RADIO TEST REPORT

Test Report No. : 11573340S-A-R1

Applicant	:	**Panasonic Corporation**
Type of Equipment	:	**Car Audio with Bluetooth**
Model No.	:	**AN1701**
FCC ID	:	**ACJ932AN1701**
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 11573340S-A. 11573340S-A is replaced with this report.

Date of test: February 3 to 9, 2017

Representative test engineer: H. Morikawa
Hiroyuki Morikawa
Engineer
Consumer Technology Division

Approved by: S. Takano
Shinichi Takano
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".

RTL02610

REVISION HISTORY

Original Test Report No.: 11573340S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	11573340S-A	February 22, 2017	-	-
1	11573340S-A-R1	March 2, 2017	10, 11	Correction of configuration and peripherals

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SECTION 1: Customer information

Company Name	:	Panasonic Corporation
Address	:	4261 Ikonobe-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa 224-8520 Japan
Telephone Number	:	+81-50-3689-7119
Facsimile Number	:	+81-45-931-0806
Contact Person	:	Meguru Kajihara

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

2.1 Identification of E.U.T.

Type of Equipment	:	Car Audio with Bluetooth
Model No.	:	AN1701
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12 V
Receipt Date of Sample	:	January 27, 2017
Country of Mass-production	:	Mexico
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

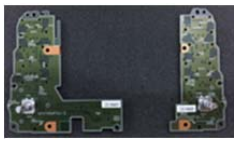
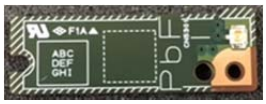
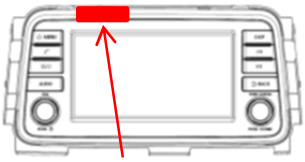
Model: AN1701 (referred to as the EUT in this report) is a Car Audio with Bluetooth.

Radio Specification

[Bluetooth]

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	:	+1.6 dBi (MAX): Including cable loss (P02F) +1.5 dBi (MAX): Including cable loss (L42P)
Clock frequency (Maximum)	:	36.4 MHz, 32.768 kHz, 8 MHz, 26 MHz, 24 MHz

Model Differential List

Differential Part	P02F	L42P
Model	AN1701	
Operational Panel		
Operational PWB		
Antenna PWB		
Antenna Cable Length	120 ±1 mm	105 ±1 mm
Antenna Position	 Antenna	Antenna
MCAN Connect	NO (Hardware Steering Control)	YES (Steering Control via MCAN)

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**	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)		Complied	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	9.1 dB 2118.892 MHz, AV, Vert. Tx, Hopping Off, DH5 2402 MHz (P02F) 7206.000 MHz, PK, Hori. Tx, Hopping Off, 3DH5 2402 MHz (L42P)	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 does not have AC power ports.
*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).
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 Antenna requirement

The equipment and its antenna comply with the requirement since the antenna is built in the equipment and it cannot be replaced by end users.

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.

Shonan EMC Lab.

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 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	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

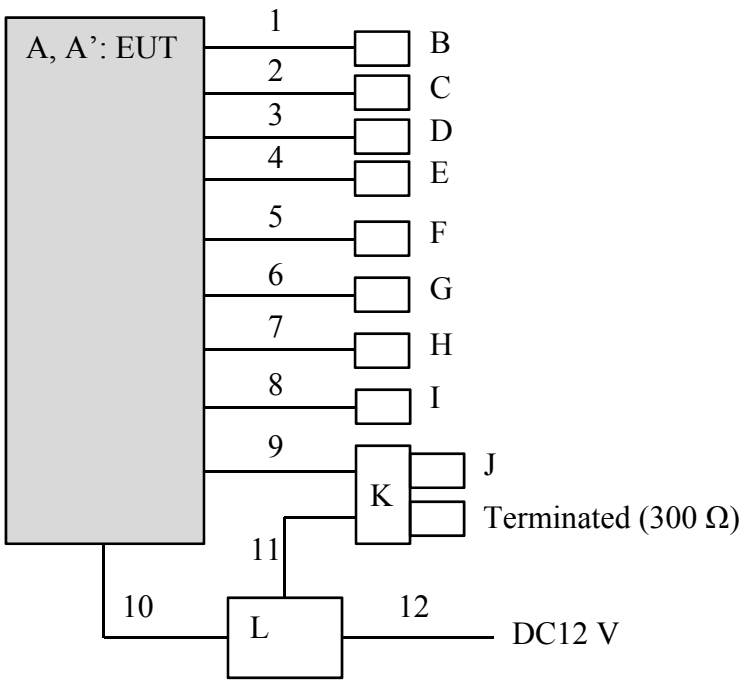
Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Spurious Emission (Conducted/Radiated)	Tx (Hopping Off) DH5, 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 the test items based on Bluetooth Core specification.

*EUT has the power settings by the software as follows;
Power settings: Fixed
Software: 05.00.05.00
*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	Car Audio with Bluetooth	AN1701(P02F)	15LDA-C3S278 *1) 15LDA-C3S279 *2)	Panasonic Corporation	EUT
A'	Car Audio with Bluetooth	AN1701(L42P) *3)	15LDA-C3S281	Panasonic Corporation	EUT
B	Speaker	LV-002	S11014200775	L&V	-
C	Speaker	LV-002	S11014200775	L&V	-
D	Speaker	LV-002	S11014200773	L&V	-
E	Speaker	LV-002	S11014200773	L&V	-
F	Glass AHT AMP	-	-	Panasonic Corporation	-
G	Rear camera	-	-	Panasonic Corporation	-
H	MIC	-	-	Panasonic Corporation	-
I	Remote controller	-	-	Panasonic Corporation	-
J	USB	USM4GU	-	Sony	-
K	USB/Audio connecter	-	-	Panasonic Corporation	-
L	Power box	-	-	Panasonic Corporation	-

*1) Used for Antenna Terminal conducted test
*2) Used for Radiated Emission test
*3) AN1701(L42P) is used for Radiated Emission test only since AN1701(P02F) and AN1701(L42P) have same module.

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Signal Cable	6.0	Unshielded	Unshielded	-
2	Signal Cable	6.0	Unshielded	Unshielded	-
3	Signal Cable	6.0	Unshielded	Unshielded	-
4	Signal Cable	6.0	Unshielded	Unshielded	-
5	Signal Cable	2.0	Unshielded	Unshielded	-
6	Signal Cable	1.0	Unshielded	Unshielded	-
7	Signal Cable	1.0	Unshielded	Unshielded	-
8	Signal Cable	1.5	Unshielded	Unshielded	-
9	Signal Cable	1.0	Unshielded	Unshielded	-
10	DC Cable	1.0	Unshielded	Unshielded	-
11	DC Cable	1.0	Unshielded	Unshielded	-
12	DC Cable	0.5	Unshielded	Unshielded	-

SECTION 5: Radiated Spurious Emission

Test Procedure

[For below 1 GHz]
EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. 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 m*2) (1 GHz – 13 GHz), 1 m*3) (13 GHz – 26 GHz),		3 m*2) (1 GHz – 13 GHz), 1 m*3) (13 GHz – 26 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 x log (3.8 m/3.0 m) = 2.06 dB
*3) Distance Factor: 20 x log (1.0 m/3.0 m) = -9.54 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 - 26 GHz
Test data : APPENDIX
Test result : Pass

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	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 *2)	-	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 *3)	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 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) Reference data
*3) 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)

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.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % 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	0.982	1.000	>= 0.654
DH5	2441.0	0.986	1.000	>= 0.657
DH5	2480.0	0.989	1.000	>= 0.659
3DH5	2402.0	1.301	1.000	>= 0.867
3DH5	2441.0	1.296	1.000	>= 0.864
3DH5	2480.0	1.286	1.000	>= 0.857

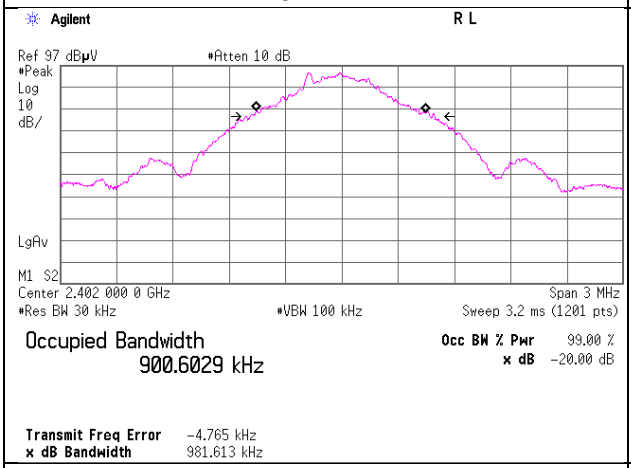
Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).
No limit applies to 20dB Bandwidth.

