




RADIO TEST REPORT


Test Report No. : 13385909S-B-R2

Applicant : Panasonic Corporation
Type of EUT : Car Navigation
Model Number of EUT : AT2103
FCC ID : ACJ932AT2103
Test regulation : FCC Part 15 Subpart C: 2020
*Wireless LAN & Bluetooth Low Energy part
Test Result : Complied (Refer to SECTION 3.2)

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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 limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
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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. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report is a revised version of 13385909S-B-R1. 13385909S-B-R1 is replaced with this report.

Date of test: June 18 to August 2, 2020

Representative test engineer: 
Shiro Kobayashi
Engineer
Consumer Technology Division

Approved by: 
Shinichi Takano
Engineer
Consumer Technology Division



CERTIFICATE 1266.03

- 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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REVISION HISTORY

Original Test Report No.: 13385909S-B

Revision	Test report No.	Date	Page revised	Contents																							
- (Original)	13385909S-B	September 15, 2020	-	-																							
1	13385909S-B-R1	October 1, 2020	P.6	Correction of "Radio Specification": from <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">IEEE802.11ac (80 MHz band)</td></tr><tr><td style="text-align: center;">5210 MHz, 5755 MHz</td></tr></table> to <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">IEEE802.11ac (80 MHz band)</td></tr><tr><td style="text-align: center;">5210 MHz, 5775 MHz</td></tr></table> =>	IEEE802.11ac (80 MHz band)	5210 MHz, 5755 MHz	IEEE802.11ac (80 MHz band)	5210 MHz, 5775 MHz																			
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5210 MHz, 5775 MHz																											
P.10	Update of Tested frequency: from <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">Tx. 11b</td><td style="text-align: center;">2412 MHz</td></tr><tr><td style="text-align: center;">Tx. 11g</td><td style="text-align: center;">2437 MHz</td></tr><tr><td style="text-align: center;">Tx. 11n-20</td><td style="text-align: center;">2462 MHz</td></tr><tr><td style="text-align: center;">Tx. 11b with Tx 11ac-20 MIMO 5745 MHz</td><td style="text-align: center;">2412 MHz</td></tr><tr><td style="text-align: center;">Tx. 11g with Tx 11ac-20 MIMO 5745 MHz</td><td style="text-align: center;">2437 MHz</td></tr><tr><td style="text-align: center;">Tx. 11n-20 with Tx 11ac-20 MIMO 5745 MHz</td><td style="text-align: center;">2462 MHz</td></tr></table> to <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">Tx. 11b</td><td style="text-align: center;">2412 MHz</td></tr><tr><td style="text-align: center;">Tx. 11b with Tx 11ac-20 MIMO 5745 MHz</td><td style="text-align: center;">2437 MHz</td></tr><tr><td style="text-align: center;">Tx. 11g</td><td style="text-align: center;">2412 MHz</td></tr><tr><td style="text-align: center;">Tx. 11n-20</td><td style="text-align: center;">2417 MHz</td></tr><tr><td style="text-align: center;">Tx. 11g with Tx 11ac-20 MIMO 5745 MHz</td><td style="text-align: center;">2437 MHz</td></tr><tr><td style="text-align: center;">Tx. 11n-20 with Tx 11ac-20 MIMO 5745 MHz</td><td style="text-align: center;">2457 MHz</td></tr><tr><td style="text-align: center;"></td><td style="text-align: center;">2462 MHz</td></tr></table>	Tx. 11b	2412 MHz	Tx. 11g	2437 MHz	Tx. 11n-20	2462 MHz	Tx. 11b with Tx 11ac-20 MIMO 5745 MHz	2412 MHz	Tx. 11g with Tx 11ac-20 MIMO 5745 MHz	2437 MHz	Tx. 11n-20 with Tx 11ac-20 MIMO 5745 MHz	2462 MHz	Tx. 11b	2412 MHz	Tx. 11b with Tx 11ac-20 MIMO 5745 MHz	2437 MHz	Tx. 11g	2412 MHz	Tx. 11n-20	2417 MHz	Tx. 11g with Tx 11ac-20 MIMO 5745 MHz	2437 MHz	Tx. 11n-20 with Tx 11ac-20 MIMO 5745 MHz	2457 MHz		2462 MHz
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2	13385909S-B-R2	October 29, 2020	P.34	Adding comment: "* The above chart is obtained with the Maximum Packet Size set that can be by test software, and it is different from the maximum duty cycle of the product."																							
			P.35	Correction of comment: from "data communication mode" to "Advertising mode"																							
			P.87, 139, 141, 142, 144, 146, 147	Adding comment: "*2) Spurious emissions of the same duty cycle as carrier."																							

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation	MCS	Modulation and Coding Scheme
AC	Alternating Current	MRA	Mutual Recognition Arrangement
AFH	Adaptive Frequency Hopping	N/A	Not Applicable
AM	Amplitude Modulation	NIST	National Institute of Standards and Technology
Amp, AMP	Amplifier	NS	No signal detect.
ANSI	American National Standards Institute	NSA	Normalized Site Attenuation
Ant, ANT	Antenna	NVLAP	National Voluntary Laboratory Accreditation Program
AP	Access Point	OBW	Occupied Band Width
ASK	Amplitude Shift Keying	OFDM	Orthogonal Frequency Division Multiplexing
Atten., ATT	Attenuator	P/M	Power meter
AV	Average	PCB	Printed Circuit Board
BPSK	Binary Phase-Shift Keying	PER	Packet Error Rate
BR	Bluetooth Basic Rate	PHY	Physical Layer
BT	Bluetooth	PK	Peak
BT LE	Bluetooth Low Energy	PN	Pseudo random Noise
BW	BandWidth	PRBS	Pseudo-Random Bit Sequence
Cal Int	Calibration Interval	PSD	Power Spectral Density
CCK	Complementary Code Keying	QAM	Quadrature Amplitude Modulation
Ch., CH	Channel	QP	Quasi-Peak
CISPR	Comite International Special des Perturbations Radioelectriques	QPSK	Quadri-Phase Shift Keying
CW	Continuous Wave	RBW	Resolution Band Width
DBPSK	Differential BPSK	RDS	Radio Data System
DC	Direct Current	RE	Radio Equipment
D-factor	Distance factor	RF	Radio Frequency
DFS	Dynamic Frequency Selection	RMS	Root Mean Square
DQPSK	Differential QPSK	RSS	Radio Standards Specifications
DSSS	Direct Sequence Spread Spectrum	Rx	Receiving
EDR	Enhanced Data Rate	SA, S/A	Spectrum Analyzer
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power	SG	Signal Generator
EMC	ElectroMagnetic Compatibility	SVSWR	Site-Voltage Standing Wave Ratio
EMI	ElectroMagnetic Interference	TR	Test Receiver
EN	European Norm	Tx	Transmitting
ERP, e.r.p.	Effective Radiated Power	VBW	Video BandWidth
EU	European Union	Vert.	Vertical
EUT	Equipment Under Test	WLAN	Wireless LAN
Fac.	Factor		
FCC	Federal Communications Commission		
FHSS	Frequency Hopping Spread Spectrum		
FM	Frequency Modulation		
Freq.	Frequency		
FSK	Frequency Shift Keying		
GFSK	Gaussian Frequency-Shift Keying		
GNSS	Global Navigation Satellite System		
GPS	Global Positioning System		
Hori.	Horizontal		
ICES	Interference-Causing Equipment Standard		
IEC	International Electrotechnical Commission		
IEEE	Institute of Electrical and Electronics Engineers		
IF	Intermediate Frequency		
ILAC	International Laboratory Accreditation Conference		
ISED	Innovation, Science and Economic Development Canada		
ISO	International Organization for Standardization		
JAB	Japan Accreditation Board		
LAN	Local Area Network		
LIMS	Laboratory Information Management System		

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CONTENTS	PAGE
SECTION 1: Customer information.....	5
SECTION 2: Equipment under test (EUT).....	5
SECTION 3: Test specification, procedures & results.....	7
SECTION 4: Operation of EUT during testing.....	10
SECTION 5: Radiated Spurious Emission	16
SECTION 6: Antenna Terminal Conducted Tests.....	19
APPENDIX 1: Test data	20
6 dB Bandwidth and 99 % Occupied Bandwidth.....	20
Maximum Peak Output Power	27
Average Output Power	31
Burst rate confirmation	33
Radiated Spurious Emission	36
Conducted Spurious Emission	150
Power Density	157
APPENDIX 2: Test instruments	161
APPENDIX 3: Photographs of test setup.....	163
Radiated Spurious Emission	163
Pre-Check Worst Case Position	164
Antenna Terminal Conducted Tests.....	165

SECTION 1: Customer information

Company Name : Panasonic Corporation
Address : 4261 Ikonobe-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken,
224-8520, Japan
Telephone Number : +81-50-3689-7112
Contact Person : Takahisa Sakai

The information provided from the customer is as follows;

- Applicant, Type of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
 - Operating/Test Mode(s) (Mode(s)) on all the relevant pages
 - SECTION 1: Customer information
 - SECTION 2: Equipment under test (EUT) other than the Receipt Date
 - SECTION 4: Operation of EUT during testing
- * The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Type : Car Navigation
Model Number : AT2103
Serial Number : Refer to SECTION 4.2
Rating : DC 13.2 V
Receipt Date : June 11, 2020
Country of Mass-production : Japan, Mexico, Czech Republic
Condition : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification : No Modification by the test lab.

2.2 Product Description

Model: AT2103 (referred to as the EUT in this report) are a Car Navigation.

There are 2 type for AT2103; Hi type(14 inch Display) and Lo type(9.8 inch Display). The same RF Part and antenna are installed in these models, however antenna gain and antenna arrangement are different.

Radio Specification

	IEEE802.11b	IEEE802.11g	IEEE802.11n (20 MHz band)	IEEE802.11n (40 MHz band)
Frequency of operation	2412 MHz - 2462 MHz	2412 MHz - 2462 MHz	2412 MHz – 2462 MHz, 5180 MHz – 5240 MHz, 5745 MHz – 5825 MHz	5190 MHz, 5230 MHz, 5755 MHz, 5795 MHz
Channel spacing	5 MHz		2.4 GHz band: 5 MHz 5 GHz band: 20 MHz	40 MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)	
	IEEE802.11a	IEEE802.11ac (20 MHz band)	IEEE802.11ac (40 MHz band)	IEEE802.11ac (80 MHz band)
Frequency of operation	5180 MHz – 5240 MHz, 5745 MHz – 5825 MHz	5180 MHz – 5240 MHz, 5745 MHz – 5825 MHz	5190 MHz, 5230 MHz, 5755 MHz, 5795 MHz	5210 MHz, 5775 MHz
Channel spacing	20 MHz		40 MHz	80 MHz
Modulation	OFDM (64QAM, 16QAM, QPSK, BPSK)		OFDM (256QAM, 16QAM, QPSK, BPSK)	
	Bluetooth (BR/EDR)		Bluetooth Low Energy	
Frequency of operation	2402 MHz - 2480 MHz		2402 MHz - 2480 MHz	
Channel spacing	1 MHz		2 MHz	
Modulation	FHSS, GFSK, $\pi/4$ DQPSK, 8DPSK		FHSS, GFSK	
Antenna type	Inverted F type antenna			
Antenna Gain	Hi type (14 inch Display)	RF0	2.4 GHz WLAN	0.07 dBi
			U-NII-1	2.14 dBi
			U-NII-3	1.00 dBi
		RF1	BT, BT LE	1.01 dBi
			U-NII-1	2.43 dBi
			U-NII-3	2.59 dBi
	Lo type (9.8 inch Display)	RF0	2.4 GHz WLAN	4.04 dBi
			U-NII-1	1.19 dBi
			U-NII-3	2.47 dBi
		RF1	BT, BT LE	2.08 dBi
			U-NII-1	1.00 dBi
			U-NII-3	1.43 dBi
Antenna Connector type	U.FL connector			
Operating Temperature	-30 deg. C to + 65 deg. C			

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on May 26, 2020 and effective July 27, 2020

Title : FCC 47 CFR Part 15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz,
and 5725-5850 MHz

* The revision does not affect the test result conducted before its effective date.

* Also the EUT complies with FCC Part 15 Subpart B.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods ISED: RSS-Gen 8.8	FCC: Section 15.207 ISED: RSS-Gen 8.8	-	N/A	-
6 dB Bandwidth	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ISED: -	FCC: Section 15.247(a)(2) ISED: RSS-247 5.2(a)	See data.	Complied a)	Conducted
Maximum Peak Output Power	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ISED: RSS-Gen 6.12	FCC: Section 15.247(b)(3) ISED: RSS-247 5.4(d)		Complied b)	Conducted
Power Density	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ISED: -	FCC: Section 15.247(e) ISED: RSS-247 5.2(b)		Complied c)	Conducted
Spurious Emission Restricted Band Edges	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02	FCC: Section 15.247(d)	Hi type (14 inch Display) 6.4 dB 2390.000 MHz, AV, Vert., Mode: Tx 11g 2417 MHz with 11ac-20 MIMO 5745 MHz	Complied d), e)	Conducted (below 30 MHz)/
	ISED: RSS-Gen 6.13	ISED: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	Lo type (9.8 inch Display) 1.8 dB 2390.000 MHz, AV, Hori., Mode: Tx 11g 2417 MHz	Complied# d), e)	Radiated (above 30 MHz) *2)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

*1) The test is not applicable since the EUT does not have AC Mains

*2) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05r02 8.5 and 8.6.

a) Refer to APPENDIX 1 (data of 6 dB Bandwidth and 99 % Occupied Bandwidth)

b) Refer to APPENDIX 1 (data of Maximum Peak Output Power)

c) Refer to APPENDIX 1 (data of Power Density)

d) Refer to APPENDIX 1 (data of Conducted Spurious Emission)

e) Refer to APPENDIX 1 (data of Radiated Spurious Emission)

Symbols:

Complied The data of this test item has enough margin, more than the measurement uncertainty.

Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.

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

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FCC Part 15.31 (e)

The EUT provides stable voltage constantly to the RF Part regardless of input voltage. Instead of a new battery, DC power supply was used for the test. That does not affect the test result, therefore the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99 % Occupied Bandwidth	ISED: RSS-Gen 6.7	ISED: -	N/A	- a)	Conducted
a) Refer to APPENDIX 1 (data of 6 dB Bandwidth and 99 % Occupied Bandwidth)					

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

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the results are derived depending on whether or not laboratory uncertainty is applied.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.
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Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4,5,6,8 SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.6 dB	2.6 dB	2.5 dB	2.6 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.0 dB	3.0 dB	3.0 dB	-
	30 MHz-200 MHz	4.6 dB	4.6 dB	4.6 dB	-
	200 MHz-1 GHz	6.0 dB	6.0 dB	6.0 dB	-
	1 GHz-6 GHz	4.9 dB	4.9 dB	4.9 dB	-
	6 GHz-18 GHz	5.5 dB	5.5 dB	5.5 dB	-
	18 GHz-40 GHz	5.4 dB	5.4 dB	5.4 dB	-
Radiated emission (Measurement distance: 1 m)	1 GHz-18 GHz	5.8 dB	5.8 dB	5.8 dB	-
	18 GHz-40 GHz	5.7 dB	5.7 dB	5.7 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	0.98 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	1.75 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.89 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.12 dB
Power Measurement above 1 GHz (Average Detector)_SPM-13	1.06 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-13	1.24 dB
Spurious emission (Conducted) below 1GHz	0.9 dB
Spurious emission (Conducted) 1 GHz-3 GHz	0.9 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.9 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.6 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.0 dB
Bandwidth Measurement	0.07 %
Duty cycle and Time Measurement	0.262 %
Temperature	0.95 deg.C.
Voltage	0.83 %

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3.5 Test Location

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A2LA Certificate Number: 1266.03 (FCC Test Firm Registration Number: 626366, ISED Lab Company Number: 2973D)

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 EUT during testing

4.1 Operating Mode(s)

Test operating mode was determined as follows according to “Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals - ” of TCB Council Workshop October 2009.

Mode	Remarks*
IEEE 802.11b (11b)	1 Mbps, PN9
IEEE 802.11g (11g)	54 Mbps, PN9
IEEE 802.11n SISO 20 MHz BW (11n-20)	MCS 7, PN9
Bluetooth (BT) Low Energy (LE)	Uncoded 1 M-PHY, Maximum Packet Size, PRBS9
	Uncoded 2 M-PHY, Maximum Packet Size, PRBS9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	
*Power of the EUT was set by the software as follows; Power settings: 11b : 13 dBm, 11g: 11 dBm (2412 MHz, 2462 MHz), 13 dBm (2417 MHz to 2457 MHz) 11n-20: 10 dBm (2412 MHz, 2462 MHz), 12 dBm (2417 MHz to 2457 MHz) BT LE 1 M-PHY: Fixed BT LE 2 M-PHY: Fixed Software: Labtool Version: 2.0.0.71 (Date: 2020.05.29, Storage location: EUT memory)	
*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.	

*The details of Operating mode(s)

Test Item	Operating Mode	Tested frequency	
Conducted Spurious Emission	Tx, 11g	2437 MHz	
	Tx BT LE 1 M-PHY, Tx BT LE 2 M-PHY	2402 MHz 2440 MHz 2480 MHz	
	Radiated Spurious Emission (Below 1 GHz)	Tx, 11g	2437 MHz
		Tx BT LE 1 M-PHY, Tx BT LE 2 M-PHY	2402 MHz 2440 MHz 2480 MHz
Radiated Spurious Emission (Above 1 GHz)		Tx, 11b	2412 MHz
		Tx, 11b with Tx 11ac-20 MIMO 5745 MHz	2437 MHz 2462 MHz
	Tx, 11g, Tx, 11n-20, Tx, 11g with Tx 11ac-20 MIMO 5745 MHz, Tx, 11n-20 with Tx 11ac-20 MIMO 5745 MHz	2412 MHz 2417 MHz 2437 MHz 2457 MHz 2462 MHz	
	Tx BT LE 1 M-PHY, Tx BT LE 2 M-PHY	2402 MHz 2440 MHz 2480 MHz	
	6 dB Bandwidth Maximum Peak Output Power Power Density 99 % Occupied Bandwidth	Tx, 11b	2412 MHz
		Tx, 11g	2437 MHz
		Tx, 11n-20	2462 MHz
		Tx BT LE 1 M-PHY, Tx BT LE 2 M-PHY	2402 MHz 2440 MHz 2480 MHz

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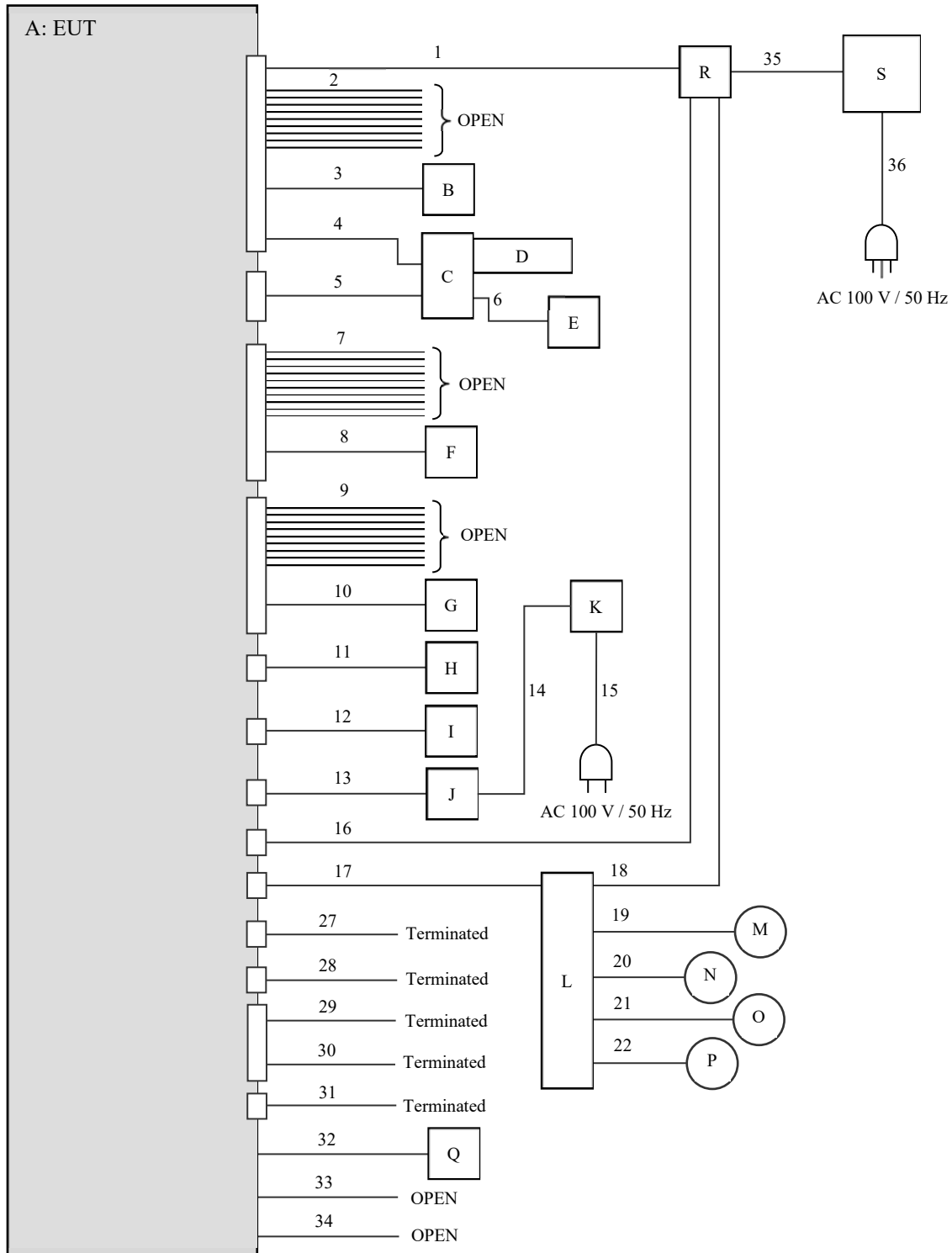
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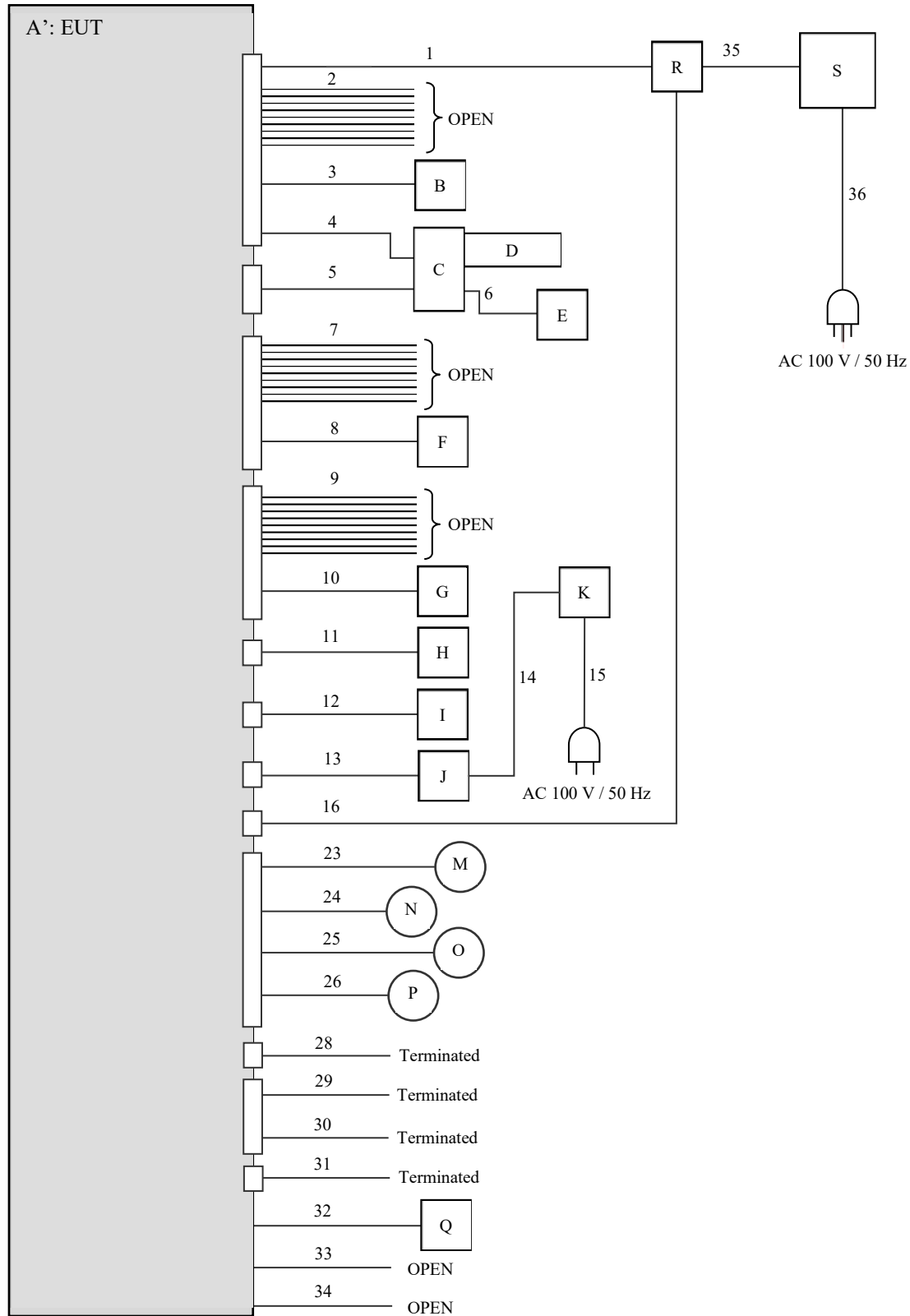
4.2 Configuration and peripherals

< Radiated Emission test for Hi type (14 inch Display) >



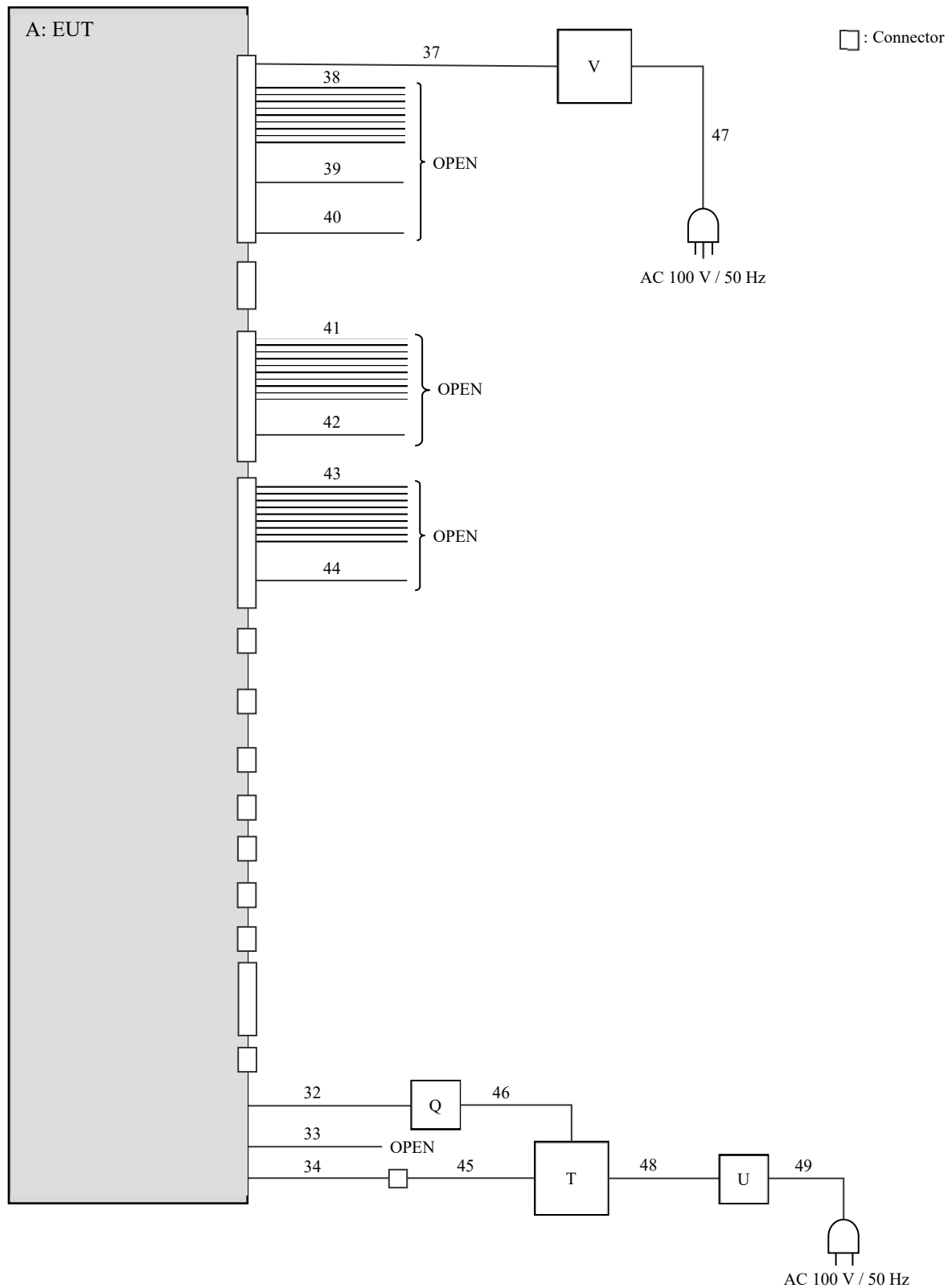
* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

< Radiated Emission test for Lo type (9.8 inch Display) >



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

< Antenna Terminal Conducted test >



Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Navigation	AT2103 Hi type (14 inch Display)	500081 *1) 500087 *2)	Panasonic Corporation	EUT
A'	Car Navigation	AT2103 Lo type (9.8 inch Display)	500065 *2)	Panasonic Corporation	EUT
B	Steering Switch	-	1142	Panasonic Corporation	-
C	IF-Box	DEP32-10078	033	Panasonic Corporation	-
D	USB Memory	USM4GU	-	Sony Corporation	-
E	Bluetooth Speaker	SRS-X11	2154715	Sony Corporation	-
F	MIC	GP-SDA3510A	0DC062519	Panasonic Corporation	-
G	MIC	GP-SDA3510A	0DC062856	Panasonic Corporation	-
H	Rear Camera	GP-KDM301RC	92	Panasonic Corporation	-
I	GPS Antenna	ANN-MS	-	U-Blox	-
J	Front Camera Jig	GVI2OUT_A	1	Panasonic Corporation	-
K	AC Adapter	GF48-US1240	-	GO FORWARD ENTERPRISE CORP.	-
L	MOST AMP	CL-DL47X2AJ Rev.A	513267	Panasonic Corporation	-
M	Speaker	KFC-RS160	-	KENWOOD	-
N	Speaker	KFC-RS160	-	KENWOOD	-
O	Speaker	KFC-RS160	-	KENWOOD	-
P	Speaker	KFC-RS160	-	KENWOOD	-
Q	Jig board	RCarDBG_JTAG2	WR19-4014 *1) WR12-3224 *2)	WESTEK	-
R	Terminal Block	-	-	-	-
S	Power Supply (DC)	PAN35-10A	NA000955	KIKUSUI	-
T	Laptop Computer	7666-77J	LV-B8R1X 08/05	Lenovo	-
U	AC Adapter	42T4422	11S92P1154Z1DXF 1DBFDN	Lenovo	-
V	Power Supply (DC)	PAN35-10A	ML002085	KIKUSUI	-

*1) For Antenna Terminal test

*2) For Radiated Emission test

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List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC	2.5 + 0.2	Unshielded	Unshielded	-
2	Signal	2.5	Unshielded	Unshielded	-
3	Signal	2.5 + 0.1	Unshielded	Unshielded	-
4	IF Box Power	2.5 + 0.3	Unshielded	Unshielded	-
5	Signal	2.5	Shielded	Shielded	-
6	USB type C	0.9	Shielded	Shielded	-
7	Signal	2.5	Unshielded	Unshielded	-
8	MIC	2.5 + 0.5	Unshielded	Unshielded	-
9	Signal	2.5	Unshielded	Unshielded	-
10	MIC	2.5 + 0.5	Unshielded	Unshielded	-
11	Rear Camera	3.0 + 0.15	Unshielded	Unshielded	-
12	GPS	3.0 + 0.12	Shielded	Shielded	-
13	Front Camera	10	Shielded	Shielded	-
14	DC	1.6	Unshielded	Unshielded	-
15	AC	1.9	Unshielded	Unshielded	-
16	DC	3.0	Unshielded	Unshielded	-
17	MOST Amp	2.5	Unshielded	Unshielded	-
18	DC	1.0	Unshielded	Unshielded	-
19	Speaker	1.0 + 1.9	Unshielded	Unshielded	-
20	Speaker	1.0 + 1.9	Unshielded	Unshielded	-
21	Speaker	1.0 + 1.9	Unshielded	Unshielded	-
22	Speaker	1.0 + 1.9	Unshielded	Unshielded	-
23	Speaker	3.0 + 1.9	Unshielded	Unshielded	-
24	Speaker	3.0 + 1.9	Unshielded	Unshielded	-
25	Speaker	3.0 + 1.9	Unshielded	Unshielded	-
26	Speaker	3.0 + 1.9	Unshielded	Unshielded	-
27	A2B	3.0	Unshielded	Unshielded	-
28	DCM	3.0	Shielded	Shielded	-
29	FM	2.5	Shielded	Shielded	-
30	FM	2.5	Shielded	Shielded	-
31	Sirius XM	2.5	Shielded	Shielded	-
32	Signal	0.1	Unshielded	Unshielded	*3)
33	Signal	0.2	Unshielded	Unshielded	*3)
34	UART	0.3	Unshielded	Unshielded	*3)
35	DC	2.4	Unshielded	Unshielded	-
36	AC	2.0	Unshielded	Unshielded	-
37	DC	1.0	Unshielded	Unshielded	-
38	Signal	0.2	Unshielded	Unshielded	-
39	Signal	0.2	Unshielded	Unshielded	-
40	IF Box Power	0.2	Unshielded	Unshielded	-
41	Signal	0.2	Unshielded	Unshielded	-
42	MIC	1.0	Unshielded	Unshielded	-
43	Signal	0.2	Unshielded	Unshielded	-
44	MIC	1.0	Unshielded	Unshielded	-
45	UART-USB	1.8	Shielded	Shielded	-
46	USB	1.5	Shielded	Shielded	-
47	AC	2.0	Unshielded	Unshielded	-
48	DC	1.8	Unshielded	Unshielded	-
49	AC	0.9	Unshielded	Unshielded	-

*3) This cable is for testing and is not included with products.

SECTION 5: Radiated Spurious Emission

Test Procedure

It was measured based on "8.5 and 8.6 of KDB 558074 D01 15.247 Meas Guidance v05r02".

[For below 1 GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.7 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.7 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.

Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.

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(ISED) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (ISED).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *1), *2)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	11,12,2.5,2 RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (Linear voltage) Trace: 100 traces Duty factor was added to the results.	RBW: 100 kHz VBW: 300 kHz

*1) Average Power Measurement was performed based on ANSI C63.10-2013.

*2) In unwanted emission derived from BT LE carrier, measurement with Average detector was not performed.

The limit for Average detector is applied to the measurement value with Peak detector used Duty cycle correction factor (DCCF).

