RADIO TEST REPORT

Test Report No.: 32EE0123-SH-01-A

Applicant	:	**PIONEER CORPORATION**
Type of Equipment	:	**Smartphone Receiver**
Model No.	:	**SPH-DA100**
FCC ID	:	**AJDK049**
Test regulation	:	**FCC Part15 Subpart C: 2012**
Test result	:	**Complied**

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3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
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6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

Date of test: January 10 to 13, 2012

Tested by:
H. Shirasawa
Hikaru Shirasawa
Engineer of WiSE Japan,
UL Verification Service

Approved by :
I. Isozaki
Ichiro Isozaki
Leader of WiSE Japan,
UL Verification Service

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

JAB Testing RTL02610

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REVISION HISTORY

Original Test Report No.: 32EE0123-SH-01-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	32EE0123-SH-01-A	February 7, 2012	-	-
1	32EE0123-SH-01-A	February 14, 2012	P1-2, 13, 50-51	Addition: - Comment about AV detection - Comment about pre-check for worst-case - Comment about emission in restricted bands

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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
Facsimile Number	:	+81-49-228-6493
Contact Person	:	Makoto Kaieda

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

2.1 Identification of E.U.T.

Type of Equipment	:	Smartphone Receiver
Model No.	:	SPH-DA100
Serial No.	:	See Section 4.
Rating	:	DC 14.4V
Country of Mass-production	:	China/Thailand
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 10, 2012

2.2 Product description

Model: SPH-DA100 (referred to as the EUT in this report) is a Smartphone Receiver.

Clock Frequency:
System microcomputer: 3.93216MHz
DC/DC converter (5V8V): 365.78kHz/413.91kHz
FM/AM tuner: 36.48MHz
GPS clock: 26MHz
Bluetooth module Clock: 26MHz
CPU: 500MHz, 166.7MHz, 41.7MHz, 27MHz, 22.5792MHz, 48MHz, 33.333MHz
DC/DC converter (1.8V): 365.78kHz/413.91kHz
DC/DC converter (USB): 365.78kHz/413.91kHz
VIDEO DECORDER: 27MHz, 33.231MHz, 33.333MHz, 32MHz
HDMI Receiver: 27MHz
DC/DC converter (LCD): 723kHz/1000kHz
LCD BACK LIGHT DRIVER: 476.57kHz/ 514.81kHz

Equipment type	:	Transceiver
Frequency of operation	:	2402-2480MHz
Bandwidth & channel spacing	:	1MHz
Type of modulation	:	GFSK, π/4DQPSK, 8DPSK
Antenna type	:	Pattern
Antenna gain with cable loss	:	-2.3dBi (max)
Antenna connector type	:	None
Operation temperature range	:	-10 to +60 deg.C.

FCC 15.31 (e)
The equipment provides the Bluetooth transmitter with stable power supply (DC1.8V and 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.

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	5.9dB Freq.: 699.993MHz Polarization: Horizontal Detection: Quasi Peak Mode: Tx 2441MHz, DH5 Freq.: 699.992MHz Polarization: Horizontal Detection: Quasi Peak Mode: Tx 2402MHz, 3-DH5 Freq.: 699.993MHz Polarization: Horizontal Detection: Quasi Peak Mode: Tx 2441MHz, 3-DH5 Freq.: 699.993MHz Polarization: Horizontal Detection: Quasi Peak Mode: Tx 2480MHz, 3-DH5	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: (±) 1.9dB
Spurious emission (Conducted) measurement (below 1GHz) uncertainty for this test was: (±) 1.8dB
Spurious emission (Conducted) measurement (1G-3GHz) uncertainty for this test was: (±) 2.3dB
Spurious emission (Conducted) measurement (3G-18GHz) uncertainty for this test was: (±) 3.6dB
Spurious emission (Conducted) measurement (18G-26.5GHz) uncertainty for this test was: (±) 4.0dB
Bandwidth measurement uncertainty for this test was: (±) 5.4%

3.5 Test location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
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)/Inquiry, Payload: PRBS9	-
20dB bandwidth	Transmitting Hopping OFF (DH5/3DH5)/Inquiry, Payload: PRBS9	2402MHz, 2441MHz, 2480MHz
Number of hopping frequency	Transmitting Hopping ON (DH5/3DH5)/Inquiry, Payload: PRBS9	-
Dwell time	Transmitting (Hopping ON), Payload: PRBS9 -DH1, -DH3, -DH5 -3DH1, -3DH3, -3DH5	-
	-Inquiry	
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:
(Radiated)	Transmitting (DH5/3DH5), Payload: PRBS9	2402MHz, 2441MHz, 2480MHz
99% occupied bandwidth	Transmitting (DH5/3DH5), Payload: PRBS9 -Hopping ON -Hopping OFF	2402MHz, 2441MHz, 2480MHz

