RADIO TEST REPORT

Test Report No. 14212703S-A

Customer	**CASIO COMPUTER CO., LTD.**
Description of EUT	**Watch**
Model Number of EUT	**GBD-H2000** (Bluetooth Module: CW3515 is contained.)
FCC ID	**BBQS37W**
Test Regulation	**FCC Part 15 Subpart C**
Test Result	**Complied (Refer to SECTION 3)**
Issue Date	**July 20, 2022**
Remarks	**-**

Representative Test Engineer	Approved By
Hiromasa Sato Engineer	Akio Hayashi Manager

CERTIFICATE 1266.03

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.

☒ There is no testing item of "Non-accreditation".

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- The information provided from the customer for this report is identified in Section 1.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

REVISION HISTORY

Original Test Report No.: 14212703S-A

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14212703S-A	July 20, 2022	-

Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer Information

Company Name	CASIO COMPUTER CO., LTD.
Address	2-1, Sakaecho 3 chome, Hamura-shi, Tokyo 205-8555 Japan
Telephone Number	+81-42-579-7282
Contact Person	Shuji Yamashita

The information provided from the customer is as follows;
- Customer, Description 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 and Test 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

Description	Watch
Model Number	GBD-H2000
Alternative Name	R044
Serial Number	Refer to SECTION 4.2
Condition	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	June 2, 2022
Test Date	June 8 to 20, 2022

2.2 Product Description

General Specification

Rating	GBD-H2000 (Watch): [Battery Use] Typical: DC 3.8 V, Min.: DC 3.68 V, Max.: DC 4.2 V [Charging terminal] DC 5 V CW3515 (Module): Typical: DC 3.8 V, Min.: DC 3.68 V, Max.: DC 4.2 V
Operating temperature	-10 deg. C to +58 deg. C

Radio Specification

Equipment Type	Transceiver
Frequency of Operation	2402 MHz to 2480 MHz
Type of Modulation	GFSK
Antenna Type	Chip Antenna (Mono Pole)
Antenna Gain	2.5 dBi

SECTION 3: Test Specification, Procedures & Results

3.1 Test Specification

Test Specification	FCC Part 15 Subpart C FCC Part 15 final revised on April 1, 2022 and effective May 2, 2022
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

* 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	**FCC:** Section 15.207	25.7 dB, 0.42203 MHz, N, QP	Complied a)	-
	ISED: RSS-Gen 8.8	**ISED:** RSS-Gen 8.8			
6 dB Bandwidth	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section 15.247(a)(2)	See data.	Complied b)	Conducted
	ISED: -	**ISED:** RSS-247 5.2(a)			
Maximum Peak Output Power	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section 15.247(b)(3)		Complied c)	Conducted
	ISED: RSS-Gen 6.12	**ISED:** RSS-247 5.4(d)			
Power Density	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section 15.247(e)		Complied d)	Conducted
	ISED: -	**ISED:** RSS-247 5.2(b)			
Spurious Emission Restricted Band Edges	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section15.247(d)	3.4 dB 7320.000 MHz, AV, Hori. Mode: Tx BT LE 2440 MHz	Complied# e), f)	Conducted (below 30 MHz)/ Radiated
	ISED: RSS-Gen 6.13	**ISED:** RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10			

Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.
* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.

a) Refer to APPENDIX 1 (data of Conducted Emission)
b) Refer to APPENDIX 1 (data of 6 dB Bandwidth and 99 % Occupied Bandwidth)
c) Refer to APPENDIX 1 (data of Maximum Peak Output Power)
d) Refer to APPENDIX 1 (data of Power Density)
e) Refer to APPENDIX 1 (data of Conducted Spurious Emission)
f) 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

FCC Part 15.31 (e)

The EUT provides stable voltage constantly to the RF part regardless of input voltage.
When powered by battery circuit, DC power supply was used instead of a new battery 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 requirement.

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 $k = 2$.

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 to 30 MHz	2.9 dB	2.9 dB	3.0 dB	2.9 dB
Radiated emission	9 kHz to 30 MHz	3.2 dB	3.1 dB	3.1 dB	-
(Measurement distance: 3 m)	30 MHz to 200 MHz	4.6 dB	4.6 dB	4.6 dB	-
	200 MHz to 1 GHz	6.0 dB	6.1 dB	6.1 dB	-
	1 GHz to 6 GHz	4.7 dB	4.7 dB	4.7 dB	-
	6 GHz to 18 GHz	5.2 dB	5.3 dB	5.3 dB	-
	18 GHz to 40 GHz	5.4 dB	5.5 dB	5.5 dB	-
Radiated emission	1 GHz to 18 GHz	5.6 dB	5.6 dB	5.6 dB	-
(Measurement distance: 1 m)	18 GHz to 40 GHz	5.8 dB	5.8 dB	5.8 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	1.2 dB
Power Measurement above 1 GHz (Peak Detector) SPM-06	2.0 dB
Power Measurement above 1 GHz (Average Detector) SPM-07	1.2 dB
Power Measurement above 1 GHz (Peak Detector) SPM-07	1.3 dB
Power Measurement above 1 GHz (Average Detector) SPM-13	1.3 dB
Power Measurement above 1 GHz (Peak Detector) SPM-13	1.3 dB
Spurious emission (Conducted) below 1 GHz	0.93 dB
Conducted emissions Power Density Measurement 1 GHz to 3 GHz	0.92 dB
Conducted emissions Power Density Measurement 3 GHz to 18 GHz	2.3 dB
Spurious emission (Conducted) 18 GHz to 26.5 GHz	2.3 dB
Spurious emission (Conducted) 26.5 GHz to 40 GHz	2.3 dB
Bandwidth Measurement	0.012 %
Duty cycle and Time Measurement	0.27 %

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 Japan
Telephone: +81-463-50-6400
A2LA Certificate Number: 1266.03
(FCC test firm registration number: 626366, ISED lab company number: 2973D / CAB identifier: JP0001)

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)

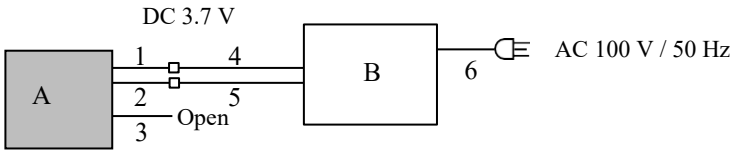
Mode	Remarks*
Bluetooth Low Energy 1M-PHY Uncoded PHY (BT LE)	Maximum Packet Size, PRBS9
*Power of the EUT was set by the software as follows; Power Setting: Fixed Software: BLE RF Test Version: 9.9 (Date: 2022.6.8, Storage location: EUT memory) *This setting of software is the worst case. Any conditions 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)

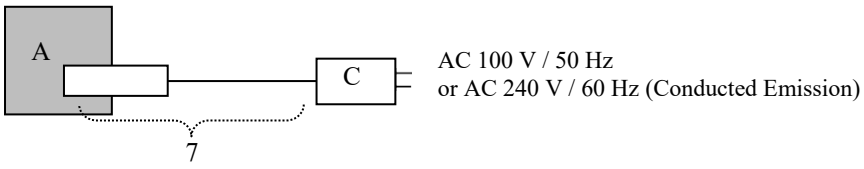
Test Item	Operating Mode	Tested frequency
Conducted Emission, Radiated Spurious Emission (Below 1 GHz)	Tx BT LE	2402 MHz *1)
Radiated Spurious Emission (Above 1 GHz), Maximum Peak Output Power, Power Density, 6 dB Bandwidth, 99 % Occupied Bandwidth, Conducted Spurious Emission	Tx BT LE	2402 MHz 2440 MHz 2480 MHz
*1) Conducted emissions and Spurious emissions for frequencies below 1 GHz were limited to the channel that had the highest power during the antenna terminal test, as preliminary testing indicated that changing the operating frequency had no significant impact on the emissions in those frequency bands.		