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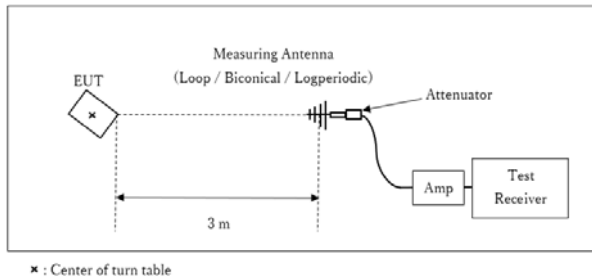
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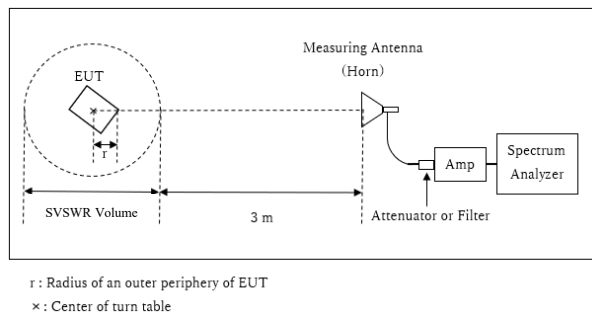
Figure 1: Test Setup

Below 1 GHz



Test Distance: 3 m

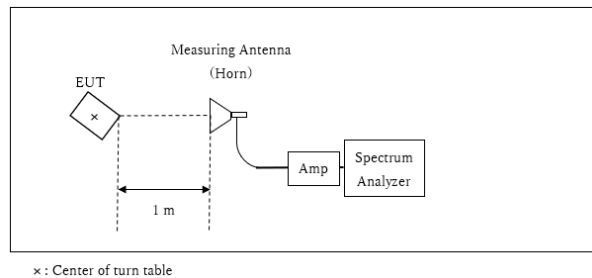
1 GHz - 13 GHz



Distance Factor: $20 \times \log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.83 \text{ m}$

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
 $r = 0.17 \text{ m}$

13 GHz - 40 GHz



Distance Factor: $20 \times \log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$
*Test Distance: 1 m

- The carrier level and noise levels were confirmed at each position of 0 deg. and 30 deg. of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Worst case:

< Hi type (14 inch Display) for WLAN >

Antenna polarization	Carrier (Band edge)	Spurious				
		Below 1 GHz	Above 1 GHz			
			1 GHz - 2.8 GHz	2.8 GHz - 13 GHz	13 GHz - 18 GHz	18 GHz - 26.5 GHz
Horizontal	0 deg.	0 deg.	0 deg.	0 deg.	0 deg.	0 deg.
Vertical	0 deg.	0 deg.	0 deg.	0 deg.	0 deg.	0 deg.

< Hi type (14 inch Display) for BT LE>

Antenna polarization	Carrier (Band edge)	Spurious				
		Below 1 GHz	Above 1 GHz			
			1 GHz - 2.8 GHz	2.8 GHz - 13 GHz	13 GHz - 18 GHz	18 GHz - 26.5 GHz
Horizontal	0 deg.	0 deg.	0 deg.	30 deg.	0 deg.	0 deg.
Vertical	0 deg.	0 deg.	0 deg.	30 deg.	0 deg.	0 deg.

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< Lo type (9.8 inch Display) for WLAN >

Antenna polarization	Carrier (Band edge)	Spurious				
		Below 1 GHz	Above 1 GHz			
			1 GHz - 2.8 GHz	2.8 GHz - 13 GHz	13 GHz - 18 GHz	18 GHz - 26.5 GHz
Horizontal	0 deg.	0 deg.	0 deg.	30 deg.	0 deg.	0 deg.
Vertical	0 deg.	0 deg.	0 deg.	30 deg.	0 deg.	0 deg.

< Lo type (9.8 inch Display) for BT LE >

Antenna polarization	Carrier (Band edge)	Spurious				
		Below 1 GHz	Above 1 GHz			
			1 GHz - 2.8 GHz	2.8 GHz - 13 GHz	13 GHz - 18 GHz	18 GHz - 26.5 GHz
Horizontal	0 deg.	0 deg.	0 deg.	30 deg.	0 deg.	0 deg.
Vertical	0 deg.	0 deg.	0 deg.	30 deg.	0 deg.	0 deg.

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

SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
6 dB Bandwidth	50 MHz, 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: 160 MHz BW)
Peak Power Density	1.5 times the 6 dB Bandwidth	3 kHz	9.1 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4) *5)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	10 kHz	30 kHz				

*1) Peak hold was applied as Worst-case measurement.
*2) Reference data
*3) Section 11.10.2 Method PKPSD (peak PSD) of "ANSI C63.10-2013".
*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 low enough as shown in the chart.
(9 kHz - 150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 10 kHz).
*5) The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohms. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to $45.5 - 51.5 = -6.0$ dBuA/m, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

The test results and limit are rounded off to two decimals place, so some differences might be observed.
The equipment and cables were not used for factor 0 dB of the data sheets.

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

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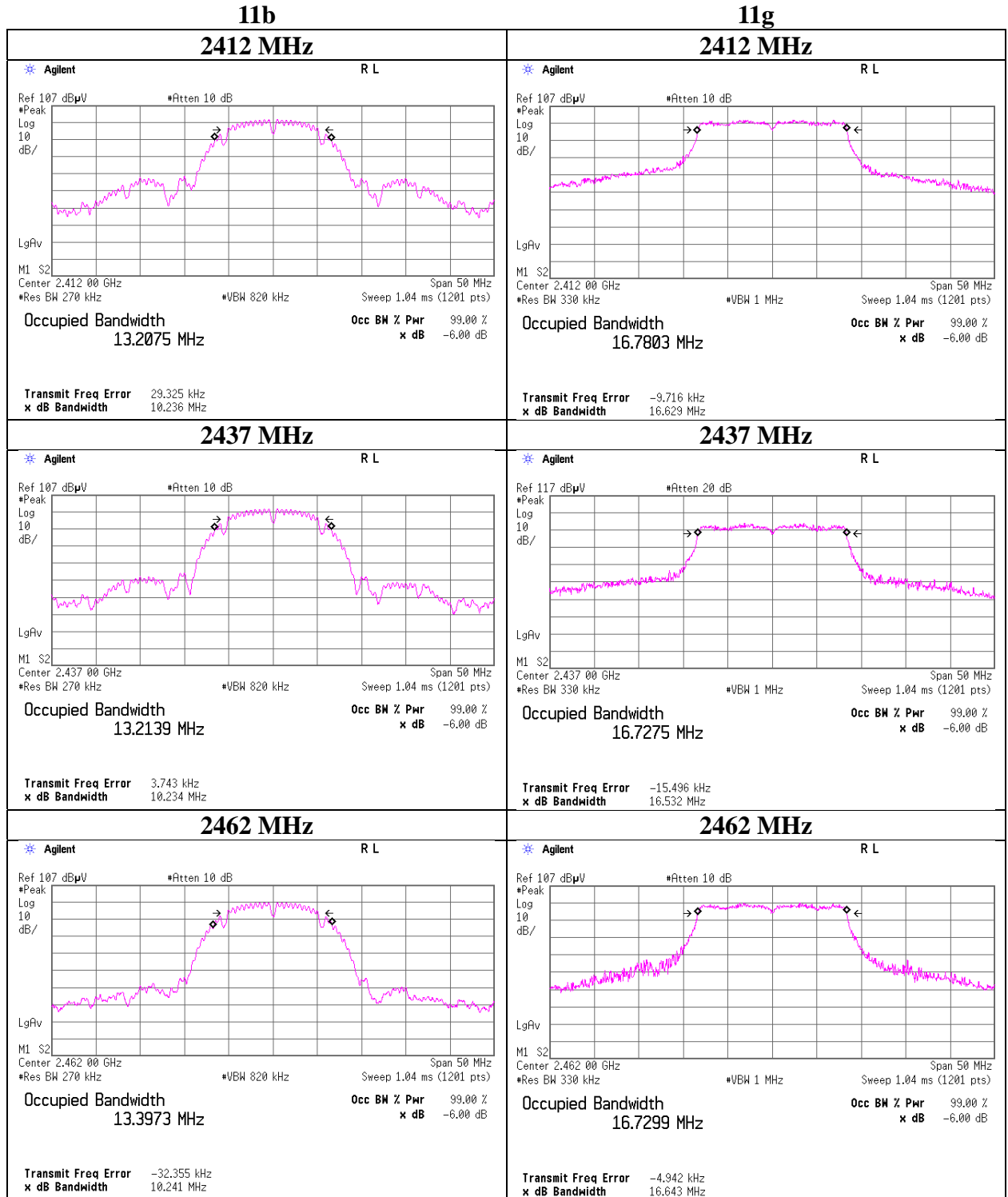
APPENDIX 1: Test data

6 dB Bandwidth and 99 % Occupied Bandwidth

Report No. 13385909S-B-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date June 18, 2020 July 1, 2020
Temperature / Humidity 25 deg. C / 50 % RH 24 deg. C / 62 % RH
Engineer Shiro Kobayashi Kazuya Noda
Mode Tx

Mode	Frequency [MHz]	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [MHz]
11b	2412	13207.5	10.106	> 0.5000
	2437	13213.9	10.106	> 0.5000
	2462	13397.3	10.119	> 0.5000
11g	2412	16780.3	16.501	> 0.5000
	2437	16727.5	16.515	> 0.5000
	2462	16729.9	16.494	> 0.5000
11n-20	2412	17864.3	17.714	> 0.5000
	2437	17829.7	17.698	> 0.5000
	2462	17786.2	17.701	> 0.5000
BT LE 1 M-PHY	2402	1040.4	0.710	> 0.5000
	2440	1042.3	0.706	> 0.5000
	2480	1039.7	0.722	> 0.5000
BT LE 2 M-PHY	2402	2065.5	1.230	> 0.5000
	2440	2074.5	1.199	> 0.5000
	2480	2078.6	1.208	> 0.5000

99 % Occupied Bandwidth



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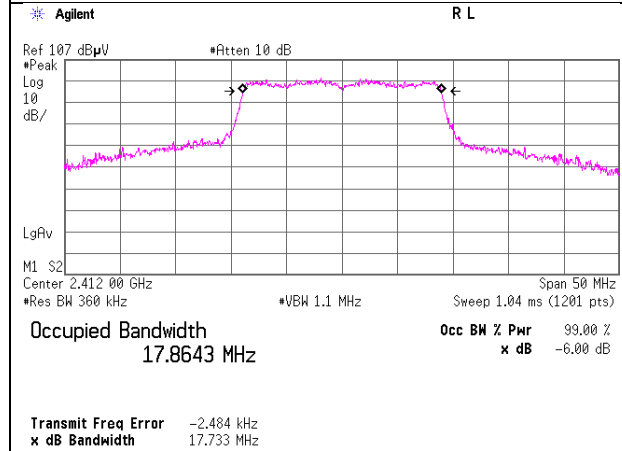
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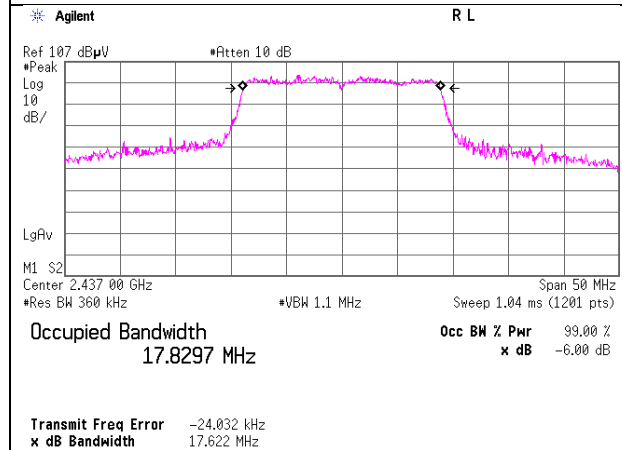
99 % Occupied Bandwidth

11n-20

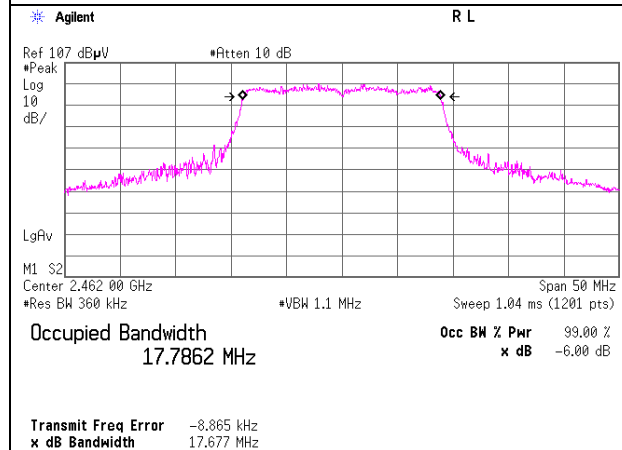
2412 MHz



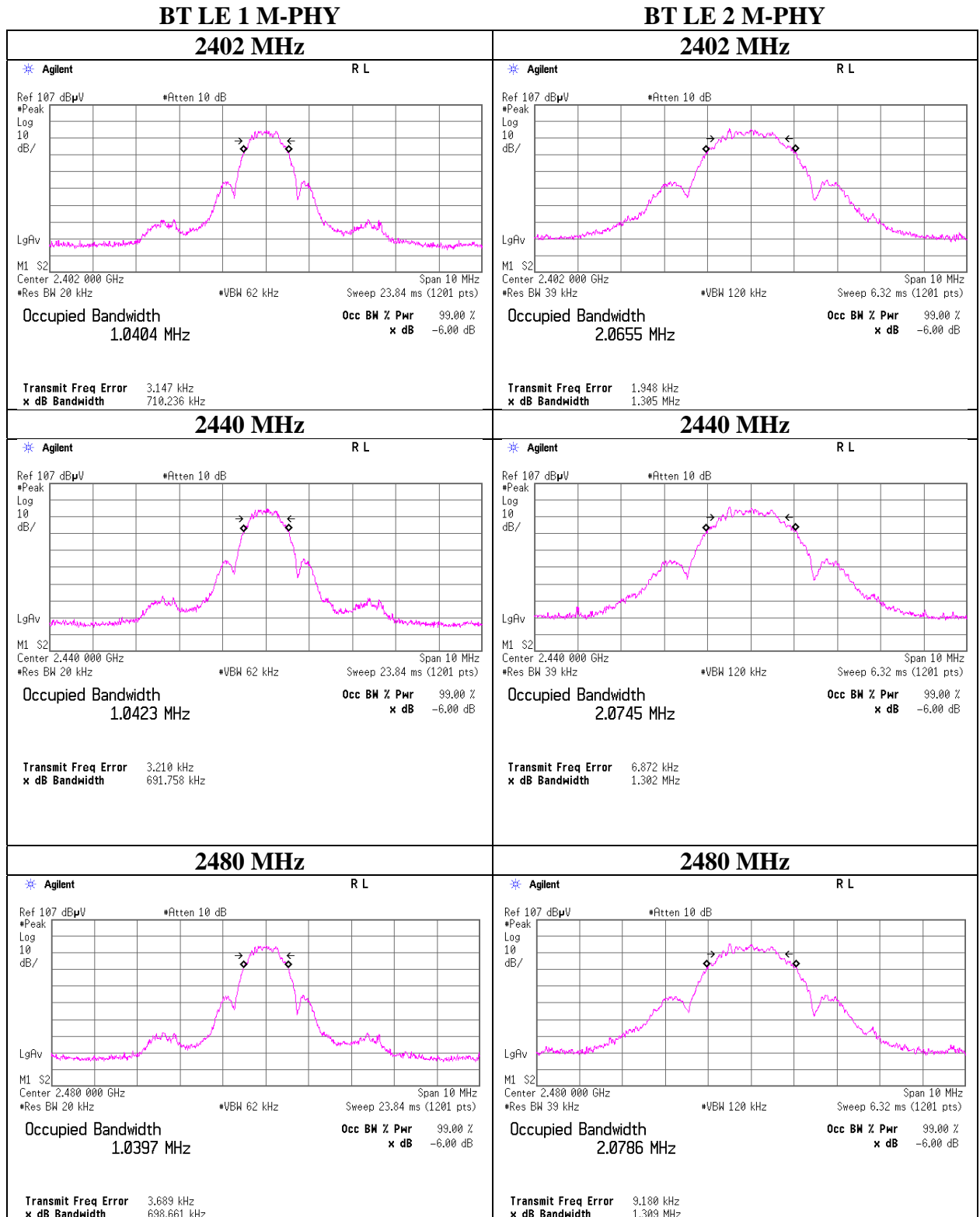
2437 MHz



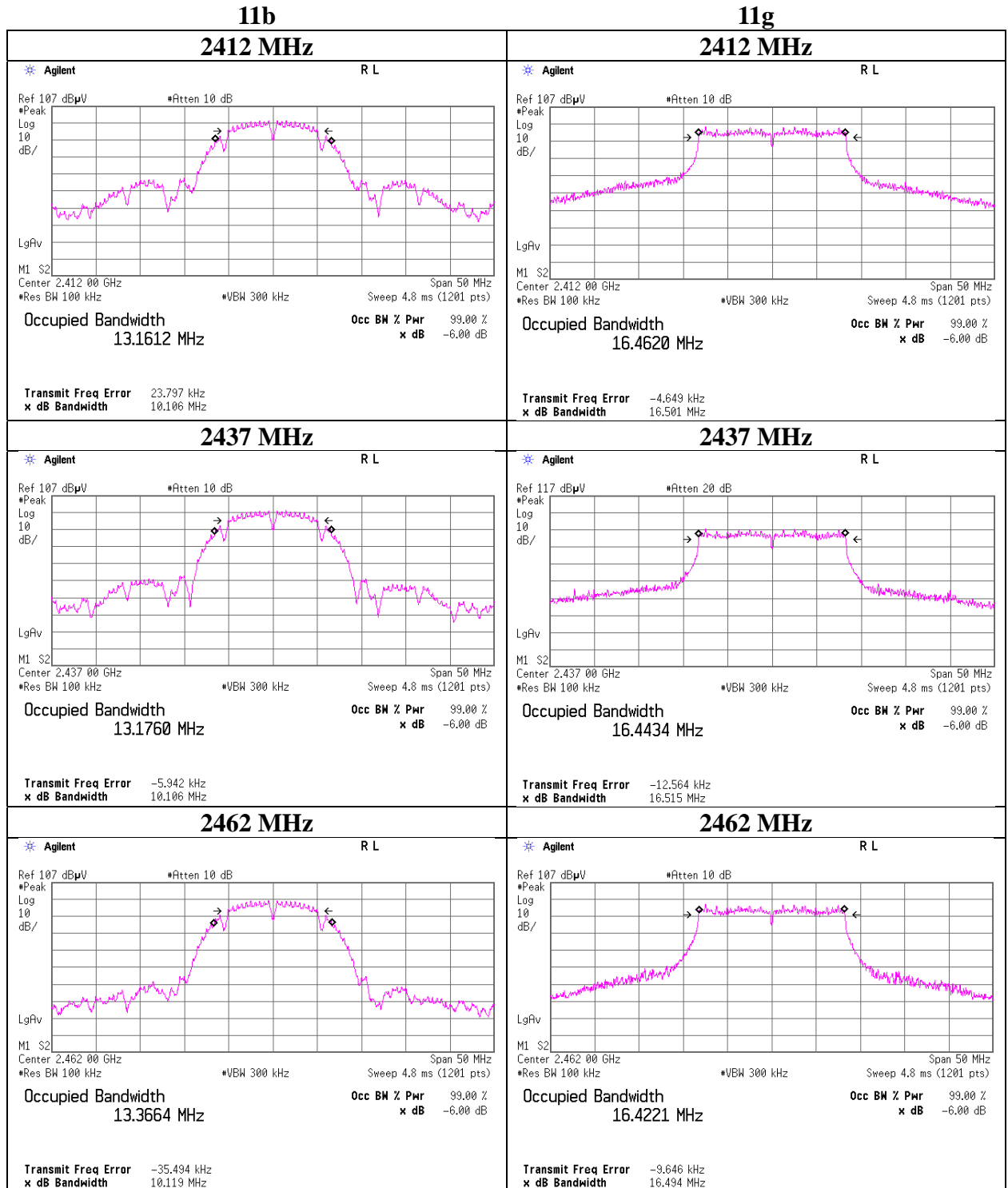
2462 MHz



99 % Occupied Bandwidth



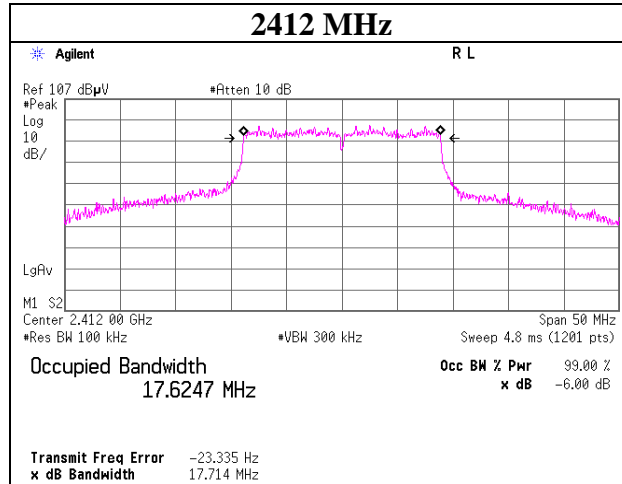
6 dB Bandwidth



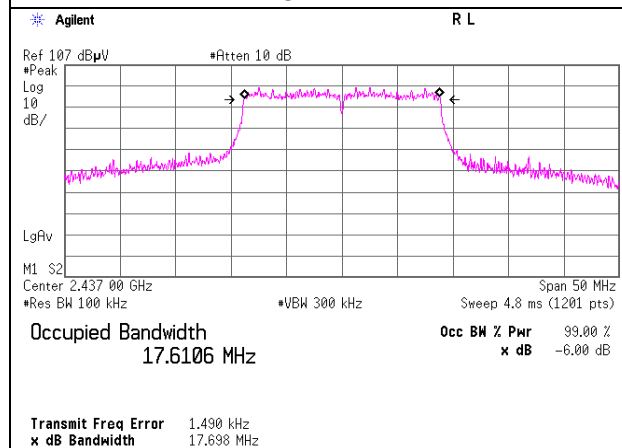
6 dB Bandwidth

11n-20

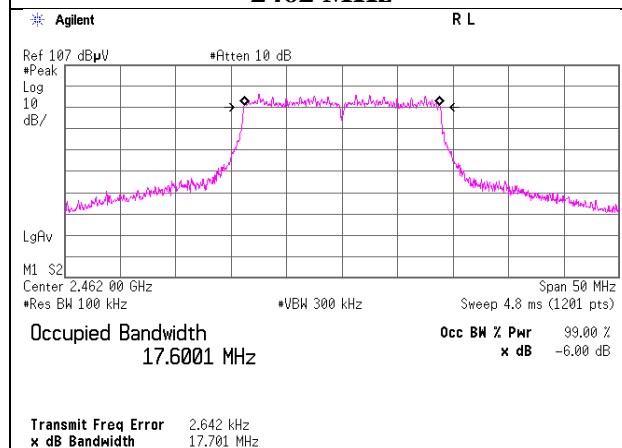
2412 MHz



2437 MHz



2462 MHz



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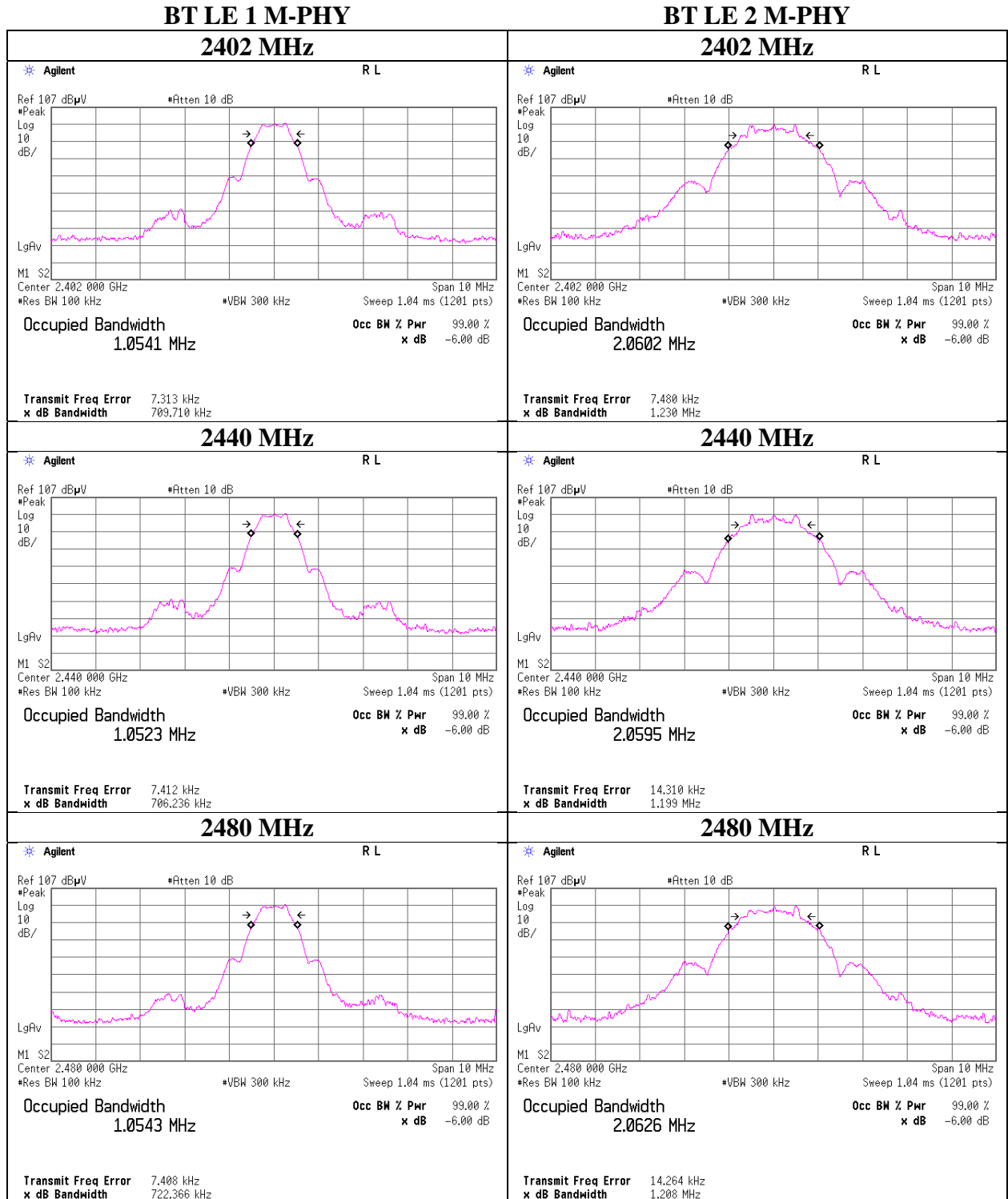
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6 dB Bandwidth



Maximum Peak Output Power

Report No. 13385909S-B-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date July 1, 2020
Temperature / Humidity 24 deg. C / 62 % RH
Engineer Kazuya Noda
Mode Tx 11b

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Conducted Power					e.i.r.p. for RSS-247					
				Result		Limit		Margin [dB]	Antenna Gain *1) [dBi]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]	[dBm]	[mW]	
2412	3.63	2.33	9.81	15.77	37.76	30.00	1000	14.23	4.04	19.81	95.72	36.02	4000	16.21
2437	3.55	2.33	9.82	15.70	37.15	30.00	1000	14.30	4.04	19.74	94.19	36.02	4000	16.28
2462	1.46	2.34	9.82	13.62	23.01	30.00	1000	16.38	4.04	17.66	58.34	36.02	4000	18.36

*1) Antenna Gain applied the higher of the two models.

Sample Calculation:

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

e.i.r.p. Result = Conducted Power Result + Antenna Gain

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

2437MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	3.55	*
2	3.53	
5.5	3.52	
11	3.54	

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

Maximum Peak Output Power

Report No. 13385909S-B-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date June 18, 2020 July 1, 2020
Temperature / Humidity 25 deg. C / 50 % RH 24 deg. C / 62 % RH
Engineer Shiro Kobayashi Kazuya Noda
Mode Tx 11g

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Conducted Power					e.i.r.p. for RSS-247					
				Result		Limit		Margin [dB]	Antenna Gain *1) [dBi]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]	[dBm]	[mW]	
2412	9.30	2.33	9.81	21.44	139.32	30.00	1000	8.56	4.04	25.48	353.18	36.02	4000	10.54
2437	9.47	2.33	9.82	21.62	145.21	30.00	1000	8.38	4.04	25.66	368.13	36.02	4000	10.36
2462	8.24	2.34	9.82	20.40	109.65	30.00	1000	9.60	4.04	24.44	277.97	36.02	4000	11.58

*1) Antenna Gain applied the higher of the two models.

Sample Calculation:

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

e.i.r.p. Result = Conducted Power Result + Antenna Gain

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

2437 MHz

Rate [Mbps]	Reading [dBm]	Remark
6	9.39	
9	9.38	
12	9.38	
18	9.40	
24	9.41	
36	9.39	
48	9.46	
54	9.47	*

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

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Maximum Peak Output Power

Report No. 13385909S-B-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date June 18, 2020 July 1, 2020
Temperature / Humidity 25 deg. C / 50 % RH 24 deg. C / 62 % RH
Engineer Shiro Kobayashi Kazuya Noda
Mode Tx 11n-20

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Conducted Power					e.i.r.p. for RSS-247					
				Result		Limit		Margin [dB]	Antenna Gain *1) [dBi]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]	[dBm]	[mW]	
2412	9.24	2.33	9.81	21.38	137.40	30.00	1000	8.62	4.04	25.42	348.34	36.02	4000	10.60
2437	9.26	2.33	9.82	21.41	138.36	30.00	1000	8.59	4.04	25.45	350.75	36.02	4000	10.57
2462	7.88	2.34	9.82	20.04	100.93	30.00	1000	9.96	4.04	24.08	255.86	36.02	4000	11.94

*1) Antenna Gain applied the higher of the two models.

Sample Calculation:

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

e.i.r.p. Result = Conducted Power Result + Antenna Gain

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

2437 MHz

MCS Number [MCS]	Reading [dBm]	Remark
0	9.15	
1	9.17	
2	9.20	
3	9.20	
4	9.21	
5	9.22	
6	9.25	
7	9.26	*

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

Maximum Peak Output Power

Report No. 13385909S-B-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date June 18, 2020
Temperature / Humidity 25 deg. C / 50 % RH
Engineer Shiro Kobayashi
Mode Tx BT LE

1 M-PHY				Conducted Power					e.i.r.p. for RSS-247					
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain *1) [dBi]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]	[dBm]	[mW]	
2402	-8.95	2.33	9.88	3.26	2.12	30.00	1000	26.74	2.08	5.34	3.42	36.02	4000	30.68
2440	-9.01	2.34	9.88	3.21	2.09	30.00	1000	26.79	2.08	5.29	3.38	36.02	4000	30.73
2480	-9.20	2.35	9.88	3.03	2.01	30.00	1000	26.97	2.08	5.11	3.24	36.02	4000	30.91

*1) Antenna Gain applied the higher of the two models.

Sample Calculation:

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

e.i.r.p. Result = Conducted Power Result + Antenna Gain

2440 MHz

Mode	Data rate [bps]	Reading [dBm]	Remark
1 M-PHY	1 M	-9.01	*
Coded-PHY(S=8)	125 k	-9.02	
Coded-PHY(S=2)	500 k	-9.04	

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

2 M-PHY				Conducted Power					e.i.r.p. for RSS-247					
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain *1) [dBi]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]	[dBm]	[mW]	
2402	-8.88	2.33	9.88	3.33	2.15	30.00	1000	26.67	2.08	5.41	3.48	36.02	4000	30.61
2440	-9.00	2.34	9.88	3.22	2.10	30.00	1000	26.78	2.08	5.30	3.39	36.02	4000	30.72
2480	-9.20	2.35	9.88	3.03	2.01	30.00	1000	26.97	2.08	5.11	3.24	36.02	4000	30.91

*1) Antenna Gain applied the higher of the two models.

Sample Calculation:

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

e.i.r.p. Result = Conducted Power Result + Antenna Gain

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

UL Japan, Inc.

Shonan EMC Lab.

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Telephone : +81 463 50 6400

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Average Output Power
(Reference data for RF Exposure)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date June 18, 2020 July 1, 2020
Temperature / Humidity 25 deg. C / 50 % RH 24 deg. C / 62 % RH
Engineer Shiro Kobayashi Kazuya Noda
Mode Tx

11b 1 Mbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2412	0.53	2.33	9.81	12.67	18.49	0.05	12.72	18.71
2437	0.56	2.33	9.82	12.71	18.66	0.05	12.76	18.88
2462	-1.38	2.34	9.82	10.78	11.97	0.05	10.83	12.11

11g 54 Mbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2412	-2.73	2.33	9.81	9.41	8.73	1.91	11.32	13.55
2437	-0.89	2.33	9.82	11.26	13.37	1.91	13.17	20.75
2462	-4.38	2.34	9.82	7.78	6.00	1.91	9.69	9.31

11n-20 MCS 7

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2412	-3.90	2.33	9.81	8.24	6.67	2.03	10.27	10.64
2437	-2.08	2.33	9.82	10.07	10.16	2.03	12.10	16.22
2462	-5.36	2.34	9.82	6.80	4.79	2.03	8.83	7.64

BT LE 1 M-PHY

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2402	-9.99	2.33	9.88	2.22	1.67	0.68	2.90	1.95
2440	-9.99	2.34	9.88	2.23	1.67	0.68	2.91	1.95
2480	-10.23	2.35	9.88	2.00	1.58	0.68	2.68	1.85

BT LE 2 M-PHY

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2402	-12.95	2.33	9.88	-0.74	0.84	3.63	2.89	1.95
2440	-12.98	2.34	9.88	-0.76	0.84	3.63	2.87	1.94
2480	-13.20	2.35	9.88	-0.97	0.80	3.63	2.66	1.85

Sample Calculation:

Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuat
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. 13385909S-B-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date June 18, 2020 July 1, 2020
Temperature / Humidity 25 deg. C / 50 % RH 24 deg. C / 62 % RH
Engineer Shiro Kobayashi Kazuya Noda
Mode Tx

2437 MHz

Mode	Rate [Mbps]	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11b	1	0.56	0.05	0.61	*
	2	0.50	0.10	0.60	
	5.5	0.28	0.27	0.55	
	11	0.11	0.48	0.59	
11g	6	0.52	0.29	0.81	
	9	0.38	0.43	0.81	
	12	0.26	0.57	0.83	
	18	0.07	0.81	0.88	
	24	-0.13	1.03	0.90	
	36	-0.49	1.42	0.93	
	48	-0.82	1.78	0.96	
	54	-0.89	1.91	1.02	

Mode	MCS Number [MCS]	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-20	0	-0.67	0.32	-0.35	
	1	-0.92	0.60	-0.32	
	2	-1.05	0.85	-0.20	
	3	-1.27	1.06	-0.21	
	4	-1.61	1.45	-0.16	
	5	-1.87	1.76	-0.11	
	6	-1.97	1.88	-0.09	
	7	-2.08	2.03	-0.05	

BT LE, 2440 MHz

Mode	Data rate [bps]	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
1 M-PHY	1 M	-9.99	0.68	-9.31	*
Coded-PHY(S=8)	125 k	-10.01	0.69	-9.32	
Coded-PHY(S=2)	500 k	-9.72	0.39	-9.33	

* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

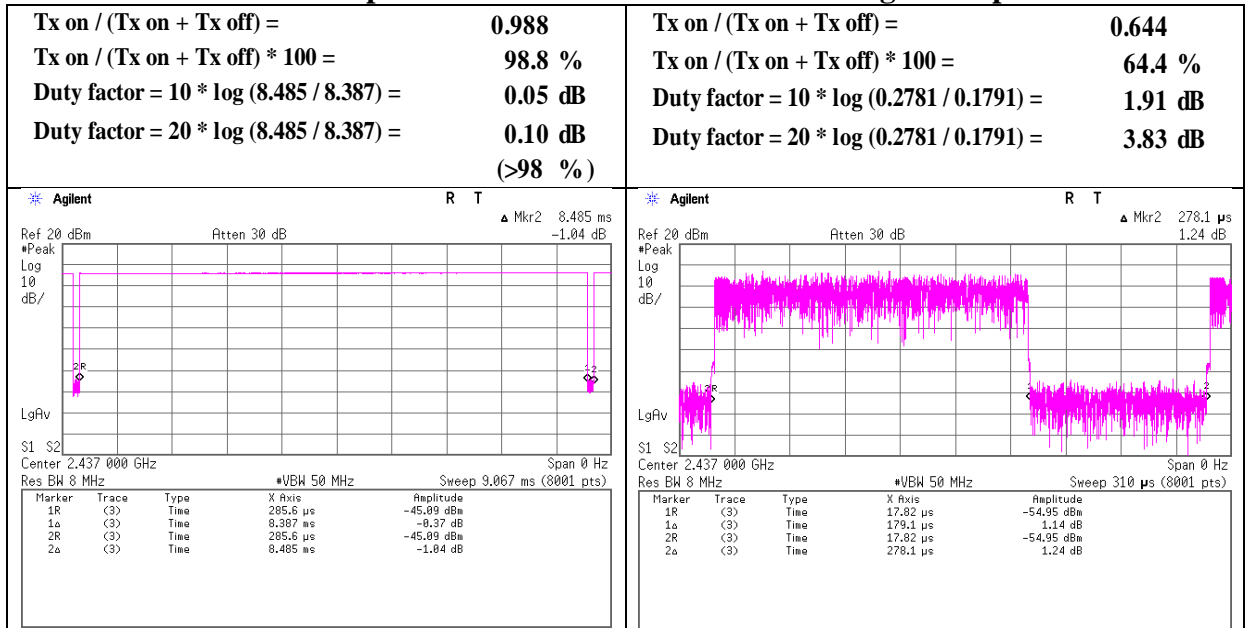
All comparison were carried out on same frequency and measurement factors.

