



RADIO TEST REPORT

Test Report No. : 11980055S-A-R2

Applicant : Yokogawa Electric Corporation
Type of Equipment : Field Wireless Access Point
Model No. : YFGW520
FCC ID : SGJ-WFC015
Test regulation : FCC Part 15 Subpart C: 2018
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 11980055S-A-R1. 11980055S-A-R1 is replaced with this report.

Date of test: December 18 to 27, 2017
March 5 and April 9, 2018

Representative test engineer:


Kazutaka Takeyama
Engineer
Consumer Technology Division

Approved by:


Toyokazu Imamura
Leader
Consumer Technology Division



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

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13-EM-F0429

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SECTION 1: Customer information

Company Name : Yokogawa Electric Corporation
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Telephone Number : +81-422-52-5885
Facsimile Number : +81-422-52-2102
Contact Person : Noriaki Kihara

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

2.1 Identification of E.U.T.

Type of Equipment : Field Wireless Access Point
Model No. : YFGW520
Serial No. : Refer to Clause 4.2
Rating : DC 24 V
Receipt Date of Sample : September 27, 2017
Country of Mass-production : Japan
Condition of EUT : Engineering 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: YFGW520 (referred to as the EUT in this report) is a Field Wireless Access Point.

General Specification

Clock frequency(ies) in the system : RF CPU 32 MHz, IF CPU 12 MHz (internal:72 MHz, 36 MHz),
RF IC 16 MHz, LAN 25 MHz, RTC 32.768 kHz

Radio Specification

IEEE802.15.4

Radio Type : Transceiver
Frequency of Operation : 2405 MHz - 2475 MHz
Bandwidth / Channel spacing : 2 MHz / 5 MHz
Type of modulation : O-QPSK, DSSS
Antenna type : Sleeve / Collinear / Patch
Antenna Gain : 2.14 dBi (Sleeve)*, 9 dBi (Collinear), 15 dBi (Patch)
Antenna connector type : N Connector
Operating Temperature : -40 deg. C to +70 deg. C

* Although the sleeve antenna is called "2 dBi antenna", the actual antenna gain is 2.14 dBi.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on March 12, 2018 and effective April 11, 2018

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 revisions made after testing date do 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	8.1 dB, 1.39594 MHz, L1, AV Antenna: 15 dBi, Tx 2405 MHz	Complied	-
6dB Bandwidth	FCC: KDB 558074 D01 DTS Meas Guidance v04 IC: -	FCC: Section 15.247(a)(2) IC: RSS-247 5.2(a)	See data.	Complied	Conducted
Maximum Peak Output Power	FCC: KDB 558074 D01 DTS Meas Guidance v04 IC: RSS-Gen 6.12	FCC: Section 15.247(b)(3) IC: RSS-247 5.4(d)		Complied	Conducted
Power Density	FCC: KDB 558074 D01 DTS Meas Guidance v04 IC: -	FCC: Section 15.247(e) IC: RSS-247 5.2(b)		Complied	Conducted
Spurious Emission Restricted Band Edges	FCC: KDB 558074 D01 DTS Meas Guidance v04 IC: RSS-Gen 6.13	FCC: Section15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10		0.1 dB 2483.500 MHz, AV, Vertical Antenna: 15 dBi, Tx 2470 MHz	Complied
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.					
*1) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 DTS Meas Guidance v04 12.2.7.					

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

FCC Part 15.31 (e)

The RF part is constantly provided voltage (DC 3.3 V, DC 1.2 V) through the regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

The EUT has an external antenna connector, but it is installed by the professionals. Therefore, the equipment complies with the antenna requirement.

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3.3 Addition to standard

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

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

3.4 Uncertainty

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

		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	2.5 dB	2.5 dB	2.6 dB	2.6 dB	2.6 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.2 dB	3.2 dB	3.3 dB	-	-
	30 MHz-200 MHz	4.3 dB	4.3 dB	4.3 dB	-	-
	200 MHz-1 GHz	5.9 dB	5.9 dB	5.9 dB	-	-
	1 GHz-6 GHz	4.7 dB	4.7 dB	4.7 dB	-	-
Radiated emission (Measurement distance: 1 m)	6 GHz-18 GHz	5.3 dB	5.3 dB	5.3 dB	-	-
	18 GHz-40 GHz	5.6 dB	5.6 dB	5.6 dB	-	-
	1 GHz-18 GHz	5.6 dB	5.6 dB	5.6 dB	-	-
	18 GHz-40 GHz	5.9 dB	5.9 dB	5.9 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	0.48 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.66 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.47 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	0.64 dB
Spurious emission (Conducted) below 1GHz	1.8 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.5 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.5 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.7 dB
Bandwidth Measurement	1.01 %
Duty cycle and Time Measurement	0.012 %

Conducted Emission test

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

Radiated emission test

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

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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
FCC Test Firm Registration Number: 839876

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)

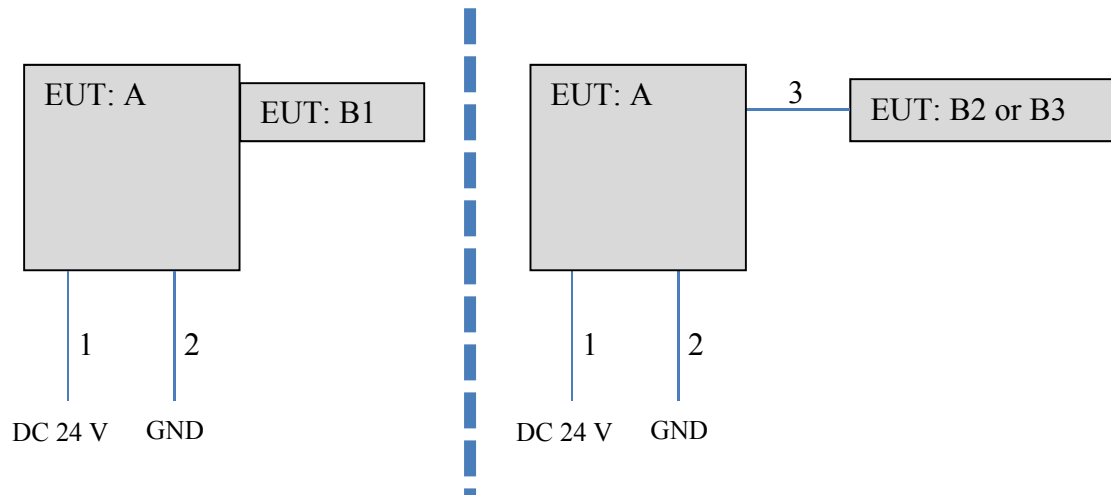
Mode	Remarks*
ISA100.11a	PN9
<p>*Power of the EUT was set by the software as follows; Power settings: High power setting 2405 MHz, 2440 MHz, 2470 MHz, 2 dBi TXPWR: 5 / ATT: 0, TXPWR: 5 / ATT: 0, TXPWR: 5 / ATT: 0 9 dBi TXPWR: 5 / ATT: 0, TXPWR: 5 / ATT: 0, TXPWR: 5 / ATT: 0 15 dBi TXPWR: 6 / ATT: 0, TXPWR: 6 / ATT: 0, TXPWR: 6 / ATT: 0</p> <p>Low power setting 2405 MHz, 2440 MHz, 2470 MHz, 2475 MHz 2 dBi TXPWR: 9 / ATT: 0, TXPWR: 9 / ATT: 0, TXPWR: 9 / ATT: 0, TXPWR: 9 / ATT: 0 9 dBi TXPWR: 9 / ATT: 1, TXPWR: 9 / ATT: 1, TXPWR: 9 / ATT: 1, TXPWR: 9 / ATT: 1 15 dBi TXPWR: 9 / ATT: 2, TXPWR: 9 / ATT: 2, TXPWR: 9 / ATT: 2, TXPWR: 9 / ATT: 2</p> <p>Software: Tera Term Version 4.71</p> <p>*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.</p>	

*The details of Operating mode(s)

Test Item	Operating Mode	Tested Antenna	Tested frequency
Conducted Emission	ISA100.11a	2 dBi 9 dBi 15 dBi	2405 MHz 2440 MHz 2470 MHz 2475 MHz
Spurious Emission	ISA100.11a	2 dBi 9 dBi 15 dBi	2405 MHz 2440 MHz 2470 MHz 2475 MHz
6dB Bandwidth Maximum Peak Output Power Power Density 99% Occupied Bandwidth *1)	ISA100.11a	-	2405 MHz 2440 MHz 2470 MHz 2475 MHz

*1) As regards other than Maximum Peak Output Power test, the EUT was tested with the power setting with the maximum value based on the result of Maximum Peak Output Power.

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	Field Wireless Access Point	YFGW520	91TA06879	Yokogawa Electric	EUT
B1	Sleeve antenna	ASSL-NP-00400	-	HOKO ELECTRONICS CO., LTD.	EUT 2 dBi
B2	Collinear Antenna	ASCL-NP-00300	-	HOKO ELECTRONICS CO., LTD.	EUT 9 dBi
B3	Patch compound Antenna	MTA-11PA15-YO	0001	Alfact co.,ltd.	EUT 15 dBi

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC	3.1	Unshielded	Unshielded	-
2	Earth	2.8	Unshielded	Unshielded	
3	Antenna	3.0	Shielded	Shielded	

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a platform of nominal size, 1.0 m by 2.0 m, raised 0.8 m above the conducting ground plane. The table is made of expanded polystyrol and expanded polypropylene and the table top is covered with polycarbonate. That has very low permittivity.

The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN / (AMN) to the input power source.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

Detector : QP and CISPR AV
Measurement range : 0.15 MHz - 30 MHz
Test data : APPENDIX
Test result : Pass

SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "KDB 558074 D01 DTS Meas Guidance v04".

[For below 1 GHz]

EUT was placed on a platform of nominal size, 1.0 m by 2.0 m, raised 0.8 m above the conducting ground plane. The table is made of expanded polystyrol and expanded polypropylene and the table top is covered with polycarbonate. That has very low permittivity.

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

[For above 1 GHz]

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

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

The height of the measuring antenna varied between 1 m 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 *1)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	Average Power Method: RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: 100 traces If duty cycle was less than 98%, a duty factor was added to the results.	RBW: 100 kHz VBW: 300 kHz
Test Distance	3 m	3.92 m *2) (1 GHz – 13 GHz), 3.85 m *3) (1 GHz – 13 GHz), 3.82 m *4) (1 GHz – 13 GHz), 1 m *5) (13 GHz – 26.5 GHz)		3.92 m *2) (1 GHz – 13 GHz), 3.85 m *3) (1 GHz – 13 GHz), 3.82 m *4) (1 GHz – 13 GHz), 1 m *3) (13 GHz – 26.5 GHz)

- *1) Average Power Measurement was performed based on 6.0 & 12.2.5 of "KDB 558074 D01 DTS Meas Guidance v04".
- *2) Antenna (2 dBi): Distance Factor: $20 \times \log(3.92 \text{ m} / 3.0 \text{ m}) = 2.33 \text{ dB}$
- *3) Antenna (9 dBi): Distance Factor: $20 \times \log(3.85 \text{ m} / 3.0 \text{ m}) = 2.17 \text{ dB}$
- *4) Antenna (15 dBi): Distance Factor: $20 \times \log(3.82 \text{ m} / 3.0 \text{ m}) = 2.10 \text{ dB}$
- *5) Distance Factor: $20 \times \log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

The test was made on EUI 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 - 26.5 GHz
Test data : APPENDIX
Test result : Pass

SECTION 7: 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
6dB Bandwidth	10 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *2)	-	Power Meter (Sensor: 50 MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3 kHz	9.1 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4)	9kHz to 150kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	10 kHz	30 kHz				

*1) Peak hold was applied as Worst-case measurement.

*2) Reference data

*3) Section 10.2 Method PKPSD (peak PSD) of "KDB 558074 D01 DTS Meas Guidance v04".

*4) 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

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APPENDI X 1: Test data

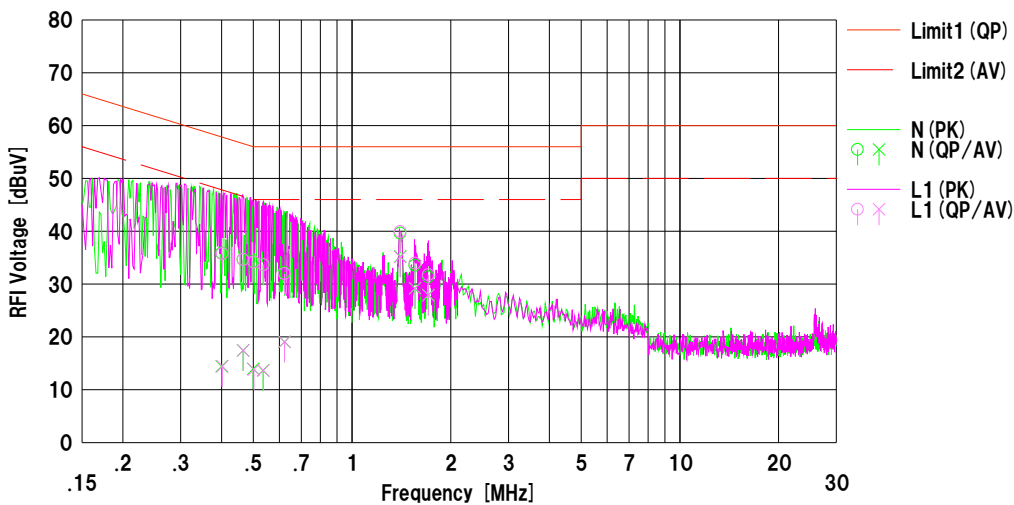
Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2017/12/25

Mode : TX 2405 MHz
Power : AC 120 V / 60 Hz
Temp./Humi. : 27 deg.C / 30 %RH
Remarks : ANT:2dBi, TXPWR:5, ATT:0

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV
Engineer : Yasumasa Owaki



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.40024	23.40	2.00	12.44	35.84	14.44	57.85	47.85	22.0	33.4	N	
2	0.46522	22.20	5.00	12.45	34.65	17.45	56.60	46.60	21.9	29.1	N	
3	0.49943	21.80	1.50	12.45	34.25	13.95	56.01	46.01	21.7	32.0	N	
4	0.53527	21.20	1.20	12.45	33.65	13.65	56.00	46.00	22.3	32.3	N	
5	0.62193	19.80	6.60	12.46	32.26	19.06	56.00	46.00	23.7	26.9	N	
6	1.40190	27.10	22.70	12.53	39.63	35.23	56.00	46.00	16.3	10.7	N	
7	1.55633	21.00	16.60	12.54	33.54	29.14	56.00	46.00	22.4	16.8	N	
8	1.70924	18.80	15.40	12.56	31.36	27.96	56.00	46.00	24.6	18.0	N	
9	0.40217	23.30	2.00	12.44	35.74	14.44	57.81	47.81	22.0	33.3	L1	
10	0.46564	22.20	5.00	12.45	34.65	17.45	56.59	46.59	21.9	29.1	L1	
11	0.50169	21.70	1.40	12.45	34.15	13.85	56.00	46.00	21.8	32.1	L1	
12	0.53650	21.20	1.20	12.45	33.65	13.65	56.00	46.00	22.3	32.3	L1	
13	0.62234	19.50	6.60	12.46	31.96	19.06	56.00	46.00	24.0	26.9	L1	
14	1.40312	27.40	22.60	12.53	39.93	35.13	56.00	46.00	16.0	10.8	L1	
15	1.55707	21.40	16.70	12.54	33.94	29.24	56.00	46.00	22.0	16.7	L1	
16	1.71022	19.20	15.30	12.56	31.76	27.86	56.00	46.00	24.2	18.1	L1	

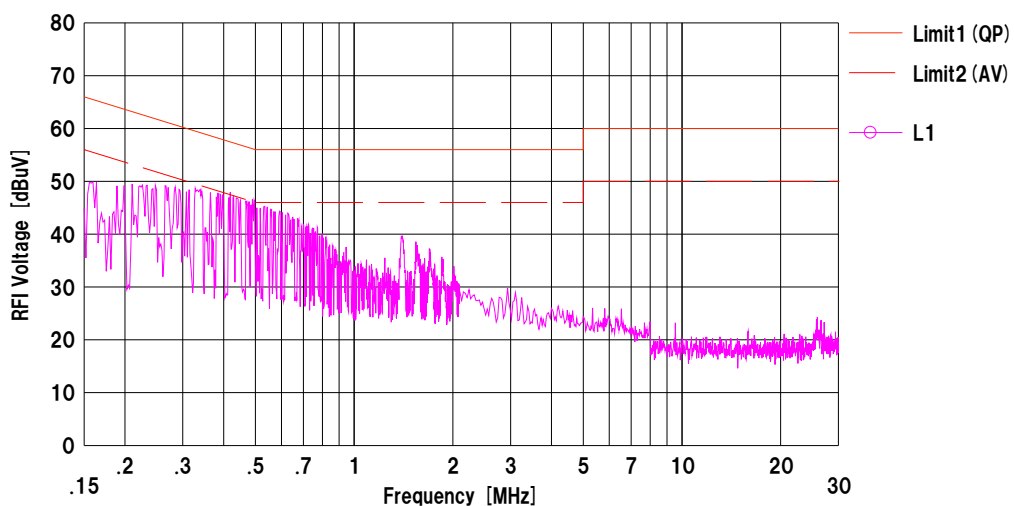
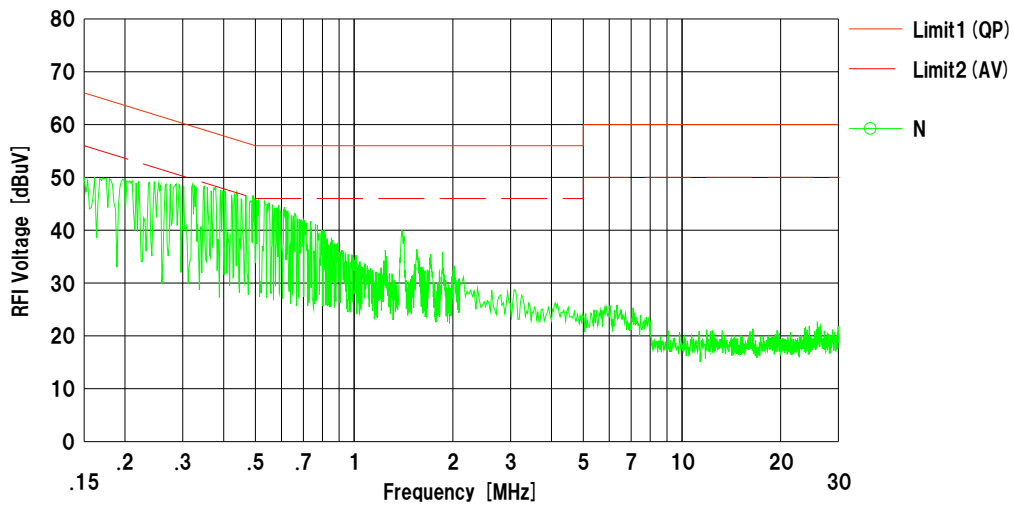
Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable + ATT) [dB]
LISN (AMN) : SLS-02

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
 Date : 2017/12/25

Mode : TX 2440 MHz
 Power : AC 120 V / 60 Hz
 Temp./Humi. : 27 deg.C / 30 %RH
 Remarks : ANT:2dBi, TXPWR:5, ATT:0
 Limit1 : FCC 15C (15.207) QP
 Limit2 : FCC 15C (15.207) AV
 Engineer : Yasumasa Owaki



Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable + ATT) [dB]
 LISN (AMN) : SLS-02

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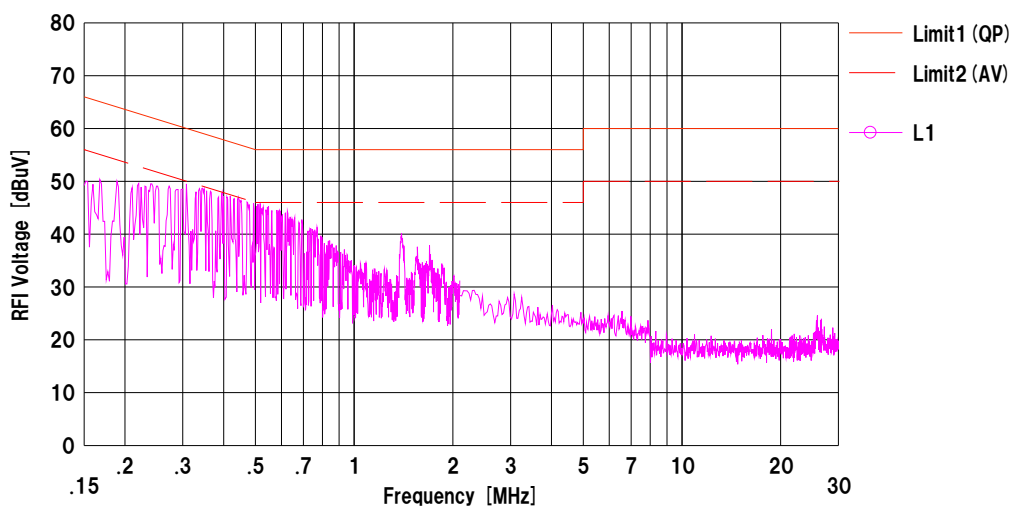
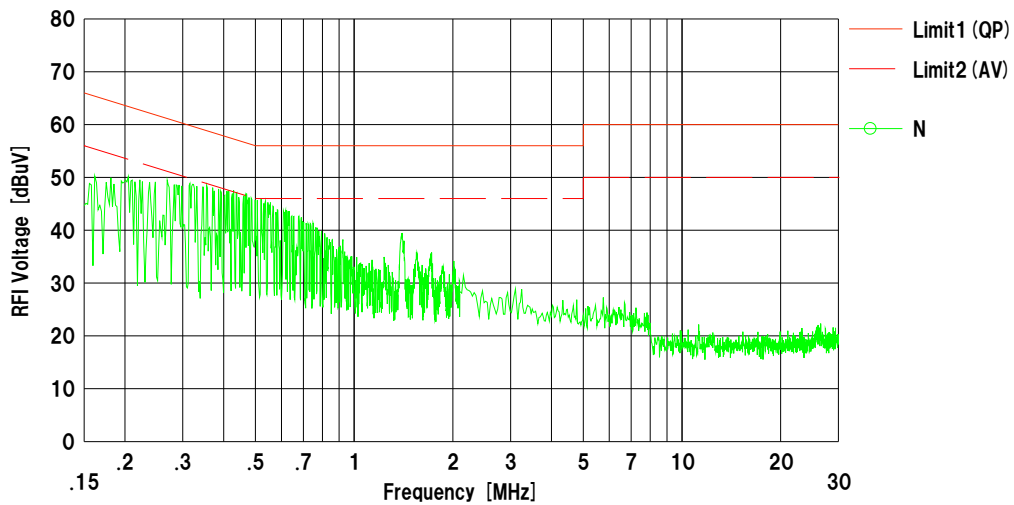
Facsimile : +81 463 50 6401