4.2 Configuration and Peripherals

Radiated Spurious Emission (Above 1 GHz)



Radiated Spurious Emission (Below 1 GHz) and Conducted Emission



* The carrier level and noise levels were confirmed at DC power supply or AC Adapter (and USB charging cable), and the test was made at the constitution that has the maximum noise.
* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.
* As a result of comparing AC 120 V and AC 240 V at pre-check, conducted emission test was performed with AC 240 V of the worst voltage as representative.
* The test was conducted at DC 3.7 V, which is within the specified operating range (DC 3.68 V to 4.2 V), based on the customer's request.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Watch	GBD-H2000	42 *1) 44 *2) 32 *3)	CASIO	EUT
B	Power Supply (DC)	PW16-5ADP	19100034	TEXIO	*1)
		PAN35-10A	BP002287	KIKUSUI	*2)
C	AC Adapter	AD-C54UJ	141124	CASIO	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC	0.1	Unshielded	Unshielded	*4)
2	DC	0.1	Unshielded	Unshielded	*4)
3	Signal	0.1	Unshielded	Unshielded	*5)
4	DC	1.5	Unshielded	Unshielded	Extension
5	DC	1.5	Unshielded	Unshielded	Extension
6	AC	2.0	Unshielded	Unshielded	-
7	USB	0.8	Shielded	Shielded	-

*1) Used for Antenna Terminal conducted test
*2) Used for Radiated Emission test (Below 1 GHz) and Conducted Emission test.
*3) Used for Radiated Emission test (Above 1 GHz)
*4) Cable for test operation
*5) Cable for system reset during the development, not used for the product

SECTION 5: Conducted Emission

Test Procedure and Conditions

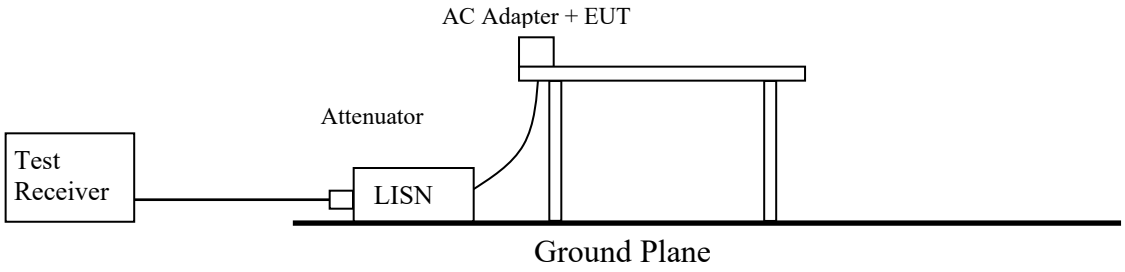
EUT was placed on a wooden platform of nominal size, 0.8 m by 1.6 m, raised 0.8 m above the conducting ground plane.
The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80 cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN).

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Shielded Room.
The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

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

Detector : QP and CISPR AV
Measurement Range : 0.15 MHz to 30 MHz
Test Data : APPENDIX
Test Result : Pass

Figure 1: Test Setup



SECTION 6: 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 30 MHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For 30 MHz to 1 GHz]
EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 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. (Above 1 GHz)
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).
The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	Below 30 MHz	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

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

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

Frequency	9 kHz to 90 kHz, 110 kHz to 150 kHz	90 kHz to 110 kHz	150 kHz to 490 kHz	490 kHz to 30 MHz
Instrument Used	Test Receiver			
Detector	PK/AV	QP	PK/AV	QP
IF Bandwidth	200 Hz	200 Hz	10 kHz	9 kHz
Distance factor *1)	-80 dB	-80 dB	-80 dB	-40 dB

*1) FCC 15.31 (f)(2) (9 kHz-30 MHz)
Distance factor: 40 x log (3[m] / 300[m]) = -80 dB
Distance factor: 40 x log (3[m] / 30[m]) = -40 dB

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument Used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *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

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

Figure 2: Direction of the Loop Antenna

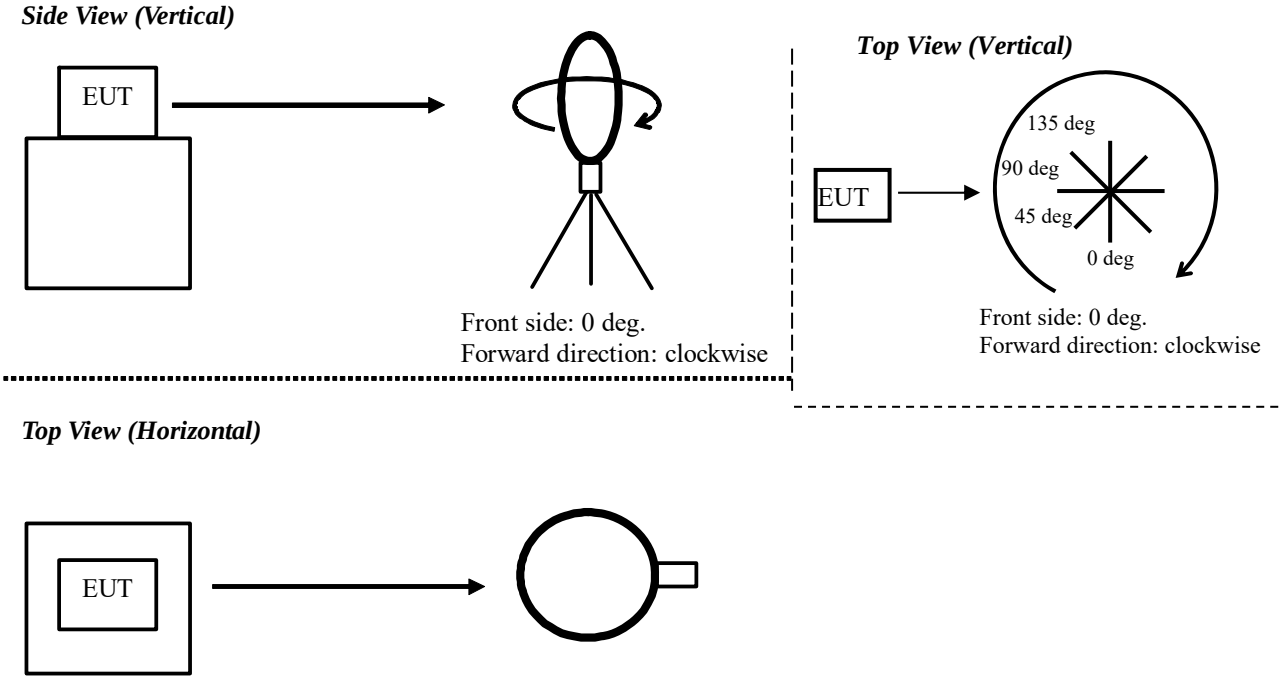
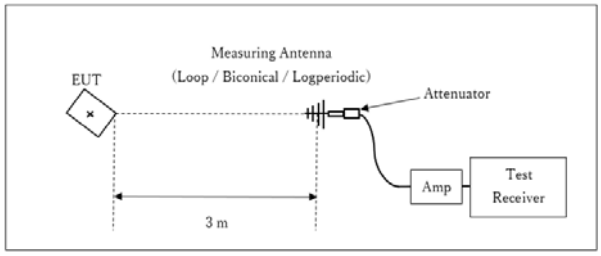


