RADIO TEST REPORT

Test Report No. : 12608632H-A-R1

Applicant	:	**MITSUBISHI ELECTRIC CORPORATION SANDA WORKS**
Type of Equipment	:	**Display Audio**
Model No.	:	**R1 LOW**
FCC ID	:	**UJHR1LOW**
Test regulation	:	**FCC Part 15 Subpart C: 2018** ***WLAN and Bluetooth Low Energy parts**
Test Result	:	**Complied (Refer to SECTION 3.2)**

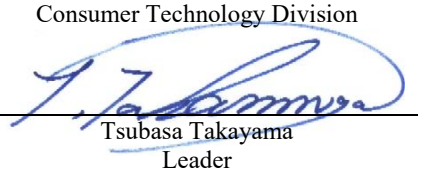
1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national 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. The information provided from the customer for this report is identified in SECTION 1.
9. This report is a revised version of 12608632H-A. 12608632H-A is replaced with this report.

Date of test: February 25 to May 17, 2019

Representative test engineer:

Takumi Shimada
Engineer
Consumer Technology Division

Approved by:



Tsubasa Takayama
Leader
Consumer Technology Division

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.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
http://japan.ul.com/resources/emc_accredited/

☐ 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.: 12608632H-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	12608632H-A	May 17, 2019	-	-
1	12608632H-A-R1	May 22, 2019	P 5	Correction of Radio Specification of 11ac (80 M band) in SECTION 2.2 From 5530 MHz - 5690 MHz to 5530 MHz, 5610 MHz
1	12608632H-A-R1	May 22, 2019	P 29, 32	Correction of test data in APPENDIX 1
1	12608632H-A-R1	May 22, 2019	P 72	Correction of table in APPENDIX 1 Test data

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	MITSUBISHI ELECTRIC CORPORATION SANDA WORKS
Address	:	2-3-33, Miwa, Sanda-city, Hyogo, 669-1513, Japan
Telephone Number	:	+81-79-559-3952
Facsimile Number	:	+81-79-559-3875
Contact Person	:	Hirotaka Minato

The information provided from the customer is as follows;
- Applicant, Type of Equipment, Model No., FCC ID on the cover and other relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (E.U.T.)
- SECTION 4: Operation of E.U.T. 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 (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Display Audio
Model No.	:	R1 LOW
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12.0 V
Receipt Date of Sample (Information from test lab.)	:	February 4, 2018
Country of Mass-production	:	Mexico, China, Thailand, Japan
Condition of EUT	:	Production model
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model: R1 LOW (referred to as the EUT in this report) is a Display Audio.

Radio Specification

Wireless LAN (IEEE802.11b/g/a/n-20/n-40/11ac-20/11ac-40/11ac-80)

Type of radio	IEEE802.11b *1)	IEEE802.11g/n (20 M band) *1)	IEEE802.11a/n/ac (20 M band)	IEEE802.11n/ac (40 M band)	IEEE802.11ac (80 M band)
Frequency of operation	2412 MHz - 2462 MHz	2412 MHz - 2462 MHz	5180 MHz - 5240 MHz 5260 MHz - 5320 MHz 5500 MHz - 5700 MHz 5745 MHz - 5825 MHz	5190 MHz - 5230 MHz 5270 MHz - 5310 MHz 5510 MHz - 5670 MHz 5755 MHz - 5795 MHz	5210 MHz 5290 MHz 5530 MHz, 5610 MHz 5775 MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM(IEEE802.11ac only))		
Channel spacing	5 MHz		20 MHz	40 MHz	80 MHz
Antenna type	Sheet metal antenna				
Antenna Gain	Antenna 0: 2.4 GHz: 1.61 dBi / 5 GHz: 3.54 dBi Antenna 1: 2.4 GHz: 3.01 dBi / 5 GHz: 1.68 dBi				
Directional Antenna Gain*2)	2.4 GHz: 5.35 dBi 5 GHz: 5.67 dBi				

Bluetooth

Type of radio	Bluetooth *1)
Frequency of operation	2402 MHz - 2480 MHz
Type of modulation	BT: FHSS (GFSK, π/4DQPSK, 8DPSK) LE: GFSK
Channel spacing	BT: 1 MHz LE: 2 MHz
Antenna type	Sheet metal antenna
Antenna Gain	1.61 dBi

*1) This test report applies to WLAN (2.4 GHz band) and Bluetooth Low Energy.

*2) $\text{Directional Antenna Gain} = 10\log\left(\left(10^{\frac{G_{\text{Ant0}}}{20}} + 10^{\frac{G_{\text{Ant1}}}{20}}\right)^2 / 2\right)$

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C FCC Part 15 final revised on March 12, 2018 and effective April 11, 2018
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

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	-	N/A *1)	-
6dB Bandwidth	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02 **IC:** -	**FCC:** Section 15.247(a)(2) **IC:** RSS-247 5.2(a)	See data.	Complied a)	Conducted
Maximum Peak Output Power	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02 **IC:** RSS-Gen 6.12	**FCC:** Section 15.247(b)(3) **IC:** RSS-247 5.4(d)		Complied b)	Conducted
Power Density	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02 **IC:** -	**FCC:** Section 15.247(e) **IC:** RSS-247 5.2(b)		Complied c)	Conducted
Spurious Emission Restricted Band Edges	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02 **IC:** RSS-Gen 6.13	**FCC:** Section15.247(d) **IC:** RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	0.8 dB 2483.500 MHz, AV, Hori.	Complied# d), e)	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *2)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.
*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.

Supplied Voltage Information
This EUT provides stable voltage constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

Antenna Information
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	RSS-Gen 6.7	**IC:** -	N/A	- a)	Conducted
a) Refer to APPENDIX 1 (data of 6 dB Bandwidth and 99 % Occupied Bandwidth)					

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

3.4 Uncertainty

EMI
There is no applicable rule of uncertainty in this applied standard. Therefore, the following 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.
Ise EMC Lab.

Antenna Terminal test

Test Item	Uncertainty (+/-)
20 dB Bandwidth / 99 % Occupied Bandwidth	0.96 %
Maximum Peak Output Power / Average Output Power	1.3 dB
Carrier Frequency Separation	0.42 %
Dwell time / Burst rate	0.10 %
Conducted Spurious Emission	2.7 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)

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

Mode	Remarks*
IEEE 802.11b (11b)	11 Mbps, PN9
IEEE 802.11g (11g)	6 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 15, PN9
Bluetooth Low Energy (BT LE)	Maximum Packet Size, PRBS9
Bluetooth (BT) Low Energy (LE) 1M-PHY Uncoded PHY (1 Mbps) / Coded PHY (125kbps) / Coded PHY (500kbps)	Maximum Packet Size, PRBS9
Bluetooth (BT) Low Energy (LE) 2M-PHY Uncoded PHY (2 Mbps)	Maximum Packet Size, PRBS9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	

*Power of the EUT was set by the software as follows;
Power settings: 11b: 14 dBm
11g: 11 dBm
11n-20: 11 dBm
BLE: Same as Production model
Software: SDK_2_40_00_32 (For BLE chip: CC2640R2F)
BTFM.RM.2.4.1-00019-QCABTFMSWPZ-1 (for WiFi / BLE module: QCA6574AU)
*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) for WLAN

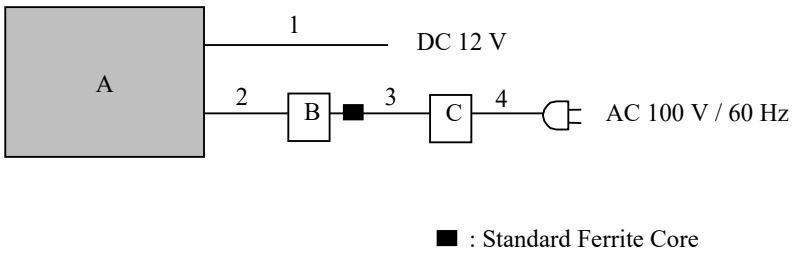
Test Item	Operating Mode	Tested Antenna	Tested frequency
Spurious Emission	11b Tx *1)	0	2412 MHz 2437 MHz 2462 MHz
	11n-20 Tx	0 + 1	2412 MHz 2437 MHz 2462 MHz *3)
Radiated Spurious Emission (Below 1GHz) Conducted Spurious Emission	11n-20 Tx *2)	0 + 1	2412 MHz
6dB Bandwidth 99% Occupied Bandwidth	11b Tx 11g Tx	0	2412 MHz 2437 MHz 2462 MHz
	11n-20 Tx	1	2412 MHz 2437 MHz 2462 MHz
Maximum Peak Output Power Power Density	11b Tx 11g Tx	0	2412 MHz 2437 MHz 2462 MHz
	11n-20 Tx	0, 1 0 + 1	2412 MHz 2437 MHz 2462 MHz
*1) Since 11g and 11n-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest peak output power *2) The mode was tested as a representative, because it had the highest power at antenna terminal test. *3) Transmit simultaneously with Bluetooth.			

*The details of Operating mode(s) for BT LE

Test item	Operating mode	Tested frequency
6dB Bandwidth, 99% Occupied Bandwidth, Conducted Spurious Emission Power Density Spurious Emission (Radiated / Conducted)	Tx BT LE Transmitting (Tx) BT LE 1M-PHY Uncoded PHY (1 Mbps), 2M-PHY Uncoded PHY (2 Mbps)	2402 MHz 2440 MHz 2480 MHz
Maximum Peak Output Power	Tx BT LE Transmitting (Tx) BT LE 1M-PHY Uncoded PHY (1 Mbps) / 1M-PHY Coded PHY(125kbps) / 1M-PHY Coded PHY(500kbps) / 2M-PHY Uncoded PHY(2 Mbps)	2402 MHz 2440 MHz 2480 MHz
*Coded PHY mode (125kbps, 500kbps) was excluded for other tests than power measurement by using 1M-PHY mode as a representative.		

4.2 Configuration and peripherals

For Antenna Terminal Conducted Tests



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

Description of EUT and Support equipment

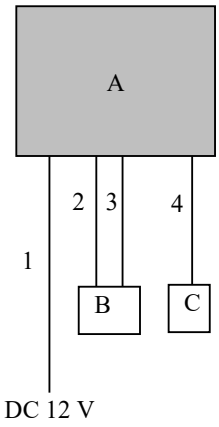
No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Display Audio	R1 LOW	PV1-UNIT-036 *1) PV1-UNIT-027 *2)	MITSUBISHI ELECTRIC CORPORATION SANDA WORKS	EUT
B	Laptop PC	CF-N8HWCDPS	OBKSA08704	Panasonic	-
C	AC Adaptor	CF-AA6372B	6372BM409907232B	Panasonic	-

*1) Used for BLE chip: CC2640R2F
*2) Used for WiFi / BLE module: QCA6574AU

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	0.9	Unshielded	Unshielded	-
2	USB Cable	1.0	Shielded	Shielded	-
3	DC Cable	0.8	Unshielded	Unshielded	-
4	AC Cable	1.0	Unshielded	Unshielded	-

For Radiated Spurious Emission



* 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	Display Audio	R1 LOW	PV1-UNIT-036 *1) PV1-UNIT-042 *2)	MITSUBISHI ELECTRIC CORPORATION SANDA WORKS	EUT
B	Jig	-	-	-	-
C	GNSS Antenna	BY-GPS-03	-	-	-

*1) Used for BLE chip: CC2640R2F
*2) Used for WiFi / BLE module: QCA6574AU

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	2.0	Unshielded	Unshielded	-
2	USB Cable	0.9	Shielded	Shielded	-
3	Signal Cable	2.0	Unshielded	Unshielded	-
4	GNSS Cable	5.0	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 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.

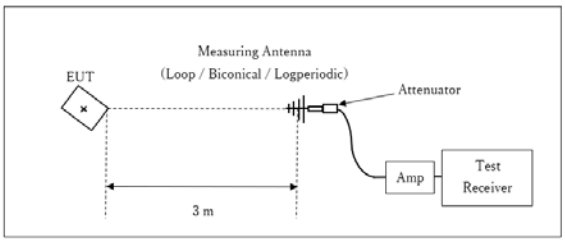
20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9(IC) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (IC).

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: 300 kHz

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

Figure 2: Test Setup

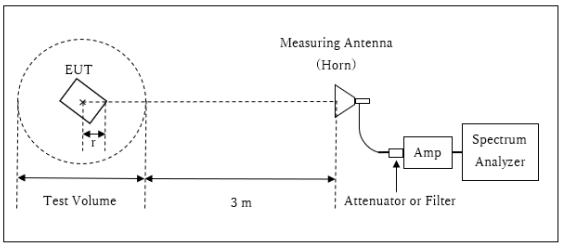
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz

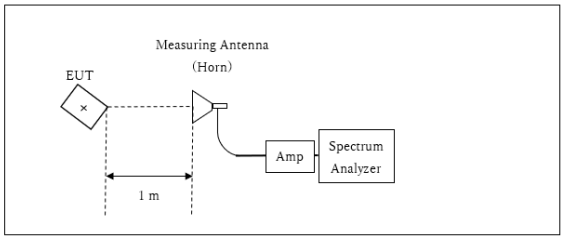


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.65 m / 3.0 m) = 1.71 dB
* Test Distance: (3 + Test Volume /2) - r = 3.65 m

Test Volume : 1.5 m
(Test 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) = -9.5 dB
*Test Distance: 1 m

The test was made on EUT at the normal use position.

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

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

SECTION 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	20 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.
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

6 dB Bandwidth and 99 % Occupied Bandwidth

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	25 deg. C / 32 % RH
Engineer	Yuichiro Yamazaki
Mode	Tx

Mode	Antenna	Frequency [MHz]	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [kHz]
11b	0	2412	12911.8	7.653	> 500
		2437	12896.1	7.651	> 500
		2462	12896.5	7.653	> 500
11g	0	2412	16727.6	15.657	> 500
		2437	16692.9	15.544	> 500
		2462	16682.6	15.695	> 500
11n-20	1	2412	18214.0	17.665	> 500
		2437	18201.8	17.662	> 500
		2462	18183.4	17.673	> 500
BT LE	0	2402	1058.7	0.671	> 500
		2440	1058.4	0.668	> 500
		2480	1059.1	0.671	> 500

6 dB Bandwidth and 99 % Occupied Bandwid

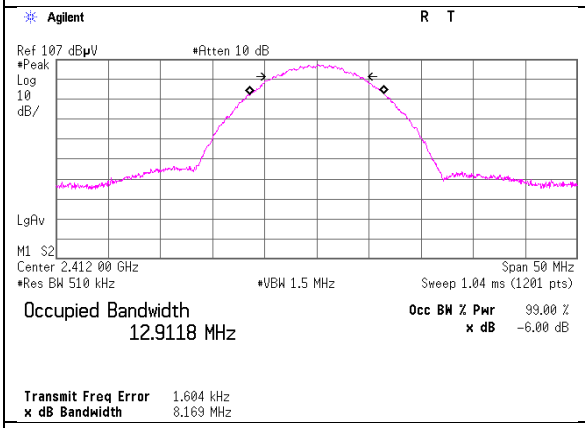
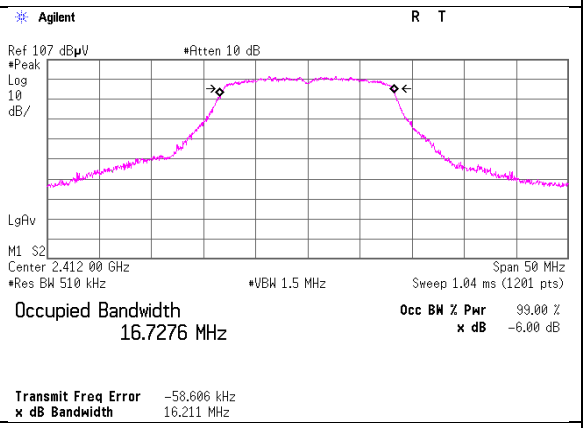
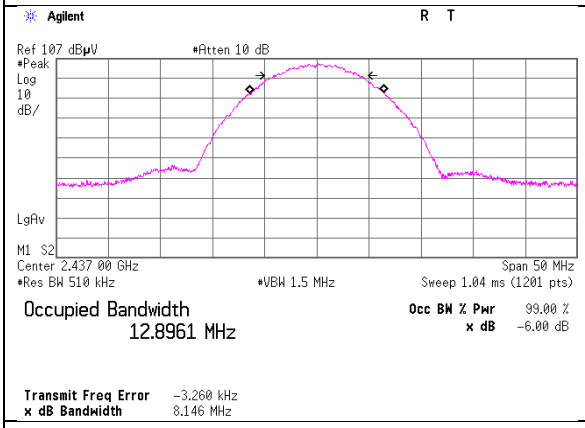
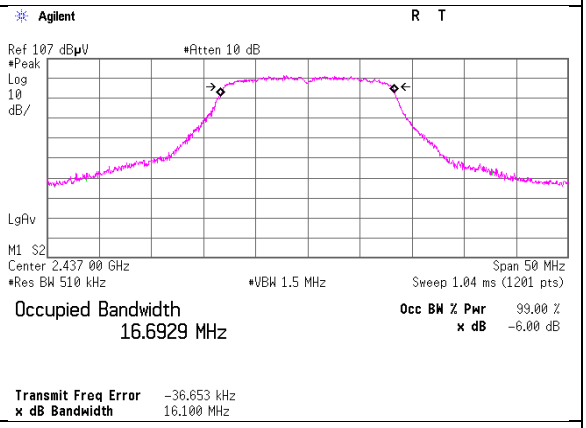
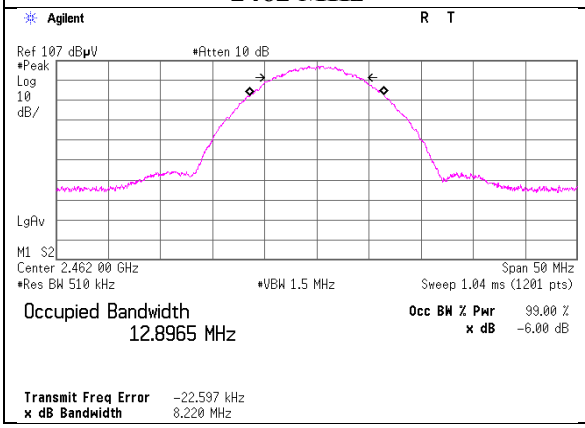
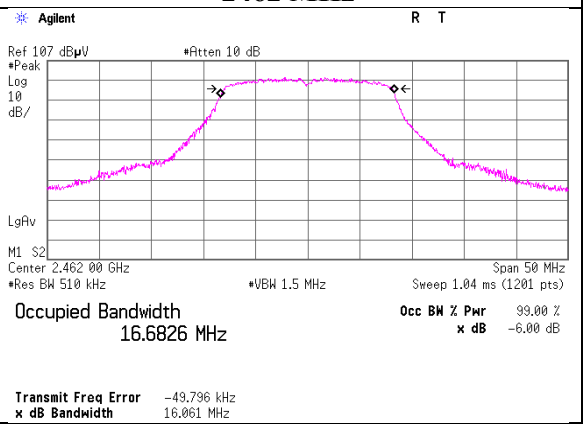
(BLE chip: CC2640R2F)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	12608632H
Date	February 25, 2019
Temperature / Humidity	24 deg. C / 38 % RH
Engineer	Takumi Shimada
Mode	Tx BT LE

Mode	Frequency [MHz]	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [MHz]
1M-PHY	2402	1040.8	0.703	> 0.5000
Uncoded PHY	2440	1061.5	0.713	> 0.5000
(1 Mbps)	2480	1067.2	0.752	> 0.5000
2M-PHY	2402	2066.9	1.404	> 0.5000
Uncoded PHY	2440	2097.7	1.453	> 0.5000
(2 Mbps)	2480	2099.8	1.454	> 0.5000

99%Occupied Bandwidth

(WiFi / BLE module: QCA6574AU)

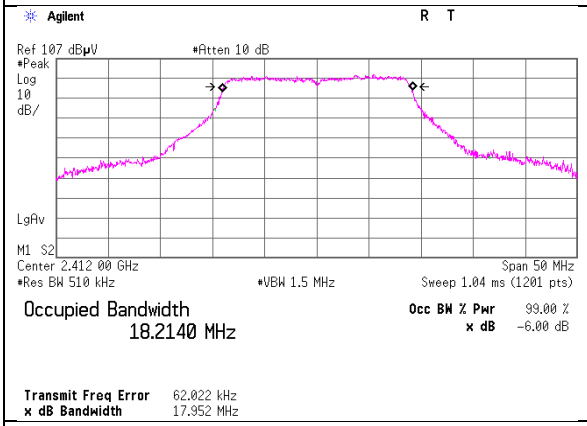
11b	11g
2412 MHz	**2412 MHz**
	
2437 MHz	**2437 MHz**
	
2462 MHz	**2462 MHz**
	

99% Occupied Bandwidth

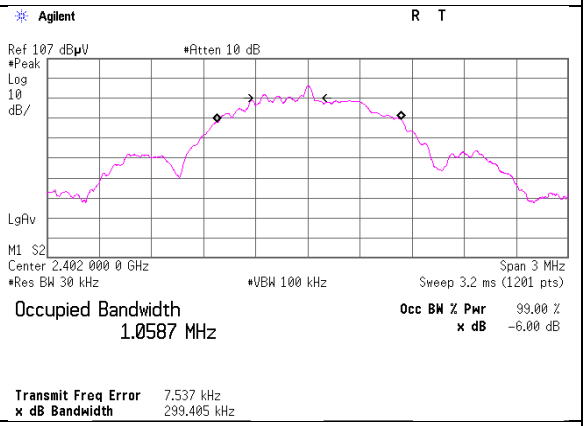
(WiFi / BLE module: QCA6574AU)

11n-20	BT LE

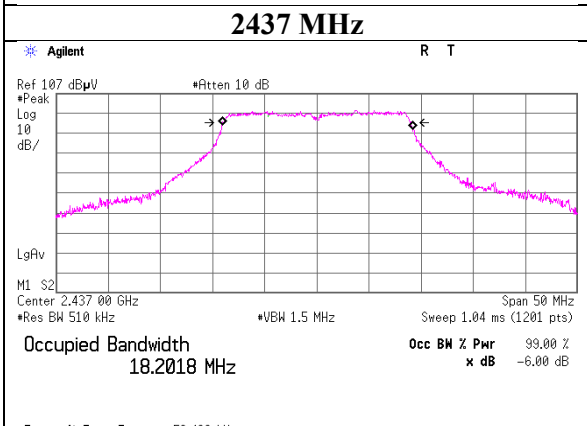
2412 MHz



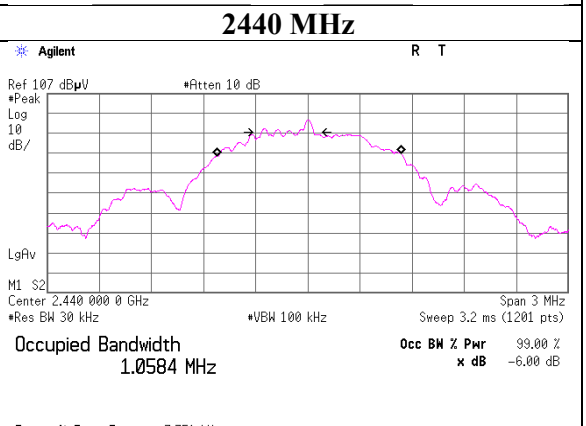
2402 MHz



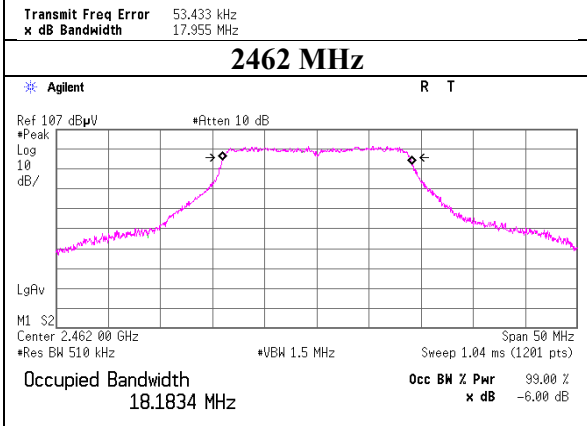
2437 MHz



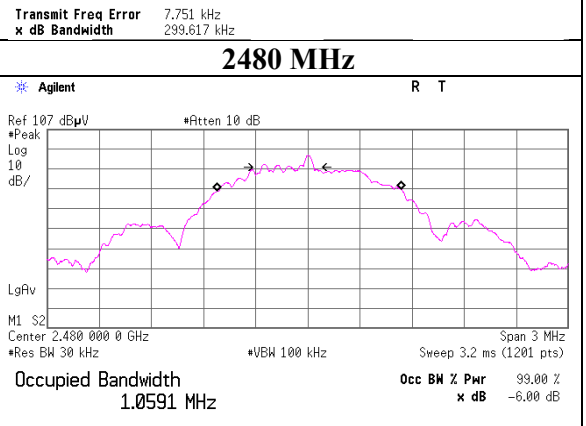
2440 MHz



2462 MHz



2480 MHz

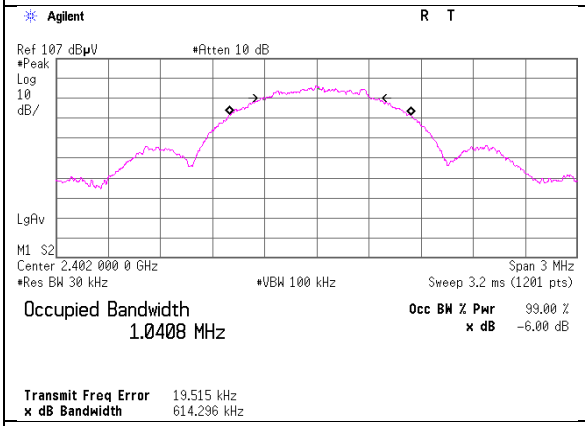


99% Occupied Bandwidth

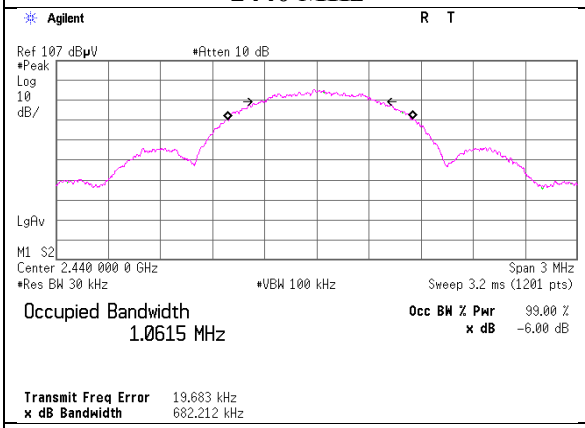
(BLE chip: CC2640R2F)