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2017/12/25

Mode : TX 2470 MHz
Power : AC 120 V / 60 Hz
Temp./Humi. : 27 deg.C / 30 %RH
Remarks : ANT:2dBi, TXPWR:5, ATT:0
Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV
Engineer : Yasumasa Owaki



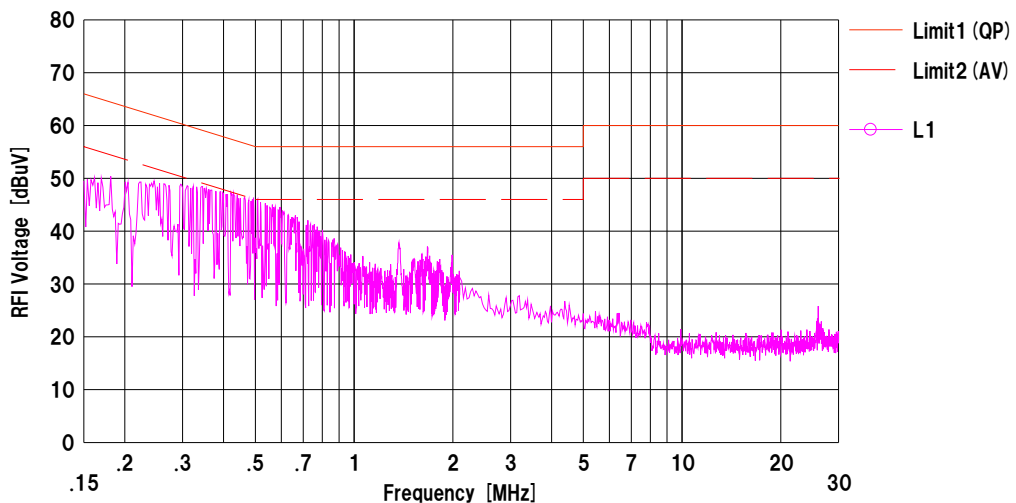
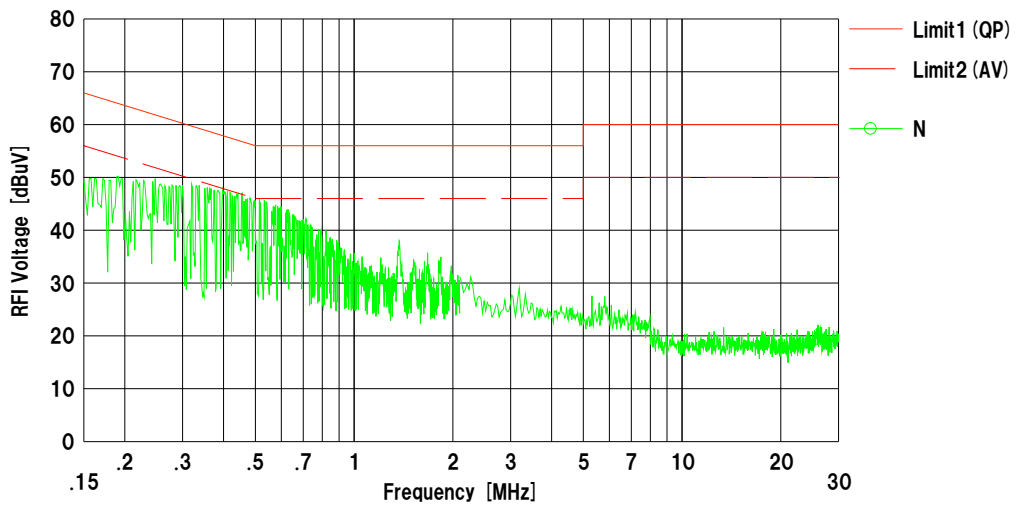
Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable+ATT) [dB]
LISN (AMN) : SLS-02

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
 Date : 2017/12/25

Mode : TX 2475 MHz
 Power : AC 120 V / 60 Hz
 Temp./Humi. : 27 deg.C / 30 %RH
 Remarks : ANT:2dBi, TXPWR:9, ATT:0
 Limit1 : FCC 15C (15.207) QP
 Limit2 : FCC 15C (15.207) AV
 Engineer : Yasumasa Owaki



Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable + ATT) [dB]
 LISN (AMN) : SLS-02

Conducted Emission

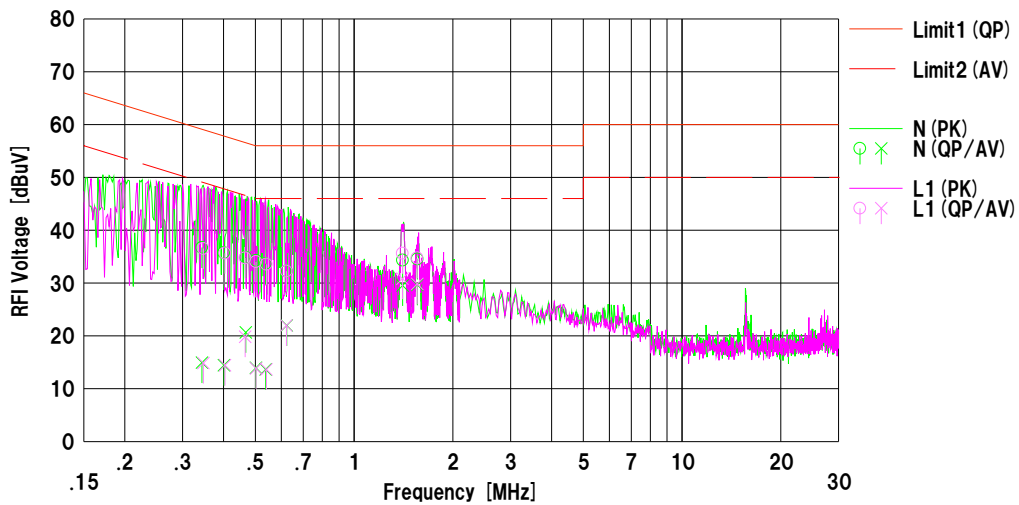
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2017/12/26

Mode : TX 2405 MHz
Power : AC 120 V / 60 Hz
Temp./Humi. : 27 deg.C / 30 %RH
Remarks : ANT:9dBi, TXPWR:5, ATT:0

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Yasumasa Owaki



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.34357	24.30	2.50	12.44	36.74	14.94	59.12	49.12	22.3	34.1	N	
2	0.40114	23.30	2.00	12.44	35.74	14.44	57.83	47.83	22.0	33.3	N	
3	0.46751	22.40	8.20	12.45	34.85	20.65	56.56	46.56	21.7	25.9	N	
4	0.50203	21.80	1.50	12.45	34.25	13.95	56.00	46.00	21.7	32.0	N	
5	0.53745	21.20	1.20	12.45	33.65	13.65	56.00	46.00	22.3	32.3	N	
6	0.62313	19.80	9.50	12.46	32.26	21.96	56.00	46.00	23.7	24.0	N	
7	1.40598	21.80	17.00	12.53	34.33	29.53	56.00	46.00	21.6	16.4	N	
8	1.55901	22.00	17.10	12.54	34.54	29.64	56.00	46.00	21.4	16.3	N	
9	0.34744	24.10	2.40	12.44	36.54	14.84	59.02	49.02	22.4	34.1	L1	
10	0.40397	23.20	2.00	12.44	35.64	14.44	57.77	47.77	22.1	33.3	L1	
11	0.46564	22.30	7.40	12.45	34.75	19.85	56.59	46.59	21.8	26.7	L1	
12	0.50242	21.60	1.40	12.45	34.05	13.85	56.00	46.00	21.9	32.1	L1	
13	0.54028	21.10	1.20	12.45	33.55	13.65	56.00	46.00	22.4	32.3	L1	
14	0.62196	19.80	9.50	12.46	32.26	21.96	56.00	46.00	23.7	24.0	L1	
15	1.40463	23.10	18.30	12.53	35.63	30.83	56.00	46.00	20.3	15.1	L1	
16	1.55820	22.20	17.30	12.54	34.74	29.84	56.00	46.00	21.2	16.1	L1	

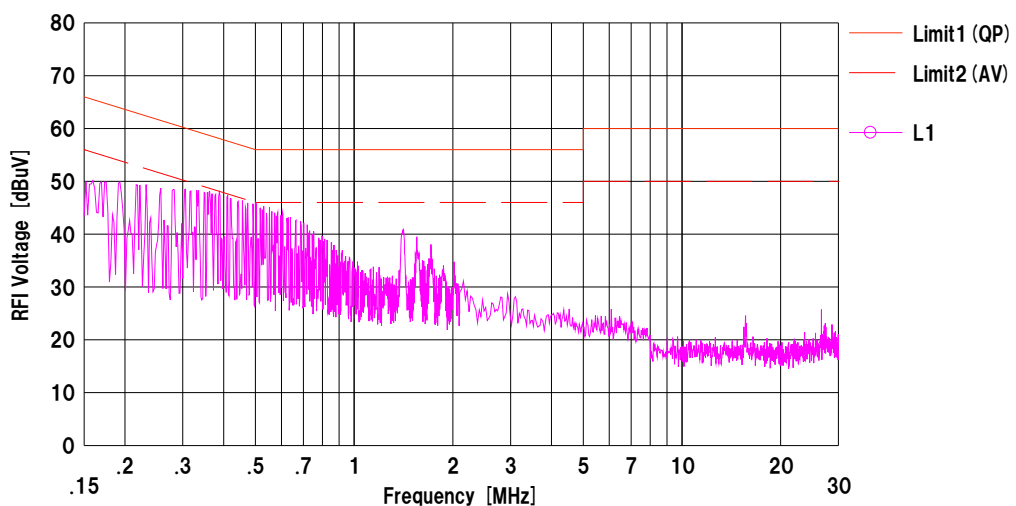
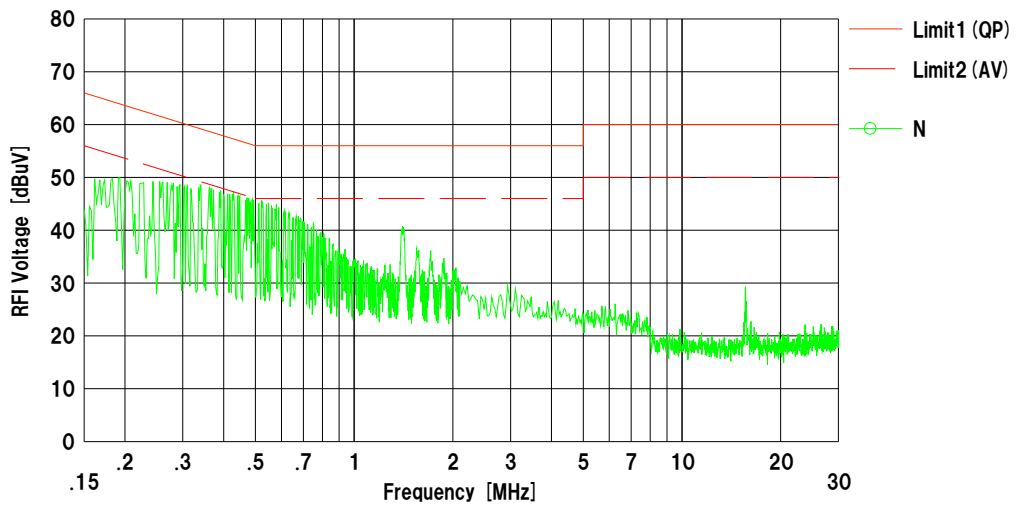
Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable + ATT) [dB]
LISN (AMN) : SLS-02

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
 Date : 2017/12/26

Mode : TX 2440 MHz
 Power : AC 120 V / 60 Hz
 Temp./Humi. : 27 deg.C / 30 %RH
 Remarks : ANT:9dBi, TXPWR:5, ATT:0
 Limit1 : FCC 15C (15.207) QP
 Limit2 : FCC 15C (15.207) AV
 Engineer : Yasumasa Owaki



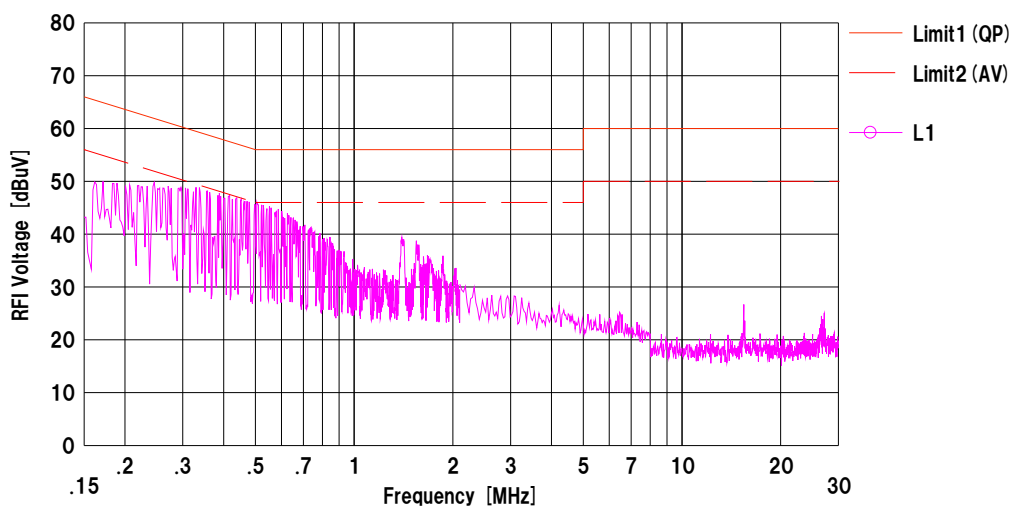
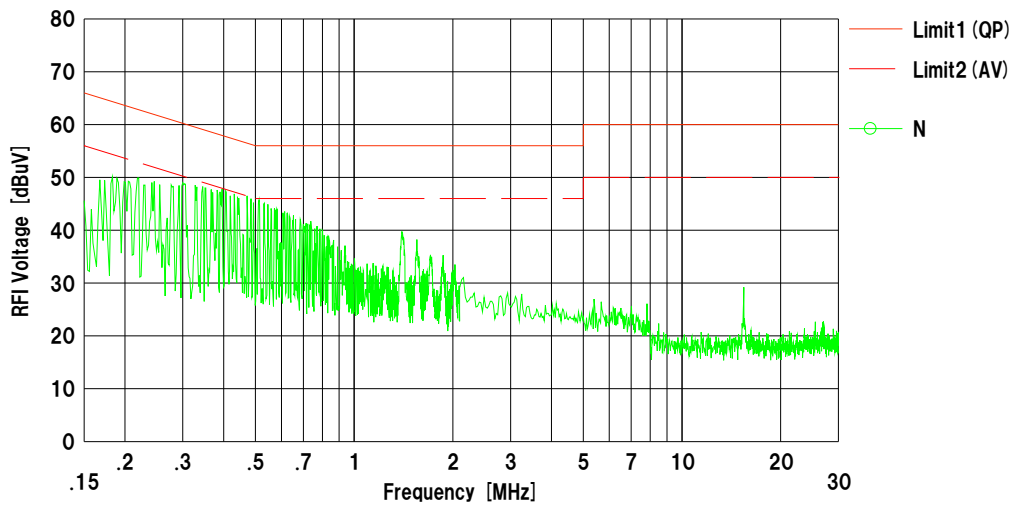
Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable + ATT) [dB]
 LISN (AMN) : SLS-02

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
 Date : 2017/12/26

Remarks : ANT:9dBi, TXPWR:5, ATT:0	Mode : TX 2470 MHz Power : AC 120 V / 60 Hz Temp./Humi. : 27 deg.C / 30 %RH
Limit1 : FCC 15C (15.207) QP Limit2 : FCC 15C (15.207) AV	Engineer : Yasumasa Owaki



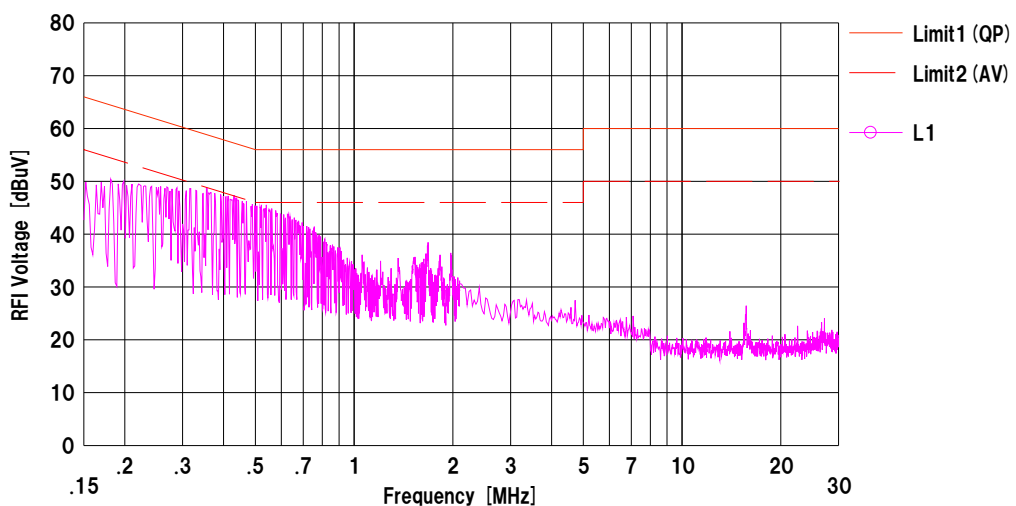
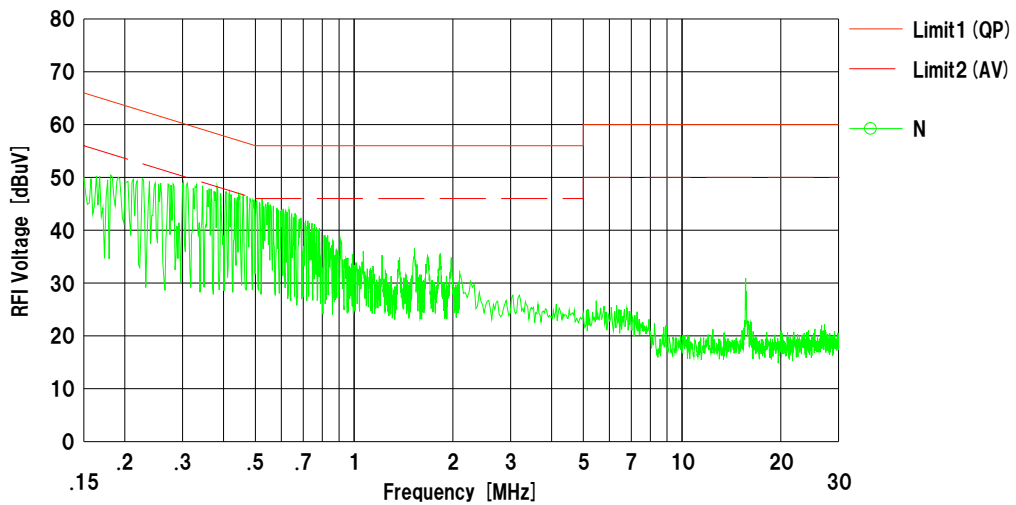
Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable + ATT) [dB]
 LISN (AMN) : SLS-02

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2017/12/26

Mode : TX 2475 MHz
Power : AC 120 V / 60 Hz
Temp./Humi. : 27 deg.C / 30 %RH
Remarks : ANT:9dBi, TXPWR:9, ATT:1
Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV
Engineer : Yasumasa Owaki



Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable + ATT) [dB]
LISN (AMN) : SLS-02

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

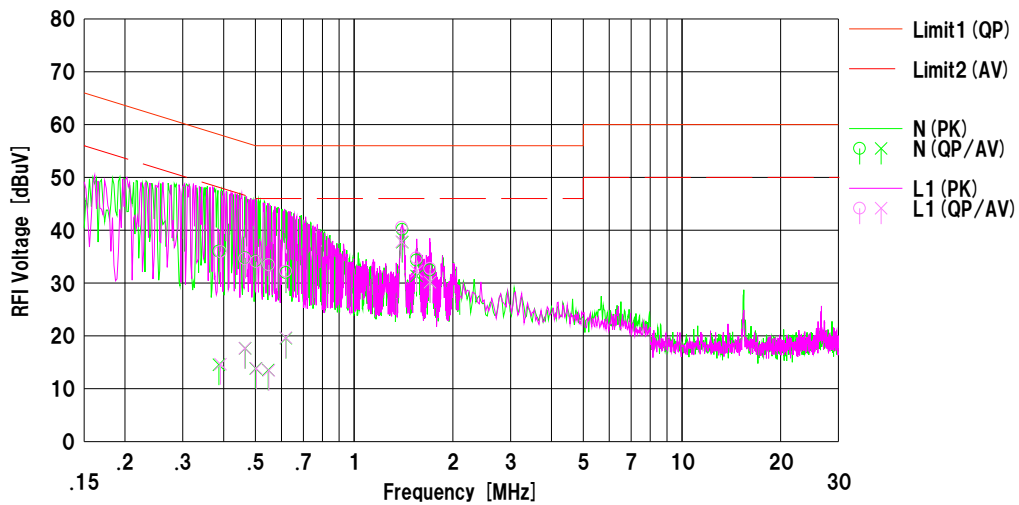
UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2017/12/26

Mode : TX 2405 MHz
Power : AC 120 V / 60 Hz
Temp./Humi. : 27 deg.C / 30 %RH

Remarks : ANT:15dBi, TXPWR:6, ATT:0

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Yasumasa Owaki



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.38684	23.60	2.10	12.44	36.04	14.54	58.13	48.13	22.0	33.5	N	
2	0.46534	22.30	5.20	12.45	34.75	17.65	56.60	46.60	21.8	28.9	N	
3	0.50091	21.70	1.40	12.45	34.15	13.85	56.00	46.00	21.8	32.1	N	
4	0.54657	21.00	1.10	12.45	33.45	13.55	56.00	46.00	22.5	32.4	N	
5	0.61948	19.50	7.10	12.46	31.96	19.56	56.00	46.00	24.0	26.4	N	
6	1.40207	27.60	25.20	12.53	40.13	37.73	56.00	46.00	15.8	8.2	N	
7	1.55055	21.80	18.80	12.54	34.34	31.34	56.00	46.00	21.6	14.6	N	
8	1.70321	19.90	17.60	12.56	32.46	30.16	56.00	46.00	23.5	15.8	N	
9	0.39121	23.50	2.20	12.44	35.94	14.64	58.04	48.04	22.1	33.4	L1	
10	0.46409	22.20	5.20	12.45	34.65	17.65	56.62	46.62	21.9	28.9	L1	
11	0.50305	21.60	1.40	12.45	34.05	13.85	56.00	46.00	21.9	32.1	L1	
12	0.54896	21.00	1.00	12.45	33.45	13.45	56.00	46.00	22.5	32.5	L1	
13	0.61896	19.80	7.20	12.46	32.26	19.66	56.00	46.00	23.7	26.3	L1	
14	1.39594	28.00	25.30	12.53	40.53	37.83	56.00	46.00	15.4	8.1	L1	
15	1.54925	22.20	19.70	12.54	34.74	32.24	56.00	46.00	21.2	13.7	L1	
16	1.70417	20.20	17.60	12.56	32.76	30.16	56.00	46.00	23.2	15.8	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable + ATT) [dB]
LISN (AMN) : SLS-02

UL Japan, Inc.