20dB Bandwidth and Carrier Frequency Separation

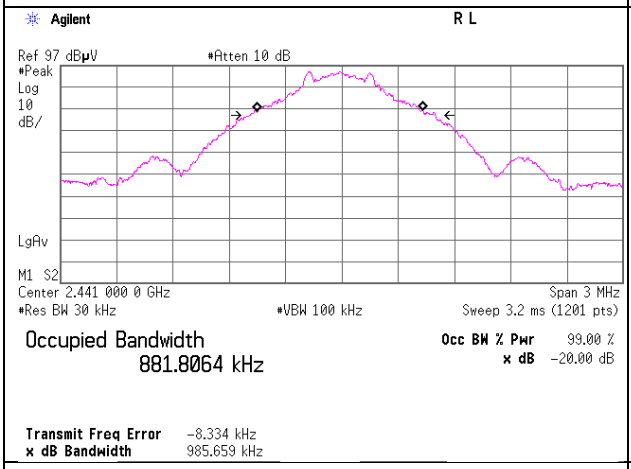
DH5

20 dB Bandwidth

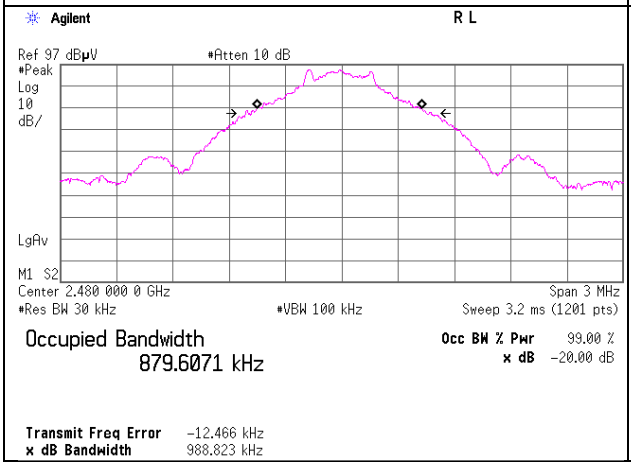
2402 MHz



2441 MHz

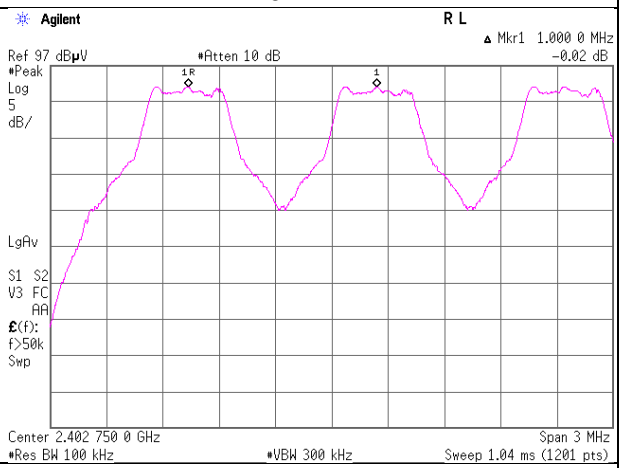


2480 MHz

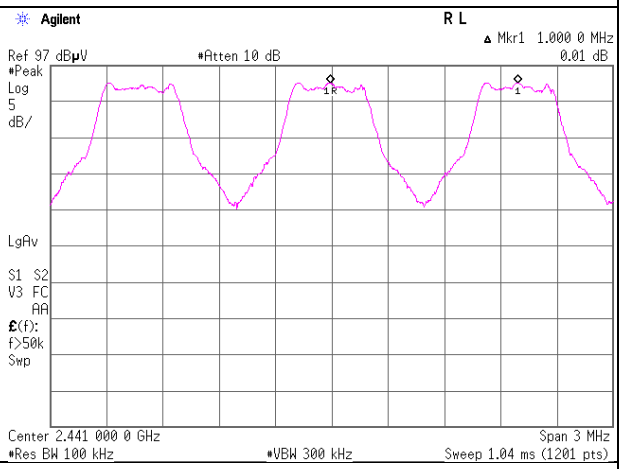


Carrier Frequency Separation

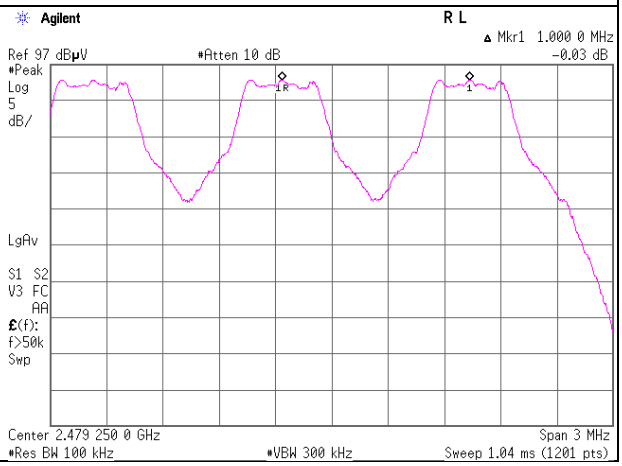
2402 MHz



2441 MHz



2480 MHz

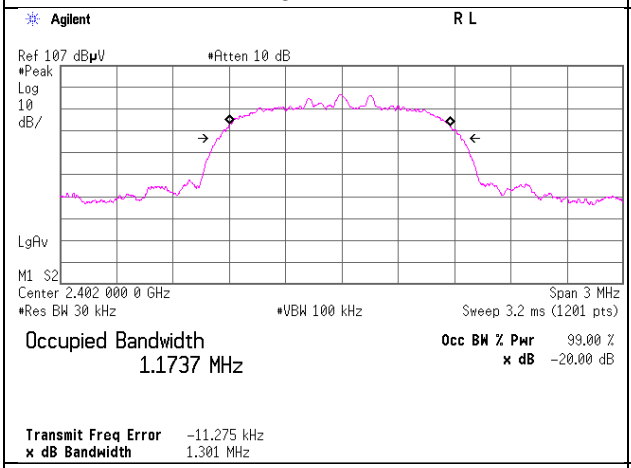


20dB Bandwidth and Carrier Frequency Separation

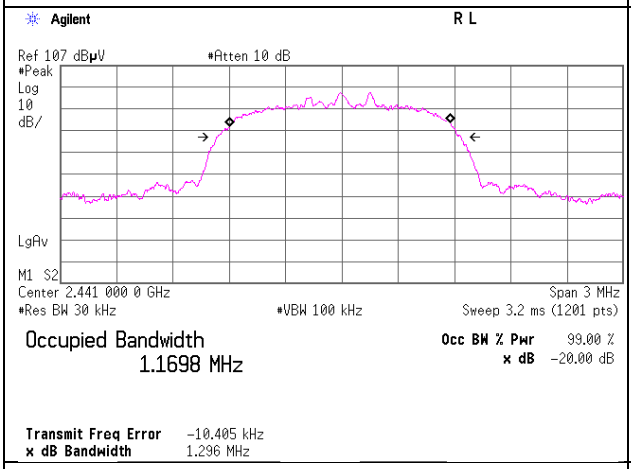
3DH5

20 dB Bandwidth

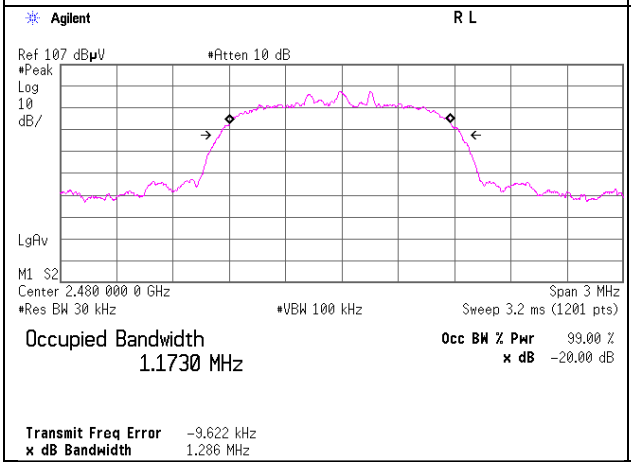
2402 MHz



2441MHz

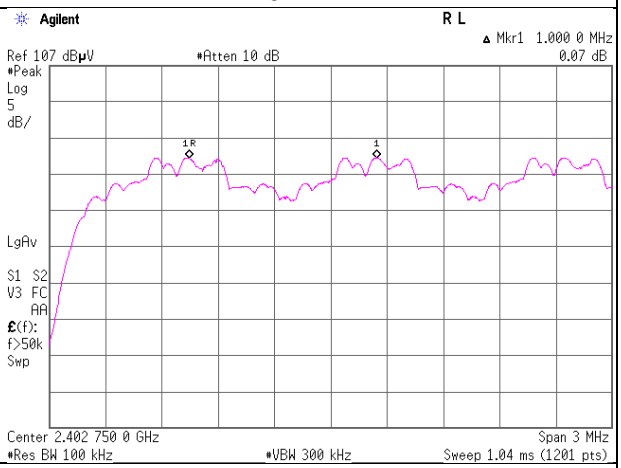


2480MHz

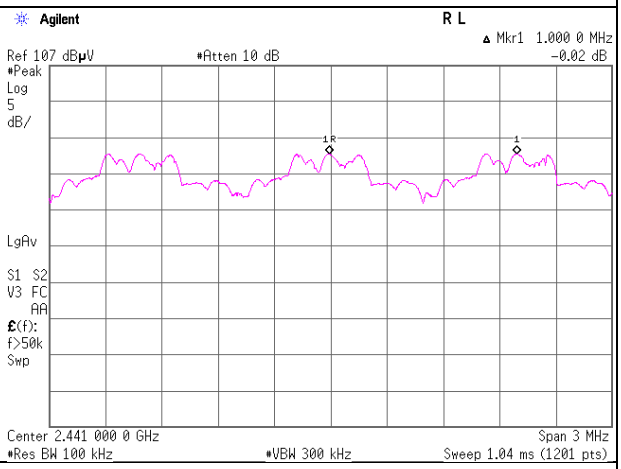


Carrier Frequency Separation

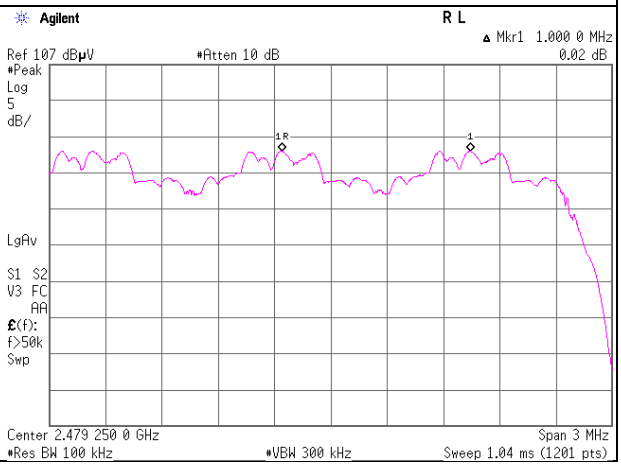
2402 MHz



2441 MHz



2480 MHz



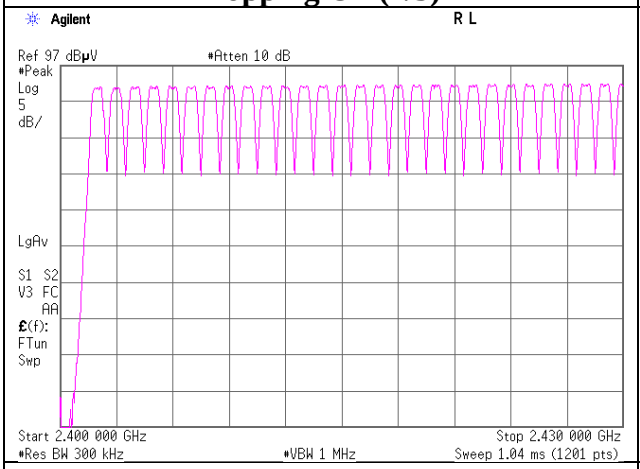
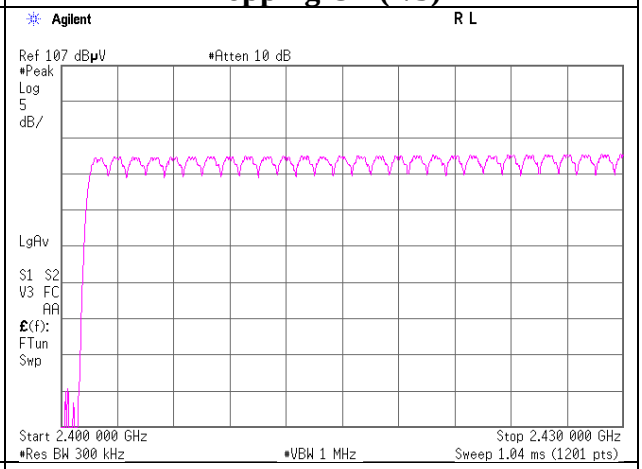
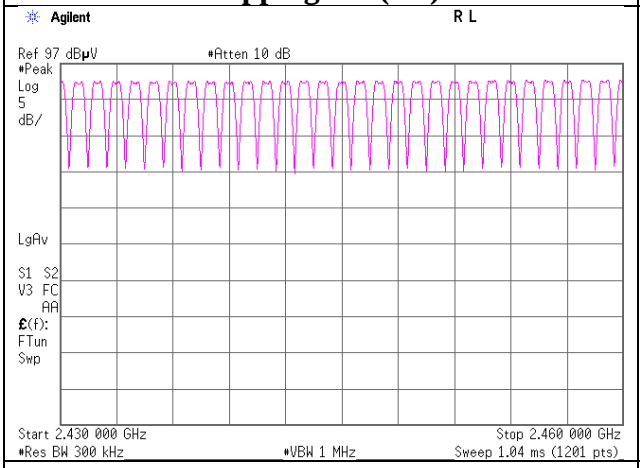
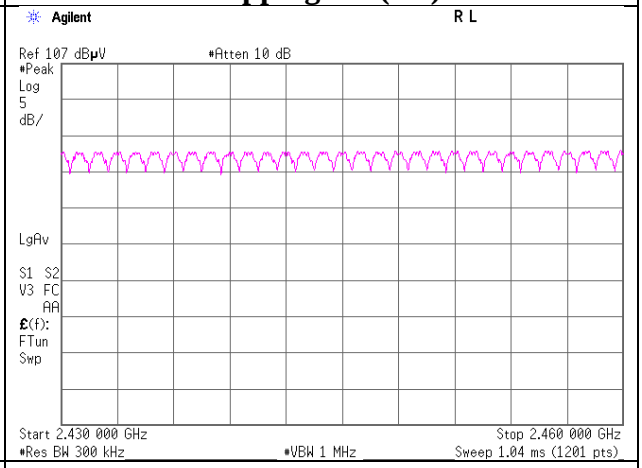
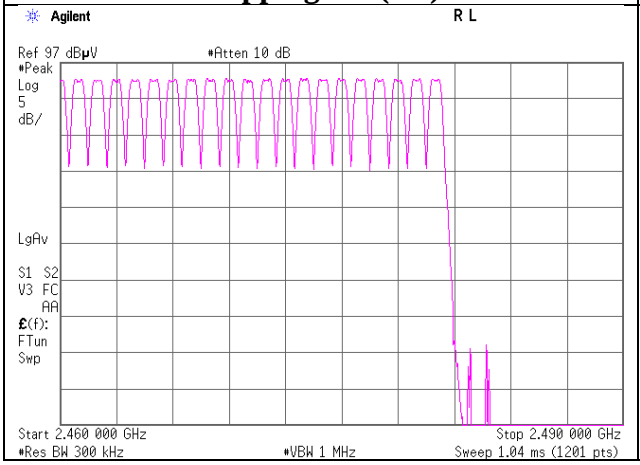
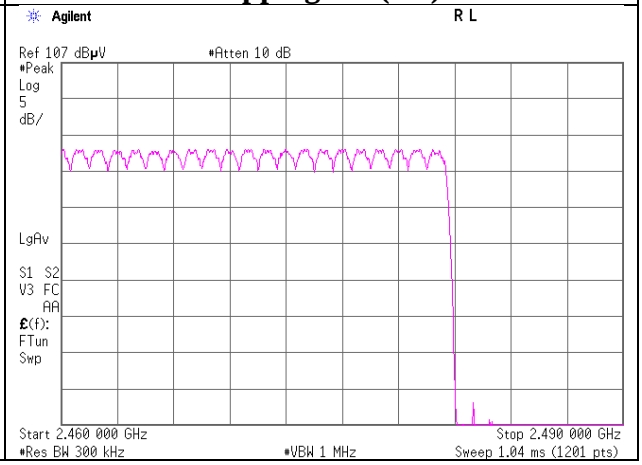
Number of Hopping Frequency

Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % 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

DH5	3DH5
Hopping On (1/3)	**Hopping On (1/3)**
	
Hopping On (2/3)	**Hopping On (2/3)**
	
Hopping On (3/3)	**Hopping On (3/3)**
	

Dwell time

Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % 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	51.4 times / 5 sec. x 31.6 sec. = 325 times	0.456	148	400
DH3	26.4 times / 5 sec. x 31.6 sec. = 167 times	1.719	287	400
DH5	18.2 times / 5 sec. x 31.6 sec. = 116 times	2.969	344	400
3DH1	51.6 times / 5 sec. x 31.6 sec. = 327 times	0.457	149	400
3DH3	26.6 times / 5 sec. x 31.6 sec. = 169 times	1.713	289	400
3DH5	17.6 times / 5 sec. x 31.6 sec. = 112 times	2.960	332	400

Sample Calculation
Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

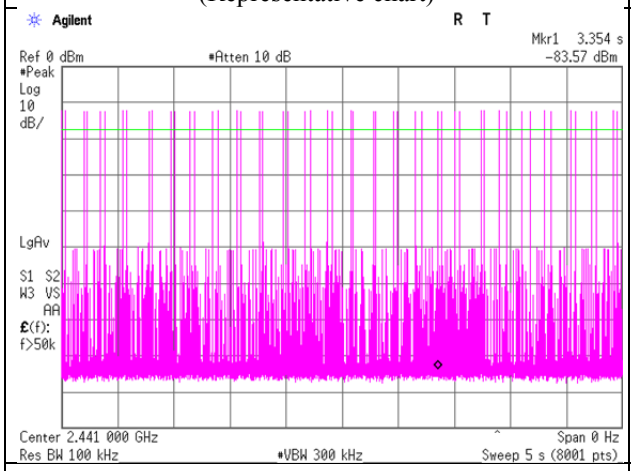
Mode	Sampling [times] 1	2	3	4	5	Average [times]
DH1	52	50	52	51	52	51.4
DH3	27	27	25	28	25	26.4
DH5	17	23	17	16	18	18.2
3DH1	51	52	51	52	52	51.6
3DH3	27	26	25	28	27	26.6
3DH5	19	17	17	17	18	17.6

Sample Calculation
Average = Summation (Sampling 1 to 5) / 5

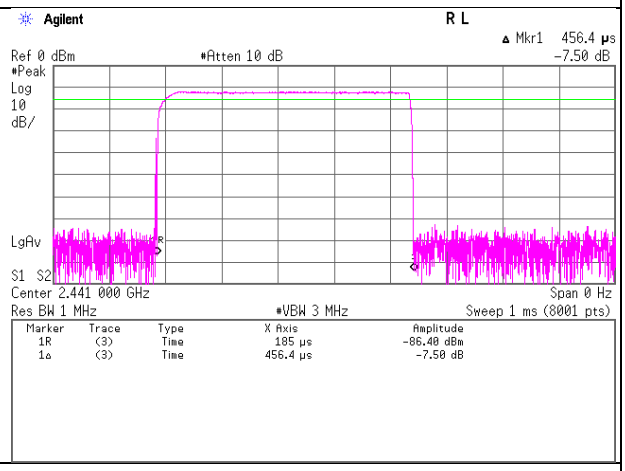
This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in N x 0.4s, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than 0.4s regardless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

Dwell time

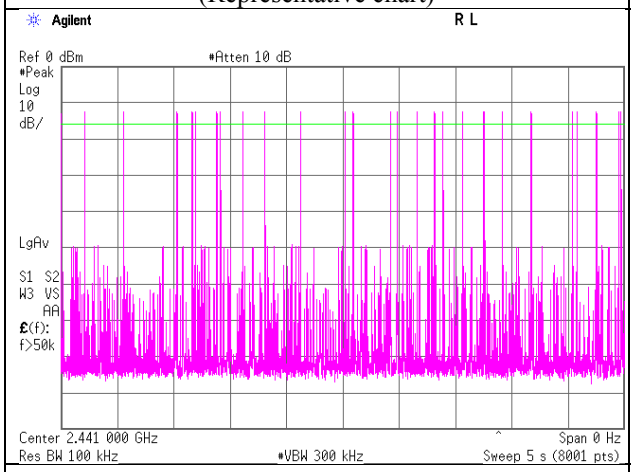
DH1 (1/2)
(Representative chart)



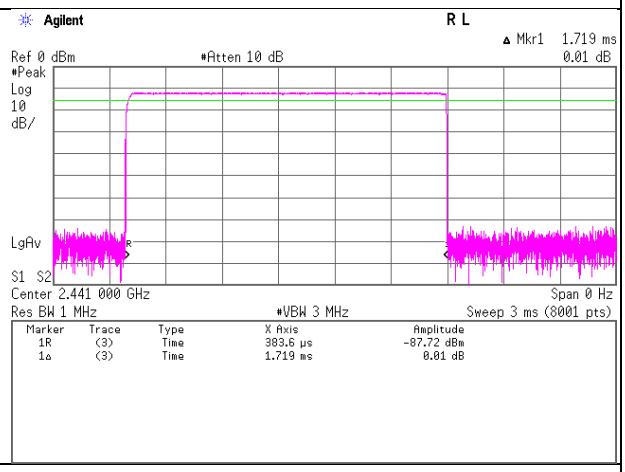
DH1 (2/2)



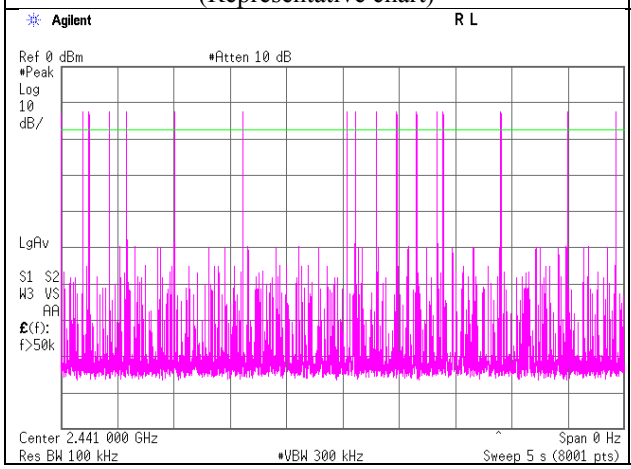
DH3 (1/2)
(Representative chart)



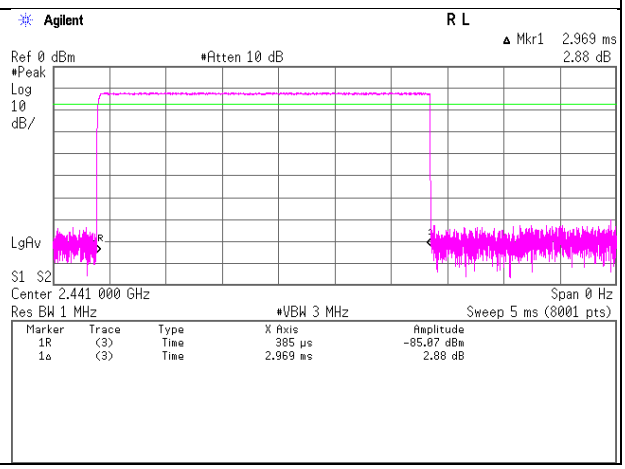
DH3 (2/2)



DH5 (1/2)
(Representative chart)

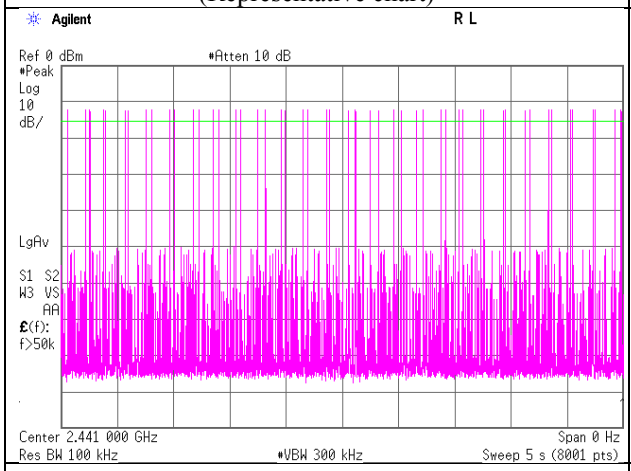


DH5 (2/2)

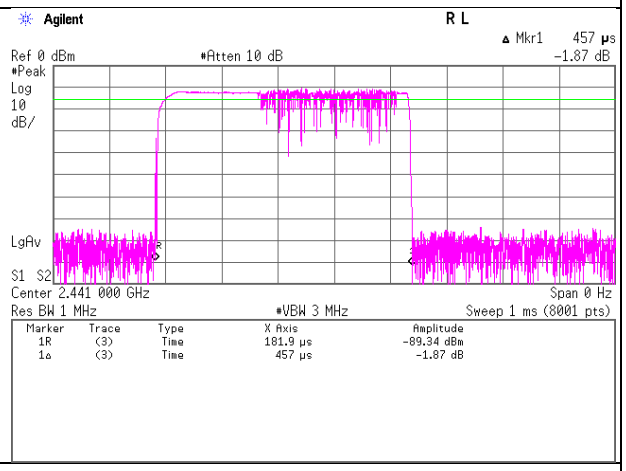


Dwell time

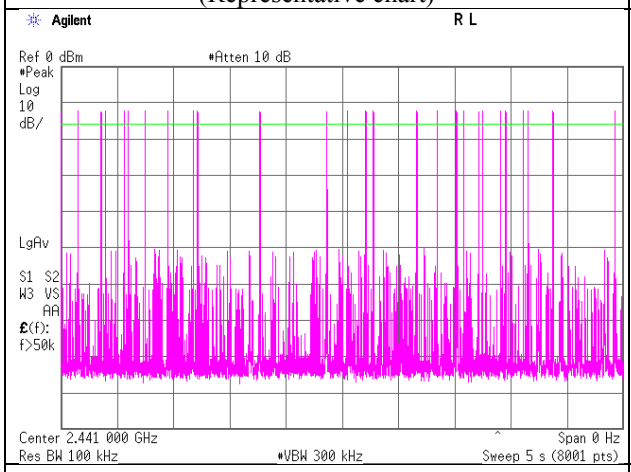
3DH1 (1/2)
(Representative chart)



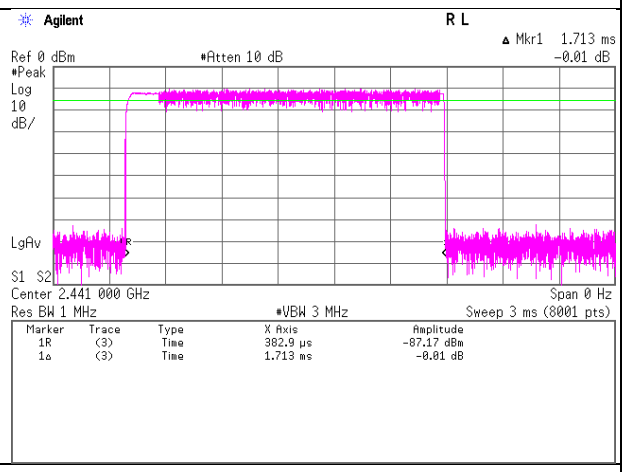
3DH1 (2/2)



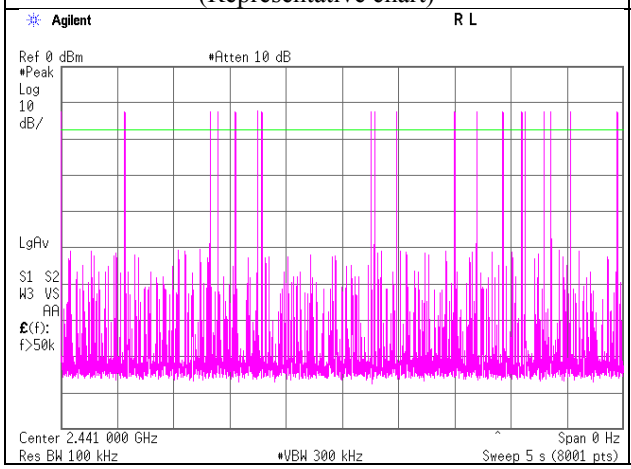
3DH3 (1/2)
(Representative chart)



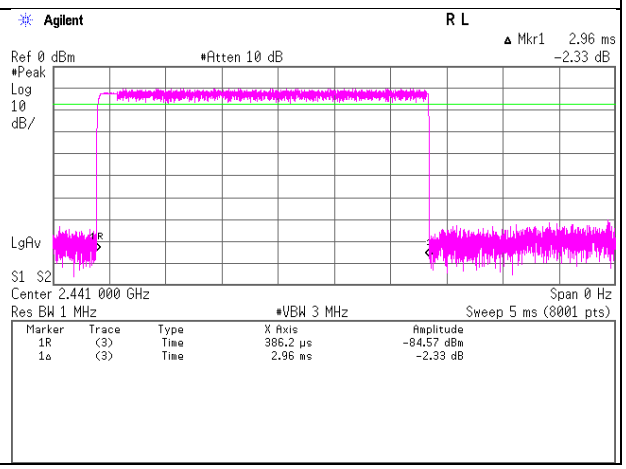
3DH3 (2/2)



