RADIO TEST REPORT

Test Report No.: 32EE0240-SH-01-A

Applicant	:	**PIONEER CORPORATION**
Type of Equipment	:	**Receiver Ass'y**
Model No.	:	**NXH-0628**
FCC ID	:	**AJDK053**
Test regulation	:	**FCC Part15 Subpart C: 2012**
Test result	:	**Complied**

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Date of test: January 24 to 25, 2012

Tested by:

Akio Hayashi
Engineer of WiSE Japan,
UL Verification Service

Approved by :

Ichiro Isozaki
Leader of WiSE Japan,
UL Verification Service

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JAB Testing RTL02610

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REVISION HISTORY

Original Test Report No.: 32EE0240-SH-01-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	32EE0240-SH-01-A	February 13, 2012	-	-

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SECTION 1: Customer information

Company Name	:	PIONEER CORPORATION
Brand name	:	Pioneer
Address	:	25-1 Aza-Nishi-machi, Yamada, Kawagoe-shi, Saitama, 350-8555, JAPAN
Telephone Number	:	+81-49-228-6415
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Contact Person	:	Makoto Kaieda

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

2.1 Identification of E.U.T.

Type of Equipment	:	Receiver Ass'y
Model No.	:	NXH-0628
Serial No.	:	See Section 4
Rating	:	DC 12V
Country of Mass-production	:	Japan
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No modification by the test lab.
Receipt Date of Sample	:	January 23, 2012

2.2 Product description

Model: NXH-0628 (referred to as the EUT in this report) is a Receiver Ass'y.

The EUT has following similar models:

Pioneer Number	NXH-0628ZT/US	NXH-0828ZT/UC	DVZ-0528ZT/US	DVZ-0728ZT/UC
Development Cord	&ZC482/US	&ZC482M/UC	&ZC360/US	&ZC360M/UC
Number	86130-50090	86130-50060	86130-50100	86130-50070
Audio Amplifier Supplier	Pioneer	Other Supplier	Pioneer	Other Supplier
NAVI	Yes	Yes	None	None

Equipment type	:	Transceiver
Frequency of operation	:	2402-2480MHz
Bandwidth & channel spacing	:	1MHz
Type of modulation	:	GFSK, π/4DQPSK, 8DPSK
Antenna type	:	Ceramic patch antenna
Antenna gain with cable loss	:	+2.0dBi (max)
Antenna connector type	:	Wiring pattern on PCB
Operation temperature range	:	-40 to +85 deg.C.

FCC 15.31 (e)
The equipment provides the Bluetooth transmitter with stable power supply (DC3.3V). Therefore, the equipment complies with the requirement.

FCC 15.203
The equipment and its antenna comply with this requirement since this antenna is built in the equipment and it cannot be replaced by end users.

Clock Frequency:

	Reason For Use	Frequency
Navi Board	NAVI SYSTEM CLOCK	32.4576MHz
	MIC AD(M3:12kHz)	12.288MHz
	PCIe(Oscillator)	100.01MHz
	SATA CLOCK	100.01MHz
	USB(Oscillator)	48MHz
	GPS CLOCK	16.368MHz
	MOST CLOCK	12.288MHz
	DOT CLOCK	33.231MHz
	NTSC CLOCK	27MHz
	GVIF CLOCK	24MHz
	DC-DC CONVERTER	416kHz
	DC-DC CONVERTER	463kHz
	REAL TIME CLOCK	32.768kHz
	RESET CPU CLOCK	4MHz
Audio Board	SYSTEM MICROCOMPUTER	16MHz
	MICROCOMPUTER COMMUNICATION	4MHz
	DC-DC CONVERTER	500kHz
	DC-DC CONVERTER	461kHz
	SUB MICROCOMPUTER	6MHz
	CAN MICROCOMPUTER	8MHz
	A/D CONVERTER	24.576MHz
	DVD MECH.	27MHz
	VIDEO_DAC	108MHz
	SDRAM	121.5MHz
	FM/AM TUNER	74.1MHz
	INTERMEDIATE FREQUENCY	10.7MHz
	XM FRONTEND	1871.004MHz
	XM FRONTEND	467.751MHz
	XM BACKEND	24.265MHz
	XM MICROCOMPUTER	4.7175MHz
Panel Board	PANEL MICROCOMPUTER	9.83MHz
	DC-DC CONVERTER	100kHz
	BLUETOOTH MODULE	26MHz
	BLUETOOTH DIGITAL AUDIO BIT CLOCK	2.086MHz

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2012, final revised on February 1, 2012
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.209 Radiated emission limits, general requirements
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

The revision on February 1, 2012 does not affect the test specification applied to the EUT.
The EUT complies with FCC Part 15 Subpart B. The test is performed by the customer.

3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2009 7. AC powerline conducted emission measurements	FCC 15.207	-	N/A *1)	-	N/A
Carrier frequency separation	FCC Public Notice DA 00-705 & ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (a)(1)	Conducted	N/A	*See data.	Complied
20dB bandwidth	FCC Public Notice DA 00-705 & ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (a)(1)	Conducted	N/A		-
Number of hopping frequency	FCC Public Notice DA 00-705 & ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (a)(1)(iii)	Conducted	N/A		Complied
Dwell time	FCC Public Notice DA 00-705 & ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (a)(1)(iii)	Conducted	N/A		Complied
Maximum peak output power	FCC Public Notice DA 00-705 & ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (b)(1)	Conducted	N/A		Complied
Band edge compliance & Spurious emission	FCC Public Notice DA 00-705 & ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (d) 15.209	Conducted/ Radiated	N/A	6.2dB Freq.: 352.005MHz Polarization: Horizontal Detection: Quasi-Peak Mode: Tx 2402MHz, 3DH5	Complied

Note: UL Japan's Work Procedures No. 13-EM-W0420 and 13-EM-W0422
*1) The test is not applicable since the EUT has no AC mains.

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.4:2009 13. Measurement of intentional radiators, RSS-Gen 4.6.1	RSS-Gen 4.6.1	Conducted	-	-
Note: UL Japan's Work Procedures No. 13-EM-W0420 and 13-EM-W0422					

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

3.4 Uncertainty

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

Item	Frequency range	No.1 SAC*1/SR*2 (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
Radiated emission (Measurement distance: 3m)	9kHz-30MHz	3.7 dB	3.7 dB	3.6 dB
	30MHz-300MHz	4.9 dB	5.1 dB	5.0 dB
	300MHz-1GHz	5.0 dB	5.2 dB	5.0 dB
	1GHz-15GHz	4.8 dB	4.8 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	15GHz-18GHz	5.6 dB	5.6 dB	5.6 dB
	18GHz-40GHz	4.8 dB	4.3 dB	4.4 dB

*1: SAC=Semi-Anechoic Chamber
*2: SR= Shielded Room is applied besides radiated emission

Radiated emission test

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

Antenna port conducted test

Power measurement uncertainty above 1GHz for this test was: (±) 1.5dB
Spurious emission (Conducted) measurement (below 1GHz) uncertainty for this test was: (±) 1.7dB
Spurious emission (Conducted) measurement (1G-3GHz) uncertainty for this test was: (±) 2.3dB
Spurious emission (Conducted) measurement (3G-18GHz) uncertainty for this test was: (±) 3.0dB
Spurious emission (Conducted) measurement (18G-26.5GHz) uncertainty for this test was: (±) 2.9dB
Bandwidth measurement uncertainty for this test was: (±) 5.4%

3.5 Test location

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Telephone number : +81 463 50 6400
Facsimile number : +81 463 50 6401
JAB Accreditation No. : RTL02610

	FCC Registration No.	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
☒ No.1 Semi-anechoic chamber	697847	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☐ No.2 Semi-anechoic chamber	697847	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☒ No.3 Semi-anechoic chamber	697847	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
☐ No.4 Full-anechoic chamber	-	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
☐ No.1 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.2 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.3 shielded room	-	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
☐ No.4 shielded room	-	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
☐ No.5 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
☒ No.6 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-

3.6 Test setup, Data of EMI & Test instruments

Refer to APPENDIX 1 to 3.

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

4.1 Operating mode

Test item	Operating mode	Tested frequency
Carrier frequency separation	Transmitting Hopping ON (DH5/3DH5) Payload: PRBS9	-
20dB bandwidth	Transmitting Hopping OFF (DH5/3DH5) Payload: PRBS9	2402MHz, 2441MHz, 2480MHz
Number of hopping frequency	Transmitting Hopping ON (DH5/3DH5) Payload: PRBS9	-
Dwell time	Transmitting (Hopping ON), Payload: PRBS9 -DH1, -DH3, -DH5 -3DH1, -3DH3, -3DH5	-
Maximum peak output power	Transmitting (Hopping OFF), Payload: PRBS9 -DH5, -2DH5, -3DH5	2402MHz, 2441MHz, 2480MHz
Band edge compliance & Spurious emission (Conducted)	Transmitting (DH5/3DH5), Payload: PRBS9 -Hopping ON -Hopping OFF	Band edge compliance: 2402MHz, 2480MHz Spurious emission: 2402MHz, 2441MHz, 2480MHz
(Radiated)	Transmitting (DH5/3DH5), Payload: PRBS9	
99% occupied bandwidth	Transmitting (DH5/3DH5), Payload: PRBS9 -Hopping ON -Hopping OFF	2402MHz, 2441MHz, 2480MHz

*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload (except Dwell time test).

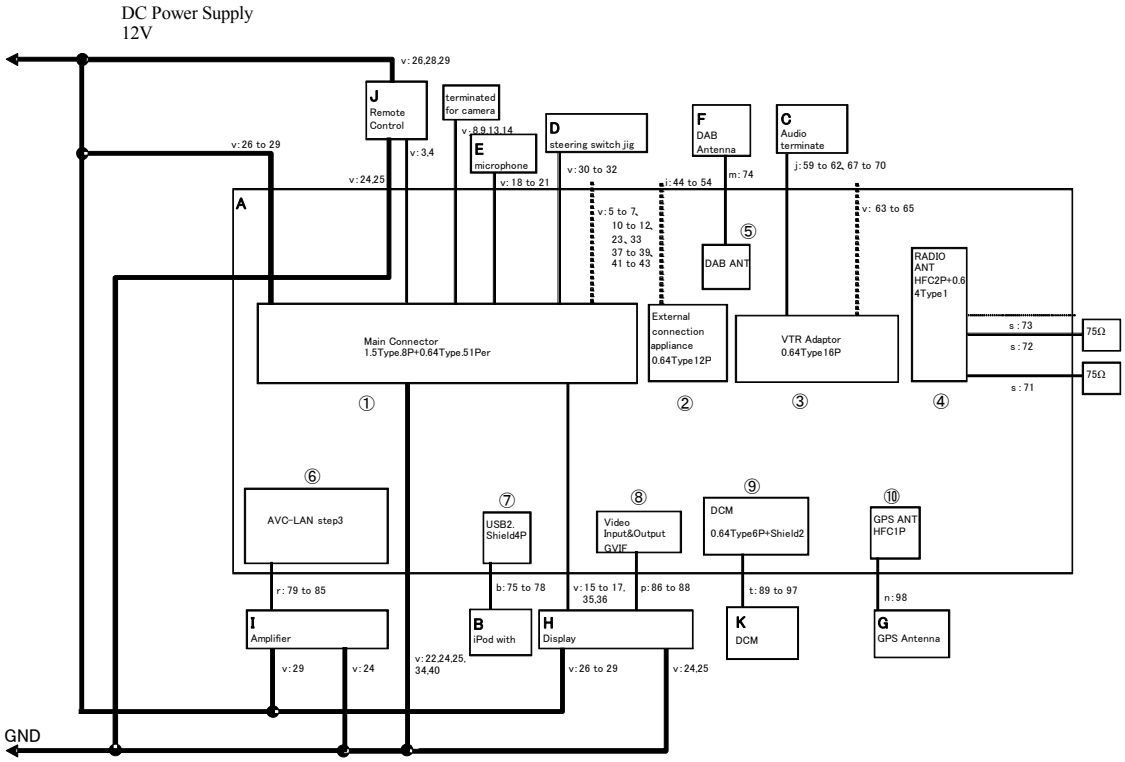
*Remarks: Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not affect the output power and bandwidth of the EUT.
As this device had AFH mode and frequency separation could not meet the requirement of over 20dB BW without 2/3 relaxation, 125mW power limit was applied to it.

*EUT has the power settings by the software as follows;
Power settings: 43
Software: Blue test 3, Ver.1.24

*The EUT has no Inquiry mode.

Justification: The system was configured in typical fashion (as customer would normally use it) for testing.

4.2 Configuration of tested system



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Receiver Ass'y	NXH-0628	*1) KLPKTP0006US *2) KLPKTP0005US	Pioneer	EUT
B	iPod	iPod nano	-	Apple	-
C	Audio terminator	-	-	-	-
D	Steering switch jig	-	-	-	-
E	microphone	-	-	-	-
F	DAB Antenna	-	-	-	-
G	GPS Antenna	-	-	-	-
H	Display	86110-919L1	462200-746	DENSO	-
I	Amplifier	86280-919L0	K3JH006	Pioneer	-
J	Remote Control Device	84780-30080	237200-0860	-	-
K	DCM	KCMV-210	8KYKY000171	DENSO	-

*1) Used for Antenna terminal conducted tests
*2) Used for Radiated emission tests

List of cables used (1/3)

No.	Connector	Item	Length(m)	Shield		Note
				Cable	Connector	
1	① Main Connector	CAN H	2	Unshielded	Unshielded	terminated for Air-conditioning ECU
2		CAN L	2	Unshielded	Unshielded	
3		CNH1	2	Unshielded	Unshielded	to Remote Control Device
4		CNL1	2	Unshielded	Unshielded	
5		BTCY	2	Unshielded	Unshielded	OPEN
6		TX1+	2	Unshielded	Unshielded	OPEN
7		TX1-	2	Unshielded	Unshielded	OPEN
8		V+	2	Shield	Unshielded	terminated for camera
9		V-	2	Shield	Unshielded	
10		TX2+	2	Unshielded	Unshielded	OPEN
11		TX2-	2	Unshielded	Unshielded	OPEN
12		SECH	2	Unshielded	Unshielded	OPEN
13		CA+	2	Shield	Unshielded	terminated for camera
14		CGND	2	Shield	Unshielded	
15		TX3+	2	Unshielded	Unshielded	to Display
16		TX3-	2	Unshielded	Unshielded	
17		VMTF	2	Unshielded	Unshielded	
18		MIN+	2	Shield	Unshielded	to Microphone
19		SGND	2	Shield	Unshielded	
20		MACC	2	Unshielded	Unshielded	
21		MIN-	2	Shield	Unshielded	
22		SNS2	2	Unshielded	Unshielded	GND
23		DR	2	Unshielded	Unshielded	OPEN
24		GND1	2	Unshielded	Unshielded	-
25		ILL-	2	Unshielded	Unshielded	GND
26		ILL+	2	Unshielded	Unshielded	from Power supply
27		IG	2	Unshielded	Unshielded	
28		ACC1	2	Unshielded	Unshielded	
29		+B1	2	Unshielded	Unshielded	
30		SW1	2	Unshielded	Unshielded	to steering switch
31		SW2	2	Unshielded	Unshielded	
32		SWG	2	Unshielded	Unshielded	
33		AIR	2	Unshielded	Unshielded	OPEN
34		ARON	2	Unshielded	Unshielded	GND
35		UPSW	2	Unshielded	Unshielded	to Display
36		UIND	2	Unshielded	Unshielded	
37		SEUC	2	Unshielded	Unshielded	OPEN
38		PBEW	2	Unshielded	Unshielded	OPEN
39		SW3	2	Unshielded	Unshielded	OPEN
40		PKB	2	Unshielded	Unshielded	GND
41		SPD	2	Unshielded	Unshielded	OPEN
42		REV	2	Unshielded	Unshielded	OPEN
43		TEST	2	Unshielded	Unshielded	OPEN

List of cables used (2/3)

No.	Connector	Item	Length(m)	Shield		Note
				Cable	Connector	
44	② External connection appliance	CSLD	1	Unshielded	Unshielded	OPEN
45		CDR+	1	Unshielded	Unshielded	
46		CDR-	1	Unshielded	Unshielded	
47		CDL+	1	Unshielded	Unshielded	
48		CDL-	1	Unshielded	Unshielded	
49		MUTE	1	Unshielded	Unshielded	
50		GND2	1	Unshielded	Unshielded	
51		TX+	1	Unshielded	Unshielded	
52		TX-	1	Unshielded	Unshielded	
53		ACC1	1	Unshielded	Unshielded	
54		+B	1	Unshielded	Unshielded	
55	③ VTR Adaptor	NTSO	2	Shield	Unshielded	-
56		NTSG	2	Shield	Unshielded	-
57		SLD2	2	Shield	Unshielded	-
58		VMTR	2	Unshielded	Unshielded	-
59		AGND	2	Shield	Unshielded	terminated for Audio
60		VV+	2	Shield	Unshielded	
61		VAR+	2	Shield	Unshielded	
62		VAL+	2	Shield	Unshielded	
63		HAZ	2	Unshielded	Unshielded	OPEN
64		LJB	2	Unshielded	Unshielded	OPEN
65		FLSW	2	Unshielded	Unshielded	OPEN
66		HFL	2	Unshielded	Unshielded	GND
67		SG	2	Shield	Unshielded	terminated for Audio
68		VV-	2	Shield	Unshielded	
69		VA-	2	Shield	Unshielded	
70		ADPG	2	Unshielded	Unshielded	
71	④ RADIO ANT	SUB	0.14+1.8	Shield	Unshielded	75Ω terminate
72		MAIN	0.14+1.8	Shield	Unshielded	75Ω terminate
73		ANT+	0.18	Shield	Unshielded	-
74	⑤ DAB ANT	DAB	3.65	Shield	Unshielded	to DAB Antenna
75	⑦ USB2.0	USV1	2	Shield	Unshielded	to USB (iPod)
76		US1-	2	Shield	Unshielded	
77		US1+	2	Shield	Unshielded	
78		UGD1	2	Shield	Unshielded	

List of cables used (3/3)

No.	Connector	Item	Length(m)	Shield		Note
				Cable	Connector	
79	⑥ AVC-LAN step3	MI+	1	Shield	Unshielded	to Amplifier
80		MI-	1	Shield	Unshielded	
81		SLDI	1	Shield	Unshielded	
82		WUO	1	Unshielded	Unshielded	
83		MO+	1	Shield	Unshielded	
84		MO-	1	Shield	Unshielded	
85		SLDO	1	Shield	Unshielded	
86	⑧ GVIF	GVI+	2	Shield	Unshielded	to Display
87		GVI-	2	Shield	Unshielded	
88		GVG1	2	Shield	Unshielded	
89	⑨ DCM	USB-	1.2	Shield	Unshielded	to DCM
90		USB+	1.2	Shield	Unshielded	
91		USBS	1.2	Shield	Unshielded	
92		USBG	1.2	Unshielded	Unshielded	
93		VOT+	1.2	Shield	Unshielded	
94		USBV	1.2	Unshielded	Unshielded	
95		VOT-	1.2	Shield	Unshielded	
96		VOR-	1.2	Shield	Unshielded	
97		VOR+	1.2	Shield	Unshielded	
98	⑩ GPS ANT	GPS	0.95	Shield	Unshielded	to GPS Antenna

*All cables used for the measurement are exclusive use or marketed.

