RADIO TEST REPORT

Test Report No. : 14173547S-B

Applicant	:	**Sony Group Corporation**
Type of EUT	:	**Wireless Noise Canceling Stereo Headset**
Model Number of EUT	:	**YY2954**
FCC ID	:	**AK8YY2954**
Test regulation	:	**FCC Part 15 Subpart C: 2021** ***Bluetooth Low Energy part**
Test result	:	**Complied (Refer to SECTION 3)**

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3. This sample tested is in compliance with the limits of the above regulation.
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   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.

Date of test: January 10 to 18, 2022

Representative test engineer: T. Kawakami
Takahiro Kawakami
Engineer

Approved by: T. Imamura
Toyokazu Imamura
Leader

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".

REVISION HISTORY

Original Test Report No.: 14173547S-B

Revision	Test report No.	Date	Page revised	Contents
- (Original)	14173547S-B	February 3, 2022	-	-

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation
AC	Alternating Current
AFH	Adaptive Frequency Hopping
AM	Amplitude Modulation
Amp, AMP	Amplifier
ANSI	American National Standards Institute
Ant, ANT	Antenna
AP	Access Point
ASK	Amplitude Shift Keying
Atten., ATT	Attenuator
AV	Average
BPSK	Binary Phase-Shift Keying
BR	Bluetooth Basic Rate
BT	Bluetooth
BT LE	Bluetooth Low Energy
BW	BandWidth
Cal Int	Calibration Interval
CCK	Complementary Code Keying
Ch., CH	Channel
CISPR	Comite International Special des Perturbations Radioelectriques
CW	Continuous Wave
DBPSK	Differential BPSK
DC	Direct Current
D-factor	Distance factor
DFS	Dynamic Frequency Selection
DQPSK	Differential QPSK
DSSS	Direct Sequence Spread Spectrum
DUT	Device Under Test
EDR	Enhanced Data Rate
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power
EMC	ElectroMagnetic Compatibility
EMI	ElectroMagnetic Interference
EN	European Norm
ERP, e.r.p.	Effective Radiated Power
ETSI	European Telecommunications Standards Institute
EU	European Union
EUT	Equipment Under Test
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
MCS	Modulation and Coding Scheme
MRA	Mutual Recognition Arrangement
N/A	Not Applicable
NIST	National Institute of Standards and Technology
NS	No signal detect.
NSA	Normalized Site Attenuation
OBW	Occupied BandWidth
OFDM	Orthogonal Frequency Division Multiplexing
P/M	Power meter
PCB	Printed Circuit Board
PER	Packet Error Rate
PHY	Physical Layer
PK	Peak
PN	Pseudo random Noise
PRBS	Pseudo-Random Bit Sequence
PSD	Power Spectral Density
QAM	Quadrature Amplitude Modulation
QP	Quasi-Peak
QPSK	Quadrature Phase Shift Keying
RBW	Resolution BandWidth
RDS	Radio Data System
RE	Radio Equipment
RF	Radio Frequency
RMS	Root Mean Square
RNSS	Radio Navigation Satellite Service
RSS	Radio Standards Specifications
Rx	Receiving
SA, S/A	Spectrum Analyzer
SG	Signal Generator
SVSWR	Site-Voltage Standing Wave Ratio
TR, T/R	Test Receiver
Tx	Transmitting
VBW	Video BandWidth
Vert.	Vertical
WLAN	Wireless LAN

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	Sony Group Corporation
Address	:	1-7-1 Konan Minato-ku, Tokyo, 108-0075 Japan
Contact Person	:	Kazuhiko Nagano

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	:	Wireless Noise Canceling Stereo Headset
Model Number	:	YY2954
Serial Number	:	Refer to SECTION 4.2
Receipt Date	:	January 6, 2022
Condition	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	:	No Modification by the test lab.

2.2 Product Description

Model: YY2954 (referred to as the EUT in this report) is a Wireless Noise Canceling Stereo Headset.

General Specification

Rating	:	DC 3.8 V (Battery) DC 5 V / 9 V (USB)

Radio Specification

Bluetooth

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	FHSS (GFSK, π/4-DQPSK, 8DPSK)
Antenna type	:	Chip antenna
Antenna Gain	:	1.6 dBi
Clock frequency (Maximum)	:	26 MHz

Bluetooth Low Energy

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	GFSK
Antenna type	:	Chip antenna
Antenna Gain	:	1.6 dBi
Clock frequency (Maximum)	:	26 MHz

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on May 3, 2021 and effective July 2, 2021

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 customer has declared that the EUT has complies with FCC Part 15 Subpart B as SDoC.

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	N/A	N/A	*1)
	ISED: RSS-Gen 8.8	**ISED:** RSS-Gen 8.8			
6dB Bandwidth	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section 15.247(a)(2)	See data.	Complied a)	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 b)	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 c)	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)	4.4 dB 2483.500 MHz, AV, Vert. Mode: Tx BT LE 2M-PHY 2480 MHz	Complied# d), e)	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *2)
	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 No. 13-EM-W0420 and 13-EM-W0422.
*1) The test was not applicable since the BLE does not operate during charging.
*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.

FCC Part 15.31 (e)
This EUT provides stable voltage constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

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

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	**ISED:** RSS-Gen 6.7	**ISED:** -	N/A	Complied a)	Conducted
a) Refer to APPENDIX 1 (data of 20dB Bandwidth, 99%Occupied Bandwidth and Carrier Frequency Separation)					

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.

Shonan EMC Lab.

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	2.7 dB	2.7 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	2.9 dB	2.9 dB	2.9 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	4.8 dB	4.8 dB	4.8 dB	-
	6 GHz-18 GHz	5.4 dB	5.4 dB	5.4 dB	-
	18 GHz-40 GHz	5.6 dB	5.6 dB	5.7 dB	-
Radiated emission (Measurement distance: 1 m)	1 GHz-18 GHz	5.7 dB	5.7 dB	5.7 dB	-
	18 GHz-40 GHz	5.9 dB	5.9 dB	5.9 dB	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	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 1GHz	0.93 dB
Spurious emission (Conducted) 1 GHz-3 GHz	0.92 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.3 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.3 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.3 dB
Spurious emission (Conducted), Power Density measurement 1 GHz-3 GHz	0.92 dB
Spurious emission (Conducted), Power Density measurement 3 GHz-18 GHz	2.3 dB
Bandwidth Measurement	0.012 %
Duty cycle and Time Measurement	0.27 %
Temperature_SCH-01	0.93 deg.C.
Humidity_SCH-01	4.1 %
Temperature_SCH-02	2.0 deg.C.
Humidity_SCH-02	6.6 %
Voltage	0.97 %

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone: +81 463 50 6400, Facsimile: +81 463 50 6401
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 (BT LE)	Maximum Packet Size, PRBS9, 1M-PHY Uncoded PHY Maximum Packet Size, PRBS9, 2M-PHY Uncoded PHY
*Power of the EUT was set by the software as follows; Power settings: 50 Software: Firmware Version 1 (Date: 2022.1.6, Storage location: EUT memory) Tera Term Ver.4.106 / Headset_BT_Test Ver.0.12 (Date: 2022.1.10, Storage location: Driven by connected PC) *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.	

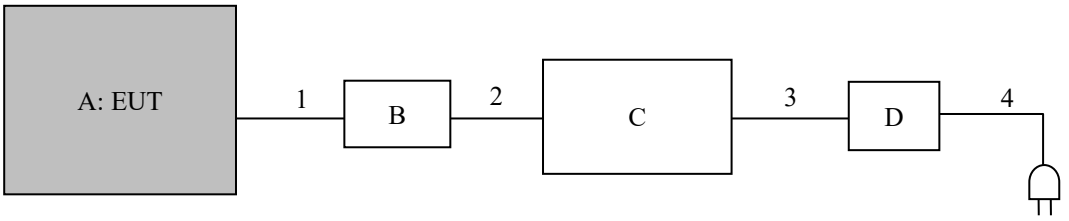
*The details of Operating mode(s)

Test Item	Operating Mode	Tested frequency
Radiated Spurious Emission (Below 1 GHz)	BT LE 1 M-PHY *1)	2480 MHz
Radiated Spurious Emission (Above 1 GHz), Maximum Peak Output Power, Power Density, 6dB Bandwidth, 99% Occupied Bandwidth, Conducted Spurious Emission	BT LE 1 M-PHY BT LE 2 M-PHY	2402 MHz 2440 MHz 2480 MHz

*1) Spurious emissions for frequencies below 1 GHz was 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.

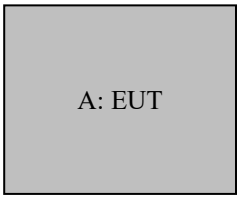
4.2 Configuration and peripherals

(Antenna Terminal conducted test)



AC 100 V / 50 Hz

(Radiated Emission test)



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Noise Canceling Stereo Headset	YY2954	1110397 *1) 1110398 *2)	Sony	EUT
B	Jig Board	-	-	-	-
C	Laptop Computer	ThinkPad E14 Gen2	PF397TQG	LENOVO	-
D	AC Adapter	ADLX65YCC2D	8SSA10R16922C2TJ19 M1368	LENOVO	-

*1) Used for Antenna Terminal conducted test
*2) Used for Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB	1.0	Shielded	Shielded	-
2	USB	0.5	Shielded	Shielded	-
3	DC	1.8	Unshielded	Unshielded	-
4	AC	0.9	Unshielded	Unshielded	-

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 2.0 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.
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.

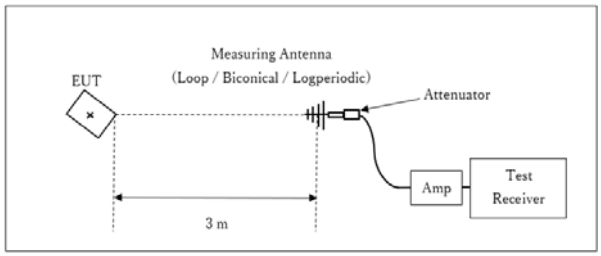
20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9(ISED) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (ISED).