Figure 3: Test Setup

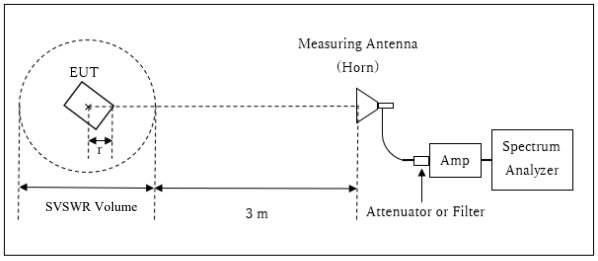
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz to 10 GHz

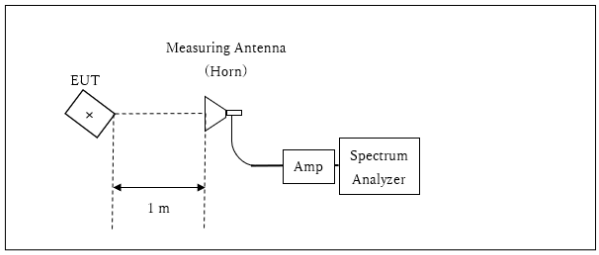


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.97 m / 3.0 m) = 2.44 dB
* Test Distance: (3 + SVSWR Volume /2) - r = 3.97 m

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.03 m

10 GHz to 26.5 GHz



× : Center of turn table

Distance Factor: 20 x log (1.0 m / 3.0 m) = -9.54 dB
*Test Distance: 1 m

The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Antenna polarization	Carrier	Spurious (Below 30 MHz)	Spurious (30 MHz - 1 GHz)	Spurious (1 GHz - 2.8 GHz)	Spurious (2.8 GHz - 10 GHz)	Spurious (10 GHz - 18 GHz)	Spurious (18 GHz - 26.5 GHz)
Horizontal	Y	X	X	Y	Y	X	X
Vertical	Z	X	X	Z	X	X	X

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

Measurement Range : 9 kHz to 26.5 GHz
Test Data : APPENDIX
Test Result : Pass

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument Used
6 dB Bandwidth	3 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	10 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	9.1 kHz	2.7 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 30 MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately and the noise was detected as shown in the chart, and therefore, Radiated Emission below 30 MHz was performed.
*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 Ohmes. 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

APPENDIX 1: Test Data

Conducted Emission

UL Japan,Inc. Shonan EMC Lab. No.2 Shielded Room
Date : 2022/06/20

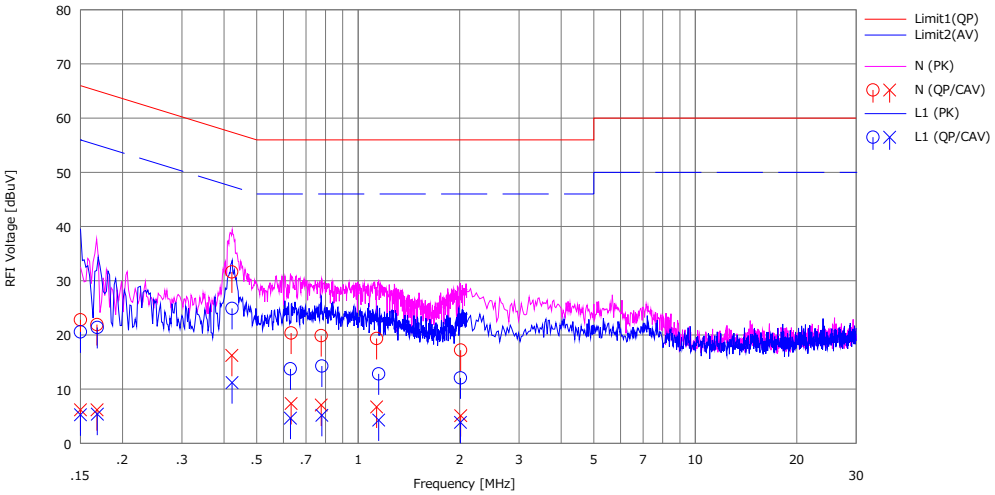
Mode : Tx BT LE 2402 MHz

Power : DC 5 V (AC 240 V / 60 Hz)
Temp./Humi. : 24 deg.C / 61 %RH

Remarks : -

Limit : FCC_Part 15 Subpart C(15.207)

Engineer : Shunsaku Yumi



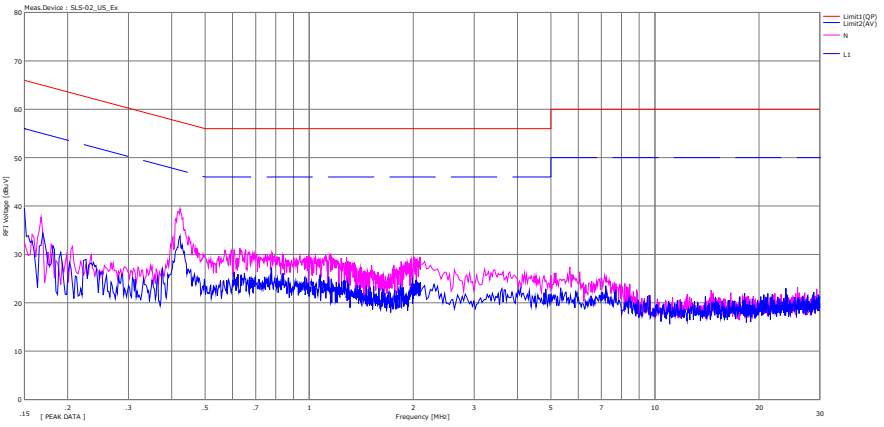
No.	Freq.	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		〈QP〉	〈CAV〉		〈QP〉	〈CAV〉	〈QP〉	〈AV〉	〈QP〉	〈AV〉		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	10.20	-6.40	12.59	22.79	6.19	66.00	56.00	43.2	49.8	N	
2	0.16806	9.30	-6.40	12.59	21.89	6.19	65.06	55.06	43.1	48.8	N	
3	0.42203	19.00	3.60	12.62	31.62	16.22	57.41	47.41	25.7	31.1	N	
4	0.63262	7.70	-5.30	12.65	20.35	7.35	56.00	46.00	35.6	38.6	N	
5	0.77680	7.20	-5.60	12.66	19.86	7.06	56.00	46.00	36.1	38.9	N	
6	1.13405	6.60	-6.00	12.71	19.31	6.71	56.00	46.00	36.6	39.2	N	
7	2.01402	4.40	-7.70	12.79	17.19	5.09	56.00	46.00	38.8	40.9	N	
8	0.15000	8.00	-7.30	12.56	20.56	5.26	66.00	56.00	45.4	50.7	L1	
9	0.16848	8.80	-7.20	12.56	21.36	5.36	65.04	55.04	43.6	49.6	L1	
10	0.42270	12.30	-1.40	12.59	24.89	11.19	57.39	47.39	32.5	36.2	L1	
11	0.62957	1.10	-8.00	12.63	13.73	4.63	56.00	46.00	42.2	41.3	L1	
12	0.78052	1.60	-7.50	12.65	14.25	5.15	56.00	46.00	41.7	40.8	L1	
13	1.14984	0.10	-8.40	12.69	12.79	4.29	56.00	46.00	43.2	41.7	L1	
14	2.01100	-0.70	-8.90	12.76	12.06	3.86	56.00	46.00	43.9	42.1	L1	