1M-PHY Uncoded PHY (1 Mbps)

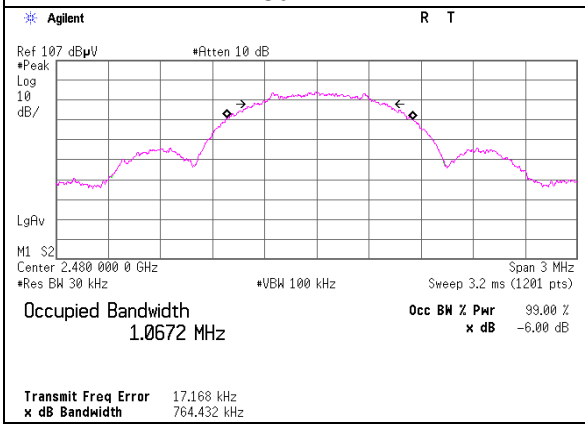
2402 MHz



2440 MHz

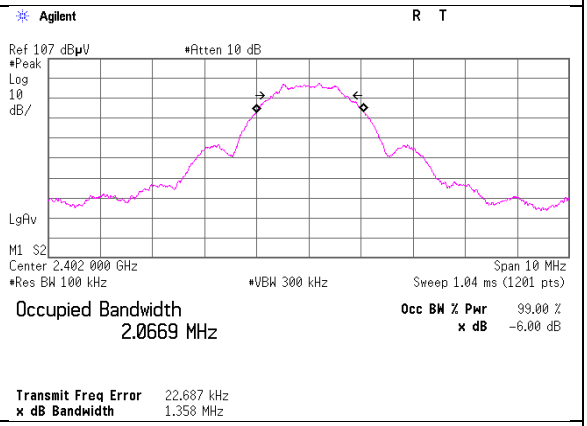


2480 MHz

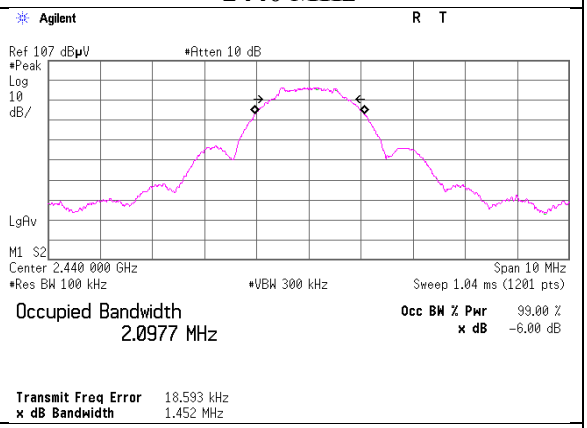


2M-PHY Uncoded PHY (2 Mbps)

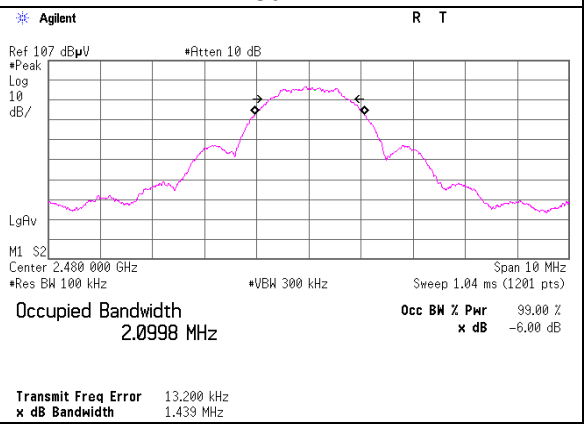
2402 MHz



2440 MHz



2480 MHz

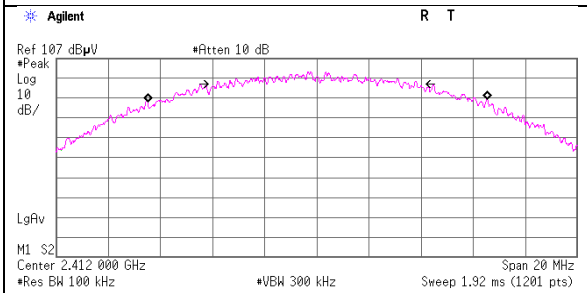


6dB Bandwidth

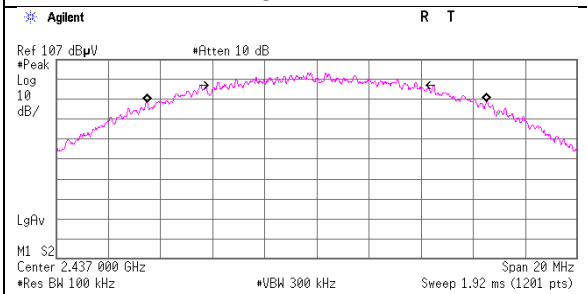
(WiFi / BLE module: QCA6574AU)

11b

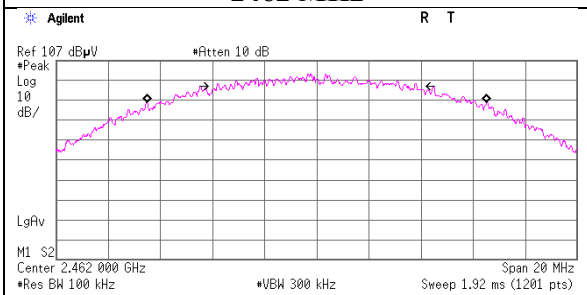
2412 MHz



2437 MHz

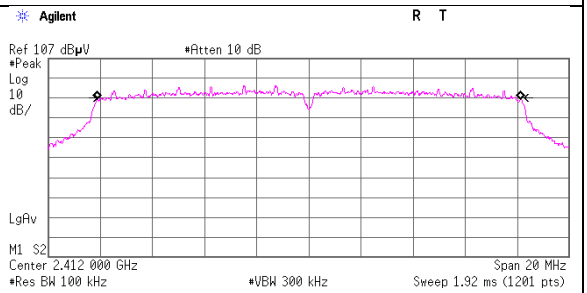


2462 MHz

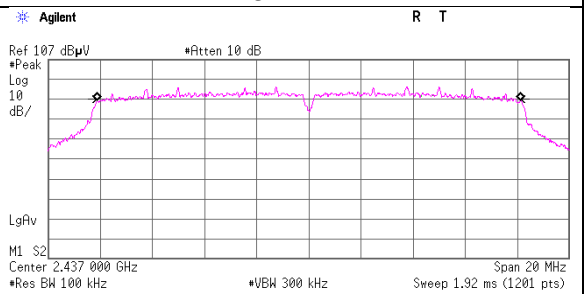


11g

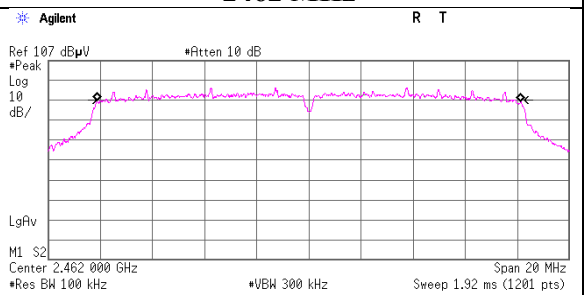
2412 MHz



2437 MHz



2462 MHz

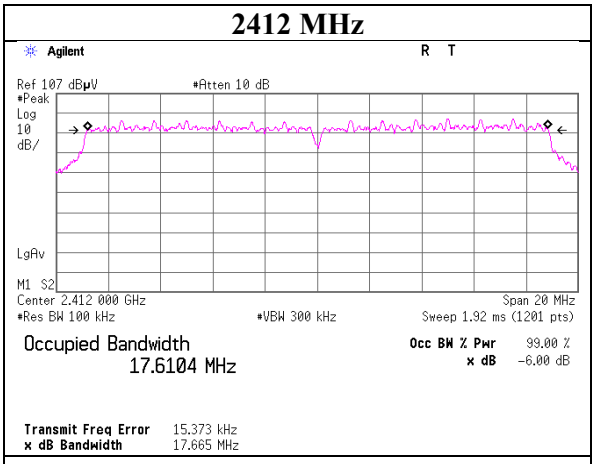


6dB Bandwidth

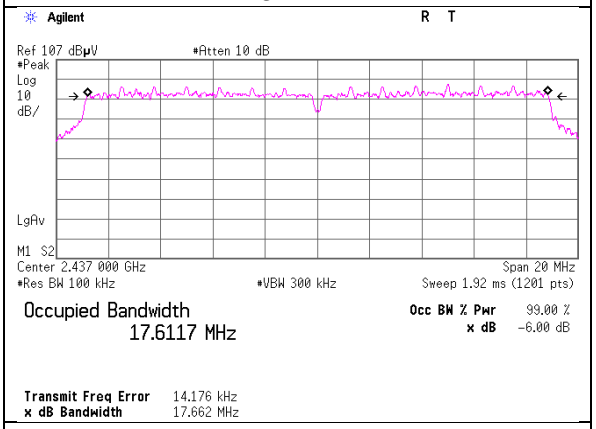
(WiFi / BLE module: QCA6574AU)

11n-20

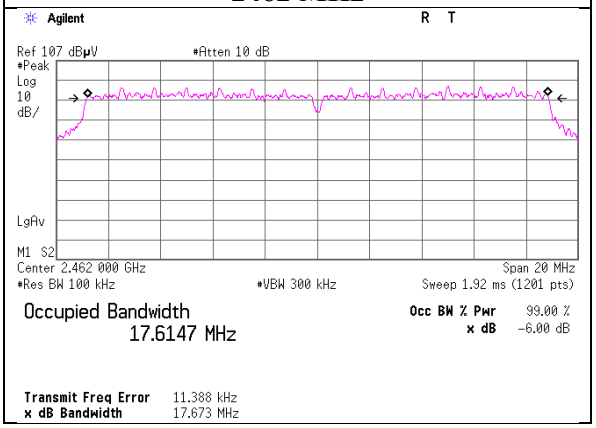
2412 MHz



2437 MHz



2462 MHz

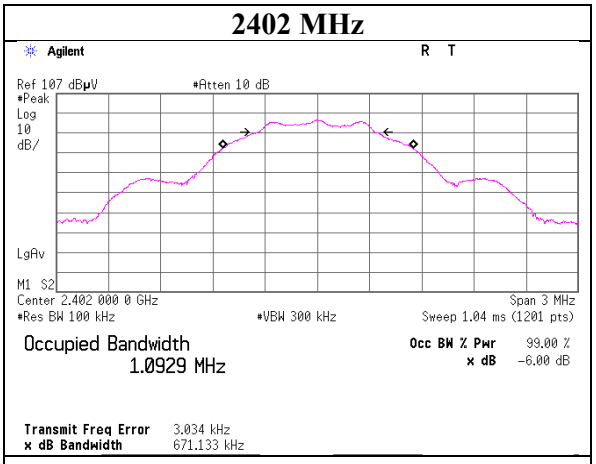


6dB Bandwidth

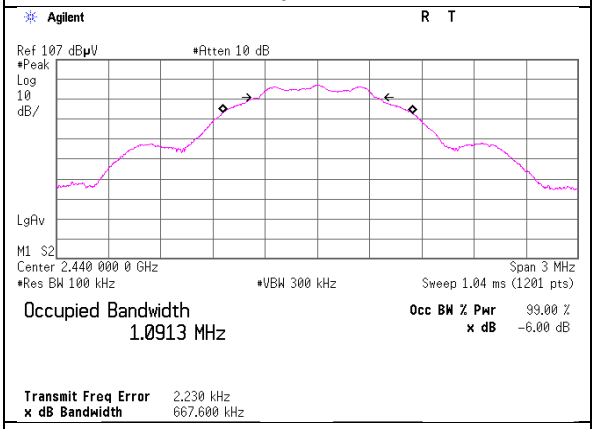
(WiFi / BLE module: QCA6574AU)

BT LE

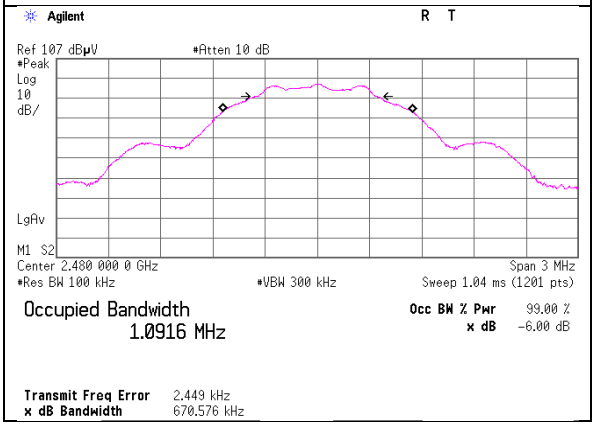
2402 MHz



2440 MHz



2480 MHz

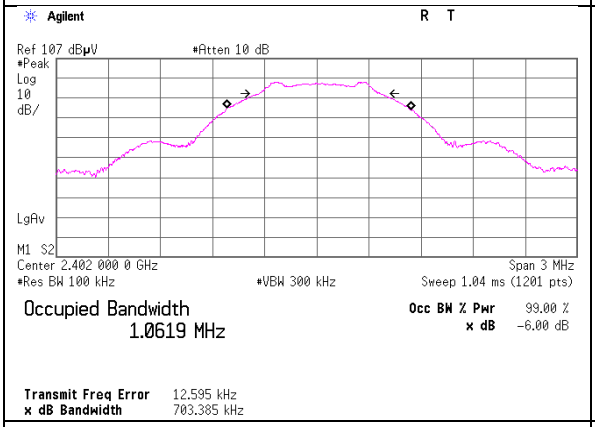


6dB Bandwidth

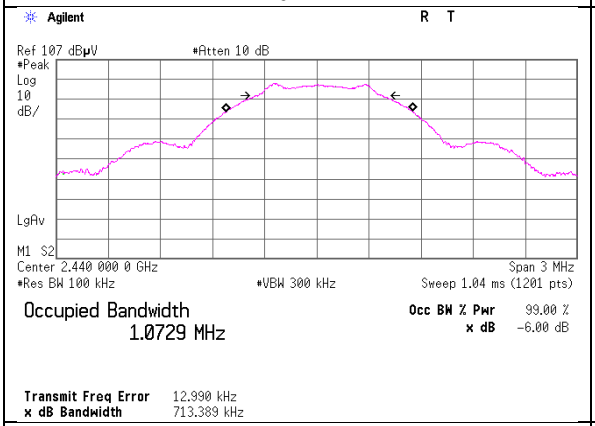
(BLE chip: CC2640R2F)

BT LE 1M-PHY Uncoded PHY (1 Mbps)

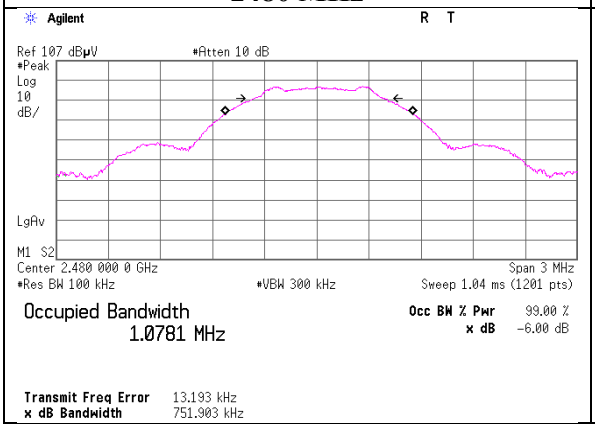
2402 MHz



2440 MHz

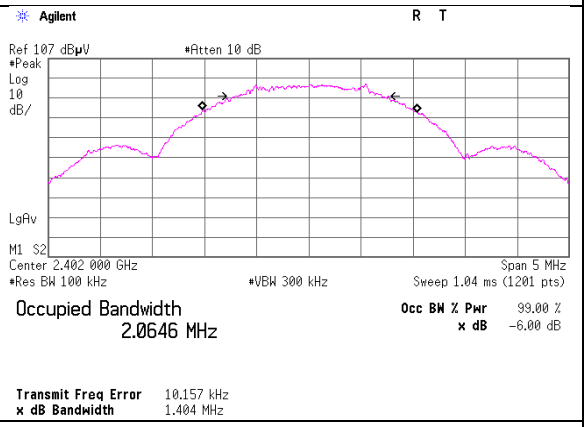


2480 MHz

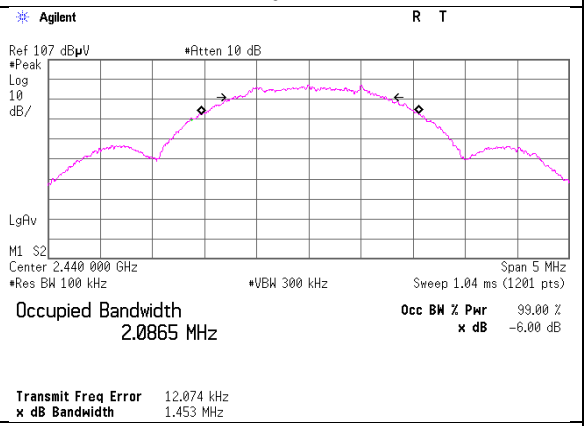


BT LE 2M-PHY Uncoded PHY (2 Mbps)

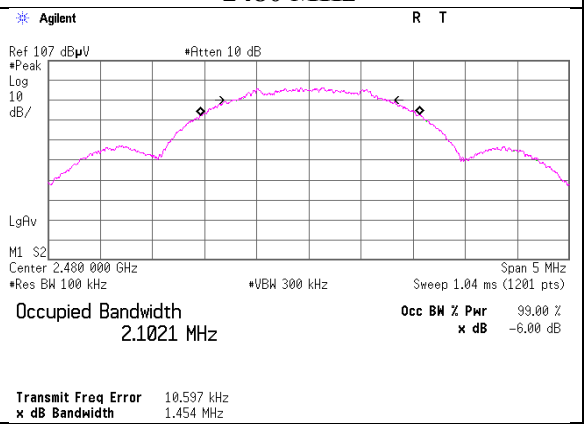
2402 MHz



2440 MHz



2480 MHz



Maximum Peak Output Power

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	24 deg. C / 30 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx 11b

Antenna 0				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]
2412	3.28	1.00	10.10	14.38	27.42	30.00	1000	15.62	1.61	15.99	39.72	36.02	4000	20.03
2437	3.22	1.00	10.11	14.33	27.10	30.00	1000	15.67	1.61	15.94	39.26	36.02	4000	20.08
2462	3.13	1.00	10.11	14.24	26.55	30.00	1000	15.76	1.61	15.85	38.46	36.02	4000	20.17

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
e.i.r.p. Result = Conducted Power Result + Antenna Gain

Antenna 0 2412MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	2.99	
2	3.30	
5.5	3.23	
11	3.33	*

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.
Difference between worst rate check data and formal test result is due to the different test condition.

Maximum Peak Output Power

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	24 deg. C / 30 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx 11g

Antenna 0				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]
2412	7.93	1.00	10.10	19.03	79.98	30.00	1000	10.97	1.61	20.64	115.88	36.02	4000	15.38
2437	7.77	1.00	10.11	18.88	77.27	30.00	1000	11.12	1.61	20.49	111.94	36.02	4000	15.53
2462	7.66	1.00	10.11	18.77	75.34	30.00	1000	11.23	1.61	20.38	109.14	36.02	4000	15.64

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
e.i.r.p. Result = Conducted Power Result + Antenna Gain

Antenna 0, 2412 MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
6	7.93	*
9	7.35	
12	7.54	
18	7.10	
24	7.71	
36	7.72	
48	7.49	
54	7.55	

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.
Difference between worst rate check data and formal test result is due to the different test condition.

Maximum Peak Output Power

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	24 deg. C / 30 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx 11n-20

Antenna 0 + Antenna 1			Conducted Power					e.i.r.p.					
Freq.	Antenna 0 Result	Antenna 1 Result	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	69.82	76.56	21.65	146.38	30.00	1000	8.35	5.35	27.00	501.75	36.02	4000.00	9.02
2437	67.76	71.78	21.45	139.54	30.00	1000	8.55	5.35	26.80	478.31	36.02	4000.00	9.22
2462	67.14	70.31	21.38	137.45	30.00	1000	8.62	5.35	26.73	471.13	36.02	4000.00	9.29

Sample Calculation:
Result = Antenna 0 + Antenna 1
e.i.r.p. Result = Conducted Power Result + Antenna Gain

Antenna 0

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	7.34	1.00	10.10	18.44	69.82
2437	7.20	1.00	10.11	18.31	67.76
2462	7.16	1.00	10.11	18.27	67.14

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	7.74	1.00	10.10	18.84	76.56
2437	7.45	1.00	10.11	18.56	71.78
2462	7.36	1.00	10.11	18.47	70.31

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

2412 MHz

MCS Number	Antenna 0 Reading Peak		Antenna 1 Reading Peak		Total Reading Power		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	7.59	5.74	-	-	7.59	5.74	
1	6.90	4.90	-	-	6.90	4.90	
2	7.37	5.46	-	-	7.37	5.46	
3	7.12	5.15	-	-	7.12	5.15	
4	7.31	5.38	-	-	7.31	5.38	
5	7.01	5.02	-	-	7.01	5.02	
6	8.21	6.62	-	-	8.21	6.62	
7	6.94	4.94	-	-	6.94	4.94	
8	6.94	4.94	8.11	6.47	10.57	11.41	
9	6.58	4.55	7.68	5.86	10.18	10.41	
10	6.70	4.68	7.48	5.60	10.12	10.27	
11	6.91	4.91	7.73	5.93	10.35	10.84	
12	7.03	5.05	7.78	6.00	10.43	11.04	
13	6.93	4.93	7.88	6.14	10.44	11.07	
14	7.55	5.69	7.50	5.62	10.54	11.31	
15	7.34	5.42	7.74	5.94	10.55	11.36	*

*Worst MCS
All comparison were carried out on same frequency and measurement factors.
Difference between worst rate check data and formal test result is due to the different test condition.