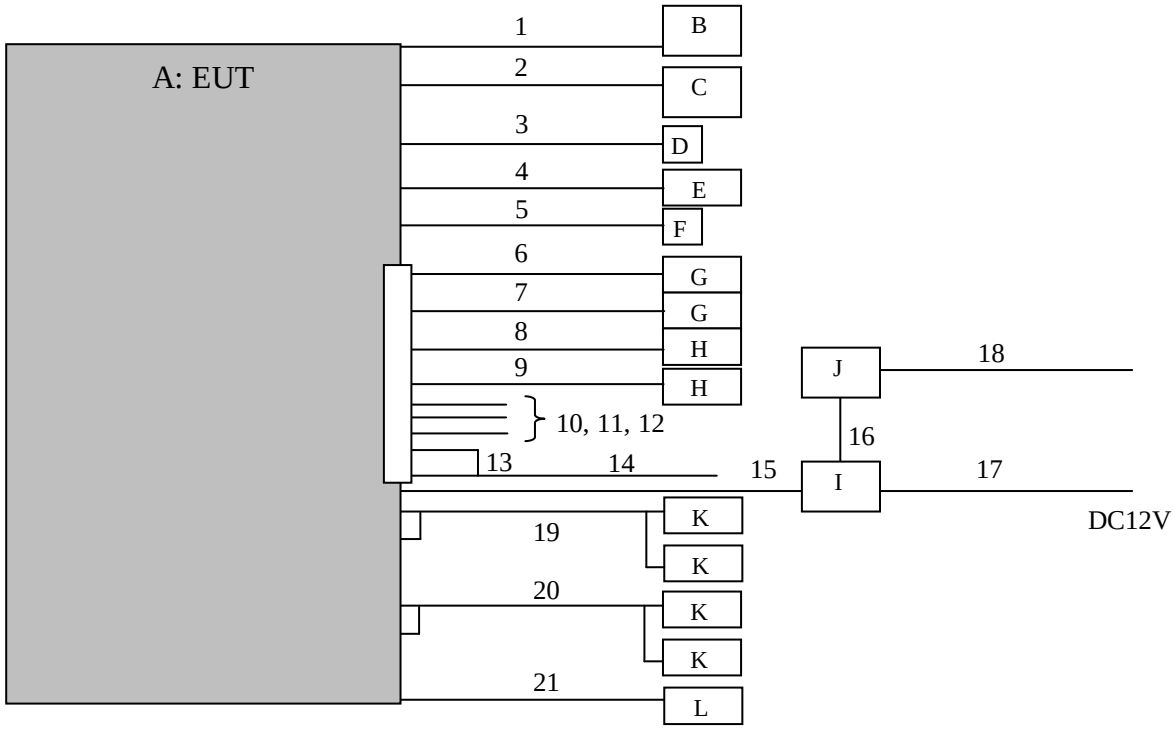
*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload (except Dwell time test).

*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: 4
Software name: CWW5112, version 7.03

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	Smartphone Receiver	SPH-DA100	17KK009 *1) 17KK010 *2)	Pioneer	EUT
B	Mobile phone (iPhone)	A1241	-	Apple	-
C	Mobile phone (Xperia acro)	SO-02C	-	Sony	-
D	GPS antenna	CZX5496	-	Pioneer	-
E	Terminal Resister (1kohm)	-	-	-	-
F	Microphone	CPM1083	-	Pioneer	-
G	Terminal Resister (4ohm)	RHF100	-	JRM	-
H	Terminal Resister (4ohm)	RHA100N	-	CHIBA	-
I	Hide-away Unit	CD-MR80D	CZX5157	Pioneer	-
J	Marine Wired Remote	CD-MR80D	CZX5156	Pioneer	-
K	Terminal Resister (22kohm)	-	-	-	-
L	Terminal Resister (75ohm)	-	-	-	-

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

List of cables used

No.	Cable name	Length (m)	Shield		Remark
			Cable	Connector	
1	iPhone/USB	2.3	Shielded	Shielded	-
2	HDMI	2.2	Shielded	Shielded	-
3	GPS	3.5	Shielded	Shielded	-
4	Video	1.5	Unshielded	Unshielded	RC IN
5	Microphone	3.9	Shielded	Shielded	-
6	Speaker (L) (+, -)	2.5	Unshielded	Unshielded	-
7	Speaker (R) (+, -)	2.5	Unshielded	Unshielded	-
8	Speaker (L) (+, -)	2.5	Unshielded	Unshielded	-
9	Speaker (R) (+, -)	2.5	Unshielded	Unshielded	-
10	Illumination	0.1	Unshielded	Unshielded	-
11	Reverse Gear Signal Input	0.1	Unshielded	Unshielded	-
12	System Remote Control	0.1	Unshielded	Unshielded	-
13	Parking	0.2	Unshielded	Unshielded	-
14	DC	1.0	Unshielded	Unshielded	-
15	Audio (Mini)	1.5	Unshielded	Unshielded	W/R
16	Display	0.2	Shielded	Shielded	-
17	DC	1.5	Unshielded	Unshielded	-
18	DC	1.5	Unshielded	Unshielded	-
19	Audio	0.9	Unshielded	Unshielded	-
20	Audio	0.9	Unshielded	Unshielded	-
21	Antenna	0.4	Shielded	Shielded	-

*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. 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 1.5m, 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

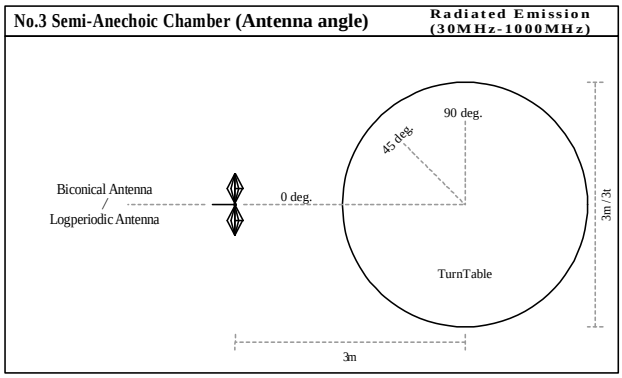
The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane and at a distance of 3m (below 15GHz) / 1m (above 15GHz) (Refer to Figure 1). Measurements were performed with quasi-peak, peak and average detector. The measuring antenna height was varied 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.

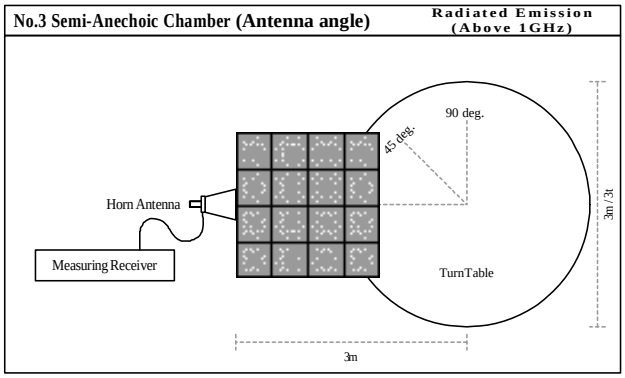
Frequency		30 - 1000MHz	1 - 25GHz	
Detection Type	:	Quasi-Peak	Peak	* Average
IF Bandwidth	:	120kHz	RBW:1MHz/VBW:3MHz	RBW:1MHz/VBW:10Hz

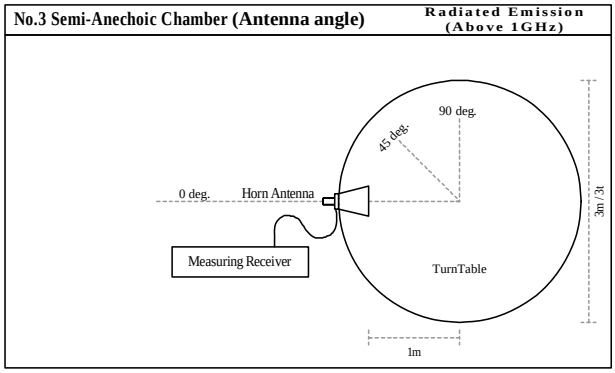
* When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.
Although 00-705 accepts VBW=10Hz for AV measurements, confirmed that superfluous smoothing was not performed.

