



RADIO TEST REPORT

Test Report No. : 11238416S-A

Applicant : JVC KENWOOD Corporation
Type of Equipment : Digital Media Receiver
Model No. : MXLO15KLG4
FCC ID : IOMK1027
Test regulation : FCC Part 15 Subpart C: 2015
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)

Date of test: April 16 to 22, 2016

Representative test engineer:

H. Morikawa

Hiroyuki Morikawa
Engineer
Consumer Technology Division

Approved by:

M. Hosaka

Makoto Hosaka
Engineer
Consumer Technology Division



- ☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

13-EM-F0429

REVISION HISTORY

Original Test Report No.: 11238416S-A

[illegible]

CONTENTS	PAGE
SECTION 1: Customer information.....	4
SECTION 2: Equipment under test (E.U.T.).....	4
SECTION 3: Test specification, procedures & results.....	5
SECTION 4: Operation of E.U.T. during testing.....	8
SECTION 5: Radiated Spurious Emission	11
SECTION 6: Antenna Terminal Conducted Tests.....	12
APPENDIX 1: Test data	13
20dB Bandwidth and Carrier Frequency Separation.....	13
Number of Hopping Frequency	16
Dwell time.....	18
Maximum Peak Output Power	21
Average Output Power	22
Radiated Spurious Emission	25
Conducted Spurious Emission	36
Conducted Emission Band Edge compliance	42
99%Occupied Bandwidth	44
APPENDIX 2: Test instruments	46
APPENDIX 3: Photographs of test setup	47
Radiated Spurious Emission	47

SECTION 1: Customer information

Company Name	:	JVC KENWOOD Corporation
Address	:	2967-3, Ishikawa-cho, Hachioji, Tokyo 192-8525 Japan
Telephone Number	:	+81-42-646-5525
Facsimile Number	:	+81-42-646-7801
Contact Person	:	Seigo Tsutsumi

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Digital Media Receiver
Model No.	:	MXLO15KLG4
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12 V
Receipt Date of Sample	:	April 13, 2016
Country of Mass-production	:	China
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab.

2.2 Product Description

Model: MXLO15KLG4 (referred to as the EUT in this report) is a Digital Media Receiver.

General Specification

Clock frequency(ies) in the system	:	26 MHz, 24 MHz, 62.4 MHz, 28.224 MHz, 32.768 kHz, 12 MHz, 12.58 MHz, 12.288 MHz, 27 MHz, 8 MHz
------------------------------------	---	---

Radio Specification

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	FHSS
Power Supply (radio part input)	:	DC 3.3 V
Antenna type	:	Pattern Antenna
Antenna Gain	:	+1 dBi

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2015, final revised on November 23, 2015

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz

* Some parts are effective on and after December 17, 2015 or December 23, 2015. The revision does not affect the test specification applied to the EUT.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods IC: RSS-Gen 8.8	FCC: Section 15.207 IC: RSS-Gen 8.8	N/A	N/A *1)	-
Carrier Frequency Separation	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-247 5.1 (2)	See data.	Complied	Conducted
20dB Bandwidth	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-247 5.1 (1)		-	Conducted
Number of Hopping Frequency	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-247 5.1 (4)		Complied	Conducted
Dwell time	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-247 5.1 (4)		Complied	Conducted
Maximum Peak Output Power	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 6.12	FCC: Section15.247(a)(b)(1) IC: RSS-247 5.4 (2)		Complied	Conducted
Spurious Emission & Band Edge Compliance	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 6.13	FCC: Section15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	10.5 dB 843.745 MHz, QP, Horizontal, Tx 2402 MHz DH5	Complied	Conducted/ Radiated (above 30 MHz) *2)
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.					
*1) The test is not applicable since the EUT has no AC mains.					
*2) Radiated test was selected over 30 MHz based on section 15.247(d).					

* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.

FCC Part 15.31 (e)

The EUT provides stable voltage (DC3.3 V) constantly to the wireless transmitter regardless of input voltage. Instead of a new battery, DC power supply was used for the test. That does not affect the test result, therefore the EUT complies with the requirement.

FCC Part 15.203

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement.

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	IC: RSS-Gen 6.6	IC: -	N/A	-	Conducted

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.
Shonan EMC Lab.

Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.1 dB	2.1 dB	2.6 dB	2.2 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	2.7 dB	2.7 dB	3.1 dB	-
	30 MHz-300 MHz	4.4 dB	4.4 dB	4.6 dB	-
	300 MHz-1 GHz	5.6 dB	5.5 dB	5.3 dB	-
	1 GHz-13 GHz	5.2 dB	5.2 dB	5.2 dB	-
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	4.9 dB	4.9 dB	4.9 dB	-
	18 GHz-40 GHz	4.9 dB	4.9 dB	4.9 dB	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	0.76 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.79 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.74 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.08 dB
Spurious emission (Conducted) below 1GHz	1.5 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.4 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.5 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.5 dB
Bandwidth Measurement	0.66 %
Duty cycle and Time Measurement	0.012 %

Radiated emission test

The data listed in this test report has enough margin, more than the site margin.

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone: +81 463 50 6400, Facsimile: +81 463 50 6401
JAB Accreditation No. RTL02610

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
No.1 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	-	2.55 x 4.1 x 2.5	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

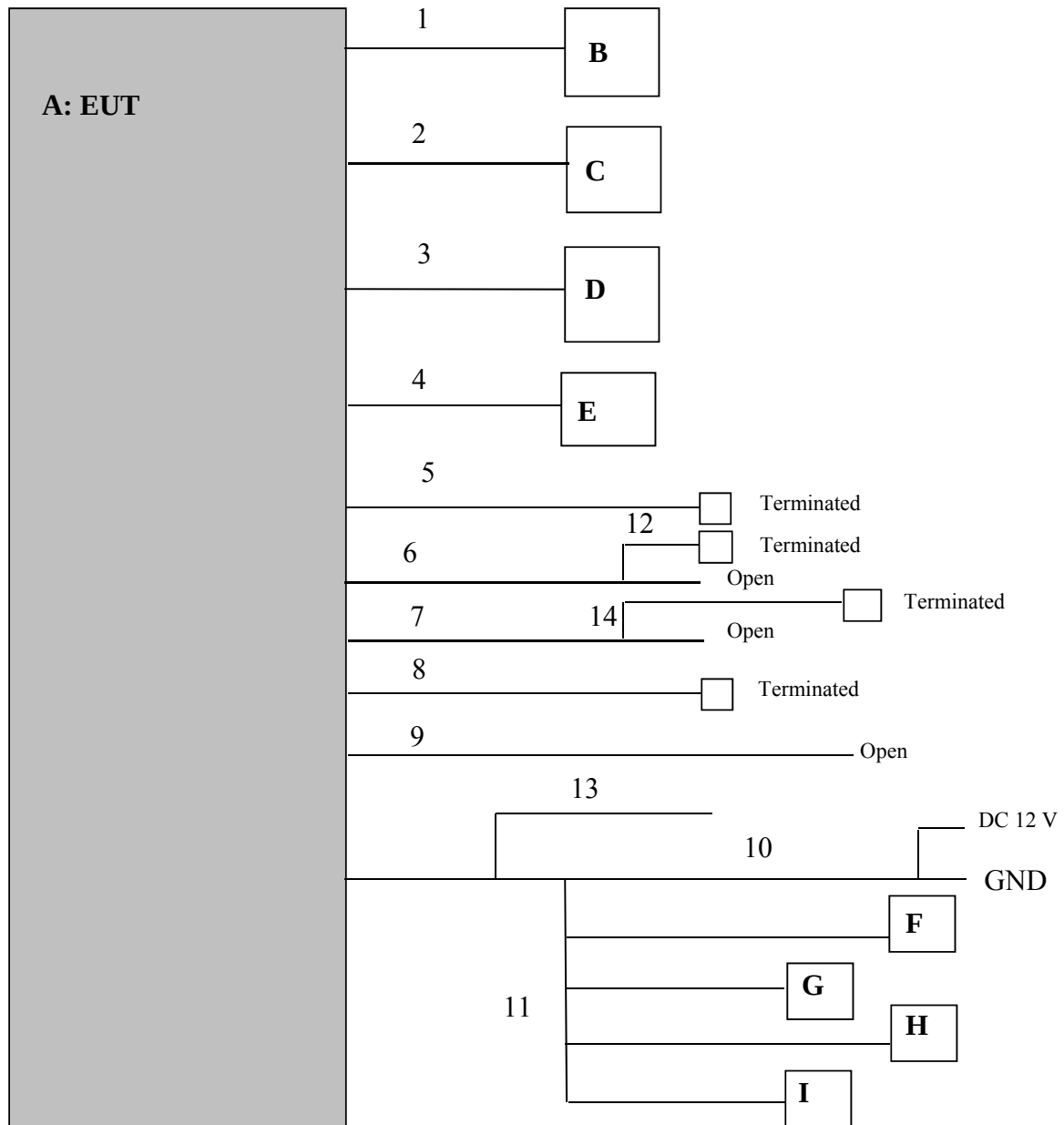
4.1 Operating Mode(s)

Bluetooth (BT): Transmitting (Tx), Payload: PRBS9

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Spurious Emission (Conducted/Radiated)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
20dB Bandwidth	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx (Hopping On) DH5, 3DH5	-
Dwell time	Tx (Hopping On), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5	-
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2480 MHz
99% Occupied Bandwidth	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2441 MHz 2480 MHz
*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test) *2DH mode (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative. * It is considered that the non-tested packet type (e.g. inquiry) can be omitted as it is complied with above all test items based on Bluetooth Core specification. *EUT has the power settings by the software as follows; Power settings: BDR: Ext.=255, Int.=42 EDR: Ext.=255, Int.=48 Software: Blue Test 3 ver.2.4.0.0 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.		

4.2 Configuration and peripherals



Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Display Audio	MXLO15KLG4	67200035 (Radiated spurious emission) 67200034 (other tests)	JVC KENWOOD	EUT
B	USB memory	SDK-USMGL(B)	08N18HDDDB	Sony	1 GB/ USB 2.0
C	USB memory	-	-	Apacer	-
D	iPhone	MD297J/A	C39KWKE6DTWD	Apple	-
E	GPS antenna	8751A075LHD	47700002	-	-
F	Speaker	KFC-RS160	-	KENWOOD	-
G	Speaker	KFC-RS160	-	KENWOOD	-
H	Speaker	KFC-RS160	-	KENWOOD	-
I	Speaker	KFC-RS160	-	KENWOOD	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB	2.0	Shielded	Shielded	-
2	USB	2.0	Shielded	Shielded	-
3	HDMI	0.1+2.0+1.5	Shielded	Shielded	-
4	GPS antenna	2.0	Shielded	Shielded	-
5	FM antenna	4.85	Shielded	Shielded	-
6	Signal	2.4	Unshielded	Unshielded	-
7	Signal	2.4	Unshielded	Unshielded	-
8	Signal	1.7	Shielded	Shielded	-
9	Signal	2.2	Unshielded	Unshielded	-
10	DC	2.2	Unshielded	Unshielded	-
11	Speaker	2.0+1.9	Unshielded	Unshielded	-
12	CAMERA IN	3.0	Shielded	Shielded	-
13	Signal	2.0	Unshielded	Unshielded	-
14	Signal	3.0	Shielded	Shielded	-

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

SECTION 5: Radiated Spurious Emission

Test Procedure

[For below 1 GHz]

EUT was placed on a platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	Below 30 MHz	30 MHz to 300 MHz	300 MHz to 1 GHz	Above 1 GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

In any 100 kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9 (IC) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (IC).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	RBW: 1 MHz VBW: 10 Hz *1)	RBW: 100 kHz VBW: 300 kHz
Test Distance	3 m	3 m*2) (below 13 GHz), 1 m*3) (above 13 GHz),		3 m*2) (below 13 GHz), 1 m*3) (above 13 GHz),

*1) Although DA 00-705 accepts VBW = 10 Hz for AV measurements, it was confirmed that superfluous smoothing was not performed.

*2) Distance Factor: $20 \times \log(3.87 \text{ m}/3.0 \text{ m}) = 2.22 \text{ dB}$

*3) Distance Factor: $20 \times \log(1.0 \text{ m}/3.0 \text{ m}) = -9.5 \text{ dB}$

The EUT was set at 24 degree as normal position according to the EUT's specification.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range	: 30 M - 26.5 GHz
Test data	: APPENDIX
Test result	: Pass

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

The tests were made with below setting connected to the antenna port.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
20dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Sample	Max Hold *1)	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *3)	-	Power Meter (Sensor: 50MHz BW)
Carrier Frequency Separation	3 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Number of Hopping Frequency	30 MHz	300 kHz	1 MHz	Auto	Peak	Max Hold	Spectrum Analyzer
Dwell Time	Zero Span	100 kHz, 1 MHz	300 kHz, 3 MHz	As necessary capture the entire dwell time per hopping channel	Peak	Clear Write	Spectrum Analyzer
Conducted Spurious Emission *2)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	9.1 kHz	27 kHz				
	30 MHz to 25 GHz	100 kHz	300 kHz				
Conducted Spurious Emission Band Edge compliance	10 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*1) The measurement was performed with Max Hold since the duty cycle was not 100 %.

*2) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.
(9 kHz -150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 10 kHz)

*3) Reference data

The test results and limit are rounded off to two decimals place, so some differences might be observed.

Test data : **APPENDIX**
Test result : **Pass**

APPENDIX 1: Test data

20dB Bandwidth and Carrier Frequency Separation

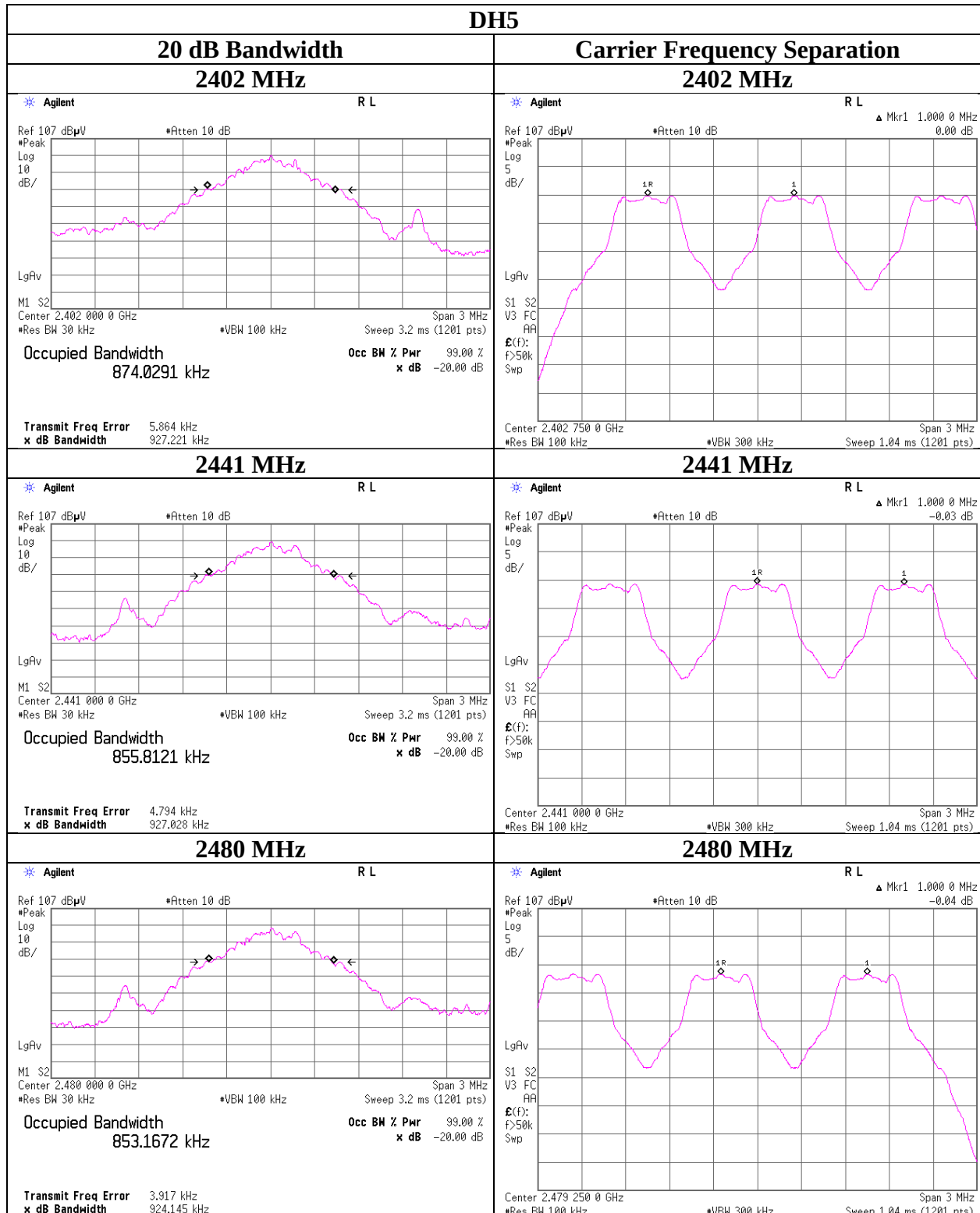
Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11238416S-A
Date April 22, 2016
Temperature / Humidity 24 deg. C / 47 % RH
Engineer Hiroyuki Morikawa
Mode Tx, Hopping Off, DH5

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.927	1.000	>= 0.618
DH5	2441.0	0.927	1.000	>= 0.618
DH5	2480.0	0.924	1.000	>= 0.616
3DH5	2402.0	1.268	1.000	>= 0.845
3DH5	2441.0	1.259	1.000	>= 0.839
3DH5	2480.0	1.260	1.000	>= 0.840

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

20dB Bandwidth and Carrier Frequency Separation



UL Japan, Inc.