Maximum Peak Output Power

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	24 deg. C / 30 % RH
Engineer	Hiroyuki Furutaka
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]
2402.00	-13.03	1.00	10.10	-1.93	0.64	30.00	1000	31.93	1.61	-0.32	0.93	36.02	4000.00	36.34
2440.00	-12.57	1.00	10.10	-1.47	0.71	30.00	1000	31.47	1.61	0.14	1.03	36.02	4000.00	35.88
2480.00	-12.50	1.00	10.10	-1.40	0.72	30.00	1000	31.40	1.61	0.21	1.05	36.02	4000.00	35.81

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
e.i.r.p. Result = Conducted Power Result + Antenna Gain

Maximum Peak Output Power

(BLE chip: CC2640R2F)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	12608632H
Date	February 25, 2019
Temperature / Humidity	24 deg. C / 38 % RH
Engineer	Takumi Shimada
Mode	Tx BT LE

1M-PHY Uncoded PHY (1 Mbps)				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]
2402.00	-12.12	2.37	10.09	0.34	1.08	30.00	1000	29.66	1.61	1.95	1.57	36.02	4000.00	34.07
2440.00	-12.43	2.36	10.09	0.02	1.00	30.00	1000	29.98	1.61	1.63	1.46	36.02	4000.00	34.39
2480.00	-12.72	2.35	10.09	-0.28	0.94	30.00	1000	30.28	1.61	1.33	1.36	36.02	4000.00	34.69

1M-PHY Coded PHY (500 kbps)				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]
2440.00	-12.44	2.36	10.09	0.01	1.00	30.00	1000	29.99	1.61	1.62	1.45	36.02	4000.00	34.40

1M-PHY Coded PHY (125 kbps)				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]
2440.00	-12.44	2.36	10.09	0.01	1.00	30.00	1000	29.99	1.61	1.62	1.45	36.02	4000.00	34.40

2M-PHY Uncoded PHY (2 Mbps)				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]
2402.00	-12.11	2.37	10.09	0.35	1.08	30.00	1000	29.65	1.61	1.96	1.57	36.02	4000.00	34.06
2440.00	-12.42	2.36	10.09	0.03	1.01	30.00	1000	29.97	1.61	1.64	1.46	36.02	4000.00	34.38
2480.00	-12.71	2.35	10.09	-0.27	0.94	30.00	1000	30.27	1.61	1.34	1.36	36.02	4000.00	34.68

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
e.i.r.p. Result = Conducted Power Result + Antenna Gain

Average Output Power
(Reference data for RF Exposure)
(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	24 deg. C / 30 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx

11b **1 Mbps** Antenna 0

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result Burst power average	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	0.34	1.00	10.10	11.44	13.93	0.04	11.48	14.06
2437	0.28	1.00	10.10	11.38	13.74	0.04	11.42	13.87
2462	0.23	1.00	10.10	11.33	13.58	0.04	11.37	13.71

11g **6 Mbps** Antenna 0

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result Burst power average	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-2.55	1.00	10.10	8.55	7.16	0.32	8.87	7.71
2437	-2.73	1.00	10.10	8.37	6.87	0.32	8.69	7.40
2462	-2.71	1.00	10.10	8.39	6.90	0.32	8.71	7.43

11n-20 **MCS 0** Antenna 0

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result Burst power average	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-2.74	1.00	10.10	8.36	6.85	0.23	8.59	7.23
2437	-2.89	1.00	10.10	8.21	6.62	0.23	8.44	6.98
2462	-2.83	1.00	10.10	8.27	6.71	0.23	8.50	7.08

11n-20 **MCS8** Antenna 0 + Antenna 1

Freq.	Antenna 0 Result	Antenna 1 Result	Result (Time average)		Duty factor	Result Burst power average	
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	6.64	7.76	11.58	14.40	0.64	12.22	16.69
2437	6.50	7.67	11.52	14.17	0.64	12.16	16.43
2462	6.64	7.59	11.53	14.22	0.64	12.17	16.48

Sample Calculation:
Result = Antenna 0+ Antenna 1

11n-20 **MCS8** Antenna 0

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	-2.88	1.00	10.10	8.22	6.64
2437	-2.97	1.00	10.10	8.13	6.50
2462	-2.88	1.00	10.10	8.22	6.64

11n-20 **MCS8** Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	-2.20	1.00	10.10	8.90	7.76
2437	-2.25	1.00	10.10	8.85	7.67
2462	-2.30	1.00	10.10	8.80	7.59

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)
(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	24 deg. C / 30 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx BT LE

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	-15.32	1.00	10.10	-4.22	0.38	1.70	-2.52	0.56
2440	-14.78	1.00	10.10	-3.68	0.43	1.70	-1.98	0.63
2480	-14.73	1.00	10.10	-3.63	0.43	1.70	-1.93	0.64

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

Average Output Power
(Reference data for RF Exposure)
(BLE chip: CC2640R2F)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	12608632H
Date	February 25, 2019
Temperature / Humidity	24 deg. C / 38 % RH
Engineer	Takumi Shimada
Mode	Tx BT LE

1M-PHY Uncoded PHY (1 Mbps)

Freq.	Reading	Cable Loss	Atten. Loss	Result Burst power average	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2402	-12.37	2.37	10.09	0.09	1.02
2440	-12.68	2.36	10.09	-0.23	0.95
2480	-13.01	2.35	10.09	-0.57	0.88

1M-PHY Coded PHY (500 kbps)

Freq.	Reading	Cable Loss	Atten. Loss	Result Burst power average	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2440	-12.69	2.36	10.09	-0.24	0.95

1M-PHY Coded PHY (125 kbps)

Freq.	Reading	Cable Loss	Atten. Loss	Result Burst power average	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2440	-12.70	2.36	10.09	-0.25	0.94

2M-PHY Uncoded PHY (2 Mbps)

Freq.	Reading	Cable Loss	Atten. Loss	Result Burst power average	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2402	-12.36	2.37	10.09	0.10	1.02
2440	-12.67	2.36	10.09	-0.22	0.95
2480	-12.99	2.35	10.09	-0.55	0.88

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

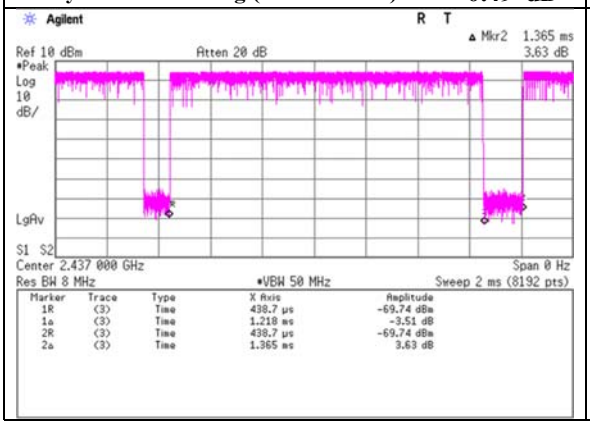
Burst rate confirmation

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	24 deg. C / 30 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx

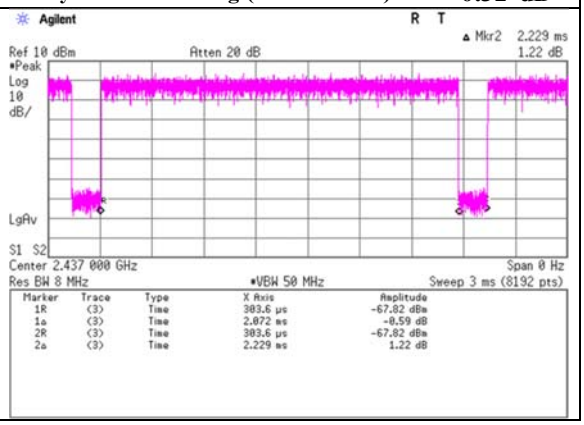
11b 11 Mbps

Tx on / (Tx on + Tx off) =	0.892
Tx on / (Tx on + Tx off) * 100 =	89.2 %
Duty factor = 10 * log (1.365 / 1.218) =	0.49 dB



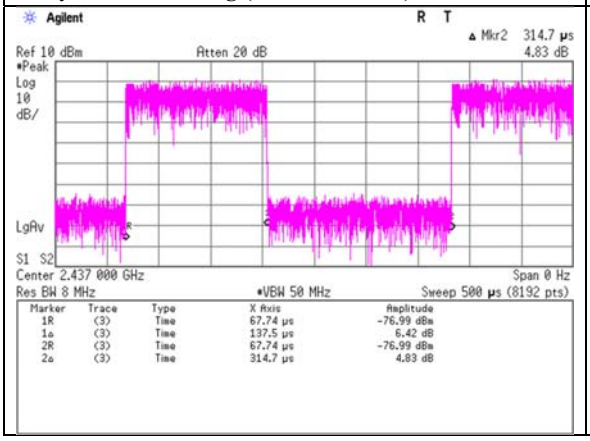
11g 6 Mbps

Tx on / (Tx on + Tx off) =	0.930
Tx on / (Tx on + Tx off) * 100 =	93.0 %
Duty factor = 10 * log (2.229 / 2.072) =	0.32 dB



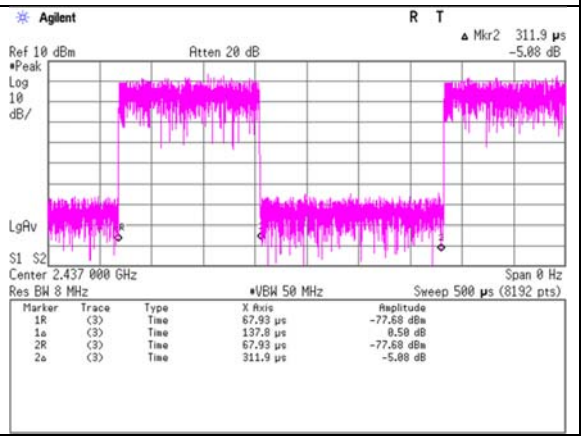
11n-20 Antenna 0 MCS 15

Tx on / (Tx on + Tx off) =	0.437
Tx on / (Tx on + Tx off) * 100 =	43.7 %
Duty factor = 10 * log (0.3147 / 0.1375) =	3.60 dB



11n-20 Antenna 1 MCS 15

Tx on / (Tx on + Tx off) =	0.442
Tx on / (Tx on + Tx off) * 100 =	44.2 %
Duty factor = 10 * log (0.3119 / 0.1378) =	3.55 dB



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

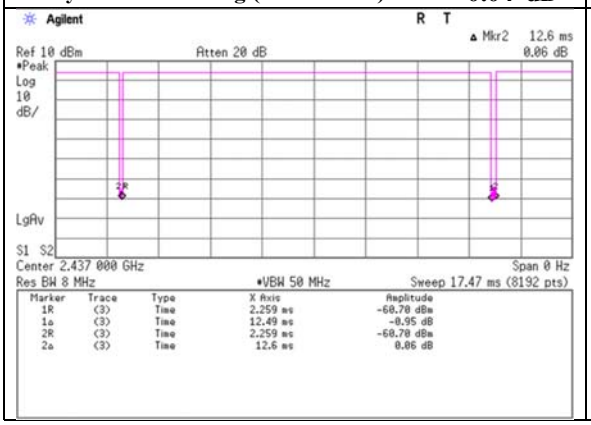
Burst rate confirmation

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	24 deg. C / 30 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx

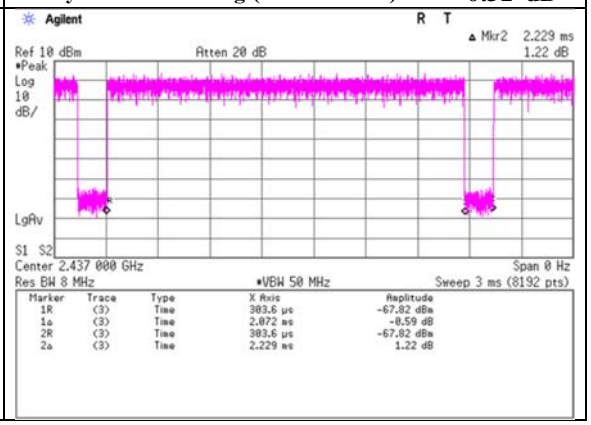
11b 1 Mbps

Tx on / (Tx on + Tx off) =	0.991
Tx on / (Tx on + Tx off) * 100 =	99.1 %
Duty factor = 10 * log (12.6 / 12.49) =	0.04 dB



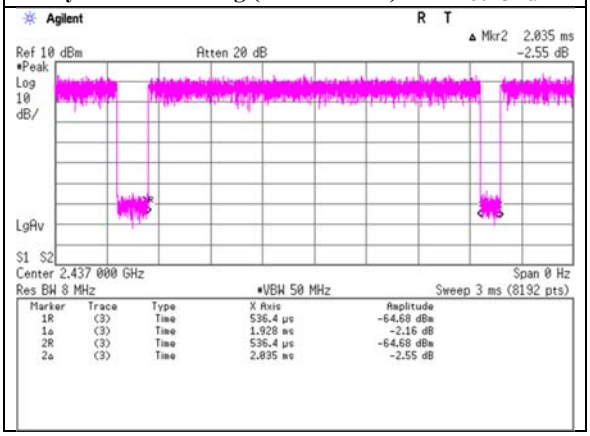
11g 6 Mbps

Tx on / (Tx on + Tx off) =	0.930
Tx on / (Tx on + Tx off) * 100 =	93.0 %
Duty factor = 10 * log (2.229 / 2.072) =	0.32 dB



11n-20 Antenna 0 MCS 0

Tx on / (Tx on + Tx off) =	0.947
Tx on / (Tx on + Tx off) * 100 =	94.7 %
Duty factor = 10 * log (2.035 / 1.928) =	0.23 dB



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

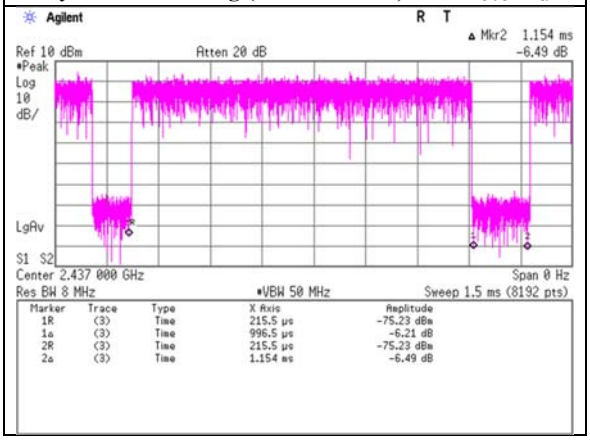
Burst rate confirmation

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	24 deg. C / 30 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx

11n-20 MCS 8

Tx on / (Tx on + Tx off) =	**0.864**
Tx on / (Tx on + Tx off) * 100 =	**86.4 %**
Duty factor = 10 * log (1.154 / 0.9965) =	**0.64 dB**



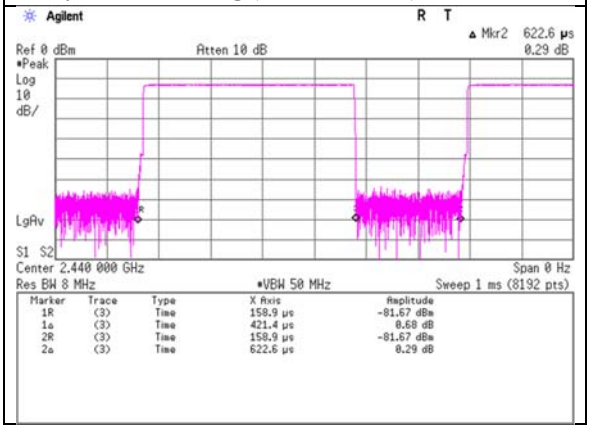
* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

Burst rate confirmation

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	24 deg. C / 30 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx BT LE

Tx on / (Tx on + Tx off) =	**0.677**
Tx on / (Tx on + Tx off) * 100 =	**67.7 %**
Duty factor = 10 * log (0.6226 / 0.4214) =	**1.70 dB**



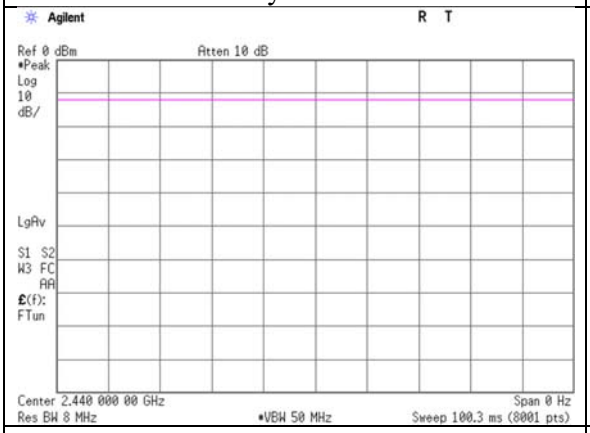
* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

Burst rate confirmation

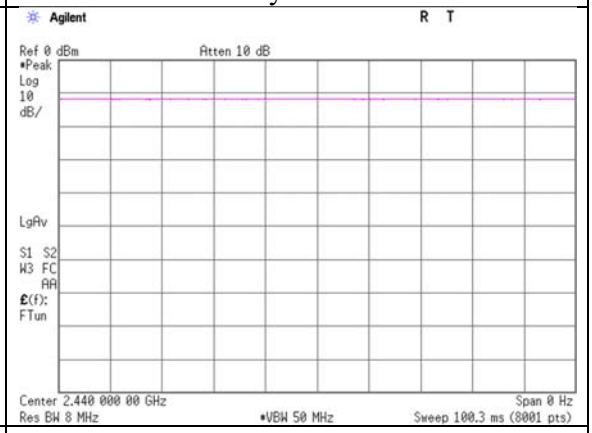
(BLE chip: CC2640R2F)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	12608632H
Date	February 25, 2019
Temperature / Humidity	24 deg. C / 38 % RH
Engineer	Takumi Shimada
Mode	Tx BT LE

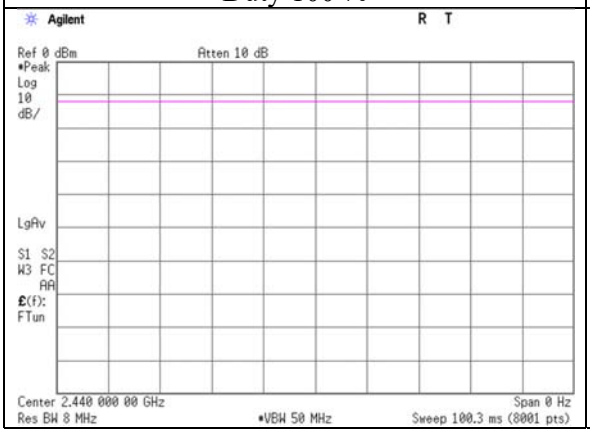
1M-PHY Uncoded PHY (1 Mbps) 2440MHz
Duty 100 %



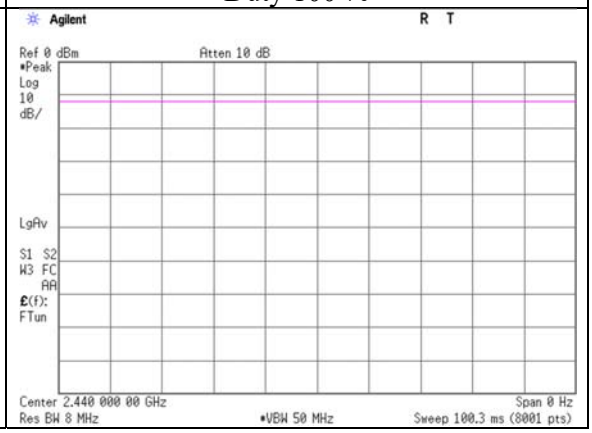
2M-PHY Uncoded PHY (2 Mbps) 2440MHz
Duty 100 %



1M-PHY Coded PHY (125 kbps)
Duty 100 %



1M-PHY Coded PHY (500 kbps)
Duty 100 %



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

Radiated Spurious Emission

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	March 25, 2019	March 26, 2019
Temperature / Humidity	23 deg. C / 35 % RH	21 deg. C / 35 % RH
Engineer	Yuta Moriya	Yuta Moriya
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)
Mode	Tx 11b 2412 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.	2390.000	PK	48.1	27.7	4.9	34.3	-	46.5	73.9	27.4	
Hori.	4824.000	PK	42.9	31.3	7.1	33.5	-	47.9	73.9	26.1	Floor noise
Hori.	7236.000	PK	43.0	35.6	8.2	33.4	-	53.4	73.9	20.5	Floor noise
Hori.	9648.000	PK	43.9	38.4	9.3	33.8	-	57.7	73.9	16.2	Floor noise
Hori.	2390.000	AV	38.8	27.7	4.9	34.3	0.5	37.6	53.9	16.3	*1)
Hori.	4824.000	AV	34.0	31.3	7.1	33.5	-	38.9	53.9	15.0	Floor noise
Hori.	7236.000	AV	34.3	35.6	8.2	33.4	-	44.6	53.9	9.3	Floor noise
Hori.	9648.000	AV	33.9	38.4	9.3	33.8	-	47.8	53.9	6.1	Floor noise
Vert.	2390.000	PK	45.6	27.7	4.9	34.3	-	44.0	73.9	29.9	
Vert.	4824.000	PK	42.8	31.3	7.1	33.5	-	47.7	73.9	26.2	Floor noise
Vert.	7236.000	PK	43.3	35.6	8.2	33.4	-	53.6	73.9	20.3	Floor noise
Vert.	9648.000	PK	43.6	38.4	9.3	33.8	-	57.5	73.9	16.4	Floor noise
Vert.	2390.000	AV	37.0	27.7	4.9	34.3	0.5	35.9	53.9	18.0	*1)
Vert.	4824.000	AV	34.0	31.3	7.1	33.5	-	38.9	53.9	15.0	Floor noise
Vert.	7236.000	AV	34.5	35.6	8.2	33.4	-	44.9	53.9	9.0	Floor noise
Vert.	9648.000	AV	34.0	38.4	9.3	33.8	-	47.9	53.9	6.0	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 (3.65 m / 3.0 m) = 1.71 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

20dBc Data Sheet

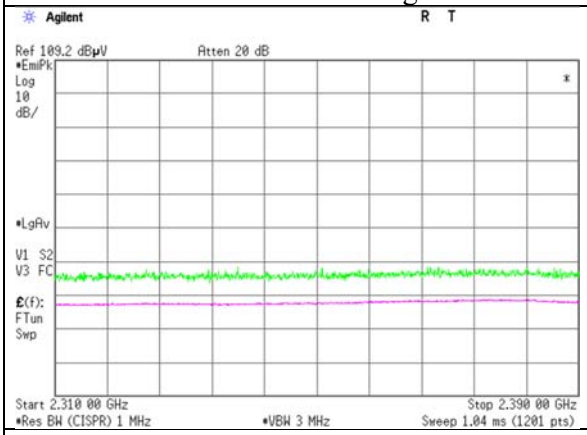
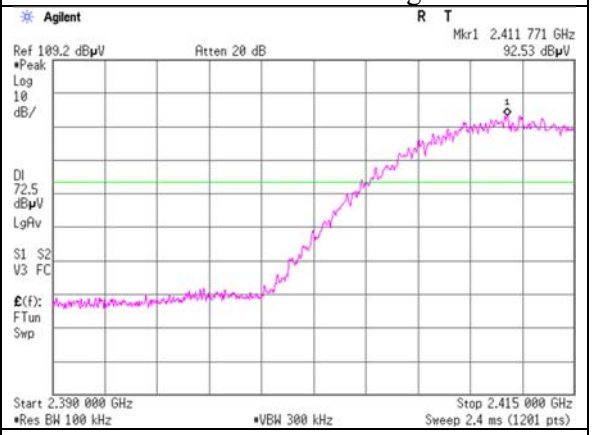
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	92.5	27.6	5.0	34.3	90.9	-	-	Carrier
Hori.	2400.000	PK	44.6	27.8	4.9	34.3	43.0	70.9	27.8	
Vert.	2412.000	PK	96.7	27.6	5.0	34.3	95.0	-	-	Carrier
Vert.	2400.000	PK	43.2	27.8	4.9	34.3	41.7	75.0	33.3	

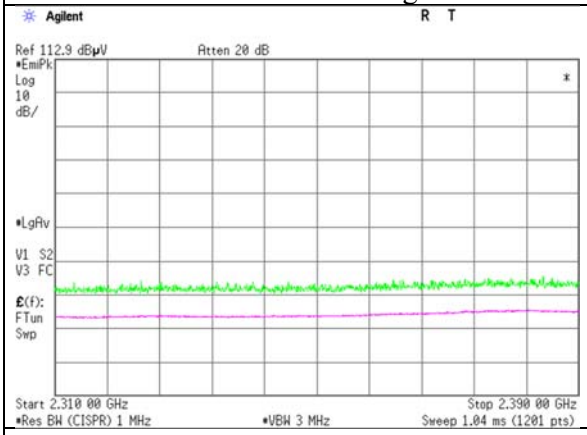
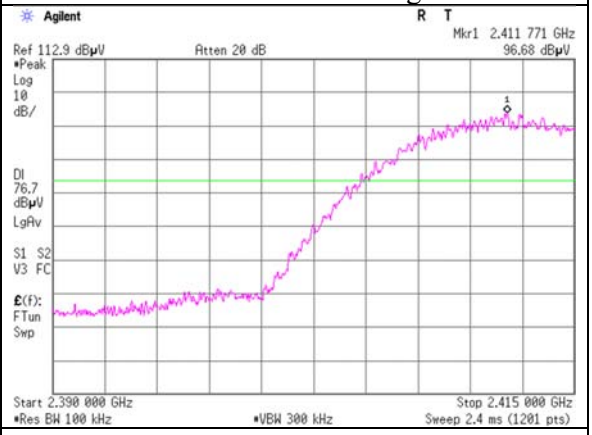
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	March 25, 2019
Temperature / Humidity	23 deg. C / 35 % RH
Engineer	Yuta Moriya
Mode	Tx 11b 2412 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

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	March 25, 2019	March 26, 2019
Temperature / Humidity	23 deg. C / 35 % RH	21 deg. C / 35 % RH
Engineer	Yuta Moriya	Yuta Moriya
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)
Mode	Tx 11b 2437 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.	4874.000	PK	42.8	31.5	7.1	33.5	-	47.8	73.9	26.1	Floor noise
Hori.	7311.000	PK	43.0	35.9	8.2	33.5	-	53.6	73.9	20.3	Floor noise
Hori.	9748.000	PK	43.5	38.6	9.3	33.8	-	57.6	73.9	16.3	Floor noise
Hori.	4874.000	AV	33.9	31.5	7.1	33.5	-	39.0	53.9	14.9	Floor noise
Hori.	7311.000	AV	34.4	35.9	8.2	33.5	-	45.0	53.9	8.9	Floor noise
Hori.	9748.000	AV	33.8	38.6	9.3	33.8	-	47.9	53.9	6.1	Floor noise
Vert.	4874.000	PK	42.2	31.5	7.1	33.5	-	47.3	73.9	26.6	Floor noise
Vert.	7311.000	PK	42.8	35.9	8.2	33.5	-	53.4	73.9	20.5	Floor noise
Vert.	9748.000	PK	43.9	38.6	9.3	33.8	-	57.9	73.9	16.0	Floor noise
Vert.	4874.000	AV	34.1	31.5	7.1	33.5	-	39.1	53.9	14.8	Floor noise
Vert.	7311.000	AV	34.2	35.9	8.2	33.5	-	44.8	53.9	9.1	Floor noise
Vert.	9748.000	AV	33.7	38.6	9.3	33.8	-	47.8	53.9	6.1	Floor noise

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

*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 (3.65 m / 3.0 m) = 1.71 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	March 25, 2019	March 26, 2019
Temperature / Humidity	23 deg. C / 35 % RH	21 deg. C / 35 % RH
Engineer	Yuta Moriya	Yuta Moriya
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)
Mode	Tx 11b 2462 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.	2483.500	PK	49.3	27.5	5.0	34.2	-	47.6	73.9	26.3	
Hori.	4924.000	PK	43.0	31.6	7.1	33.5	-	48.2	73.9	25.7	Floor noise
Hori.	7386.000	PK	43.3	36.1	8.3	33.5	-	54.2	73.9	19.7	Floor noise
Hori.	9848.000	PK	43.5	38.6	9.4	33.8	-	57.6	73.9	16.3	Floor noise
Hori.	2483.500	AV	39.1	27.5	5.0	34.2	0.5	37.8	53.9	16.1	*1)
Hori.	4924.000	AV	33.8	31.6	7.1	33.5	-	39.0	53.9	14.9	Floor noise
Hori.	7386.000	AV	35.1	36.1	8.3	33.5	-	46.0	53.9	7.9	Floor noise
Hori.	9848.000	AV	33.7	38.6	9.4	33.8	-	47.8	53.9	6.1	Floor noise
Vert.	2483.500	PK	45.6	27.5	5.0	34.2	-	43.8	73.9	30.1	
Vert.	4924.000	PK	41.6	31.6	7.1	33.5	-	46.9	73.9	27.0	Floor noise
Vert.	7386.000	PK	42.4	36.1	8.3	33.5	-	53.3	73.9	20.6	Floor noise
Vert.	9848.000	PK	43.3	38.6	9.4	33.8	-	57.4	73.9	16.5	Floor noise
Vert.	2483.500	AV	35.0	27.5	5.0	34.2	0.5	33.8	53.9	20.2	*1)
Vert.	4924.000	AV	33.6	31.6	7.1	33.5	-	38.8	53.9	15.1	Floor noise
Vert.	7386.000	AV	34.7	36.1	8.3	33.5	-	45.6	53.9	8.3	Floor noise
Vert.	9848.000	AV	33.5	38.6	9.4	33.8	-	47.6	53.9	6.3	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).