SECTION 5: Carrier frequency separation

Test procedure
The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX

SECTION 6: 20dB bandwidth & Occupied bandwidth (99%)

Test procedure
The bandwidth was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX

SECTION 7: Number of hopping frequency

Test procedure
The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX

SECTION 8: Dwell time

Test procedure
The Dwell time was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX

SECTION 9: Maximum peak output power

Test procedure
The Maximum Peak Output Power was measured with a power meter connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX

SECTION 10: Spurious emissions (Antenna port conducted)

Test procedure
The Out of Band Emissions was measured with a spectrum analyzer connected to the antenna port.
In any 100kHz bandwidth outside the frequency 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.
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 not detected as shown in the chart.
(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=10kHz)

Summary of the test results: Pass
Refer to APPENDIX

SECTION 11: Radiated emission

11.1 Operating environment

The test was carried out in No.1 / No.3 Semi-Anechoic Chamber.

Temperature : See test data (APPENDIX)
Humidity : See test data (APPENDIX)

11.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 2.0m, raised 0.8m above the conducting ground plane.
The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.
The rear of EUT, including its peripherals was aligned and flushed with rear of tabletop. I/O cables that were connected to the peripherals were bundled in center. They were folded back and for the forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.
Photographs of the set up are shown in APPENDIX.

11.3 Test conditions

Frequency range : 30MHz to 25GHz
Test distance : 3m (below 15GHz) / 1m (above 15GHz)
EUT position : Table top

11.4 Test procedure

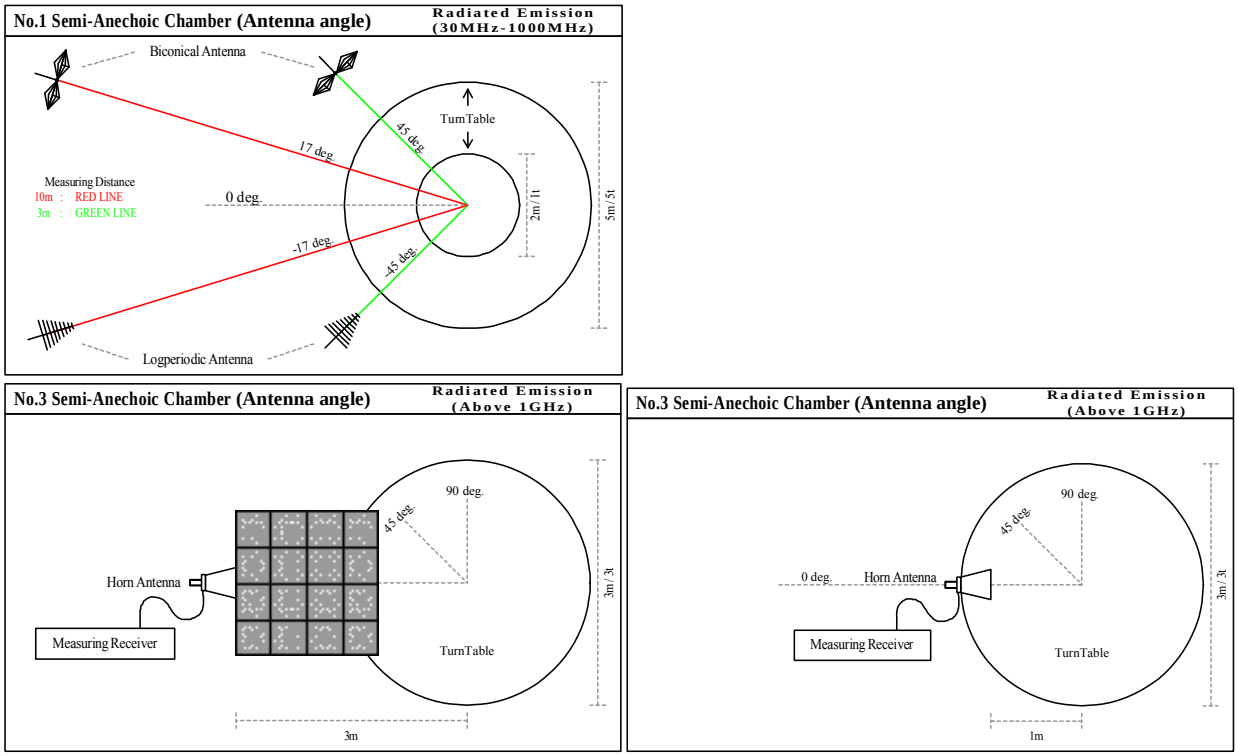
The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane and at a distance of 3m (below 15GHz) / 1m (above 15GHz) (Refer to Figure 1). Measurements were performed with quasi-peak, peak and average detector. The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. The measurements were performed for both vertical and horizontal antenna polarization.
The radiated emission measurements were made with the following detection of the test receiver.

Frequency		30 - 1000MHz	1 - 25GHz	
Detection Type	:	Quasi-Peak	Peak	* Average
IF Bandwidth	:	120kHz	RBW:1MHz/VBW:3MHz	RBW:1MHz/VBW:10Hz

* When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.
Although 00-705 accepts VBW=10Hz for AV measurements, confirmed that superfluous smoothing was not performed.

The EUT was set at 11.5 degree as normal position according to the EUT's specification.

Figure 1. Antenna angle



11.5 Band edge

Band edge level is below the limits of FCC 15.209. Refer to the data.

11.6 Results

Summary of the test results : Pass *No noise was detected above the 5th order harmonics.
Refer to APPENDIX

Contents of APPENDIXES

APPENDIX 1: Data of Radio tests

20dB bandwidth and Carrier frequency separation
Number of Hopping Frequency
Dwell time
Maximum peak output power
Radiated emission
Spurious emission (Antenna port conducted)
Occupied Bandwidth

APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Radiated emission

APPENDIX 1: Data of Radio tests

20dB Bandwidth and Carrier Frequency Separation

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	January 24, 2012	
Temperature / Humidity	26deg.C , 33%RH	
Engineer	Akio Hayashi	
Mode	Tx, Bluetooth, BDR, PRBS9	

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
DH5	2402.0	0.927	1.000	>= 0.618
DH5	2441.0	0.930	1.003	>= 0.620
DH5	2480.0	0.943	1.003	>= 0.629

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).
No limit applies to 20dB Bandwidth.

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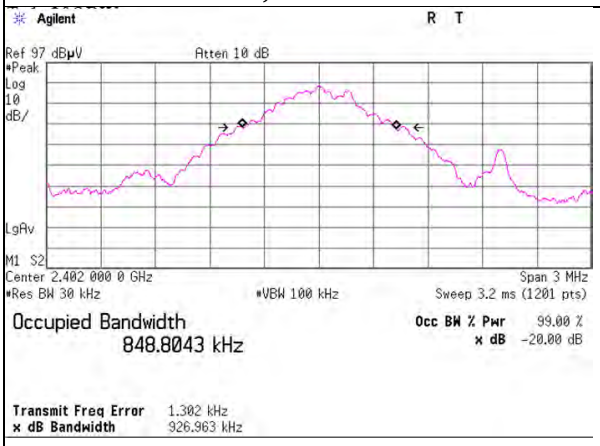
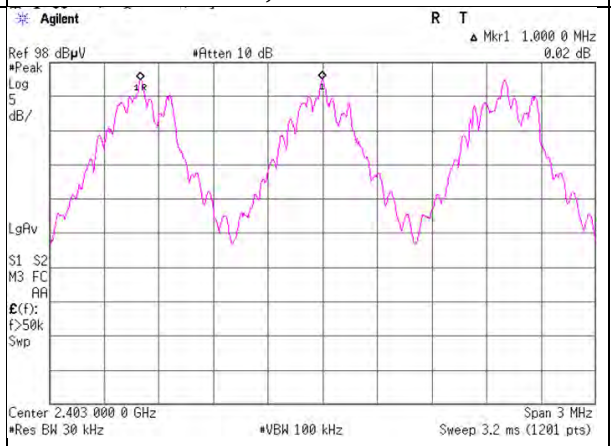
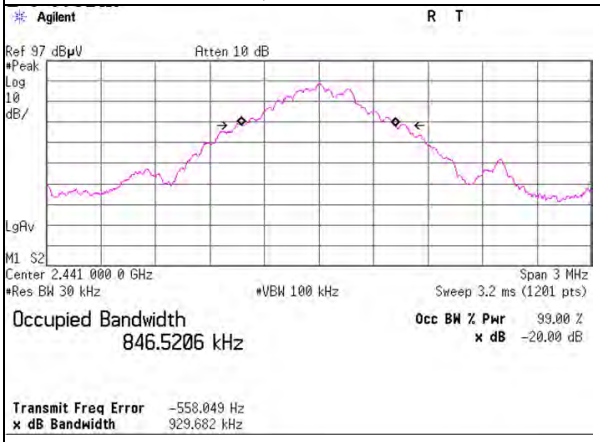
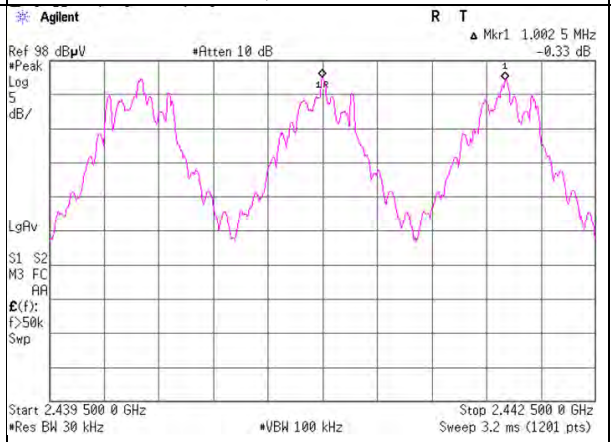
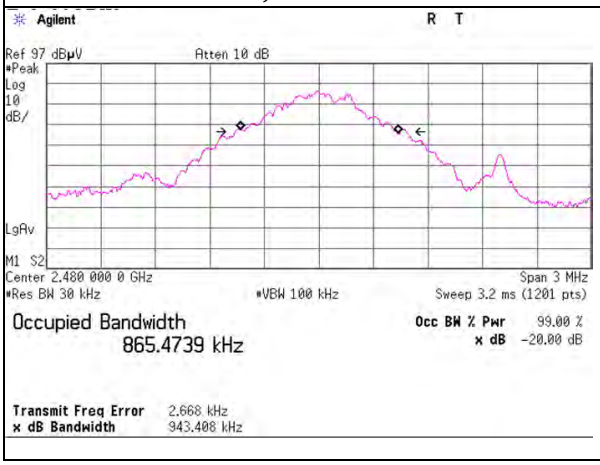
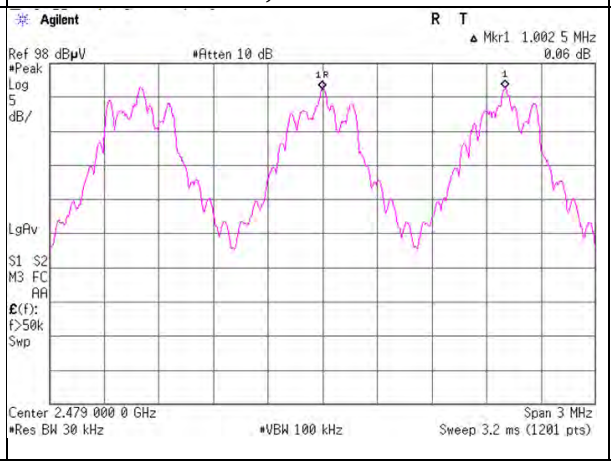
20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, BDR, PRBS9

20dB Bandwidth	Carrier Frequency Separation
Tx, 2402MHz	**Tx, 2402MHz**
	
Tx, 2441MHz	**Tx, 2441MHz**
	
Tx, 2480MHz	**Tx, 2480MHz**
	

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20dB Bandwidth and Carrier Frequency Separation

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	January 24, 2012	
Temperature / Humidity	26deg.C , 33%RH	
Engineer	Akio Hayashi	
Mode	Tx, Bluetooth, EDR, PRBS9	

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
3-DH5	2402.0	1.293	1.000	>= 0.862
3-DH5	2441.0	1.285	1.000	>= 0.857
3-DH5	2480.0	1.275	1.003	>= 0.850

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).
No limit applies to 20dB Bandwidth.

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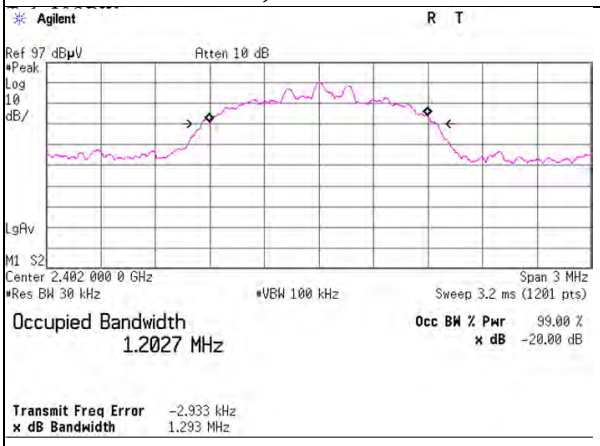
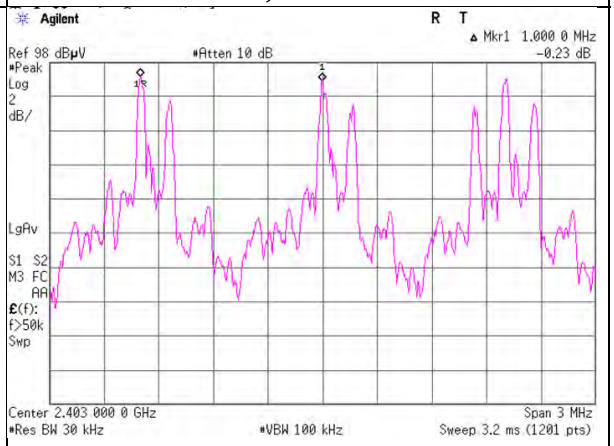
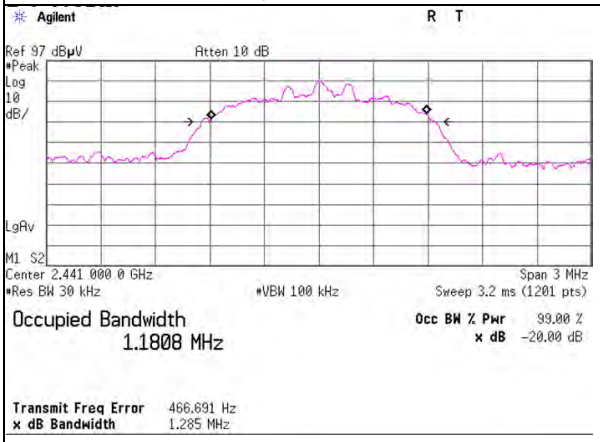
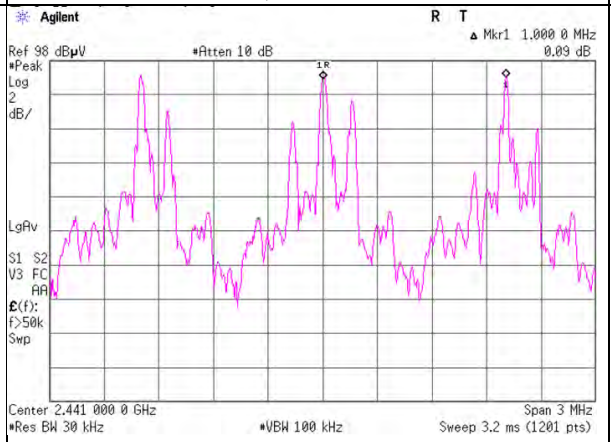
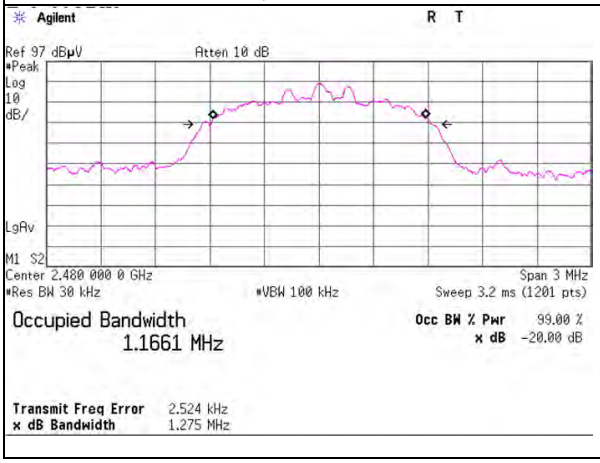
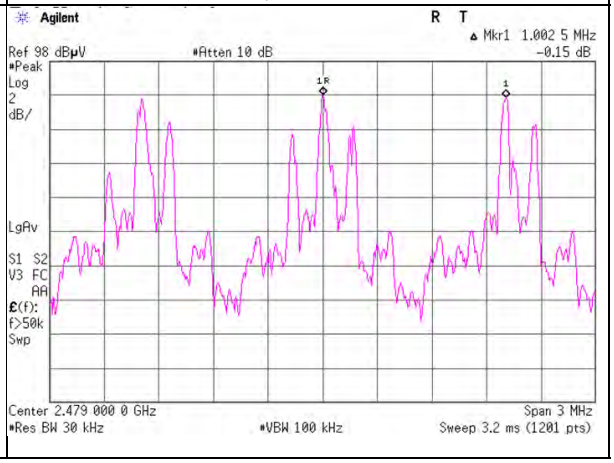
20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, EDR, PRBS9

20dB Bandwidth	Carrier Frequency Separation
Tx, 2402MHz	**Tx, 2402MHz**
	
Tx, 2441MHz	**Tx, 2441MHz**
	
Tx, 2480MHz	**Tx, 2480MHz**
	

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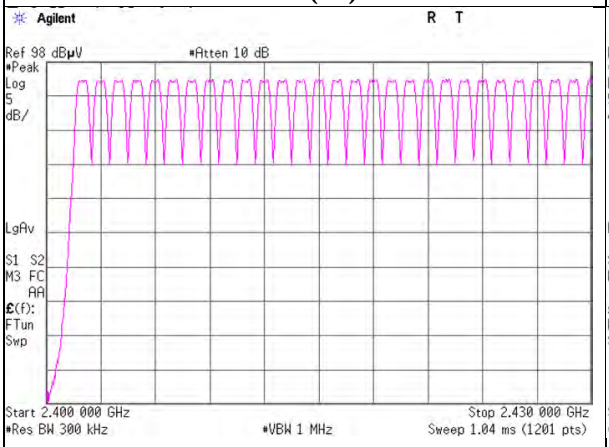
Number of Hopping Frequency

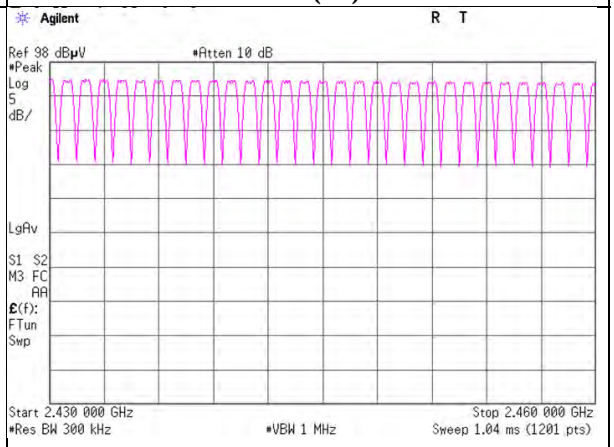
Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	January 24, 2012	
Temperature / Humidity	26deg.C , 33%RH	
Engineer	Akio Hayashi	
Mode	Tx, Bluetooth, BDR, PRBS9	