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

Figure 2: Test Setup

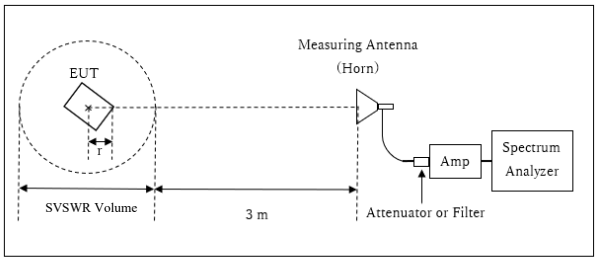
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz

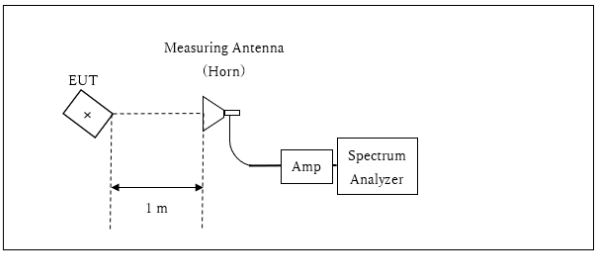


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.90 m / 3.0 m) = 2.28 dB
* Test Distance: (3 + SVSWR Volume /2) - r = 3.90 m

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.1 m

10 GHz - 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 (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	X	X	X	X	X	X
Vertical	Z	Y	Z	X	X	X

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

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

SECTION 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
6dB Bandwidth	10 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *2)	-	Power Meter (Sensor: 160 MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3 kHz	9.1 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4) *5)	9kHz to 150kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	10 kHz	30 kHz				

*1) Peak hold was applied as Worst-case measurement.
*2) Reference data
*3) Section 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 not detected 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 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

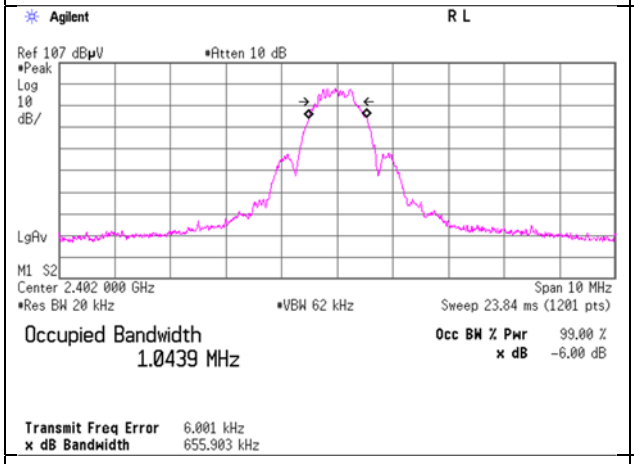
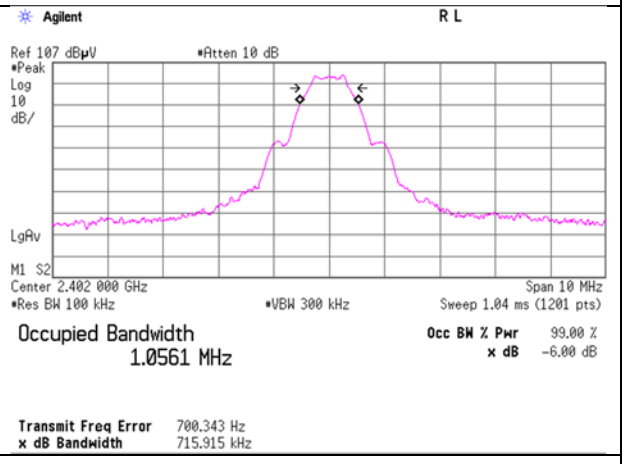
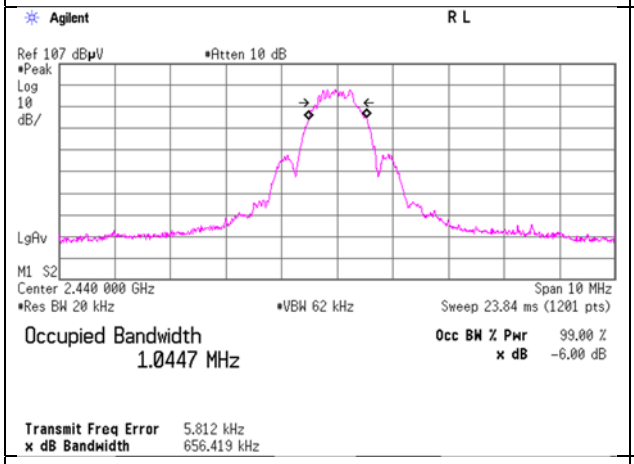
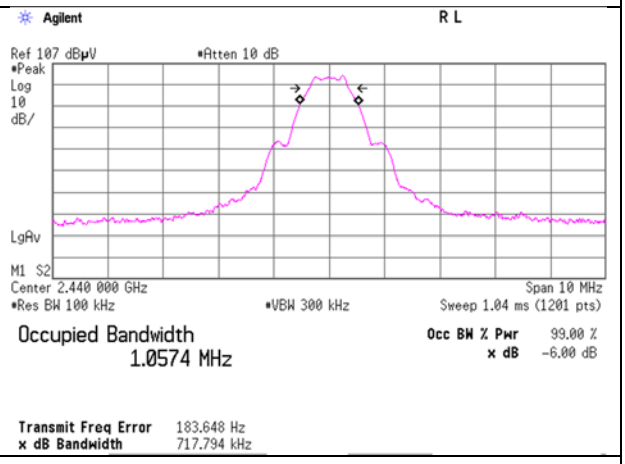
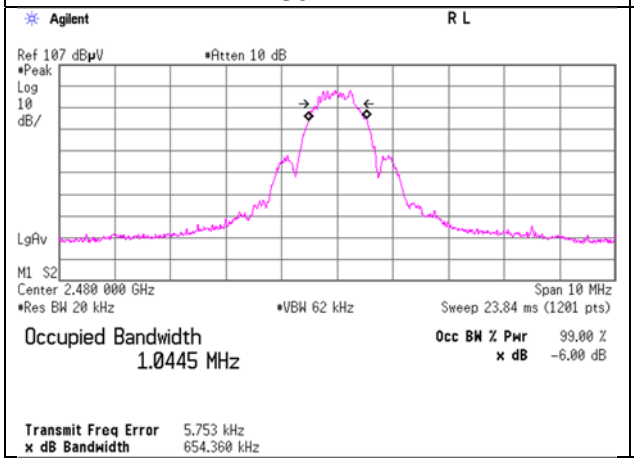
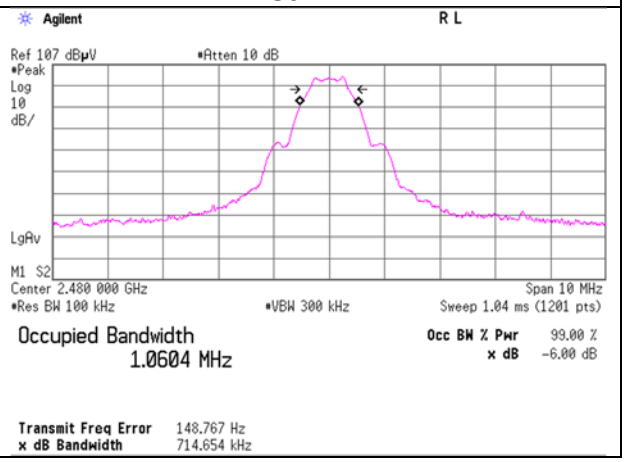
99 % Occupied Bandwidth and 6 dB Bandwidth

Report No.	14173547S-B	
Test place	Shonan EMC Lab. No.5 Shielded Room/No.1 Measurement Room	
Date	January 11, 2022	January 18, 2022
Temperature / Humidity	25 deg. C / 27 % RH	21 deg. C / 24 % RH
Engineer	Yosuke Murakami	Takahiro Kawakami
Mode	Tx	

Mode	Frequency [MHz]	99 % Occupied Bandwidth [kHz]	6 dB Bandwidth [MHz]	Limit for 6 dB Bandwidth [MHz]
BT LE 1 M-PHY	2402	1043.9	0.716	> 0.5000
	2440	1044.7	0.718	> 0.5000
	2480	1044.5	0.715	> 0.5000
BT LE 2 M-PHY	2402	2077.1	1.349	> 0.5000
	2440	2080.2	1.231	> 0.5000
	2480	2077.0	1.270	> 0.5000

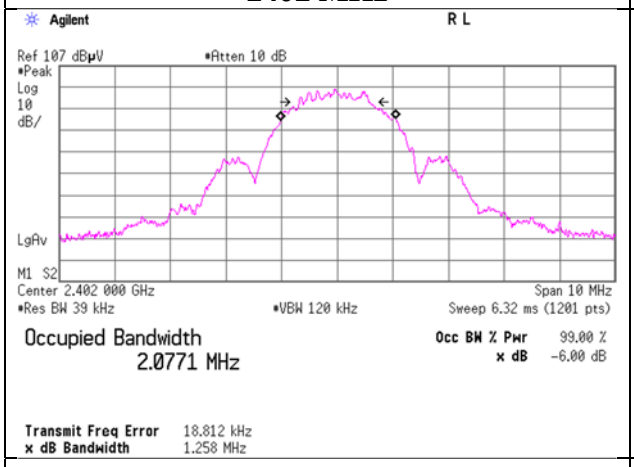
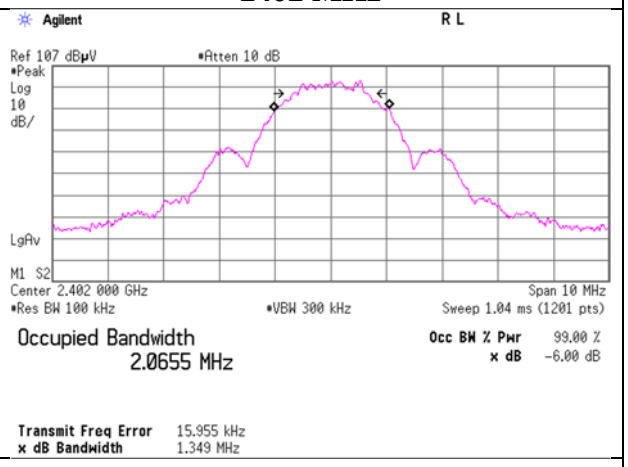
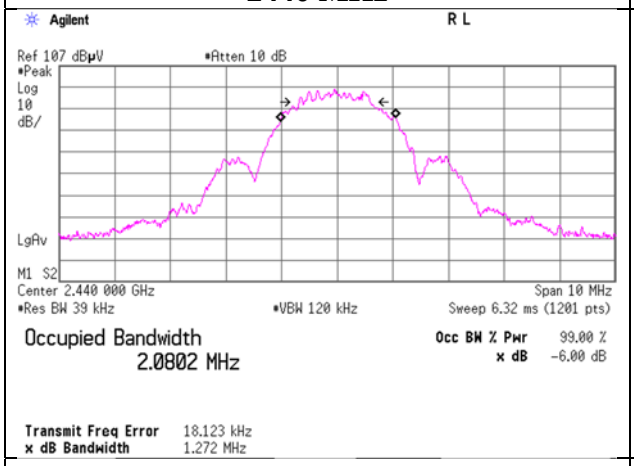
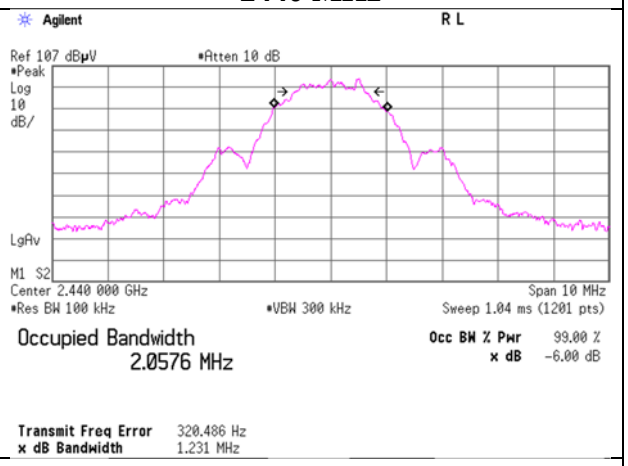
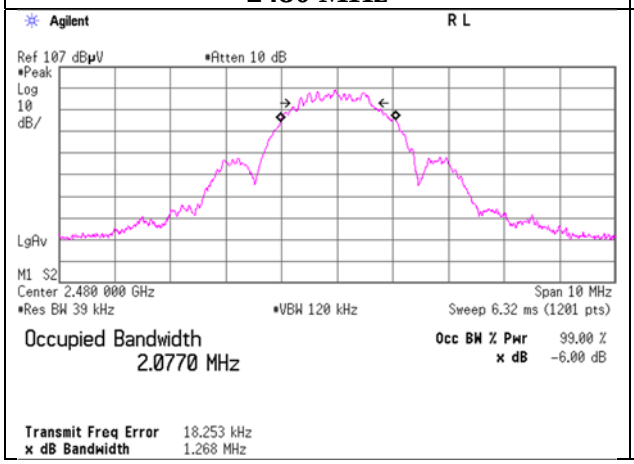
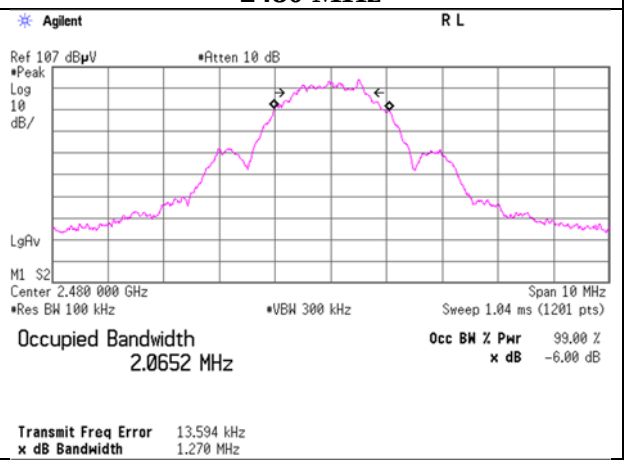
99 % Occupied Bandwidth and 6 dB Bandwidth