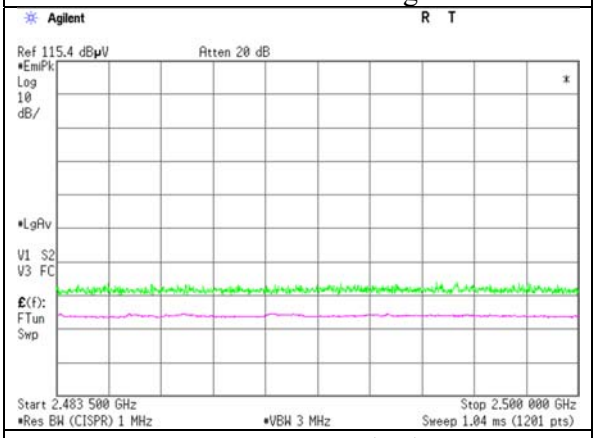
Distance factor: 1 GHz - 10 GHz 20log (3.65 m / 3.0 m) = 1.71 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

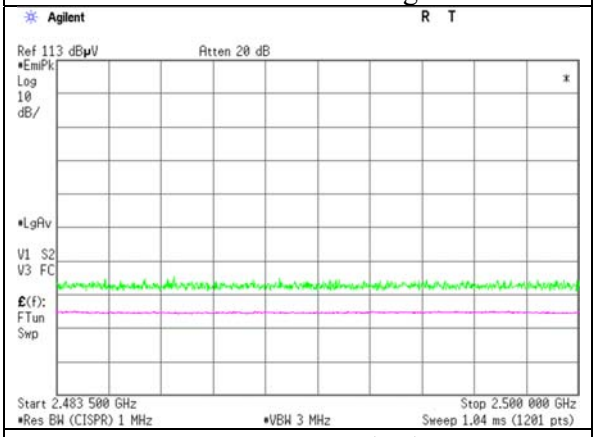
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	March 25, 2019
Temperature / Humidity	23 deg. C / 35 % RH
Engineer	Yuta Moriya
	(1 GHz - 10 GHz)
Mode	Tx 11b 2462 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

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	March 25, 2019	March 26, 2019	April 4, 2019
Temperature / Humidity	23 deg. C / 35 % RH	21 deg. C / 35 % RH	23 deg. C / 30 % RH
Engineer	Yuta Moriya	Yuta Moriya	Yuta Moriya
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx 11n-20 2412 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.	82.188	QP	35.4	6.5	7.3	30.3	-	18.8	40.0	21.2	
Hori.	124.769	QP	32.9	13.3	7.6	30.1	-	23.7	43.5	19.8	
Hori.	143.614	QP	35.9	14.5	7.8	30.0	-	28.2	43.5	15.3	
Hori.	150.910	QP	30.1	14.7	7.9	30.0	-	22.7	43.5	20.8	
Hori.	169.113	QP	29.1	15.6	8.0	29.9	-	22.8	43.5	20.7	
Hori.	655.557	QP	26.3	19.3	10.4	29.4	-	26.5	46.0	19.5	
Hori.	2390.000	PK	59.7	27.7	4.9	34.3	-	58.0	73.9	15.9	
Hori.	4824.000	PK	41.6	31.3	7.1	33.5	-	46.5	73.9	27.4	Floor noise
Hori.	7236.000	PK	43.0	35.6	8.2	33.4	-	53.4	73.9	20.6	Floor noise
Hori.	9648.000	PK	43.2	38.4	9.3	33.8	-	57.1	73.9	16.8	Floor noise
Hori.	2390.000	AV	39.2	27.7	4.9	34.3	3.6	41.2	53.9	12.7	*1)
Hori.	4824.000	AV	33.1	31.3	7.1	33.5	-	38.0	53.9	15.9	Floor noise
Hori.	7236.000	AV	33.4	35.6	8.2	33.4	-	43.7	53.9	10.2	Floor noise
Hori.	9648.000	AV	33.5	38.4	9.3	33.8	-	47.4	53.9	6.5	Floor noise
Vert.	82.341	QP	38.2	6.5	7.3	30.3	-	21.7	40.0	18.4	
Vert.	124.669	QP	38.2	13.3	7.6	30.1	-	29.0	43.5	14.5	
Vert.	143.518	QP	37.8	14.5	7.8	30.0	-	30.1	43.5	13.4	
Vert.	150.600	QP	34.0	14.7	7.8	30.0	-	26.6	43.5	16.9	
Vert.	169.993	QP	33.1	15.6	8.0	29.8	-	26.8	43.5	16.7	
Vert.	655.501	QP	31.4	19.3	10.4	29.4	-	31.6	46.0	14.4	
Vert.	2390.000	PK	55.5	27.7	4.9	34.3	-	53.9	73.9	20.0	
Vert.	4824.000	PK	41.5	31.3	7.1	33.5	-	46.4	73.9	27.5	Floor noise
Vert.	7236.000	PK	42.5	35.6	8.2	33.4	-	52.9	73.9	21.1	Floor noise
Vert.	9648.000	PK	43.4	38.4	9.3	33.8	-	57.3	73.9	16.7	Floor noise
Vert.	2390.000	AV	40.7	27.7	4.9	34.3	3.6	42.6	53.9	11.3	*1)
Vert.	4824.000	AV	33.1	31.3	7.1	33.5	-	38.0	53.9	15.9	Floor noise
Vert.	7236.000	AV	33.3	35.6	8.2	33.4	-	43.7	53.9	10.2	Floor noise
Vert.	9648.000	AV	33.4	38.4	9.3	33.8	-	47.3	53.9	6.6	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 (3.65 m / 3.0 m) = 1.71 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

20dBc Data Sheet

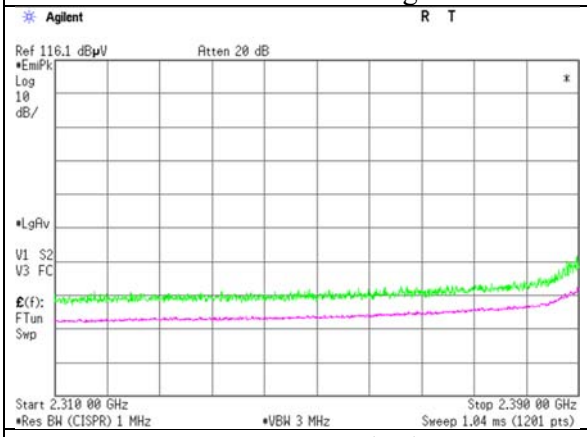
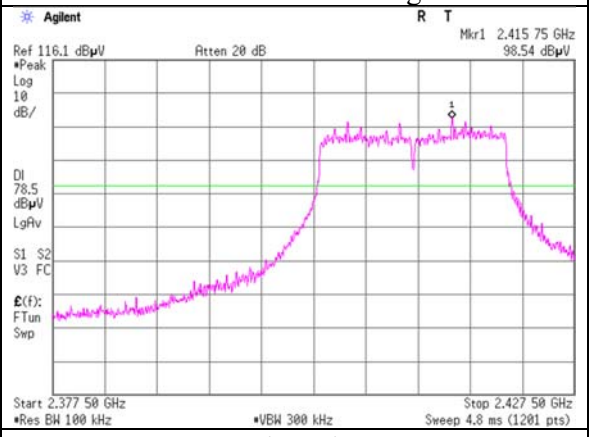
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	98.5	27.6	5.0	34.3	96.8	-	-	Carrier
Hori.	2400.000	PK	59.8	27.8	4.9	34.3	58.2	76.8	18.6	
Vert.	2412.000	PK	95.4	27.6	5.0	34.3	93.7	-	-	Carrier
Vert.	2400.000	PK	56.5	27.8	4.9	34.3	54.9	73.7	18.8	

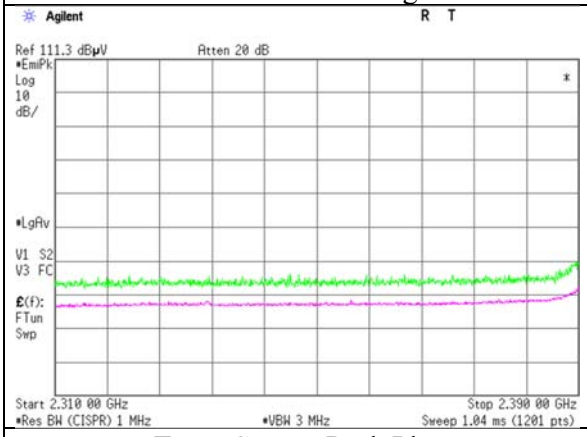
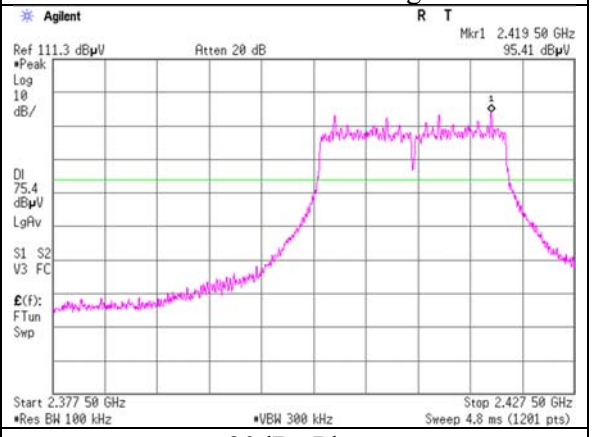
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	March 25, 2019
Temperature / Humidity	23 deg. C / 35 % RH
Engineer	Yuta Moriya
Mode	Tx 11n-20 2412 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

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	March 25, 2019	March 26, 2019
Temperature / Humidity	23 deg. C / 35 % RH	21 deg. C / 35 % RH
Engineer	Yuta Moriya	Yuta Moriya
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)
Mode	Tx 11n-20 2437 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.	4874.000	PK	42.0	31.5	7.1	33.5	-	47.1	73.9	26.9	Floor noise
Hori.	7311.000	PK	42.3	35.9	8.2	33.5	-	52.9	73.9	21.0	Floor noise
Hori.	9748.000	PK	43.2	38.6	9.3	33.8	-	57.3	73.9	16.6	Floor noise
Hori.	4874.000	AV	33.2	31.5	7.1	33.5	-	38.2	53.9	15.7	Floor noise
Hori.	7311.000	AV	33.4	35.9	8.2	33.5	-	44.0	53.9	9.9	Floor noise
Hori.	9748.000	AV	33.5	38.6	9.3	33.8	-	47.6	53.9	6.3	Floor noise
Vert.	4874.000	PK	42.2	31.5	7.1	33.5	-	47.3	73.9	26.6	Floor noise
Vert.	7311.000	PK	42.3	35.9	8.2	33.5	-	53.0	73.9	20.9	Floor noise
Vert.	9748.000	PK	43.2	38.6	9.3	33.8	-	57.2	73.9	16.7	Floor noise
Vert.	4874.000	AV	33.1	31.5	7.1	33.5	-	38.2	53.9	15.7	Floor noise
Vert.	7311.000	AV	33.3	35.9	8.2	33.5	-	43.9	53.9	10.0	Floor noise
Vert.	9748.000	AV	33.7	38.6	9.3	33.8	-	47.8	53.9	6.1	Floor noise

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

*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 (3.65 m / 3.0 m) = 1.71 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	March 25, 2019	March 26, 2019
Temperature / Humidity	23 deg. C / 35 % RH	21 deg. C / 35 % RH
Engineer	Yuta Moriya	Yuta Moriya
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)
Mode	Tx 11n-20 2462 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.	2483.500	PK	66.4	27.5	5.0	34.2	-	64.7	73.9	9.2	
Hori.	4924.000	PK	42.5	31.6	7.1	33.5	-	47.8	73.9	26.2	Floor noise
Hori.	7386.000	PK	42.9	36.1	8.3	33.5	-	53.8	73.9	20.1	Floor noise
Hori.	9848.000	PK	43.2	38.6	9.4	33.8	-	57.3	73.9	16.6	Floor noise
Hori.	2483.500	AV	51.2	27.5	5.0	34.2	3.6	53.1	53.9	0.8	*1)
Hori.	4924.000	AV	33.2	31.6	7.1	33.5	-	38.4	53.9	15.5	Floor noise
Hori.	7386.000	AV	33.4	36.1	8.3	33.5	-	44.3	53.9	9.6	Floor noise
Hori.	9848.000	AV	33.6	38.6	9.4	33.8	-	47.7	53.9	6.2	Floor noise
Vert.	2483.500	PK	58.6	27.5	5.0	34.2	-	56.8	73.9	17.1	
Vert.	4924.000	PK	41.2	31.6	7.1	33.5	-	46.5	73.9	27.4	Floor noise
Vert.	7386.000	PK	42.8	36.1	8.3	33.5	-	53.7	73.9	20.2	Floor noise
Vert.	9848.000	PK	43.6	38.6	9.4	33.8	-	57.7	73.9	16.2	Floor noise
Vert.	2483.500	AV	38.4	27.5	5.0	34.2	3.6	40.2	53.9	13.7	*1)
Vert.	4924.000	AV	32.8	31.6	7.1	33.5	-	38.0	53.9	15.9	Floor noise
Vert.	7386.000	AV	33.4	36.1	8.3	33.5	-	44.3	53.9	9.6	Floor noise
Vert.	9848.000	AV	33.4	38.6	9.4	33.8	-	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).

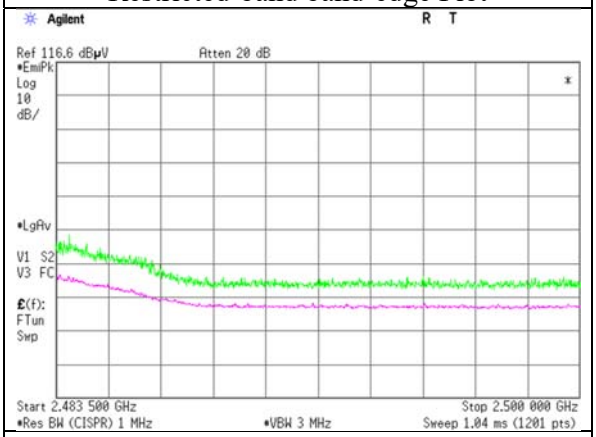
Distance factor: 1 GHz - 10 GHz 20log (3.65 m / 3.0 m) = 1.71 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

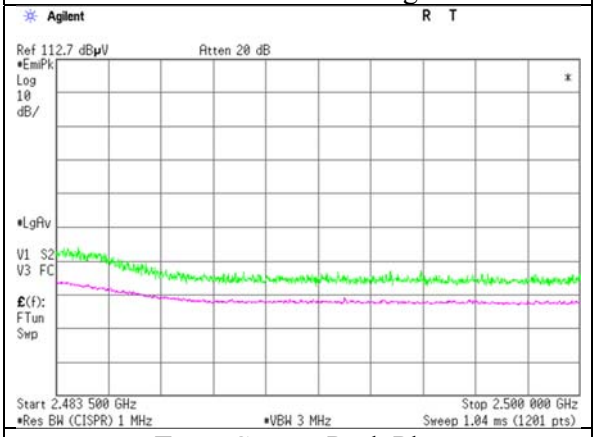
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	March 25, 2019
Temperature / Humidity	23 deg. C / 35 % RH
Engineer	Yuta Moriya
Mode	Tx 11n-20 2462 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

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	March 26, 2019	March 26, 2019	April 4, 2019
Temperature / Humidity	21 deg. C / 35 % RH	21 deg. C / 35 % RH	23 deg. C / 30 % RH
Engineer	Yuichiro Yamazaki	Yuta Moriya	Yuta Moriya
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)	(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.	82.201	QP	35.4	6.5	7.3	30.3	-	18.8	40.0	21.2	
Hori.	124.705	QP	32.8	13.3	7.6	30.1	-	23.6	43.5	19.9	
Hori.	143.528	QP	36.0	14.5	7.8	30.0	-	28.3	43.5	15.2	
Hori.	150.586	QP	30.0	14.7	7.8	30.0	-	22.6	43.5	20.9	
Hori.	169.910	QP	29.1	15.6	8.0	29.8	-	22.8	43.5	20.7	
Hori.	665.587	QP	26.2	19.4	10.4	29.4	-	26.7	46.0	19.4	
Hori.	2390.000	PK	45.2	27.7	4.9	34.3	-	43.5	73.9	30.4	
Hori.	4804.000	PK	41.8	31.2	7.0	33.5	-	46.6	73.9	27.3	Floor noise
Hori.	7206.000	PK	42.8	35.5	8.4	33.4	-	53.2	73.9	20.7	Floor noise
Hori.	9608.000	PK	43.6	38.4	8.9	33.8	-	57.1	73.9	16.9	Floor noise
Hori.	2390.000	AV	33.1	27.7	4.9	34.3	1.7	33.1	53.9	20.8	*1)
Hori.	4804.000	AV	33.9	31.2	7.0	33.5	-	38.7	53.9	15.2	Floor noise
Hori.	7206.000	AV	34.1	35.5	8.4	33.4	-	44.6	53.9	9.3	Floor noise
Hori.	9608.000	AV	33.8	38.4	8.9	33.8	-	47.2	53.9	6.7	Floor noise
Vert.	82.359	QP	38.3	6.5	7.3	30.3	-	21.8	40.0	18.3	
Vert.	124.709	QP	38.1	13.3	7.6	30.1	-	28.9	43.5	14.6	
Vert.	143.527	QP	37.8	14.5	7.8	30.0	-	30.1	43.5	13.4	
Vert.	150.596	QP	33.9	14.7	7.8	30.0	-	26.5	43.5	17.0	
Vert.	169.998	QP	33.0	15.6	8.0	29.8	-	26.7	43.5	16.8	
Vert.	665.563	QP	31.5	19.4	10.4	29.4	-	32.0	46.0	14.1	
Vert.	2390.000	PK	45.0	27.7	4.9	34.3	-	43.3	73.9	30.6	
Vert.	4804.000	PK	41.8	31.2	7.0	33.5	-	46.6	73.9	27.3	Floor noise
Vert.	7206.000	PK	42.6	35.5	8.4	33.4	-	53.1	73.9	20.8	Floor noise
Vert.	9608.000	PK	43.5	38.4	8.9	33.8	-	57.0	73.9	16.9	Floor noise
Vert.	2390.000	AV	32.9	27.7	4.9	34.3	1.7	33.0	53.9	20.9	*1)
Vert.	4804.000	AV	33.8	31.2	7.0	33.5	-	38.6	53.9	15.4	Floor noise
Vert.	7206.000	AV	34.0	35.5	8.4	33.4	-	44.5	53.9	9.4	Floor noise
Vert.	9608.000	AV	33.8	38.4	8.9	33.8	-	47.3	53.9	6.6	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 (3.65 m / 3.0 m) = 1.71 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

20dBc Data Sheet

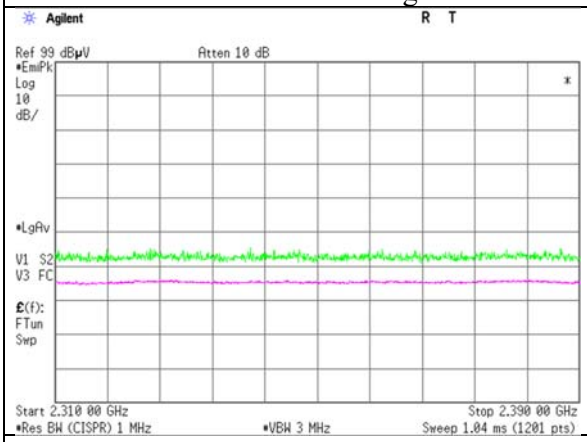
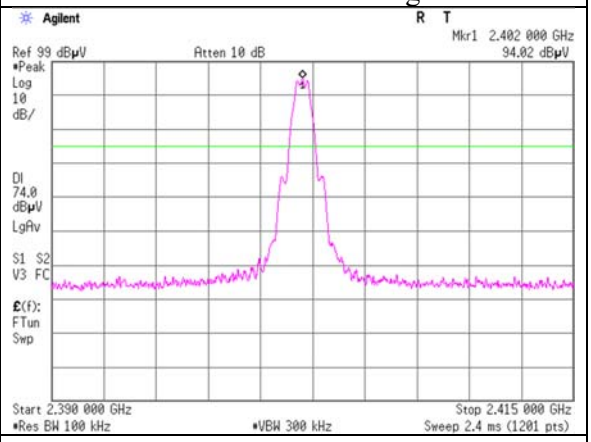
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	94.0	27.7	4.9	34.3	92.5	-	-	Carrier
Hori.	2400.000	PK	41.9	27.8	4.9	34.3	40.3	72.5	32.2	
Hori.	2399.960	PK	42.4	27.8	4.9	34.3	40.8	72.5	31.7	
Vert.	2402.000	PK	94.7	27.7	4.9	34.3	93.1	-	-	Carrier
Vert.	2400.000	PK	41.8	27.8	4.9	34.3	40.2	73.1	32.9	
Vert.	2399.945	PK	42.8	27.8	4.9	34.3	41.3	73.1	31.9	

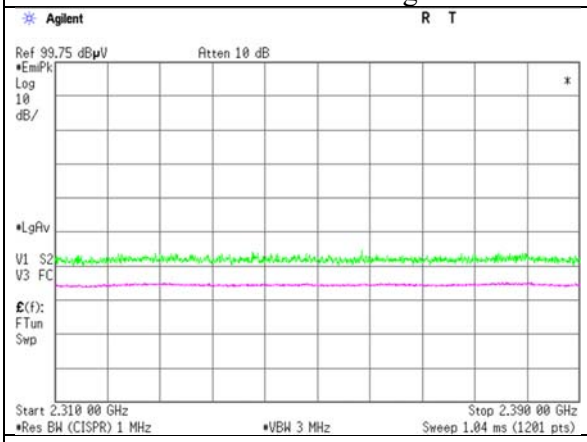
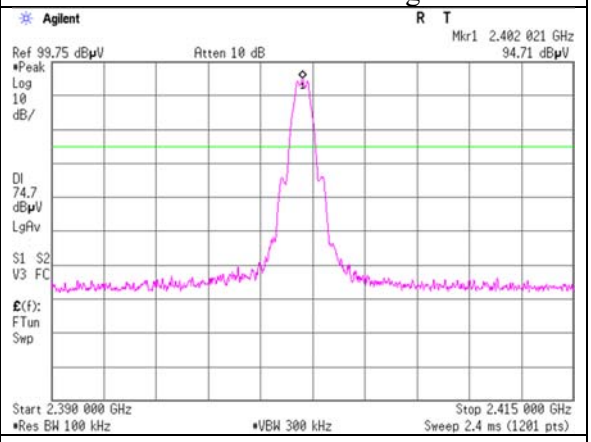
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	March 26, 2019
Temperature / Humidity	21 deg. C / 35 % RH
Engineer	Yuichiro Yamazaki
	(1 GHz - 10 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

