RADIO TEST REPORT

Test Report No. : 12517307H-B-R1

Applicant	:	**TandD Corporation**
Type of Equipment	:	**Data Logger**
Model No.	:	**TR-75wb**
FCC ID	:	**SRD50090**
Test regulation	:	**FCC Part 15 Subpart C: 2018**
Test Result	:	**Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
6. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
7. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
8. This report is a revised version of 12517307H-B. 12517307H-B is replaced with this report.

Date of test: October 24 to November 1, 2018

Representative test engineer: T. Noguchi

Takafumi Noguchi
Engineer
Consumer Technology Division

Approved by: Takayuki. S

Takayuki Shimada
Leader
Consumer Technology Division

NVLAP TESTING
NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
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☒ There is no testing item of "Non-accreditation".

UL Japan, Inc.
Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

REVISION HISTORY

Original Test Report No.: 12517307H-B

Revision	Test report No.	Date	Page revised	Contents
- (Original)	12517307H-B	December 10, 2018	-	-
1	12517307H-B-R1	December 20, 2018	P.4	Correction of Rating: from DC 3.0 V to DC 3.0 V (Battery) / DC 5.0 V (USB)
1	12517307H-B-R1	December 20, 2018	P.4	Correction of Frequency range of WLAN: from 2412 MHz - 2472 MHz to 2412 MHz - 2462 MHz
1	12517307H-B-R1	December 20, 2018	P.5	Correction of Worst margin of Conducted emission: phase of AV from N to L
1	12517307H-B-R1	December 20, 2018	P.33	Correction of Model number: LIMS ID 141503 from Sep-60 to 3160-09

CONTENTS PAGE

SECTION 1: Customer information

Company Name	:	TandD Corporation
Address	:	817-1 Shimadachi, Matsumoto City, Nagano 390-0852 JAPAN
Telephone Number	:	+81-263-40-0131
Facsimile Number	:	+81-263-40-3152
Contact Person	:	Akemi Oana

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

2.1 Identification of E.U.T.

Type of Equipment	:	Data Logger
Model No.	:	TR-75wb
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.0 V (Battery) DC 5.0 V (USB)
Receipt Date of Sample	:	September 21, 2018
Country of Mass-production	:	Japan
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model: TR-75wb (referred to as the EUT in this report) is a Data Logger.

General Specification

Clock frequency(ies) in the system	:	CPU: 16 MHz, WLAN CPU:40 MHz, BLE CPU:24 MHz
Operating Temperature	:	-10 deg. C - +60 deg. C

Radio Specification

Type of radio	IEEE802.11b	IEEE802.11g	IEEE802.11n (20 M band)	Bluetooth Low Energy *1)
Radio Type	Transceiver			Transceiver
Frequency of operation	2412MHz - 2462 MHz			2402 MHz - 2480 MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)	GFSK
Channel spacing	5 MHz			2 MHz
Antenna type	Internal Antenna (ceramic chip antenna)			Pattern Antenna
Antenna Gain	3.35 dBi			1.6 dBi

*1) The Wireless LAN module installed in the EUT has already been approved by the FCC (FCC ID: YOPGS2200M). Therefore, this test report only concerns Bluetooth Low Energy.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

* 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 **IC:** RSS-Gen 8.8	**FCC:** Section 15.207 **IC:** RSS-Gen 8.8	**QP** 2.3 dB, 0.19716 MHz, N **AV** 14.9 dB, 0.19796 MHz, L	Complied#	-
6dB Bandwidth	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05 **IC:** -	**FCC:** Section 15.247(a)(2) **IC:** RSS-247 5.2(a)	See data.	Complied	Conducted
Maximum Peak Output Power	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05 **IC:** RSS-Gen 6.12	**FCC:** Section 15.247(b)(3) **IC:** RSS-247 5.4(d)		Complied	Conducted
Power Density	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05 **IC:** -	**FCC:** Section 15.247(e) **IC:** RSS-247 5.2(b)		Complied	Conducted
Spurious Emission Restricted Band Edges	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05 **IC:** RSS-Gen 6.13	**FCC:** Section15.247(d) **IC:** RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	0.7 dB 4960.000 MHz, AV, Vert.	Complied#	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *1)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
*1) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05 8.5 and 8.6.

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	**IC:** RSS-Gen 6.6	**IC:** -	N/A	Complied	Conducted

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.

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

3.4 Uncertainty

EMI
The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor *k*=2.
Ise EMC Lab.

Antenna Terminal test

Test Item	Uncertainty (+/-)
6 dB Bandwidth / 99 % Occupied Bandwidth	0.96 %
Maximum Peak Output Power / Average Output Power	1.3 dB
Burst Rate	0.10 %
Power Density	2.7 dB
Conducted Spurious Emission	2.7 dB

Conducted emission

using Item	Frequency range	Uncertainty (+/-)
AMN (LISN)	0.009 MHz to 0.15 MHz	3.8 dB
	0.15 MHz to 30 MHz	3.4 dB

Radiated emission

Measurement distance	Frequency range	Uncertainty (+/-)
3 m	9 kHz to 30 MHz	3.3 dB
10 m		3.2 dB
3 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
	(Vertical)	5.0 dB
	200 MHz to 1000 MHz (Horizontal)	5.2 dB
	(Vertical)	6.3 dB
10 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
	(Vertical)	4.9 dB
	200 MHz to 1000 MHz (Horizontal)	5.0 dB
	(Vertical)	5.0 dB
3 m	1 GHz to 6 GHz	5.0 dB
	6 GHz to 18 GHz	5.3 dB
1 m	10 GHz to 26.5 GHz	5.8 dB
	26.5 GHz to 40 GHz	5.8 dB
10 m	1 GHz to 18 GHz	5.2 dB

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124
NVLAP Lab. code: 200572-0 / FCC Test Firm Registration Number: 199967

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.6 shielded room	-	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	-	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	-	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	-	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room	-	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.11 measurement room	-	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 m x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

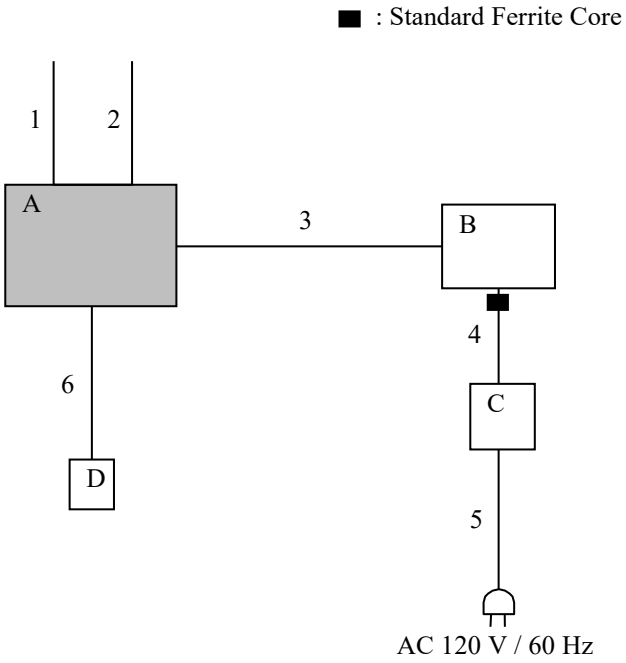
4.1 Operating Mode(s)

Mode	Remarks*
Bluetooth (BT) Low Energy (LE)	Maximum Packet Size, PRBS9
*Power of the EUT was set by the software as follows; Power settings: 3 dBm Software: PSoC4 BLE Radio Examination Version 1.0.0.0 *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 Spurious Emission (Conducted / Radiated) 6dB Bandwidth Maximum Peak Output Power Power Density 99% Occupied Bandwidth	Transmitting (Tx) BT LE	2402 MHz 2440 MHz 2480 MHz

