



RADIO TEST REPORT

Test Report No. : 11504641S-A-R2

Applicant : JVC KENWOOD Corporation
Type of Equipment : GPS Navigation System
Model No. : ECI1-MC100K
FCC ID : IOMKC014
Test regulation : FCC Part 15 Subpart C: 2016
Test Result : Complied

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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)
7. This report is a revised version of 11504641S-A-R1. 11504641S-A-R1 is replaced with this report.

Date of test: November 4 to 22, 2016

Representative test engineer:


Shinichi Takano

Engineer

Consumer Technology Division

Approved by:


Toyokazu Imamura

Leader

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".

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 11504641S-A

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SECTION 1: Customer information

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

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

2.1 Identification of E.U.T.

Type of Equipment	:	GPS Navigation System
Model No.	:	ECI1-MC100K
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12 V
Receipt Date of Sample	:	October 28, 2016
Country of Mass-production	:	Japan
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: ECI1-MC100K (referred to as the EUT in this report) is a GPS Navigation System.

Radio Specification

[Bluetooth]

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	FHSS
Power Supply (radio part input)	:	DC 3.3 V / 1.8 V
Antenna type	:	Inverted F Pattern Antenna
Antenna Gain	:	1.5 dBi (Antenna 2)
Clock frequency (Maximum)	:	6.3 GHz

[WLAN]

Radio Type	:	Transceiver
Frequency of Operation	:	2412 MHz - 2462 MHz
Modulation	:	DSSS
Power Supply (radio part input)	:	DC 3.3 V / 1.8 V
Antenna type	:	Inverted F Pattern Antenna
Antenna Gain	:	Antenna 1 : -2.2 dBi Antenna 2 : 1.5 dBi
Clock frequency (Maximum)	:	6.3 GHz

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on November 14, 2016 and effective December 14, 2016

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

* The revision on November 14, 2016, 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	*1)
Carrier Frequency Separation	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section 15.247(a)(1) IC: RSS-247 5.1 (2)	See data.	Complied	Conducted
20dB Bandwidth	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section 15.247(a)(1) IC: RSS-247 5.1 (1)		Complied	Conducted
Number of Hopping Frequency	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section 15.247(a)(1)(iii) IC: RSS-247 5.1 (4)		Complied	Conducted
Dwell time	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section 15.247(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: Section 15.247(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: Section 15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	6.3 dB 2483.500 MHz, AV, Vert. Tx, Hopping Off, DH5 2480 MHz	Complied	Conducted/ Radiated (above 30 MHz) *2)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420.

*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 equipment provides the wireless transmitter with stable power supply (DC 3.3 V / 1.8 V). Instead of a new battery, DC power supply was used for the test. That does not affect the test result. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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 of Section 15.203.

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

EMI

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

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Item	Frequency range	Uncertainty (+/-)				
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR	No. 5,6,8 SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.6 dB	2.5 dB	2.6 dB	2.5 dB	2.5 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.1 dB	3.1 dB	3.1 dB	-	-
	30 MHz-200 MHz	4.6 dB	4.4 dB	4.6 dB	-	-
	200 MHz-1 GHz	5.8 dB	5.7 dB	5.8 dB	-	-
	1 GHz-13 GHz	4.9 dB	4.9 dB	4.9 dB	-	-
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	4.6 dB	4.6 dB	4.6 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	0.72 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.85 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.74 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	0.91 dB
Spurious emission (Conducted) below 1GHz	1.6 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.3 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.2 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.3 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.4 dB
Bandwidth Measurement	1.01 %
Duty cycle and Time Measurement	0.012 %

Radiated emission test

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

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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	10 m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
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

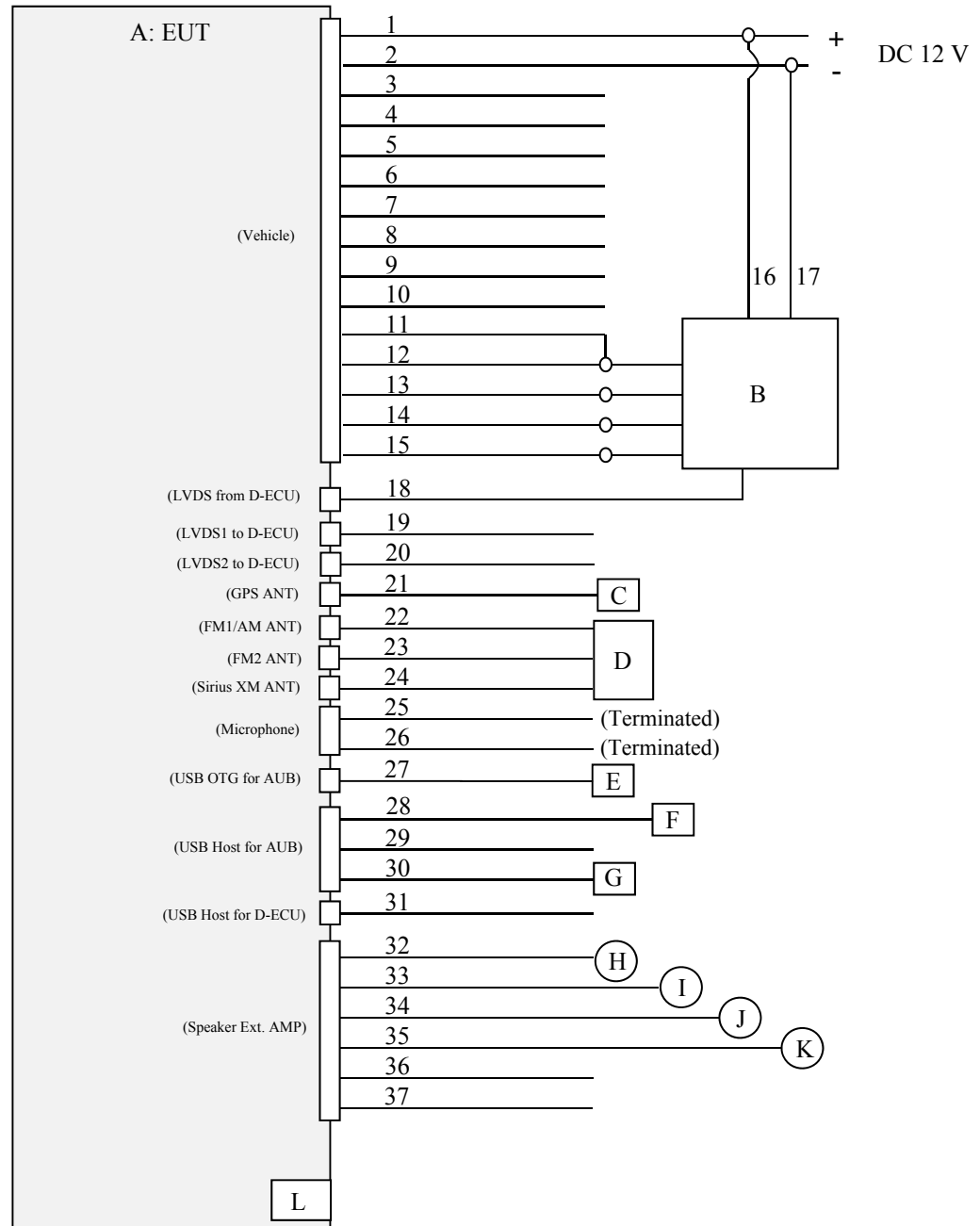
4.1 Operating Mode(s)

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

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Spurious Emission (Conducted/Radiated)	Tx (Hopping Off) DH5, 2DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) DH5, 2DH5	2402 MHz 2441 MHz 2480 MHz
20dB Bandwidth	Tx (Hopping Off) DH5, 2DH5	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx (Hopping On) DH5, 2DH5	-
Dwell time	Tx (Hopping On), -DH1, DH3, DH5 -2DH1, 2DH3, 2DH5	-
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5, 2DH5 -Hopping On -Hopping Off	2402 MHz 2480 MHz
99% Occupied Bandwidth	Tx DH5, 2DH5 -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) *3DH mode (3Mb/s EDR: 8DPSK) was excluded for other tests than power measurement by using 2DH mode (2 Mb/s EDR: pi/4DQPSK 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 the test items based on Bluetooth Core specification. *EUT has the power settings by the software as follows; Power settings: Fixed Software: JVCKENWOOD BT WiFi Certification Test iMX_MC_2016 Version: V0.991 *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



Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	GPS Navigation System	ECI1-MC100K	H7900011	JVC KENWOOD Corporation	EUT
B	Display	DDR2-MC100W	67900046	JVC KENWOOD Corporation	-
C	Jig	-	-	JVC KENWOOD Corporation	-
D	Jig	-	-	JVC KENWOOD Corporation	-
E	USB Memory	SDK-USM1GL	08N18HDDDB	Sony	-
F	USB Memory	AH312	-	Apacer	-
G	iPod	A1320	YM005VWJ71Y	Apple	-
H	Speaker	KFC-RS160	-	JVC KENWOOD Corporation	-
I	Speaker	KFC-RS160	-	JVC KENWOOD Corporation	-
J	Speaker	KFC-RS160	-	JVC KENWOOD Corporation	-
K	Speaker	KFC-RS160	-	JVC KENWOOD Corporation	-
L	micro SDHC Card	4GB	-	TDK	-

List of cable used

No.	Item	Length (m)	Shield (Cable)	Shield (Connector)	Remarks
1	KL30 BATT	2.0 + 1.9	Unshielded	Unshielded	-
2	KL30 GND	2.0 + 1.9	Unshielded	Unshielded	-
3	LIN	2.0	Unshielded	Unshielded	-
4	LIN +12V	2.0	Unshielded	Unshielded	-
5	LIN GND	2.0	Unshielded	Unshielded	-
6	C-SW +12V	2.0	Unshielded	Unshielded	-
7	C-SW GND	2.0	Unshielded	Unshielded	-
8	KL15 Ignition	2.0	Unshielded	Unshielded	-
9	Priv Vehicle L	2.0	Unshielded	Unshielded	-
10	Priv Vehicle H	2.0	Unshielded	Unshielded	-
11	BU 5U	2.0	Unshielded	Unshielded	-
12	ECU ON	2.0 + 0.5	Unshielded	Unshielded	-
13	Priv Control L	2.0 + 0.5	Unshielded	Unshielded	-
14	Priv Control H	2.0 + 0.5	Unshielded	Unshielded	-
15	Safe Shutdown	2.0 + 0.5	Unshielded	Unshielded	-
16	KL30 BATT	0.5	Unshielded	Unshielded	-
17	KL30 GND	0.5	Unshielded	Unshielded	-
18	LVDS from D-ECU	1.0	Shielded	Shielded	-
19	LVDS1 to D-ECU	2.8	Shielded	Shielded	-
20	LVDS2 to D-ECU	2.8	Shielded	Shielded	-
21	GPS ANT	3.2	Shielded	Shielded	-
22	FM1/AM ANT	2.8	Shielded	Shielded	-
23	FM2 ANT	2.8	Shielded	Shielded	-
24	Sirius XM ANT	2.8	Shielded	Shielded	-
25	MIC 1	2.8	Shielded	Unshielded	-
26	MIC 2	2.8	Shielded	Unshielded	-
27	USB (USB OTG for AUB)	2.8	Shielded	Shielded	-
28	USB (USB Host for AUB)	2.8	Unshielded	Shielded	-
29	USB Host GND	2.8	Unshielded	Unshielded	-
30	Audio	2.8 + 3.0	Unshielded	Shielded	-
31	USB Host for D-ECU	2.8	Shielded	Shielded	-
32	Speaker Front L	2.8 + 1.9	Unshielded	Unshielded	-
33	Speaker Front R	2.8 + 1.9	Unshielded	Unshielded	-
34	Speaker Rear L	2.8 + 1.9	Unshielded	Unshielded	-
35	Speaker Rear R	2.8 + 1.9	Unshielded	Unshielded	-
36	Info CAN L	2.8	Unshielded	Unshielded	-
37	Info CAN H	2.8	Unshielded	Unshielded	-

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SECTION 5: Radiated Spurious Emission

Test Procedure

[For below 1 GHz]

EUT was placed on a platform of nominal size, 2.0 m by 1.0 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	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	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	3.88 m*2) (1 GHz – 13 GHz), 1 m*3) (13 GHz – 31.5 GHz)		3.88 m*2) (1 GHz – 13 GHz), 1 m*3) (13 GHz – 31.5 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: $20 \times \log(3.88 \text{ m}/3.0 \text{ m}) = 2.24 \text{ dB}$

*3) Distance Factor: $20 \times \log(1.0 \text{ m}/3.0 \text{ m}) = -9.54 \text{ dB}$

The test was made on EUT at the normal use position.

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

Measurement range : 30 MHz - 31.5 GHz

Test data : APPENDIX

Test result : Pass

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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	10 kHz	30 kHz				
	30 MHz to 31.5 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 %. Peak hold was applied as Worst-case measurement. *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

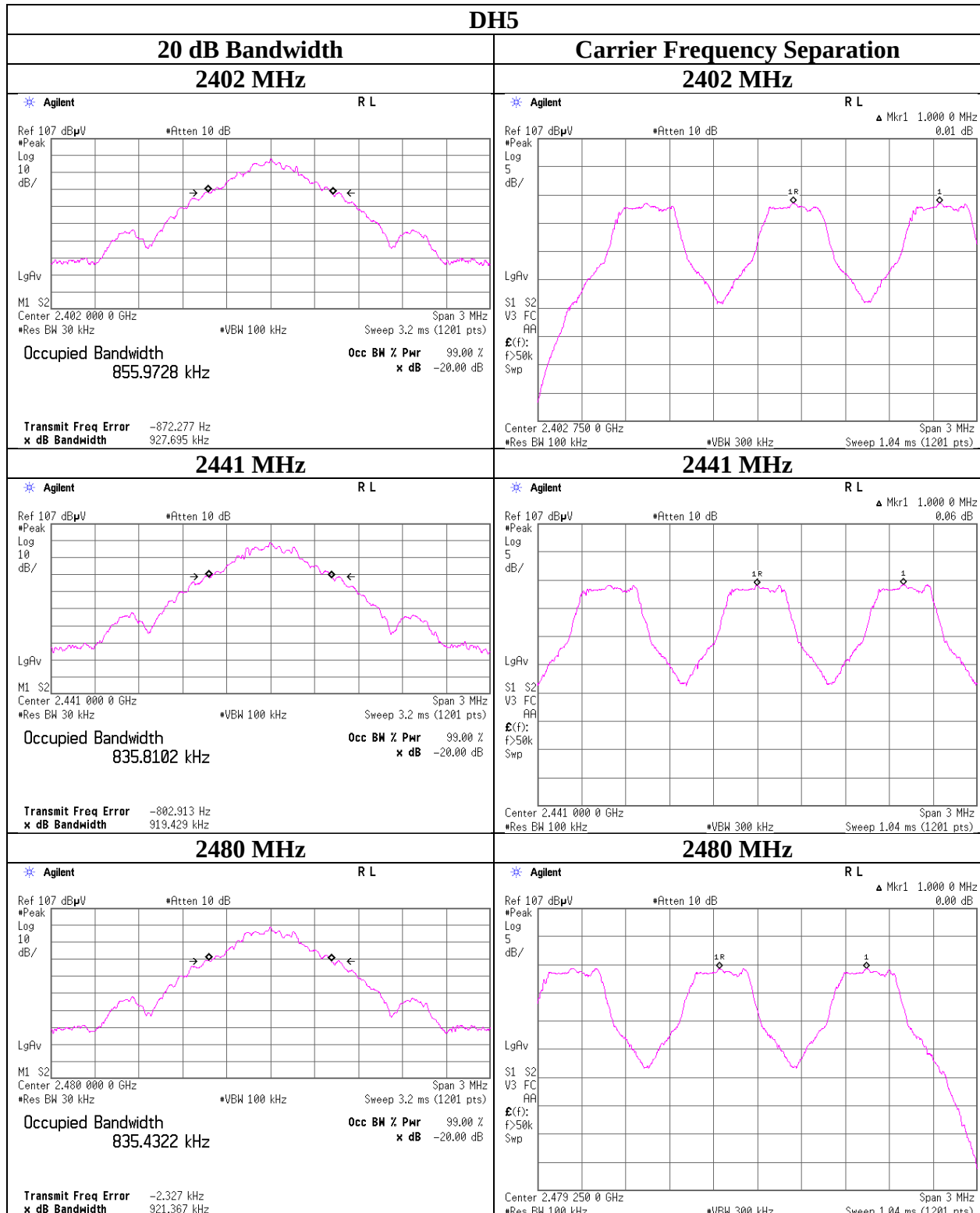
Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-A-R2
Date	November 22, 2016
Temperature / Humidity	28deg. C / 47% RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.928	1.000	≥ 0.618
DH5	2441.0	0.919	1.000	≥ 0.613
DH5	2480.0	0.921	1.000	≥ 0.614
2DH5	2402.0	1.278	1.000	≥ 0.852
2DH5	2441.0	1.277	1.000	≥ 0.851
2DH5	2480.0	1.278	1.000	≥ 0.852

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

No limit applies to 20dB Bandwidth.

