TEST REPORT

For

BROADCOM BLUETOOTH MODULE

In conformity with

FCC CFR 47 Part15 Subpart C

Model : BCM20737S

FCC ID : 2AFXT-RB002-B

Report No. : ERY1603P29R2

Issue Date : 29 Mar. 2016

Prepared for

Yukai Engineering Inc.
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Prepared by

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SGS RF Technologies Inc. is managed to ISO17025 and has the necessary knowledge and test facilities for testing according to the referenced standards. The test results in this report apply only to the sample(s) tested.

Table of contents

History

Report No.	Date	Revisions	Issued By
ERY1602P01R2	01 Feb. 2016	Initial Issue	T.Kato
ERY1603P29R2	29 Mar. 2016	Add the test result of radiated spurious emission Correct of erroneous description of test result (Sec 2.8)	T.Kato

1 General information

1.1 Product description

Test item	: BROADCOM BLUETOOTH MODULE
Manufacturer	: BROADCOM CORPORATION
Address	: 190 MATHILDA PLACE SUNNYVALE, CA 94086, U.S.A.
Model	: BCM20737S
FCC ID	: 2AFXT-RB002-B
Serial number	: 246c8a003e7f
Hardware version	: -
Software version	: 1.0.0
Operating frequency	: 2402 - 2480 MHz
Modulation	: GSFK
Antenna Gain	: -1.5 dBi
Receipt date of EUT	: 26 Oct. 2015
Nominal power source voltages	: DC 3.3 V (for BLE module) AC 120 V / 60 Hz (AC ADAPTOR)

1.2 Test(s) performed/ Summary of test result

Test specification(s)	: FCC CFR 47 Part 15 Subpart C (01 Oct. 2014)
Test method(s)	: ANSI C63.10: 2013
Test(s) started	: 08 Jan. 2016
Test(s) completed	: 28 Mar. 2016
Purpose of test(s)	: Class 2 Permissive Change
Summary of test result	: *Complied*

Note: The above judgment is only based on the measurement data and it does not include the measurement uncertainty. Accordingly, the statement below is applied to the test result.
The EUT complies with the limit required in the standard in case that the margin is not less than the measurement uncertainty in the Laboratory.
Compliance of the EUT is more probable than non-compliance is case that the margin is less than the measurement uncertainty in the Laboratory.

Test engineer : T. Kato
EMC testing Department

Reviewer : K. Onishi
Manager
EMC testing Department

1.3 Test facility

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at SGS RF Technologies Inc., located in 472, Nippa-cho, Kohoku-ku, Yokohama, 223-0057, Japan, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948, per October 1, 2014.
The description of the test facilities has been filed under registration number 319924 at the Office of the Federal Communications Commission. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.
The list of all public test facilities is available on the Internet at http://www.fcc.gov.

Registered by Industry Canada (IC): The registered facility number is as follows;
Test site No. 1 (Semi-Anechoic chamber 3m): 6974A-1

Accredited by **National Voluntary Laboratory Accreditation Program** (NVLAP) for the emission tests stated in the scope of the certificate under Certificate Number 200780-0

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

1.4 Measurement uncertainty

The treatment of uncertainty is based on the general matters on the definition of uncertainty in “Guide to the expression of uncertainty in measurement (GUM)” published by ISO. The Lab’s uncertainty is determined by referring UKAS Publication LAB34: 2002 “The Expression of Uncertainty in EMC Testing” and CISPR16-4-2: 2011 “Uncertainty in EMC Measurements”.
The uncertainty of the measurement result in the level of confidence of approximately 95% (k=2) is as follows;

Conducted emission: ± 3.4 dB (10 kHz - 30 MHz)
Radiated emission (9 kHz - 30 MHz): ± 3.3 dB
Radiated emission (30 MHz - 200 MHz): ± 4.8 dB
Radiated emission (200 MHz - 1000 MHz): ± 6.1 dB
Radiated emission (1 GHz - 6 GHz): ± 4.5 dB
Radiated emission (6 GHz - 18 GHz): ± 4.6 dB
Radiated emission (18 GHz - 26 GHz): ± 4.7 dB

1.5 Summary of test results

Requirement	Section in FCC	Result	Section in this report
Occupied Bandwidth (99 %)	2.1049	N/A (*)	2.1
6 dB Bandwidth	15.247 (a) (2)	N/A (*)	2.2
Conducted Output Power	15.247 (b) (3)	N/A (*)	2.3
Conducted Spurious Emission	15.247 (d)	N/A (*)	2.4
Power Spectral Density	15.247 (e)	N/A (*)	2.5
Radiated Emissions	15.247(d), 15.205 (a)	N/A (*)	2.6
AC power line conducted emissions	15.207	N/A (*)	2.7
Radiated Emissions (Simultaneous Transmission)	15.247(d), 15.205 (a)	Complied	2.8

(*) This BLE was certificated as a single transmission RF component (FCC ID: QDS-BRCM1078). But this BLE will be used as simultaneous transmission component with WLAN in the EUT. So, only radiated test in simultaneous transmission mode is tested in this report.