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Data Logger	TR-75wb	5F380232	TandD Corporation	EUT
B	Laptop PC	CF-N8HWCDPS	0BKSA08725	Panasonic	-
C	AC Adaptor	CF-AA6372B M4	6372BM409X17298B	Panasonic	-
D	Jig	-	-	-	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Sensor Cable	0.1	Unshielded	Unshielded	-
2	Sensor Cable	0.1	Unshielded	Unshielded	-
3	USB Cable	2.0	Shielded	Shielded	-
4	DC Cable	1.0	Unshielded	Unshielded	-
5	AC Cable	0.8	Unshielded	Unshielded	-
6	Signal Cable	0.1	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

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

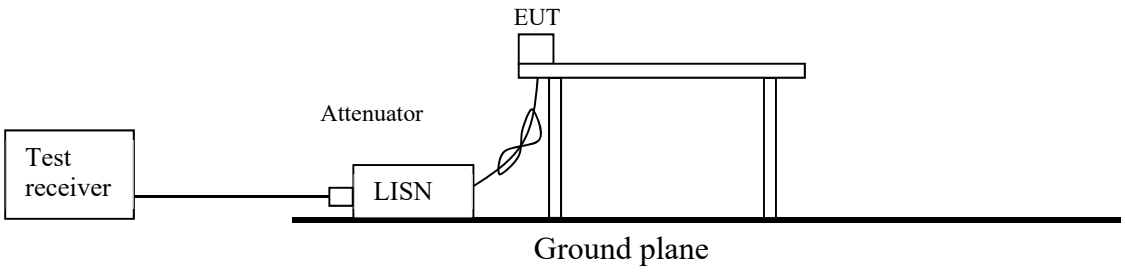
I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

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

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

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

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 v05".

[For below 1 GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 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 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).
The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

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

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

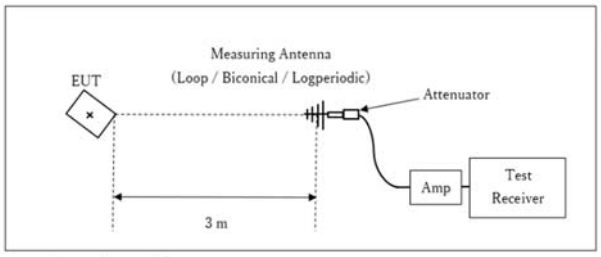
20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9(IC) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (IC).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *1)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	11.12.2.5.1 RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: 100 traces 11.12.2.5.2 The duty cycle was less than 98% for detected noise, a duty factor was added to the 11.12.2.5.1 results.	RBW: 100 kHz VBW: 300kHz
Test Distance	3 m	3.75 m *2) (1 GHz - 10 GHz), 1.0 m *3) (10 GHz - 26.5 GHz)		3.75 m *2) (1 GHz - 10 GHz), 1.0 m *3) (10 GHz - 26.5 GHz)

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

Figure 2: Test Setup

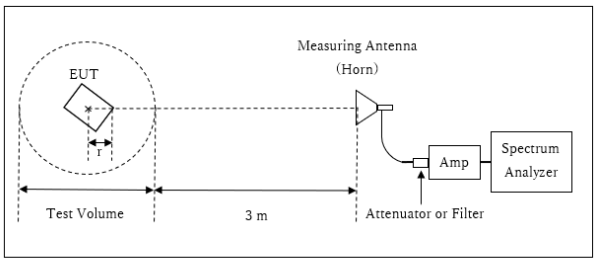
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz



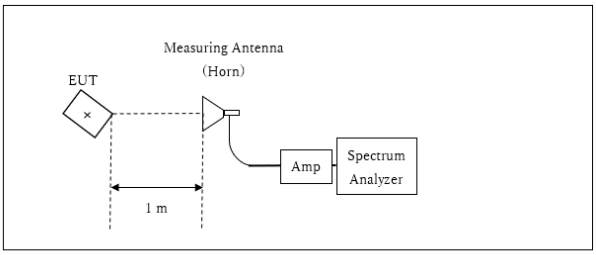
r : Radius of an outer periphery of EUT
× : Center of turn table

*2)Distance Factor: 20 x log (3.75 m / 3.0 m) = 1.94 dB
* Test Distance: (3 + Test Volume /2) - r = 3.75 m

Test Volume : 1.5 m
(Test Volume has been calibrated based on CISPR 16-1-4.)
r = 0.0 m

* The test was performed with r = 0.0 m since EUT is small and it was the rather conservative condition.

10 GHz - 26.5 GHz



× : Center of turn table

*3) Distance Factor: 20 x log (1.0 m / 3.0 m) = -9.5 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.

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

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

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
6dB Bandwidth	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: 50 MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3 kHz	10 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4)	9kHz to 150kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1 kHz	27 kHz				

*1) Peak hold was applied as Worst-case measurement.
*2) Reference data
*3) Section 11.10.2 Method PKPSD (peak PSD) of "ANSI C63.10-2013".
*4) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was low enough as shown in the chart.
(9 kHz - 150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 9.1 kHz).

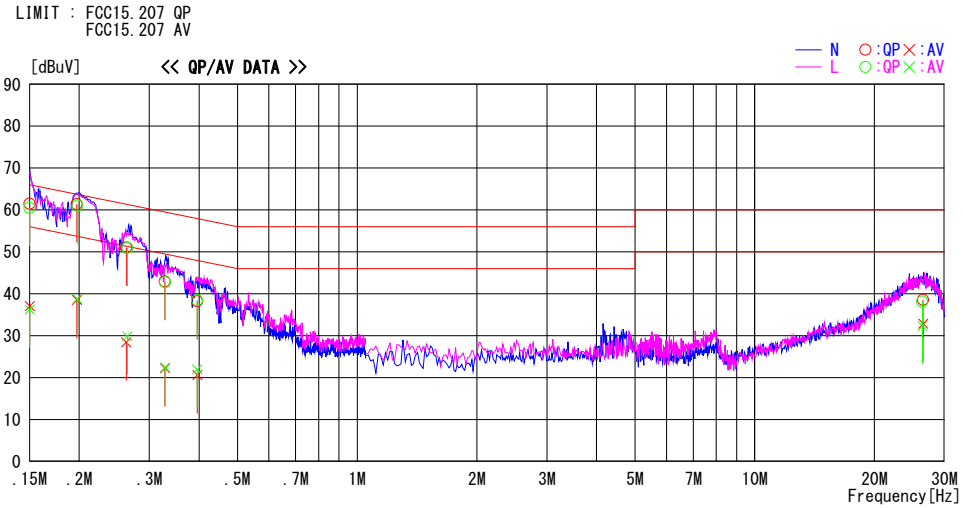
The test results and limit are rounded off to two decimals place, so some differences might be observed.