BT LE 1 M-PHY

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

99 % Occupied Bandwidth and 6 dB Bandwidth

BT LE 2 M-PHY

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

Maximum Peak Output Power

Report No.	14173547S-B	
Test place	Shonan EMC Lab. No.5 Shielded Room/No.3 Shielded Room	
Date	January 11, 2022	January 17, 2022
Temperature / Humidity	25 deg. C / 27 % RH	24 deg. C / 34 % RH
Engineer	Yosuke Murakami	Shiro Kobayashi
Mode	Tx	

BT LE 1 M-PHY

				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	-5.07	0.89	10.17	5.99	3.97	30.00	1000	24.01	1.60	7.59	5.74	36.02	4000	28.43
2440	-4.99	0.89	10.18	6.08	4.06	30.00	1000	23.92	1.60	7.68	5.86	36.02	4000	28.34
2480	-4.97	0.90	10.18	6.11	4.08	30.00	1000	23.89	1.60	7.71	5.90	36.02	4000	28.31

BT LE 2 M-PHY

				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	-5.09	0.89	10.17	5.97	3.95	30.00	1000	24.03	1.60	7.57	5.71	36.02	4000	28.45
2440	-5.00	0.89	10.18	6.07	4.05	30.00	1000	23.93	1.60	7.67	5.85	36.02	4000	28.35
2480	-4.98	0.90	10.18	6.10	4.07	30.00	1000	23.90	1.60	7.70	5.89	36.02	4000	28.32

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.

Average Output Power
(Reference data for RF Exposure)

Report No.	14173547S-B	
Test place	Shonan EMC Lab. No.5 Shielded Room/No.3 Shielded Room	
Date	January 11, 2022	January 17, 2022
Temperature / Humidity	25 deg. C / 27 % RH	24 deg. C / 34 % RH
Engineer	Yosuke Murakami	Shiro Kobayashi
Mode	Tx	

BT LE 1 M-PHY

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	-6.05	0.89	10.17	5.01	3.17	0.68	5.69	3.71
2440	-6.02	0.89	10.18	5.05	3.20	0.68	5.73	3.74
2480	-5.93	0.90	10.18	5.15	3.27	0.68	5.83	3.83

BT LE 2 M-PHY

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	-7.78	0.89	10.17	3.28	2.13	2.40	5.68	3.70
2440	-7.69	0.89	10.18	3.38	2.18	2.40	5.78	3.78
2480	-7.67	0.90	10.18	3.41	2.19	2.40	5.81	3.81

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

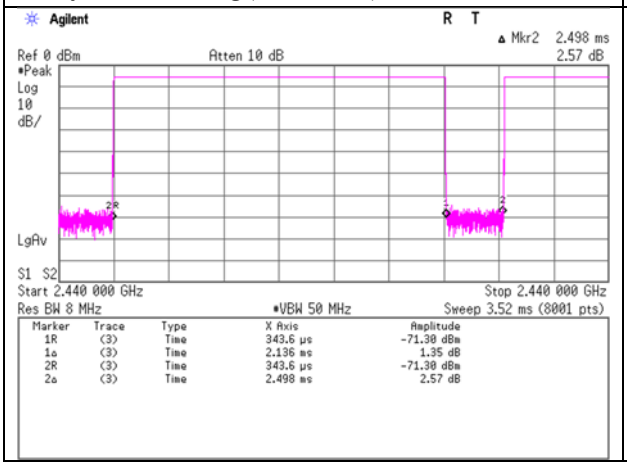
*The equipment and cables were not used for factor 0 dB of the data sheets.

Burst rate confirmation

Report No.	14173547S-B	
Test place	Shonan EMC Lab. No.5 Shielded Room/No.1 Measurement Room	
Date	January 11, 2022	January 18, 2022
Temperature / Humidity	25 deg. C / 27 % RH	21 deg. C / 24 % RH
Engineer	Yosuke Murakami	Takahiro Kawakami
Mode	Tx	

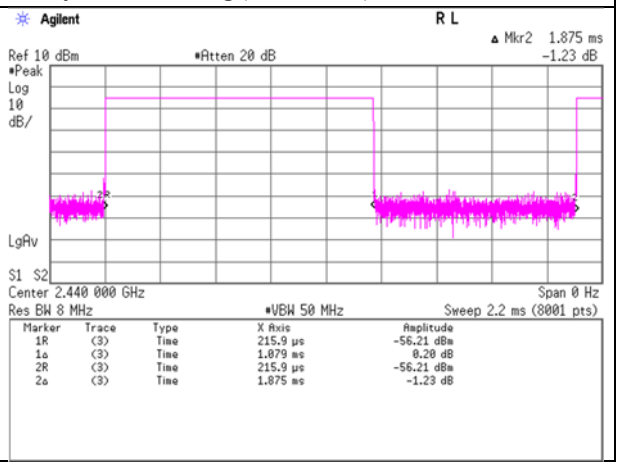
BT LE 1 M-PHY

Tx on / (Tx on + Tx off) =	**0.855**
Tx on / (Tx on + Tx off) * 100 =	**85.5 %**
Duty factor = 10 * log (2.498 / 2.136) =	**0.68 dB**
Duty factor = 20 * log (2.498 / 2.136) =	**1.36 dB**



BT LE 2 M-PHY

Tx on / (Tx on + Tx off) =	**0.575**
Tx on / (Tx on + Tx off) * 100 =	**57.5 %**
Duty factor = 10 * log (1.875 / 1.079) =	**2.40 dB**
Duty factor = 20 * log (1.875 / 1.079) =	**4.80 dB**



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

Radiated Spurious Emission

Report No.	14173547S-B
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 10, 2022
Temperature / Humidity	20 deg. C / 25 % RH
Engineer	Takahiro Kawakami
	(1 GHz – 26.5 GHz)
Mode	Tx BT LE 1M-PHY 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.	2390.000	PK	47.76	28.33	14.42	41.62	2.28	51.17	73.9	22.7	382	95	-
Hori.	4804.000	PK	50.09	31.77	6.88	42.89	2.28	48.13	73.9	25.7	100	228	-
Hori.	7206.000	PK	48.93	37.37	8.25	43.39	2.28	53.44	73.9	20.4	150	0	-
Hori.	9608.000	PK	49.06	39.12	9.45	43.18	2.28	56.73	73.9	17.1	150	0	-
Hori.	7206.000	AV	39.71	37.37	8.25	43.39	2.28	44.22	53.9	9.6	150	0	Floor Noise
Hori.	9608.000	AV	40.34	39.12	9.45	43.18	2.28	48.01	53.9	**5.8**	150	0	Floor Noise
Vert.	2390.000	PK	47.72	28.33	14.42	41.62	2.28	51.13	73.9	22.7	154	19	-
Vert.	4804.000	PK	50.06	31.77	6.88	42.89	2.28	48.10	73.9	25.8	182	318	-
Vert.	7206.000	PK	48.82	37.37	8.25	43.39	2.28	53.33	73.9	20.5	150	0	-
Vert.	9608.000	PK	49.70	39.12	9.45	43.18	2.28	57.37	73.9	16.5	150	0	-
Vert.	7206.000	AV	39.80	37.37	8.25	43.39	2.28	44.31	53.9	9.5	150	0	Floor Noise
Vert.	9608.000	AV	40.16	39.12	9.45	43.18	2.28	47.83	53.9	6.0	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 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	37.39	28.33	14.42	41.62	1.36	2.28	42.16	53.9	11.7	*1)
Hori.	4804.000	AV	41.13	31.77	6.88	42.89	1.36	2.28	40.53	53.9	13.3	-
Vert.	2390.000	AV	38.26	28.33	14.42	41.62	1.36	2.28	43.03	53.9	10.8	*1)
Vert.	4804.000	AV	40.97	31.77	6.88	42.89	1.36	2.28	40.37	53.9	13.5	-

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 (3.90 m / 3.0 m) = 2.28 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)