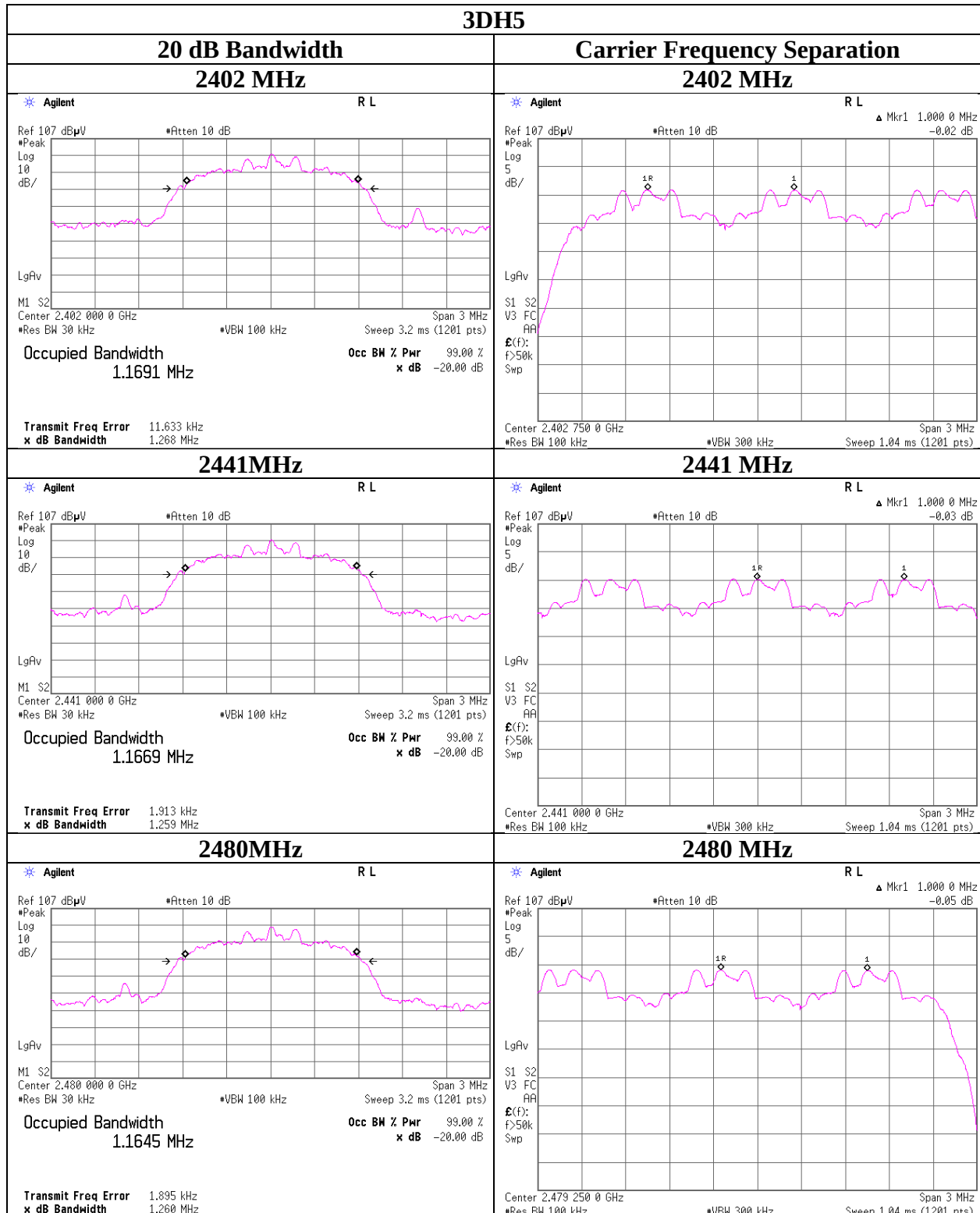
Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

20dB Bandwidth and Carrier Frequency Separation



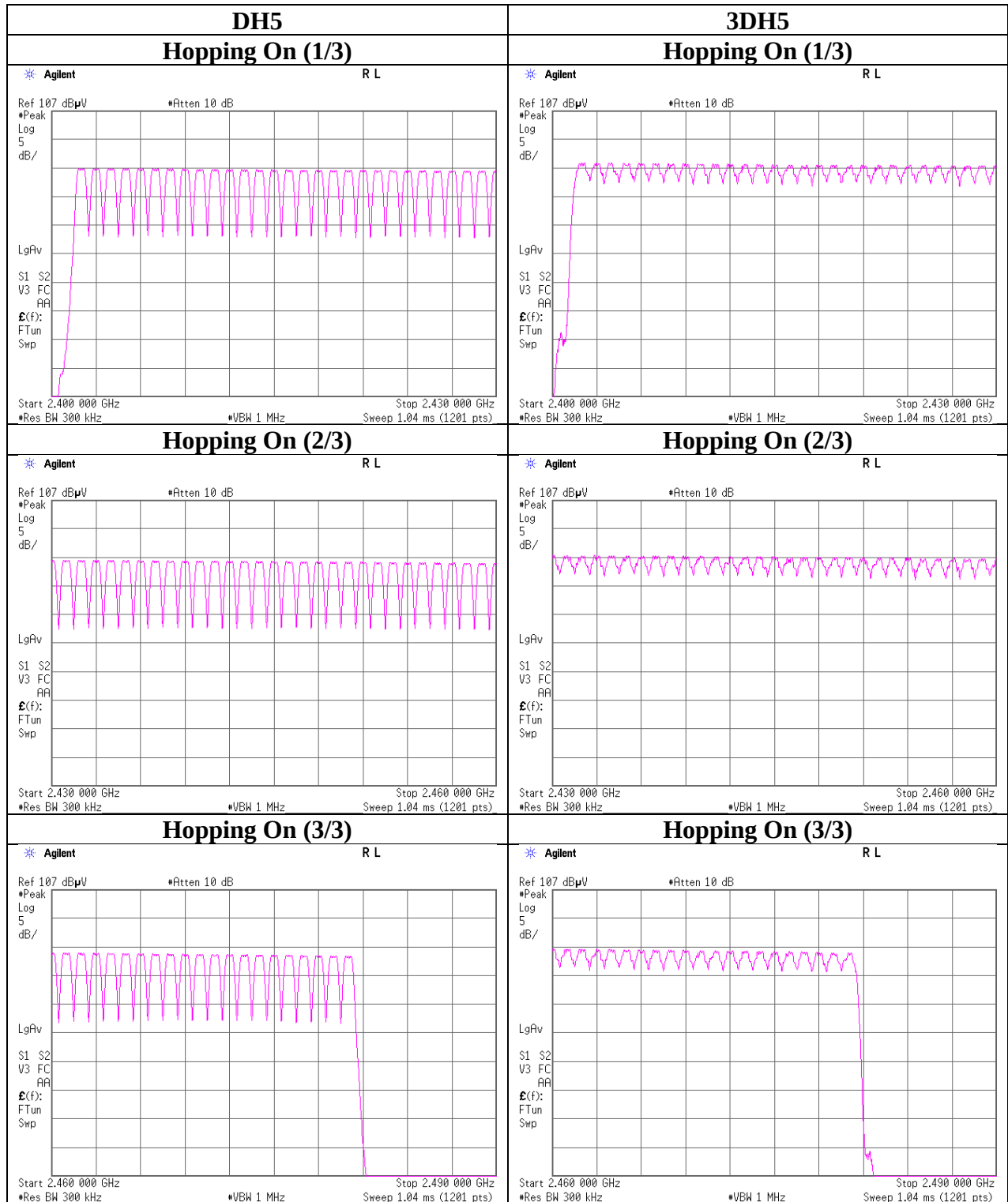
Number of Hopping Frequency

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11238416S-A
Date April 22, 2016
Temperature / Humidity 24 deg. C / 47 % RH
Engineer Hiroyuki Morikawa
Mode Tx, Hopping On

Mode	Number of channel [channels]	Limit [channels]
DH5	79	≥ 15
3DH5	79	≥ 15

Test was not performed at AFH mode whose number of hopping channel is 20 channels because this Bluetooth radio is in compliance of Bluetooth Specification.

Number of Hopping Frequency



UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Dwell time

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11238416S-A
Date April 22, 2016
Temperature / Humidity 24 deg. C / 47 % RH
Engineer Hiroyuki Morikawa
Mode Tx, Hopping On

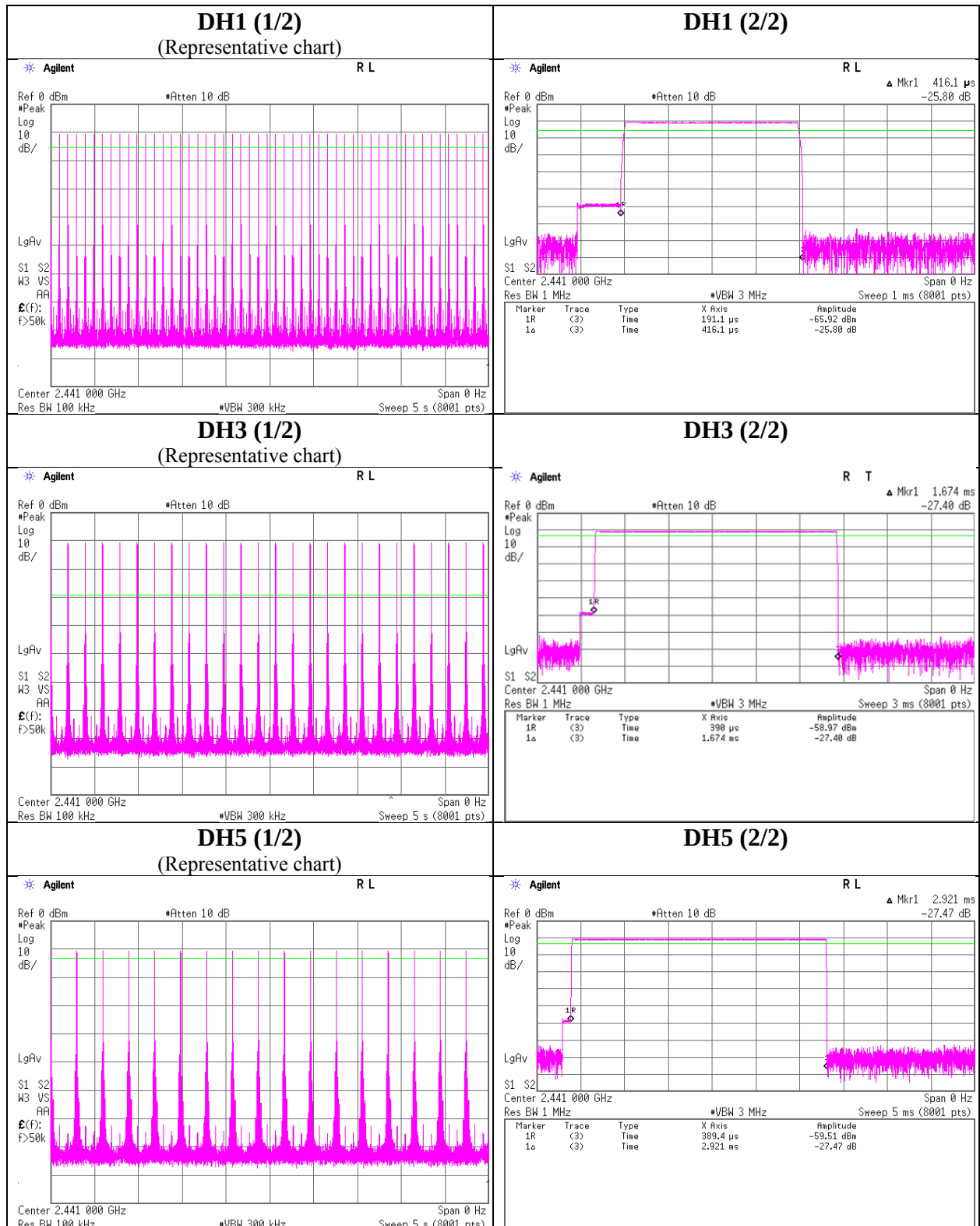
Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8 (32 Hopping x 0.4) second period				Length of transmission [msec]	Result [msec]	Limit [msec]
DH1	50.0 times	/	5 sec.	x 31.6 sec. = 316 times	0.416	131	400
DH3	26.0 times	/	5 sec.	x 31.6 sec. = 165 times	1.674	276	400
DH5	17.0 times	/	5 sec.	x 31.6 sec. = 108 times	2.921	315	400
3DH1	50.0 times	/	5 sec.	x 31.6 sec. = 316 times	0.433	137	400
3DH3	26.0 times	/	5 sec.	x 31.6 sec. = 165 times	1.683	278	400
3DH5	17.0 times	/	5 sec.	x 31.6 sec. = 108 times	2.935	317	400

Sample Calculation

Result = Number of transmission x Length of transmission

This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in $N \times 0.4s$, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than 0.4s regardless of packet size. This is confirmed in the test report for $N = 79$.

Dwell time



UL Japan, Inc.