3DH5 (1/2)
(Representative chart)



3DH5 (2/2)



Maximum Peak Output Power

Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]	Limit [dBm]	Limit [mW]	Margin [dB]
DH5	2402.0	-12.03	1.97	9.92	-0.14	0.97	20.96	125	21.10
DH5	2441.0	-11.64	1.98	9.92	0.26	1.06	20.96	125	20.70
DH5	2480.0	-11.45	1.99	9.92	0.46	1.11	20.96	125	20.50
2DH5	2402.0	-10.39	1.97	9.92	1.50	1.41	20.96	125	19.46
2DH5	2441.0	-9.97	1.98	9.92	1.93	1.56	20.96	125	19.03
2DH5	2480.0	-9.73	1.99	9.92	2.18	1.65	20.96	125	18.78
3DH5	2402.0	-9.89	1.97	9.92	2.00	1.58	20.96	125	18.96
3DH5	2441.0	-9.45	1.98	9.92	2.45	1.76	20.96	125	18.51
3DH5	2480.0	-9.27	1.99	9.92	2.64	1.84	20.96	125	18.32

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.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx, Hopping Off

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
DH5	2402.0	-13.81	1.97	9.92	-1.92	0.64	1.02	-0.90	0.81
DH5	2441.0	-13.32	1.98	9.92	-1.42	0.72	1.02	-0.40	0.91
DH5	2480.0	-13.10	1.99	9.92	-1.19	0.76	1.02	-0.17	0.96
2DH5	2402.0	-14.31	1.97	9.92	-2.42	0.57	1.03	-1.39	0.73
2DH5	2441.0	-13.81	1.98	9.92	-1.91	0.64	1.03	-0.88	0.82
2DH5	2480.0	-13.62	1.99	9.92	-1.71	0.67	1.03	-0.68	0.86
3DH5	2402.0	-14.31	1.97	9.92	-2.42	0.57	1.03	-1.39	0.73
3DH5	2441.0	-13.83	1.98	9.92	-1.93	0.64	1.03	-0.90	0.81
3DH5	2480.0	-13.61	1.99	9.92	-1.70	0.68	1.03	-0.67	0.86

Sample Calculation:
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
Result (Burst power average) = Time average + Duty factor

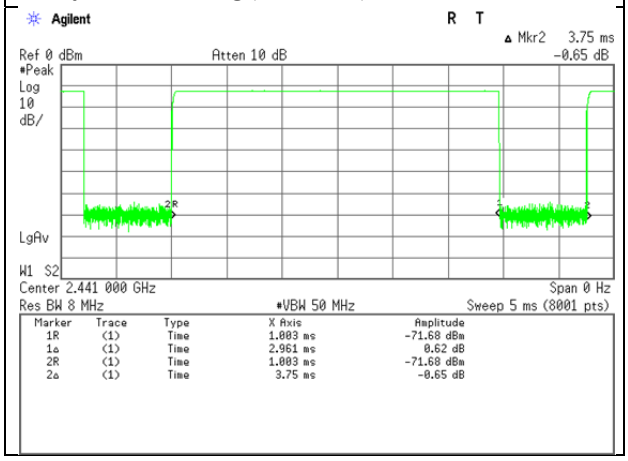
*The equipment and cables were not used for factor 0 dB of the data sheets.

Burst Rate Confirmation

Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx, Hopping Off

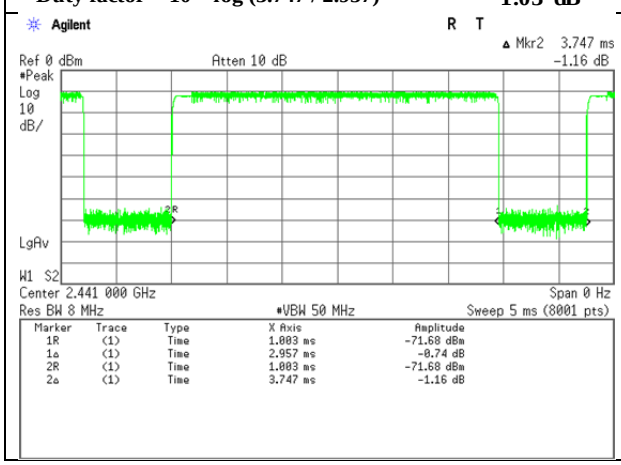
DH5

Tx on / (Tx on + Tx off) = 0.790
Tx on / (Tx on + Tx off) * 100 = 79.0 %
Duty factor = 10 * log (3.75 / 2.961) = 1.02 dB



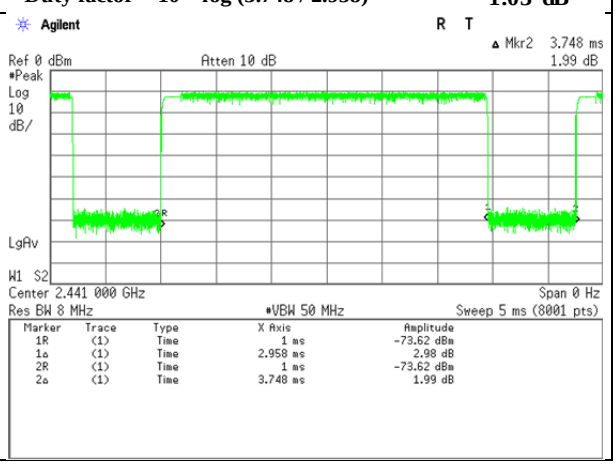
2DH5

Tx on / (Tx on + Tx off) = 0.789
Tx on / (Tx on + Tx off) * 100 = 78.9 %
Duty factor = 10 * log (3.747 / 2.957) = 1.03 dB



3DH5

Tx on / (Tx on + Tx off) = 0.789
Tx on / (Tx on + Tx off) * 100 = 78.9 %
Duty factor = 10 * log (3.748 / 2.958) = 1.03 dB



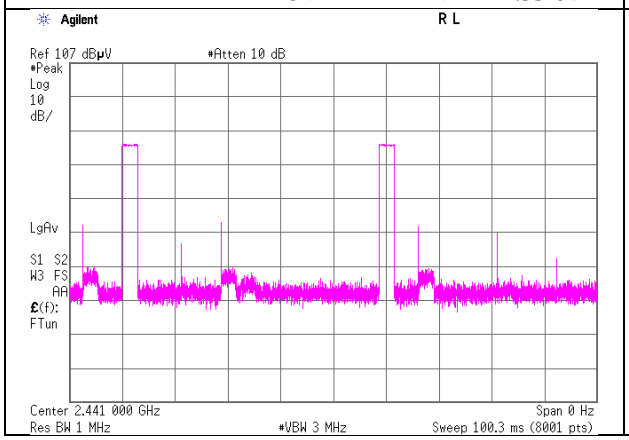
Dwell time factor

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11573340S-A-R1
Date	February 7, 2017
Temperature / Humidity	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping On

DH5

Tx On time **2.961 ms**

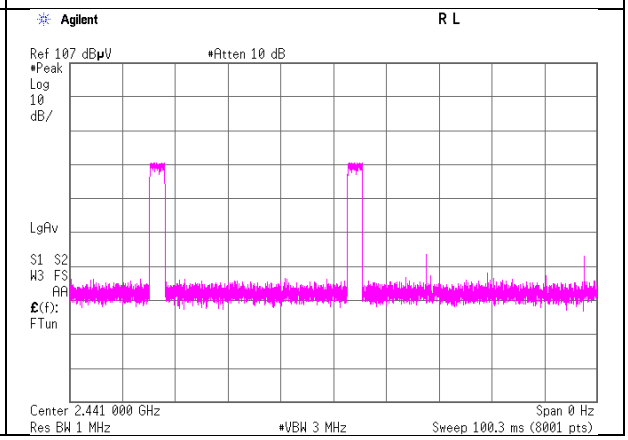
Dwell time factor = 20 * log (2.961 * 2 / 100) = -24.55 dB



3DH5

Tx On time **2.958 ms**

Dwell time factor = 20 * log (2.958 * 2 / 100) = -24.56 dB



Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 7, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	23 deg. C / 28 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	P02F		
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.	82.403	QP	43.10	6.68	7.73	32.15	0.00	25.36	40.00	14.6	225	252	
Hori.	116.206	QP	39.50	12.30	7.37	32.12	0.00	27.05	43.50	16.4	306	242	
Hori.	192.437	QP	36.10	16.25	7.95	32.06	0.00	28.24	43.50	15.2	167	42	
Hori.	363.996	QP	40.80	14.82	9.02	31.93	0.00	32.71	46.00	13.2	100	223	
Hori.	2118.910	PK	44.73	26.30	13.93	37.19	2.06	49.83	73.90	24.1	127	359	
Hori.	2390.000	PK	42.61	27.41	14.20	37.06	2.06	49.22	73.90	24.7	148	203	
Hori.	4237.850	PK	43.36	30.07	6.34	36.94	2.06	44.89	73.90	29.0	154	319	
Hori.	4804.000	PK	42.08	31.13	6.67	37.12	2.06	44.82	73.90	29.1	100	0	
Hori.	7206.000	PK	53.81	36.44	8.16	37.84	2.06	62.63	73.90	11.3	158	262	
Hori.	9608.000	PK	44.21	38.63	8.99	39.13	2.06	54.76	73.90	19.1	100	0	
Hori.	2118.910	AV	37.11	26.30	13.93	37.19	2.06	42.21	53.90	11.7	127	359	
Hori.	2390.000	AV	30.67	27.41	14.20	37.06	2.06	37.28	53.90	16.6	148	203	
Hori.	4237.850	AV	35.76	30.07	6.34	36.94	2.06	37.29	53.90	16.6	154	319	
Hori.	4804.000	AV	31.29	31.13	6.67	37.12	2.06	34.03	53.90	19.9	100	0	
Hori.	9608.000	AV	32.73	38.63	8.99	39.13	2.06	43.28	53.90	10.6	100	0	
Vert.	115.250	QP	40.80	12.16	7.36	32.12	0.00	28.20	43.50	15.3	100	114	
Vert.	124.518	QP	38.70	13.17	7.45	32.12	0.00	27.20	43.50	16.3	100	151	
Vert.	706.296	QP	30.40	19.64	10.41	31.82	0.00	28.63	46.00	17.3	100	358	
Vert.	2118.892	PK	45.75	26.30	13.93	37.19	2.06	50.85	73.90	23.1	254	6	
Vert.	2390.000	PK	42.19	27.41	14.20	37.06	2.06	48.80	73.90	25.1	126	358	
Vert.	4237.801	PK	44.76	30.07	6.34	36.94	2.06	46.29	73.90	27.6	102	359	
Vert.	4804.000	PK	41.85	31.13	6.67	37.12	2.06	44.59	73.90	29.3	100	0	
Vert.	7206.000	PK	53.02	36.44	8.16	37.84	2.06	61.84	73.90	12.1	130	270	
Vert.	9608.000	PK	43.22	38.63	8.99	39.13	2.06	53.77	73.90	20.1	100	0	
Vert.	2118.892	AV	39.68	26.30	13.93	37.19	2.06	44.78	53.90	**9.1**	254	6	
Vert.	2390.000	AV	30.83	27.41	14.20	37.06	2.06	37.44	53.90	16.5	126	358	
Vert.	4237.801	AV	38.54	30.07	6.34	36.94	2.06	40.07	53.90	13.8	102	359	
Vert.	4804.000	AV	31.21	31.13	6.67	37.12	2.06	33.95	53.90	20.0	100	0	
Vert.	9608.000	AV	32.57	38.63	8.99	39.13	2.06	43.12	53.90	10.8	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

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.	7206.000	AV	48.15	36.44	8.16	37.84	-24.55	2.06	32.42	53.90	**21.5**	
Vert.	7206.000	AV	46.03	36.44	8.16	37.84	-24.55	2.06	30.30	53.90	23.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 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.

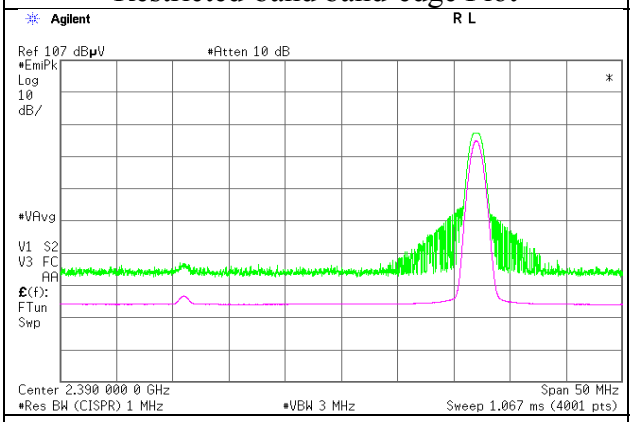
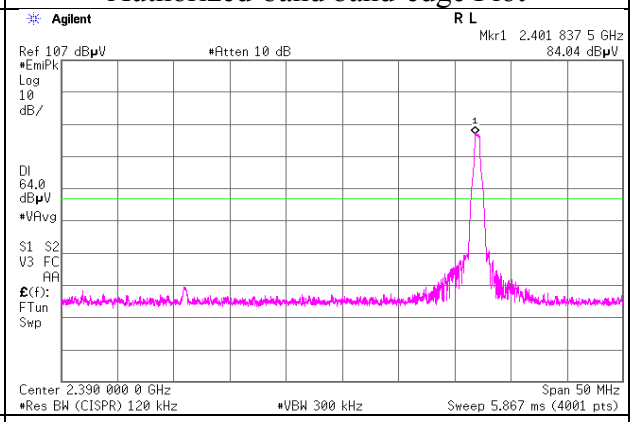
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

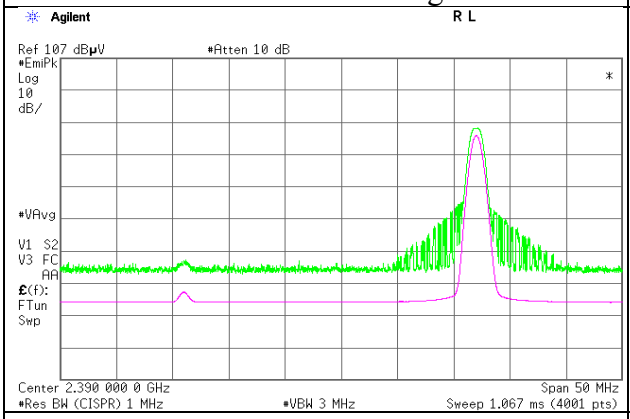
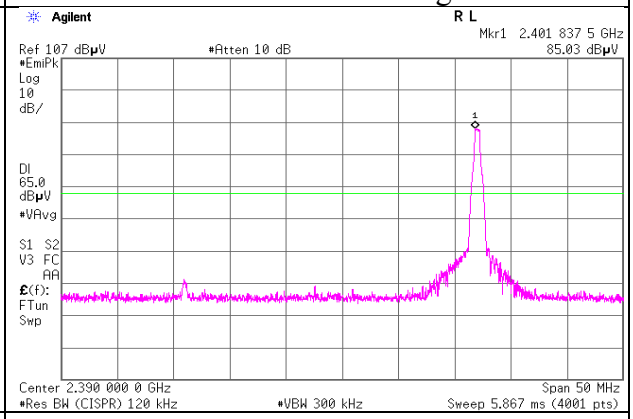
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	83.57	27.46	14.21	37.05	2.06	90.25	-	-	Carrier
Hori.	2400.000	PK	43.44	27.45	14.20	37.05	2.06	50.10	70.25	20.2	
Vert.	2402.000	PK	84.80	27.46	14.21	37.05	2.06	91.48	-	-	Carrier
Vert.	2400.000	PK	43.65	27.45	14.20	37.05	2.06	50.31	71.48	21.2	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11573340S-A-R1
Date	February 7, 2017
Temperature / Humidity	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)
Model No	P02F
Mode	Tx, Hopping Off, DH5 2402 MHz

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 7, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	23 deg. C / 28 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	P02F		
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.	82.533	QP	43.10	6.71	7.72	32.15	0.00	25.38	40.00	14.6	225	256	
Hori.	115.241	QP	39.40	12.16	7.36	32.12	0.00	26.80	43.50	16.7	305	236	
Hori.	192.277	QP	35.70	16.25	7.94	32.06	0.00	27.83	43.50	15.6	185	41	
Hori.	363.997	QP	40.80	14.82	9.02	31.93	0.00	32.71	46.00	13.2	100	224	
Hori.	2118.886	PK	45.77	26.30	13.93	37.19	2.06	50.87	73.90	23.0	102	359	
Hori.	4237.792	PK	43.86	30.07	6.34	36.94	2.06	45.39	73.90	28.5	172	25	
Hori.	4882.000	PK	42.68	31.29	6.74	37.16	2.06	45.61	73.90	28.3	100	0	
Hori.	7323.000	PK	50.60	36.77	8.32	37.92	2.06	59.83	73.90	14.1	227	288	
Hori.	9764.000	PK	43.56	38.75	9.13	39.20	2.06	54.30	73.90	19.6	100	0	
Hori.	2118.886	AV	37.12	26.30	13.93	37.19	2.06	42.22	53.90	11.7	102	359	
Hori.	4237.792	AV	35.53	30.07	6.34	36.94	2.06	37.06	53.90	16.8	172	25	
Hori.	4882.000	AV	31.09	31.29	6.74	37.16	2.06	34.02	53.90	19.9	100	0	
Hori.	9764.000	AV	32.86	38.75	9.13	39.20	2.06	43.60	53.90	10.3	100	0	
Vert.	115.222	QP	40.30	12.16	7.36	32.12	0.00	27.70	43.50	15.8	100	104	
Vert.	124.368	QP	39.00	13.16	7.45	32.12	0.00	27.49	43.50	16.0	100	139	
Vert.	706.300	QP	30.60	19.64	10.41	31.82	0.00	28.83	46.00	17.1	100	359	
Vert.	2118.887	PK	45.57	26.30	13.93	37.19	2.06	50.67	73.90	23.2	257	7	
Vert.	4237.791	PK	45.32	30.07	6.34	36.94	2.06	46.85	73.90	27.1	104	359	
Vert.	4882.000	PK	42.49	31.29	6.74	37.16	2.06	45.42	73.90	28.5	100	0	
Vert.	7323.000	PK	49.45	36.77	8.32	37.92	2.06	58.68	73.90	15.2	101	227	
Vert.	9764.000	PK	43.54	38.75	9.13	39.20	2.06	54.28	73.90	19.6	100	0	
Vert.	2118.887	AV	39.40	26.30	13.93	37.19	2.06	44.50	53.90	**9.4**	257	7	
Vert.	4237.791	AV	38.43	30.07	6.34	36.94	2.06	39.96	53.90	13.9	104	359	
Vert.	4882.000	AV	31.06	31.29	6.74	37.16	2.06	33.99	53.90	19.9	100	0	
Vert.	9764.000	AV	32.70	38.75	9.13	39.20	2.06	43.44	53.90	10.5	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