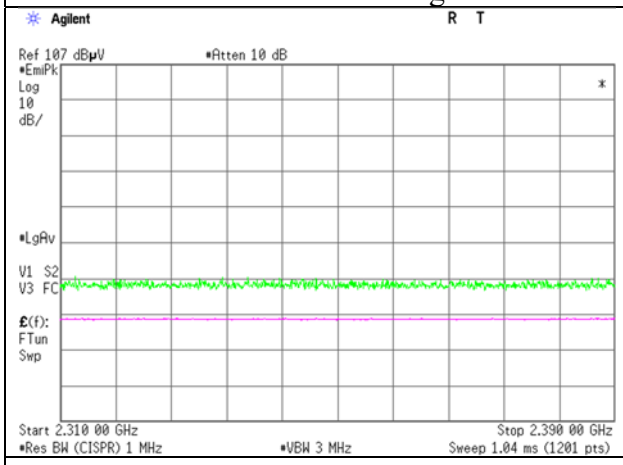
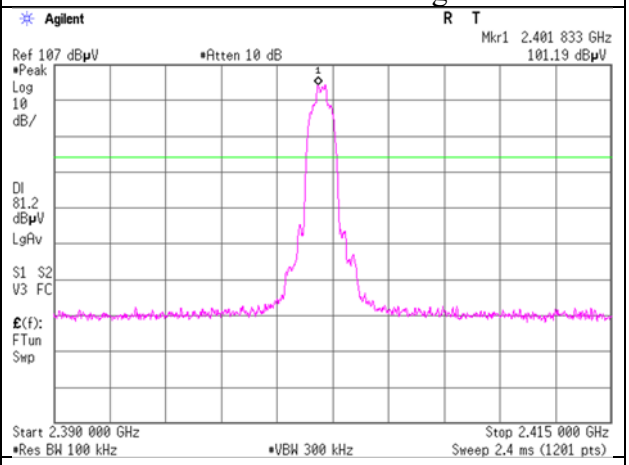
20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

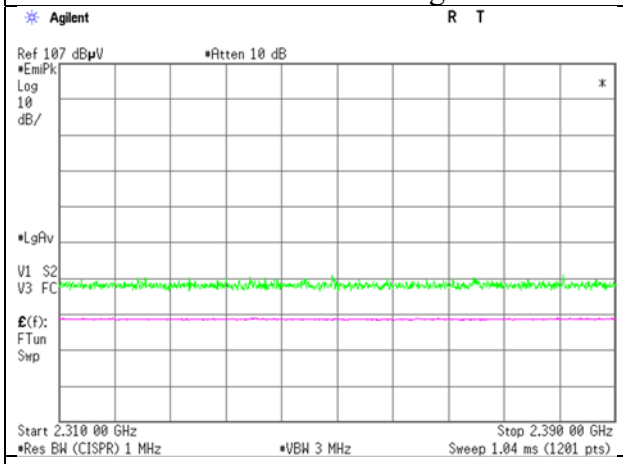
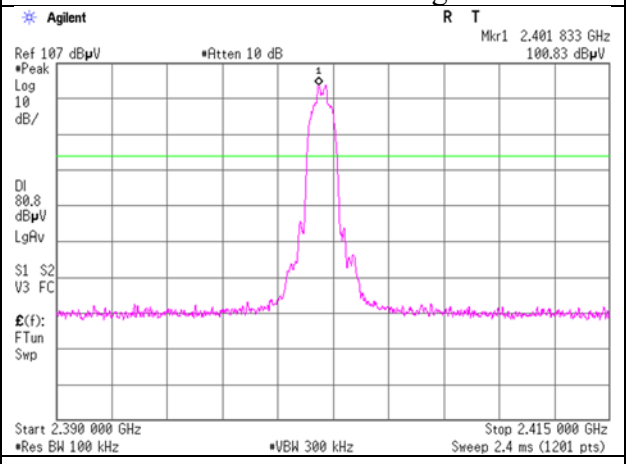
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	99.92	28.31	14.44	41.63	2.28	103.32	-	-	Carrier
Hori.	2400.000	PK	43.49	28.31	14.44	41.63	2.28	46.89	83.3	36.4	-
Vert.	2402.000	PK	99.85	28.31	14.44	41.63	2.28	103.25	-	-	Carrier
Vert.	2400.000	PK	43.61	28.31	14.44	41.63	2.28	47.01	83.2	36.1	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	14173547S-B
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 10, 2022
Temperature / Humidity	20 deg. C / 25 % RH
Engineer	Takahiro Kawakami
Mode	Tx BT LE 1M-PHY 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

Report No.	14173547S-B
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 10, 2022
Temperature / Humidity	20 deg. C / 25 % RH
Engineer	Takahiro Kawakami
	(1 GHz – 26.5 GHz)
Mode	Tx BT LE 1M-PHY 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	50.25	31.87	6.93	42.89	2.28	48.44	73.9	25.4	185	45	-
Hori.	7320.000	PK	49.73	37.53	8.32	43.52	2.28	54.34	73.9	19.5	150	0	-
Hori.	9760.000	PK	49.98	39.41	9.51	42.98	2.28	58.20	73.9	15.7	150	0	-
Hori.	7320.000	AV	39.54	37.53	8.32	43.52	2.28	44.15	53.9	9.7	150	0	Floor Noise
Hori.	9760.000	AV	39.48	39.41	9.51	42.98	2.28	47.70	53.9	6.2	150	0	Floor Noise
Vert.	4880.000	PK	50.75	31.87	6.93	42.89	2.28	48.94	73.9	24.9	167	163	-
Vert.	7320.000	PK	48.53	37.53	8.32	43.52	2.28	53.14	73.9	20.7	150	0	-
Vert.	9760.000	PK	48.59	39.41	9.51	42.98	2.28	56.81	73.9	17.0	150	0	-
Vert.	7320.000	AV	39.38	37.53	8.32	43.52	2.28	43.99	53.9	9.9	150	0	Floor Noise
Vert.	9760.000	AV	39.63	39.41	9.51	42.98	2.28	47.85	53.9	**6.0**	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 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	39.87	31.87	6.93	42.89	1.36	2.28	39.42	53.9	14.4	-
Vert.	4880.000	AV	40.28	31.87	6.93	42.89	1.36	2.28	39.83	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 - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 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

Report No.	14173547S-B	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	No.2	No.3
Date	January 11, 2022	January 10, 2022
Temperature / Humidity	24 deg. C / 27 % RH	20 deg. C / 25 % RH
Engineer	Shiro Kobayashi	Takahiro Kawakami
	(30 MHz - 1 GHz)	(1 GHz – 26.5 GHz)
Mode	Tx BT LE 1M-PHY 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.	135.165	QP	38.50	14.13	8.28	31.83	0.00	29.08	43.5	14.4	236	134	-
Hori.	147.455	QP	35.90	14.67	8.56	31.82	0.00	27.31	43.5	16.1	220	330	-
Hori.	159.741	QP	35.60	15.16	8.73	31.81	0.00	27.68	43.5	15.8	194	318	-
Hori.	294.912	QP	35.30	13.67	6.40	31.69	0.00	23.68	46.0	22.3	100	25	-
Hori.	356.352	QP	32.40	15.29	6.84	31.63	0.00	22.90	46.0	23.1	100	323	-
Hori.	589.834	QP	29.30	19.16	8.19	31.61	0.00	25.04	46.0	20.9	141	147	-
Hori.	651.271	QP	28.20	19.44	8.50	31.61	0.00	24.53	46.0	21.4	129	286	-
Hori.	2483.500	PK	49.42	28.24	14.52	41.65	2.28	52.81	73.9	21.0	245	98	-
Hori.	4960.000	PK	50.43	32.14	6.99	42.89	2.28	48.95	73.9	24.9	100	211	-
Hori.	7440.000	PK	48.52	37.62	8.37	43.65	2.28	53.14	73.9	20.7	150	0	-
Hori.	9920.000	PK	47.35	39.30	9.59	42.77	2.28	55.75	73.9	18.1	150	0	-
Hori.	7440.000	AV	39.19	37.62	8.37	43.65	2.28	43.81	53.9	10.0	150	0	Floor Noise
Hori.	9920.000	AV	38.52	39.30	9.59	42.77	2.28	46.92	53.9	**6.9**	150	0	Floor Noise
Vert.	135.167	QP	37.00	14.13	8.28	31.83	0.00	27.58	43.5	15.9	100	127	-
Vert.	147.453	QP	33.50	14.67	8.56	31.82	0.00	24.91	43.5	18.5	100	70	-
Vert.	159.749	QP	33.00	15.16	8.73	31.81	0.00	25.08	43.5	18.4	100	125	-
Vert.	528.383	QP	31.40	17.75	7.86	31.63	0.00	25.38	46.0	20.6	100	96	-
Vert.	2483.500	PK	49.71	28.24	14.52	41.65	2.28	53.10	73.9	20.8	109	327	-
Vert.	4960.000	PK	50.58	32.14	6.99	42.89	2.28	49.10	73.9	24.8	148	168	-
Vert.	7440.000	PK	48.35	37.62	8.37	43.65	2.28	52.97	73.9	20.9	150	0	-
Vert.	9920.000	PK	48.03	39.30	9.59	42.77	2.28	56.43	73.9	17.4	150	0	-
Vert.	7440.000	AV	39.18	37.62	8.37	43.65	2.28	43.80	53.9	10.1	150	0	Floor Noise
Vert.	9920.000	AV	38.25	39.30	9.59	42.77	2.28	46.65	53.9	7.2	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 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	38.41	28.24	14.52	41.65	1.36	2.28	43.16	53.9	10.7	*1)
Hori.	4960.000	AV	40.33	32.14	6.99	42.89	1.36	2.28	40.21	53.9	13.6	-
Vert.	2483.500	AV	39.55	28.24	14.52	41.65	1.36	2.28	44.30	53.9	9.6	*1)
Vert.	4960.000	AV	40.82	32.14	6.99	42.89	1.36	2.28	40.70	53.9	13.2	-

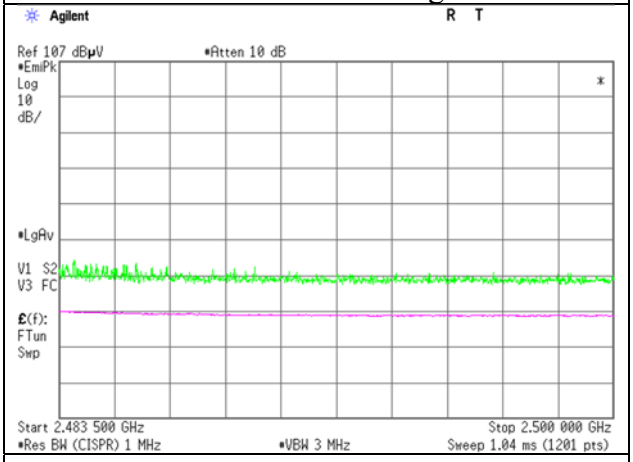
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Burst rate confirmation" sheet.
*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	14173547S-B
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 10, 2022
Temperature / Humidity	20 deg. C / 25 % RH
Engineer	Takahiro Kawakami
Mode	Tx BT LE 1M-PHY 2480 MHz