20dB Bandwidth and Carrier Frequency Separation



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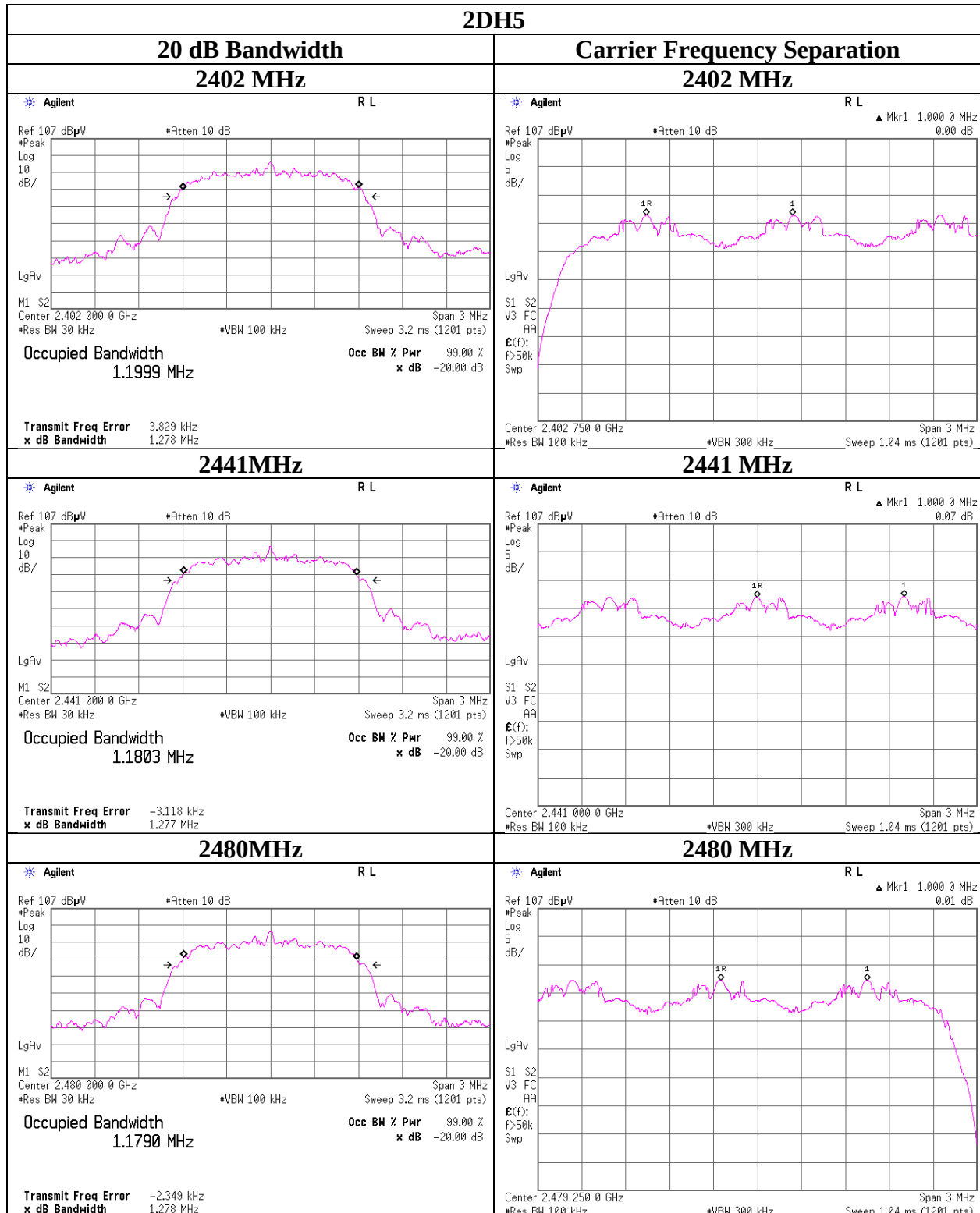
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20dB Bandwidth and Carrier Frequency Separation



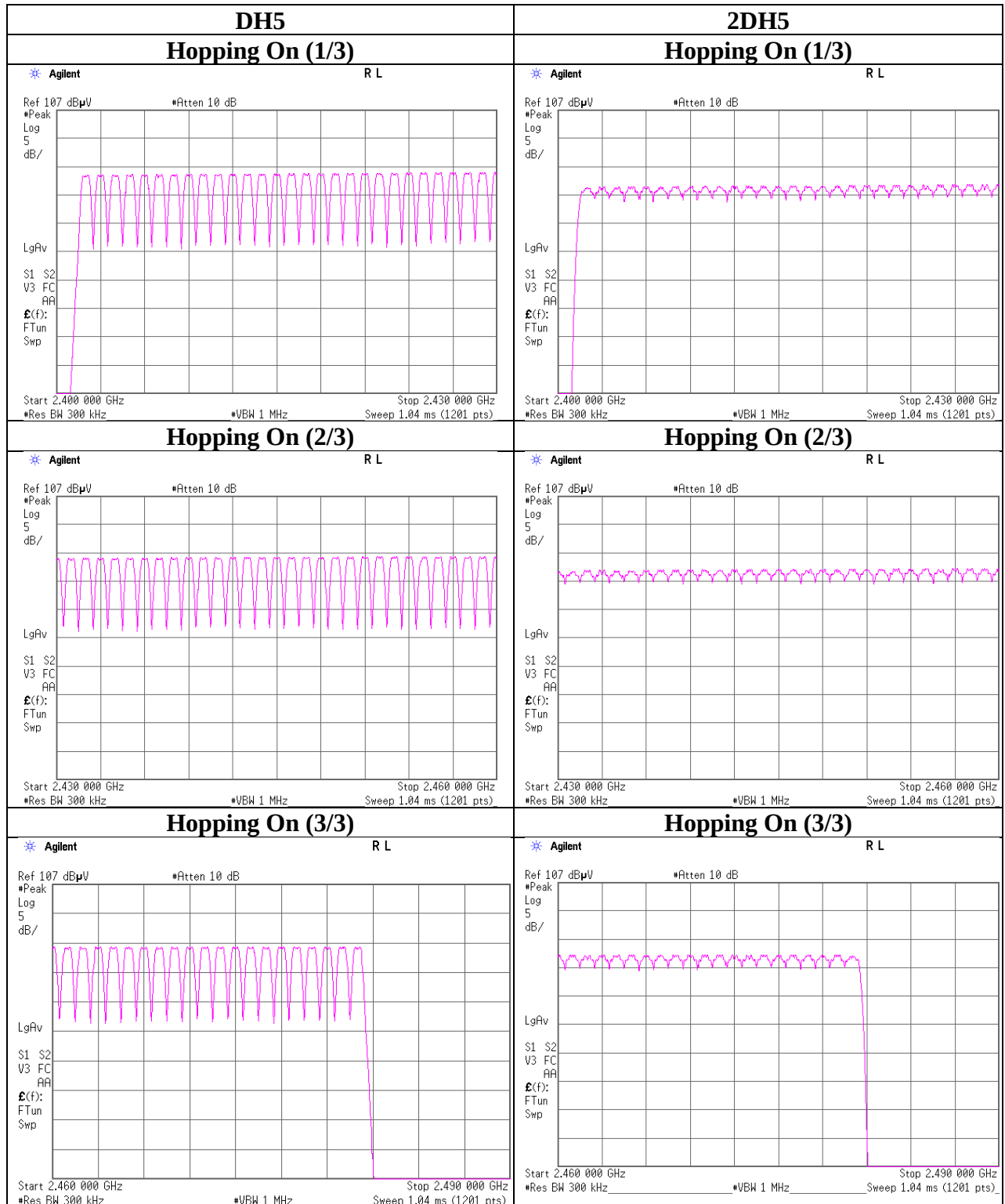
Number of Hopping Frequency

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11504641S-A-R2
Date November 22, 2016
Temperature / Humidity 28 deg. C / 47 % RH
Engineer Yosuke Ishikawa
Mode Tx, Hopping On

Mode	Number of channel [channels]	Limit [channels]
DH5	79	≥ 15
2DH5	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



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Dwell time

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-A-R2
Date	November 22, 2016
Temperature / Humidity	28 deg. C / 47 % RH
Engineer	Yosuke Ishikawa
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	48.6 times / 5 sec. x 31.6 sec. = 308 times	0.417	128	400
DH3	28.2 times / 5 sec. x 31.6 sec. = 179 times	1.673	299	400
DH5	17.4 times / 5 sec. x 31.6 sec. = 110 times	2.924	322	400
2DH1	48.8 times / 5 sec. x 31.6 sec. = 309 times	0.432	133	400
2DH3	27.2 times / 5 sec. x 31.6 sec. = 172 times	1.676	288	400
2DH5	18.0 times / 5 sec. x 31.6 sec. = 114 times	2.924	333	400

Sample Calculation

Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

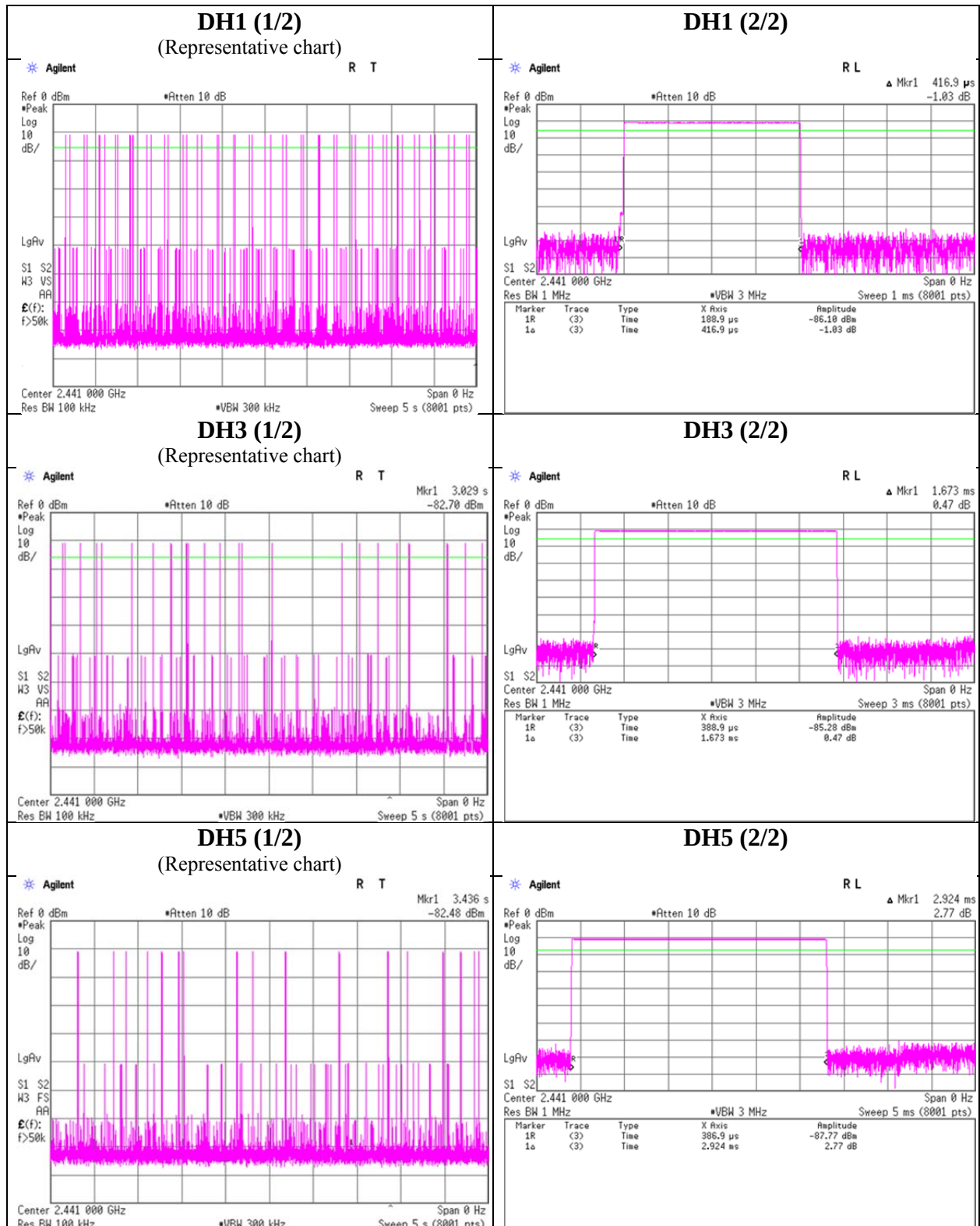
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	47	49	50	49	48	48.6
DH3	24	28	25	27	37	28.2
DH5	17	16	18	19	17	17.4
2DH1	49	48	48	49	50	48.8
2DH3	28	25	28	28	27	27.2
2DH5	19	18	17	18	18	18

Sample Calculation

Average = Summation (Sampling 1 to 5) / 5

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



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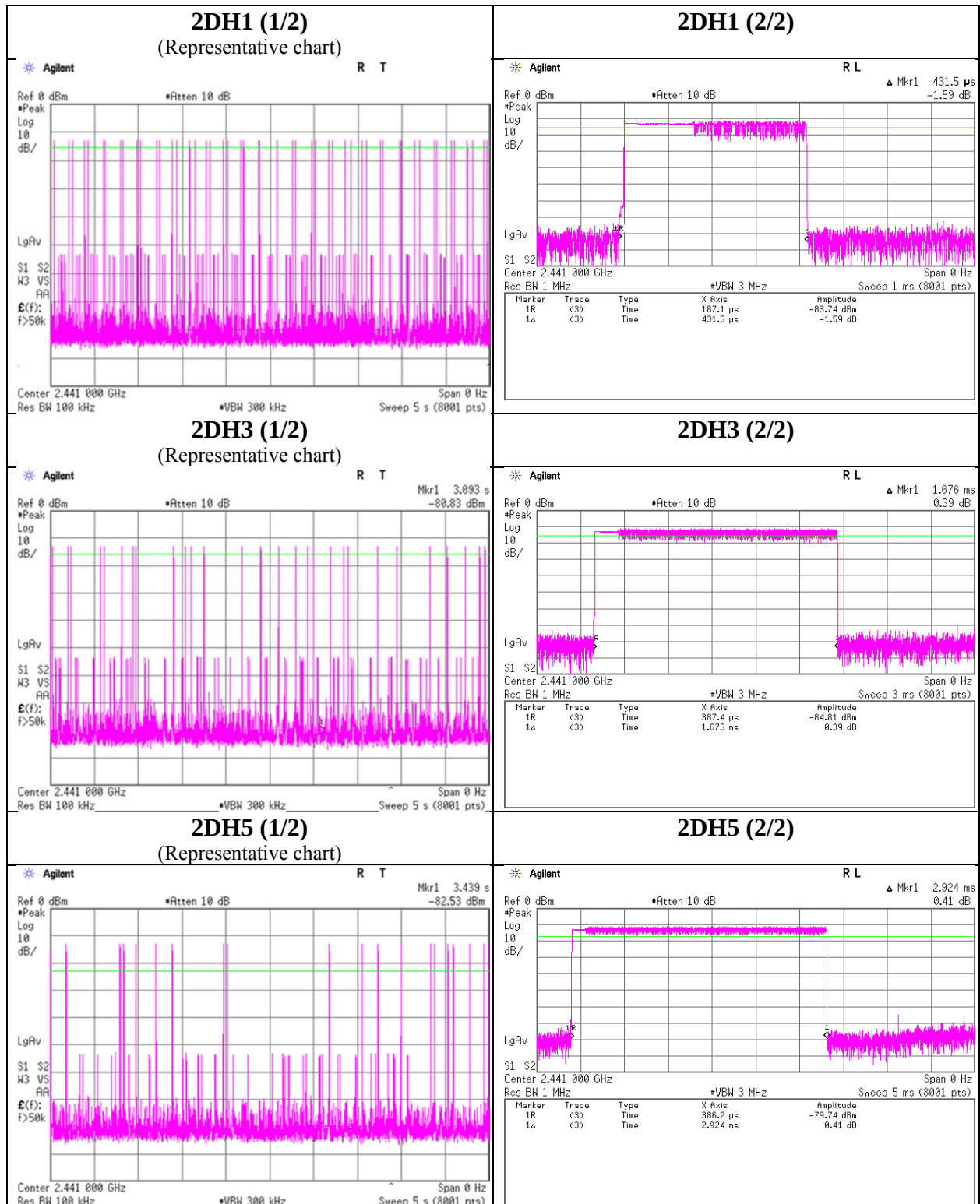
Shonan EMC Lab.

