



RADIO TEST REPORT

Test Report No. : 32KE0041-HO-02-C-R1

Applicant : Sony Corporation
Type of Equipment : Personal Computer
Model No. : SVD112A1WL
FCC ID : AK8SVD112A1WL
Test regulation : FCC Part 15 Subpart C: 2012
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This report is a revised version of 32KE0041-HO-02-C. 32KE0041-HO-02-C is replaced with this report.

Date of test: July 18 to August 7, 2012

Representative test engineer:

Yutaka Yoshida
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

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SECTION 1: Customer information

Company Name : Sony Corporation
Address : 1-7-1 Konan, Minato-ku, Tokyo, 399-8282 Japan
Telephone Number : +81-263-71-8272
Facsimile Number : +81-263-71-8984
Contact Person : Yuichi Kosaka

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

2.1 Identification of E.U.T.

Type of Equipment : Personal Computer
Model No. : SVD112A1WL
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 10.5V, 4.3A
Receipt Date of Sample : July 7, 2012
Country of Mass-production : Japan
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product description

General Specification

Feature of EUT : This model is co-located with Wireless LAN(IEEE802.11a/b/g/n)/
Bluetooth module, NFC Module and stylus.
Each antenna is included in the Personal computer.
This model can co-operate Wireless LAN(IEEE802.11a) + Bluetooth +
NFC + stylus.
Clock frequency(ies) in the system : 12MHz, 25MHz

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Radio Specification

Specification of Wireless LAN (IEEE802.11a/b/g) and Bluetooth

Type of radio	Wireless LAN (IEEE802.11a)	Wireless LAN (IEEE802.11b/g)	Bluetooth (EDR/BDR/LE)
Equipment Type	Transceiver		
Frequency of Operation	Low Band Lower frequency=5180MHz Upper frequency=5320MHz High Band Lower frequency=5500MHz Upper frequency=5700MHz Upper Band Lower frequency=5745MHz Upper frequency=5825MHz	Lower frequency=2412MHz Upper frequency=2462MHz	Lower frequency=2402MHz Upper frequency=2480MHz
Bandwidth & Channel spacing	Bandwidth: 20MHz Ch spacing: 20MHz	Bandwidth: 20MHz Ch spacing: 5MHz	Bandwidth: 1MHz Ch spacing: 1MHz (EDR/BDR), 2MHz (LE)
Type of Modulation	OFDM	11b: DSSS 11g: OFDM	EDR/BDR: GFSK, $\pi/4$ DQPSK, 8DPSK LE: GFSK
Antenna Type	PIFA (Internal)		
Antenna Connector Type	U.FL compatible connector		
Antenna Gain	Antenna 1: +1.95dBi (2.4GHz) +1.83dBi (5GHz) Antenna 2: +1.20dBi (2.4GHz) +2.33dBi (5GHz) (Including Cableloss)	+1.20dBi	
Power Supply	DC 3.3V		
Operating temperature range	+5 to +35 deg. C.		

Specification of Wireless LAN (IEEE802.11n)

Type of radio	Wireless LAN (IEEE802.11n)			
	2.4G Band MISO / MIMO (20M Band)	2.4G Band MISO / MIMO (40M Band)	5G Band MISO / MIMO (20M Band)	5G Band MISO / MIMO (40M Band)
Equipment Type	Transceiver			
Frequency of Operation	Lower frequency =2412MHz Upper frequency =2462MHz	Lower frequency =2422MHz Upper frequency =2452MHz	Low Band Lower frequency=5180MHz Upper frequency=5320MHz High Band Lower frequency=5500MHz Upper frequency=5700MHz Upper Band Lower frequency=5745MHz Upper frequency=5825MHz	Low Band Lower frequency=5190MHz Upper frequency=5310MHz High Band Lower frequency=5510MHz Upper frequency=5670MHz Upper Band Lower frequency=5755MHz Upper frequency=5795MHz
Bandwidth & Channel spacing	Bandwidth: 20MHz Ch spacing: 5MHz	Bandwidth: 40MHz Ch spacing: 5MHz	Bandwidth: 20MHz Ch spacing: 20MHz	Bandwidth: 40MHz Ch spacing: 40MHz
Type of Modulation	OFDM			
Antenna Type	PIFA (Internal)			
Antenna Connector Type	U.FL compatible connector			
Antenna Gain	Antenna 1: +1.95dBi (2.4GHz) +1.83dBi (5GHz) Antenna 2: +1.20dBi (2.4GHz) +2.33dBi (5GHz) (Including Cableloss)			
Power Supply	DC 3.3V			
Operating temperature range	+5 to +35 deg. C.			

*This test report applies for Bluetooth (LE).

*Wireless LAN (IEEE802.11a/n, 5G Band) and Bluetooth transmit simultaneously by Antenna 2. The co-location and co-operation are tested in the test report 32KE0041-HO-02-A(FCC15.247(for WLAN)), 32KE0041-HO-02-B(FCC15.247(for BT[EDR/BDR])) and 32KE0041-HO-02-D(FCC15.407) issued by UL Japan Inc.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2012, final revised on July 23, 2012 and effective August 22, 2012

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

* The revision on July 23, 2012 does not affect the test specification applied to the EUT.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.4:2003 7. AC powerline Conducted Emission measurements ----- IC: RSS-Gen 7.2.4	FCC: Section 15.207 ----- IC: RSS-Gen 7.2.4	QP 10.9dB, 0.50534MHz, L AV 7.7dB, 0.50534MHz, L	Complied	-
6dB Bandwidth	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" ----- IC: RSS-Gen 4.6.2	FCC: Section 15.247(a)(2) ----- IC: RSS-210 A8.2(a)	See data.	Complied	Conducted
Maximum Peak Output Power	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" ----- IC: RSS-Gen 4.8	FCC: Section 15.247(b)(3) ----- IC: RSS-210 A8.4(4)		Complied	Conducted
Power Density	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" ----- IC: -	FCC: Section 15.247 (e) ----- IC: RSS-210 A8.2(b)		Complied	Conducted
Spurious Emission Restricted Band Edges	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" ----- IC: RSS-Gen 4.9	FCC: Section15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 7.2.3	0.5dB 2483.500MHz, AV, Vert.	Complied	Conducted/ Radiated

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

FCC 15.31 (e)

This EUT provides stable voltage(DC3.3V) constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	IC: RSS-Gen 4.6.1	IC: RSS-Gen 4.6.1	N/A	-	Conducted

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

3.4 Uncertainty

EMI

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

Test room (semi-anechoic chamber)	Conducted emission (+dB)
	150kHz-30MHz
No.1	3.5dB
No.2	3.6dB
No.3	3.6dB
No.4	3.6dB

Test room (semi-anechoic chamber)	Radiated emission (10m*)(+dB)		
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz
No.1	4.2dB	5.0dB	4.8dB
No.2	-	-	-
No.3	-	-	-
No.4	-	-	-