1.6 Setup of equipment under test (EUT)

1.6.1 Test configuration of EUT

Equipment(s) under test

No.	Item	Manufacture	Model No.	Serial No.
A	BROADCOM BLUETOOTH MODULE	BROADCOM CORPORATION	BCM20737S	246c8a003e7f

Support Equipment(s)

No.	Item	Manufacture	Model No.	Serial No.
B	Communication Robot	Yukai Engineering Inc.	YE-RB002G	0103212
C	AC ADAPTOR	UNIFIVE	US318-0628	-

Connected cable(s)

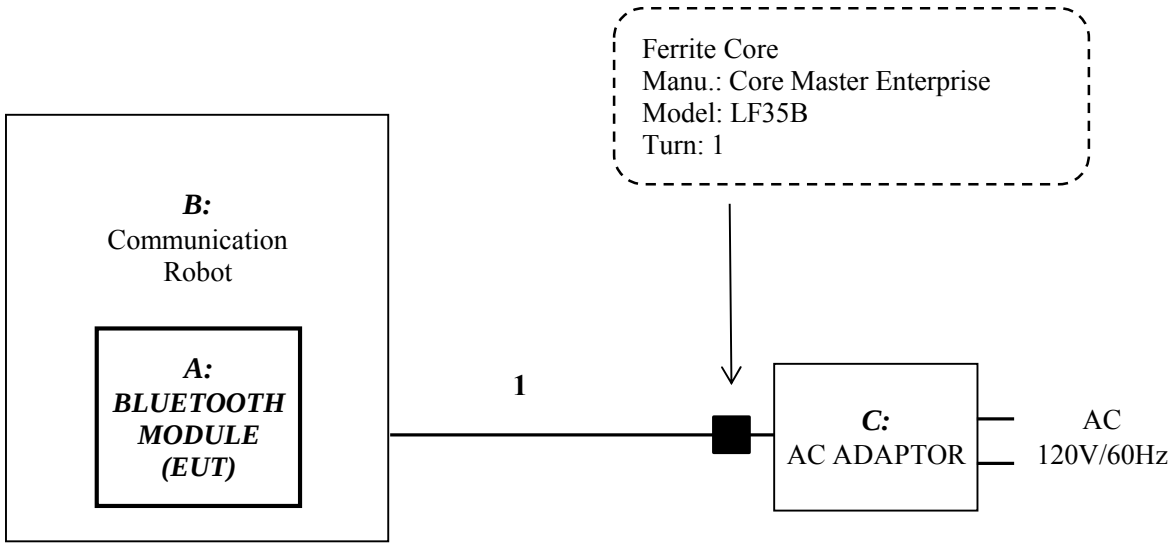
No.	Item	Identification (Manu.etc.)	Cable Shielded	Ferrite Core	Length [m]
1	DC cable for AC ADAPTOR	-	No	Yes	1.5

1.6.2 Operating condition:

- Tx (2402MHz): The EUT is in normal transmission mode at 2402MHz
- Tx (2440MHz): The EUT is in normal transmission mode at 2440MHz
- Tx (2480MHz): The EUT is in normal transmission mode at 2480MHz

- Simultaneous transmission mode with WLAN:
  WLAN and BLE is transmitted at the same time.
  WLAN: 11b / 1 Mbps / 2412 MHz
  BLE: 2402 / 2440 / 2480 MHz

1.6.3 Setup diagram of tested system



1.7 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the applicable standards described in clause 1.2.

1.8 Deviation from the standard

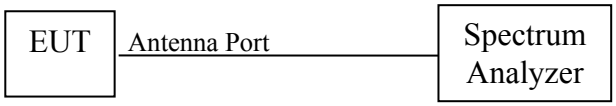
No deviations from the standards described in clause 1.2.

2 Test procedure and test data

2.1 Occupied Bandwidth (99%)

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10 clause 6.9

- RBW : 1 to 5 % of OBW
- VBW > 3 x RBW
- Span : OBW x 1.5 to 5
- Trace : Max hold

Limitation

There are no limitations.
The measurement value is used for the emission designator.

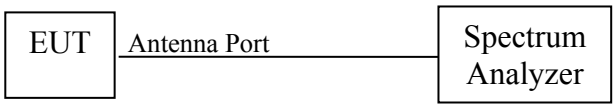
Test equipment used (refer to List of utilized test equipment)

Test results

2.2 6dB Bandwidth

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10 clause 11.8

- RBW = 100 kHz
- VBW : 300 kHz
- Detector : Peak
- Trace : Max hold

Applicable rule and limitation

15.247 (a) (2) Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test equipment used (refer to List of utilized test equipment)

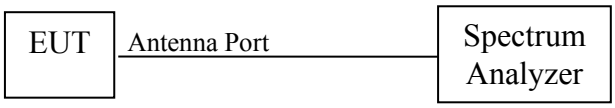
Test results - *This item was not tested.*

Test Data

2.3 Peak Output Power

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10 clause 11.9

- RBW > 6dB BW
- VBW > 3 x RBW
- Span > 3 x RBW
- Detector : Peak
- Trace : Max hold

Applicable rule and limitation

15.247(b) (3) For systems using digital modulation in the 902–928 MHz, 2400–2483.5MHz, and 5725–5850 MHz bands: 1 Watt (30 dBm).