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Dwell time



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Maximum Peak Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-A-R2
Date	November 22, 2016
Temperature / Humidity	28 deg. C / 47 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-11.24	2.33	9.92	1.01	1.26	20.96	125	19.95
DH5	2441.0	-10.69	2.34	9.92	1.57	1.44	20.96	125	19.39
DH5	2480.0	-10.54	2.35	9.92	1.73	1.49	20.96	125	19.23
2DH5	2402.0	-10.99	2.33	9.92	1.26	1.34	20.96	125	19.70
2DH5	2441.0	-10.35	2.34	9.92	1.91	1.55	20.96	125	19.05
2DH5	2480.0	-10.24	2.35	9.92	2.03	1.60	20.96	125	18.93
3DH5	2402.0	-11.33	2.33	9.92	0.92	1.24	20.96	125	20.04
3DH5	2441.0	-10.77	2.34	9.92	1.49	1.41	20.96	125	19.47
3DH5	2480.0	-10.57	2.35	9.92	1.70	1.48	20.96	125	19.26

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 for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-A-R2
Date	November 22, 2016
Temperature / Humidity	28 deg. C / 47 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
					[dBm]	[mW]		[dBm]	[mW]
DH5	2402.0	-12.57	2.33	9.92	-0.32	0.93	1.08	0.76	1.19
DH5	2441.0	-11.96	2.34	9.92	0.30	1.07	1.08	1.38	1.37
DH5	2480.0	-11.79	2.35	9.92	0.48	1.12	1.08	1.56	1.43
2DH5	2402.0	-14.63	2.33	9.92	-2.38	0.58	1.07	-1.31	0.74
2DH5	2441.0	-14.03	2.34	9.92	-1.77	0.67	1.07	-0.70	0.85
2DH5	2480.0	-13.86	2.35	9.92	-1.59	0.69	1.07	-0.52	0.89
3DH5	2402.0	-15.46	2.33	9.92	-3.21	0.48	1.07	-2.14	0.61
3DH5	2441.0	-14.86	2.34	9.92	-2.60	0.55	1.07	-1.53	0.70
3DH5	2480.0	-14.70	2.35	9.92	-2.43	0.57	1.07	-1.36	0.73

Sample Calculation:

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

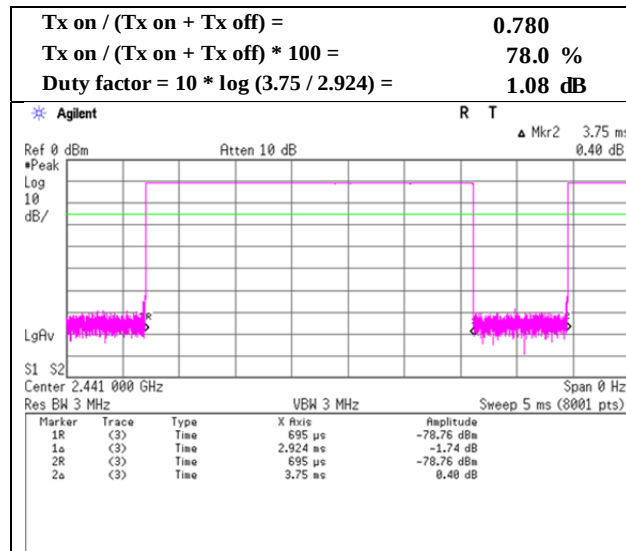
Result (Burst power average) = Time average + Duty factor

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

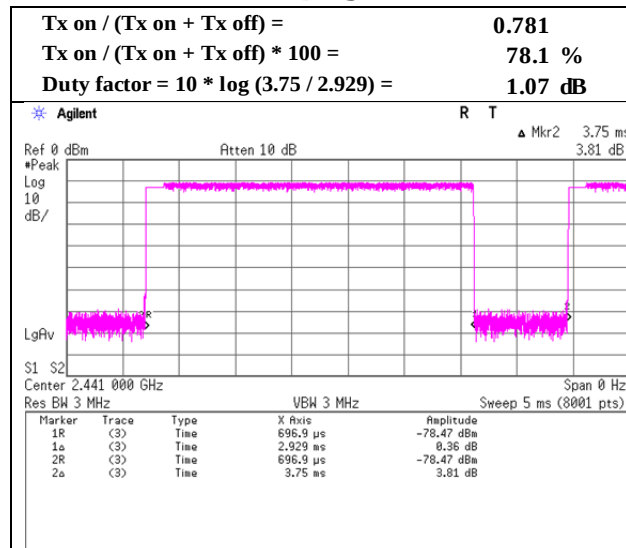
Burst Rate Confirmation

Test place : Shonan EMC Lab. No.5Shielded Room
Report No. : 11504641S-A-R2
Date : November 22, 2016
Temperature / Humidity : 28 deg. C / 47 % RH
Engineer : Yosuke Ishikawa
Mode : Tx, Hopping Off

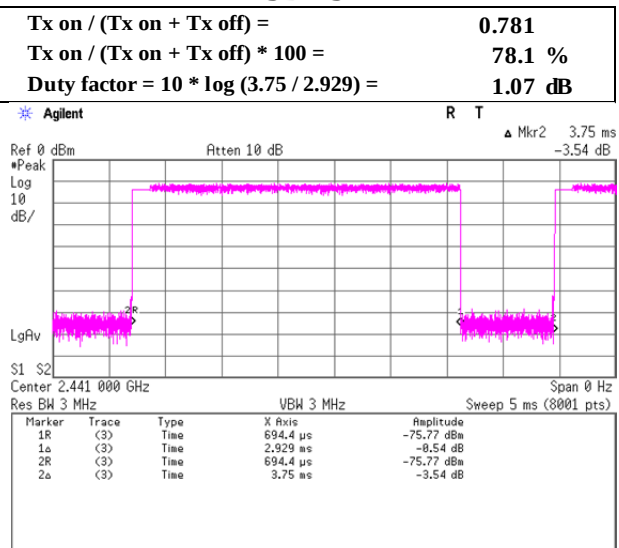
DH5



2DH5



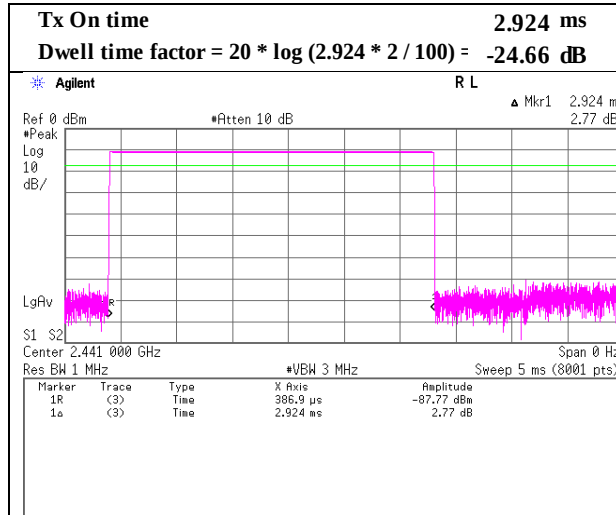
3DH5



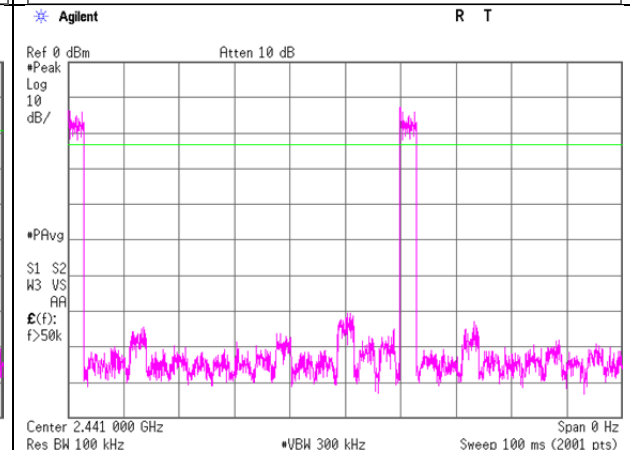
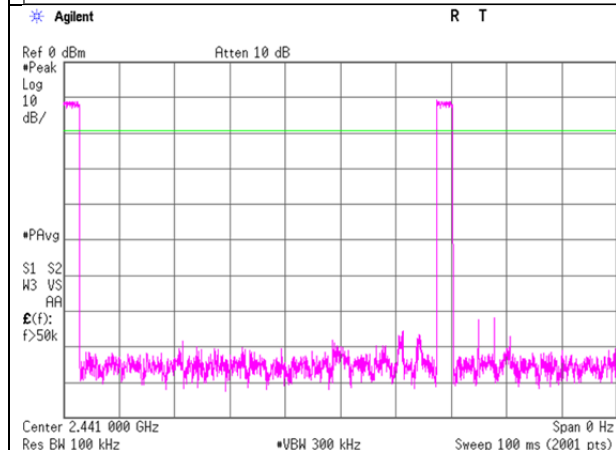
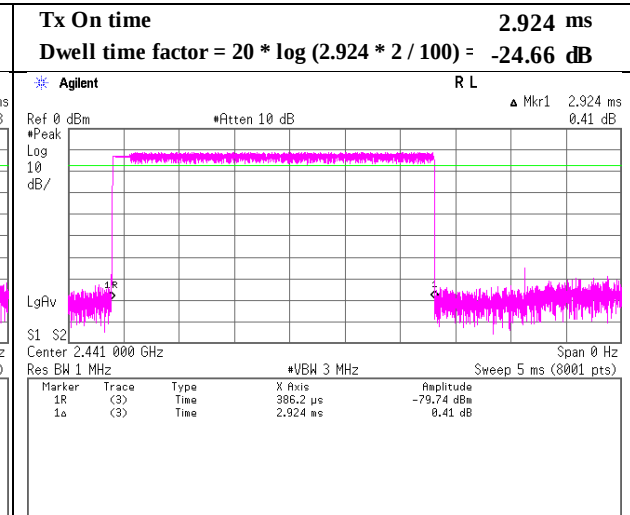
Dwell time factor

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-A-R2
Date	November 22, 2016
Temperature / Humidity	28 deg. C / 47 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping On

DH5



2DH5



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Radiated Spurious Emission

Test place Shonan EMC Lab.
Report No. 11504641S-A-R2
Semi Anechoic Chamber 3 2 3 3 3
Date November 8, 2016 November 4, 2016 November 7, 2016 November 4, 2016 November 18, 2016
Temperature / Humidity 23 deg. C / 38 % RH 23 deg. C / 45 % RH 23 deg. C / 44 % RH 25 deg. C / 41 % RH 23 deg. C / 46 % RH
Engineer Takahiro Suzuki Takahiro Suzuki Takahiro Suzuki Shinichi Takano Kenichi Adachi
(30 MHz -1000 MHz) (1 GHz -2.8 GHz) (2.8 GHz -13 GHz) (13 GHz -26.5 GHz) (26.5 GHz -31.5 GHz)
Mode Tx, Hopping Off, DH5 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.	145.000	QP	36.50	14.51	8.49	31.81	0.00	27.69	43.50	15.8	227	32	
Hori.	152.405	QP	39.00	14.76	8.62	31.81	0.00	30.57	43.50	12.9	277	256	
Hori.	155.000	QP	34.50	14.85	8.66	31.81	0.00	26.20	43.50	17.3	212	119	
Hori.	316.102	QP	41.50	13.73	6.67	31.66	0.00	30.24	46.00	15.7	152	263	
Hori.	349.976	QP	38.30	14.50	6.92	31.64	0.00	28.08	46.00	17.9	100	312	
Hori.	960.277	QP	37.00	22.14	10.10	30.42	0.00	38.82	53.90	15.0	100	171	
Hori.	2390.000	PK	46.11	27.41	13.84	40.70	2.24	48.90	73.90	25.0	260	231	
Hori.	3834.110	PK	51.57	29.36	5.58	41.66	2.24	47.09	73.90	26.8	386	29	
Hori.	4804.000	PK	52.11	31.13	6.01	41.54	2.24	49.95	73.90	23.9	383	305	
Hori.	7206.000	PK	50.48	36.44	7.55	41.12	2.24	55.59	73.90	18.3	181	171	
Hori.	9608.000	PK	45.39	38.63	8.40	40.49	2.24	54.17	73.90	19.7	150	0	
Hori.	2390.000	AV	35.16	27.41	13.84	40.70	2.24	37.95	53.90	15.9	260	231	
Hori.	3834.110	AV	46.03	29.36	5.58	41.66	2.24	41.55	53.90	12.3	386	29	
Vert.	67.739	QP	49.00	6.57	7.14	31.88	0.00	30.83	40.00	9.1	100	93	
Vert.	107.267	QP	40.50	11.20	7.92	31.84	0.00	27.78	43.50	15.7	100	179	
Vert.	112.893	QP	44.70	12.05	7.91	31.84	0.00	32.82	43.50	10.6	100	156	
Vert.	114.874	QP	40.10	12.35	7.90	31.84	0.00	28.51	43.50	14.9	100	121	
Vert.	2390.000	PK	46.44	27.41	13.84	40.70	2.24	49.23	73.90	24.6	203	277	
Vert.	3833.914	PK	51.39	29.36	5.58	41.66	2.24	46.91	73.90	26.9	146	165	
Vert.	4804.000	PK	53.28	31.13	6.01	41.54	2.24	51.12	73.90	22.7	225	316	
Vert.	7206.000	PK	55.43	36.44	7.55	41.12	2.24	60.54	73.90	13.3	204	325	
Vert.	9608.000	PK	45.96	38.63	8.40	40.49	2.24	54.74	73.90	19.1	100	0	
Vert.	2390.000	AV	35.21	27.41	13.84	40.70	2.24	38.00	53.90	15.9	203	277	
Vert.	3833.914	AV	43.98	29.36	5.58	41.66	2.24	39.50	53.90	14.4	146	165	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 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	42.29	31.13	6.01	41.54	-24.66	2.24	15.47	53.90	38.4	
Hori.	7206.000	AV	41.22	36.44	7.55	41.12	-24.66	2.24	21.67	53.90	32.2	
Hori.	9608.000	AV	33.54	38.63	8.40	40.49	-24.66	2.24	17.66	53.90	36.2	
Vert.	4804.000	AV	45.12	31.13	6.01	41.54	-24.66	2.24	18.30	53.90	35.6	
Vert.	7206.000	AV	48.03	36.44	7.55	41.12	-24.66	2.24	28.48	53.90	25.4	
Vert.	9608.000	AV	33.67	38.63	8.40	40.49	-24.66	2.24	17.79	53.90	36.1	