Burst rate confirmation

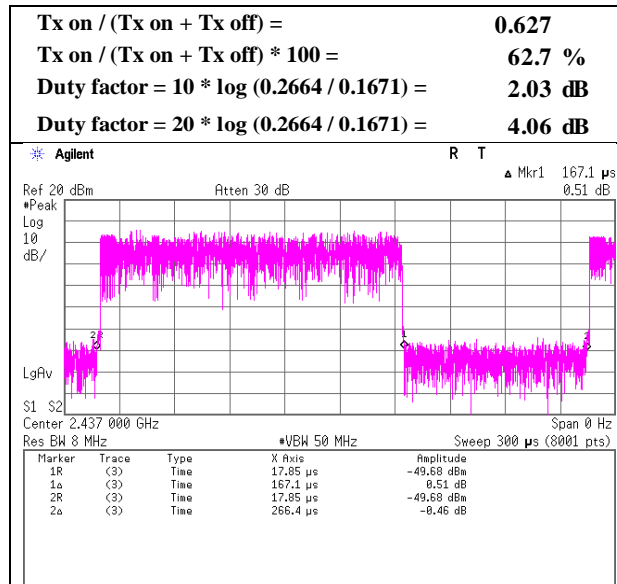
Report No. 13385909S-B-R2
 Test place Shonan EMC Lab. No.5 Shielded Room
 Date June 18, 2020
 Temperature / Humidity 25 deg. C / 50 % RH
 Engineer Shiro Kobayashi
 Mode Tx

11b 1 Mbps

11g 54 Mbps



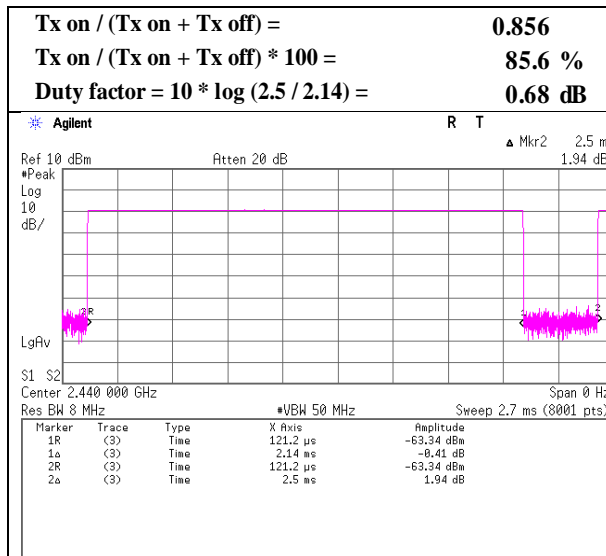
11n-20 MCS 7



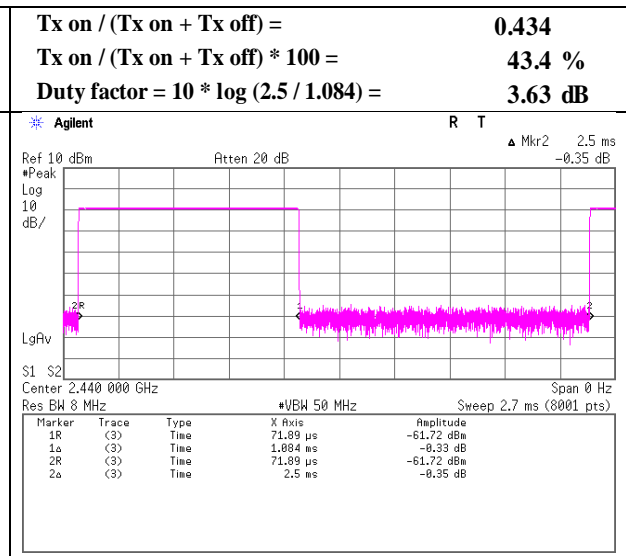
Burst rate confirmation

Report No.	13385909S-B-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	June 18, 2020
Temperature / Humidity	25 deg. C / 50 % RH
Engineer	Shiro Kobayashi
Mode	Tx

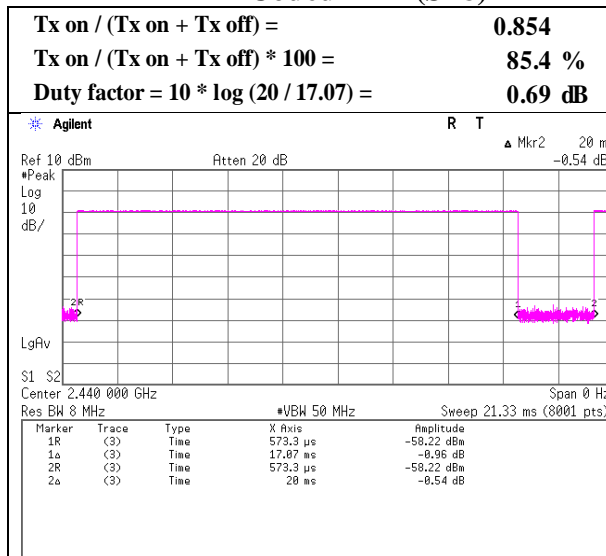
BT LE 1 M-PHY



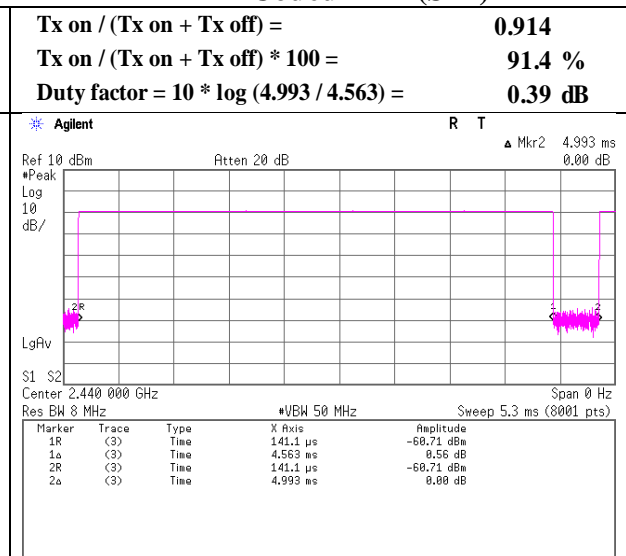
BT LE 2 M-PHY



BT LE Coded-PHY(S=8)



BT LE Coded-PHY(S=2)

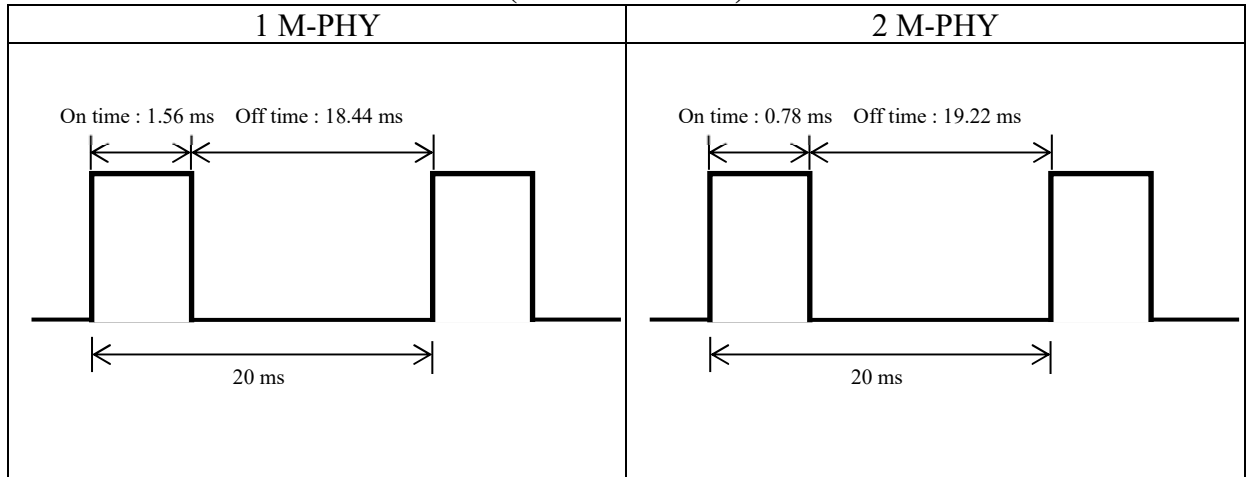


- * Since the burst rate is not different between the channels, the data has been obtained on the representative channel.
- * The above chart is obtained with the Maximum Packet Size set that can be by test software, and it is different from the maximum duty cycle of the product.

Duty cycle correction factor

The information provided from the applicant.

(Reference chart)



**(for Duty cycle correction factor for Radiated Spurious Emission)
Worst 100 ms case**

1 M-PHY	2 M-PHY
$DCCF = 20 \log(1.56 \times 5 / 100) = -22.15 \text{ dB}$	$DCCF = 20 \log(0.78 \times 5 / 100) = -28.17 \text{ dB}$

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

*Worst TX Duty cycle BLE is Advertising mode.

The actual measurement value was applied as Duty Cycle Correction factor.

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3 3 3 3
Date July 2, 2020 July 3, 2020 July 24, 2020 July 26, 2020
Temperature / Humidity 23 deg. C / 56 % RH 22 deg. C / 69 % RH 23 deg. C / 60 % RH 23 deg. C / 69 % RH
Engineer Hiromasa Sato Hiromasa Sato Hiromasa Sato Takahiro Suzuki
(1 GHz - 2.8 GHz) (2.8 GHz - 13 GHz) (13 GHz - 18 GHz) (18 GHz - 26.5 GHz)
Mode Tx 11b 2412 MHz
EUT Hi type(14 inch Display)

(* 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.	2390.000	PK	49.37	28.41	14.23	41.66	2.13	52.48	73.9	21.4	184	6	
Hori.	4824.000	PK	49.03	31.61	6.83	42.93	2.13	46.67	73.9	27.2	105	278	
Hori.	7236.000	PK	48.00	37.62	8.39	43.41	2.13	52.73	73.9	21.1	100	0	
Hori.	2386.510	AV	40.03	28.42	14.22	41.66	2.13	43.14	53.9	10.7	184	6	
Hori.	2390.000	AV	38.53	28.41	14.23	41.66	2.13	41.64	53.9	12.2	184	6	
Hori.	4824.000	AV	40.28	31.61	6.83	42.93	2.13	37.92	53.9	15.9	105	278	
Hori.	7236.000	AV	39.06	37.62	8.39	43.41	2.13	43.79	53.9	10.1	100	0	Floor noise
Vert.	2390.000	PK	47.78	28.41	14.23	41.66	2.13	50.89	73.9	23.0	104	232	
Vert.	4824.000	PK	49.08	31.61	6.83	42.93	2.13	46.72	73.9	27.1	144	3	
Vert.	7236.000	PK	48.44	37.62	8.39	43.41	2.13	53.17	73.9	20.7	100	0	
Vert.	2386.360	AV	39.64	28.42	14.22	41.66	2.13	42.75	53.9	11.1	104	232	
Vert.	2390.000	AV	38.63	28.41	14.23	41.66	2.13	41.74	53.9	12.1	104	232	
Vert.	4824.000	AV	40.29	31.61	6.83	42.93	2.13	37.93	53.9	15.9	144	3	
Vert.	7236.000	AV	39.03	37.62	8.39	43.41	2.13	43.76	53.9	10.1	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

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.	2412.000	PK	94.57	28.37	14.24	41.67	2.13	97.64	-	-	Carrier
Hori.	2399.454	PK	42.05	28.38	14.23	41.67	2.13	45.12	77.64	32.5	
Hori.	2400.000	PK	40.26	28.38	14.23	41.67	2.13	43.33	77.64	34.3	
Vert.	2412.000	PK	94.04	28.37	14.24	41.67	2.13	97.11	-	-	Carrier
Vert.	2399.517	PK	42.84	28.38	14.23	41.67	2.13	45.91	77.11	31.2	
Vert.	2400.000	PK	41.11	28.38	14.23	41.67	2.13	44.18	77.11	32.9	

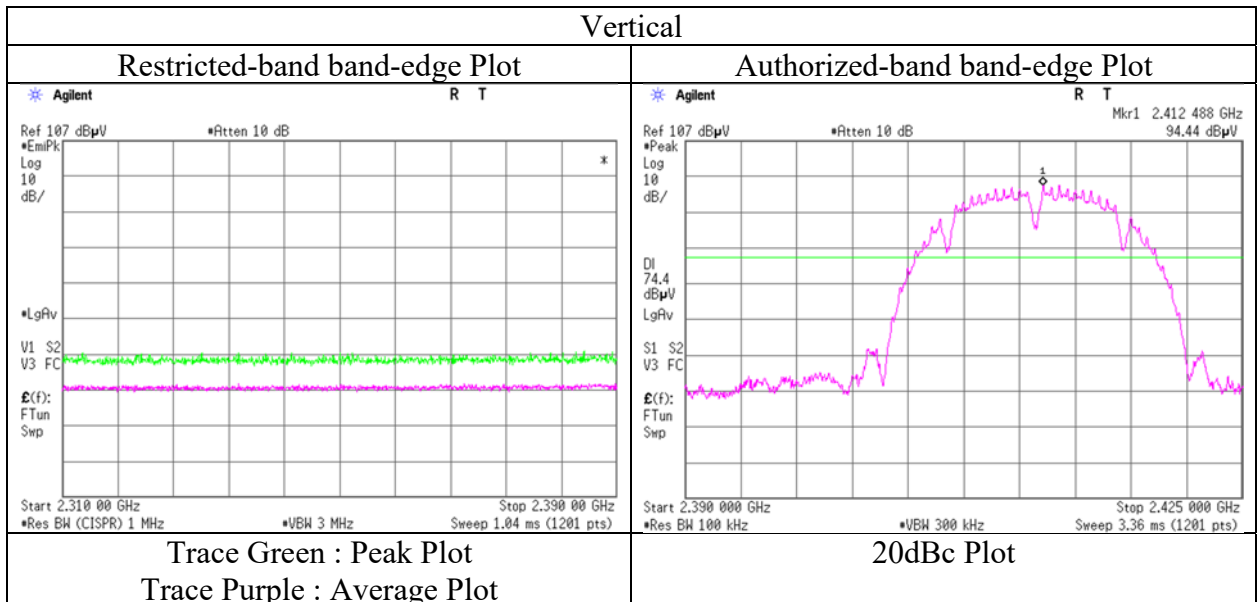
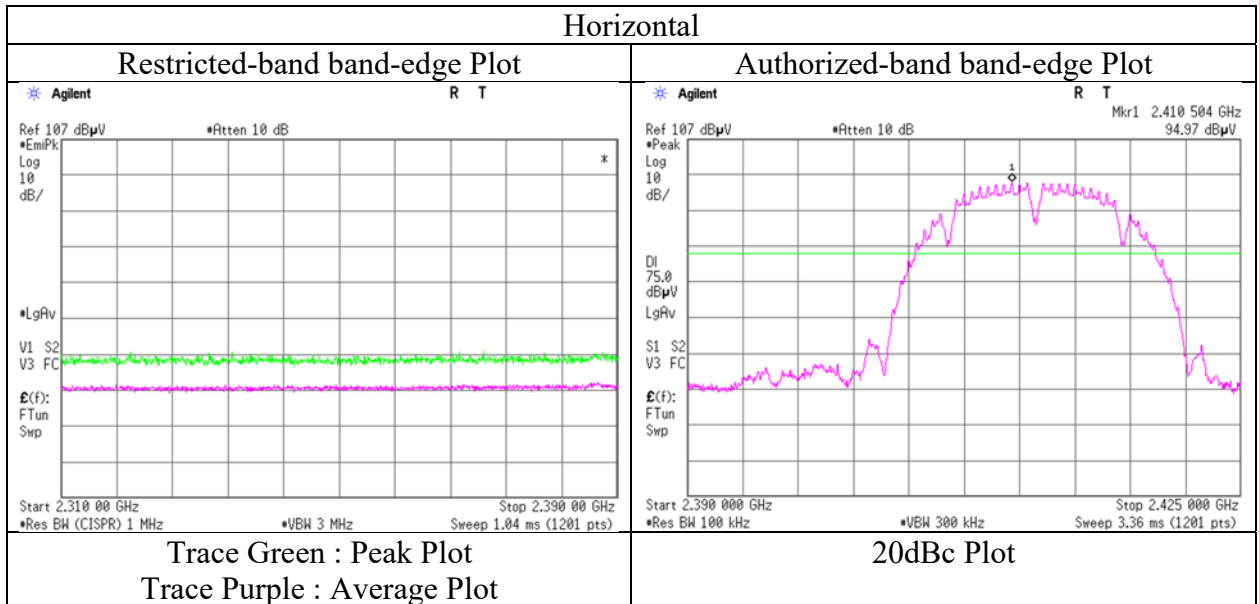
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 2, 2020
Temperature / Humidity 23 deg. C / 56 % RH
Engineer Hiromasa Sato
Mode Tx 11b 2412 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 2, 2020	July 4, 2020	July 24, 2020	July 26, 2020
Temperature / Humidity	23 deg. C / 56 % RH	23 deg. C / 60 % RH	23 deg. C / 60 % RH	23 deg. C / 69 % RH
Engineer	Hiromasa Sato	Makoto Hosaka	Hiromasa Sato	Takahiro Suzuki
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11b 2437 MHz			
EUT	Hi type(14 inch Display)			

(* 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.	4874.000	PK	49.39	31.63	6.87	42.93	2.13	47.09	73.9	26.8	107	277	
Hori.	7311.000	PK	48.45	37.69	8.43	43.48	2.13	53.22	73.9	20.6	100	0	
Hori.	4874.000	AV	40.03	31.63	6.87	42.93	2.13	37.73	53.9	16.1	107	277	
Hori.	7311.000	AV	38.31	37.69	8.43	43.48	2.13	43.08	53.9	10.8	100	0	Floor noise
Vert.	4874.000	PK	49.23	31.63	6.87	42.93	2.13	46.93	73.9	26.9	156	317	
Vert.	7311.000	PK	48.60	37.69	8.43	43.48	2.13	53.37	73.9	20.5	100	0	
Vert.	4874.000	AV	40.11	31.63	6.87	42.93	2.13	37.81	53.9	16.0	156	317	
Vert.	7311.000	AV	38.22	37.69	8.43	43.48	2.13	42.99	53.9	10.9	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

UL Japan, Inc.

Shonan EMC Lab.

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

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Facsimile : +81 463 50 6401

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 2, 2020	July 4, 2020	July 24, 2020	July 26, 2020
Temperature / Humidity	23 deg. C / 56 % RH	23 deg. C / 60 % RH	23 deg. C / 60 % RH	23 deg. C / 69 % RH
Engineer	Hiromasa Sato	Makoto Hosaka	Hiromasa Sato	Takahiro Suzuki
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11b 2462 MHz			
EUT	Hi type(14 inch Display)			

(* 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.	2483.500	PK	48.36	28.28	14.32	41.69	2.13	51.40	73.9	22.5	271	8	
Hori.	4924.000	PK	48.78	31.68	6.91	42.94	2.13	46.56	73.9	27.3	160	141	
Hori.	7386.000	PK	48.63	37.81	8.48	43.55	2.13	53.50	73.9	20.4	100	0	
Hori.	2483.500	AV	38.64	28.28	14.32	41.69	2.13	41.68	53.9	12.2	271	8	
Hori.	4924.000	AV	39.05	31.68	6.91	42.94	2.13	36.83	53.9	17.0	160	141	
Hori.	7386.000	AV	38.40	37.81	8.48	43.55	2.13	43.27	53.9	10.6	100	0	Floor noise
Vert.	2483.500	PK	48.45	28.28	14.32	41.69	2.13	51.49	73.9	22.4	128	297	
Vert.	4924.000	PK	48.75	31.68	6.91	42.94	2.13	46.53	73.9	27.3	133	1	
Vert.	7386.000	PK	48.36	37.81	8.48	43.55	2.13	53.23	73.9	20.6	100	0	
Vert.	2483.500	AV	38.76	28.28	14.32	41.69	2.13	41.80	53.9	12.1	128	297	
Vert.	4924.000	AV	38.47	31.68	6.91	42.94	2.13	36.25	53.9	17.6	133	1	
Vert.	7386.000	AV	38.42	37.81	8.48	43.55	2.13	43.29	53.9	10.6	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

UL Japan, Inc.

Shonan EMC Lab.

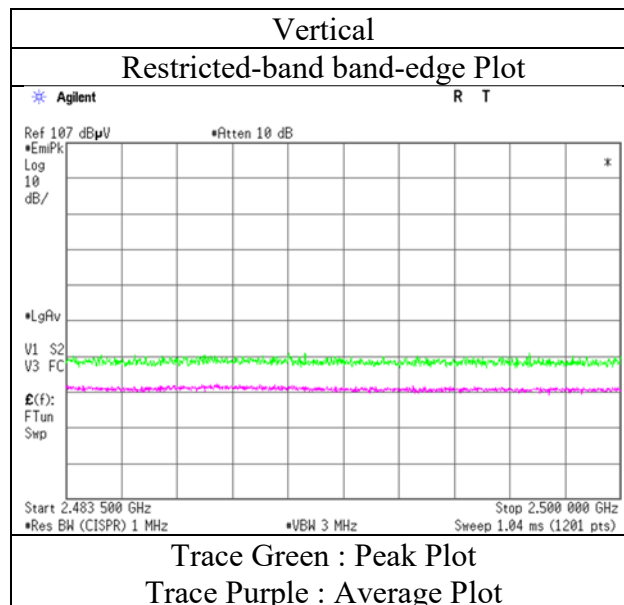
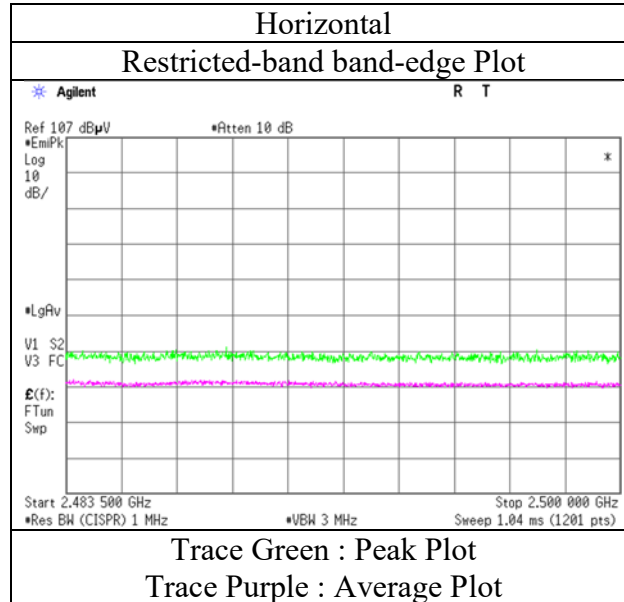
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 2, 2020
Temperature / Humidity 23 deg. C / 56 % RH
Engineer Hiromasa Sato
Mode Tx 11b 2462 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 2, 2020	July 4, 2020	July 24, 2020	July 26, 2020
Temperature / Humidity	23 deg. C / 56 % RH	23 deg. C / 60 % RH	23 deg. C / 60 % RH	23 deg. C / 69 % RH
Engineer	Hirosasa Sato	Makoto Hosaka	Hirosasa Sato	Takahiro Suzuki
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11g 2412 MHz			
EUT	Hi type(14 inch Display)			

(* 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.	2388.430	PK	58.49	28.41	14.23	41.66	2.13	61.60	73.9	12.3	216	8	
Hori.	2390.000	PK	59.72	28.41	14.23	41.66	2.13	62.83	73.9	11.0	216	8	
Hori.	4824.000	PK	48.93	31.61	6.83	42.93	2.13	46.57	73.9	27.3	120	309	
Hori.	7236.000	PK	49.82	37.62	8.39	43.41	2.13	54.55	73.9	19.3	100	0	
Hori.	7236.000	AV	37.71	37.62	8.39	43.41	2.13	42.44	53.9	11.4	100	0	Floor noise
Vert.	2376.754	PK	49.70	28.44	14.22	41.66	2.13	52.83	73.9	21.0	107	260	
Vert.	2390.000	PK	56.71	28.41	14.23	41.66	2.13	59.82	73.9	14.0	107	260	
Vert.	4824.000	PK	49.18	31.61	6.83	42.93	2.13	46.82	73.9	27.0	148	5	
Vert.	7236.000	PK	49.12	37.62	8.39	43.41	2.13	53.85	73.9	20.0	100	0	
Vert.	7236.000	AV	38.51	37.62	8.39	43.41	2.13	43.24	53.9	10.6	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2388.430	AV	39.51	28.41	14.23	41.66	3.83	2.13	46.45	53.9	7.4	
Hori.	2390.000	AV	40.36	28.41	14.23	41.66	3.83	2.13	47.30	53.9	6.6	*1)
Hori.	4824.000	AV	38.55	31.61	6.83	42.93	3.83	2.13	40.02	53.9	13.8	
Vert.	2376.754	AV	38.59	28.44	14.22	41.66	3.83	2.13	45.55	53.9	8.3	
Vert.	2390.000	AV	39.47	28.41	14.23	41.66	3.83	2.13	46.41	53.9	7.4	*1)
Vert.	4824.000	AV	38.44	31.61	6.83	42.93	3.83	2.13	39.91	53.9	13.9	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

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.	2412.000	PK	91.12	28.37	14.24	41.67	2.13	94.19	-	-	Carrier
Hori.	2400.000	PK	53.05	28.38	14.23	41.67	2.13	56.12	74.19	18.0	
Vert.	2412.000	PK	90.92	28.37	14.24	41.67	2.13	93.99	-	-	Carrier
Vert.	2400.000	PK	52.21	28.38	14.23	41.67	2.13	55.28	73.99	18.7	

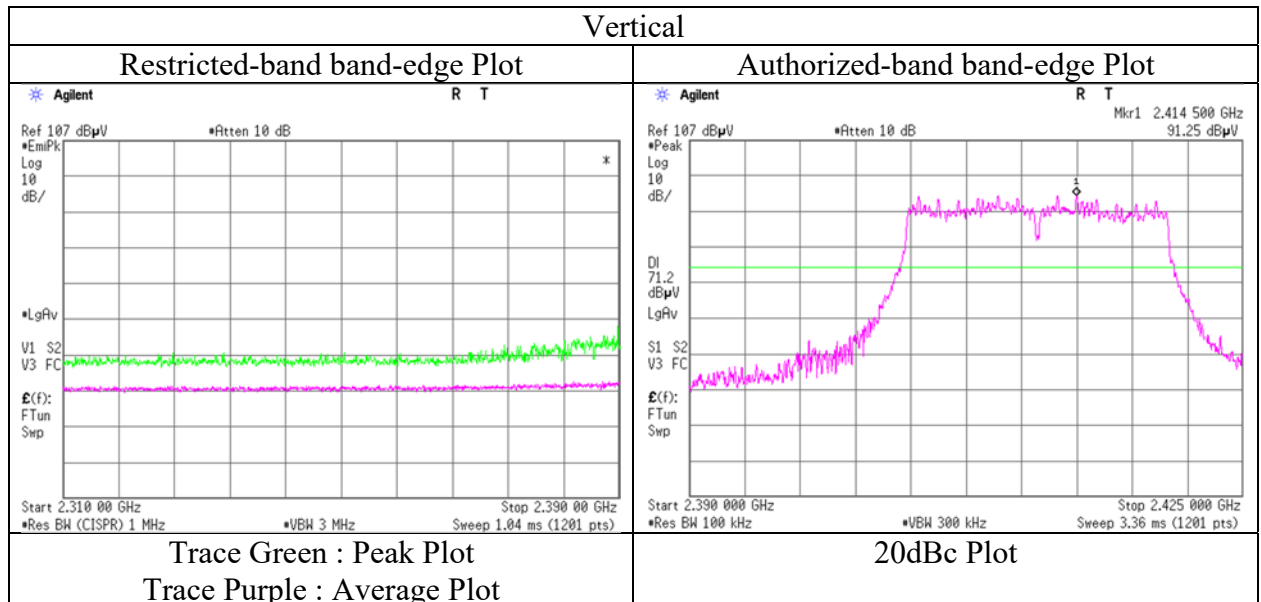
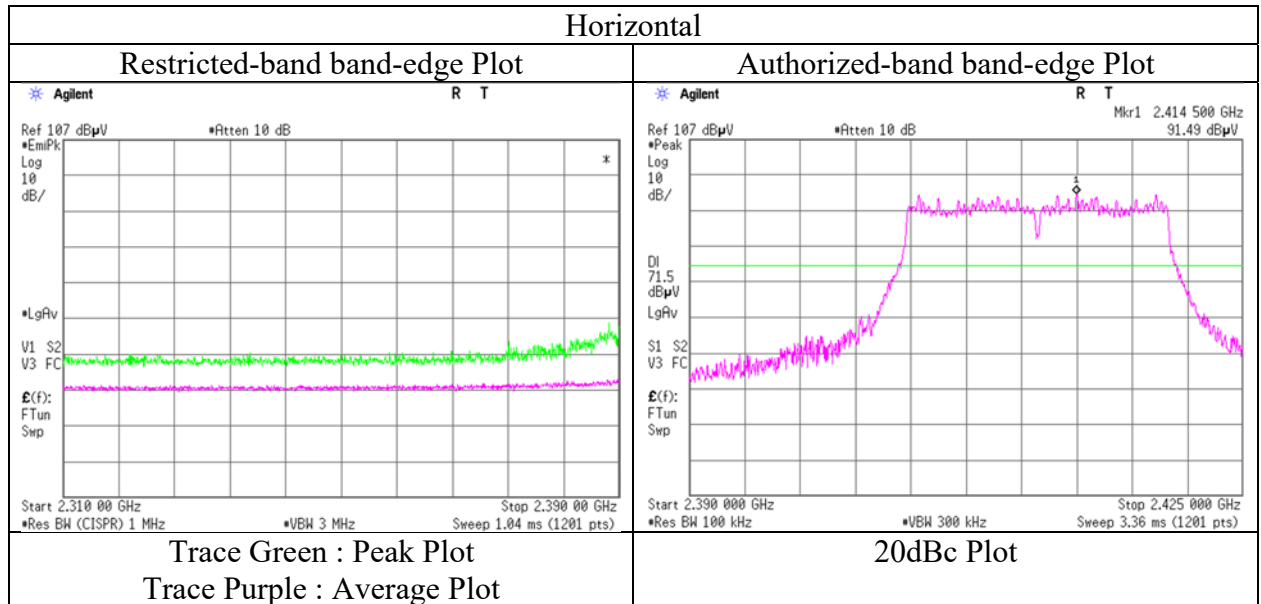
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 2, 2020
Temperature / Humidity 23 deg. C / 56 % RH
Engineer Hiromasa Sato
Mode Tx 11g 2412 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 2, 2020
Temperature / Humidity 23 deg. C / 56 % RH
Engineer Hiromasa Sato
(1 GHz - 2.8 GHz)
Mode Tx 11g 2417 MHz
EUT Hi type(14 inch Display)

(* 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.	2389.267	PK	59.48	28.41	14.23	41.66	2.13	62.59	73.9	11.3	327	58	-
Hori.	2390.000	PK	61.13	28.41	14.23	41.66	2.13	64.24	73.9	9.6	327	58	
Vert.	2389.267	PK	59.88	28.41	14.23	41.66	2.13	62.99	73.9	10.9	145	305	
Vert.	2390.000	PK	60.15	28.41	14.23	41.66	2.13	63.26	73.9	10.6	145	305	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2389.267	AV	40.38	28.41	14.23	41.66	3.83	2.13	47.32	53.9	6.5	
Hori.	2390.000	AV	40.13	28.41	14.23	41.66	3.83	2.13	47.07	53.9	6.8	*1)
Vert.	2389.267	AV	39.68	28.41	14.23	41.66	3.83	2.13	46.62	53.9	7.2	
Vert.	2390.000	AV	40.38	28.41	14.23	41.66	3.83	2.13	47.32	53.9	6.5	*1)

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

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.	2417.000	PK	94.78	28.36	14.26	41.67	2.13	97.86	-	-	Carrier
Hori.	2400.000	PK	52.90	28.38	14.23	41.67	2.13	55.97	77.86	21.8	
Vert.	2417.000	PK	94.57	28.36	14.26	41.67	2.13	97.65	-	-	Carrier
Vert.	2400.000	PK	51.02	28.38	14.23	41.67	2.13	54.09	77.65	23.5	

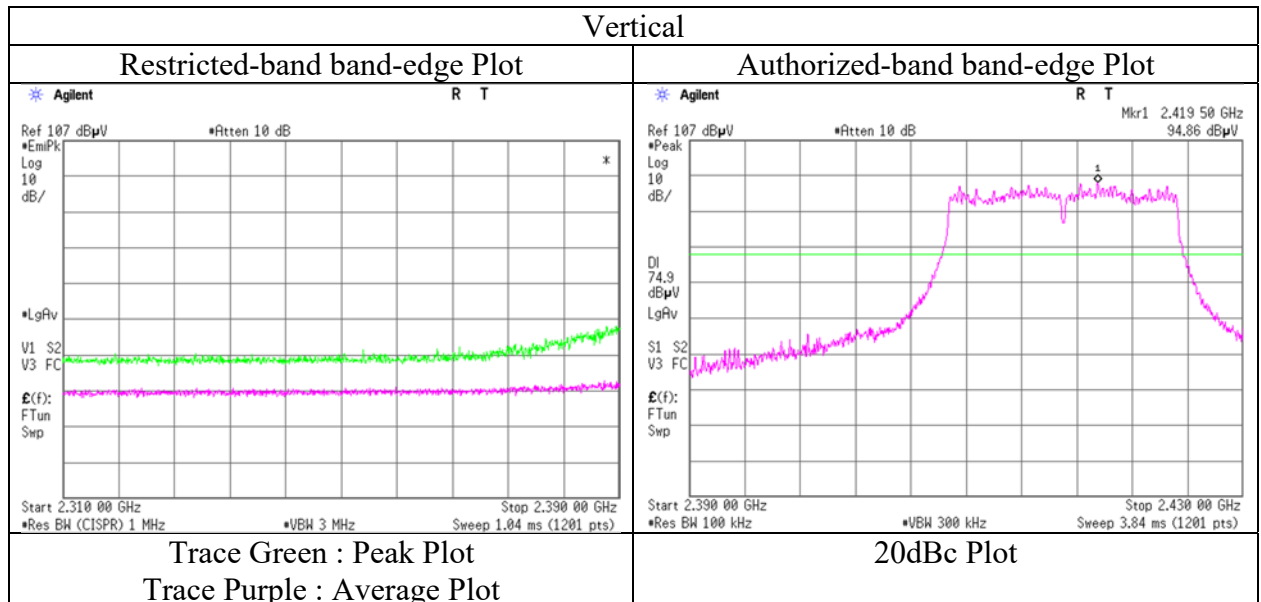
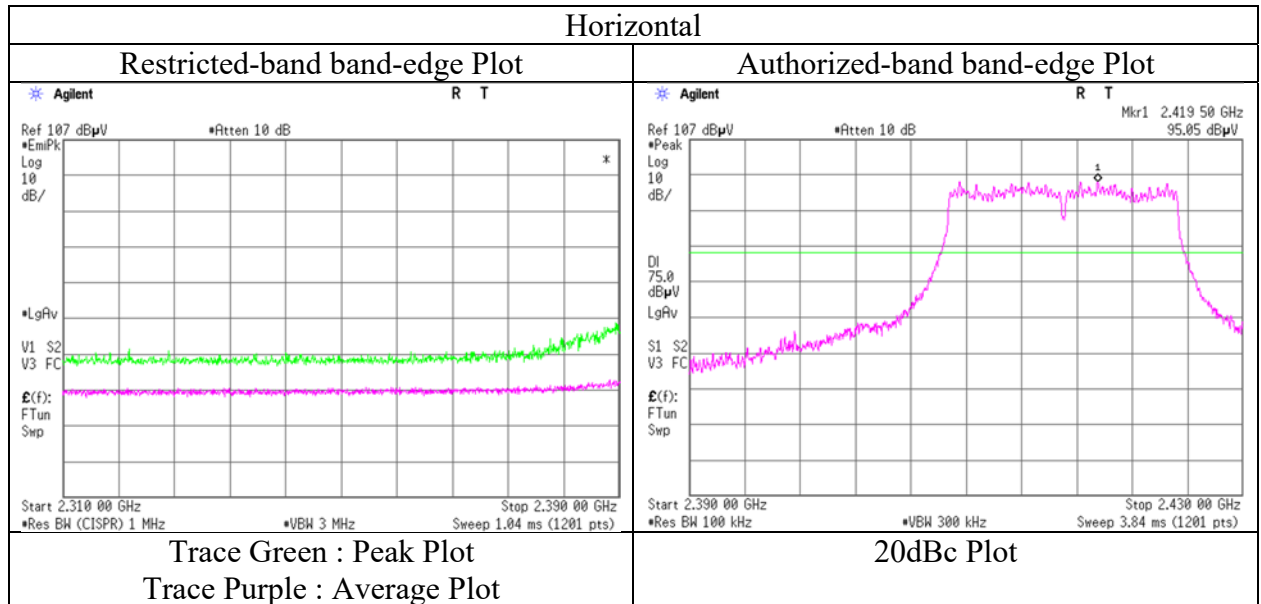
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 2, 2020
Temperature / Humidity 23 deg. C / 56 % RH
Engineer Hiromasa Sato
Mode Tx 11g 2417 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	July 27, 2020	July 2, 2020	July 4, 2020
Temperature / Humidity	23 deg. C / 65 % RH	23 deg. C / 56 % RH	23 deg. C / 60 % RH
Engineer	Yusuke Tanikawara (30 MHz - 1 GHz)	Hiromasa Sato (1 GHz - 2.8 GHz)	Makoto Hosaka (2.8 GHz - 13 GHz)
Semi Anechoic Chamber	3	3	
Date	July 24, 2020	July 26, 2020	
Temperature / Humidity	23 deg. C / 60 % RH	23 deg. C / 69 % RH	
Engineer	Hiromasa Sato (13 GHz - 18 GHz)	Takahiro Suzuki (18 GHz - 26.5 GHz)	
Mode	Tx 11g 2437 MHz		
EUT	Hi type(14 inch Display)		

(* 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.	250.402	QP	40.50	11.78	8.26	31.98	0.00	28.56	46.0	17.4	136	146	
Hori.	391.706	QP	33.40	15.47	8.96	31.93	0.00	25.90	46.0	20.1	100	141	
Hori.	580.294	QP	36.40	18.76	9.73	31.96	0.00	32.93	46.0	13.0	165	187	
Hori.	592.197	QP	36.30	19.14	9.77	31.95	0.00	33.26	46.0	12.7	145	210	
Hori.	768.976	QP	35.60	20.43	10.40	31.70	0.00	34.73	46.0	11.2	115	195	
Hori.	828.052	QP	34.20	21.01	10.59	31.47	0.00	34.33	46.0	11.6	102	223	
Hori.	839.981	QP	33.60	21.22	10.63	31.38	0.00	34.07	46.0	11.9	183	224	
Hori.	4874.000	PK	48.81	31.63	6.87	42.93	2.13	46.51	73.9	27.3	108	45	
Hori.	7311.000	PK	47.87	37.69	8.43	43.48	2.13	52.64	73.9	21.2	100	0	
Hori.	7311.000	AV	38.68	37.69	8.43	43.48	2.13	43.45	53.9	10.4	100	0	Floor noise
Vert.	130.566	QP	36.10	13.92	7.39	32.10	0.00	25.31	43.5	18.1	100	175	
Vert.	913.977	QP	33.80	22.13	10.86	30.94	0.00	35.85	46.0	10.1	100	185	
Vert.	4874.000	PK	48.68	31.63	6.87	42.93	2.13	46.38	73.9	27.5	145	6	
Vert.	7311.000	PK	48.45	37.69	8.43	43.48	2.13	53.22	73.9	20.6	100	0	
Vert.	7311.000	AV	38.24	37.69	8.43	43.48	2.13	43.01	53.9	10.8	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	37.16	31.63	6.87	42.93	3.83	2.13	38.69	53.9	15.2	
Vert.	4874.000	AV	38.68	31.63	6.87	42.93	3.83	2.13	40.21	53.9	13.6	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Duty factor refer to "Duty factor Calculation chart" sheet.