* 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

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	March 26, 2019	March 26, 2019	April 4, 2019
Temperature / Humidity	21 deg. C / 35 % RH	21 deg. C / 35 % RH	23 deg. C / 30 % RH
Engineer	Yuichiro Yamazaki	Yuta Moriya	Yuta Moriya
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)	(Below 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.	82.213	QP	35.7	6.5	7.3	30.3	-	19.1	40.0	20.9	
Hori.	124.700	QP	32.9	13.3	7.6	30.1	-	23.7	43.5	19.8	
Hori.	143.512	QP	35.8	14.5	7.8	30.0	-	28.1	43.5	15.4	
Hori.	150.602	QP	29.9	14.7	7.8	30.0	-	22.5	43.5	21.0	
Hori.	169.891	QP	29.2	15.6	8.0	29.8	-	22.9	43.5	20.6	
Hori.	665.549	QP	26.3	19.4	10.4	29.4	-	26.8	46.0	19.3	
Hori.	4880.000	PK	42.2	31.5	7.1	33.5	-	47.3	73.9	26.6	Floor noise
Hori.	7320.000	PK	42.6	35.9	8.4	33.5	-	53.4	73.9	20.5	Floor noise
Hori.	9760.000	PK	43.7	38.6	8.9	33.8	-	57.3	73.9	16.6	Floor noise
Hori.	4880.000	AV	34.0	31.5	7.1	33.5	-	39.1	53.9	14.8	Floor noise
Hori.	7320.000	AV	33.9	35.9	8.4	33.5	-	44.7	53.9	9.2	Floor noise
Hori.	9760.000	AV	33.9	38.6	8.9	33.8	-	47.6	53.9	6.3	Floor noise
Vert.	82.333	QP	38.5	6.5	7.3	30.3	-	22.0	40.0	18.1	
Vert.	124.751	QP	38.3	13.3	7.6	30.1	-	29.1	43.5	14.4	
Vert.	143.537	QP	37.9	14.5	7.8	30.0	-	30.2	43.5	13.3	
Vert.	150.593	QP	34.0	14.7	7.8	30.0	-	26.6	43.5	16.9	
Vert.	169.948	QP	33.0	15.6	8.0	29.8	-	26.7	43.5	16.8	
Vert.	665.529	QP	31.6	19.4	10.4	29.4	-	32.1	46.0	14.0	
Vert.	4880.000	PK	42.0	31.5	7.1	33.5	-	47.0	73.9	26.9	Floor noise
Vert.	7320.000	PK	42.5	35.9	8.4	33.5	-	53.3	73.9	20.6	Floor noise
Vert.	9760.000	PK	43.4	38.6	8.9	33.8	-	57.0	73.9	16.9	Floor noise
Vert.	4880.000	AV	33.7	31.5	7.1	33.5	-	38.8	53.9	15.1	Floor noise
Vert.	7320.000	AV	34.2	35.9	8.4	33.5	-	45.0	53.9	9.0	Floor noise
Vert.	9760.000	AV	34.0	38.6	8.9	33.8	-	47.7	53.9	6.2	Floor noise

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

*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 (3.65 m / 3.0 m) = 1.71 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	March 26, 2019	March 26, 2019	April 4, 2019
Temperature / Humidity	21 deg. C / 35 % RH	21 deg. C / 35 % RH	23 deg. C / 30 % RH
Engineer	Yuichiro Yamazaki	Yuta Moriya	Yuta Moriya
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)	(Below 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.	82.226	QP	35.5	6.5	7.3	30.3	-	18.9	40.0	21.1	
Hori.	124.682	QP	32.7	13.3	7.6	30.1	-	23.5	43.5	20.0	
Hori.	143.526	QP	36.2	14.5	7.8	30.0	-	28.5	43.5	15.0	
Hori.	150.590	QP	30.1	14.7	7.8	30.0	-	22.7	43.5	20.8	
Hori.	169.884	QP	29.2	15.6	8.0	29.8	-	22.9	43.5	20.6	
Hori.	665.549	QP	26.2	19.4	10.4	29.4	-	26.7	46.0	19.4	
Hori.	2483.500	PK	52.6	27.5	5.0	34.2	-	50.8	73.9	23.1	
Hori.	4960.000	PK	42.3	31.7	7.1	33.5	-	47.6	73.9	26.3	Floor noise
Hori.	7440.000	PK	42.6	36.1	8.4	33.5	-	53.5	73.9	20.4	Floor noise
Hori.	9920.000	PK	43.6	38.5	8.9	33.8	-	57.2	73.9	16.7	Floor noise
Hori.	2483.500	AV	36.7	27.5	5.0	34.2	1.7	36.7	53.9	17.2	*1)
Hori.	4960.000	AV	32.9	31.7	7.1	33.5	-	38.2	53.9	15.7	Floor noise
Hori.	7440.000	AV	33.6	36.1	8.4	33.5	-	44.6	53.9	9.3	Floor noise
Hori.	9920.000	AV	33.8	38.5	8.9	33.8	-	47.4	53.9	6.5	Floor noise
Vert.	82.348	QP	38.4	6.5	7.3	30.3	-	21.9	40.0	18.2	
Vert.	124.712	QP	38.2	13.3	7.6	30.1	-	29.0	43.5	14.5	
Vert.	143.526	QP	37.2	14.5	7.8	30.0	-	29.5	43.5	14.0	
Vert.	150.609	QP	34.0	14.7	7.8	30.0	-	26.6	43.5	16.9	
Vert.	169.998	QP	32.9	15.6	8.0	29.8	-	26.6	43.5	16.9	
Vert.	665.519	QP	31.6	19.4	10.4	29.4	-	32.1	46.0	14.0	
Vert.	2483.500	PK	50.6	27.5	5.0	34.2	-	48.9	73.9	25.1	
Vert.	4960.000	PK	42.0	31.7	7.1	33.5	-	47.3	73.9	26.7	Floor noise
Vert.	7440.000	PK	42.7	36.1	8.4	33.5	-	53.6	73.9	20.3	Floor noise
Vert.	9920.000	PK	43.2	38.5	8.9	33.8	-	56.7	73.9	17.2	Floor noise
Vert.	2483.500	AV	33.2	27.5	5.0	34.2	1.7	33.2	53.9	20.7	*1)
Vert.	4960.000	AV	33.2	31.7	7.1	33.5	-	38.5	53.9	15.4	Floor noise
Vert.	7440.000	AV	33.8	36.1	8.4	33.5	-	44.8	53.9	9.1	Floor noise
Vert.	9920.000	AV	33.7	38.5	8.9	33.8	-	47.3	53.9	6.6	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).

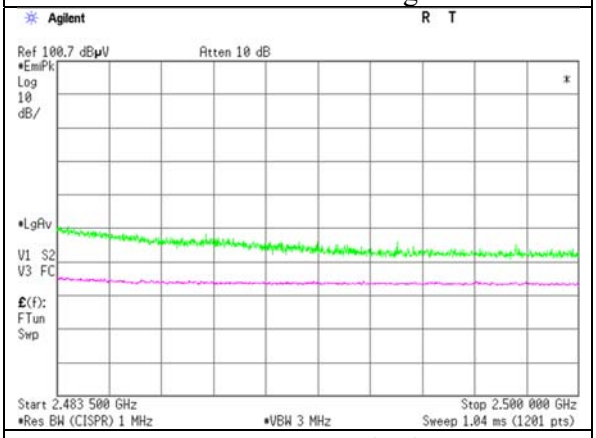
Distance factor: 1 GHz - 10 GHz 20log (3.65 m / 3.0 m) = 1.71 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

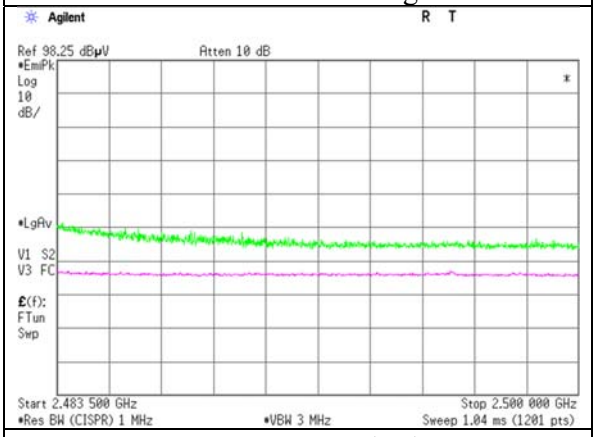
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	March 26, 2019
Temperature / Humidity	21 deg. C / 35 % RH
Engineer	Yuichiro Yamazaki
	(1 GHz - 10 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

* 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
(BLE CHIP: CC2640R2F)

Report No.	12608632H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	March 5, 2019	March 5, 2019
Temperature / Humidity	20 deg. C / 30 % RH	22 deg. C / 36 % RH
Engineer	Yuichiro Yamazaki	Koji Yamamoto
	(Above 1 GHz)	(Below 1 GHz)
Mode	Tx BT LE 1 Mbps 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.	32.049	QP	27.4	17.7	6.7	30.5	-	21.3	40.0	18.7	
Hori.	38.165	QP	25.1	15.4	6.8	30.5	-	16.8	40.0	23.2	
Hori.	92.575	QP	24.7	8.5	7.4	30.3	-	10.3	43.5	33.2	
Hori.	165.306	QP	23.9	15.4	7.9	29.9	-	17.4	43.5	26.1	
Hori.	608.421	QP	22.6	19.2	10.2	29.7	-	22.3	46.0	23.7	
Hori.	862.863	QP	21.3	21.7	11.1	28.3	-	25.9	46.0	20.1	
Hori.	2390.000	PK	44.7	27.7	5.2	34.3	-	43.3	73.9	30.6	
Hori.	4804.000	PK	43.2	31.2	7.3	33.5	-	48.2	73.9	25.7	
Hori.	7206.000	PK	44.8	35.5	8.4	33.4	-	55.3	73.9	18.7	
Hori.	9608.000	PK	42.6	38.4	9.5	33.8	-	56.7	73.9	17.3	Floor noise
Hori.	2390.000	AV	33.4	27.7	5.2	34.3	-	32.0	53.9	21.9	
Hori.	4804.000	AV	34.0	31.2	7.3	33.5	-	39.0	53.9	14.9	
Hori.	7206.000	AV	34.2	35.5	8.4	33.4	-	44.7	53.9	9.2	
Hori.	9608.000	AV	32.4	38.4	9.5	33.8	-	46.4	53.9	7.5	Floor noise
Vert.	32.049	QP	27.1	17.7	6.7	30.5	-	21.0	40.0	19.0	
Vert.	38.165	QP	25.5	15.4	6.8	30.5	-	17.2	40.0	22.8	
Vert.	92.575	QP	26.7	8.5	7.4	30.3	-	12.3	43.5	31.2	
Vert.	165.306	QP	23.9	15.4	7.9	29.9	-	17.3	43.5	26.2	
Vert.	608.421	QP	22.6	19.2	10.2	29.7	-	22.3	46.0	23.7	
Vert.	862.863	QP	21.2	21.7	11.1	28.3	-	25.7	46.0	20.3	
Vert.	2390.000	PK	45.0	27.7	5.2	34.3	-	43.6	73.9	30.3	
Vert.	4804.000	PK	44.2	31.2	7.3	33.5	-	49.3	73.9	24.6	
Vert.	7206.000	PK	45.1	35.5	8.4	33.4	-	55.6	73.9	18.3	
Vert.	9608.000	PK	43.1	38.4	9.5	33.8	-	57.2	73.9	16.7	Floor noise
Vert.	2390.000	AV	32.8	27.7	5.2	34.3	-	31.4	53.9	22.5	
Vert.	4804.000	AV	35.9	31.2	7.3	33.5	-	41.0	53.9	12.9	
Vert.	7206.000	AV	34.3	35.5	8.4	33.4	-	44.7	53.9	9.2	
Vert.	9608.000	AV	32.7	38.4	9.5	33.8	-	46.7	53.9	7.2	Floor noise

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

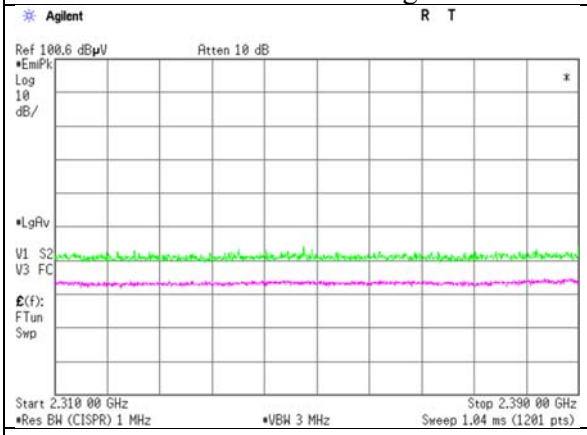
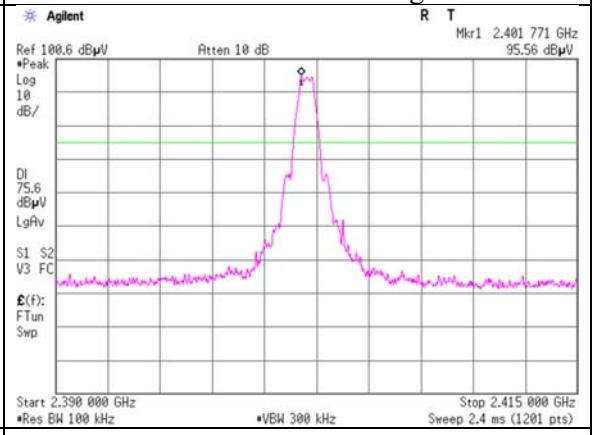
20dBc Data Sheet

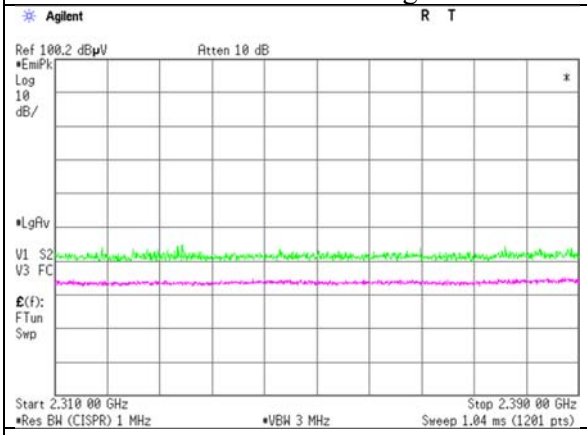
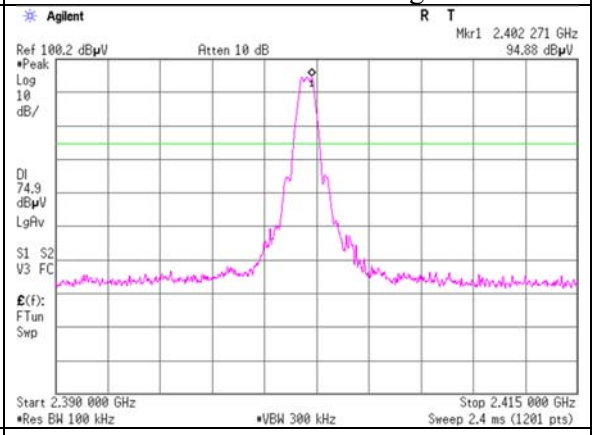
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	95.6	27.7	5.2	34.3	94.2	-	-	Carrier
Hori.	2400.000	PK	51.3	27.8	5.2	34.3	50.0	74.2	24.3	
Vert.	2402.000	PK	94.9	27.7	5.2	34.3	93.6	-	-	Carrier
Vert.	2400.000	PK	50.1	27.8	5.2	34.3	48.8	73.6	24.8	

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

Radiated Spurious Emission
(Reference Plot for band-edge)
(BLE CHIP: CC2640R2F)

Report No.	12608632H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	March 5, 2019
Temperature / Humidity	20 deg. C / 30 % RH
Engineer	Yuichiro Yamazaki (Above 1 GHz)
Mode	Tx BT LE 1 Mbps 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
(BLE CHIP: CC2640R2F)

Report No.	12608632H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	March 5, 2019	March 5, 2019
Temperature / Humidity	20 deg. C / 30 % RH	22 deg. C / 36 % RH
Engineer	Yuichiro Yamazaki	Koji Yamamoto
	(Above 1 GHz)	(Below 1 GHz)
Mode	Tx BT LE 1 Mbps 2440MHz	

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.	30.956	QP	26.3	18.1	6.7	30.5	-	20.6	40.0	19.4	
Hori.	37.126	QP	25.1	15.8	6.8	30.5	-	17.2	40.0	22.8	
Hori.	98.319	QP	25.2	9.7	7.4	30.3	-	12.1	43.5	31.4	
Hori.	180.284	QP	23.7	16.1	8.1	29.8	-	18.1	43.5	25.4	
Hori.	545.142	QP	22.8	17.6	9.9	29.9	-	20.4	46.0	25.6	
Hori.	892.889	QP	21.1	21.8	11.2	28.1	-	26.1	46.0	19.9	
Hori.	4880.000	PK	44.7	31.5	7.4	33.5	-	50.0	73.9	23.9	
Hori.	7320.000	PK	45.1	35.9	8.5	33.5	-	56.0	73.9	17.9	
Hori.	9760.000	PK	43.1	38.6	9.6	33.8	-	57.4	73.9	16.5	Floor noise
Hori.	4880.000	AV	35.4	31.5	7.4	33.5	-	40.8	53.9	13.1	
Hori.	7320.000	AV	36.7	35.9	8.5	33.5	-	47.6	53.9	6.3	
Hori.	9760.000	AV	33.3	38.6	9.6	33.8	-	47.6	53.9	6.3	Floor noise
Vert.	30.956	QP	33.2	18.1	6.7	30.5	-	27.5	40.0	12.5	
Vert.	37.126	QP	25.8	15.8	6.8	30.5	-	17.9	40.0	22.2	
Vert.	98.319	QP	25.5	9.7	7.4	30.3	-	12.4	43.5	31.1	
Vert.	180.284	QP	23.8	16.1	8.1	29.8	-	18.1	43.5	25.4	
Vert.	545.142	QP	22.4	17.6	9.9	29.9	-	20.0	46.0	26.0	
Vert.	892.889	QP	20.7	21.8	11.2	28.1	-	25.7	46.0	20.3	
Vert.	4880.000	PK	43.3	31.5	7.4	33.5	-	48.7	73.9	25.2	
Vert.	7320.000	PK	44.5	35.9	8.5	33.5	-	55.4	73.9	18.5	
Vert.	9760.000	PK	43.2	38.6	9.6	33.8	-	57.5	73.9	16.4	Floor noise
Vert.	4880.000	AV	34.3	31.5	7.4	33.5	-	39.7	53.9	14.2	
Vert.	7320.000	AV	35.8	35.9	8.5	33.5	-	46.7	53.9	7.2	
Vert.	9760.000	AV	33.3	38.6	9.6	33.8	-	47.6	53.9	6.3	Floor noise

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

(BLE CHIP: CC2640R2F)

Report No.	12608632H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	March 5, 2019	March 5, 2019
Temperature / Humidity	20 deg. C / 30 % RH	22 deg. C / 36 % RH
Engineer	Yuichiro Yamazaki	Koji Yamamoto
	(Above 1 GHz)	(Below 1 GHz)
Mode	Tx BT LE 1 Mbps 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.	31.001	QP	26.2	18.1	6.7	30.5	-	20.5	40.0	19.6	
Hori.	36.150	QP	25.5	16.2	6.8	30.5	-	17.9	40.0	22.1	
Hori.	98.368	QP	26.1	9.8	7.5	30.3	-	13.0	43.5	30.5	
Hori.	178.485	QP	23.7	16.0	8.0	29.8	-	17.9	43.5	25.6	
Hori.	612.004	QP	22.3	19.3	10.2	29.6	-	22.1	46.0	23.9	
Hori.	865.689	QP	22.1	21.7	11.2	28.2	-	26.7	46.0	19.3	
Hori.	2483.500	PK	45.5	27.5	5.2	34.2	-	44.0	73.9	29.9	
Hori.	4960.000	PK	42.9	31.7	7.4	33.5	-	48.5	73.9	25.4	
Hori.	7440.000	PK	44.3	36.1	8.5	33.5	-	55.4	73.9	18.5	
Hori.	9920.000	PK	43.2	38.5	9.6	33.8	-	57.5	73.9	16.4	Floor noise
Hori.	2483.500	AV	35.1	27.5	5.2	34.2	-	33.6	53.9	20.3	
Hori.	4960.000	AV	31.7	31.7	7.4	33.5	-	37.3	53.9	16.6	
Hori.	7440.000	AV	34.1	36.1	8.5	33.5	-	45.3	53.9	8.6	
Hori.	9920.000	AV	32.9	38.5	9.6	33.8	-	47.3	53.9	6.6	Floor noise
Vert.	31.001	QP	29.6	18.1	6.7	30.5	-	23.9	40.0	16.1	
Vert.	36.150	QP	25.7	16.2	6.8	30.5	-	18.1	40.0	21.9	
Vert.	98.368	QP	25.8	9.8	7.5	30.3	-	12.7	43.5	30.8	
Vert.	178.485	QP	23.4	16.0	8.0	29.8	-	17.7	43.5	25.8	
Vert.	612.004	QP	22.5	19.3	10.2	29.6	-	22.3	46.0	23.7	
Vert.	865.689	QP	21.9	21.7	11.2	28.2	-	26.6	46.0	19.4	
Vert.	2483.500	PK	44.5	27.5	5.2	34.2	-	43.0	73.9	30.9	
Vert.	4960.000	PK	42.4	31.7	7.4	33.5	-	48.0	73.9	25.9	
Vert.	7440.000	PK	44.0	36.1	8.5	33.5	-	55.1	73.9	18.8	
Vert.	9920.000	PK	43.1	38.5	9.6	33.8	-	57.4	73.9	16.5	Floor noise
Vert.	2483.500	AV	34.3	27.5	5.2	34.2	-	32.8	53.9	21.1	
Vert.	4960.000	AV	32.1	31.7	7.4	33.5	-	37.7	53.9	16.2	
Vert.	7440.000	AV	33.6	36.1	8.5	33.5	-	44.7	53.9	9.2	
Vert.	9920.000	AV	33.1	38.5	9.6	33.8	-	47.5	53.9	6.5	Floor noise

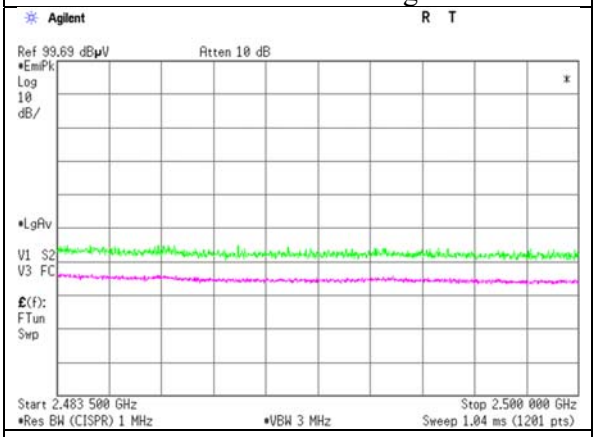
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

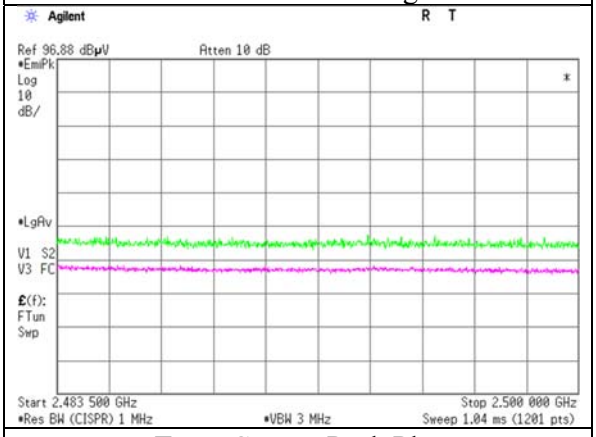
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

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
(Reference Plot for band-edge)
(BLE CHIP: CC2640R2F)

Report No.	12608632H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	March 5, 2019
Temperature / Humidity	20 deg. C / 30 % RH
Engineer	Yuichiro Yamazaki
	(Above 1 GHz)
Mode	Tx BT LE 1 Mbps 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
(BLE CHIP: CC2640R2F)