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 (3.88 m / 3.0 m) = 2.24 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 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	89.95	27.46	13.85	40.70	2.24	92.80	-	-	Carrier
Hori.	2400.000	PK	35.85	27.45	13.85	40.70	2.24	38.69	72.80	34.1	
Vert.	2402.000	PK	91.69	27.46	13.85	40.70	2.24	94.54	-	-	Carrier
Vert.	2400.000	PK	40.03	27.45	13.85	40.70	2.24	42.87	74.54	31.7	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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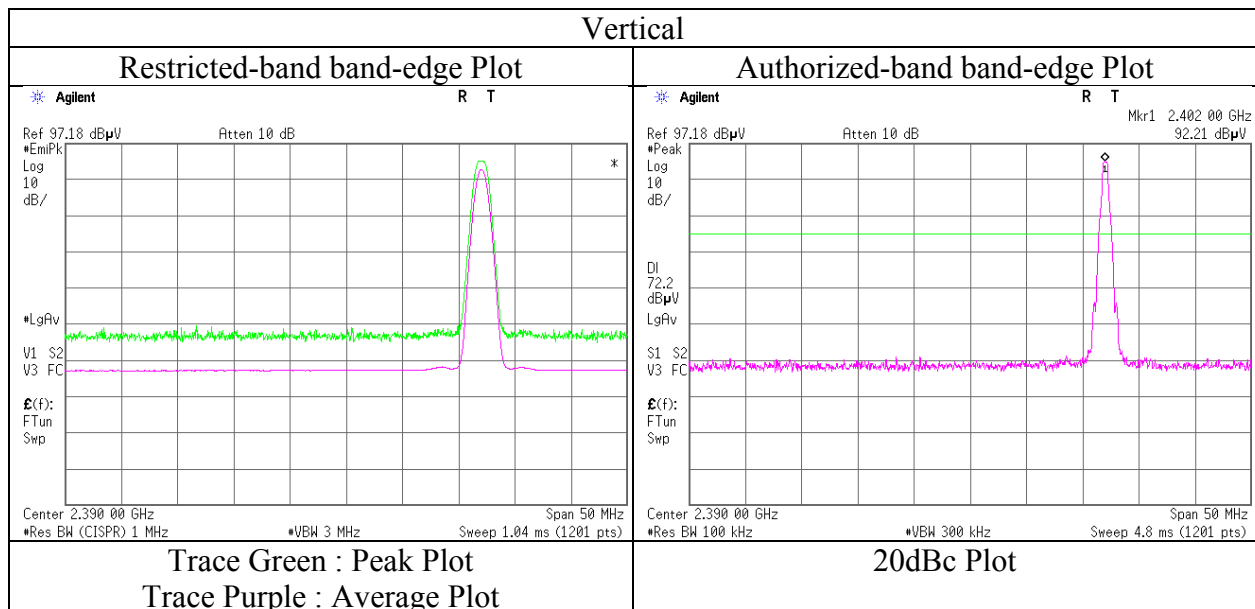
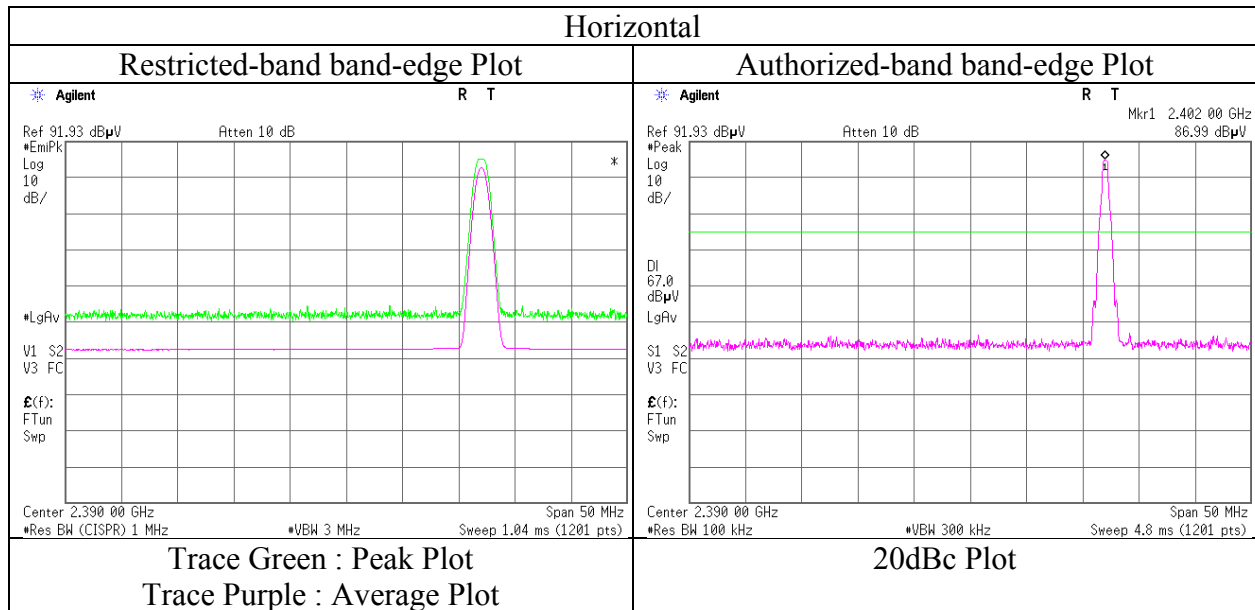
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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11504641S-A-R2
Date	November 5, 2016
Temperature / Humidity	23 deg. C / 44 % RH
Engineer	Yosuke Ishikawa (1 GHz -2.8 GHz)
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.
Report No. 11504641S-A-R2
Semi Anechoic Chamber 3 2 3 3 3
Date November 8, 2016 November 4, 2016 November 7, 2016 November 4, 2016 November 18, 2016
Temperature / Humidity 23 deg. C / 38 % RH 23 deg. C / 45 % RH 23 deg. C / 44 % RH 25 deg. C / 41 % RH 23 deg. C / 46 % RH
Engineer Takahiro Suzuki Takahiro Suzuki Takahiro Suzuki Shinichi Takano Kenichi Adachi
(30 MHz -1000 MHz) (1 GHz -2.8 GHz) (2.8 GHz -13 GHz) (13 GHz -26.5 GHz) (26.5 GHz -31.5 GHz)
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.	152.408	QP	39.00	14.76	8.62	31.81	0.00	30.57	43.50	12.9	277	256	
Hori.	155.000	QP	34.60	14.85	8.66	31.81	0.00	26.30	43.50	17.2	212	120	
Hori.	316.103	QP	41.50	13.73	6.67	31.66	0.00	30.24	46.00	15.7	152	265	
Hori.	732.369	QP	29.20	20.06	9.03	31.47	0.00	26.82	46.00	19.1	163	170	
Hori.	960.277	QP	37.00	22.14	10.10	30.42	0.00	38.82	53.90	15.0	100	171	
Hori.	3833.610	PK	52.65	29.36	5.58	41.66	2.24	48.17	73.90	25.7	386	30	
Hori.	4882.000	PK	49.20	31.29	6.04	41.39	2.24	47.38	73.90	26.5	281	334	
Hori.	7323.000	PK	50.55	36.77	7.59	41.25	2.24	55.90	73.90	18.0	178	141	
Hori.	9764.000	PK	45.21	38.75	8.49	40.41	2.24	54.28	73.90	19.6	150	0	
Hori.	3833.610	AV	46.70	29.36	5.58	41.66	2.24	42.22	53.90	11.6	386	30	
Vert.	67.740	QP	49.00	6.57	7.14	31.88	0.00	30.83	40.00	9.1	100	93	
Vert.	107.267	QP	40.60	11.20	7.92	31.84	0.00	27.88	43.50	15.6	100	180	
Vert.	112.898	QP	44.80	12.05	7.91	31.84	0.00	32.92	43.50	10.5	100	82	
Vert.	114.458	QP	40.20	12.28	7.91	31.84	0.00	28.55	43.50	14.9	100	122	
Vert.	174.987	QP	35.00	15.69	8.72	31.79	0.00	27.62	43.50	15.8	100	344	
Vert.	3833.774	PK	51.07	29.36	5.58	41.66	2.24	46.59	73.90	27.3	189	166	
Vert.	4882.000	PK	51.80	31.29	6.04	41.39	2.24	49.98	73.90	23.9	149	324	
Vert.	7323.000	PK	53.89	36.77	7.59	41.25	2.24	59.24	73.90	14.6	207	327	
Vert.	9764.000	PK	45.09	38.75	8.49	40.41	2.24	54.16	73.90	19.7	150	0	
Vert.	3833.774	AV	43.99	29.36	5.58	41.66	2.24	39.51	53.90	14.3	189	166	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.88\text{ m} / 3.0\text{ m}) = 2.24\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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	38.00	31.29	6.04	41.39	-24.66	2.24	11.52	53.90	42.4	
Hori.	7323.000	AV	42.20	36.77	7.59	41.25	-24.66	2.24	22.89	53.90	31.0	
Hori.	9764.000	AV	33.51	38.75	8.49	40.41	-24.66	2.24	17.92	53.90	36.0	
Vert.	4882.000	AV	43.73	31.29	6.04	41.39	-24.66	2.24	17.25	53.90	36.7	
Vert.	7323.000	AV	46.89	36.77	7.59	41.25	-24.66	2.24	27.58	53.90	26.3	
Vert.	9764.000	AV	33.97	38.75	8.49	40.41	-24.66	2.24	18.38	53.90	35.5	

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 : $20\log(3.88\text{ m} / 3.0\text{ m}) = 2.24\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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

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Radiated Spurious Emission

Test place Shonan EMC Lab.
Report No. 11504641S-A-R2
Semi Anechoic Chamber 3 2 3 3 3
Date November 8, 2016 November 4, 2016 November 7, 2016 November 4, 2016 November 18, 2016
Temperature / Humidity 23 deg. C / 38 % RH 23 deg. C / 45 % RH 23 deg. C / 44 % RH 25 deg. C / 41 % RH 23 deg. C / 46 % RH
Engineer Takahiro Suzuki Takahiro Suzuki Takahiro Suzuki Shinichi Takano Kenichi Adachi
(30 MHz -1000 MHz) (1 GHz -2.8 GHz) (2.8 GHz -13 GHz) (13 GHz -26.5 GHz) (26.5 GHz -31.5 GHz)
Mode Tx, Hopping Off, DH5 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.	145.000	QP	36.50	14.51	8.49	31.81	0.00	27.69	43.50	15.8	228	33	
Hori.	152.399	QP	39.00	14.76	8.62	31.81	0.00	30.57	43.50	12.9	280	255	
Hori.	316.095	QP	41.60	13.73	6.67	31.66	0.00	30.34	46.00	15.6	150	266	
Hori.	826.594	QP	28.80	21.02	9.47	31.22	0.00	28.07	46.00	17.9	122	156	
Hori.	960.265	QP	37.00	22.14	10.10	30.42	0.00	38.82	53.90	15.0	100	170	
Hori.	2483.500	PK	49.71	27.79	13.93	40.69	2.24	52.98	73.90	20.9	244	333	
Hori.	3833.664	PK	52.42	29.36	5.58	41.66	2.24	47.94	73.90	25.9	388	30	
Hori.	4960.000	PK	48.70	31.45	6.06	41.23	2.24	47.22	73.90	26.6	142	40	
Hori.	7440.000	PK	50.59	37.11	7.63	41.37	2.24	56.20	73.90	17.7	150	271	
Hori.	9920.000	PK	44.22	38.87	8.57	40.32	2.24	53.58	73.90	20.3	150	0	
Hori.	2483.500	AV	38.37	27.79	13.93	40.69	2.24	41.64	53.90	12.2	244	333	
Hori.	3833.664	AV	46.57	29.36	5.58	41.66	2.24	42.09	53.90	11.8	388	30	
Vert.	67.740	QP	49.00	6.57	7.14	31.88	0.00	30.83	40.00	9.1	100	93	
Vert.	107.273	QP	40.50	11.20	7.92	31.84	0.00	27.78	43.50	15.7	100	180	
Vert.	112.898	QP	44.80	12.05	7.91	31.84	0.00	32.92	43.50	10.5	100	155	
Vert.	114.016	QP	41.00	12.22	7.90	31.84	0.00	29.28	43.50	14.2	100	130	
Vert.	125.075	QP	37.60	13.43	8.04	31.83	0.00	27.24	43.50	16.2	101	203	
Vert.	2483.500	PK	52.90	27.79	13.93	40.69	2.24	56.17	73.90	17.7	379	270	
Vert.	3833.593	PK	50.61	29.36	5.58	41.66	2.24	46.13	73.90	27.7	190	166	
Vert.	4960.000	PK	52.16	31.45	6.06	41.23	2.24	50.68	73.90	23.2	262	204	
Vert.	7440.000	PK	53.75	37.11	7.63	41.37	2.24	59.36	73.90	14.5	200	355	
Vert.	9920.000	PK	44.35	38.87	8.57	40.32	2.24	53.71	73.90	20.1	100	0	
Vert.	2483.500	AV	44.26	27.79	13.93	40.69	2.24	47.53	53.90	6.3	379	270	
Vert.	3833.593	AV	44.07	29.36	5.58	41.66	2.24	39.59	53.90	14.3	190	166	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.88 m / 3.0 m) = 2.24 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 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	39.19	31.45	6.06	41.23	-24.66	2.24	13.05	53.90	40.8	
Hori.	7440.000	AV	42.21	37.11	7.63	41.37	-24.66	2.24	23.16	53.90	30.7	
Hori.	9920.000	AV	33.21	38.87	8.57	40.32	-24.66	2.24	17.91	53.90	36.0	
Vert.	4960.000	AV	46.29	31.45	6.06	41.23	-24.66	2.24	20.15	53.90	33.8	
Vert.	7440.000	AV	46.57	37.11	7.63	41.37	-24.66	2.24	27.52	53.90	26.4	
Vert.	9920.000	AV	33.21	38.87	8.57	40.32	-24.66	2.24	17.91	53.90	36.0	

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(3.88 m / 3.0 m) = 2.24 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