Test equipment used (refer to List of utilized test equipment)

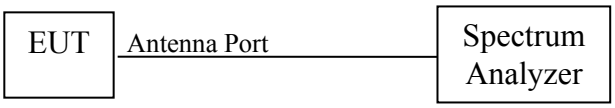
Test results - *This item was not tested.*

Test Data

2.4 Conducted Spurious Emissions

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10 clause 7.8.8

- RBW : 100 kHz
- VBW : 300 kHz
- Detector : Peak
- Trace : Max hold

Limitation

15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test equipment used (refer to List of utilized test equipment)

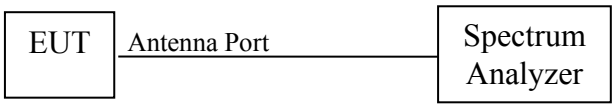
Test results - *This item was not tested.*

Test Data

2.5 Power Spectral density

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10 clause 11.10

- RBW : 3 kHz
- VBW : 10 kHz
- Span > 1.5 x 6dB BW
- Detector : Peak
- Trace : Max hold

Limitation

15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test equipment used (refer to List of utilized test equipment)

Test results - *This item was not tested.*

Test Data

2.6 Radiated emissions (for restricted frequency band)

Test setup

Test setup was implemented according to the method of ANSI C63.10 clause 6 .

Test procedure

Measurement procedures were implemented according to the method of ANSI C63.10 clauses 6.
The test receiver is set as below

[below 1000 MHz]
RBW: 120 kHz, Detector: QP

[above 1000 MHz]
RBW: 1 MHz, Detector: Ave/PK

Applicable rule and limitation

FCC 15.205 restricted bands of operation
Except as shown in paragraph 15.205 (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.490 - 0.510	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	38.6 -

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in FCC 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in FCC 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions.

FCC 15.209 Field strength limits

Frequency [MHz]	Field Strength [μV/m]	Measurement Distance [m]	Field Strength [dBμV/m]
30 – 88	100	3	40.0
88 –216	150	3	43.5
216 – 960	200	3	46.0
Above 960	500	3	53.9

In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a quasi-peak detector.

Test results - *Complied with requirement*

Test equipment used (refer to List of utilized test equipment)

AC01	CL11	TR06	PR15	BA07	CL29	CL30	PR12
DH01	CH01	SH01	LPF1	BRF12	HPF1	CL31	

Test software used

EMI1 Ver. 3.2

Calculation method

The Correction Factor and Result are calculated as followings.

Correction Factor [dB/m] = Ant. Factor [dB/m] + Loss [dB] – Gain [dB]
Result [dBµV/m] = Reading [dBµV] + Correction Factor [dB/m]

Tested Date: 28 Mar. 2016 **Temperature:** 17 degC
Humidity: 40 % **Atmos. Press:** 1020 hPa

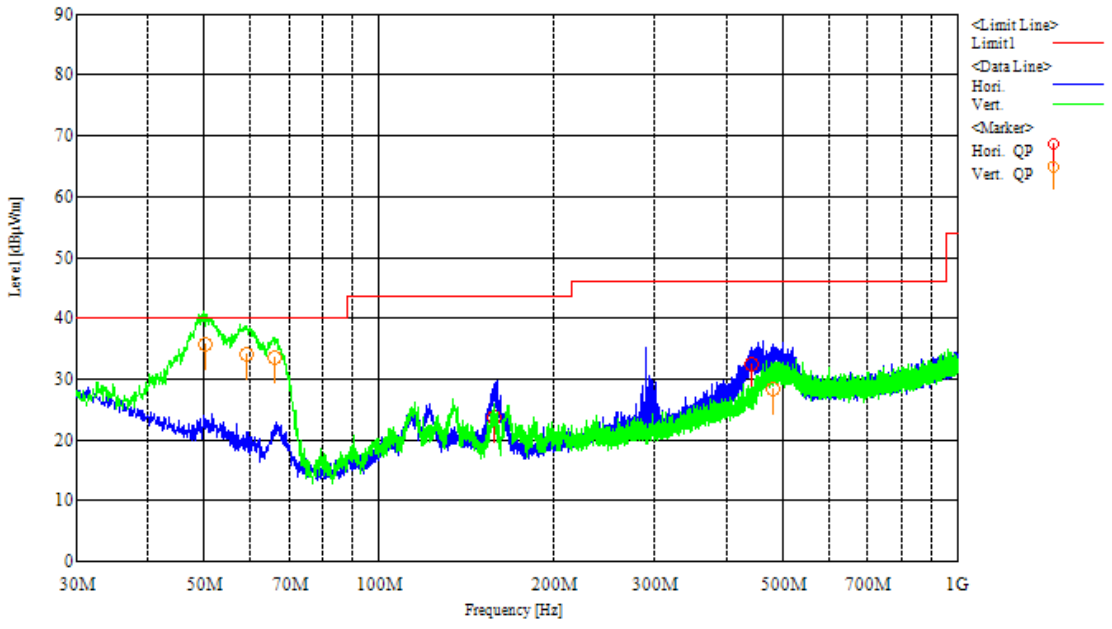
Test Data (Below 1000MHz)

Tested sample: A2
Worst operating mode: Tx (2480MHz)

[Emission level] Y-plane (Worst)

No.	Frequency [MHz]	Reading [dBµV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Ant.
1	158.792	34.6	10.7	8.4	30.0	23.7	43.5	19.8	Hori.
2	441.273	35.2	16.7	10.2	29.8	32.3	46.0	13.7	Hori.
3	**50.112**	**45.4**	**13.2**	**7.2**	**30.2**	**35.6**	**40.0**	**4.4**	**Vert.**
4	58.946	46.4	10.6	7.3	30.2	34.1	40.0	5.9	Vert.
5	66.183	47.0	9.3	7.4	30.2	33.5	40.0	6.5	Vert.
6	480.066	30.6	17.0	10.3	29.6	28.3	46.0	17.7	Vert.