Report No.	12608632H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	March 5, 2019	March 5, 2019
Temperature / Humidity	20 deg. C / 30 % RH	22 deg. C / 36 % RH
Engineer	Yuichiro Yamazaki	Koji Yamamoto
	(Above 1 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2 Mbps 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.	31.419	QP	25.9	17.9	6.7	30.5	-	20.1	40.0	19.9	
Hori.	37.752	QP	24.9	15.6	6.8	30.5	-	16.7	40.0	23.3	
Hori.	98.376	QP	25.4	9.8	7.5	30.3	-	12.3	43.5	31.2	
Hori.	180.116	QP	23.6	16.1	8.0	29.8	-	18.0	43.5	25.5	
Hori.	542.850	QP	23.1	17.5	9.9	29.9	-	20.6	46.0	25.4	
Hori.	868.531	QP	22.0	21.8	11.2	28.2	-	26.7	46.0	19.3	
Hori.	2390.000	PK	44.9	27.7	5.2	34.3	-	43.5	73.9	30.4	
Hori.	4804.000	PK	42.7	31.2	7.3	33.5	-	47.8	73.9	26.1	
Hori.	7206.000	PK	45.7	35.5	8.4	33.4	-	56.1	73.9	17.8	
Hori.	9608.000	PK	43.0	38.4	9.5	33.8	-	57.0	73.9	16.9	Floor noise
Hori.	2390.000	AV	33.6	27.7	5.2	34.3	-	32.2	53.9	21.7	
Hori.	4804.000	AV	33.2	31.2	7.3	33.5	-	38.3	53.9	15.6	
Hori.	7206.000	AV	34.8	35.5	8.4	33.4	-	45.3	53.9	8.6	
Hori.	9608.000	AV	32.1	38.4	9.5	33.8	-	46.1	53.9	7.8	Floor noise
Vert.	31.419	QP	28.2	17.9	6.7	30.5	-	22.3	40.0	17.7	
Vert.	37.752	QP	24.4	15.6	6.8	30.5	-	16.2	40.0	23.8	
Vert.	98.376	QP	25.0	9.8	7.5	30.3	-	12.0	43.5	31.6	
Vert.	180.116	QP	24.1	16.1	8.0	29.8	-	18.5	43.5	25.0	
Vert.	542.850	QP	23.6	17.5	9.9	29.9	-	21.2	46.0	24.8	
Vert.	868.531	QP	22.9	21.8	11.2	28.2	-	27.6	46.0	18.4	
Vert.	2390.000	PK	44.9	27.7	5.2	34.3	-	43.5	73.9	30.5	
Vert.	4804.000	PK	44.7	31.2	7.3	33.5	-	49.7	73.9	24.2	
Vert.	7206.000	PK	44.6	35.5	8.4	33.4	-	55.0	73.9	18.9	
Vert.	9608.000	PK	43.2	38.4	9.5	33.8	-	57.3	73.9	16.6	Floor noise
Vert.	2390.000	AV	33.0	27.7	5.2	34.3	-	31.6	53.9	22.3	
Vert.	4804.000	AV	35.0	31.2	7.3	33.5	-	40.1	53.9	13.8	
Vert.	7206.000	AV	34.3	35.5	8.4	33.4	-	44.8	53.9	9.1	
Vert.	9608.000	AV	32.7	38.4	9.5	33.8	-	46.7	53.9	7.2	Floor noise

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

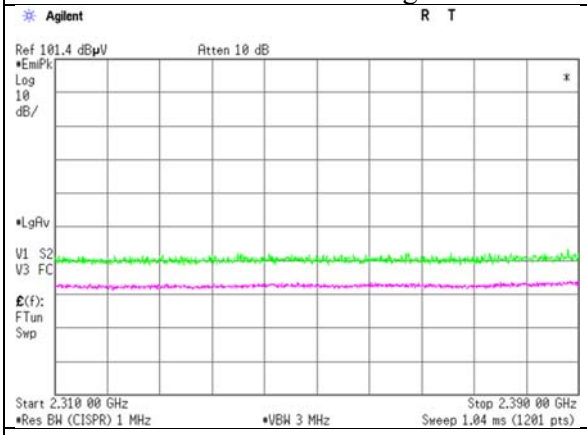
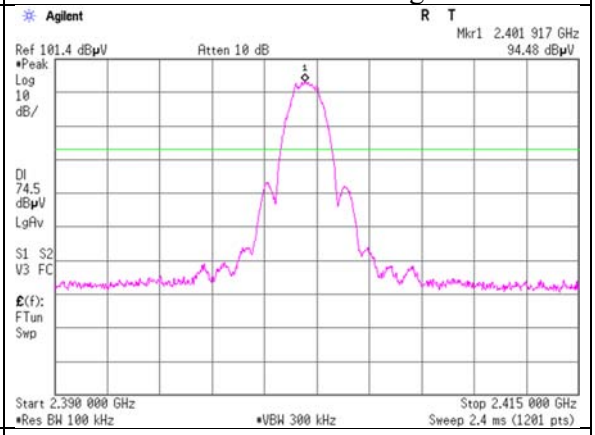
20dBc Data Sheet

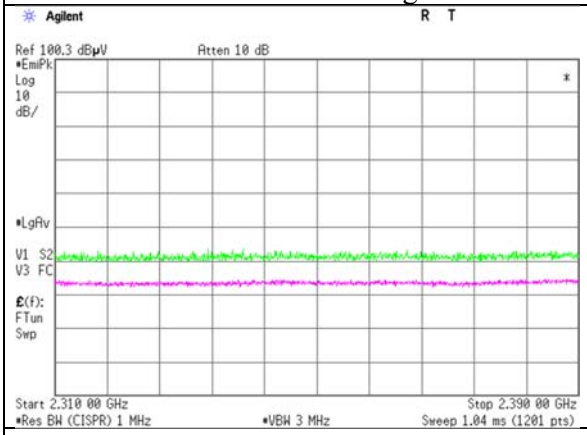
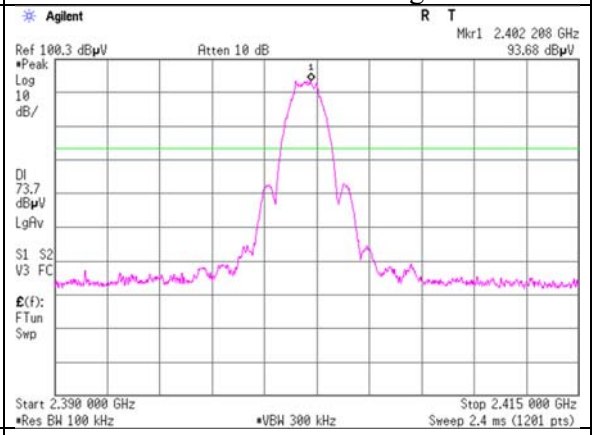
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	94.5	27.7	5.2	34.3	93.2	-	-	Carrier
Hori.	2400.000	PK	64.1	27.8	5.2	34.3	62.8	73.2	10.4	
Vert.	2402.000	PK	93.7	27.7	5.2	34.3	92.4	-	-	Carrier
Vert.	2400.000	PK	62.4	27.8	5.2	34.3	61.1	72.4	11.3	

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

Radiated Spurious Emission
(Reference Plot for band-edge)
(BLE CHIP: CC2640R2F)

Report No.	12608632H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	March 5, 2019
Temperature / Humidity	20 deg. C / 30 % RH
Engineer	Yuichiro Yamazaki (Above 1 GHz)
Mode	Tx BT LE 2 Mbps 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
(BLE CHIP: CC2640R2F)

Report No.	12608632H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	March 5, 2019	March 5, 2019
Temperature / Humidity	20 deg. C / 30 % RH	22 deg. C / 36 % RH
Engineer	Yuichiro Yamazaki	Koji Yamamoto
	(Above 1 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2 Mbps 2440MHz	

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.	31.065	QP	27.0	18.1	6.7	30.5	-	21.3	40.0	18.7	
Hori.	41.174	QP	24.7	14.3	6.9	30.5	-	15.3	40.0	24.7	
Hori.	98.322	QP	25.4	9.7	7.4	30.3	-	12.3	43.5	31.2	
Hori.	182.921	QP	23.6	16.2	8.1	29.8	-	18.1	43.5	25.4	
Hori.	552.393	QP	23.1	17.8	10.0	29.8	-	21.1	46.0	24.9	
Hori.	862.650	QP	21.9	21.7	11.1	28.3	-	26.4	46.0	19.6	
Hori.	4880.000	PK	44.6	31.5	7.4	33.5	-	49.9	73.9	24.0	
Hori.	7320.000	PK	44.7	35.9	8.5	33.5	-	55.6	73.9	18.3	
Hori.	9760.000	PK	43.3	38.6	9.6	33.8	-	57.6	73.9	16.3	Floor noise
Hori.	4880.000	AV	35.3	31.5	7.4	33.5	-	40.6	53.9	13.3	
Hori.	7320.000	AV	36.5	35.9	8.5	33.5	-	47.4	53.9	6.5	
Hori.	9760.000	AV	33.4	38.6	9.6	33.8	-	47.7	53.9	6.2	Floor noise
Vert.	31.065	QP	28.3	18.1	6.7	30.5	-	22.6	40.0	17.5	
Vert.	41.174	QP	24.6	14.3	6.9	30.5	-	15.2	40.0	24.8	
Vert.	98.322	QP	26.1	9.7	7.4	30.3	-	13.0	43.5	30.5	
Vert.	182.921	QP	23.2	16.2	8.1	29.8	-	17.7	43.5	25.9	
Vert.	552.393	QP	23.8	17.8	10.0	29.8	-	21.8	46.0	24.2	
Vert.	862.650	QP	22.0	21.7	11.1	28.3	-	26.6	46.0	19.4	
Vert.	4880.000	PK	43.7	31.5	7.4	33.5	-	49.1	73.9	24.8	
Vert.	7320.000	PK	44.6	35.9	8.5	33.5	-	55.5	73.9	18.4	
Vert.	9760.000	PK	43.0	38.6	9.6	33.8	-	57.4	73.9	16.5	Floor noise
Vert.	4880.000	AV	34.3	31.5	7.4	33.5	-	39.7	53.9	14.2	
Vert.	7320.000	AV	36.7	35.9	8.5	33.5	-	47.6	53.9	6.3	
Vert.	9760.000	AV	33.5	38.6	9.6	33.8	-	47.9	53.9	6.0	Floor noise

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

(BLE CHIP: CC2640R2F)

Report No.	12608632H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	March 5, 2019	March 5, 2019
Temperature / Humidity	20 deg. C / 30 % RH	22 deg. C / 36 % RH
Engineer	Yuichiro Yamazaki	Koji Yamamoto
	(Above 1 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2 Mbps 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.	30.741	QP	26.6	18.2	6.7	30.5	-	21.0	40.0	19.0	
Hori.	38.070	QP	25.2	15.4	6.8	30.5	-	16.9	40.0	23.1	
Hori.	97.720	QP	25.4	9.6	7.4	30.3	-	12.2	43.5	31.3	
Hori.	137.754	QP	24.8	14.1	7.8	30.1	-	16.6	43.5	26.9	
Hori.	551.552	QP	23.2	17.8	10.0	29.8	-	21.2	46.0	24.8	
Hori.	871.883	QP	22.1	21.8	11.2	28.2	-	26.9	46.0	19.1	
Hori.	2483.500	PK	50.4	27.5	5.2	34.2	-	48.9	73.9	25.0	
Hori.	4960.000	PK	42.3	31.7	7.4	33.5	-	47.9	73.9	26.0	
Hori.	7440.000	PK	44.5	36.1	8.5	33.5	-	55.6	73.9	18.3	
Hori.	9920.000	PK	43.1	38.5	9.6	33.8	-	57.4	73.9	16.5	Floor noise
Hori.	2483.500	AV	44.2	27.5	5.2	34.2	-	42.7	53.9	11.2	
Hori.	4960.000	AV	31.9	31.7	7.4	33.5	-	37.5	53.9	16.4	
Hori.	7440.000	AV	34.6	36.1	8.5	33.5	-	45.7	53.9	8.2	
Hori.	9920.000	AV	33.3	38.5	9.6	33.8	-	47.7	53.9	6.2	Floor noise
Vert.	30.741	QP	28.6	18.2	6.7	30.5	-	23.0	40.0	17.0	
Vert.	38.070	QP	25.4	15.4	6.8	30.5	-	17.1	40.0	22.9	
Vert.	97.720	QP	25.0	9.6	7.4	30.3	-	11.7	43.5	31.8	
Vert.	137.754	QP	25.5	14.1	7.8	30.1	-	17.4	43.5	26.1	
Vert.	551.552	QP	23.2	17.8	10.0	29.8	-	21.1	46.0	24.9	
Vert.	871.883	QP	21.8	21.8	11.2	28.2	-	26.5	46.0	19.5	
Vert.	2483.500	PK	47.9	27.5	5.2	34.2	-	46.5	73.9	27.5	
Vert.	4960.000	PK	42.4	31.7	7.4	33.5	-	48.0	73.9	25.9	
Vert.	7440.000	PK	44.1	36.1	8.5	33.5	-	55.3	73.9	18.7	
Vert.	9920.000	PK	42.3	38.5	9.6	33.8	-	56.6	73.9	17.3	Floor noise
Vert.	2483.500	AV	40.7	27.5	5.2	34.2	-	39.2	53.9	14.7	
Vert.	4960.000	AV	31.7	31.7	7.4	33.5	-	37.3	53.9	16.6	
Vert.	7440.000	AV	33.7	36.1	8.5	33.5	-	44.9	53.9	9.1	
Vert.	9920.000	AV	33.1	38.5	9.6	33.8	-	47.4	53.9	6.5	Floor noise

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

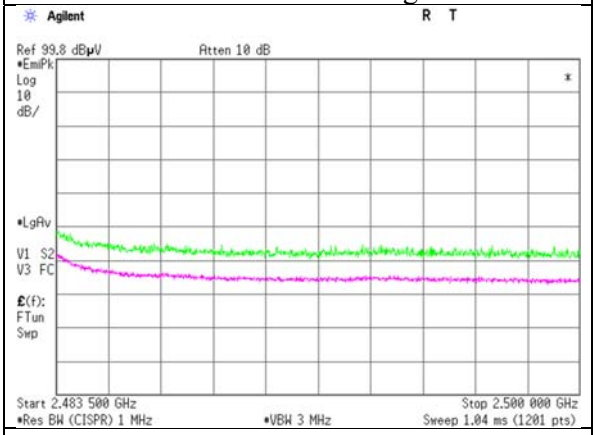
Distance factor: 1 GHz - 10 GHz 20log (3.75 m / 3.0 m) = 1.94 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(BLE CHIP: CC2640R2F)

Report No.	12608632H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	March 5, 2019
Temperature / Humidity	20 deg. C / 30 % RH
Engineer	Yuichiro Yamazaki
	(Above 1 GHz)
Mode	Tx BT LE 2 Mbps 2480 MHz

Horizontal

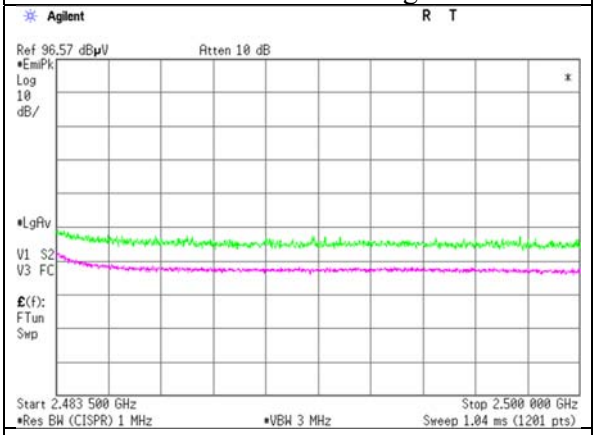
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

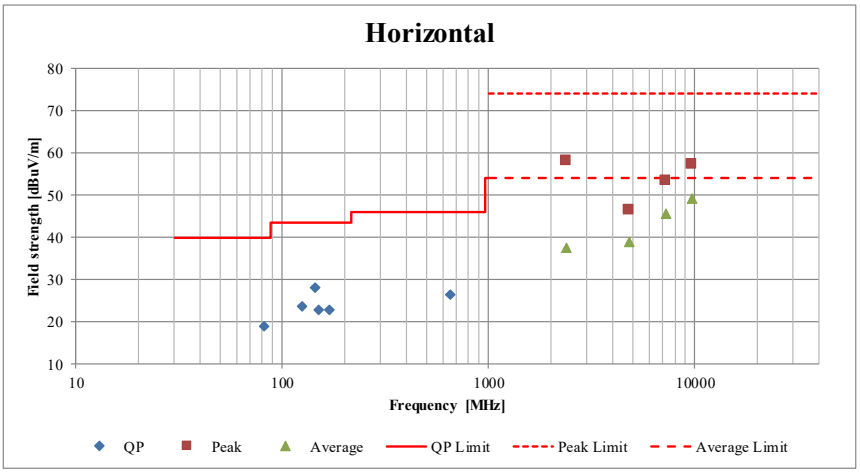


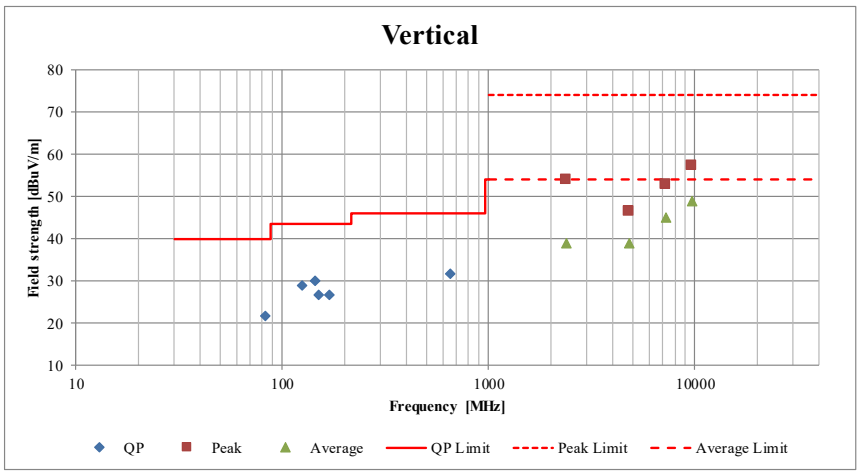
Trace Green : Peak Plot
Trace Purple : Average Plot

* 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)
(WiFi / BLE module: QCA6574AU)

Report No.	12608632H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	March 25, 2019	March 26, 2019	April 4, 2019
Temperature / Humidity	23 deg. C / 35 % RH	21 deg. C / 35 % RH	23 deg. C / 30 % RH
Engineer	Yuta Moriya	Yuta Moriya	Yuta Moriya
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx 11n-20 2412 MHz		

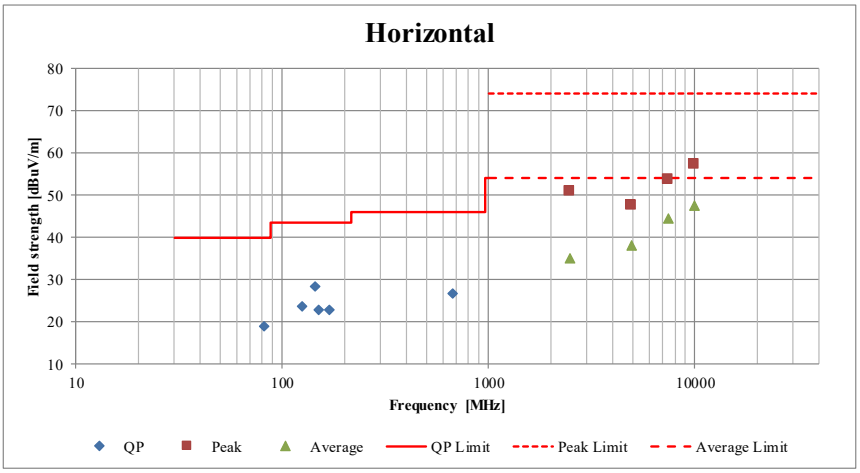


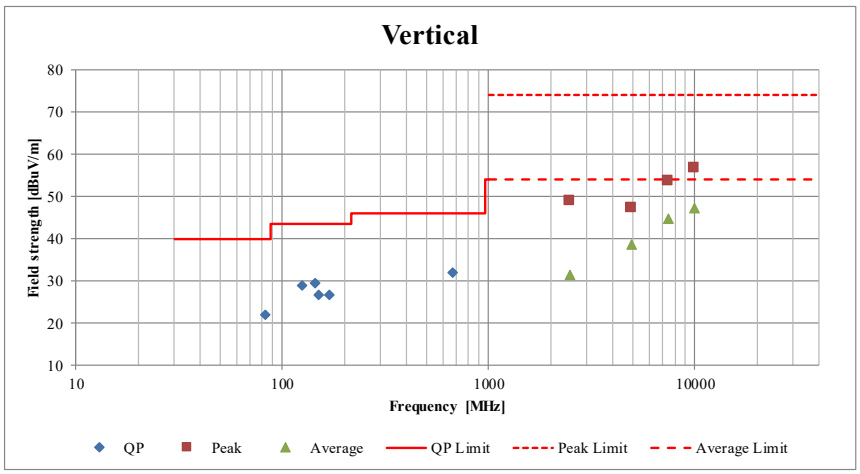


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Radiated Spurious Emission
(Plot data, Worst case)
(WiFi / BLE module: QCA6574AU)

Report No.	12608632H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	March 26, 2019	March 26, 2019	April 4, 2019
Temperature / Humidity	21 deg. C / 35 % RH	21 deg. C / 35 % RH	23 deg. C / 30 % RH
Engineer	Yuichiro Yamazaki (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 26.5 GHz)	Yuta Moriya (Below 1 GHz)
Mode	Tx BT LE 2480 MHz		

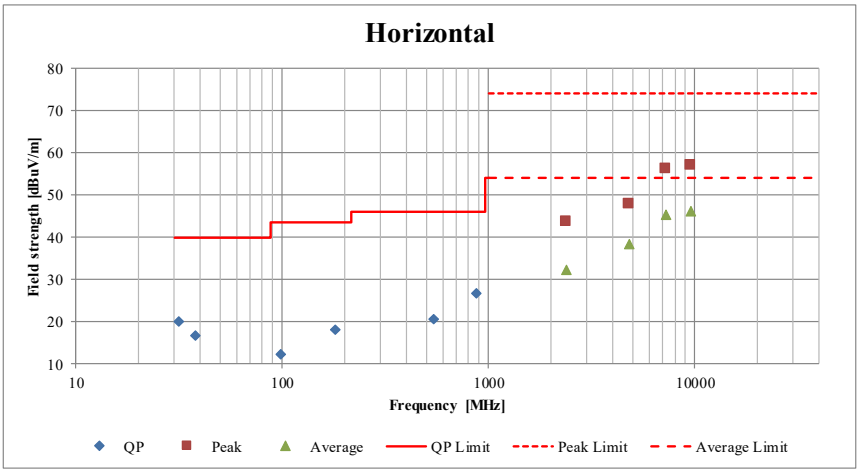


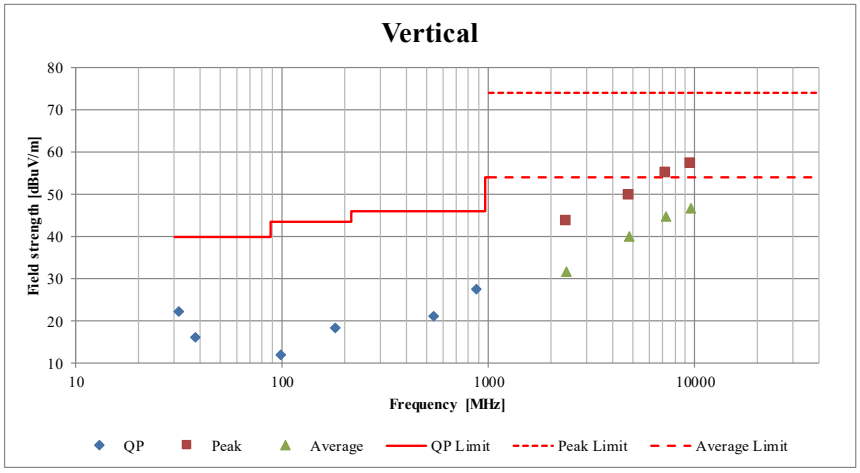


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Radiated Spurious Emission
(Plot data, Worst case)
(BLE CHIP: CC2640R2F)

Report No.	12608632H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	March 5, 2019	March 5, 2019
Temperature / Humidity	20 deg. C / 30 % RH	22 deg. C / 36 % RH
Engineer	Yuichiro Yamazaki	Koji Yamamoto
	(Above 1 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2 Mbps 2402 MHz	





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

Radiated Spurious Emission

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	May 17, 2019	May 16, 2019	May 17, 2019
Temperature / Humidity	23 deg. C / 35 % RH	24 deg. C / 39 % RH	23 deg. C / 35 % RH
Engineer	Yuta Moriya	Junki Nagatomi	Yuta Moriya
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)	Below 1GHz
Mode	Tx 11n-20 2462 MHz + BT TX Hopping on 3DH5		

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.	82.221	QP	35.6	6.9	7.3	30.3	-	19.4	40.0	20.6	
Hori.	124.433	QP	32.2	13.2	7.6	30.1	-	22.9	43.5	20.6	
Hori.	143.522	QP	35.6	14.5	7.8	30.0	-	27.9	43.5	15.6	
Hori.	150.542	QP	30.2	14.9	7.8	30.0	-	22.9	43.5	20.6	
Hori.	169.113	QP	29.2	15.5	8.0	29.9	-	22.8	43.5	20.7	
Hori.	655.557	QP	26.2	19.3	10.4	29.4	-	26.4	46.0	19.6	
Hori.	2483.500	PK	66.3	27.5	5.0	34.2	-	64.6	73.9	9.3	
Hori.	4924.000	PK	41.1	31.6	7.1	33.5	-	46.3	73.9	27.6	Floor noise
Hori.	7386.000	PK	42.8	36.1	8.3	33.5	-	53.7	73.9	20.2	Floor noise
Hori.	9848.000	PK	43.1	38.6	9.4	33.8	-	57.2	73.9	16.7	Floor noise
Hori.	2483.500	AV	50.9	27.5	5.0	34.2	3.6	52.8	53.9	1.1	*1)
Hori.	4924.000	AV	32.7	31.6	7.1	33.5	-	37.9	53.9	16.0	Floor noise
Hori.	7386.000	AV	33.3	36.1	8.3	33.5	-	44.2	53.9	9.7	Floor noise
Hori.	9848.000	AV	33.5	38.6	9.4	33.8	-	47.6	53.9	6.3	Floor noise
Vert.	82.221	QP	38.4	6.9	7.3	30.3	-	22.2	40.0	17.8	
Vert.	124.332	QP	38.6	13.2	7.6	30.1	-	29.3	43.5	14.2	
Vert.	143.321	QP	38.0	14.5	7.8	30.0	-	30.2	43.5	13.3	
Vert.	150.622	QP	34.2	14.9	7.8	30.0	-	26.9	43.5	16.6	
Vert.	169.993	QP	33.3	15.2	8.0	29.8	-	26.7	43.5	16.8	
Vert.	655.523	QP	31.5	19.3	10.4	29.4	-	31.7	46.0	14.3	
Vert.	2483.500	PK	58.5	27.5	5.0	34.2	-	56.8	73.9	17.1	
Vert.	4924.000	PK	41.0	31.6	7.1	33.5	-	46.2	73.9	27.7	Floor noise
Vert.	7386.000	PK	42.8	36.1	8.3	33.5	-	53.7	73.9	20.2	Floor noise
Vert.	9848.000	PK	43.0	38.6	9.4	33.8	-	57.1	73.9	16.8	Floor noise
Vert.	2483.500	AV	38.4	27.5	5.0	34.2	3.6	40.3	53.9	13.6	*1)
Vert.	4924.000	AV	32.7	31.6	7.1	33.5	-	37.9	53.9	16.0	Floor noise
Vert.	7386.000	AV	33.3	36.1	8.3	33.5	-	44.2	53.9	9.7	Floor noise
Vert.	9848.000	AV	33.3	38.6	9.4	33.8	-	47.4	53.9	6.5	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 (3.65 m / 3.0 m) = 1.71 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