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

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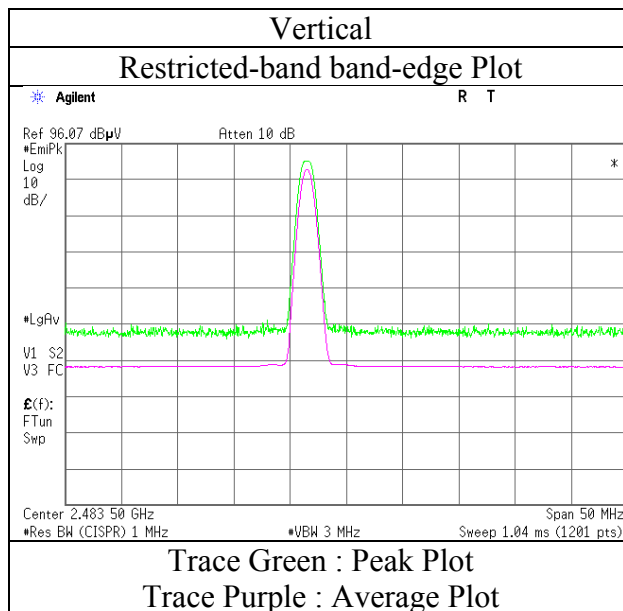
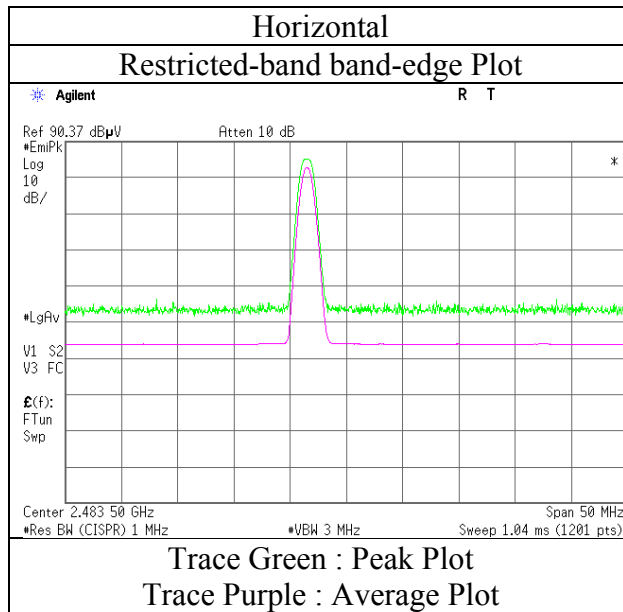
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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11504641S-A-R2
Date	November 5, 2016
Temperature / Humidity	23 deg. C / 44 % RH
Engineer	Yosuke Ishikawa
	(1 GHz -2.8 GHz)
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.
Report No. : 11504641S-A-R2
Semi Anechoic Chamber : 2 3
Date : November 8, 2016 November 18, 2016
Temperature / Humidity : 23 deg. C / 38 % RH 23 deg. C / 46 % RH
Engineer : Takahiro Suzuki Kenichi Adachi
(30 MHz -1000 MHz) (1 GHz -31.5 GHz)
Mode : Tx, Hopping Off, 2DH5 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.	152.408	QP	39.00	14.76	8.62	31.81	0.00	30.57	43.50	12.9	227	256	
Hori.	316.097	QP	41.60	13.73	6.67	31.66	0.00	30.34	46.00	15.6	152	263	
Hori.	571.989	QP	32.80	18.71	8.22	31.63	0.00	28.10	46.00	17.9	100	3	
Hori.	960.277	QP	37.00	22.14	10.10	30.42	0.00	38.82	53.90	15.0	100	171	
Hori.	2390.000	PK	43.30	27.41	13.77	37.06	2.24	49.66	73.90	24.2	353	233	
Hori.	3834.253	PK	46.59	29.36	5.65	36.85	2.24	46.99	73.90	26.9	241	178	
Hori.	4804.000	PK	44.09	31.13	5.95	37.12	2.24	46.29	73.90	27.6	236	306	
Hori.	7206.000	PK	45.41	36.44	7.38	37.84	2.24	53.63	73.90	20.2	267	99	
Hori.	9608.000	PK	43.59	38.63	8.32	39.13	2.24	53.65	73.90	20.2	150	0	
Hori.	2390.000	AV	31.32	27.41	13.77	37.06	2.24	37.68	53.90	16.2	353	233	
Hori.	3834.253	AV	41.02	29.36	5.65	36.85	2.24	41.42	53.90	12.4	241	178	
Vert.	67.739	QP	49.00	6.57	7.14	31.88	0.00	30.83	40.00	9.1	100	93	
Vert.	107.258	QP	40.50	11.20	7.92	31.84	0.00	27.78	43.50	15.7	100	180	
Vert.	112.902	QP	44.80	12.05	7.91	31.84	0.00	32.92	43.50	10.5	100	70	
Vert.	114.066	QP	40.30	12.22	7.90	31.84	0.00	28.58	43.50	14.9	100	120	
Vert.	127.496	QP	36.60	13.58	8.08	31.83	0.00	26.43	43.50	17.0	100	199	
Vert.	145.000	QP	37.20	14.51	8.49	31.81	0.00	28.39	43.50	15.1	100	208	
Vert.	2390.000	PK	43.18	27.41	13.77	37.06	2.24	49.54	73.90	24.3	352	88	
Vert.	3836.829	PK	48.09	29.36	5.64	36.85	2.24	48.48	73.90	25.4	177	154	
Vert.	4804.000	PK	43.79	31.13	5.95	37.12	2.24	45.99	73.90	27.9	195	214	
Vert.	7206.000	PK	50.48	36.44	7.38	37.84	2.24	58.70	73.90	15.2	221	331	
Vert.	9608.000	PK	44.66	38.63	8.32	39.13	2.24	54.72	73.90	19.1	150	0	
Vert.	2390.000	AV	31.27	27.41	13.77	37.06	2.24	37.63	53.90	16.2	352	88	
Vert.	3836.829	AV	42.79	29.36	5.64	36.85	2.24	43.18	53.90	10.7	177	154	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.88 \text{ m} / 3.0 \text{ m}) = 2.24 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

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.	4804.000	AV	31.37	31.13	5.95	37.12	-24.66	2.24	8.91	53.90	45.0	
Hori.	7206.000	AV	34.13	36.44	7.38	37.84	-24.66	2.24	17.69	53.90	36.2	
Hori.	9608.000	AV	30.59	38.63	8.32	39.13	-24.66	2.24	15.99	53.90	37.9	
Vert.	4804.000	AV	32.75	31.13	5.95	37.12	-24.66	2.24	10.29	53.90	43.6	
Vert.	7206.000	AV	40.70	36.44	7.38	37.84	-24.66	2.24	24.26	53.90	29.6	
Vert.	9608.000	AV	31.37	38.63	8.32	39.13	-24.66	2.24	16.77	53.90	37.1	

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 : $20\log(3.88 \text{ m} / 3.0 \text{ m}) = 2.24 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

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	82.11	27.46	13.78	37.05	2.24	88.54	-	-	Carrier
Hori.	2400.000	PK	35.22	27.45	13.78	37.05	2.24	41.64	68.54	26.9	
Vert.	2402.000	PK	83.85	27.46	13.78	37.05	2.24	90.28	-	-	Carrier
Vert.	2400.000	PK	35.79	27.45	13.78	37.05	2.24	42.21	70.28	28.1	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.88 \text{ m} / 3.0 \text{ m}) = 2.24 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

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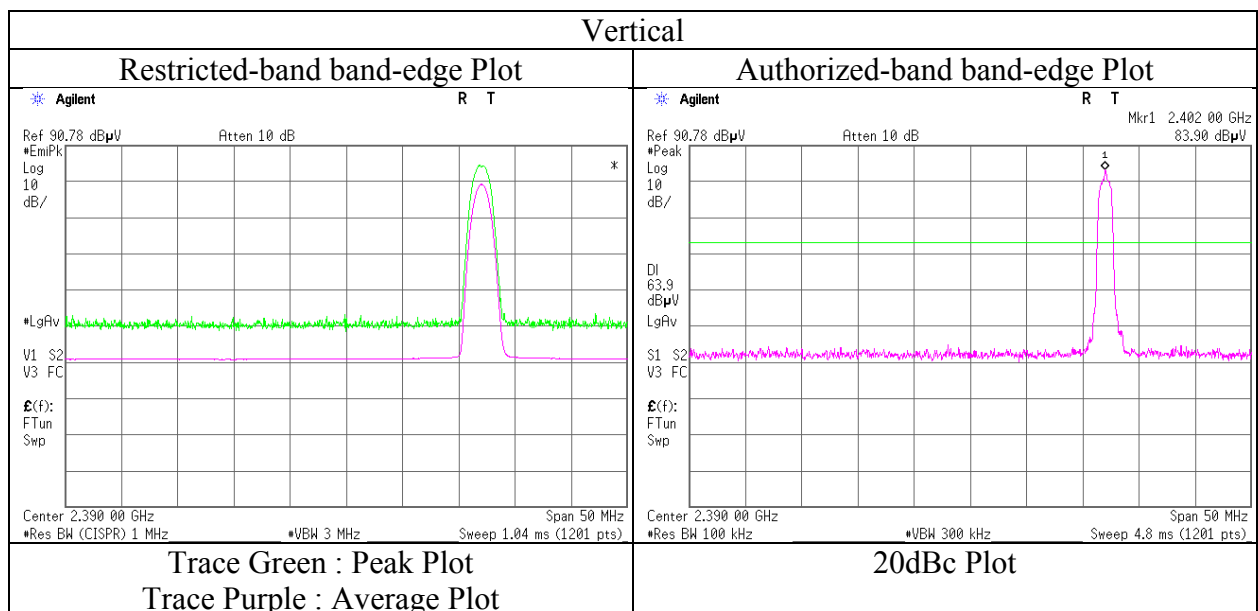
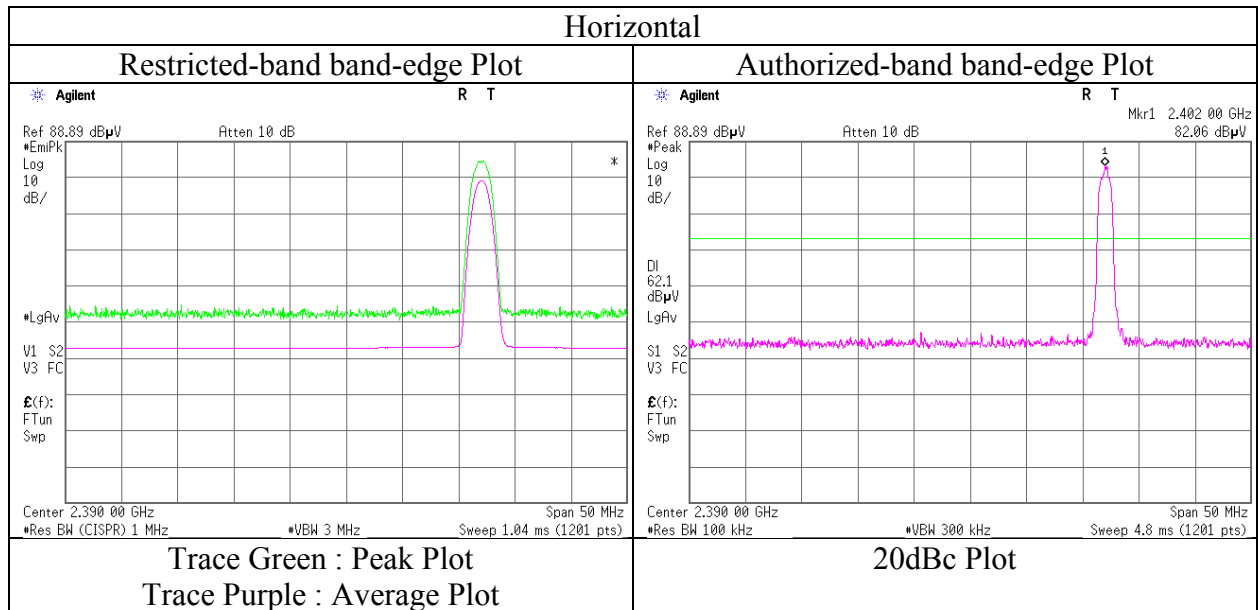
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11504641S-A-R2
Date	November 18, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Kenichi Adachi (1 GHz -2.8 GHz)
Mode	Tx, Hopping Off, 2DH5 2402 MHz



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

Radiated Spurious Emission

Test place : Shonan EMC Lab.
Report No. : 11504641S-A-R2
Semi Anechoic Chamber : 2 3
Date : November 8, 2016 November 18, 2016
Temperature / Humidity : 23 deg. C / 38 % RH 23 deg. C / 46 % RH
Engineer : Takahiro Suzuki Kenichi Adachi
(30 MHz -1000 MHz) (1 GHz -31.5 GHz)
Mode : Tx, Hopping Off, 2DH5 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.	145.000	QP	36.60	14.51	8.49	31.81	0.00	27.79	43.50	15.7	226	33	
Hori.	152.406	QP	39.20	14.76	8.62	31.81	0.00	30.77	43.50	12.7	276	255	
Hori.	240.000	QP	41.20	11.54	6.11	31.71	0.00	27.14	46.00	18.8	150	99	
Hori.	316.097	QP	41.50	13.73	6.67	31.66	0.00	30.24	46.00	15.7	150	264	
Hori.	960.277	QP	37.00	22.14	10.10	30.42	0.00	38.82	53.90	15.0	100	171	
Hori.	3834.401	PK	44.41	29.36	5.65	36.85	2.24	44.81	73.90	29.0	231	274	
Hori.	4882.000	PK	42.62	31.29	5.97	37.16	2.24	44.96	73.90	28.9	261	110	
Hori.	7323.000	PK	46.05	36.77	7.36	37.92	2.24	54.50	73.90	19.4	258	105	
Hori.	9764.000	PK	43.46	38.75	8.35	39.20	2.24	53.60	73.90	20.3	150	0	
Hori.	3834.401	AV	38.46	29.36	5.65	36.85	2.24	38.86	53.90	15.0	231	274	
Vert.	67.738	QP	49.00	6.57	7.14	31.88	0.00	30.83	40.00	9.1	100	93	
Vert.	107.253	QP	40.60	11.20	7.92	31.84	0.00	27.88	43.50	15.6	100	180	
Vert.	112.895	QP	44.80	12.05	7.91	31.84	0.00	32.92	43.50	10.5	100	155	
Vert.	114.035	QP	40.00	12.22	7.90	31.84	0.00	28.28	43.50	15.2	100	122	
Vert.	125.011	QP	40.20	13.43	8.04	31.83	0.00	29.84	43.50	13.6	100	204	
Vert.	3834.401	PK	46.97	29.36	5.65	36.85	2.24	47.37	73.90	26.5	181	341	
Vert.	4882.000	PK	44.78	31.29	5.97	37.16	2.24	47.12	73.90	26.7	233	319	
Vert.	7323.000	PK	49.55	36.77	7.36	37.92	2.24	58.00	73.90	15.9	178	336	
Vert.	9764.000	PK	43.96	38.75	8.35	39.20	2.24	54.10	73.90	19.8	150	0	
Vert.	3834.401	AV	42.87	29.36	5.65	36.85	2.24	43.27	53.90	10.6	181	341	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 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	31.94	31.29	5.97	37.16	-24.66	2.24	9.62	53.90	44.3	
Hori.	7323.000	AV	34.90	36.77	7.36	37.92	-24.66	2.24	18.69	53.90	35.2	
Hori.	9764.000	AV	32.25	38.75	8.35	39.20	-24.66	2.24	17.73	53.90	36.2	
Vert.	4882.000	AV	34.13	31.29	5.97	37.16	-24.66	2.24	11.81	53.90	42.1	
Vert.	7323.000	AV	39.54	36.77	7.36	37.92	-24.66	2.24	23.33	53.90	30.6	
Vert.	9764.000	AV	32.36	38.75	8.35	39.20	-24.66	2.24	17.84	53.90	36.1	

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 (3.88 m / 3.0 m) = 2.24 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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