Shonan EMC Lab.

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Telephone : +81 463 50 6400

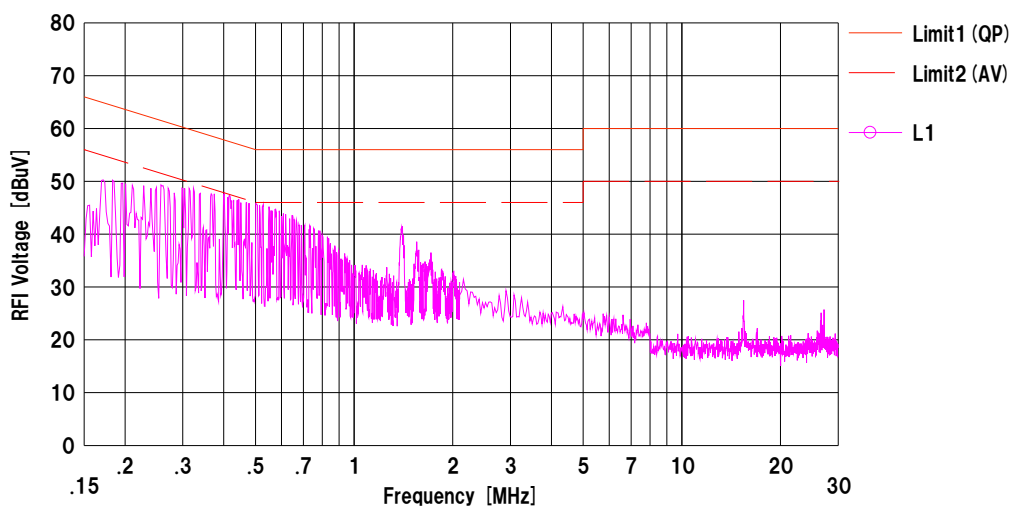
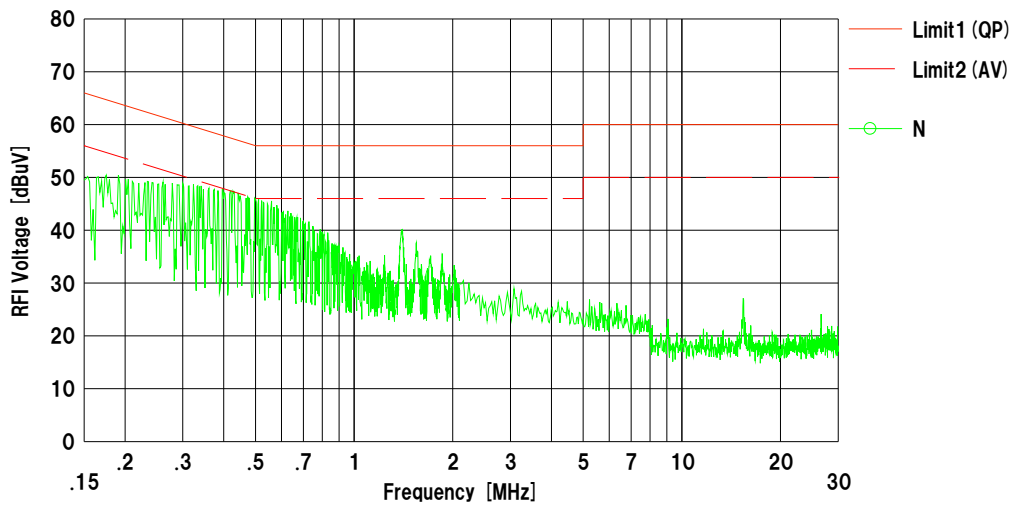
Facsimile : +81 463 50 6401

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
 Date : 2017/12/26

Remarks : ANT:15dBi, TXPWR:6, ATT:0	Mode : TX 2440 MHz Power : AC 120 V / 60 Hz Temp./Humi. : 27 deg.C / 30 %RH
Limit1 : FCC 15C (15.207) QP Limit2 : FCC 15C (15.207) AV	Engineer : Yasumasa Owaki



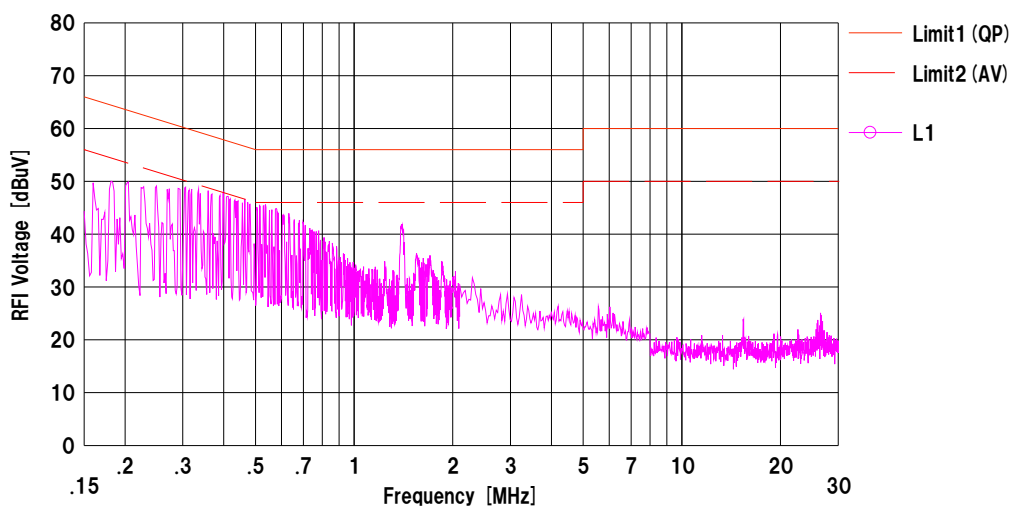
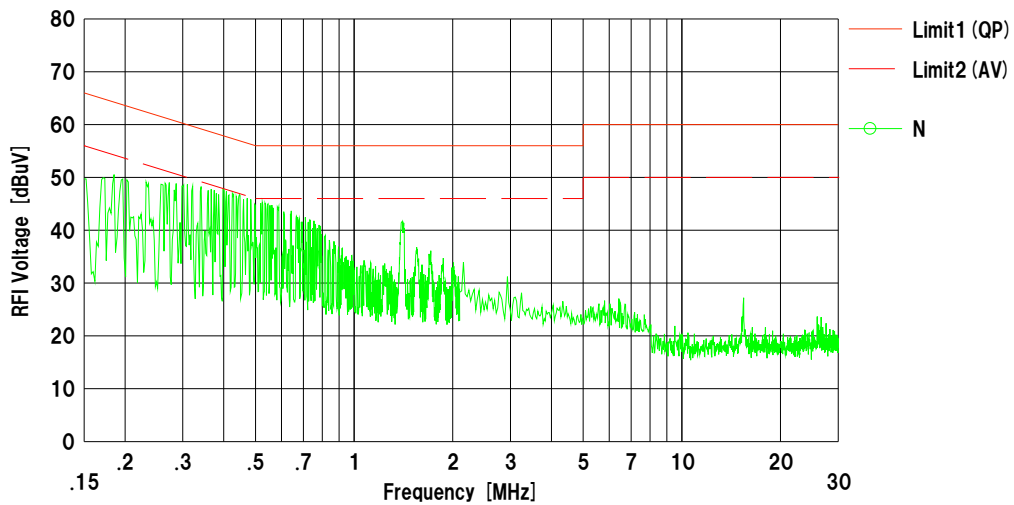
Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable+ATT) [dB]
 LISN (AMN) : SLS-02

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2017/12/26

Mode : TX 2470 MHz
Power : AC 120 V / 60 Hz
Temp./Humi. : 27 deg.C / 30 %RH
Remarks : ANT:15dBi, TXPWR:6, ATT:0
Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV
Engineer : Yasumasa Owaki



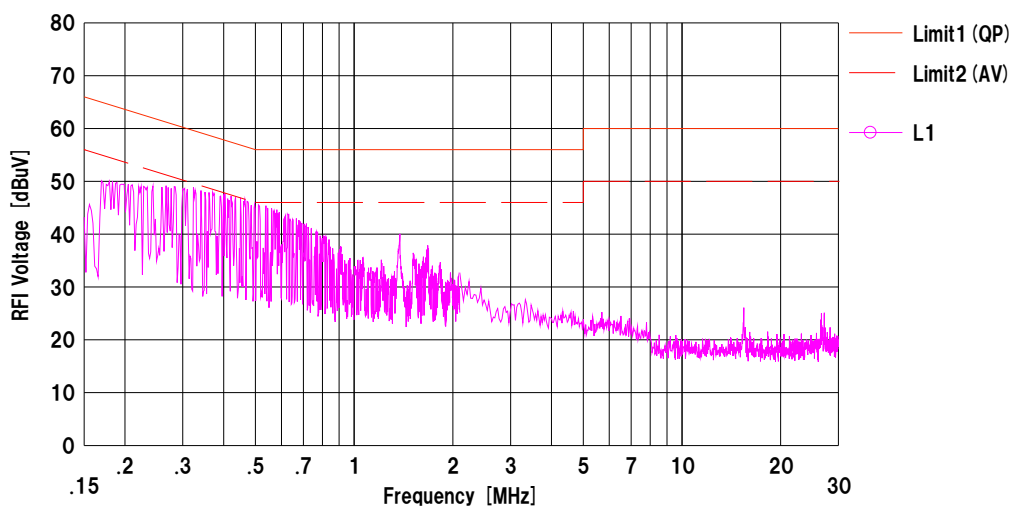
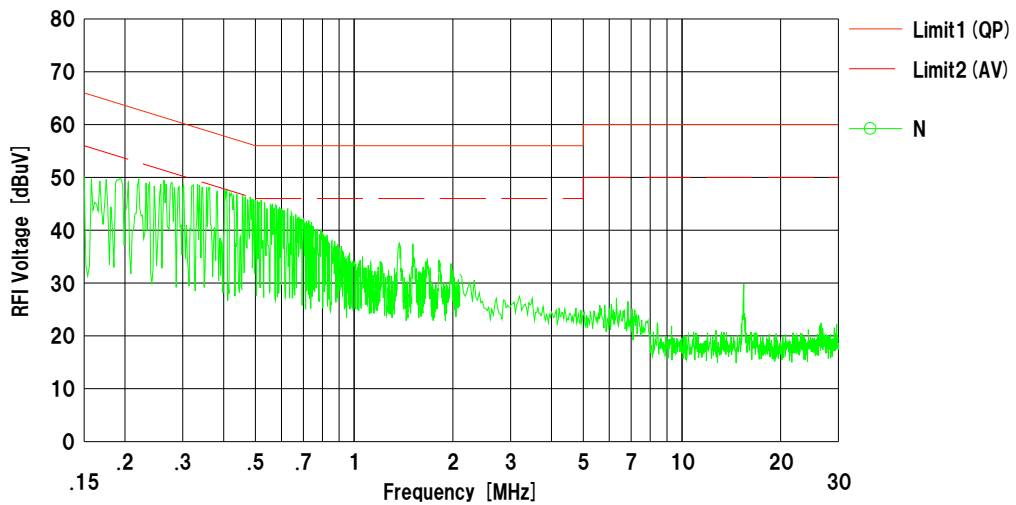
Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable + ATT) [dB]
LISN (AMN) : SLS-02

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
 Date : 2017/12/26

Mode : TX 2475 MHz
 Power : AC 120 V / 60 Hz
 Temp./Humi. : 27 deg.C / 30 %RH
 Remarks : ANT:15dBi, TXPWR:9, ATT:2
 Limit1 : FCC 15C (15.207) QP
 Limit2 : FCC 15C (15.207) AV
 Engineer : Yasumasa Owaki



Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable + ATT) [dB]
 LISN (AMN) : SLS-02

6 dB Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11980055S-A-R2
Date April 9, 2018
Temperature / Humidity 22 deg. C / 31 % RH
Engineer Kazuya Noda
Mode Tx ISA100.11a

Power setting High power setting 15 dBi antenna

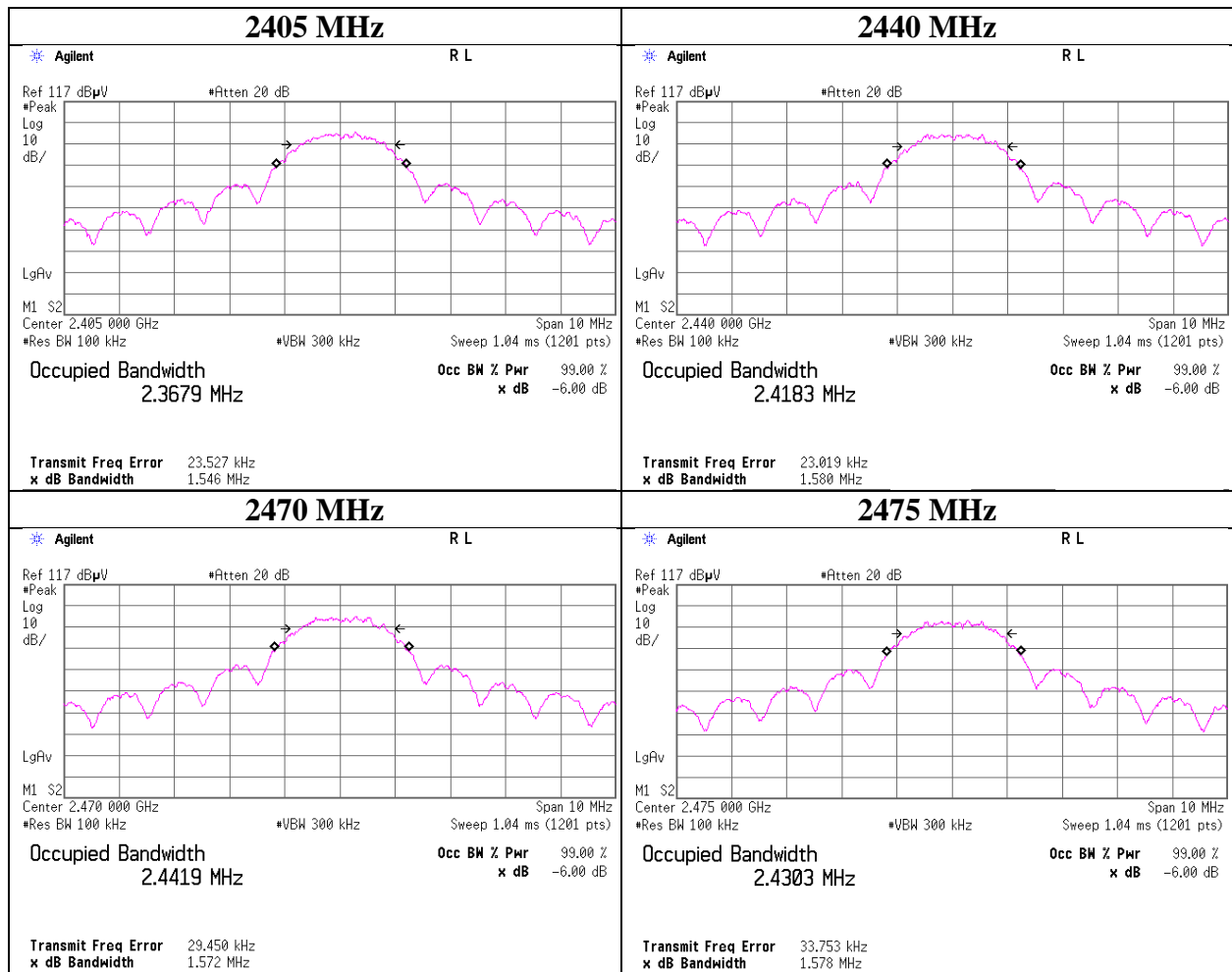
Mode	Frequency [MHz]	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [MHz]
ISA 100.11a	2405	2361.1	1.546	> 0.5000
	2440	2415.4	1.580	> 0.5000
	2470	2446.4	1.572	> 0.5000

Power settings Low power setting 2 dBi antenna

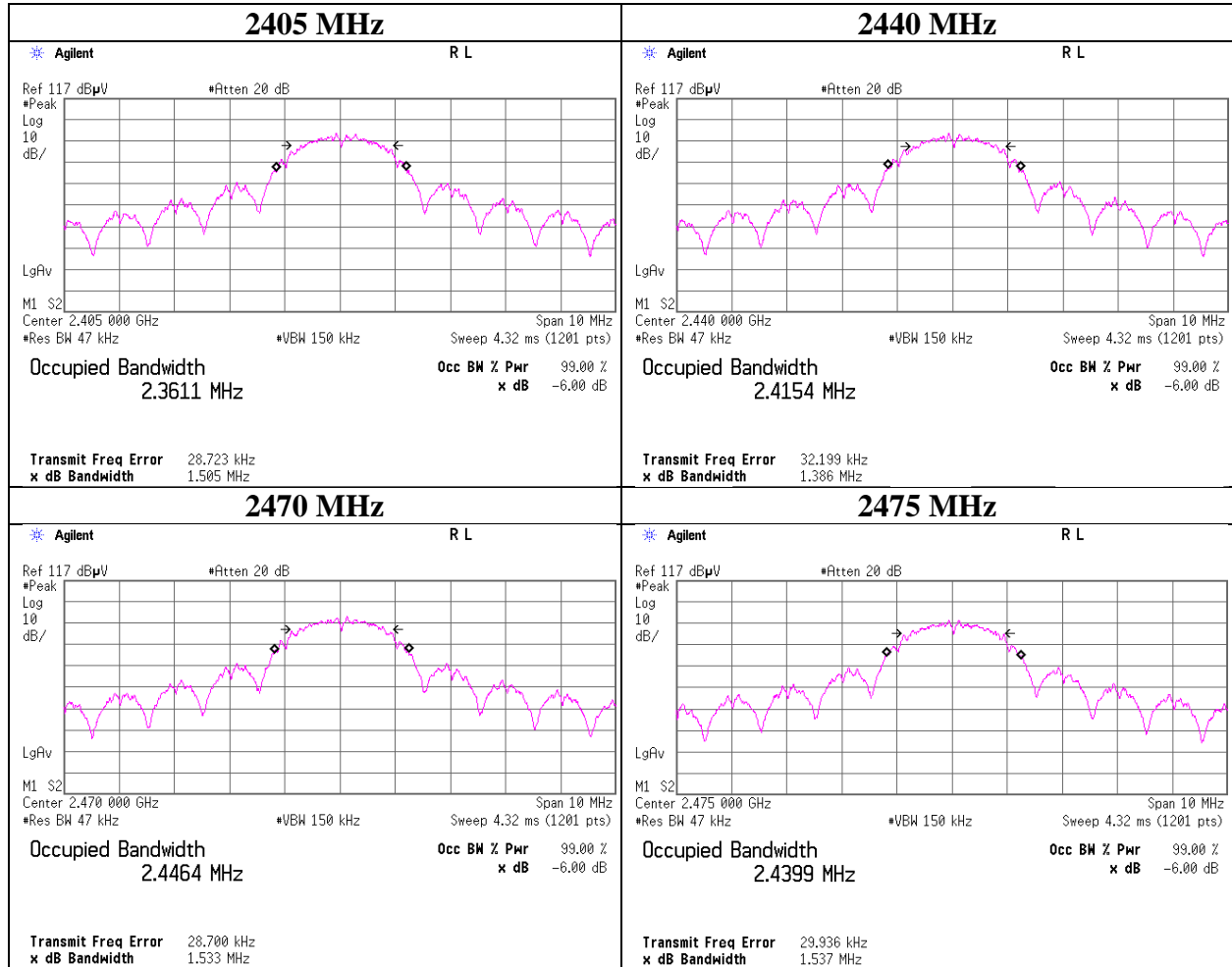
Mode	Frequency [MHz]	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [MHz]
ISA 100.11a	2475	2439.9	1.578	> 0.5000

6dB Bandwidth

Tx ISA100.11a



99% Occupied Bandwidth
Tx ISA100.11a



Maximum Peak Output Power

Report No.	11980055S-A-R2	
Test place	Shonan EMC Lab. No.1 SAC	Shonan EMC Lab. No.6 SR
Date	December 27, 2017	March 5, 2018
Temperature / Humidity	23 deg. C / 35 % RH	22 deg. C / 51 % RH
Engineer	Kazutaka Takeyama	Hiroyuki Morikawa
Mode	Tx ISA100.11a, Power settings for 2 dBi antenna	

High power setting

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2405	-1.04	1.89	9.68	10.53	11.30	30.00	1000	19.47
2440	-1.25	1.85	9.67	10.27	10.64	30.00	1000	19.73
2470	-1.40	1.97	9.67	10.24	10.57	30.00	1000	19.76

Low power setting

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2405	-3.05	1.89	9.68	8.52	7.11	30.00	1000	21.48
2440	-3.20	1.85	9.67	8.32	6.79	30.00	1000	21.68
2470	-3.43	1.97	9.67	8.21	6.63	30.00	1000	21.79
2475	-3.48	1.97	9.67	8.16	6.55	30.00	1000	21.84

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.