Mode	Number of Channel [times]	Limit [times]
DH5	79	>= 15

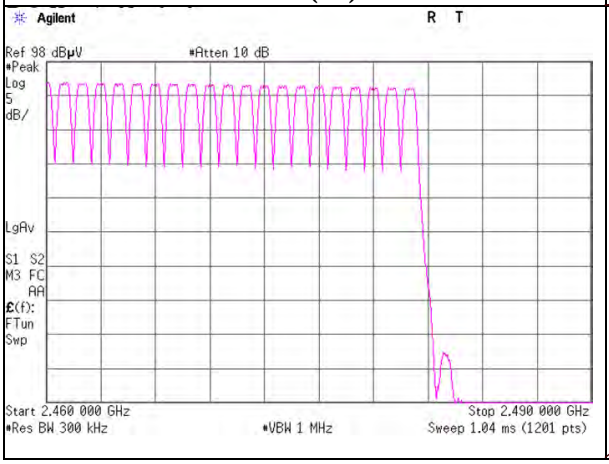
DH5 (1/3)



DH5 (2/3)



DH5 (3/3)



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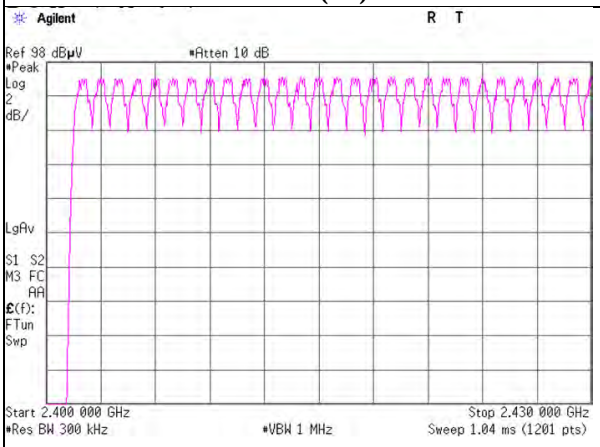
Number of Hopping Frequency

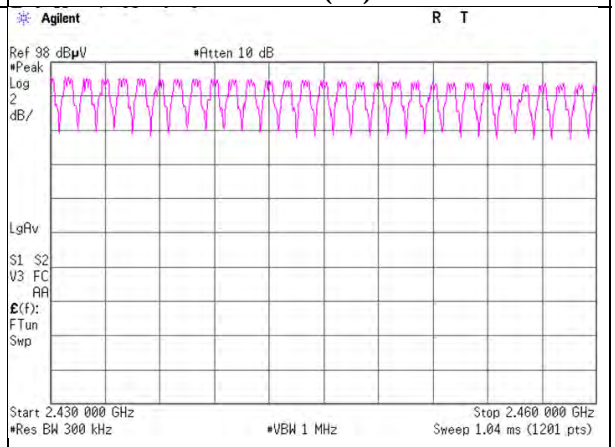
Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	January 24, 2012	
Temperature / Humidity	26deg.C , 33%RH	
Engineer	Akio Hayashi	
Mode	Tx, Bluetooth, EDR, PRBS9	

Mode	Number of Channel [times]	Limit [times]
3-DH5	79	>= 15

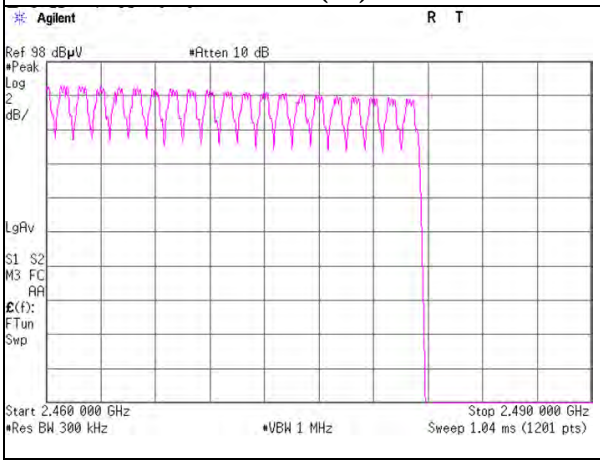
3-DH5 (1/3)



3-DH5 (2/3)



3-DH5 (3/3)



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Dwell Time

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	January 24, 2012	
Temperature / Humidity	26deg.C , 33%RH	
Engineer	Akio Hayashi	
Mode	Tx, Bluetooth, BDR, PRBS9	

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	51.0 / 5.0 sec. x 31.6 sec. = 323 times	0.402	130	400
DH3	26.0 / 5.0 sec. x 31.6 sec. = 165 times	1.659	274	400
DH5	17.0 / 5.0 sec. x 31.6 sec. = 108 times	2.911	314	400

Sample Calculation

Result = Number of transmission x Length of transmition time

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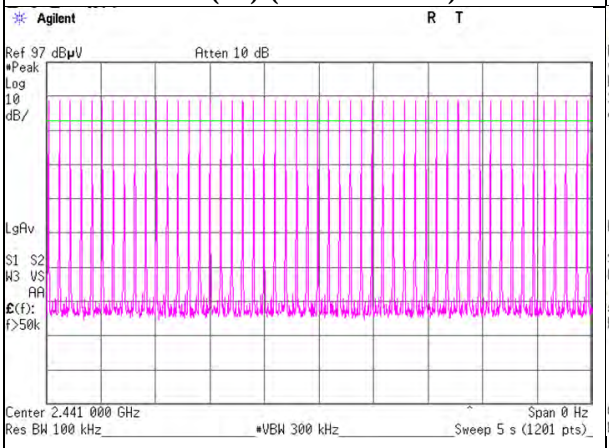
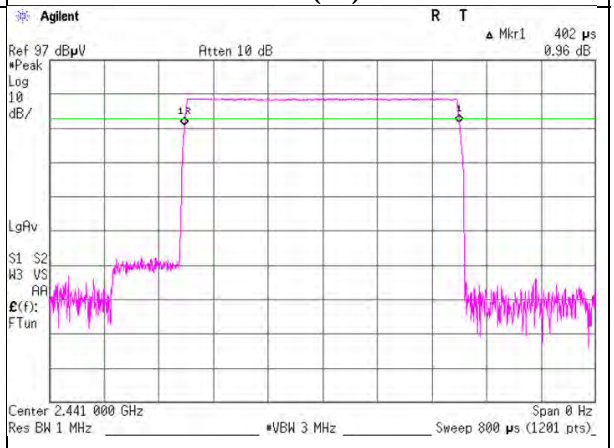
Dwell time

Tx, Bluetooth, BDR, PRBS9

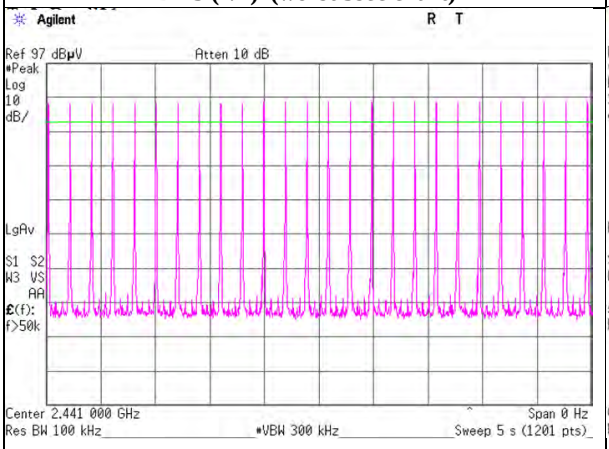
DH1 (1/2) (worst 5sec chart)



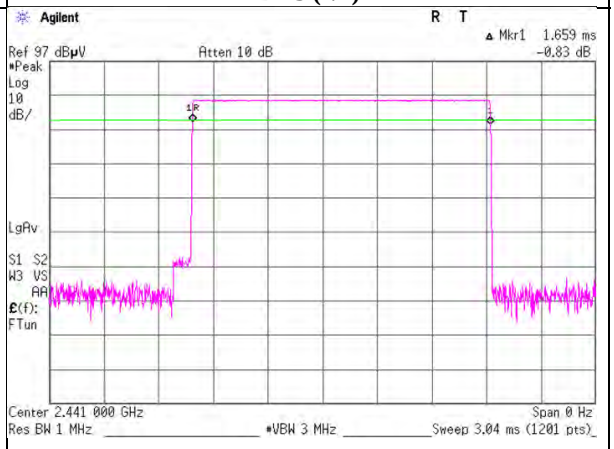
DH1 (2/2)



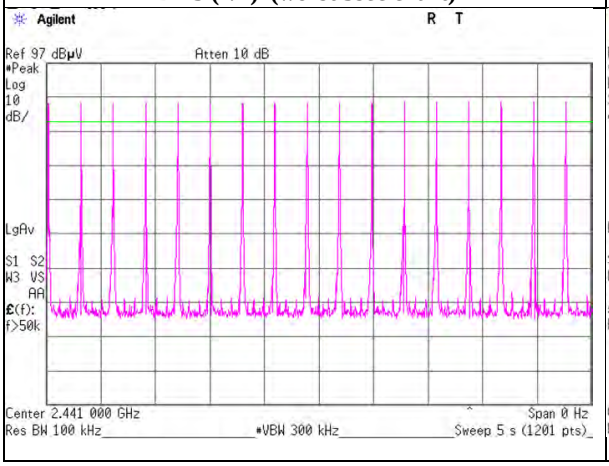
DH3 (1/2) (worst 5sec chart)



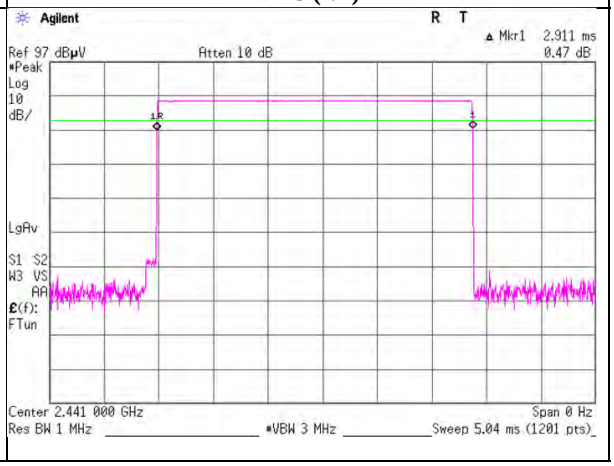
DH3 (2/2)



DH5 (1/2) (worst 5sec chart)



DH5 (2/2)



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Dwell Time

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	January 24, 2012	
Temperature / Humidity	26deg.C , 33%RH	
Engineer	Akio Hayashi	
Mode	Tx, Bluetooth, EDR, PRBS9	

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
3-DH1	51.0 / 5.0 sec. x 31.6 sec. = 323 times	0.413	133	400
3-DH3	26.0 / 5.0 sec. x 31.6 sec. = 165 times	1.667	275	400
3-DH5	17.0 / 5.0 sec. x 31.6 sec. = 108 times	2.919	315	400

Sample Calculation

Result = Number of transmission x Length of transmition time

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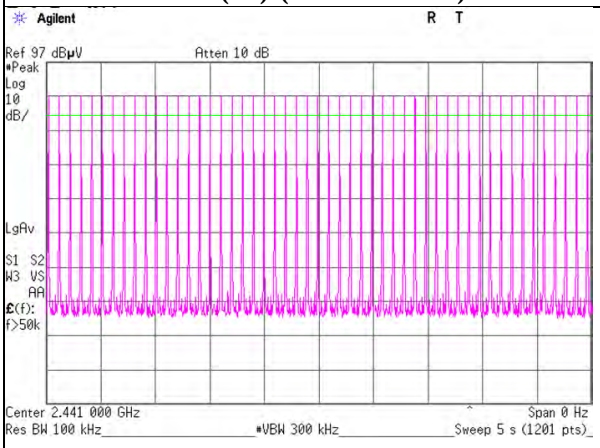
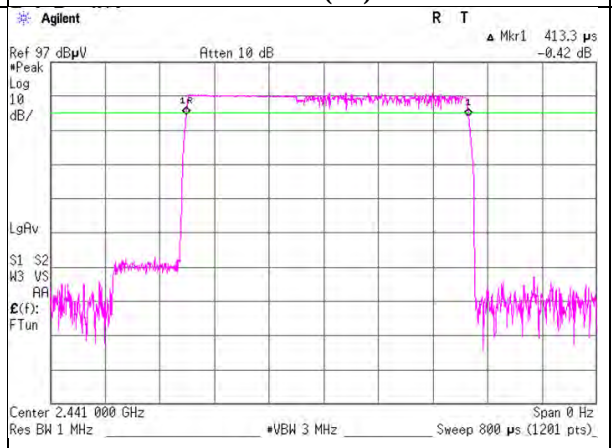
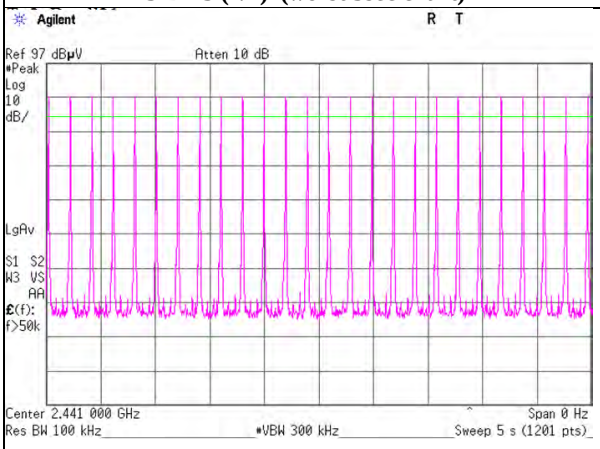
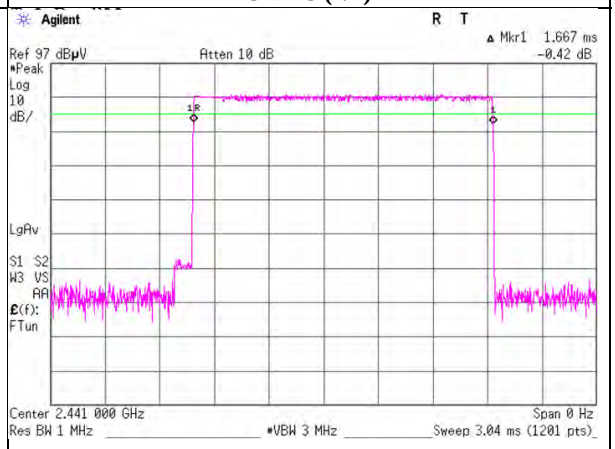
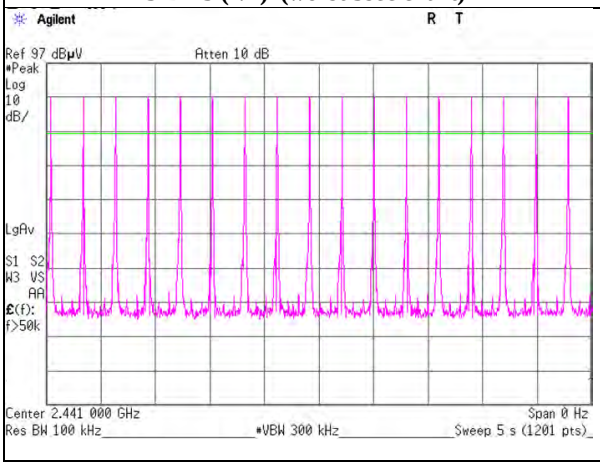
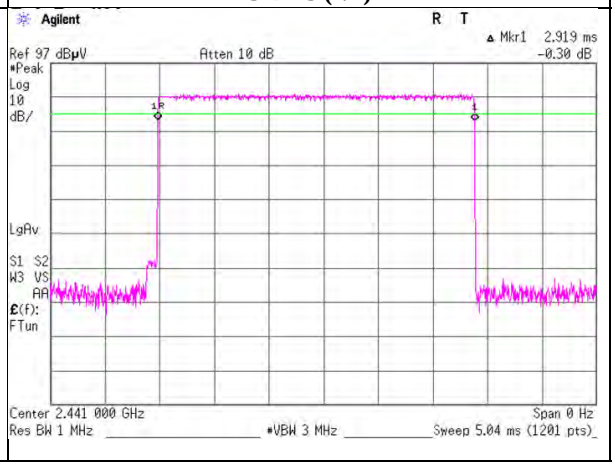
Dwell time

Tx, Bluetooth, EDR, PRBS9

3-DH1 (1/2) (worst 5sec chart)	3-DH1 (2/2)
	
3-DH3 (1/2) (worst 5sec chart)	**3-DH3 (2/2)**
	
3-DH5 (1/2) (worst 5sec chart)	**3-DH5 (2/2)**
	

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Peak Output Power (Conducted)

Test place	UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date	January 24, 2012
Temperature / Humidity	26deg.C , 33%RH
Engineer	Akio Hayashi
Mode	Tx, Bluetooth

(* P/M: Power Meter with power sensor)

	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
DH5	2402.0	-11.26	1.26	9.68	-0.32	0.93	20.97	125	21.29
DH5	2441.0	-11.51	1.27	9.68	-0.56	0.88	20.97	125	21.53
DH5	2480.0	-12.31	1.28	9.68	-1.35	0.73	20.97	125	22.32
2-DH5	2402.0	-8.95	1.26	9.68	1.99	1.58	20.97	125	18.98
2-DH5	2441.0	-9.16	1.27	9.68	1.79	1.51	20.97	125	19.18
2-DH5	2480.0	-10.00	1.28	9.68	0.96	1.25	20.97	125	20.01
3-DH5	2402.0	-8.93	1.26	9.68	2.01	1.59	20.97	125	18.96
3-DH5	2441.0	-9.16	1.27	9.68	1.79	1.51	20.97	125	19.18
3-DH5	2480.0	-10.06	1.28	9.68	0.90	1.23	20.97	125	20.07