The carrier level and noise levels were confirmed at angle of 0 to 60 deg. based on the product specification to see the position of maximum noise, and the test was made at the position (0 deg.) that has the maximum noise.

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

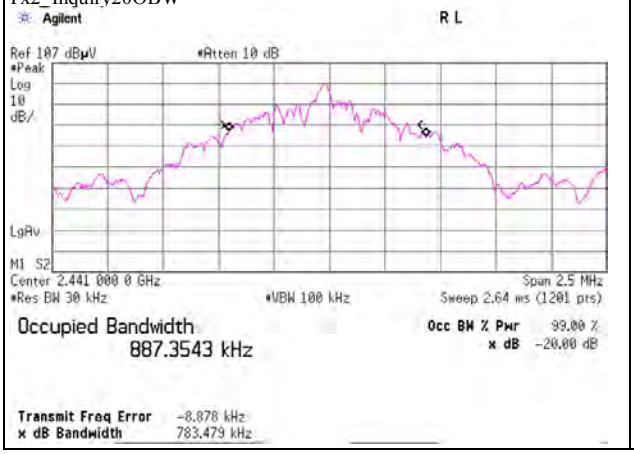
20dB Bandwidth and Carrier Frequency Separation

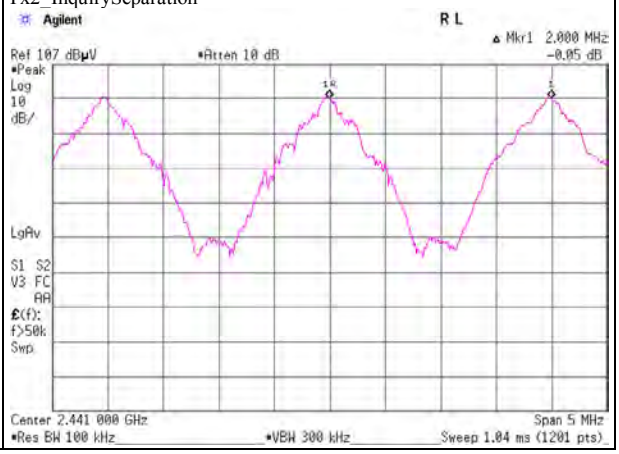
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 12, 2012	
Temperature / Humidity	22deg.C , 33%RH	
Engineer	Kenichi Adachi	
Mode	Tx, Bluetooth, BDR, PRBS9	

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
DH5	2402.0	0.926	1.000	>= 0.617
DH5	2441.0	0.928	1.000	>= 0.619
DH5	2480.0	0.932	1.000	>= 0.621
Inquiry	2441.0	0.783	2.000	>= 0.522

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

Inquiry	
20dB Bandwidth	**Carrier Frequency Separation**
Tx, 2441MHz	**Tx, 2441MHz**
Tx2_Inquiry20OBW	Tx2_InquirySeparation