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Conducted Emission

Report No.	12517307H
Test place	Ise EMC Lab. No.1 Semi Anechoic Chamber
Date	November 1, 2018
Temperature / Humidity	22 deg. C / 39 % RH
Engineer	Akihiko Maeda
Mode	Tx BT LE 2402 MHz



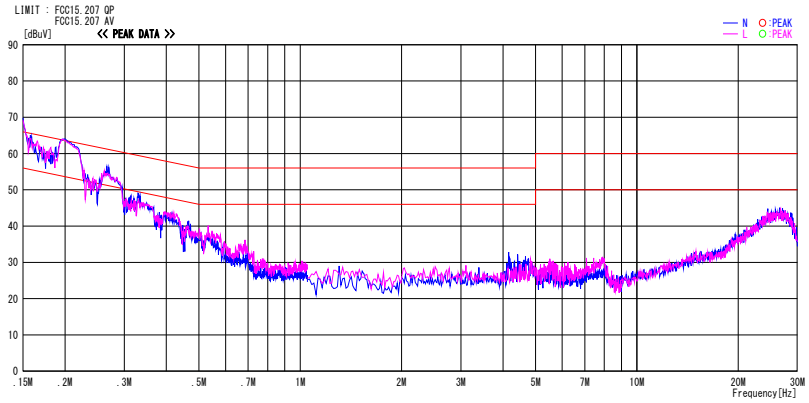
Frequency	Reading Level QP	Reading Level AV	Corr. Factor	Results QP	Results AV	Limit QP	Limit AV	Margin QP	Margin AV	Phase	Comment
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15000	48.3	23.9	13.2	61.5	37.1	66.0	56.0	4.5	18.9	N	
0.19716	48.2	25.3	13.2	61.4	38.5	63.7	53.7	2.3	15.2	N	
0.26244	37.9	15.3	13.1	51.0	28.4	61.4	51.4	10.4	23.0	N	
0.32848	29.7	9.0	13.2	42.9	22.2	59.5	49.5	16.6	27.3	N	
0.39631	25.0	7.4	13.2	38.2	20.6	57.9	47.9	19.7	27.3	N	
26.53321	23.4	17.7	15.2	38.6	32.9	60.0	50.0	21.4	17.1	N	
0.15000	47.3	23.0	13.2	60.5	36.2	66.0	56.0	5.5	19.8	L	
0.19796	47.8	25.6	13.2	61.0	38.8	63.7	53.7	2.7	14.9	L	
0.26428	37.8	16.8	13.1	50.9	29.9	61.3	51.3	10.4	21.4	L	
0.32892	29.5	9.2	13.2	42.7	22.4	59.5	49.5	16.8	27.1	L	
0.39568	25.3	8.8	13.2	38.5	22.0	57.9	47.9	19.4	25.9	L	
26.41728	22.9	17.1	15.2	38.1	32.3	60.0	50.0	21.9	17.7	L	

CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + C.F (LISN + CABLE + ATT)
Except for the above table: adequate margin data below the limits.

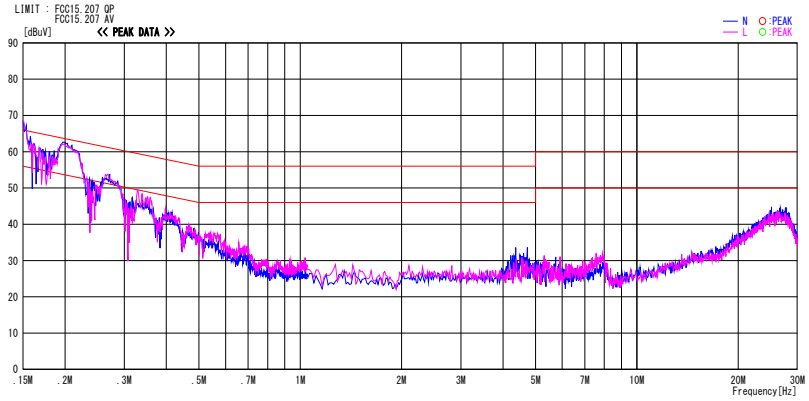
Conducted Emission

Report No.	12517307H
Test place	Ise EMC Lab. No.1 Semi Anechoic Chamber
Date	November 1, 2018
Temperature / Humidity	22 deg. C / 39 % RH
Engineer	Akihiko Maeda
Mode	Tx BT LE

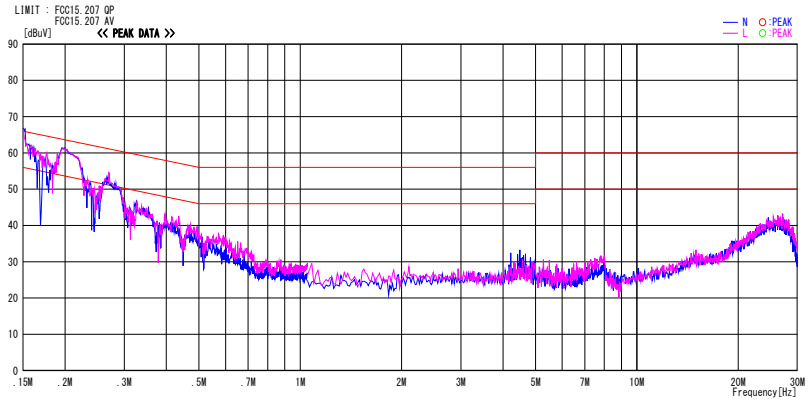
2402 MHz



2440 MHz



2480 MHz



Y scale [dBuV] Chart — N — L

6 dB Bandwidth and 99 % Occupied Bandwidth

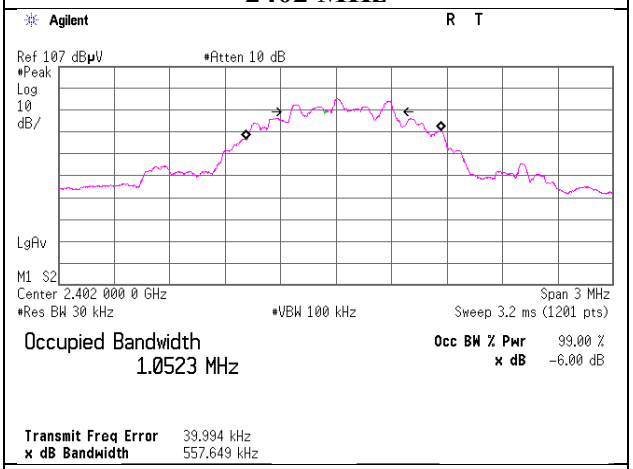
Report No.	12517307H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	October 27, 2018
Temperature / Humidity	24 deg. C / 50 % RH
Engineer	Takafumi Noguchi
Mode	Tx

Mode	Frequency [MHz]	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [MHz]
BT LE	2402	1052.3	0.672	> 0.5000
	2440	1047.3	0.658	> 0.5000
	2480	1047.0	0.652	> 0.5000