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

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		No.1,3 Semi Anechoic Chamber
Date	January 24, 2012(1SAC*)	January 25, 2012(3SAC*)	* SAC=Semi-Anechoic Chamber
Temperature / Humidity	22deg.C , 31%RH	22deg.C , 33%RH	
Engineer	Wataru Kojima	Shinichi Takano	
Mode	Tx, 2402 MHz	(1/2)	
	Tx, Bluetooth, BDR, PRBS9		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	224.010	QP	36.4	16.8	9.2	31.7	30.7	46.0	15.3	145	265	PK:VBW 3MHz
Hori.	351.995	QP	49.1	15.1	7.2	31.8	39.6	46.0	6.4	100	190	AV:VBW 10Hz
Hori.	375.585	QP	47.8	15.5	7.4	31.8	38.9	46.0	7.1	100	197	
Hori.	835.589	QP	33.5	21.2	9.7	31.7	32.7	46.0	13.3	100	359	
Hori.	1280.004	PK	47.9	24.7	12.8	40.7	44.7	73.9	29.2	153	53	
Hori.	2390.000	PK	47.6	27.2	13.8	41.1	47.5	73.9	26.4	221	330	
Hori.	3142.658	PK	48.0	28.9	5.4	41.5	40.8	73.9	33.1	111	145	
Hori.	3204.016	PK	46.2	29.0	5.4	41.5	39.1	73.9	34.8	100	50	
Hori.	4006.017	PK	47.6	30.0	5.6	41.7	41.5	73.9	32.4	217	74	
Hori.	4804.000	PK	55.0	31.1	5.9	41.1	50.9	73.9	23.0	103	305	
Hori.	6285.300	PK	47.2	34.1	6.7	40.4	47.6	73.9	26.3	100	224	
Hori.	7206.000	PK	44.8	36.5	7.4	41.3	47.4	73.9	26.5	100	0	
Hori.	9608.000	PK	43.6	38.2	8.6	38.8	51.6	73.9	22.3	100	0	
Hori.	12010.000	PK	44.5	39.3	10.2	39.2	54.8	73.9	19.1	100	0	
Hori.	1280.004	AV	39.6	24.7	12.8	40.7	36.4	53.9	17.5	153	53	
Hori.	3142.658	AV	41.7	28.9	5.4	41.5	34.5	53.9	19.4	111	145	
Hori.	3204.016	AV	35.5	29.0	5.4	41.5	28.4	53.9	25.5	100	50	
Hori.	4006.017	AV	37.7	30.0	5.6	41.7	31.6	53.9	22.3	217	74	
Hori.	6285.300	AV	40.6	34.1	6.7	40.4	41.0	53.9	12.9	100	224	
Vert.	192.005	QP	35.2	16.1	8.9	31.8	28.4	43.5	15.1	103	35	
Vert.	391.994	QP	38.6	15.8	7.5	31.8	30.1	46.0	15.9	100	162	
Vert.	835.593	QP	29.7	21.2	9.7	31.7	28.9	46.0	17.1	100	352	
Vert.	1280.012	PK	50.9	24.7	12.8	40.7	47.7	73.9	26.2	113	290	
Vert.	2390.000	PK	47.1	27.2	13.8	41.1	47.0	73.9	26.9	125	31	
Vert.	3142.664	PK	47.1	28.9	5.4	41.5	39.9	73.9	34.0	100	167	
Vert.	3203.975	PK	46.3	29.0	5.4	41.5	39.2	73.9	34.7	100	339	
Vert.	4005.951	PK	47.2	30.0	5.6	41.7	41.1	73.9	32.8	103	322	
Vert.	4804.000	PK	54.8	31.1	5.9	41.1	50.7	73.9	23.2	100	203	
Vert.	6285.299	PK	47.8	34.1	6.7	40.4	48.2	73.9	25.7	104	181	
Vert.	7206.000	PK	45.0	36.5	7.4	41.3	47.6	73.9	26.3	100	0	
Vert.	9608.000	PK	43.6	38.2	8.6	38.8	51.6	73.9	22.3	100	0	
Vert.	12010.000	PK	45.0	39.3	10.2	39.2	55.3	73.9	18.6	100	0	
Vert.	1280.012	AV	46.1	24.7	12.8	40.7	42.9	53.9	11.0	113	290	
Vert.	3142.664	AV	39.0	28.9	5.4	41.5	31.8	53.9	22.1	100	167	
Vert.	3203.975	AV	36.2	29.0	5.4	41.5	29.1	53.9	24.8	100	339	
Vert.	4005.951	AV	36.5	30.0	5.6	41.7	30.4	53.9	23.5	103	322	
Vert.	6285.299	AV	40.9	34.1	6.7	40.4	41.3	53.9	12.6	104	181	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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

20dBc Data Sheet (RBW 100kHz, VBW 300kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	95.1	27.3	13.8	41.1	95.1	-	-	Carrier
Hori.	2400.000	PK	50.0	27.3	13.8	41.1	50.0	75.1	25.1	
Vert.	2402.000	PK	92.9	27.3	13.8	41.1	92.9	-	-	Carrier
Vert.	2400.000	PK	48.3	27.3	13.8	41.1	48.3	72.9	24.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber
Date	January 25, 2012	
Temperature / Humidity	22deg.C , 33%RH	
Engineer	Shinichi Takano	
Mode	Tx, 2402 MHz (2/2)	
	Tx, Bluetooth, BDR, PRBS9	

(* AV: Average)

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	35.5	27.2	13.8	41.1	-24.7	10.7	53.9	43.2	AV:VBW 10Hz
Hori.	4804.000	AV	50.4	31.1	5.9	41.1	-24.7	21.6	53.9	32.3	
Hori.	7206.000	AV	34.9	36.5	7.4	41.3	-24.7	12.8	53.9	41.1	
Hori.	9608.000	AV	32.9	38.2	8.6	38.8	-24.7	16.2	53.9	37.7	
Hori.	12010.000	AV	34.4	39.3	10.2	39.2	-24.7	20.0	53.9	33.9	
Vert.	2390.000	AV	35.4	27.2	13.8	41.1	-24.7	10.6	53.9	43.3	
Vert.	4804.000	AV	49.6	31.1	5.9	41.1	-24.7	20.8	53.9	33.1	
Vert.	7206.000	AV	35.1	36.5	7.4	41.3	-24.7	13.0	53.9	40.9	
Vert.	9608.000	AV	33.2	38.2	8.6	38.8	-24.7	16.5	53.9	37.4	
Vert.	12010.000	AV	34.4	39.3	10.2	39.2	-24.7	20.0	53.9	33.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier) + Dwell time factor (Refer to dwell time data sheet)

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

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1,3 Semi Anechoic Chamber	
Date	January 24, 2012(1SAC*)	January 25, 2012(3SAC*)	* SAC=Semi-Anechoic Chamber
Temperature / Humidity	22deg.C , 31%RH	22deg.C , 33%RH	
Engineer	Wataru Kojima	Shinichi Takano	
Mode	Tx, 2441 MHz		
	Tx, Bluetooth, BDR, PRBS9		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	232.006	QP	39.2	16.9	9.3	31.7	33.7	46.0	12.3	130	352	PK:VBW 3MHz
Hori.	256.004	QP	37.0	17.5	9.5	31.7	32.3	46.0	13.7	141	248	AV:VBW 10Hz
Hori.	351.994	QP	49.0	15.1	7.2	31.8	39.5	46.0	6.5	100	186	
Hori.	375.990	QP	41.0	15.5	7.4	31.8	32.1	46.0	13.9	100	186	
Hori.	392.009	QP	44.0	15.8	7.5	31.8	35.5	46.0	10.5	104	105	
Hori.	1279.989	PK	50.7	24.7	12.8	40.7	47.5	73.9	26.4	114	279	
Hori.	3142.662	PK	48.5	28.9	5.4	41.5	41.3	73.9	32.6	108	146	
Hori.	3256.050	PK	44.4	29.0	5.4	41.6	37.2	73.9	36.7	100	53	
Hori.	4070.988	PK	45.3	30.1	5.6	41.7	39.3	73.9	34.6	214	308	
Hori.	4882.000	PK	58.4	31.2	5.9	40.9	54.6	73.9	19.3	110	57	
Hori.	6285.305	PK	47.1	34.1	6.7	40.4	47.5	73.9	26.4	100	225	
Hori.	7323.000	PK	45.3	36.8	7.5	41.4	48.2	73.9	25.7	100	0	
Hori.	9764.000	PK	43.0	38.5	8.6	38.8	51.3	73.9	22.6	100	0	
Hori.	12205.000	PK	44.1	39.3	10.2	39.2	54.4	73.9	19.5	100	0	
Hori.	1279.989	AV	46.0	24.7	12.8	40.7	42.8	53.9	11.1	114	279	
Hori.	3142.662	AV	41.3	28.9	5.4	41.5	34.1	53.9	19.8	108	146	
Hori.	3256.050	AV	35.2	29.0	5.4	41.6	28.0	53.9	25.9	100	53	
Hori.	4068.988	AV	35.8	30.1	5.6	41.7	29.8	53.9	24.1	214	308	
Hori.	6285.305	AV	40.6	34.1	6.7	40.4	41.0	53.9	12.9	100	225	
Vert.	599.988	QP	30.3	18.8	8.6	32.0	25.7	46.0	20.3	100	55	
Vert.	1279.992	PK	48.4	24.7	12.8	40.7	45.2	73.9	28.7	152	49	
Vert.	3142.652	PK	46.9	28.9	5.4	41.5	39.7	73.9	34.2	100	168	
Vert.	3255.996	PK	46.0	29.0	5.4	41.6	38.8	73.9	35.1	100	341	
Vert.	4070.993	PK	45.7	30.1	5.6	41.7	39.7	73.9	34.2	100	322	
Vert.	4882.000	PK	55.0	31.2	5.9	40.9	51.2	73.9	22.7	123	355	
Vert.	6285.329	PK	48.2	34.1	6.7	40.4	48.6	73.9	25.3	105	181	
Vert.	7323.000	PK	46.7	36.8	7.5	41.4	49.6	73.9	24.3	100	0	
Vert.	9764.000	PK	44.2	38.5	8.6	38.8	52.5	73.9	21.4	100	0	
Vert.	12205.000	PK	44.4	39.3	10.2	39.2	54.7	73.9	19.2	100	0	
Vert.	1279.992	AV	39.5	24.7	12.8	40.7	36.3	53.9	17.6	152	49	
Vert.	3142.652	AV	39.0	28.9	5.4	41.5	31.8	53.9	22.1	100	168	
Vert.	3255.996	AV	36.3	29.0	5.4	41.6	29.1	53.9	24.8	100	341	
Vert.	4070.993	AV	36.1	30.1	5.6	41.7	30.1	53.9	23.8	100	322	
Vert.	6285.329	AV	41.2	34.1	6.7	40.4	41.6	53.9	12.3	105	181	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4882.000	AV	54.1	31.2	5.9	40.9	-24.7	25.6	53.9	28.3	AV:VBW 10Hz
Hori.	7323.000	AV	34.9	36.8	7.5	41.4	-24.7	13.1	53.9	40.8	
Hori.	9764.000	AV	33.0	38.5	8.6	38.8	-24.7	16.6	53.9	37.3	
Hori.	12205.000	AV	33.8	39.3	10.2	39.2	-24.7	19.4	53.9	34.5	
Vert.	4882.000	AV	50.3	31.2	5.9	40.9	-24.7	21.8	53.9	32.1	
Vert.	7323.000	AV	35.4	36.8	7.5	41.4	-24.7	13.6	53.9	40.3	
Vert.	9764.000	AV	33.4	38.5	8.6	38.8	-24.7	17.0	53.9	36.9	
Vert.	12205.000	AV	34.0	39.3	10.2	39.2	-24.7	19.6	53.9	34.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier) + Dwell time factor (Refer to dwell time data sheet)

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		No.1,3 Semi Anechoic Chamber
Date	January 24, 2012(1SAC*)	January 25, 2012(3SAC*)	* SAC=Semi-Anechoic Chamber
Temperature / Humidity	22deg.C , 31%RH	22deg.C , 33%RH	
Engineer	Wataru Kojima	Shinichi Takano	
Mode	Tx, 2480 MHz (1/2)		
	Tx, Bluetooth, BDR, PRBS9		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	127.999	QP	37.2	13.5	8.2	31.8	27.1	43.5	16.4	267	148	PK:VBW 3MHz
Hori.	231.991	QP	33.6	16.9	9.3	31.7	28.1	46.0	17.9	153	65	AV:VBW 10Hz
Hori.	351.995	QP	49.0	15.1	7.2	31.8	39.5	46.0	6.5	100	199	
Hori.	375.947	QP	41.2	15.5	7.4	31.8	32.3	46.0	13.7	100	225	
Hori.	384.007	QP	44.1	15.6	7.5	31.8	35.4	46.0	10.6	100	187	
Hori.	400.015	QP	42.6	15.9	7.6	31.8	34.3	46.0	11.7	100	98	
Hori.	1280.011	PK	48.6	24.7	12.8	40.7	45.4	73.9	28.5	155	52	
Hori.	2483.500	PK	51.1	27.5	13.8	41.1	51.3	73.9	22.6	100	54	
Hori.	3142.669	PK	49.5	28.9	5.4	41.5	42.3	73.9	31.6	110	146	
Hori.	3308.024	PK	46.4	29.1	5.3	41.6	39.2	73.9	34.7	100	60	
Hori.	4133.955	PK	45.9	30.1	5.7	41.7	40.0	73.9	33.9	100	311	
Hori.	4960.000	PK	54.5	31.4	5.9	40.8	51.0	73.9	22.9	109	61	
Hori.	6285.334	PK	47.5	34.1	6.7	40.4	47.9	73.9	26.0	100	224	
Hori.	7440.000	PK	46.3	37.0	7.5	41.5	49.3	73.9	24.6	100	0	
Hori.	9920.000	PK	43.9	38.8	8.6	38.8	52.5	73.9	21.4	100	0	
Hori.	12400.000	PK	44.4	39.4	10.1	39.2	54.7	73.9	19.2	100	0	
Hori.	1280.011	AV	39.6	24.7	12.8	40.7	36.4	53.9	17.5	155	52	
Hori.	3142.669	AV	41.9	28.9	5.4	41.5	34.7	53.9	19.2	110	146	
Hori.	3308.024	AV	35.8	29.1	5.3	41.6	28.6	53.9	25.3	100	60	
Hori.	4133.955	AV	35.7	30.1	5.7	41.7	29.8	53.9	24.1	100	311	
Hori.	6285.334	AV	40.6	34.1	6.7	40.4	41.0	53.9	12.9	100	224	
Vert.	535.983	QP	32.1	18.1	8.3	32.0	26.5	46.0	19.5	100	138	
Vert.	1279.979	PK	50.5	24.7	12.8	40.7	47.3	73.9	26.6	116	278	
Vert.	2483.500	PK	52.6	27.5	13.8	41.1	52.8	73.9	21.1	117	342	
Vert.	3142.657	PK	47.7	28.9	5.4	41.5	40.5	73.9	33.4	100	168	
Vert.	3307.980	PK	48.2	29.1	5.3	41.6	41.0	73.9	32.9	100	348	
Vert.	4134.005	PK	45.9	30.1	5.7	41.7	40.0	73.9	33.9	100	3	
Vert.	4960.000	PK	51.6	31.4	5.9	40.8	48.1	73.9	25.8	100	244	
Vert.	6285.324	PK	48.1	34.1	6.7	40.4	48.5	73.9	25.4	104	181	
Vert.	7440.000	PK	46.3	37.0	7.5	41.5	49.3	73.9	24.6	100	0	
Vert.	9920.000	PK	43.7	38.8	8.6	38.8	52.3	73.9	21.6	100	0	
Vert.	12400.000	PK	45.7	39.4	10.1	39.2	56.0	73.9	17.9	100	0	
Vert.	1279.979	AV	45.9	24.7	12.8	40.7	42.7	53.9	11.2	116	278	
Vert.	3142.657	AV	39.2	28.9	5.4	41.5	32.0	53.9	21.9	100	168	
Vert.	3307.980	AV	37.7	29.1	5.3	41.6	30.5	53.9	23.4	100	348	
Vert.	4134.005	AV	36.5	30.1	5.7	41.7	30.6	53.9	23.3	100	3	
Vert.	6285.324	AV	41.2	34.1	6.7	40.4	41.6	53.9	12.3	104	181	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber
Date	January 25, 2012	
Temperature / Humidity	22deg.C , 33%RH	
Engineer	Shinichi Takano	
Mode	Tx, 2480 MHz (2/2)	
	Tx, Bluetooth, BDR, PRBS9	

(* AV: Average)

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	39.3	27.5	13.8	41.1	-24.7	14.8	53.9	39.1	AV:VBW 10Hz
Hori.	4960.000	AV	49.3	31.4	5.9	40.8	-24.7	21.1	53.9	32.8	
Hori.	7440.000	AV	35.2	37.0	7.5	41.5	-24.7	13.5	53.9	40.4	
Hori.	9920.000	AV	32.7	38.8	8.6	38.8	-24.7	16.6	53.9	37.3	
Hori.	12400.000	AV	34.0	39.4	10.1	39.2	-24.7	19.6	53.9	34.3	
Vert.	2483.500	AV	40.7	27.5	13.8	41.1	-24.7	16.2	53.9	37.7	
Vert.	4960.000	AV	45.5	31.4	5.9	40.8	-24.7	17.3	53.9	36.6	
Vert.	7440.000	AV	35.6	37.0	7.5	41.5	-24.7	13.9	53.9	40.0	
Vert.	9920.000	AV	33.1	38.8	8.6	38.8	-24.7	17.0	53.9	36.9	
Vert.	12400.000	AV	34.2	39.4	10.1	39.2	-24.7	19.8	53.9	34.1	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier) + Dwell time factor (Refer to dwell time data sheet)

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

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		No.1,3 Semi Anechoic Chamber
Date	January 24, 2012	January 25, 2012	
Temperature / Humidity	22deg.C , 31%RH	22deg.C , 33%RH	
Engineer	Wataru Kojima	Shinichi Takano	
Mode	Tx, 2402 MHz		
	Tx, Bluetooth, EDR, PRBS9		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	232.002	QP	32.7	16.9	9.3	31.7	27.2	46.0	18.8	132	83	PK:VBW 3MHz
Hori.	352.005	QP	49.3	15.1	7.2	31.8	39.8	46.0	6.2	100	181	AV:VBW 10Hz
Hori.	367.947	QP	38.8	15.3	7.4	31.8	29.7	46.0	16.3	100	213	
Hori.	383.998	QP	44.4	15.6	7.5	31.8	35.7	46.0	10.3	100	52	
Hori.	400.130	QP	41.2	15.9	7.6	31.8	32.9	46.0	13.1	100	111	
Hori.	544.246	QP	42.6	18.2	8.3	32.0	37.1	46.0	8.9	150	136	
Hori.	1279.966	PK	48.1	24.7	12.8	40.7	44.9	73.9	29.0	150	52	
Hori.	2390.000	PK	47.4	27.2	13.8	41.1	47.3	73.9	26.6	223	331	
Hori.	3142.658	PK	48.3	28.9	5.4	41.5	41.1	73.9	32.8	108	146	
Hori.	3203.930	PK	45.8	29.0	5.4	41.5	38.7	73.9	35.2	100	0	
Hori.	4005.946	PK	46.3	30.0	5.6	41.7	40.2	73.9	33.7	190	73	
Hori.	4804.000	PK	56.8	31.1	5.9	41.1	52.7	73.9	21.2	105	304	
Hori.	6285.319	PK	48.3	34.1	6.7	40.4	48.7	73.9	25.2	100	224	
Hori.	7206.000	PK	45.5	36.5	7.4	41.3	48.1	73.9	25.8	100	0	
Hori.	9608.000	PK	43.6	38.2	8.6	38.8	51.6	73.9	22.3	100	0	
Hori.	12010.000	PK	45.0	39.3	10.2	39.2	55.3	73.9	18.6	100	0	
Hori.	1279.966	AV	39.6	24.7	12.8	40.7	36.4	53.9	17.5	150	52	
Hori.	3142.658	AV	41.7	28.9	5.4	41.5	34.5	53.9	19.4	108	146	
Hori.	3203.930	AV	35.4	29.0	5.4	41.5	28.3	53.9	25.6	100	0	
Hori.	4005.946	AV	36.4	30.0	5.6	41.7	30.3	53.9	23.6	190	73	
Hori.	6285.319	AV	40.8	34.1	6.7	40.4	41.2	53.9	12.7	100	224	
Vert.	351.914	QP	45.1	15.1	7.2	31.8	35.6	46.0	10.4	100	152	
Vert.	1279.981	PK	50.9	24.7	12.8	40.7	47.7	73.9	26.2	111	277	
Vert.	2390.000	PK	46.3	27.2	13.8	41.1	46.2	73.9	27.7	126	29	
Vert.	3142.644	PK	47.1	28.9	5.4	41.5	39.9	73.9	34.0	100	168	
Vert.	3203.968	PK	46.5	29.0	5.4	41.5	39.4	73.9	34.5	100	341	
Vert.	4005.941	PK	46.1	30.0	5.6	41.7	40.0	73.9	33.9	103	321	
Vert.	4804.000	PK	56.9	31.1	5.9	41.1	52.8	73.9	21.1	100	203	
Vert.	6285.310	PK	48.4	34.1	6.7	40.4	48.8	73.9	25.1	104	181	
Vert.	7206.000	PK	45.8	36.5	7.4	41.3	48.4	73.9	25.5	100	0	
Vert.	9608.000	PK	43.7	38.2	8.6	38.8	51.7	73.9	22.2	100	0	
Vert.	12010.000	PK	45.1	39.3	10.2	39.2	55.4	73.9	18.5	100	0	
Vert.	1279.981	AV	46.0	24.7	12.8	40.7	42.8	53.9	11.1	111	277	
Vert.	3142.644	AV	39.1	28.9	5.4	41.5	31.9	53.9	22.0	100	168	
Vert.	3203.968	AV	36.2	29.0	5.4	41.5	29.1	53.9	24.8	100	341	
Vert.	4005.941	AV	35.6	30.0	5.6	41.7	29.5	53.9	24.4	103	321	
Vert.	6285.310	AV	41.5	34.1	6.7	40.4	41.9	53.9	12.0	104	181	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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