Maximum Peak Output Power

Report No.	11980055S-A-R2	
Test place	Shonan EMC Lab. No.1 SAC	Shonan EMC Lab. No.6 SR
Date	December 27, 2017	March 5, 2018
Temperature / Humidity	23 deg. C / 35 % RH	22 deg. C / 51 % RH
Engineer	Kazutaka Takeyama	Hiroyuki Morikawa
Mode	Tx ISA100.11a, Power settings for 9 dBi antenna	

High power setting

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2405	-1.04	1.89	9.68	10.53	11.30	27.00	501	16.47
2440	-1.25	1.85	9.67	10.27	10.64	27.00	501	16.73
2470	-1.40	1.97	9.67	10.24	10.57	27.00	501	16.76

Low power setting

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2405	-9.05	1.89	9.68	2.52	1.79	27.00	501	24.48
2440	-9.19	1.85	9.67	2.33	1.71	27.00	501	24.67
2470	-9.37	1.97	9.67	2.27	1.69	27.00	501	24.73
2475	-9.00	1.97	9.67	2.64	1.84	27.00	501	24.36

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.

Maximum Peak Output Power

Report No.	11980055S-A-R2	
Test place	Shonan EMC Lab. No.1 SAC	Shonan EMC Lab. No.6 SR
Date	December 27, 2017	March 5, 2018
Temperature / Humidity	23 deg. C / 35 % RH	22 deg. C / 51 % RH
Engineer	Kazutaka Takeyama	Hiroyuki Morikawa
Mode	Tx ISA100.11a, Power settings for 15 dBi antenna	

High power setting

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2405	-1.48	1.89	9.68	10.09	10.21	21.00	126	10.91
2440	-1.69	1.85	9.67	9.83	9.62	21.00	126	11.17
2470	-1.80	1.97	9.67	9.84	9.64	21.00	126	11.16

Low power setting

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2405	-14.76	1.89	9.68	-3.19	0.48	21.00	126	24.19
2440	-14.66	1.85	9.67	-3.14	0.49	21.00	126	24.14
2470	-14.88	1.97	9.67	-3.24	0.47	21.00	126	24.24
2475	-14.53	1.97	9.67	-2.89	0.51	21.00	126	23.89

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.

Average Output Power
(Reference data for RF Exposure)

Report No.	11980055S-A-R2	
Test place	Shonan EMC Lab. No.1 SAC	Shonan EMC Lab. No.6 SR
Date	December 27, 2017	March 5, 2018
Temperature / Humidity	23 deg. C / 35 % RH	22 deg. C / 51 % RH
Engineer	Kazutaka Takeyama	Hiroyuki Morikawa
Mode	Tx ISA100.11a, Power settings for 2 dBi antenna	

High power setting

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2405	-1.12	1.89	9.68	10.45	11.09	0.00	10.45	11.09
2440	-1.31	1.85	9.67	10.21	10.50	0.00	10.21	10.50
2470	-1.48	1.97	9.67	10.16	10.38	0.00	10.16	10.38

Low power setting

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2405	-3.15	1.89	9.68	8.42	6.95	0.00	8.42	6.95
2440	-3.32	1.85	9.67	8.20	6.61	0.00	8.20	6.61
2470	-3.54	1.97	9.67	8.10	6.46	0.00	8.10	6.46
2475	-3.59	1.97	9.67	8.05	6.39	0.00	8.05	6.39

Sample Calculation:

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

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

Average Output Power
(Reference data for RF Exposure)

Report No.	11980055S-A-R2	
Date	December 27, 2017	March 5, 2018
Test place	Shonan EMC Lab.	Shonan EMC Lab.
	No.1 SAC	No.6 SR
Temperature / Humidity	23 deg. C / 35 % RH	22 deg. C / 51 % RH
Engineer	Kazutaka Takeyama	Hiroyuki Morikawa
Mode	Tx ISA100.11a, Power settings for 9 dBi antenna	

High power setting

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2405	-1.12	1.89	9.68	10.45	11.09	0.00	10.45	11.09
2440	-1.31	1.85	9.67	10.21	10.50	0.00	10.21	10.50
2470	-1.48	1.97	9.67	10.16	10.38	0.00	10.16	10.38

Low power setting

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2405	-9.36	1.89	9.68	2.21	1.66	0.00	2.21	1.66
2440	-9.48	1.85	9.67	2.04	1.60	0.00	2.04	1.60
2470	-9.67	1.97	9.67	1.97	1.57	0.00	1.97	1.57
2475	-9.75	1.97	9.67	1.89	1.55	0.00	1.89	1.55

Sample Calculation:

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

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

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

Average Output Power
(Reference data for RF Exposure)

Report No.	11980055S-A-R2	
Test place	Shonan EMC Lab. No.1 SAC	Shonan EMC Lab. No.6 SR
Date	December 27, 2017	March 5, 2018
Temperature / Humidity	23 deg. C / 35 % RH	22 deg. C / 51 % RH
Engineer	Kazutaka Takeyama	Hiroyuki Morikawa
Mode	Tx ISA100.11a, Power settings for 15 dBi antenna	

High power setting

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2405	-1.56	1.89	9.68	10.01	10.02	0.00	10.01	10.02
2440	-1.77	1.85	9.67	9.75	9.44	0.00	9.75	9.44
2470	-1.88	1.97	9.67	9.76	9.47	0.00	9.76	9.47

Low power setting

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2405	-15.76	1.89	9.68	-4.19	0.38	0.00	-4.19	0.38
2440	-15.78	1.85	9.67	-4.26	0.38	0.00	-4.26	0.38
2470	-15.91	1.97	9.67	-4.27	0.37	0.00	-4.27	0.37
2475	-15.89	1.97	9.67	-4.25	0.38	0.00	-4.25	0.38

Sample Calculation:

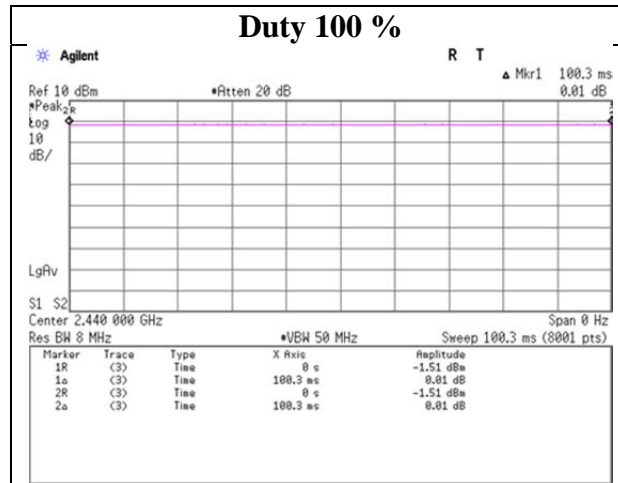
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

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.5 Shielded Room
Report No.	11980055S-A-R2
Date	April 9, 2018
Temperature / Humidity	22 deg. C / 31 % RH
Engineer	Kazuya Noda
Mode	Tx ISA100.11a
Power setting	High power setting 15 dBi antenna



* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

Radiated Spurious Emission

Test place	No.1 SAC	No.2 SAC	No.1 SAC
Date	December 19, 2017	December 25, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 37 %RH	23 deg.C, 38 %RH	25 deg.C, 30 %RH
Engineer	Takahiro Suzuki (1 GHz - 18 GHz)	Takahiro Suzuki (30 MHz - 1000 MHz)	Yasumasa Owaki (18 GHz - 26.5 GHz)
Mode	Tx, 2405 MHz	(Antenna: 2 dBi)	

(* 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.	106.033	QP	22.35	10.92	7.98	31.84	0.00	9.41	43.50	34.0	287	9	
Hori.	133.686	QP	22.47	13.89	8.27	31.82	0.00	12.81	43.50	30.6	225	359	
Hori.	164.619	QP	22.82	15.51	8.79	31.79	0.00	15.33	43.50	28.1	121	4	
Hori.	290.096	QP	22.47	13.06	6.37	31.68	0.00	10.22	46.00	35.7	100	22	
Hori.	446.942	QP	22.19	16.74	7.46	31.61	0.00	14.78	46.00	31.2	100	185	
Hori.	2390.000	PK	39.74	27.14	14.19	36.83	2.33	46.57	73.90	27.3	205	123	
Hori.	4810.000	PK	45.07	31.14	6.78	37.00	2.33	48.32	73.90	25.5	137	225	
Hori.	7215.000	PK	43.29	36.36	8.38	37.81	2.33	52.55	73.90	21.3	150	0	
Hori.	9620.000	PK	45.44	38.13	9.38	38.49	2.33	56.79	73.90	17.1	150	0	
Hori.	12025.000	PK	45.25	39.13	10.80	39.18	2.33	58.33	73.90	15.5	150	0	
Hori.	2390.000	AV	33.37	27.14	14.19	36.83	2.33	40.20	53.90	13.7	205	123	
Hori.	4810.000	AV	36.02	31.14	6.78	37.00	2.33	39.27	53.90	14.6	137	225	
Hori.	7215.000	AV	33.54	36.36	8.38	37.81	2.33	42.80	53.90	11.1	150	0	
Hori.	9620.000	AV	35.00	38.13	9.38	38.49	2.33	46.35	53.90	7.5	150	0	
Hori.	12025.000	AV	35.73	39.13	10.80	39.18	2.33	48.81	53.90	5.0	150	0	
Vert.	35.907	QP	28.92	15.77	6.96	31.90	0.00	19.75	40.00	20.2	100	47	
Vert.	60.004	QP	34.86	7.72	7.06	31.88	0.00	17.76	40.00	22.2	100	32	
Vert.	198.584	QP	25.09	16.33	8.89	31.77	0.00	18.54	43.50	24.9	100	11	
Vert.	461.258	QP	21.68	17.01	7.53	31.61	0.00	14.61	46.00	31.3	100	236	
Vert.	596.852	QP	21.64	19.06	8.21	31.57	0.00	17.34	46.00	28.6	100	308	
Vert.	2390.000	PK	44.03	27.14	14.19	36.83	2.33	50.86	73.90	23.0	159	167	
Vert.	4810.000	PK	45.69	31.14	6.78	37.00	2.33	48.94	73.90	24.9	131	343	
Vert.	7215.000	PK	44.29	36.36	8.38	37.81	2.33	53.55	73.90	20.3	150	0	
Vert.	9620.000	PK	45.41	38.13	9.38	38.49	2.33	56.76	73.90	17.1	150	0	
Vert.	12025.000	PK	43.09	39.13	10.80	39.18	2.33	56.17	73.90	17.7	150	0	
Vert.	2390.000	AV	37.85	27.14	14.19	36.83	2.33	44.68	53.90	9.2	159	167	
Vert.	4810.000	AV	37.56	31.14	6.78	37.00	2.33	40.81	53.90	13.0	131	343	
Vert.	7215.000	AV	33.34	36.36	8.38	37.81	2.33	42.60	53.90	11.3	150	0	
Vert.	9620.000	AV	34.53	38.13	9.38	38.49	2.33	45.88	53.90	8.0	150	0	
Vert.	12025.000	AV	34.48	39.13	10.80	39.18	2.33	47.56	53.90	6.3	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.92 m / 3.0 m) = 2.33 dB

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

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.	2405.000	PK	84.55	27.19	14.20	36.82	2.33	91.45	-	-	Carrier
Hori.	2400.000	PK	42.82	27.17	14.19	36.83	2.33	49.68	71.45	21.8	
Vert.	2405.000	PK	94.18	27.19	14.20	36.82	2.33	101.08	-	-	Carrier
Vert.	2400.000	PK	51.05	27.17	14.19	36.83	2.33	57.91	81.08	23.2	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.92 m / 3.0 m) = 2.33 dB

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

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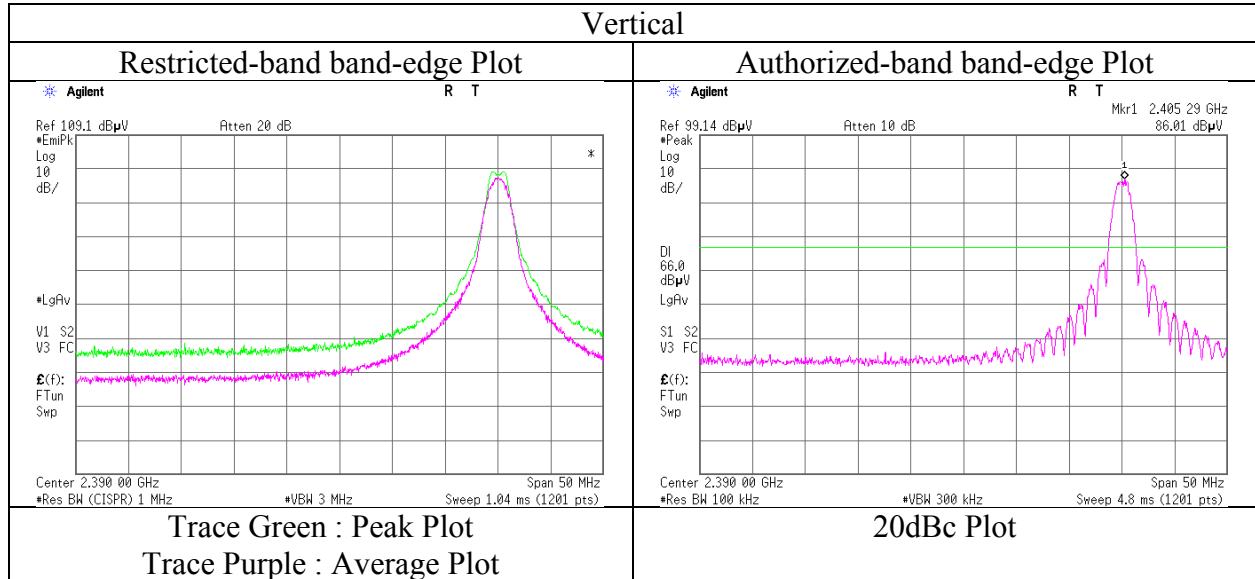
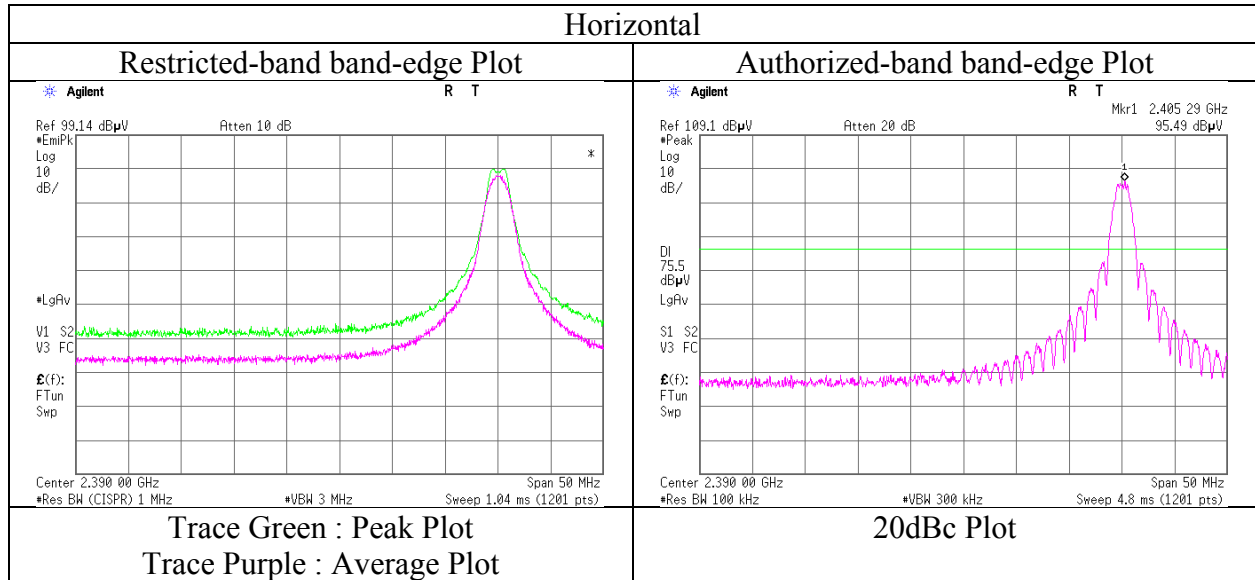
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Radiated Spurious Emission
(Reference Plot for band-edge)

Test place
Date
Temperature / Humidity
Engineer

Mode

No.1 SAC
December 19, 2017
22 deg. C / 37 % RH
Takahiro Suzuki
(1 GHz – 2.8 GHz)
Tx, 2405 MHz (Antenna: 2 dBi)



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

Radiated Spurious Emission

Test place	No.1 SAC	No.2 SAC	No.1 SAC
Date	December 19, 2017	December 25, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 37 %RH	23 deg.C, 38 %RH	25 deg.C, 30 %RH
Engineer	Takahiro Suzuki (1 GHz - 18 GHz)	Takahiro Suzuki (30 MHz - 1000 MHz)	Yasumasa Owaki (18 GHz - 26.5 GHz)
Mode	Tx, 2440 MHz	(Antenna: 2 dBi)	

(* 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.	106.812	QP	22.24	11.03	7.98	31.84	0.00	9.41	43.50	34.0	154	279	
Hori.	133.406	QP	22.51	13.88	8.27	31.82	0.00	12.84	43.50	30.6	209	344	
Hori.	164.382	QP	22.73	15.51	8.79	31.79	0.00	15.24	43.50	28.2	321	5	
Hori.	286.449	QP	22.29	12.94	6.35	31.68	0.00	9.90	46.00	36.1	132	44	
Hori.	446.517	QP	22.26	16.73	7.46	31.61	0.00	14.84	46.00	31.1	119	50	
Hori.	4880.000	PK	42.19	31.30	6.86	37.03	2.33	45.65	73.90	28.2	151	5	
Hori.	7320.000	PK	43.72	36.51	8.50	37.88	2.33	53.18	73.90	20.7	150	0	
Hori.	9760.000	PK	46.12	38.36	9.49	38.67	2.33	57.63	73.90	16.2	150	0	
Hori.	12200.000	PK	45.58	39.11	11.17	39.14	2.33	59.05	73.90	14.8	150	0	
Hori.	4880.000	AV	34.52	31.30	6.86	37.03	2.33	37.98	53.90	15.9	151	5	
Hori.	7320.000	AV	33.46	36.51	8.50	37.88	2.33	42.92	53.90	10.9	150	0	
Hori.	9760.000	AV	35.49	38.36	9.49	38.67	2.33	47.00	53.90	6.9	150	0	
Hori.	12200.000	AV	35.03	39.11	11.17	39.14	2.33	48.50	53.90	5.4	150	0	
Vert.	35.248	QP	29.00	16.00	6.93	31.90	0.00	20.03	40.00	19.9	100	7	
Vert.	59.275	QP	34.28	7.94	7.08	31.88	0.00	17.42	40.00	22.5	100	2	
Vert.	198.240	QP	25.03	16.32	8.88	31.77	0.00	18.46	43.50	25.0	100	139	
Vert.	463.375	QP	21.57	17.06	7.54	31.61	0.00	14.56	46.00	31.4	100	153	
Vert.	594.976	QP	21.45	19.03	8.20	31.58	0.00	17.10	46.00	28.9	100	248	
Vert.	4880.000	PK	45.87	31.30	6.86	37.03	2.33	49.33	73.90	24.5	144	3	
Vert.	7320.000	PK	45.00	36.51	8.50	37.88	2.33	54.46	73.90	19.4	150	0	
Vert.	9760.000	PK	44.78	38.36	9.49	38.67	2.33	56.29	73.90	17.6	150	0	
Vert.	12200.000	PK	46.08	39.11	11.17	39.14	2.33	59.55	73.90	14.3	150	0	
Vert.	4880.000	AV	36.34	31.30	6.86	37.03	2.33	39.80	53.90	14.1	144	3	
Vert.	7320.000	AV	33.52	36.51	8.50	37.88	2.33	42.98	53.90	10.9	150	0	
Vert.	9760.000	AV	35.25	38.36	9.49	38.67	2.33	46.76	53.90	7.1	150	0	
Vert.	12200.000	AV	34.67	39.11	11.17	39.14	2.33	48.14	53.90	5.7	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.92 m / 3.0 m) = 2.33 dB

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

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Radiated Spurious Emission

Test place	No.1 SAC	No.1 SAC	No.2 SAC	No.1 SAC
Date	December 18, 2017	December 19, 2017	December 25, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 41 %RH	22 deg.C, 37 %RH	23 deg.C, 38 %RH	25 deg.C, 30 %RH
Engineer	Takahiro Suzuki	Takahiro Suzuki	Takahiro Suzuki	Yasumasa Owaki
	(1 GHz - 13 GHz)	(13 GHz - 18 GHz)	(30 MHz - 1000 MHz)	(18 GHz - 26.5 GHz)
Mode	Tx, 2470 MHz (Antenna: 2 dBi)			