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 2, 2020
Temperature / Humidity 23 deg. C / 56 % RH
Engineer Hiromasa Sato
(1 GHz - 2.8 GHz)
Mode Tx 11g 2457 MHz
EUT Hi type(14 inch Display)

(* 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.	2483.500	PK	54.22	28.28	14.32	41.69	2.13	57.26	73.9	16.6	241	16	-
Hori.	2487.336	PK	51.54	28.28	14.32	41.70	2.13	54.57	73.9	19.3	241	16	
Vert.	2483.500	PK	55.03	28.28	14.32	41.69	2.13	58.07	73.9	15.8	102	308	
Vert.	2486.117	PK	52.42	28.28	14.32	41.70	2.13	55.45	73.9	18.4	102	308	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	39.15	28.28	14.32	41.69	3.83	2.13	46.02	53.9	7.8	*1)
Hori.	2487.336	AV	38.67	28.28	14.32	41.70	3.83	2.13	45.53	53.9	8.3	
Vert.	2483.500	AV	38.90	28.28	14.32	41.69	3.83	2.13	45.77	53.9	8.1	*1)
Vert.	2486.117	AV	38.66	28.28	14.32	41.70	3.83	2.13	45.52	53.9	8.3	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

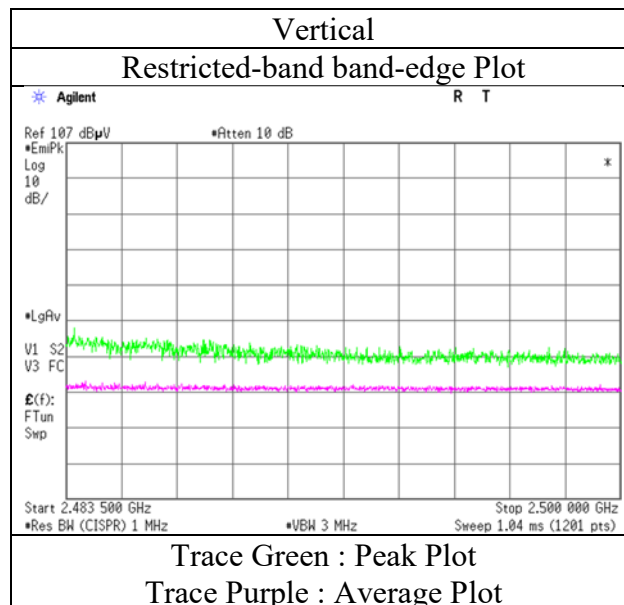
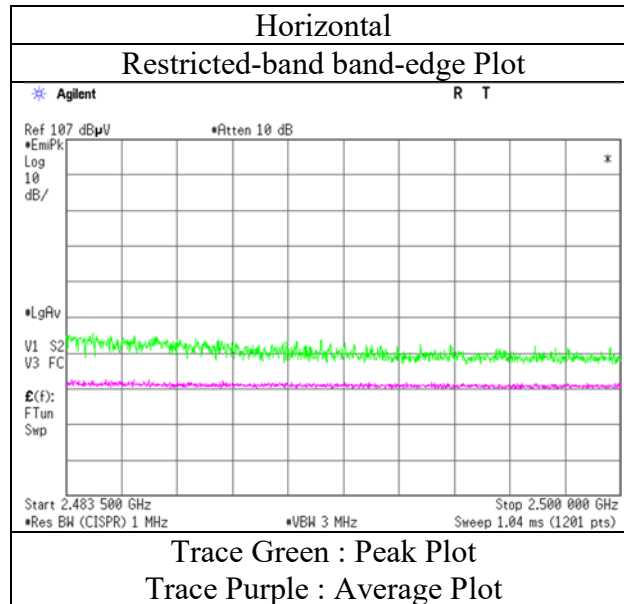
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 2, 2020
Temperature / Humidity 23 deg. C / 56 % RH
Engineer Hiromasa Sato
Mode Tx 11g 2457 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 2, 2020	July 4, 2020	July 24, 2020	July 26, 2020
Temperature / Humidity	23 deg. C / 56 % RH	23 deg. C / 60 % RH	23 deg. C / 60 % RH	23 deg. C / 69 % RH
Engineer	Hirosasa Sato	Makoto Hosaka	Hirosasa Sato	Takahiro Suzuki
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11g 2462 MHz			
EUT	Hi type(14 inch Display)			

(* 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.	2483.500	PK	55.00	28.28	14.32	41.69	2.13	58.04	73.9	15.8	245	13	
Hori.	2484.523	PK	54.96	28.28	14.32	41.69	2.13	58.00	73.9	15.9	245	13	
Hori.	4924.000	PK	49.16	31.68	6.91	42.94	2.13	46.94	73.9	26.9	118	198	
Hori.	7386.000	PK	48.56	37.81	8.48	43.55	2.13	53.43	73.9	20.4	100	0	
Hori.	7386.000	AV	38.08	37.81	8.48	43.55	2.13	42.95	53.9	10.9	100	0	Floor noise
Vert.	2483.500	PK	58.30	28.28	14.32	41.69	2.13	61.34	73.9	12.5	100	264	
Vert.	2483.981	PK	57.95	28.28	14.32	41.69	2.13	60.99	73.9	12.9	100	264	
Vert.	4924.000	PK	49.21	31.68	6.91	42.94	2.13	46.99	73.9	26.9	132	5	
Vert.	7385.725	PK	48.46	37.81	8.48	43.55	2.13	53.33	73.9	20.5	100	0	
Vert.	7385.725	AV	38.16	37.81	8.48	43.55	2.13	43.03	53.9	10.8	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	39.14	28.28	14.32	41.69	3.83	2.13	46.01	53.9	7.8	*1)
Hori.	2484.523	AV	38.84	28.28	14.32	41.69	3.83	2.13	45.71	53.9	8.1	
Hori.	4924.000	AV	38.27	31.68	6.91	42.94	3.83	2.13	39.88	53.9	14.0	
Vert.	2483.500	AV	39.08	28.28	14.32	41.69	3.83	2.13	45.95	53.9	7.9	*1)
Vert.	2483.981	AV	39.66	28.28	14.32	41.69	3.83	2.13	46.53	53.9	7.3	
Vert.	4924.000	AV	37.37	31.68	6.91	42.94	3.83	2.13	38.98	53.9	14.9	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

UL Japan, Inc.

Shonan EMC Lab.

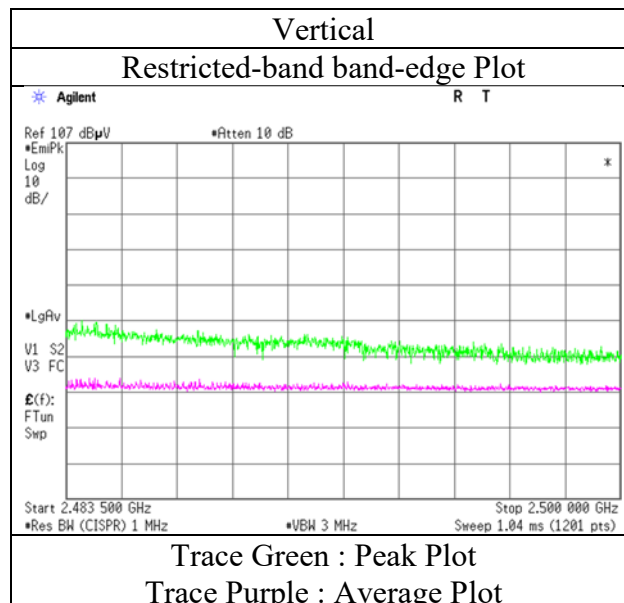
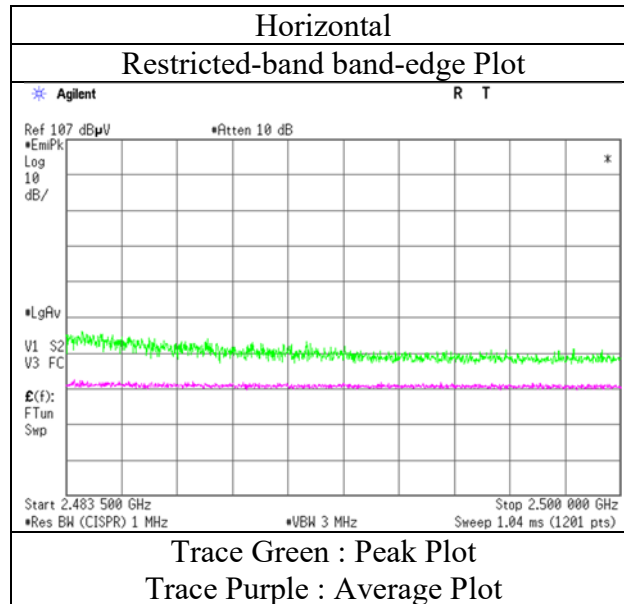
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 2, 2020
Temperature / Humidity 23 deg. C / 56 % RH
Engineer Hiromasa Sato
Mode Tx 11g 2462 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 3, 2020	July 4, 2020	July 24, 2020	July 26, 2020
Temperature / Humidity	22 deg. C / 69 % RH	23 deg. C / 60 % RH	23 deg. C / 60 % RH	23 deg. C / 69 % RH
Engineer	Hirosasa Sato	Makoto Hosaka	Hirosasa Sato	Takahiro Suzuki
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11n-20 2412 MHz			
EUT	Hi type(14 inch Display)			

(* 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.	2389.830	PK	53.39	28.41	14.23	41.66	2.13	56.50	73.9	17.4	207	8	
Hori.	2390.000	PK	55.94	28.41	14.23	41.66	2.13	59.05	73.9	14.8	207	8	
Hori.	4824.000	PK	48.86	31.61	6.83	42.93	2.13	46.50	73.9	27.4	142	133	
Hori.	7236.000	PK	48.36	37.62	8.39	43.41	2.13	53.09	73.9	20.8	100	0	
Hori.	7236.000	AV	38.62	37.62	8.39	43.41	2.13	43.35	53.9	10.5	100	0	Floor noise
Vert.	2389.490	PK	53.24	28.41	14.23	41.66	2.13	56.35	73.9	17.5	105	284	
Vert.	2390.000	PK	55.45	28.41	14.23	41.66	2.13	58.56	73.9	15.3	105	284	
Vert.	4824.000	PK	48.63	31.61	6.83	42.93	2.13	46.27	73.9	27.6	109	129	
Vert.	7236.000	PK	48.44	37.62	8.39	43.41	2.13	53.17	73.9	20.7	100	0	
Vert.	7236.000	AV	37.59	37.62	8.39	43.41	2.13	42.32	53.9	11.5	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2389.830	AV	39.59	28.41	14.23	41.66	4.06	2.13	46.76	53.9	7.1	
Hori.	2390.000	AV	39.86	28.41	14.23	41.66	4.06	2.13	47.03	53.9	6.8 *1)	
Hori.	4824.000	AV	39.37	31.61	6.83	42.93	4.06	2.13	41.07	53.9	12.8	
Vert.	2389.490	AV	39.64	28.41	14.23	41.66	4.06	2.13	46.81	53.9	7.0	
Vert.	2390.000	AV	39.86	28.41	14.23	41.66	4.06	2.13	47.03	53.9	6.8 *1)	
Vert.	4824.000	AV	37.38	31.61	6.83	42.93	4.06	2.13	39.08	53.9	14.8	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

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.	2412.000	PK	90.51	28.37	14.24	41.67	2.13	93.58	-	-	Carrier
Hori.	2400.000	PK	51.43	28.38	14.23	41.67	2.13	54.50	73.58	19.0	
Vert.	2412.000	PK	89.88	28.37	14.24	41.67	2.13	92.95	-	-	Carrier
Vert.	2400.000	PK	52.01	28.38	14.23	41.67	2.13	55.08	72.95	17.8	

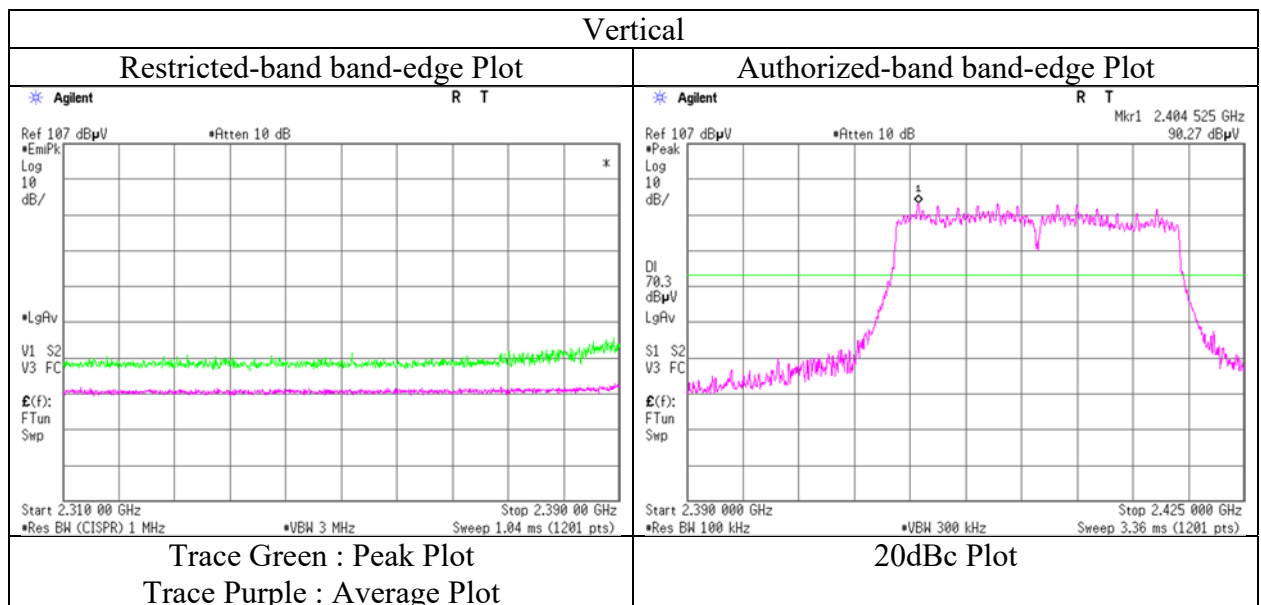
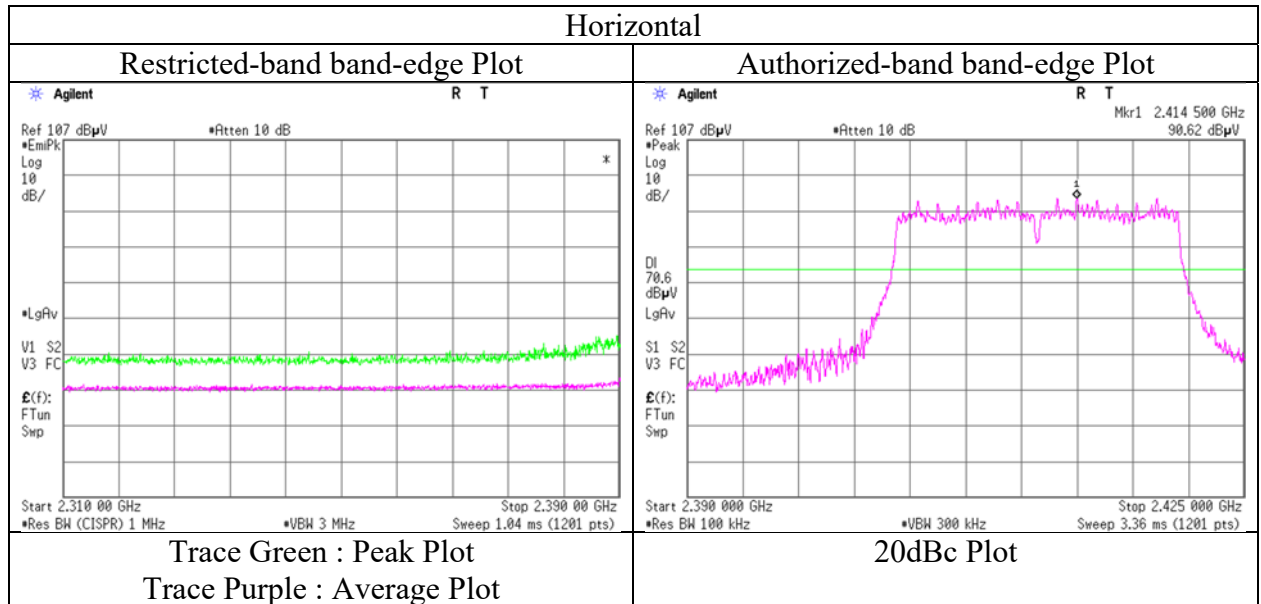
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 3, 2020
Temperature / Humidity 22 deg. C / 69 % RH
Engineer Hiromasa Sato
Mode Tx 11n-20 2412 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 3, 2020
Temperature / Humidity 22 deg. C / 69 % RH
Engineer Hiromasa Sato
(1 GHz - 2.8 GHz)
Mode Tx 11n-20 2417 MHz
EUT Hi type(14 inch Display)

(* 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.	2389.200	PK	56.42	28.41	14.23	41.66	2.13	59.53	73.9	14.3	180	4	-
Hori.	2390.000	PK	57.14	28.41	14.23	41.66	2.13	60.25	73.9	13.6	180	4	-
Vert.	2388.290	PK	54.24	28.41	14.23	41.66	2.13	57.35	73.9	16.5	108	296	-
Vert.	2390.000	PK	55.95	28.41	14.23	41.66	2.13	59.06	73.9	14.8	108	296	-

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2389.200	AV	39.06	28.41	14.23	41.66	4.06	2.13	46.23	53.9	7.6	-
Hori.	2390.000	AV	38.74	28.41	14.23	41.66	4.06	2.13	45.91	53.9	7.9	*1)
Vert.	2388.290	AV	38.88	28.41	14.23	41.66	4.06	2.13	46.05	53.9	7.8	-
Vert.	2390.000	AV	38.62	28.41	14.23	41.66	4.06	2.13	45.79	53.9	8.1	*1)

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

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.	2417.000	PK	92.24	28.36	14.26	41.67	2.13	95.32	-	-	Carrier
Hori.	2400.000	PK	49.02	28.38	14.23	41.67	2.13	52.09	75.32	23.2	-
Vert.	2417.000	PK	91.22	28.36	14.26	41.67	2.13	94.30	-	-	Carrier
Vert.	2400.000	PK	45.52	28.38	14.23	41.67	2.13	48.59	74.30	25.7	-

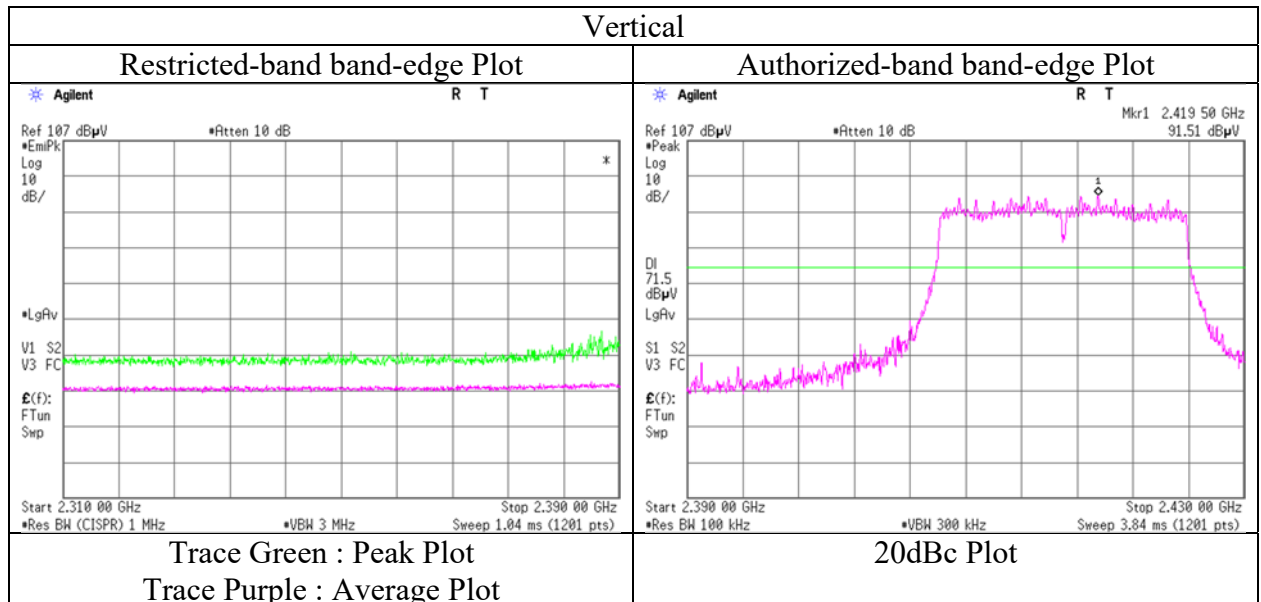
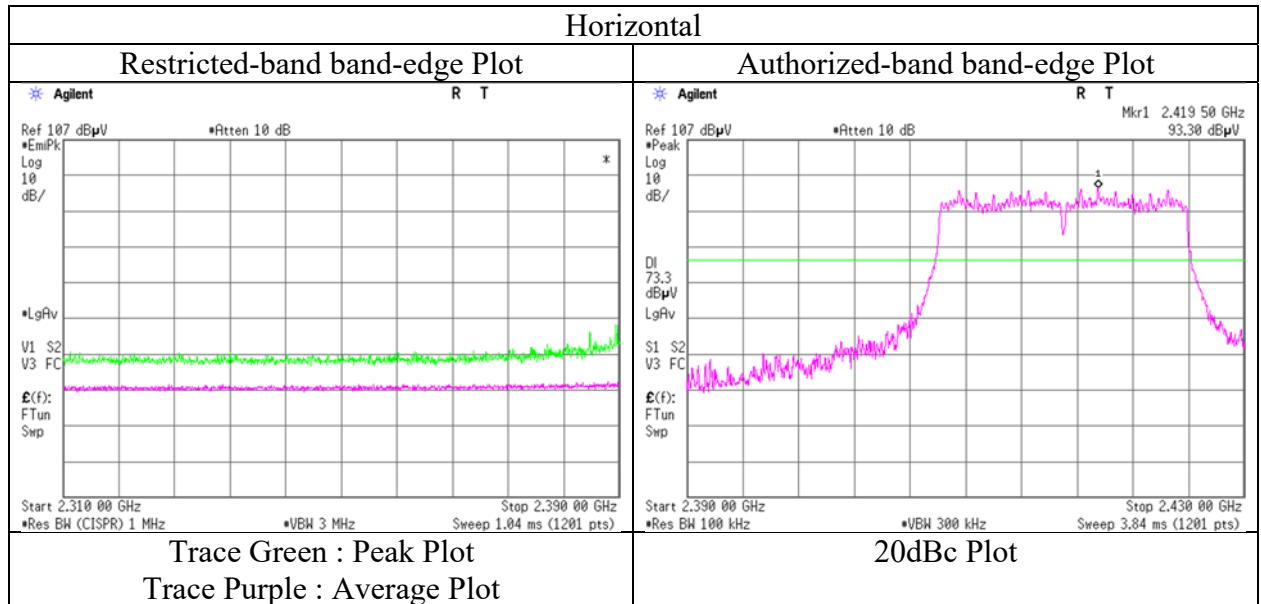
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 3, 2020
Temperature / Humidity 22 deg. C / 69 % RH
Engineer Hiromasa Sato
Mode Tx 11n-20 2417 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 3, 2020	July 4, 2020	July 24, 2020	July 26, 2020
Temperature / Humidity	22 deg. C / 69 % RH	23 deg. C / 60 % RH	23 deg. C / 60 % RH	23 deg. C / 69 % RH
Engineer	Hiromasa Sato	Makoto Hosaka	Hiromasa Sato	Takahiro Suzuki
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11n-20 2437 MHz			
EUT	Hi type(14 inch Display)			

(* 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.	4874.000	PK	48.57	31.63	6.87	42.93	2.13	46.27	73.9	27.6	106	248	
Hori.	7311.000	PK	48.62	37.69	8.43	43.48	2.13	53.39	73.9	20.5	100	0	
Hori.	7311.000	AV	37.67	37.69	8.43	43.48	2.13	42.44	53.9	11.4	100	0	Floor noise
Vert.	4874.000	PK	48.75	31.63	6.87	42.93	2.13	46.45	73.9	27.4	133	72	
Vert.	7311.000	PK	48.61	37.69	8.43	43.48	2.13	53.38	73.9	20.5	100	0	
Vert.	7311.000	AV	37.86	37.69	8.43	43.48	2.13	42.63	53.9	11.2	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	38.31	31.63	6.87	42.93	4.06	2.13	40.07	53.9	13.8	-
Vert.	4874.000	AV	38.14	31.63	6.87	42.93	4.06	2.13	39.90	53.9	14.0	-

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Duty factor refer to "Duty factor Calculation chart" sheet.

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Shonan EMC Lab.

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Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 3, 2020
Temperature / Humidity 22 deg. C / 69 % RH
Engineer Hiromasa Sato
(1 GHz - 2.8 GHz)
Mode Tx 11n-20 2457 MHz
EUT Hi type(14 inch Display)

(* 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.	2483.500	PK	54.02	28.28	14.32	41.69	2.13	57.06	73.9	16.8	298	6	-
Hori.	2484.533	PK	53.23	28.28	14.32	41.69	2.13	56.27	73.9	17.6	298	6	
Vert.	2483.500	PK	55.32	28.28	14.32	41.69	2.13	58.36	73.9	15.5	142	266	
Vert.	2484.278	PK	54.94	28.28	14.32	41.69	2.13	57.98	73.9	15.9	142	266	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	38.93	28.28	14.32	41.69	4.06	2.13	46.03	53.9	7.8	*1)
Hori.	2484.533	AV	38.80	28.28	14.32	41.69	4.06	2.13	45.90	53.9	8.0	
Vert.	2483.500	AV	39.56	28.28	14.32	41.69	4.06	2.13	46.66	53.9	7.2	*1)
Vert.	2484.278	AV	39.23	28.28	14.32	41.69	4.06	2.13	46.33	53.9	7.5	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

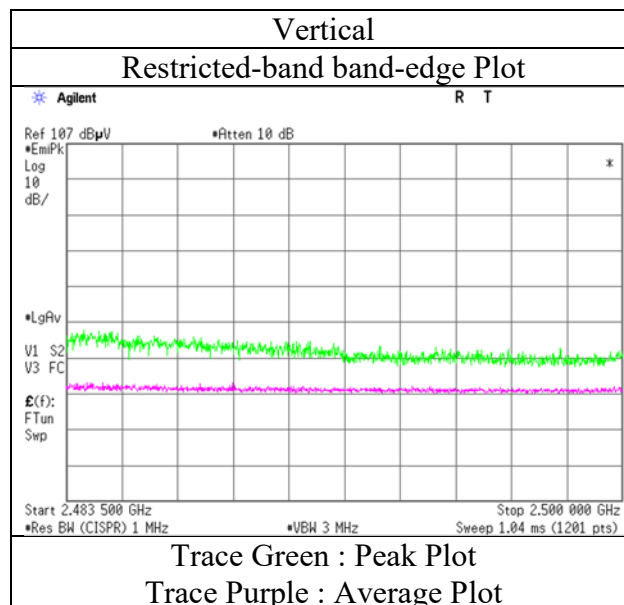
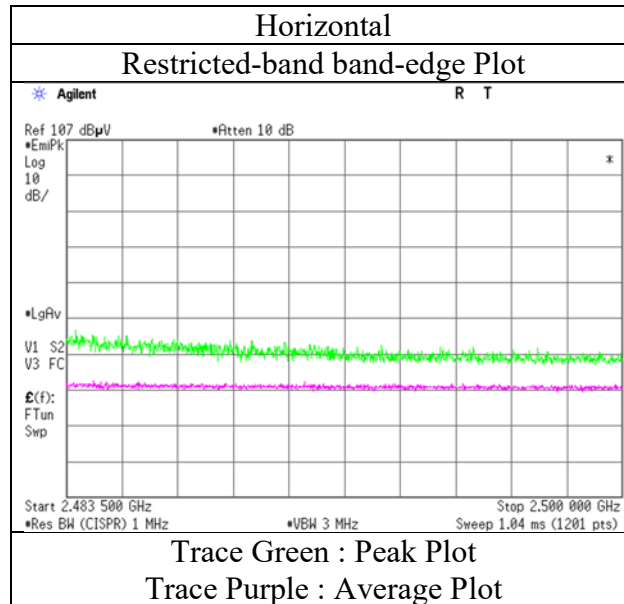
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 3, 2020
Temperature / Humidity 22 deg. C / 69 % RH
Engineer Hiromasa Sato
Mode Tx 11n-20 2457 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 3, 2020	July 4, 2020	July 24, 2020	July 26, 2020
Temperature / Humidity	22 deg. C / 69 % RH	23 deg. C / 60 % RH	23 deg. C / 60 % RH	23 deg. C / 69 % RH
Engineer	Hiromasa Sato	Makoto Hosaka	Hiromasa Sato	Takahiro Suzuki
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11n-20 2462 MHz			
EUT	Hi type(14 inch Display)			

(* 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.	2483.500	PK	56.20	28.28	14.32	41.69	2.13	59.24	73.9	14.6	250	8	
Hori.	2483.861	PK	54.00	28.28	14.32	41.69	2.13	57.04	73.9	16.8	250	8	
Hori.	4924.000	PK	48.86	31.68	6.91	42.94	2.13	46.64	73.9	27.2	103	130	
Hori.	7386.000	PK	48.58	37.81	8.48	43.55	2.13	53.45	73.9	20.4	100	0	
Hori.	7386.000	AV	38.66	37.81	8.48	43.55	2.13	43.53	53.9	10.3	100	0	Floor noise
Vert.	2483.500	PK	57.33	28.28	14.32	41.69	2.13	60.37	73.9	13.5	111	269	
Vert.	2483.926	PK	55.37	28.28	14.32	41.69	2.13	58.41	73.9	15.4	111	269	
Vert.	4924.000	PK	47.86	31.68	6.91	42.94	2.13	45.64	73.9	28.2	113	126	
Vert.	7386.000	PK	48.38	37.81	8.48	43.55	2.13	53.25	73.9	20.6	100	0	
Vert.	7386.000	AV	38.57	37.81	8.48	43.55	2.13	43.44	53.9	10.4	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	39.23	28.28	14.32	41.69	4.06	2.13	46.33	53.9	7.5	*1)
Hori.	2483.861	AV	39.19	28.28	14.32	41.69	4.06	2.13	46.29	53.9	7.6	
Hori.	4924.000	AV	37.38	31.68	6.91	42.94	4.06	2.13	39.22	53.9	14.6	
Vert.	2483.500	AV	39.32	28.28	14.32	41.69	4.06	2.13	46.42	53.9	7.4	*1)
Vert.	2483.926	AV	38.35	28.28	14.32	41.69	4.06	2.13	45.45	53.9	8.4	
Vert.	4924.000	AV	37.83	31.68	6.91	42.94	4.06	2.13	39.67	53.9	14.2	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