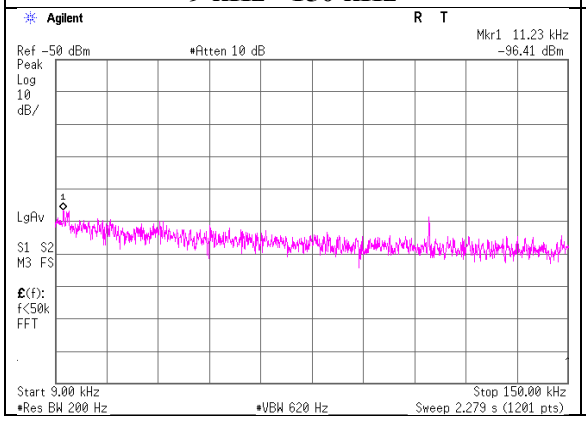
*1) Not Out of Band emission(Leakage Power)

Conducted Spurious Emission

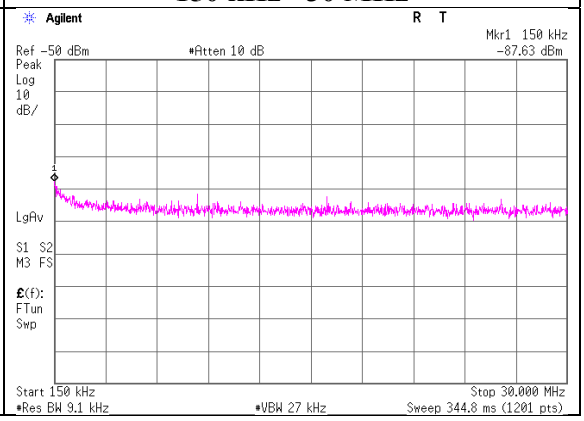
(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	25 deg. C / 32 % RH
Engineer	Yuichiro Yamazaki
Mode	Tx 11n-20 2412 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
11.23	-96.4	1.00	9.8	5.4	2	-77.2	300	6.0	-16.0	46.5	62.5	
150.00	-87.6	1.00	9.8	5.4	2	-68.5	300	6.0	-7.2	24.0	31.2	

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)

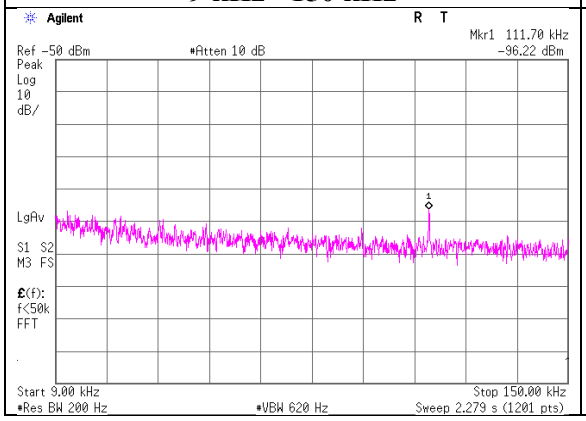
N: Number of output

Conducted Spurious Emission

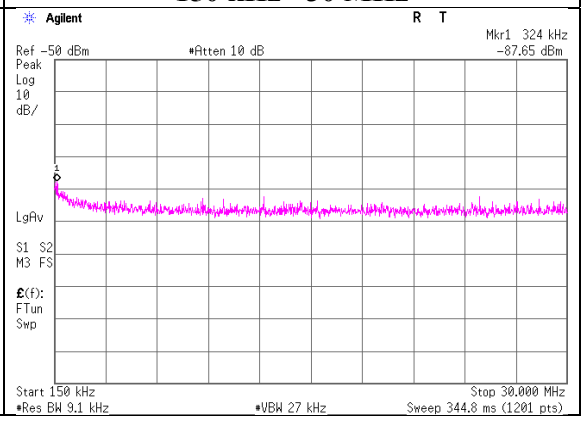
(WiFi / BLE module: QCA6574AU)

Test place	Ise EMC Lab. No.8 Measurement Room
Report No.	12608632H
Date	March 19, 2019
Temperature / Humidity	25 deg. C / 32 % RH
Engineer	Yuichiro Yamazaki
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
111.70	-96.2	1.00	9.8	2.0	1	-83.4	300	6.0	-22.1	26.6	48.7	
324.00	-87.7	1.00	9.8	2.0	1	-74.8	300	6.0	-13.6	17.3	30.9	

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

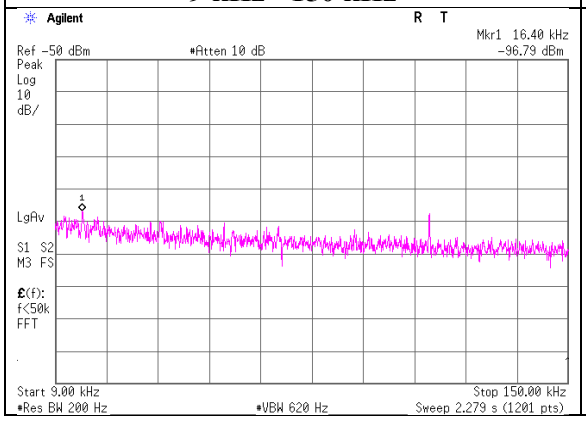
*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

Conducted Spurious Emission

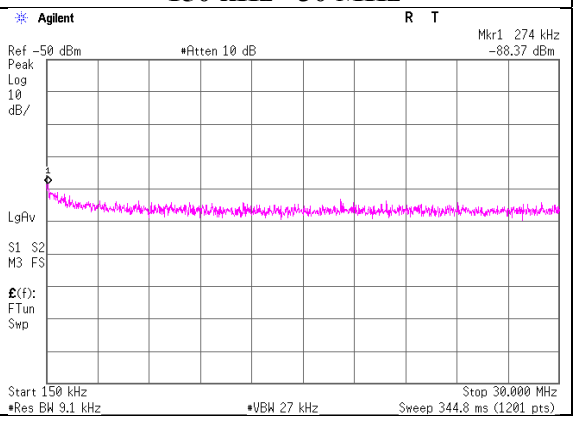
(WiFi / BLE module: QCA6574AU)

Test place	Ise EMC Lab. No.8 Measurement Room
Report No.	12608632H
Date	March 19, 2019
Temperature / Humidity	25 deg. C / 32 % RH
Engineer	Yuichiro Yamazaki
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
16.40	-96.8	1.00	9.8	2.0	1	-84.0	300	6.0	-22.7	43.3	66.0	
274.00	-88.4	1.00	9.8	2.0	1	-75.6	300	6.0	-14.3	18.8	33.1	

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

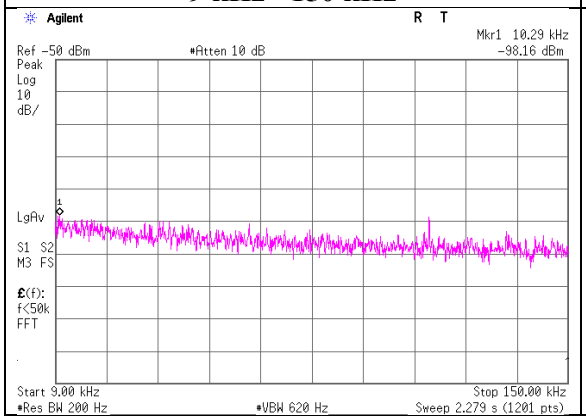
*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

Conducted Spurious Emission

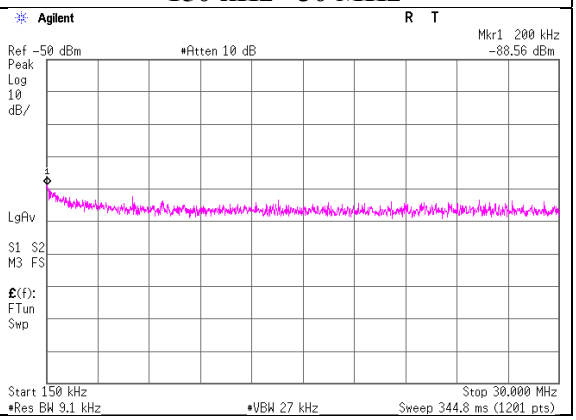
(WiFi / BLE module: QCA6574AU)

Test place	Ise EMC Lab. No.8 Measurement Room
Report No.	12608632H
Date	March 19, 2019
Temperature / Humidity	25 deg. C / 32 % RH
Engineer	Yuichiro Yamazaki
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
10.29	-98.2	1.00	9.8	2.0	1	-85.3	300	6.0	-24.1	47.3	71.4	
200.00	-88.6	1.00	9.8	2.0	1	-75.8	300	6.0	-14.5	21.5	36.0	

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

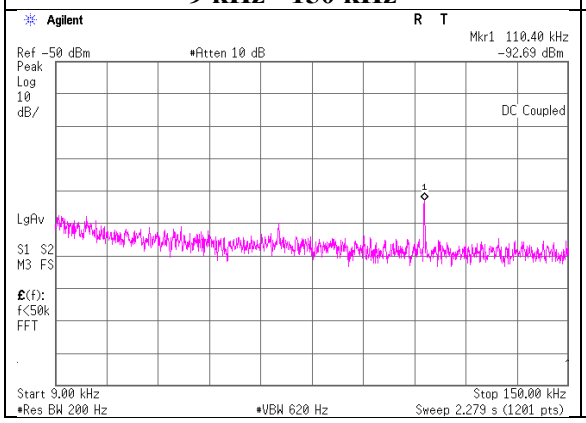
*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

Conducted Spurious Emission

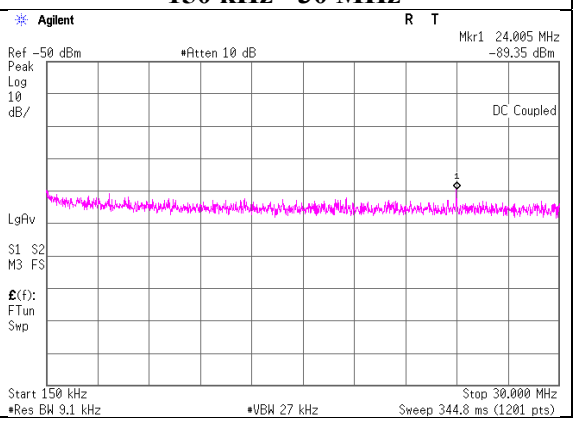
(BLE chip: CC2640R2F)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	12608632H
Date	February 25, 2019
Temperature / Humidity	24 deg. C / 38 % RH
Engineer	Takumi Shimada
Mode	Tx BT LE 1M-PHY Uncoded PHY (1 Mbps) 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
110.40	-92.7	1.00	9.8	2.0	1	-79.9	300	6.0	-18.6	26.7	45.3	
24005.00	-89.4	1.00	9.8	2.0	1	-76.5	30	6.0	4.7	29.5	24.8	

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

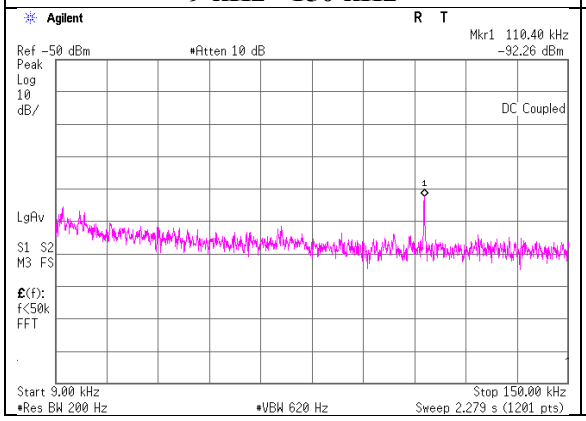
*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

Conducted Spurious Emission

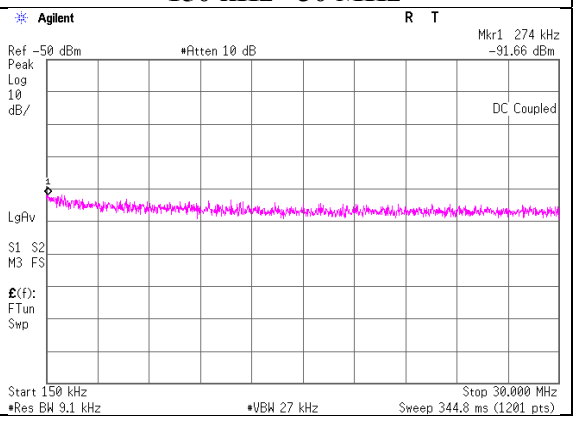
(BLE chip: CC2640R2F)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	12608632H
Date	February 25, 2019
Temperature / Humidity	24 deg. C / 38 % RH
Engineer	Takumi Shimada
Mode	Tx BT LE 1M-PHY Uncoded PHY (1 Mbps) 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
110.40	-92.3	1.00	9.8	2.0	1	-79.4	300	6.0	-18.2	26.7	44.9	
274.00	-91.7	1.00	9.8	2.0	1	-78.9	300	6.0	-17.6	18.8	36.4	

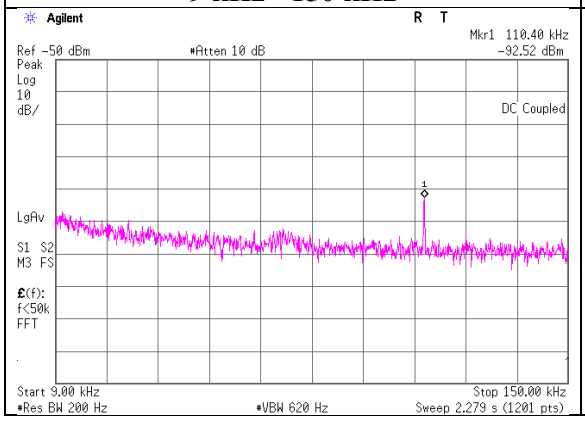
E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]
EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)
N: Number of output
*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

Conducted Spurious Emission

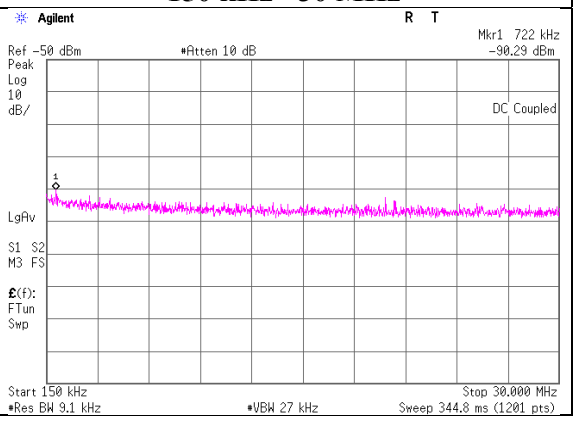
(BLE chip: CC2640R2F)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	12608632H
Date	February 25, 2019
Temperature / Humidity	24 deg. C / 38 % RH
Engineer	Takumi Shimada
Mode	Tx BT LE 1M-PHY Uncoded PHY (1 Mbps) 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
110.40	-92.5	1.00	9.8	2.0	1	-79.7	300	6.0	-18.4	26.7	45.1	
722.00	-90.3	1.01	9.8	2.0	1	-77.5	30	6.0	3.8	30.4	26.6	

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)

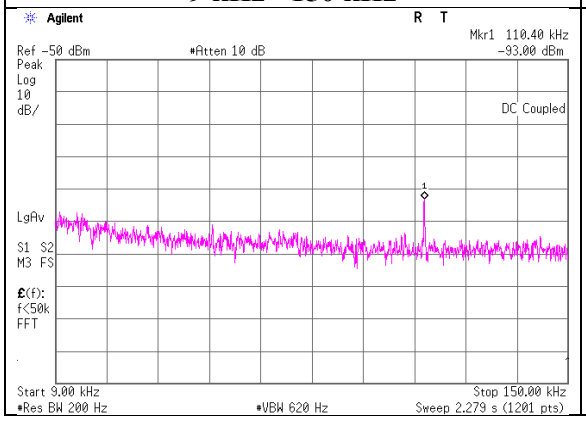
N: Number of output

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

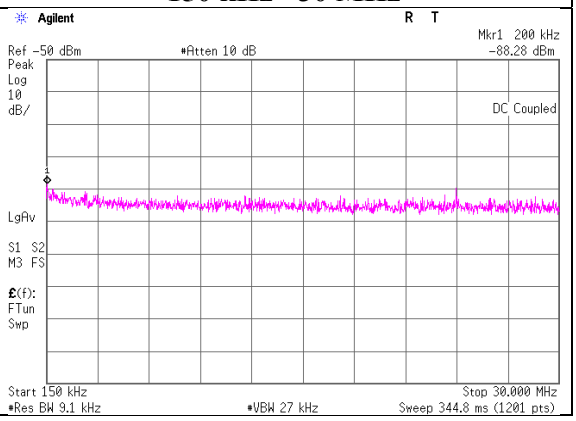
Conducted Spurious Emission
(BLE chip: CC2640R2F)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	12608632H
Date	February 25, 2019
Temperature / Humidity	24 deg. C / 38 % RH
Engineer	Takumi Shimada
Mode	Tx BT LE 2M-PHY Uncoded PHY (2 Mbps) 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
110.40	-93.0	1.00	9.8	2.0	1	-80.2	300	6.0	-18.9	26.7	45.6	
200.00	-88.3	1.00	9.8	2.0	1	-75.5	300	6.0	-14.2	21.5	35.7	

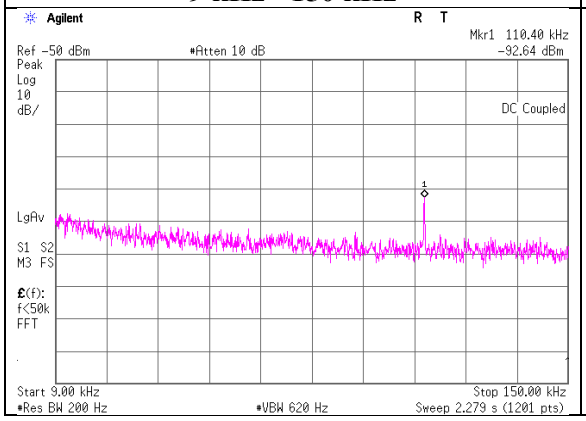
E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]
EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)
N: Number of output
*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

Conducted Spurious Emission

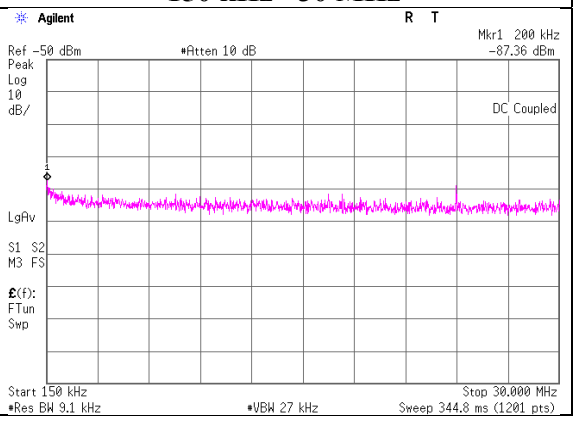
(BLE chip: CC2640R2F)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	12608632H
Date	February 25, 2019
Temperature / Humidity	24 deg. C / 38 % RH
Engineer	Takumi Shimada
Mode	Tx BT LE 2M-PHY Uncoded PHY (2 Mbps) 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
110.40	-92.6	1.00	9.8	2.0	1	-79.8	300	6.0	-18.5	26.7	45.2	
200.00	-87.4	1.00	9.8	2.0	1	-74.6	300	6.0	-13.3	21.5	34.8	

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

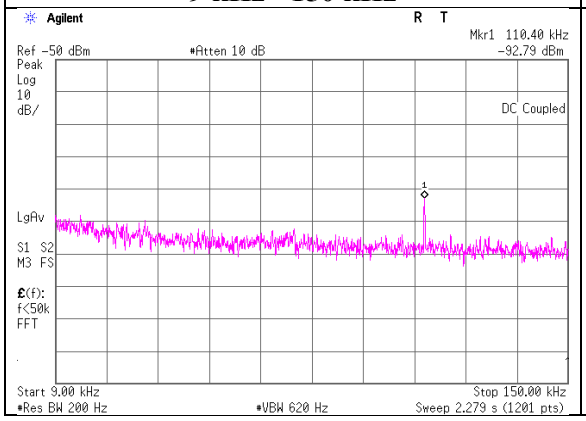
*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

Conducted Spurious Emission

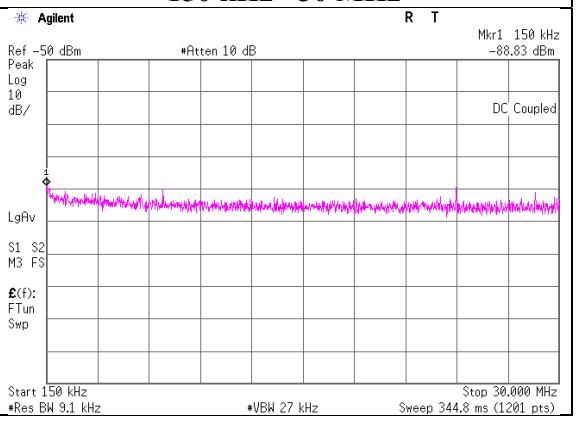
(BLE chip: CC2640R2F)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	12608632H
Date	February 25, 2019
Temperature / Humidity	24 deg. C / 38 % RH
Engineer	Takumi Shimada
Mode	Tx BT LE 2M-PHY Uncoded PHY (2 Mbps) 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
110.40	-92.8	1.00	9.8	2.0	1	-80.0	300	6.0	-18.7	26.7	45.4	
150.00	-88.8	1.00	9.8	2.0	1	-76.0	300	6.0	-14.8	24.0	38.8	

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 KDB 558074 since antenna gain was less than 2.0 dBi.