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

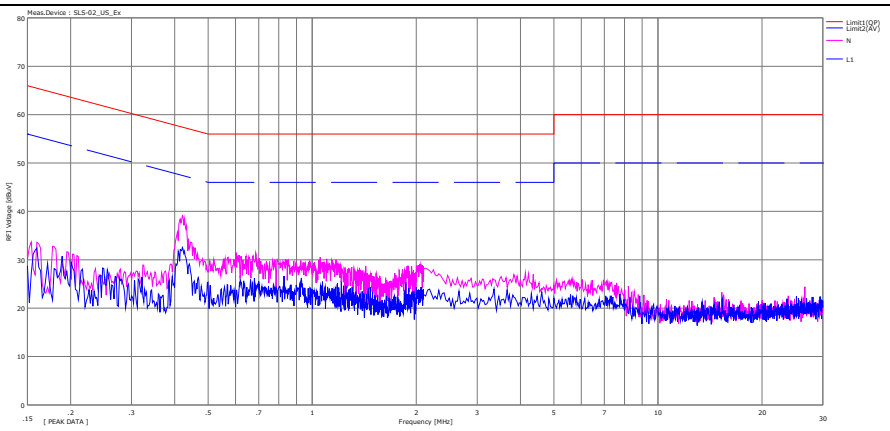
Conducted Emission

Test place	Shonan EMC Lab. No.2 Shielded Room
Date	June 20, 2022
Temperature / Humidity	24 deg. C / 61 % RH
Engineer	Shunsaku Yumi
Mode	Tx BT LE

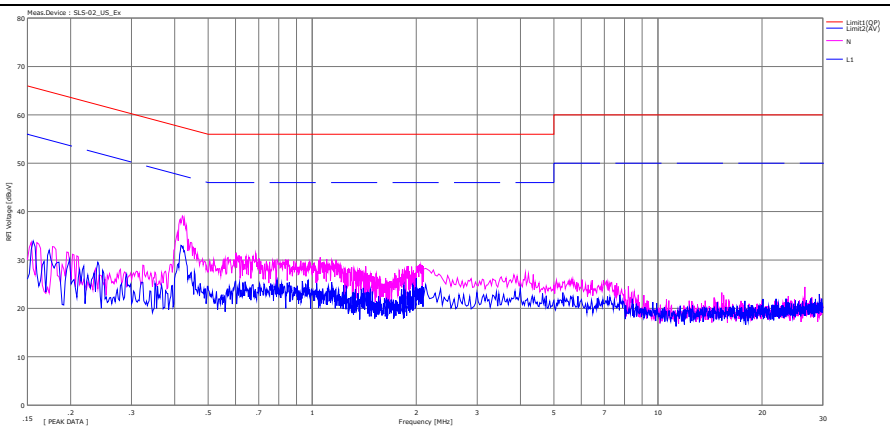
2402 MHz



2440 MHz



2480 MHz



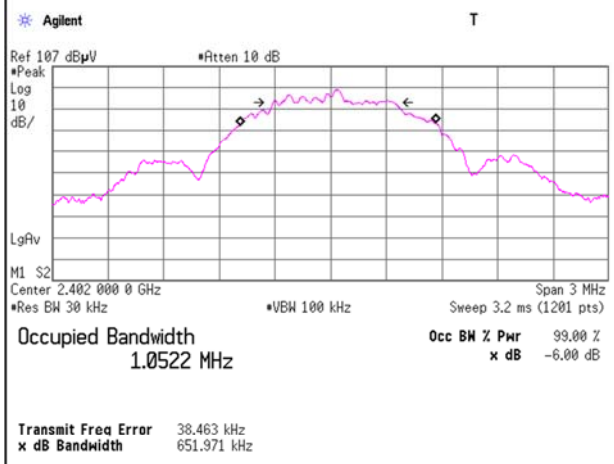
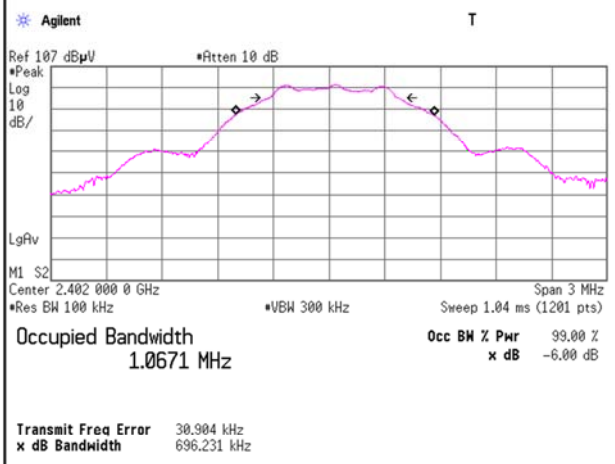
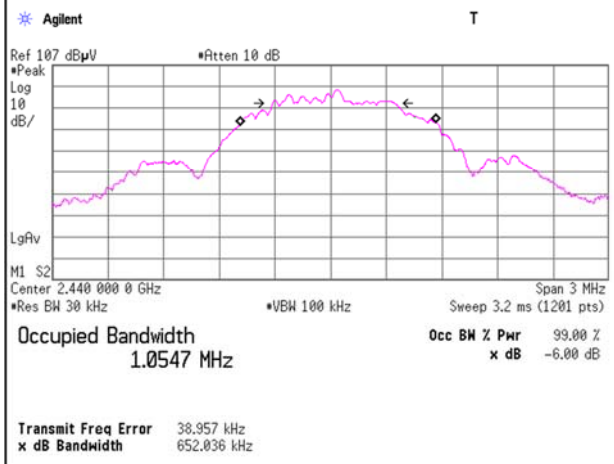
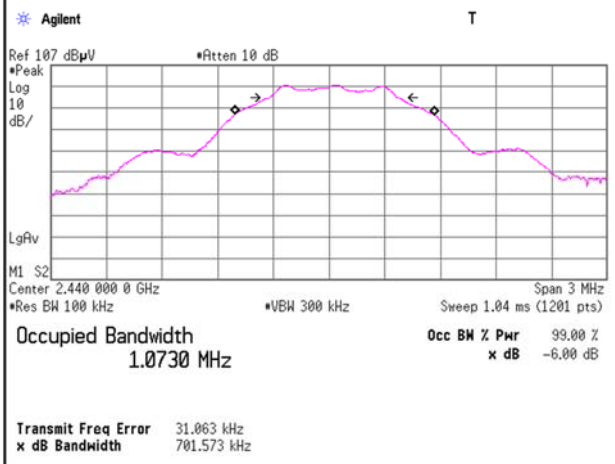
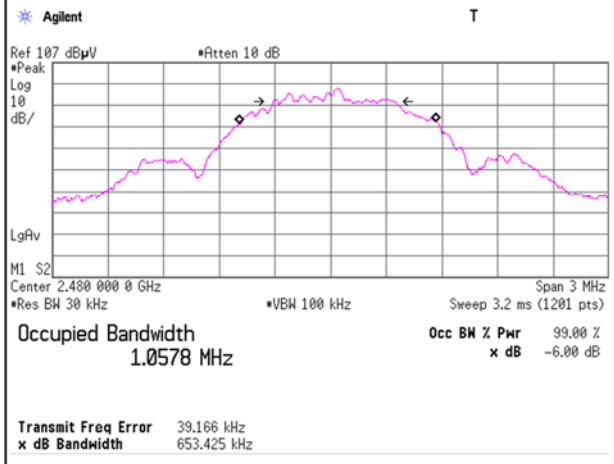
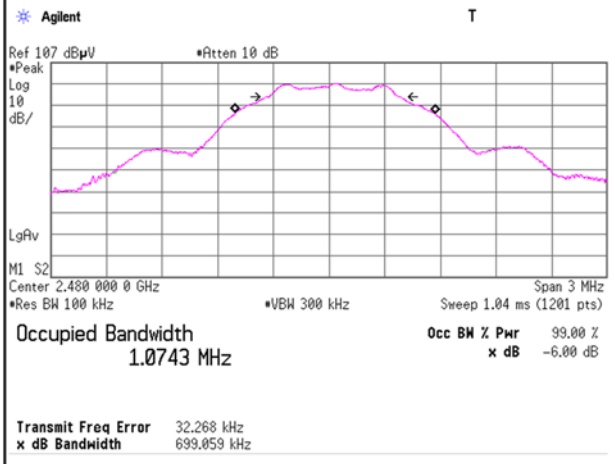
Y scale [dBuV] Chart — N — L