Horizontal

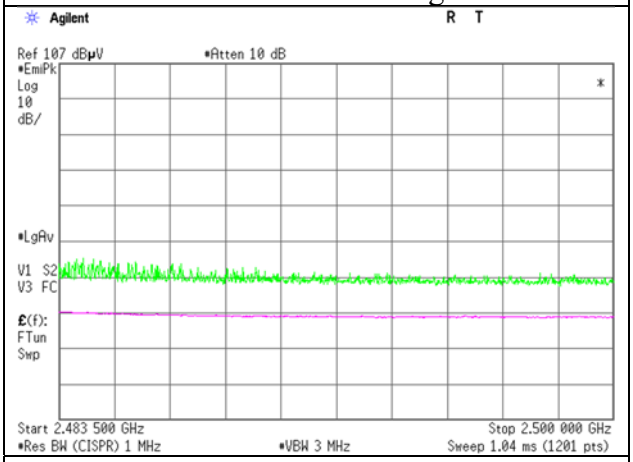
Restricted-band band-edge Plot



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

Report No.	14173547S-B
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	January 16, 2022
Temperature / Humidity	21 deg. C / 30 % RH
Engineer	Miku Ikudome
	(1 GHz – 26.5 GHz)
Mode	Tx BT LE 2M-PHY 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.	2390.000	PK	45.06	28.58	14.08	38.72	2.28	51.28	73.9	22.6	147	105	-
Hori.	4804.000	PK	45.54	31.75	6.49	38.55	2.28	47.51	73.9	26.3	128	274	-
Hori.	7206.000	PK	44.98	37.60	7.92	39.16	2.28	53.62	73.9	20.2	150	0	-
Hori.	9608.000	PK	44.57	39.01	9.21	39.70	2.28	55.37	73.9	18.5	150	0	-
Hori.	7206.000	AV	35.67	37.60	7.92	39.16	2.28	44.31	53.9	9.5	150	0	Floor Noise
Hori.	9608.000	AV	35.28	39.01	9.21	39.70	2.28	46.08	53.9	7.8	150	0	Floor Noise
Vert.	2390.000	PK	45.26	28.58	14.08	38.72	2.28	51.48	73.9	22.4	182	63	-
Vert.	4804.000	PK	45.79	31.75	6.49	38.55	2.28	47.76	73.9	26.1	172	355	-
Vert.	7206.000	PK	45.01	37.60	7.92	39.16	2.28	53.65	73.9	20.2	150	0	-
Vert.	9608.000	PK	44.40	39.01	9.21	39.70	2.28	55.20	73.9	18.7	150	0	-
Vert.	7206.000	AV	36.02	37.60	7.92	39.16	2.28	44.66	53.9	9.2	150	0	Floor Noise
Vert.	9608.000	AV	35.42	39.01	9.21	39.70	2.28	46.22	53.9	7.6	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 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	35.66	28.58	14.08	38.72	4.80	2.28	46.68	53.9	7.2	*1)
Hori.	4804.000	AV	35.78	31.75	6.49	38.55	4.80	2.28	42.55	53.9	11.3	-
Vert.	2390.000	AV	35.78	28.58	14.08	38.72	4.80	2.28	46.80	53.9	**7.1**	*1)
Vert.	4804.000	AV	35.79	31.75	6.49	38.55	4.80	2.28	42.56	53.9	11.3	-

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 (3.90 m / 3.0 m) = 2.28 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)**

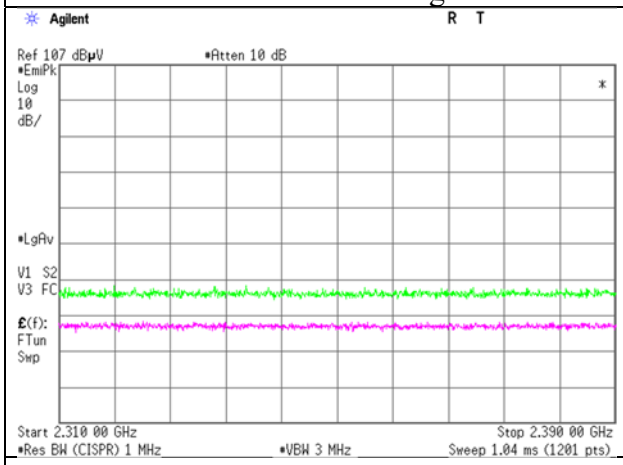
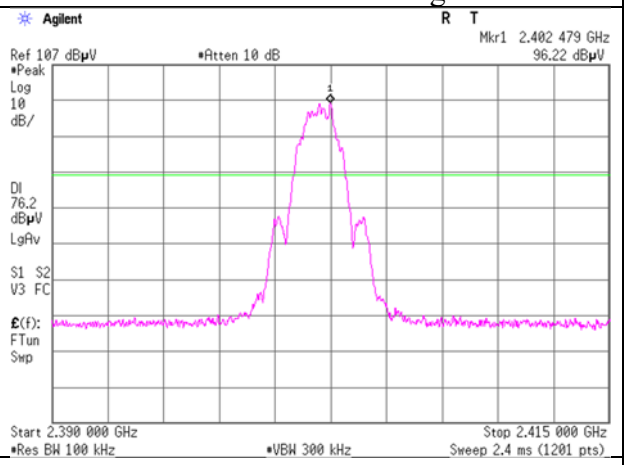
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	95.58	28.56	14.10	38.72	2.28	101.80	-	-	Carrier
Hori.	2400.000	PK	63.83	28.56	14.09	38.72	2.28	70.04	81.8	11.7	-
Vert.	2402.000	PK	96.67	28.56	14.10	38.72	2.28	102.89	-	-	Carrier
Vert.	2400.000	PK	64.88	28.56	14.09	38.72	2.28	71.09	82.8	11.7	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

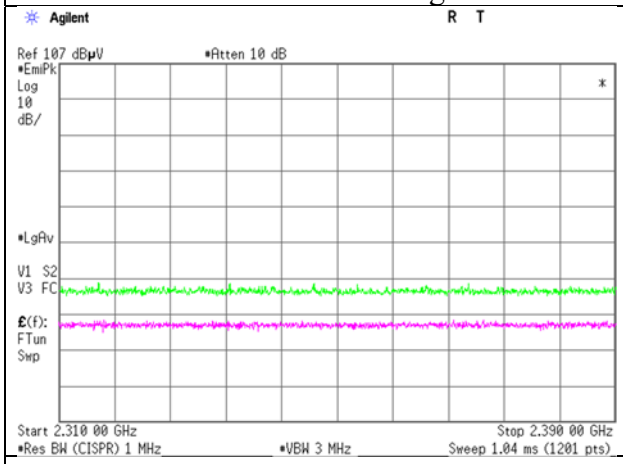
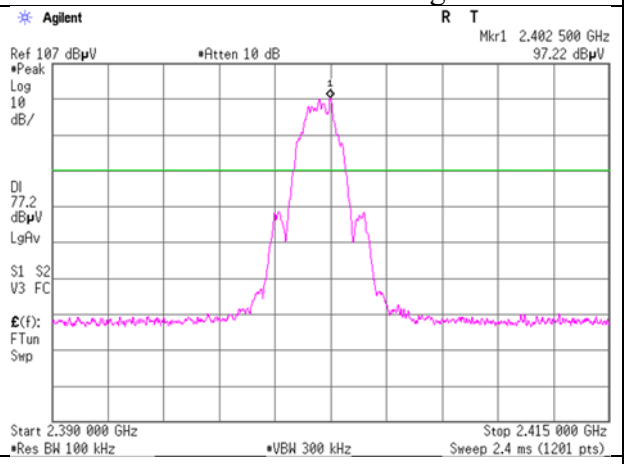
Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	14173547S-B
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	January 16, 2022
Temperature / Humidity	21 deg. C / 30 % RH
Engineer	Miku Ikudome
Mode	Tx BT LE 2M-PHY 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

Report No.	14173547S-B
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	January 16, 2022
Temperature / Humidity	21 deg. C / 30 % RH
Engineer	Miku Ikudome
	(1 GHz – 26.5 GHz)
Mode	Tx BT LE 2M-PHY 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	45.72	31.78	6.53	38.58	2.28	47.73	73.9	26.1	111	49	-
Hori.	7320.000	PK	44.37	37.75	7.99	39.22	2.28	53.17	73.9	20.7	150	0	-
Hori.	9760.000	PK	44.85	39.43	9.27	39.73	2.28	56.10	73.9	17.8	150	0	-
Hori.	7320.000	AV	35.54	37.75	7.99	39.22	2.28	44.34	53.9	9.5	150	0	Floor Noise
Hori.	9760.000	AV	35.68	39.43	9.27	39.73	2.28	46.93	53.9	**6.9**	150	0	Floor Noise
Vert.	4880.000	PK	46.23	31.78	6.53	38.58	2.28	48.24	73.9	25.6	113	181	-
Vert.	7320.000	PK	45.16	37.75	7.99	39.22	2.28	53.96	73.9	19.9	150	0	-
Vert.	9760.000	PK	44.49	39.43	9.27	39.73	2.28	55.74	73.9	18.1	150	0	-
Vert.	7320.000	AV	35.45	37.75	7.99	39.22	2.28	44.25	53.9	9.6	150	0	Floor Noise
Vert.	9760.000	AV	35.61	39.43	9.27	39.73	2.28	46.86	53.9	7.0	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 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	35.67	31.78	6.53	38.58	4.80	2.28	42.48	53.9	11.4	-
Vert.	4880.000	AV	36.44	31.78	6.53	38.58	4.80	2.28	43.25	53.9	10.6	-

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 (3.90 m / 3.0 m) = 2.28 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