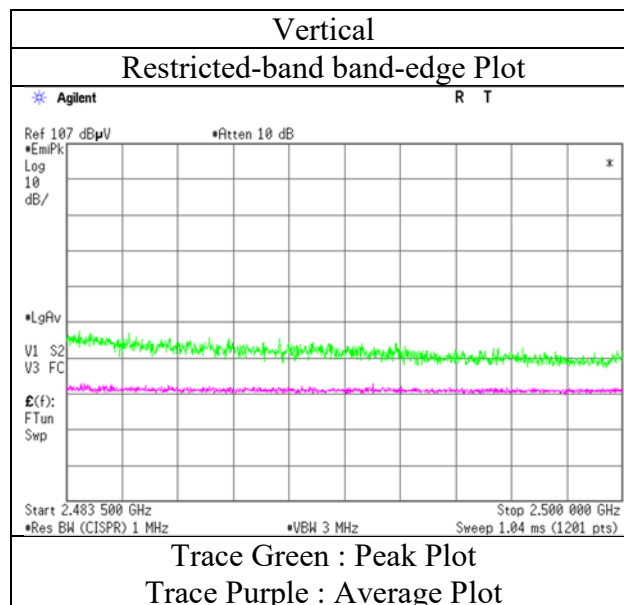
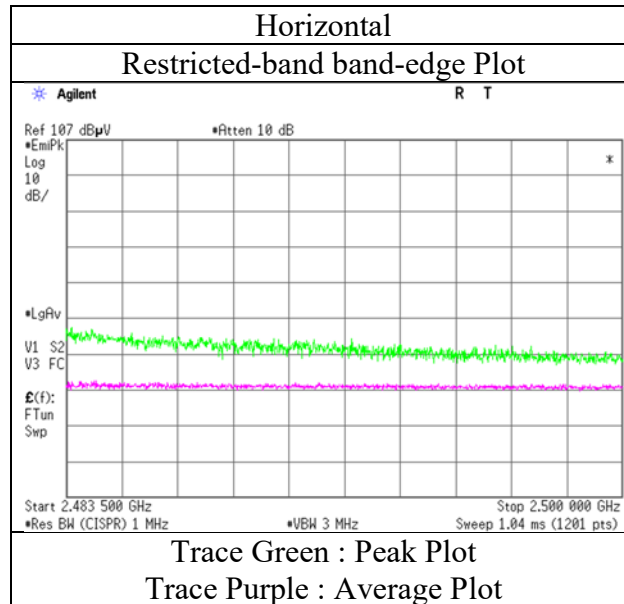
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 3, 2020
Temperature / Humidity 22 deg. C / 69 % RH
Engineer Hiromasa Sato
Mode Tx 11n-20 2462 MHz
EUT Hi type(14 inch Display)

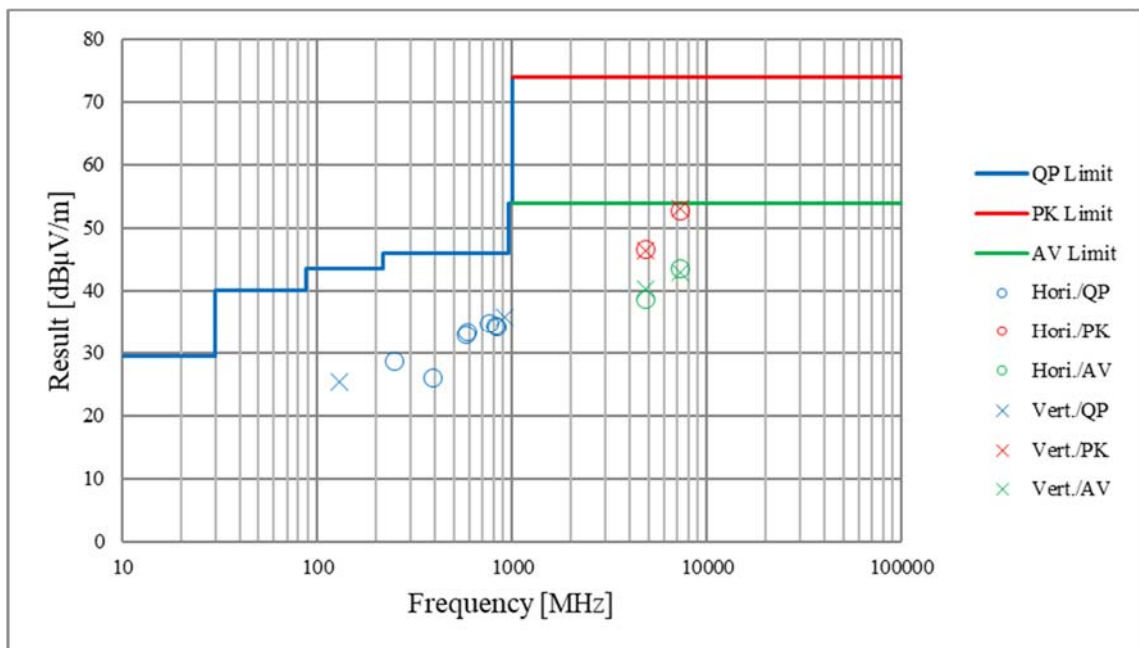


* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	13385909S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	July 27, 2020	July 2, 2020	July 4, 2020
Temperature / Humidity	23 deg. C / 65 % RH	23 deg. C / 56 % RH	23 deg. C / 60 % RH
Engineer	Yusuke Tanikawara (30 MHz - 1 GHz)	Hiromasa Sato (1 GHz - 2.8 GHz)	Makoto Hosaka (2.8 GHz - 13 GHz)
Semi Anechoic Chamber	3	3	
Date	July 24, 2020	July 26, 2020	
Temperature / Humidity	23 deg. C / 60 % RH	23 deg. C / 69 % RH	
Engineer	Hiromasa Sato (13 GHz - 18 GHz)	Takahiro Suzuki (18 GHz - 26.5 GHz)	
Mode	Tx 11g 2437 MHz		
EUT	Hi type(14 inch Display)		



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

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
(1 GHz – 2.8 GHz)
Mode Tx 11b 2412 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)

(* 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.	2390.000	PK	48.06	28.41	14.23	41.66	2.13	51.17	73.9	22.7	288	55	-
Hori.	2390.000	AV	38.39	28.41	14.23	41.66	2.13	41.50	53.9	12.4	288	55	
Vert.	2390.000	PK	47.90	28.41	14.23	41.66	2.13	51.01	73.9	22.8	149	303	
Vert.	2390.000	AV	38.55	28.41	14.23	41.66	2.13	41.66	53.9	12.2	149	303	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

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.	2412.000	PK	95.40	28.37	14.24	41.67	2.13	98.47	-	-	Carrier
Hori.	2399.008	PK	46.29	28.38	14.23	41.67	2.13	49.36	78.47	29.1	
Hori.	2400.000	PK	39.07	28.38	14.23	41.67	2.13	42.14	78.47	36.3	
Vert.	2412.000	PK	93.85	28.37	14.24	41.67	2.13	96.92	-	-	Carrier
Vert.	2398.002	PK	42.50	28.39	14.23	41.67	2.13	45.58	76.92	31.3	
Vert.	2400.000	PK	38.62	28.38	14.23	41.67	2.13	41.69	76.92	35.2	

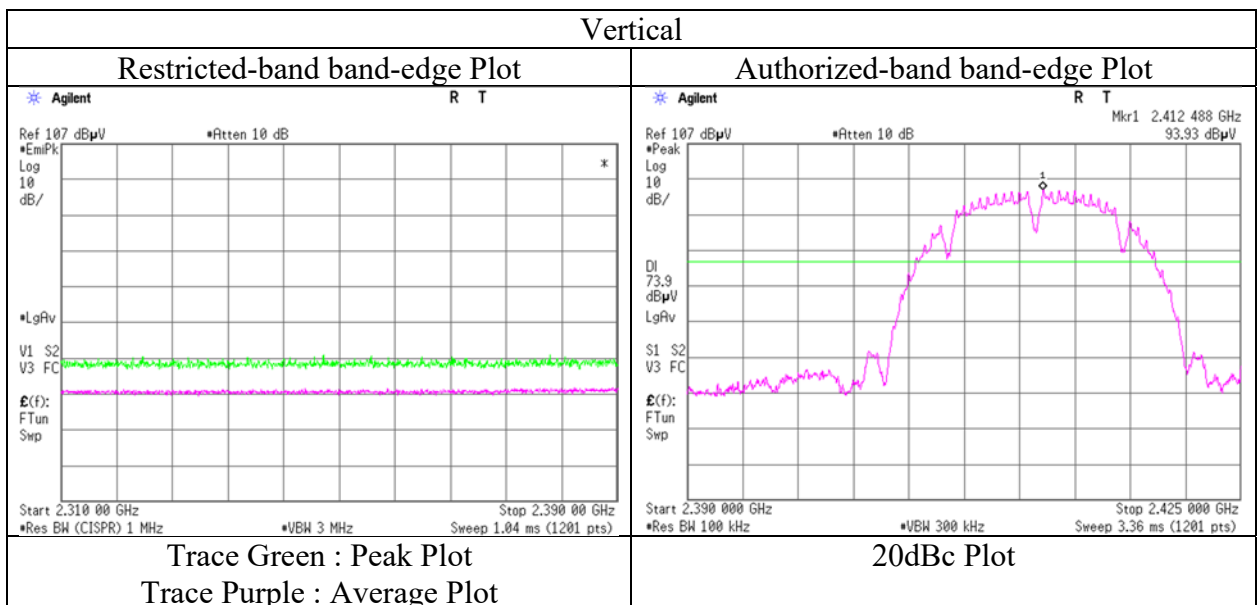
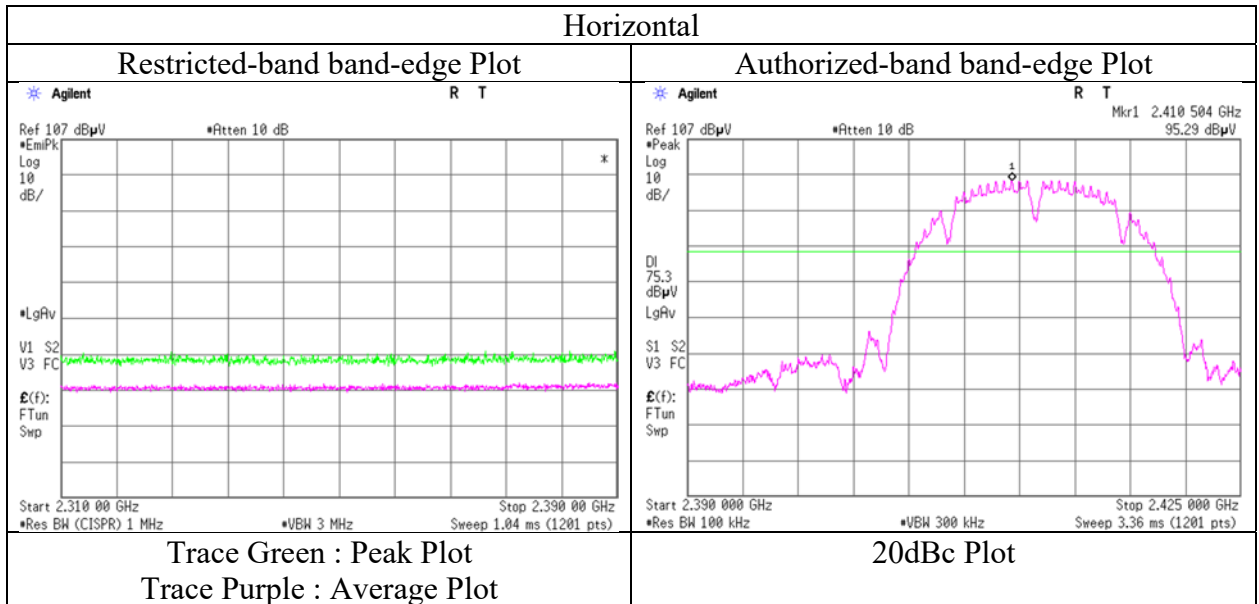
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
Mode Tx 11b 2412 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
(1 GHz – 2.8 GHz)
Mode Tx 11b 2462 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)

(* 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.	2483.500	PK	48.30	28.28	14.32	41.69	2.13	51.34	73.9	22.5	154	330	-
Hori.	2483.500	AV	38.37	28.28	14.32	41.69	2.13	41.41	53.9	12.4	154	330	
Vert.	2483.500	PK	48.46	28.28	14.32	41.69	2.13	51.50	73.9	22.4	145	286	
Vert.	2483.500	AV	38.33	28.28	14.32	41.69	2.13	41.37	53.9	12.5	145	286	

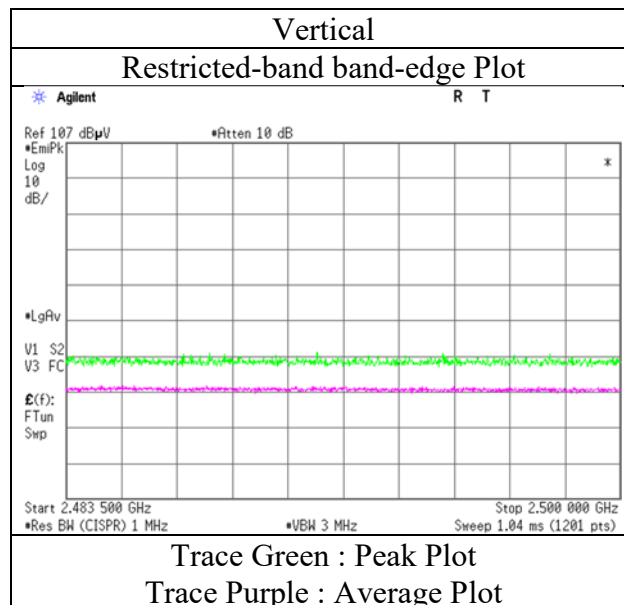
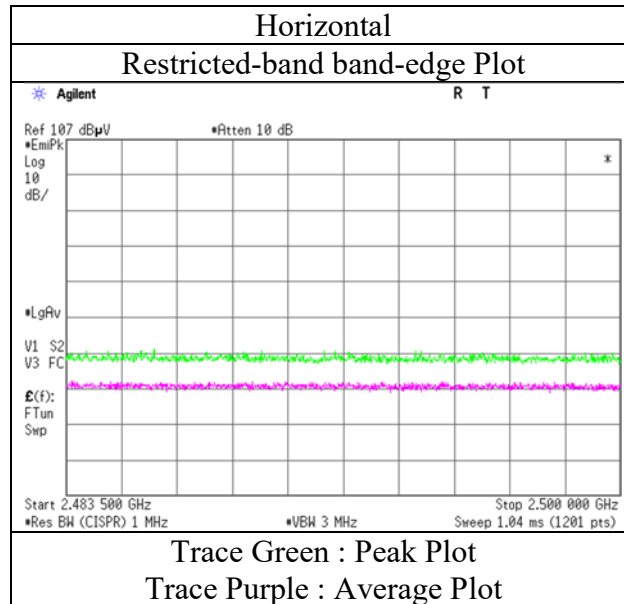
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
Mode Tx 11b 2462 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
(1 GHz – 2.8 GHz)
Mode Tx 11g 2412 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)

(* 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.	2390.000	PK	55.90	28.41	14.23	41.66	2.13	59.01	73.9	14.8	148	341	-
Vert.	2390.000	PK	55.69	28.41	14.23	41.66	2.13	58.80	73.9	15.1	148	288	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	39.39	28.41	14.23	41.66	3.83	2.13	46.33	53.9	7.5	*1)
Vert.	2390.000	AV	39.58	28.41	14.23	41.66	3.83	2.13	46.52	53.9	7.3	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

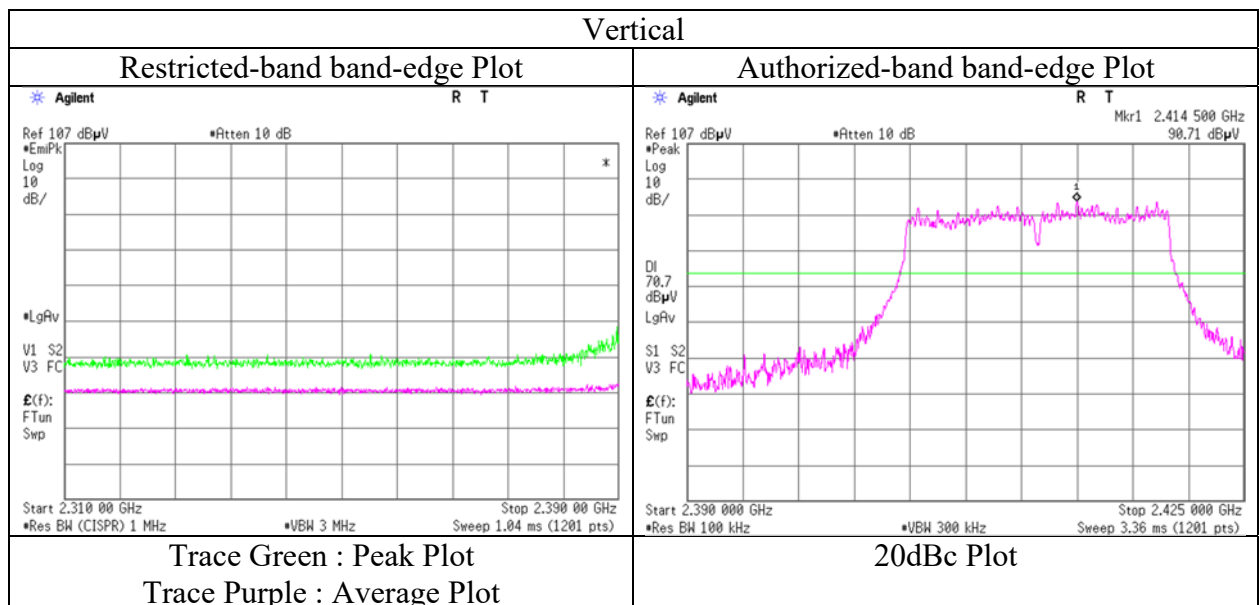
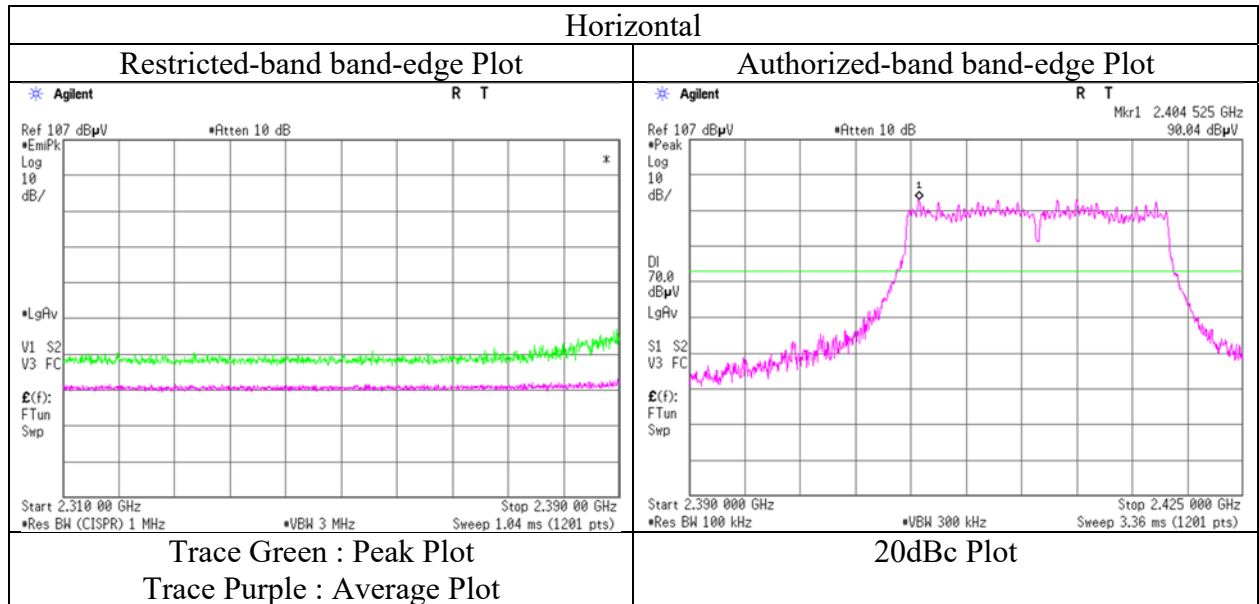
20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

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.	2412.000	PK	90.03	28.37	14.24	41.67	2.13	93.10	-	-	Carrier
Hori.	2400.000	PK	53.94	28.38	14.23	41.67	2.13	57.01	73.10	16.0	-
Vert.	2412.000	PK	90.56	28.37	14.24	41.67	2.13	93.63	-	-	Carrier
Vert.	2400.000	PK	52.72	28.38	14.23	41.67	2.13	55.79	73.63	17.8	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

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

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
Mode Tx 11g 2412 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
(1 GHz – 2.8 GHz)
Mode Tx 11g 2417 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)

(* 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.	2390.000	PK	58.01	28.41	14.23	41.66	2.13	61.12	73.9	12.7	150	336	-
Vert.	2390.000	PK	57.79	28.41	14.23	41.66	2.13	60.90	73.9	13.0	148	289	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	40.03	28.41	14.23	41.66	3.83	2.13	46.97	53.9	6.9	*1)
Vert.	2390.000	AV	40.53	28.41	14.23	41.66	3.83	2.13	47.47	53.9	6.4	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

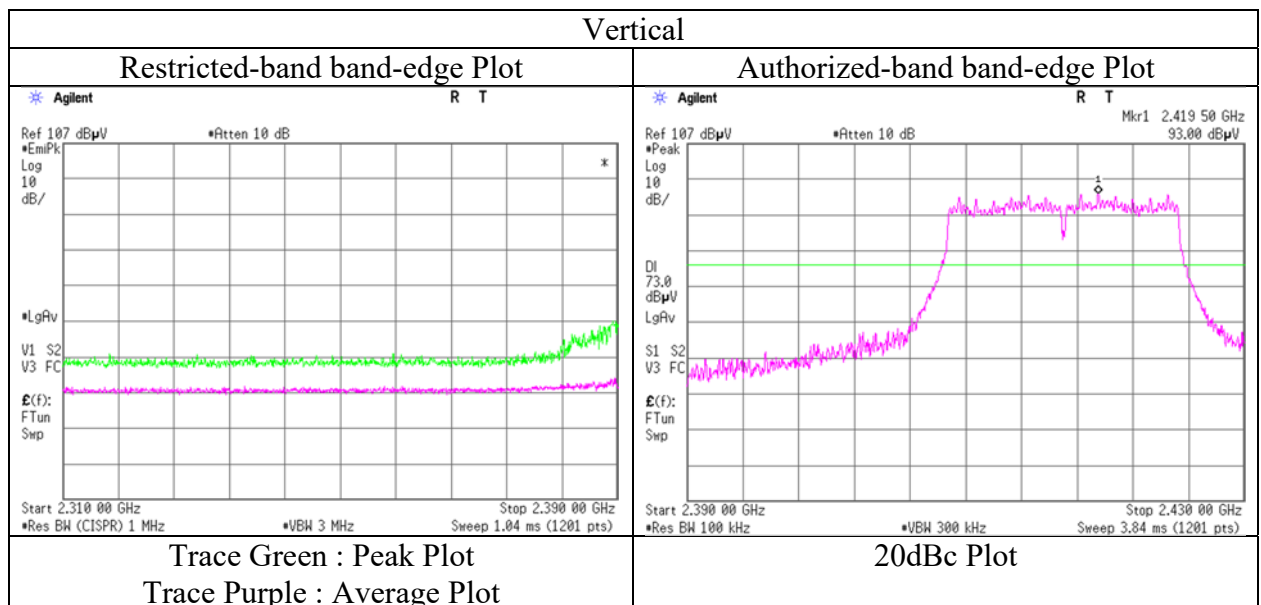
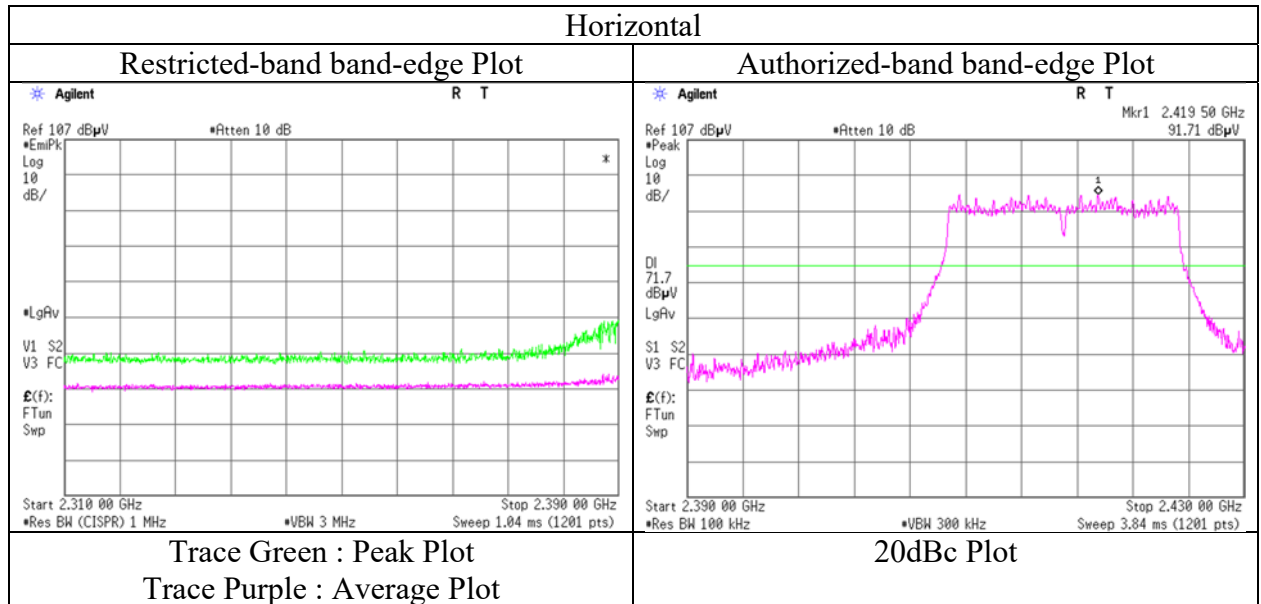
20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

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.	2417.000	PK	91.71	28.36	14.26	41.67	2.13	94.79	-	-	Carrier
Hori.	2400.000	PK	48.94	28.38	14.23	41.67	2.13	52.01	74.79	22.7	-
Vert.	2417.000	PK	92.77	28.36	14.26	41.67	2.13	95.85	-	-	Carrier
Vert.	2400.000	PK	48.51	28.38	14.23	41.67	2.13	51.58	75.85	24.2	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

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

Report No. 13385909S-B-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3
 Date July 21, 2020
 Temperature / Humidity 23 deg. C / 63 % RH
 Engineer Yusuke Tanikawara
 Mode Tx 11g 2417 MHz with 11ac-20 MIMO 5745 MHz
 EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3 3 3 3
Date July 27, 2020 July 21, 2020 July 24, 2020 July 26, 2020
Temperature / Humidity 23 deg. C / 65 % RH 24 deg. C / 58 % RH 23 deg. C / 60 % RH 23 deg. C / 69 % RH
Engineer Yusuke Tanikawara Toshinori Yamada Hiromasa Sato Takahiro Suzuki
(30 MHz - 1 GHz) (1 GHz - 13 GHz) (13 GHz - 18 GHz) (18 GHz - 26.5 GHz)
Mode Tx 11g 2437 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)

(* 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.	250.284	QP	39.30	11.78	8.26	31.98	0.00	27.36	46.00	18.6	138	141	
Hori.	391.693	QP	33.60	15.47	8.96	31.93	0.00	26.10	46.00	19.9	100	151	
Hori.	580.196	QP	35.20	18.76	9.73	31.96	0.00	31.73	46.00	14.2	160	189	
Hori.	591.873	QP	35.00	19.14	9.77	31.95	0.00	31.96	46.00	14.0	161	187	
Hori.	768.535	QP	33.80	20.43	10.40	31.71	0.00	32.92	46.00	13.0	122	196	
Hori.	827.713	QP	33.50	21.00	10.59	31.47	0.00	33.62	46.00	12.3	103	219	
Hori.	839.337	QP	33.20	21.21	10.63	31.39	0.00	33.65	46.00	12.3	180	220	
Hori.	4874.000	PK	48.87	31.63	6.87	42.93	2.13	46.57	73.90	27.3	117	289	
Hori.	7311.000	PK	48.50	37.69	8.43	43.48	2.13	53.27	73.90	20.6	150	0	
Hori.	7311.000	AV	38.99	37.69	8.43	43.48	2.13	43.76	53.90	10.1	150	0	Floor noise
Vert.	130.562	QP	35.80	13.92	7.39	32.10	0.00	25.01	43.50	18.4	100	176	
Vert.	913.968	QP	29.20	22.13	10.86	30.94	0.00	31.25	46.00	14.7	253	186	
Vert.	4874.000	PK	48.52	31.63	6.87	42.93	2.13	46.22	73.90	27.6	196	342	
Vert.	7311.000	PK	48.56	37.69	8.43	43.48	2.13	53.33	73.90	20.5	150	0	
Vert.	7311.000	AV	39.14	37.69	8.43	43.48	2.13	43.91	53.90	10.0	150	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	39.04	31.63	6.87	42.93	3.83	2.13	40.57	53.9	13.3	-
Vert.	4874.000	AV	39.46	31.63	6.87	42.93	3.83	2.13	40.99	53.9	12.9	-

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Duty factor refer to "Duty factor Calculation chart" sheet.

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
(1 GHz – 2.8 GHz)
Mode Tx 11g 2457 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)

(* 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.	2483.500	PK	58.94	28.28	14.32	41.69	2.13	61.98	73.9	11.9	225	58	-
Vert.	2483.500	PK	54.94	28.28	14.32	41.69	2.13	57.98	73.9	15.9	132	297	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	39.96	28.28	14.32	41.69	3.83	2.13	46.83	53.9	7.0	*1)
Vert.	2483.500	AV	39.45	28.28	14.32	41.69	3.83	2.13	46.32	53.9	7.5	*1)

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$

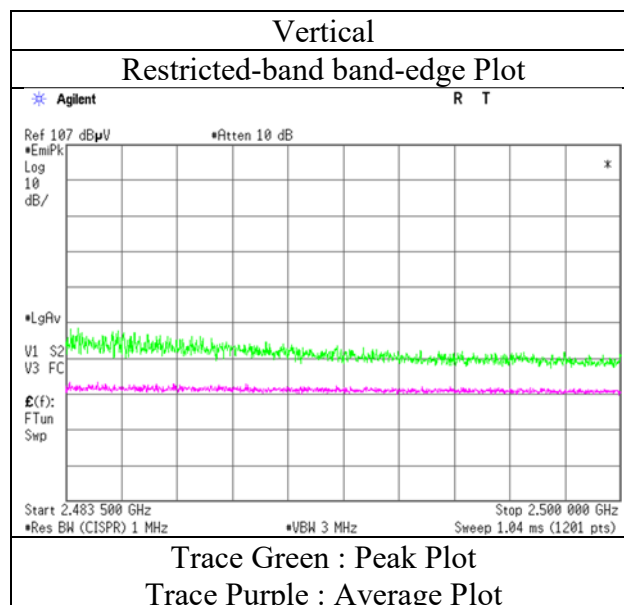
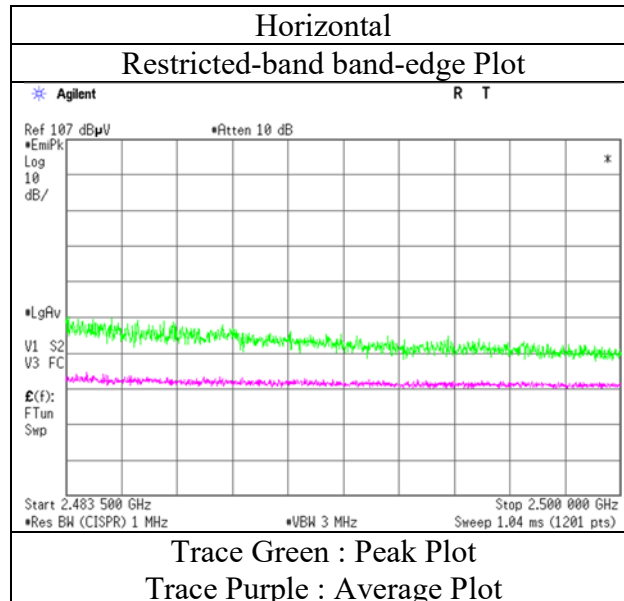
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
Mode Tx 11g 2457 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
(1 GHz – 2.8 GHz)
Mode Tx 11g 2462 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)

(* 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.	2483.500	PK	58.42	28.28	14.32	41.69	2.13	61.46	73.9	12.4	213	54	-
Vert.	2483.500	PK	55.30	28.28	14.32	41.69	2.13	58.34	73.9	15.5	148	285	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	40.25	28.28	14.32	41.69	3.83	2.13	47.12	53.9	6.7	*1)
Vert.	2483.500	AV	39.52	28.28	14.32	41.69	3.83	2.13	46.39	53.9	7.5	*1)

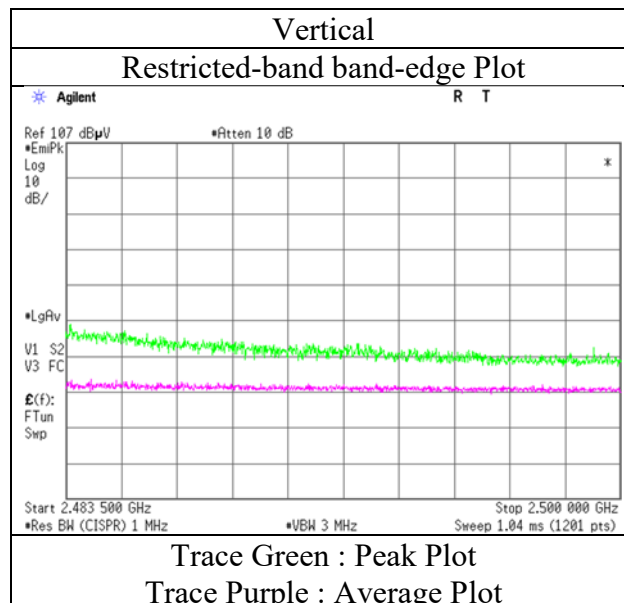
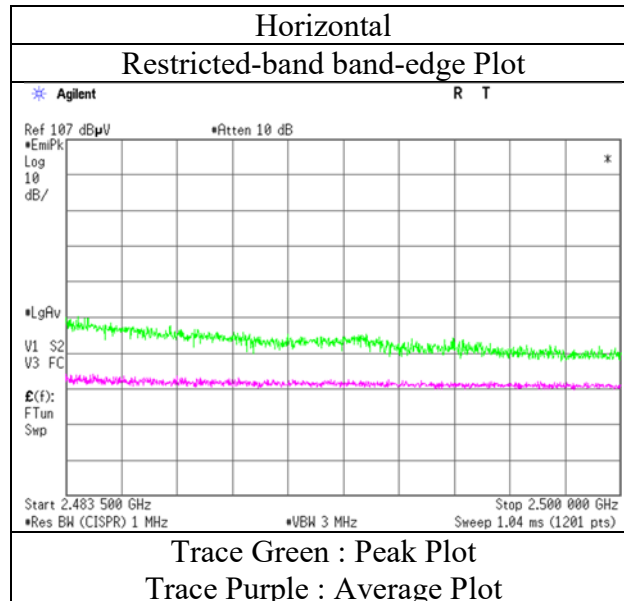
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
Mode Tx 11g 2462 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
(1 GHz – 2.8 GHz)
Mode Tx 11n-20 2412 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)

(* 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.	2390.000	PK	55.93	28.41	14.23	41.66	2.13	59.04	73.9	14.8	261	68	-
Vert.	2390.000	PK	53.54	28.41	14.23	41.66	2.13	56.65	73.9	17.2	151	313	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	39.40	28.41	14.23	41.66	4.06	2.13	46.57	53.9	7.3	*1)
Vert.	2390.000	AV	38.93	28.41	14.23	41.66	4.06	2.13	46.10	53.9	7.8	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

