

TEST REPORT

REGULATIONS : FCC Part15 C §15.247
RSS-247 Issue 1

Applicant	Testing Laboratory
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Equipment Type	Communication module
Trademark	Murata
Model(s)	Type1LD
Serial No.	11
FCC ID	VPYLB1LD
IC CN and UPN	772C-LB1LD
Test Result	Complied
Report Number	17040026JMA-002
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Approved by



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Tested by



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[Engineer]



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SECTION 1. GENERAL INFORMATION

Test Performed

EUT Received	March 30, 2017	
Date of Test	From April 7, 2017 to April 14, 2017	
Standard Applied	FCC	IC
	FCC Part15 C §15.247	RSS-247 Issue 1
Test methods	ANSI C63.10-2013	RSS-Gen Issue 4 ANSI C63.10-2013
Deviation from Standard(s)	None	

Qualifications of Testing Laboratory

Accreditation	Scope	Lab. Code	Remarks
VLAC	EMC Testing	VLAC-008-3	JAPAN
BSMI	EMC Testing	SL2-IN-E-6009	TAIWAN
Filing			
VCCI	EMC Testing	A-0127	JAPAN
FCC	EMC Testing	Designation Number : JP0009	USA
IC	EMC Testing	2042S-1, 2042S-2, 2042S-3	Canada
CB-Scheme	EMC Testing	TL223	IECEE
SAUDI ARABIA	EMC Testing	N/A	

Abbreviations

EUT	Equipment Under Test	DoC	Declaration of Conformity
AMN	Artificial Mains Network	ISN	Impedance Stabilization Network
LISN	Line Impedance Stabilization Network	Q-P	Quasi-peak
AMP	Amplifier	AVG	Average
ATT	Attenuator	PK	Peak
ANT	Antenna	Cal	Calibration
BBA	Broadband Antenna	N/A	Not applicable or Not available
DIP	Dipole Antenna	LCD	Liquid-Crystal Display
AE	Associated Equipment	HDMI	High-Definition Multimedia Interface
AFH	Adaptive Hopping Frequency		

Revision Summary

Revised Date	Section	Description of Changes
April 20, 2017	-	First issue.
May 2, 2017	3, 9, 10	Page 5: Error correction. Page 18: Error correction. Page 19, 22: Described the method of calculating the limit value. Page 33, 34, 37: Error correction.
-	-	-

SECTION 2. SUMMARY OF TEST RESULTS

Test Item	Specification	Results	Detail
20 dB Bandwidth and 99 % Occupied Bandwidth	FCC Part15C §15.247 (a) (1) RSS-247 5.1 (1) RSS-Gen 6.6	PASS	Section 9.1
Maximum Peak Output Power	FCC Part15C §15.247 (b) (1) RSS-247 5.4 (2)	PASS	Section 9.2
Carrier Frequency Separation	FCC Part15C §15.247 (a) (1) RSS-247 5.1 (2)	PASS	Section 9.3
Number of Hopping Frequency	FCC Part15C §15.247 (a) (1) (iii) RSS-247 5.1 (4)	PASS	Section 9.4
Time of occupancy	FCC Part15C §15.247 (a) (1) (iii) RSS-247 5.1 (4)	PASS	Section 9.5
Radiated Spurious Emissions and Restrict Band edge	FCC Part15C §15.209, §15.205 RSS-247 5.5 RSS-Gen 8.9	PASS	Section 9.6
Band Edge of Authorized Frequency Band	FCC Part15C §15.247 (d) RSS-247 5.5	PASS	Section 9.7
Spurious RF Conducted Emissions	FCC Part15C §15.247 (d) RSS-247 5.5	PASS	Section 9.8
AC Conducted Emissions	FCC Part15C §15.207 RSS-Gen 7.2.2	PASS	Section 9.9
Receiver Spurious Emissions	RSS-Gen 7.1	PASS	Section 9.10

Limitation on Results

The test result of this report is effective equipment under test itself and under the test configuration described on the report.

This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.

SECTION 3. EQUIPMENT UNDER TEST

The equipment under test (EUT) consisted of the following apparatus.

3.1 System Configuration

Symbol	Item	Model No.	Serial No.	Manufacturer
A	Communication module	Type1LD	11	Murata Manufacturing Co., Ltd.
Rated Power		DC 3.2 ~ 4.8 V		
Supplied Power		DC 3.3 V		
Condition of Equipment		Prototype		
Type		Communication module		
Suppression Devices		No Modifications by the laboratory were made to the device		

3.2 Port(s)/Connector(s)

Port Name	Connector Type	Connector Pin	Remarks
-	-	-	-

3.3 Highest Frequency Generated / Used

Operating Frequency	Board Name	Remarks
37.4 MHz	Generated	-

3.4 Over View of EUT

Access method	WLAN 802.11b/g/n20
Rated Output Power	11b 17 dBm (Antenna terminal conducted average power)
	11g 17 dBm (Antenna terminal conducted average power)
	11n20 17 dBm (Antenna terminal conducted average power)
Rated Output Power	17 dBm (Antenna terminal conducted average power)
Frequency Range of Operating	2412 – 2462 MHz
Number of Channels	11 ch, 5 MHz step
Modulation Method	DSSS, OFDM

Access method	Bluetooth Version 4.1
Rated Output Power	BT 9 dBm (Antenna terminal conducted average power)
	LE 7 dBm (Antenna terminal conducted average power)
Frequency Range of Operating	2402 – 2480 MHz
Number of Channels	BT 79 ch, 1 MHz step
	LE 40 ch, 2 MHz step
Modulation Method	BT FHSS (GFSK, π /4DQPSK, 8DPSK)
	LE GFSK

Antenna Type and Gain	Integrated Printed Antenna, 0 dBi See Note 1
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Note:

- The EUT comply with the requirement of FCC Part15C §15.203, because
 - The antenna was built in the EUT and permanently attached.
 - There were no other antennas.

SECTION 4. SUPPORT EQUIPMENT

The EUT was supported by the following equipment during the test.

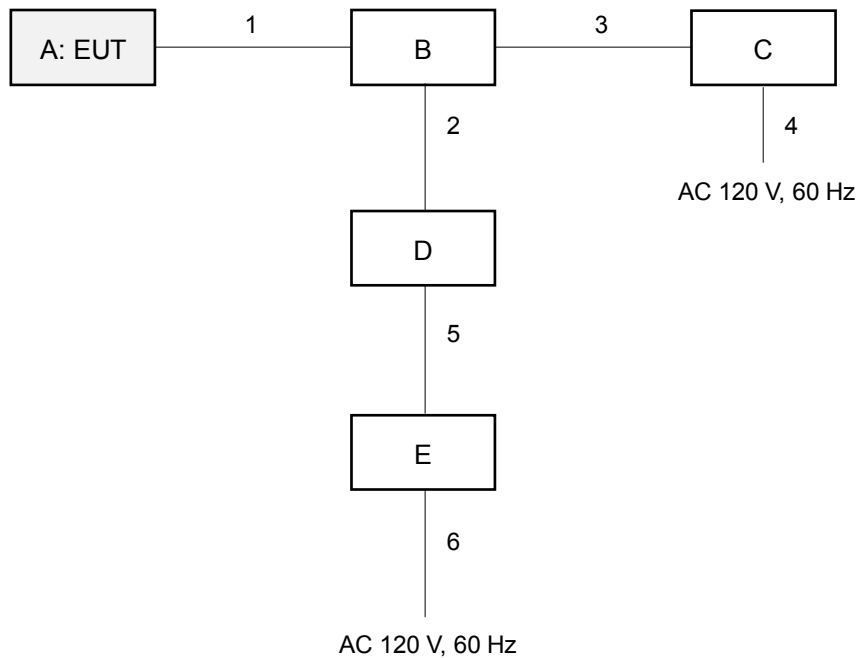
Symbol	Item	Model No.	Serial No.	Manufacturer	Remarks	FCC ID
B	Jig board	-	-	Murata	-	-
C	DC Power Supply	PAN60-3A	ND001658	KIKUSUI	-	N/A
D	Notebook Computer	X61s	7666-77J	Lenovo	-	N/A
E	AC Adaptor	92P1213	11S92P1213Z1ZDDZ92	Lenovo	-	-
Supplied Power:						
B	DC 3.3 V					
C, E	AC 120 V, 60 Hz					

SECTION 5. USED CABLE(S)

The following cable(s) was used for the test.