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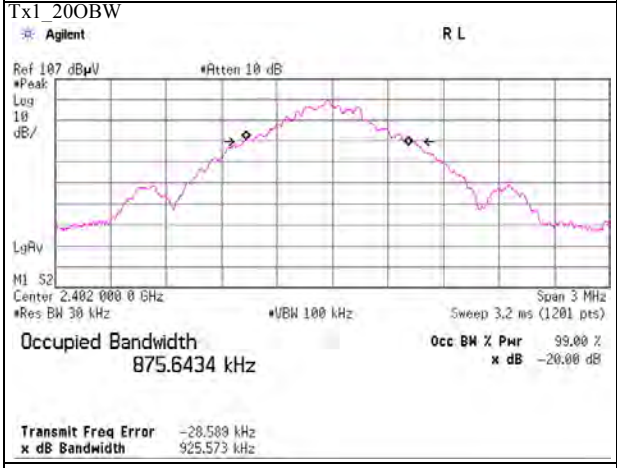
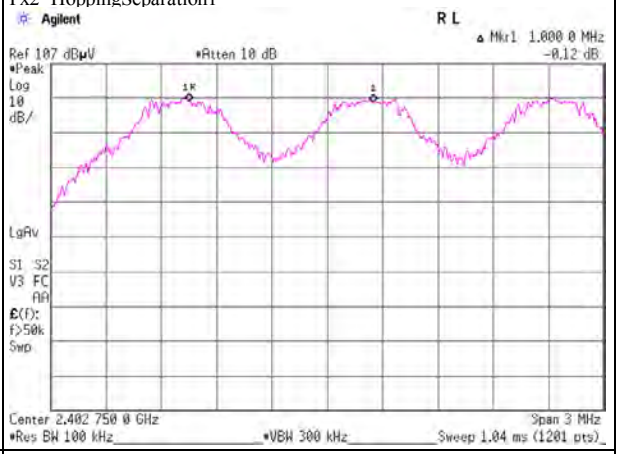
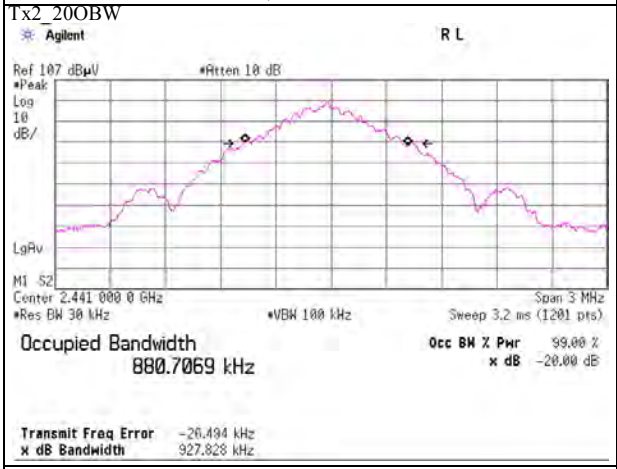
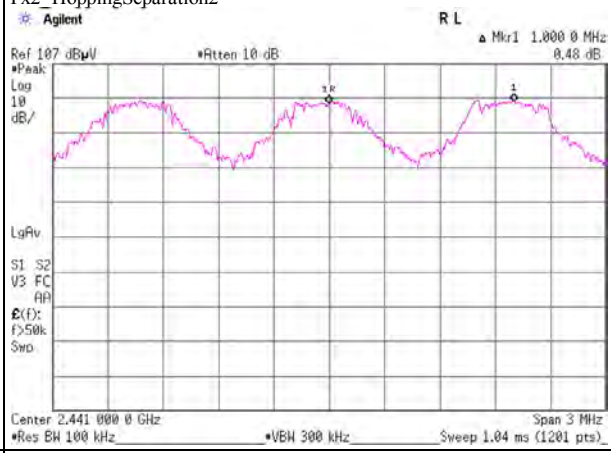
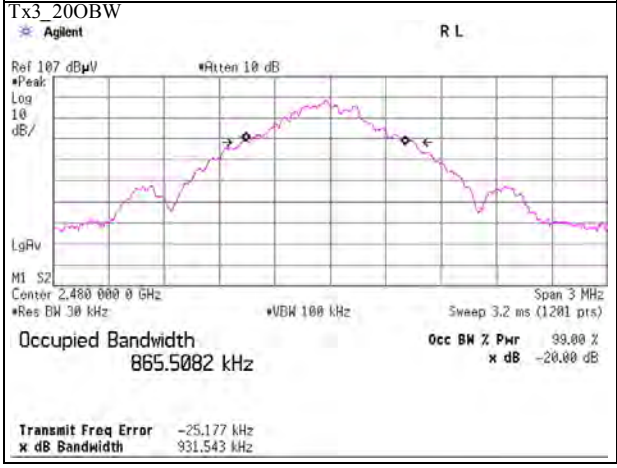
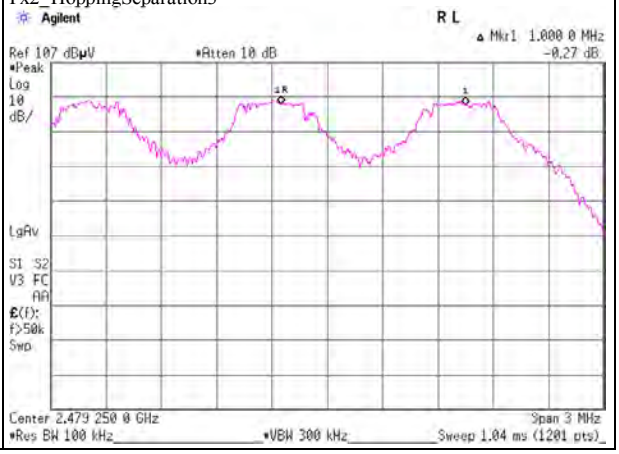
20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, BDR, PRBS9

20dB Bandwidth	Carrier Frequency Separation
Tx, 2402MHz	**Tx, 2402MHz**
Tx1_20OBW 	Tx2_HoppingSeparation1 
Tx, 2441MHz	**Tx, 2441MHz**
Tx2_20OBW 	Tx2_HoppingSeparation2 
Tx, 2480MHz	**Tx, 2480MHz**
Tx3_20OBW 	Tx2_HoppingSeparation3 

20dB Bandwidth and Carrier Frequency Separation

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 12, 2012	
Temperature / Humidity	22deg.C , 33%RH	
Engineer	Kenichi Adachi	
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	1.291	1.020	>= 0.860
3-DH5	2441.0	1.288	0.963	>= 0.859
3-DH5	2480.0	1.291	1.043	>= 0.860