99 % Occupied Bandwidth and 6 dB Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	June 8, 2022
Temperature / Humidity	22 deg. C / 54 % RH
Engineer	Hiromasa Sato
Mode	Tx

Frequency [MHz]	99 % Occupied Bandwidth [kHz]	6 dB Bandwidth [MHz]	Limit for 6 dB Bandwidth [MHz]
2402	1052.2	0.696	> 0.5000
2440	1054.7	0.702	> 0.5000
2480	1057.8	0.699	> 0.5000

99 % Occupied Bandwidth and 6 dB Bandwidth

99 % Occupied Bandwidth	6 dB Bandwidth
2402 MHz	2402 MHz
	
2440 MHz	2440 MHz
	
2480 MHz	2480 MHz
	

Maximum Peak Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	June 8, 2022
Temperature / Humidity	22 deg. C / 54 % RH
Engineer	Hiromasa Sato
Mode	Tx

				Conducted Power					e.i.r.p. for RSS-247					
Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2402	-8.44	1.76	9.87	3.19	2.08	30.00	1000	26.81	2.50	5.69	3.71	36.02	4000	30.33
2440	-8.88	1.77	9.87	2.76	1.89	30.00	1000	27.24	2.50	5.26	3.36	36.02	4000	30.76
2480	-9.52	1.79	9.87	2.14	1.64	30.00	1000	27.86	2.50	4.64	2.91	36.02	4000	31.38

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

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	June 8, 2022
Temperature / Humidity	22 deg. C / 54 % RH
Engineer	Hiromasa Sato
Mode	Tx

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2402	-10.88	1.76	9.87	0.75	1.19	2.06	2.81	1.91
2440	-11.36	1.77	9.87	0.28	1.07	2.06	2.34	1.71
2480	-11.97	1.79	9.87	-0.31	0.93	2.06	1.75	1.50

Sample Calculation:

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

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

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

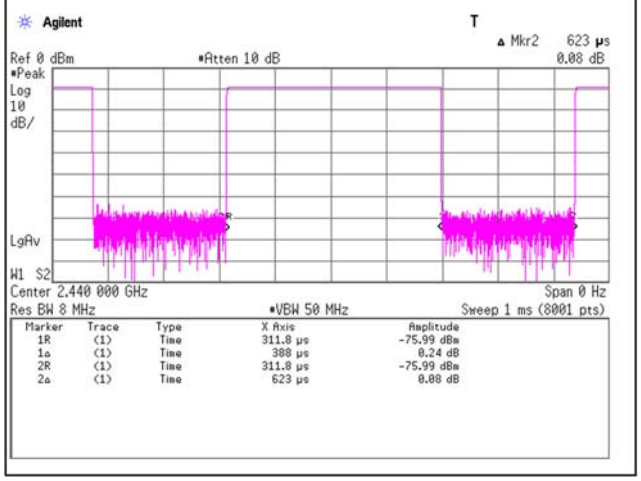
Burst rate confirmation

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	June 8, 2022
Temperature / Humidity	22 deg. C / 54 % RH
Engineer	Hiromasa Sato
Mode	Tx

BT LE 1 M-PHY (for Average power) *1)

BT LE 1 M-PHY (for Radiated emission) *2)

Tx on / (Tx on + Tx off) =	**0.623**
Tx on / (Tx on + Tx off) * 100 =	**62.3 %**
Duty factor = 10 * log (0.623 / 0.388) =	**2.06 dB *1)**
Duty factor = 20 * log (0.623 / 0.388) =	**4.11 dB *2)**



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

Radiated Spurious Emission

Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	No.2	No.3
Date	June 16, 2022	June 9, 2022
Temperature / Humidity	23 deg.C, 58 %RH	21 deg.C, 51 %RH
Engineer	Shunsaku Yumi	Kenichi Adachi
	(Below 1 GHz)	(1 GHz -26.5 GHz)
Mode	Tx BT LE, 2402 MHz	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	30.349	QP	23.70	18.72	6.96	31.93	0.00	17.45	40.0	22.5	100	149	-
Hori.	185.883	QP	23.70	16.27	8.91	31.80	0.00	17.08	43.5	26.4	100	303	-
Hori.	952.583	QP	23.80	22.02	9.97	30.58	0.00	25.21	46.0	20.7	100	1	-
Hori.	2390.000	PK	47.02	28.18	14.56	41.63	2.44	50.57	73.9	23.3	162	324	-
Hori.	4804.000	PK	47.16	31.54	7.11	42.87	2.44	45.38	73.9	28.5	138	269	-
Hori.	7206.000	PK	50.59	37.37	8.67	43.39	2.44	55.68	73.9	18.2	130	354	-
Vert.	31.783	QP	23.80	18.15	6.98	31.93	0.00	17.00	40.0	23.0	100	201	-
Vert.	68.080	QP	36.80	6.84	7.57	31.91	0.00	19.30	40.0	20.7	100	103	-
Vert.	71.623	QP	36.70	6.49	7.61	31.91	0.00	18.89	40.0	21.1	100	215	-
Vert.	87.612	QP	36.30	7.82	7.83	31.90	0.00	20.05	40.0	19.9	100	163	-
Vert.	107.048	QP	32.10	11.45	8.08	31.88	0.00	19.75	43.5	23.7	100	83	-
Vert.	935.170	QP	23.60	22.13	9.89	30.68	0.00	24.94	46.0	21.0	100	359	-
Vert.	2390.000	PK	46.98	28.18	14.56	41.63	2.44	50.53	73.9	23.3	212	211	-
Vert.	4804.000	PK	47.06	31.54	7.11	42.87	2.44	45.28	73.9	28.6	120	233	-
Vert.	7206.000	PK	49.66	37.37	8.67	43.39	2.44	54.75	73.9	19.1	148	355	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.97 m / 3.0 m) = 2.44 dB
10 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	37.82	28.18	14.56	41.63	4.11	2.44	45.48	53.9	8.4	*1)
Hori.	4804.000	AV	38.96	31.54	7.11	42.87	4.11	2.44	41.29	53.9	12.6	-
Hori.	7206.000	AV	40.98	37.37	8.67	43.39	4.11	2.44	50.18	53.9	**3.7**	-
Vert.	2390.000	AV	37.89	28.18	14.56	41.63	4.11	2.44	45.55	53.9	8.3	*1)
Vert.	4804.000	AV	38.88	31.54	7.11	42.87	4.11	2.44	41.21	53.9	12.6	-
Vert.	7206.000	AV	40.37	37.37	8.67	43.39	4.11	2.44	49.57	53.9	4.3	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.97 m / 3.0 m) = 2.44 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Burst rate confirmation" sheet.
*1) Not out of band emission (Leakage Power)

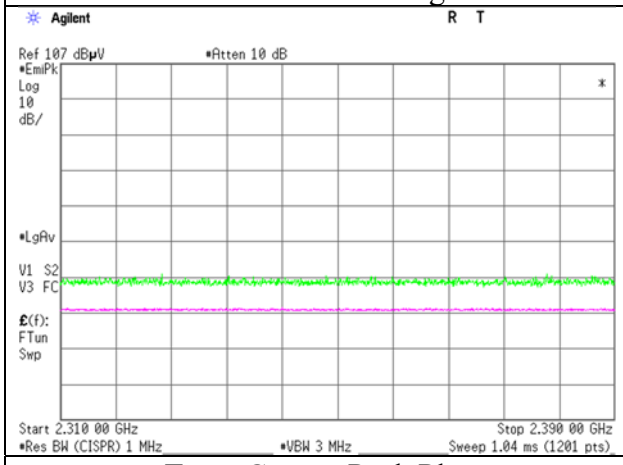
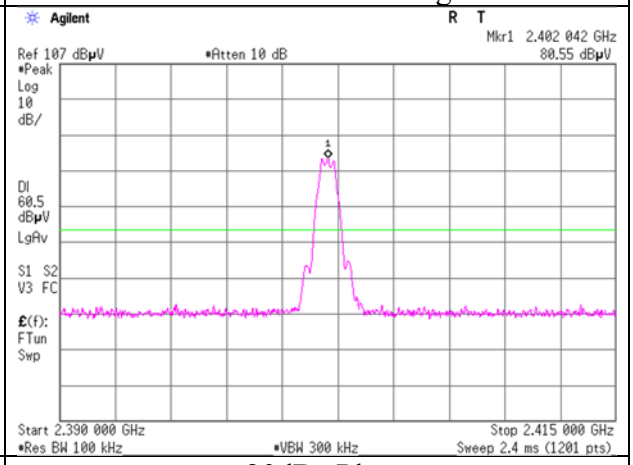
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