No.	Name	Length (m)	Shield	Metal Connector	Ferrite Core
1	FLEXIBLE PRINTED CIRCUITS CABLE	0.20	No	No	-
2	USB CABEL	2.00	Shielded	Shielded	-
3	DC CABLE	0.70	No	No	-
4	AC CABLE	1.80	No	No	-
5	DC CABLE	0.80	No	No	-
6	AC CABLE	1.80	Shielded	Shielded	-

SECTION 6. TEST CONFIGURATION



The symbols and numbers assigned to the equipment and cables on this diagram correspond to the ones in Sections 3 to 5.

SECTION 7. OPERATING CONDITION

The test was carried out under the following mode.

Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

7.1 Test Channel

In accordance with Section 15.31 (m), all test items was conducted in the following three channels:

Operating mode	Test Channel	Frequency [MHz]
Bluetooth	Low	2402
	Middle	2441
	High	2480

7.2 Test modes

Test Item	Operating modes
Maximum Peak Output Power	Hopping OFF DH1, DH3, DH5 2-DH1, 2-DH3, 2-DH5 3-DH1, 3-DH3, 3-DH5
Carrier Frequency Separation	Hopping ON DH5, 2-DH5, 3-DH5
Number of Hopping Frequency	Hopping ON DH5, 2-DH5, 3-DH5
Time of occupancy	Hopping OFF DH1, DH3, DH5 2-DH1, 2-DH3, 2-DH5 3-DH1, 3-DH3, 3-DH5
Radiated Spurious Emissions and Restrict Band edge	Hopping OFF DH5, 2-DH5, 3-DH5
Band Edge of Authorized Frequency Band	Hopping OFF/ON DH5, 2-DH5, 3-DH5
Spurious RF Conducted Emissions	Hopping OFF DH5, 2-DH5, 3-DH5
AC Conducted Emissions	Hopping ON DH5, 2-DH5, 3-DH5
Receiver Spurious Emissions	Transmit OFF, Receive mode

Note: The Test modes were configured in typical fashion as a customer would normally use it.

SECTION 8. UNCERTAINTY

The following uncertainty represents the expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Traceability to national standard in SI units is ensured with these values.

Compliance with the limits in this standard are determined without in consideration of the measurement uncertainty of the measurement instrumentation.

8.1 Emission tests

Test items	$U_{lab} [k = 2]$	U_{cispr}
Radiated Spurious Emissions at 3m		
30 MHz – 1000 MHz	+/- 3.96 dB	6.3 dB
Above 1 GHz	+/- 4.91 dB	5.2 dB
AC Conducted Emissions		
150 kHz – 30 MHz	+/- 2.80 dB	3.4 dB

The above expanded instrumentation uncertainty, U_{lab} , is estimated in accordance with CISPR 16-4-2:2011.

8.2 RF Conducted tests

Test Items	$U_{lab} [k = 2]$
Bandwidth	+/- 1.42 %
Maximum Output Power	+/- 1.96 dB
Conducted Emissions	+/- 1.82 dB

SECTION 9. TEST DATA

9.1 20 dB Bandwidth and 99 % Occupied Bandwidth

Regulations	FCC Part15C §15.247 (a) (1) RSS-247 5.1 (1) RSS-Gen 6.6
Test Method/Guide	ANSI C63.10-2013 clause 6.9.2

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.1.
2. Adjust the test instrument for the following setting:

RBW	:	1 to 5 % of the 20 dB bandwidth
VBW	:	approximately 3 times RBW
Span	:	approximately 3 times the 20 dB bandwidth
Detector	:	Peak
Sweep Time	:	Auto
Trace mode	:	Max Hold
3. Allow trace to fully stabilize.
4. Use "Occupied Bandwidth Measurement" function to measure the 20 dB bandwidth.

Test Result

Location	Matsuda Laboratory No.1 Test Site
Test date	April 7, 2017
Temperature	22.0 [degree C]
Humidity variation	55.0 [%RH]
Test Engineer	Tomochika Yonemura

Operating modes	Frequency [MHz]	20 dB Bandwidth [MHz]	99 % Bandwidth [MHz]
DH5	2402	0.992	0.913
	2441	0.995	0.912
	2480	0.977	0.909
2-DH5	2402	1.335	1.213
	2441	1.339	1.217
	2480	1.346	1.222
3-DH5	2402	1.331	1.210
	2441	1.334	1.215
	2480	1.341	1.222

Spectrum Plots

See ANNEX A.1.

9.2 Maximum Peak Output Power

Regulations	FCC Part15C §15.247 (b) (1) RSS-247 5.4 (2)
Test Method/Guide	ANSI C63.10-2013 clause 7.8.5

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.1.
2. Adjust the test instrument for the following setting:

RBW	:	≥ the 20 dB bandwidth
VBW	:	≥ RBW
Span	:	approximately 5 times the 20 dB bandwidth
Detector	:	Peak
Sweep Time	:	Auto
Trace mode	:	Max Hold

Note: The value of the “20 dB bandwidth”, from the result of section 9.1.

3. Allow trace to fully stabilize.
4. Use the peak search function to measure the peak of the emission.
5. Measurement data correction;

Measured Value [dBm] = Reading [dBm] + Factor [dB]

*Factor = Cable Loss [dB] + Attenuator [dB]

Margin [dB] = Limit [dBm] - Measured Value [dBm]

Test Result

Location	Matsuda Laboratory No.1 Test Site
Test date	April 10, 2017
Temperature	22.0 [degree C]
Humidity variation	55.0 [%]
Test Engineer	Tomochika Yonemura

Operating modes	Freq. [MHz]	Reading [dBm]	Factor [dB]	Measured Value [dBm]	Limit		Margin [dB]
					[mW]	[dBm]	
DH5	2402	-11.310	21.020	9.710	125	20.97	11.259
	2441	-11.446	21.020	9.574			11.395
	2480	-11.442	21.020	9.578			11.391
2-DH5	2402	-12.887	21.020	8.133			12.836
	2441	-12.928	21.020	8.092			12.877
	2480	-13.166	21.020	7.854			13.115
3-DH5	2402	-12.919	21.020	8.101			12.868
	2441	-12.981	21.020	8.039			12.930
	2480	-13.201	21.020	7.819			13.150

Spectrum Plots
See ANNEX A.2

9.3 Carrier Frequency Separation

Regulations	FCC Part15C §15.247 (a) (1) RSS-247 5.1 (2)
Test Method/Guide	ANSI C63.10-2013 clause 7.8.2

Test Procedure

- The EUT and test instrument were set up as shown on section 10.1.
- Adjust the test instrument for the following setting:

RBW	:	approximately 30% of the channel spacing
VBW	:	≥ RBW
Span	:	Including emission band
Detector	:	Peak
Sweep Time	:	Auto
Trace mode	:	Max Hold
- Allow trace to fully stabilize.
- Use delta marker function to measure the separation between the two channels.