Radiated Spurious Emission

Test place : Shonan EMC Lab.
Report No. : 11504641S-A-R2
Semi Anechoic Chamber : 2 3
Date : November 8, 2016 November 18, 2016
Temperature / Humidity : 23 deg. C / 38 % RH 23 deg. C / 46 % RH
Engineer : Takahiro Suzuki Kenichi Adachi
(30 MHz -1000 MHz) (1 GHz -31.5 GHz)
Mode : Tx, Hopping Off, 2DH5 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.	145.000	QP	36.70	14.51	8.49	31.81	0.00	27.89	43.50	15.6	225	33	
Hori.	152.408	QP	39.30	14.76	8.62	31.81	0.00	30.87	43.50	12.6	276	256	
Hori.	316.099	QP	41.50	13.73	6.67	31.66	0.00	30.24	46.00	15.7	150	265	
Hori.	730.281	QP	30.00	20.04	9.02	31.48	0.00	27.58	46.00	18.4	150	159	
Hori.	960.277	QP	37.00	22.14	10.10	30.42	0.00	38.82	53.90	15.0	100	171	
Hori.	2483.500	PK	43.57	27.79	13.86	37.01	2.24	50.45	73.90	23.4	385	152	
Hori.	3833.974	PK	46.86	29.36	5.65	36.85	2.24	47.26	73.90	26.6	242	178	
Hori.	4960.000	PK	43.72	31.45	5.98	37.19	2.24	46.20	73.90	27.7	253	107	
Hori.	7440.000	PK	46.17	37.11	7.33	37.99	2.24	54.86	73.90	19.0	233	145	
Hori.	9920.000	PK	44.49	38.87	8.38	39.26	2.24	54.72	73.90	19.1	150	0	
Hori.	2483.500	AV	31.45	27.79	13.86	37.01	2.24	38.33	53.90	15.5	385	152	
Hori.	3833.974	AV	41.19	29.36	5.65	36.85	2.24	41.59	53.90	12.3	242	178	
Vert.	67.400	QP	49.00	6.63	7.13	31.88	0.00	30.88	40.00	9.1	100	93	
Vert.	107.240	QP	40.60	11.19	7.92	31.84	0.00	27.87	43.50	15.6	100	181	
Vert.	112.895	QP	44.80	12.05	7.91	31.84	0.00	32.92	43.50	10.5	100	70	
Vert.	114.036	QP	40.50	12.22	7.90	31.84	0.00	28.78	43.50	14.7	100	121	
Vert.	155.000	QP	35.20	14.85	8.66	31.81	0.00	26.90	43.50	16.6	100	52	
Vert.	2483.500	PK	44.17	27.79	13.86	37.01	2.24	51.05	73.90	22.8	347	295	
Vert.	3834.030	PK	48.11	29.36	5.65	36.85	2.24	48.51	73.90	25.3	185	341	
Vert.	4960.000	PK	45.45	31.45	5.98	37.19	2.24	47.93	73.90	25.9	161	64	
Vert.	7440.000	PK	51.20	37.11	7.33	37.99	2.24	59.89	73.90	14.0	262	327	
Vert.	9920.000	PK	43.88	38.87	8.38	39.26	2.24	54.11	73.90	19.7	150	0	
Vert.	2483.500	AV	32.14	27.79	13.86	37.01	2.24	39.02	53.90	14.8	347	295	
Vert.	3834.030	AV	43.14	29.36	5.65	36.85	2.24	43.54	53.90	10.3	185	341	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.88 \text{ m} / 3.0 \text{ m}) = 2.24 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

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	31.85	31.45	5.98	37.19	-24.66	2.24	9.67	53.90	44.2	
Hori.	7440.000	AV	35.53	37.11	7.33	37.99	-24.66	2.24	19.56	53.90	34.3	
Hori.	9920.000	AV	32.51	38.87	8.38	39.26	-24.66	2.24	18.08	53.90	35.8	
Vert.	4960.000	AV	34.30	31.45	5.98	37.19	-24.66	2.24	12.12	53.90	41.8	
Vert.	7440.000	AV	42.88	37.11	7.33	37.99	-24.66	2.24	26.91	53.90	27.0	
Vert.	9920.000	AV	32.48	38.87	8.38	39.26	-24.66	2.24	18.05	53.90	35.8	

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 : $20\log(3.88 \text{ m} / 3.0 \text{ m}) = 2.24 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

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

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Shonan EMC Lab.

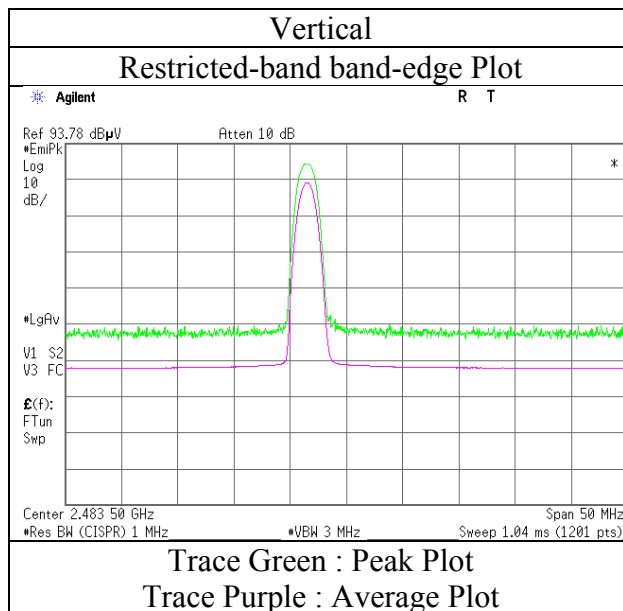
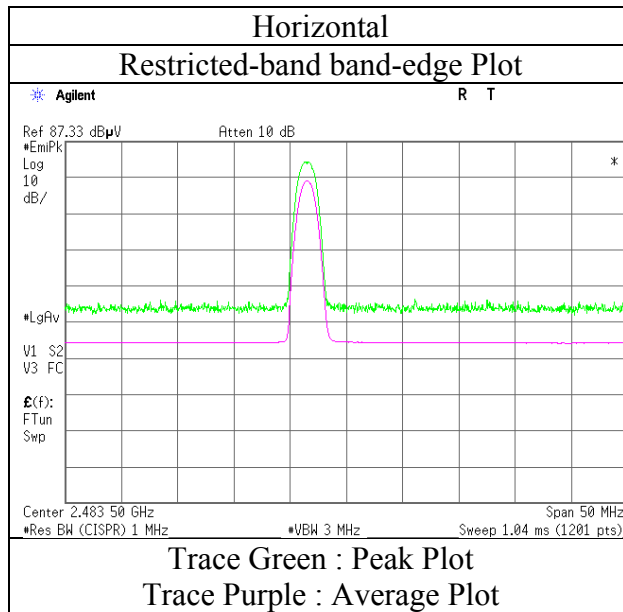
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Radiated Spurious Emission (Reference Plot for band-edge)

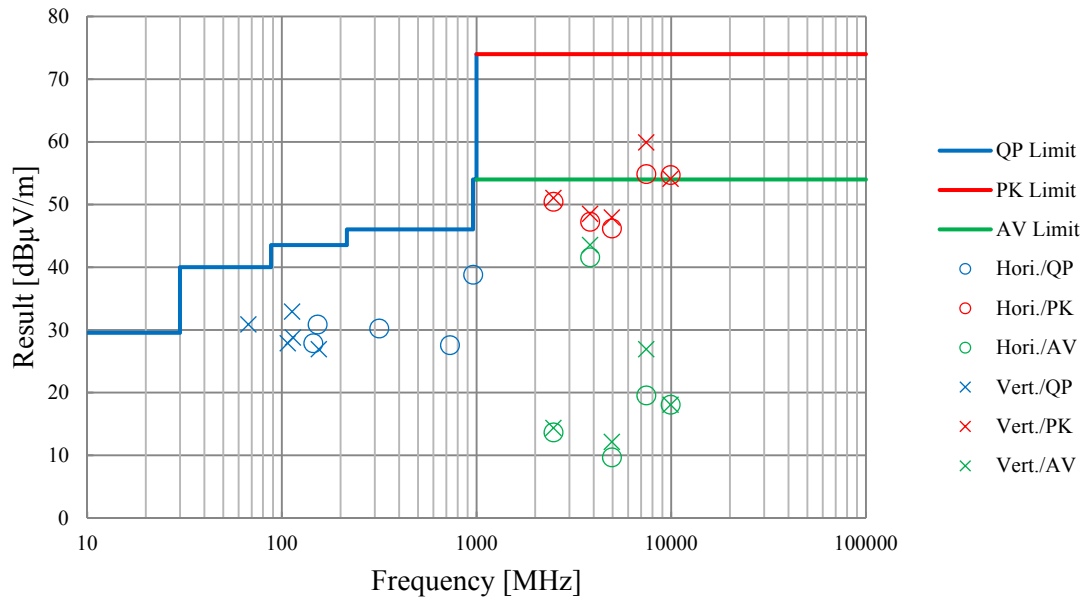
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11504641S-A-R2
Date	November 18, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Kenichi Adachi (1 GHz -2.8 GHz)
Mode	Tx, Hopping Off, 2DH5 2480 MHz



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

Radiated Spurious Emission (Plot data, Worst case)

Test place	Shonan EMC Lab.	
Report No.	11504641S-A-R2	
Semi Anechoic Chamber	2	3
Date	November 8, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 38 % RH	23 deg. C / 46 % RH
Engineer	Takahiro Suzuki	Kenichi Adachi
	(30 MHz -1000 MHz)	(1 GHz -31.5 GHz)
Mode	Tx, Hopping Off, 2DH5 2480 MHz	

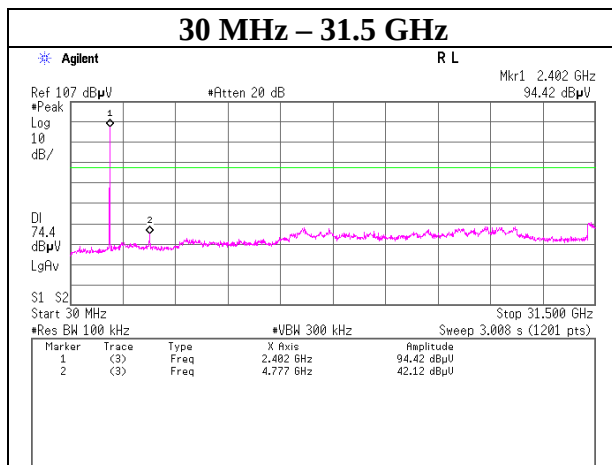
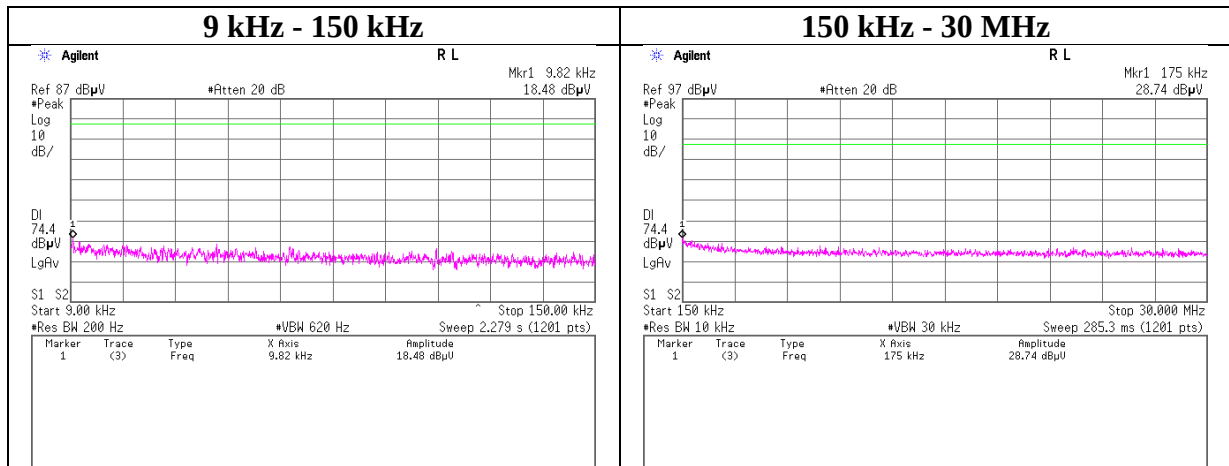


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11504641S-A-R2
Date : November 22, 2016
Temperature / Humidity : 28 deg. C / 47 % RH
Engineer : Yosuke Ishikawa
Mode : Tx, Hopping Off, DH5

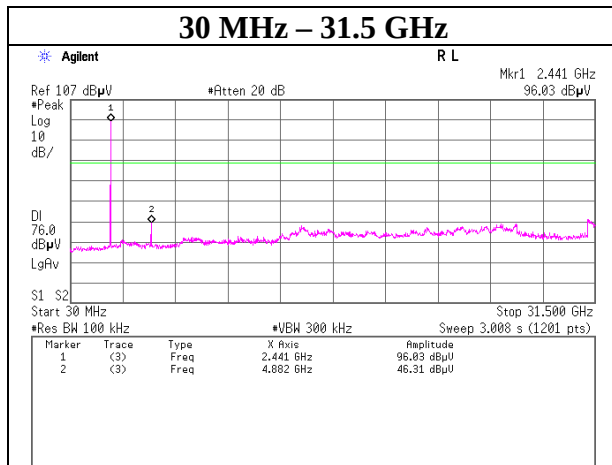
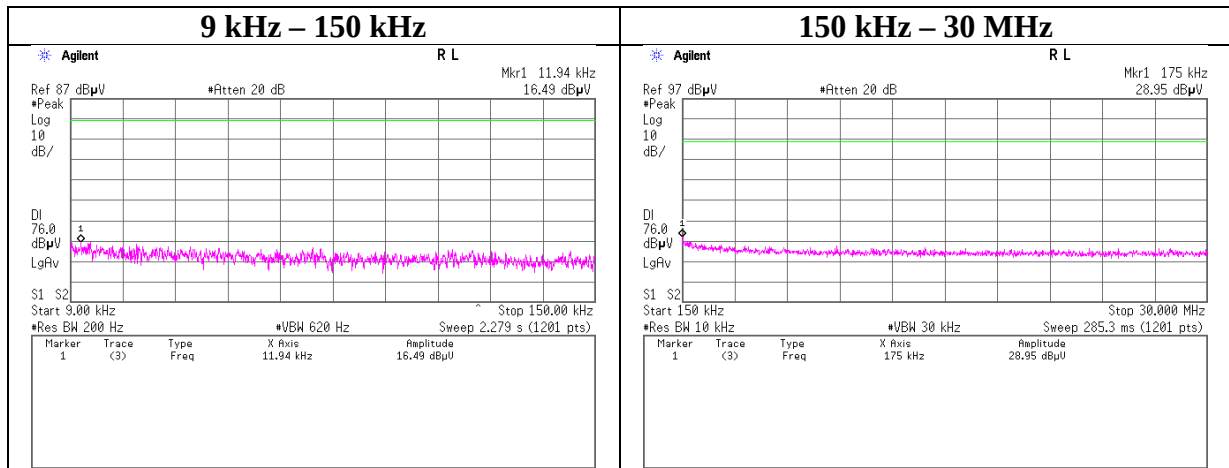
2402 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11504641S-A-R2
Date : November 22, 2016
Temperature / Humidity : 28 deg. C / 47 % RH
Engineer : Yosuke Ishikawa
Mode : Tx, Hopping Off, DH5