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.	7323.000	AV	44.63	36.77	8.32	37.92	-24.55	2.06	29.31	53.90	**24.6**	
Vert.	7323.000	AV	42.66	36.77	8.32	37.92	-24.55	2.06	27.34	53.90	26.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 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. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 7, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	23 deg. C / 28 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	P02F		
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.	82.483	QP	43.10	6.70	7.73	32.15	0.00	25.38	40.00	14.6	226	251	
Hori.	116.143	QP	38.10	12.29	7.37	32.12	0.00	25.64	43.50	17.8	311	242	
Hori.	192.307	QP	35.30	16.25	7.94	32.06	0.00	27.43	43.50	16.0	166	36	
Hori.	363.996	QP	40.60	14.82	9.02	31.93	0.00	32.51	46.00	13.4	100	222	
Hori.	2118.890	PK	45.18	26.30	13.93	37.19	2.06	50.28	73.90	23.6	146	265	
Hori.	2483.500	PK	53.66	27.79	14.30	37.01	2.06	60.80	73.90	13.1	158	347	
Hori.	4237.797	PK	44.17	30.07	6.34	36.94	2.06	45.70	73.90	28.2	100	319	
Hori.	4960.000	PK	42.36	31.45	6.81	37.19	2.06	45.49	73.90	28.4	100	0	
Hori.	7440.000	PK	51.55	37.11	8.49	37.99	2.06	61.22	73.90	12.7	194	277	
Hori.	9920.000	PK	45.51	38.87	9.27	39.26	2.06	56.45	73.90	17.5	100	0	
Hori.	2118.890	AV	37.27	26.30	13.93	37.19	2.06	42.37	53.90	11.5	146	265	
Hori.	2483.500	AV	31.08	27.79	14.30	37.01	2.06	38.22	53.90	15.7	158	347	
Hori.	4237.797	AV	35.38	30.07	6.34	36.94	2.06	36.91	53.90	17.0	100	319	
Hori.	4960.000	AV	31.10	31.45	6.81	37.19	2.06	34.23	53.90	19.7	100	0	
Hori.	9920.000	AV	33.50	38.87	9.27	39.26	2.06	44.44	53.90	9.5	100	0	
Vert.	115.239	QP	40.80	12.16	7.36	32.12	0.00	28.20	43.50	15.3	100	114	
Vert.	124.277	QP	39.00	13.15	7.44	32.12	0.00	27.47	43.50	16.0	100	140	
Vert.	706.297	QP	30.20	19.64	10.41	31.82	0.00	28.43	46.00	17.5	100	359	
Vert.	2118.924	PK	44.68	26.30	13.93	37.19	2.06	49.78	73.90	24.1	100	161	
Vert.	2483.500	PK	53.93	27.79	14.30	37.01	2.06	61.07	73.90	12.8	100	6	
Vert.	4237.779	PK	44.77	30.07	6.34	36.94	2.06	46.30	73.90	27.6	104	359	
Vert.	4960.000	PK	42.93	31.45	6.81	37.19	2.06	46.06	73.90	27.8	100	0	
Vert.	7440.000	PK	49.63	37.11	8.49	37.99	2.06	59.30	73.90	14.6	221	159	
Vert.	9920.000	PK	45.03	38.87	9.27	39.26	2.06	55.97	73.90	17.9	100	0	
Vert.	2118.924	AV	35.39	26.30	13.93	37.19	2.06	40.49	53.90	13.4	100	161	
Vert.	2483.500	AV	31.26	27.79	14.30	37.01	2.06	38.40	53.90	15.5	100	6	
Vert.	4237.779	AV	38.45	30.07	6.34	36.94	2.06	39.98	53.90	13.9	104	359	
Vert.	4960.000	AV	31.08	31.45	6.81	37.19	2.06	34.21	53.90	19.7	100	0	
Vert.	9920.000	AV	33.59	38.87	9.27	39.26	2.06	44.53	53.90	**9.4**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

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.	7440.000	AV	44.77	37.11	8.49	37.99	-24.55	2.06	29.89	53.90	**24.0**	
Vert.	7440.000	AV	42.93	37.11	8.49	37.99	-24.55	2.06	28.05	53.90	25.9	

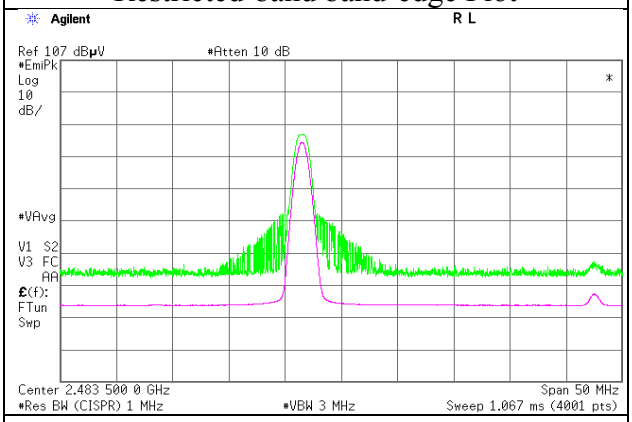
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11573340S-A-R1
Date	February 7, 2017
Temperature / Humidity	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)
Model No	P02F
Mode	Tx, Hopping Off, DH5 2480 MHz

Horizontal

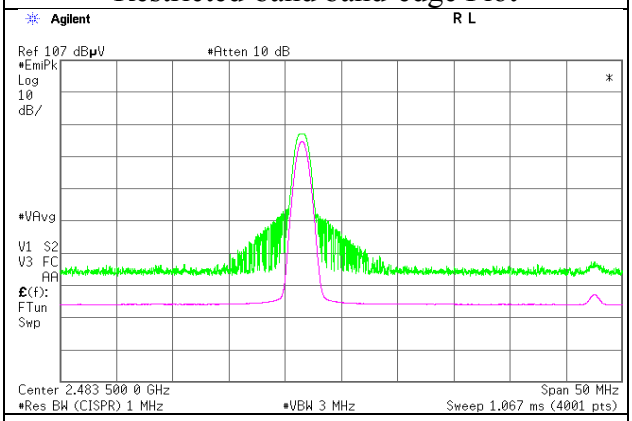
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 7, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	23 deg. C / 28 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	P02F		
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.	82.512	QP	41.90	6.70	7.72	32.15	0.00	24.17	40.00	15.8	233	256	
Hori.	115.276	QP	38.70	12.16	7.36	32.12	0.00	26.10	43.50	17.4	296	232	
Hori.	192.570	QP	34.30	16.25	7.95	32.06	0.00	26.44	43.50	17.0	170	41	
Hori.	363.997	QP	40.60	14.82	9.02	31.93	0.00	32.51	46.00	13.4	100	220	
Hori.	2118.877	PK	45.19	26.30	13.93	37.19	2.06	50.29	73.90	23.6	122	359	
Hori.	2390.000	PK	41.69	27.41	14.20	37.06	2.06	48.30	73.90	25.6	145	204	
Hori.	4237.797	PK	43.56	30.07	6.34	36.94	2.06	45.09	73.90	28.8	100	222	
Hori.	4804.000	PK	42.54	31.13	6.67	37.12	2.06	45.28	73.90	28.6	100	0	
Hori.	7206.000	PK	54.83	36.44	8.16	37.84	2.06	63.65	73.90	**10.2**	240	286	
Hori.	9608.000	PK	44.36	38.63	8.99	39.13	2.06	54.91	73.90	18.9	100	0	
Hori.	2118.877	AV	37.26	26.30	13.93	37.19	2.06	42.36	53.90	11.5	122	359	
Hori.	2390.000	AV	30.22	27.41	14.20	37.06	2.06	36.83	53.90	17.0	145	204	
Hori.	4237.797	AV	35.31	30.07	6.34	36.94	2.06	36.84	53.90	17.0	100	222	
Hori.	4804.000	AV	31.27	31.13	6.67	37.12	2.06	34.01	53.90	19.8	100	0	
Hori.	9608.000	AV	32.74	38.63	8.99	39.13	2.06	43.29	53.90	10.6	100	0	
Vert.	115.277	QP	40.50	12.16	7.36	32.12	0.00	27.90	43.50	15.6	100	113	
Vert.	124.604	QP	38.60	13.18	7.45	32.12	0.00	27.11	43.50	16.3	100	139	
Vert.	706.293	QP	30.80	19.64	10.41	31.82	0.00	29.03	46.00	16.9	100	359	
Vert.	2118.904	PK	44.16	26.30	13.93	37.19	2.06	49.26	73.90	24.6	170	163	
Vert.	2390.000	PK	42.72	27.41	14.20	37.06	2.06	49.33	73.90	24.5	127	359	
Vert.	4237.797	PK	45.79	30.07	6.34	36.94	2.06	47.32	73.90	26.5	104	359	
Vert.	4804.000	PK	43.01	31.13	6.67	37.12	2.06	45.75	73.90	28.1	100	0	
Vert.	7206.000	PK	52.08	36.44	8.16	37.84	2.06	60.90	73.90	13.0	100	266	
Vert.	9608.000	PK	43.36	38.63	8.99	39.13	2.06	53.91	73.90	19.9	100	0	
Vert.	2118.904	AV	35.40	26.30	13.93	37.19	2.06	40.50	53.90	13.4	170	163	
Vert.	2390.000	AV	30.76	27.41	14.20	37.06	2.06	37.37	53.90	16.5	127	359	
Vert.	4237.797	AV	38.50	30.07	6.34	36.94	2.06	40.03	53.90	13.8	104	359	
Vert.	4804.000	AV	31.14	31.13	6.67	37.12	2.06	33.88	53.90	20.0	100	0	
Vert.	9608.000	AV	32.52	38.63	8.99	39.13	2.06	43.07	53.90	10.8	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

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.	7206.000	AV	47.31	36.44	8.16	37.84	-24.56	2.06	31.57	53.90	**22.3**	
Vert.	7206.000	AV	45.01	36.44	8.16	37.84	-24.56	2.06	29.27	53.90	24.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 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	83.36	27.46	14.21	37.05	2.06	90.04	-	-	Carrier
Hori.	2400.000	PK	42.38	27.45	14.20	37.05	2.06	49.04	70.04	21.0	
Vert.	2402.000	PK	84.64	27.46	14.21	37.05	2.06	91.32	-	-	Carrier
Vert.	2400.000	PK	43.77	27.45	14.20	37.05	2.06	50.43	71.32	20.9	

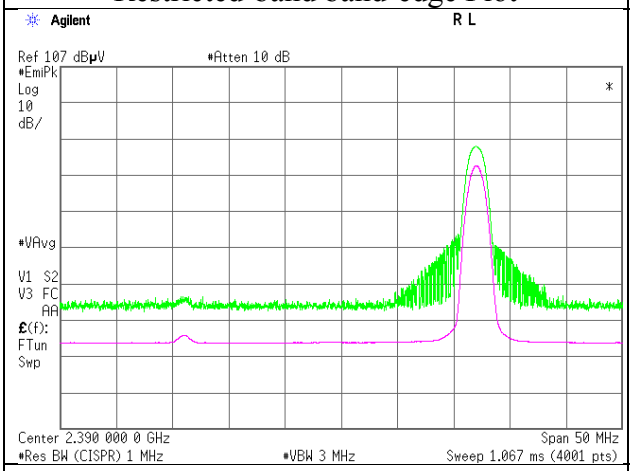
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11573340S-A-R1
Date	February 7, 2017
Temperature / Humidity	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)
Model No	P02F
Mode	Tx, Hopping Off, 3DH5 2402 MHz

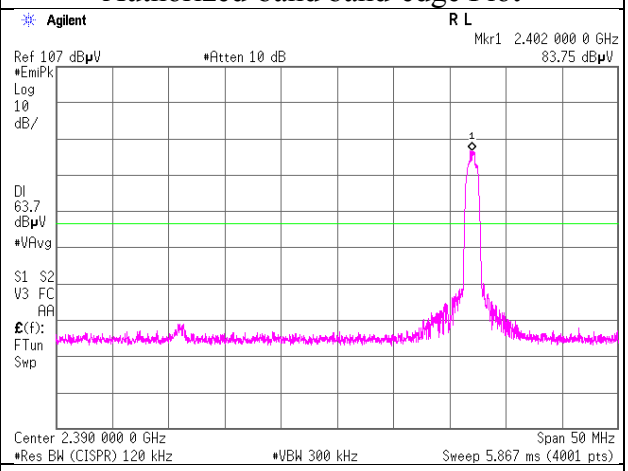
Horizontal

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

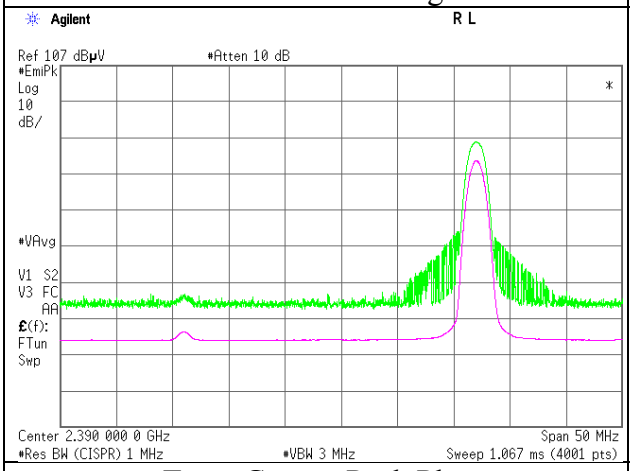
Authorized-band band-edge Plot



20dBc Plot

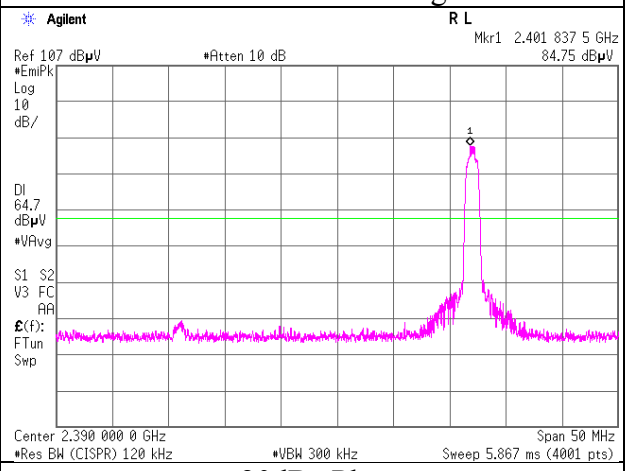
Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Authorized-band band-edge Plot



20dBc Plot

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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 7, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	23 deg. C / 28 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	P02F		
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.	82.498	QP	42.90	6.70	7.73	32.15	0.00	25.18	40.00	14.8	225	256	
Hori.	116.275	QP	38.90	12.31	7.37	32.12	0.00	26.46	43.50	17.0	292	233	
Hori.	192.467	QP	35.50	16.25	7.95	32.06	0.00	27.64	43.50	15.8	177	41	
Hori.	363.999	QP	40.70	14.82	9.02	31.93	0.00	32.61	46.00	13.3	100	223	
Hori.	2118.721	PK	44.33	26.30	13.93	37.19	2.06	49.43	73.90	24.4	117	359	
Hori.	4237.789	PK	43.32	30.07	6.34	36.94	2.06	44.85	73.90	29.0	100	222	
Hori.	4882.000	PK	43.28	31.29	6.74	37.16	2.06	46.21	73.90	27.6	100	0	
Hori.	7323.000	PK	51.07	36.77	8.32	37.92	2.06	60.30	73.90	13.6	195	291	
Hori.	9764.000	PK	43.71	38.75	9.13	39.20	2.06	54.45	73.90	19.4	100	0	
Hori.	2118.721	AV	36.79	26.30	13.93	37.19	2.06	41.89	53.90	12.0	117	359	
Hori.	4237.789	AV	35.37	30.07	6.34	36.94	2.06	36.90	53.90	17.0	100	222	
Hori.	4882.000	AV	31.19	31.29	6.74	37.16	2.06	34.12	53.90	19.7	100	0	
Hori.	9764.000	AV	32.91	38.75	9.13	39.20	2.06	43.65	53.90	**10.2**	100	0	
Vert.	115.238	QP	40.60	12.16	7.36	32.12	0.00	28.00	43.50	15.5	100	115	
Vert.	124.578	QP	38.70	13.17	7.45	32.12	0.00	27.20	43.50	16.3	100	152	
Vert.	706.301	QP	30.70	19.64	10.41	31.82	0.00	28.93	46.00	17.0	100	359	
Vert.	2118.903	PK	43.90	26.30	13.93	37.19	2.06	49.00	73.90	24.9	168	164	
Vert.	4237.780	PK	45.48	30.07	6.34	36.94	2.06	47.01	73.90	26.8	103	359	
Vert.	4882.000	PK	42.44	31.29	6.74	37.16	2.06	45.37	73.90	28.5	100	0	
Vert.	7323.000	PK	49.58	36.77	8.32	37.92	2.06	58.81	73.90	15.0	100	227	
Vert.	9764.000	PK	43.76	38.75	9.13	39.20	2.06	54.50	73.90	19.4	100	0	
Vert.	2118.903	AV	35.01	26.30	13.93	37.19	2.06	40.11	53.90	13.7	168	164	
Vert.	4237.780	AV	38.43	30.07	6.34	36.94	2.06	39.96	53.90	13.9	103	359	
Vert.	4882.000	AV	31.08	31.29	6.74	37.16	2.06	34.01	53.90	19.8	100	0	
Vert.	9764.000	AV	32.75	38.75	9.13	39.20	2.06	43.49	53.90	10.4	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

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.	7323.000	AV	42.86	36.77	8.32	37.92	-24.56	2.06	27.53	53.90	**26.4**	
Vert.	7323.000	AV	41.40	36.77	8.32	37.92	-24.56	2.06	26.07	53.90	27.8	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 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. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 7, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	23 deg. C / 28 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	P02F		
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.	82.531	QP	41.90	6.71	7.72	32.15	0.00	24.18	40.00	15.8	230	255	
Hori.	116.272	QP	38.70	12.31	7.37	32.12	0.00	26.26	43.50	17.2	294	240	
Hori.	187.367	QP	34.40	16.26	7.94	32.06	0.00	26.54	43.50	16.9	187	274	
Hori.	364.002	QP	40.60	14.82	9.02	31.93	0.00	32.51	46.00	13.4	100	219	
Hori.	2118.936	PK	44.04	26.30	13.93	37.19	2.06	49.14	73.90	24.7	126	359	
Hori.	2483.500	PK	52.80	27.79	14.30	37.01	2.06	59.94	73.90	13.9	175	351	
Hori.	4237.790	PK	42.93	30.07	6.34	36.94	2.06	44.46	73.90	29.4	100	222	
Hori.	4960.000	PK	41.75	31.45	6.81	37.19	2.06	44.88	73.90	29.0	100	0	
Hori.	7440.000	PK	50.74	37.11	8.49	37.99	2.06	60.41	73.90	13.4	195	275	
Hori.	9920.000	PK	45.17	38.87	9.27	39.26	2.06	56.11	73.90	17.7	100	0	
Hori.	2118.936	AV	36.05	26.30	13.93	37.19	2.06	41.15	53.90	12.7	126	359	
Hori.	2483.500	AV	30.58	27.79	14.30	37.01	2.06	37.72	53.90	16.1	175	351	
Hori.	4237.790	AV	35.24	30.07	6.34	36.94	2.06	36.77	53.90	17.1	100	222	
Hori.	4960.000	AV	31.07	31.45	6.81	37.19	2.06	34.20	53.90	19.7	100	0	
Hori.	9920.000	AV	33.56	38.87	9.27	39.26	2.06	44.50	53.90	**9.4**	100	0	
Vert.	115.221	QP	40.40	12.16	7.36	32.12	0.00	27.80	43.50	15.7	100	113	
Vert.	124.596	QP	38.60	13.18	7.45	32.12	0.00	27.11	43.50	16.3	100	135	
Vert.	706.295	QP	30.60	19.64	10.41	31.82	0.00	28.83	46.00	17.1	100	358	
Vert.	2118.907	PK	44.76	26.30	13.93	37.19	2.06	49.86	73.90	24.0	260	9	
Vert.	2483.500	PK	52.75	27.79	14.30	37.01	2.06	59.89	73.90	14.0	100	6	
Vert.	4237.788	PK	44.60	30.07	6.34	36.94	2.06	46.13	73.90	27.7	105	359	
Vert.	4960.000	PK	41.63	31.45	6.81	37.19	2.06	44.76	73.90	29.1	100	0	
Vert.	7440.000	PK	49.44	37.11	8.49	37.99	2.06	59.11	73.90	14.7	254	159	
Vert.	9920.000	PK	44.52	38.87	9.27	39.26	2.06	55.46	73.90	18.4	100	0	
Vert.	2118.907	AV	38.39	26.30	13.93	37.19	2.06	43.49	53.90	10.4	260	9	
Vert.	2483.500	AV	30.72	27.79	14.30	37.01	2.06	37.86	53.90	16.0	100	6	
Vert.	4237.788	AV	38.34	30.07	6.34	36.94	2.06	39.87	53.90	14.0	105	359	
Vert.	4960.000	AV	31.06	31.45	6.81	37.19	2.06	34.19	53.90	19.7	100	0	
Vert.	9920.000	AV	33.56	38.87	9.27	39.26	2.06	44.50	53.90	**9.4**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