20dBc Data Sheet (RBW 100kHz, VBW 300kHz)

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	97.0	27.3	13.8	41.1	97.0	-	-	Carrier
Hori.	2400.000	PK	52.7	27.3	13.8	41.1	52.7	77.0	24.3	
Vert.	2402.000	PK	94.7	27.3	13.8	41.1	94.7	-	-	Carrier
Vert.	2400.000	PK	51.2	27.3	13.8	41.1	51.2	74.7	23.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber
Date	January 25, 2012	
Temperature / Humidity	22deg.C , 33%RH	
Engineer	Shinichi Takano	
Mode	Tx, 2402 MHz (2/2)	
	Tx, Bluetooth, EDR, PRBS9	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	35.5	27.2	13.8	41.1	-24.7	10.7	53.9	43.2	AV:VBW 10Hz
Hori.	4804.000	AV	48.9	31.1	5.9	41.1	-24.7	20.1	53.9	33.8	
Hori.	7206.000	AV	35.0	36.5	7.4	41.3	-24.7	12.9	53.9	41.0	
Hori.	9608.000	AV	33.2	38.2	8.6	38.8	-24.7	16.5	53.9	37.4	
Hori.	12010.000	AV	34.6	39.3	10.2	39.2	-24.7	20.2	53.9	33.7	
Vert.	2390.000	AV	35.4	27.2	13.8	41.1	-24.7	10.6	53.9	43.3	
Vert.	4804.000	AV	48.9	31.1	5.9	41.1	-24.7	20.1	53.9	33.8	
Vert.	7206.000	AV	35.4	36.5	7.4	41.3	-24.7	13.3	53.9	40.6	
Vert.	9608.000	AV	33.5	38.2	8.6	38.8	-24.7	16.8	53.9	37.1	
Vert.	12010.000	AV	34.5	39.3	10.2	39.2	-24.7	20.1	53.9	33.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier) + Dwell time factor (Refer to dwell time data sheet)

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

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1,3 Semi Anechoic Chamber	
Date	January 24, 2012(1SAC*)	January 25, 2012(3SAC*)	* SAC=Semi-Anechoic Chamber
Temperature / Humidity	22deg.C , 31%RH	22deg.C , 33%RH	
Engineer	Wataru Kojima	Shinichi Takano	
Mode	Tx, 2441 MHz		
	Tx, Bluetooth, EDR, PRBS9		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	232.066	QP	38.6	16.9	9.3	31.7	33.1	46.0	12.9	150	351	PK:VBW 3MHz
Hori.	351.865	QP	44.5	15.1	7.2	31.8	35.0	46.0	11.0	100	40	AV:VBW 10Hz
Hori.	367.924	QP	40.0	15.3	7.4	31.8	30.9	46.0	15.1	100	142	
Hori.	384.122	QP	39.6	15.6	7.5	31.8	30.9	46.0	15.1	100	169	
Hori.	391.813	QP	46.6	15.8	7.5	31.8	38.1	46.0	7.9	100	82	
Hori.	400.060	QP	47.6	15.9	7.6	31.8	39.3	46.0	6.7	100	87	
Hori.	1279.949	PK	47.4	24.7	12.8	40.7	44.2	73.9	29.7	149	51	
Hori.	3142.659	PK	48.5	28.9	5.4	41.5	41.3	73.9	32.6	111	146	
Hori.	3256.074	PK	45.6	29.0	5.4	41.6	38.4	73.9	35.5	100	55	
Hori.	4070.987	PK	45.7	30.1	5.6	41.7	39.7	73.9	34.2	212	313	
Hori.	4882.000	PK	60.9	31.2	5.9	40.9	57.1	73.9	16.8	110	59	
Hori.	6285.319	PK	47.3	34.1	6.7	40.4	47.7	73.9	26.2	100	256	
Hori.	7323.000	PK	45.9	36.8	7.5	41.4	48.8	73.9	25.1	100	0	
Hori.	9764.000	PK	42.8	38.5	8.6	38.8	51.1	73.9	22.8	100	0	
Hori.	12205.000	PK	44.4	39.3	10.2	39.2	54.7	73.9	19.2	100	0	
Hori.	1279.949	AV	39.7	24.7	12.8	40.7	36.5	53.9	17.4	149	51	
Hori.	3142.659	AV	41.8	28.9	5.4	41.5	34.6	53.9	19.3	111	146	
Hori.	3256.074	AV	35.3	29.0	5.4	41.6	28.1	53.9	25.8	100	55	
Hori.	4070.987	AV	35.6	30.1	5.6	41.7	29.6	53.9	24.3	212	313	
Hori.	6285.319	AV	40.4	34.1	6.7	40.4	40.8	53.9	13.1	100	256	
Vert.	544.326	QP	39.8	18.2	8.3	32.0	34.3	46.0	11.7	100	308	
Vert.	1279.967	PK	51.1	24.7	12.8	40.7	47.9	73.9	26.0	114	280	
Vert.	3142.650	PK	47.0	28.9	5.4	41.5	39.8	73.9	34.1	100	166	
Vert.	3255.972	PK	46.2	29.0	5.4	41.6	39.0	73.9	34.9	115	346	
Vert.	4070.981	PK	44.5	30.1	5.6	41.7	38.5	73.9	35.4	100	323	
Vert.	4882.000	PK	56.6	31.2	5.9	40.9	52.8	73.9	21.1	123	354	
Vert.	6285.320	PK	47.6	34.1	6.7	40.4	48.0	73.9	25.9	104	181	
Vert.	7323.000	PK	46.9	36.8	7.5	41.4	49.8	73.9	24.1	100	0	
Vert.	9764.000	PK	44.4	38.5	8.6	38.8	52.7	73.9	21.2	100	0	
Vert.	12205.000	PK	44.5	39.3	10.2	39.2	54.8	73.9	19.1	100	0	
Vert.	1279.967	AV	46.0	24.7	12.8	40.7	42.8	53.9	11.1	114	280	
Vert.	3142.650	AV	39.2	28.9	5.4	41.5	32.0	53.9	21.9	100	166	
Vert.	3255.972	AV	36.5	29.0	5.4	41.6	29.3	53.9	24.6	115	346	
Vert.	4070.981	AV	35.4	30.1	5.6	41.7	29.4	53.9	24.5	100	323	
Vert.	6285.320	AV	41.3	34.1	6.7	40.4	41.7	53.9	12.2	104	181	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4882.000	AV	53.7	31.2	5.9	40.9	-24.7	25.2	53.9	28.7	AV:VBW 10Hz
Hori.	7323.000	AV	34.9	36.8	7.5	41.4	-24.7	13.1	53.9	40.8	
Hori.	9764.000	AV	33.2	38.5	8.6	38.8	-24.7	16.8	53.9	37.1	
Hori.	12205.000	AV	33.9	39.3	10.2	39.2	-24.7	19.5	53.9	34.4	
Vert.	4882.000	AV	48.9	31.2	5.9	40.9	-24.7	20.4	53.9	33.5	
Vert.	7323.000	AV	35.5	36.8	7.5	41.4	-24.7	13.7	53.9	40.2	
Vert.	9764.000	AV	33.3	38.5	8.6	38.8	-24.7	16.9	53.9	37.0	
Vert.	12205.000	AV	34.1	39.3	10.2	39.2	-24.7	19.7	53.9	34.2	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier) + Dwell time factor (Refer to dwell time data sheet)

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

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		No.3 Semi Anechoic Chamber
Date	January 24, 2012(1SAC*)	January 25, 2012(3SAC*)	* SAC=Semi-Anechoic Chamber
Temperature / Humidity	22deg.C , 31%RH	22deg.C , 33%RH	
Engineer	Wataru Kojima	Shinichi Takano	
Mode	Tx, 2480 MHz		
	Tx, Bluetooth, EDR, PRBS9		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	232.036	QP	35.7	16.9	9.3	31.7	30.2	46.0	15.8	200	359	PK:VBW 3MHz
Hori.	351.765	QP	43.4	15.1	7.2	31.8	33.9	46.0	12.1	100	221	AV:VBW 10Hz
Hori.	359.384	QP	47.2	15.2	7.2	31.8	37.8	46.0	8.2	100	185	
Hori.	375.689	QP	43.0	15.5	7.4	31.8	34.1	46.0	11.9	100	199	
Hori.	400.035	QP	38.9	15.9	7.6	31.8	30.6	46.0	15.4	100	48	
Hori.	415.447	QP	38.5	16.2	7.7	31.8	30.6	46.0	15.4	100	337	
Hori.	544.261	QP	44.3	18.2	8.3	32.0	38.8	46.0	7.2	100	219	
Hori.	1279.964	PK	47.4	24.7	12.8	40.7	44.2	73.9	29.7	153	49	
Hori.	2483.500	PK	56.0	27.5	13.8	41.1	56.2	73.9	17.7	100	55	
Hori.	3142.692	PK	49.9	28.9	5.4	41.5	42.7	73.9	31.2	111	144	
Hori.	3308.031	PK	46.6	29.1	5.3	41.6	39.4	73.9	34.5	100	63	
Hori.	4133.972	PK	45.5	30.1	5.7	41.7	39.6	73.9	34.3	100	320	
Hori.	4960.000	PK	56.0	31.4	5.9	40.8	52.5	73.9	21.4	111	61	
Hori.	6285.330	PK	47.7	34.1	6.7	40.4	48.1	73.9	25.8	100	221	
Hori.	7440.000	PK	45.5	37.0	7.5	41.5	48.5	73.9	25.4	100	0	
Hori.	9920.000	PK	43.6	38.8	8.6	38.8	52.2	73.9	21.7	100	0	
Hori.	12400.000	PK	44.7	39.4	10.1	39.2	55.0	73.9	18.9	100	0	
Hori.	1279.964	AV	39.5	24.7	12.8	40.7	36.3	53.9	17.6	153	49	
Hori.	3142.692	AV	42.2	28.9	5.4	41.5	35.0	53.9	18.9	111	144	
Hori.	3308.031	AV	35.3	29.1	5.3	41.6	28.1	53.9	25.8	100	63	
Hori.	4133.972	AV	35.8	30.1	5.7	41.7	29.9	53.9	24.0	100	320	
Hori.	6285.330	AV	40.1	34.1	6.7	40.4	40.5	53.9	13.4	100	221	
Vert.	608.000	QP	35.8	19.0	8.6	32.0	31.4	46.0	14.6	100	353	
Vert.	1279.971	PK	51.2	24.7	12.8	40.7	48.0	73.9	25.9	114	278	
Vert.	2483.500	PK	58.0	27.5	13.8	41.1	58.2	73.9	15.7	115	342	
Vert.	3142.693	PK	47.8	28.9	5.4	41.5	40.6	73.9	33.3	100	163	
Vert.	3307.992	PK	48.8	29.1	5.3	41.6	41.6	73.9	32.3	100	349	
Vert.	4134.013	PK	46.3	30.1	5.7	41.7	40.4	73.9	33.5	100	11	
Vert.	4960.000	PK	53.0	31.4	5.9	40.8	49.5	73.9	24.4	100	245	
Vert.	6285.335	PK	48.8	34.1	6.7	40.4	49.2	73.9	24.7	103	180	
Vert.	7440.000	PK	46.4	37.0	7.5	41.5	49.4	73.9	24.5	100	0	
Vert.	9920.000	PK	43.9	38.8	8.6	38.8	52.5	73.9	21.4	100	0	
Vert.	12400.000	PK	45.4	39.4	10.1	39.2	55.7	73.9	18.2	100	0	
Vert.	1279.971	AV	46.1	24.7	12.8	40.7	42.9	53.9	11.0	114	278	
Vert.	3142.693	AV	39.4	28.9	5.4	41.5	32.2	53.9	21.7	100	163	
Vert.	3307.992	AV	37.2	29.1	5.3	41.6	30.0	53.9	23.9	100	349	
Vert.	4134.013	AV	36.1	30.1	5.7	41.7	30.2	53.9	23.7	100	11	
Vert.	6285.335	AV	41.3	34.1	6.7	40.4	41.7	53.9	12.2	103	180	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber
Date	January 25, 2012	
Temperature / Humidity	22deg.C , 33%RH	
Engineer	Shinichi Takano	
Mode	Tx, 2480 MHz	
	Tx, Bluetooth, EDR, PRBS9	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	45.4	27.5	13.8	41.1	-24.7	20.9	53.9	33.0	AV:VBW 10Hz
Hori.	4960.000	AV	48.2	31.4	5.9	40.8	-24.7	20.0	53.9	33.9	
Hori.	7440.000	AV	35.7	37.0	7.5	41.5	-24.7	14.0	53.9	39.9	
Hori.	9920.000	AV	32.3	38.8	8.6	38.8	-24.7	16.2	53.9	37.7	
Hori.	12400.000	AV	34.1	39.4	10.1	39.2	-24.7	19.7	53.9	34.2	
Vert.	2483.500	AV	47.3	27.5	13.8	41.1	-24.7	22.8	53.9	31.1	
Vert.	4960.000	AV	44.3	31.4	5.9	40.8	-24.7	16.1	53.9	37.8	
Vert.	7440.000	AV	35.6	37.0	7.5	41.5	-24.7	13.9	53.9	40.0	
Vert.	9920.000	AV	33.2	38.8	8.6	38.8	-24.7	17.1	53.9	36.8	
Vert.	12400.000	AV	34.5	39.4	10.1	39.2	-24.7	20.1	53.9	33.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier) + Dwell time factor (Refer to dwell time data sheet)

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

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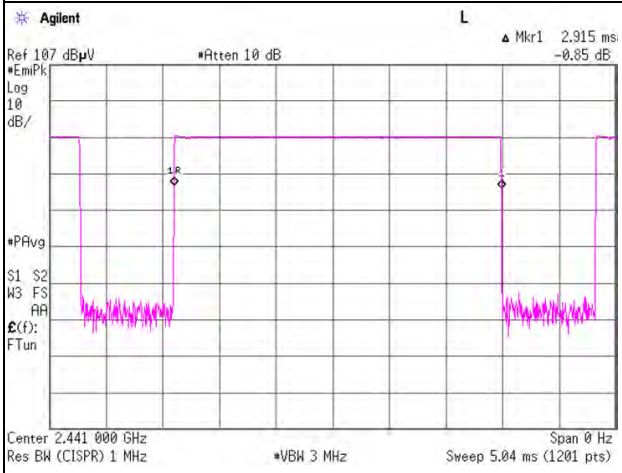
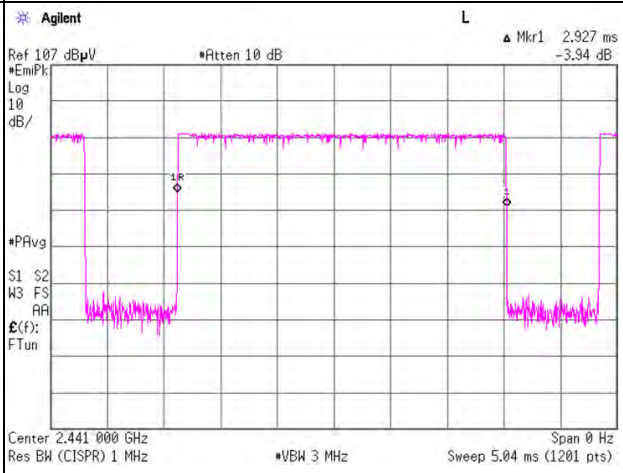
Dwell time factor Calculation chart

Dwell time factor Calculation	
Tx, Bluetooth, BDR, PRBS9	**Tx, Bluetooth, EDR, PRBS9**
1cycle On time : 2.915ms **Dwell time factor =20log((2.915 x 2)/100) = -24.69dB**	**1cycle On time : 2.927ms** **Dwell time factor =20log((2.927 x 2)/100) = -24.65dB**
	

ON time of some channel during 100ms: Twice
This is the worst case in hopping sequence of Bluetooth.

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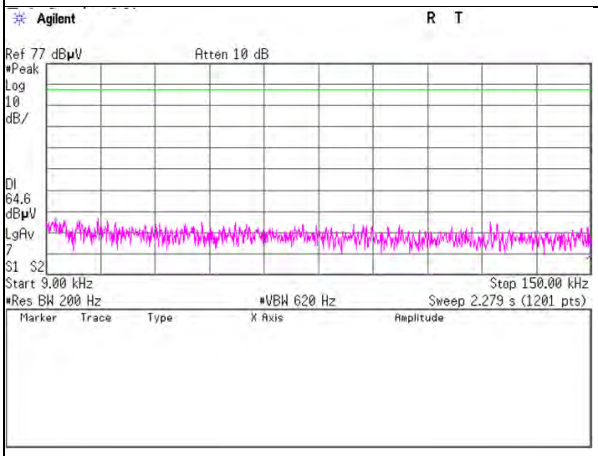
Spurious emission (Conducted)

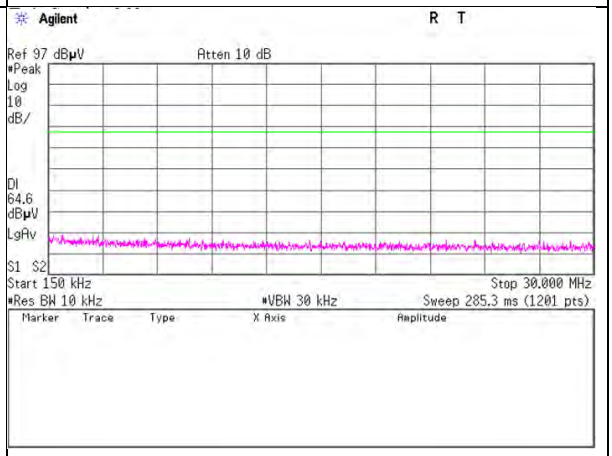
Tx, Bluetooth, BDR, PRBS9

Tx, 2402MHz (1/2)