(* 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.	108.804	QP	22.11	11.32	7.97	31.84	0.00	9.56	43.50	33.9	176	179	
Hori.	127.830	QP	22.32	13.48	8.15	31.82	0.00	12.13	43.50	31.3	155	60	
Hori.	164.803	QP	22.29	15.52	8.80	31.79	0.00	14.82	43.50	28.6	209	30	
Hori.	283.041	QP	22.35	12.83	6.32	31.69	0.00	9.81	46.00	36.1	100	341	
Hori.	440.322	QP	22.09	16.61	7.41	31.61	0.00	14.50	46.00	31.5	136	271	
Hori.	2483.500	PK	43.45	27.45	14.28	36.79	2.33	48.39	73.90	25.5	158	123	
Hori.	4940.000	PK	45.53	31.44	6.91	37.06	2.33	46.82	73.90	27.0	165	16	
Hori.	7410.000	PK	43.46	36.63	8.62	37.93	2.33	50.78	73.90	23.1	150	0	
Hori.	9880.000	PK	44.40	38.56	9.57	38.82	2.33	53.71	73.90	20.1	150	0	
Hori.	12350.000	PK	44.03	39.09	11.49	39.11	2.33	55.50	73.90	18.4	150	0	
Hori.	2483.500	AV	32.74	27.45	14.28	36.79	2.33	37.68	53.90	16.2	158	123	
Hori.	4940.000	AV	38.12	31.44	6.91	37.06	2.33	39.41	53.90	14.4	165	16	
Hori.	7410.000	AV	33.76	36.63	8.62	37.93	2.33	41.08	53.90	12.8	150	0	
Hori.	9880.000	AV	34.51	38.56	9.57	38.82	2.33	43.82	53.90	10.0	150	0	
Hori.	12350.000	AV	34.32	39.09	11.49	39.11	2.33	45.79	53.90	8.1	150	0	
Vert.	35.596	QP	28.67	15.88	6.94	31.90	0.00	19.59	40.00	20.4	100	117	
Vert.	59.799	QP	34.12	7.78	7.07	31.88	0.00	17.09	40.00	22.9	100	301	
Vert.	199.327	QP	25.13	16.33	8.89	31.77	0.00	18.58	43.50	24.9	100	129	
Vert.	453.656	QP	21.36	16.87	7.50	31.61	0.00	14.12	46.00	31.8	100	51	
Vert.	593.511	QP	21.28	19.01	8.20	31.58	0.00	16.91	46.00	29.0	100	302	
Vert.	2483.500	PK	49.98	27.45	14.28	36.79	2.33	54.92	73.90	18.9	154	7	
Vert.	4940.000	PK	45.84	31.44	6.91	37.06	2.33	47.13	73.90	26.7	139	3	
Vert.	7410.000	PK	44.66	36.63	8.62	37.93	2.33	51.98	73.90	21.9	150	0	
Vert.	9880.000	PK	43.68	38.56	9.57	38.82	2.33	52.99	73.90	20.9	150	0	
Vert.	12350.000	PK	44.53	39.09	11.49	39.11	2.33	56.00	73.90	17.9	150	0	
Vert.	2483.500	AV	39.48	27.45	14.28	36.79	2.33	44.42	53.90	9.4	154	7	
Vert.	4940.000	AV	36.24	31.44	6.91	37.06	2.33	37.53	53.90	16.3	139	3	
Vert.	7410.000	AV	33.64	36.63	8.62	37.93	2.33	40.96	53.90	12.9	150	0	
Vert.	9880.000	AV	33.96	38.56	9.57	38.82	2.33	43.27	53.90	10.6	150	0	
Vert.	12350.000	AV	34.82	39.09	11.49	39.11	2.33	46.29	53.90	7.6	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.92 m / 3.0 m) = 2.33 dB

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

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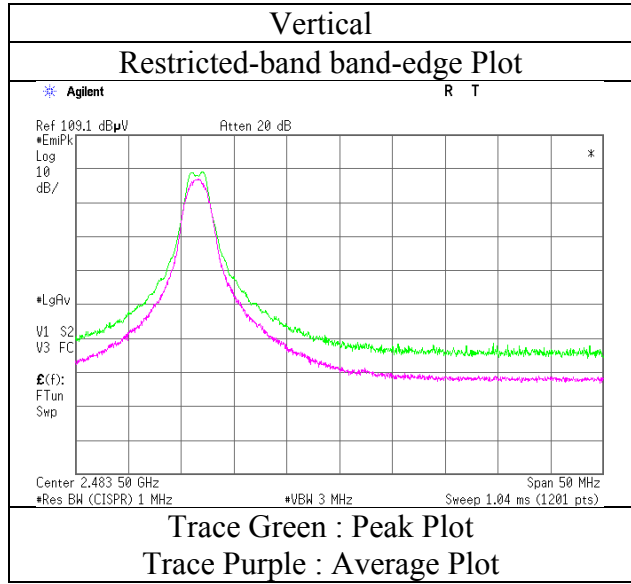
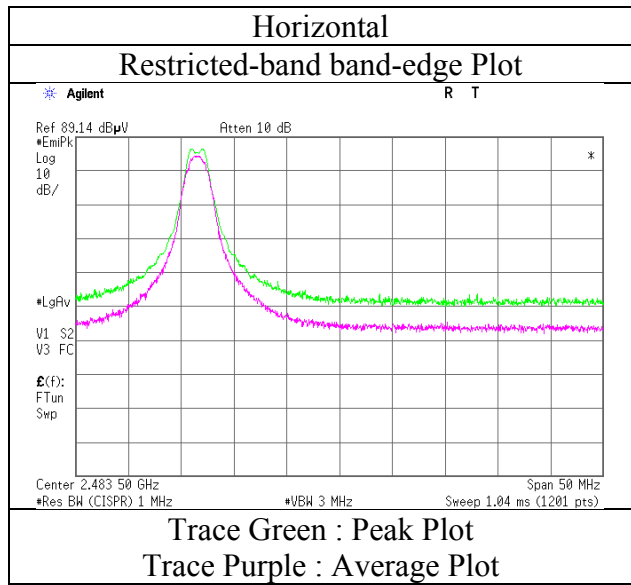
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Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	No.1 SAC
Date	December 18, 2017
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Takahiro Suzuki
	(1 GHz – 2.8 GHz)
Mode	Tx, 2470 MHz (Antenna: 2 dBi)



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

Radiated Spurious Emission

Test place	No.1 SAC	No.1 SAC	No.2 SAC	No.1 SAC
Date	December 18, 2017	December 19, 2017	December 25, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 41 %RH	22 deg.C, 37 %RH	23 deg.C, 38 %RH	25 deg.C, 30 %RH
Engineer	Takahiro Suzuki (1 GHz - 13 GHz)	Takahiro Suzuki (13 GHz - 18 GHz)	Takahiro Suzuki (30 MHz - 1000 MHz)	Yasumasa Owaki (18 GHz - 26.5 GHz)
Mode	Tx, 2475 MHz	(Antenna: 2 dBi)		

(* 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.	102.245	QP	22.37	10.37	8.02	31.85	0.00	8.91	43.50	34.5	208	353	
Hori.	128.339	QP	22.19	13.52	8.16	31.82	0.00	12.05	43.50	31.4	278	22	
Hori.	156.698	QP	22.30	15.17	8.75	31.80	0.00	14.42	43.50	29.0	245	348	
Hori.	283.479	QP	22.18	12.84	6.32	31.69	0.00	9.65	46.00	36.3	123	344	
Hori.	429.628	QP	22.25	16.40	7.34	31.62	0.00	14.37	46.00	31.6	135	84	
Hori.	2483.500	PK	44.46	27.45	14.28	36.79	2.33	51.73	73.90	22.1	185	73	
Hori.	4950.000	PK	44.22	31.46	6.92	37.07	2.33	47.86	73.90	26.0	148	272	
Hori.	7425.000	PK	44.69	36.66	8.64	37.94	2.33	54.38	73.90	19.5	150	0	
Hori.	9900.000	PK	44.61	38.59	9.58	38.84	2.33	56.27	73.90	17.6	150	0	
Hori.	12375.000	PK	45.03	39.09	11.55	39.11	2.33	58.89	73.90	15.0	150	0	
Hori.	2483.500	AV	34.13	27.45	14.28	36.79	2.33	41.40	53.90	12.5	185	73	
Hori.	4950.000	AV	34.48	31.46	6.92	37.07	2.33	38.12	53.90	15.7	148	272	
Hori.	7425.000	AV	33.52	36.66	8.64	37.94	2.33	43.21	53.90	10.6	150	0	
Hori.	9900.000	AV	33.81	38.59	9.58	38.84	2.33	45.47	53.90	8.4	150	0	
Hori.	12375.000	AV	34.89	39.09	11.55	39.11	2.33	48.75	53.90	5.1	150	0	
Vert.	35.440	QP	28.51	15.94	6.94	31.90	0.00	19.49	40.00	20.5	100	352	
Vert.	59.984	QP	34.06	7.72	7.06	31.88	0.00	16.96	40.00	23.0	100	32	
Vert.	196.615	QP	25.29	16.30	8.88	31.77	0.00	18.70	43.50	24.8	100	66	
Vert.	460.000	QP	21.57	16.99	7.53	31.61	0.00	14.48	46.00	31.5	100	153	
Vert.	592.071	QP	21.33	18.99	8.19	31.58	0.00	16.93	46.00	29.0	100	15	
Vert.	2483.500	PK	50.22	27.45	14.28	36.79	2.33	57.49	73.90	16.4	140	174	
Vert.	4950.000	PK	45.10	31.46	6.92	37.07	2.33	48.74	73.90	25.1	153	2	
Vert.	7425.000	PK	44.44	36.66	8.64	37.94	2.33	54.13	73.90	19.7	150	0	
Vert.	9900.000	PK	44.61	38.59	9.58	38.84	2.33	56.27	73.90	17.6	150	0	
Vert.	12375.000	PK	45.39	39.09	11.55	39.11	2.33	59.25	73.90	14.6	150	0	
Vert.	2483.500	AV	41.98	27.45	14.28	36.79	2.33	49.25	53.90	4.6	140	174	
Vert.	4950.000	AV	35.72	31.46	6.92	37.07	2.33	39.36	53.90	14.5	153	2	
Vert.	7425.000	AV	33.56	36.66	8.64	37.94	2.33	43.25	53.90	10.6	150	0	
Vert.	9900.000	AV	34.43	38.59	9.58	38.84	2.33	46.09	53.90	7.8	150	0	
Vert.	12375.000	AV	34.68	39.09	11.55	39.11	2.33	48.54	53.90	5.3	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.92 m / 3.0 m) = 2.33 dB

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

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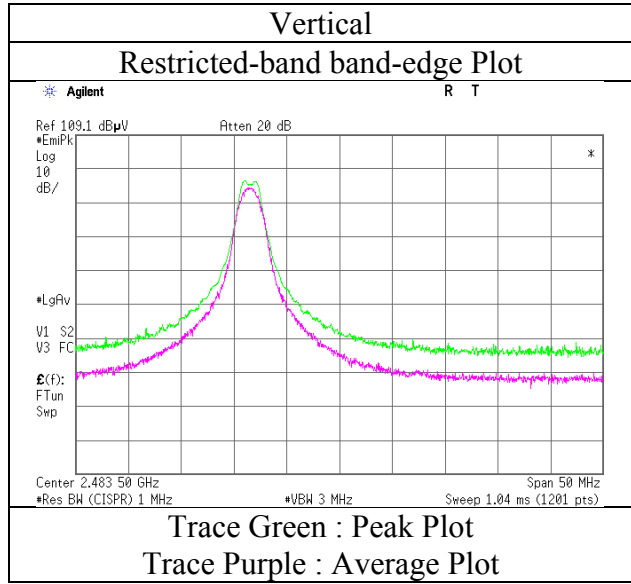
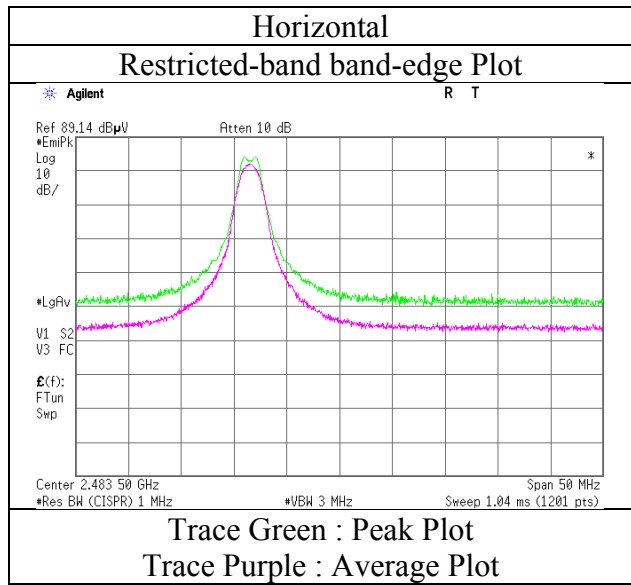
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Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	No.1 SAC
Date	December 18, 2017
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Takahiro Suzuki
	(1 GHz – 2.8 GHz)
Mode	Tx, 2475 MHz (Antenna: 2 dBi)



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

Radiated Spurious Emission

Test place	No.1 SAC	No.1 SAC	No.2 SAC
Date	December 18, 2017	December 19, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 41 %RH	22 deg.C, 37 %RH	23 deg.C, 38 %RH
Engineer	Takahiro Suzuki	Takahiro Suzuki	Takahiro Suzuki
	(1 GHz - 13 GHz)	(13 GHz - 18 GHz)	(30 MHz - 1000 MHz, 18 GHz - 26.5 GHz)
Mode	Tx, 2405 MHz	(Antenna: 9 dBi)	

(* 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.	106.941	QP	22.21	11.05	7.98	31.84	0.00	9.40	43.50	34.1	125	219	
Hori.	133.958	QP	22.32	13.91	8.29	31.82	0.00	12.70	43.50	30.8	205	355	
Hori.	153.550	QP	22.06	15.01	8.70	31.80	0.00	13.97	43.50	29.5	176	215	
Hori.	276.797	QP	22.25	12.62	6.27	31.69	0.00	9.45	46.00	36.5	131	3	
Hori.	447.858	QP	22.19	16.75	7.47	31.61	0.00	14.80	46.00	31.2	100	163	
Hori.	2390.000	PK	44.93	27.14	14.19	36.83	2.17	51.60	73.90	22.3	118	154	
Hori.	4810.000	PK	45.79	31.14	6.78	37.00	2.17	48.88	73.90	25.0	106	238	
Hori.	7215.000	PK	43.45	36.36	8.38	37.81	2.17	52.55	73.90	21.3	150	0	
Hori.	9620.000	PK	45.40	38.13	9.38	38.49	2.17	56.59	73.90	17.3	150	0	
Hori.	12025.000	PK	45.23	39.13	10.80	39.18	2.17	58.15	73.90	15.7	150	0	
Hori.	2390.000	AV	33.37	27.14	14.19	36.83	2.17	40.04	53.90	13.8	118	154	
Hori.	4810.000	AV	36.36	31.14	6.78	37.00	2.17	39.45	53.90	14.4	106	238	
Hori.	7215.000	AV	33.64	36.36	8.38	37.81	2.17	42.74	53.90	11.1	150	0	
Hori.	9620.000	AV	35.13	38.13	9.38	38.49	2.17	46.32	53.90	7.5	150	0	
Hori.	12025.000	AV	35.71	39.13	10.80	39.18	2.17	48.63	53.90	5.2	150	0	
Vert.	38.155	QP	28.18	14.99	7.01	31.90	0.00	18.28	40.00	21.7	100	210	
Vert.	47.863	QP	34.89	11.51	7.22	31.89	0.00	21.73	40.00	18.2	100	66	
Vert.	92.557	QP	29.37	8.60	8.15	31.86	0.00	14.26	43.50	29.2	100	235	
Vert.	174.188	QP	25.12	15.90	8.81	31.78	0.00	18.05	43.50	25.4	100	317	
Vert.	586.182	QP	21.26	18.92	8.16	31.59	0.00	16.75	46.00	29.2	100	91	
Vert.	2390.000	PK	47.72	27.14	14.19	36.83	2.17	54.39	73.90	19.5	136	136	
Vert.	4810.000	PK	46.12	31.14	6.78	37.00	2.17	49.21	73.90	24.6	152	353	
Vert.	7215.000	PK	44.20	36.36	8.38	37.81	2.17	53.30	73.90	20.6	150	0	
Vert.	9620.000	PK	45.59	38.13	9.38	38.49	2.17	56.78	73.90	17.1	150	0	
Vert.	12025.000	PK	43.18	39.13	10.80	39.18	2.17	56.10	73.90	17.8	150	0	
Vert.	2390.000	AV	42.56	27.14	14.19	36.83	2.17	49.23	53.90	4.6	136	136	
Vert.	4810.000	AV	38.15	31.14	6.78	37.00	2.17	41.24	53.90	12.6	152	353	
Vert.	7215.000	AV	33.21	36.36	8.38	37.81	2.17	42.31	53.90	11.5	150	0	
Vert.	9620.000	AV	34.87	38.13	9.38	38.49	2.17	46.06	53.90	7.8	150	0	
Vert.	12025.000	AV	34.62	39.13	10.80	39.18	2.17	47.54	53.90	6.3	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.85 m / 3.0 m) = 2.17 dB

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

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.	2405.000	PK	88.99	27.19	14.20	36.82	2.17	95.73	-	-	Carrier
Hori.	2400.000	PK	47.90	27.17	14.19	36.83	2.17	54.60	75.73	21.1	
Vert.	2405.000	PK	100.54	27.19	14.20	36.82	2.17	107.28	-	-	Carrier
Vert.	2400.000	PK	59.24	27.17	14.19	36.83	2.17	65.94	87.28	21.3	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.85 m / 3.0 m) = 2.17 dB

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

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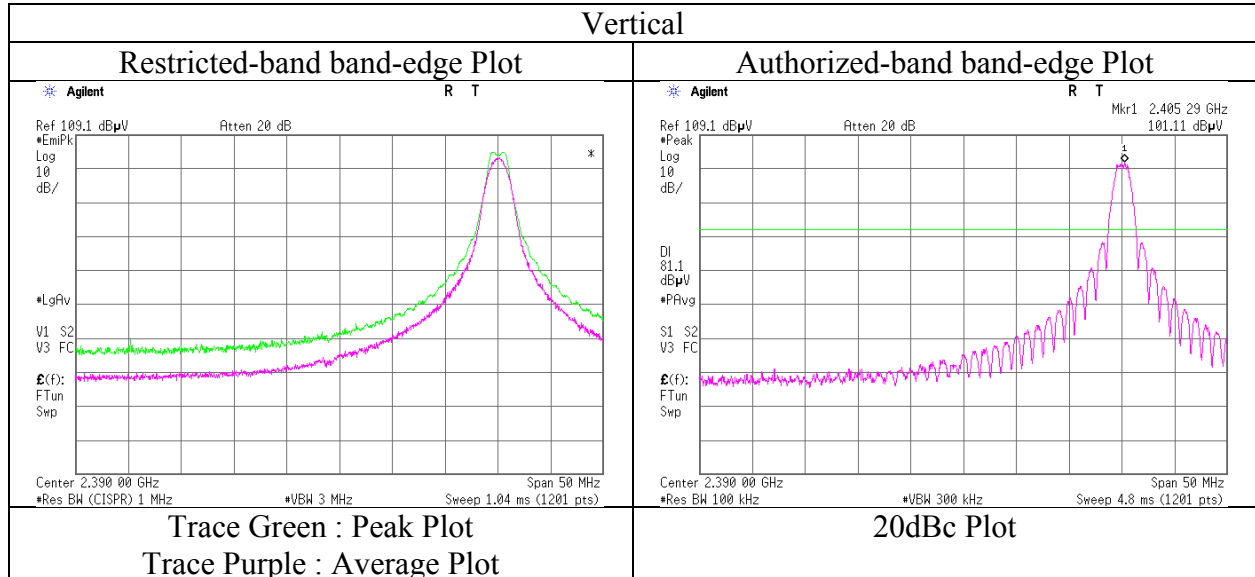
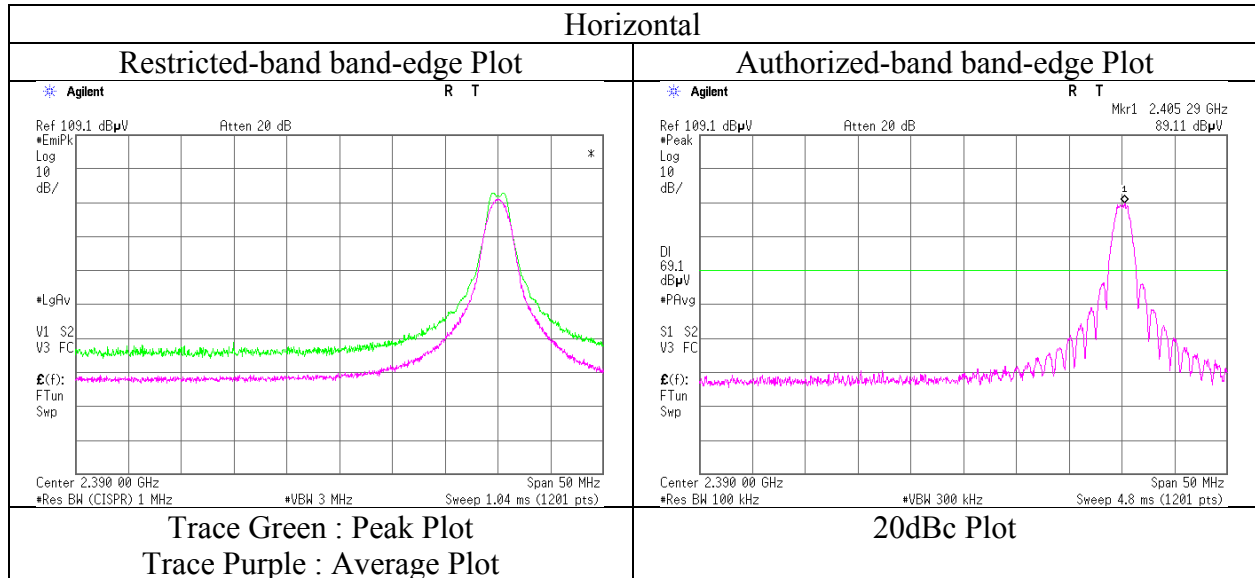
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Radiated Spurious Emission
(Reference Plot for band-edge)

Test place
Date
Temperature / Humidity
Engineer

Mode

No.1 SAC
December 18, 2017
22 deg. C / 41 % RH
Takahiro Suzuki
(1 GHz – 2.8 GHz)
Tx, 2405 MHz (Antenna: 9 dBi)