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.	7440.000	AV	42.77	37.11	8.49	37.99	-24.56	2.06	27.88	53.90	**26.0**	
Vert.	7440.000	AV	41.47	37.11	8.49	37.99	-24.56	2.06	26.58	53.90	27.3	

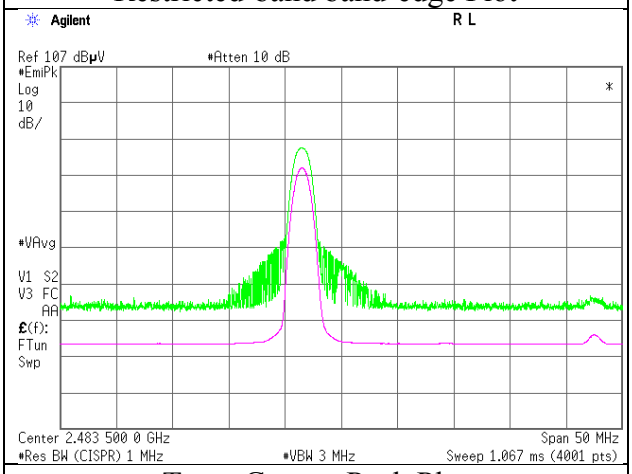
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11573340S-A-R1
Date	February 7, 2017
Temperature / Humidity	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)
Model No	P02F
Mode	Tx, Hopping Off, 3DH5 2480 MHz

Horizontal

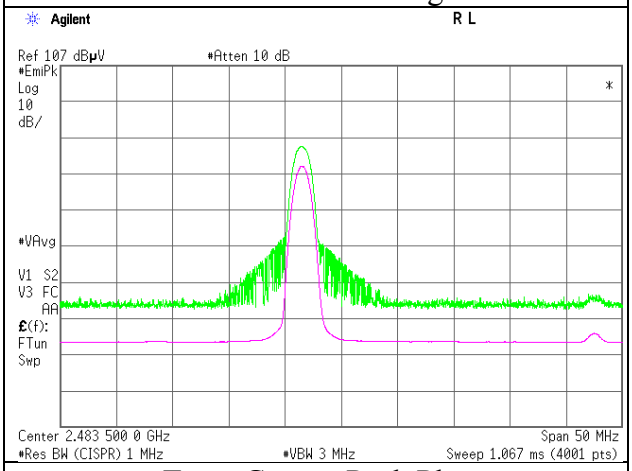
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

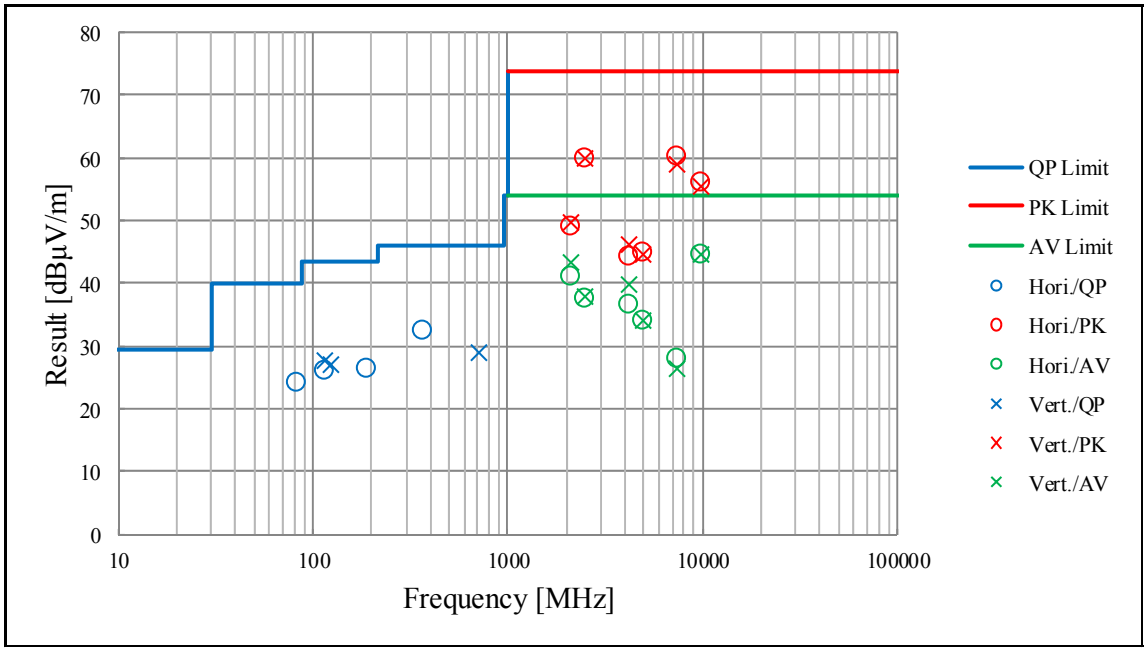


Trace Green : Peak Plot
Trace Purple : Average Plot

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

Radiated Spurious Emission
(Plot data, Worst case)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 7, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	23 deg. C / 28 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	P02F		
Mode	Tx, Hopping Off, 3DH5 2480 MHz		



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 8, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	25 deg. C / 23 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	L42P		
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.	162.877	QP	37.20	15.52	8.00	32.08	0.00	28.64	43.50	14.8	186	67	
Hori.	178.876	QP	36.80	16.23	7.95	32.07	0.00	28.91	43.50	14.5	186	288	
Hori.	189.048	QP	39.30	16.26	7.94	32.06	0.00	31.44	43.50	12.0	164	276	
Hori.	353.149	QP	38.80	14.58	8.98	31.92	0.00	30.44	46.00	15.5	100	310	
Hori.	363.997	QP	38.40	14.82	9.02	31.93	0.00	30.31	46.00	15.6	100	310	
Hori.	2390.000	PK	42.34	27.41	14.16	37.06	2.06	48.91	73.90	24.9	109	306	
Hori.	4237.785	PK	46.08	30.07	6.34	36.94	2.06	47.61	73.90	26.2	100	213	
Hori.	4804.000	PK	42.37	31.13	6.67	37.12	2.06	45.11	73.90	28.7	100	0	
Hori.	7206.000	PK	55.46	36.44	8.16	37.84	2.06	64.28	73.90	**9.6**	319	6	
Hori.	9608.000	PK	43.51	38.63	8.99	39.13	2.06	54.06	73.90	19.8	100	0	
Hori.	2390.000	AV	30.41	27.41	14.16	37.06	2.06	36.98	53.90	16.9	109	306	
Hori.	4237.785	AV	39.38	30.07	6.34	36.94	2.06	40.91	53.90	12.9	100	213	
Hori.	4804.000	AV	31.26	31.13	6.67	37.12	2.06	34.00	53.90	19.9	100	0	
Hori.	9608.000	AV	32.59	38.63	8.99	39.13	2.06	43.14	53.90	10.7	100	0	
Vert.	137.150	QP	38.40	14.09	7.67	32.10	0.00	28.06	43.50	15.4	100	247	
Vert.	911.403	QP	32.40	21.98	11.05	30.95	0.00	34.48	46.00	11.5	100	15	
Vert.	2390.000	PK	42.52	27.41	14.16	37.06	2.06	49.09	73.90	24.8	192	335	
Vert.	4237.789	PK	47.07	30.07	6.34	36.94	2.06	48.60	73.90	25.3	246	157	
Vert.	4804.000	PK	41.40	31.13	6.67	37.12	2.06	44.14	73.90	29.7	100	0	
Vert.	7206.000	PK	53.62	36.44	8.16	37.84	2.06	62.44	73.90	11.4	268	265	
Vert.	9608.000	PK	42.94	38.63	8.99	39.13	2.06	53.49	73.90	20.4	100	0	
Vert.	2390.000	AV	30.62	27.41	14.16	37.06	2.06	37.19	53.90	16.7	192	335	
Vert.	4237.789	AV	40.17	30.07	6.34	36.94	2.06	41.70	53.90	12.2	246	157	
Vert.	4804.000	AV	31.14	31.13	6.67	37.12	2.06	33.88	53.90	20.0	100	0	
Vert.	9608.000	AV	32.34	38.63	8.99	39.13	2.06	42.89	53.90	11.0	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

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.	7206.000	AV	50.47	36.44	8.16	37.84	-24.55	2.06	34.74	53.90	**19.2**	
Vert.	7206.000	AV	48.41	36.44	8.16	37.84	-24.55	2.06	32.68	53.90	21.2	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 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	81.56	27.46	14.17	37.05	2.06	88.20	-	-	Carrier
Hori.	2400.000	PK	40.03	27.45	14.16	37.05	2.06	46.65	68.20	21.6	
Vert.	2402.000	PK	84.94	27.46	14.17	37.05	2.06	91.58	-	-	Carrier
Vert.	2400.000	PK	42.98	27.45	14.16	37.05	2.06	49.60	71.58	22.0	

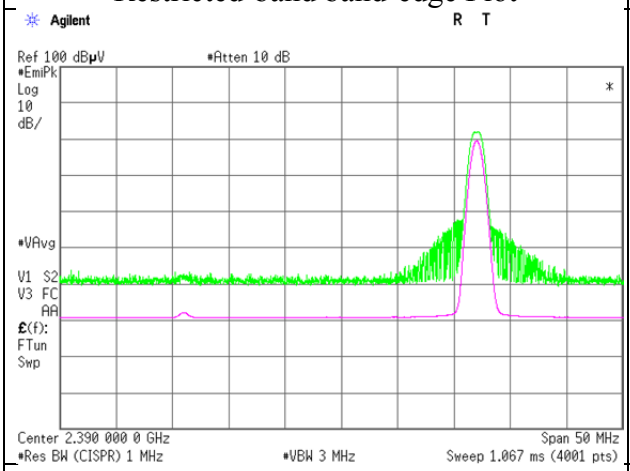
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11573340S-A-R1
Date	February 8, 2017
Temperature / Humidity	25 deg. C / 23 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)
Model No	L42P
Mode	Tx, Hopping Off, DH5 2402 MHz

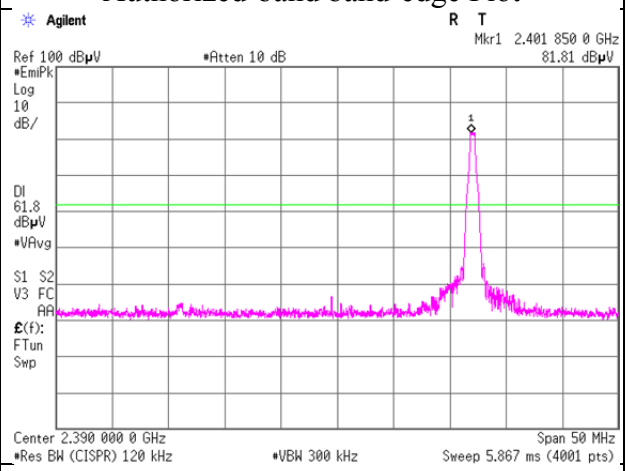
Horizontal

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

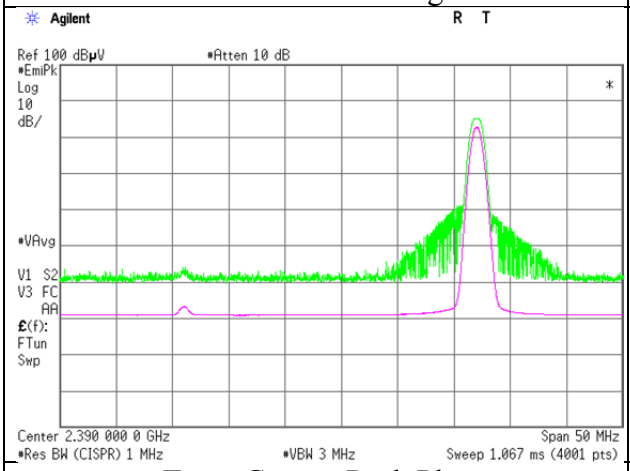
Authorized-band band-edge Plot



20dBc Plot

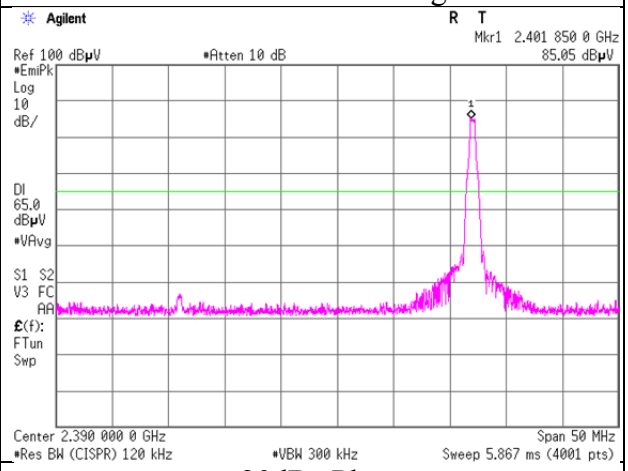
Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Authorized-band band-edge Plot



20dBc Plot

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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 8, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	25 deg. C / 23 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	L42P		
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.	162.955	QP	37.30	15.52	8.00	32.08	0.00	28.74	43.50	14.7	201	75	
Hori.	178.363	QP	36.40	16.21	7.96	32.07	0.00	28.50	43.50	15.0	199	284	
Hori.	189.201	QP	37.00	16.26	7.94	32.06	0.00	29.14	43.50	14.3	179	258	
Hori.	353.149	QP	38.90	14.58	8.98	31.92	0.00	30.54	46.00	15.4	100	307	
Hori.	364.004	QP	38.20	14.82	9.02	31.93	0.00	30.11	46.00	15.8	100	310	
Hori.	4237.791	PK	46.42	30.07	6.34	36.94	2.06	47.95	73.90	25.9	100	219	
Hori.	4882.000	PK	42.73	31.29	6.74	37.16	2.06	45.66	73.90	28.2	100	0	
Hori.	7323.000	PK	52.70	36.77	8.32	37.92	2.06	61.93	73.90	11.9	100	11	
Hori.	9764.000	PK	43.91	38.75	9.13	39.20	2.06	54.65	73.90	19.2	100	0	
Hori.	4237.791	AV	38.87	30.07	6.34	36.94	2.06	40.40	53.90	13.5	100	219	
Hori.	4882.000	AV	31.06	31.29	6.74	37.16	2.06	33.99	53.90	19.9	100	0	
Hori.	9764.000	AV	32.74	38.75	9.13	39.20	2.06	43.48	53.90	**10.4**	100	0	
Vert.	136.228	QP	38.10	14.02	7.65	32.10	0.00	27.67	43.50	15.8	100	253	
Vert.	911.426	QP	32.50	21.98	11.05	30.94	0.00	34.59	46.00	11.4	100	12	
Vert.	4237.798	PK	46.06	30.07	6.34	36.94	2.06	47.59	73.90	26.3	182	155	
Vert.	4882.000	PK	42.49	31.29	6.74	37.16	2.06	45.42	73.90	28.4	100	0	
Vert.	7323.000	PK	51.36	36.77	8.32	37.92	2.06	60.59	73.90	13.3	265	277	
Vert.	9764.000	PK	43.97	38.75	9.13	39.20	2.06	54.71	73.90	19.1	100	0	
Vert.	4237.798	AV	39.74	30.07	6.34	36.94	2.06	41.27	53.90	12.6	182	155	
Vert.	4882.000	AV	30.99	31.29	6.74	37.16	2.06	33.92	53.90	19.9	100	0	
Vert.	9764.000	AV	32.56	38.75	9.13	39.20	2.06	43.30	53.90	10.6	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

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.	7323.000	AV	47.39	36.77	8.32	37.92	-24.55	2.06	32.07	53.90	**21.8**	
Vert.	7323.000	AV	44.93	36.77	8.32	37.92	-24.55	2.06	29.61	53.90	24.3	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 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. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 8, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	25 deg. C / 23 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	L42P		
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.	162.676	QP	37.10	15.51	8.00	32.08	0.00	28.53	43.50	14.9	197	68	
Hori.	178.478	QP	37.10	16.21	7.96	32.07	0.00	29.20	43.50	14.3	178	288	
Hori.	188.989	QP	39.40	16.26	7.94	32.06	0.00	31.54	43.50	11.9	179	283	
Hori.	353.148	QP	38.70	14.58	8.98	31.92	0.00	30.34	46.00	15.6	100	312	
Hori.	363.993	QP	38.30	14.82	9.02	31.93	0.00	30.21	46.00	15.7	100	312	
Hori.	2483.500	PK	52.12	27.79	14.25	37.01	2.06	59.21	73.90	14.6	100	320	
Hori.	4237.598	PK	46.17	30.07	6.34	36.94	2.06	47.70	73.90	26.2	100	213	
Hori.	4960.000	PK	41.88	31.45	6.81	37.19	2.06	45.01	73.90	28.8	100	0	
Hori.	7440.000	PK	52.78	37.11	8.49	37.99	2.06	62.45	73.90	11.4	157	78	
Hori.	9920.000	PK	44.24	38.87	9.27	39.26	2.06	55.18	73.90	18.7	100	0	
Hori.	2483.500	AV	30.09	27.79	14.25	37.01	2.06	37.18	53.90	16.7	100	320	
Hori.	4237.598	AV	38.78	30.07	6.34	36.94	2.06	40.31	53.90	13.5	100	213	
Hori.	4960.000	AV	31.03	31.45	6.81	37.19	2.06	34.16	53.90	19.7	100	0	
Hori.	9920.000	AV	33.55	38.87	9.27	39.26	2.06	44.49	53.90	**9.4**	100	0	
Vert.	137.265	QP	38.10	14.10	7.68	32.10	0.00	27.78	43.50	15.7	100	244	
Vert.	911.431	QP	32.60	21.98	11.05	30.94	0.00	34.69	46.00	11.3	100	17	
Vert.	2483.500	PK	54.97	27.79	14.25	37.01	2.06	62.06	73.90	11.8	189	51	
Vert.	4237.778	PK	45.81	30.07	6.34	36.94	2.06	47.34	73.90	26.5	178	156	
Vert.	4960.000	PK	42.02	31.45	6.81	37.19	2.06	45.15	73.90	28.7	100	0	
Vert.	7440.000	PK	51.09	37.11	8.49	37.99	2.06	60.76	73.90	13.1	168	11	
Vert.	9920.000	PK	44.06	38.87	9.27	39.26	2.06	55.00	73.90	18.9	100	0	
Vert.	2483.500	AV	30.91	27.79	14.25	37.01	2.06	38.00	53.90	15.9	189	51	
Vert.	4237.778	AV	39.66	30.07	6.34	36.94	2.06	41.19	53.90	12.7	178	156	
Vert.	4960.000	AV	30.98	31.45	6.81	37.19	2.06	34.11	53.90	19.7	100	0	
Vert.	9920.000	AV	33.47	38.87	9.27	39.26	2.06	44.41	53.90	**9.4**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