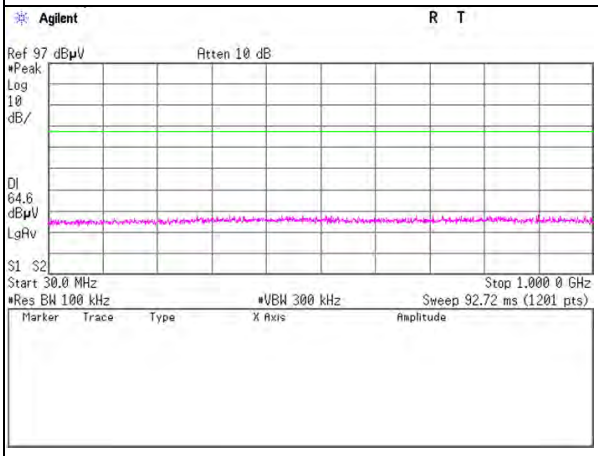
9kHz - 150kHz



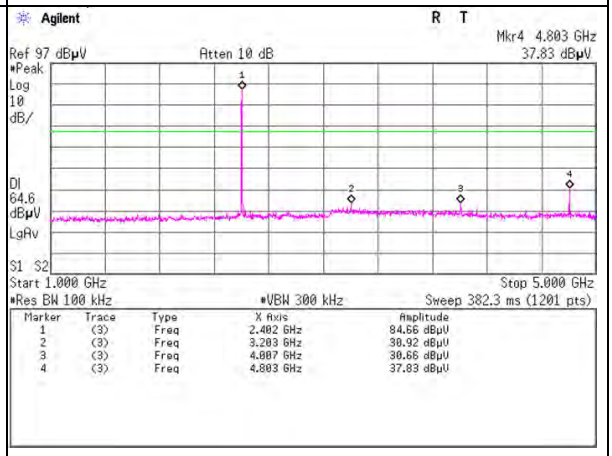
150kHz - 30MHz



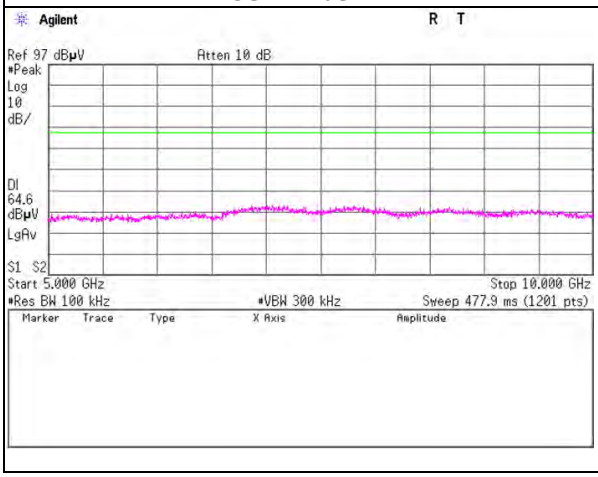
30MHz - 1GHz



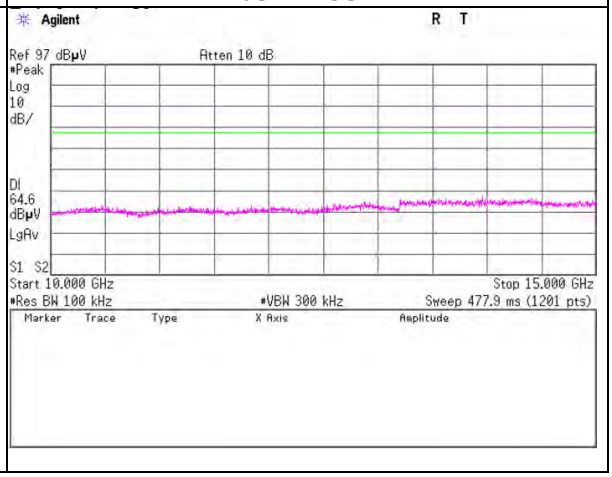
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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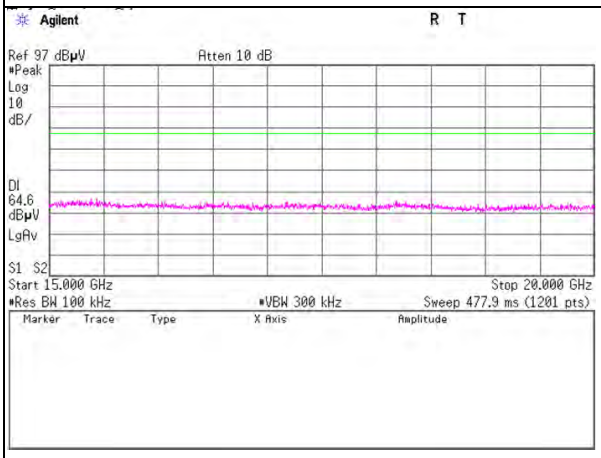
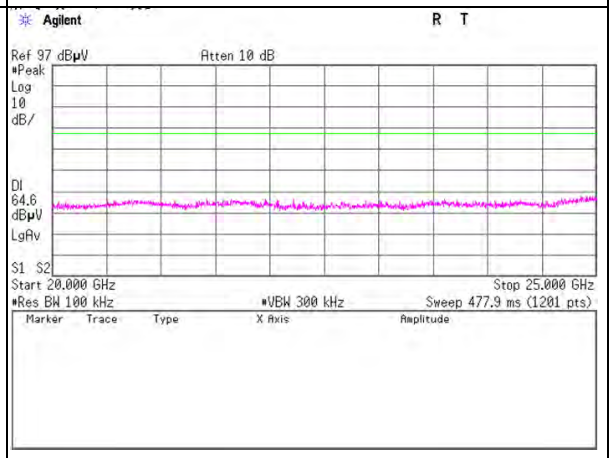
Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2402MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
	
Tx1_SpuriousG6	Tx1_SpuriousG7
Tx1_SpuriousG8	

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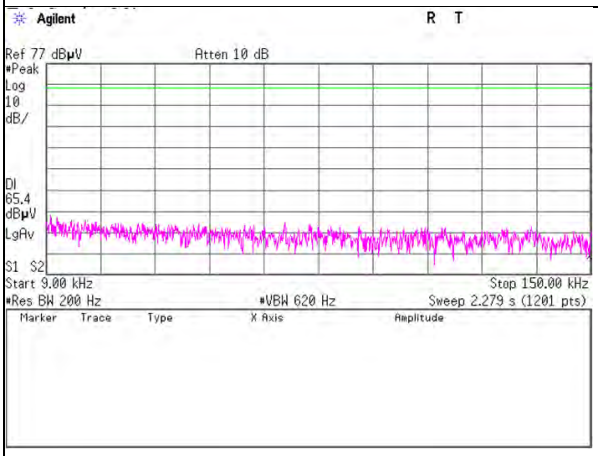
Spurious emission (Conducted)

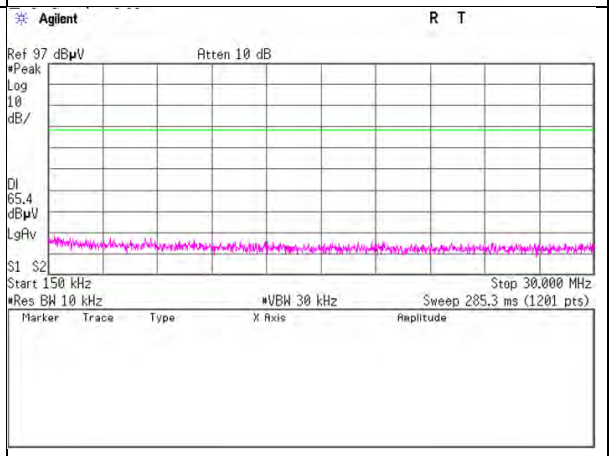
Tx, Bluetooth, BDR, PRBS9

Tx, 2441MHz (1/2)

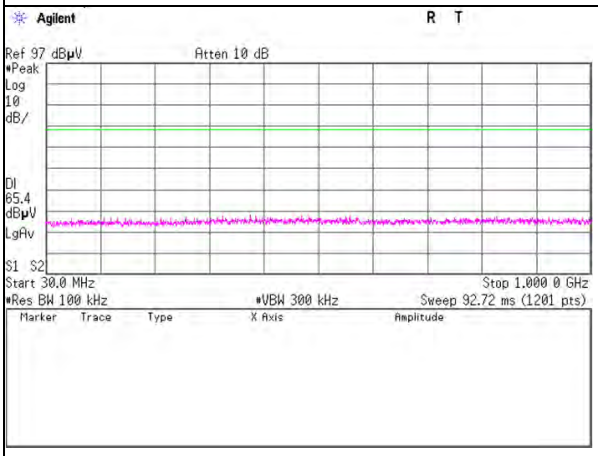
9kHz - 150kHz



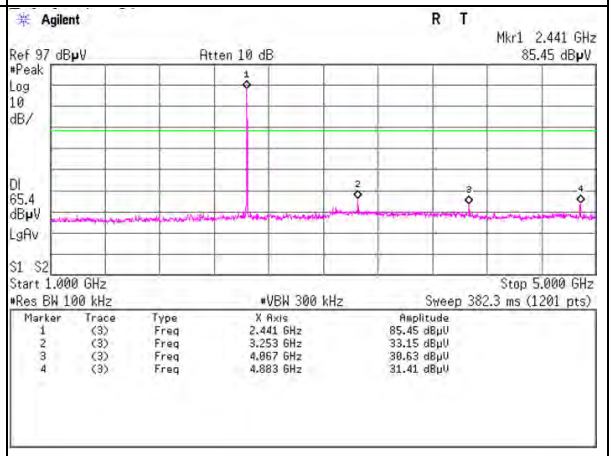
150kHz - 30MHz



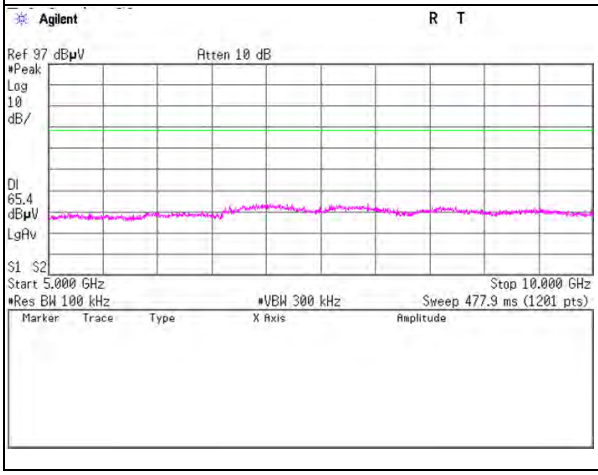
30MHz - 1GHz



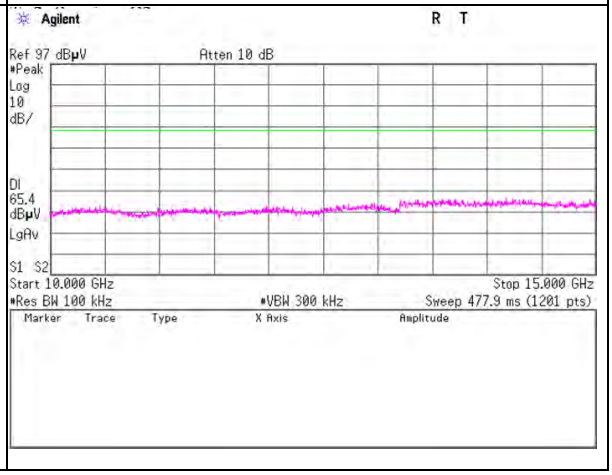
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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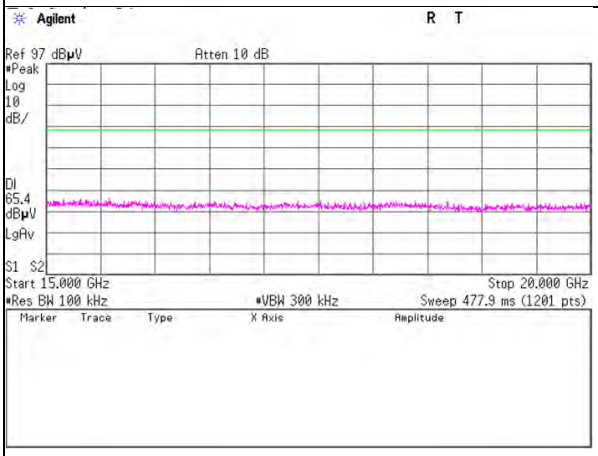
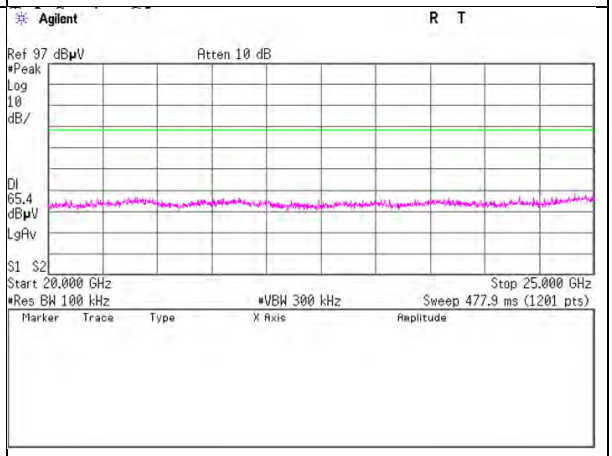
Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2441MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
	
Tx2_SpuriousG6	Tx2_SpuriousG7
Tx2_SpuriousG8	

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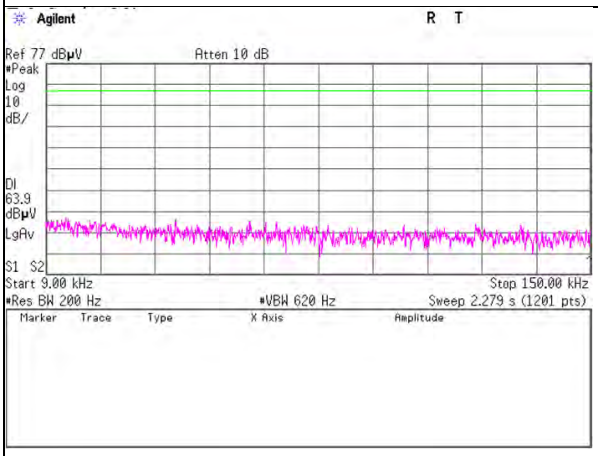
Spurious emission (Conducted)

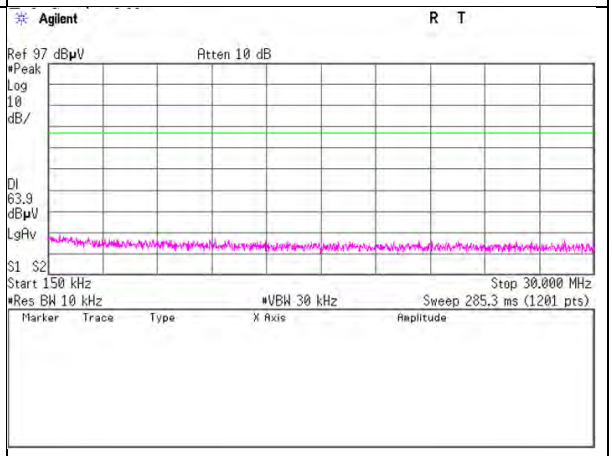
Tx, Bluetooth, BDR, PRBS9

Tx, 2480MHz (1/2)

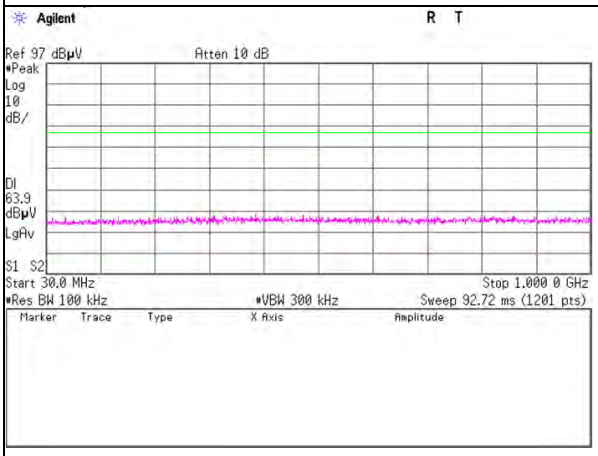
9kHz - 150kHz



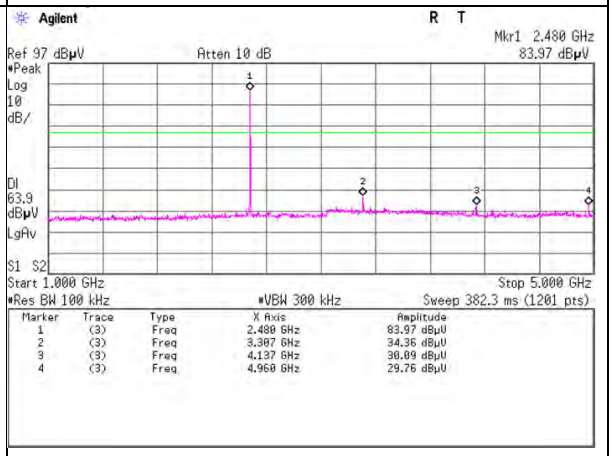
150kHz - 30MHz



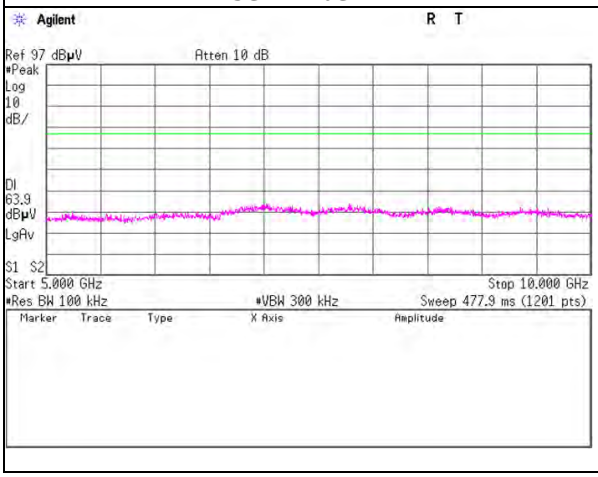
30MHz - 1GHz



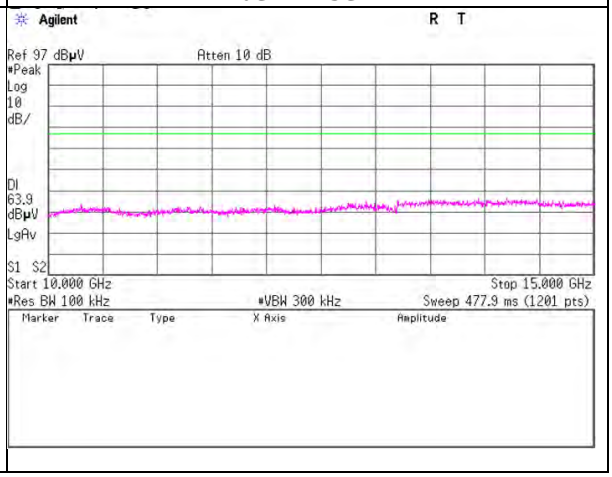
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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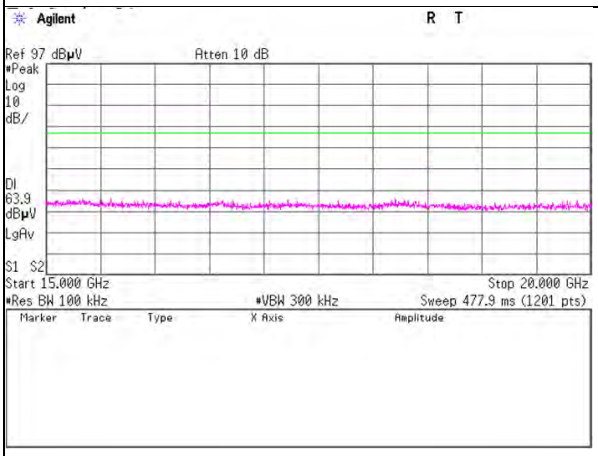
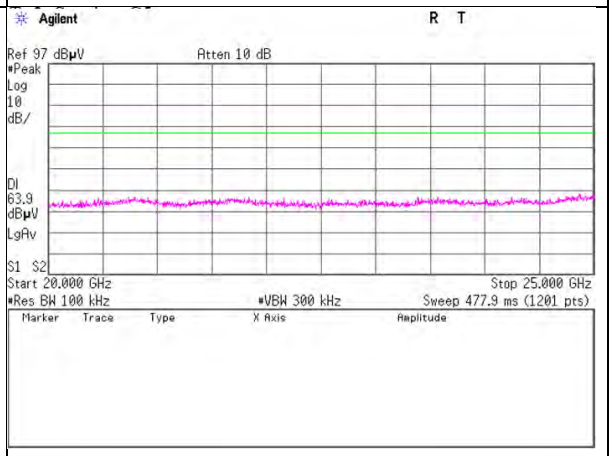
Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2480MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
	