Test Result

Location	Matsuda Laboratory No.1 Test Site
Test date	April 7, 2017
Temperature	22.0 [degree C]
Humidity variation	55.0 [%]
Test Engineer	Tomochika Yonemura

Operating modes	Frequency [MHz]	Measured Value [MHz]	Limit [MHz]
DH5	2402	1.000	≥ 0.661
	2441	1.000	≥ 0.663
	2480	1.000	≥ 0.652
2-DH5	2402	1.000	≥ 0.890
	2441	1.000	≥ 0.893
	2480	1.000	≥ 0.897
3-DH5	2402	1.000	≥ 0.890
	2441	1.000	≥ 0.889
	2480	1.000	≥ 0.894

Note: Limits were applied to two-thirds of 20 dB bandwidth.
The value of the "20 dB bandwidth", from the result of section 9.1.

Spectrum Plots

See ANNEX A.3

9.4 Number of Hopping Frequency

Regulations	FCC Part15C §15.247 (a) (1) (iii) RSS-247 5.1 (4)
Test Method/Guide	ANSI C63.10-2013 clause 7.8.3

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.1.
2. Adjust the test instrument for the following setting:

RBW	:	< 30% of the channel spacing
VBW	:	≥ RBW
Span	:	Including emission band
Detector	:	Peak
Sweep Time	:	Auto
Trace mode	:	Max Hold
3. Allow trace to fully stabilize.
4. Count the peaks.

Test Result

Location	Matsuda Laboratory No.1 Test Site
Test date	April 7, 2017
Temperature	22.0 [degree C]
Humidity variation	55.0 [%]
Test Engineer	Tomochika Yonemura

Operating modes	Measured Value	Limit
DH5	79	≥ 15
2-DH5	79	
3-DH5	79	

Spectrum Plots

See ANNEX A.4

9.5 Time of Occupancy

Regulations	FCC Part15C §15.247 (a) (1) (iii) RSS-247 5.1 (4)
Test Method/Guide	ANSI C63.10-2013 clause 7.8.4

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.1.
2. Adjust the test instrument for the following setting:
 - RBW : $\leq$ channel spacing
 - VBW : $\geq$ RBW
 - Span : 0 Hz
 - Detector : Peak
 - Sweep Time : As necessary to capture the entire dwell time per hopping channel
 - Trace mode : Single, Use Video Trigger
3. Use delta marker function to measure the transmit time as per hop.
4. By the following method, calculated time of occupancy;

(1) Number of hops per sec
= Hopping rate / 1 time slots / 1 [sec].

* 1 time slots : 2 for DH1 packet
4 for DH3 packet
6 for DH5 packet

* Hopping rate : 1600 for Normal mode
800 for AFH mode

(2) Number of hops per sec in each channel
= Number of hops per sec / number of hopping channel.

* number of hopping channel: 79 for Normal mode
20 for AFH mode

(3) Specified periods [sec]
= 0.4 [sec] x number of hopping channels.

(4) Number of hops per specified periods in each channel
= Number of hops per sec in each channel x Specified periods [sec].

(5) Time of occupancy [ms]
= Number of hops per specified periods in each channel x the transmit time as per hop [ms].

Test Result

Location	Matsuda Laboratory No.1 Test Site
Test date	April 7, 2017
Temperature	22.0 [degree C]
Humidity variation	55.0 [%]
Test Engineer	Tomochika Yonemura

Normal mode

Operating modes	Transmit Time per Hop [ms]	Number of hops per channel in specified period	Time of Occupancy [ms]	Limit [ms]
DH1	0.4370	320.00	139.84	400
DH3	1.6800	160.00	268.80	
DH5	2.9320	106.67	312.75	
2-DH1	0.3608	213.33	76.97	
2-DH3	1.1936	160.00	190.98	
2-DH5	2.0260	106.67	216.11	
3-DH1	0.4360	320.00	139.52	
3-DH3	1.6870	160.00	269.92	
3-DH5	2.9370	106.67	313.28	

AFH mode

Operating modes	Transmit Time per Hop [ms]	Number of hops per channel in specified period	Time of Occupancy [ms]	Limit [ms]
DH1	0.4370	160.00	69.92	400
DH3	1.6800	80.00	134.40	
DH5	2.9320	53.33	156.37	
2-DH1	0.3608	160.00	57.73	
2-DH3	1.1936	80.00	95.49	
2-DH5	2.0260	53.33	108.05	
3-DH1	0.4360	160.00	69.76	
3-DH3	1.6870	80.00	134.96	
3-DH5	2.9370	53.33	156.64	

Spectrum Chart

See ANNEX A.5

9.6 Radiated Spurious Emissions and Band Edge of Restrict Band

Regulations	FCC Part15C §15.209, §15.205 RSS-247 5.5 RSS-Gen 8.9
Test Method/Guide	ANSI C63.10-2013 clause 6.5 and 6.6

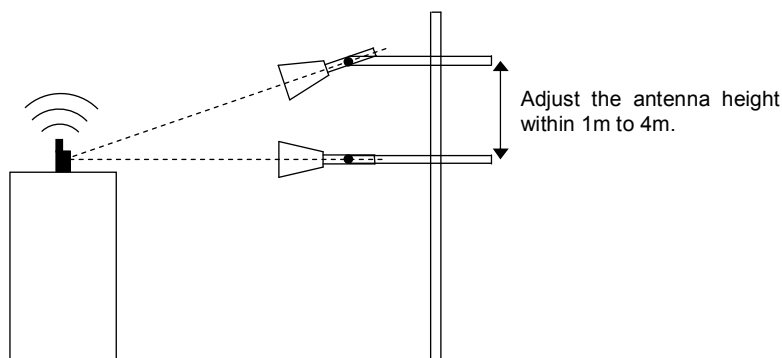
Test Procedure

1. The EUT and test instrument were set up as shown on section 10.2.
2. The measurement antenna was placed at a distance of 3 m from the EUT.
4. The turntable azimuth (EUT direction, 0 – 360 degree) and antenna height (1 – 4 m) are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured.

The equipment and cables are arranged or manipulated within the range of the test standard in the above condition. At least six highest spectrums are measured by the test receiver (below 1 GHz) and spectrum analyzer (above 1 GHz).

For measurements above 1GHz, the emission signal shall be kept within the illumination area of the 3 dB beamwidth of the antenna so that the maximum emission from the EUT is measured.

And the antenna angle toward the source of the emission.



5. Adjust the test instrument for the following setting:

Frequency	Instruments	Detector	RBW	VBW	Remarks
30 – 1000 MHz	CISPR Receiver	QP	120 kHz	N/A	-
Above 1000 MHz	Spectrum Analyzer	Peak	1 MHz	1 MHz	for Peak
				10 Hz	for Average

6. Measurement data correction;

$$\text{Emission Level [dBuV/m]} = \text{Reading [dBuV]} + \text{Factor [dB/m]}$$

$$\text{Margin [dB]} = \text{Limit [dBuV/m]} - \text{Emission Level [dBuV/m]}$$

$$\begin{aligned} * \text{Factor} = & \text{Antenna Factor} + \text{Amplifier gain} + \text{Cable loss} + \text{Attenuator (+ Filter)} \\ & (+ \text{Distance Conversion Factor})^* \end{aligned}$$

* For other than Standard distance:

$$\text{Distance Conversion Factor} = 20 \log (\text{Measurement distance} / \text{Standard distance})$$

Note: Did not carried out the fainal measurement about frequency range of 9 kHz to 30 MHz, because result of pre-check in shield room, spurious emissions was not detected.