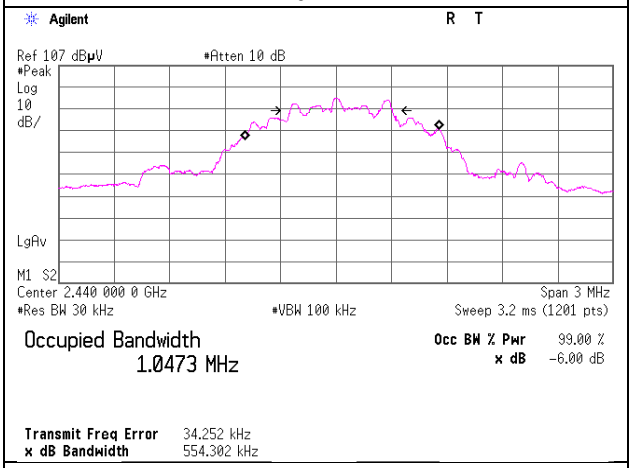
99%Occupied Bandwidth

BT LE

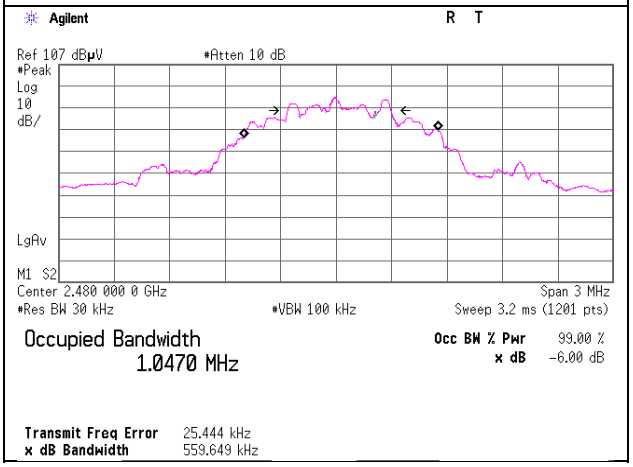
2402 MHz



2440 MHz



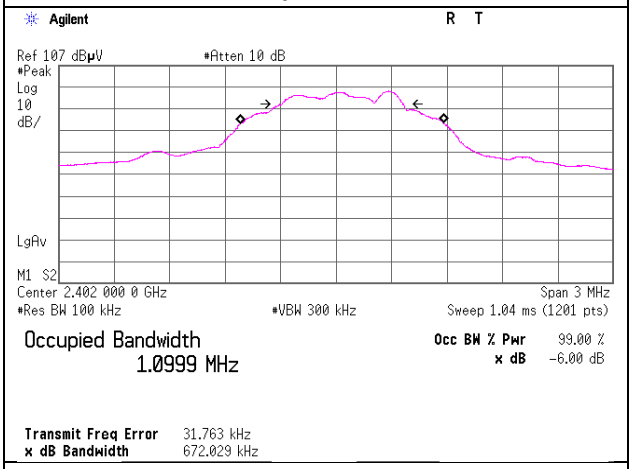
2480 MHz



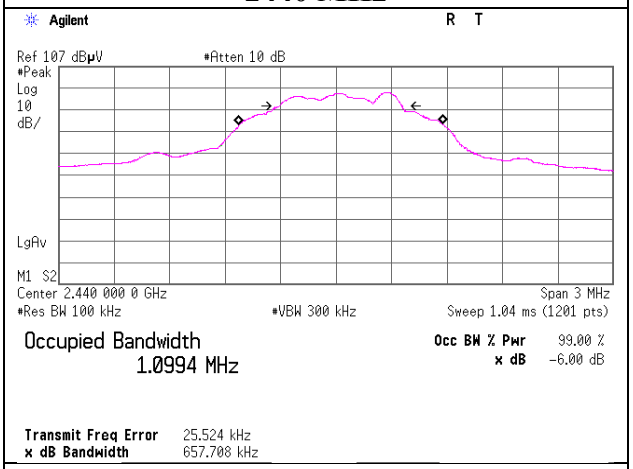
6dB Bandwidth

BT LE

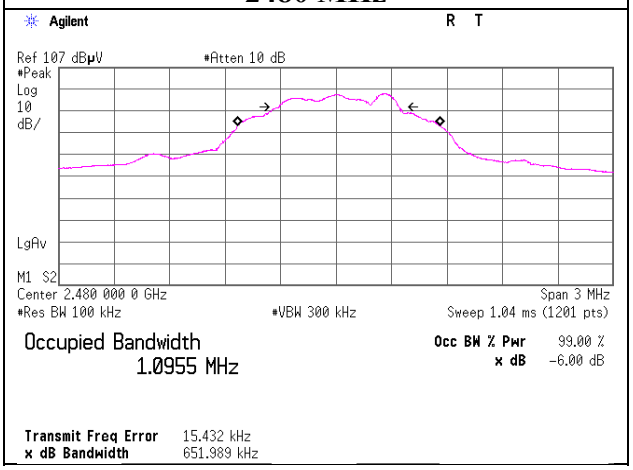
2402 MHz



2440 MHz



2480 MHz



Maximum Peak Output Power

Report No.	12517307H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	October 27, 2018
Temperature / Humidity	24 deg. C / 50 % RH
Engineer	Takafumi Noguchi
Mode	Tx BT LE

				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	-11.24	1.50	10.06	0.32	1.08	30.00	1000	29.68	1.60	1.92	1.56	36.02	4000	34.10
2440	-11.31	1.50	10.06	0.25	1.06	30.00	1000	29.75	1.60	1.85	1.53	36.02	4000	34.17
2480	-11.45	1.50	10.06	0.11	1.03	30.00	1000	29.89	1.60	1.71	1.48	36.02	4000	34.31

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 / SAR testing)

Report No.	12517307H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	October 27, 2018
Temperature / Humidity	24 deg. C / 50 % RH
Engineer	Takafumi Noguchi
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	-12.49	1.50	10.06	-0.93	0.81	0.70	-0.23	0.95
2440	-12.60	1.50	10.06	-1.04	0.79	0.70	-0.34	0.92
2480	-12.77	1.50	10.06	-1.21	0.76	0.70	-0.51	0.89

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

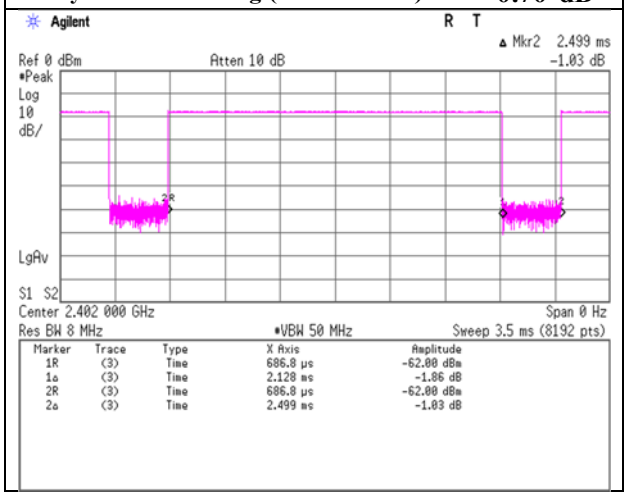
*The equipment and cables were not used for factor 0 dB of the data sheets.

Burst rate confirmation

Report No.	12517307H
Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Date	October 24, 2018
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Takafumi Noguchi
Mode	Tx

BT LE

Tx on / (Tx on + Tx off) =	**0.852**
Tx on / (Tx on + Tx off) * 100 =	**85.2 %**
Duty factor = 10 * log (2.499 / 2.128) =	**0.70 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.	12517307H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.1
Date	October 24, 2018	November 1, 2018
Temperature / Humidity	23 deg. C / 55 % RH	22 deg. C / 39 % RH
Engineer	Takafumi Noguchi (Above 1 GHz)	Akihiko Maeda (Below 1 GHz)
Mode	Tx BT LE 2402 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	50.120	QP	41.0	11.0	7.7	38.9	-	20.8	40.0	19.2	
Hori	58.638	QP	39.0	8.1	7.9	38.9	-	16.1	40.0	23.9	
Hori	105.460	QP	39.0	10.8	8.6	39.0	-	19.4	43.5	24.1	
Hori	252.374	QP	45.0	11.8	10.2	38.9	-	28.1	46.0	17.9	
Hori	297.320	QP	45.7	13.5	10.6	38.8	-	31.0	46.0	15.0	
Hori	308.744	QP	46.2	13.8	10.7	38.7	-	32.0	46.0	14.0	
Hori	2390.000	PK	53.8	27.7	5.2	34.4	-	52.3	73.9	21.6	
Hori	4804.000	PK	51.0	31.2	7.3	33.7	-	55.8	73.9	18.1	
Hori	7206.000	PK	46.6	35.5	8.4	33.6	-	56.9	73.9	17.0	
Hori	9608.000	PK	44.0	38.4	8.1	33.9	-	56.6	73.9	17.3	Floor noise
Hori	2390.000	AV	35.7	27.7	5.2	34.4	0.7	34.9	53.9	19.0	*1)
Hori	4804.000	AV	45.1	31.2	7.3	33.7	0.7	50.6	53.9	3.3	
Hori	7206.000	AV	37.5	35.5	8.4	33.6	0.7	48.5	53.9	5.4	
Hori	9608.000	AV	34.7	38.4	8.1	33.9	-	47.3	53.9	6.6	Floor noise
Vert	50.104	QP	51.5	11.0	7.7	38.9	-	31.3	40.0	8.7	
Vert	57.739	QP	45.8	8.4	7.9	38.9	-	23.2	40.0	16.8	
Vert	96.020	QP	48.6	9.3	8.5	38.9	-	27.5	43.5	16.0	
Vert	256.054	QP	46.2	11.9	10.3	38.9	-	29.5	46.0	16.5	
Vert	296.193	QP	44.5	13.5	10.6	38.8	-	29.8	46.0	16.2	
Vert	310.561	QP	44.7	13.9	10.7	38.7	-	30.6	46.0	15.4	
Vert	2390.000	PK	54.5	27.7	5.2	34.4	-	53.0	73.9	20.9	
Vert	4804.000	PK	52.0	31.2	7.3	33.7	-	56.8	73.9	17.1	
Vert	7206.000	PK	46.7	35.5	8.4	33.6	-	57.0	73.9	16.9	
Vert	9608.000	PK	43.6	38.4	8.1	33.9	-	56.2	73.9	17.7	Floor noise
Vert	2390.000	AV	36.2	27.7	5.2	34.4	0.7	35.4	53.9	18.5	*1)
Vert	4804.000	AV	46.6	31.2	7.3	33.7	0.7	52.1	53.9	1.8	
Vert	7206.000	AV	37.3	35.5	8.4	33.6	0.7	48.3	53.9	5.6	
Vert	9608.000	AV	34.9	38.4	8.1	33.9	-	47.5	53.9	6.4	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.75 m / 3.0 m) = 1.94 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

