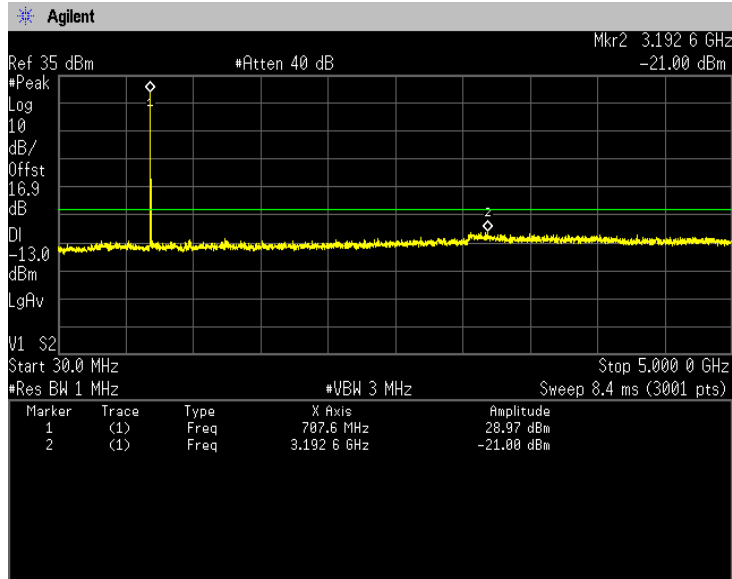
**5GHz-10GHz**



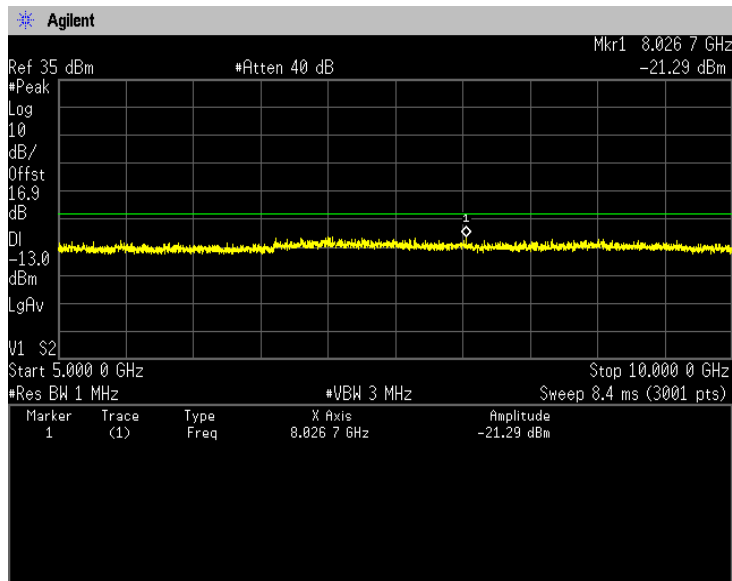




**[LTE Band XII]  
QPSK, BW 1.4MHz, RB1-3  
Channel: 23095  
30MHz-5GHz**



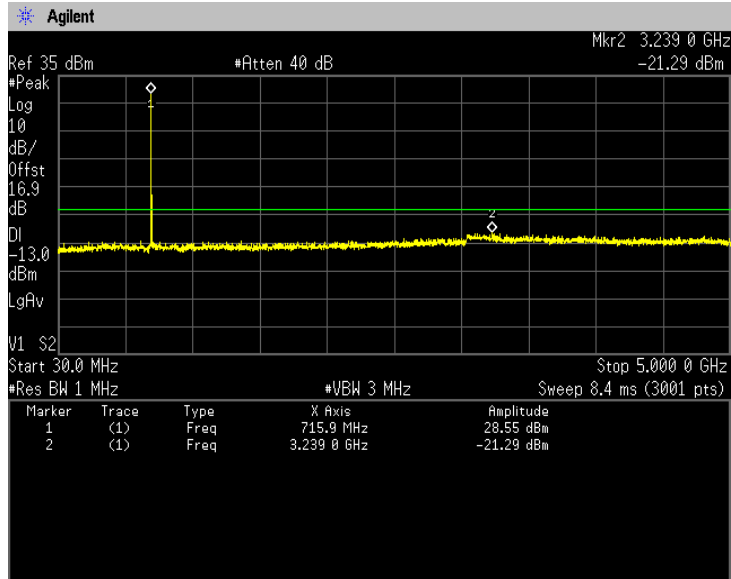
**5GHz-10GHz**



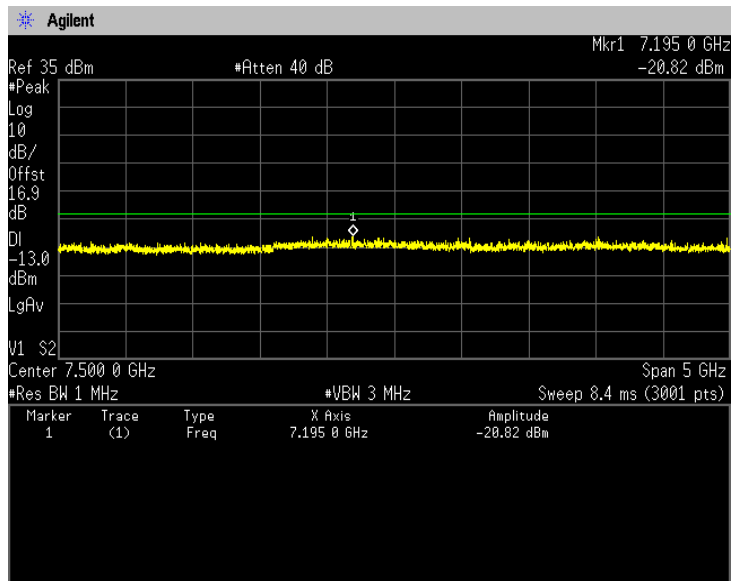


Japan

**[LTE Band XII]  
QPSK, BW 1.4MHz, RB1-3  
Channel: 23173  
30MHz-5GHz**



**5GHz-10GHz**



## 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).

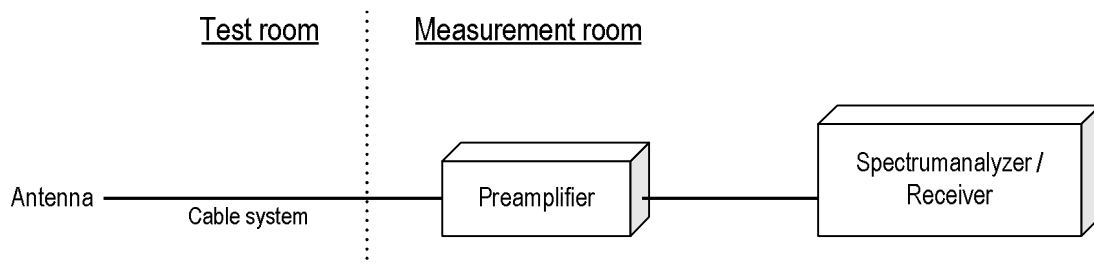
The frequency of the signal generator is adjusted to the measurement frequency.

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;

- RBW = 100 kHz for below 1GHz and 1MHz for above 1GHz / VBW  $\geq$  3 x RBW
- Detector = Peak
- Trace mode = Max hold
- Sweep time = auto-couple

- Test configuration



#### 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	:	20~21-September-2022		
Temperature	:	21.5 [°C]		
Humidity	:	54.6 [%]	Test engineer	:
Test place	:	3m Semi-anechoic chamber		<u>Chiaki Kanno</u>
Date	:	21~22-September-2022		
Temperature	:	20.6 [°C]		
Humidity	:	51.1 [%]	Test engineer	:
Test place	:	3m Semi-anechoic chamber		<u>Chiaki Kanno</u>
Date	:	23~24-September-2022		
Temperature	:	22.7 [°C]		
Humidity	:	63.1 [%]	Test engineer	:
Test place	:	3m Semi-anechoic chamber		<u>Chiaki Kanno</u>

**[LTE Band XII - Z-axis, Open, Without camera]****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	-50.2	-40.0	1.0	4.6	-36.4	-13.0	23.4
H	2099.1	-51.6	-40.0	1.2	4.8	-36.4	-13.0	23.4
H	2798.8	-53.8	-45.0	1.4	6.3	-40.2	-13.0	27.2

**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	-53.2	-40.0	1.0	4.8	-36.2	-13.0	23.2
H	2122.5	-50.4	-40.0	1.3	5.0	-36.2	-13.0	23.2
H	2830.0	-51.6	-40.0	1.4	6.6	-34.9	-13.0	21.9

**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	-52.0	-40.0	1.0	5.1	-36.0	-13.0	23.0
H	2145.9	-50.2	-40.0	1.3	5.3	-36.0	-13.0	23.0
H	2861.2	-49.4	-40.0	1.5	6.8	-34.6	-13.0	21.6