Test Result

Operating mode	Bluetooth DH5, 2402 MHz, EUT axis: X		
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site	
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz
Test date	April 12, 2017	April 13, 2017	April 14, 2017
Temperature	20.0	22.0	22.0 [degree C]
Humidity variation	50.0	55.0	55.0 [%]
Test Engineer	Tomochika Yonemura		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver	Hor	Ver	Hor	Ver
1	296.550	QuasiPeak	38.10	37.20	-3.0	0.0	35.1	34.2	46		10.9	11.8
2	960.230	QuasiPeak	35.98	37.70	5.7	0.0	41.7	43.4	54		12.3	10.6
3	2390.000	Peak	42.33	41.21	3.8	0.0	46.1	45.0	74		27.9	29.0
4	2390.000	Average	31.99	30.03	3.8	0.0	35.7	33.8	54		18.2	20.2
5	4804.000	Peak	40.65	41.46	9.6	0.0	50.2	51.0	74		23.7	22.9
6	4804.000	Average	30.68	30.61	9.6	0.0	40.3	40.2	54		13.7	13.8
7	7206.000	Peak	44.13	39.80	15.0	0.0	59.1	54.8	74		14.9	19.2
8	7206.000	Average	28.54	28.43	15.0	0.0	43.5	43.4	54		10.5	10.6
9	9608.000	Peak	34.86	37.38	17.3	0.0	52.2	54.7	74		21.8	19.3
10	9608.000	Average	27.29	27.34	17.3	0.0	44.6	44.7	54		9.4	9.3
11	12010.000	Peak	34.82	35.96	21.7	0.0	56.6	57.7	74		17.4	16.3
12	12010.000	Average	26.43	26.42	21.7	0.0	48.2	48.2	54		5.8	5.8

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver	Hor	Ver	Hor	Ver
1*	2402.000	Peak	75.17	73.91	3.8	0.0	79.0	77.7	-	-	-	-
2*	2400.000	Peak	33.21	31.99	3.8	0.0	37.0	35.8	59.0	57.7	22.0	21.9

Note.

* : Band Edge of Restrict Band

- : Measurement limit

The limit value is -20dBc from the detected the carrier power.

Any Spurious emissions higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	Bluetooth DH5, 2441 MHz, EUT axis: X		
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site	
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz
Test date	April 12, 2017	April 13, 2017	April 14, 2017
Temperature	20.0	22.0	22.0 [degree C]
Humidity variation	50.0	55.0	55.0 [%]
Test Engineer	Tomochika Yonemura		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	296.580	QuasiPeak	39.13	39.23	-3.0	0.0	36.2	36.3	46	9.9	9.8
2	960.240	QuasiPeak	37.93	39.65	5.7	0.0	43.6	45.3	54	10.4	8.6
3	4882.000	Peak	41.58	42.39	9.6	0.0	51.2	52.0	74	22.8	22.0
4	4882.000	Average	32.06	31.99	9.6	0.0	41.6	41.6	54	12.3	12.4
5	7323.000	Peak	48.30	44.97	15.0	0.0	63.3	59.9	74	10.7	14.1
6	7323.000	Average	28.2	29.00	15.0	0.0	43.2	44.0	54	10.8	10.0
7	9764.000	Peak	37.83	40.35	17.3	0.0	55.1	57.7	74	18.8	16.3
8	9764.000	Average	28.13	28.18	17.3	0.0	45.4	45.5	54	8.5	8.5
9	12205.000	Peak	36.13	37.27	21.7	0.0	57.9	59.0	74	16.1	15.0
10	12205.000	Average	26.56	26.32	21.7	0.0	48.3	48.1	54	5.7	5.9

Note.

Any Spurious emissions higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	Bluetooth DH5, 2480 MHz, EUT axis: X		
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site	
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz
Test date	April 12, 2017	April 13, 2017	April 14, 2017
Temperature	20.0	22.0	22.0 [degree C]
Humidity variation	50.0	55.0	55.0 [%]
Test Engineer	Tomochika Yonemura		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	296.610	QuasiPeak	38.26	40.00	-3.0	0.0	35.3	37.0	46	10.7	9.0
2	960.250	QuasiPeak	40.07	38.79	5.7	0.0	45.8	44.5	54	8.2	9.5
3	2483.500	Peak	45.00	43.88	3.8	0.0	48.8	47.6	74	25.2	26.3
4	2483.500	Average	36.64	34.68	3.8	0.0	40.4	38.4	54	13.6	15.5
5	4960.000	Peak	42.59	43.40	9.6	0.0	52.2	53.0	74	21.8	21.0
6	4960.000	Average	33.55	33.48	9.6	0.0	43.1	43.1	54	10.8	10.9
7	7440.000	Peak	47.01	51.68	15.0	0.0	62.0	66.6	74	12.0	7.3
8	7440.000	Average	29.91	29.80	15.0	0.0	44.9	44.8	54	9.1	9.2
9	9920.000	Peak	41.07	43.59	17.3	0.0	58.4	60.9	74	15.6	13.1
10	9920.000	Average	28.67	27.72	17.3	0.0	46.0	45.0	54	8.0	8.9
11	12400.000	Peak	37.55	38.69	21.7	0.0	59.3	60.4	74	14.7	13.6
12	12400.000	Average	25.70	26.20	21.7	0.0	47.4	47.9	54	6.5	6.0

Note.

Any Spurious emissions higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	Bluetooth 3DH5, 2402 MHz, EUT axis: X		
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site	
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz
Test date	April 12, 2017	April 13, 2017	April 14, 2017
Temperature	20.0	22.0	22.0 [degree C]
Humidity variation	50.0	55.0	55.0 [%]
Test Engineer	Tomochika Yonemura		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver	Hor	Ver	Hor	Ver
1	296.490	QuasiPeak	35.98	35.98	-3.0	0.0	33.0	33.0	46		13.0	13.0
2	960.190	QuasiPeak	29.45	29.25	5.7	0.0	35.1	34.9	54		18.8	19.0
3	2390.000	Peak	40.39	40.06	3.8	0.0	44.1	43.8	74		29.8	30.2
4	2390.000	Average	31.30	31.24	3.8	0.0	35.1	35.0	54		18.9	19.0
5	4804.000	Peak	38.41	39.22	9.6	0.0	48.0	48.8	74		26.0	25.2
6	4804.000	Average	30.84	30.77	9.6	0.0	40.4	40.4	54		13.6	13.6
7	7206.000	Peak	44.83	39.50	15.0	0.0	59.8	54.5	74		14.2	19.5
8	7206.000	Average	28.61	28.50	15.0	0.0	43.6	43.5	54		10.4	10.5
9	9608.000	Peak	35.24	37.76	17.3	0.0	52.6	55.1	74		21.4	18.9
10	9608.000	Average	27.42	27.47	17.3	0.0	44.7	44.8	54		9.2	9.2
11	12010.000	Peak	34.95	36.09	21.7	0.0	56.7	57.8	74		17.3	16.2
12	12010.000	Average	26.45	26.44	21.7	0.0	48.2	48.2	54		5.8	5.8

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver	Hor	Ver	Hor	Ver
1*	2402.000	Peak	77.27	78.12	3.8	0.0	81.1	81.9	-	-	-	-
2*	2400.000	Peak	32.89	32.32	3.8	0.0	36.7	36.1	61.1	61.9	24.4	25.8

Note.