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.	7440.000	AV	47.68	37.11	8.49	37.99	-24.55	2.06	32.80	53.90	**21.1**	
Vert.	7440.000	AV	44.80	37.11	8.49	37.99	-24.55	2.06	29.92	53.90	24.0	

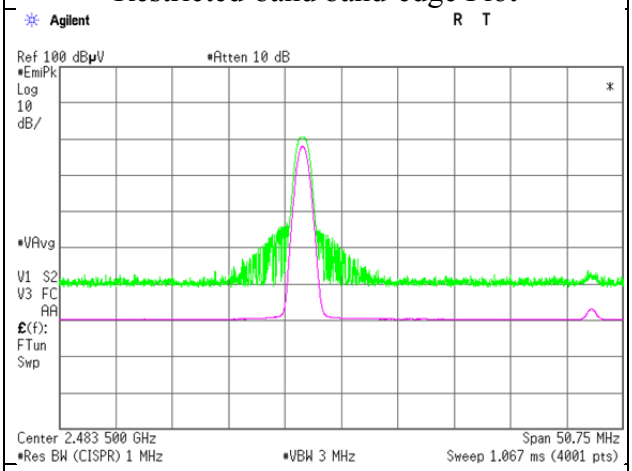
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11573340S-A-R1
Date	February 8, 2017
Temperature / Humidity	25 deg. C / 23 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)
Model No	L42P
Mode	Tx, Hopping Off, DH5 2480 MHz

Horizontal

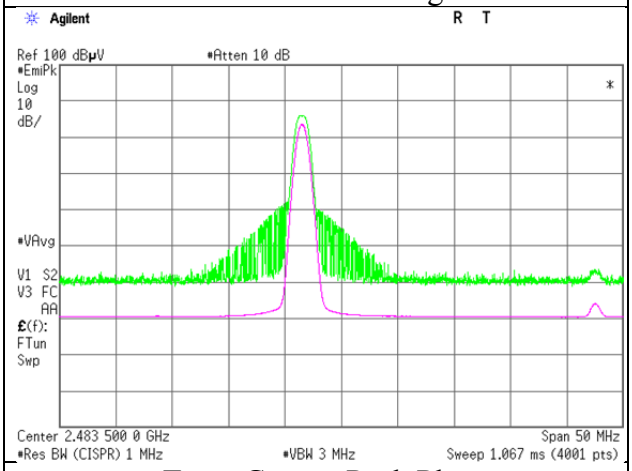
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 8, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	25 deg. C / 23 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	L42P		
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.	162.860	QP	37.30	15.52	8.00	32.08	0.00	28.74	43.50	14.7	189	70	
Hori.	178.170	QP	36.60	16.20	7.96	32.07	0.00	28.69	43.50	14.8	190	291	
Hori.	188.938	QP	39.30	16.26	7.94	32.06	0.00	31.44	43.50	12.0	170	282	
Hori.	353.151	QP	38.70	14.58	8.98	31.92	0.00	30.34	46.00	15.6	100	310	
Hori.	363.993	QP	38.20	14.82	9.02	31.93	0.00	30.11	46.00	15.8	100	309	
Hori.	2390.000	PK	42.74	27.41	14.16	37.06	2.06	49.31	73.90	24.5	111	307	
Hori.	4237.826	PK	46.17	30.07	6.34	36.94	2.06	47.70	73.90	26.2	100	213	
Hori.	4804.000	PK	41.93	31.13	6.67	37.12	2.06	44.67	73.90	29.2	100	0	
Hori.	7206.000	PK	55.97	36.44	8.16	37.84	2.06	64.79	73.90	**9.1**	120	8	
Hori.	9608.000	PK	44.47	38.63	8.99	39.13	2.06	55.02	73.90	18.8	100	0	
Hori.	2390.000	AV	30.22	27.41	14.16	37.06	2.06	36.79	53.90	17.1	111	307	
Hori.	4237.826	AV	38.91	30.07	6.34	36.94	2.06	40.44	53.90	13.4	100	213	
Hori.	4804.000	AV	31.15	31.13	6.67	37.12	2.06	33.89	53.90	20.0	100	0	
Hori.	9608.000	AV	32.61	38.63	8.99	39.13	2.06	43.16	53.90	10.7	100	0	
Vert.	137.206	QP	38.00	14.10	7.68	32.10	0.00	27.68	43.50	15.8	100	235	
Vert.	911.372	QP	32.40	21.98	11.05	30.95	0.00	34.48	46.00	11.5	100	9	
Vert.	2390.000	PK	42.93	27.41	14.16	37.06	2.06	49.50	73.90	24.4	213	337	
Vert.	4237.809	PK	46.51	30.07	6.34	36.94	2.06	48.04	73.90	25.8	239	0	
Vert.	4804.000	PK	41.54	31.13	6.67	37.12	2.06	44.28	73.90	29.6	100	0	
Vert.	7206.000	PK	53.61	36.44	8.16	37.84	2.06	62.43	73.90	11.4	267	267	
Vert.	9608.000	PK	43.62	38.63	8.99	39.13	2.06	54.17	73.90	19.7	100	0	
Vert.	2390.000	AV	30.56	27.41	14.16	37.06	2.06	37.13	53.90	16.7	213	337	
Vert.	4237.809	AV	39.73	30.07	6.34	36.94	2.06	41.26	53.90	12.6	239	0	
Vert.	4804.000	AV	31.11	31.13	6.67	37.12	2.06	33.85	53.90	20.0	100	0	
Vert.	9608.000	AV	32.40	38.63	8.99	39.13	2.06	42.95	53.90	10.9	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

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.	7206.000	AV	48.72	36.44	8.16	37.84	-24.56	2.06	32.98	53.90	**20.9**	
Vert.	7206.000	AV	45.97	36.44	8.16	37.84	-24.56	2.06	30.23	53.90	23.7	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 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	81.14	27.46	14.17	37.05	2.06	87.78	-	-	Carrier
Hori.	2400.000	PK	40.12	27.45	14.16	37.05	2.06	46.74	67.78	21.0	
Vert.	2402.000	PK	84.59	27.46	14.17	37.05	2.06	91.23	-	-	Carrier
Vert.	2400.000	PK	42.82	27.45	14.16	37.05	2.06	49.44	71.23	21.8	

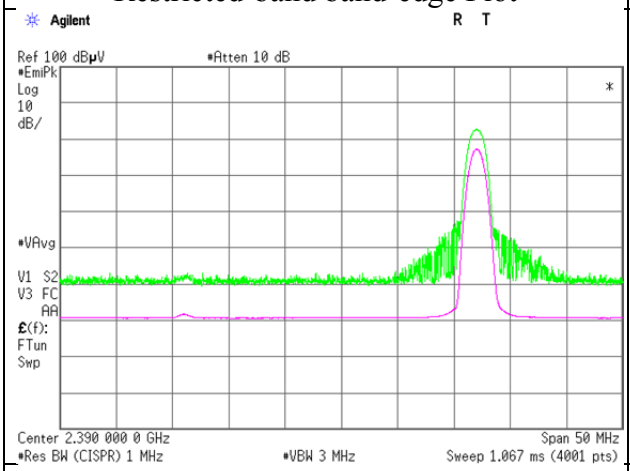
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11573340S-A-R1
Date	February 8, 2017
Temperature / Humidity	25 deg. C / 23 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)
Model No	L42P
Mode	Tx, Hopping Off, 3DH5 2402 MHz

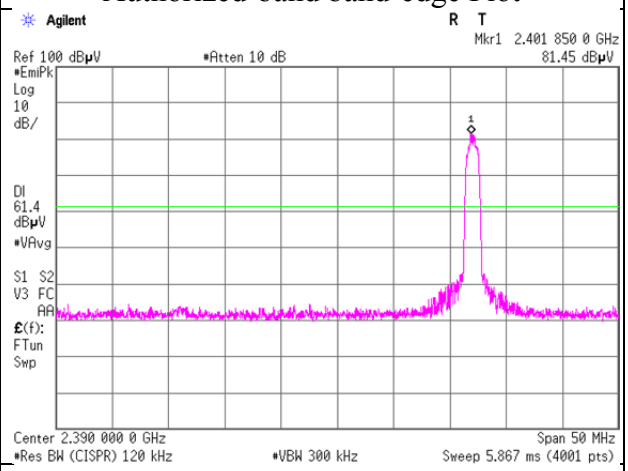
Horizontal

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

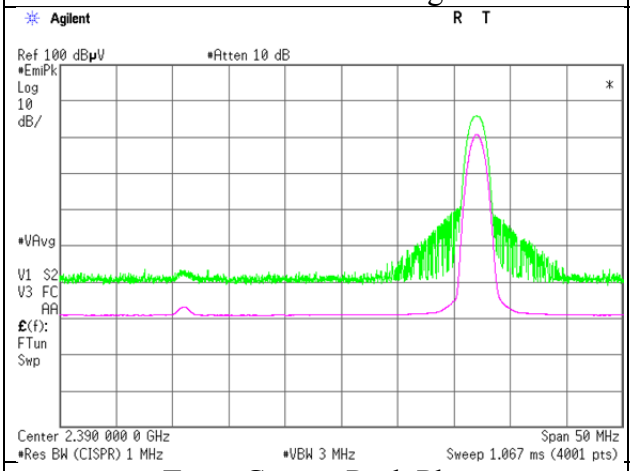
Authorized-band band-edge Plot



20dBc Plot

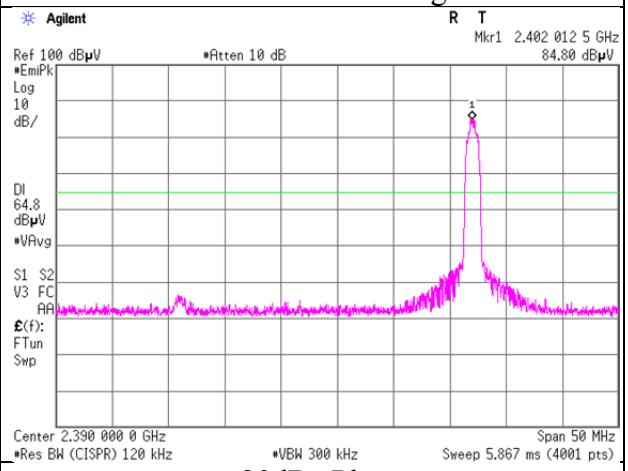
Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Authorized-band band-edge Plot



20dBc Plot

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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 8, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	25 deg. C / 23 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	L42P		
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.	162.680	QP	37.20	15.51	8.00	32.08	0.00	28.63	43.50	14.8	190	71	
Hori.	178.393	QP	36.80	16.21	7.96	32.07	0.00	28.90	43.50	14.6	187	282	
Hori.	188.835	QP	39.40	16.26	7.94	32.06	0.00	31.54	43.50	11.9	181	283	
Hori.	353.153	QP	38.70	14.58	8.98	31.92	0.00	30.34	46.00	15.6	100	307	
Hori.	363.997	QP	38.30	14.82	9.02	31.93	0.00	30.21	46.00	15.7	100	309	
Hori.	4237.825	PK	45.75	30.07	6.34	36.94	2.06	47.28	73.90	26.6	100	210	
Hori.	4882.000	PK	41.78	31.29	6.74	37.16	2.06	44.71	73.90	29.1	100	0	
Hori.	7323.000	PK	53.55	36.77	8.32	37.92	2.06	62.78	73.90	11.1	100	358	
Hori.	9764.000	PK	44.40	38.75	9.13	39.20	2.06	55.14	73.90	18.7	100	0	
Hori.	4237.825	AV	39.01	30.07	6.34	36.94	2.06	40.54	53.90	13.3	100	210	
Hori.	4882.000	AV	30.99	31.29	6.74	37.16	2.06	33.92	53.90	19.9	100	0	
Hori.	9764.000	AV	32.86	38.75	9.13	39.20	2.06	43.60	53.90	**10.3**	100	0	
Vert.	136.299	QP	38.80	14.03	7.65	32.10	0.00	28.38	43.50	15.1	100	236	
Vert.	911.406	QP	32.50	21.98	11.05	30.95	0.00	34.58	46.00	11.4	100	15	
Vert.	4237.802	PK	45.68	30.07	6.34	36.94	2.06	47.21	73.90	26.6	268	157	
Vert.	4882.000	PK	41.71	31.29	6.74	37.16	2.06	44.64	73.90	29.2	100	0	
Vert.	7323.000	PK	50.67	36.77	8.32	37.92	2.06	59.90	73.90	14.0	152	56	
Vert.	9764.000	PK	43.40	38.75	9.13	39.20	2.06	54.14	73.90	19.7	100	0	
Vert.	4237.802	AV	39.95	30.07	6.34	36.94	2.06	41.48	53.90	12.4	268	157	
Vert.	4882.000	AV	30.95	31.29	6.74	37.16	2.06	33.88	53.90	20.0	100	0	
Vert.	9764.000	AV	32.74	38.75	9.13	39.20	2.06	43.48	53.90	10.4	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

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.	7323.000	AV	45.72	36.77	8.32	37.92	-24.56	2.06	30.39	53.90	**23.5**	
Vert.	7323.000	AV	43.12	36.77	8.32	37.92	-24.56	2.06	27.79	53.90	26.1	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 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. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 8, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	25 deg. C / 23 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	L42P		
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.	162.794	QP	38.00	15.51	8.00	32.08	0.00	29.43	43.50	14.0	195	70	
Hori.	178.352	QP	36.80	16.21	7.96	32.07	0.00	28.90	43.50	14.6	192	287	
Hori.	189.045	QP	39.60	16.26	7.94	32.06	0.00	31.74	43.50	11.7	172	284	
Hori.	353.149	QP	38.70	14.58	8.98	31.92	0.00	30.34	46.00	15.6	100	308	
Hori.	363.991	QP	38.10	14.82	9.02	31.93	0.00	30.01	46.00	15.9	100	309	
Hori.	2483.500	PK	51.43	27.79	14.25	37.01	2.06	58.52	73.90	15.3	113	314	
Hori.	4237.784	PK	45.89	30.07	6.34	36.94	2.06	47.42	73.90	26.4	100	212	
Hori.	4960.000	PK	41.59	31.45	6.81	37.19	2.06	44.72	73.90	29.1	100	0	
Hori.	7440.000	PK	52.77	37.11	8.49	37.99	2.06	62.44	73.90	11.4	153	77	
Hori.	9920.000	PK	43.62	38.87	9.27	39.26	2.06	54.56	73.90	19.3	100	0	
Hori.	2483.500	AV	30.67	27.79	14.25	37.01	2.06	37.76	53.90	16.1	113	314	
Hori.	4237.784	AV	39.08	30.07	6.34	36.94	2.06	40.61	53.90	13.2	100	212	
Hori.	4960.000	AV	30.92	31.45	6.81	37.19	2.06	34.05	53.90	19.8	100	0	
Hori.	9920.000	AV	33.39	38.87	9.27	39.26	2.06	44.33	53.90	**9.5**	100	0	
Vert.	136.306	QP	38.70	14.03	7.65	32.10	0.00	28.28	43.50	15.2	100	249	
Vert.	911.424	QP	32.70	21.98	11.05	30.94	0.00	34.79	46.00	11.2	100	13	
Vert.	2483.500	PK	55.80	27.79	14.25	37.01	2.06	62.89	73.90	11.0	186	51	
Vert.	4237.787	PK	46.29	30.07	6.34	36.94	2.06	47.82	73.90	26.0	246	158	
Vert.	4960.000	PK	41.21	31.45	6.81	37.19	2.06	44.34	73.90	29.5	100	0	
Vert.	7440.000	PK	49.90	37.11	8.49	37.99	2.06	59.57	73.90	14.3	156	26	
Vert.	9920.000	PK	43.98	38.87	9.27	39.26	2.06	54.92	73.90	18.9	100	0	
Vert.	2483.500	AV	31.62	27.79	14.25	37.01	2.06	38.71	53.90	15.1	186	51	
Vert.	4237.787	AV	39.94	30.07	6.34	36.94	2.06	41.47	53.90	12.4	246	158	
Vert.	4960.000	AV	30.85	31.45	6.81	37.19	2.06	33.98	53.90	19.9	100	0	
Vert.	9920.000	AV	33.35	38.87	9.27	39.26	2.06	44.29	53.90	9.6	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

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.	7440.000	AV	45.31	37.11	8.49	37.99	-24.56	2.06	30.42	53.90	**23.5**	
Vert.	7440.000	AV	41.93	37.11	8.49	37.99	-24.56	2.06	27.04	53.90	26.9	

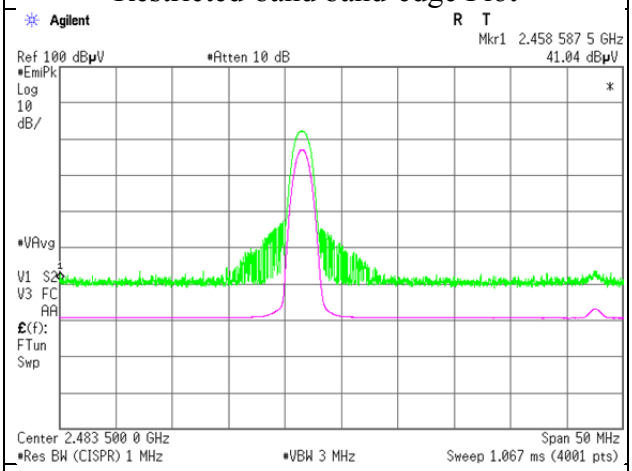
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.8 m / 3.0 m) = 2.06 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11573340S-A-R1
Date	February 8, 2017
Temperature / Humidity	25 deg. C / 23 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)
Model No	L42P
Mode	Tx, Hopping Off, 3DH5 2480 MHz

Horizontal

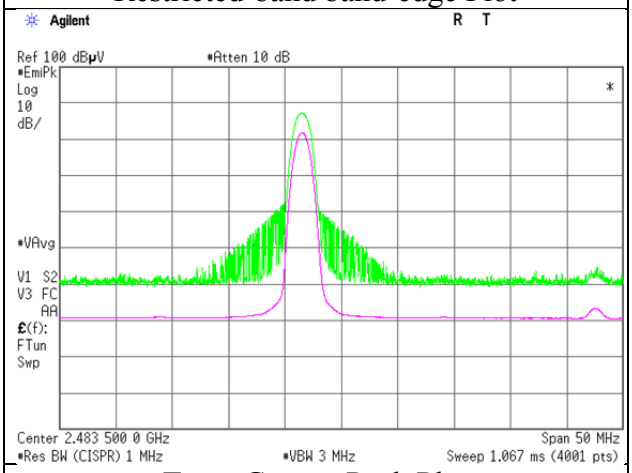
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