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

Radiated Spurious Emission

Test place	No.1 SAC	No.1 SAC	No.2 SAC
Date	December 18, 2017	December 19, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 41 %RH	22 deg.C, 37 %RH	23 deg.C, 38 %RH
Engineer	Takahiro Suzuki	Takahiro Suzuki	Takahiro Suzuki
	(1 GHz - 13 GHz)	(13 GHz - 18 GHz)	(30 MHz - 1000 MHz, 18 GHz - 26.5 GHz)
Mode	Tx, 2440 MHz	(Antenna: 9 dBi)	

(* 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.	107.862	QP	22.44	11.18	7.97	31.84	0.00	9.75	43.50	33.7	298	296	
Hori.	134.066	QP	22.15	13.92	8.29	31.82	0.00	12.54	43.50	30.9	142	219	
Hori.	152.385	QP	22.27	14.95	8.69	31.80	0.00	14.11	43.50	29.3	251	220	
Hori.	276.816	QP	22.51	12.62	6.27	31.69	0.00	9.71	46.00	36.2	100	356	
Hori.	453.848	QP	22.74	16.87	7.50	31.61	0.00	15.50	46.00	30.5	100	356	
Hori.	4880.000	PK	42.47	31.30	6.86	37.03	2.17	45.77	73.90	28.1	149	1	
Hori.	7320.000	PK	43.40	36.51	8.50	37.88	2.17	52.70	73.90	21.2	150	0	
Hori.	9760.000	PK	45.94	38.36	9.49	38.67	2.17	57.29	73.90	16.6	150	0	
Hori.	12200.000	PK	45.84	39.11	11.17	39.14	2.17	59.15	73.90	14.7	150	0	
Hori.	4880.000	AV	34.62	31.30	6.86	37.03	2.17	37.92	53.90	15.9	149	1	
Hori.	7320.000	AV	33.38	36.51	8.50	37.88	2.17	42.68	53.90	11.2	150	0	
Hori.	9760.000	AV	35.82	38.36	9.49	38.67	2.17	47.17	53.90	6.7	150	0	
Hori.	12200.000	AV	35.23	39.11	11.17	39.14	2.17	48.54	53.90	5.3	150	0	
Vert.	38.016	QP	28.63	15.04	7.00	31.90	0.00	18.77	40.00	21.2	100	210	
Vert.	47.802	QP	34.91	11.53	7.22	31.89	0.00	21.77	40.00	18.2	100	218	
Vert.	92.307	QP	29.16	8.55	8.15	31.86	0.00	14.00	43.50	29.5	100	198	
Vert.	174.849	QP	25.37	15.92	8.80	31.78	0.00	18.31	43.50	25.1	100	254	
Vert.	580.058	QP	21.53	18.83	8.13	31.60	0.00	16.89	46.00	29.1	100	3	
Vert.	4880.000	PK	46.54	31.30	6.86	37.03	2.17	49.84	73.90	24.0	147	9	
Vert.	7320.000	PK	45.05	36.51	8.50	37.88	2.17	54.35	73.90	19.5	150	0	
Vert.	9760.000	PK	44.91	38.36	9.49	38.67	2.17	56.26	73.90	17.6	150	0	
Vert.	12200.000	PK	46.36	39.11	11.17	39.14	2.17	59.67	73.90	14.2	150	0	
Vert.	4880.000	AV	36.72	31.30	6.86	37.03	2.17	40.02	53.90	13.8	147	9	
Vert.	7320.000	AV	33.61	36.51	8.50	37.88	2.17	42.91	53.90	10.9	150	0	
Vert.	9760.000	AV	35.13	38.36	9.49	38.67	2.17	46.48	53.90	7.4	150	0	
Vert.	12200.000	AV	34.91	39.11	11.17	39.14	2.17	48.22	53.90	5.6	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.85 m / 3.0 m) = 2.17 dB

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

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Radiated Spurious Emission

Test place	No.1 SAC	No.1 SAC	No.2 SAC
Date	December 18, 2017	December 19, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 41 %RH	22 deg.C, 37 %RH	23 deg.C, 38 %RH
Engineer	Takahiro Suzuki	Takahiro Suzuki	Takahiro Suzuki
	(1 GHz - 13 GHz)	(13 GHz - 18 GHz)	(30 MHz - 1000 MHz, 18 GHz - 26.5 GHz)
Mode	Tx, 2470 MHz	(Antenna: 9 dBi)	

(* 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.	116.405	QP	22.01	12.41	7.98	31.83	0.00	10.57	43.50	32.9	162	1	
Hori.	141.562	QP	22.25	14.42	8.48	31.81	0.00	13.34	43.50	30.1	123	245	
Hori.	156.457	QP	22.41	15.15	8.74	31.80	0.00	14.50	43.50	29.0	174	222	
Hori.	282.699	QP	22.37	12.82	6.32	31.69	0.00	9.82	46.00	36.1	136	267	
Hori.	448.381	QP	22.26	16.76	7.47	31.61	0.00	14.88	46.00	31.1	100	49	
Hori.	2483.500	PK	48.36	27.45	14.28	36.79	2.17	55.47	73.90	18.4	152	200	
Hori.	4940.000	PK	46.05	31.44	6.91	37.06	2.17	49.51	73.90	24.3	155	11	
Hori.	7410.000	PK	45.81	36.63	8.62	37.93	2.17	55.30	73.90	18.6	150	0	
Hori.	9880.000	PK	43.97	38.56	9.57	38.82	2.17	55.45	73.90	18.4	150	0	
Hori.	12350.000	PK	43.12	39.09	11.49	39.11	2.17	56.76	73.90	17.1	150	0	
Hori.	2483.500	AV	38.06	27.45	14.28	36.79	2.17	45.17	53.90	8.7	152	200	
Hori.	4940.000	AV	37.07	31.44	6.91	37.06	2.17	40.53	53.90	13.3	155	11	
Hori.	7410.000	AV	33.75	36.63	8.62	37.93	2.17	43.24	53.90	10.6	150	0	
Hori.	9880.000	AV	34.52	38.56	9.57	38.82	2.17	46.00	53.90	7.9	150	0	
Hori.	12350.000	AV	34.61	39.09	11.49	39.11	2.17	48.25	53.90	5.6	150	0	
Vert.	36.347	QP	28.09	15.62	6.96	31.90	0.00	18.77	40.00	21.2	100	237	
Vert.	47.965	QP	34.72	11.47	7.22	31.89	0.00	21.52	40.00	18.4	100	66	
Vert.	94.389	QP	29.54	8.96	8.13	31.85	0.00	14.78	43.50	28.7	100	216	
Vert.	178.897	QP	25.06	16.09	8.80	31.78	0.00	18.17	43.50	25.3	100	288	
Vert.	588.830	QP	21.38	18.95	8.17	31.59	0.00	16.91	46.00	29.0	100	271	
Vert.	2483.500	PK	51.26	27.45	14.28	36.79	2.17	58.37	73.90	15.5	145	131	
Vert.	4940.000	PK	46.82	31.44	6.91	37.06	2.17	50.28	73.90	23.6	144	2	
Vert.	7410.000	PK	44.45	36.63	8.62	37.93	2.17	53.94	73.90	19.9	150	0	
Vert.	9880.000	PK	45.31	38.56	9.57	38.82	2.17	56.79	73.90	17.1	150	0	
Vert.	12350.000	PK	45.18	39.09	11.49	39.11	2.17	58.82	73.90	15.0	150	0	
Vert.	2483.500	AV	42.04	27.45	14.28	36.79	2.17	49.15	53.90	4.7	145	131	
Vert.	4940.000	AV	35.23	31.44	6.91	37.06	2.17	38.69	53.90	15.2	144	2	
Vert.	7410.000	AV	33.87	36.63	8.62	37.93	2.17	43.36	53.90	10.5	150	0	
Vert.	9880.000	AV	33.26	38.56	9.57	38.82	2.17	44.74	53.90	9.1	150	0	
Vert.	12350.000	AV	34.79	39.09	11.49	39.11	2.17	48.43	53.90	5.4	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.85 m / 3.0 m) = 2.17 dB

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

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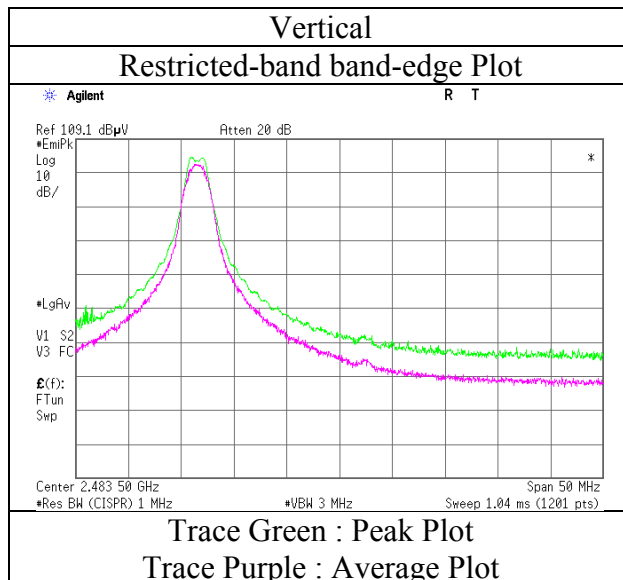
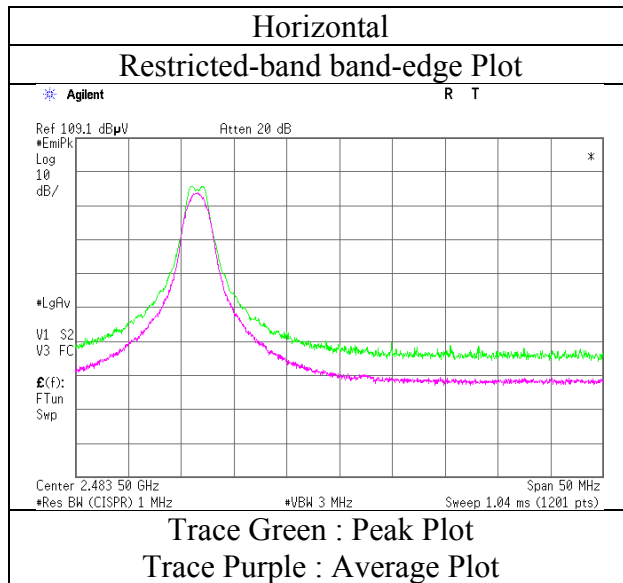
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Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	No.1 SAC
Date	December 18, 2017
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Takahiro Suzuki
	(1 GHz – 2.8 GHz)
Mode	Tx, 2470 MHz (Antenna: 9 dBi)



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

Radiated Spurious Emission

Test place	No.1 SAC	No.1 SAC	No.2 SAC
Date	December 18, 2017	December 19, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 41 %RH	22 deg.C, 37 %RH	23 deg.C, 38 %RH
Engineer	Takahiro Suzuki	Takahiro Suzuki	Takahiro Suzuki
	(1 GHz - 13 GHz)	(13 GHz - 18 GHz)	(30 MHz - 1000 MHz, 18 GHz - 26.5 GHz)
Mode	Tx, 2475 MHz	(Antenna: 9 dBi)	

(* 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.	105.999	QP	22.12	10.91	7.98	31.84	0.00	9.17	43.50	34.3	218	92	
Hori.	130.297	QP	22.09	13.66	8.20	31.82	0.00	12.13	43.50	31.3	137	72	
Hori.	152.873	QP	22.36	14.98	8.70	31.80	0.00	14.24	43.50	29.2	109	207	
Hori.	280.802	QP	22.29	12.75	6.30	31.69	0.00	9.65	46.00	36.3	117	277	
Hori.	457.449	QP	22.28	16.94	7.52	31.61	0.00	15.13	46.00	30.8	100	81	
Hori.	2483.500	PK	44.41	27.45	14.28	36.79	2.17	51.52	73.90	22.3	149	203	
Hori.	4950.000	PK	43.85	31.46	6.92	37.07	2.17	47.33	73.90	26.5	148	302	
Hori.	7425.000	PK	44.69	36.66	8.64	37.94	2.17	54.22	73.90	19.6	150	0	
Hori.	9900.000	PK	44.72	38.59	9.58	38.84	2.17	56.22	73.90	17.6	150	0	
Hori.	12375.000	PK	43.58	39.09	11.55	39.11	2.17	57.28	73.90	16.6	150	0	
Hori.	2483.500	AV	34.73	27.45	14.28	36.79	2.17	41.84	53.90	12.0	149	203	
Hori.	4950.000	AV	34.32	31.46	6.92	37.07	2.17	37.80	53.90	16.1	148	302	
Hori.	7425.000	AV	33.54	36.66	8.64	37.94	2.17	43.07	53.90	10.8	150	0	
Hori.	9900.000	AV	35.47	38.59	9.58	38.84	2.17	46.97	53.90	6.9	150	0	
Hori.	12375.000	AV	35.16	39.09	11.55	39.11	2.17	48.86	53.90	5.0	150	0	
Vert.	36.818	QP	28.35	15.46	6.97	31.90	0.00	18.88	40.00	21.1	100	75	
Vert.	47.185	QP	34.73	11.75	7.22	31.89	0.00	21.81	40.00	18.1	100	8	
Vert.	92.901	QP	29.51	8.67	8.14	31.86	0.00	14.46	43.50	29.0	100	52	
Vert.	164.279	QP	25.27	15.50	8.79	31.79	0.00	17.77	43.50	25.7	100	306	
Vert.	571.166	QP	21.34	18.72	8.09	31.61	0.00	16.54	46.00	29.4	100	216	
Vert.	2483.500	PK	48.51	27.45	14.28	36.79	2.17	55.62	73.90	18.2	141	125	
Vert.	4950.000	PK	44.59	31.46	6.92	37.07	2.17	48.07	73.90	25.8	133	344	
Vert.	7425.000	PK	43.89	36.66	8.64	37.94	2.17	53.42	73.90	20.4	150	0	
Vert.	9900.000	PK	44.48	38.59	9.58	38.84	2.17	55.98	73.90	17.9	150	0	
Vert.	12375.000	PK	45.33	39.09	11.55	39.11	2.17	59.03	73.90	14.8	150	0	
Vert.	2483.500	AV	42.54	27.45	14.28	36.79	2.17	49.65	53.90	4.2	141	125	
Vert.	4950.000	AV	35.75	31.46	6.92	37.07	2.17	39.23	53.90	14.6	133	344	
Vert.	7425.000	AV	34.00	36.66	8.64	37.94	2.17	43.53	53.90	10.3	150	0	
Vert.	9900.000	AV	34.46	38.59	9.58	38.84	2.17	45.96	53.90	7.9	150	0	
Vert.	12375.000	AV	34.87	39.09	11.55	39.11	2.17	48.57	53.90	5.3	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.85 m / 3.0 m) = 2.17 dB

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

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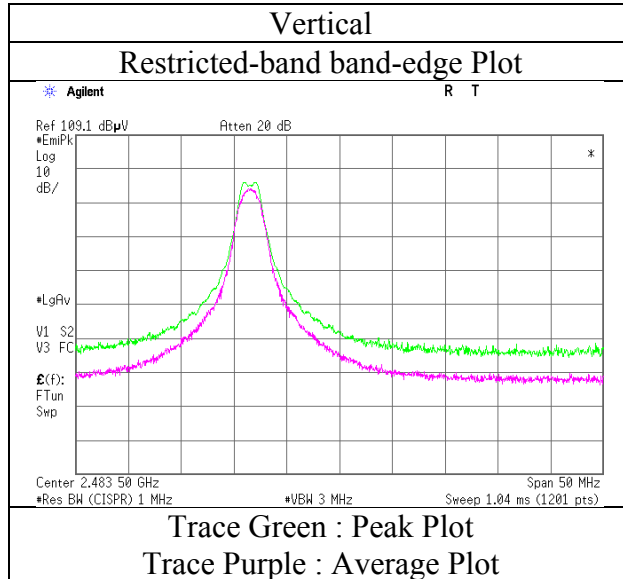
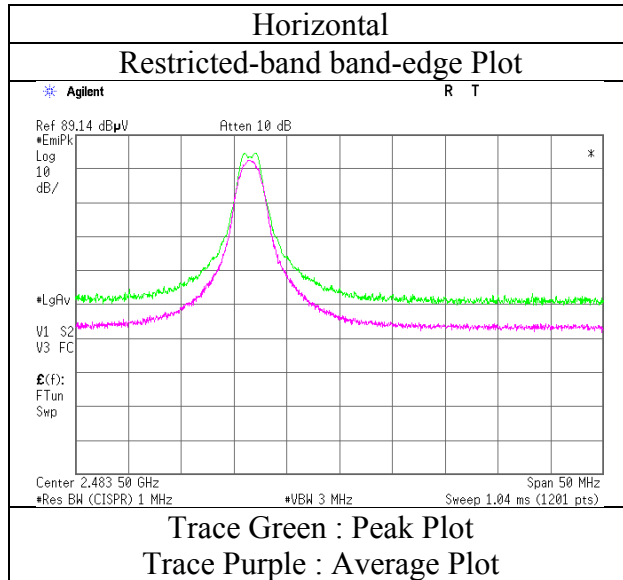
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Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	No.1 SAC
Date	December 18, 2017
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Takahiro Suzuki
	(1 GHz – 2.8 GHz)
Mode	Tx, 2475 MHz (Antenna: 9 dBi)



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

Radiated Spurious Emission

Test place	No.1 SAC	No.2 SAC
Date	December 19, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 37 %RH	23 deg.C, 38 %RH
Engineer	Takahiro Suzuki	Takahiro Suzuki
	(1 GHz - 18 GHz)	(30 MHz - 1000 MHz, 18 GHz - 26.5 GHz)
Mode	Tx, 2405 MHz	(Antenna: 15 dBi)

(* 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.	110.079	QP	22.18	11.50	7.96	31.84	0.00	9.80	43.50	33.7	275	3	
Hori.	130.863	QP	22.31	13.70	8.21	31.82	0.00	12.40	43.50	31.1	156	325	
Hori.	157.089	QP	22.25	15.19	8.75	31.80	0.00	14.39	43.50	29.1	282	92	
Hori.	285.435	QP	22.41	12.91	6.34	31.68	0.00	9.98	46.00	36.0	100	268	
Hori.	429.352	QP	22.17	16.39	7.34	31.62	0.00	14.28	46.00	31.7	100	357	
Hori.	2390.000	PK	41.49	27.14	14.19	36.83	2.10	48.09	73.90	25.8	152	315	
Hori.	4810.000	PK	49.06	31.14	6.78	37.00	2.10	52.08	73.90	21.8	189	351	
Hori.	7215.000	PK	40.67	36.36	8.38	37.81	2.10	49.70	73.90	24.2	150	0	
Hori.	9620.000	PK	42.52	38.13	9.38	38.49	2.10	53.64	73.90	20.2	150	0	
Hori.	12025.000	PK	43.04	39.13	10.80	39.18	2.10	55.89	73.90	18.0	150	0	
Hori.	2390.000	AV	32.78	27.14	14.19	36.83	2.10	39.38	53.90	14.5	152	315	
Hori.	4810.000	AV	43.07	31.14	6.78	37.00	2.10	46.09	53.90	7.8	189	351	
Hori.	7215.000	AV	33.78	36.36	8.38	37.81	2.10	42.81	53.90	11.0	150	0	
Hori.	9620.000	AV	34.35	38.13	9.38	38.49	2.10	45.47	53.90	8.4	150	0	
Hori.	12025.000	AV	34.29	39.13	10.80	39.18	2.10	47.14	53.90	6.7	150	0	
Vert.	36.351	QP	28.38	15.62	6.96	31.90	0.00	19.06	40.00	20.9	100	18	
Vert.	45.649	QP	34.98	12.31	7.19	31.89	0.00	22.59	40.00	17.4	100	110	
Vert.	196.856	QP	25.16	16.31	8.88	31.77	0.00	18.58	43.50	24.9	100	330	
Vert.	457.955	QP	21.37	16.95	7.52	31.61	0.00	14.23	46.00	31.7	100	40	
Vert.	574.380	QP	21.29	18.76	8.10	31.60	0.00	16.55	46.00	29.4	100	356	
Vert.	2390.000	PK	53.76	27.14	14.19	36.83	2.10	60.36	73.90	13.5	169	1	
Vert.	4810.000	PK	53.71	31.14	6.78	37.00	2.10	56.73	73.90	17.1	161	39	
Vert.	7215.000	PK	44.04	36.36	8.38	37.81	2.10	53.07	73.90	20.8	150	0	
Vert.	9620.000	PK	43.37	38.13	9.38	38.49	2.10	54.49	73.90	19.4	150	0	
Vert.	12025.000	PK	43.31	39.13	10.80	39.18	2.10	56.16	73.90	17.7	150	0	
Vert.	2390.000	AV	46.76	27.14	14.19	36.83	2.10	53.36	53.90	0.5	169	1	
Vert.	4810.000	AV	47.56	31.14	6.78	37.00	2.10	50.58	53.90	3.3	161	39	
Vert.	7215.000	AV	33.41	36.36	8.38	37.81	2.10	42.44	53.90	11.4	150	0	
Vert.	9620.000	AV	34.03	38.13	9.38	38.49	2.10	45.15	53.90	8.7	150	0	
Vert.	12025.000	AV	34.66	39.13	10.80	39.18	2.10	47.51	53.90	6.3	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.82 m / 3.0 m) = 2.10 dB

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

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.	2405.000	PK	86.07	27.19	14.20	36.82	2.10	92.74	-	-	Carrier
Hori.	2400.000	PK	51.23	27.17	14.19	36.83	2.10	57.86	72.74	14.9	
Vert.	2405.000	PK	105.76	27.19	14.20	36.82	2.10	112.43	-	-	Carrier
Vert.	2400.426	PK	64.95	27.18	14.19	36.83	2.10	71.59	92.43	20.8	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.82 m / 3.0 m) = 2.10 dB