* : Band Edge of Restrict Band

- : Measurement limit

The limit value is -20dBc from the detected the carrier power.

Any Spurious emissions higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	Bluetooth 3DH5, 2441 MHz, EUT axis: X		
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site	
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz
Test date	April 12, 2017	April 13, 2017	April 14, 2017
Temperature	20.0	22.0	22.0 [degree C]
Humidity variation	50.0	55.0	55.0 [%]
Test Engineer	Tomochika Yonemura		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	296.500	QuasiPeak	35.92	35.92	-3.0	0.0	32.9	32.9	46	13.1	13.1
2	960.220	QuasiPeak	29.33	29.13	5.7	0.0	35.0	34.8	54	19.0	19.2
3	4882.000	Peak	38.35	39.16	9.6	0.0	47.9	48.7	74	26.0	25.2
4	4882.000	Average	30.76	30.69	9.6	0.0	40.3	40.3	54	13.6	13.7
5	7323.000	Peak	44.44	39.11	15.0	0.0	59.4	54.1	74	14.6	19.9
6	7323.000	Average	28.58	28.47	15.0	0.0	43.5	43.4	54	10.4	10.6
7	9764.000	Peak	35.06	37.58	17.3	0.0	52.4	54.9	74	21.6	19.1
8	9764.000	Average	27.36	27.41	17.3	0.0	44.7	44.7	54	9.3	9.3
9	12205.000	Peak	34.87	36.01	21.7	0.0	56.6	57.7	74	17.4	16.2
10	12205.000	Average	26.44	26.43	21.7	0.0	48.2	48.2	54	5.8	5.8

Note.

Any Spurious emissions higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	Bluetooth 3DH5, 2480 MHz, EUT axis: X		
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site	
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz
Test date	April 12, 2017	April 13, 2017	April 14, 2017
Temperature	20.0	22.0	22.0 [degree C]
Humidity variation	50.0	55.0	55.0 [%]
Test Engineer	Tomochika Yonemura		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	296.510	QuasiPeak	36.01	36.01	-3.0	0.0	33.0	33.0	46	13.0	13.0
2	960.240	QuasiPeak	29.50	29.30	5.7	0.0	35.2	35.0	54	18.8	19.0
3	2483.500	Peak	40.42	40.09	3.8	0.0	44.2	43.8	74	29.8	30.1
4	2483.500	Average	31.35	31.29	3.8	0.0	35.1	35.0	54	18.9	18.9
5	4960.000	Peak	38.43	39.24	9.6	0.0	48.0	48.8	74	26.0	25.2
6	4960.000	Average	30.87	30.80	9.6	0.0	40.5	40.4	54	13.5	13.6
7	7440.000	Peak	44.97	39.64	15.0	0.0	59.9	54.6	74	14.1	19.4
8	7440.000	Average	28.62	28.51	15.0	0.0	43.6	43.5	54	10.4	10.5
9	9920.000	Peak	35.31	37.83	17.3	0.0	52.6	55.1	74	21.4	18.8
10	9920.000	Average	27.45	27.50	17.3	0.0	44.8	44.8	54	9.2	9.2
11	12400.000	Peak	34.98	36.12	21.7	0.0	56.7	57.9	74	17.3	16.1
12	12400.000	Average	26.45	26.44	21.7	0.0	48.2	48.2	54	5.8	5.8

Note.

Any Spurious emissions higher than the frequency reported in the table above were not detected during the measurement.

9.7 Band Edge of Authorized Frequency Band

Regulations	FCC Part15C §15.247 (d) RSS-247 5.5
Test Method/Guide	ANSI C63.10-2013 clause 6.10.4

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.1.
2. Adjust the measurement instrument for the following setting:

RBW	:	100 kHz
VBW	:	300 kHz
Span	:	20 MHz
Detector	:	Peak
Sweep Time	:	Auto
Trace mode	:	Max Hold
3. Allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within in-band emission.
5. Use the marker function to ensure that the band edge level of the authorized frequency band was attenuated by at least the minimum requirements specified.
6. Band Edge Measurement data correction;
 $\text{Limit [dBm]} = \text{Peak level within in-band emission [dBm]} + \text{Factor [dB]} - 20 \text{ [dB]}$
 $\text{Margin [dB]} = \text{Limit [dBm]} - (\text{Band edge Level [dBm]} + \text{Factor [dB]})$

Test Result

Location	Matsuda Laboratory No.1 Test Site
Test date	April 7, 2017
Temperature	19.0 [degree C]
Humidity variation	45.0 [%RH]
Test Engineer	Tomochika Yonemura

Operating mode	Bluetooth DH5, Hopping OFF			
Freq. [MHz]	Peak level within in-band emission [dBm]	Limit [dBm]	Band edge level [dBm]	Margin [dB]
2400	9.341	-10.659	-53.060	42.401
2483.5	9.068	-10.932	-57.289	46.357

Operating mode	Bluetooth DH5, Hopping ON			
Freq. [MHz]	Peak level within in-band emission [dBm]	Limit [dBm]	Band edge level [dBm]	Margin [dB]
2400	8.791	-11.209	-54.055	42.846
2483.5	8.310	-11.690	-62.666	50.976

Operating mode	Bluetooth 2DH5, Hopping OFF			
Freq. [MHz]	Peak level within in-band emission [dBm]	Limit [dBm]	Band edge level [dBm]	Margin [dB]
2400	5.320	-14.680	-54.572	39.892
2483.5	5.450	-14.550	-60.312	45.762

Operating mode	Bluetooth 2DH5, Hopping ON			
Freq. [MHz]	Peak level within in-band emission [dBm]	Limit [dBm]	Band edge level [dBm]	Margin [dB]
2400	4.693	-15.307	-56.618	41.311
2483.5	4.885	-15.115	-61.430	46.315

Operating mode	Bluetooth 3-DH5, Hopping OFF			
Freq. [MHz]	Peak level within in-band emission [dBm]	Limit [dBm]	Band edge level [dBm]	Margin [dB]
2400	5.201	-14.799	-55.470	40.671
2483.5	5.488	-14.512	-60.361	45.849

Operating mode	Bluetooth 3-DH5, Hopping ON			
Freq. [MHz]	Peak level within in-band emission [dBm]	Limit [dBm]	Band edge level [dBm]	Margin [dB]
2400	3.863	-16.137	-57.379	41.242
2483.5	4.639	-15.361	-60.015	44.654

Spectrum Plots
 See ANNEX A.6

9.8 Spurious RF Conducted Emissions

Regulations	FCC Part15C §15.247 (d) RSS-247 5.5
Test Method/Guide	ANSI C63.10-2013 clause 7.8.8

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.1.
2. Adjust the measurement instrument for the following setting:

RBW	:	100 kHz
VBW	:	300 kHz
Span	:	Set span to encompass the spectrum to be examined
Detector	:	Peak
Sweep Time	:	Auto
Correction Factor	:	Input Cable loss and Attenuator
Trace mode	:	Max Hold, Allow trace to fully stabilize.
3. Use the marker function to ensure that the amplitude of all unwanted emissions outside of the authorized frequency band is attenuated by at least the minimum requirements specified.

Spectrum Plots

See ANNEX A.7

Location	Matsuda Laboratory No.1 Test Site
Test date	April 10, 2017
Temperature	22.0 [degree C]
Humidity variation	55.0 [%]
Test Engineer	Tomochika Yonemura

9.9 AC Conducted Emissions

Regulations	FCC Part15C §15.207 RSS-Gen 7.2.2
Test Method/Guide	ANSI C63.10-2013 clause 6.2

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.3.
2. The spectrum analyzer is controlled by the computer program to sweep the frequency range to be measured, then spectrum chart is plotted out to find the worst emission.