[Chart]



Test Data (Above 1000MHz)

Tested sample: A2
Operating mode: Tx (2402MHz)

[Emission level] X-plane

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	2390.000	46.8	30.6	-4.1	42.7	26.5	73.9	53.9	31.2	27.4	Hori.
2	2390.000	45.0	30.5	-4.1	40.9	26.4	73.9	53.9	33.0	27.5	Vert.
3	4803.896	47.4	37.6	3.6	51.0	41.2	73.9	53.9	22.9	12.7	Hori.
4	4803.770	46.8	36.1	3.6	50.4	39.7	73.9	53.9	23.5	14.2	Vert.

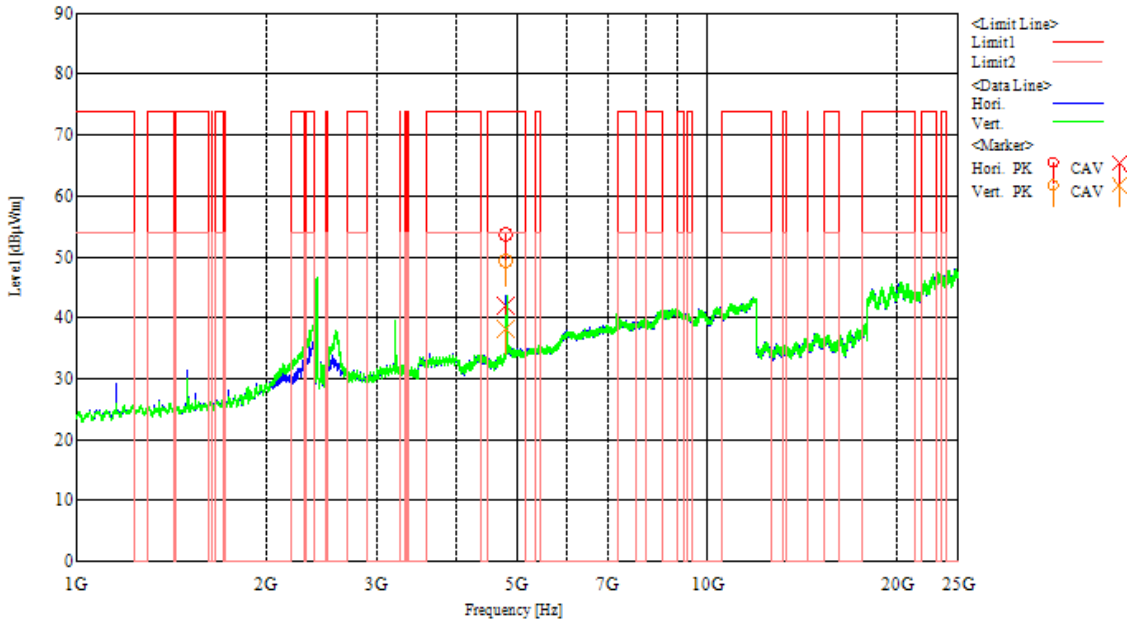
[Emission level] Y-plane

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	2390.000	46.2	30.5	-4.1	42.1	26.4	73.9	53.9	31.8	27.5	Hori.
2	2390.000	48.8	30.6	-4.1	44.7	26.5	73.9	53.9	29.2	27.4	Vert.
3	4803.754	47.5	37.0	3.6	51.1	40.6	73.9	53.9	22.8	13.3	Hori.
4	**4803.688**	**50.2**	**40.4**	**3.6**	**53.8**	**44.0**	**73.9**	**53.9**	**20.1**	**9.9**	**Vert.**

[Emission level] Z-plane

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	2390.000	49.5	30.6	-4.1	45.4	26.5	73.9	53.9	28.5	27.4	Hori.
2	2390.000	47.2	30.6	-4.1	43.1	26.5	73.9	53.9	30.8	27.4	Vert.
3	4803.896	47.4	37.6	3.6	51.0	41.2	73.9	53.9	22.9	12.7	Hori.
4	4803.770	46.8	36.1	3.6	50.4	39.7	73.9	53.9	23.5	14.2	Vert.

[Chart (Y-plane)]



Tested sample: A2
Operating mode: Tx (2440MHz)

[Emission level] X-plane

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	4879.446	46.4	34.6	3.7	50.1	38.3	73.9	53.9	23.8	15.6	Hori.
2	4879.848	44.6	33.2	3.7	48.3	36.9	73.9	53.9	25.6	17.0	Vert.