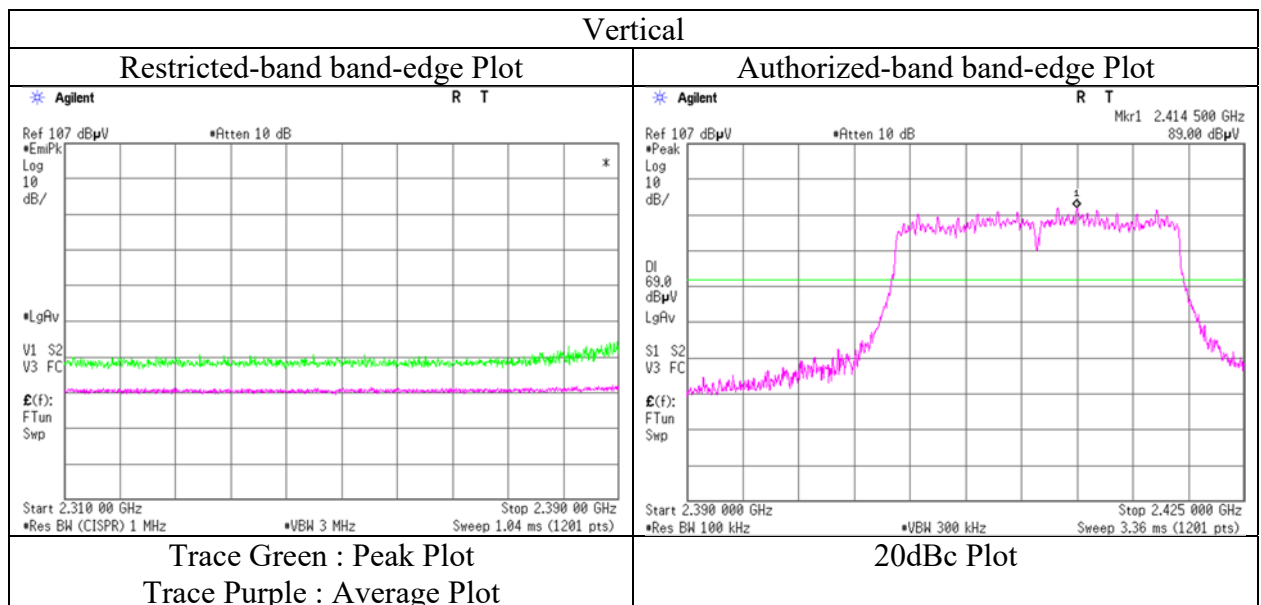
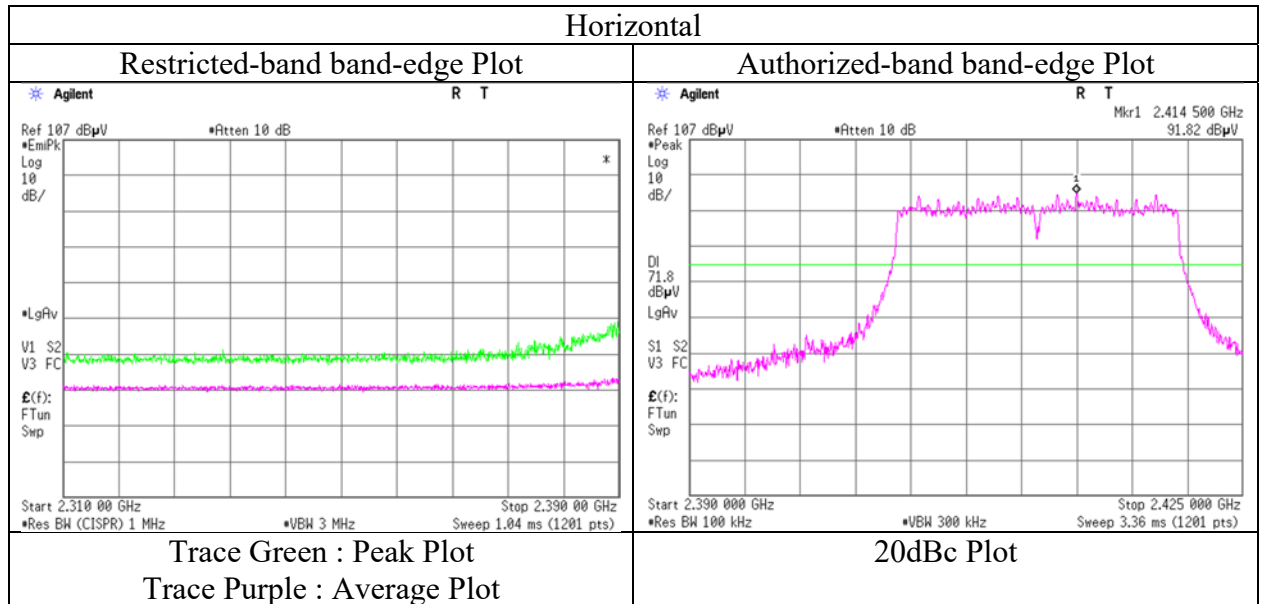
20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

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.	2412.000	PK	91.59	28.37	14.24	41.67	2.13	94.66	-	-	Carrier
Hori.	2400.000	PK	51.40	28.38	14.23	41.67	2.13	54.47	74.66	20.1	-
Vert.	2412.000	PK	89.17	28.37	14.24	41.67	2.13	92.24	-	-	Carrier
Vert.	2400.000	PK	47.65	28.38	14.23	41.67	2.13	50.72	72.24	21.5	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

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

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
Mode Tx 11n-20 2412 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
(1 GHz – 2.8 GHz)
Mode Tx 11n-20 2417 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)

(* 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.	2390.000	PK	60.43	28.41	14.23	41.66	2.13	63.54	73.9	10.3	238	57	-
Vert.	2390.000	PK	58.11	28.41	14.23	41.66	2.13	61.22	73.9	12.6	147	303	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	39.56	28.41	14.23	41.66	4.06	2.13	46.73	53.9	7.1	*1)
Vert.	2390.000	AV	39.00	28.41	14.23	41.66	4.06	2.13	46.17	53.9	7.7	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

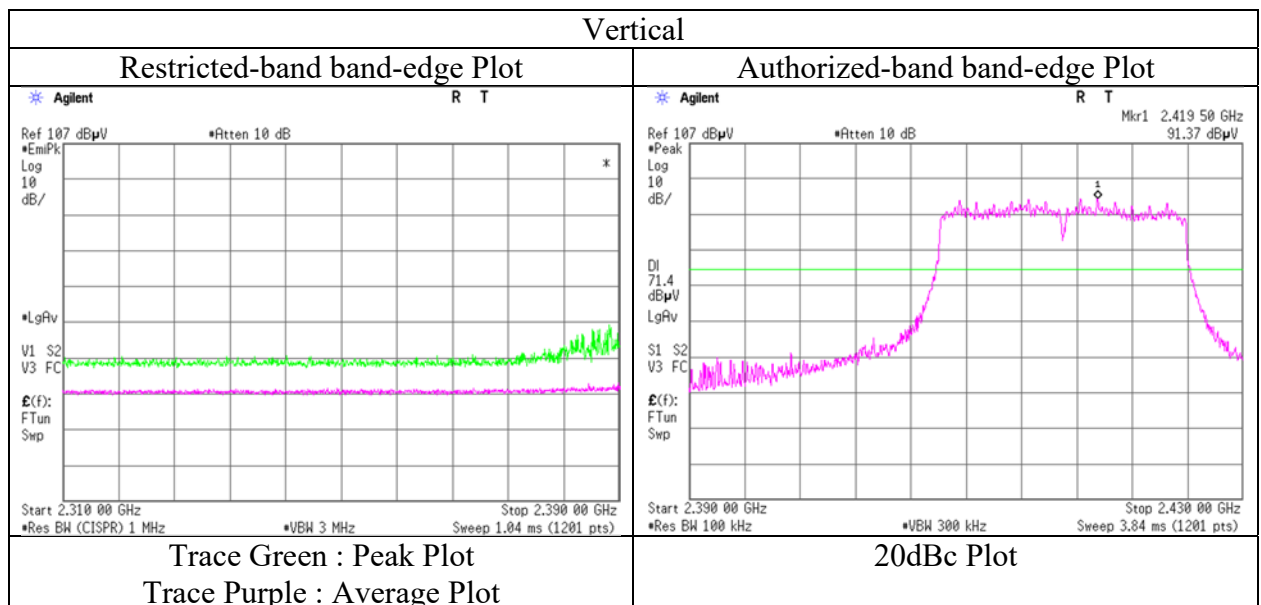
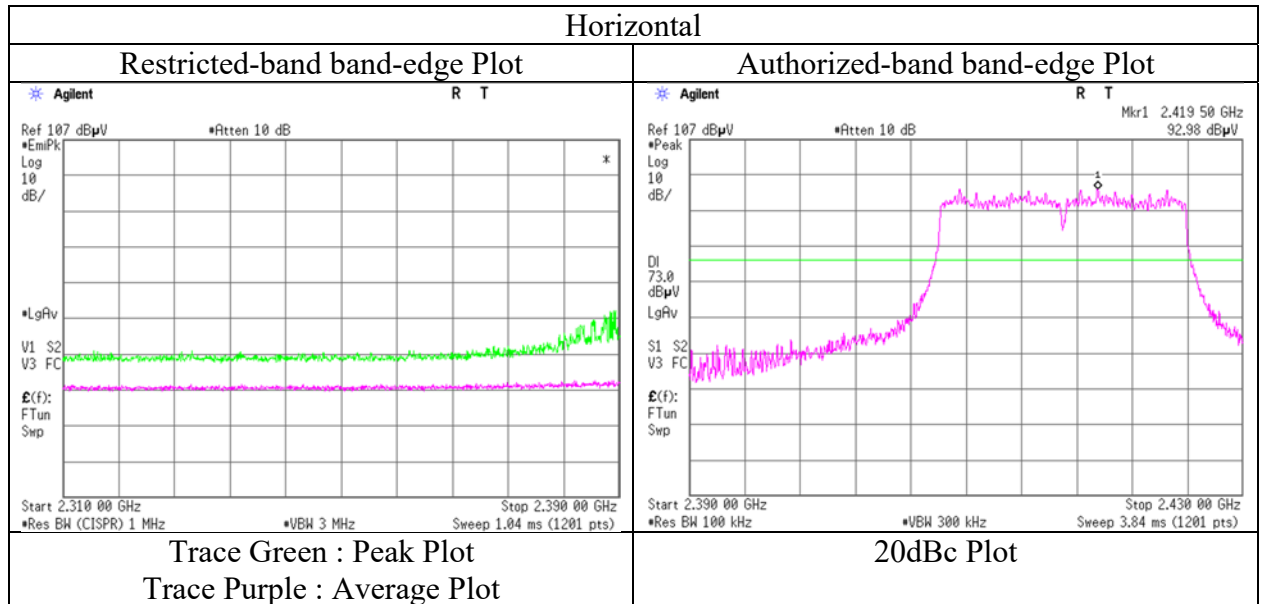
20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

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.	2417.000	PK	92.70	28.36	14.26	41.67	2.13	95.78	-	-	Carrier
Hori.	2400.000	PK	49.27	28.38	14.23	41.67	2.13	52.34	75.78	23.4	-
Vert.	2417.000	PK	91.15	28.36	14.26	41.67	2.13	94.23	-	-	Carrier
Vert.	2400.000	PK	46.77	28.38	14.23	41.67	2.13	49.84	74.23	24.3	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
Mode Tx 11n-20 2417 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
(1 GHz – 2.8 GHz)
Mode Tx 11n-20 2457 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)

(* 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.	2483.500	PK	57.40	28.28	14.32	41.69	2.13	60.44	73.9	13.4	254	72	-
Vert.	2483.500	PK	56.47	28.28	14.32	41.69	2.13	59.51	73.9	14.3	150	281	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	39.27	28.28	14.32	41.69	4.06	2.13	46.37	53.9	7.5	*1)
Vert.	2483.500	AV	39.17	28.28	14.32	41.69	4.06	2.13	46.27	53.9	7.6	*1)

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

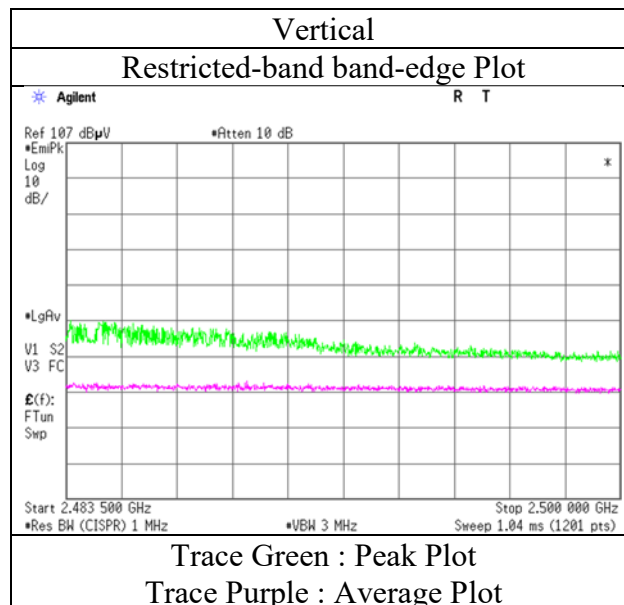
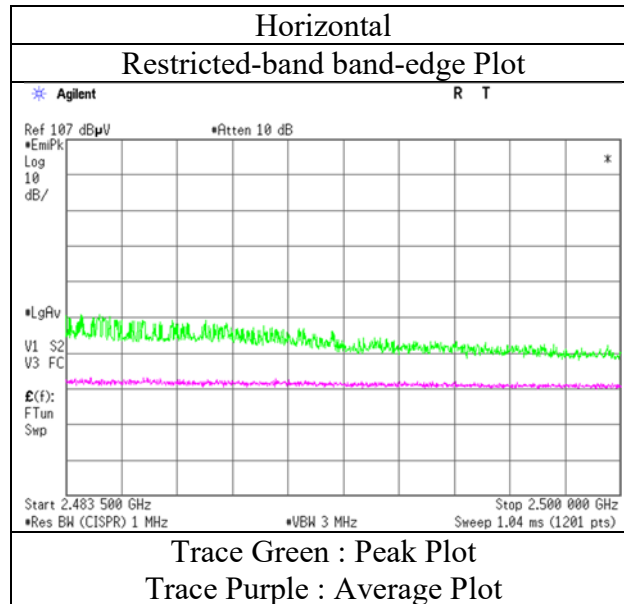
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 23 deg. C / 63 % RH
Engineer Yusuke Tanikawara
Mode Tx 11n-20 2457 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 24 deg. C / 58 % RH
Engineer Toshinori Yamada
(1 GHz – 2.8 GHz)
Mode Tx 11n-20 2462 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)

(* 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.	2483.500	PK	58.28	28.28	14.32	41.69	2.13	61.32	73.9	12.5	276	63	-
Vert.	2483.500	PK	57.16	28.28	14.32	41.69	2.13	60.20	73.9	13.7	124	272	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	39.35	28.28	14.32	41.69	4.06	2.13	46.45	53.9	7.4	*1)
Vert.	2483.500	AV	38.90	28.28	14.32	41.69	4.06	2.13	46.00	53.9	7.9	*1)

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

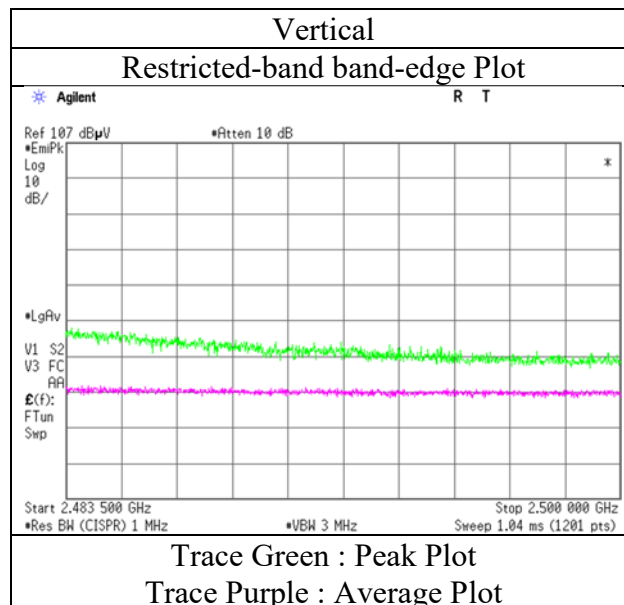
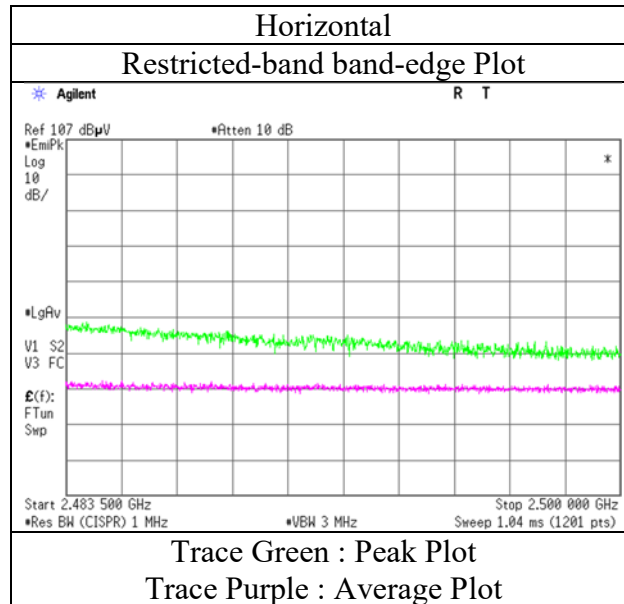
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 21, 2020
Temperature / Humidity 24 deg. C / 58 % RH
Engineer Toshinori Yamada
Mode Tx 11n-20 2462 MHz with 11ac-20 MIMO 5745 MHz
EUT Hi type(14 inch Display)

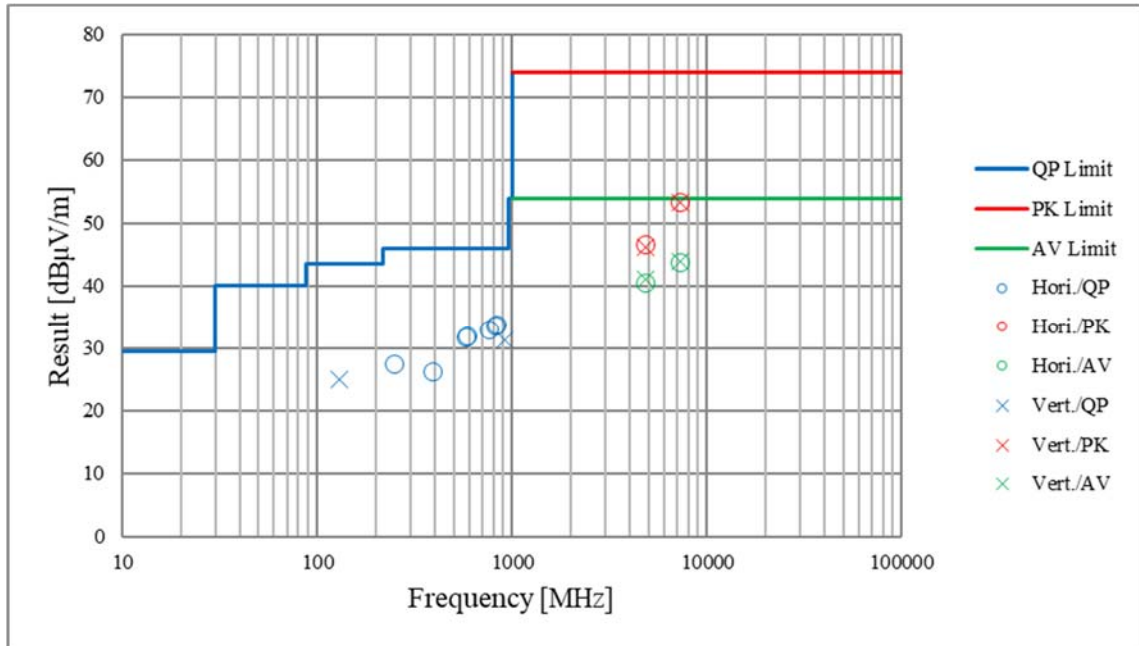


* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 27, 2020	July 21, 2020	July 24, 2020	July 26, 2020
Temperature / Humidity	23 deg. C / 65 % RH	24 deg. C / 58 % RH	23 deg. C / 60 % RH	23 deg. C / 69 % RH
Engineer	Yusuke Tanikawara (30 MHz - 1 GHz)	Toshinori Yamada (1 GHz - 13 GHz)	Hiromasa Sato (13 GHz - 18 GHz)	Takahiro Suzuki (18 GHz - 26.5 GHz)
Mode	Tx 11g 2437 MHz with 11ac-20 MIMO 5745 MHz			
EUT	Hi type(14 inch Display)			



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

Radiated Spurious Emission

Report No.	13385909S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	July 27, 2020	July 1, 2020	July 5, 2020
Temperature / Humidity	23 deg. C / 62 % RH	24 deg. C / 51 % RH	24 deg. C / 55 % RH
Engineer	Toshinori Yamada (30 MHz - 1 GHz)	Hiromasa Sato (1 GHz - 2.8 GHz)	Takahiro Kawakami (2.8 GHz - 13 GHz)
Semi Anechoic Chamber	3	3	
Date	July 24, 2020	July 26, 2020	
Temperature / Humidity	23 deg. C / 60 % RH	23 deg. C / 69 % RH	
Engineer	Hiromasa Sato (13 GHz - 18 GHz)	Takahiro Suzuki (18 GHz - 26.5 GHz)	
Mode	Tx BT LE 1 M-PHY 2402 MHz		
EUT	Hi type(14 inch Display)		

(* 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.	250.379	QP	37.70	11.78	8.26	31.98	0.00	25.76	46.0	20.2	123	165	-
Hori.	387.502	QP	36.80	15.36	8.94	31.93	0.00	29.17	46.0	16.8	100	98	
Hori.	580.226	QP	35.70	18.76	9.73	31.96	0.00	32.23	46.0	13.7	155	190	
Hori.	591.974	QP	35.70	19.14	9.77	31.95	0.00	32.66	46.0	13.3	152	208	
Hori.	775.001	QP	36.80	20.44	10.42	31.70	0.00	35.96	46.0	10.0	128	83	
Hori.	827.645	QP	32.30	21.00	10.59	31.47	0.00	32.42	46.0	13.5	100	224	
Hori.	844.785	QP	35.90	21.30	10.65	31.35	0.00	36.50	46.0	9.5	124	34	
Hori.	913.975	QP	32.30	22.13	10.86	30.94	0.00	34.35	46.0	11.6	241	213	
Hori.	2390.000	PK	47.31	28.41	14.23	41.66	2.13	50.42	73.9	23.4	309	21	
Hori.	4804.000	PK	49.60	31.60	6.82	42.92	2.13	47.23	73.9	26.6	188	210	
Hori.	7206.000	PK	53.16	37.60	8.38	43.39	2.13	57.88	73.9	16.0	184	217	
Vert.	130.571	QP	35.50	13.92	7.39	32.10	0.00	24.71	43.5	18.7	100	189	
Vert.	913.975	QP	31.60	22.13	10.86	30.94	0.00	33.65	46.0	12.3	100	181	
Vert.	2390.000	PK	48.01	28.41	14.23	41.66	2.13	51.12	73.9	22.7	391	206	
Vert.	4804.000	PK	47.76	31.60	6.82	42.92	2.13	45.39	73.9	28.5	172	329	
Vert.	7206.000	PK	53.19	37.60	8.38	43.39	2.13	57.91	73.9	15.9	128	178	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	47.31	28.41	14.23	41.66	-22.15	2.13	28.27	53.9	25.6	*1)
Hori.	4804.000	PK	49.60	31.60	6.82	42.92	-22.15	2.13	25.08	53.9	28.8	
Hori.	7206.000	PK	53.16	37.60	8.38	43.39	-22.15	2.13	35.73	53.9	18.2	
Vert.	2390.000	PK	48.01	28.41	14.23	41.66	-22.15	2.13	28.97	53.9	24.9	*1)
Vert.	4804.000	PK	47.76	31.60	6.82	42.92	-22.15	2.13	23.24	53.9	30.7	
Vert.	7206.000	PK	53.19	37.60	8.38	43.39	-22.15	2.13	35.76	53.9	18.1	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.

*1) Not out of band emission (Leakage Power)

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
Vert.	2402.000	PK	94.33	28.38	14.24	41.67	2.13	97.41	-	-	Carrier
Vert.	2400.000	PK	42.20	28.38	14.23	41.67	2.13	45.27	77.41	32.1	
Hori.	2402.000	PK	93.03	28.38	14.24	41.67	2.13	96.11	-	-	Carrier
Hori.	2400.000	PK	41.03	28.38	14.23	41.67	2.13	44.10	76.11	32.0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

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Shonan EMC Lab.

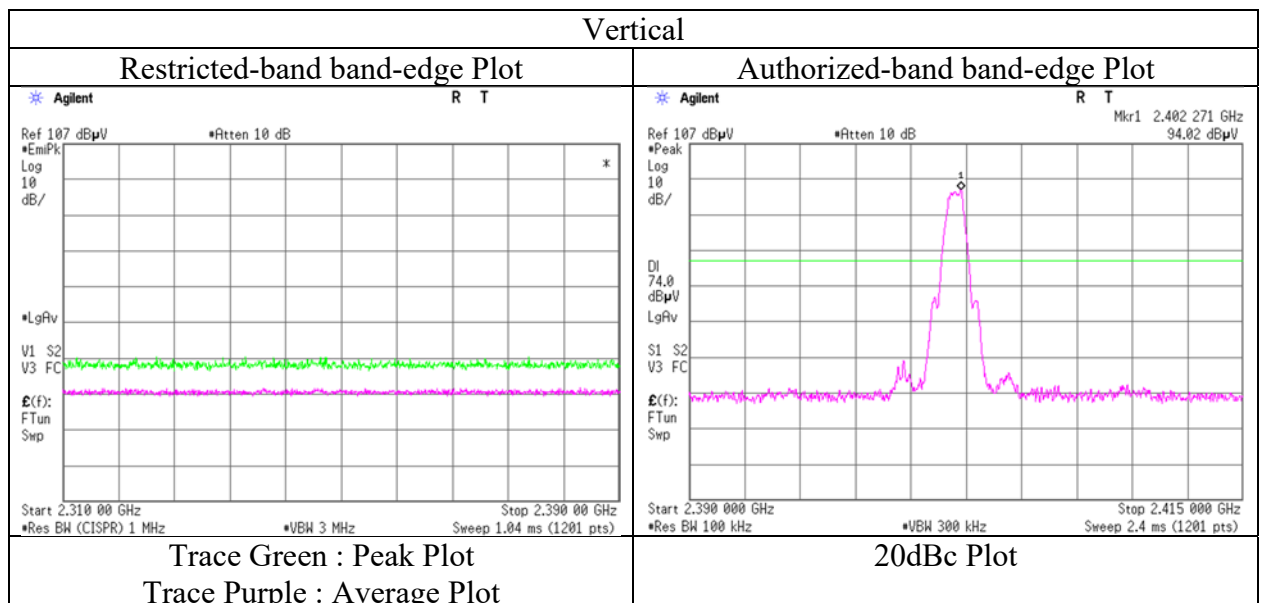
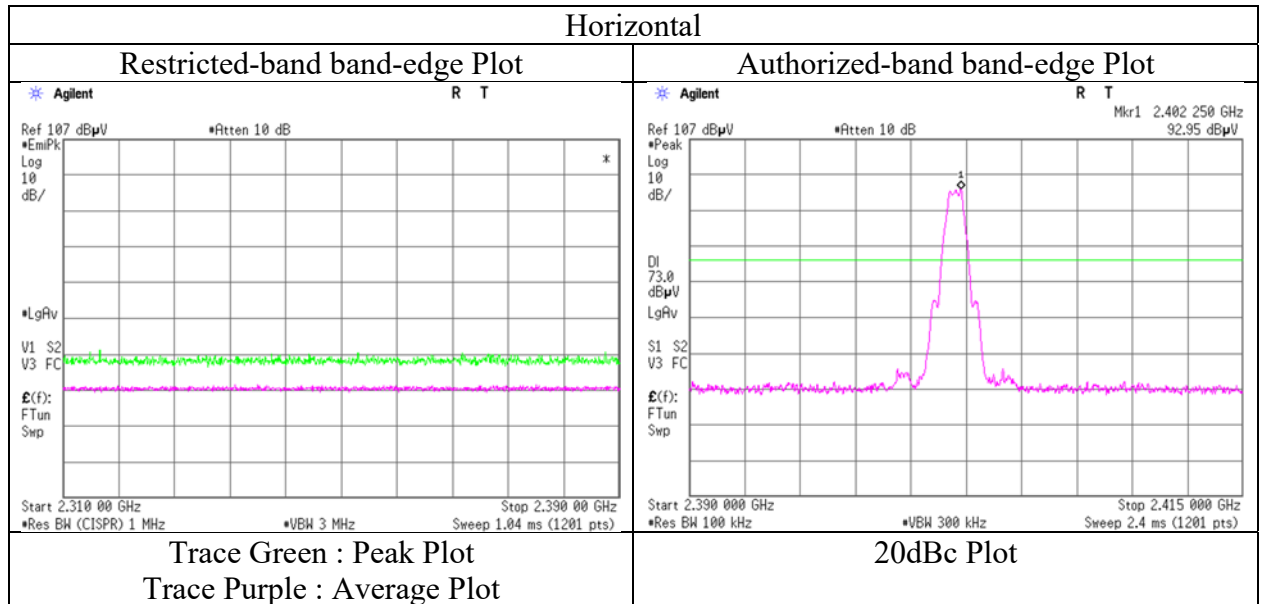
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Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	13385909S-B-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	July 1, 2020
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Hiromasa Sato
Mode	Tx BT LE 1 M-PHY 2402 MHz
EUT	Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	July 28, 2020	July 1, 2020	July 5, 2020
Temperature / Humidity	25 deg. C / 64 % RH	24 deg. C / 51 % RH	24 deg. C / 55 % RH
Engineer	Makoto Hosaka (30 MHz - 1 GHz)	Hiromasa Sato (1 GHz - 2.8 GHz)	Takahiro Kawakami (2.8 GHz - 13 GHz)
Semi Anechoic Chamber	3	3	
Date	July 24, 2020	July 26, 2020	
Temperature / Humidity	23 deg. C / 60 % RH	23 deg. C / 69 % RH	
Engineer	Hiromasa Sato (13 GHz - 18 GHz)	Takahiro Suzuki (18 GHz - 26.5 GHz)	
Mode	Tx BT LE 1 M-PHY 2440 MHz		
EUT	Hi type(14 inch Display)		

(* 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.	250.692	QP	35.70	11.79	8.26	31.98	0.00	23.77	46.0	22.2	123	131	-
Hori.	581.091	QP	36.30	18.78	9.73	31.96	0.00	32.85	46.0	13.1	171	169	
Hori.	592.837	QP	36.40	19.16	9.77	31.95	0.00	33.38	46.0	12.6	135	206	
Hori.	640.002	QP	37.30	19.27	9.94	31.95	0.00	34.56	46.0	11.4	148	208	
Hori.	722.863	QP	32.40	20.04	10.24	31.82	0.00	30.86	46.0	15.1	121	219	
Hori.	769.926	QP	34.30	20.43	10.41	31.70	0.00	33.44	46.0	12.5	121	193	
Hori.	829.096	QP	33.20	21.03	10.59	31.46	0.00	33.36	46.0	12.6	100	226	
Hori.	913.973	QP	34.10	22.13	10.86	30.94	0.00	36.15	46.0	9.8	205	116	
Hori.	4880.000	PK	49.21	31.63	6.87	42.93	2.13	46.91	73.9	26.9	211	202	
Hori.	7320.000	PK	53.93	37.71	8.45	43.49	2.13	58.73	73.9	15.1	190	234	
Vert.	130.568	QP	37.40	13.92	7.39	32.10	0.00	26.61	43.5	16.8	100	179	
Vert.	581.654	QP	34.00	18.81	9.73	31.96	0.00	30.58	46.0	15.4	158	229	
Vert.	4880.000	PK	47.46	31.63	6.87	42.93	2.13	45.16	73.9	28.7	129	333	
Vert.	7320.000	PK	52.85	37.71	8.45	43.49	2.13	57.65	73.9	16.2	136	179	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4880.000	PK	49.21	31.63	6.87	42.93	-22.15	2.13	24.76	53.9	29.1	-
Hori.	7320.000	PK	53.93	37.71	8.45	43.49	-22.15	2.13	36.58	53.9	17.3	
Vert.	4880.000	PK	47.46	31.63	6.87	42.93	-22.15	2.13	23.01	53.9	30.9	
Vert.	7320.000	PK	52.85	37.71	8.45	43.49	-22.15	2.13	35.50	53.9	18.4	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission

Report No.	13385909S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	July 28, 2020	July 1, 2020	July 5, 2020
Temperature / Humidity	25 deg. C / 64 % RH	24 deg. C / 51 % RH	24 deg. C / 55 % RH
Engineer	Makoto Hosaka (30 MHz - 1 GHz)	Hiromasa Sato (1 GHz - 2.8 GHz)	Takahiro Kawakami (2.8 GHz - 13 GHz)
Semi Anechoic Chamber	3	3	
Date	July 24, 2020	July 26, 2020	
Temperature / Humidity	23 deg. C / 60 % RH	23 deg. C / 69 % RH	
Engineer	Hiromasa Sato (13 GHz - 18 GHz)	Takahiro Suzuki (18 GHz - 26.5 GHz)	
Mode	Tx BT LE 1 M-PHY 2480 MHz		
EUT	Hi type(14 inch Display)		

(* 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.	580.759	QP	35.60	18.77	9.73	31.96	0.00	32.14	46.0	13.8	158	181	-
Hori.	592.542	QP	36.80	19.15	9.77	31.95	0.00	33.77	46.0	12.2	136	204	
Hori.	640.000	QP	38.00	19.27	9.94	31.95	0.00	35.26	46.0	10.7	152	238	
Hori.	733.958	QP	32.10	20.09	10.28	31.78	0.00	30.69	46.0	15.3	127	216	
Hori.	769.239	QP	35.50	20.43	10.40	31.70	0.00	34.63	46.0	11.3	115	198	
Hori.	828.386	QP	32.90	21.02	10.59	31.46	0.00	33.05	46.0	12.9	100	225	
Hori.	913.977	QP	35.10	22.13	10.86	30.94	0.00	37.15	46.0	8.8	197	119	
Hori.	2483.500	PK	47.50	28.28	14.32	41.69	2.13	50.54	73.9	23.3	227	351	
Hori.	4960.000	PK	50.11	31.79	6.94	42.94	2.13	48.03	73.9	25.8	145	227	
Hori.	7440.000	PK	50.17	37.88	8.52	43.60	2.13	55.10	73.9	18.8	124	101	
Vert.	130.564	QP	37.40	13.92	7.39	32.10	0.00	26.61	43.5	16.8	100	185	
Vert.	232.875	QP	38.20	11.41	8.16	32.01	0.00	25.76	46.0	20.2	100	42	
Vert.	913.974	QP	33.50	22.13	10.86	30.94	0.00	35.55	46.0	10.4	100	329	
Vert.	2483.500	PK	48.88	28.28	14.32	41.69	2.13	51.92	73.9	21.9	345	163	
Vert.	4960.000	PK	49.25	31.79	6.94	42.94	2.13	47.17	73.9	26.7	100	0	
Vert.	7440.000	PK	48.63	37.88	8.52	43.60	2.13	53.56	73.9	20.3	110	127	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	PK	47.50	28.28	14.32	41.69	-22.15	2.13	28.39	53.9	25.5	*1)
Hori.	4960.000	PK	50.11	31.79	6.94	42.94	-22.15	2.13	25.88	53.9	28.0	
Hori.	7440.000	PK	50.17	37.88	8.52	43.60	-22.15	2.13	32.95	53.9	21.0	
Vert.	2483.500	PK	48.88	28.28	14.32	41.69	-22.15	2.13	29.77	53.9	24.1	*1)
Vert.	4960.000	PK	49.25	31.79	6.94	42.94	-22.15	2.13	25.02	53.9	28.9	
Vert.	7440.000	PK	48.63	37.88	8.52	43.60	-22.15	2.13	31.41	53.9	22.5	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

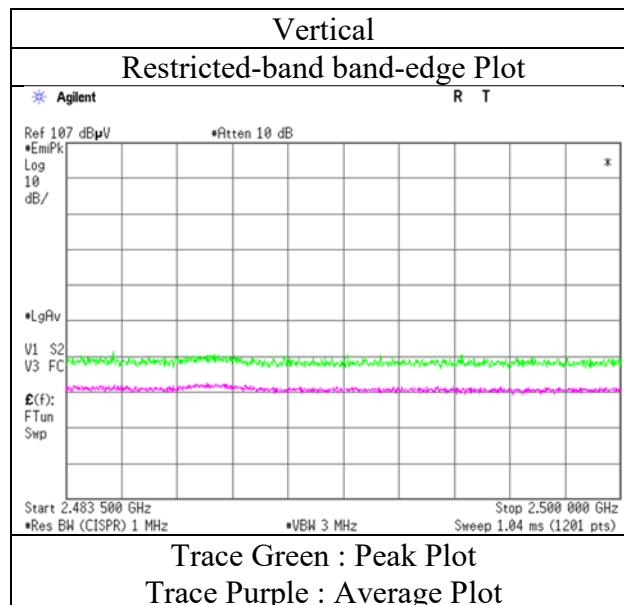
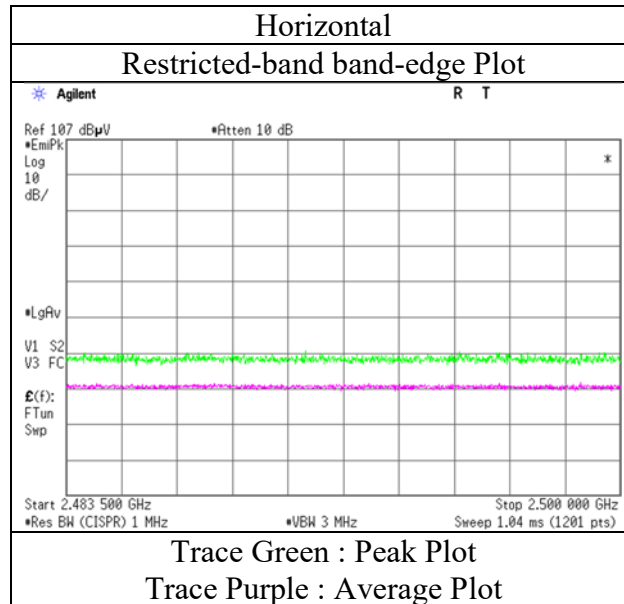
13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 1, 2020
Temperature / Humidity 24 deg. C / 51 % RH
Engineer Hiromasa Sato
Mode Tx BT LE 1 M-PHY 2480 MHz
EUT Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	July 28, 2020	July 1, 2020	July 5, 2020
Temperature / Humidity	25 deg. C / 64 % RH	24 deg. C / 51 % RH	24 deg. C / 55 % RH
Engineer	Makoto Hosaka (30 MHz - 1 GHz)	Hiromasa Sato (1 GHz - 2.8 GHz)	Takahiro Kawakami (2.8 GHz - 13 GHz)
Semi Anechoic Chamber	3	3	
Date	July 24, 2020	July 26, 2020	
Temperature / Humidity	23 deg. C / 60 % RH	23 deg. C / 69 % RH	
Engineer	Hiromasa Sato (13 GHz - 18 GHz)	Takahiro Suzuki (18 GHz - 26.5 GHz)	
Mode	Tx BT LE 2 M-PHY 2402 MHz		
EUT	Hi type(14 inch Display)		

(* 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.	250.535	QP	40.90	11.79	8.26	31.98	0.00	28.97	46.0	17.0	138	132	-
Hori.	580.659	QP	36.80	18.77	9.73	31.96	0.00	33.34	46.0	12.6	169	177	-
Hori.	592.456	QP	36.80	19.15	9.77	31.95	0.00	33.77	46.0	12.2	147	203	-
Hori.	640.003	QP	37.50	19.27	9.94	31.95	0.00	34.76	46.0	11.2	146	226	-
Hori.	804.503	QP	31.80	20.80	10.51	31.63	0.00	31.48	46.0	14.5	100	233	-
Hori.	828.093	QP	33.00	21.01	10.59	31.47	0.00	33.13	46.0	12.8	100	223	-
Hori.	913.974	QP	35.80	22.13	10.86	30.94	0.00	37.85	46.0	8.1	199	120	-
Hori.	2337.661	PK	49.74	28.01	14.17	41.64	2.13	52.41	73.9	21.4	197	213	-
Hori.	2390.000	PK	47.64	27.93	14.22	41.66	2.13	50.26	73.9	23.6	197	213	-
Hori.	4804.000	PK	48.98	31.60	6.82	42.92	2.13	46.61	73.9	27.2	209	217	-
Hori.	7206.000	PK	54.04	37.60	8.38	43.39	2.13	58.76	73.9	15.1	166	201	-
Vert.	130.567	QP	37.20	13.92	7.39	32.10	0.00	26.41	43.5	17.0	100	171	-
Vert.	921.585	QP	25.30	22.13	10.89	30.88	0.00	27.44	46.0	18.5	148	184	-
Vert.	2336.825	PK	51.02	28.02	14.17	41.64	2.13	53.70	73.9	20.2	314	166	-
Vert.	2390.000	PK	47.61	27.93	14.22	41.66	2.13	50.23	73.9	23.6	314	166	-
Vert.	4804.000	PK	47.45	31.60	6.82	42.92	2.13	45.08	73.9	28.8	223	357	-
Vert.	7206.000	PK	53.42	37.60	8.38	43.39	2.13	58.14	73.9	15.7	129	178	-

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant. Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2337.661	PK	49.74	28.01	14.17	41.64	-28.17	2.13	24.24	53.9	29.7	*2)
Hori.	2390.000	PK	47.64	27.93	14.22	41.66	-28.17	2.13	22.09	53.9	31.8	*1)
Hori.	4804.000	PK	48.98	31.60	6.82	42.92	-28.17	2.13	18.44	53.9	35.5	-
Hori.	7206.000	PK	54.04	37.60	8.38	43.39	-28.17	2.13	30.59	53.9	23.3	-
Vert.	2336.825	PK	51.02	28.02	14.17	41.64	-28.17	2.13	25.53	53.9	28.4	*2)
Vert.	2390.000	PK	47.61	27.93	14.22	41.66	-28.17	2.13	22.06	53.9	31.8	*1)
Vert.	4804.000	PK	47.45	31.60	6.82	42.92	-28.17	2.13	16.91	53.9	37.0	-
Vert.	7206.000	PK	53.42	37.60	8.38	43.39	-28.17	2.13	29.97	53.9	23.9	-

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.