At least six highest spectrum are measured in quasi-peak and average (if necessary) using the CISPR Receiver.

3. Adjust the test instrument for the following setting:

Frequency	Instruments	Detector	RBW	VBW
0.15 – 30 MHz	CISPR Receiver	QP	9 kHz	N/A
		AVG		

6. Measurement data correction;

Emission Level [dBuV] = Reading [dBuV] + Factor [dB]

Margin [dB] = Limit [dBuV] – Emission Level [dBuV]

* Factor = LISN Factor + Cable loss + Attenuator

Test Result

Test date	April 14, 2017
Location	Matsuda Laboratory No.2 Test Site
Temperature	22.0 [degree C]
Humidity variation	55.0 [%]
Test Engineer	Tomochika Yonemura

Operating mode			Bluetooth DH5, Hopping ON								
No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.24	QuasiPeak	36.56	37.25	10.40	10.40	46.96	47.65	62.40	15.44	14.75
2	0.26	Average	29.36	31.22	10.40	10.40	39.76	41.62	52.40	12.64	10.78
3	0.41	QuasiPeak	25.49	29.40	10.50	10.50	35.99	39.90	58.90	22.91	19.00
4	0.37	Average	19.24	22.15	10.50	10.50	29.74	32.65	48.90	19.16	16.25
5	0.63	QuasiPeak	10.86	12.97	10.50	10.50	21.36	23.47	56.00	34.64	32.53
6	0.66	Average	9.14	8.84	10.50	10.50	19.64	19.34	46.00	26.36	26.66
7	14.25	QuasiPeak	30.74	28.81	11.30	11.30	42.04	40.11	60.00	17.96	19.89
8	15.10	Average	12.13	11.56	11.30	11.30	23.43	22.86	50.00	26.57	27.14
9	17.12	QuasiPeak	27.96	26.63	11.30	11.30	39.26	37.93	60.00	20.74	22.07
10	15.28	Average	12.52	11.77	11.30	11.30	23.82	23.07	50.00	26.18	26.93
11	16.82	QuasiPeak	33.02	30.35	11.30	11.30	44.32	41.65	60.00	15.68	18.35
12	17.79	Average	13.92	13.08	11.30	11.30	25.22	24.38	50.00	24.78	25.62

Operating mode			Bluetooth 2DH5, Hopping ON								
No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.25	QuasiPeak	37.41	37.66	10.40	10.40	47.81	48.06	62.40	14.59	14.34
2	0.27	Average	30.04	31.57	10.40	10.40	40.44	41.97	52.40	11.96	10.43
3	0.42	QuasiPeak	26.08	29.73	10.50	10.50	36.58	40.23	58.90	22.32	18.67
4	0.38	Average	19.69	22.40	10.50	10.50	30.19	32.90	48.90	18.71	16.00
5	0.64	QuasiPeak	11.11	13.12	10.50	10.50	21.61	23.62	56.00	34.39	32.38
6	0.67	Average	9.36	8.94	10.50	10.50	19.86	19.44	46.00	26.14	26.56
7	14.43	QuasiPeak	31.45	29.13	11.30	11.30	42.75	40.43	60.00	17.25	19.57
8	15.29	Average	12.41	11.69	11.30	11.30	23.71	22.99	50.00	26.29	27.01
9	17.33	QuasiPeak	28.61	26.93	11.30	11.30	39.91	38.23	60.00	20.09	21.77
10	15.47	Average	12.81	11.90	11.30	11.30	24.11	23.20	50.00	25.89	26.80
11	17.03	QuasiPeak	33.78	30.69	11.30	11.30	45.08	41.99	60.00	14.92	18.01
12	18.01	Average	14.25	13.23	11.30	11.30	25.55	24.53	50.00	24.45	25.47

Operating mode			Bluetooth 3DH5, Hopping ON								
No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.25	QuasiPeak	36.97	37.96	10.40	10.40	47.37	48.36	62.40	15.03	14.04
2	0.27	Average	29.69	31.82	10.40	10.40	40.09	42.22	52.40	12.31	10.18
3	0.42	QuasiPeak	25.78	29.96	10.50	10.50	36.28	40.46	58.90	22.62	18.44
4	0.38	Average	19.46	22.58	10.50	10.50	29.96	33.08	48.90	18.94	15.82
5	0.64	QuasiPeak	10.98	13.22	10.50	10.50	21.48	23.72	56.00	34.52	32.28
6	0.67	Average	9.25	9.01	10.50	10.50	19.75	19.51	46.00	26.25	26.49
7	14.28	QuasiPeak	31.08	29.36	11.30	11.30	42.38	40.66	60.00	17.62	19.34
8	15.14	Average	12.27	11.78	11.30	11.30	23.57	23.08	50.00	26.43	26.92
9	17.16	QuasiPeak	28.27	27.14	11.30	11.30	39.57	38.44	60.00	20.43	21.56
10	15.32	Average	12.66	12.00	11.30	11.30	23.96	23.30	50.00	26.04	26.70
11	16.86	QuasiPeak	33.39	30.93	11.30	11.30	44.69	42.23	60.00	15.31	17.77
12	17.83	Average	14.08	13.33	11.30	11.30	25.38	24.63	50.00	24.62	25.37

9.10 Receiver Spurious Emissions

Regulations	RSS-Gen 7.1
Test Method/Guide	ANSI C63.10-2013 clause 6.5 and 6.6

Test Procedure

See section 9.6

Test Result

Operating mode	Bluetooth Receiving mode, EUT Axis: X		
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site	
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz
Test date	April 12, 2017	April 13, 2017	April 14, 2017
Temperature	20.0	22.0	22.0 [degree C]
Humidity variation	50.0	55.0	55.0 [%]
Test Engineer	Tomochika Yonemura		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	296.450	QuasiPeak	38.59	37.04	-3.0	0.0	35.6	34.1	46	10.4	12.0
2	960.280	QuasiPeak	32.19	30.70	5.7	0.0	37.9	36.4	54	16.1	17.6
3	2440.000	Peak	42.31	40.31	3.8	0.0	46.1	44.1	74	27.9	29.9
4	2440.000	Average	34.40	32.96	3.8	0.0	38.2	36.7	54	15.8	17.3
5	4880.000	Peak	39.89	39.07	9.6	0.0	49.5	48.7	74	24.5	25.3
6	4880.000	Average	32.82	31.43	9.6	0.0	42.4	41.0	54	11.6	13.0
7	7320.000	Peak	43.02	36.15	15.0	0.0	58.0	51.1	74	16.0	22.9
8	7320.000	Average	29.64	28.34	15.0	0.0	44.6	43.3	54	9.4	10.7
9	9760.000	Peak	39.32	40.19	17.3	0.0	56.6	57.5	74	17.3	16.5
10	9760.000	Average	27.41	26.22	17.3	0.0	44.7	43.5	54	9.3	10.4
11	12200.000	Peak	36.90	36.52	21.7	0.0	58.6	58.3	74	15.3	15.7
12	12200.000	Average	26.81	25.72	21.7	0.0	48.5	47.5	54	5.4	6.5

Note.

Any Spurious emissions higher than the frequency reported in the table above were not detected during the measurement.

SECTION 10. LIST AND DIAGRAM OF MEASURING INSTRUMENTS

Test instruments are calibrated according to Quality Manual and Calibration Rules of Intertek Japan K.K.