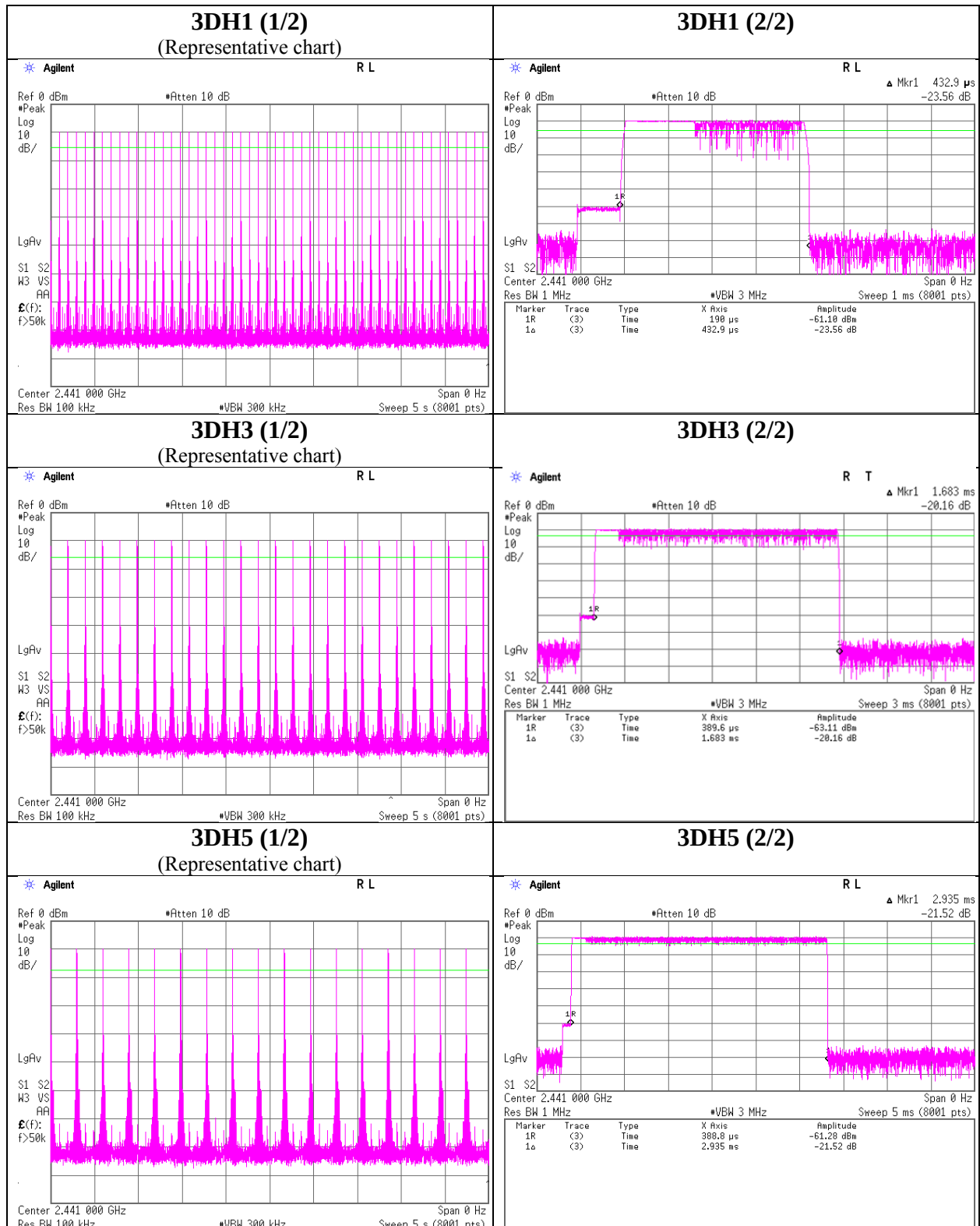
Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Dwell time



UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Peak Output Power

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11238416S-A
Date : April 22, 2016
Temperature / Humidity : 24 deg. C / 47 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx, Hopping Off

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
DH5	2402.0	-9.99	2.32	9.67	2.00	1.58	20.96	125	18.96
DH5	2441.0	-10.46	2.32	9.67	1.53	1.42	20.96	125	19.43
DH5	2480.0	-11.36	2.33	9.67	0.64	1.16	20.96	125	20.32
2DH5	2402.0	-8.20	2.32	9.67	3.79	2.39	20.96	125	17.17
2DH5	2441.0	-8.92	2.32	9.67	3.07	2.03	20.96	125	17.89
2DH5	2480.0	-10.05	2.33	9.67	1.95	1.57	20.96	125	19.01
3DH5	2402.0	-8.17	2.32	9.67	3.82	2.41	20.96	125	17.14
3DH5	2441.0	-8.78	2.32	9.67	3.21	2.09	20.96	125	17.75
3DH5	2480.0	-9.85	2.33	9.67	2.15	1.64	20.96	125	18.81

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT.

As this device had AFH mode and frequency separation could not meet the requirement of over 20dB BW without 2/3 relaxation, 125mW power limit was applied to it.

Average Output Power
(Reference data)

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11238416S-A
Date	April 22, 2016
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
					[dBm]	[mW]		[dBm]	[mW]
DH5	2402.0	-11.51	2.32	9.67	0.48	1.12	1.08	1.56	1.43
DH5	2441.0	-12.05	2.32	9.67	-0.06	0.99	1.08	1.02	1.26
DH5	2480.0	-13.03	2.33	9.67	-1.03	0.79	1.08	0.05	1.01
2DH5	2402.0	-11.52	2.32	9.67	0.47	1.11	1.07	1.54	1.43
2DH5	2441.0	-12.28	2.32	9.67	-0.29	0.94	1.07	0.78	1.20
2DH5	2480.0	-13.55	2.33	9.67	-1.55	0.70	1.07	-0.48	0.90
3DH5	2402.0	-11.53	2.32	9.67	0.46	1.11	1.07	1.53	1.42
3DH5	2441.0	-12.35	2.32	9.67	-0.36	0.92	1.07	0.71	1.18
3DH5	2480.0	-13.53	2.33	9.67	-1.53	0.70	1.07	-0.46	0.90

Sample Calculation:

Result (Frame power) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

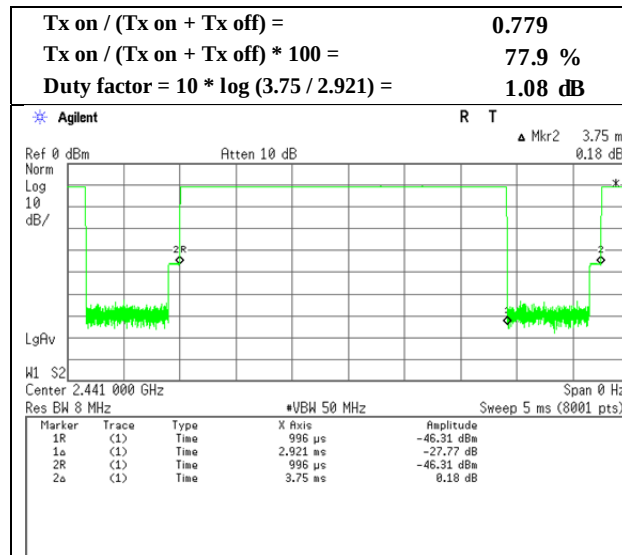
Result (Burst power) = Frame power + Duty factor

*The equipment and cables were not used for factor 0 dB of the data sheets.

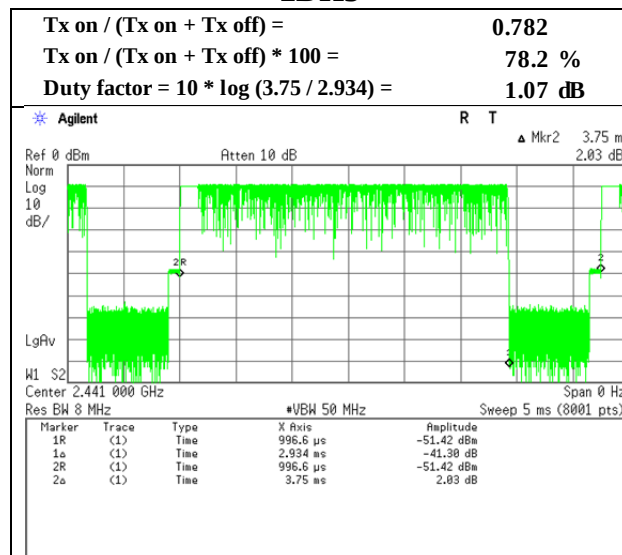
Burst Rate Confirmation

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11238416S-A
Date : April 22, 2016
Temperature / Humidity : 24 deg. C / 47 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx, Hopping Off

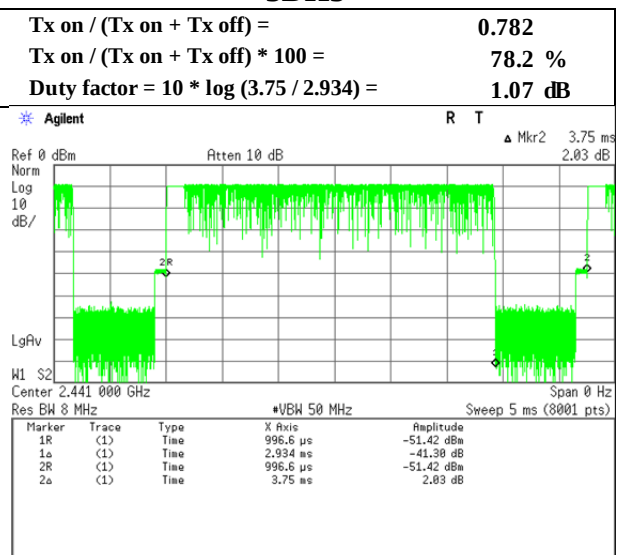
DH5



2DH5

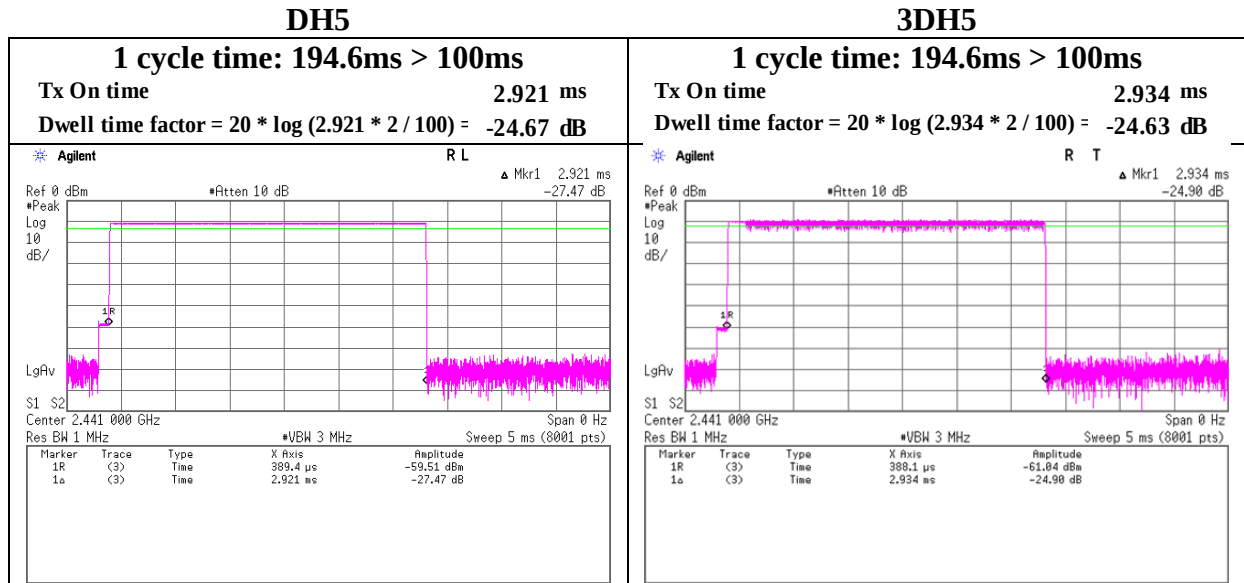


3DH5



Dwell time factor

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11238416S-A
Date : April 22, 2016
Temperature / Humidity : 24 deg. C / 47 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx, Hopping On



A hopping channel might be occupied 2 times within 100 ms on minimum hopping mode (AFH). Therefore Tx On time was multiplied by 2. As for Tx On time, refer to "Burst Rate Confirmation".

Radiated Spurious Emission

Test place Shonan EMC Lab. No.1 and 2 Semi Anechoic Chamber
Report No. 11238416S-A
Date April 16, 2016 April 17, 2016 April 21, 2016
Temperature / Humidity 21 deg. C / 38 % RH 22 deg. C / 40 % RH 22 deg. C / 51 % RH
Engineer Hikaru Shirasawa Kazutaka Takeyama Yasumasa Owaki
(1-26.5 GHz) No.1SAC (30-1000 MHz) No.1SAC (1-2.8 GHz) No.2 SAC
Mode Tx, Hopping Off, DH5 2402 MHz

SAC=Semi-Anechoic Chamber

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	120.031	QP	34.1	12.7	8.1	31.8	0.0	23.1	43.5	20.4	253	136	
Hori.	185.255	QP	23.6	16.2	8.9	31.8	0.0	16.9	43.5	26.6	150	356	
Hori.	375.003	QP	37.4	15.5	7.0	31.8	0.0	28.1	46.0	17.9	100	163	
Hori.	406.256	QP	36.7	16.1	7.2	31.8	0.0	28.2	46.0	17.8	100	212	
Hori.	648.001	QP	37.4	19.6	8.5	32.0	0.0	33.5	46.0	12.5	100	147	
Hori.	843.745	QP	36.1	21.6	9.4	31.6	0.0	35.5	46.0	10.5	133	0	
Hori.	960.799	QP	33.3	22.7	9.9	30.9	0.0	35.0	53.9	18.9	167	144	
Hori.	1601.333	PK	47.2	25.3	13.9	40.8	2.2	47.8	73.9	26.1	100	284	
Hori.	2390.000	PK	47.2	27.7	14.8	40.7	2.2	51.2	73.9	22.7	196	135	
Hori.	4804.000	PK	54.6	31.3	7.5	41.5	2.2	54.1	73.9	19.8	100	178	
Hori.	7206.000	PK	47.5	36.6	9.0	41.1	2.2	54.2	73.9	19.7	150	359	
Hori.	9608.000	PK	45.8	37.9	9.9	40.5	2.2	55.3	73.9	18.6	150	0	
Hori.	12010.000	PK	45.8	39.6	11.1	39.9	2.2	58.8	73.9	15.1	150	359	
Hori.	1601.333	AV	33.2	25.3	13.9	40.8	2.2	33.8	53.9	20.1	100	284	
Hori.	2390.000	AV	32.9	27.7	14.8	40.7	2.2	36.9	53.9	17.0	196	135	
Vert.	120.036	QP	35.0	12.7	8.1	31.8	0.0	24.0	43.5	19.5	100	256	
Vert.	720.006	QP	32.5	20.4	8.8	32.0	0.0	29.7	46.0	16.3	111	345	
Vert.	843.747	QP	34.4	21.6	9.4	31.6	0.0	33.8	46.0	12.2	100	337	
Vert.	936.003	QP	31.0	22.5	9.8	31.1	0.0	32.2	46.0	13.8	100	328	
Vert.	1601.333	PK	46.9	25.3	13.9	40.8	2.2	47.5	73.9	26.4	100	0	
Vert.	2390.000	PK	46.1	27.7	14.8	40.7	2.2	50.1	73.9	23.8	210	180	
Vert.	4804.000	PK	55.4	31.3	7.5	41.5	2.2	54.9	73.9	19.0	164	155	
Vert.	7206.000	PK	47.3	36.6	9.0	41.1	2.2	54.0	73.9	19.9	150	0	
Vert.	9608.000	PK	46.6	37.9	9.9	40.5	2.2	56.1	73.9	17.8	150	359	
Vert.	12010.000	PK	45.8	39.6	11.1	39.9	2.2	58.8	73.9	15.1	150	0	
Vert.	1601.333	AV	33.7	25.3	13.9	40.8	2.2	34.3	53.9	19.6	100	0	
Vert.	2390.000	AV	33.1	27.7	14.8	40.7	2.2	37.1	53.9	16.8	210	180	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : 20log(3.87 m / 3.0 m) = 2.2 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4804.000	AV	47.7	31.3	7.5	41.5	-24.7	2.2	22.5	53.9	31.4	
Hori.	7206.000	AV	34.4	36.6	9.0	41.1	-24.7	2.2	16.4	53.9	37.5	
Hori.	9608.000	AV	33.2	37.9	9.9	40.5	-24.7	2.2	18.0	53.9	35.9	
Hori.	12010.000	AV	33.0	39.6	11.1	39.9	-24.7	2.2	21.3	53.9	32.6	
Vert.	4804.000	AV	49.9	31.3	7.5	41.5	-24.7	2.2	24.7	53.9	29.2	
Vert.	7206.000	AV	34.4	36.6	9.0	41.1	-24.7	2.2	16.4	53.9	37.5	
Vert.	9608.000	AV	33.2	37.9	9.9	40.5	-24.7	2.2	18.0	53.9	35.9	
Vert.	12010.000	AV	33.0	39.6	11.1	39.9	-24.7	2.2	21.3	53.9	32.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Dwell(time)factor + Distance factor

Distance factor : 1 GHz - 13 GHz : 20log(3.87 m / 3.0 m) = 2.2 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	86.8	27.7	14.9	40.7	2.2	90.9	-	-	Carrier
Hori.	2399.514	PK	41.4	27.7	14.9	40.7	2.2	45.5	70.9	25.4	
Hori.	2400.000	PK	44.0	27.7	14.9	40.7	2.2	48.1	70.9	22.8	
Vert.	2402.000	PK	83.6	27.7	14.9	40.7	2.2	87.7	-	-	Carrier
Vert.	2399.516	PK	41.9	27.7	14.9	40.7	2.2	46.0	67.7	21.7	
Vert.	2400.000	PK	43.2	27.7	14.9	40.7	2.2	47.3	67.7	20.4	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : 20log(3.87 m / 3.0 m) = 2.2 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

UL Japan, Inc.