*1) Not out of band emission (Leakage Power)

*2) Spurious emissions of the same duty cycle as carrier.

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant. Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	92.75	27.92	14.23	41.67	2.13	95.36	-	-	Carrier
Hori.	2400.000	PK	61.11	27.92	14.22	41.67	2.13	63.71	75.36	11.6	-
Vert.	2402.000	PK	94.61	27.92	14.23	41.67	2.13	97.22	-	-	Carrier
Vert.	2400.000	PK	62.74	27.92	14.22	41.67	2.13	65.34	77.22	11.8	-

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

UL Japan, Inc.

Shonan EMC Lab.

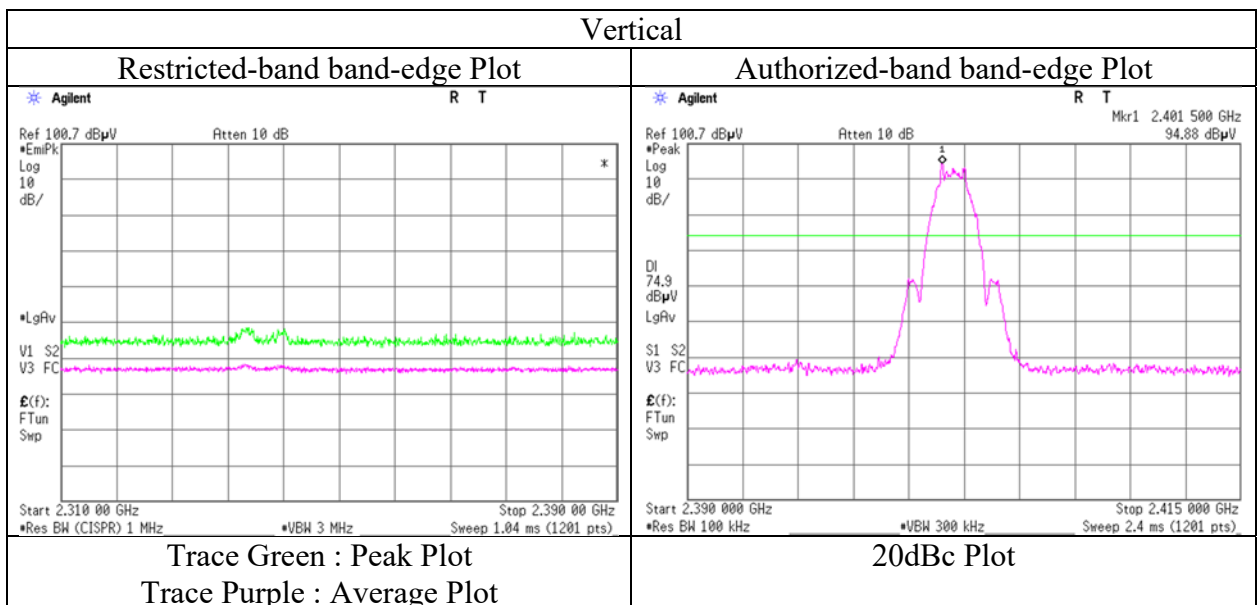
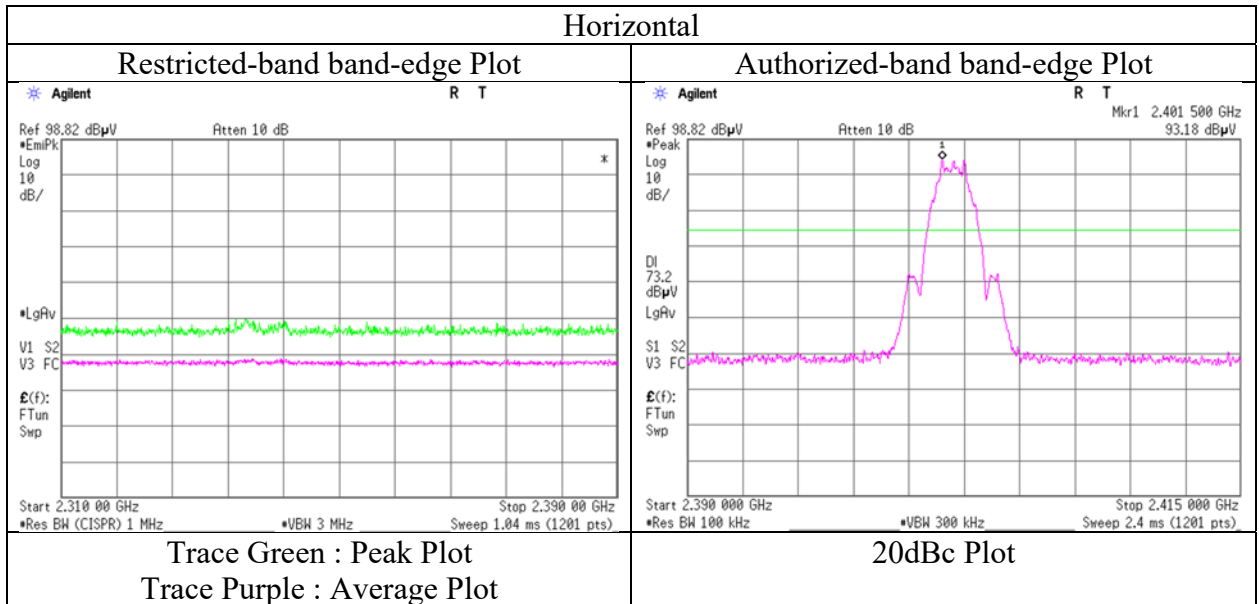
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Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	13385909S-B-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	July 1, 2020
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Hiromasa Sato
Mode	Tx BT LE 2 M-PHY 2402 MHz
EUT	Hi type(14 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	July 28, 2020	July 1, 2020	July 5, 2020
Temperature / Humidity	25 deg. C / 64 % RH	24 deg. C / 51 % RH	24 deg. C / 55 % RH
Engineer	Makoto Hosaka (30 MHz - 1 GHz)	Hiromasa Sato (1 GHz - 2.8 GHz)	Takahiro Kawakami (2.8 GHz - 13 GHz)
Semi Anechoic Chamber	3	3	
Date	July 24, 2020	July 26, 2020	
Temperature / Humidity	23 deg. C / 60 % RH	23 deg. C / 69 % RH	
Engineer	Hiromasa Sato (13 GHz - 18 GHz)	Takahiro Suzuki (18 GHz - 26.5 GHz)	
Mode	Tx BT LE 2 M-PHY 2440 MHz		
EUT	Hi type(14 inch Display)		

(* 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.	250.425	QP	39.90	11.78	8.26	31.98	0.00	27.96	46.0	18.0	122	133	-
Hori.	580.405	QP	35.40	18.76	9.73	31.96	0.00	31.93	46.0	14.0	166	185	
Hori.	592.146	QP	36.10	19.14	9.77	31.95	0.00	33.06	46.0	12.9	145	205	
Hori.	640.003	QP	37.80	19.27	9.94	31.95	0.00	35.06	46.0	10.9	151	208	
Hori.	792.402	QP	32.60	20.70	10.47	31.67	0.00	32.10	46.0	13.9	196	232	
Hori.	827.814	QP	32.90	21.01	10.59	31.47	0.00	33.03	46.0	12.9	100	228	
Hori.	845.813	QP	31.50	21.33	10.65	31.34	0.00	32.14	46.0	13.8	100	228	
Hori.	913.977	QP	34.50	22.13	10.86	30.94	0.00	36.55	46.0	9.4	198	122	
Hori.	4880.000	PK	48.88	31.63	6.87	42.93	2.13	46.58	73.9	27.3	213	169	
Hori.	7320.000	PK	54.58	37.71	8.45	43.49	2.13	59.38	73.9	14.5	188	239	
Vert.	130.573	QP	37.30	13.92	7.39	32.10	0.00	26.51	43.5	16.9	100	179	
Vert.	913.974	QP	32.70	22.13	10.86	30.94	0.00	34.75	46.0	11.2	100	196	
Vert.	4880.000	PK	47.77	31.63	6.87	42.93	2.13	45.47	73.9	28.4	106	237	
Vert.	7320.000	PK	52.32	37.71	8.45	43.49	2.13	57.12	73.9	16.7	135	180	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4880.000	PK	48.88	31.63	6.87	42.93	-28.17	2.13	18.41	53.9	35.5	-
Hori.	7320.000	PK	54.58	37.71	8.45	43.49	-28.17	2.13	31.21	53.9	22.7	
Vert.	4880.000	PK	47.77	31.63	6.87	42.93	-28.17	2.13	17.30	53.9	36.6	
Vert.	7320.000	PK	52.32	37.71	8.45	43.49	-28.17	2.13	28.95	53.9	25.0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission

Report No.	13385909S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	July 28, 2020	July 1, 2020	July 5, 2020
Temperature / Humidity	25 deg. C / 64 % RH	24 deg. C / 51 % RH	24 deg. C / 55 % RH
Engineer	Makoto Hosaka (30 MHz - 1 GHz)	Hiromasa Sato (1 GHz - 2.8 GHz)	Takahiro Kawakami (2.8 GHz - 13 GHz)
Semi Anechoic Chamber	3	3	
Date	July 24, 2020	July 26, 2020	
Temperature / Humidity	23 deg. C / 60 % RH	23 deg. C / 69 % RH	
Engineer	Hiromasa Sato (13 GHz - 18 GHz)	Takahiro Suzuki (18 GHz - 26.5 GHz)	
Mode	Tx BT LE 2 M-PHY 2480 MHz		
EUT	Hi type(14 inch Display)		

(* 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.	250.400	QP	40.70	11.78	8.26	31.98	0.00	28.76	46.0	17.2	131	132	-
Hori.	580.374	QP	35.70	18.76	9.73	31.96	0.00	32.23	46.0	13.7	163	181	
Hori.	592.122	QP	36.80	19.14	9.77	31.95	0.00	33.76	46.0	12.2	146	202	
Hori.	640.002	QP	37.10	19.27	9.94	31.95	0.00	34.36	46.0	11.6	148	236	
Hori.	804.310	QP	31.80	20.81	10.51	31.63	0.00	31.49	46.0	14.5	105	222	
Hori.	827.680	QP	33.20	21.00	10.59	31.47	0.00	33.32	46.0	12.6	100	226	
Hori.	845.351	QP	32.00	21.32	10.65	31.35	0.00	32.62	46.0	13.3	100	228	
Hori.	913.974	QP	33.90	22.13	10.86	30.94	0.00	35.95	46.0	10.0	195	130	
Hori.	2483.500	PK	48.65	27.84	14.31	41.69	2.13	51.24	73.9	22.6	220	217	
Hori.	4960.000	PK	48.51	31.79	6.94	42.94	2.13	46.43	73.9	27.4	100	213	
Hori.	7440.000	PK	50.68	37.88	8.52	43.60	2.13	55.61	73.9	18.2	100	114	
Vert.	130.569	QP	36.90	13.92	7.39	32.10	0.00	26.11	43.5	17.3	100	174	
Vert.	913.975	QP	32.50	22.13	10.86	30.94	0.00	34.55	46.0	11.4	100	197	
Vert.	2483.500	PK	48.77	27.84	14.31	41.69	2.13	51.36	73.9	22.5	309	170	
Vert.	4960.000	PK	48.31	31.79	6.94	42.94	2.13	46.23	73.9	27.6	110	214	
Vert.	7440.000	PK	49.23	37.88	8.52	43.60	2.13	54.16	73.9	19.7	265	9	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	PK	48.65	27.84	14.31	41.69	-28.17	2.13	23.07	53.9	30.8	*1)
Hori.	4960.000	PK	48.51	31.79	6.94	42.94	-28.17	2.13	18.26	53.9	35.6	
Hori.	7440.000	PK	50.68	37.88	8.52	43.60	-28.17	2.13	27.44	53.9	26.5	
Vert.	2483.500	PK	48.77	27.84	14.31	41.69	-28.17	2.13	23.19	53.9	30.7	*1)
Vert.	4960.000	PK	48.31	31.79	6.94	42.94	-28.17	2.13	18.06	53.9	35.8	
Vert.	7440.000	PK	49.23	37.88	8.52	43.60	-28.17	2.13	25.99	53.9	27.9	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

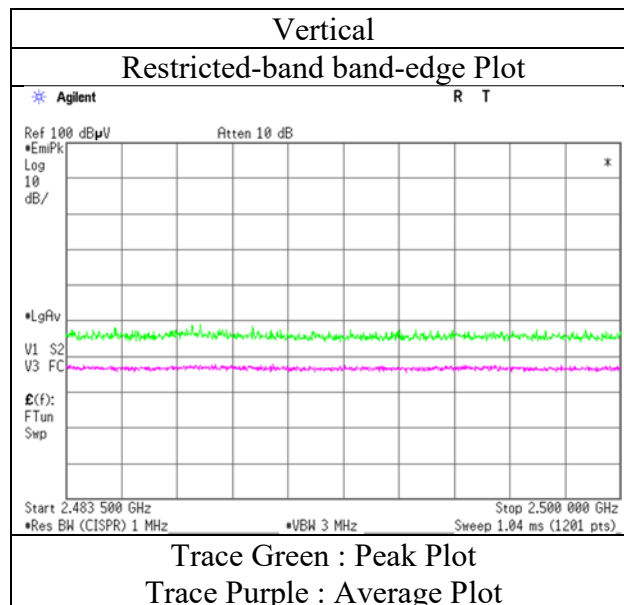
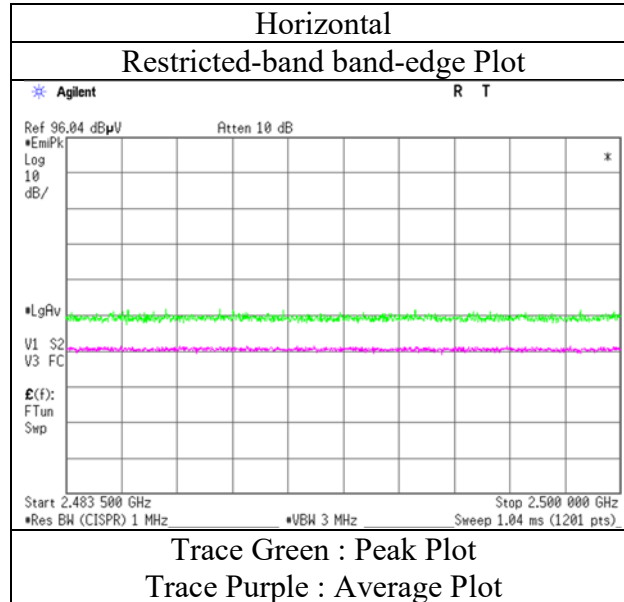
13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 1, 2020
Temperature / Humidity 24 deg. C / 51 % RH
Engineer Hiromasa Sato
Mode Tx BT LE 2 M-PHY 2480 MHz
EUT Hi type(14 inch Display)

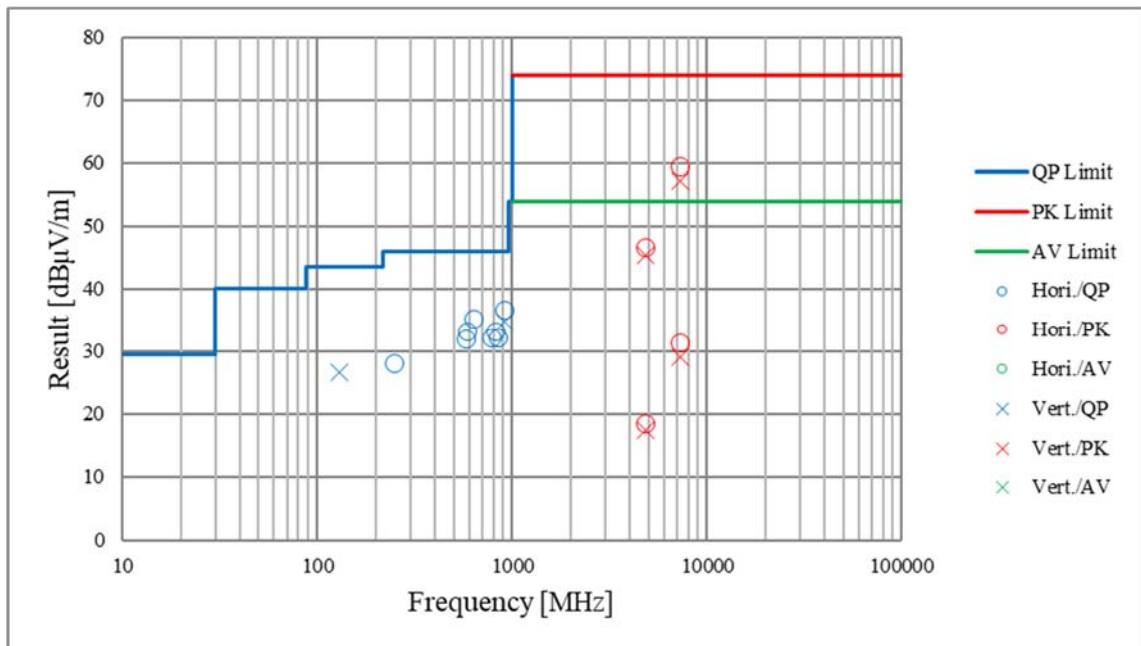


* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission (Plot data, Worst case)

Report No.	13385909S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	July 28, 2020	July 1, 2020	July 5, 2020
Temperature / Humidity	25 deg. C / 64 % RH	24 deg. C / 51 % RH	24 deg. C / 55 % RH
Engineer	Makoto Hosaka (30 MHz - 1 GHz)	Hiromasa Sato (1 GHz - 2.8 GHz)	Takahiro Kawakami (2.8 GHz - 13 GHz)
Semi Anechoic Chamber	3	3	
Date	July 24, 2020	July 26, 2020	
Temperature / Humidity	23 deg. C / 60 % RH	23 deg. C / 69 % RH	
Engineer	Hiromasa Sato (13 GHz - 18 GHz)	Takahiro Suzuki (18 GHz - 26.5 GHz)	
Mode	Tx BT LE 2 M-PHY 2440 MHz		
EUT	Hi type(14 inch Display)		



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

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 6, 2020	July 7, 2020	July 23, 2020	July 23, 2020
Temperature / Humidity	22 deg.C / 69 %RH	23 deg.C / 66 %RH	24 deg.C / 61 %RH	22 deg.C / 63 %RH
Engineer	Kazuya Noda	Kazuya Noda	Hiromasa Sato	Toshinori Yamada
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11b 2412 MHz			
EUT	Lo type(9.8 inch Display)			

(* 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.	2376.091	PK	49.65	28.44	14.22	41.66	2.13	52.78	73.90	21.1	202	265	
Hori.	2388.891	PK	49.88	28.41	14.23	41.66	2.13	52.99	73.90	20.9	202	265	
Hori.	2390.000	PK	49.08	28.41	14.23	41.66	2.13	52.19	73.90	21.7	202	265	
Hori.	3531.501	PK	59.46	29.29	6.14	42.20	2.13	54.82	73.90	19.0	156	234	
Hori.	4824.000	PK	49.25	31.61	6.83	42.93	2.13	46.89	73.90	27.0	122	212	
Hori.	7236.000	PK	48.62	37.62	8.39	43.41	2.13	53.35	73.90	20.5	100	0	
Hori.	2376.091	AV	40.88	28.44	14.22	41.66	2.13	44.01	53.90	9.8	202	265	
Hori.	2388.891	AV	41.79	28.41	14.23	41.66	2.13	44.90	53.90	9.0	202	265	
Hori.	2390.000	AV	40.33	28.41	14.23	41.66	2.13	43.44	53.90	10.4	202	265	
Hori.	4824.000	AV	39.70	31.61	6.83	42.93	2.13	37.34	53.90	16.5	122	212	
Hori.	7236.000	AV	38.79	37.62	8.39	43.41	2.13	43.52	53.90	10.3	100	0	Floor noise
Vert.	2376.217	PK	48.56	28.44	14.22	41.66	2.13	51.69	73.90	22.2	185	255	
Vert.	2388.930	PK	48.64	28.41	14.23	41.66	2.13	51.75	73.90	22.1	185	255	
Vert.	2390.000	PK	48.12	28.41	14.23	41.66	2.13	51.23	73.90	22.6	185	255	
Vert.	4824.000	PK	49.94	31.61	6.83	42.93	2.13	47.58	73.90	26.3	239	267	
Vert.	7236.000	PK	48.21	37.62	8.39	43.41	2.13	52.94	73.90	20.9	100	0	
Vert.	2376.217	AV	39.04	28.44	14.22	41.66	2.13	42.17	53.90	11.7	185	255	
Vert.	2388.930	AV	40.14	28.41	14.23	41.66	2.13	43.25	53.90	10.6	185	255	
Vert.	2390.000	AV	39.18	28.41	14.23	41.66	2.13	42.29	53.90	11.6	185	255	
Vert.	4824.000	AV	41.32	31.61	6.83	42.93	2.13	38.96	53.90	14.9	239	267	
Vert.	7236.000	AV	38.85	37.62	8.39	43.41	2.13	43.58	53.90	10.3	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 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.	2412.000	PK	98.06	28.37	14.24	41.67	2.13	101.13	-	-	Carrier
Hori.	2398.467	PK	51.26	28.38	14.23	41.67	2.13	54.33	81.13	26.8	
Hori.	2400.000	PK	42.71	28.38	14.23	41.67	2.13	45.78	81.13	35.3	
Vert.	2412.000	PK	94.07	28.37	14.24	41.67	2.13	97.14	-	-	Carrier
Vert.	2398.500	PK	50.16	28.38	14.23	41.67	2.13	53.23	77.14	23.9	
Vert.	2400.000	PK	40.88	28.38	14.23	41.67	2.13	43.95	77.14	33.1	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

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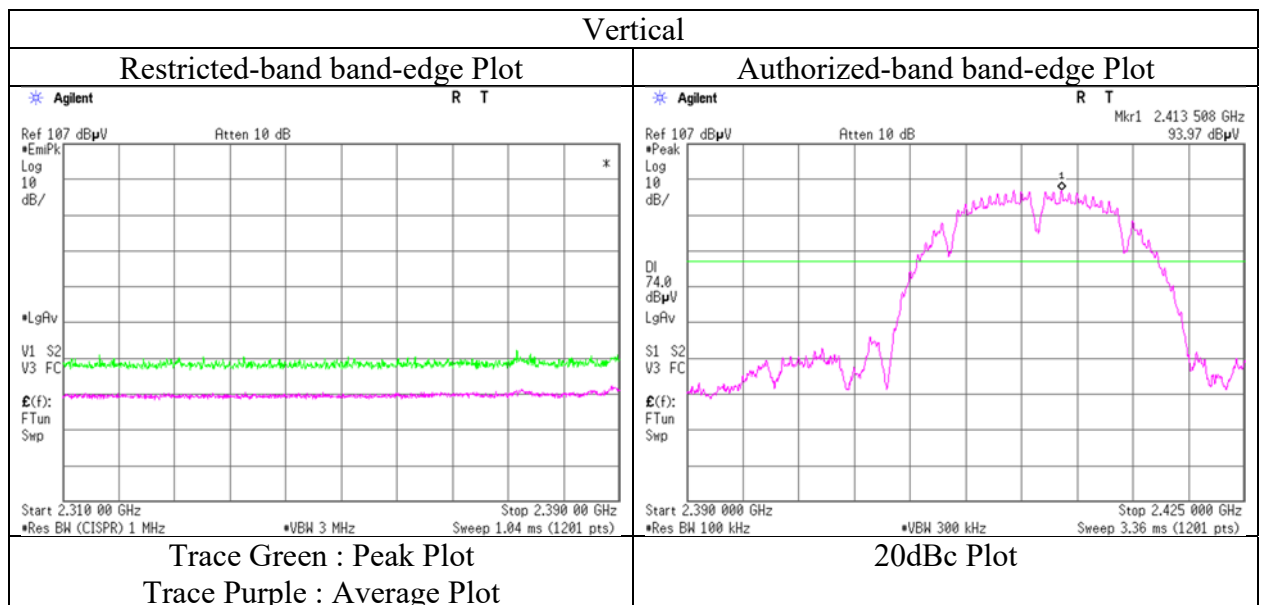
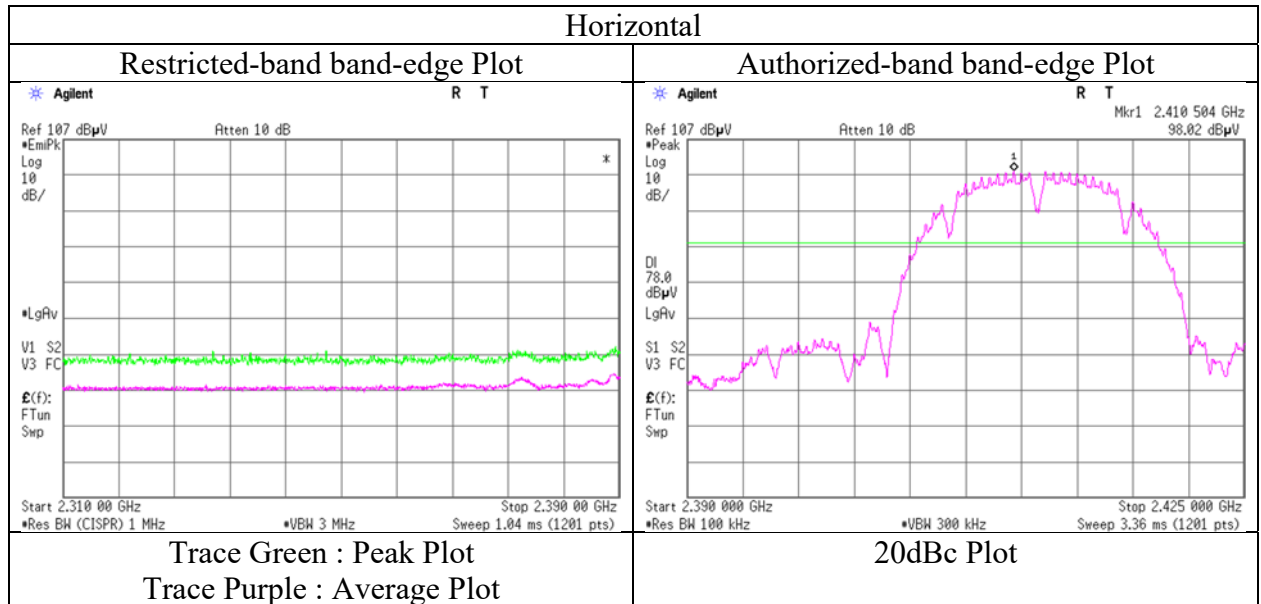
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Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 6, 2020
Temperature / Humidity 22 deg.C / 69 %RH
Engineer Kazuya Noda
Mode Tx 11b 2412 MHz
EUT Lo type(9.8 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 6, 2020	July 7, 2020	July 23, 2020	July 23, 2020
Temperature / Humidity	22 deg.C / 69 %RH	23 deg.C / 66 %RH	24 deg.C / 61 %RH	22 deg.C / 63 %RH
Engineer	Kazuya Noda	Kazuya Noda	Hiromasa Sato	Toshinori Yamada
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11b 2437 MHz			
EUT	Lo type(9.8 inch Display)			

(* 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.	4874.000	PK	48.85	31.63	6.87	42.93	2.13	46.55	73.90	27.3	112	209	
Hori.	7311.000	PK	48.07	37.69	8.43	43.48	2.13	52.84	73.90	21.0	100	0	
Hori.	4874.000	AV	40.08	31.63	6.87	42.93	2.13	37.78	53.90	16.1	112	209	
Hori.	7311.000	AV	38.46	37.69	8.43	43.48	2.13	43.23	53.90	10.6	100	0	Floor noise
Vert.	4874.000	PK	50.42	31.63	6.87	42.93	2.13	48.12	73.90	25.7	232	265	
Vert.	7311.000	PK	47.82	37.69	8.43	43.48	2.13	52.59	73.90	21.3	100	0	
Vert.	4874.000	AV	41.97	31.63	6.87	42.93	2.13	39.67	53.90	14.2	232	265	
Vert.	7311.000	AV	38.54	37.69	8.43	43.48	2.13	43.31	53.90	10.5	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$

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

UL Japan, Inc.

Shonan EMC Lab.

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Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 6, 2020	July 7, 2020	July 23, 2020	July 23, 2020
Temperature / Humidity	22 deg.C / 69 %RH	23 deg.C / 66 %RH	24 deg.C / 61 %RH	22 deg.C / 63 %RH
Engineer	Kazuya Noda	Kazuya Noda	Hiromasa Sato	Toshinori Yamada
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11b 2462 MHz			
EUT	Lo type(9.8 inch Display)			

(* 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.	2483.500	PK	48.53	28.28	14.32	41.69	2.13	51.57	73.90	22.3	164	255	
Hori.	2488.737	PK	50.18	28.27	14.32	41.70	2.13	53.20	73.90	20.7	164	255	
Hori.	4924.000	PK	48.65	31.68	6.91	42.94	2.13	46.43	73.90	27.4	142	206	
Hori.	7386.000	PK	48.91	37.81	8.48	43.55	2.13	53.78	73.90	20.1	100	0	
Hori.	2483.500	AV	40.25	28.28	14.32	41.69	2.13	43.29	53.90	10.6	164	255	
Hori.	2488.737	AV	41.21	28.27	14.32	41.70	2.13	44.23	53.90	9.6	164	255	
Hori.	4924.000	AV	38.76	31.68	6.91	42.94	2.13	36.54	53.90	17.3	142	206	
Hori.	7386.000	AV	38.88	37.81	8.48	43.55	2.13	43.75	53.90	10.1	100	0	Floor noise
Vert.	2483.500	PK	47.86	28.28	14.32	41.69	2.13	50.90	73.90	23.0	177	252	
Vert.	2488.491	PK	48.42	28.27	14.32	41.70	2.13	51.44	73.90	22.4	177	252	
Vert.	4924.000	PK	48.94	31.68	6.91	42.94	2.13	46.72	73.90	27.1	233	263	
Vert.	7386.000	PK	48.41	37.81	8.48	43.55	2.13	53.28	73.90	20.6	100	0	
Vert.	2483.500	AV	38.38	28.28	14.32	41.69	2.13	41.42	53.90	12.4	177	252	
Vert.	2488.491	AV	38.72	28.27	14.32	41.70	2.13	41.74	53.90	12.1	177	252	
Vert.	4924.000	AV	39.02	31.68	6.91	42.94	2.13	36.80	53.90	17.1	233	263	
Vert.	7386.000	AV	38.79	37.81	8.48	43.55	2.13	43.66	53.90	10.2	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

UL Japan, Inc.

Shonan EMC Lab.