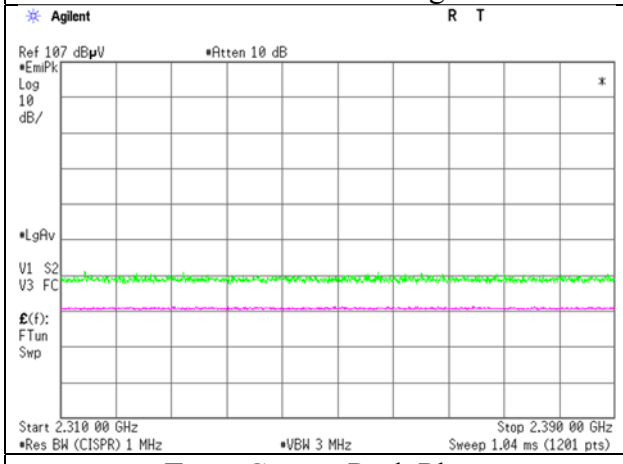
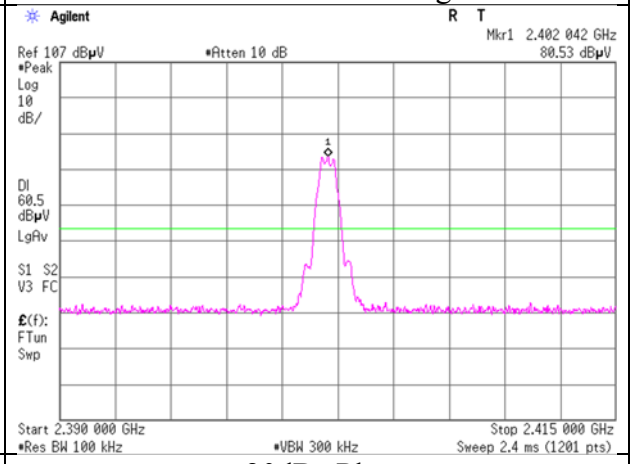
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	80.74	28.17	14.58	41.64	2.44	84.29	-	-	Carrier
Hori.	2400.000	PK	39.76	28.17	14.58	41.64	2.44	43.31	64.2	20.8	-
Vert.	2402.000	PK	80.60	28.17	14.58	41.64	2.44	84.15	-	-	Carrier
Vert.	2400.000	PK	39.68	28.17	14.58	41.64	2.44	43.23	64.1	20.8	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.97 m / 3.0 m) = 2.44 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	June 9, 2022
Temperature / Humidity	21 deg. C / 51 % RH
Engineer	Kenichi Adachi
Mode	Tx BT LE, 2402 MHz

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

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

* 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

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	June 9, 2022
Temperature / Humidity	21 deg. C / 51 % RH
Engineer	Kenichi Adachi
	(1 GHz - 26.5 GHz)
Mode	Tx BT LE, 2440 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4880.000	PK	47.04	31.64	7.15	42.83	2.44	45.44	73.9	28.4	133	273	-
Hori.	7320.000	PK	51.18	37.46	8.73	43.52	2.44	56.29	73.9	17.6	129	354	-
Vert.	4880.000	PK	47.12	31.64	7.15	42.83	2.44	45.52	73.9	28.3	118	231	-
Vert.	7320.000	PK	50.26	37.46	8.73	43.52	2.44	55.37	73.9	18.5	144	352	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.97 m / 3.0 m) = 2.44 dB
10 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.	4880.000	AV	38.74	31.64	7.15	42.83	4.11	2.44	41.25	53.9	12.6	-
Hori.	7320.000	AV	41.24	37.46	8.73	43.52	4.11	2.44	50.46	53.9	**3.4**	-
Vert.	4880.000	AV	38.88	31.64	7.15	42.83	4.11	2.44	41.39	53.9	12.5	-
Vert.	7320.000	AV	40.58	37.46	8.73	43.52	4.11	2.44	49.80	53.9	4.1	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.97 m / 3.0 m) = 2.44 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Burst rate confirmation" sheet.

Radiated Spurious Emission

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	June 9, 2022
Temperature / Humidity	21 deg. C / 51 % RH
Engineer	Kenichi Adachi
	(1 GHz - 26.5 GHz)
Mode	Tx BT LE, 2480 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	48.14	28.08	14.68	41.68	2.44	51.66	73.9	22.2	163	321	-
Hori.	4960.000	PK	47.22	31.81	7.21	42.80	2.44	45.88	73.9	28.0	141	267	-
Hori.	7440.000	PK	50.78	37.61	8.81	43.65	2.44	55.99	73.9	17.9	128	352	-
Vert.	2483.500	PK	48.08	28.08	14.68	41.68	2.44	51.60	73.9	22.3	209	208	-
Vert.	4960.000	PK	47.08	31.81	7.21	42.80	2.44	45.74	73.9	28.1	116	237	-
Vert.	7440.000	PK	49.89	37.61	8.81	43.65	2.44	55.10	73.9	18.8	142	353	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.97 m / 3.0 m) = 2.44 dB
10 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.	2483.500	AV	37.87	28.08	14.68	41.68	4.11	2.44	45.50	53.9	8.4	*1)
Hori.	4960.000	AV	38.82	31.81	7.21	42.80	4.11	2.44	41.59	53.9	12.3	-
Hori.	7440.000	AV	41.02	37.61	8.81	43.65	4.11	2.44	50.34	53.9	**3.5**	-
Vert.	2483.500	AV	37.78	28.08	14.68	41.68	4.11	2.44	45.41	53.9	8.4	*1)
Vert.	4960.000	AV	38.96	31.81	7.21	42.80	4.11	2.44	41.73	53.9	12.1	-
Vert.	7440.000	AV	40.56	37.61	8.81	43.65	4.11	2.44	49.88	53.9	4.0	-

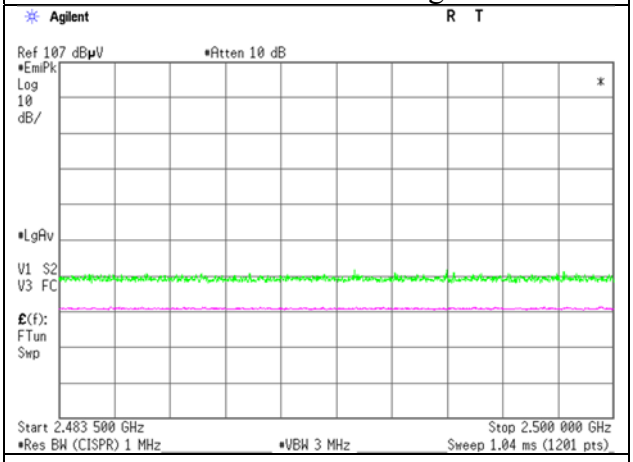
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.97 m / 3.0 m) = 2.44 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Burst rate confirmation" sheet.
*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	June 9, 2022
Temperature / Humidity	21 deg. C / 51 % RH
Engineer	Kenichi Adachi
Mode	Tx BT LE, 2480 MHz