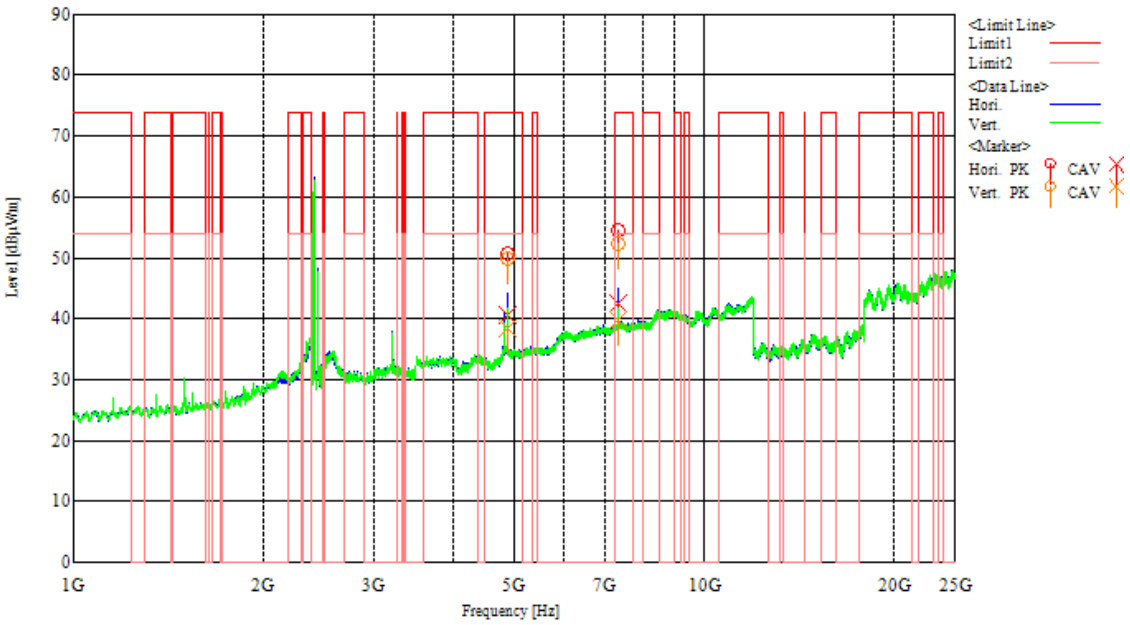
[Emission level] Y-plane

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	4879.800	45.0	33.4	3.7	48.7	37.1	73.9	53.9	25.2	16.8	Hori.
2	7319.386	43.6	31.7	8.6	52.2	40.3	73.9	53.9	21.7	13.6	Hori.
3	4879.767	48.1	38.1	3.7	51.8	41.8	73.9	53.9	22.1	12.1	Vert.
4	**7319.305**	**46.5**	**33.9**	**8.6**	**55.1**	**42.5**	**73.9**	**53.9**	**18.8**	**11.4**	**Vert.**

[Emission level] Z-plane

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	4879.904	47.0	36.8	3.7	50.7	40.5	73.9	53.9	23.2	13.4	Hori.
2	**7319.283**	**45.9**	**33.9**	**8.6**	**54.5**	**42.5**	**73.9**	**53.9**	**19.4**	**11.4**	**Hori.**
3	4879.729	46.1	34.7	3.7	49.8	38.4	73.9	53.9	24.1	15.5	Vert.
4	7319.280	43.8	31.1	8.6	52.4	39.7	73.9	53.9	21.5	14.2	Vert.

[Chart (Z-plane)]



Tested sample: A2
Operating mode: Tx (2480MHz)

[Emission level] X-plane

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	2483.500	53.7	32.3	-3.5	50.2	28.8	73.9	53.9	23.7	25.1	Hori.
2	2483.500	49.3	31.1	-3.5	45.8	27.6	73.9	53.9	28.1	26.3	Vert.
3	4960.154	43.9	31.2	3.9	47.8	35.1	73.9	53.9	26.1	18.8	Hori.
4	7439.356	44.5	31.6	8.4	52.9	40.0	73.9	53.9	21.0	13.9	Hori.
5	4960.154	43.5	31.4	3.9	47.4	35.3	73.9	53.9	26.5	18.6	Vert.
6	7439.356	44.4	31.2	8.4	52.8	39.6	73.9	53.9	21.1	14.3	Vert.