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

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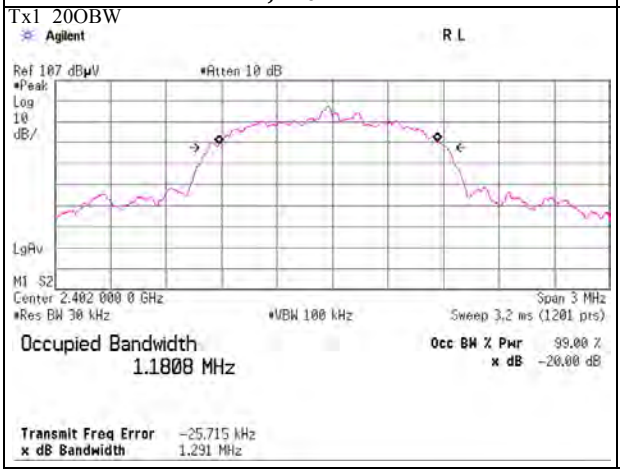
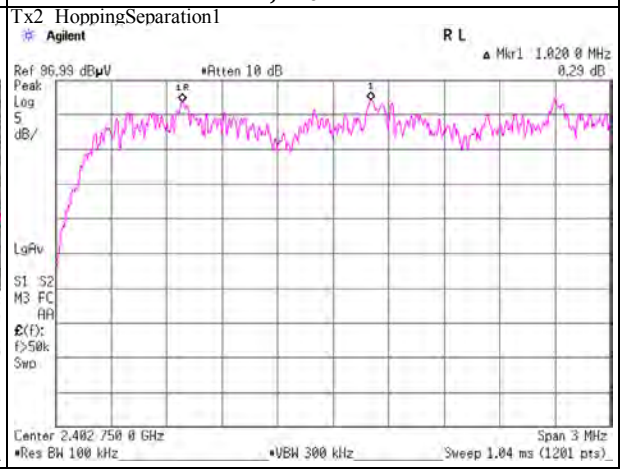
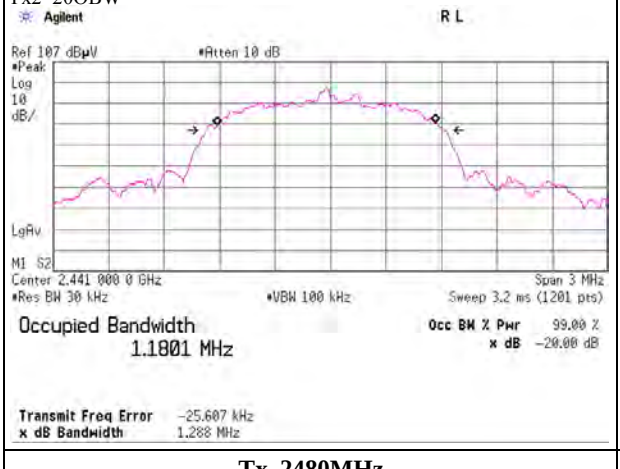
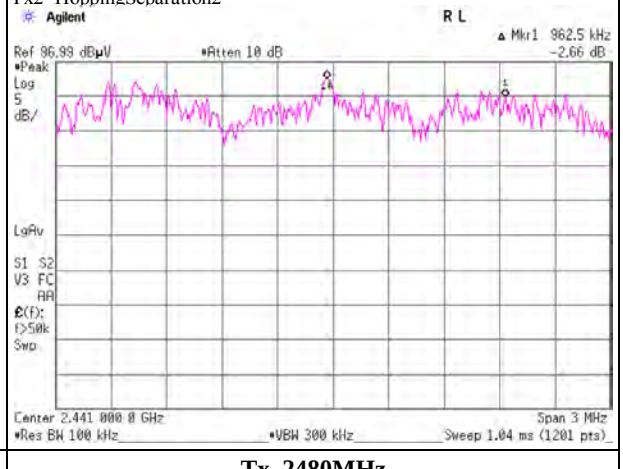
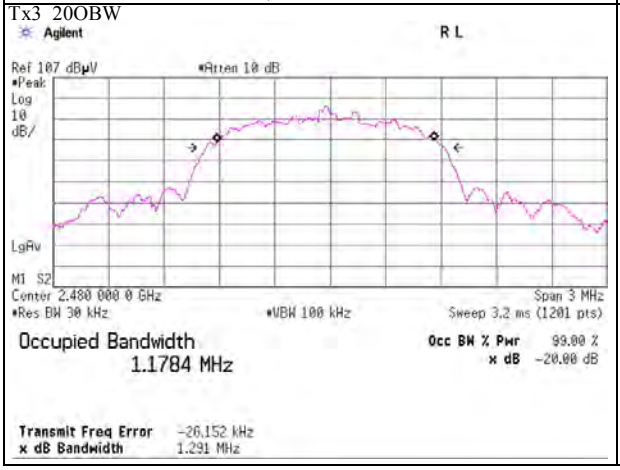
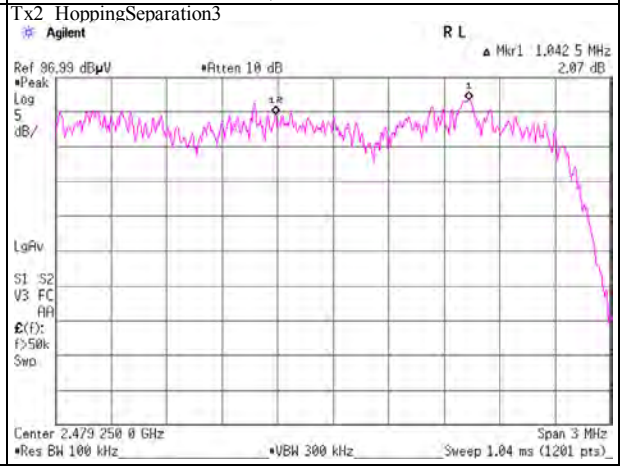
20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, EDR, PRBS9

20dB Bandwidth	Carrier Frequency Separation
Tx, 2402MHz	**Tx, 2402MHz**
Tx1 20OBW 	Tx2 HoppingSeparation1 
Tx, 2441MHz	**Tx, 2441MHz**
Tx2 20OBW 	Tx2 HoppingSeparation2 
Tx, 2480MHz	**Tx, 2480MHz**
Tx3 20OBW 	Tx2 HoppingSeparation3 

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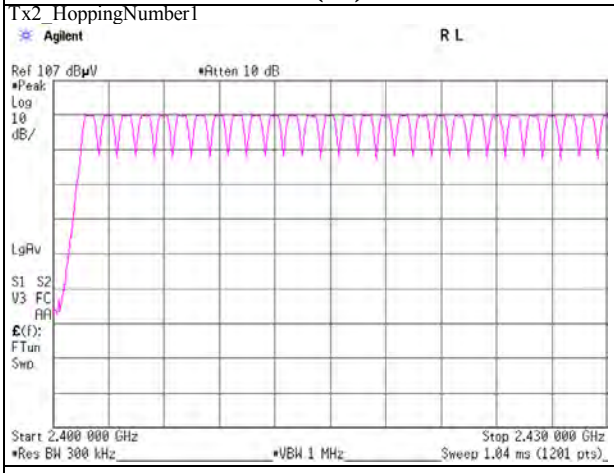
Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date	January 12, 2012
Temperature / Humidity	22deg.C , 33%RH
Engineer	Kenichi Adachi
Mode	Tx, Bluetooth, BDR, PRBS9

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

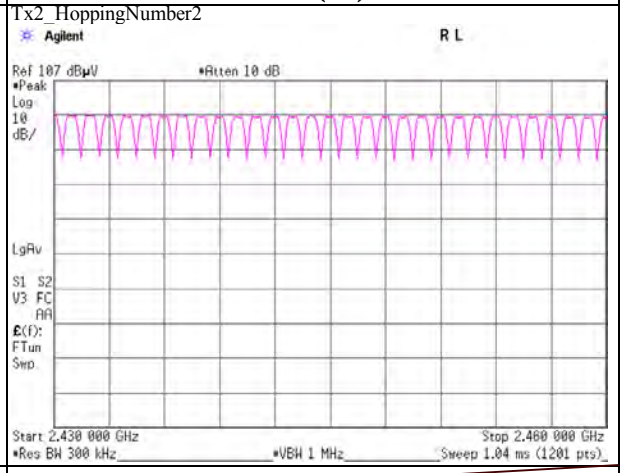
DH5 (1/3)