Horizontal

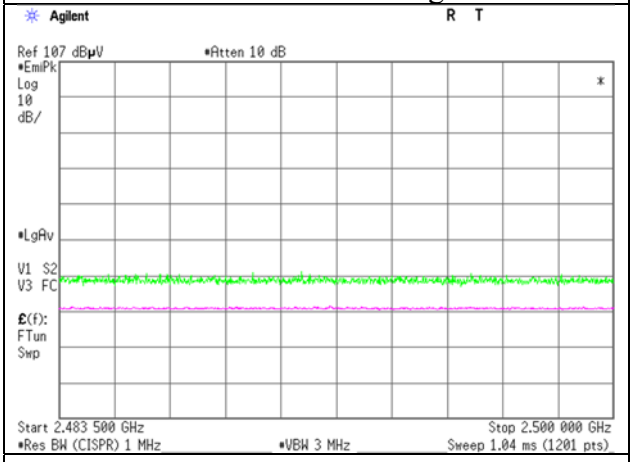
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

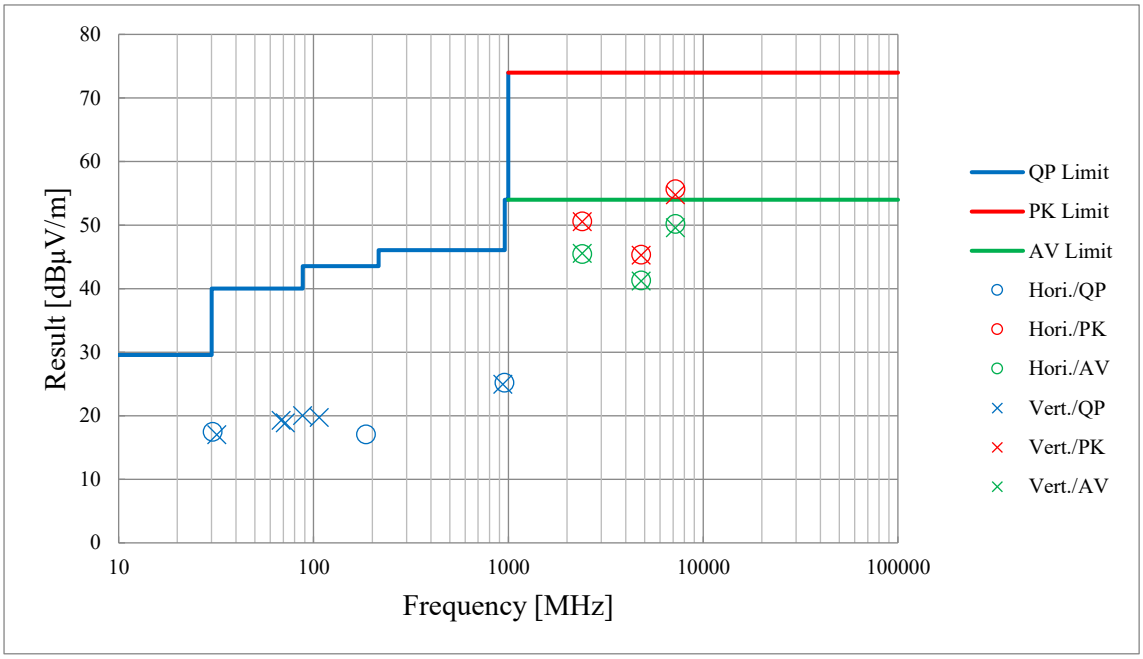


Trace Green : Peak Plot
Trace Purple : Average Plot

* 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 mode for Maximum Peak Output Power)

Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	No.2	No.3
Date	June 16, 2022	June 9, 2022
Temperature / Humidity	23 deg.C, 58 %RH	21 deg.C, 51 %RH
Engineer	Shunsaku Yumi	Kenichi Adachi
	(Below 1 GHz)	(1 GHz -26.5 GHz)
Mode	Tx BT LE, 2402 MHz	

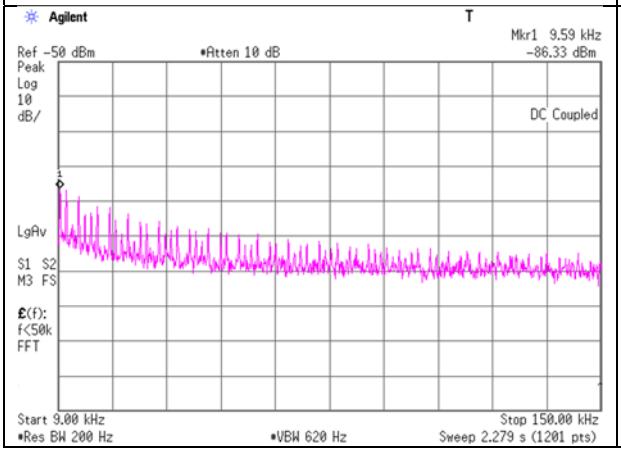


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

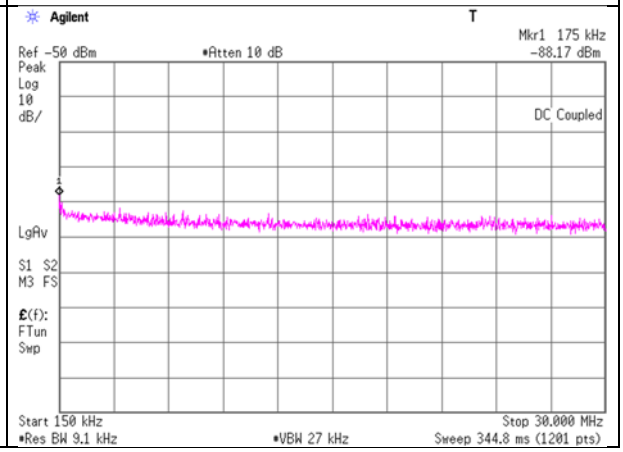
Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	June 8, 2022
Temperature / Humidity	22 deg. C / 54 % RH
Engineer	Hiromasa Sato
Mode	Tx BT LE, 2402 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
9.59	-86.33	0.5	9.8	2.5	1.0	-73.5	300	6.0	-12.3	47.9	60.2	-
175.00	-88.17	0.5	9.8	2.5	1.0	-75.4	300	6.0	-14.1	22.7	36.8	-

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

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

N: Number of output

Power Density

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	June 8, 2022
Temperature / Humidity	22 deg. C / 54 % RH
Engineer	Hiromasa Sato
Mode	Tx

Frequency [MHz]	Measured Frequency [MHz]	Reading [dBm/3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm/3 kHz]	Limit [dBm/3 kHz]	Margin [dB]
2402	2402.000	-23.28	1.76	9.87	-11.65	8.00	19.65
2440	2440.000	-23.79	1.77	9.87	-12.15	8.00	20.15
2480	2480.000	-24.48	1.79	9.87	-12.82	8.00	20.82

Sample Calculation:

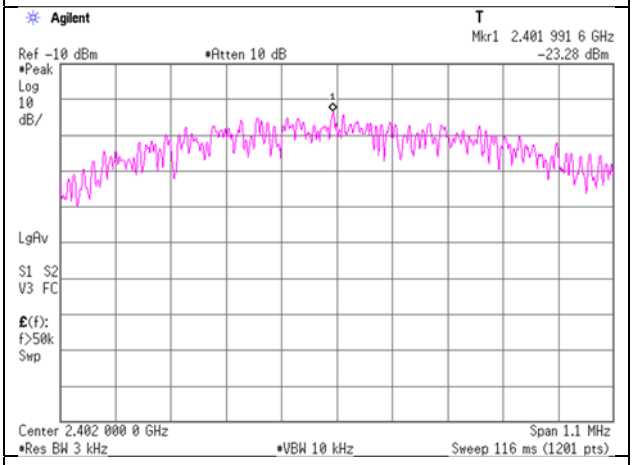
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