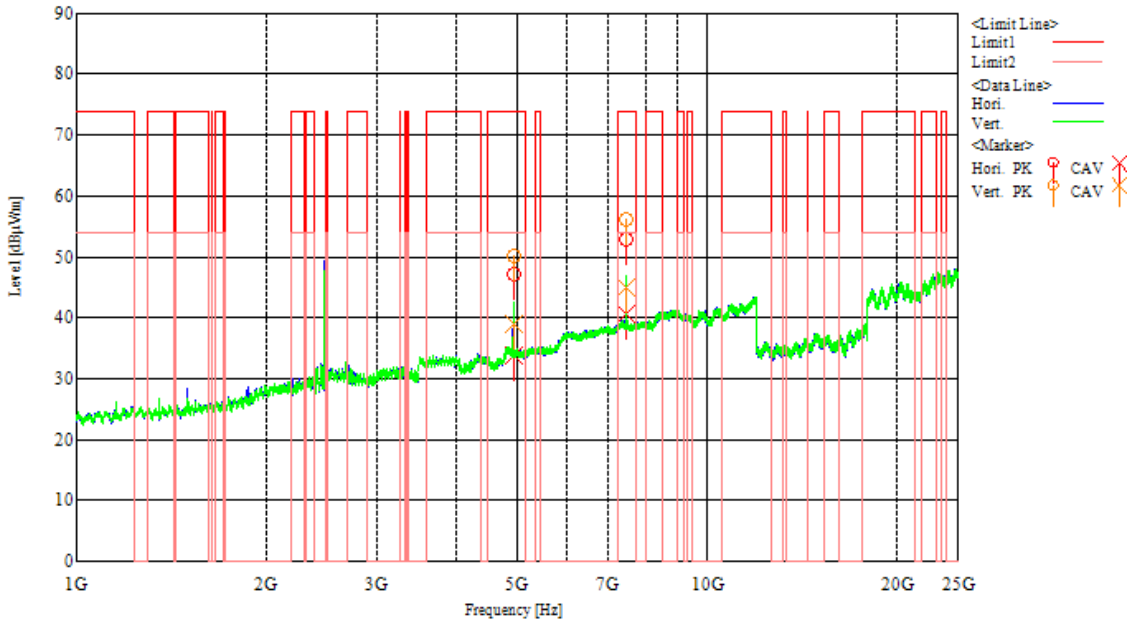
[Emission level] Y-plane

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	2483.500	51.8	31.2	-3.5	48.3	27.7	73.9	53.9	25.6	26.2	Hori.
2	2483.500	55.4	32.5	-3.5	51.9	29.0	73.9	53.9	22.0	24.9	Vert.
3	4959.304	43.2	30.0	3.9	47.1	33.9	73.9	53.9	26.8	20.0	Hori.
4	7439.356	44.6	32.3	8.4	53.0	40.7	73.9	53.9	20.9	13.2	Hori.
5	4960.154	46.2	35.0	3.9	50.1	38.9	73.9	53.9	23.8	15.0	Vert.
6	**7440.206**	**47.7**	**36.5**	**8.4**	**56.1**	**44.9**	**73.9**	**53.9**	**17.8**	**9.0**	**Vert.**

[Emission level] Z-plane

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	2483.500	55.7	32.5	-3.5	52.2	29.0	73.9	53.9	21.7	24.9	Hori.
2	2483.500	53.5	32.1	-3.5	50.0	28.6	73.9	53.9	23.9	25.3	Vert.
3	4960.154	44.8	33.4	3.9	48.7	37.3	73.9	53.9	25.2	16.6	Hori.
4	7439.356	47.4	36.0	8.4	55.8	44.4	73.9	53.9	18.1	9.5	Hori.
5	4960.154	45.0	33.3	3.9	48.9	37.2	73.9	53.9	25.0	16.7	Vert.
6	7439.290	46.0	33.5	8.4	54.4	41.9	73.9	53.9	19.5	12.0	Vert.

[Chart (Y-plane)]



2.7 AC power line conducted emissions

Test setup

Test setup was implemented according to the method of ANSI C63.10 clause 6.2 .

Test procedure

Measurement procedures were implemented according to the method of ANSI C63.10 clause 6.2.

Applicable rule and limitation

FCC 15.207 AC power line conducted emissions limits

Frequency of Emission [MHz]	Conducted emissions Limit [dBµV]	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency. The lower limit applies at the band edges.

Test equipment used (refer to List of utilized test equipment)

Test software used

EMI Ver. 5.6

Calculation method

The Correction Factor and Result are calculated as followings.

Correction Factor [dB] = ISN Factor [dB] + Loss [dB]
Result [dBµV] = Reading [dBµV] + Correction Factor [dB]

Test results - *This item was not tested.*

2.8 Radiated emissions (Simultaneous Transmission)

This EUT is intended that WLAN and BLE are transmitted simultaneously.
So radiated emission test is applied with simultaneous transmission mode also.

Setup and limit is same as section 2.6.

Test results - *Complied with requirement*

Test equipment used (refer to List of utilized test equipment)

AC01	CL11	TR06	PR15	BA07	CL29	CL30	PR12
DH01	CH01	SH01	LPF1	BRF12	HPF1	CL31	

Test software used
EMI1 Ver. 3.2

Calculation method
The Correction Factor and Result are calculated as followings.

Correction Factor [dB/m] = Ant. Factor [dB/m] + Loss [dB] – Gain [dB]
Result [dBμV/m] = Reading [dBμV] + Correction Factor [dB/m]

Test Data

Tested sample: A2
Worst operating mode: WLAN 2412 MHz / 11b / 1Mbps
BLE 2480 MHz

[Emission level (Below 1000MHz)] Y-plane (Worst)