Tx2_HoppingNumber1



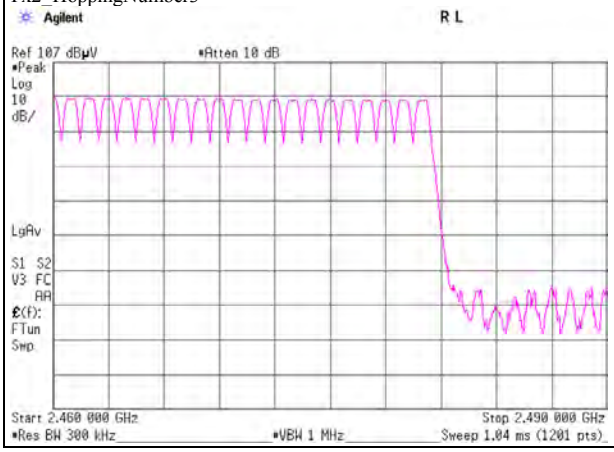
DH5 (2/3)

Tx2_HoppingNumber2



DH5 (3/3)

Tx2_HoppingNumber3



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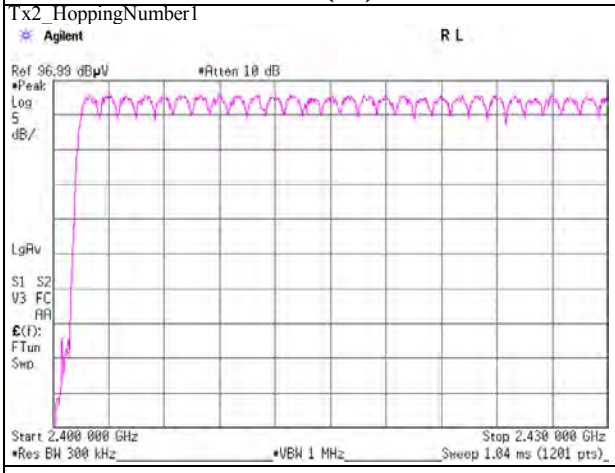
Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date	January 12, 2012
Temperature / Humidity	22deg.C , 33%RH
Engineer	Kenichi Adachi
Mode	Tx, Bluetooth, EDR, PRBS9

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

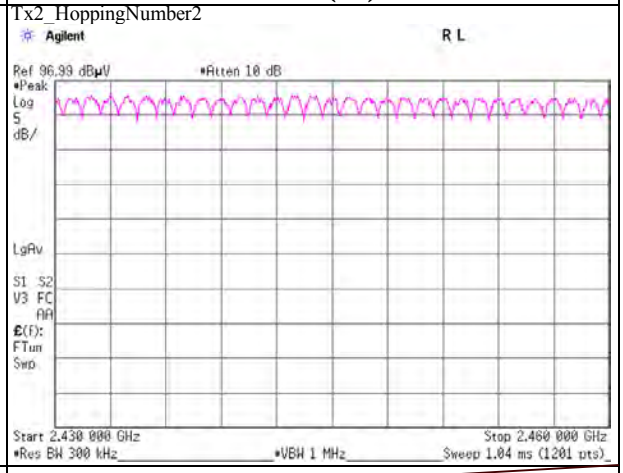
3-DH5 (1/3)

Tx2_HoppingNumber1



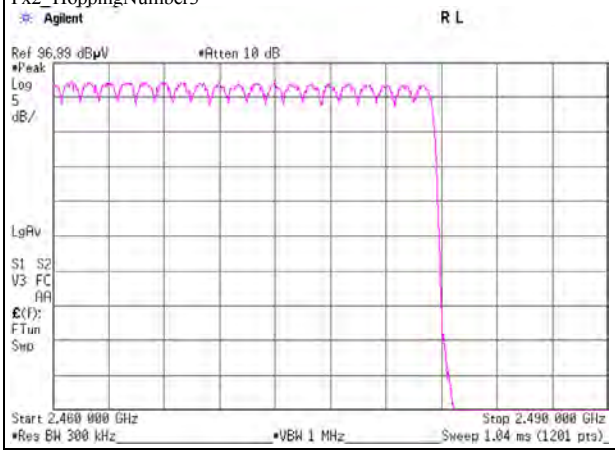
3-DH5 (2/3)

Tx2_HoppingNumber2



3-DH5 (3/3)

Tx2_HoppingNumber3



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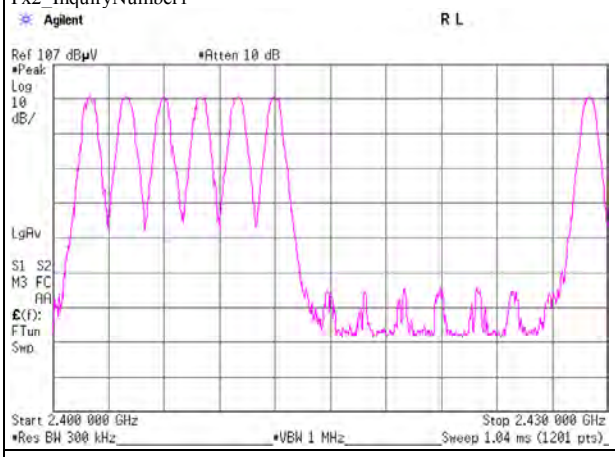
Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date	January 12, 2012
Temperature / Humidity	22deg.C , 33%RH
Engineer	Kenichi Adachi
Mode	Tx, Bluetooth, Inquiry