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

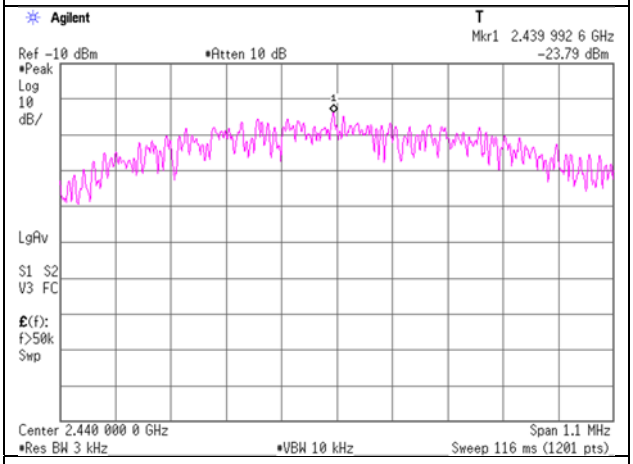
Power Density

BT LE

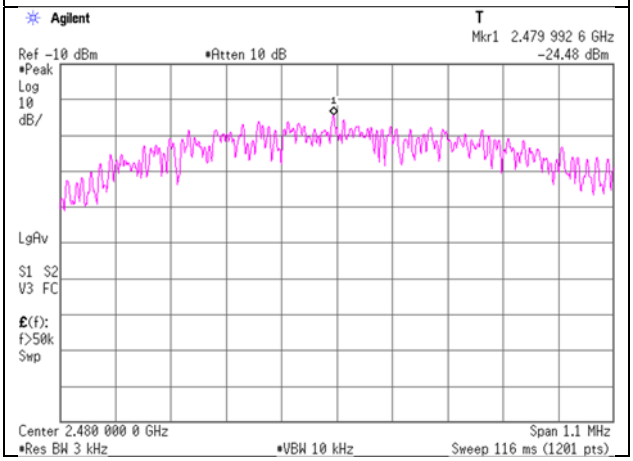
2402 MHz



2440 MHz



2480 MHz



APPENDIX 2: Test Instruments

Test Equipment (1/2)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	SAT10-16	160494	Attenuator	Weinschel Corp.	54A-10	83420	2021/12/07	12
AT	SCC-G66	196947	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	803478/2	2022/03/02	12
AT	SOS-27	191845	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2021/08/02	12
AT	SPM-13	169910	Power Meter	Keysight Technologies Inc	8990B	MY51000448	2022/01/25	12
AT	SPSS-06	169911	Power sensor	Keysight Technologies Inc	N1923A	MY57270004	2022/01/25	12
AT	SRENT-15	160899	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46185516	2022/02/02	12
AT	STS-05	146212	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997828	2021/09/14	12
CE	SAT3-13	150923	Attenuator	JFW	50HF-003N	-	2022/02/21	12
CE	SCC-B12/B13/SRSE-02	144969	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-270(RF Selector)	2022/04/20	12
CE	SLS-02	145539	LISN	Rohde & Schwarz	ENV216	100512	2022/02/23	12
CE	SOS-22	191839	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2021/10/14	12
CE	STR-06	146208	Test Receiver	Rohde & Schwarz	ESCI	101259	2022/04/08	12
CE,RE	COTS-SEMI-5	170932	EMI Software	TSJ (Techno Science Japan)	TEPTO-DV3(RE,CE,ME,PE)	-	-	-
CE,RE	SJM-20	207277	Measuring	ASKUL	-	-	-	-
CE,RE	STS-02	145793	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997819	2022/04/07	12
RE	KHA-04	146351	Horn Antenna	EMCO	3160-09	1278	2022/05/20	12
RE	KJM-02	146432	Measure	TAJIMA	GL19-55	-	-	-
RE	KSA-08	145089	Spectrum Analyzer	Keysight Technologies Inc	E4446A	MY46180525	2021/10/13	12
RE	SAEC-02(NSA)	145563	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	2022/03/20	12
RE	SAEC-03(NSA)	145565	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	2022/04/15	12
RE	SAEC-03(SVSWR)	145566	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	2022/05/18	12
RE	SAF-02	145004	Pre Amplifier	SONOMA	310N	290212	2022/02/24	12
RE	SAF-03	145126	Pre Amplifier	SONOMA	310N	290213	2022/02/24	12
RE	SAF-05	145128	Pre Amplifier	Toyo Corporation	TPA0118-36	1440490	2022/05/12	12
RE	SAF-06	145005	Pre Amplifier	Toyo Corporation	TPA0118-36	1440491	2022/02/04	12
RE	SAF-08	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2022/03/03	12
RE	SAJ-03	146105	Antenna Tilt Jig	Intelligent System Engineering Co., Ltd	Antenna Tilt Jig	T-S003	-	-
RE	SAT10-06	145137	Attenuator	Keysight Technologies Inc	8493C-010	74865	2021/10/05	12
RE	SAT3-11	150921	Attenuator	JFW	50HF-003N	-	2022/02/21	12
RE	SAT6-14	167095	Attenuator	JFW	50HF-006N	-	2022/02/21	12
RE	SAT6-15	167096	Attenuator	JFW	50HF-006N	-	2022/02/21	12
RE	SBA-02	145022	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	BBA9106	91032665	2022/04/16	12
RE	SCC-B1/B3/B5/B7/B8/B13/SRSE-02	144975	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	2022/04/20	12
RE	SCC-B2/B4/B6/B7/B8/B13/SRSE-02	144976	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	2022/04/20	12

Test Equipment (2/2)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	SCC-C1/C2/C3/C4/C5/C10/SRSE-03	145171	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	2022/04/20	12
RE	SCC-G15	145176	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	2022/03/03	12
RE	SCC-G40	166491	Coaxial Cable	Junkosha	MWX221-01000NFSNMS/B	1612S005	2022/01/06	12
RE	SCC-G43	156380	Coaxial Cable	Huber+Suhner	SUCOFLEX_104_E	SN MY 13406/4E	2022/05/20	12
RE	SCC-G50	178573	Coaxial Cable	Huber+Suhner	SUCOFLEX_104_E	MY13407/4E	2022/03/03	12
RE	SCC-G51	178572	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	800288 /4A	2022/03/03	12
RE	SCC-G57	179540	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	802815/2	2022/05/12	12
RE	SCC-G58	183047	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	800287/4A	2022/05/20	12
RE	SCC-G70	200010	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	575618/4	2021/07/06	12
RE	SCC-M1	194601	Coaxial Cable	Fjikura	5D-2W	-	2021/12/10	12
RE	SFL-18	145305	Highpass Filter	MICRO-TRONICS	HPM50111	119	2022/03/02	12
RE	SHA-02	145384	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	9120D-726	2022/03/10	12
RE	SHA-03	145501	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	9120D-739	2022/03/16	12
RE	SHA-10	194685	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA 9120 C	711	2022/03/16	12
RE	SLA-06	145528	Logperiodic Antenna	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	195	2022/04/16	12
RE	SLP-02	145536	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100218	2022/04/07	12
RE	SOS-21	191838	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2021/08/02	12
RE	SOS-23	191840	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2021/08/02	12
RE	STR-01	145790	Test Receiver	Rohde & Schwarz	ESU40	100093	2022/04/28	12
RE	STR-09	213530	Test Receiver	Rohde & Schwarz	ESW44	103068	2022/01/17	12
RE	STS-03	146210	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997823	2021/09/14	12

***Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.**

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

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

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