*10m = Measurement distance

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(+dB)				(1m*)(+dB)		(0.5m*)(+dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.3dB	5.0dB	5.1dB	4.9dB	5.8dB	4.4dB	4.3dB
No.2	4.3dB	5.2dB	5.1dB	5.0dB	5.7dB	4.3dB	4.2dB
No.3	4.6dB	5.0dB	5.1dB	5.0dB	5.7dB	4.5dB	4.2dB
No.4	4.8dB	5.2dB	5.0dB	5.0dB	5.7dB	5.2dB	4.2dB

*3m/1m/0.5m = Measurement distance

Power meter (+dB)	
Below 1GHz	Above 1GHz
1.0dB	1.0dB

Antenna terminal conducted emission and Power density (+dB)			Antenna terminal conducted emission (+dB)		Channel power (+dB)
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.0dB	1.1dB	2.7dB	3.2dB	3.3dB	1.5dB

Conducted Emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test(3m)

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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3.5 Test Location

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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 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 Data of EMI, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

Mode	Remarks*
Bluetooth(BT) LE(Low Energy)	Maximum Packet Size, PN9
<p>*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)</p> <p>*EUT has the power settings by the software as follows; Power settings: BDR/EDR: 8dBm LE: None (The power setting by the software was not possible) Software: Intel DRTU, Version 1.5.3-0335</p> <p>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.</p>	

*The details of Operating mode(s)

Test Item	Operating Mode	Tested frequency
Conducted Emission	BT LE	2402MHz
Spurious Emission		2440MHz
6dB Bandwidth		2480MHz
Maximum Peak Output Power		
Power Density		
99% Occupied Bandwidth		

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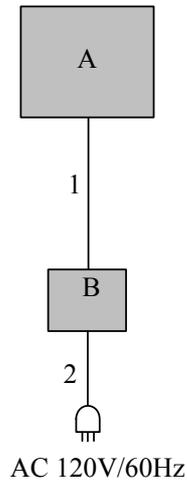
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4.2 Configuration and peripherals



* Cabling and setup 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	Remark
A	Personal Computer	SVD112A1WL	XTA2-1 3 *1) XTD2-2 12 *2)	Sony Corporation	EUT
B	AC Adapter	VGP-AC10V8	1490488110000393	Sony Corporation	EUT

*1) Used for Conducted emission and Radiated emission tests

*2) Used for Antenna terminal conducted test

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	1.7	Unshielded	Unshielded	-
2	AC Cable	1.5	Unshielded	Unshielded	-

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SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)

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

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

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

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SECTION 6: Radiated Spurious Emission

Test Procedure

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

The height of the measuring antenna varied between 1 and 4m 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	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Biconical	Logperiodic	Horn

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20dBc was applied to the frequency over the limit of FCC 15.209 / Table 5 of RSS-Gen 7.2.5(IC) and outside the restricted band of FCC15.205 / Table 3 of RSS-Gen 7.2.2 (IC).

Frequency	Below 1GHz	Above 1GHz		20dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 10Hz or RBW: 1MHz VBW: 3kHz *1)	RBW: 100kHz VBW: 300kHz (S/A)
Test Distance	3m	3m (below 10GHz), 1m*2) (above 10GHz)		3m (below 10GHz), 1m*2) (above 10GHz)

*1) Used for the band edge of the carrier and the harmonics that can be measured. The VBW is based on the inverse of the Tx on (transmitting on time) (see Appendix).

*2) Distance Factor: $20 \times \log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

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

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

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SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
6dB Bandwidth	3MHz	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	1 to 3% of Span	Three times of RBW	Auto	Sample	Clear Write (Gate function was used)	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/Average *3)	-	Power Meter (Sensor: 50MHz BW)
Peak Power Density	1.5MHz	3kHz	10kHz	500sec	Peak	Max Hold	Spectrum Analyzer *1)
Conducted Spurious Emission *2)	9kHz to 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1kHz	27kHz				
	30MHz to 25GHz (Less or equal to 5GHz)	100kHz	300kHz				

*1) PSD Option 1 of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".
*2) 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. (9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz).
*3) Testing using an average detector was performed in order to confirm that the output power of the EUT met the exclusion limits stated in FCC Part 2 Section 2.1093 and FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET 65 and the EUT was exempt from RF exposure SAR evaluation.

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

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Data of EMI test

Conducted Emission

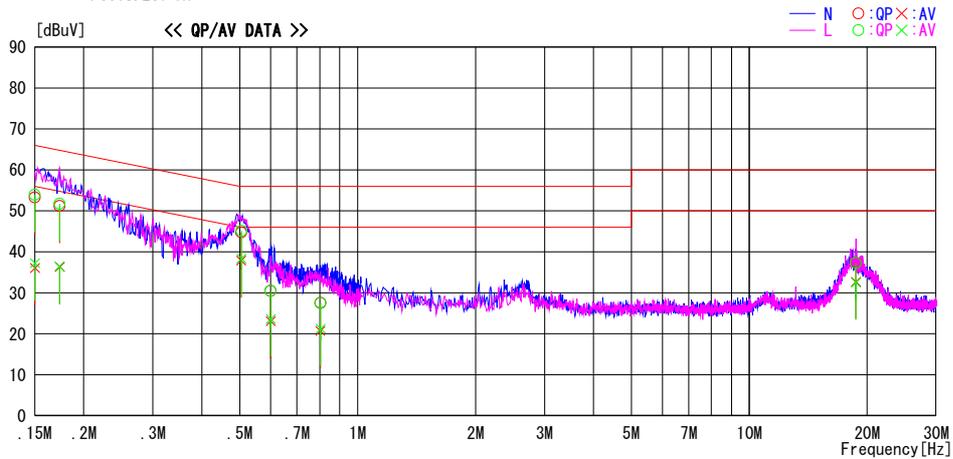
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2012/07/23

Report No. : 32KE0041-HO-02
 Power : AC 120V / 60Hz
 Temp./Humi. : 24 deg. C / 62% RH
 Engineer : Takumi Shimada