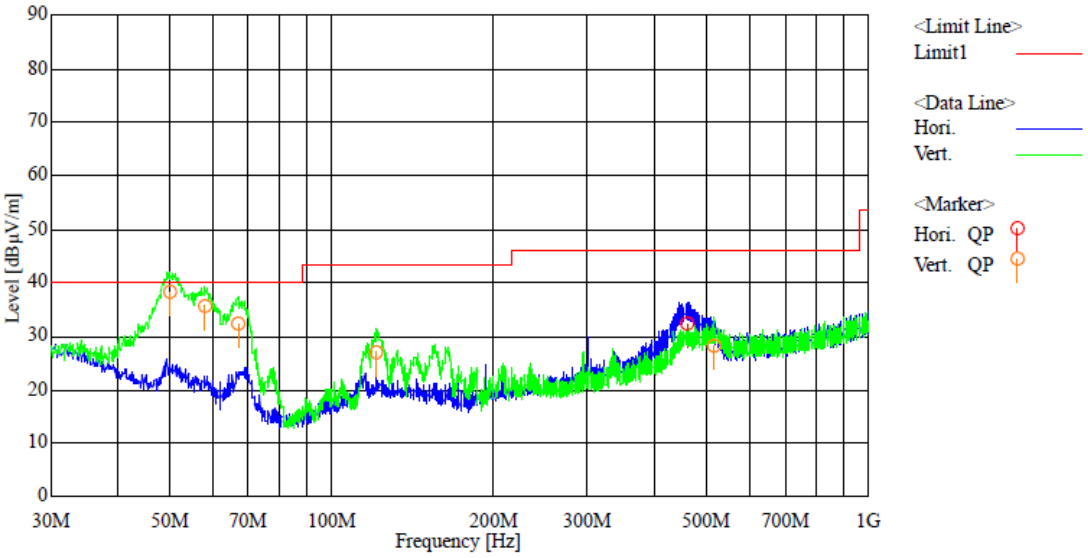
No.	Frequency [MHz]	Reading [dBμV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Ant.
1	459.306	35.3	16.7	10.2	29.7	32.5	46.0	13.5	Hori.
2	50.018	48.5	12.9	7.2	30.2	38.4	40.0	1.6	Vert.
3	58.006	47.8	10.7	7.3	30.2	35.6	40.0	4.4	Vert.
4	66.841	46.1	9.0	7.4	30.2	32.3	40.0	7.7	Vert.
5	121.444	36.8	12.4	8.0	30.1	27.1	43.5	16.4	Vert.
6	517.596	30.0	17.3	10.5	29.5	28.3	46.0	17.7	Vert.

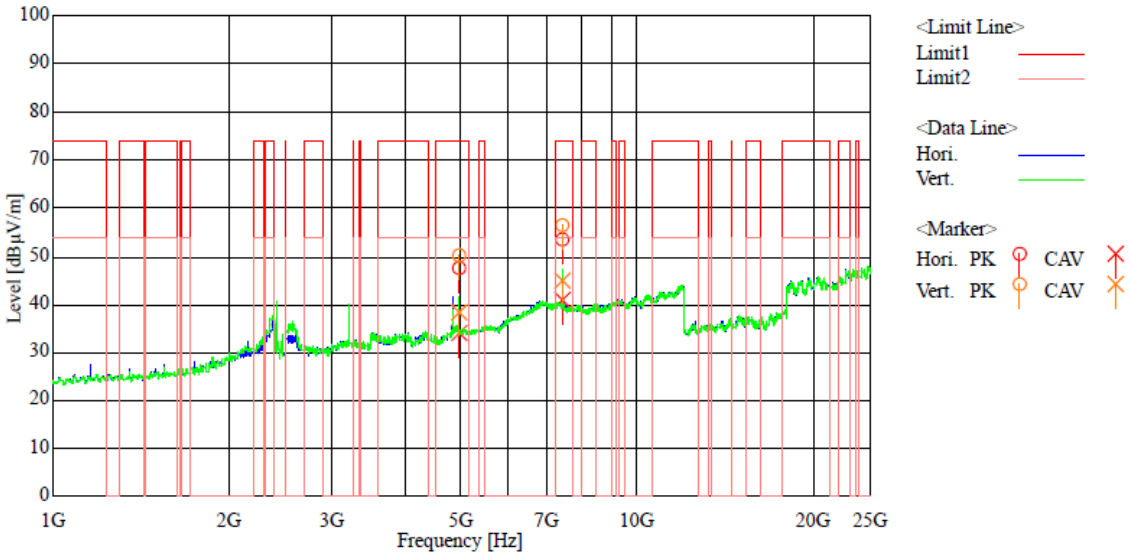
[Emission level (Above 1000MHz)] Y-plane (Worst)

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	4959.493	43.9	30.2	3.8	47.7	34.0	73.9	53.9	26.2	19.9	Hori.
2	7439.298	44.8	32.1	8.8	53.6	40.9	73.9	53.9	20.3	13.0	Hori.
3	4959.493	46.4	34.6	3.8	50.2	38.4	73.9	53.9	23.7	15.5	Vert.
4	7439.299	47.5	36.0	8.8	56.3	44.8	73.9	53.9	17.6	9.1	Vert.

[Chart]

WLAN: 2412MHz / 11b / 1Mbps
BLE: 2480MHz
Y-plane





[Result (Band edge)]

Tested sample: A2
Operating mode: WLAN 2412 MHz / 11b / 1Mbps (Worst)
BLE 2402 MHz

[Emission level] Y-plane (Worst)

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	2390.000	49.8	39.3	5.5	55.3	44.8	73.9	53.9	18.6	9.1	Vert.

Operating mode: WLAN 2462 MHz / 11b / 1Mbps (Worst)
BLE 2480 MHz

[Emission level] Y-plane (Worst)

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	2483.500	51.9	31.1	6.4	58.3	37.5	73.9	53.9	15.6	16.4	Vert.

Operating mode: WLAN 2412 MHz / 11g / 6Mbps (Worst)
BLE 2402 MHz

[Emission level] Z-plane (Worst)

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	2390.000	58.9	41.8	5.5	64.4	47.3	73.9	53.9	9.5	6.6	Hori.
2	2390.000	59.7	42.4	5.5	65.2	47.9	73.9	53.9	8.7	6.0	Vert.