Power Density

(WiFi / BLE module: QCA6574AU)

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	25 deg. C / 32 % RH
Engineer	Yuichiro Yamazaki
Mode	Tx

11b Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.00	-8.03	1.00	10.10	3.07	8.00	4.93
2437.00	-8.18	1.00	10.10	2.92	8.00	5.08
2462.00	-7.09	1.00	10.10	4.01	8.00	3.99

11g Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.00	-30.31	1.00	10.10	-19.21	8.00	27.21
2437.00	-29.47	1.00	10.10	-18.37	8.00	26.37
2462.00	-30.18	1.00	10.10	-19.08	8.00	27.08

11n-20 Antenna 0 + 1

Freq. [MHz]	Antenna 1 Result [mW]	Antenna 2 Result [mW]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2412.00	0.01	0.01	-15.88	0.03	8.00	23.88
2437.00	0.01	0.02	-15.44	0.03	8.00	23.44
2462.00	0.01	0.02	-14.68	0.03	8.00	22.68

Sample Calculation:
Result = Antenna 0 + 1

11n-20 Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2412.00	-29.96	1.00	10.10	-18.86	0.01	8.00	26.86
2437.00	-30.14	1.00	10.10	-19.04	0.01	8.00	27.04
2462.00	-29.79	1.00	10.10	-18.69	0.01	8.00	26.69

11n-20 Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2412.00	-30.02	1.00	10.10	-18.92	0.01	8.00	26.92
2437.00	-29.03	1.00	10.10	-17.93	0.02	8.00	25.93
2462.00	-27.97	1.00	10.10	-16.87	0.02	8.00	24.87

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

Power Density

(WiFi / BLE module: QCA6574AU)

Test place	Ise EMC Lab. No.8 Measurement Room
Report No.	12608632H
Date	March 19, 2019
Temperature / Humidity	25 deg. C / 32 % RH
Engineer	Yuichiro Yamazaki
Mode	Tx BT LE

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-28.06	1.00	10.10	-16.96	8.00	24.96
2440.00	-27.49	1.00	10.10	-16.39	8.00	24.39
2480.00	-27.39	1.00	10.10	-16.29	8.00	24.29

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
(BLE chip: CC2640R2F)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	12608632H
Date	February 25, 2019
Temperature / Humidity	24 deg. C / 38 % RH
Engineer	Takumi Shimada
Mode	Tx BT LE

1M-PHY Uncoded PHY (1 Mbps)

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-21.04	2.37	10.09	-8.58	8.00	16.58
2440.00	-22.58	2.36	10.09	-10.13	8.00	18.13
2480.00	-20.98	2.35	10.09	-8.54	8.00	16.54

2M-PHY Uncoded PHY (2 Mbps)

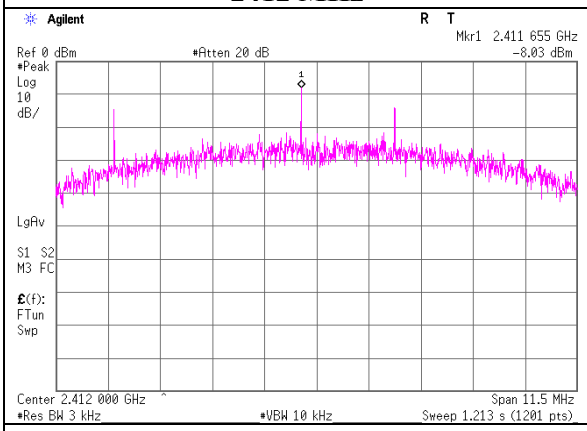
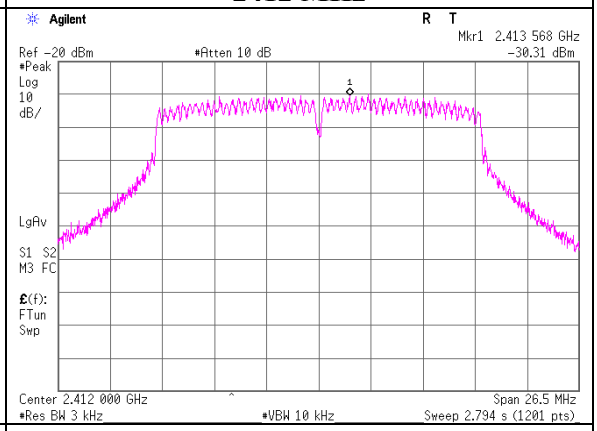
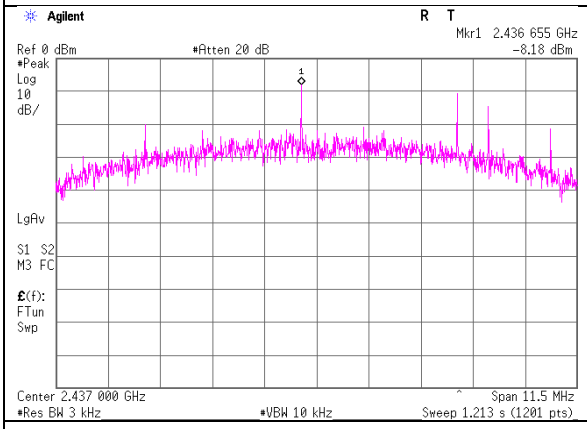
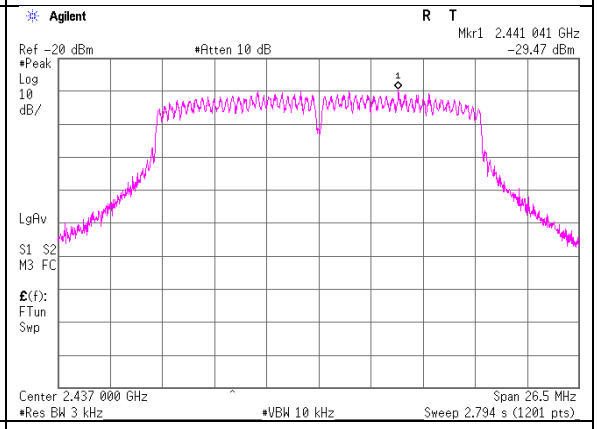
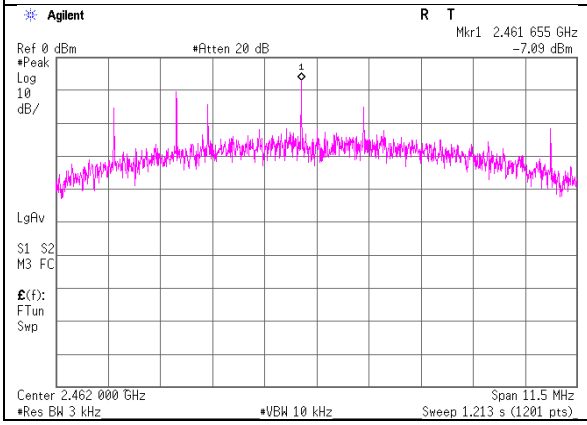
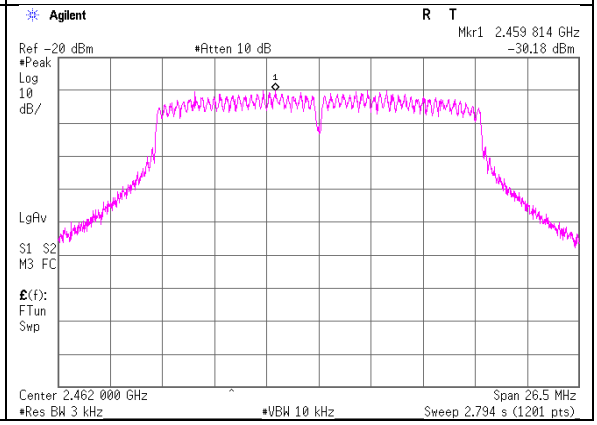
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-25.90	2.37	10.09	-13.44	8.00	21.44
2440.00	-26.54	2.36	10.09	-14.09	8.00	22.09
2480.00	-25.88	2.35	10.09	-13.44	8.00	21.44

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.

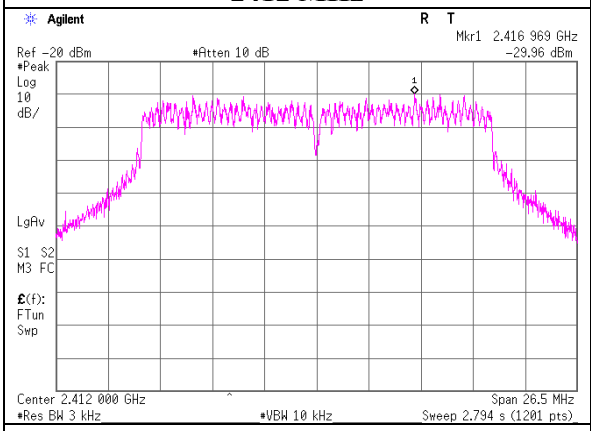
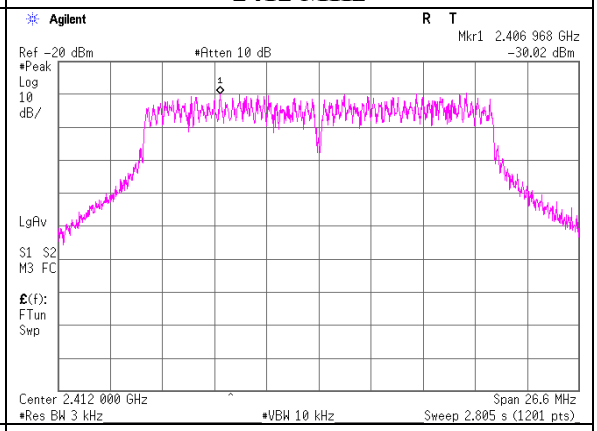
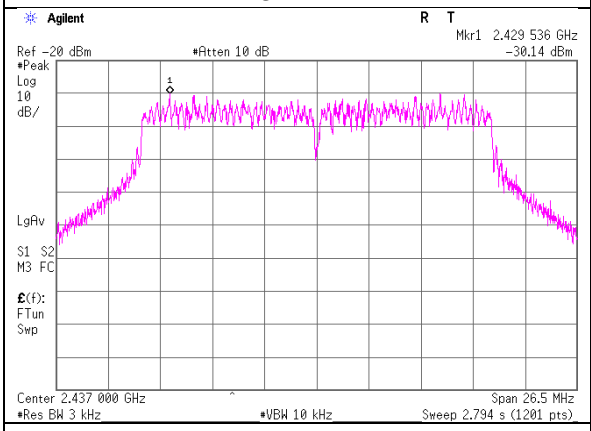
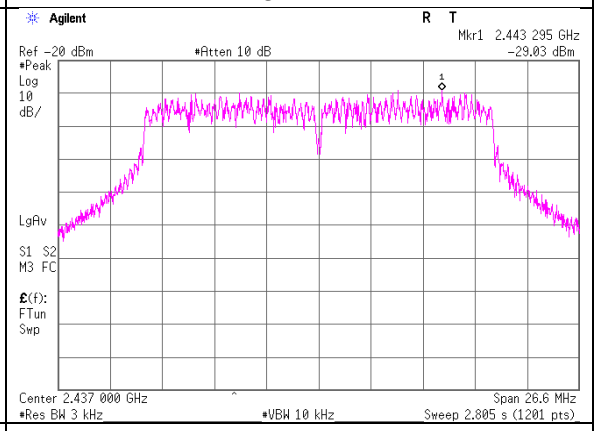
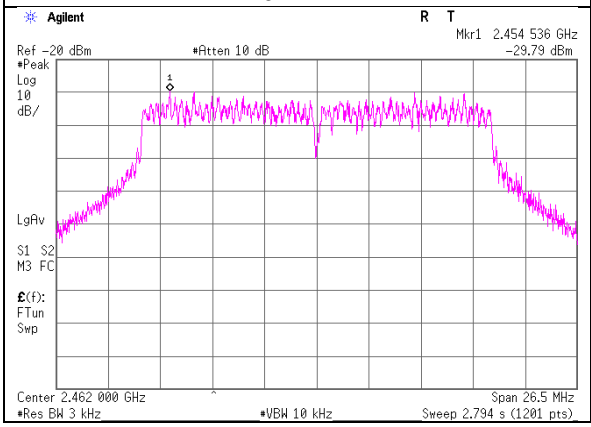
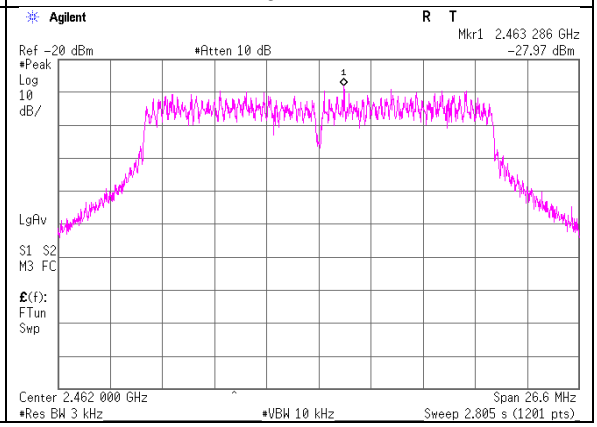
Power Density

(WiFi / BLE module: QCA6574AU)

11b	11g
2412 MHz	**2412 MHz**
	
2437 MHz	**2437 MHz**
	
2462 MHz	**2462 MHz**
	

Power Density

(WiFi / BLE module: QCA6574AU)

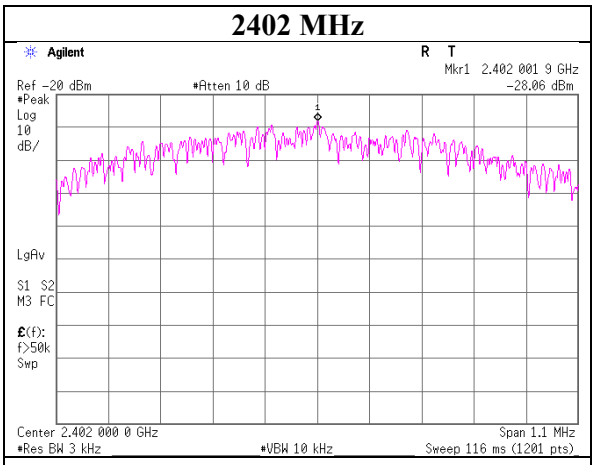
11n-20 Antenna 0	11n-20 Antenna 1
2412 MHz	2412 MHz
	
2437 MHz	2437 MHz
	
2462 MHz	2462 MHz
	

Power Density

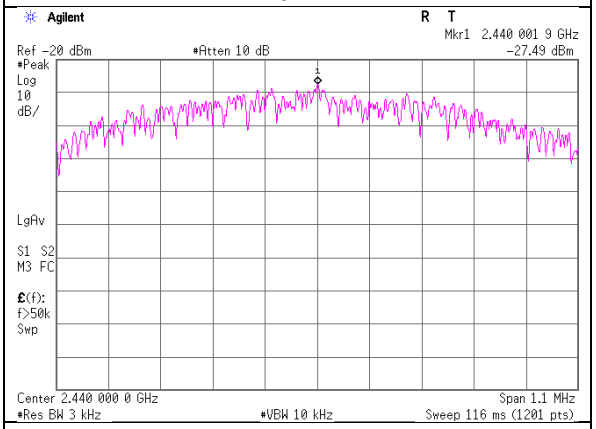
(WiFi / BLE module: QCA6574AU)

BT LE

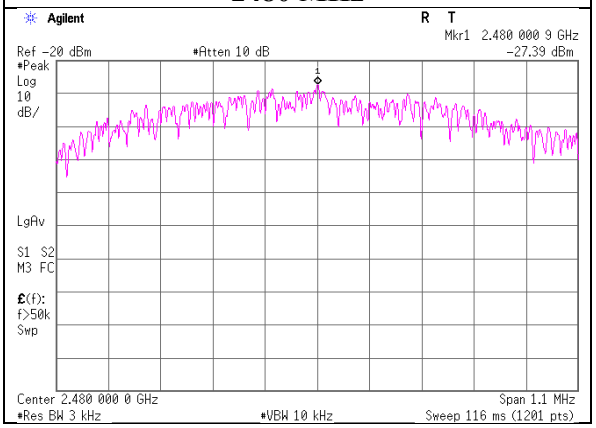
2402 MHz



2440 MHz



2480 MHz

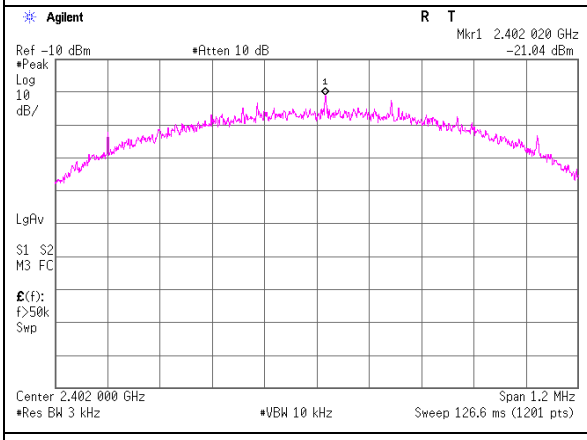


Power Density

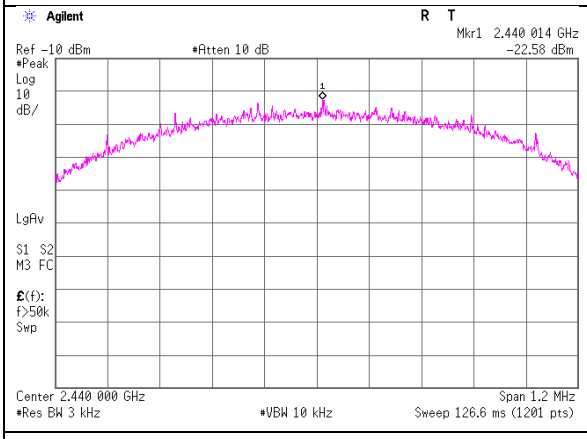
(BLE chip: CC2640R2F)

1M-PHY Uncoded PHY (1 Mbps)

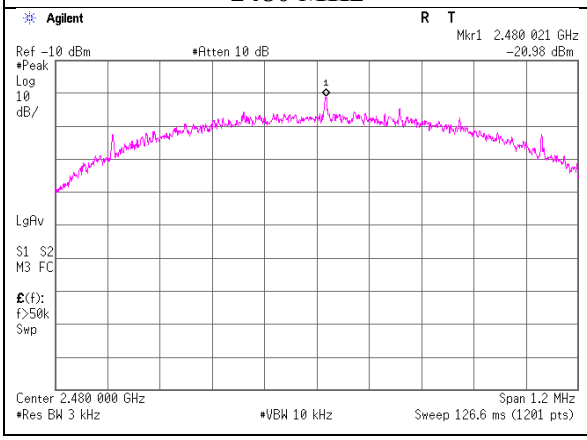
2402 MHz



2440 MHz

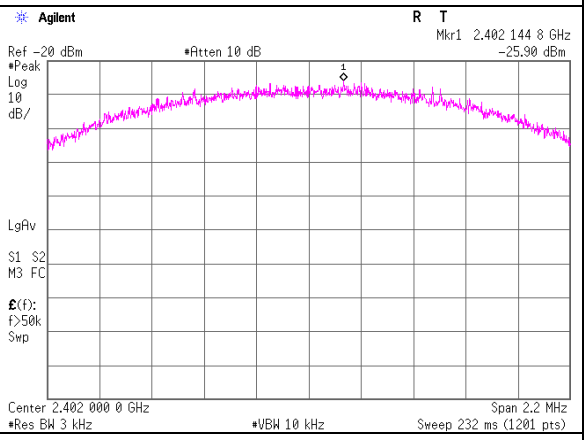


2480 MHz

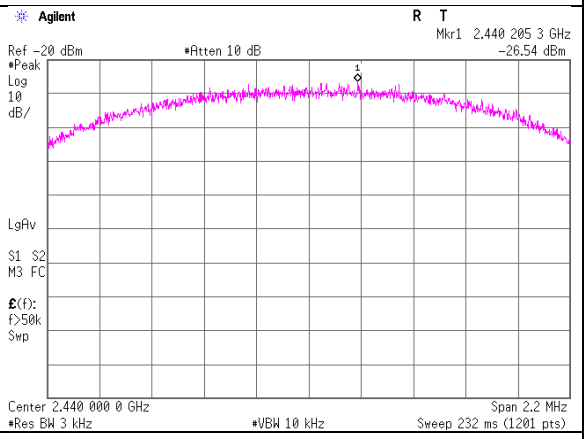


2M-PHY Uncoded PHY (2 Mbps)

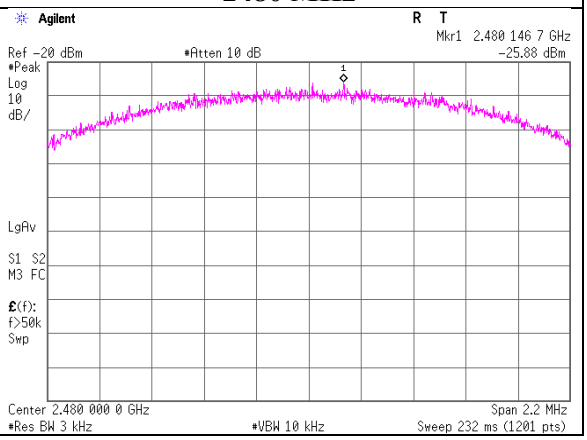
2402 MHz



2440 MHz



2480 MHz



APPENDIX 2: Test instruments

Test Instruments (1/2)

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Cal Int
AT	141855	Spectrum Analyzer	AGILENT	E4440A	MY46187750	11/09/2018	11/30/2019	12
AT	141810	Power Meter	ANRITSU	ML2495A	824014	10/09/2018	10/31/2019	12
AT	141832	Power sensor	ANRITSU	MA2411B	738174	10/09/2018	10/31/2019	12
AT	141156	Attenuator(10dB)	Weinschel Corp	2	BL1173	11/02/2018	11/30/2019	12
AT	141225	Microwave Cable	Junkosha	MWX221	1409S497	03/04/2018	03/31/2019	12
AT	141395	Coaxial Cable	UL Japan	-	-	11/13/2018	11/30/2019	12
AT	141572	Thermo-Hygrometer	CUSTOM	CTH-201	3401	01/11/2019	01/31/2020	12
AT	141362	Attenuator(10dB) (above1GHz)	AGILENT	8493C	71642	05/29/2018	05/31/2019	12
AT	141563	Thermo-Hygrometer	CUSTOM	CTH-180	1701	01/11/2019	01/31/2020	12
AT	141901	Spectrum Analyzer	AGILENT	E4440A	MY48250080	10/04/2018	10/31/2019	12
AT	141937	Terminator	TME	CT-01BP	-	12/05/2018	12/31/2019	12
AT	141334	Attenuator(10dB)	Suhner	6810.19.A	-	12/06/2018	12/31/2019	12
AT	141414	Microwave Cable	Junkosha	MWX221	1207S407	08/21/2018	08/31/2019	12
AT	141327	Coaxial Cable	UL Japan	-	-	02/07/2019	02/29/2020	12
AT	141361	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	03/04/2019	03/31/2020	12
AT	141812	Power Meter	AGILENT	8990B	MY51000271	08/21/2018	08/31/2019	12
AT	141842	Power sensor	AGILENT	N1923A	MY54070003	08/21/2018	08/31/2019	12
AT	141173	Attenuator(10dB) (above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	12/17/2018	12/31/2019	12
AT	141902	Spectrum Analyzer	AGILENT	E4440A	MY46187105	10/04/2018	10/31/2019	12
AT	141806	Power Meter	ANRITSU	ML2495A	6K00003348	10/31/2018	10/31/2019	12
AT	141841	Power sensor	ANRITSU	MA2411B	11598	10/31/2018	10/31/2019	12
AT	141329	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28635/2	04/03/2019	04/30/2020	12
AT	141561	Thermo-Hygrometer	CUSTOM	CTH-201	1401	01/11/2019	01/31/2020	12
RE	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/21/2018	08/31/2019	12
RE	141503	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	06/06/2018	06/30/2019	12
RE	141579	Pre Amplifier	AGILENT	8449B	3008A02142	01/21/2019	01/31/2020	12
RE	141392	Microwave Cable	Junkosha	MWX221	1604S253(1 m) / 1608S087(5 m)	08/08/2018	08/31/2019	12
RE	141512	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	06/06/2018	06/30/2019	12
RE	141903	Spectrum Analyzer	AGILENT	E4440A	MY46186390	09/20/2018	09/30/2019	12
RE	142182	Measure	KOMELON	KMC-36	-	-	-	-
RE	141556	Thermo-Hygrometer	CUSTOM	CTH-201	0003	12/05/2018	12/31/2019	12
RE	142006	AC2_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-06902	04/01/2018	04/29/2019	12
RE	141152	EMI measurement program	TSJ	TEPTO-DV	-	-	-	-
RE	141296	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	002	09/19/2018	09/30/2019	12
RE	141578	Pre Amplifier	AGILENT	8447D	2944A10845	09/19/2018	09/30/2019	12
RE	141265	Logperiodic Antenna (200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-190	03/25/2019	03/31/2020	12
RE	141427	Biconical Antenna	Schwarzbeck	VHA9103B	8031	05/31/2018	05/31/2019	12
RE	141942	Test Receiver	Rohde & Schwarz	ESCI	100300	08/08/2018	08/31/2019	12
RE	141218	Coaxial Cable	UL Japan	-	-	07/19/2018	07/31/2019	12
AT	141884	Spectrum Analyzer	AGILENT	E4448A	MY44020357	03/13/2019	03/31/2020	12
AT	141557	DIGIITAL HiTESTER	HIOKI	3805	70900530	01/29/2019	01/31/2020	12
AT	141567	Thermo-Hygrometer	CUSTOM	CTH-201	0008	01/11/2019	01/31/2020	12
AT	141835	Power sensor	AGILENT	N1923A	MY54070004	08/21/2018	08/31/2019	12
RE	141203	Attenuator(6dB)	Weinschel Corp	2	BK7970	11/05/2018	11/30/2019	12
RE	141317	Coaxial Cable	Fujikura/Agilent	-	-	02/25/2019	02/29/2020	12
RE	141950	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	06/15/2018	06/30/2019	12
RE	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	06/29/2018	06/30/2020	24

Test Instruments (2/2)

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Cal Int
RE	141949	Test Receiver	Rohde & Schwarz	ESCI	100767	08/06/2018	08/31/2019	12
RE	141424	Biconical Antenna	Schwarzbeck	BBA9106	1915	06/04/2018	06/30/2019	12
RE	141554	Thermo-Hygrometer	CUSTOM	CTH-180	1301	01/11/2019	01/31/2020	12
RE	141323	Coaxial cable	UL Japan	-	-	07/03/2018	07/31/2019	12
RE	142008	AC3_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	06/26/2018	06/30/2020	24
RE	141266	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-191	03/25/2019	03/31/2020	12
RE	141532	DIGITAL HiTESTER	HIOKI	3805	51201197	01/29/2019	01/31/2020	12
RE	142183	Measure	KOMELON	KMC-36	-	-	-	-
RE	141582	Pre Amplifier	SONOMA INSTRUMENT	310	260834	02/08/2019	02/29/2020	12
RE	148897	Attenuator	KEYSIGHT	8491A	MY52462349	12/20/2018	12/31/2019	12
RE	142006	AC2_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-06902	04/01/2019	04/30/2020	12
RE	141427	Biconical Antenna	Schwarzbeck	VHA9103B	8031	04/12/2019	04/30/2020	12

***Hyphens for Last Calibration Date, Calibration Due 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.
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: RE: Radiated Emission test
AT: Antenna Terminal Conducted test