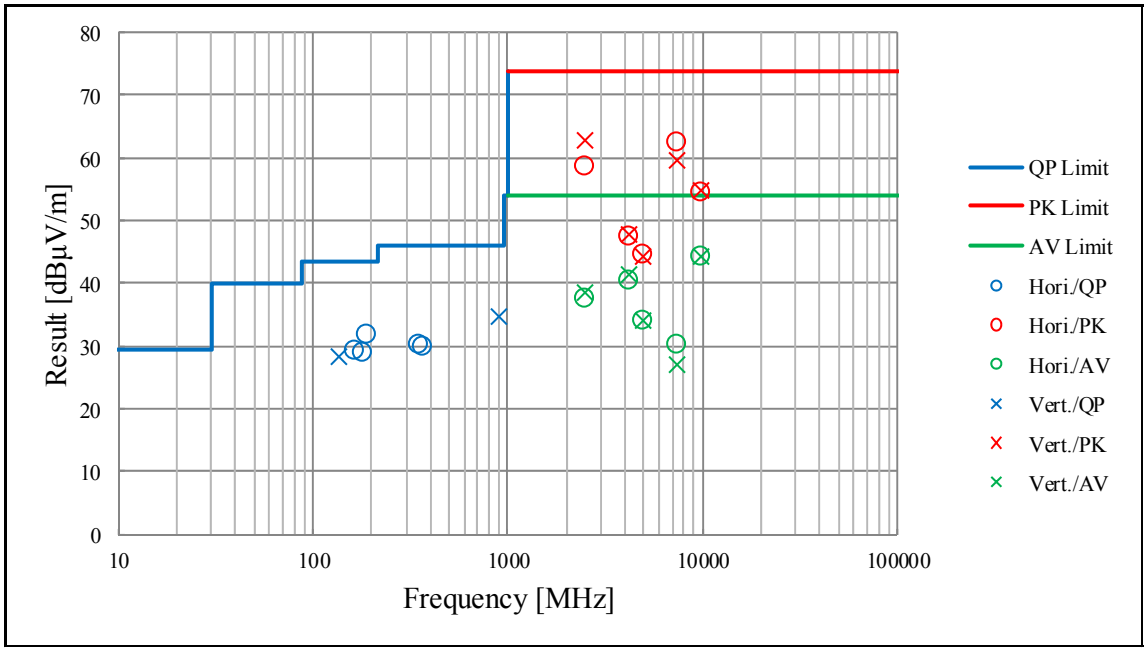


Trace Green : Peak Plot
Trace Purple : Average Plot

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

Radiated Spurious Emission
(Plot data, Worst case)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11573340S-A-R1		
Date	February 8, 2017	February 6, 2016	February 9, 2017
Temperature / Humidity	25 deg. C / 23 % RH	24 deg. C / 22 % RH	23 deg. C / 28 % RH
Engineer	Yosuke Ishikawa (1 GHz -13 GHz)	Yosuke Ishikawa (30 MHz -1000 MHz)	Yosuke Ishikawa (13 GHz -26 GHz)
Model No	L42P		
Mode	Tx, Hopping Off, 3DH5 2480 MHz		



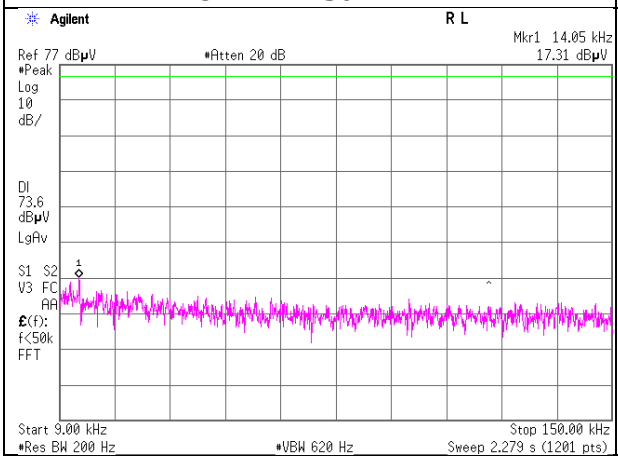
*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

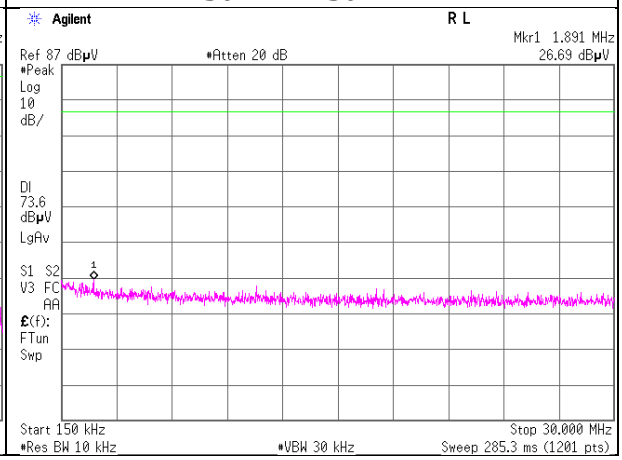
Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx, Hopping Off, DH5

2402 MHz

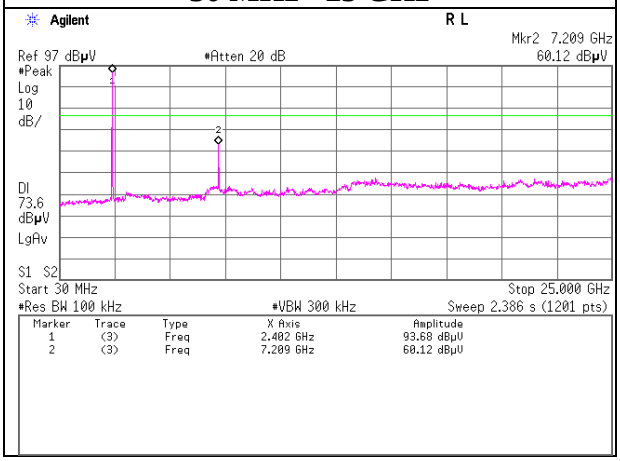
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 25 GHz

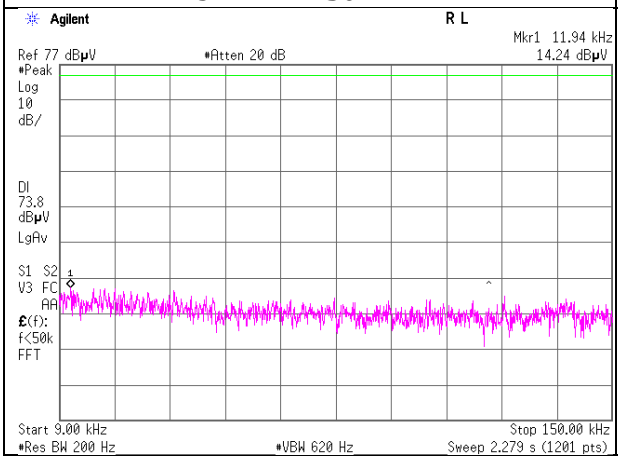


Conducted Spurious Emission

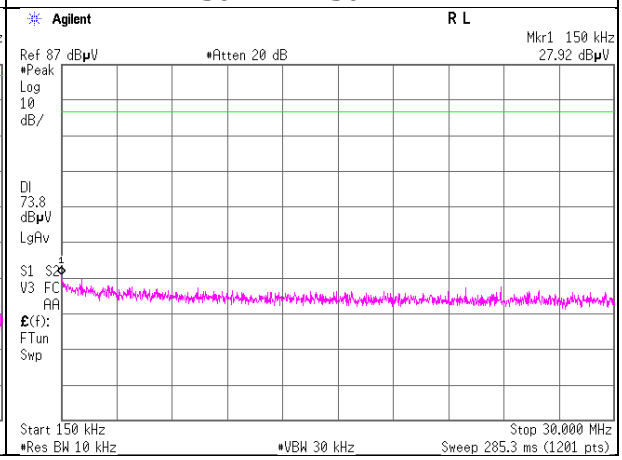
Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx, Hopping Off, DH5

2441 MHz

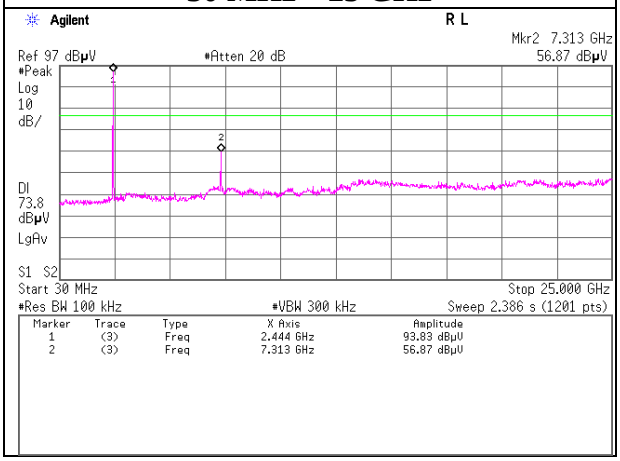
9 kHz – 150 kHz



150 kHz – 30 MHz



30 MHz – 25 GHz

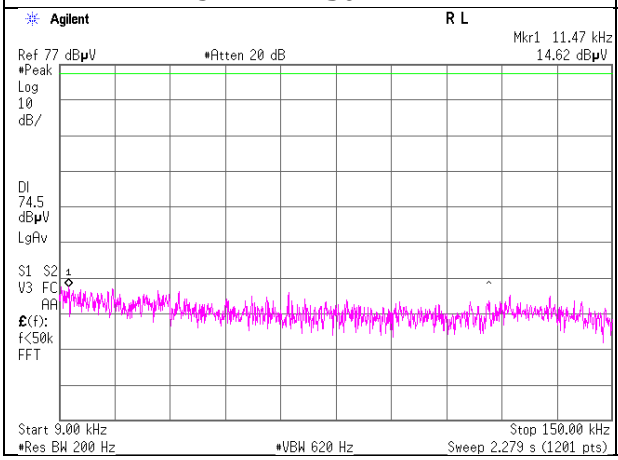


Conducted Spurious Emission

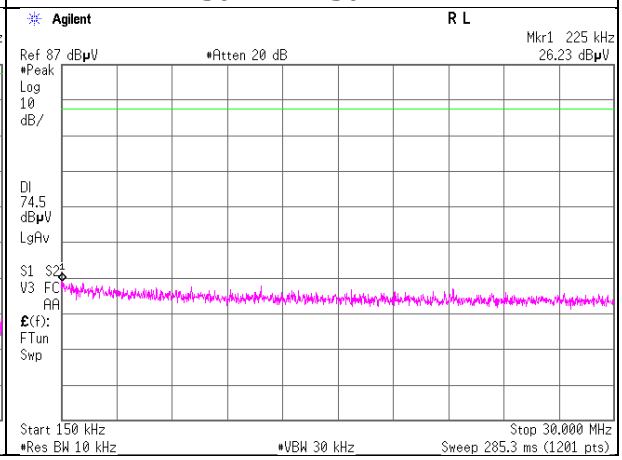
Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx, Hopping Off, DH5

2480 MHz

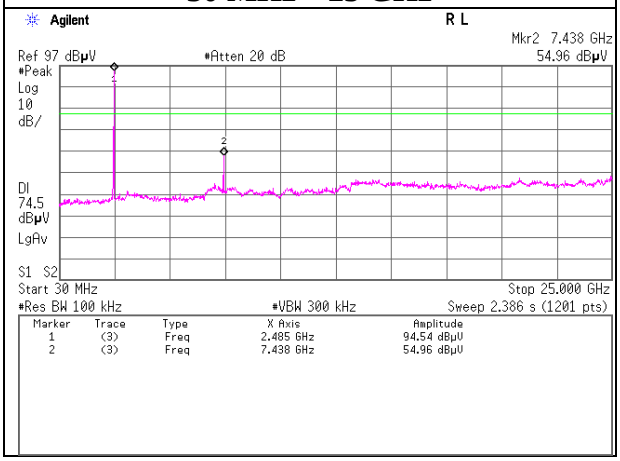
9 kHz – 150 kHz



150 kHz – 30 MHz



30 MHz – 25 GHz

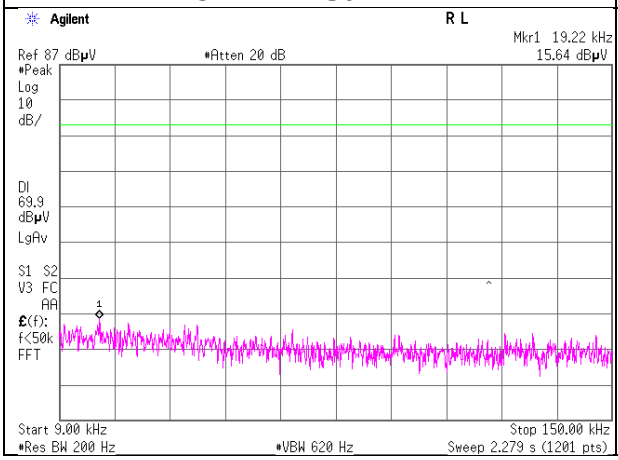


Conducted Spurious Emission

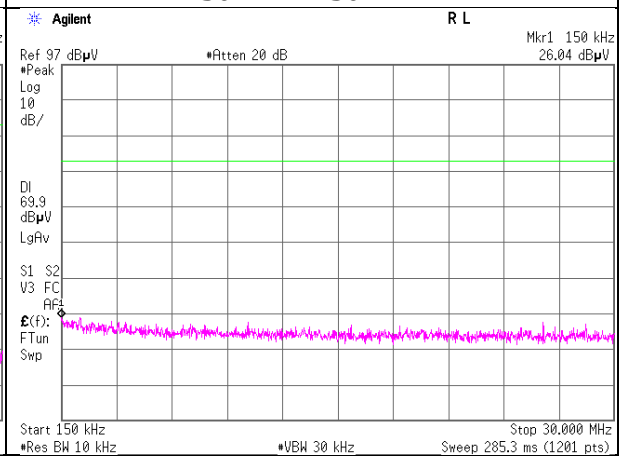
Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx, Hopping Off, DH5

2402 MHz

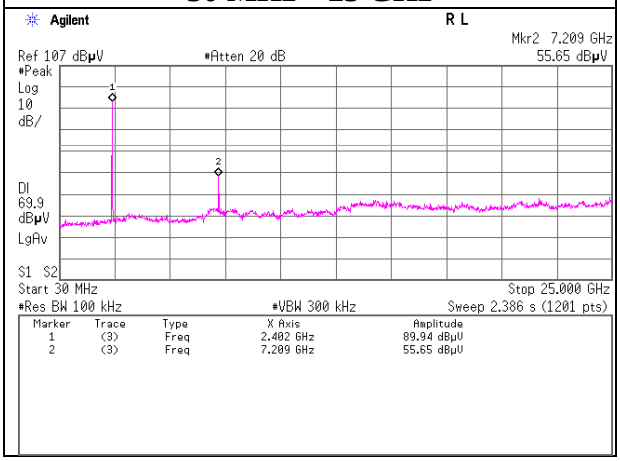
9 kHz – 150 kHz



150 kHz – 30 MHz



30 MHz – 25 GHz

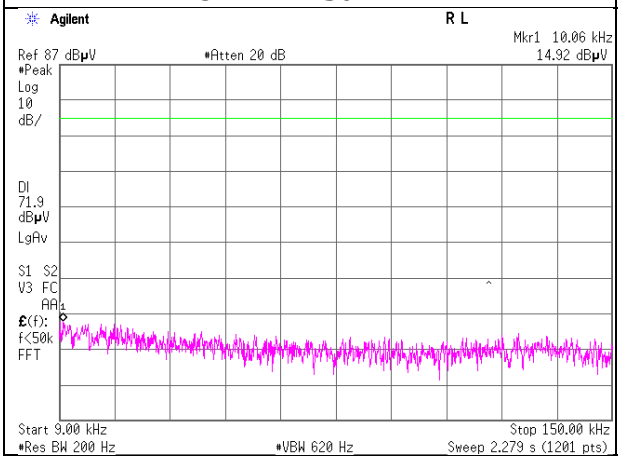


Conducted Spurious Emission

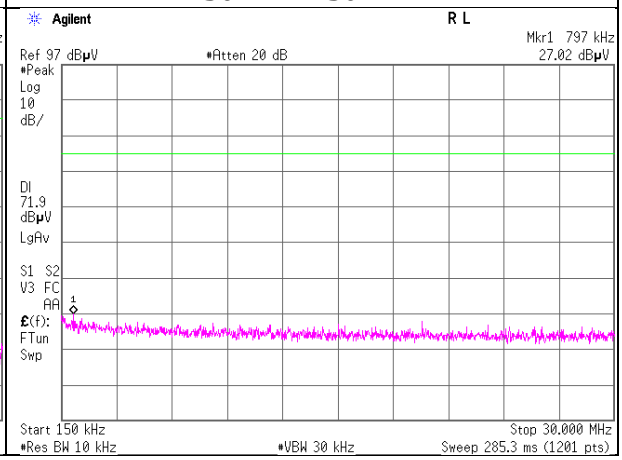
Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx, Hopping Off, 3DH5

2441 MHz

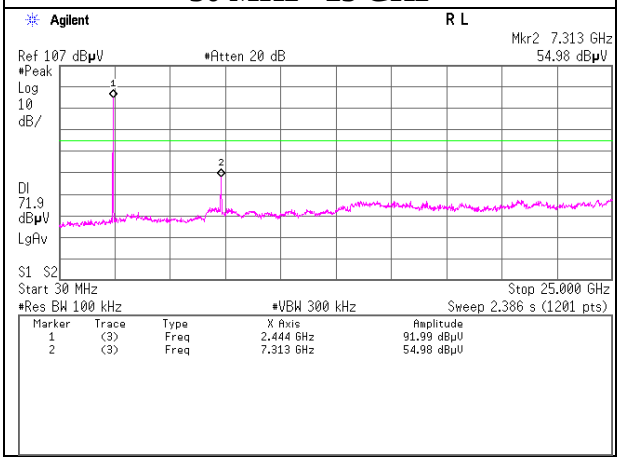
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 25 GHz