Tx3_SpuriousG6	Tx3_SpuriousG7
Tx3_SpuriousG8	

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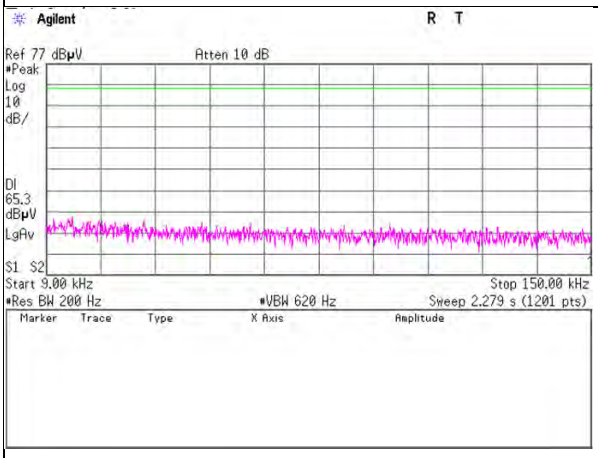
Spurious emission (Conducted)

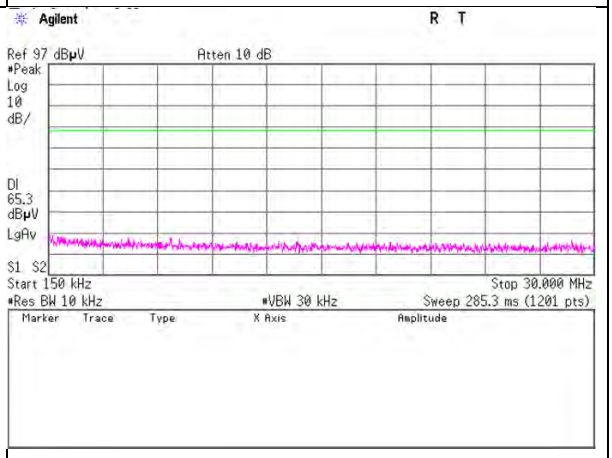
Tx, Bluetooth, EDR, PRBS9

Tx, 2402MHz (1/2)

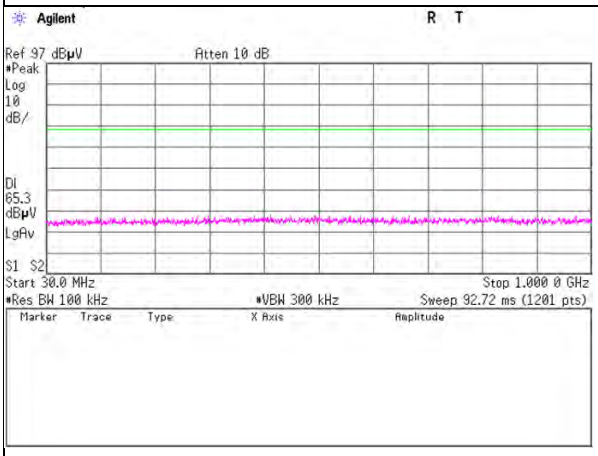
9kHz - 150kHz



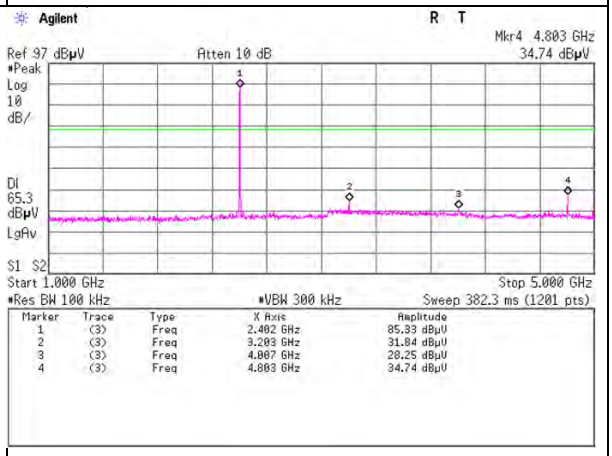
150kHz - 30MHz



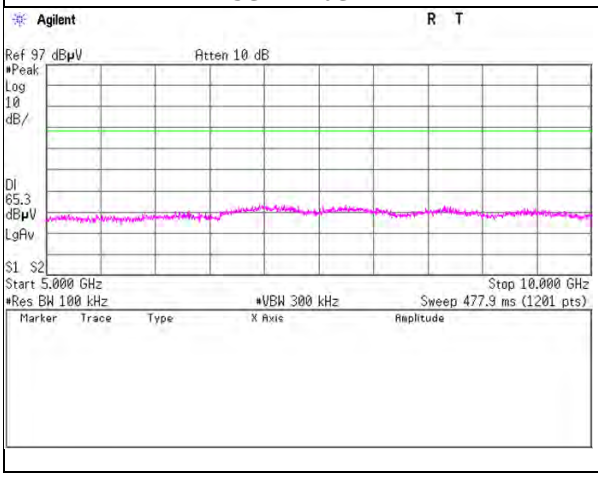
30MHz - 1GHz



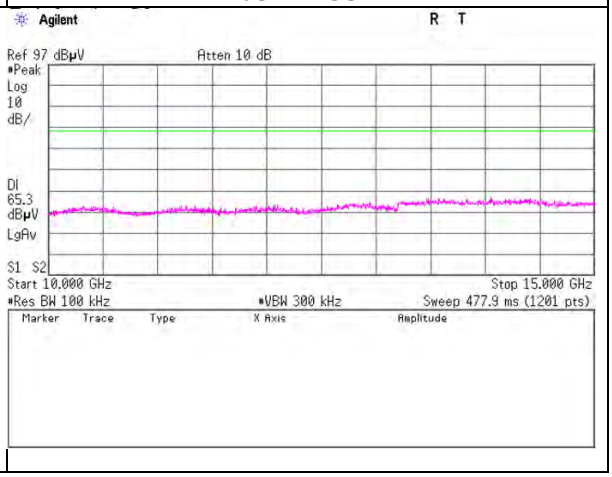
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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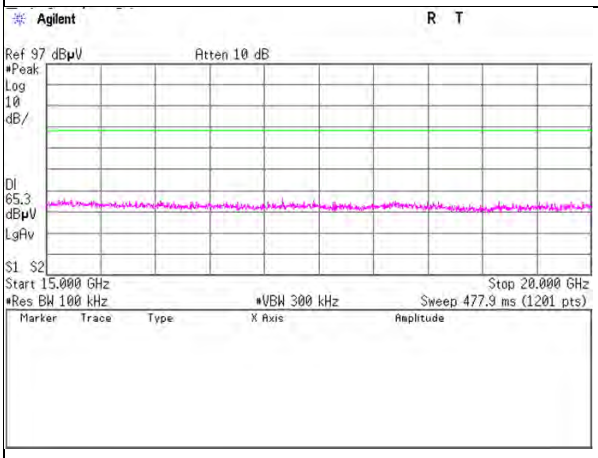
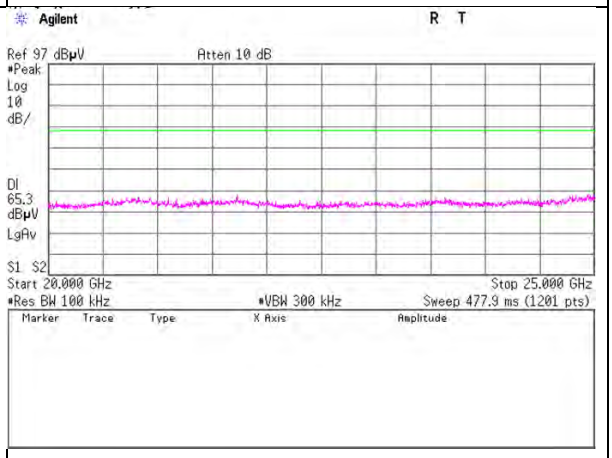
Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2402MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
	
Tx1_SpuriousG6	Tx1_SpuriousG7
Tx1_SpuriousG8	

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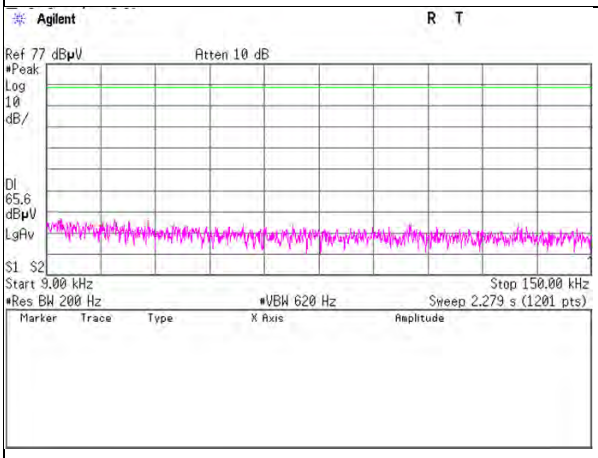
Spurious emission (Conducted)

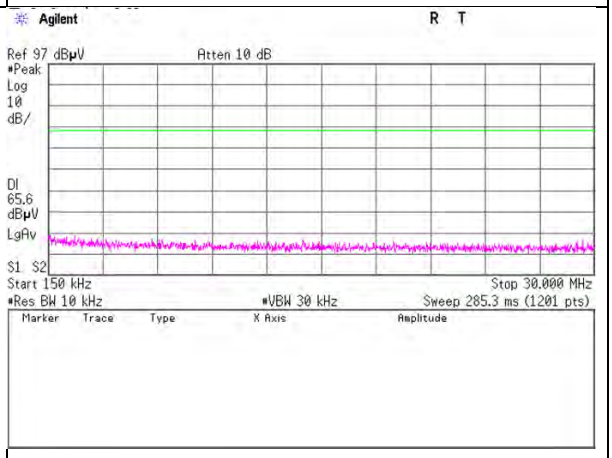
Tx, Bluetooth, EDR, PRBS9

Tx, 2441MHz (1/2)

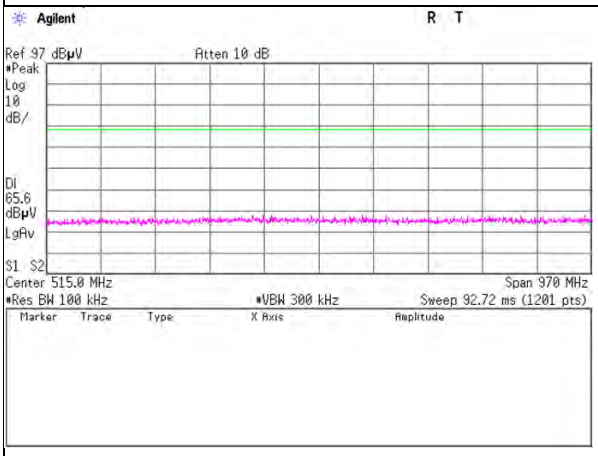
9kHz - 150kHz



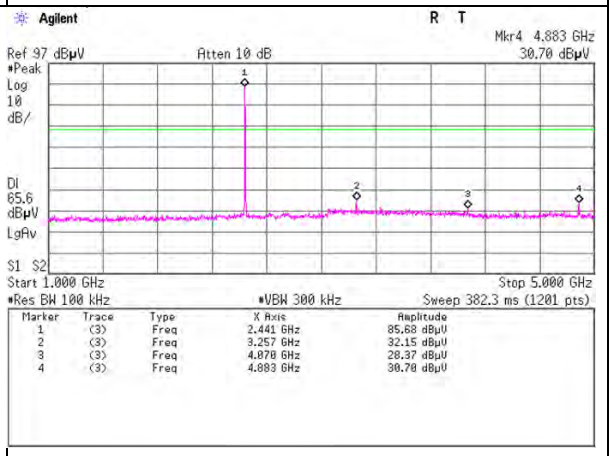
150kHz - 30MHz



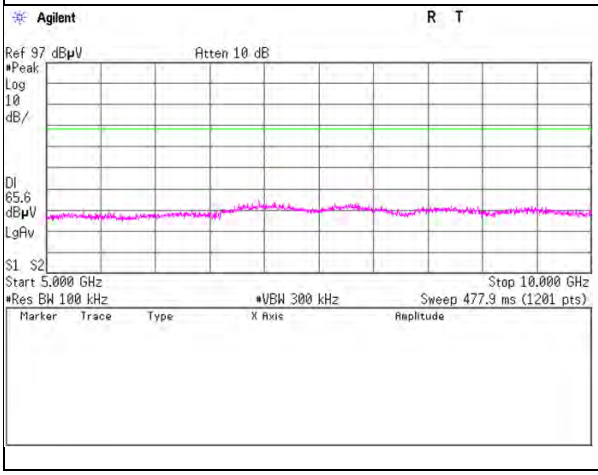
30MHz - 1GHz



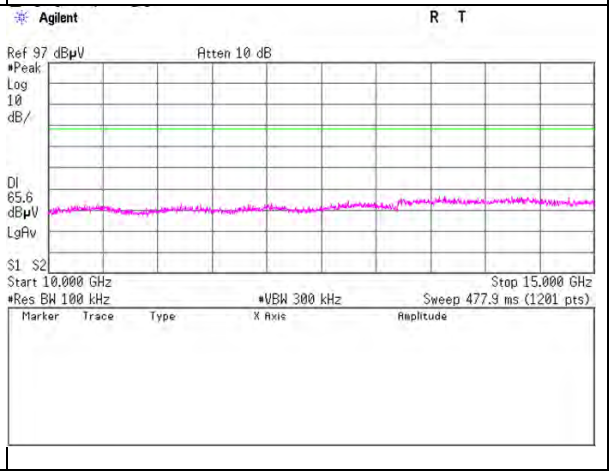
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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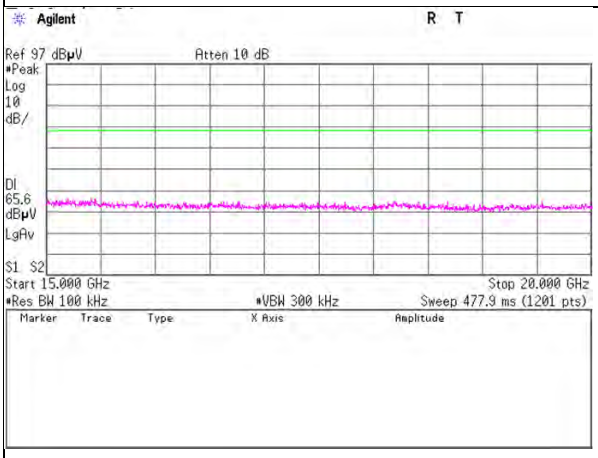
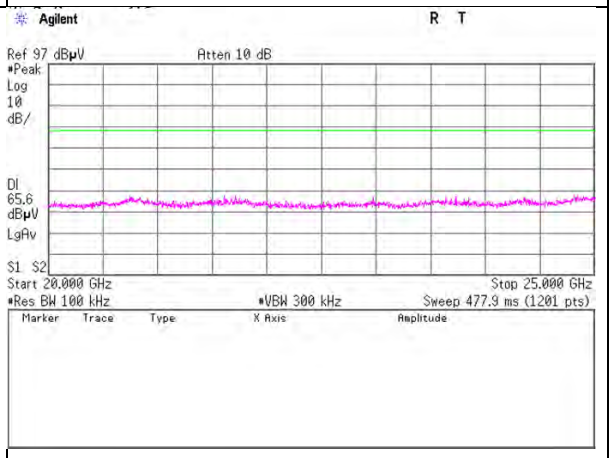
Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2441MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
	
Tx2_SpuriousG6	Tx2_SpuriousG7
Tx2_SpuriousG8	

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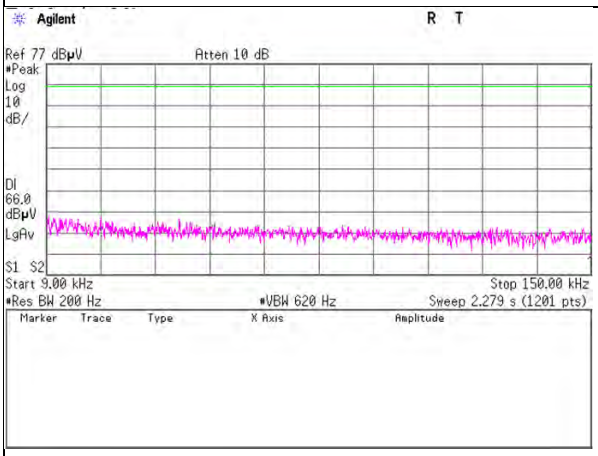
Spurious emission (Conducted)

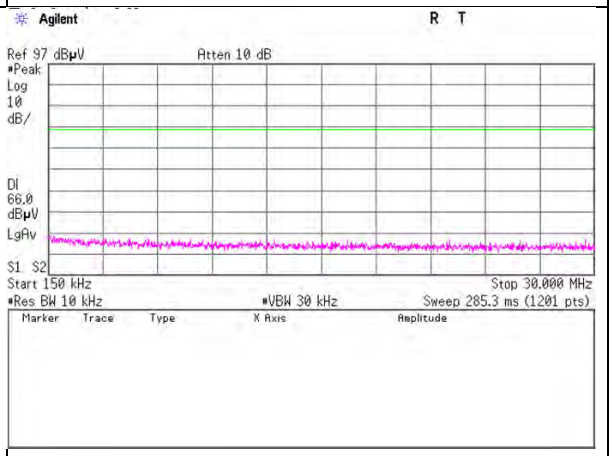
Tx, Bluetooth, EDR, PRBS9

Tx, 2480MHz (1/2)