Mode / Remarks : BT Tx 2480MHz LE

LIMIT : FCC15.207 QP
 FCC15.207 AV

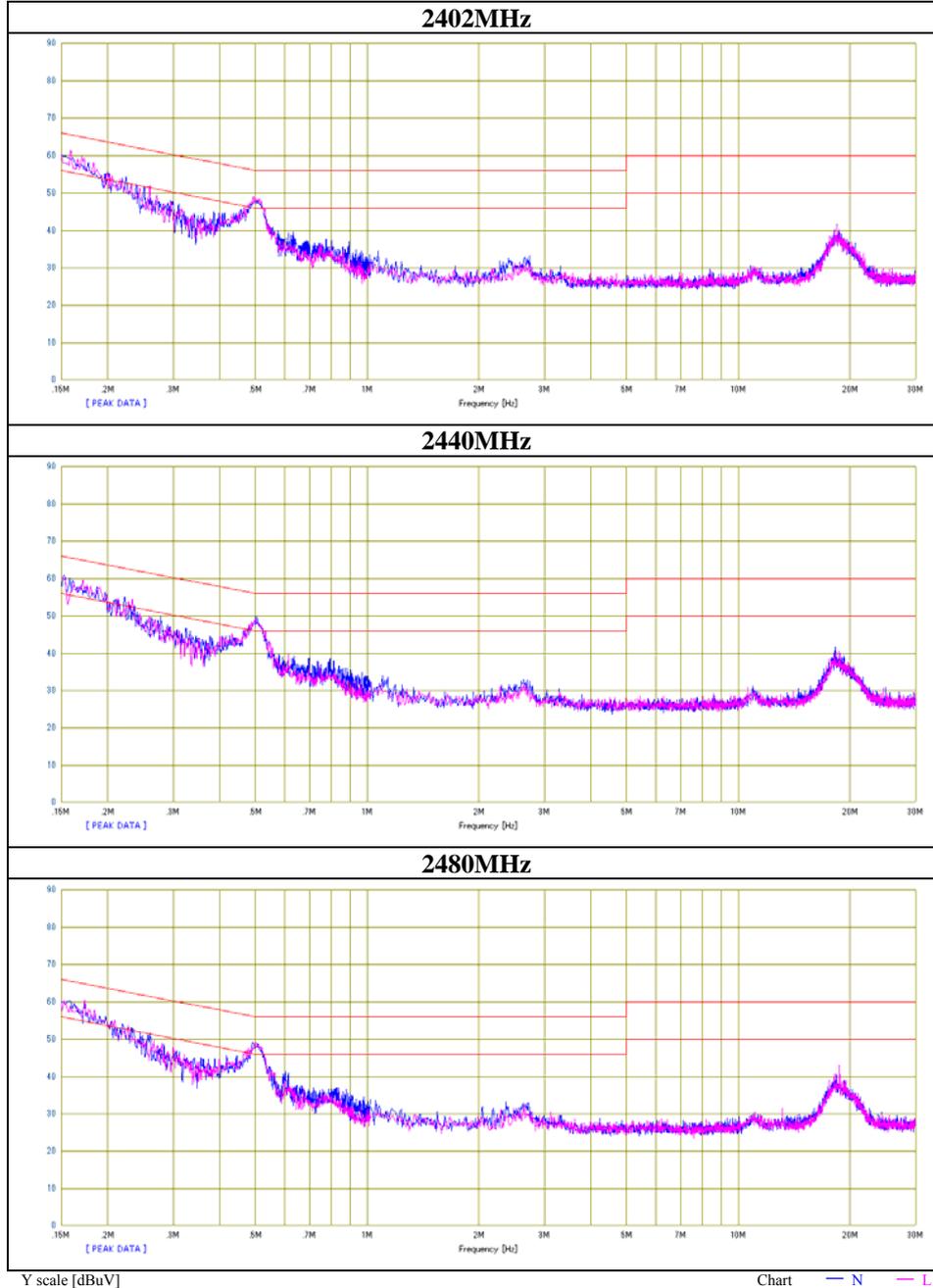


Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	40.0	22.8	13.3	53.3	36.1	66.0	56.0	12.7	19.9	N	
0.17349	37.9	23.0	13.3	51.2	36.3	64.8	54.8	13.6	18.5	N	
0.50421	31.4	24.6	13.3	44.7	37.9	56.0	46.0	11.3	8.1	N	
0.59960	17.2	9.8	13.3	30.5	23.1	56.0	46.0	25.5	22.9	N	
0.80339	14.3	7.4	13.3	27.6	20.7	56.0	46.0	28.4	25.3	N	
18.71670	22.8	18.1	14.6	37.4	32.7	60.0	50.0	22.6	17.3	N	
0.15000	40.6	23.9	13.3	53.9	37.2	66.0	56.0	12.1	18.8	L	
0.17334	38.4	23.1	13.3	51.7	36.4	64.8	54.8	13.1	18.4	L	
0.50534	31.8	25.0	13.3	45.1	38.3	56.0	46.0	10.9	7.7	L	
0.59976	17.2	10.3	13.3	30.5	23.6	56.0	46.0	25.5	22.4	L	
0.80440	14.2	7.9	13.3	27.5	21.2	56.0	46.0	28.5	24.8	L	
18.71634	22.7	17.9	14.6	37.3	32.5	60.0	50.0	22.7	17.5	L	

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

Conducted Emission

Test place	Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No.	32KE0041-HO-02
Date	07/23/2012
Temperature/ Humidity	24 deg.C / 62% RH
Engineer	Takumi Shimada
Mode	Tx Bluetooth LE

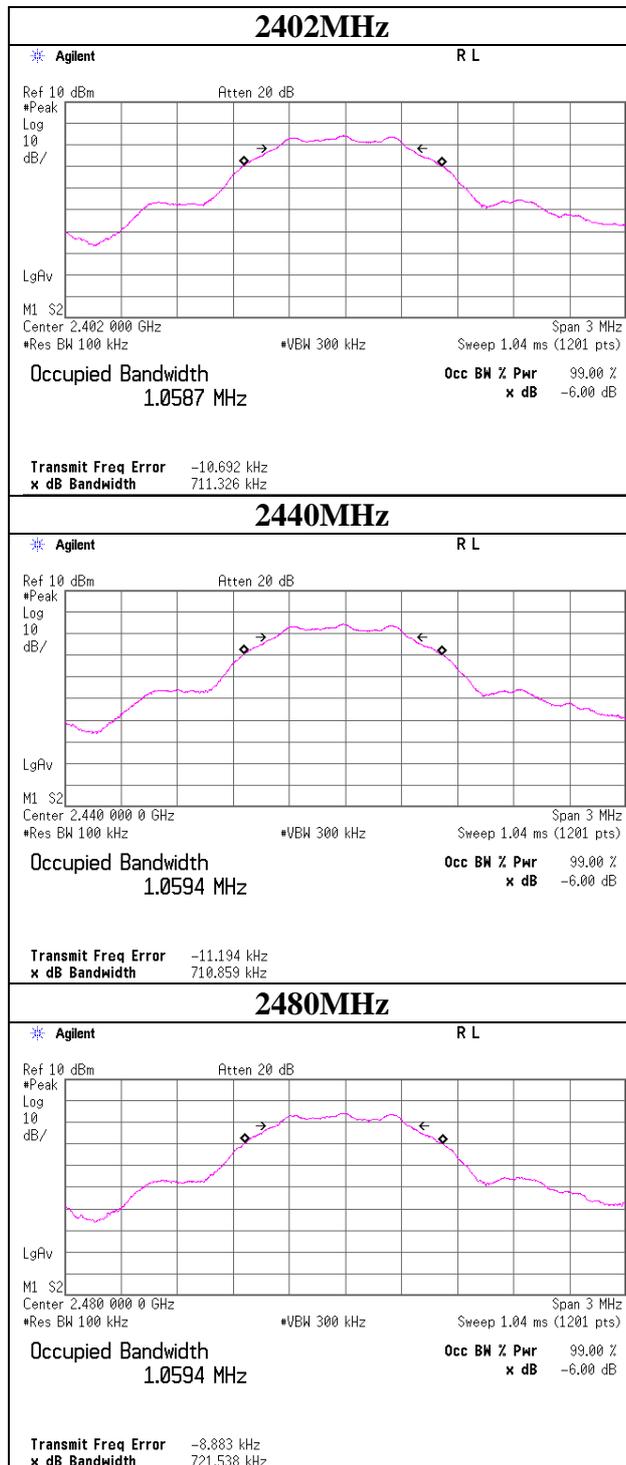


6dB Bandwidth

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 32KE0041-HO-02
Date 08/07/2012
Temperature/ Humidity 26deg. C / 65% RH
Engineer Yutaka Yoshida
Mode Tx Bluetooth LE