**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	-50.7	-40.0	1.0	4.6	-36.4	-13.0	23.4
H	2099.1	-52.0	-40.0	1.2	4.8	-36.4	-13.0	23.4
H	2798.8	-54.0	-45.0	1.4	6.3	-40.2	-13.0	27.2

**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	-53.7	-40.0	1.0	4.8	-36.2	-13.0	23.2
H	2122.5	-50.6	-40.0	1.3	5.0	-36.2	-13.0	23.2
H	2830.0	-51.9	-40.0	1.4	6.6	-34.9	-13.0	21.9

**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	-52.4	-40.0	1.0	5.1	-36.0	-13.0	23.0
H	2145.9	-51.7	-40.0	1.3	5.3	-36.0	-13.0	23.0
H	2861.2	-49.5	-40.0	1.5	6.8	-34.6	-13.0	21.6

**[LTE Band XII - Z-axis, Open, Without camera]****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	-50.3	-40.0	1.0	4.6	-36.4	-13.0	23.4
H	2101.5	-51.3	-40.0	1.3	4.8	-36.4	-13.0	23.4
H	2802.0	-53.9	-45.0	1.4	6.3	-40.2	-13.0	27.2

**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	-53.3	-40.0	1.0	4.8	-36.2	-13.0	23.2
H	2122.5	-50.1	-40.0	1.3	5.0	-36.2	-13.0	23.2
H	2830.0	-50.2	-40.0	1.4	6.6	-34.9	-13.0	21.9

**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	-50.7	-40.0	1.0	5.0	-36.0	-13.0	23.0
H	2143.5	-51.9	-40.0	1.3	5.3	-36.0	-13.0	23.0
H	2858.0	-51.1	-40.0	1.5	6.8	-34.7	-13.0	21.7

**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	-50.7	-40.0	1.0	4.6	-36.4	-13.0	23.4
H	2101.5	-51.8	-40.0	1.3	4.8	-36.4	-13.0	23.4
H	2802.0	-54.4	-45.0	1.4	6.3	-40.2	-13.0	27.2

**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	-53.6	-40.0	1.0	4.8	-36.2	-13.0	23.2
H	2122.5	-50.7	-40.0	1.3	5.0	-36.2	-13.0	23.2
H	2830.0	-50.7	-40.0	1.4	6.6	-34.9	-13.0	21.9

**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	-50.9	-40.0	1.0	5.0	-36.0	-13.0	23.0
H	2143.5	-52.5	-40.0	1.3	5.3	-36.0	-13.0	23.0
H	2858.0	-51.2	-40.0	1.5	6.8	-34.7	-13.0	21.7

**[LTE Band XII - Z-axis, Open, Without camera]****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	-50.6	-40.0	1.0	4.6	-36.4	-13.0	23.4
H	2104.5	-51.5	-40.0	1.3	4.9	-36.4	-13.0	23.4
H	2806.0	-54.0	-45.0	1.4	6.3	-40.1	-13.0	27.1

**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	-53.6	-40.0	1.0	4.8	-36.2	-13.0	23.2
H	2122.5	-49.9	-40.0	1.3	5.0	-36.2	-13.0	23.2
H	2830.0	-51.2	-40.0	1.4	6.6	-34.9	-13.0	21.9

**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	-50.2	-40.0	1.0	5.0	-36.0	-13.0	23.0
H	2140.5	-52.9	-40.0	1.3	5.2	-36.0	-13.0	23.0
H	2854.0	-52.1	-40.0	1.5	6.8	-34.7	-13.0	21.7

**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	-51.4	-40.0	1.0	4.6	-36.4	-13.0	23.4
H	2104.5	-51.7	-40.0	1.3	4.9	-36.4	-13.0	23.4
H	2806.0	-54.5	-45.0	1.4	6.3	-40.1	-13.0	27.1

**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	-53.7	-40.0	1.0	4.8	-36.2	-13.0	23.2
H	2122.5	-50.6	-40.0	1.3	5.0	-36.2	-13.0	23.2
H	2830.0	-52.4	-40.0	1.4	6.6	-34.9	-13.0	21.9

**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	-50.6	-40.0	1.0	5.0	-36.0	-13.0	23.0
H	2140.5	-53.1	-40.0	1.3	5.2	-36.0	-13.0	23.0
H	2854.0	-52.6	-40.0	1.5	6.8	-34.7	-13.0	21.7