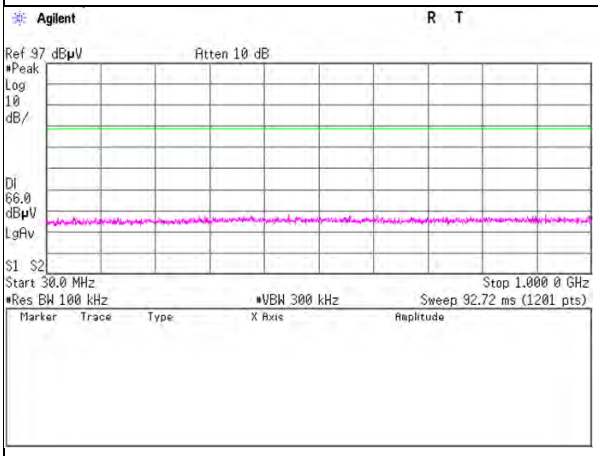
9kHz - 150kHz



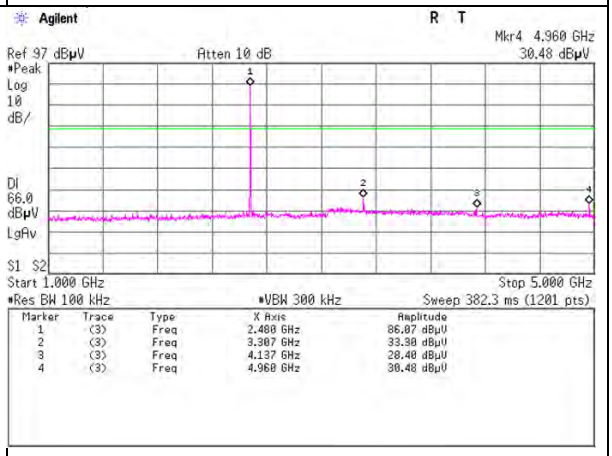
150kHz - 30MHz



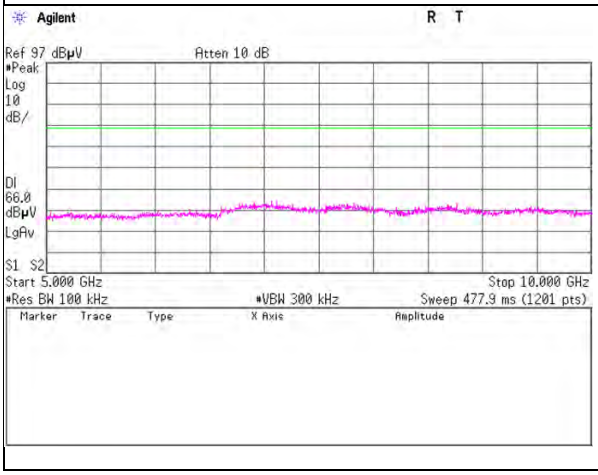
30MHz - 1GHz



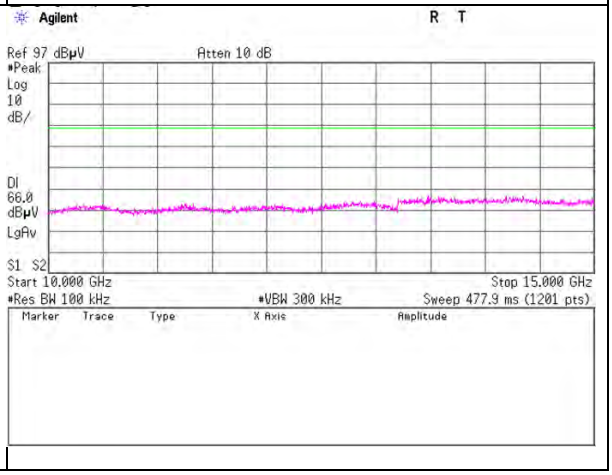
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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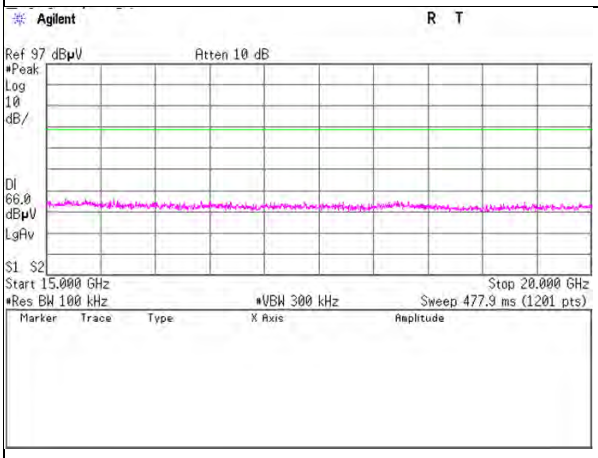
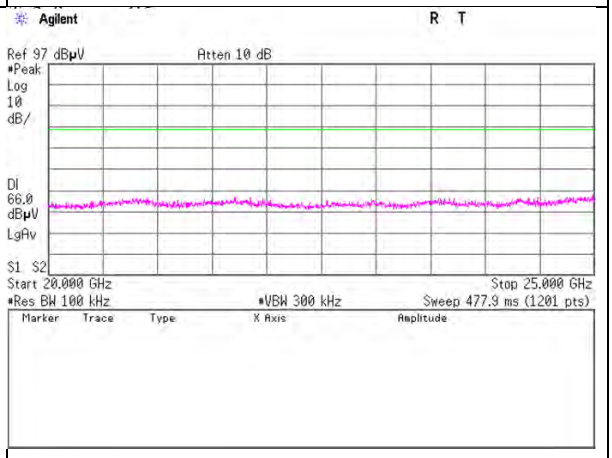
Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2480MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
	
Tx3_SpuriousG6	Tx3_SpuriousG7
Tx3_SpuriousG8	

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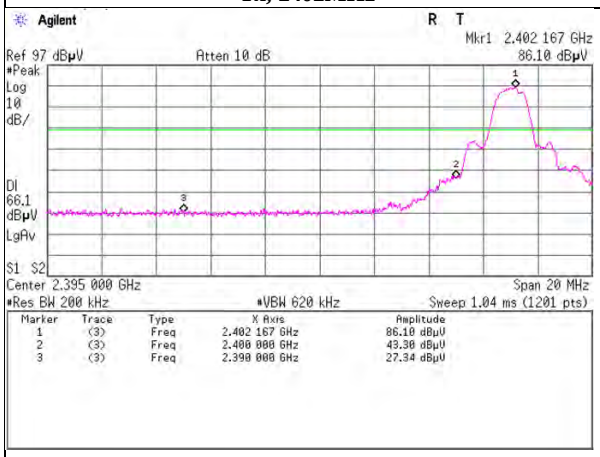
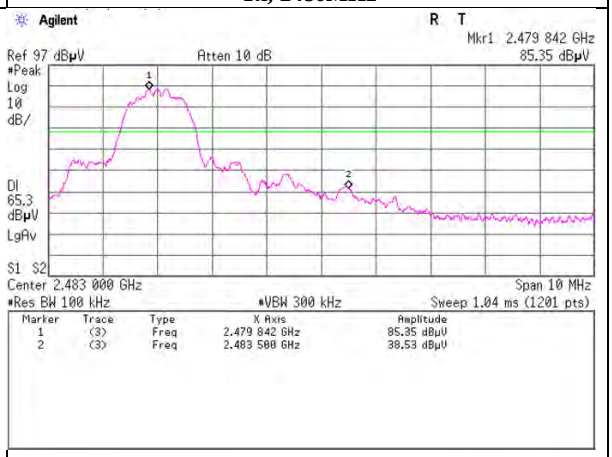
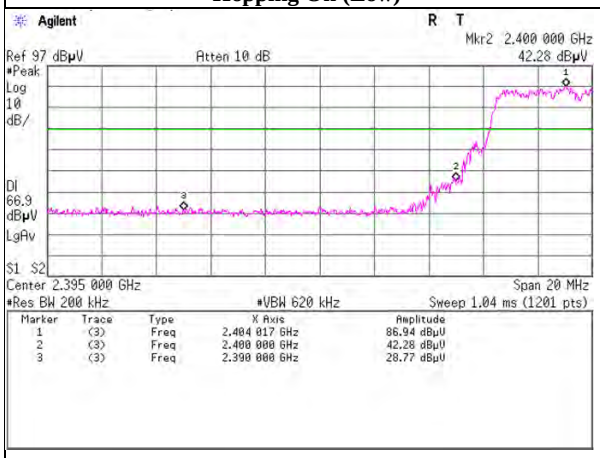
Spurious emission (Conducted)

Band Edge compliance

Tx, Bluetooth, EDR, PRBS9	
Tx, 2402MHz	**Tx, 2480MHz**
	

Tx, Bluetooth, EDR, PRBS9	
Hopping On (Low)	**Hopping On (High)**
	

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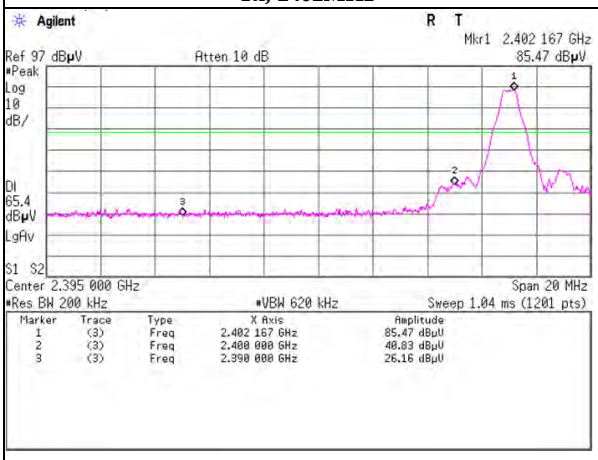
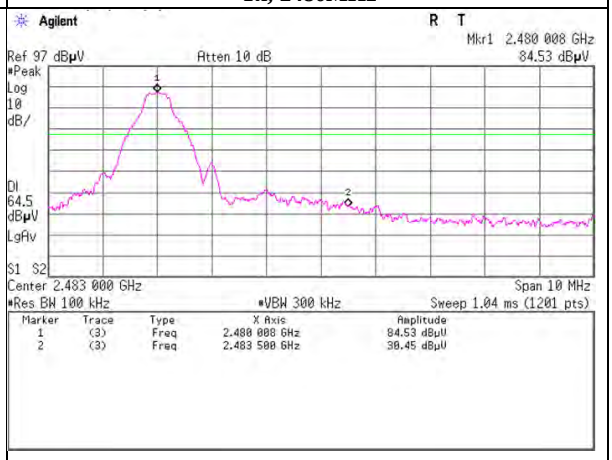
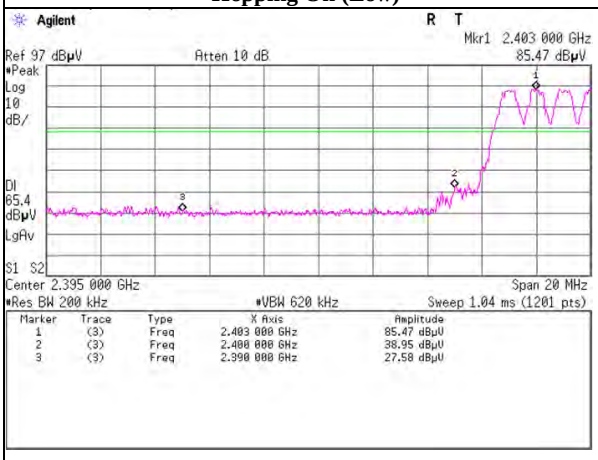
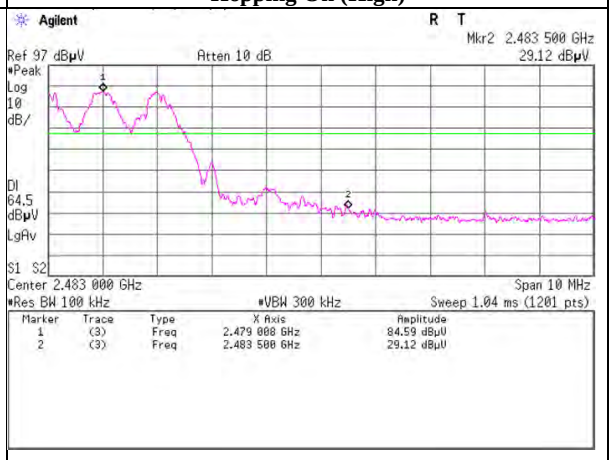
Spurious emission (Conducted)

Band Edge compliance

Tx, Bluetooth, BDR, PRBS9	
Tx, 2402MHz	**Tx, 2480MHz**
	

Tx, Bluetooth, BDR, PRBS9	
Hopping On (Low)	**Hopping On (High)**
	

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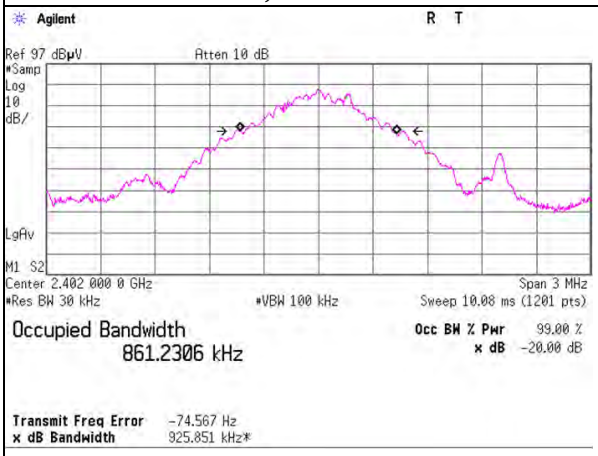
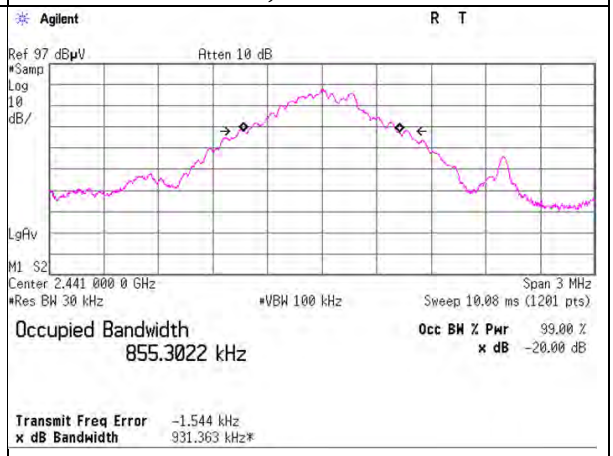
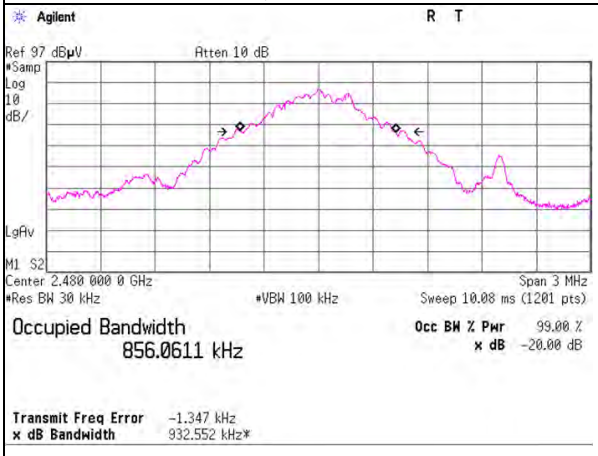
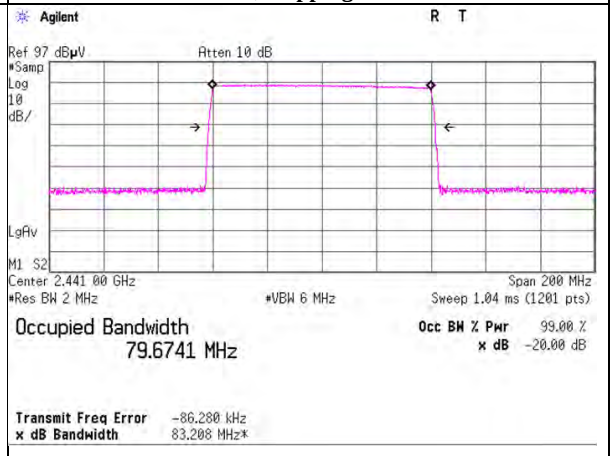
99% Occupied Bandwidth

Tx, Bluetooth, BDR, PRBS9	
Tx, 2402MHz	**Tx, 2441MHz**
	
Tx, 2480MHz	**Tx, Hopping On**
	

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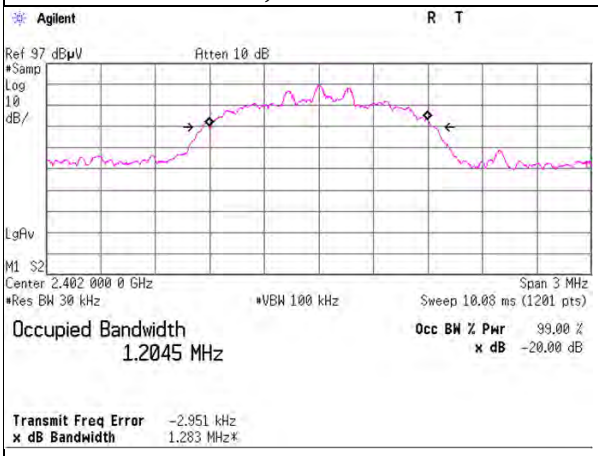
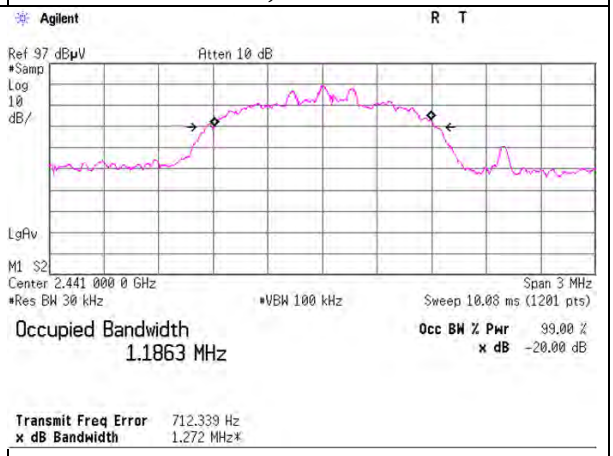
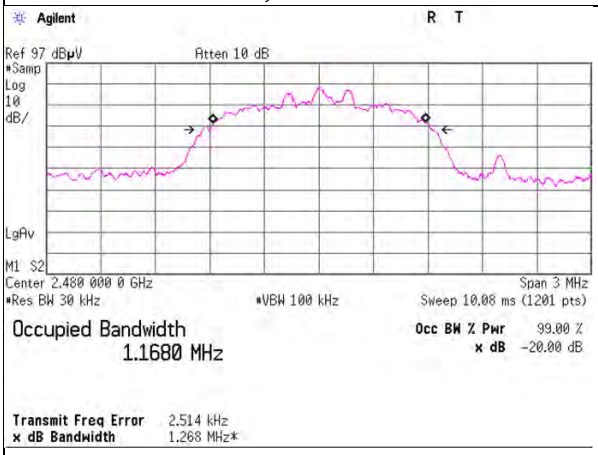
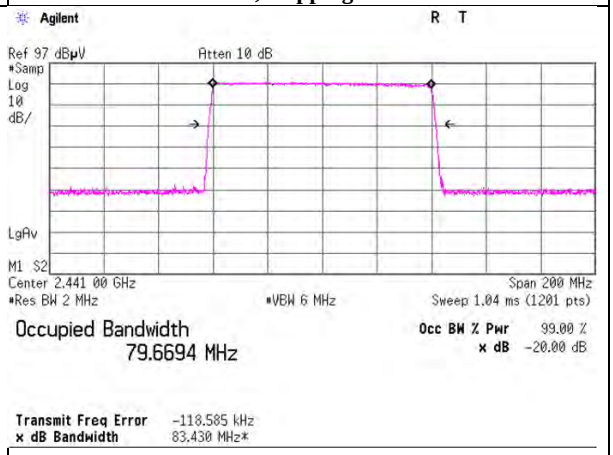
99% Occupied Bandwidth

Tx, Bluetooth, EDR, PRBS9	
Tx, 2402MHz	**Tx, 2441MHz**
	
Tx, 2480MHz	**Tx, Hopping On**
	
Tx2_Inquiry99OBW	Tx2_InqHopping99OBW

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APPENDIX 2
Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SOS-10	Humidity Indicator	A&D	AD-5681	4064561	AT	02/23/2011 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	04/12/2011 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	04/12/2011 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	AT	03/07/2011 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	03/23/2011 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	AT	12/27/2011 * 12
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	11/09/2011 * 12
SAF-01	Pre Amplifier	SONOMA	310N	290211	RE	02/17/2011 * 12
SAT6-05	Attenuator	JFW	50HF-006N	-	RE	02/17/2011 * 12
SAT3-04	Attenuator	JFW	50HF-003N	-	RE	02/17/2011 * 12
SBA-01	Biconical Antenna	Schwarzbeck	BBA9106	91032664	RE	10/15/2011 * 12
SCC-A1/A3/A5/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	04/28/2011 * 12
SCC-A2/A4/A6/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	04/28/2011 * 12
SLA-01	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0888	RE	11/23/2011 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	02/23/2011 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	10/22/2011 * 12
SJM-12	Measure	PROMART	SEN1935	-	RE	-
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	09/01/2011 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	07/19/2011 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	04/28/2011 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	05/27/2011 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	08/28/2011 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	02/23/2011 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	RE	12/05/2011 * 12
SJM-10	Measure	PROMART	SEN1935	-	RE	-
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	03/16/2011 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	03/15/2011 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	03/16/2011 * 12

The expiration date of the calibration is the end of the expired month .
As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations .

All equipment is calibrated with valid calibrations . Each measurement data is traceable to the national or international standards .
Test Item :
RE: Radiated emission
AT: Antenna terminal disturbance voltage