Frequency [MHz]	6dB Bandwidth [kHz]	Limit [kHz]
2402	711.326	>500
2440	710.859	>500
2480	721.538	>500

6dB Bandwidth



Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 32KE0041-HO
Date 07/18/2012 07/19/2012
Temperature/ Humidity 22 deg.C/ 59% RH 21 deg.C/ 60% RH
Engineer Katsunori Okai Takumi Shimada
(1-26.5GHz) (30-1000MHz)
Mode Tx LE 2402MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	98.983	QP	29.7	9.4	7.5	28.4	18.2	43.5	25.3	
Hori	270.010	QP	29.5	18.0	8.7	27.6	28.6	46.0	17.4	
Hori	352.541	QP	35.4	16.0	9.2	28.0	32.6	46.0	13.4	
Hori	433.986	QP	37.1	17.7	9.5	28.5	35.8	46.0	10.2	
Hori	480.002	QP	35.1	18.1	9.7	28.7	34.2	46.0	11.8	
Hori	564.483	QP	30.2	19.3	10.0	28.8	30.7	46.0	15.3	
Hori	2282.000	PK	51.7	27.4	2.2	34.9	46.4	73.9	27.5	
Hori	2390.000	PK	51.4	27.4	2.2	34.8	46.2	73.9	27.7	
Hori	4804.000	PK	45.8	31.2	4.0	34.0	47.0	73.9	26.9	
Hori	2282.000	AV	47.8	27.4	2.2	34.9	42.5	53.9	11.4	
Hori	2390.000	AV	34.2	27.4	2.2	34.8	29.0	53.9	24.9	
Hori	4804.000	AV	39.1	31.2	4.0	34.0	40.3	53.9	13.6	
Vert	49.134	QP	30.4	11.4	7.0	28.6	20.2	40.0	19.8	
Vert	121.135	QP	34.8	12.7	7.7	28.3	26.9	43.5	16.6	
Vert	140.011	QP	39.7	14.3	7.8	28.2	33.6	43.5	9.9	
Vert	437.051	QP	41.4	17.7	9.5	28.5	40.1	46.0	5.9	
Vert	487.406	QP	39.7	18.2	9.7	28.7	38.9	46.0	7.1	
Vert	564.487	QP	32.5	19.3	10.0	28.8	33.0	46.0	13.0	
Vert	2282.000	PK	59.8	27.4	2.2	34.9	54.5	73.9	19.4	
Vert	2390.000	PK	52.6	27.4	2.2	34.8	47.4	73.9	26.5	
Vert	4804.000	PK	45.9	31.2	4.0	34.0	47.1	73.9	26.8	
Vert	2282.000	AV	54.6	27.4	2.2	34.9	49.3	53.9	4.6	
Vert	2390.000	AV	35.3	27.4	2.2	34.8	30.1	53.9	23.8	
Vert	4804.000	AV	39.4	31.2	4.0	34.0	40.6	53.9	13.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

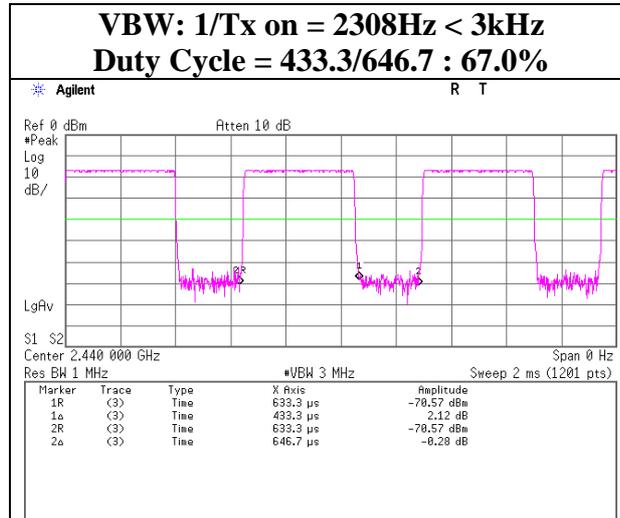
$$26.5\text{GHz}-40\text{GHz} \quad 20\log(3.0\text{m}/0.5\text{m})=15.6\text{dB}$$

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	107.0	27.5	2.2	34.8	101.9	-	-	Carrier
Hori	2400.000	PK	58.8	27.5	2.2	34.8	53.7	81.9	28.2	
Hori	2522.000	PK	57.8	27.5	2.3	34.8	52.8	81.9	29.1	
Vert	2402.000	PK	110.4	27.5	2.2	34.8	105.3	-	-	Carrier
Vert	2400.000	PK	63.1	27.5	2.2	34.8	58.0	85.3	27.3	
Vert	2522.000	PK	61.9	27.5	2.3	34.8	56.9	85.3	28.4	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