Shonan EMC Lab.

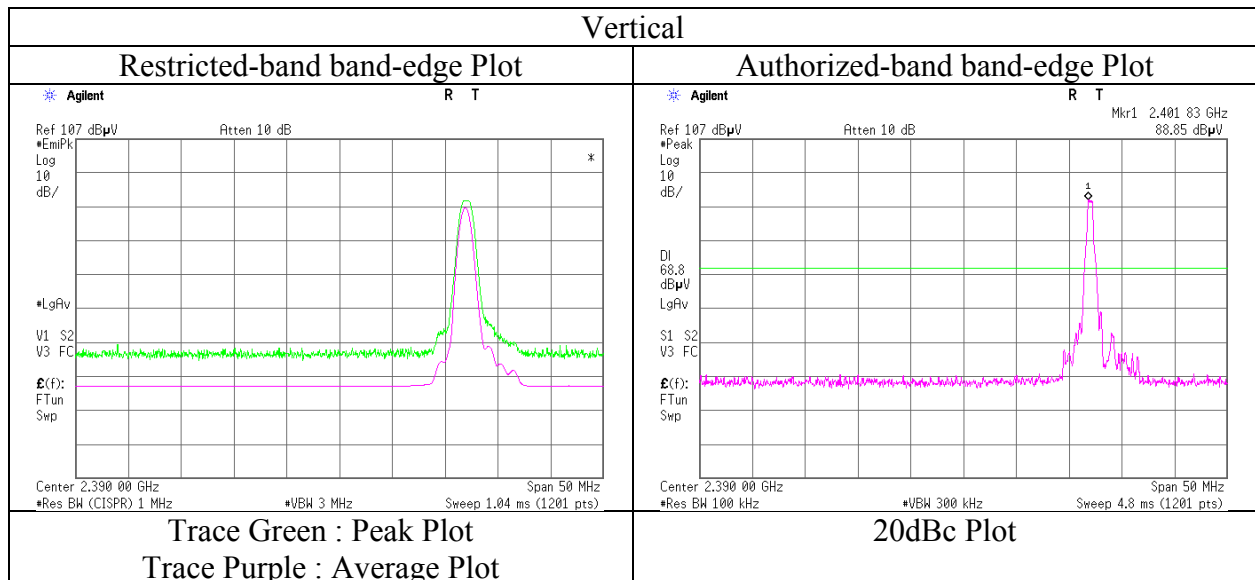
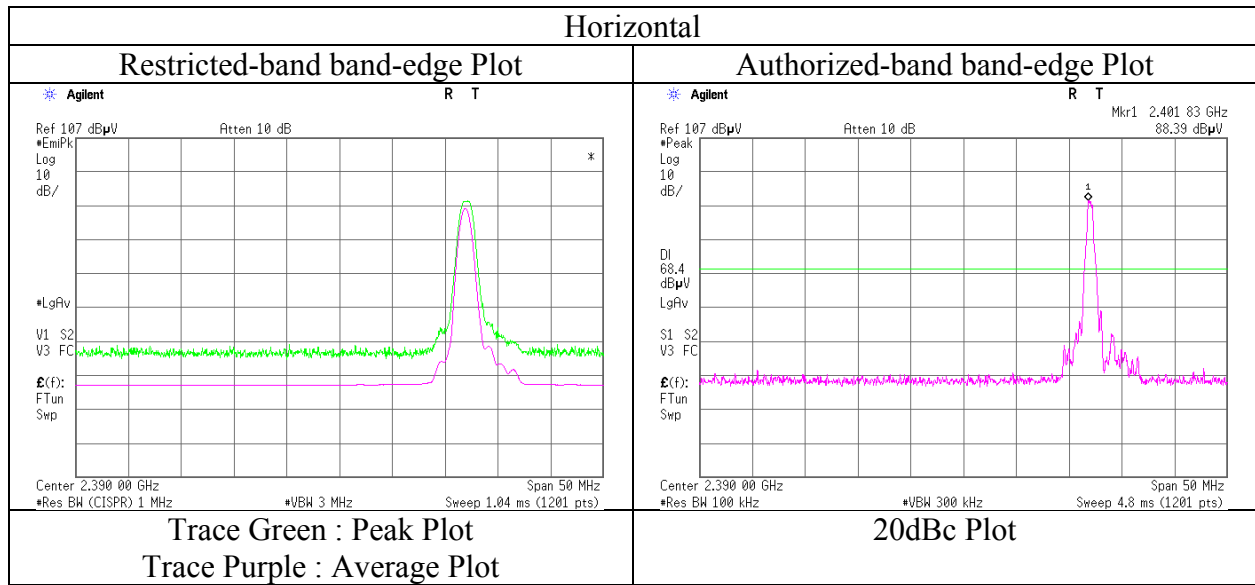
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11238416S-A
Date	April 21, 2016
Temperature / Humidity	22 deg. C / 51 % RH
Engineer	Yasumasa Owaki
Mode	Tx, Hopping Off, DH5 2402 MHz



* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No. : 11238416S-A
Date : April 16, 2016 April 17, 2016
Temperature / Humidity : 21 deg. C / 38 % RH 22 deg. C / 40 % RH
Engineer : Hikaru Shirasawa Kazutaka Takeyama
(1-26.5 GHz) (30-1000 MHz)
Mode : Tx, Hopping Off, DH5 2441 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	120.031	QP	34.0	12.7	8.1	31.8	0.0	23.0	43.5	20.5	256	142	
Hori.	374.893	QP	37.4	15.5	7.0	31.8	0.0	28.1	46.0	17.9	100	166	
Hori.	406.256	QP	36.3	16.1	7.2	31.8	0.0	27.8	46.0	18.2	100	214	
Hori.	648.000	QP	37.4	19.6	8.5	32.0	0.0	33.5	46.0	12.5	100	2	
Hori.	843.747	QP	36.0	21.6	9.4	31.6	0.0	35.4	46.0	10.6	132	359	
Hori.	960.269	QP	33.6	22.7	9.9	30.9	0.0	35.3	53.9	18.6	167	142	
Hori.	1627.333	PK	46.5	25.4	13.9	40.8	2.2	47.2	73.9	26.7	150	0	
Hori.	4882.000	PK	55.8	31.6	7.6	41.4	2.2	55.8	73.9	18.1	182	139	
Hori.	7323.000	PK	48.8	36.7	9.1	41.3	2.2	55.5	73.9	18.4	150	359	
Hori.	9764.000	PK	48.4	38.0	10.0	40.4	2.2	58.2	73.9	15.7	150	0	
Hori.	12205.000	PK	47.6	39.6	11.2	39.8	2.2	60.8	73.9	13.1	150	359	
Hori.	1627.333	AV	33.5	25.4	13.9	40.8	2.2	34.2	53.9	19.7	150	0	
Vert.	120.039	QP	34.8	12.7	8.1	31.8	0.0	23.8	43.5	19.7	100	259	
Vert.	843.749	QP	34.2	21.6	9.4	31.6	0.0	33.6	46.0	12.4	100	339	
Vert.	864.359	QP	31.9	21.8	9.5	31.5	0.0	31.7	46.0	14.3	100	323	
Vert.	906.252	QP	30.7	22.3	9.7	31.3	0.0	31.4	46.0	14.6	100	351	
Vert.	1627.333	PK	46.2	25.4	13.9	40.8	2.2	46.9	73.9	27.0	150	359	
Vert.	4882.000	PK	56.1	31.6	7.6	41.4	2.2	56.1	73.9	17.8	153	156	
Vert.	7323.000	PK	47.8	36.7	9.1	41.3	2.2	54.5	73.9	19.4	150	359	
Vert.	9764.000	PK	46.9	38.0	10.0	40.4	2.2	56.7	73.9	17.2	150	0	
Vert.	12205.000	PK	46.3	39.6	11.2	39.8	2.2	59.5	73.9	14.4	150	359	
Vert.	1627.333	AV	33.1	25.4	13.9	40.8	2.2	33.8	53.9	20.1	150	359	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.87\text{ m} / 3.0\text{ m}) = 2.2\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4882.000	AV	49.2	31.6	7.6	41.4	-24.7	2.2	24.5	53.9	29.4	
Hori.	7323.000	AV	34.6	36.7	9.1	41.3	-24.7	2.2	16.6	53.9	37.3	
Hori.	9764.000	AV	35.1	38.0	10.0	40.4	-24.7	2.2	20.2	53.9	33.7	
Hori.	12205.000	AV	34.6	39.6	11.2	39.8	-24.7	2.2	23.1	53.9	30.8	
Vert.	4882.000	AV	50.5	31.6	7.6	41.4	-24.7	2.2	25.8	53.9	28.1	
Vert.	7323.000	AV	34.8	36.7	9.1	41.3	-24.7	2.2	16.8	53.9	37.1	
Vert.	9764.000	AV	33.6	38.0	10.0	40.4	-24.7	2.2	18.7	53.9	35.2	
Vert.	12205.000	AV	33.1	39.6	11.2	39.8	-24.7	2.2	21.6	53.9	32.3	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Dwell(time)factor + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.87\text{ m} / 3.0\text{ m}) = 2.2\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

Radiated Spurious Emission

Test place Shonan EMC Lab. No.1 and 2 Semi Anechoic Chamber
Report No. 11238416S-A
Date April 16, 2016 April 17, 2016 April 21, 2016
Temperature / Humidity 21 deg. C / 38 % RH 22 deg. C / 40 % RH 22 deg. C / 51 % RH
Engineer Hikaru Shirasawa Kazutaka Takeyama Yasumasa Owaki
(1-26.5 GHz) No.2 SAC (30-1000 MHz) No.2 SAC (1-2.8 GHz) No.2 SAC
Mode Tx, Hopping Off, DH5 2480 MHz

SAC=Semi-Anechoic Chamber

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	120.038	QP	33.9	12.7	8.1	31.8	0.0	22.9	43.5	20.6	255	136	
Hori.	312.502	QP	38.6	14.2	6.6	31.8	0.0	27.6	46.0	18.4	150	176	
Hori.	375.001	QP	37.6	15.5	7.0	31.8	0.0	28.3	46.0	17.7	100	164	
Hori.	406.250	QP	36.4	16.1	7.2	31.8	0.0	27.9	46.0	18.1	100	210	
Hori.	648.002	QP	37.3	19.6	8.5	32.0	0.0	33.4	46.0	12.6	100	145	
Hori.	843.756	QP	35.8	21.6	9.4	31.6	0.0	35.2	46.0	10.8	137	0	
Hori.	960.270	QP	33.6	22.7	9.9	30.9	0.0	35.3	53.9	18.6	166	143	
Hori.	1653.333	PK	46.1	25.6	14.0	40.8	2.2	47.1	73.9	26.8	150	0	
Hori.	2483.500	PK	47.7	27.8	15.0	40.7	2.2	52.0	73.9	21.9	201	140	
Hori.	4960.000	PK	51.7	31.9	7.6	41.2	2.2	52.2	73.9	21.7	160	38	
Hori.	7440.000	PK	48.1	36.7	9.1	41.4	2.2	54.7	73.9	19.2	150	359	
Hori.	9920.000	PK	45.4	38.1	10.2	40.3	2.2	55.6	73.9	18.3	150	0	
Hori.	12400.000	PK	45.8	39.6	11.3	39.7	2.2	59.2	73.9	14.7	150	359	
Hori.	1653.333	AV	32.7	25.6	14.0	40.8	2.2	33.7	53.9	20.2	150	0	
Hori.	2483.500	AV	34.7	27.8	15.0	40.7	2.2	39.0	53.9	14.9	201	140	
Vert.	120.037	QP	34.6	12.7	8.1	31.8	0.0	23.6	43.5	19.9	100	258	
Vert.	719.998	QP	32.5	20.4	8.8	32.0	0.0	29.7	46.0	16.3	100	344	
Vert.	843.751	QP	34.2	21.6	9.4	31.6	0.0	33.6	46.0	12.4	100	333	
Vert.	906.248	QP	30.4	22.3	9.7	31.3	0.0	31.1	46.0	14.9	100	313	
Vert.	1653.333	PK	45.8	25.6	14.0	40.8	2.2	46.8	73.9	27.1	100	0	
Vert.	2483.500	PK	45.0	27.8	15.0	40.7	2.2	49.3	73.9	24.6	246	152	
Vert.	4960.000	PK	54.4	31.9	7.6	41.2	2.2	54.9	73.9	19.0	153	157	
Vert.	7440.000	PK	47.8	36.7	9.1	41.4	2.2	54.4	73.9	19.5	150	359	
Vert.	9920.000	PK	47.1	38.1	10.2	40.3	2.2	57.3	73.9	16.6	150	0	
Vert.	12400.000	PK	46.2	39.6	11.3	39.7	2.2	59.6	73.9	14.3	150	0	
Vert.	1653.333	AV	33.1	25.6	14.0	40.8	2.2	34.1	53.9	19.8	100	0	
Vert.	2483.500	AV	34.4	27.8	15.0	40.7	2.2	38.7	53.9	15.2	246	152	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : 20log(3.87 m / 3.0 m) = 2.2 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4960.000	AV	43.3	31.9	7.6	41.2	-24.7	2.2	19.1	53.9	34.8	
Hori.	7440.000	AV	34.4	36.7	9.1	41.4	-24.7	2.2	16.3	53.9	37.6	
Hori.	9920.000	AV	33.1	38.1	10.2	40.3	-24.7	2.2	18.6	53.9	35.3	
Hori.	12400.000	AV	33.0	39.6	11.3	39.7	-24.7	2.2	21.7	53.9	32.2	
Vert.	4960.000	AV	48.0	31.9	7.6	41.2	-24.7	2.2	23.8	53.9	30.1	
Vert.	7440.000	AV	34.4	36.7	9.1	41.4	-24.7	2.2	16.3	53.9	37.6	
Vert.	9920.000	AV	34.4	38.1	10.2	40.3	-24.7	2.2	19.9	53.9	34.0	
Vert.	12400.000	AV	33.1	39.6	11.3	39.7	-24.7	2.2	21.8	53.9	32.1	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Dwell(time)factor + Distance factor