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

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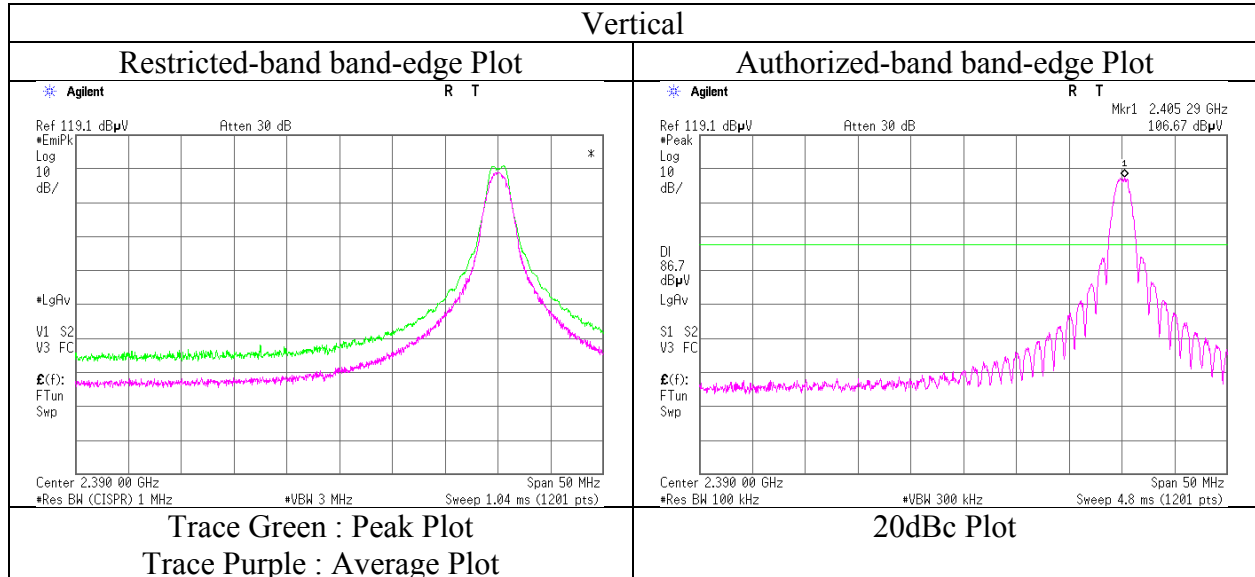
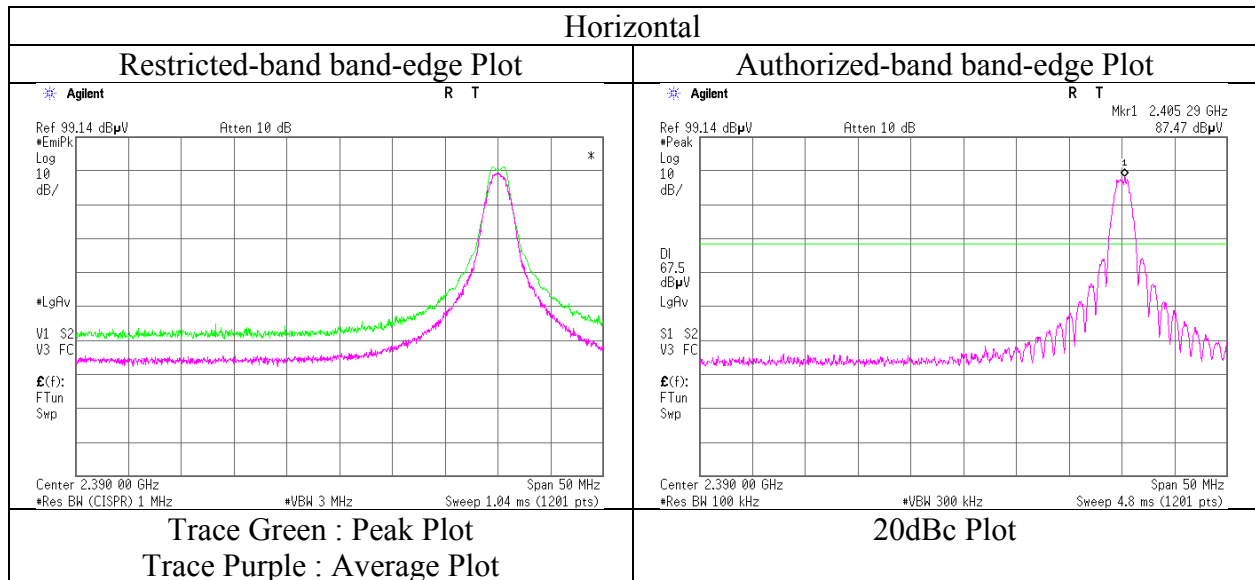
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Radiated Spurious Emission
(Reference Plot for band-edge)

Test place
Date
Temperature / Humidity
Engineer
Mode

No.1 SAC
December 19, 2017
22 deg. C / 37 % RH
Takahiro Suzuki
(1 GHz – 2.8 GHz)
Tx, 2405 MHz (Antenna: 15 dBi)



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

Radiated Spurious Emission

Test place	No.1 SAC	No.2 SAC
Date	December 19, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 37 %RH	23 deg.C, 38 %RH
Engineer	Takahiro Suzuki	Takahiro Suzuki
	(1 GHz - 18 GHz)	(30 MHz - 1000 MHz, 18 GHz - 26.5 GHz)
Mode	Tx, 2440 MHz	(Antenna: 15 dBi)

(* 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.	109.107	QP	22.19	11.36	7.96	31.84	0.00	9.67	43.50	33.8	209	358	
Hori.	137.788	QP	22.52	14.18	8.38	31.81	0.00	13.27	43.50	30.2	264	206	
Hori.	164.031	QP	22.24	15.49	8.79	31.79	0.00	14.73	43.50	28.7	142	359	
Hori.	285.745	QP	22.31	12.92	6.34	31.68	0.00	9.89	46.00	36.1	100	236	
Hori.	426.545	QP	22.36	16.34	7.32	31.62	0.00	14.40	46.00	31.6	132	349	
Hori.	4880.000	PK	46.63	31.30	6.86	37.03	2.10	49.86	73.90	24.0	157	322	
Hori.	7320.000	PK	43.47	36.51	8.50	37.88	2.10	52.70	73.90	21.2	150	0	
Hori.	9760.000	PK	45.85	38.36	9.49	38.67	2.10	57.13	73.90	16.7	150	0	
Hori.	12200.000	PK	45.79	39.11	11.17	39.14	2.10	59.03	73.90	14.8	150	0	
Hori.	4880.000	AV	39.58	31.30	6.86	37.03	2.10	42.81	53.90	11.0	157	322	
Hori.	7320.000	AV	33.41	36.51	8.50	37.88	2.10	42.64	53.90	11.2	150	0	
Hori.	9760.000	AV	35.68	38.36	9.49	38.67	2.10	46.96	53.90	6.9	150	0	
Hori.	12200.000	AV	35.08	39.11	11.17	39.14	2.10	48.32	53.90	5.5	150	0	
Vert.	36.506	QP	28.27	15.57	6.97	31.90	0.00	18.91	40.00	21.0	100	312	
Vert.	45.751	QP	33.98	12.27	7.19	31.89	0.00	21.55	40.00	18.4	100	110	
Vert.	198.827	QP	25.06	16.33	8.89	31.77	0.00	18.51	43.50	24.9	100	292	
Vert.	458.548	QP	21.43	16.96	7.52	31.61	0.00	14.30	46.00	31.7	100	1	
Vert.	597.570	QP	21.27	19.07	8.22	31.57	0.00	16.99	46.00	29.0	100	65	
Vert.	4880.000	PK	46.75	31.30	6.86	37.03	2.10	49.98	73.90	23.9	147	324	
Vert.	7320.000	PK	44.96	36.51	8.50	37.88	2.10	54.19	73.90	19.7	150	0	
Vert.	9760.000	PK	45.00	38.36	9.49	38.67	2.10	56.28	73.90	17.6	150	0	
Vert.	12200.000	PK	46.21	39.11	11.17	39.14	2.10	59.45	73.90	14.4	150	0	
Vert.	4880.000	AV	39.17	31.30	6.86	37.03	2.10	42.40	53.90	11.5	147	324	
Vert.	7320.000	AV	33.55	36.51	8.50	37.88	2.10	42.78	53.90	11.1	150	0	
Vert.	9760.000	AV	35.24	38.36	9.49	38.67	2.10	46.52	53.90	7.3	150	0	
Vert.	12200.000	AV	34.68	39.11	11.17	39.14	2.10	47.92	53.90	5.9	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.82 m / 3.0 m) = 2.10 dB

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

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Radiated Spurious Emission

Test place	No.1 SAC	No.2 SAC
Date	December 19, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 37 %RH	23 deg.C, 38 %RH
Engineer	Takahiro Suzuki	Takahiro Suzuki
	(1 GHz - 18 GHz)	(30 MHz - 1000 MHz, 18 GHz - 26.5 GHz)
Mode	Tx, 2470 MHz	(Antenna: 15 dBi)

(* 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.	108.933	QP	22.24	11.34	7.97	31.84	0.00	9.71	43.50	33.7	276	107	
Hori.	137.878	QP	22.36	14.19	8.39	31.81	0.00	13.13	43.50	30.3	198	206	
Hori.	163.759	QP	22.18	15.48	8.78	31.79	0.00	14.65	43.50	28.8	216	65	
Hori.	289.155	QP	22.04	13.03	6.37	31.68	0.00	9.76	46.00	36.2	100	84	
Hori.	449.384	QP	22.19	16.78	7.48	31.61	0.00	14.84	46.00	31.1	100	182	
Hori.	2483.500	PK	41.77	27.45	14.28	36.79	2.10	48.81	73.90	25.0	139	313	
Hori.	4940.000	PK	48.25	31.44	6.91	37.06	2.10	51.64	73.90	22.2	158	40	
Hori.	7410.000	PK	45.90	36.63	8.62	37.93	2.10	55.32	73.90	18.5	150	0	
Hori.	9880.000	PK	43.58	38.56	9.57	38.82	2.10	54.99	73.90	18.9	150	0	
Hori.	12350.000	PK	43.09	39.09	11.49	39.11	2.10	56.66	73.90	17.2	150	0	
Hori.	2483.500	AV	33.62	27.45	14.28	36.79	2.10	40.66	53.90	13.2	139	313	
Hori.	4940.000	AV	41.11	31.44	6.91	37.06	2.10	44.50	53.90	9.4	158	40	
Hori.	7410.000	AV	33.82	36.63	8.62	37.93	2.10	43.24	53.90	10.6	150	0	
Hori.	9880.000	AV	34.36	38.56	9.57	38.82	2.10	45.77	53.90	8.1	150	0	
Hori.	12350.000	AV	34.48	39.09	11.49	39.11	2.10	48.05	53.90	5.8	150	0	
Vert.	36.135	QP	28.35	15.70	6.96	31.90	0.00	19.11	40.00	20.8	100	212	
Vert.	45.511	QP	34.29	12.36	7.19	31.89	0.00	21.95	40.00	18.0	100	174	
Vert.	198.518	QP	25.18	16.32	8.89	31.77	0.00	18.62	43.50	24.8	100	298	
Vert.	428.077	QP	25.23	16.37	7.33	31.62	0.00	17.31	46.00	28.6	100	296	
Vert.	591.565	QP	21.27	18.99	8.19	31.58	0.00	16.87	46.00	29.1	100	273	
Vert.	2483.500	PK	55.99	27.45	14.28	36.79	2.10	63.03	73.90	10.8	157	2	
Vert.	4940.000	PK	45.14	31.44	6.91	37.06	2.10	48.53	73.90	25.3	132	341	
Vert.	7410.000	PK	44.63	36.63	8.62	37.93	2.10	54.05	73.90	19.8	150	0	
Vert.	9880.000	PK	45.48	38.56	9.57	38.82	2.10	56.89	73.90	17.0	150	0	
Vert.	12350.000	PK	45.24	39.09	11.49	39.11	2.10	58.81	73.90	15.0	150	0	
Vert.	2483.500	AV	46.74	27.45	14.28	36.79	2.10	53.78	53.90	0.1	157	2	
Vert.	4940.000	AV	37.16	31.44	6.91	37.06	2.10	40.55	53.90	13.3	132	341	
Vert.	7410.000	AV	33.94	36.63	8.62	37.93	2.10	43.36	53.90	10.5	150	0	
Vert.	9880.000	AV	33.32	38.56	9.57	38.82	2.10	44.73	53.90	9.1	150	0	
Vert.	12350.000	AV	34.62	39.09	11.49	39.11	2.10	48.19	53.90	5.7	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.82 m / 3.0 m) = 2.10 dB

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

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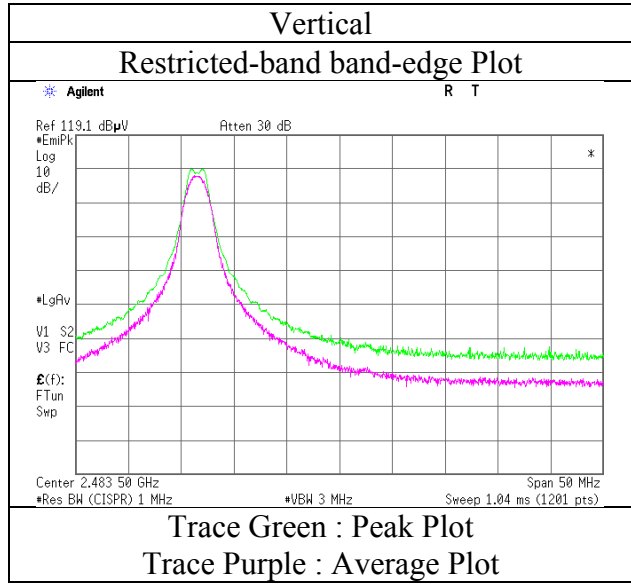
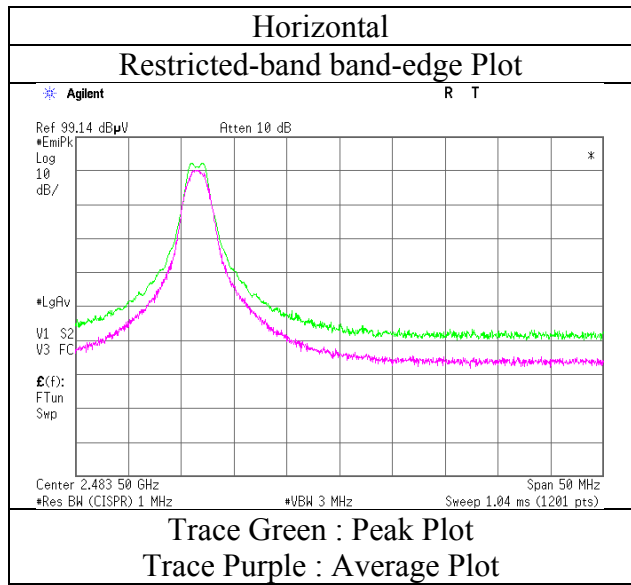
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Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	No.1 SAC
Date	December 19, 2017
Temperature / Humidity	22 deg. C / 37 % RH
Engineer	Takahiro Suzuki
	(1 GHz – 2.8 GHz)
Mode	Tx, 2470 MHz (Antenna: 15 dBi)



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

Radiated Spurious Emission

Test place	No.1 SAC	No.1 SAC	No.2 SAC
Date	December 18, 2017	December 19, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 41 %RH	22 deg.C, 37 %RH	23 deg.C, 38 %RH
Engineer	Takahiro Suzuki	Takahiro Suzuki	Takahiro Suzuki
	(1 GHz - 13 GHz)	(13 GHz - 18 GHz)	(30 MHz - 1000 MHz, 18 GHz - 26.5 GHz)
Mode	Tx, 2475 MHz	(Antenna: 15 dBi)	

(* 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.	104.290	QP	22.50	10.67	8.00	31.85	0.00	9.32	43.50	34.1	213	165	
Hori.	132.407	QP	22.23	13.80	8.25	31.82	0.00	12.46	43.50	31.0	145	353	
Hori.	156.482	QP	22.06	15.16	8.74	31.80	0.00	14.16	43.50	29.3	276	135	
Hori.	279.308	QP	22.19	12.70	6.29	31.69	0.00	9.49	46.00	36.5	100	352	
Hori.	437.730	QP	22.17	16.56	7.40	31.61	0.00	14.52	46.00	31.4	100	139	
Hori.	2483.500	PK	42.76	27.45	14.28	36.79	2.10	49.80	73.90	24.1	128	314	
Hori.	4950.000	PK	50.13	31.46	6.92	37.07	2.10	53.54	73.90	20.3	178	315	
Hori.	7425.000	PK	44.52	36.66	8.64	37.94	2.10	53.98	73.90	19.9	150	0	
Hori.	9900.000	PK	44.66	38.59	9.58	38.84	2.10	56.09	73.90	17.8	150	0	
Hori.	12375.000	PK	46.40	39.09	11.55	39.11	2.10	60.03	73.90	13.8	150	0	
Hori.	2483.500	AV	32.56	27.45	14.28	36.79	2.10	39.60	53.90	14.3	128	314	
Hori.	4950.000	AV	42.99	31.46	6.92	37.07	2.10	46.40	53.90	7.5	178	315	
Hori.	7425.000	AV	34.02	36.66	8.64	37.94	2.10	43.48	53.90	10.4	150	0	
Hori.	9900.000	AV	34.78	38.59	9.58	38.84	2.10	46.21	53.90	7.6	150	0	
Hori.	12375.000	AV	35.16	39.09	11.55	39.11	2.10	48.79	53.90	5.1	150	0	
Vert.	35.935	QP	28.46	15.76	6.96	31.90	0.00	19.28	40.00	20.7	100	14	
Vert.	45.960	QP	34.35	12.19	7.20	31.89	0.00	21.85	40.00	18.1	100	18	
Vert.	197.311	QP	25.61	16.31	8.88	31.77	0.00	19.03	43.50	24.4	100	1	
Vert.	463.063	QP	21.38	17.05	7.54	31.61	0.00	14.36	46.00	31.6	100	113	
Vert.	587.481	QP	21.27	18.93	8.17	31.59	0.00	16.78	46.00	29.2	100	68	
Vert.	2483.500	PK	50.66	27.45	14.28	36.79	2.10	57.70	73.90	16.2	168	0	
Vert.	4950.000	PK	47.73	31.46	6.92	37.07	2.10	51.14	73.90	22.7	149	316	
Vert.	7425.000	PK	44.81	36.66	8.64	37.94	2.10	54.27	73.90	19.6	150	0	
Vert.	9900.000	PK	43.83	38.59	9.58	38.84	2.10	55.26	73.90	18.6	150	0	
Vert.	12375.000	PK	44.97	39.09	11.55	39.11	2.10	58.60	73.90	15.3	150	0	
Vert.	2483.500	AV	41.32	27.45	14.28	36.79	2.10	48.36	53.90	5.5	168	0	
Vert.	4950.000	AV	40.03	31.46	6.92	37.07	2.10	43.44	53.90	10.4	149	316	
Vert.	7425.000	AV	34.72	36.66	8.64	37.94	2.10	44.18	53.90	9.7	150	0	
Vert.	9900.000	AV	34.96	38.59	9.58	38.84	2.10	46.39	53.90	7.5	150	0	
Vert.	12375.000	AV	35.23	39.09	11.55	39.11	2.10	48.86	53.90	5.0	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.82 m / 3.0 m) = 2.10 dB

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

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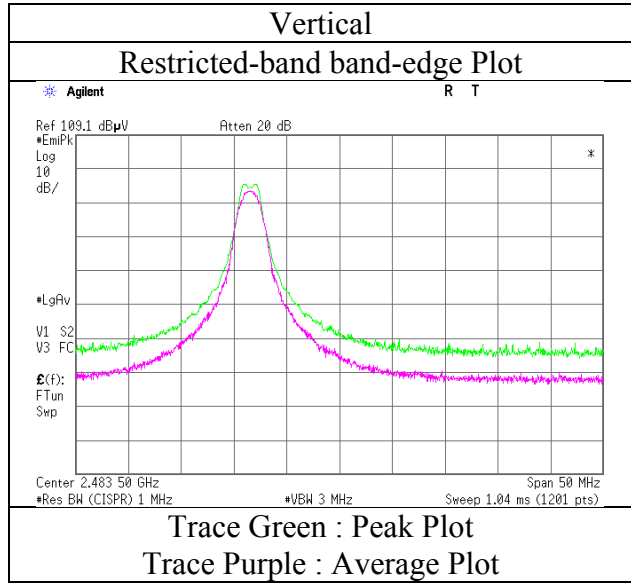
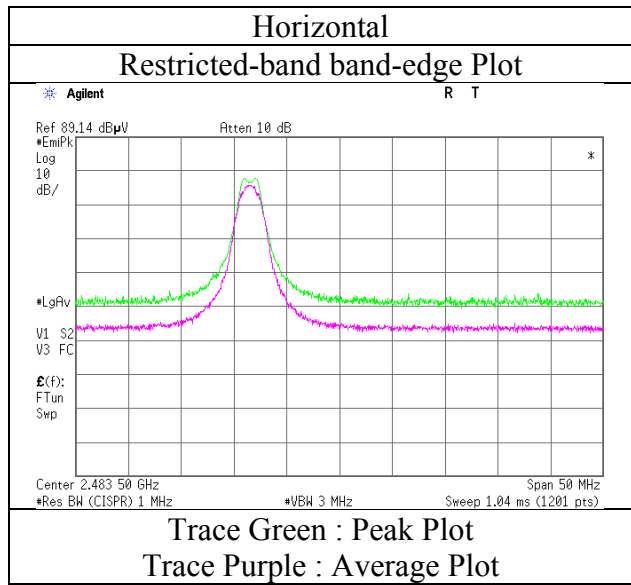
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Radiated Spurious Emission
(Reference Plot for band-edge)