Report No.	14173547S-B
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	January 16, 2022
Temperature / Humidity	21 deg. C / 30 % RH
Engineer	Miku Ikudome
	(1 GHz – 26.5 GHz)
Mode	Tx BT LE 2M-PHY 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	48.23	28.47	14.18	38.67	2.28	54.49	73.9	19.4	289	112	-
Hori.	4960.000	PK	46.36	32.03	6.59	38.62	2.28	48.64	73.9	25.2	103	224	-
Hori.	7440.000	PK	45.76	37.82	8.05	39.28	2.28	54.63	73.9	19.2	150	0	-
Hori.	9920.000	PK	45.16	39.55	9.34	39.76	2.28	56.57	73.9	17.3	150	0	-
Hori.	7440.000	AV	35.83	37.82	8.05	39.28	2.28	44.70	53.9	9.2	150	0	Floor Noise
Hori.	9920.000	AV	36.27	39.55	9.34	39.76	2.28	47.68	53.9	6.2	150	0	Floor Noise
Vert.	2483.500	PK	48.47	28.47	14.18	38.67	2.28	54.73	73.9	19.1	129	328	-
Vert.	4960.000	PK	46.23	32.03	6.59	38.62	2.28	48.51	73.9	25.3	130	187	-
Vert.	7440.000	PK	45.97	37.82	8.05	39.28	2.28	54.84	73.9	19.0	150	0	-
Vert.	9920.000	PK	45.64	39.55	9.34	39.76	2.28	57.05	73.9	16.8	150	0	-
Vert.	7440.000	AV	35.93	37.82	8.05	39.28	2.28	44.80	53.9	9.1	150	0	Floor Noise
Vert.	9920.000	AV	36.04	39.55	9.34	39.76	2.28	47.45	53.9	6.4	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 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	37.67	28.47	14.18	38.67	4.80	2.28	48.73	53.9	5.1	*1)
Hori.	4960.000	AV	36.36	32.03	6.59	38.62	4.80	2.28	43.44	53.9	10.4	-
Vert.	2483.500	AV	38.37	28.47	14.18	38.67	4.80	2.28	49.43	53.9	**4.4**	*1)
Vert.	4960.000	AV	36.61	32.03	6.59	38.62	4.80	2.28	43.69	53.9	10.2	-

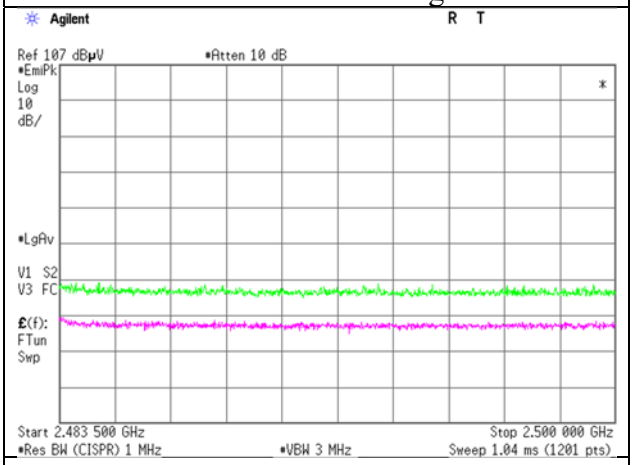
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Burst rate confirmation" sheet.
*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	14173547S-B
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	January 16, 2022
Temperature / Humidity	21 deg. C / 30 % RH
Engineer	Miku Ikudome
Mode	Tx BT LE 2M-PHY 2480 MHz

Horizontal

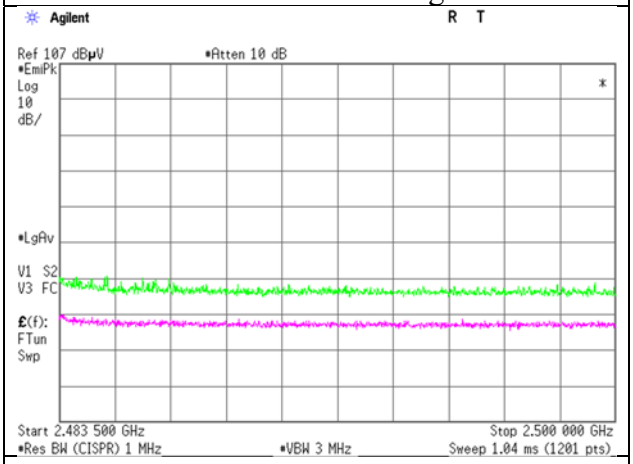
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

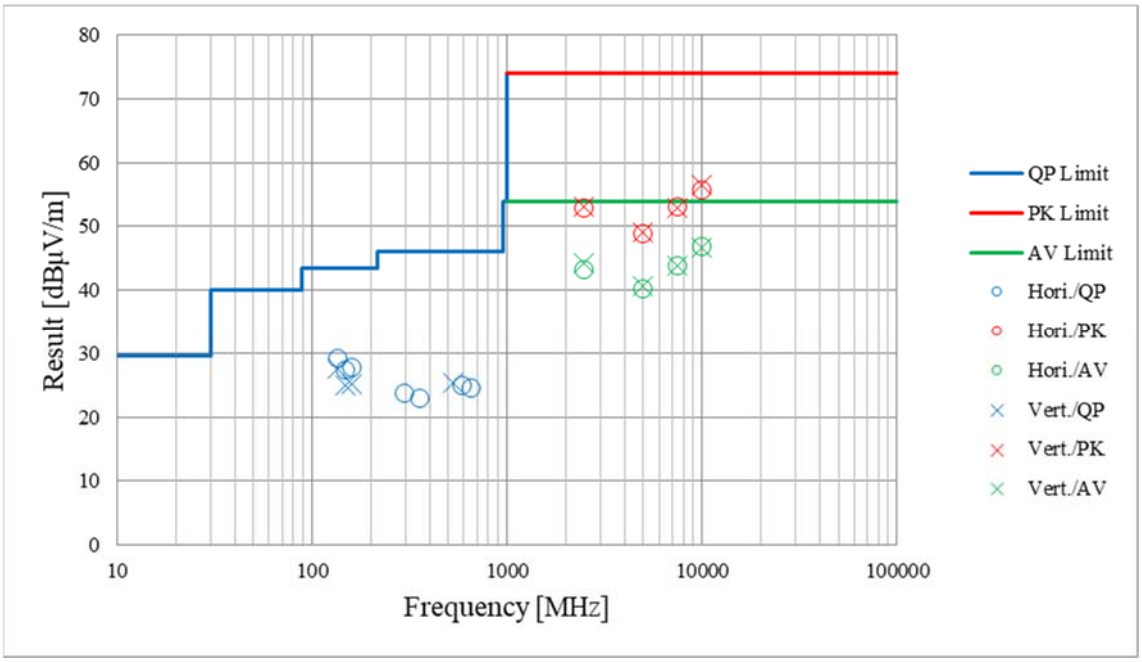


Trace Green : Peak Plot
Trace Purple : Average Plot

* 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)

Report No.	14173547S-B	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	No.2	No.3
Date	January 11, 2022	January 10, 2022
Temperature / Humidity	24 deg. C / 27 % RH	20 deg. C / 25 % RH
Engineer	Shiro Kobayashi	Takahiro Kawakami
	(30 MHz - 1 GHz)	(1 GHz – 26.5 GHz)
Mode	Tx BT LE 1 M-PHY 2480 MHz	

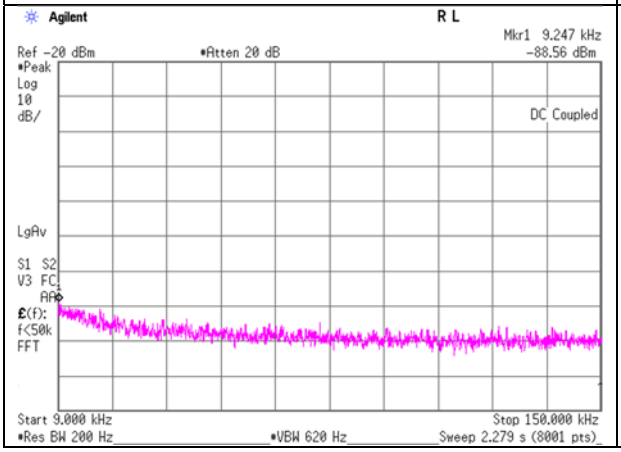


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

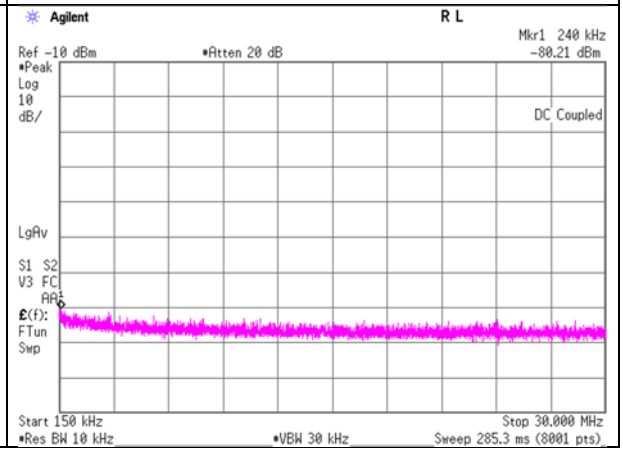
Conducted Spurious Emission

Report No.	14173547S-B
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	January 11, 2022
Temperature / Humidity	25 deg. C / 27 % RH
Engineer	Yosuke Murakami
Mode	Tx BT LE 1 M-PHY 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
9.25	-88.6	0.00	10.1	2.0	1	-76.5	300	6.0	-15.2	48.2	63.4	-
240.00	-80.2	0.01	10.1	2.0	1	-68.1	300	6.0	-6.8	20.0	26.8	-

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)

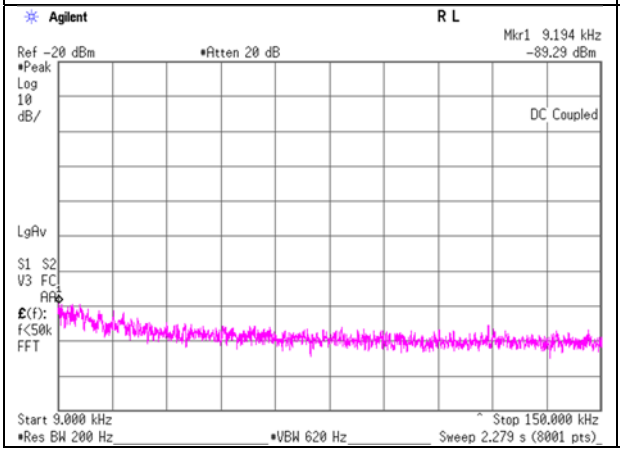
N: Number of output

*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

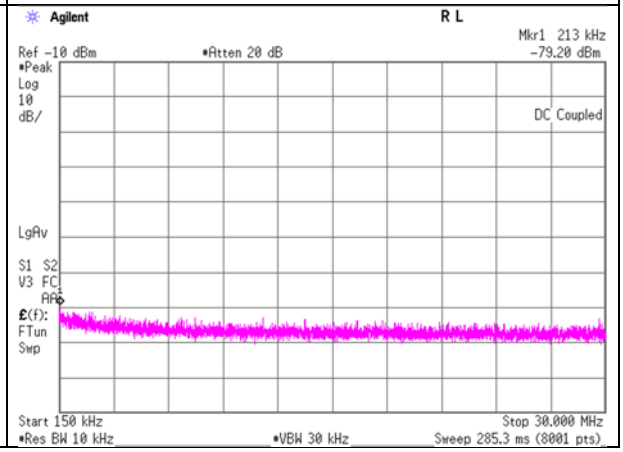
Conducted Spurious Emission

Report No.	14173547S-B
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	January 11, 2022
Temperature / Humidity	25 deg. C / 27 % RH
Engineer	Yosuke Murakami
Mode	Tx BT LE 1 M-PHY 2440 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
9.19	-89.3	0.00	10.1	2.0	1	-77.2	300	6.0	-15.9	48.3	64.2	-
213.00	-79.2	0.01	10.1	2.0	1	-67.1	300	6.0	-5.8	21.0	26.8	-