20dBc Data Sheet

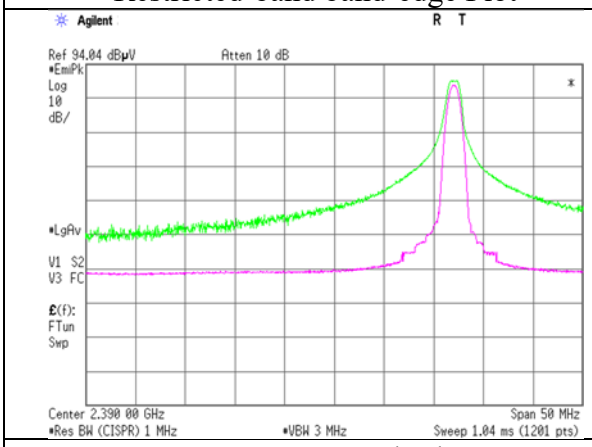
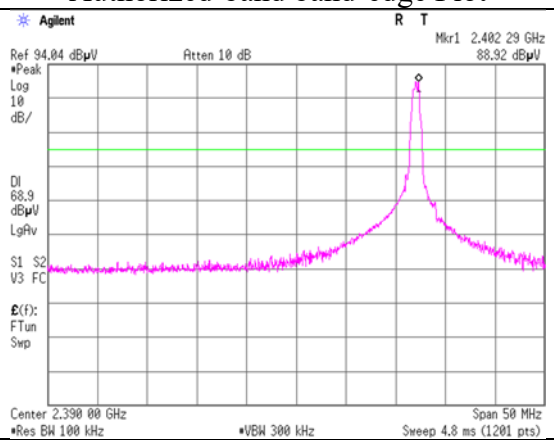
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	88.9	27.7	5.2	34.4	87.4	-	-	Carrier
Hori	2400.000	PK	53.3	27.8	5.2	34.4	51.9	67.4	15.5	
Vert	2402.000	PK	89.6	27.7	5.2	34.4	88.1	-	-	Carrier
Vert	2400.000	PK	53.7	27.8	5.2	34.4	52.3	68.1	15.8	

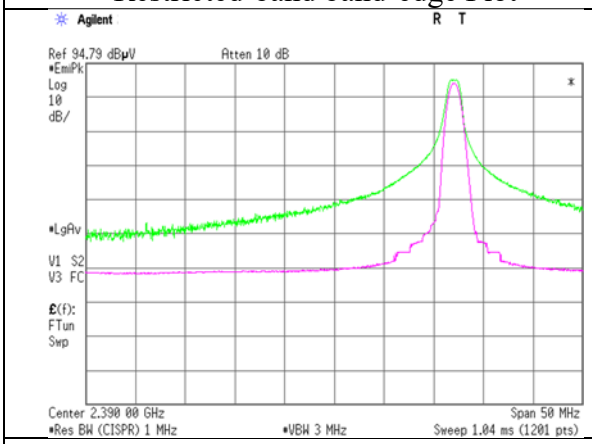
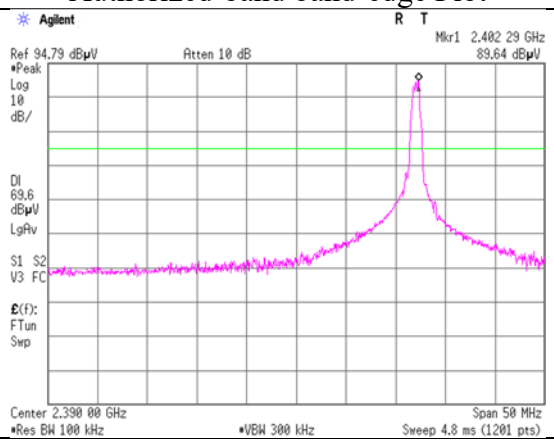
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Distance factor: 1 GHz - 10 GHz 20log (3.75 m / 3.0 m) = 1.94 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12517307H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	October 24, 2018
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Takafumi Noguchi (Above 1 GHz)
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