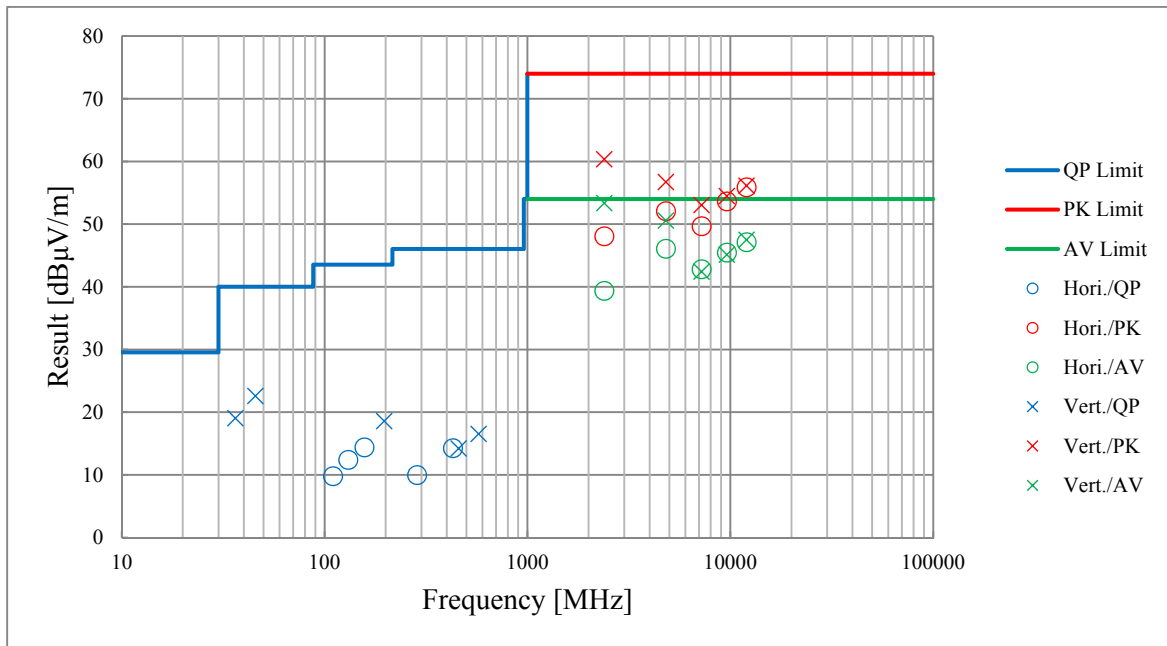
Test place	No.1 SAC
Date	December 18, 2017
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Takahiro Suzuki
	(1 GHz – 2.8 GHz)
Mode	Tx, 2475 MHz (Antenna: 15 dBi)



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

Radiated Spurious Emission
(Plot data, Worst case)

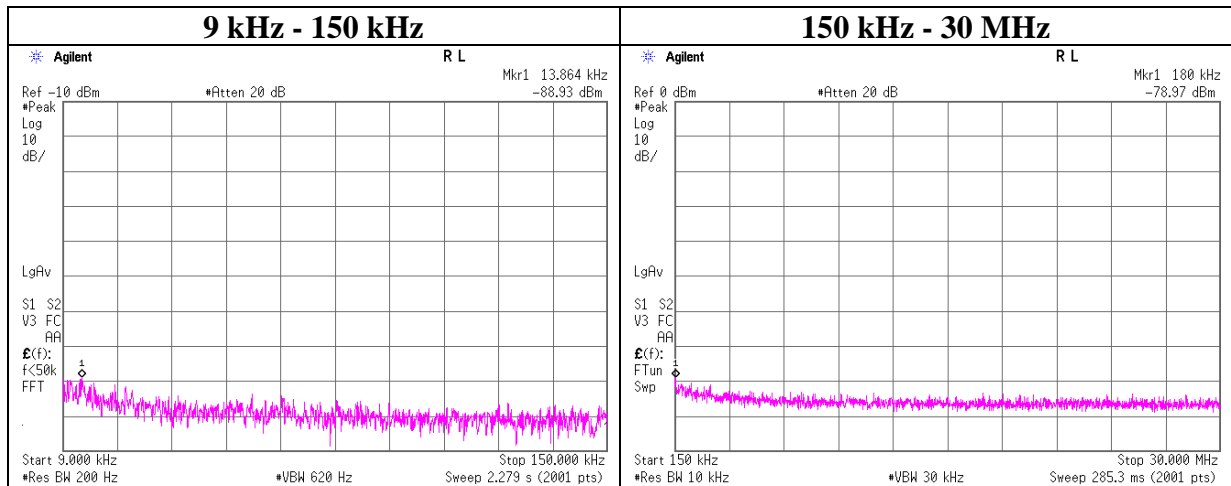
Test place	No.1 SAC	No.2 SAC
Date	December 19, 2017	December 25, 2017
Temperature / Humidity	22 deg.C, 37 %RH	23 deg.C, 38 %RH
Engineer	Takahiro Suzuki	Takahiro Suzuki
	(1 GHz - 18 GHz)	(30 MHz - 1000 MHz, 18 GHz - 26.5 GHz)
Mode	Tx, 2405 MHz	(Antenna: 15 dBi)



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

Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11980055S-A-R2
Date	April 9, 2018
Temperature / Humidity	22 deg. C / 31 % RH
Engineer	Kazuya Noda
Mode	Tx ISA100.11a 2405 MHz
Power setting	High power setting 15 dBi antenna



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
13.86	-88.9	0.01	9.8	15.0	1	-64.1	300	6.0	-2.9	44.7	47.6	
180.00	-79.0	0.01	9.8	15.0	1	-54.2	300	6.0	7.1	22.4	15.3	

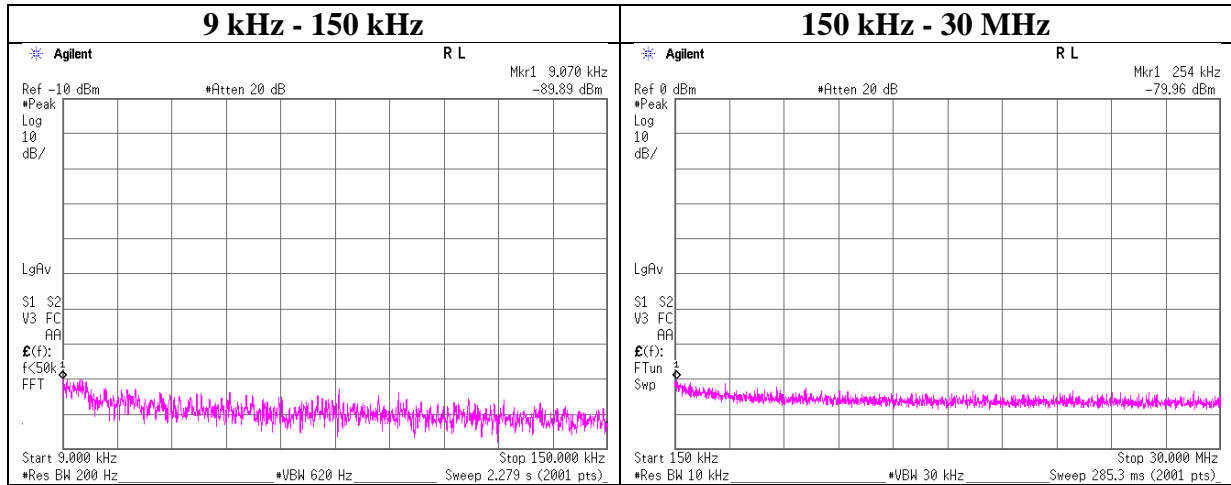
$E \text{ [dBuV/m]} = \text{EIRP [dBm]} - 20 \log(\text{Distance [m]}) + \text{Ground bounce [dB]} + 104.8 \text{ [dBuV/m]}$

$\text{EIRP[dBm]} = \text{Reading [dBm]} + \text{Cable loss [dB]} + \text{Attenuator Loss [dB]} + \text{Antenna gain [dBi]} + 10 * \log(N)$

N: Number of output

Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11980055S-A-R2
Date : April 9, 2018
Temperature / Humidity : 22 deg. C / 31 % RH
Engineer : Kazuya Noda
Mode : Tx ISA100.11a 2440 MHz
Power setting : High power setting 15 dBi antenna



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
9.07	-89.9	0.01	9.8	15.0	1	-65.1	300	6.0	-3.8	48.4	52.2	
254.00	-80.0	0.01	9.8	15.0	1	-55.1	300	6.0	6.1	19.5	13.4	

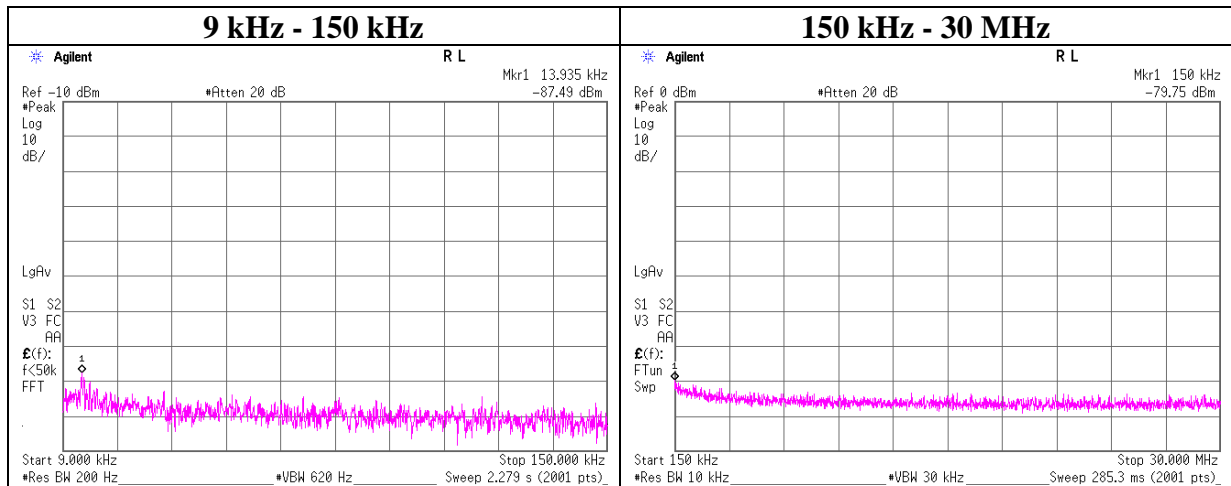
$E \text{ [dBuV/m]} = \text{EIRP [dBm]} - 20 \log (\text{Distance [m]}) + \text{Ground bounce [dB]} + 104.8 \text{ [dBuV/m]}$

$\text{EIRP [dBm]} = \text{Reading [dBm]} + \text{Cable loss [dB]} + \text{Attenuator Loss [dB]} + \text{Antenna gain [dBi]} + 10 * \log (N)$

N: Number of output

Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11980055S-A-R2
Date	April 9, 2018
Temperature / Humidity	22 deg. C / 31 % RH
Engineer	Kazuya Noda
Mode	Tx ISA100.11a 2470 MHz
Power setting	High power setting 15 dBi antenna



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
13.94	-87.5	0.01	9.8	15.0	1	-62.7	300	6.0	-1.4	44.7	46.1	
150.00	-79.8	0.01	9.8	15.0	1	-54.9	300	6.0	6.3	24.0	17.7	

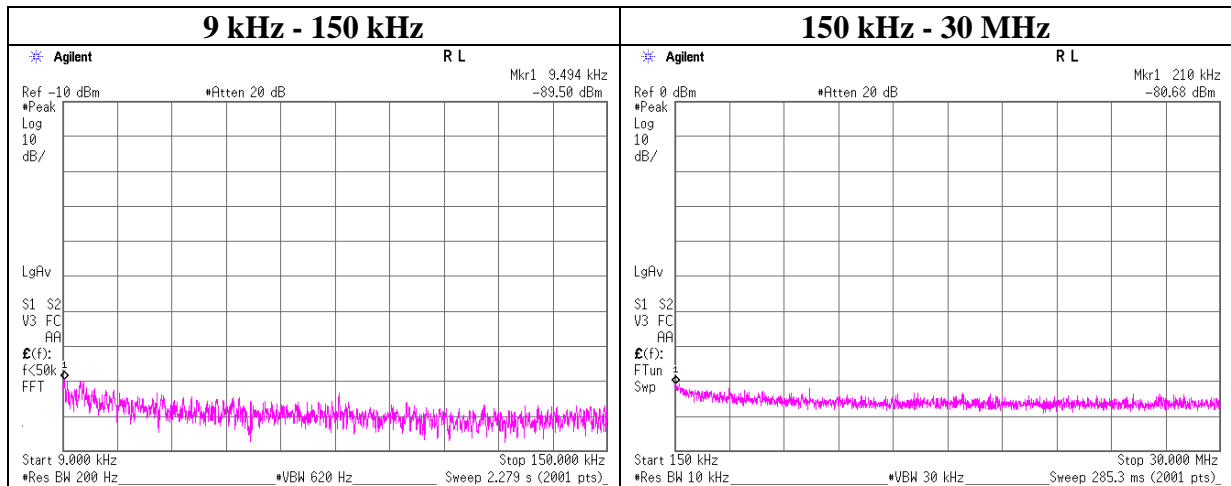
$E \text{ [dBuV/m]} = \text{EIRP [dBm]} - 20 \log (\text{Distance [m]}) + \text{Ground bounce [dB]} + 104.8 \text{ [dBuV/m]}$

$\text{EIRP [dBm]} = \text{Reading [dBm]} + \text{Cable loss [dB]} + \text{Attenuator Loss [dB]} + \text{Antenna gain [dBi]} + 10 * \log (N)$

N: Number of output

Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11980055S-A-R2
Date	April 9, 2018
Temperature / Humidity	22 deg. C / 31 % RH
Engineer	Kazuya Noda
Mode	Tx ISA100.11a 2475 MHz
Power settings	Low power setting 2 dBi antenna



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
9.49	-89.5	0.01	9.8	2.0	1	-77.7	300	6.0	-16.4	48.0	64.4	
210.00	-80.7	0.01	9.8	2.0	1	-68.9	300	6.0	-7.6	21.1	28.7	

$$E \text{ [dBuV/m]} = \text{EIRP [dBm]} - 20 \log (\text{Distance [m]}) + \text{Ground bounce [dB]} + 104.8 \text{ [dBuV/m]}$$

$$\text{EIRP [dBm]} = \text{Reading [dBm]} + \text{Cable loss [dB]} + \text{Attenuator Loss [dB]} + \text{Antenna gain [dBi]} + 10 * \log (N)$$

N: Number of output

Power Density

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11980055S-A-R2
Date April 9, 2018
Temperature / Humidity 22 deg. C / 31 % RH
Engineer Kazuya Noda
Mode Tx ISA100.11a

Power setting High power setting 15 dBi antenna

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2405.47	-16.38	1.32	9.85	-5.21	8.00	13.21
2440.47	-16.69	1.33	9.84	-5.52	8.00	13.52
2470.47	-16.75	1.34	9.84	-5.57	8.00	13.57

Sample Calculation:

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

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

Power settings Low power setting 2 dBi antenna

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2475.47	-18.49	1.34	9.84	-7.31	8.00	15.31

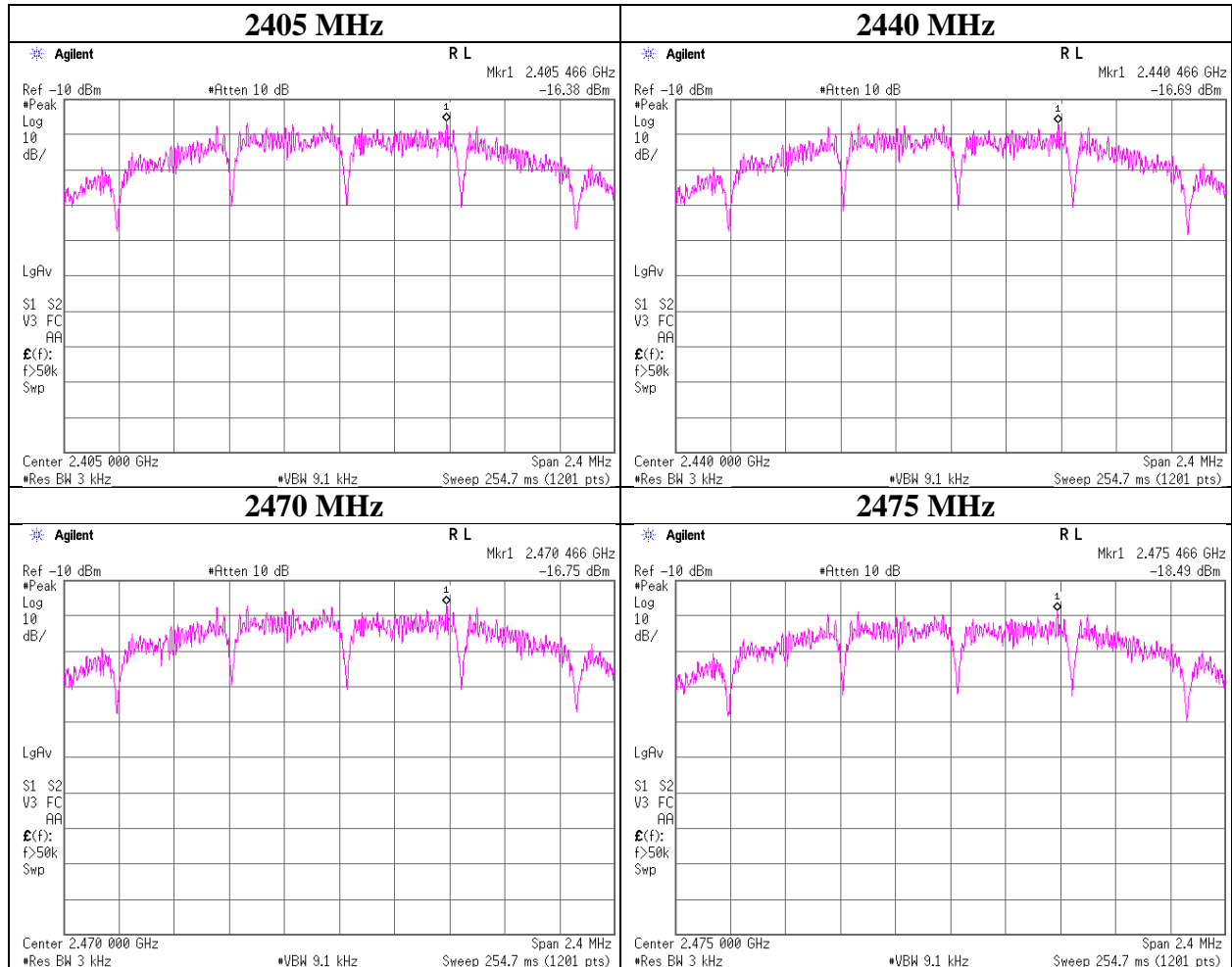
Sample Calculation:

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

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

Power Density

ISA100.11a



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APPENDIX 2: Test instruments

Test Instruments (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2017/02/17 * 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	2017/05/08 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2017/08/14 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2017/10/30 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2017/10/10 * 12
KJM-09	Measure	KOMELON	KMC-36	-	RE,CE	-
SAEC-01(SVS WR)	Semi-Anechoic Chamber	TDK	SAEC-01(SVSW R)	1	RE	2017/07/20 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE, CE,RFI,MF)	-	RE,CE	-
STS-01	Digital Hitester	Hioki	3805-50	080997812	RE,CE	2017/10/16 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2017/11/16 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2017/11/22 * 12
SCC-G41	Coaxial Cable	Junkosha	MWX221-01000 NFSNMS/B	1612S006	RE	2017/01/08 * 12
SAF-02	Pre Amplifier	SONOMA	310N	290212	RE	2017/02/09 * 12
SAT6-02	Attenuator	JFW	50HF-006N	-	RE	2017/02/09 * 12
SAT3-11	Attenuator	JFW	50HF-003N	-	RE	2017/02/23 * 12
SBA-02	Biconical Antenna	Schwarzbeck	BBA9106	91032665	RE	2017/11/23 * 12
SCC-B1/B3/B5/ B7/B8/B13/SRS E-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhn er/Suhner/Suhner/Suhn er/TOYO	8D2W/12DSFA/ 141PE/141PE/14 1PE/141PE/NS4 906	-/0901-270(RF Selector)	RE	2017/04/07 * 12
SCC-B2/B4/B6/ B7/B8/B13/SRS E-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhn er/Suhner/Suhner/Suhn er/TOYO	8D2W/12DSFA/ 141PE/141PE/14 1PE/141PE/NS4 906	-/0901-270(RF Selector)	RE	2017/04/07 * 12
SLA-06	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	195	RE	2017/01/05 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2017/10/30 * 12
STR-07	Test Receiver	Rohde & Schwarz	ESU26	100484	RE	2017/09/26 * 12
SJM-09	Measure	PROMART	SEN1935	-	RE	-
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2017/06/08 * 12
STS-02	Digital Hitester	Hioki	3805-50	080997819	RE	2017/03/08 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM9861	RE	2017/07/11 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2017/03/17 * 12
SCC-G20	Coaxial Cable	Junkosha	J12J102518-00	APR-15-15-003	RE	2017/04/20 * 12
SCC-G33	Coaxial Cable	Junkosha	MWX241-01000 KMSKMS	-	RE	2017/04/20 * 12

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

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

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

Test item: **CE: Conducted Emission test**
 RE: Radiated Emission test
 AT: Antenna Terminal Conducted test

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Test Instruments (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SCC-A12/A13/S RSE-01	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/ NS4906	-/0901-269(RF Selector)	CE	2017/04/07 * 12
SLS-02	LISN	Rohde & Schwarz	ENV216	100512	CE	2017/02/10 * 12
SAT3-07	Attenuator	JFW	50HF-003N	-	CE	2017/09/08 * 12
SOS-15	Humidity Indicator	A&D	AD-5681	7478311	CE	2017/02/21 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	CE,RE	2017/04/12 * 12
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	2017/11/22 * 12
SPM-07	Power Meter	Agilent	8990B	MY5100272	AT	2017/05/01 * 12
SPSS-04	Power sensor	Agilent	N1923A	MY5326009	AT	2017/05/01 * 12
STS-05	Digital Hitester	Hioki	3805-50	080997828	AT	2017/10/16 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2017/08/20 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2018/03/19 * 12
SAT10-16	Attenuator	Weinschel Corp.	54A-10	83420	AT	2017/12/08 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2017/12/21 * 12
KTS-07	Digital Tester	SANWA	PC500	7019232	AT	2017/10/11 * 12

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

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

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

Test item: **CE: Conducted Emission test**
 RE: Radiated Emission test
 AT: Antenna Terminal Conducted test