Mode	Number of Channel [times]	Limit [times]
Inquiry	32	>= 15

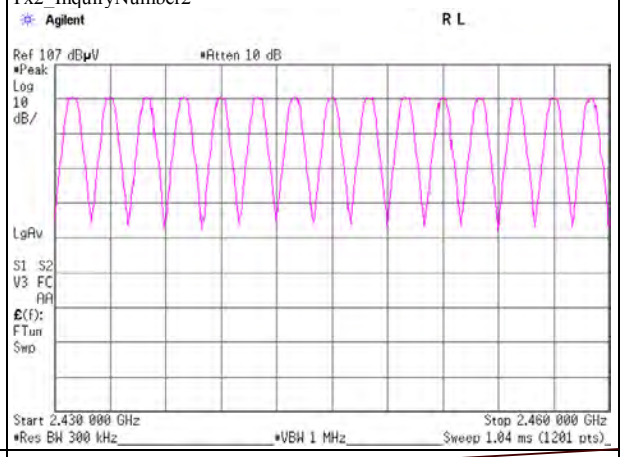
Inquiry (1/3)

Tx2_InquiryNumber1



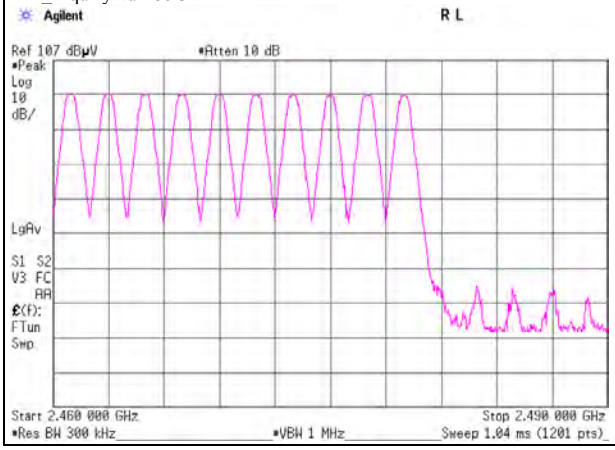
Inquiry (2/3)

Tx2_InquiryNumber2



Inquiry (3/3)

Tx2_InquiryNumber3



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Dwell Time

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 12, 2012	
Temperature / Humidity	22deg.C , 33%RH	
Engineer	Kenichi Adachi	
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	23.2 / 5.0 sec. x 31.6 sec. = 147 times	0.395	58	400
DH3	22.0 / 5.0 sec. x 31.6 sec. = 140 times	1.651	231	400
DH5	19.8 / 5.0 sec. x 31.6 sec. = 126 times	2.929	369	400
Inquiry	100.0 / 1.0 sec. x 12.8 sec. = 1280 times	0.098	125	400

Sample Calculation

Result = Number of transmission x Length of transmition time

*Average data of 5 tests.(except Inquiry)

Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	20	23	26	22	25	23.2
DH3	20	24	22	20	24	22.0
DH5	18	23	19	16	23	19.8
Inquiry	100	100	100	100	100	100.0

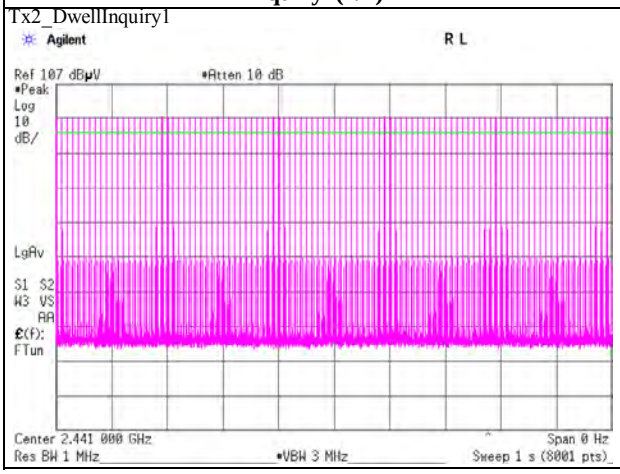
Sample Calculation

Average= Summation(Sampling 1 to 5) / 5

Inquiry

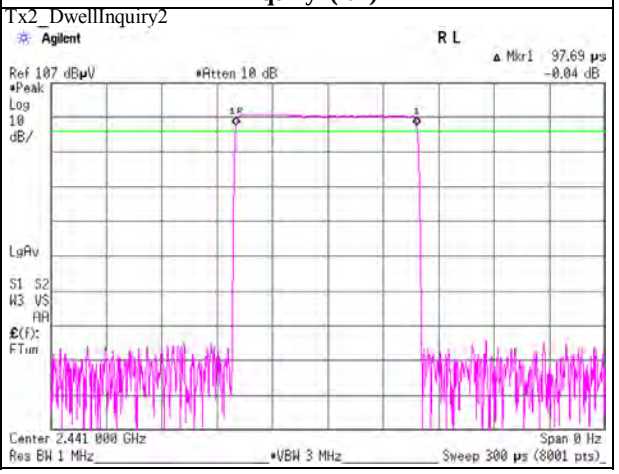
Inquiry (1/2)

Tx2_DwellInquiry1



Inquiry (2/2)