All measurements equipment used for the measurement is calibrated based on standard.

Each measurement result is traceable to national or international standards.

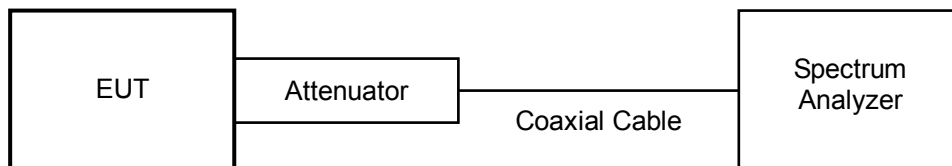
Antenna used in the measurement is calibrated according to ANSI C63.5.

10.1 RF Conducted

Measurement Instruments

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
Spectrum Analyzer	N9030A	MY52350520	Agilent	1 Y	Mar. 31, 2018
20 dB Attenuator	8493C	78585	Agilent	1 Y	Mar. 31, 2018
Coaxial Cable	SUCOFLEX 104PE	94703/4PE	SUHNER	1 Y	Mar. 31, 2018

Measurement Equipment Configuration



10.2 Radiated Emission

Measurement Instruments

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
30 – 1000 MHz					
Broad Band Antenna	VULB9168	111	Schwarzbeck	1 Y	Sep. 30, 2017
Amplifier	8447F	2805A02505	Hewlett Packard	1 Y	Jan. 31, 2018
Attenuator	6806.17.AC	-	HUBER+SUHNER	1 Y	Jan. 31, 2018
Coaxial Cable (R1)	EM0NSA3	MTD02325	Fujiura	1 Y	Jan. 31, 2018
Coaxial Cable (R2)	SUCOFLEX 106	12718/6	HUBER+SUHNRT	1 Y	Jan. 31, 2018
Site Attenuation	-	-	-	1 Y	Apr. 30, 2017
Test Receiver	ESS (Firmware Version 1.07)	842886/010	Rohde & Schwarz	1 Y	Feb. 28, 2018
Above 1000 MHz					
Double Ridged Antenna	3115	2568	EMCO	1 Y	Jan. 31, 2018
Horn Antenna with Preamplifier	MLA-18265-B03-30	1694440	TSJ	1 Y	Sep. 30, 2017
Amplifier	TPA0118-30	950186	TOYO Corporation	1 Y	Apr. 30, 2017
6dB Attenuator	6806.17.B	E00AT6GA	SUNNER	1 Y	Apr. 30, 2017
Coaxial Cable (R3)	SUCOFLEX 104(6.0m)	64611/4PE	SUNNER	1 Y	Apr. 30, 2017
Coaxial Cable (R4)	SUCOFLEX 104(1.0m)	64587/4PE	SUNNER	1 Y	Apr. 30, 2017
Coaxial Cable (R5)	5B-048-98-98-6000	120315	Candox	1 Y	Sep. 30, 2017
SVSWR				1 Y	Sep. 30, 2017
Spectrum Analyzer	N9030A	MY52350520	Agilent	1 Y	Mar. 31, 2018
Common					
Testing Software	emiT (Version 3,0,0,0)			N/A	N/A

Measurement Instruments Configurations

Diagram of the measurement instruments (30-1000 MHz)

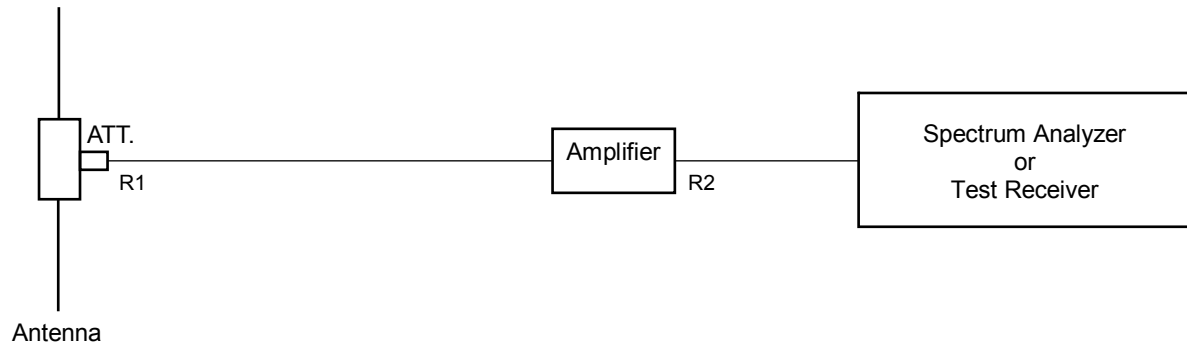


Diagram of the measurement instruments (2000 - 3000 MHz)

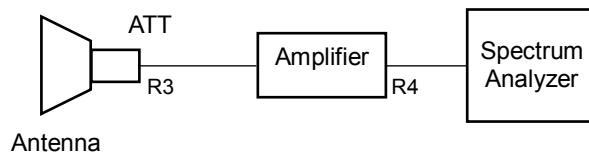


Diagram of the measurement instruments (1000- 2000 and 3000 – 18000 MHz)

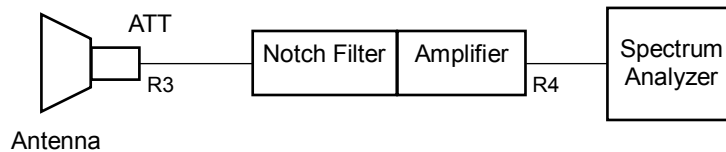
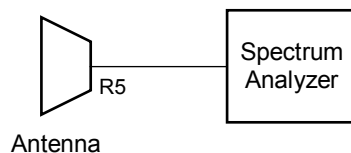
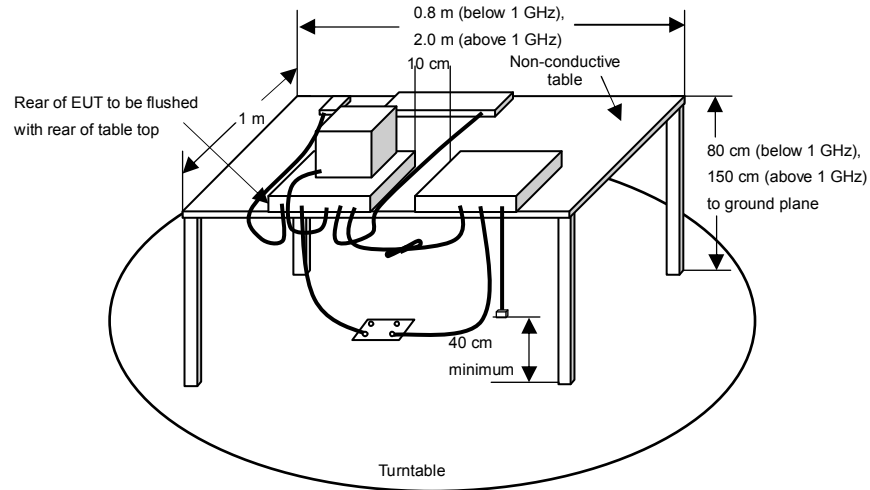