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)

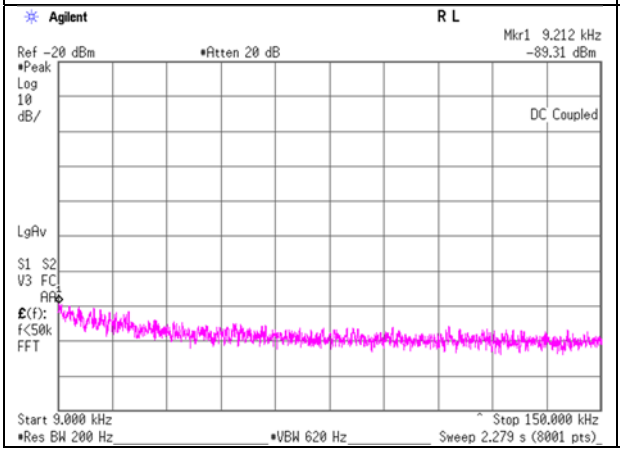
N: Number of output

*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

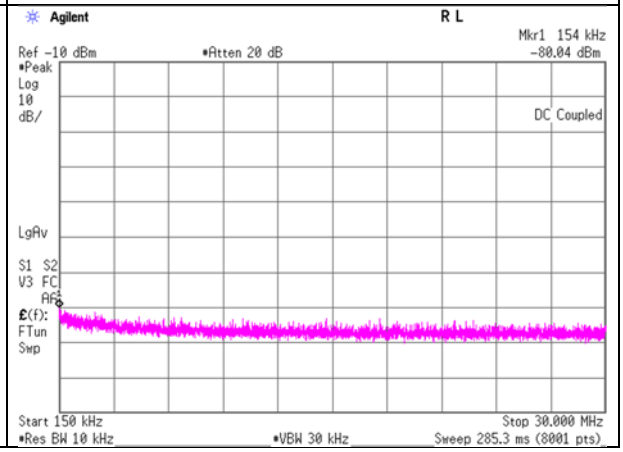
Conducted Spurious Emission

Report No.	14173547S-B
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	January 11, 2022
Temperature / Humidity	25 deg. C / 27 % RH
Engineer	Yosuke Murakami
Mode	Tx BT LE 1 M-PHY 2480 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
9.21	-89.3	0.00	10.1	2.0	1	-77.2	300	6.0	-15.9	48.3	64.2	-
154.00	-80.0	0.00	10.1	2.0	1	-67.9	300	6.0	-6.7	23.8	30.5	-

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)

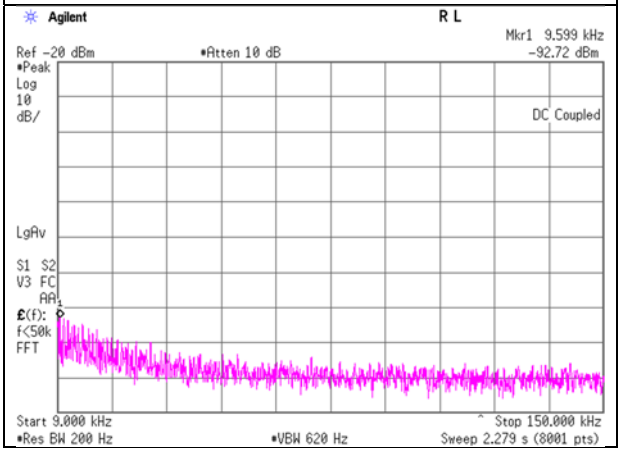
N: Number of output

*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

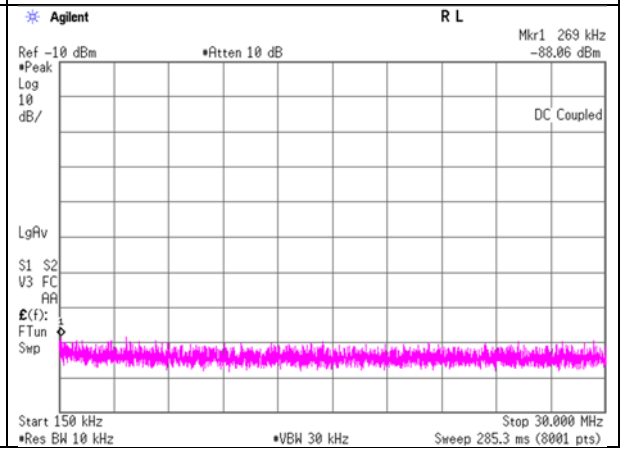
Conducted Spurious Emission

Report No.	14173547S-B
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	January 18, 2022
Temperature / Humidity	21 deg. C / 24 % RH
Engineer	Takahiro Kawakami
Mode	Tx BT LE 2 M-PHY 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
9.60	-92.7	0.00	10.1	2.0	1	-80.6	300	6.0	-19.4	47.9	67.3	-
269.00	-88.1	0.01	10.1	2.0	1	-75.9	300	6.0	-14.7	19.0	33.7	-

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)

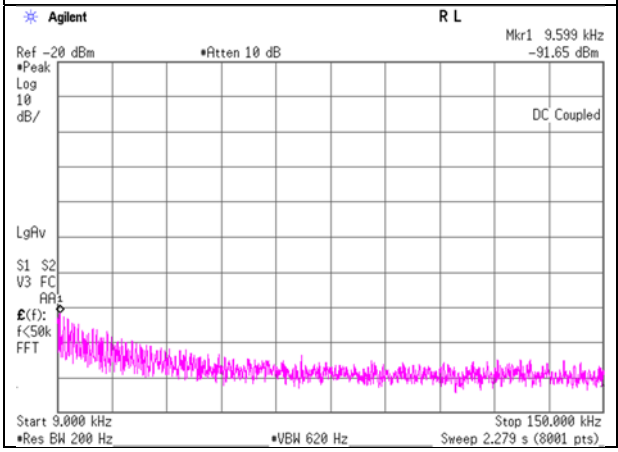
N: Number of output

*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

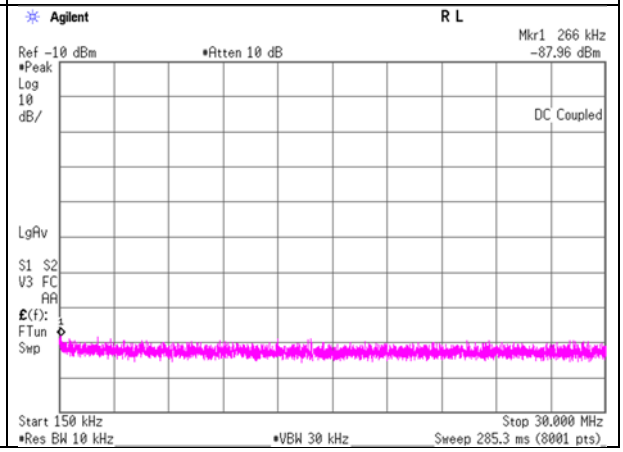
Conducted Spurious Emission

Report No.	14173547S-B
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	January 18, 2022
Temperature / Humidity	21 deg. C / 24 % RH
Engineer	Takahiro Kawakami
Mode	Tx BT LE 2 M-PHY 2440 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
9.60	-91.7	0.00	10.1	2.0	1	-79.5	300	6.0	-18.3	47.9	66.2	-
266.00	-88.0	0.01	10.1	2.0	1	-75.8	300	6.0	-14.6	19.1	33.7	-

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)

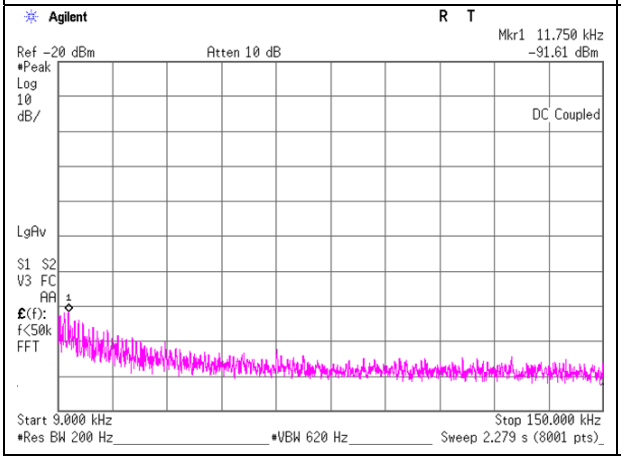
N: Number of output

*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

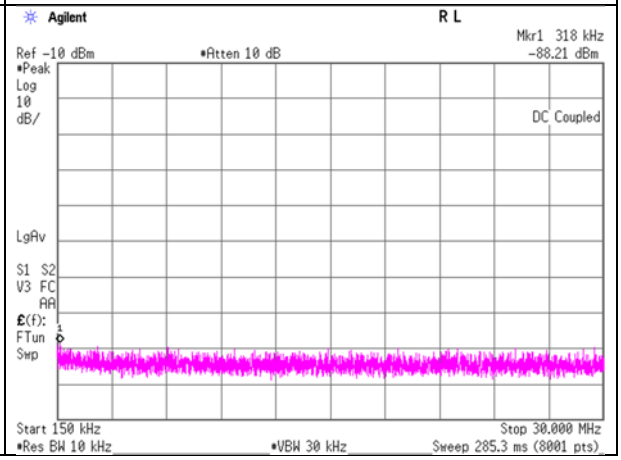
Conducted Spurious Emission

Report No.	14173547S-B
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	January 18, 2022
Temperature / Humidity	21 deg. C / 24 % RH
Engineer	Takahiro Kawakami
Mode	Tx BT LE 2 M-PHY 2480 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
11.75	-91.6	0.00	10.1	2.0	1	-79.5	300	6.0	-18.2	46.2	64.4	-
318.00	-88.2	0.01	10.1	2.0	1	-76.1	300	6.0	-14.8	17.5	32.3	-