**[LTE Band XII - Z-axis, Open, Without camera]****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	-52.6	-40.0	1.0	4.7	-36.3	-13.0	23.3
H	2112.0	-52.2	-40.0	1.3	4.9	-36.3	-13.0	23.3
H	2816.0	-52.3	-45.0	1.4	6.4	-40.0	-13.0	27.0

**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	-53.5	-40.0	1.0	4.8	-36.2	-13.0	23.2
H	2122.5	-50.5	-40.0	1.3	5.0	-36.2	-13.0	23.2
H	2830.0	-51.2	-40.0	1.4	6.6	-34.9	-13.0	21.9

**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	-50.4	-40.0	1.0	4.9	-36.1	-13.0	23.1
H	2133.0	-51.2	-40.0	1.3	5.2	-36.1	-13.0	23.1
H	2844.0	-53.4	-40.0	1.4	6.7	-34.7	-13.0	21.7

**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	-52.7	-40.0	1.0	4.7	-36.3	-13.0	23.3
H	2112.0	-52.7	-40.0	1.3	4.9	-36.3	-13.0	23.3
H	2816.0	-52.9	-45.0	1.4	6.4	-40.0	-13.0	27.0

**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	-54.2	-40.0	1.0	4.8	-36.2	-13.0	23.2
H	2122.5	-50.8	-40.0	1.3	5.0	-36.2	-13.0	23.2
H	2830.0	-51.5	-40.0	1.4	6.6	-34.9	-13.0	21.9

**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	-51.3	-40.0	1.0	4.9	-36.1	-13.0	23.1
H	2133.0	-50.8	-40.0	1.3	5.2	-36.1	-13.0	23.1
H	2844.0	-54.0	-40.0	1.4	6.7	-34.7	-13.0	21.7



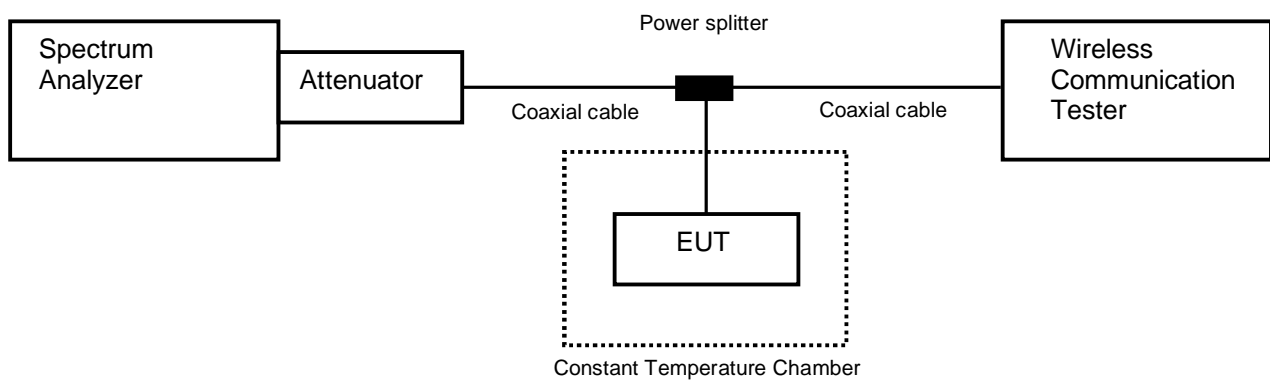
## 4.6 Frequency Stability

### 4.6.1 Measurement procedure

#### [FCC 27.54, 2.1055]

The EUT was placed of an inside of an 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 : 15-September-2022  
 Temperature : 23.3 [°C]  
 Humidity : 42.6 [%]  
 Test place : Shielded room No.4

Test engineer : Kazunori Saito

**[LTE Band XII]  
QPSK, BW 10MHz, RB 50-0  
Channel: 23095**

Power Supply [V]	Temperature [°C]	Measurements Frequency [Hz]	Frequency Tolerance [ppm]	Result
3.80	25(Ref.)	707,499,992	0.00000	Pass
	50	707,499,983	-0.01231	Pass
	40	707,499,989	-0.00404	Pass
	30	707,499,991	-0.00102	Pass
	20	707,499,989	-0.00458	Pass
	10	707,499,989	-0.00447	Pass
	0	707,499,989	-0.00345	Pass
	-10	707,499,988	-0.00511	Pass
	-20	707,499,987	-0.00667	Pass
	-30	707,499,991	-0.00059	Pass
3.42	25	707,499,989	-0.00454	Pass
4.18	25	707,499,989	-0.00358	Pass