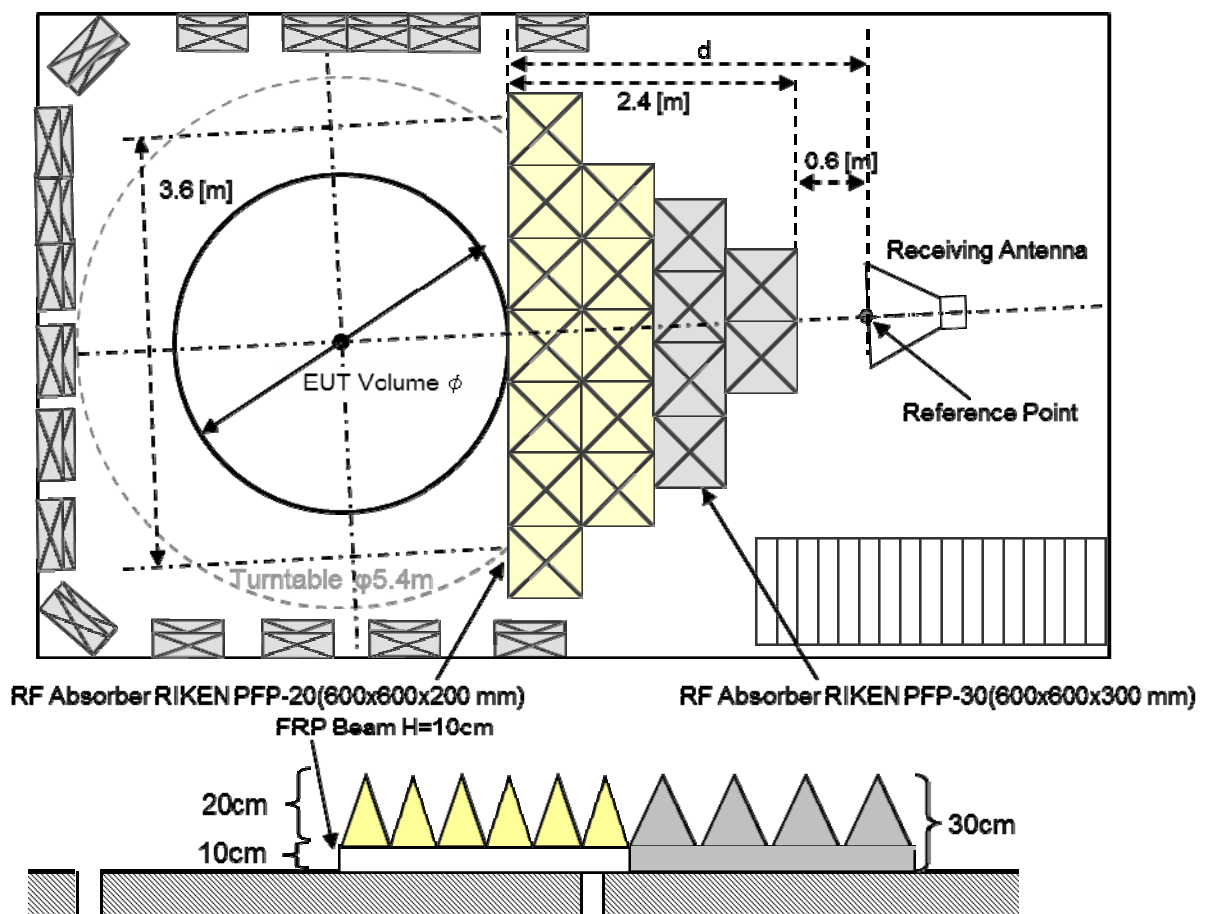
Diagram of the measurement instruments (18000 - 25000 MHz)



EUT set-up as per standard



Absorber placement and Receive Antenna location in Radiated disturbance above 1 GHz

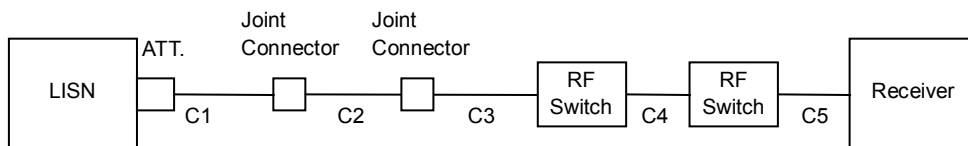


10.3 AC Line Conducted Emission

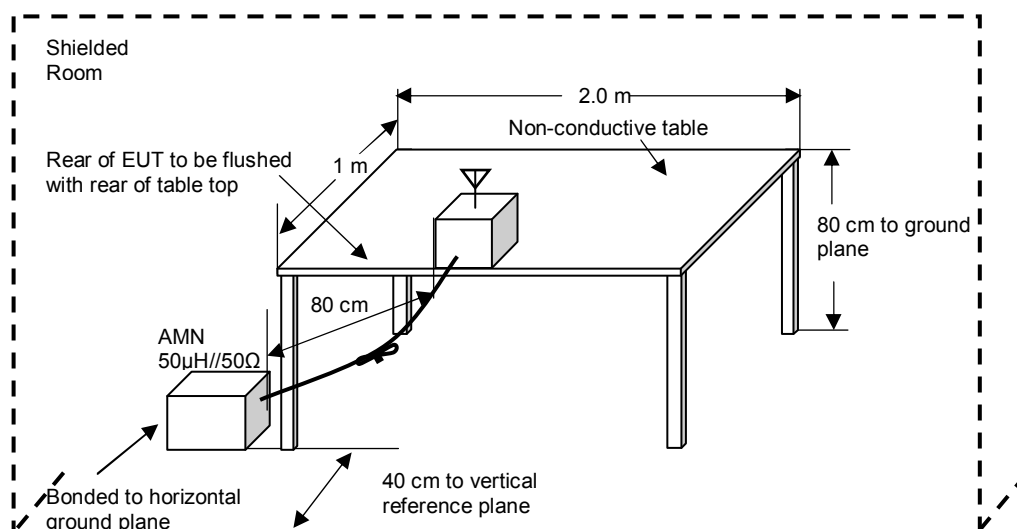
Measurement Instrument

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
LISN(EUT)	ESH2-Z5	842966/001	Rohde & Schwarz	1 Y	Aug. 31, 2017
LISN(Peripheral)	KNW-407	8-1395-2	Kyoritsu	1 Y	Jun. 31, 2017
10dB LISN Pad	CFA-01	E03AT10D	TAMAGAWA	1 Y	Aug. 31, 2017
10dB LISN Pad	6801.01.A	E00AT10D	HUBER+SUHNER	1 Y	Jun. 31, 2017
50Ω Termination	65BNC-50-0-2/133NE	E02TRM50A	SUHNER	1 Y	Jun. 31, 2017
Coaxial Cable (C1)	3D-2W(7.8m)	MTS02CSR-1	Intertek	1 Y	Jan. 31, 2018
Coaxial Cable (C2)	RG-5A/U(12.0m)	MTS02CSR-2	Intertek	1 Y	Jan. 31, 2018
Coaxial Cable (C3)	RG214HF(1.5m)	MTS02CSR-3	SUHNER	1 Y	Jan. 31, 2018
Coaxial Cable (C4)	RG214HF(1.5m)	MTS02CSR-4	SUHNER	1 Y	Jan. 31, 2018
Coaxial Cable (C5)	RG214HF(1.5m)	MTS02CSR-5	SUHNER	1 Y	Jan. 31, 2018
RF Switch	MP59B	M28542	Anritsu	1 Y	Feb. 28, 2018
RF Switch	ACX-150-1	E02301501	Intertek	1 Y	Feb. 28, 2018
Test Receiver	ESS (Firmware Version 1.21)	842123/010	Rohde & Schwarz	1 Y	Feb. 28, 2018
Testing Software	emiT (Version 3,0,0,0)	-	-	-	-

Measurement Instruments Configurations



Test setup as per standard



* Reference Ground plane : greater than 2 x 2m