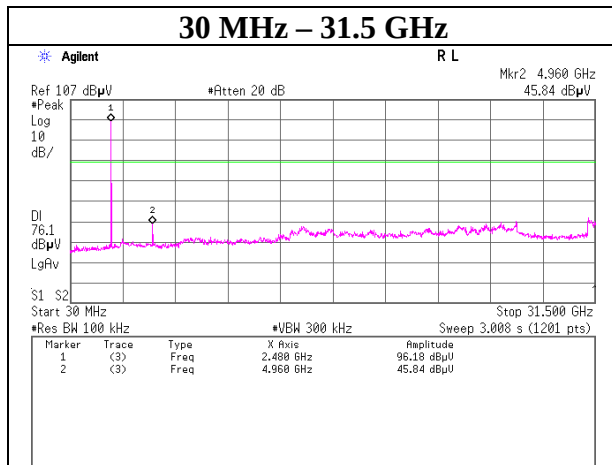
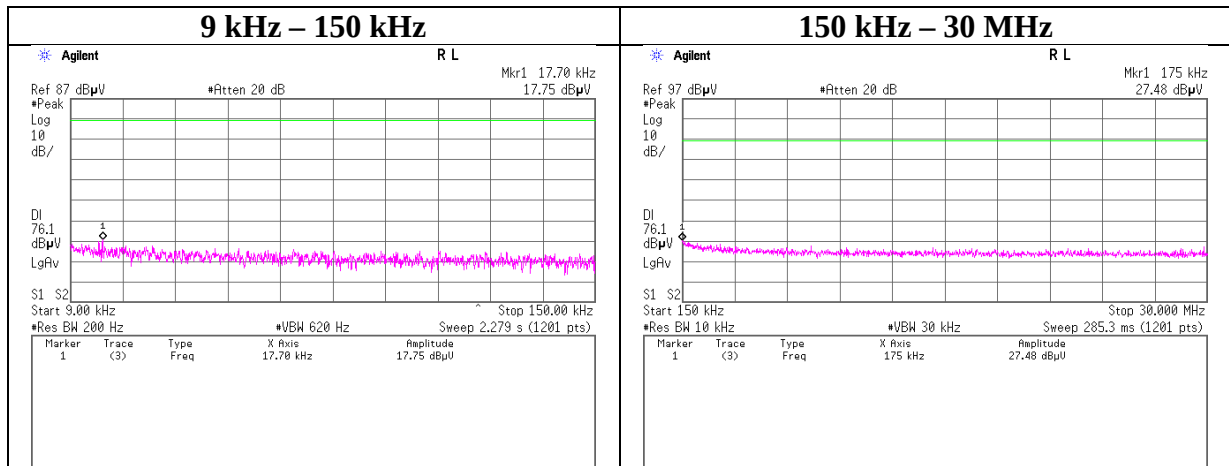
2441 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11504641S-A-R2
Date : November 22, 2016
Temperature / Humidity : 28 deg. C / 47 % RH
Engineer : Yosuke Ishikawa
Mode : Tx, Hopping Off, DH5

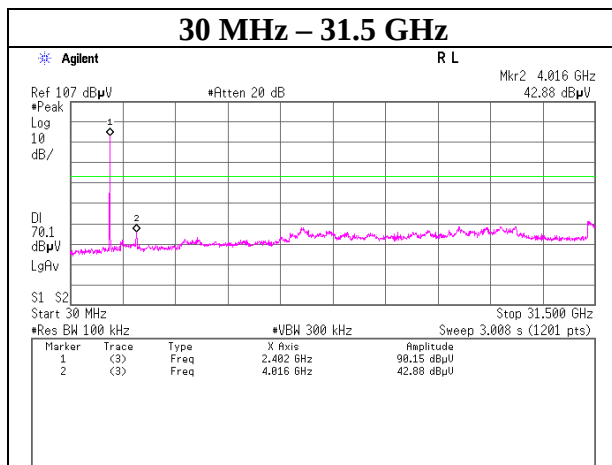
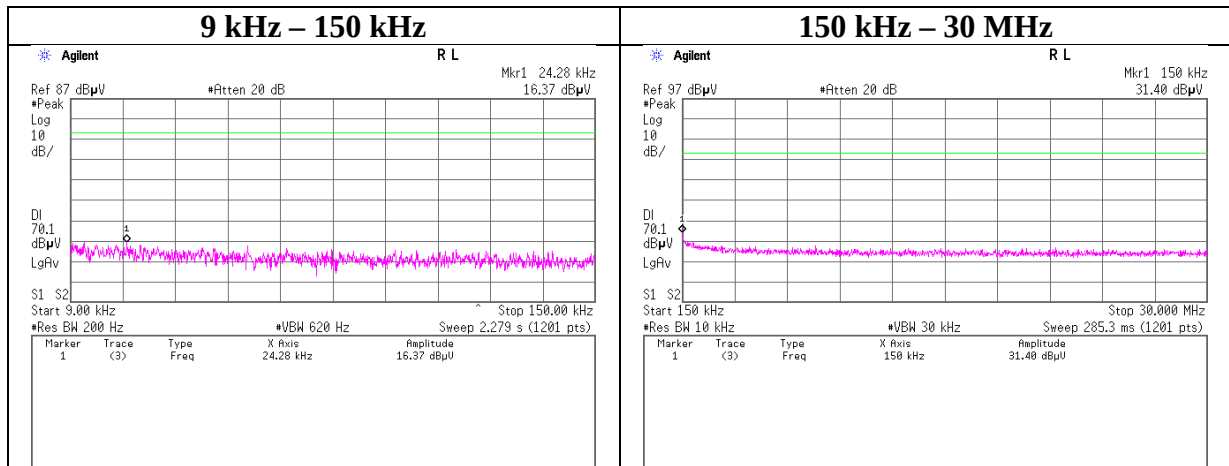
2480 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11504641S-A-R2
Date : November 22, 2016
Temperature / Humidity : 28 deg. C / 47 % RH
Engineer : Yosuke Ishikawa
Mode : Tx, Hopping Off, 2DH5

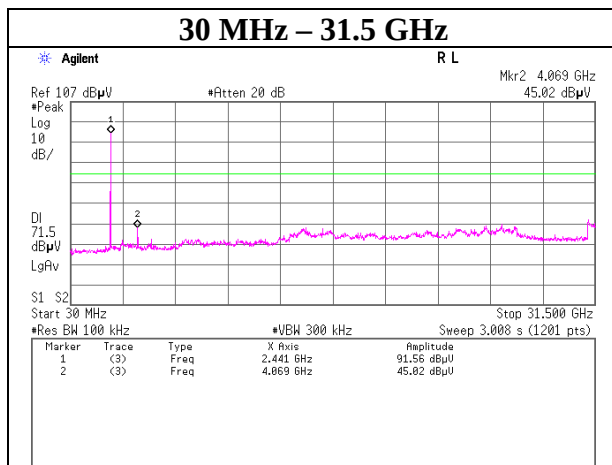
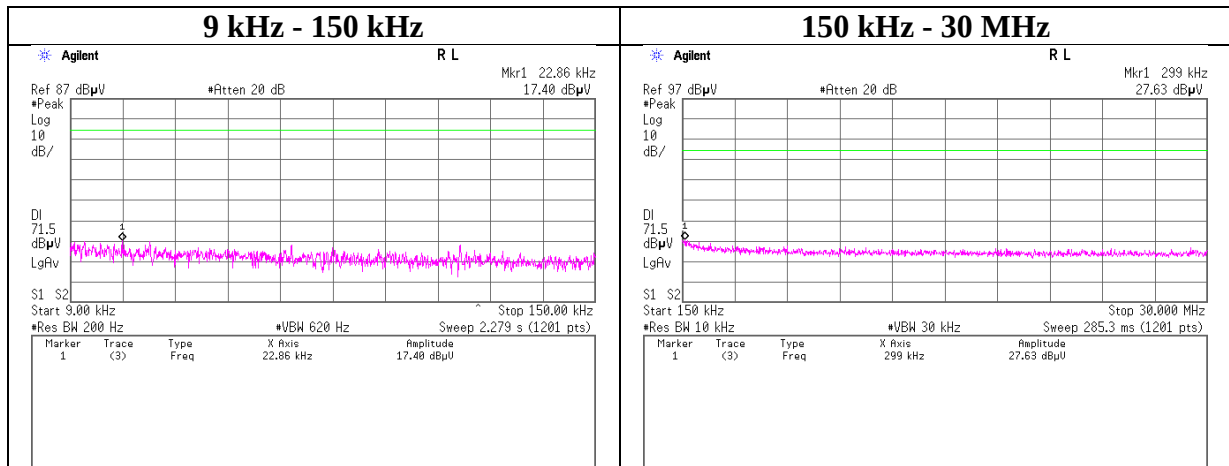
2402 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11504641S-A-R2
Date : November 22, 2016
Temperature / Humidity : 28 deg. C / 47 % RH
Engineer : Yosuke Ishikawa
Mode : Tx, Hopping Off, 2DH5

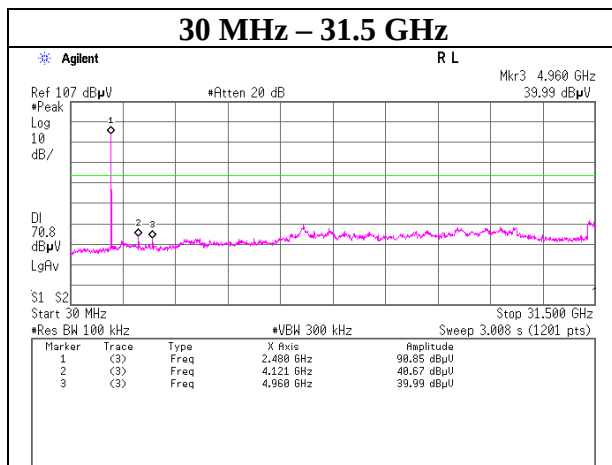
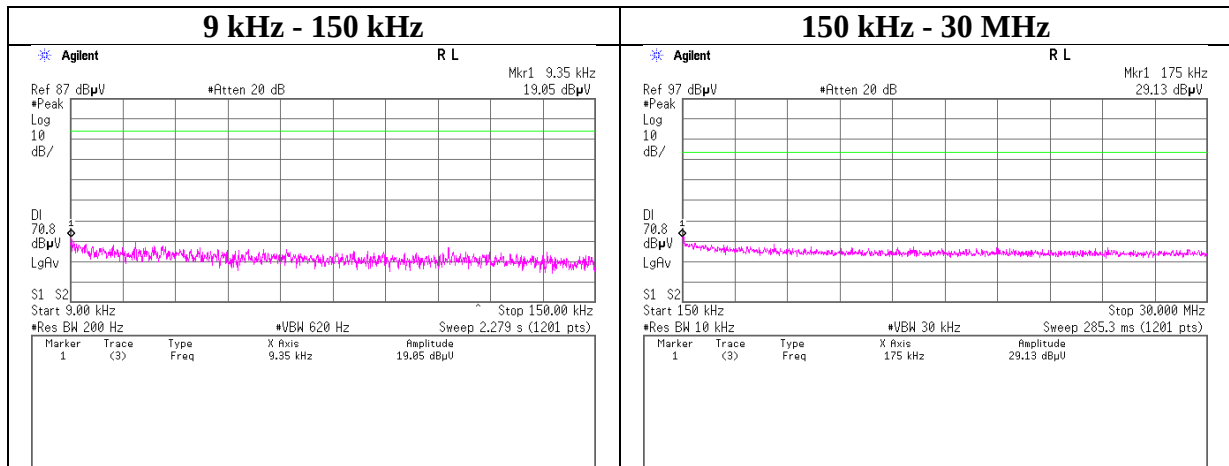
2441 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11504641S-A-R2
Date : November 22, 2016
Temperature / Humidity : 28 deg. C / 47 % RH
Engineer : Yosuke Ishikawa
Mode : Tx, Hopping Off, 2DH5

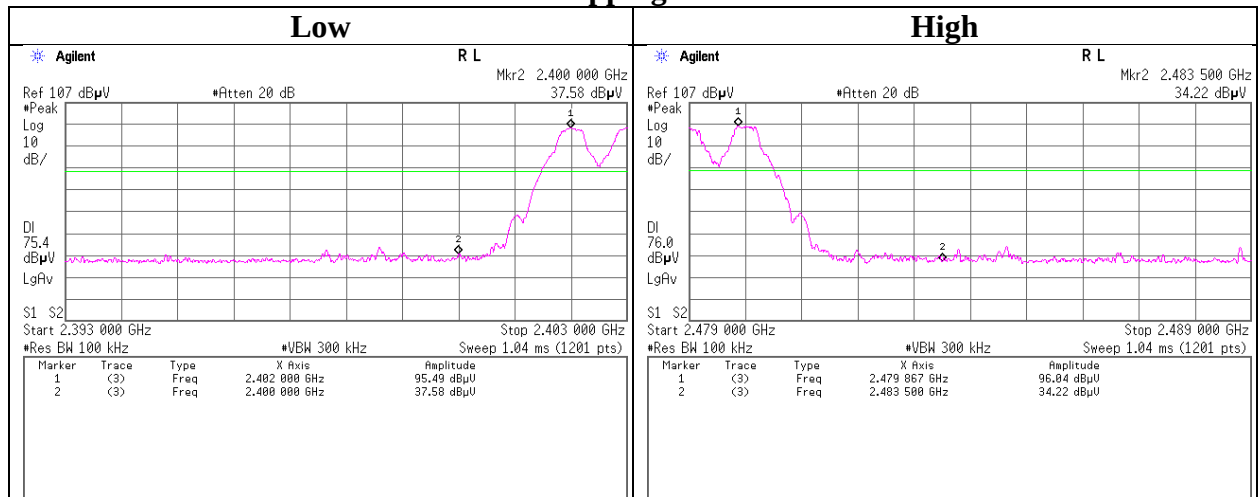
2480 MHz



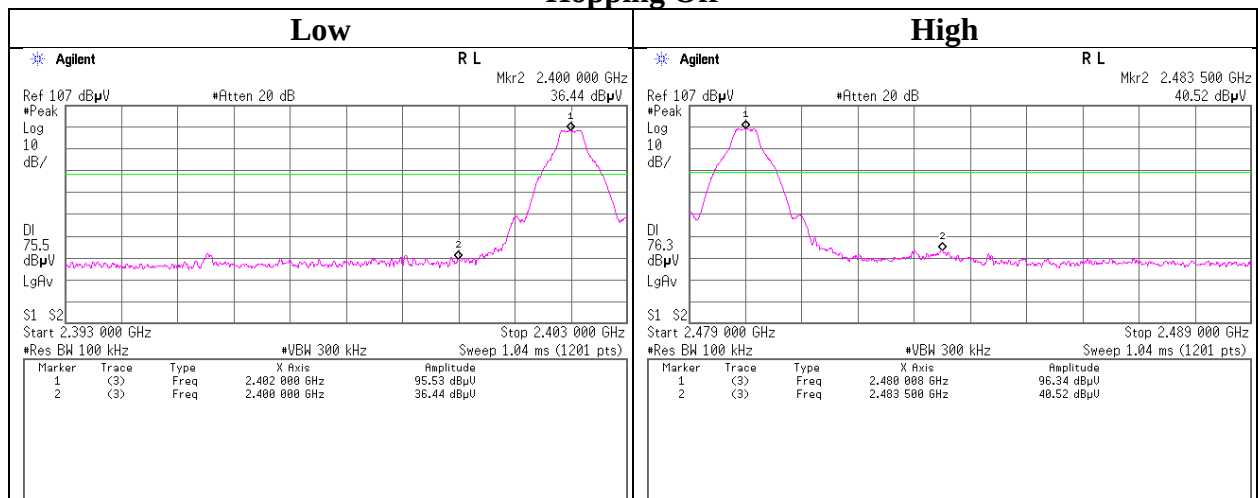
Conducted Emission Band Edge compliance

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-A-R2
Date	November 22, 2016
Temperature / Humidity	28 deg. C / 47 % RH
Engineer	Yosuke Ishikawa
Mode	Tx DH5