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

Radiated Spurious Emission

Report No.	12517307H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	October 24, 2018
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Takafumi Noguchi (Above 1 GHz)
Mode	Tx BT LE 2440 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	50.120	QP	41.2	11.0	7.7	38.9	-	21.0	40.0	19.0	
Hori	58.638	QP	38.9	8.1	7.9	38.9	-	16.0	40.0	24.0	
Hori	105.460	QP	39.0	10.8	8.6	39.0	-	19.4	43.5	24.1	
Hori	252.374	QP	45.2	11.8	10.2	38.9	-	28.3	46.0	17.7	
Hori	297.320	QP	45.0	13.5	10.6	38.8	-	30.3	46.0	15.7	
Hori	308.744	QP	45.6	13.8	10.7	38.7	-	31.4	46.0	14.6	
Hori	4880.000	PK	51.2	31.5	7.4	33.7	-	56.4	73.9	17.5	
Hori	7320.000	PK	46.8	35.9	8.4	33.6	-	57.5	73.9	16.4	
Hori	9760.000	PK	41.1	38.6	8.1	34.0	-	53.8	73.9	20.1	Floor noise
Hori	4880.000	AV	45.5	31.5	7.4	33.7	0.7	51.4	53.9	2.5	
Hori	7320.000	AV	38.3	35.9	8.4	33.6	0.7	49.7	53.9	4.2	
Hori	9760.000	AV	32.7	38.6	8.1	34.0	-	45.4	53.9	8.5	Floor noise
Vert	50.104	QP	51.2	11.0	7.7	38.9	-	31.0	40.0	9.0	
Vert	57.739	QP	45.9	8.4	7.9	38.9	-	23.3	40.0	16.7	
Vert	96.020	QP	48.3	9.3	8.5	38.9	-	27.2	43.5	16.3	
Vert	256.054	QP	45.7	11.9	10.3	38.9	-	29.0	46.0	17.0	
Vert	296.193	QP	44.5	13.5	10.6	38.8	-	29.8	46.0	16.2	
Vert	310.561	QP	43.9	13.9	10.7	38.7	-	29.8	46.0	16.2	
Vert	4880.000	PK	52.2	31.5	7.4	33.7	-	57.4	73.9	16.5	
Vert	7320.000	PK	46.5	35.9	8.4	33.6	-	57.2	73.9	16.7	
Vert	9760.000	PK	41.1	38.6	8.1	34.0	-	53.8	73.9	20.1	Floor noise
Vert	4880.000	AV	46.9	31.5	7.4	33.7	0.7	52.8	53.9	1.1	
Vert	7320.000	AV	37.9	35.9	8.4	33.6	0.7	49.3	53.9	4.6	
Vert	9760.000	AV	32.7	38.6	8.1	34.0	-	45.4	53.9	8.5	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.75 m / 3.0 m) = 1.94 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	12517307H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	October 24, 2018
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Takafumi Noguchi (Above 1 GHz)
Mode	Tx BT LE 2480 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	50.120	QP	41.0	11.0	7.7	38.9	-	20.8	40.0	19.2	
Hori	58.638	QP	38.5	8.1	7.9	38.9	-	15.6	40.0	24.4	
Hori	105.460	QP	39.1	10.8	8.6	39.0	-	19.5	43.5	24.0	
Hori	252.374	QP	45.3	11.8	10.2	38.9	-	28.4	46.0	17.6	
Hori	297.320	QP	45.7	13.5	10.6	38.8	-	31.0	46.0	15.0	
Hori	308.744	QP	46.1	13.8	10.7	38.7	-	31.9	46.0	14.1	
Hori	2483.500	PK	64.4	27.5	5.2	34.4	-	62.7	73.9	11.2	
Hori	4960.000	PK	51.5	31.7	7.4	33.7	-	56.9	73.9	17.0	
Hori	7440.000	PK	46.2	36.1	8.5	33.6	-	57.2	73.9	16.7	
Hori	9920.000	PK	42.3	38.5	8.2	34.0	-	55.0	73.9	18.9	Floor noise
Hori	2483.500	AV	44.3	27.5	5.2	34.4	0.7	43.3	53.9	10.6	*1)
Hori	4960.000	AV	45.9	31.7	7.4	33.7	0.7	52.0	53.9	1.9	
Hori	7440.000	AV	37.7	36.1	8.5	33.6	0.7	49.4	53.9	4.5	
Hori	9920.000	AV	33.2	38.5	8.2	34.0	-	45.9	53.9	8.0	Floor noise
Vert	50.104	QP	51.4	11.0	7.7	38.9	-	31.2	40.0	8.8	
Vert	57.739	QP	44.9	8.4	7.9	38.9	-	22.3	40.0	17.7	
Vert	96.020	QP	48.6	9.3	8.5	38.9	-	27.5	43.5	16.0	
Vert	256.054	QP	46.0	11.9	10.3	38.9	-	29.3	46.0	16.7	
Vert	296.193	QP	44.7	13.5	10.6	38.8	-	30.0	46.0	16.0	
Vert	310.561	QP	43.2	13.9	10.7	38.7	-	29.1	46.0	16.9	
Vert	2483.500	PK	64.1	27.5	5.2	34.4	-	62.4	73.9	11.5	
Vert	4960.000	PK	52.5	31.7	7.4	33.7	-	57.9	73.9	16.0	
Vert	7440.000	PK	45.8	36.1	8.5	33.6	-	56.8	73.9	17.1	
Vert	9920.000	PK	42.1	38.5	8.2	34.0	-	54.8	73.9	19.1	Floor noise
Vert	2483.500	AV	43.8	27.5	5.2	34.4	0.7	42.8	53.9	11.1	*1)
Vert	4960.000	AV	47.1	31.7	7.4	33.7	0.7	53.2	53.9	0.7	
Vert	7440.000	AV	37.1	36.1	8.5	33.6	0.7	48.8	53.9	5.1	
Vert	9920.000	AV	33.4	38.5	8.2	34.0	-	46.1	53.9	7.8	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.75 m / 3.0 m) = 1.94 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

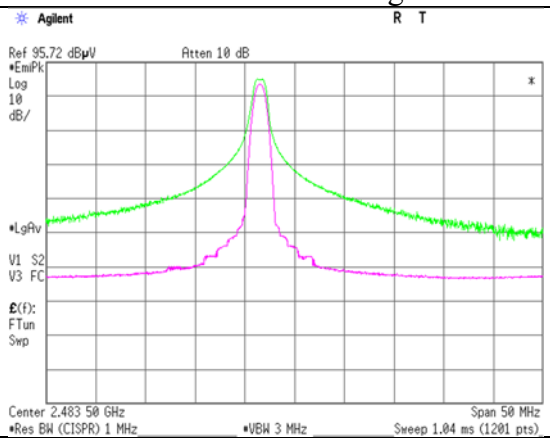
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12517307H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	October 24, 2018
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Takafumi Noguchi (Above 1 GHz)
Mode	Tx BT LE 2480 MHz

Horizontal

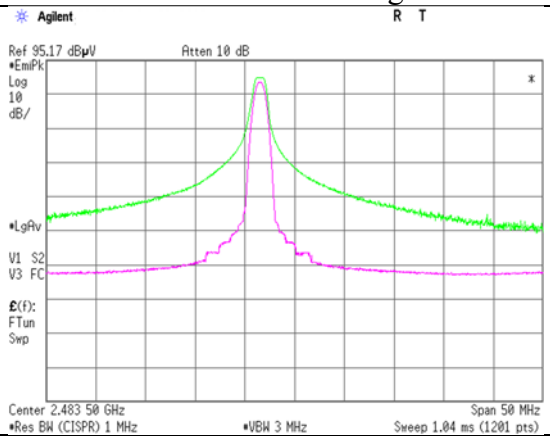
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

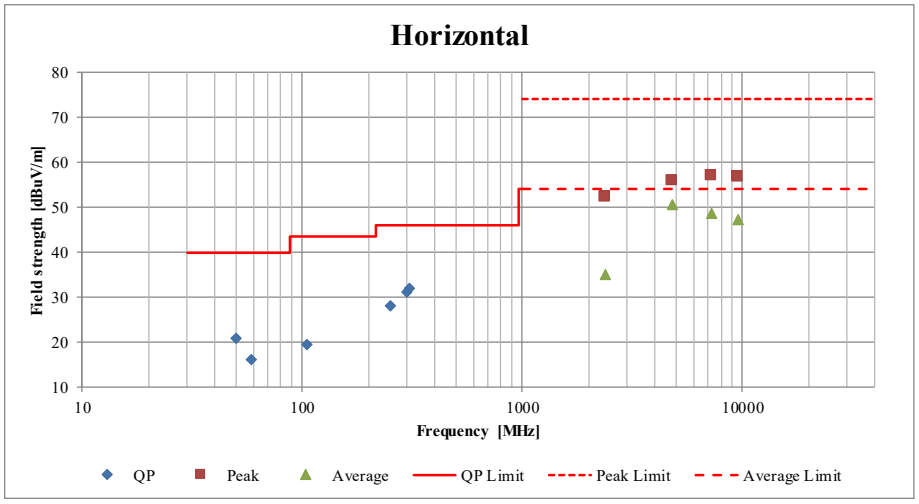


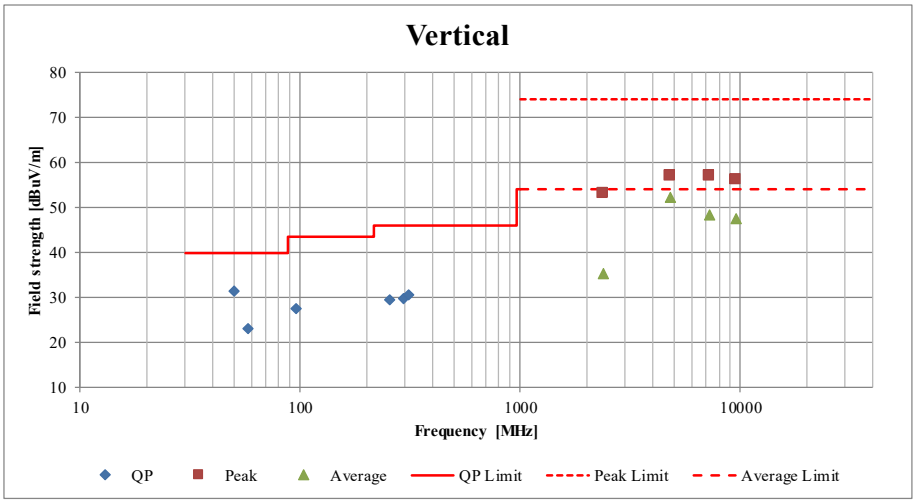
Trace Green : Peak Plot
Trace Purple : Average Plot