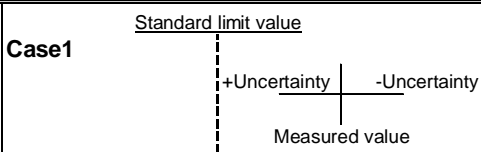
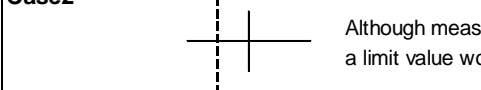


Calculation;

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

## 5 Measurement Uncertainty

Expanded uncertainties stated are calculated with a coverage Factor k=2.  
 Please note that these results are not taken into account when measurement uncertainty considerations contained in ETSI TR 100 028 Parts 1 and 2 determining compliance or non-compliance with test result.

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)	±3.2 dB
Radiated emission (30 MHz – 1000 MHz)	±5.5 dB
Radiated emission (1 GHz – 6 GHz)	±4.8 dB
Radiated emission (6 GHz – 18 GHz)	±4.4 dB
Radiated emission (18 GHz – 40 GHz)	±6.4 dB
Radio Frequency	±1.3 * 10 <sup>-8</sup>
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 %

Judge	Measured value and standard limit value	
PASS	 <p>Standard limit value</p> <p>+Uncertainty   -Uncertainty</p> <p>Measured value</p>	Even if it takes uncertainty into consideration, a standard limit value is fulfilled.
		Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.
FAIL		Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.
		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

## Appendix A. Test Equipment

### Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	31-Dec-2022	13-Dec-2021
Spectrum analyzer	ROHDE&SCHWARZ	FSV40	101731	31-Jul-2023	19-Jul-2022
Attenuator	HUBER+SUHNER	6810.19.A	N/A(S450)	31-Dec-2022	21-Dec-2021
Microwave cable	Junkosha Inc.	MWX221/1m	N/A(S400)	31-Mar-2023	02-Mar-2022
Power divider	Keysight	11636B	MY51359874	30-Sep-2022	15-Sep-2021
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	ESCI	100765	30-Sep-2022	15-Sep-2021
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	30-Sep-2023	05-Sep-2022
Preamplifier	SONOMA	310	372170	30-Sep-2022	15-Sep-2021
Biconical antenna	Schwarzbeck	VHBB9124/BBA9106	1332	30-Nov-2022	08-Nov-2021
Log periodic antenna	Schwarzbeck	VUSLP9111B	346	31-Oct-2022	15-Oct-2021
Attenuator	TOYO Connector	NA-PJ-6/6dB	N/A(S541)	30-Sep-2022	16-Sep-2021
Attenuator	TAMAGAWA.ELEC	CFA-10/3dB	N/A(S503)	31-Jul-2023	14-Jul-2022
Preamplifier	TSJ	MLA-100M18-B02-40	1929118	31-Dec-2022	22-Dec-2021
Attenuator	AEROFLEX	26A-10	081217-08	31-Dec-2022	22-Dec-2021
Double ridged guide antenna	ETS LINDGREN	3117	00052315	30-Jun-2023	22-Jun-2022
Attenuator	HUBER+SUHNER	6803.17.B	N/A(2340)	31-Dec-2022	23-Dec-2021
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-2023	14-Jul-2022
HighPass Filter	Micro-Tronics	HPM50115	004	30-Sep-2023	05-Sep-2022
Signal generator	ROHDE&SCHWARZ	SMB100A	177525	31-Dec-2022	08-Dec-2021
RF power amplifier	R&K	CGA020M602-2633R	B40240	30-Jun-2023	16-Jun-2022
Attenuator	HUBER+SUHNER	6820.19.A	N/A(2399)	30-Sep-2022	15-Sep-2021
Microwave cable	HUBER+SUHNER	SUCOFLEX102/2m	31648	31-Mar-2023	02-Mar-2022
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-2022	06-Dec-2021
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	MY30037/4	31-Dec-2022	22-Dec-2021
		SUCOFLEX104/1m	my24610/4	31-Dec-2022	22-Dec-2021
		SUCOFLEX104/8m	SN MY30033/4	31-Dec-2022	22-Dec-2021
		SUCOFLEX104/1m	MY32976/4	31-Dec-2022	22-Dec-2021
		SUCOFLEX104/2m	SN MY28404/4	31-Dec-2022	22-Dec-2021
		SUCOFLEX104/7m	41625/6	31-Dec-2022	22-Dec-2021
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V6.0.140	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-2023	28-May-2022
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-SVSWR)	31-May-2023	28-May-2022

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