Hopping On



Hopping Off



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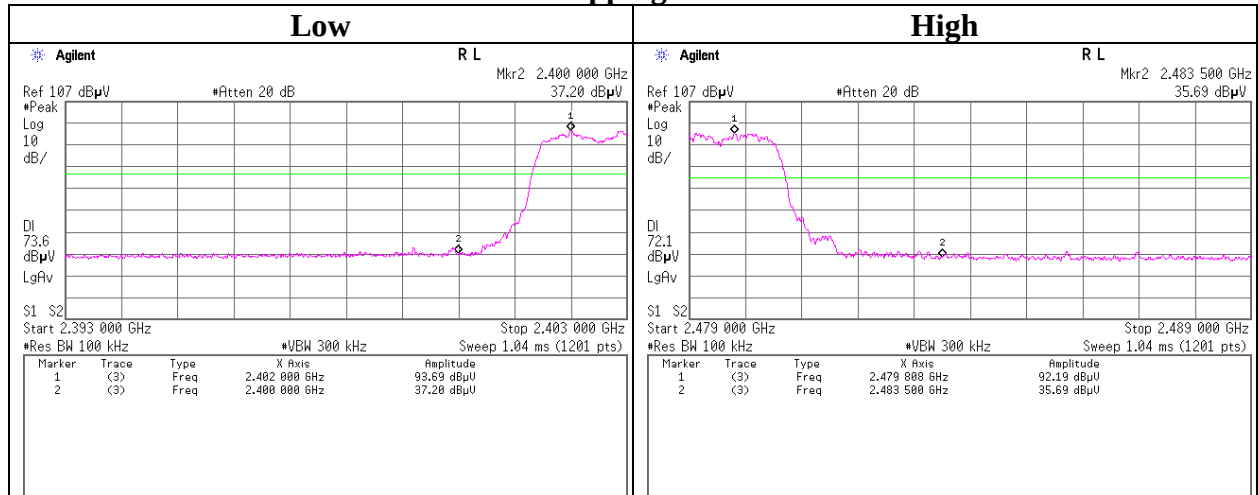
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

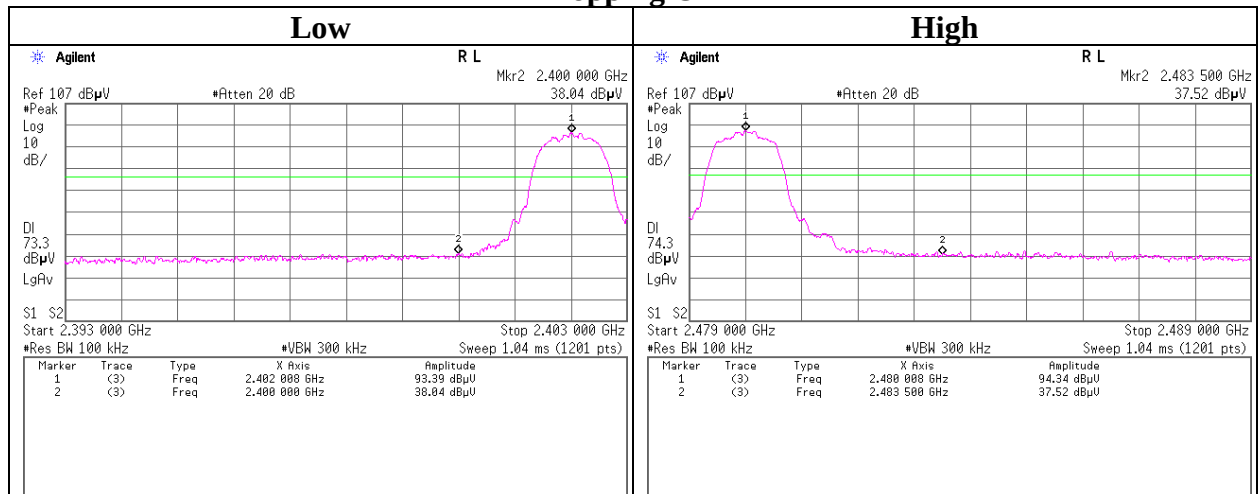
Conducted Emission Band Edge compliance

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11504641S-A-R2
Date : November 22, 2016
Temperature / Humidity : 28 deg. C / 47 % RH
Engineer : Yosuke Ishikawa
Mode : Tx 2DH5

Hopping On



Hopping Off



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Telephone : +81 463 50 6400

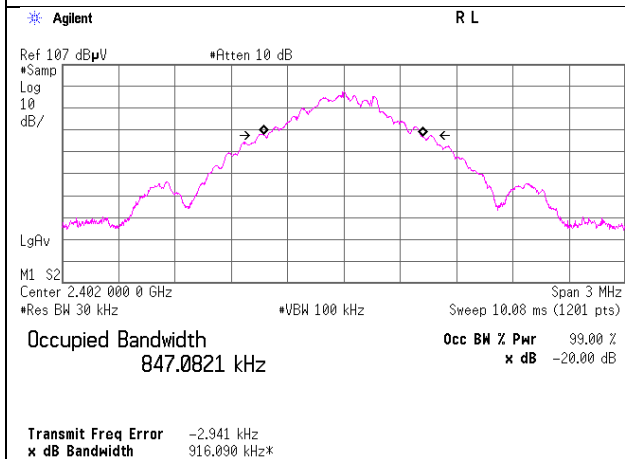
Facsimile : +81 463 50 6401

99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-A-R2
Date	November 22, 2016
Temperature / Humidity	28 deg. C / 47 % RH
Engineer	Yosuke Ishikawa
Mode	Tx Hopping Off

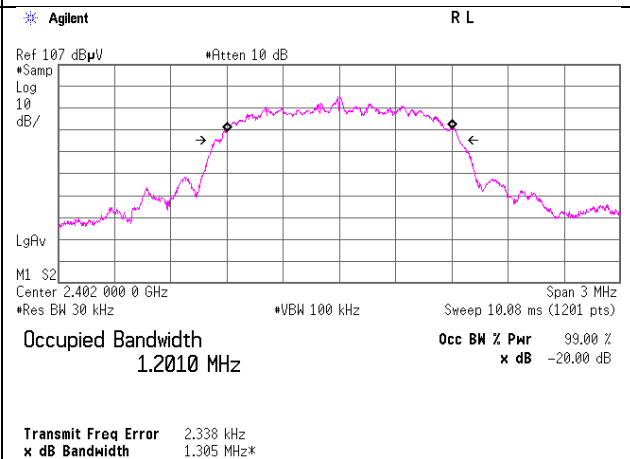
Hopping Off, DH5

2402 MHz

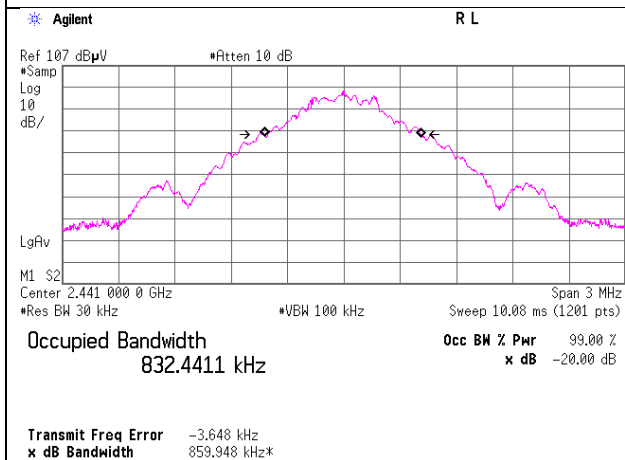


Hopping Off, 2DH5

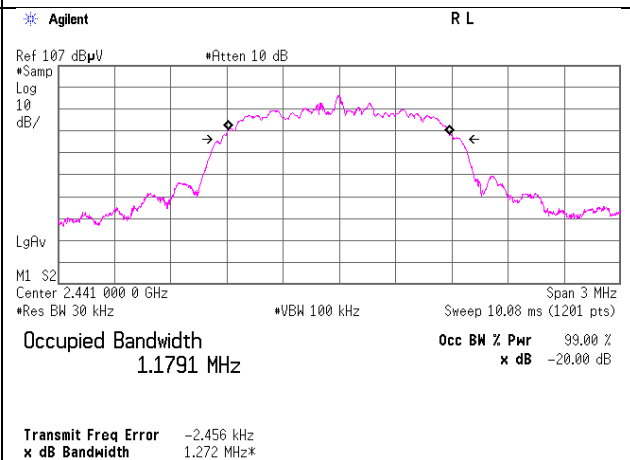
2402 MHz



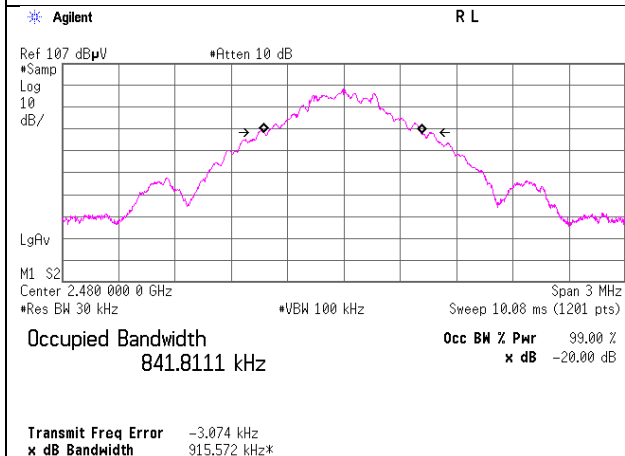
2441 MHz



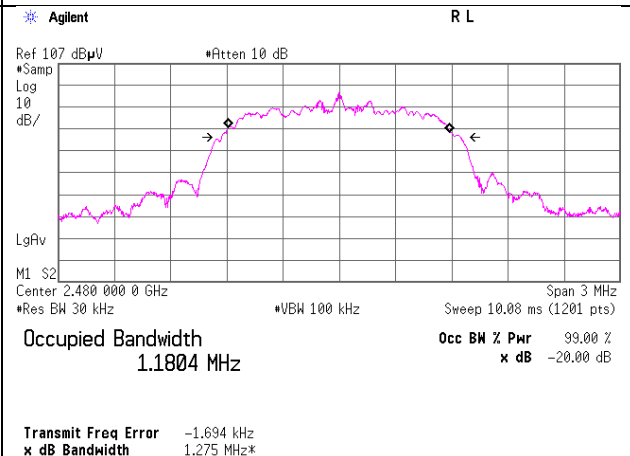
2441 MHz



2480 MHz



2480 MHz



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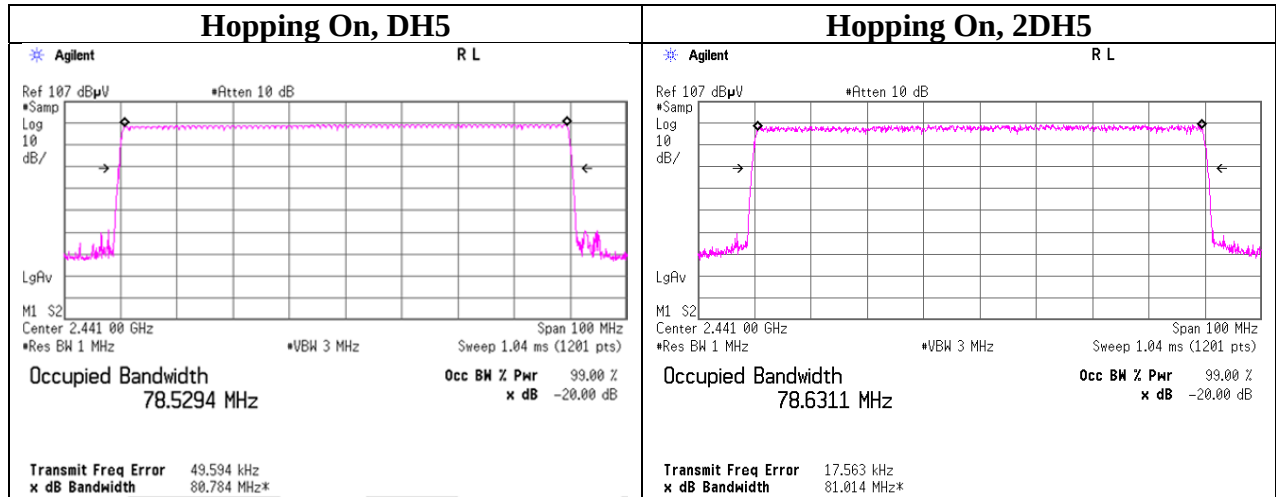
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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-A-R2
Date	November 22, 2016
Temperature / Humidity	28 deg. C / 47 % RH
Engineer	Yosuke Ishikawa
Mode	Tx Hopping On



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APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MSA-16	Spectrum Analyzer	Agilent	E4440A	MY46186390	AT	2016/02/08 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2016/04/01 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2016/04/01 * 12
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	AT	2016/03/23 * 12
SAT10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2016/04/18 * 12
STM-G3	Terminator	Weinschel	M1459A	U6569	AT	2016/07/27 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT *1)	2015/12/07 * 12
KTS-07	Digital Tester	SANWA	PC500	7019232	AT	2016/10/17 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2016/03/22 * 12
SCC-G04	Coaxial Cable	Junkosha	J12J102207-00	JUN-12-14-018	RE	2016/06/23 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2016/05/11 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2016/08/22 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2016/10/12 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE *1)	2015/11/06 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
SAEC-03(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	RE	2016/07/25 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,R FI,MF)	-	RE	-
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE	2016/10/17 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE, AT	2016/03/23 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2016/03/08 * 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
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2016/11/07 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE *1)	2015/11/16 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	RE	2016/09/26 * 12
SAF-02	Pre Amplifier	SONOMA	310N	290212	RE	2016/02/19 * 12
SAT6-02	Attenuator	JFW	50HF-006N	-	RE	2016/02/25 * 12
KAT3-10	Attenuator	JFW IND. INC.	50HF-003N	-	RE	2016/07/26 * 12
SBA-02	Biconical Antenna	Schwarzbeck	BBA9106	91032665	RE *1)	2015/11/02 * 12
SCC-B1/B3/B5/B 7/B8/B13/SRSE- 02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner /Suhner/Suhner/Suhner/T OYO	8D2W/12DSFA/141P E/141PE/141PE/141P E/NS4906	-/0901-270(RF Selector)	RE	2016/04/22 * 12
SCC-B2/B4/B6/B 7/B8/B13/SRSE- 02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner /Suhner/Suhner/Suhner/T OYO	8D2W/12DSFA/141P E/141PE/141PE/141P E/NS4906	-/0901-270(RF Selector)	RE	2016/04/22 * 12
SLA-06	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	195	RE	2016/01/30 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2016/10/12 * 12
TR-09	Test Receiver	Rohde & Schwarz	ESCI	100769	RE	2016/10/07 * 12
SJM-09	Measure	PROMART	SEN1935	-	RE	-
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2016/07/13 * 12
STS-02	Digital Hitester	Hioki	3805-50	080997819	RE	2016/03/22 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2016/10/11 * 12
SHA-06	Horn Antenna	ETS LINDGREN	3160-10	LM3459	RE	2016/03/24 * 12
SAF-10	Pre Amplifier	TOYO Corporation	HAP26-40W	00000010	RE	2016/03/23 * 12
SCC-G19	Coaxial Cable	Suhner	SUCOFLEX 102A	1188/2A	RE	2016/03/08 * 12
SCC-G33	Coaxial Cable	Junkosha	MWX241-01000KM SKMS	-	RE	2016/04/18 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2016/11/07 * 12
SFL-18	Highpass Filter	MICRO-TRONICS	HPM50111	119	RE	2016/04/18 * 12

*1) This test equipment was used for the tests before the expiration date of the calibration.

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

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