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

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	12517307H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.1
Date	October 24, 2018	November 1, 2018
Temperature / Humidity	23 deg. C / 55 % RH	22 deg. C / 39 % RH
Engineer	Takafumi Noguchi (Above 1 GHz)	Akihiko Maeda (Below 1 GHz)
Mode	Tx BT LE 2402 MHz	



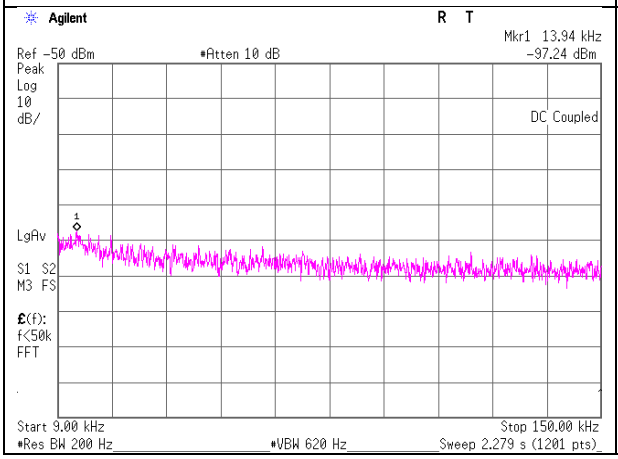


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

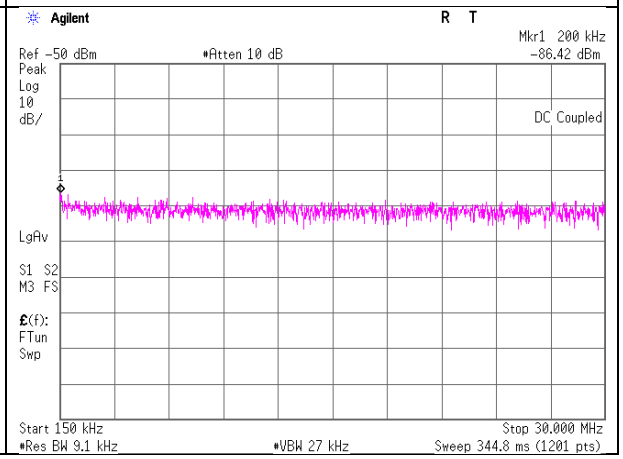
Conducted Spurious Emission

Report No.	12517307H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	October 27, 2018
Temperature / Humidity	24 deg. C / 50 % RH
Engineer	Takafumi Noguchi
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
13.94	-97.2	1.50	9.8	2.0	1	-83.9	300	6.0	-22.7	44.7	67.4	
200.00	-86.4	1.50	9.8	2.0	1	-73.1	300	6.0	-11.9	21.5	33.4	

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)

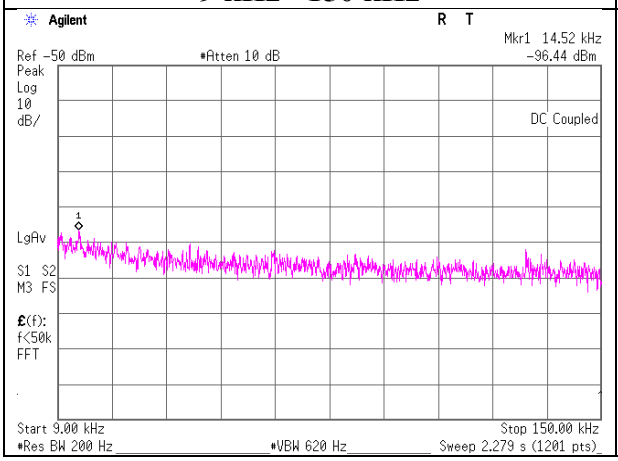
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

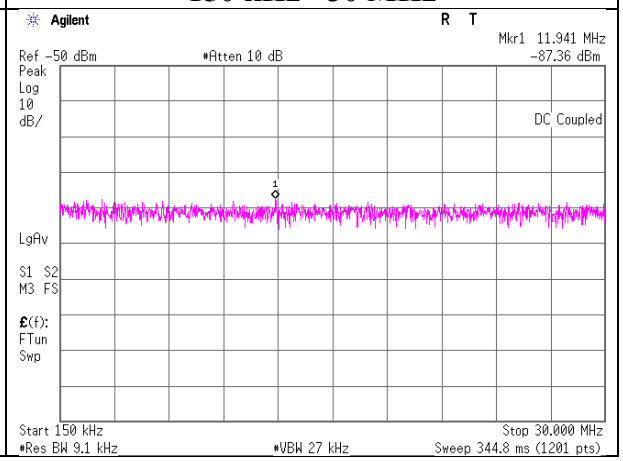
Conducted Spurious Emission

Report No.	12517307H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	October 27, 2018
Temperature / Humidity	24 deg. C / 50 % RH
Engineer	Takafumi Noguchi
Mode	Tx BT LE 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
14.52	-96.4	1.50	9.8	2.0	1	-83.1	300	6.0	-21.9	44.3	66.2	
11941.00	-87.4	1.50	9.8	2.0	1	-74.1	30	6.0	7.2	29.5	22.3	

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)

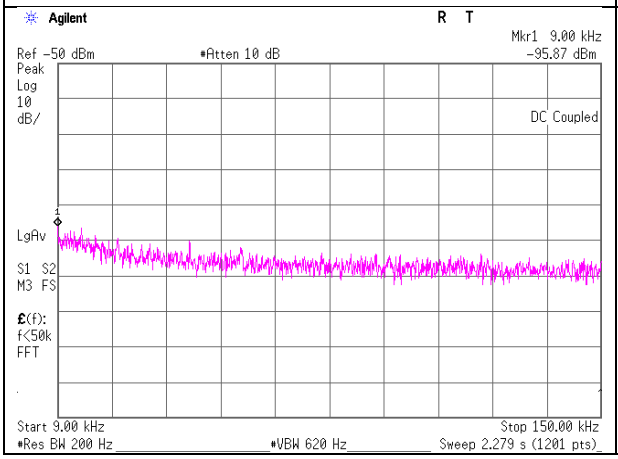
N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

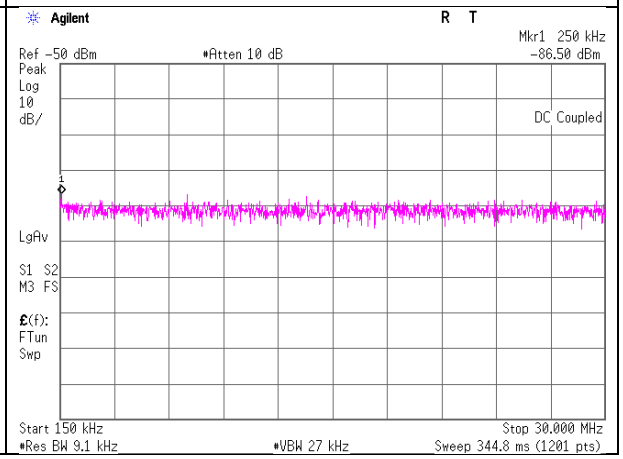
Conducted Spurious Emission

Report No.	12517307H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	October 27, 2018
Temperature / Humidity	24 deg. C / 50 % RH
Engineer	Takafumi Noguchi
Mode	Tx BT LE 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
9.00	-95.9	1.50	9.8	2.0	1	-82.6	300	6.0	-21.3	48.5	69.8	
250.00	-86.5	1.50	9.8	2.0	1	-73.2	300	6.0	-11.9	19.6	31.5	

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 KDB 558074 since antenna gain was less than 2.0 dBi.