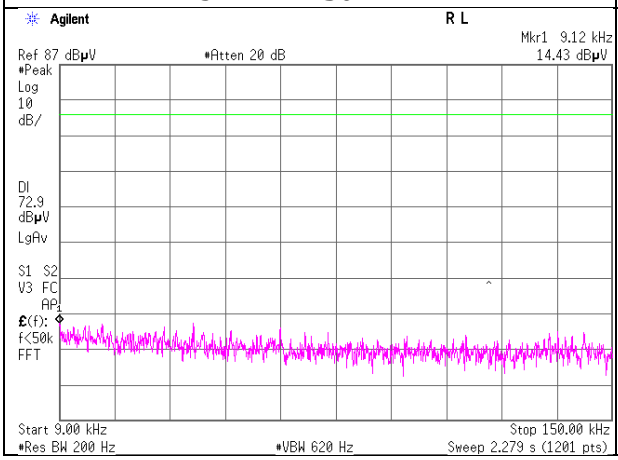


Conducted Spurious Emission

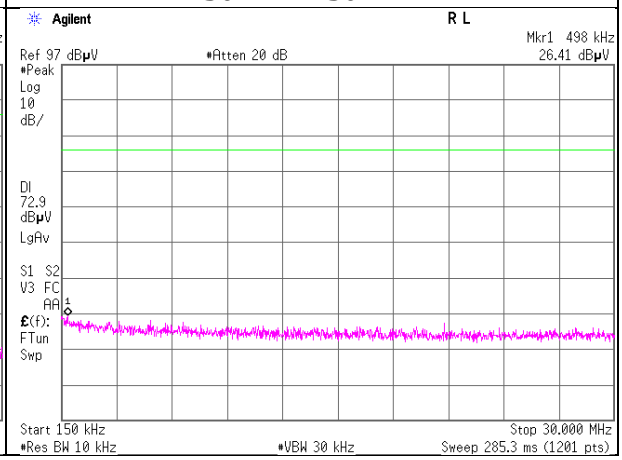
Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx, Hopping Off, 3DH5

2480 MHz

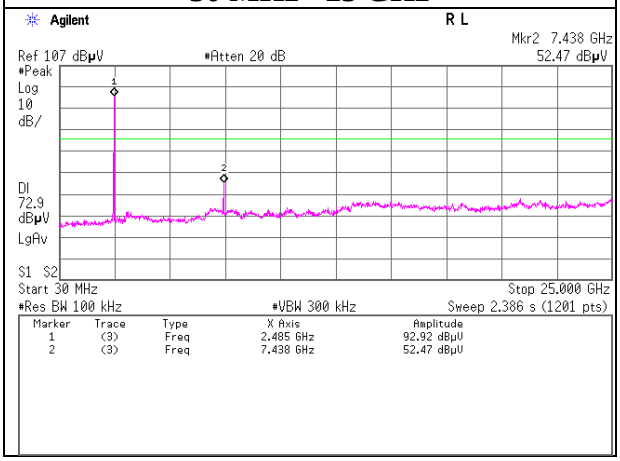
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 25 GHz

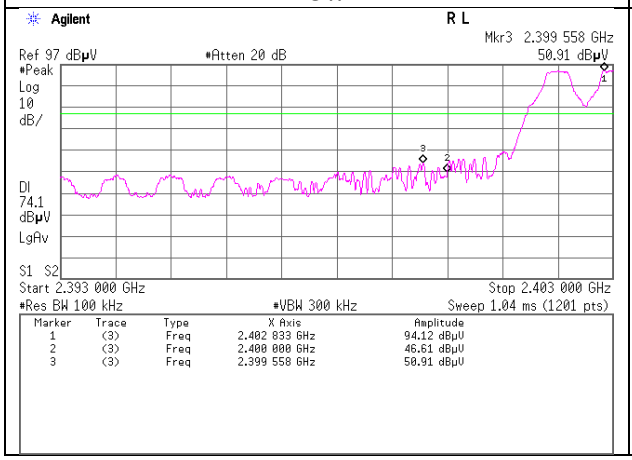


Conducted Emission Band Edge compliance

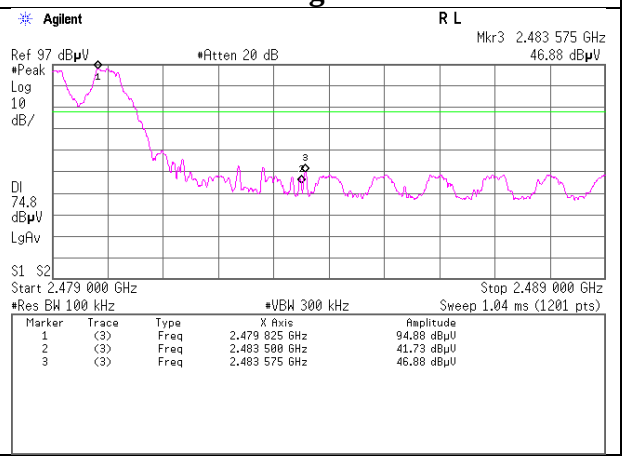
Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx DH5

Hopping On

Low

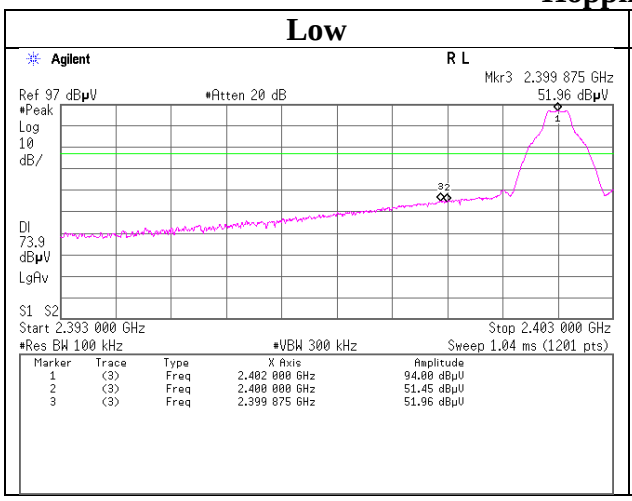


High

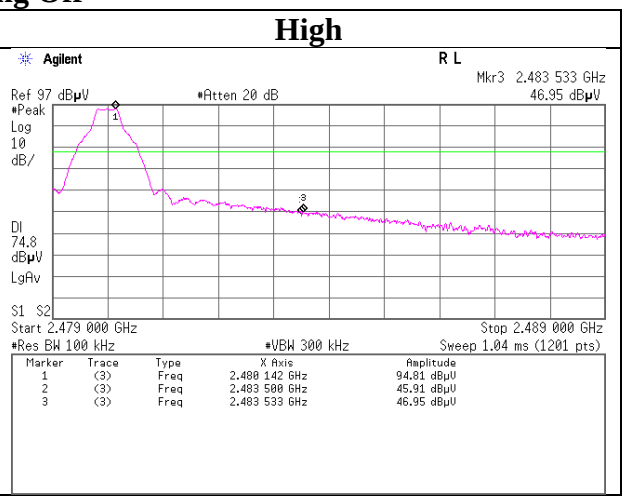


Hopping Off

Low



High

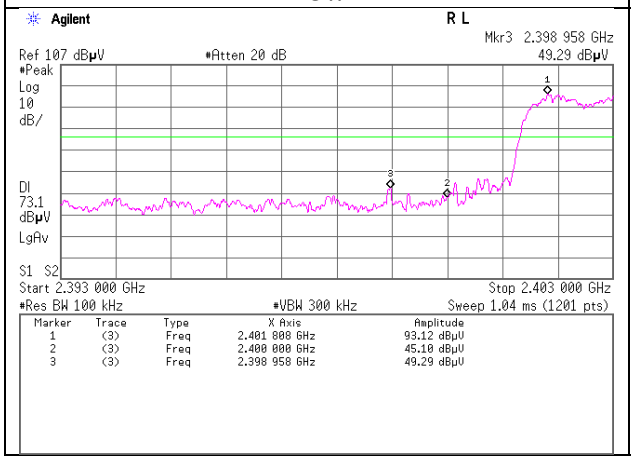


Conducted Emission Band Edge compliance

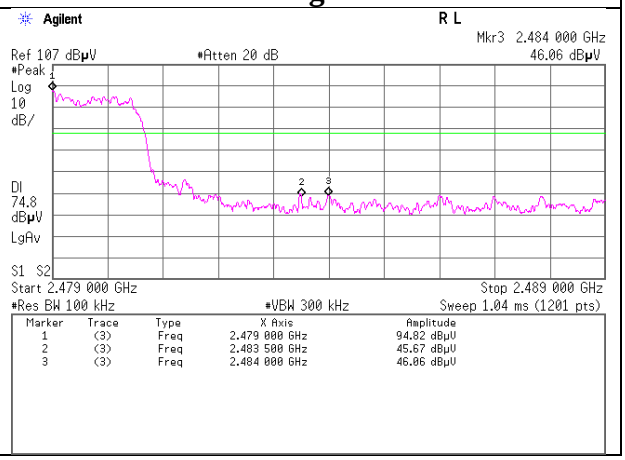
Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 3DH5

Hopping On

Low

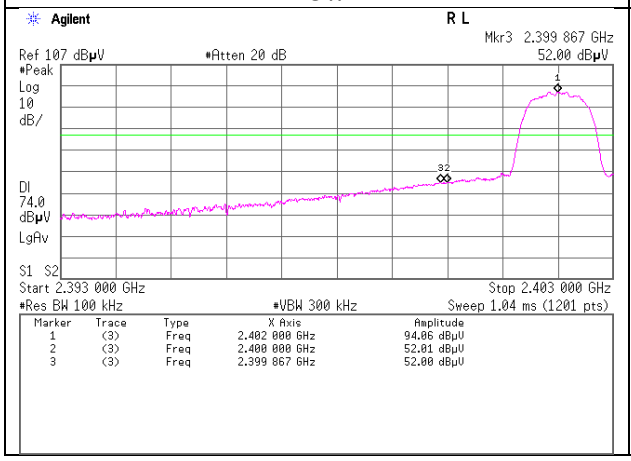


High

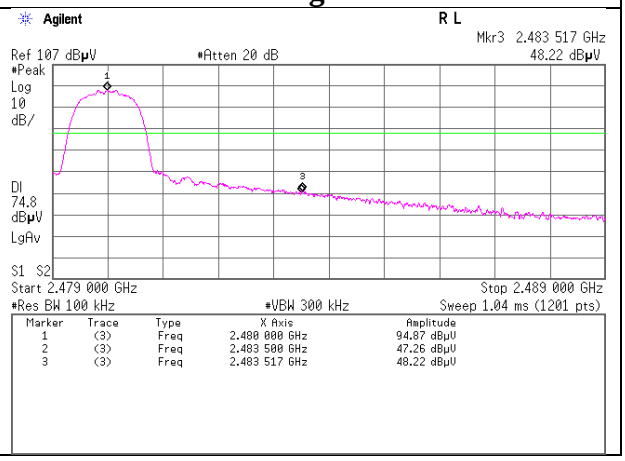


Hopping Off

Low



High

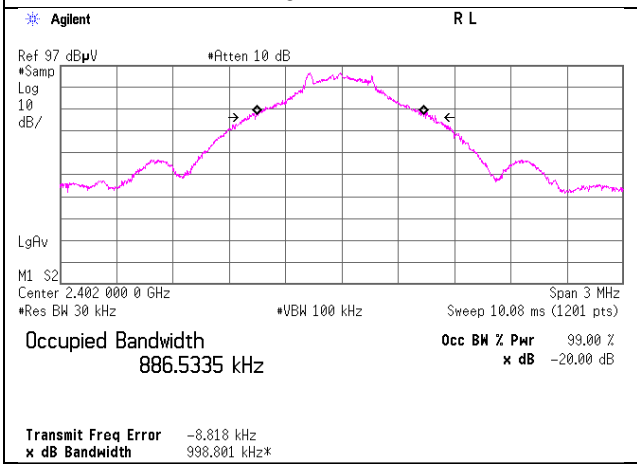


99%Occupied Bandwidth

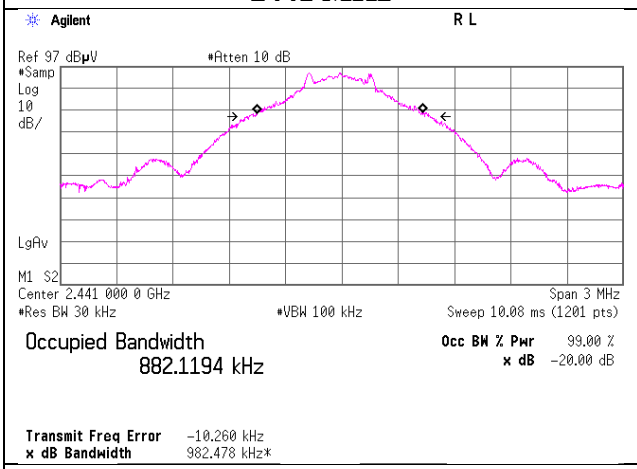
Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx Hopping Off

Hopping Off, DH5

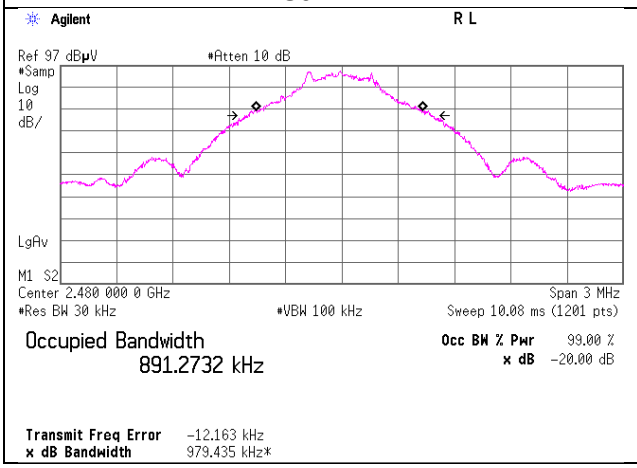
2402 MHz



2441 MHz

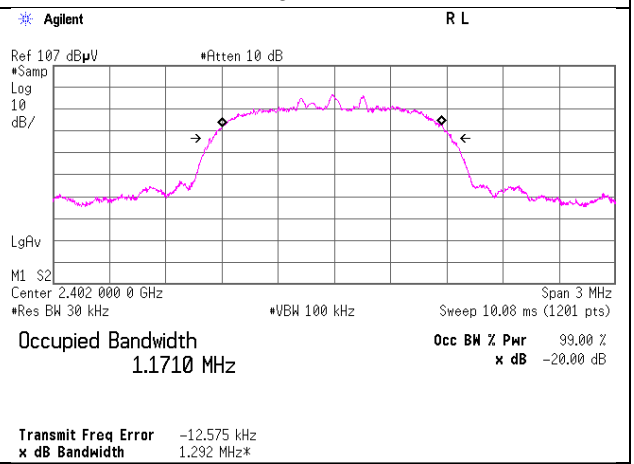


2480 MHz

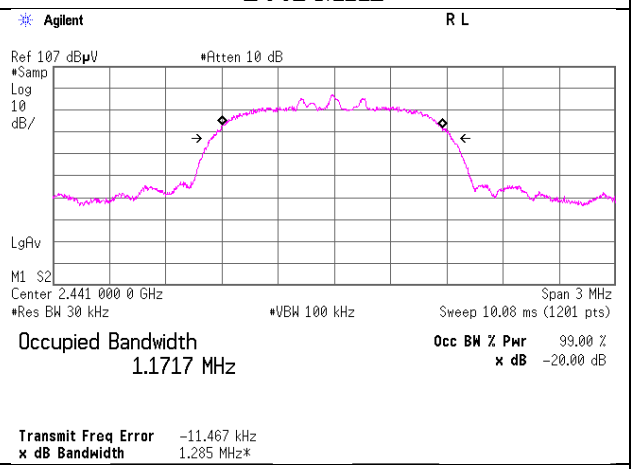


Hopping Off, 3DH5

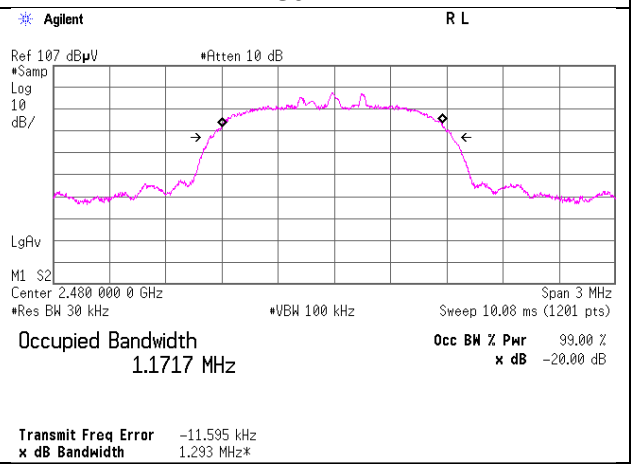
2402 MHz



2441 MHz



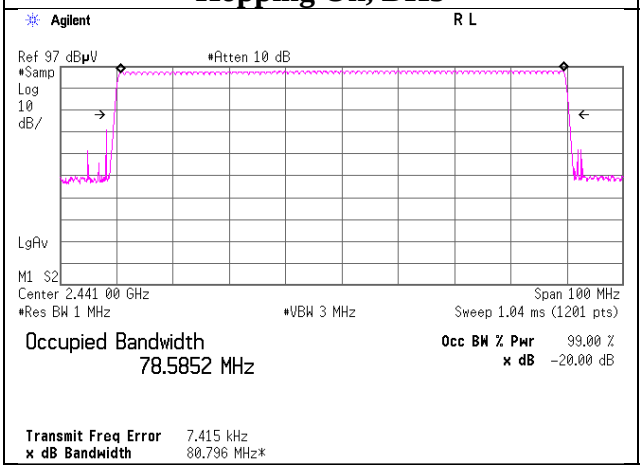
2480 MHz



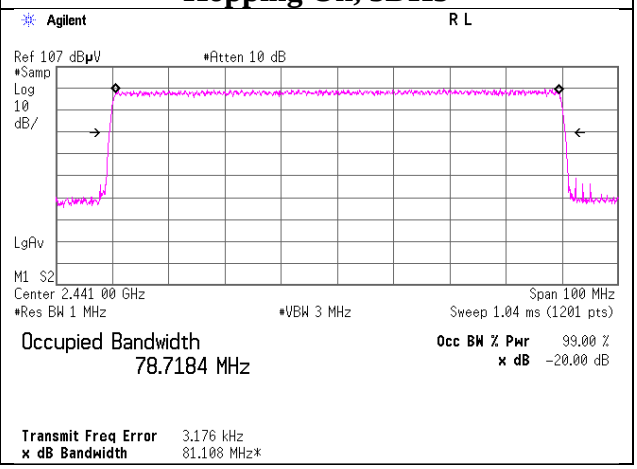
99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	11573340S-A-R1
Date	February 3, 2017
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx Hopping On

Hopping On, DH5



Hopping On, 3DH5



APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	AT	2016/03/23 * 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
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
STS-06	Digital Hitester	Hioki	3805-50	080997830	AT	2016/03/22 * 12
SOS-10	Humidity Indicator	A&D	AD-5681	4064561	AT	2016/10/12 * 12
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2016/02/10 * 12
SCC-G05	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-037	RE	2017/01/08 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2016/05/11 * 12
SCC-G40	Coaxial Cable	Junkosha	MWX221-01000 NFSNMS/B	1612S005	RE	2017/01/08 * 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
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2016/10/11 * 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,RFI,MF)	-	RE	-
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE	2016/10/17 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2016/11/07 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2016/11/29 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2016/07/15 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2016/10/18 * 12
SLA-07	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	196	RE	2017/01/26 * 12
SAT6-08	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2016/08/04 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2016/04/22 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2016/02/25 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE	2016/03/28 * 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-G33	Coaxial Cable	Junkosha	MWX241-01000 KMSKMS	-	RE	2016/04/18 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2016/03/08 * 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