Burst rate confirmation



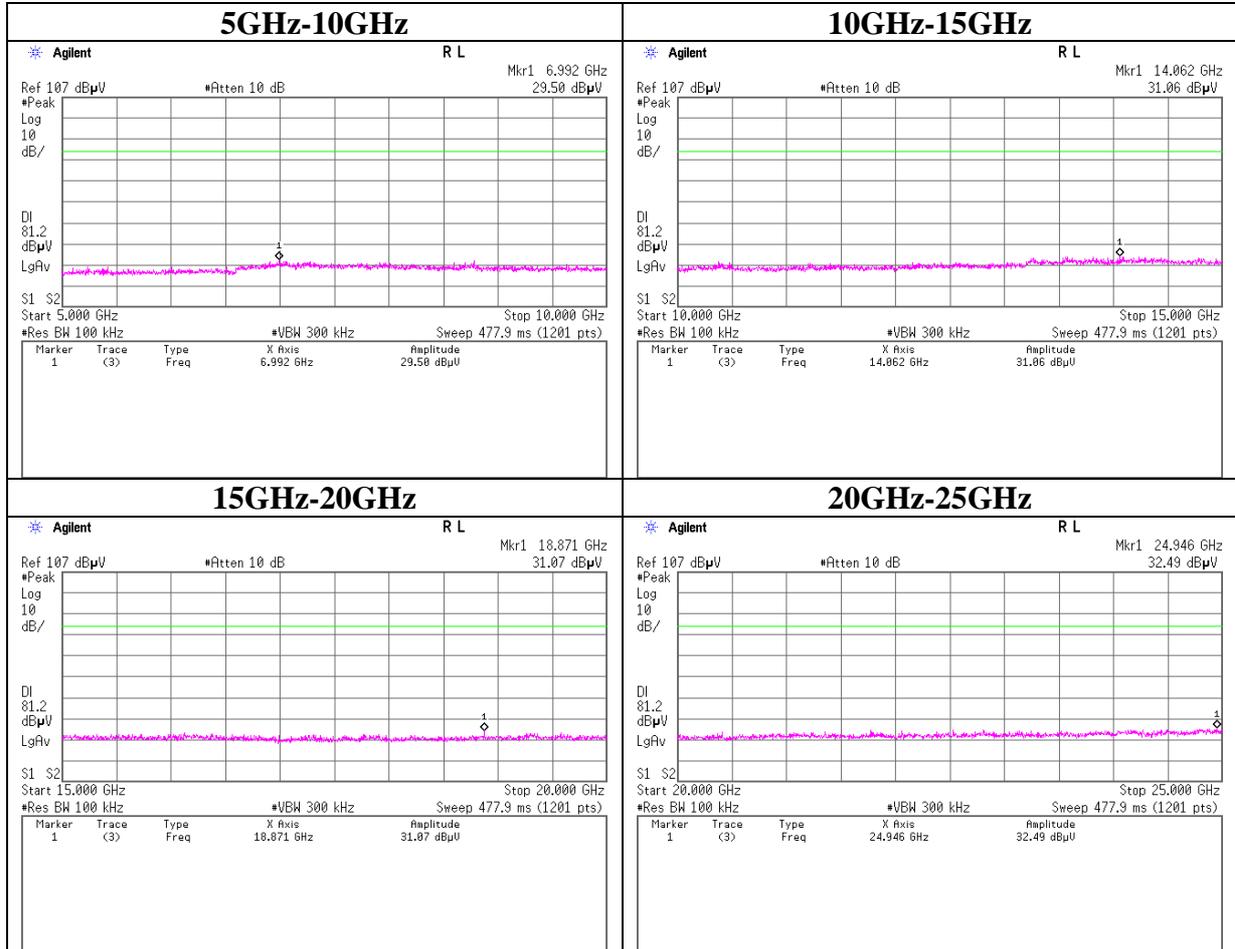
Conducted Spurious Emission

Tx 2402MHz



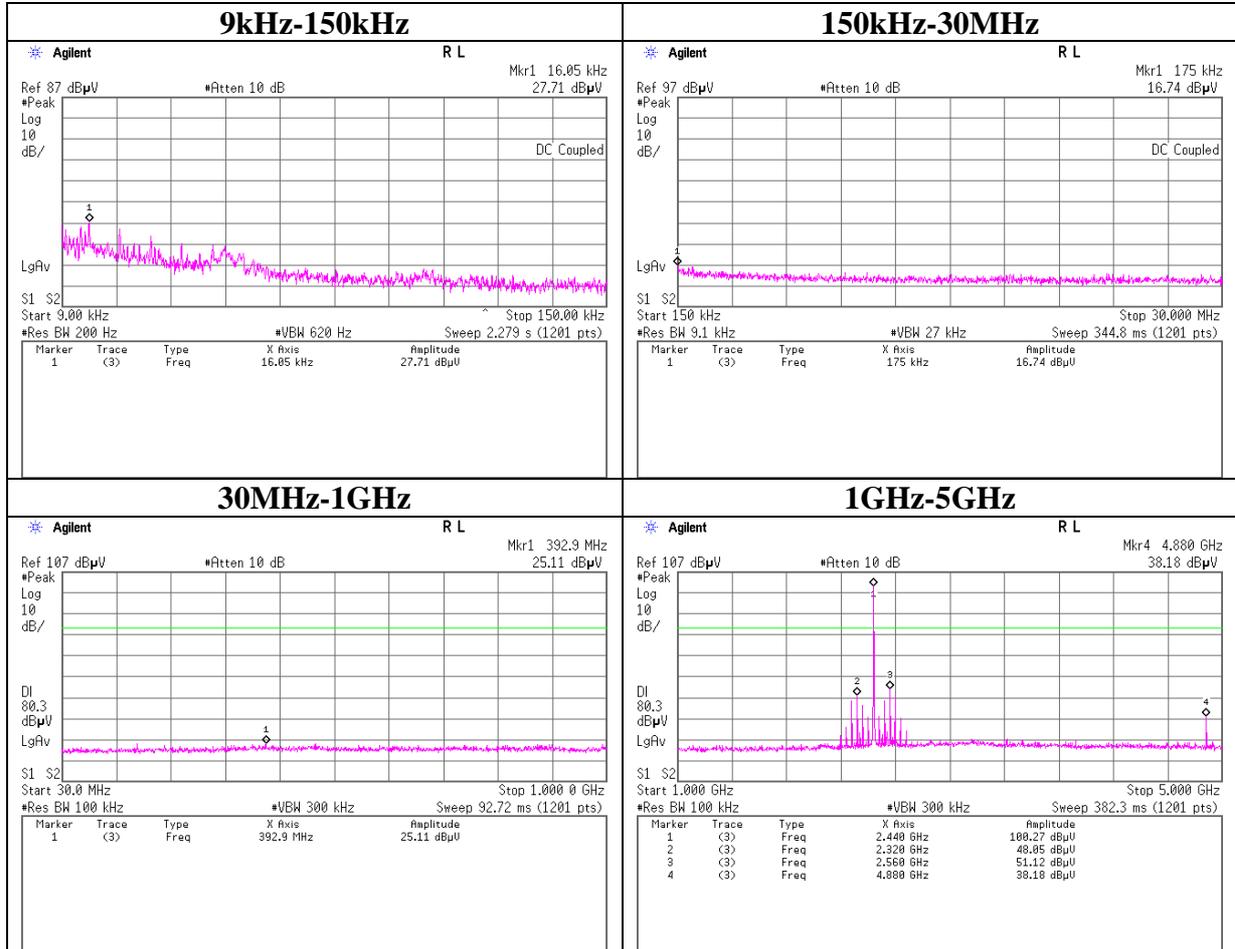
Conducted Spurious Emission

Tx 2402MHz



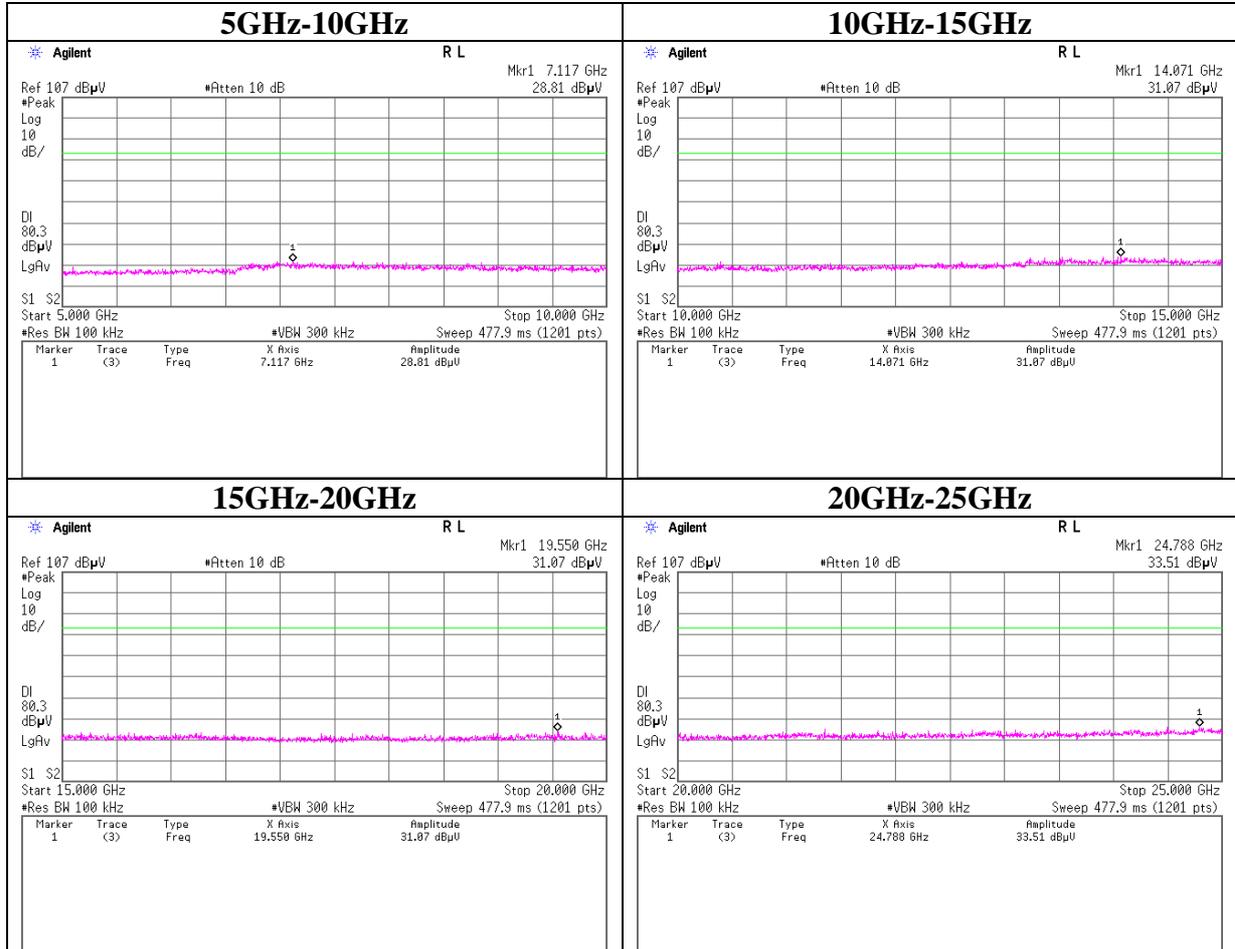
Conducted Spurious Emission

Tx 2440MHz



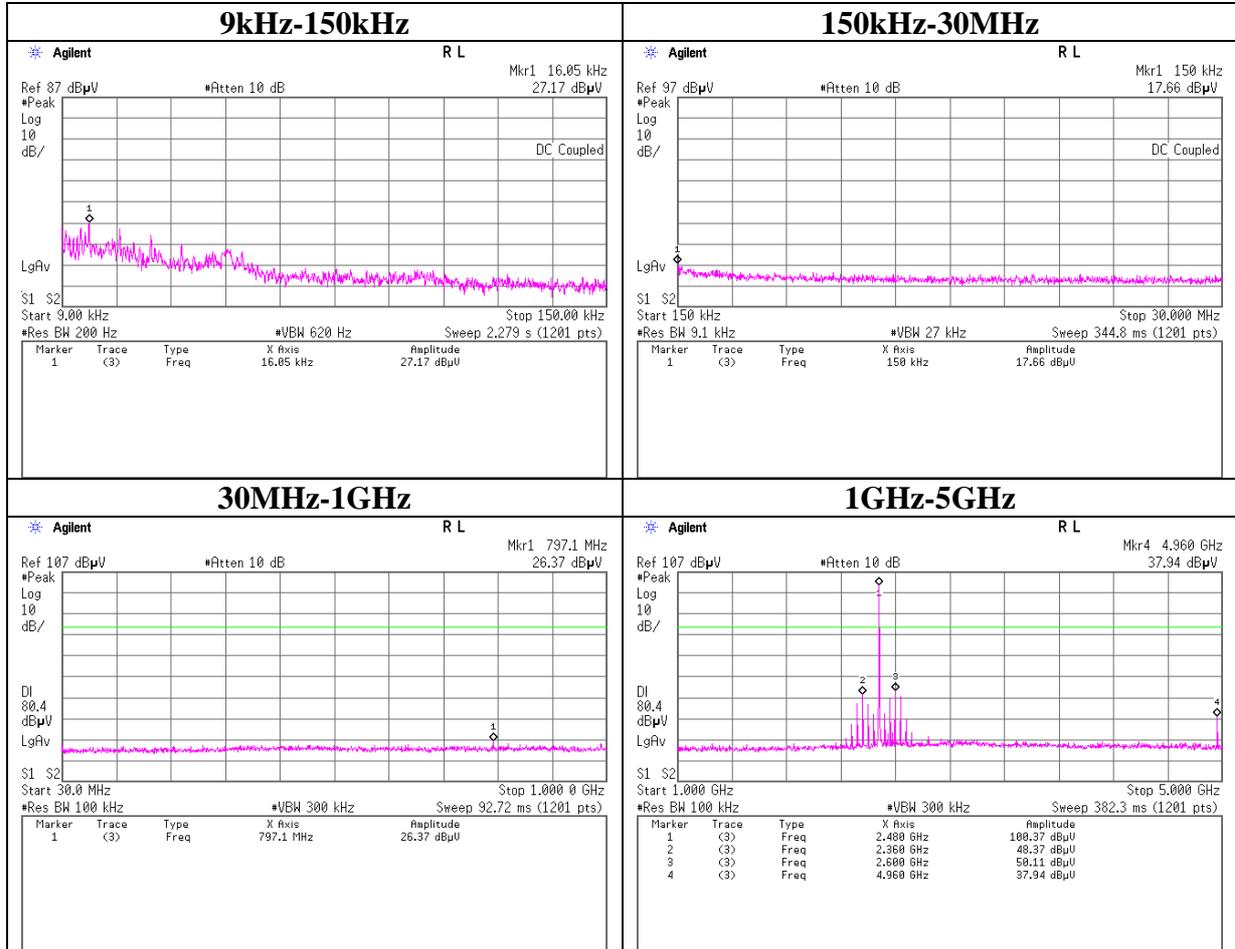
Conducted Spurious Emission

Tx 2440MHz



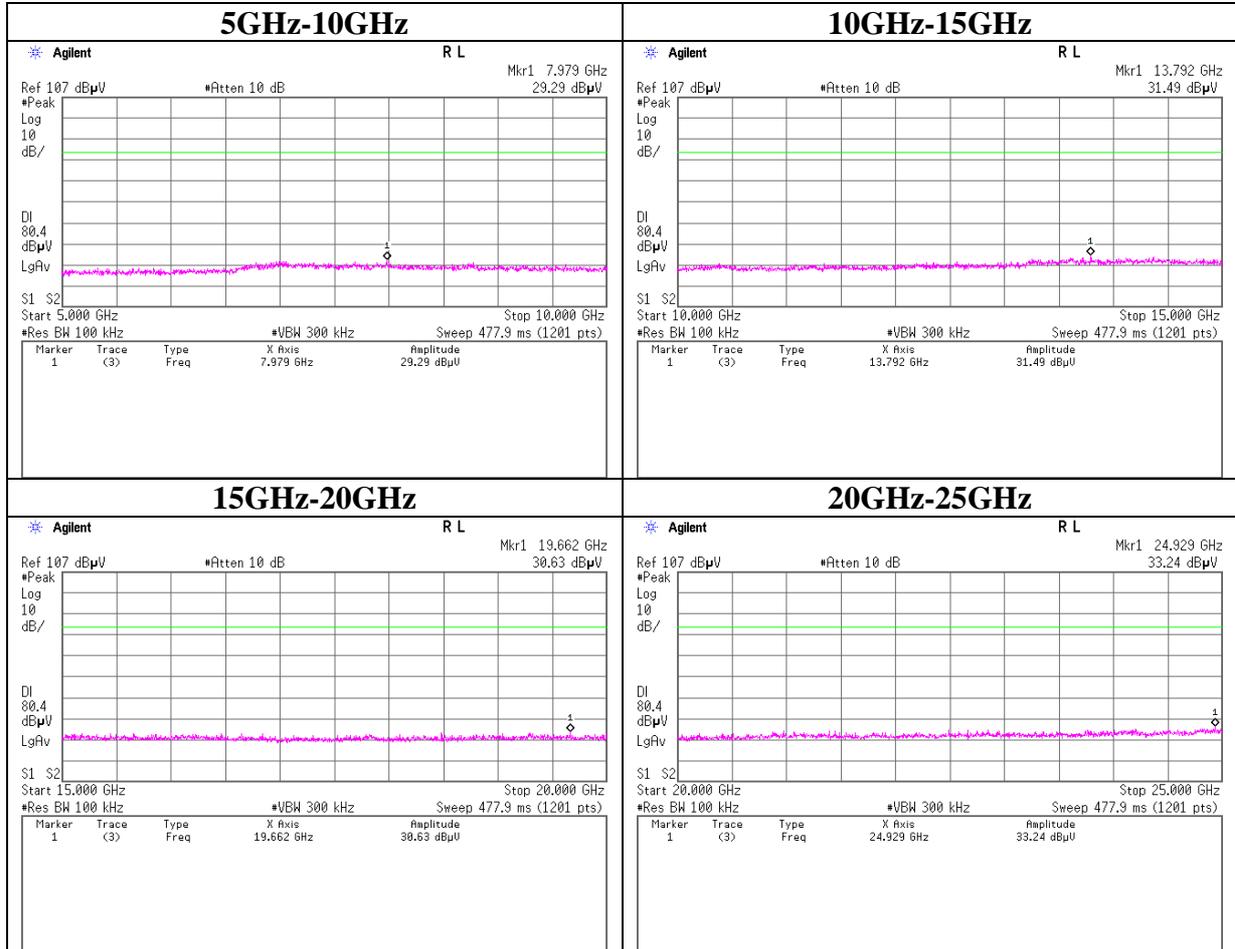
Conducted Spurious Emission

Tx 2480MHz



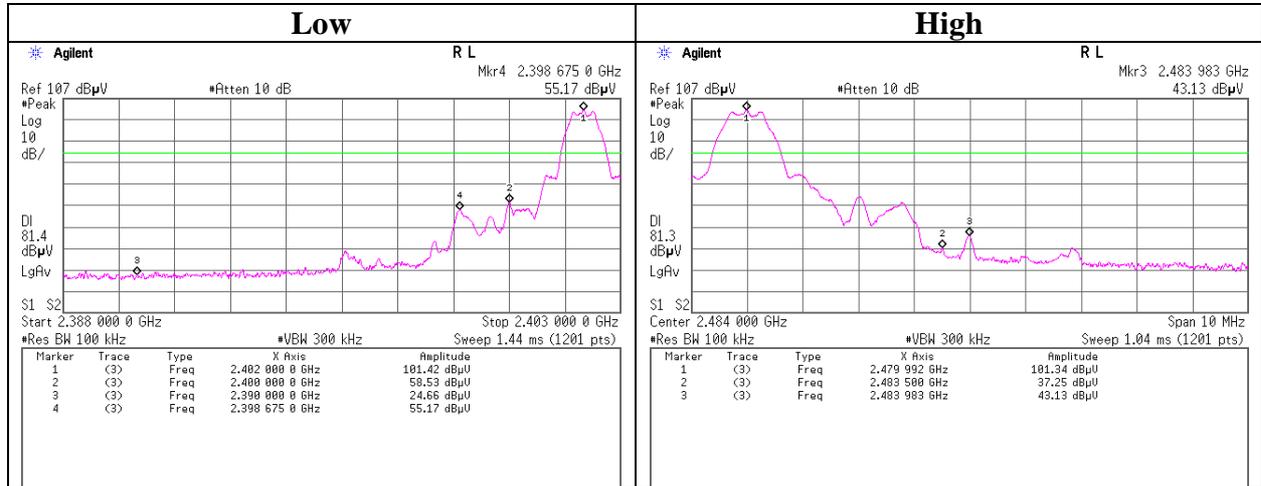
Conducted Spurious Emission

Tx 2480MHz



Conducted Emission Band Edge compliance

Bluetooth LE Tx



Power Density

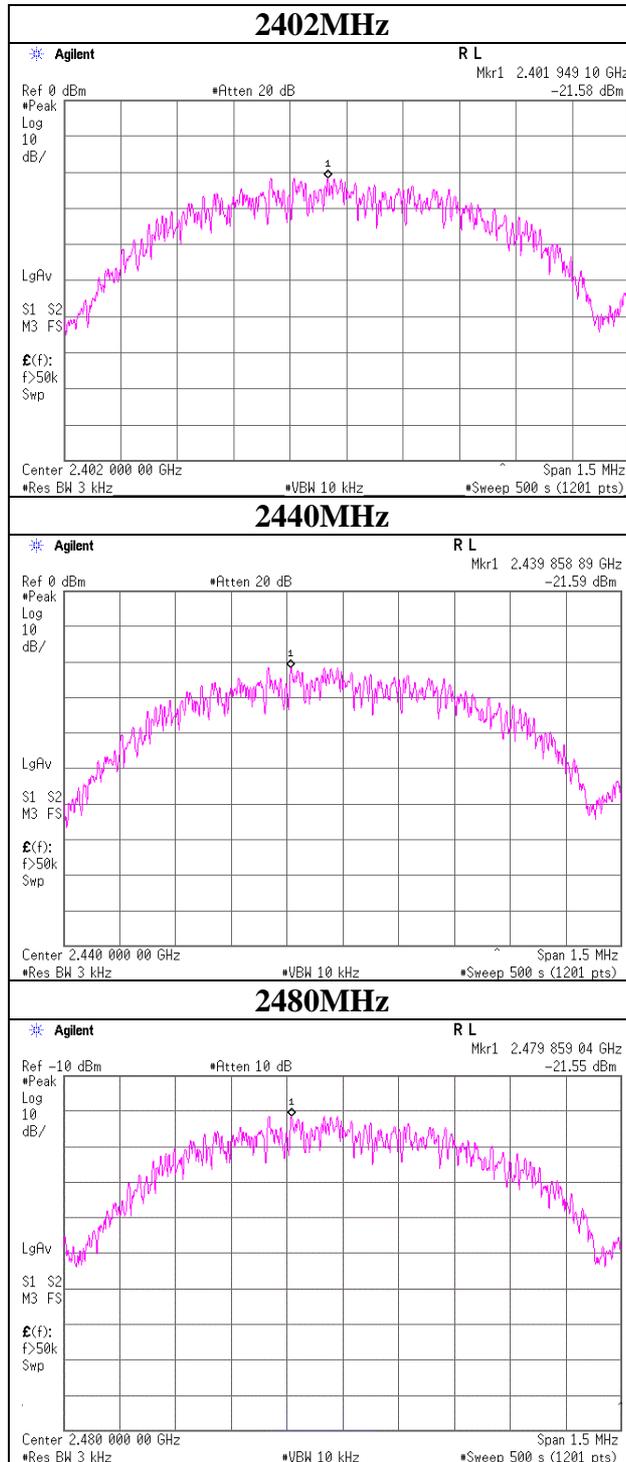
Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 32KE0041-HO-02
Date 08/07/2012
Temperature/ Humidity 26deg. C / 65% RH
Engineer Yutaka Yoshida
Mode Tx Bluetooth LE

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-21.58	2.66	9.95	-8.97	8.00	16.97