Distance factor : 1 GHz - 13 GHz : 20log(3.87 m / 3.0 m) = 2.2 dB

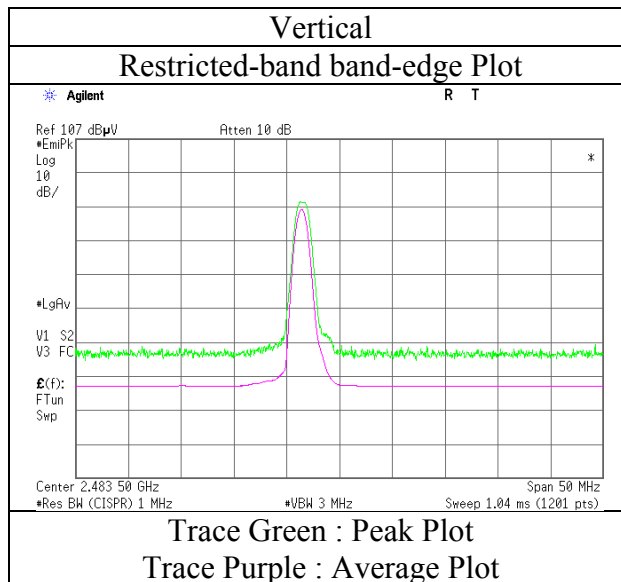
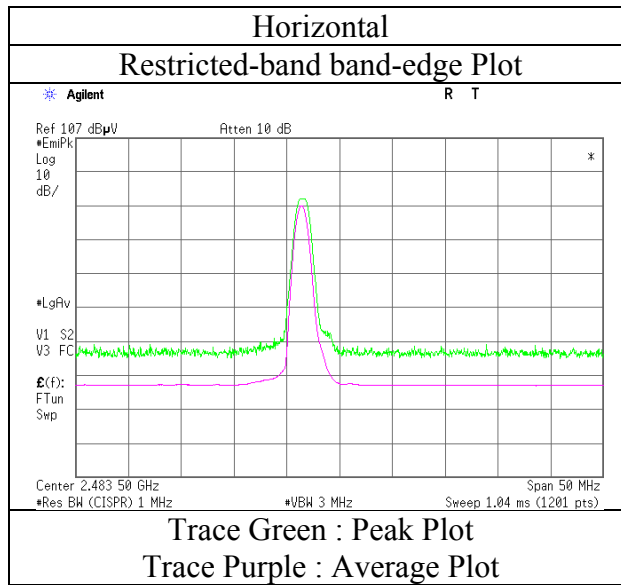
13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

Radiated Spurious Emission **(Reference Plot for band-edge)**

Test place Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No. 11238416S-A
Date April 21, 2016
Temperature / Humidity 22 deg. C / 51 % RH
Engineer Yasumasa Owaki

Mode Tx, Hopping Off, DH5 2480 MHz



* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No. : 11238416S-A
Date : April 16, 2016 April 17, 2016
Temperature / Humidity : 21 deg. C / 38 % RH 22 deg. C / 40 % RH
Engineer : Hikaru Shirasawa Kazutaka Takeyama
 (1-26.5 GHz) (30-1000 MHz)
Mode : Tx, Hopping Off, 3DH5 2402 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	120.038	QP	33.3	12.7	8.1	31.8	0.0	22.3	43.5	21.2	255	131	
Hori.	312.504	QP	37.5	14.2	6.6	31.8	0.0	26.5	46.0	19.5	100	176	
Hori.	375.002	QP	37.3	15.5	7.0	31.8	0.0	28.0	46.0	18.0	100	165	
Hori.	648.003	QP	37.0	19.6	8.5	32.0	0.0	33.1	46.0	12.9	100	127	
Hori.	843.748	QP	35.8	21.6	9.4	31.6	0.0	35.2	46.0	10.8	130	3	
Hori.	906.122	QP	30.8	22.3	9.7	31.3	0.0	31.5	46.0	14.5	100	356	
Hori.	960.849	QP	33.2	22.7	9.9	30.9	0.0	34.9	53.9	19.0	164	144	
Hori.	1601.333	PK	46.7	25.3	13.9	40.8	2.2	47.3	73.9	26.6	150	0	
Hori.	2390.000	PK	45.4	27.7	14.8	40.7	2.2	49.4	73.9	24.5	180	132	
Hori.	4804.000	PK	51.6	31.3	7.5	41.5	2.2	51.1	73.9	22.8	105	149	
Hori.	7206.000	PK	47.4	36.6	9.0	41.1	2.2	54.1	73.9	19.8	150	359	
Hori.	9608.000	PK	47.5	37.9	9.9	40.5	2.2	57.0	73.9	16.9	150	0	
Hori.	12010.000	PK	46.3	39.6	11.1	39.9	2.2	59.3	73.9	14.6	150	359	
Hori.	1601.333	AV	33.4	25.3	13.9	40.8	2.2	34.0	53.9	19.9	150	0	
Hori.	2390.000	AV	33.4	27.7	14.8	40.7	2.2	37.4	53.9	16.5	180	132	
Vert.	120.038	QP	32.3	12.7	8.1	31.8	0.0	21.3	43.5	22.2	100	255	
Vert.	843.745	QP	34.0	21.6	9.4	31.6	0.0	33.4	46.0	12.6	100	336	
Vert.	864.357	QP	32.3	21.8	9.5	31.5	0.0	32.1	46.0	13.9	100	317	
Vert.	906.247	QP	30.8	22.3	9.7	31.3	0.0	31.5	46.0	14.5	100	356	
Vert.	1601.333	PK	46.4	25.3	13.9	40.8	2.2	47.0	73.9	26.9	168	8	
Vert.	2390.000	PK	45.7	27.7	14.8	40.7	2.2	49.7	73.9	24.2	157	180	
Vert.	4804.000	PK	53.1	31.3	7.5	41.5	2.2	52.6	73.9	21.3	209	229	
Vert.	7206.000	PK	47.5	36.6	9.0	41.1	2.2	54.2	73.9	19.7	150	0	
Vert.	9608.000	PK	46.6	37.9	9.9	40.5	2.2	56.1	73.9	17.8	150	359	
Vert.	12010.000	PK	46.9	39.6	11.1	39.9	2.2	59.9	73.9	14.0	150	0	
Vert.	1601.333	AV	34.0	25.3	13.9	40.8	2.2	34.6	53.9	19.3	168	8	
Vert.	2390.000	AV	33.4	27.7	14.8	40.7	2.2	37.4	53.9	16.5	157	180	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : 20log(3.87 m / 3.0 m) = 2.2 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4804.000	AV	41.1	31.3	7.5	41.5	-24.6	2.2	16.0	53.9	37.9	
Hori.	7206.000	AV	34.4	36.6	9.0	41.1	-24.6	2.2	16.5	53.9	37.4	
Hori.	9608.000	AV	33.2	37.9	9.9	40.5	-24.6	2.2	18.1	53.9	35.8	
Hori.	12010.000	AV	33.0	39.6	11.1	39.9	-24.6	2.2	21.4	53.9	32.5	
Vert.	4804.000	AV	43.5	31.3	7.5	41.5	-24.6	2.2	18.4	53.9	35.5	
Vert.	7206.000	AV	34.4	36.6	9.0	41.1	-24.6	2.2	16.5	53.9	37.4	
Vert.	9608.000	AV	33.2	37.9	9.9	40.5	-24.6	2.2	18.1	53.9	35.8	
Vert.	12010.000	AV	33.0	39.6	11.1	39.9	-24.6	2.2	21.4	53.9	32.5	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Dwell(time)factor + Distance factor

Distance factor : 1 GHz - 13 GHz : 20log(3.87 m / 3.0 m) = 2.2 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	88.9	27.7	14.9	40.7	2.2	93.0	-	-	Carrier
Hori.	2398.749	PK	48.6	27.7	14.8	40.7	2.2	52.6	93.0	40.4	
Hori.	2400.000	PK	42.2	27.7	14.9	40.7	2.2	46.3	93.0	46.7	
Vert.	2402.000	PK	87.3	27.7	14.9	40.7	2.2	91.4	-	-	Carrier
Vert.	2398.762	PK	47.3	27.7	14.8	40.7	2.2	51.3	71.4	20.1	
Vert.	2400.000	PK	41.2	27.7	14.9	40.7	2.2	45.3	71.4	26.1	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : 20log(3.87 m / 3.0 m) = 2.2 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

UL Japan, Inc.

Shonan EMC Lab.

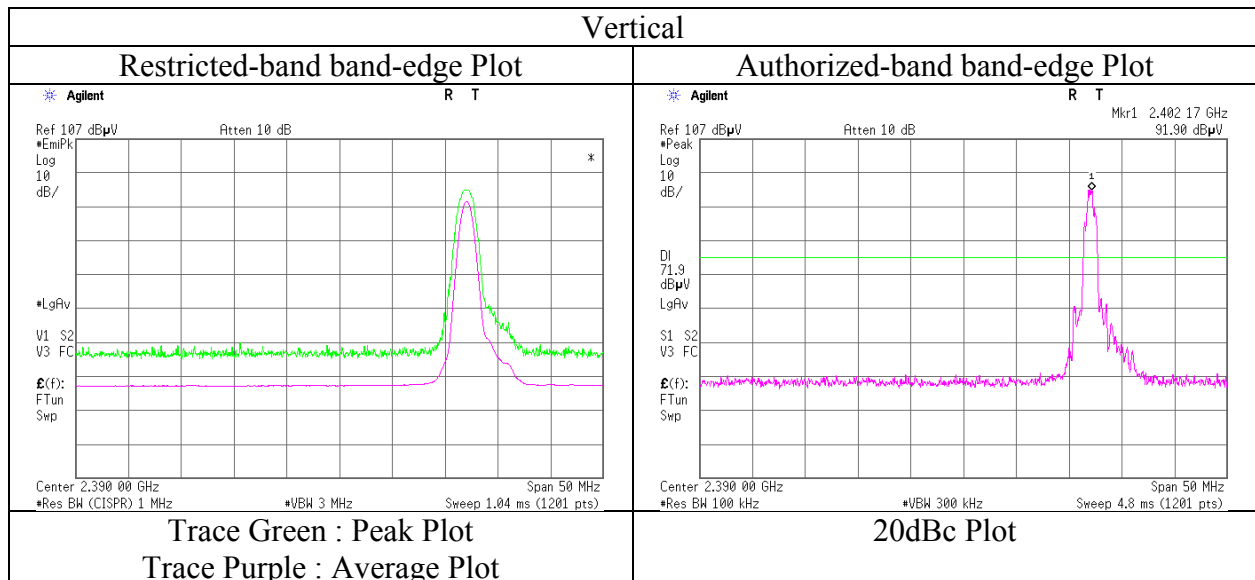
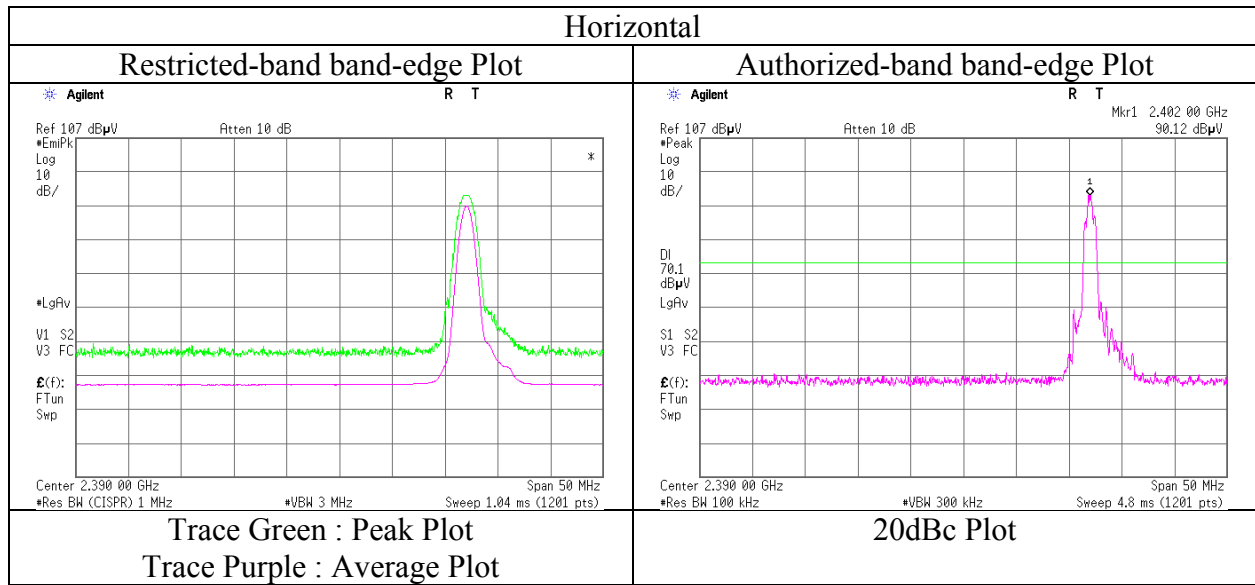
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11238416S-A
Date	April 21, 2016
Temperature / Humidity	22 deg. C / 51 % RH
Engineer	Yasumasa Owaki
Mode	Tx, Hopping Off, 3DH5 2402 MHz



* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No. : 11238416S-A
Date : April 16, 2016 April 17, 2016
Temperature / Humidity : 21 deg. C / 38 % RH 22 deg. C / 40 % RH
Engineer : Hikaru Shirasawa Kazutaka Takeyama
(1-26.5 GHz) (30-1000 MHz)
Mode : Tx, Hopping Off, 3DH5 2441 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	120.031	QP	33.0	12.7	8.1	31.8	0.0	22.0	43.5	21.5	255	127	
Hori.	312.497	QP	37.7	14.2	6.6	31.8	0.0	26.7	46.0	19.3	150	175	
Hori.	375.000	QP	38.6	15.5	7.0	31.8	0.0	29.3	46.0	16.7	100	159	
Hori.	437.504	QP	38.1	16.5	7.4	31.9	0.0	30.1	46.0	15.9	100	101	
Hori.	648.006	QP	36.5	19.6	8.5	32.0	0.0	32.6	46.0	13.4	100	147	
Hori.	843.747	QP	35.0	21.6	9.4	31.6	0.0	34.4	46.0	11.6	133	2	
Hori.	906.249	QP	32.0	22.3	9.7	31.3	0.0	32.7	46.0	13.3	112	356	
Hori.	1627.333	PK	46.2	25.4	13.9	40.8	2.2	46.9	73.9	27.0	178	35	
Hori.	4882.000	PK	51.1	31.6	7.6	41.4	2.2	51.1	73.9	22.8	107	147	
Hori.	7323.000	PK	48.9	36.7	9.1	41.3	2.2	55.6	73.9	18.3	150	359	
Hori.	9764.000	PK	48.4	38.0	10.0	40.4	2.2	58.2	73.9	15.7	150	0	
Hori.	12205.000	PK	47.3	39.6	11.2	39.8	2.2	60.5	73.9	13.4	150	359	
Hori.	1627.333	AV	34.8	25.4	13.9	40.8	2.2	35.5	53.9	18.4	178	35	
Vert.	120.041	QP	33.0	12.7	8.1	31.8	0.0	22.0	43.5	21.5	100	254	
Vert.	185.252	QP	24.0	16.2	8.9	31.8	0.0	17.3	43.5	26.2	100	2	
Vert.	843.745	QP	34.0	21.6	9.4	31.6	0.0	33.4	46.0	12.6	100	333	
Vert.	864.353	QP	30.3	21.8	9.5	31.5	0.0	30.1	46.0	15.9	100	262	
Vert.	1627.333	PK	46.2	25.4	13.9	40.8	2.2	46.9	73.9	27.0	150	359	
Vert.	4882.000	PK	51.4	31.6	7.6	41.4	2.2	51.4	73.9	22.5	131	153	
Vert.	7323.000	PK	46.8	36.7	9.1	41.3	2.2	53.5	73.9	20.4	150	359	
Vert.	9764.000	PK	46.2	38.0	10.0	40.4	2.2	56.0	73.9	17.9	150	0	
Vert.	12205.000	PK	45.9	39.6	11.2	39.8	2.2	59.1	73.9	14.8	150	359	
Vert.	1627.333	AV	35.9	25.4	13.9	40.8	2.2	36.6	53.9	17.3	150	359	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.87\text{ m} / 3.0\text{ m}) = 2.2\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4882.000	AV	38.0	31.6	7.6	41.4	-24.6	2.2	13.4	53.9	40.5	
Hori.	7323.000	AV	36.9	36.7	9.1	41.3	-24.6	2.2	19.0	53.9	34.9	
Hori.	9764.000	AV	35.7	38.0	10.0	40.4	-24.6	2.2	20.9	53.9	33.0	
Hori.	12205.000	AV	35.2	39.6	11.2	39.8	-24.6	2.2	23.8	53.9	30.1	
Vert.	4882.000	AV	36.5	31.6	7.6	41.4	-24.6	2.2	11.9	53.9	42.0	
Vert.	7323.000	AV	34.3	36.7	9.1	41.3	-24.6	2.2	16.4	53.9	37.5	
Vert.	9764.000	AV	33.6	38.0	10.0	40.4	-24.6	2.2	18.8	53.9	35.1	
Vert.	12205.000	AV	33.0	39.6	11.2	39.8	-24.6	2.2	21.6	53.9	32.3	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Dwell(time)factor + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.87\text{ m} / 3.0\text{ m}) = 2.2\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No. : 11238416S-A
Date : April 16, 2016 April 17, 2016
Temperature / Humidity : 21 deg. C / 38 % RH 22 deg. C / 40 % RH
Engineer : Hikaru Shirasawa Kazutaka Takeyama
(1-26.5 GHz) (30-1000 MHz)
Mode : Tx, Hopping Off, 3DH5 2480 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	120.036	QP	35.0	12.7	8.1	31.8	0.0	24.0	43.5	19.5	255	132	
Hori.	312.502	QP	38.7	14.2	6.6	31.8	0.0	27.7	46.0	18.3	150	171	
Hori.	374.998	QP	39.3	15.5	7.0	31.8	0.0	30.0	46.0	16.0	100	162	
Hori.	437.495	QP	38.2	16.5	7.4	31.9	0.0	30.2	46.0	15.8	100	106	
Hori.	648.004	QP	36.4	19.6	8.5	32.0	0.0	32.5	46.0	13.5	100	140	
Hori.	769.012	QP	25.0	20.8	9.0	31.9	0.0	22.9	46.0	23.1	150	4	
Hori.	843.744	QP	35.4	21.6	9.4	31.6	0.0	34.8	46.0	11.2	133	6	
Hori.	1653.333	PK	46.4	25.6	14.0	40.8	2.2	47.4	73.9	26.5	100	0	
Hori.	2483.500	PK	49.5	27.8	15.0	40.7	2.2	53.8	73.9	20.1	173	135	
Hori.	4960.000	PK	47.1	31.9	7.6	41.2	2.2	47.6	73.9	26.3	129	155	
Hori.	7440.000	PK	47.3	36.7	9.1	41.4	2.2	53.9	73.9	20.0	150	0	
Hori.	9920.000	PK	45.4	38.1	10.2	40.3	2.2	55.6	73.9	18.3	150	359	
Hori.	12400.000	PK	46.1	39.6	11.3	39.7	2.2	59.5	73.9	14.4	150	0	
Hori.	1653.333	AV	33.4	25.6	14.0	40.8	2.2	34.4	53.9	19.5	100	0	
Hori.	2483.500	AV	35.5	27.8	15.0	40.7	2.2	39.8	53.9	14.1	173	135	
Vert.	120.034	QP	34.4	12.7	8.1	31.8	0.0	23.4	43.5	20.1	100	261	
Vert.	843.747	QP	34.0	21.6	9.4	31.6	0.0	33.4	46.0	12.6	100	336	
Vert.	864.352	QP	33.4	21.8	9.5	31.5	0.0	33.2	46.0	12.8	100	313	
Vert.	906.248	QP	31.1	22.3	9.7	31.3	0.0	31.8	46.0	14.2	100	354	
Vert.	1653.333	PK	45.9	25.6	14.0	40.8	2.2	46.9	73.9	27.0	151	182	
Vert.	2483.583	PK	47.4	27.8	15.0	40.7	2.2	51.7	73.9	22.2	150	0	
Vert.	4960.000	PK	48.7	31.9	7.6	41.2	2.2	49.2	73.9	24.7	149	143	
Vert.	7440.000	PK	49.1	36.7	9.1	41.4	2.2	55.7	73.9	18.2	150	359	
Vert.	9920.000	PK	47.3	38.1	10.2	40.3	2.2	57.5	73.9	16.4	150	0	
Vert.	12400.000	PK	47.6	39.6	11.3	39.7	2.2	61.0	73.9	12.9	150	359	
Vert.	1653.333	AV	35.7	25.6	14.0	40.8	2.2	36.7	53.9	17.2	151	182	
Vert.	2483.583	AV	34.8	27.8	15.0	40.7	2.2	39.1	53.9	14.8	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.87\text{ m} / 3.0\text{ m}) = 2.2\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4960.000	AV	35.5	31.9	7.6	41.2	-24.6	2.2	11.4	53.9	42.5	
Hori.	7440.000	AV	35.8	36.7	9.1	41.4	-24.6	2.2	17.8	53.9	36.1	
Hori.	9920.000	AV	33.6	38.1	10.2	40.3	-24.6	2.2	19.2	53.9	34.7	
Hori.	12400.000	AV	33.7	39.6	11.3	39.7	-24.6	2.2	22.5	53.9	31.4	
Vert.	4960.000	AV	37.1	31.9	7.6	41.2	-24.6	2.2	13.0	53.9	40.9	
Vert.	7440.000	AV	36.6	36.7	9.1	41.4	-24.6	2.2	18.6	53.9	35.3	
Vert.	9920.000	AV	35.2	38.1	10.2	40.3	-24.6	2.2	20.8	53.9	33.1	
Vert.	12400.000	AV	35.2	39.6	11.3	39.7	-24.6	2.2	24.0	53.9	29.9	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Dwell(time)factor + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.87\text{ m} / 3.0\text{ m}) = 2.2\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

UL Japan, Inc.

Shonan EMC Lab.

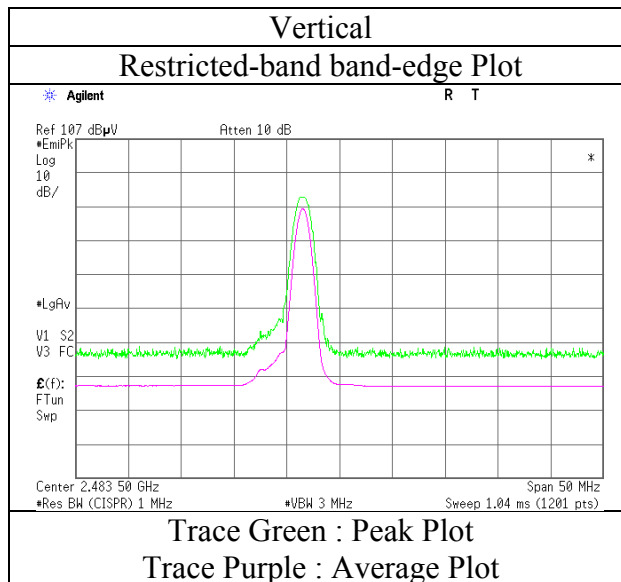
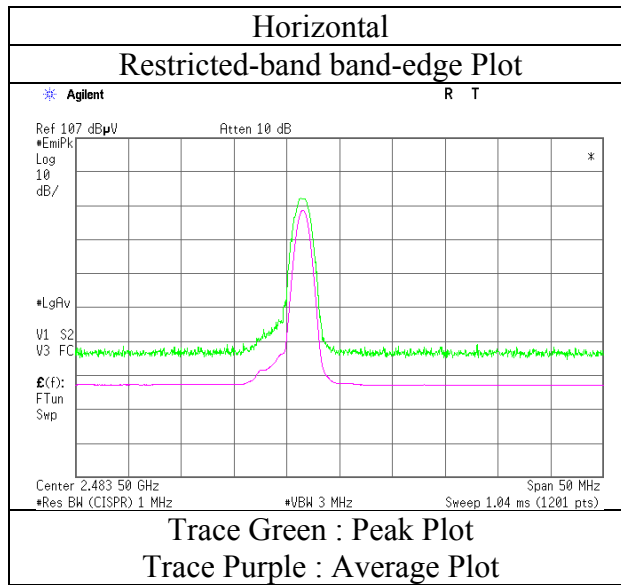
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission (Reference Plot for band-edge)

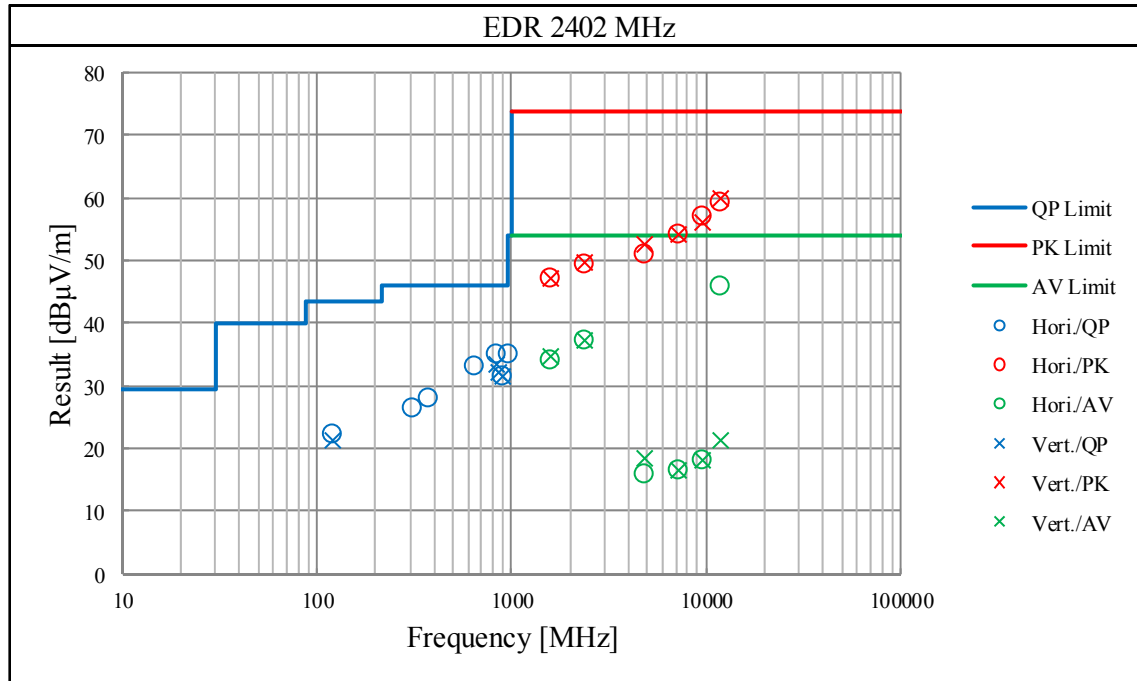
Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11238416S-A
Date	April 21, 2016
Temperature / Humidity	22 deg. C / 51 % RH
Engineer	Yasumasa Owaki
Mode	Tx, Hopping Off, 3DH5 2480 MHz



* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission (Plot data, Worst case)

Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber		
Report No.	11238416S-A		
Date	April 16, 2016	April 17, 2016	
Temperature / Humidity	21 deg. C / 38 % RH	22 deg. C / 40 % RH	
Engineer	Hikaru Shirasawa	Kazutaka Takeyama	
	(1-26.5 GHz)	(30-1000 MHz)	
Mode	Tx, Hopping Off, 3DH5 2402 MHz		

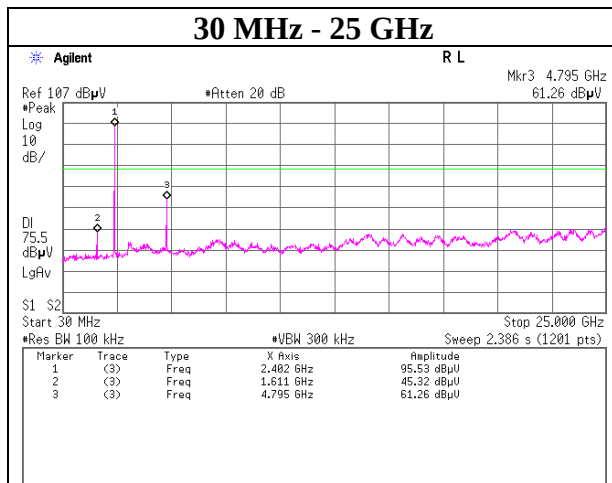
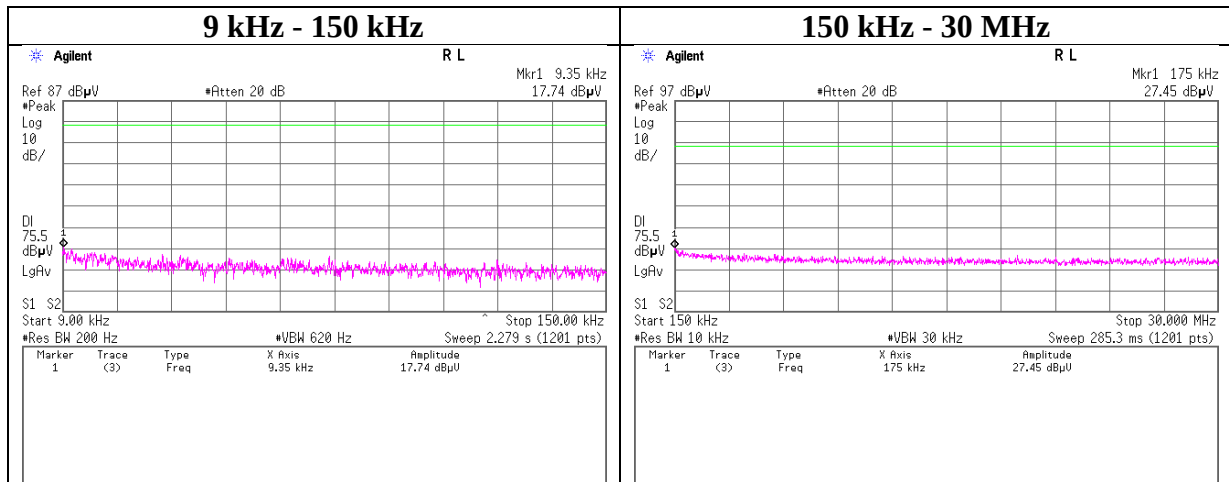


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11238416S-A
Date : April 22, 2016
Temperature / Humidity : 24 deg. C / 47 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx, Hopping Off, DH5

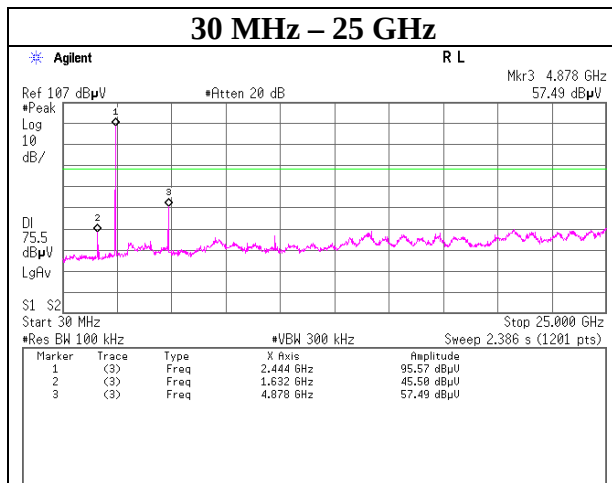
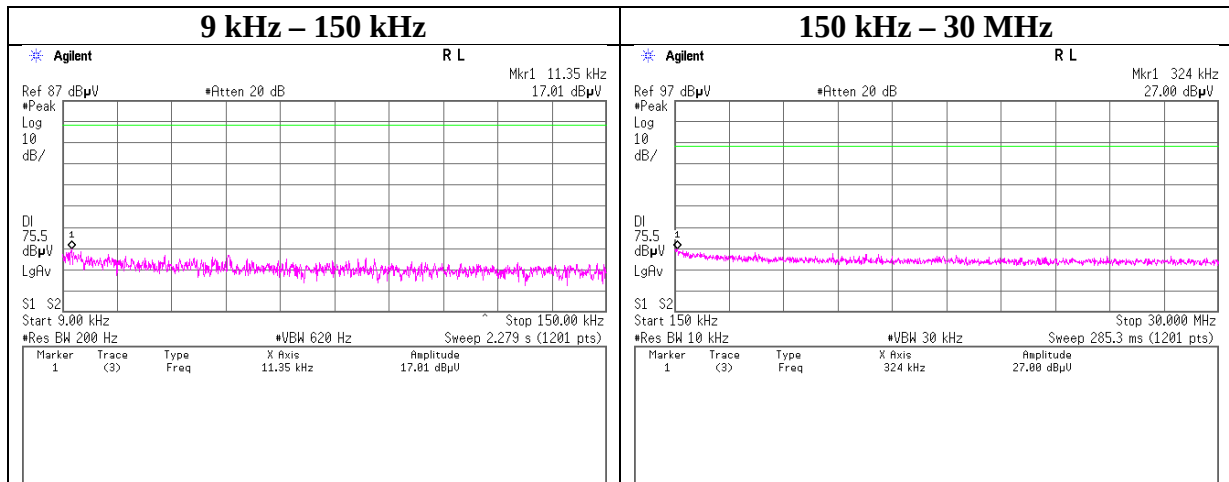
2402 MHz



Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11238416S-A
Date	April 22, 2016
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx, Hopping Off, DH5

2441 MHz



UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

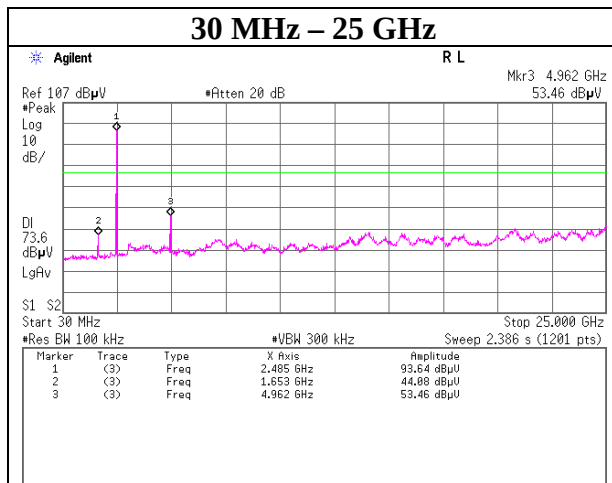
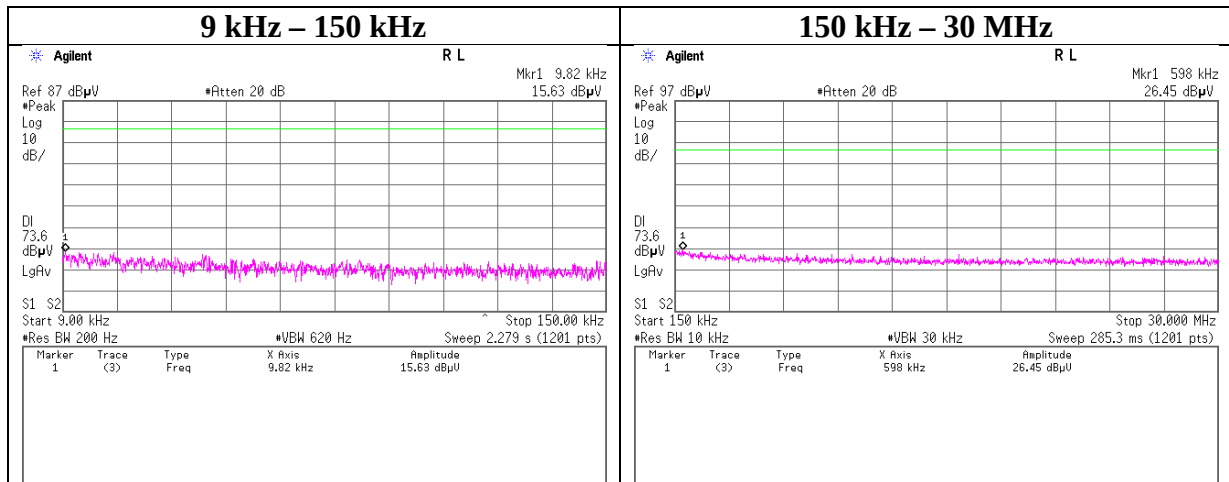
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11238416S-A
Date	April 22, 2016
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx, Hopping Off, DH5

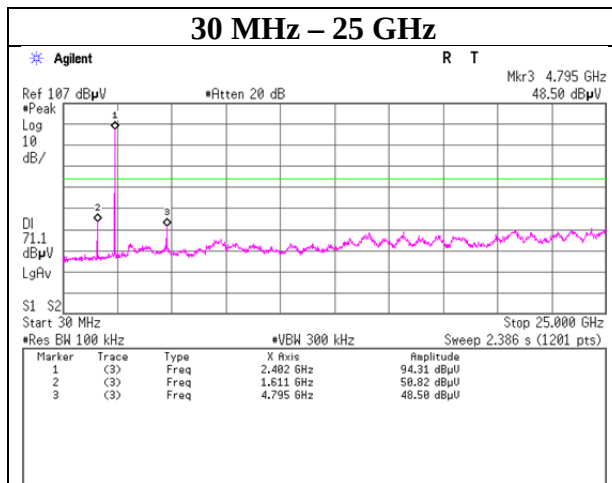
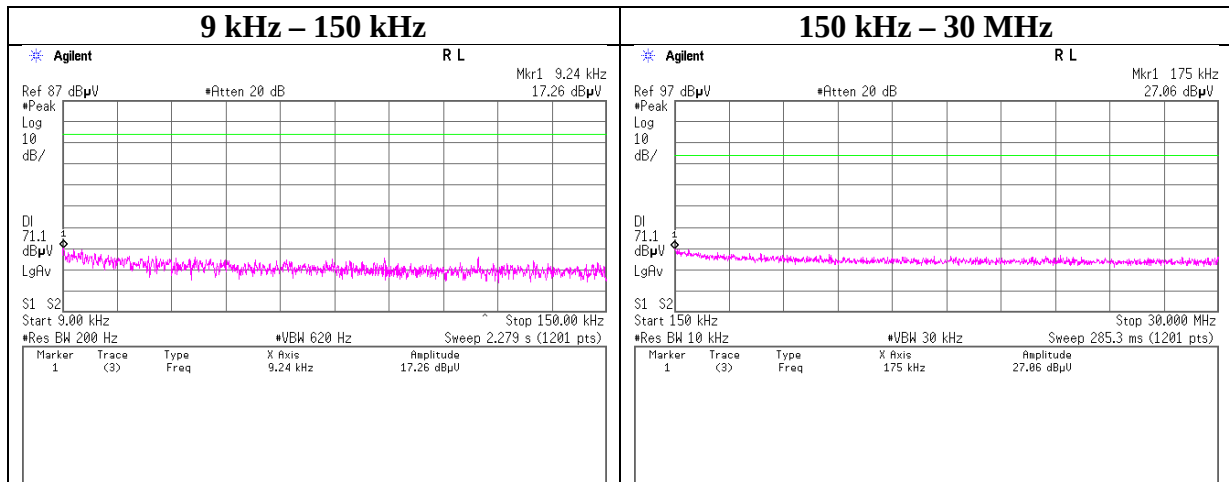
2480 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11238416S-A
Date : April 22, 2016
Temperature / Humidity : 24 deg. C / 47 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx, Hopping Off, 3DH5

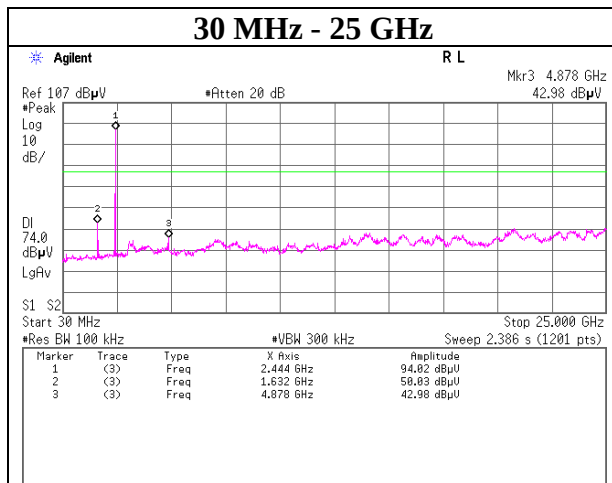
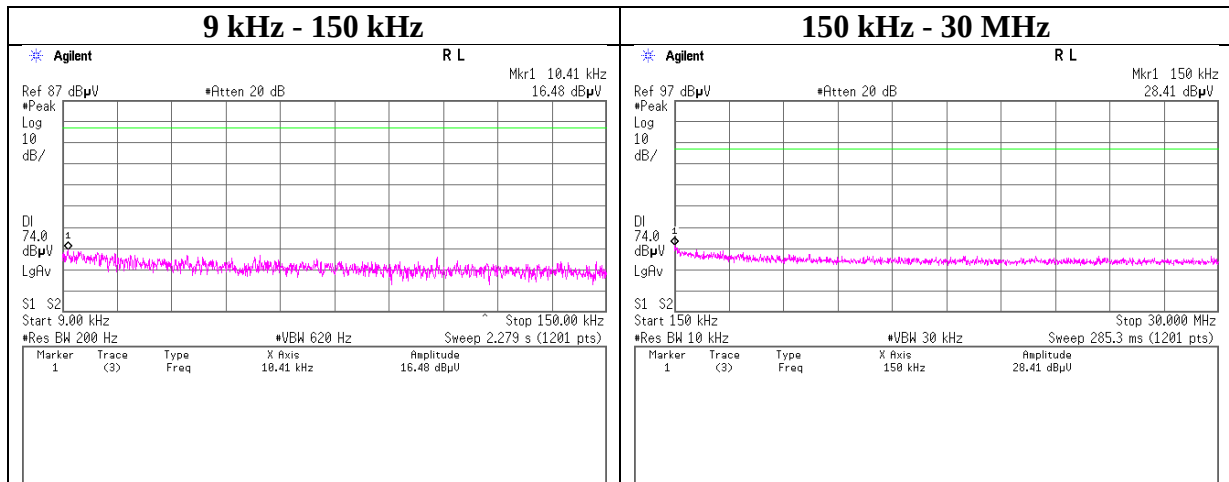
2402 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11238416S-A
Date : April 22, 2016
Temperature / Humidity : 24 deg. C / 47 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx, Hopping Off, 3DH5

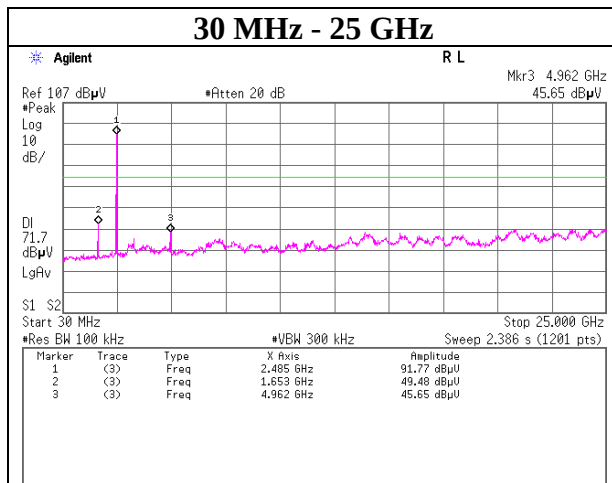
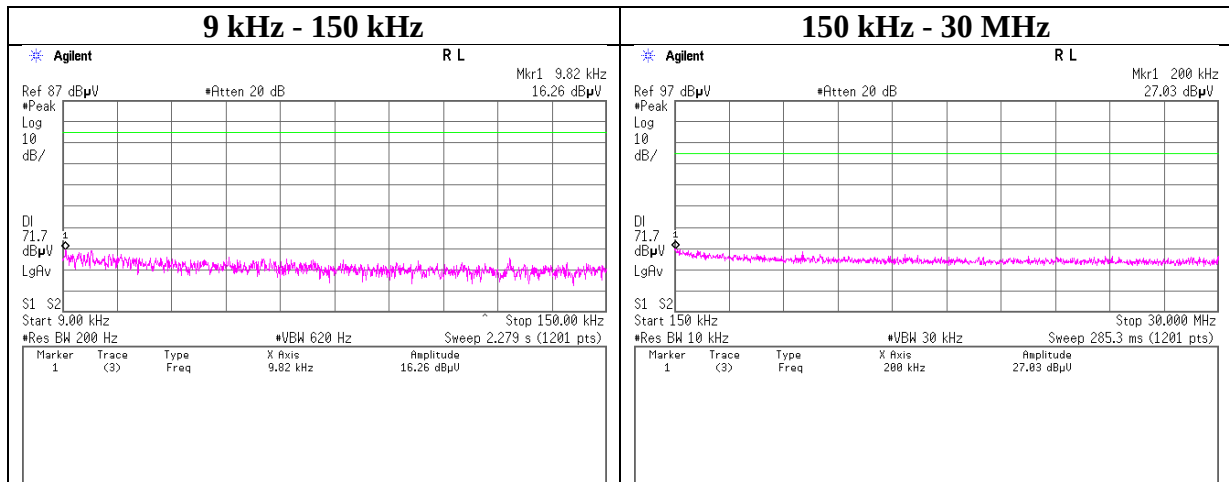
2441 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11238416S-A
Date : April 22, 2016
Temperature / Humidity : 24 deg. C / 47 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx, Hopping Off, 3DH5

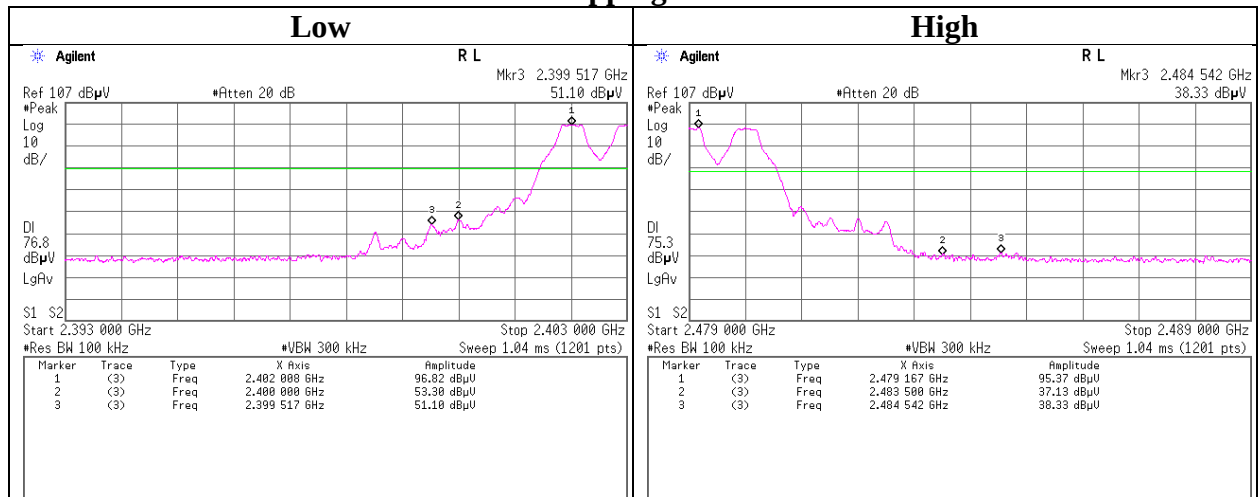
2480 MHz



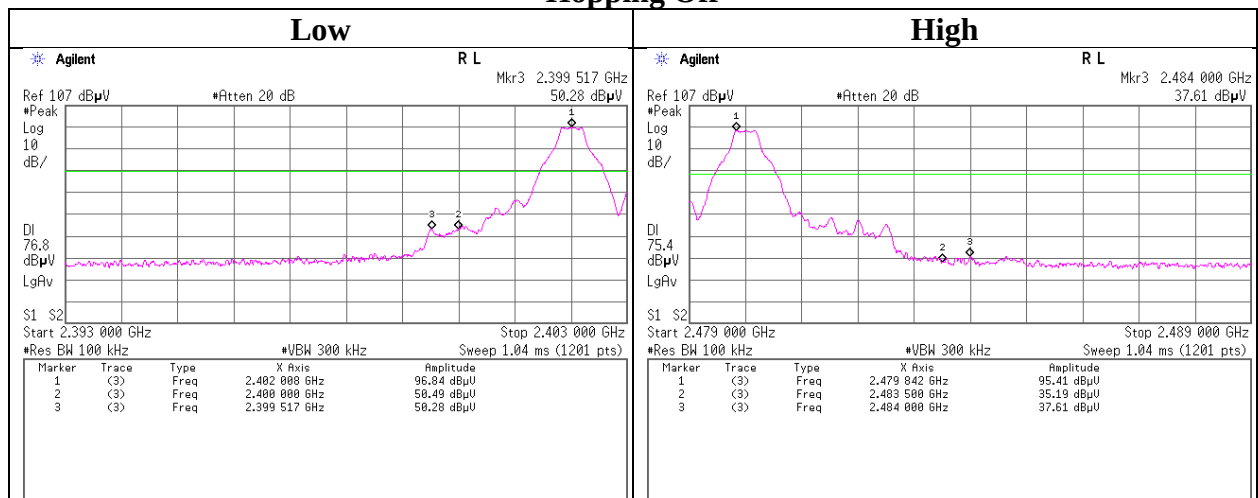
Conducted Emission Band Edge compliance

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11238416S-A
Date : April 22, 2016
Temperature / Humidity : 24 deg. C / 47 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx DH5