Power Density

Report No.	12517307H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	October 27, 2018
Temperature / Humidity	24 deg. C / 50 % RH
Engineer	Takafumi Noguchi
Mode	Tx BT LE

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-17.63	1.50	10.06	-6.07	8.00	14.07
2440.00	-17.76	1.50	10.06	-6.20	8.00	14.20
2480.00	-17.92	1.50	10.06	-6.36	8.00	14.36

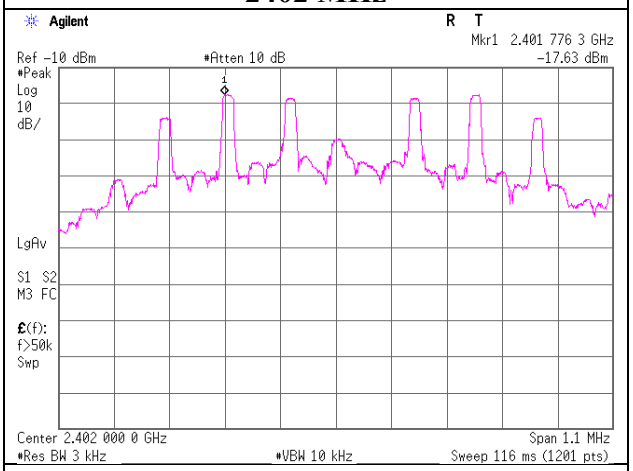
Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

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

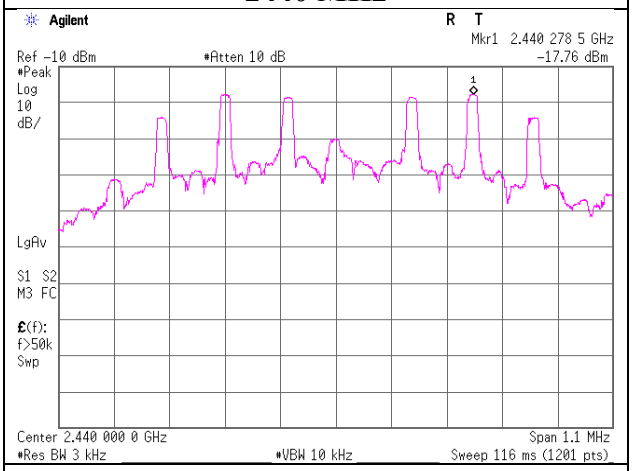
Power Density

BT LE

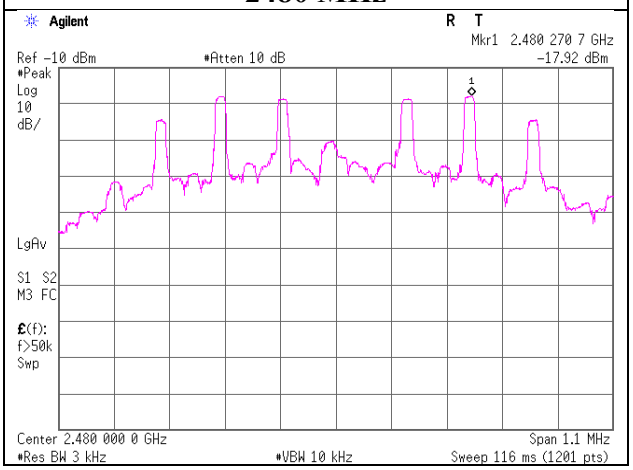
2402 MHz



2440 MHz



2480 MHz



APPENDIX 2: Test instruments

Test Instruments

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Cal Int
RE	142006	AC2_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-06902	04/01/2018	04/30/2019	12
RE	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/21/2018	08/31/2019	12
RE	141152	EMI measurement program	TSJ	TEPTO-DV	-	-	-	-
RE	141512	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	06/06/2018	06/30/2019	12
RE	141900	Spectrum Analyzer	AGILENT	E4440A	MY46185823	11/16/2017	11/30/2018	12
RE	142228	Measure	KOMELON	KMC-36	-	-	-	-
RE	141392	Microwave Cable	Junkosha	MWX221	1604S253(1 m) / 1608S087(5 m)	08/08/2018	08/31/2019	12
RE	141579	Pre Amplifier	AGILENT	8449B	3008A02142	01/23/2018	01/31/2019	12
RE	141556	Thermo-Hygrometer	CUSTOM	CTH-201	0003	12/21/2017	12/31/2018	12
AT	141842	Power sensor	AGILENT	N1923A	MY54070003	08/21/2018	08/31/2019	12
AT	141902	Spectrum Analyzer	AGILENT	E4440A	MY46187105	10/04/2018	10/31/2019	12
AT	141156	Attenuator(10dB)	Weinschel Corp	2	BL1173	11/02/2018	11/30/2019	12
AT	141334	Attenuator(10dB)	Suhner	6810.19.A	-	12/04/2017	12/31/2018	12
AT	141812	Power Meter	AGILENT	8990B	MY51000271	08/21/2018	08/31/2019	12
AT	141567	Thermo-Hygrometer	CUSTOM	CTH-201	0008	01/24/2018	01/31/2019	12
RE	141404	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	05/14/2018	05/31/2019	12
RE	141296	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	002	09/19/2018	09/30/2019	12
RE	141503	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	06/06/2018	06/30/2019	12
RE	141899	Spectrum Analyzer	AGILENT	E4448A	MY46180655	08/10/2018	08/31/2019	12
RE	141350	Coaxial Cable	Suhner/storm/Agilent /TSJ	-	-	06/04/2018	06/30/2019	12
RE	141264	Logperiodic Antenna (200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-189	06/01/2018	06/30/2019	12
RE	141198	Biconical Antenna	Schwarzbeck	BBA9106	2513	06/01/2018	06/30/2019	12
RE	141950	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	06/15/2018	06/30/2019	12
RE/CE	142226	Measure	KOMELON	KMC-36	-	-	-	-
CE	141247	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	12/19/2017	12/31/2018	12
RE/CE	141566	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q26	01/24/2018	01/31/2019	12
RE/CE	141998	AC1_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	06/18/2018	06/30/2020	24
CE	141215	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W/3D-2W/ RG400u/ RFM-E421(SW)	-/01068 (Switcher)	06/04/2018	06/30/2019	12
CE	141537	LISN(AMN)	Schwarzbeck	NSLK8127	8127-731	07/12/2018	07/31/2019	12
RE	141213	Attenuator(6dB)	Weinschel Corp	2	BK7971	11/05/2018	11/30/2019	12
RE/CE	141360	DIGITAL HiTESTER	HIOKI	3805	70900532	01/15/2018	01/31/2019	12

***Hyphens for Last Calibration Date, Calibration Due Date and Cal Int 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.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

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

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