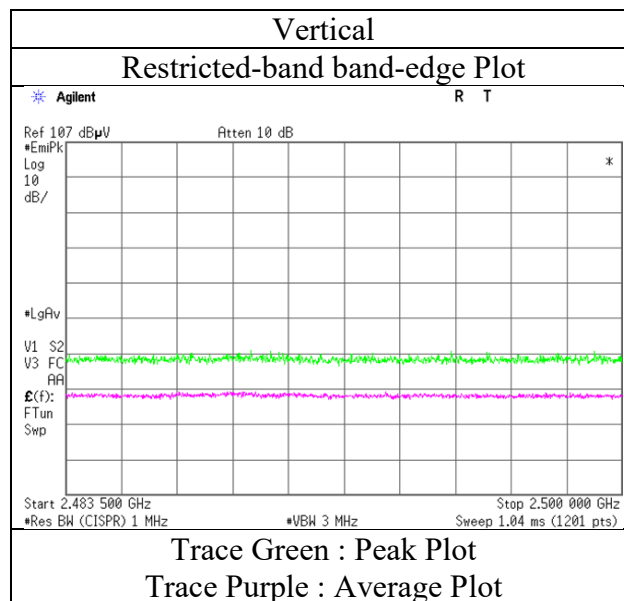
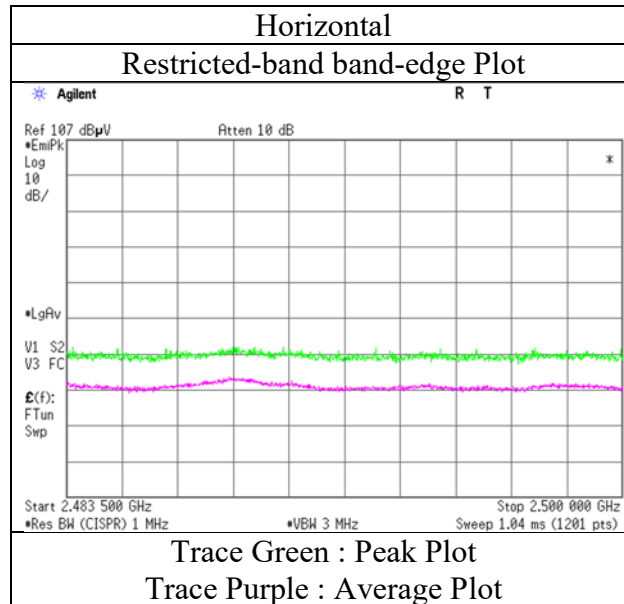
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 6, 2020
Temperature / Humidity 22 deg.C / 69 %RH
Engineer Kazuya Noda
Mode Tx 11b 2462 MHz
EUT Lo type(9.8 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 6, 2020	July 7, 2020	July 23, 2020	July 23, 2020
Temperature / Humidity	22 deg.C / 69 %RH	23 deg.C / 66 %RH	24 deg.C / 61 %RH	22 deg.C / 63 %RH
Engineer	Kazuya Noda	Kazuya Noda	Hiromasa Sato	Toshinori Yamada
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11g 2412 MHz			
EUT	Lo type(9.8 inch Display)			

(* 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.	2390.000	PK	63.45	28.41	14.23	41.66	2.13	66.56	73.90	7.3	175	259	
Hori.	4824.000	PK	48.23	31.61	6.83	42.93	2.13	45.87	73.90	28.0	122	217	
Hori.	7236.000	PK	48.47	37.62	8.39	43.41	2.13	53.20	73.90	20.7	100	0	
Hori.	7236.000	AV	38.41	37.62	8.39	43.41	2.13	43.14	53.90	10.7	100	0	Floor noise
Vert.	2390.000	PK	60.78	28.41	14.23	41.66	2.13	63.89	73.90	10.0	186	254	
Vert.	4824.000	PK	48.34	31.61	6.83	42.93	2.13	45.98	73.90	27.9	228	265	
Vert.	7236.000	PK	48.73	37.62	8.39	43.41	2.13	53.46	73.90	20.4	100	0	
Vert.	7236.000	AV	38.42	37.62	8.39	43.41	2.13	43.15	53.90	10.7	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB
13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	43.55	28.41	14.23	41.66	3.83	2.13	50.49	53.9	3.4	*1)
Hori.	4824.000	AV	38.87	31.61	6.83	42.93	3.83	2.13	40.34	53.9	13.5	
Vert.	2390.000	AV	41.31	28.41	14.23	41.66	3.83	2.13	48.25	53.9	5.6	*1)
Vert.	4824.000	AV	38.74	31.61	6.83	42.93	3.83	2.13	40.21	53.9	13.6	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB
13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

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.	2412.000	PK	94.34	28.37	14.24	41.67	2.13	97.41	-	-	Carrier
Hori.	2400.000	PK	57.30	28.38	14.23	41.67	2.13	60.37	77.41	17.0	
Vert.	2412.000	PK	90.42	28.37	14.24	41.67	2.13	93.49	-	-	Carrier
Vert.	2400.000	PK	54.25	28.38	14.23	41.67	2.13	57.32	73.49	16.1	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB
13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

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Shonan EMC Lab.

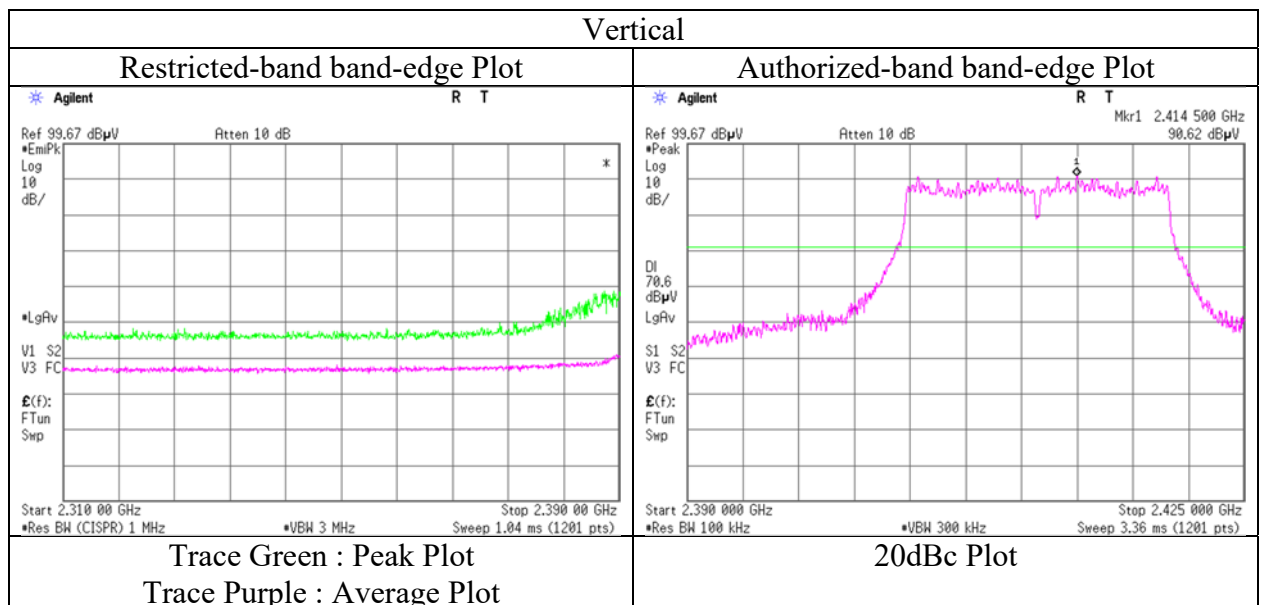
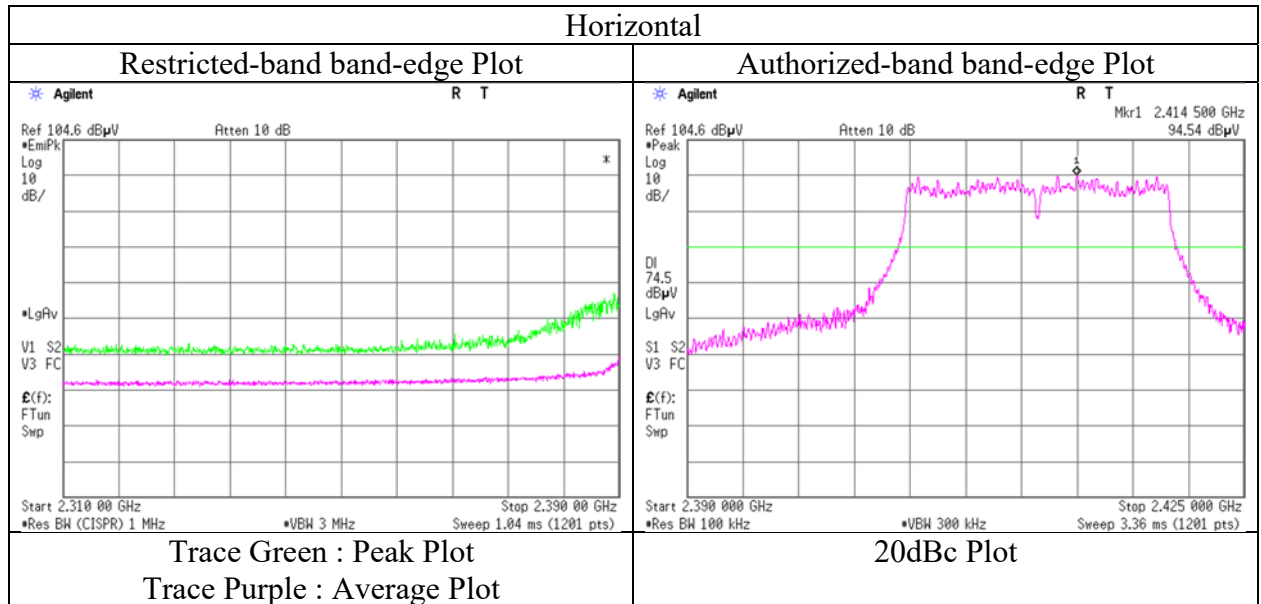
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 6, 2020
Temperature / Humidity 22 deg.C / 69 %RH
Engineer Kazuya Noda
Mode Tx 11g 2412 MHz
EUT Lo type(9.8 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

UL Japan, Inc.

Shonan EMC Lab.

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

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Facsimile : +81 463 50 6401

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 6, 2020	July 7, 2020	July 23, 2020	July 23, 2020
Temperature / Humidity	22 deg.C / 69 %RH	23 deg.C / 66 %RH	24 deg.C / 61 %RH	22 deg.C / 63 %RH
Engineer	Kazuya Noda	Kazuya Noda	Hiromasa Sato	Toshinori Yamada
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11g 2417 MHz			
EUT	Lo type(9.8 inch Display)			

(* 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.	2390.000	PK	65.22	28.41	14.23	41.66	2.13	68.33	73.9	5.5	205	264	-
Vert.	2390.000	PK	63.49	28.41	14.23	41.66	2.13	66.60	73.9	7.3	184	254	-

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	45.12	28.41	14.23	41.66	3.83	2.13	52.06	53.9	1.8	*1)
Vert.	2390.000	AV	43.04	28.41	14.23	41.66	3.83	2.13	49.98	53.9	3.9	*1)

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$

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

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

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.	2417.000	PK	97.05	28.36	14.26	41.67	2.13	100.13	-	-	Carrier
Hori.	2400.000	PK	57.23	28.38	14.23	41.67	2.13	60.30	80.13	19.8	
Vert.	2417.000	PK	92.79	28.36	14.26	41.67	2.13	95.87	-	-	Carrier
Vert.	2400.000	PK	54.91	28.38	14.23	41.67	2.13	57.98	75.87	17.8	

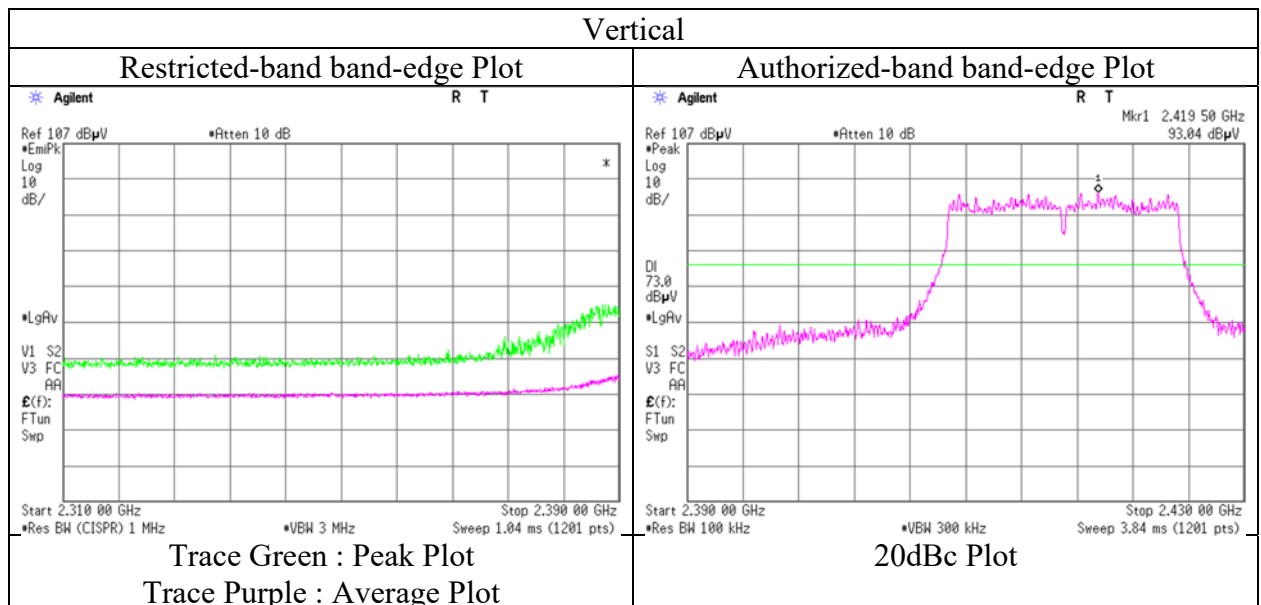
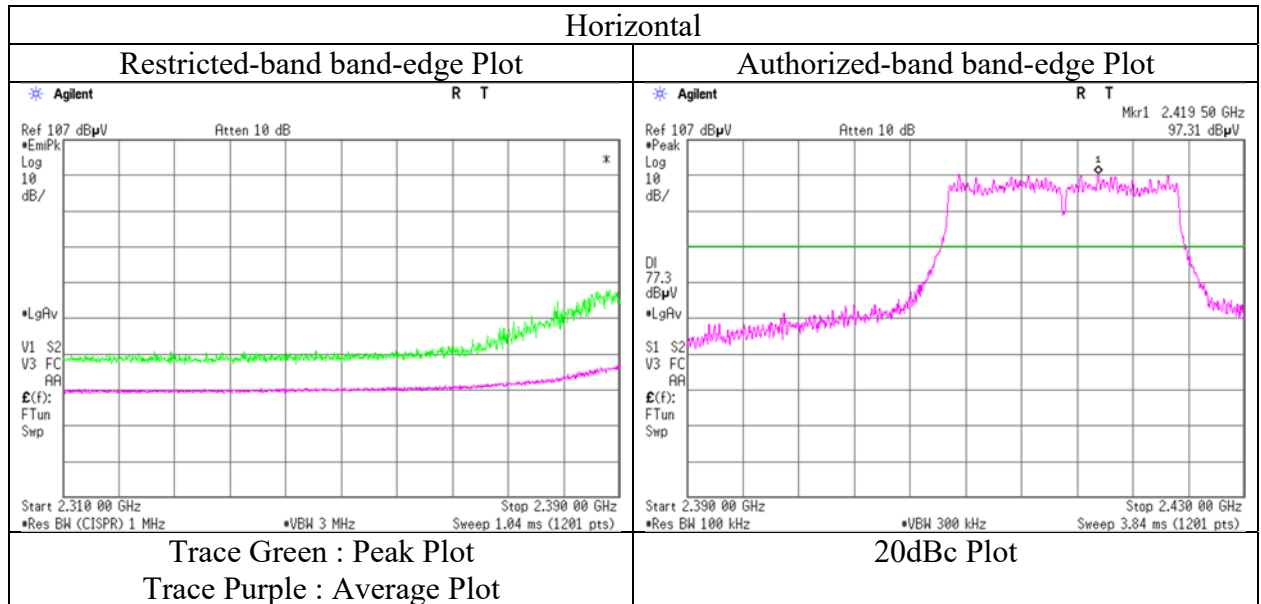
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 6, 2020
Temperature / Humidity 22 deg.C / 69 %RH
Engineer Kazuya Noda
Mode Tx 11g 2417 MHz
EUT Lo type(9.8 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

UL Japan, Inc.

Shonan EMC Lab.

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

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Facsimile : +81 463 50 6401

Radiated Spurious Emission

Report No.	13385909S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	July 31, 2020	July 6, 2020	July 7, 2020
Temperature / Humidity	23 deg.C / 62 %RH	22 deg.C / 69 %RH	23 deg.C / 66 %RH
Engineer	Toshinori Yamada (30 MHz - 1 GHz)	Kazuya Noda (1 GHz - 2.8 GHz)	Kazuya Noda (2.8 GHz - 13 GHz)
Semi Anechoic Chamber	3	3	
Date	July 23, 2020	July 23, 2020	
Temperature / Humidity	24 deg.C / 61 %RH	22 deg.C / 63 %RH	
Engineer	Hiromasa Sato (13 GHz - 18 GHz)	Toshinori Yamada (18 GHz - 26.5 GHz)	
Mode	Tx 11g 2437 MHz		
EUT	Lo type(9.8 inch Display)		

(* 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.	239.960	QP	37.60	11.57	8.20	32.00	0.00	25.37	46.00	20.6	134	146	
Hori.	640.000	QP	33.90	19.27	9.94	31.95	0.00	31.16	46.00	14.8	148	216	
Hori.	652.839	QP	30.10	19.23	9.98	31.94	0.00	27.37	46.00	18.6	143	205	
Hori.	737.787	QP	30.00	20.09	10.30	31.77	0.00	28.62	46.00	17.3	227	136	
Hori.	748.593	QP	33.30	20.15	10.33	31.74	0.00	32.04	46.00	13.9	121	153	
Hori.	760.250	QP	30.90	20.30	10.38	31.72	0.00	29.86	46.00	16.1	126	132	
Hori.	832.065	QP	28.50	21.07	10.61	31.44	0.00	28.74	46.00	17.2	100	191	
Hori.	4874.000	PK	47.94	31.63	6.87	42.93	2.13	45.64	73.90	28.2	122	214	
Hori.	7311.000	PK	47.32	37.69	8.43	43.48	2.13	52.09	73.90	21.8	100	0	
Hori.	7311.000	AV	37.80	37.69	8.43	43.48	2.13	42.57	53.90	11.3	100	0	Flooe noise
Vert.	57.076	QP	41.32	8.91	6.65	32.16	0.00	24.72	40.00	15.2	100	359	
Vert.	195.844	QP	27.20	16.51	7.94	32.05	0.00	19.60	43.50	23.9	100	348	
Vert.	4874.000	PK	48.15	31.63	6.87	42.93	2.13	45.85	73.90	28.0	240	264	
Vert.	7311.000	PK	47.38	37.69	8.43	43.48	2.13	52.15	73.90	21.7	100	0	
Vert.	7311.000	AV	37.61	37.69	8.43	43.48	2.13	42.38	53.90	11.5	100	0	Flooe noise

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	38.45	31.63	6.87	42.93	3.83	2.13	39.98	53.9	13.9	-
Vert.	4874.000	AV	38.13	31.63	6.87	42.93	3.83	2.13	39.66	53.9	14.2	-

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

Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB

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

Duty factor refer to "Duty factor Calculation chart" sheet.

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 6, 2020	July 7, 2020	July 23, 2020	July 23, 2020
Temperature / Humidity	22 deg.C / 69 %RH	23 deg.C / 66 %RH	24 deg.C / 61 %RH	22 deg.C / 63 %RH
Engineer	Kazuya Noda	Kazuya Noda	Hiromasa Sato	Toshinori Yamada
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11g 2457 MHz			
EUT	Lo type(9.8 inch Display)			

(* 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.	2483.500	PK	62.34	28.28	14.32	41.69	2.13	65.38	73.9	8.5	198	261	-
Vert.	2483.500	PK	51.83	28.28	14.32	41.69	2.13	54.87	73.9	19.0	205	262	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	40.90	28.28	14.32	41.69	3.83	2.13	47.77	53.9	6.1	*1)
Vert.	2483.500	AV	37.79	28.28	14.32	41.69	3.83	2.13	44.66	53.9	9.2	*1)

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

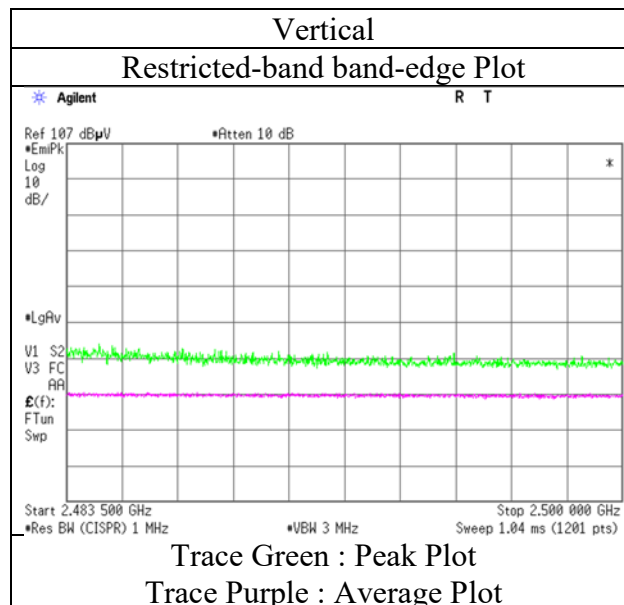
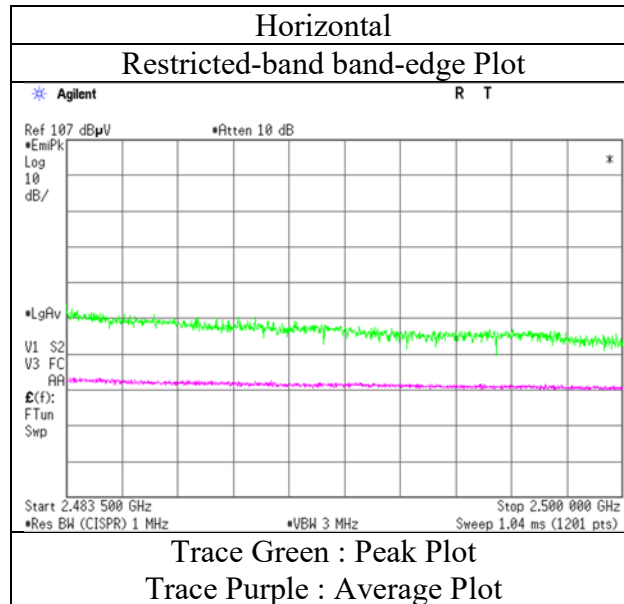
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 6, 2020
Temperature / Humidity 22 deg.C / 69 %RH
Engineer Kazuya Noda
Mode Tx 11g 2457 MHz
EUT Lo type(9.8 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 6, 2020	July 7, 2020	July 23, 2020	July 23, 2020
Temperature / Humidity	22 deg.C / 69 %RH	23 deg.C / 66 %RH	24 deg.C / 61 %RH	22 deg.C / 63 %RH
Engineer	Kazuya Noda	Kazuya Noda	Hiromasa Sato	Toshinori Yamada
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11g 2462 MHz			
EUT	Lo type(9.8 inch Display)			

(* 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.	2483.500	PK	62.12	28.28	14.32	41.69	2.13	65.16	73.90	8.7	206	260	
Hori.	4924.000	PK	48.41	31.68	6.91	42.94	2.13	46.19	73.90	27.7	123	215	
Hori.	7386.000	PK	47.76	37.81	8.48	43.55	2.13	52.63	73.90	21.2	100	0	
Hori.	7386.000	AV	38.11	37.81	8.48	43.55	2.13	42.98	53.90	10.9	100	0	Floor noise
Vert.	2483.500	PK	55.87	28.28	14.32	41.69	2.13	58.91	73.90	14.9	147	239	
Vert.	4924.000	PK	48.25	31.68	6.91	42.94	2.13	46.03	73.90	27.8	232	256	
Vert.	7386.000	PK	48.03	37.81	8.48	43.55	2.13	52.90	73.90	21.0	100	0	
Vert.	7386.000	AV	38.16	37.81	8.48	43.55	2.13	43.03	53.90	10.8	100	0	Floor noise

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	40.27	28.28	14.32	41.69	3.83	2.13	47.14	53.9	6.7	*1)
Hori.	4924.000	AV	38.41	31.68	6.91	42.94	3.83	2.13	40.02	53.9	13.8	
Vert.	2483.500	AV	38.09	28.28	14.32	41.69	3.83	2.13	44.96	53.9	8.9	*1)
Vert.	4924.000	AV	38.29	31.68	6.91	42.94	3.83	2.13	39.90	53.9	14.0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.83\text{ m} / 3.0\text{ m}) = 2.13\text{ dB}$

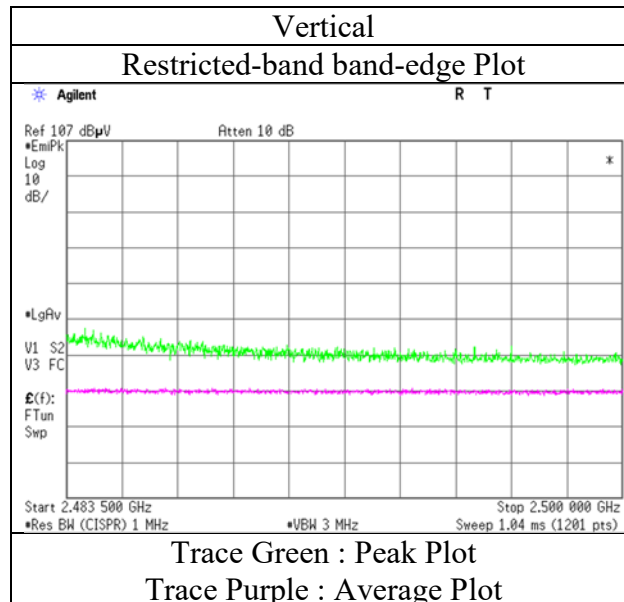
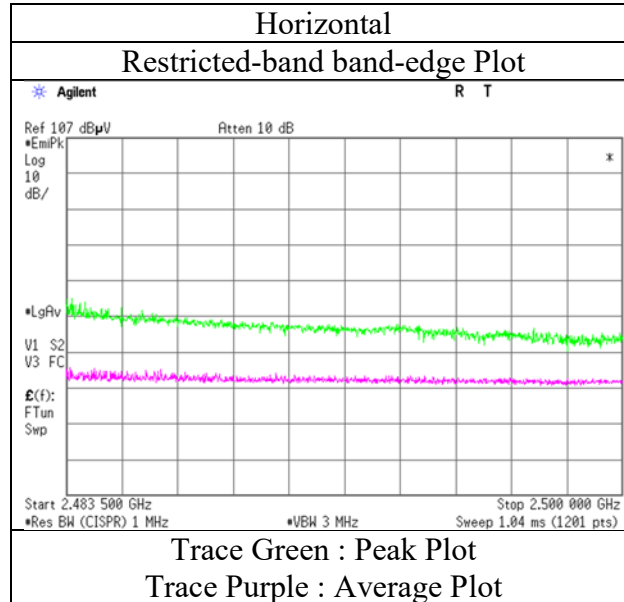
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 6, 2020
Temperature / Humidity 22 deg.C / 69 %RH
Engineer Kazuya Noda
Mode Tx 11g 2462 MHz
EUT Lo type(9.8 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	July 6, 2020	July 7, 2020	July 23, 2020
Temperature / Humidity	22 deg.C / 69 %RH	23 deg.C / 66 %RH	24 deg.C / 61 %RH
Engineer	Kazuya Noda	Kazuya Noda	Hiromasa Sato
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)
Mode	Tx 11n-20 2412 MHz		
EUT	Lo type(9.8 inch Display)		

(* 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.	2390.000	PK	61.04	28.41	14.23	41.66	2.13	64.15	73.90	9.7	201	266	
Hori.	3531.501	PK	59.10	29.29	6.14	42.20	2.13	54.46	73.90	19.4	156	236	
Hori.	4824.000	PK	48.09	31.61	6.83	42.93	2.13	45.73	73.90	28.1	118	211	
Hori.	7236.000	PK	48.23	37.62	8.39	43.41	2.13	52.96	73.90	20.9	100	0	
Hori.	7236.000	AV	38.92	37.62	8.39	43.41	2.13	43.65	53.90	10.2	100	0	Floor noise
Vert.	2390.000	PK	59.17	28.41	14.23	41.66	2.13	62.28	73.90	11.6	146	261	
Vert.	4824.000	PK	48.43	31.61	6.83	42.93	2.13	46.07	73.90	27.8	239	267	
Vert.	7236.000	PK	48.27	37.62	8.39	43.41	2.13	53.00	73.90	20.9	100	0	
Vert.	7236.000	AV	38.91	37.62	8.39	43.41	2.13	43.64	53.90	10.2	100	0	Floor noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB
13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	43.86	28.41	14.23	41.66	4.06	2.13	51.03	53.9	2.8	*1)
Hori.	4824.000	AV	38.57	31.61	6.83	42.93	4.06	2.13	40.27	53.9	13.6	
Vert.	2390.000	AV	41.70	28.41	14.23	41.66	4.06	2.13	48.87	53.9	5.0	*1)
Vert.	4824.000	AV	38.74	31.61	6.83	42.93	4.06	2.13	40.44	53.9	13.4	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB
13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

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.	2412.000	PK	94.16	28.37	14.24	41.67	2.13	97.23	-	-	Carrier
Hori.	2400.000	PK	57.51	28.38	14.23	41.67	2.13	60.58	77.23	16.6	
Vert.	2412.000	PK	90.01	28.37	14.24	41.67	2.13	93.08	-	-	Carrier
Vert.	2400.000	PK	54.68	28.38	14.23	41.67	2.13	57.75	73.08	15.3	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log(3.83 m / 3.0 m) = 2.13 dB
13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

UL Japan, Inc.

Shonan EMC Lab.

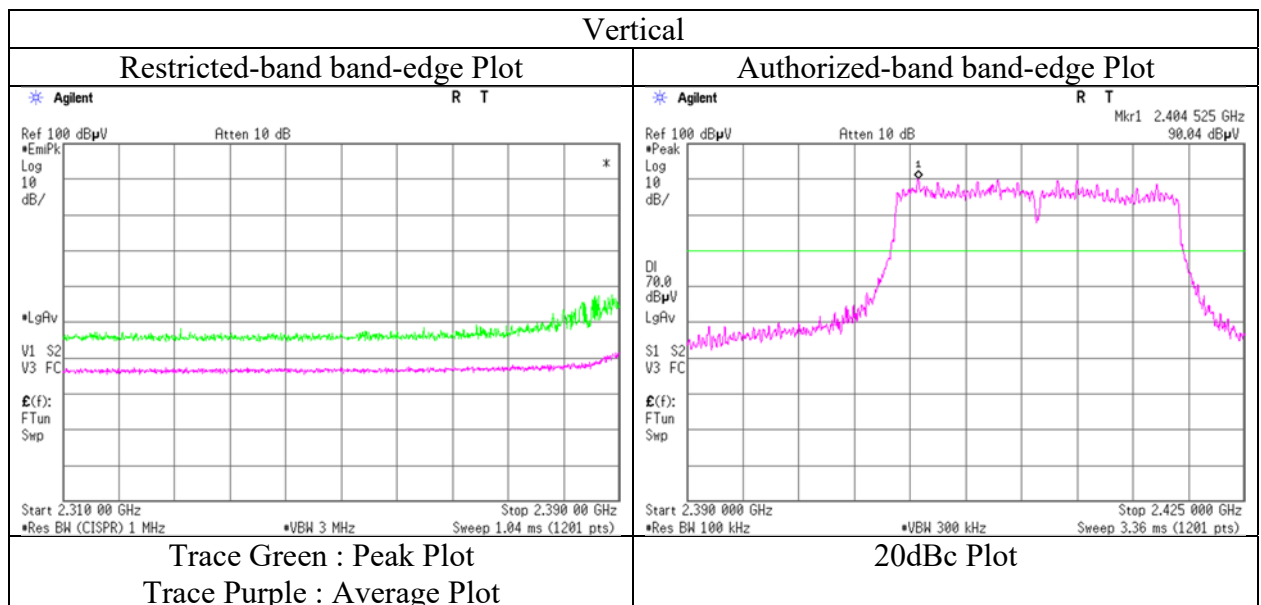
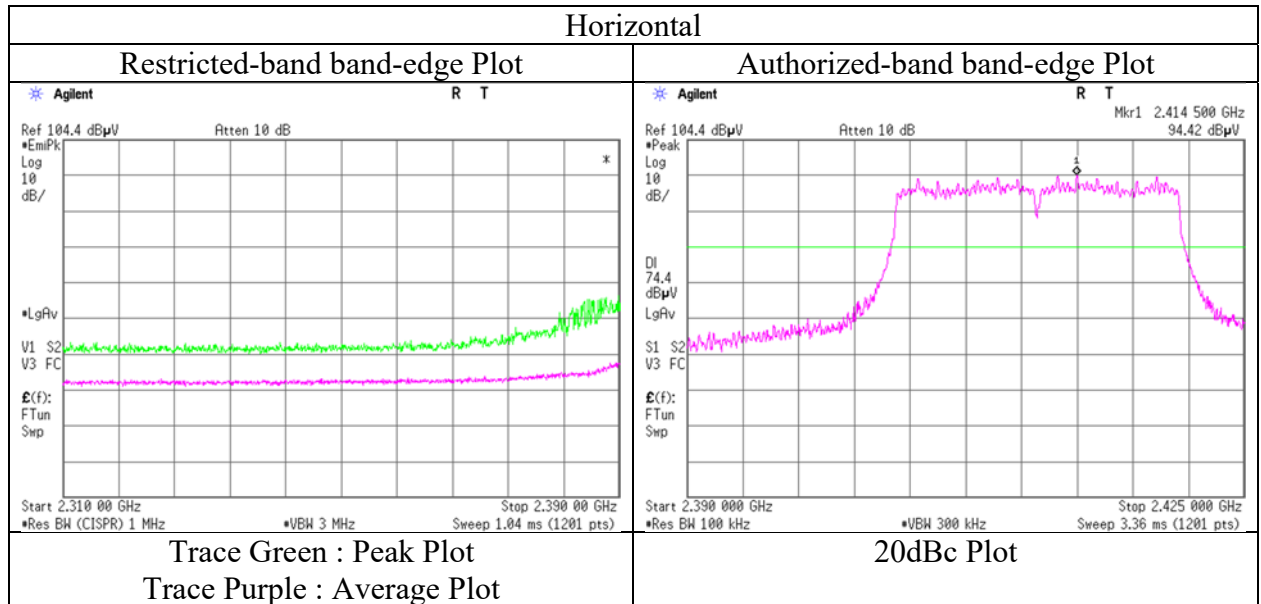
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**Radiated Spurious Emission
(Reference Plot for band-edge)**

Report No. 13385909S-B-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date July 6, 2020
Temperature / Humidity 22 deg.C / 69 %RH
Engineer Kazuya Noda
Mode Tx 11n-20 2412 MHz
EUT Lo type(9.8 inch Display)



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

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

Radiated Spurious Emission

Report No.	13385909S-B-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	July 6, 2020	July 7, 2020	July 23, 2020	July 23, 2020
Temperature / Humidity	22 deg.C / 69 %RH	23 deg.C / 66 %RH	24 deg.C / 61 %RH	22 deg.C / 63 %RH
Engineer	Kazuya Noda	Kazuya Noda	Hiromasa Sato	Toshinori Yamada
	(1 GHz - 2.8 GHz)	(2.8 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11n-20 2417 MHz			
EUT	Lo type(9.8 inch Display)			

(* 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.	2390.000	PK	64.35	28.41	14.23	41.66	2.13	67.46	73.9	6.4	206	264	-
Vert.	2390.000	PK	61.58	28.41	14.23	41.66	2.13	64.69	73.9	9.2	182	256	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	42.56	28.41	14.23	41.66	4.06	2.13	49.73	53.9	4.1	*1)
Vert.	2390.000	AV	40.75	28.41	14.23	41.66	4.06	2.13	47.92	53.9	5.9	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

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.	2417.000	PK	95.91	28.36	14.26	41.67	2.13	98.99	-	-	Carrier
Hori.	2400.000	PK	54.74	28.38	14.23	41.67	2.13	57.81	78.99	21.1	
Vert.	2417.000	PK	91.84	28.36	14.26	41.67	2.13	94.92	-	-	Carrier
Vert.	2400.000	PK	52.04	28.38	14.23	41.67	2.13	55.11	74.92	19.8	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : $20\log(3.83 \text{ m} / 3.0 \text{ m}) = 2.13 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$