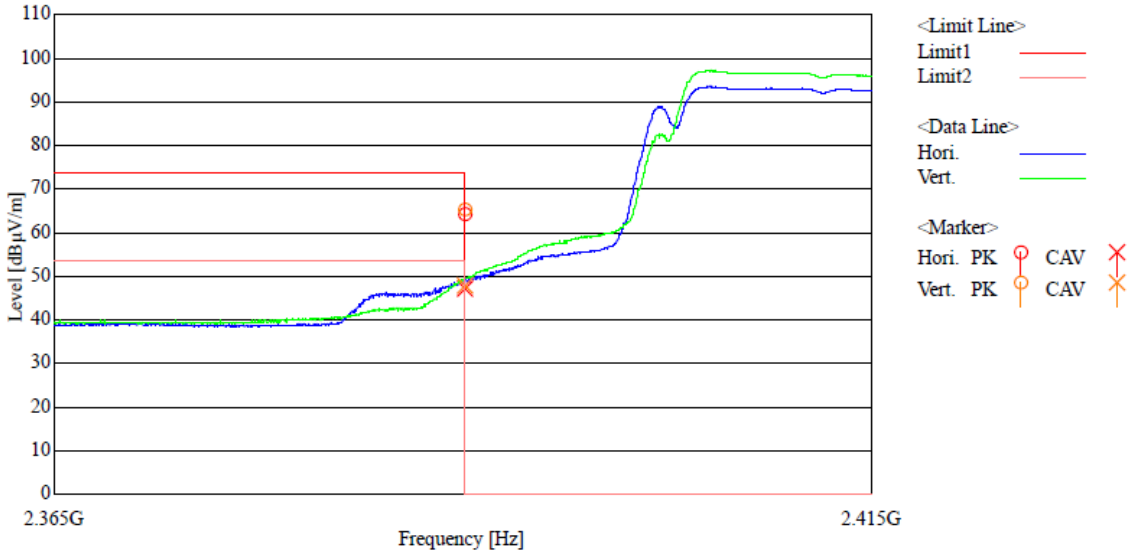
Operating mode: WLAN 2462 MHz / 11g / 6Mbps (Worst)
BLE 2480 MHz

[Emission level] Y-plane (Worst)

No.	Frequency [MHz]	Reading PK [dBµV]	Reading Ave [dBµV]	C.Factor [dB]	Result PK [dBµV/m]	Result Ave [dBµV/m]	Limit PK [dBµV/m]	Limit Ave [dBµV/m]	Margin PK [dB]	Margin Ave [dB]	Ant.
1	2483.500	50.5	33.8	6.4	56.9	40.2	73.9	53.9	17.0	13.7	Vert.

[Chart]

WLAN *2412 MHz / 11g / 6Mbps (Worst)*
BLE *2402 MHz*
Z-plane



[Band edge testing]

Tested Date:	15 Jan. 2016	Temperature:	16 degC
Humidity:	38 %	Atmos. Press:	1016 hPa

[out of band testing]

Tested Date:	18 Jan. 2016	Temperature:	15 degC
Humidity:	40 %	Atmos. Press:	1000 hPa

4 List of utilized test equipment / calibration

RFT ID No.	Kind of Equipment and Precision	Manufacturer	Model No.	Serial Number	Calibration Date	Calibrated until
AC01 (EM)	Anechoic Chamber (1st test room)	JSE	203397C	-	2015/04/18	2016/04/30
AC01 (EG)	Anechoic Chamber (1st test room)	JSE	203397C	-	2015/11/03	2016/11/30
BA07	Bilogical Antenna	TESEQ	CBL6143A	26670	2016/01/25	2017/01/31
BRF12	Band Reject Filter (2400MHz)	M-City	BRF2440-01	RF0012-02	2016/03/15	2017/03/31
CH01	Conical Horn Antenna (12-18GHz)	ETS-Lindgren	3163-05	00126641	2014/07/03	2016/07/31
CL11	RF Cable for RE	RFT	-	-	2016/03/15	2017/03/31
CL18	RF Cable for CE	RFT	-	-	2015/05/01	2016/05/31
CL29	RF Cable 2 m	SUHNER	SUCOFLEX104PE	94709	2015/08/25	2016/08/31
CL30	RF Cable 5 m	SUHNER	SUCOFLEX104PE	MY3599	2015/08/25	2016/08/31
CL31	RF Cable 1 m	Junkosha	MWX221	1303S118	2015/11/24	2016/11/30
DH01	DRG Horn Antenna	A.H. Systems	SAS-571	785	2016/01/26	2018/01/31
HPF1	High Pass Filter (3500MHz)	TOKIMEC	TF323DCA	603	2015/06/13	2016/06/30
LN05	LISN	Kyoritsu	KNW-407F	8-1773-2	2015/06/02	2016/06/30
LPF1	Low Pass Filter (1000MHz)	M-City	LPF1000-04	RF0012-01	2016/03/15	2017/03/31
PR12	Pre. Amplifier (1-26G)	Agilent Technologies	8449B	3008A02513	2016/01/29	2017/01/31
PR15	Pre. Amplifier	Anritsu	MH648A	6201156141	2015/06/13	2016/06/30
SH01	Standard Horn Antenna (18-26G)	A.H. Systems	SAS-572	208	2014/07/03	2016/07/31
TR06	Test Receiver (F/W : 3.93 SP2)	Rohde & Schwarz	ESU26	100002	2015/09/28	2016/09/30
TR09	Test Receiver (F/W : 4.43 SP3)	Rohde & Schwarz	ESU8	100386	2016/02/02	2017/02/28

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.