2440.00	-21.59	2.70	9.95	-8.94	8.00	16.94
2480.00	-21.55	2.81	9.95	-8.79	8.00	16.79

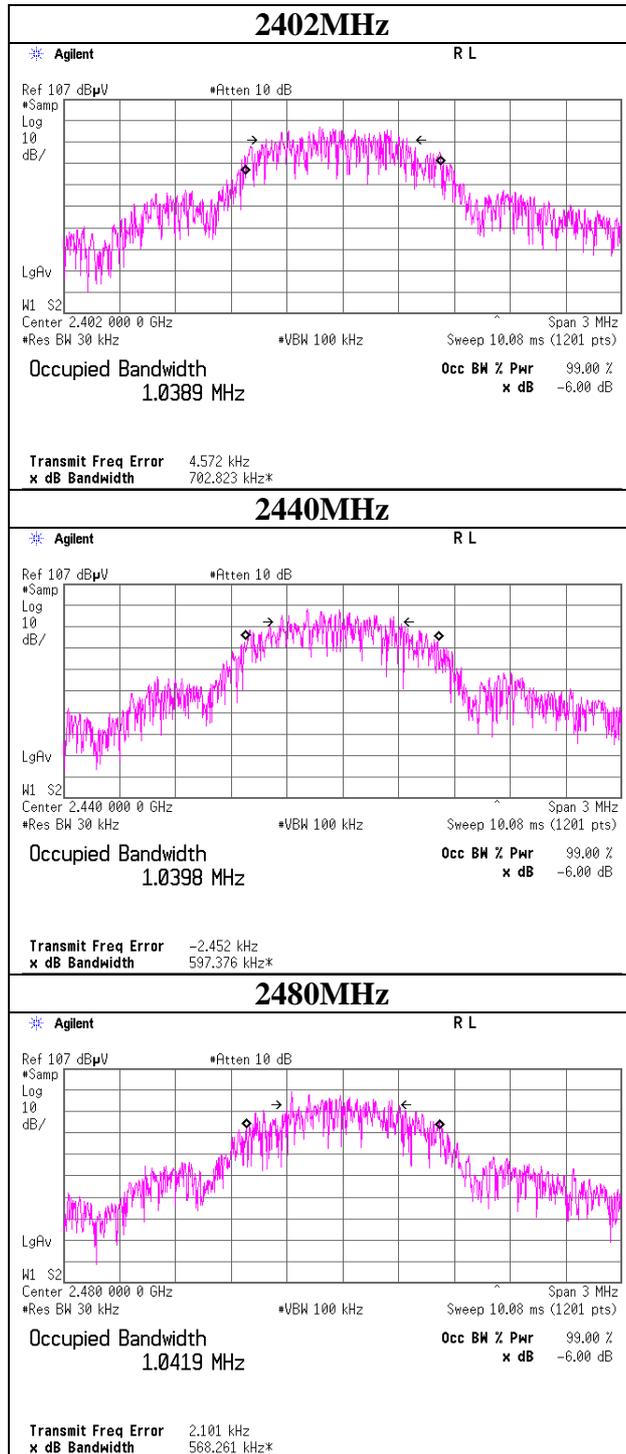
Sample Calculation:

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

Power Density



99% Occupied Bandwidth



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2012/02/06 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2012/04/06 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2012/01/25 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2012/02/22 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2011/09/06 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2012/05/30 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2012/04/03 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2011/10/23 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2011/10/23 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2012/02/16 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2011/11/02 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2011/09/26 * 12
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	CE	2012/02/29 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	CE	2012/02/06 * 12
MJM-07	Measure	PROMART	SEN1955	-	CE	-
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	CE	2011/11/23 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	CE	2011/08/11 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	8127364	CE(EUT)	2012/02/09 * 12
MAT-67	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(5m)/421-010(1m)/sucoform141-PE(1m)/RFM-E121(Switcher)	-/04178	CE	2012/07/12 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2012/02/06 * 12
MPM-09	Power Meter	Anritsu	ML2495A	6K00003348	AT	2011/09/12 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2011/09/12 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2012/03/27 * 12
MCC-138	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37953/2	AT	2011/10/28 * 12
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	AT	2012/06/19 * 12
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2011/10/28 * 12
MAT-24	Attenuator(10dB)(above1 GHz)	Agilent	8493C	71389	AT	2012/06/27 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2011/09/13 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2011/09/13 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2011/12/09 * 12

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The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

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

Test Item: CE: Conducted Emission
RE: Radiated Emission
AT: Antenna Terminal Conducted test