Hopping On



Hopping Off



UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

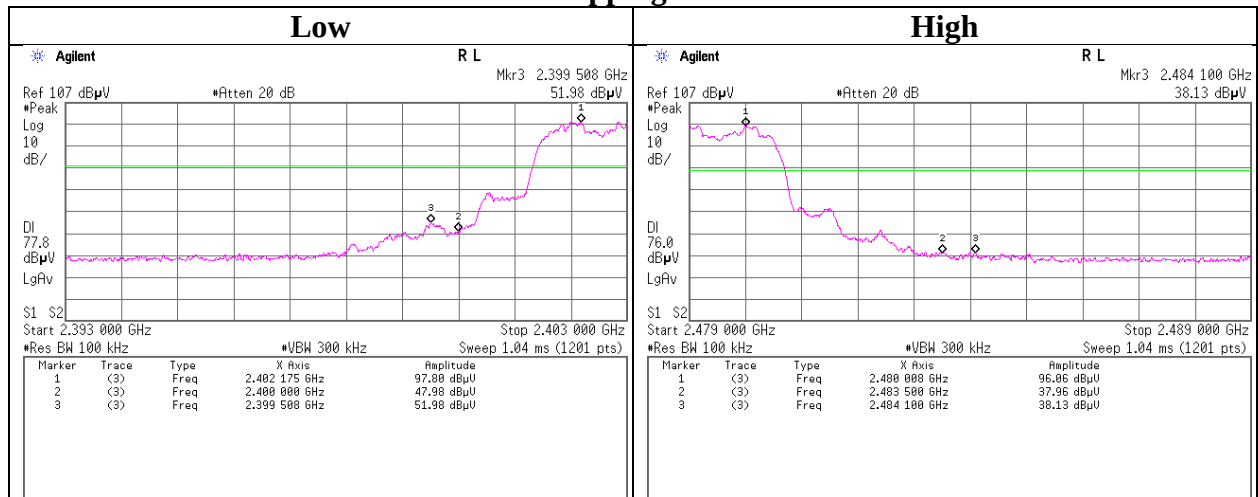
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

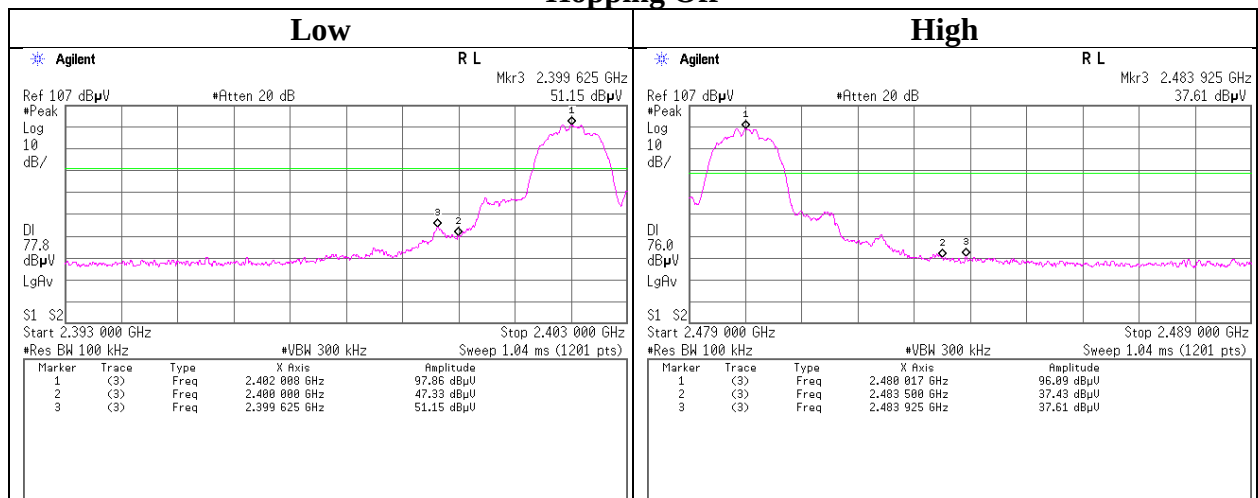
Conducted Emission Band Edge compliance

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11238416S-A
Date : April 22, 2016
Temperature / Humidity : 24 deg. C / 47 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx 3DH5

Hopping On



Hopping Off



UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

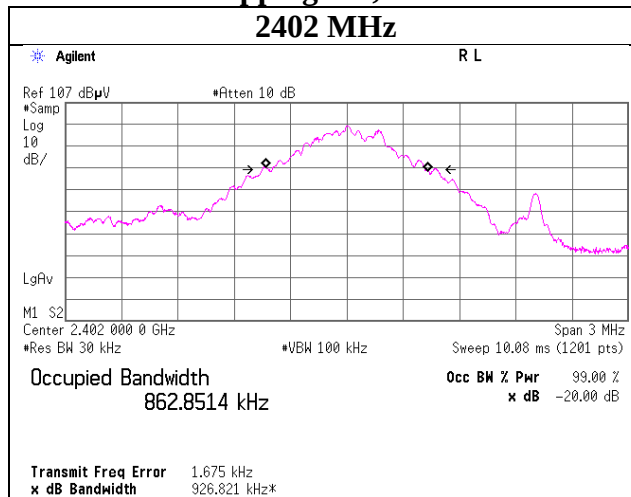
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

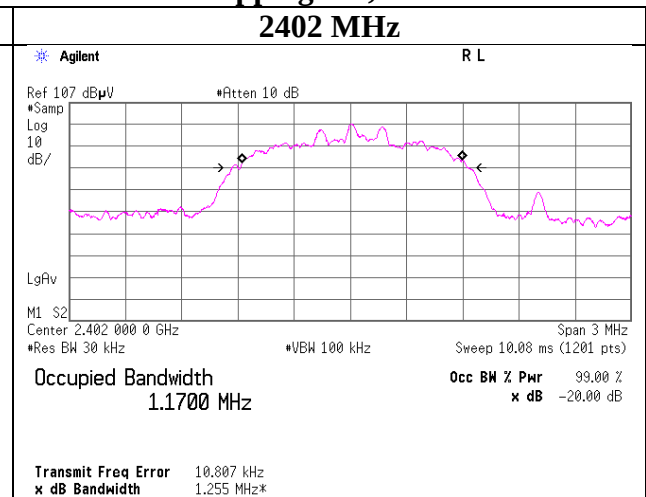
99%Occupied Bandwidth

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11238416S-A
Date : April 22, 2016
Temperature / Humidity : 24 deg. C / 47 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx Hopping Off

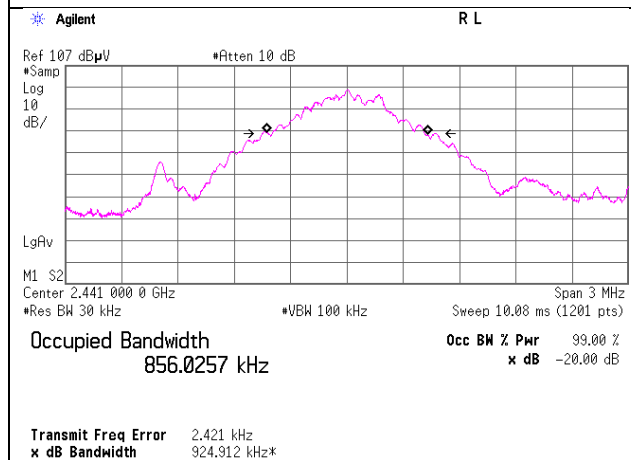
Hopping Off, DH5



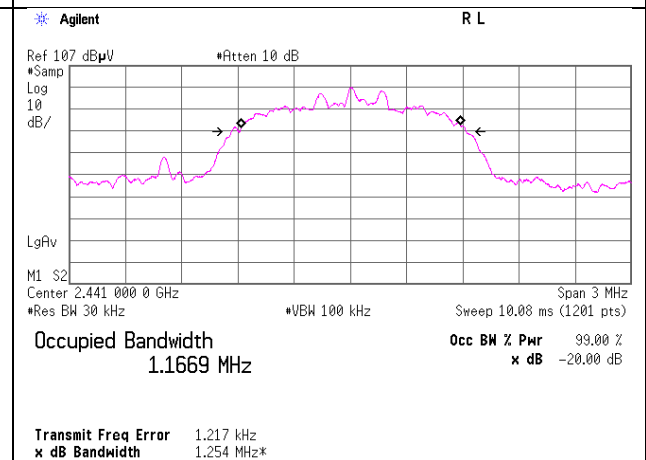
Hopping Off, 3DH5



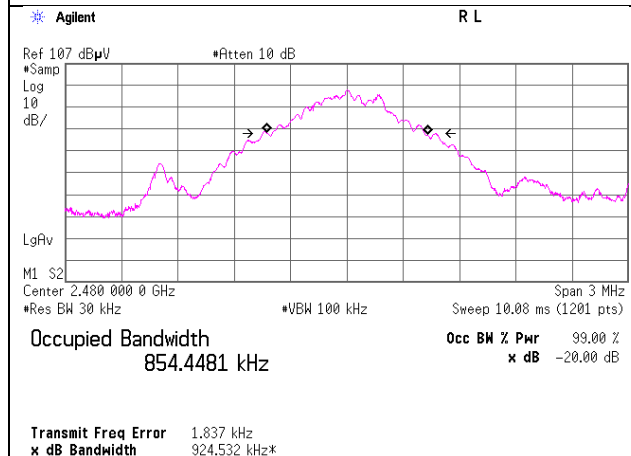
2441 MHz



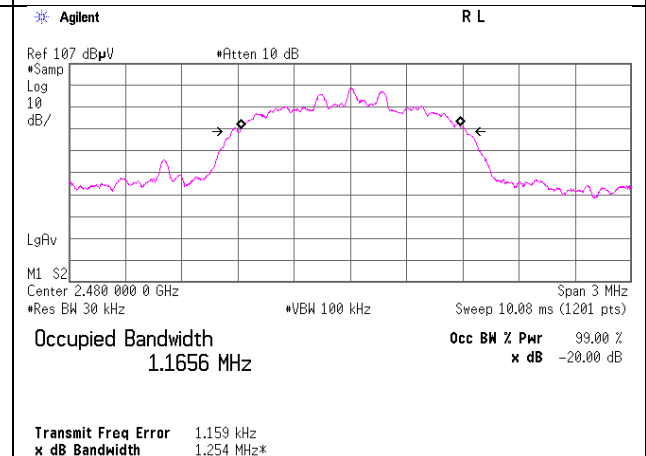
2441 MHz



2480 MHz



2480 MHz



UL Japan, Inc.

Shonan EMC Lab.

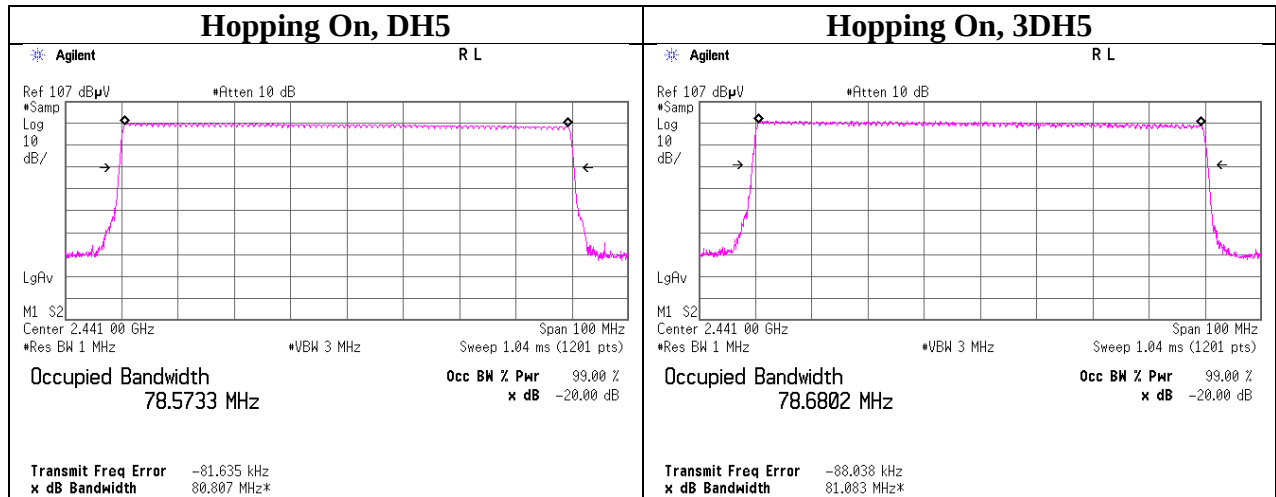
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11238416S-A
Date	April 22, 2016
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx Hopping On



UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	2015/11/04 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2016/03/23 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY4825015 2	AT,RE	2015/09/16 * 12
SOS-10	Humidity Indicator	A&D	AD-5681	4064561	AT	2015/10/22 * 12
STS-06	Digital Hitester	Hioki	3805-50	080997830	AT	2016/03/22 * 12
SPM-07	Power Meter	Agilent	8990B	MY5100272	AT	2016/04/04 * 12
SPSS-04	Power sensor	Agilent	N1923A	MY5326009	AT	2016/04/04 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2016/03/22 * 12
SCC-G01	Coaxial Cable	Suhner	SUCOFLEX 104A	46497/4A	RE	2015/04/17 * 12
SCC-G21	Coaxial Cable	Suhner	SUCOFLEX 104	296169/4	RE	2015/05/19 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2015/08/10 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2015/10/22 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
SAEC-01(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-01(SVSWR)	1	RE	2015/07/08 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
STS-01	Digital Hitester	Hioki	3805-50	080997812	RE	2015/11/18 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2015/11/04 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2015/11/16 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2016/03/15 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2016/03/23 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2016/03/08 * 12
SAJ-02	Antenna Tilt Jig	Intelligent System Engineering Co., Ltd	Antenna Tilt Jig	T-S002	RE	Pre Check
SAF-01	Pre Amplifier	SONOMA	310N	290211	RE	2016/02/19 * 12
KAT6-04	Attenuator	INMET	18N-6dB	-	RE	2015/12/18 * 12
SAT3-09	Attenuator	JFW	50HF-003N	-	RE	2015/08/31 * 12
SBA-01	Biconical Antenna	Schwarzbeck	BBA9106	91032664	RE	2015/10/11 * 12
SCC-A1/A3/A5/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/T OYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(R F Selector)	RE	2015/04/17 * 12
SCC-A2/A4/A6/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/T OYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(R F Selector)	RE	2015/04/17 * 12
SLA-01	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0888	RE	2015/10/11 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2015/11/06 * 12
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2015/07/13 * 12

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: RE: Radiated Emission test
AT: Antenna Terminal Conducted test

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401