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

*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

Power Density

Report No.	14173547S-B	
Test place	Shonan EMC Lab. No.5 Shielded Room / No.1 Measurement Room	
Date	January 11, 2022	January 18, 2022
Temperature / Humidity	25 deg. C / 27 % RH	21 deg. C / 24 % RH
Engineer	Yosuke Murakami	Takahiro Kawakami
Mode	Tx	

BT LE 1 M-PHY

Freq. [MHz]	Reading [dBm / 3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2402	-21.93	0.89	10.17	-10.87	8.00	18.87
2440	-21.79	0.89	10.18	-10.72	8.00	18.72
2480	-21.83	0.90	10.18	-10.75	8.00	18.75

BT LE 2 M-PHY

Freq. [MHz]	Reading [dBm / 3 kHz]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2402	-24.54	0.89	10.17	-13.48	8.00	21.48
2440	-24.48	0.89	10.18	-13.41	8.00	21.41
2480	-24.55	0.90	10.18	-13.47	8.00	21.47

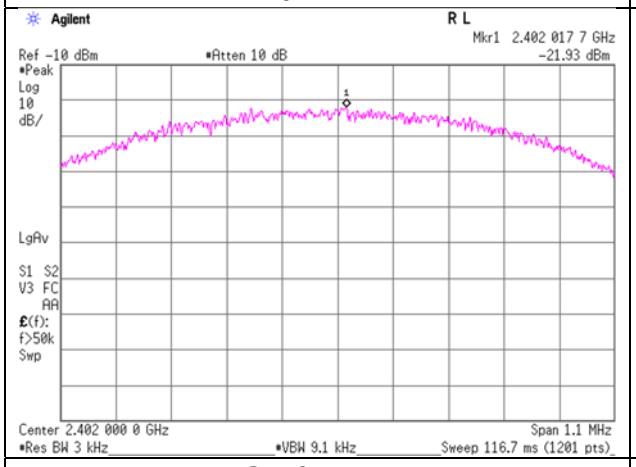
Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

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

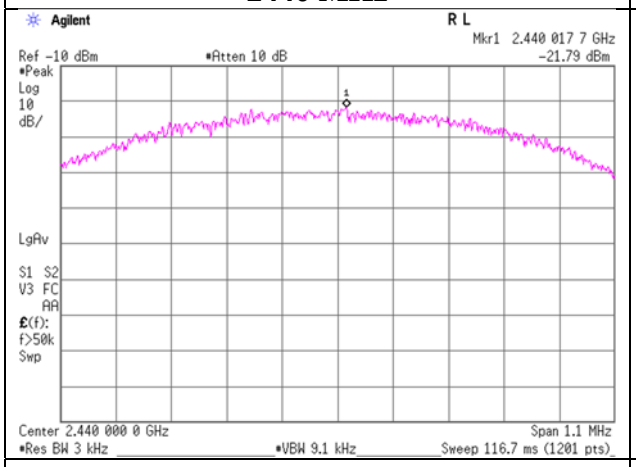
Power Density

BT LE 1 M-PHY

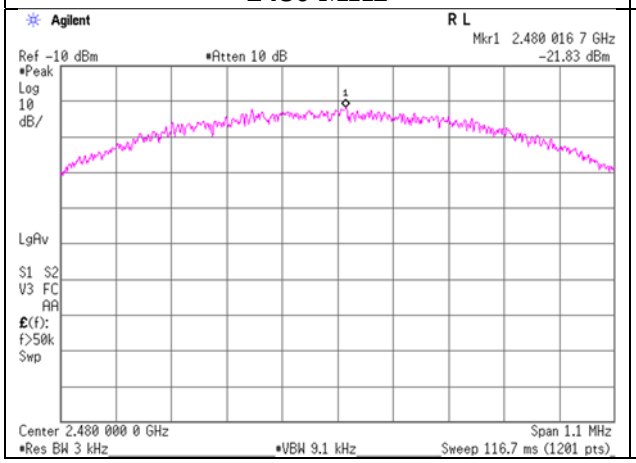
2402 MHz



2440 MHz

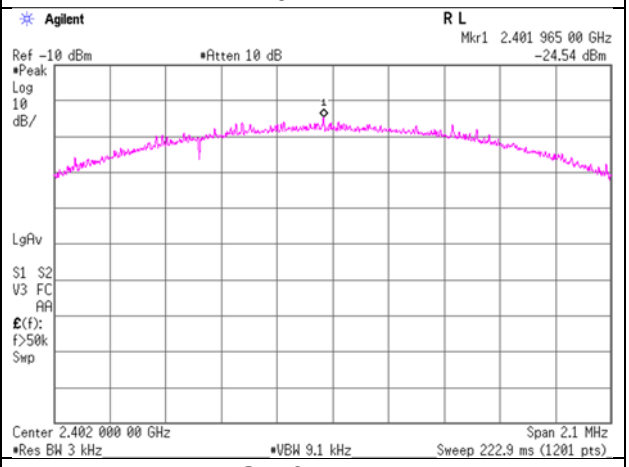


2480 MHz

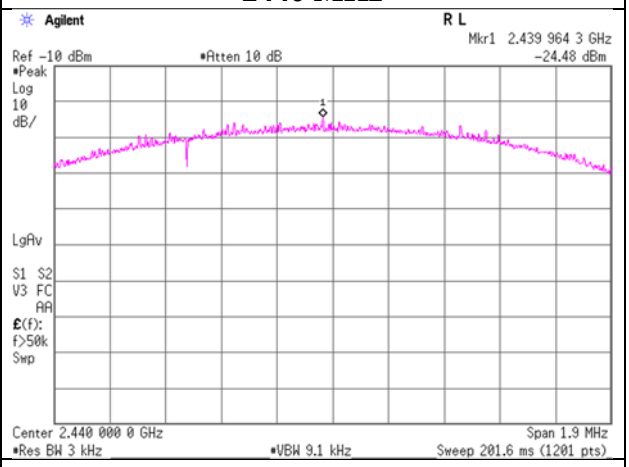


BT LE 2 M-PHY

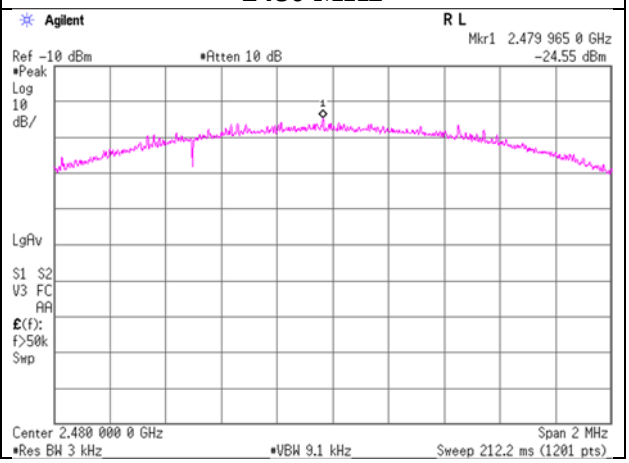
2402 MHz



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	KTS-08	145095	Digital Tester	SANWA	PC500	7019224	2021/04/26	12
AT	SAT10-15	160493	Attenuator	Weinschel Corp.	54A-10	83406	2021/12/07	12
AT	SCC-G11	145174	Coaxial Cable	Suhner	SUCOFLEX 102	31595/2	2021/03/01	12
AT	SOS-27	191845	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2021/08/02	12
AT	SOS-28	191846	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2021/08/02	12
AT	SPM-13	169910	Power Meter	Keysight Technologies Inc	8990B	MY51000448	2021/01/25	12
AT	SPSS-06	169911	Power sensor	Keysight Technologies Inc	N1923A	MY57270004	2021/01/25	12
AT	SRENT-09	150461	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46186392	2021/02/22	12
AT	SRENT-22	202830	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY48250036	2021/12/01	12
RE	COTS-SEMI-5	170932	EMI Software	TSJ (Techno Science Japan)	TEPTO-DV3(RE,CE,ME,PE)	-	-	-
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	2021/03/16	12
RE	SAEC-02(SVSWR)	145598	Semi-Anechoic Chamber	TDK	SAEC-02(SVSWR)	2	2021/05/20	12
RE	SAEC-03(SVSWR)	145566	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	2021/05/21	12
RE	SAF-02	145004	Pre Amplifier	SONOMA	310N	290212	2021/02/10	12
RE	SAF-05	145128	Pre Amplifier	Toyo Corporation	TPA0118-36	1440490	2021/05/17	12
RE	SAF-06	145005	Pre Amplifier	Toyo Corporation	TPA0118-36	1440491	2021/02/08	12
RE	SAF-08	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2021/03/01	12
RE	SAT10-06	145137	Attenuator	Keysight Technologies Inc	8493C-010	74865	2021/10/05	12
RE	SAT3-11	150921	Attenuator	JFW	50HF-003N	-	2021/01/26	12
RE	SAT6-14	167095	Attenuator	JFW	50HF-006N	-	2021/02/10	12
RE	SBA-02	145022	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	BBA9106	91032665	2021/04/10	12
RE	SCC-B1/B3/B5/B7/B8/B13/SRSE-02	144975	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	2021/04/12	12
RE	SCC-B2/B4/B6/B7/B8/B13/SRSE-02	144976	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	2021/04/12	12

Test equipment (2/2)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	SCC-G15	145176	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	2021/03/01	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	2021/05/17	12
RE	SCC-G50	178573	Coaxial Cable	Huber+Suhner	SUCOFLEX_104_E	MY13407/4E	2021/03/01	12
RE	SCC-G51	178572	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	800288 /4A	2021/03/01	12
RE	SCC-G57	179540	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	802815/2	2021/05/18	12
RE	SCC-G58	183047	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	800287/4A	2021/05/17	12
RE	SCC-G69	200009	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	575617/4	2021/07/06	12
RE	SCC-G70	200010	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	575618/4	2021/07/06	12
RE	SFL-18	145305	Highpass Filter	MICRO-TRONICS	HPM50111	119	2021/04/08	12
RE	SHA-02	145384	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	9120D-726	2021/06/14	12
RE	SHA-03	145501	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	9120D-739	2021/06/14	12
RE	SHA-04	145512	Horn Antenna	ETS-Lindgren	3160-09	00094868	2021/06/14	12
RE	SHA-09	194684	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA 9120 C	695	2021/03/03	12
RE	SHA-10	194685	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA 9120 C	711	2021/03/03	12
RE	SJM-20	207277	Measuring	ASKUL	-	-	-	-
RE	SLA-06	145528	Logperiodic Antenna	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	195	2021/04/10	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	SSA-02	145800	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY48250106	2021/04/13	12
RE	STR-07	146209	Test Receiver	Rohde & Schwarz	ESU26	100484	2021/09/17	12
RE	STS-02	145793	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997819	2021/04/28	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: RE: Radiated Emission
AT: Antenna Terminal Conducted