Tx2_DwellInquiry2



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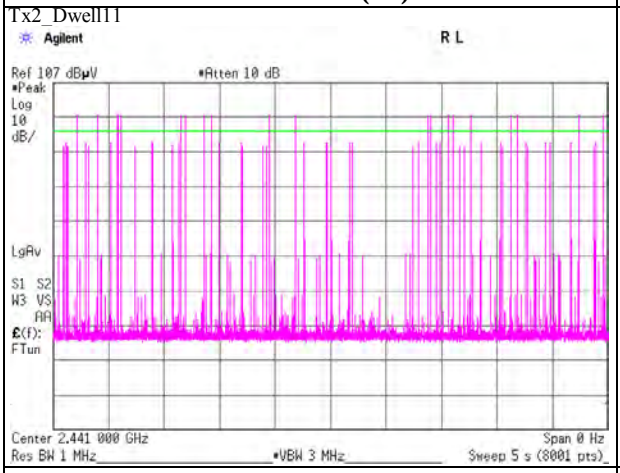
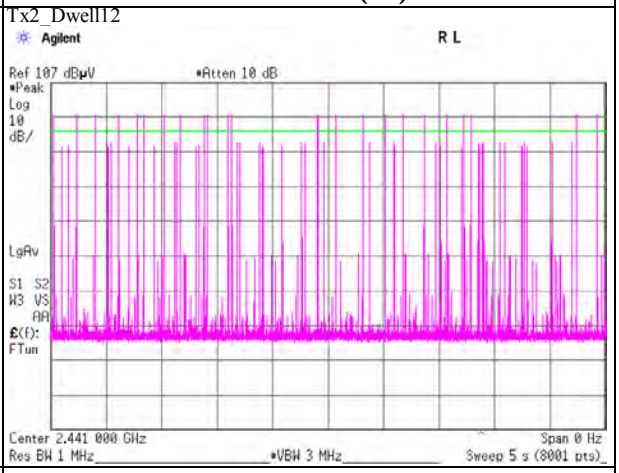
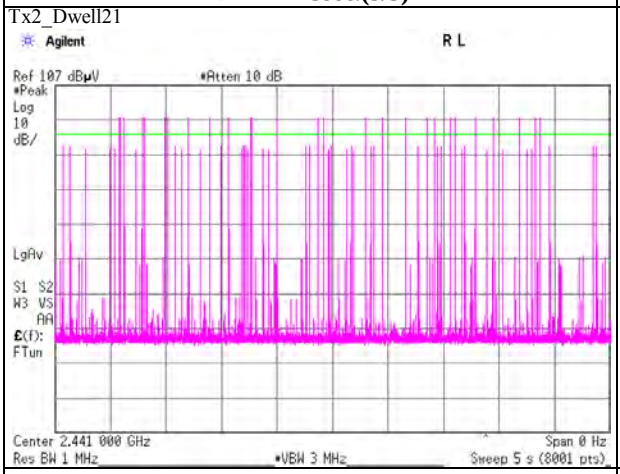
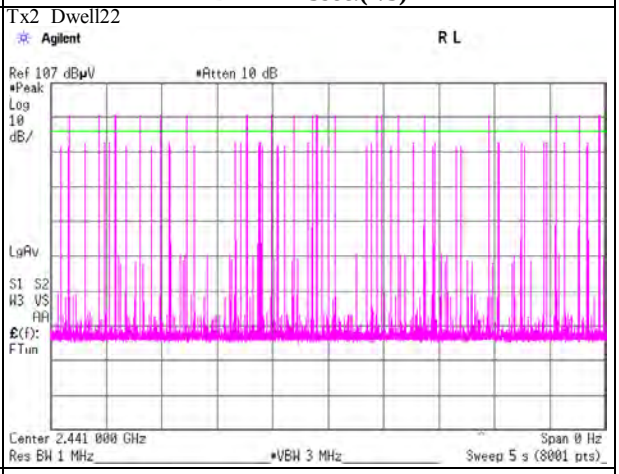
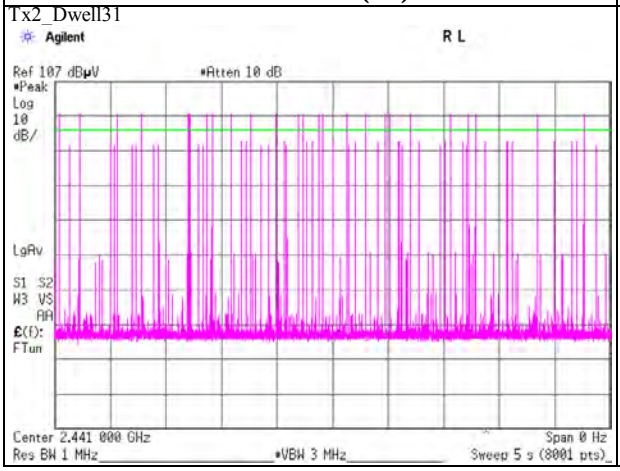
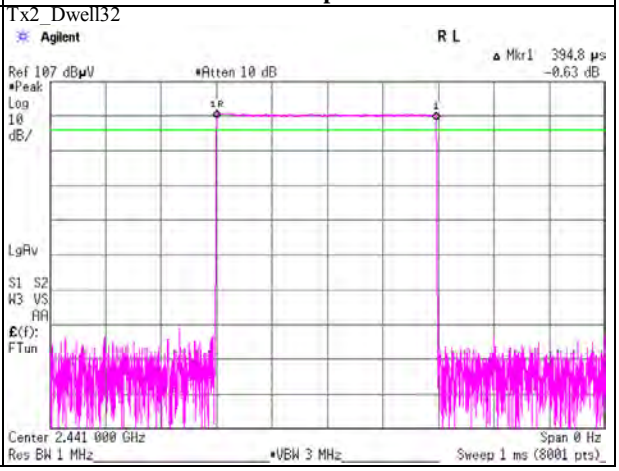
Dwell time

Tx, Bluetooth, BDR, PRBS9

DH1 - in 5sec.(1/5)	DH1 - in 5sec.(2/5)
Tx2_Dwell11 	Tx2_Dwell12 
DH1 - in 5sec.(3/5)	**DH1 - in 5sec.(4/5)**
Tx2_Dwell21 	Tx2_Dwell22 
DH1 - in 5sec.(5/5)	**DH1 - 1pulse**
Tx2_Dwell31 	Tx2_Dwell32 

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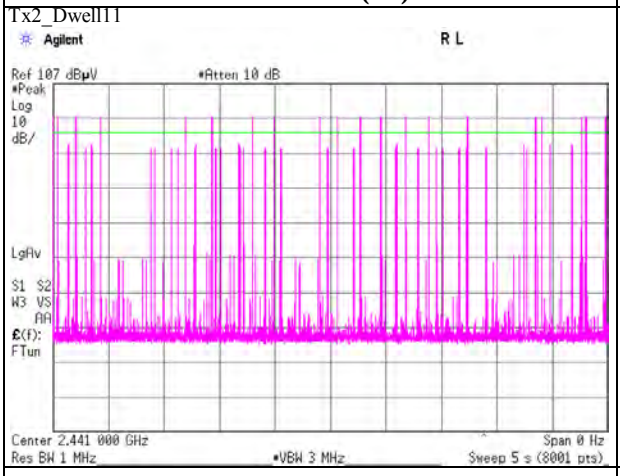
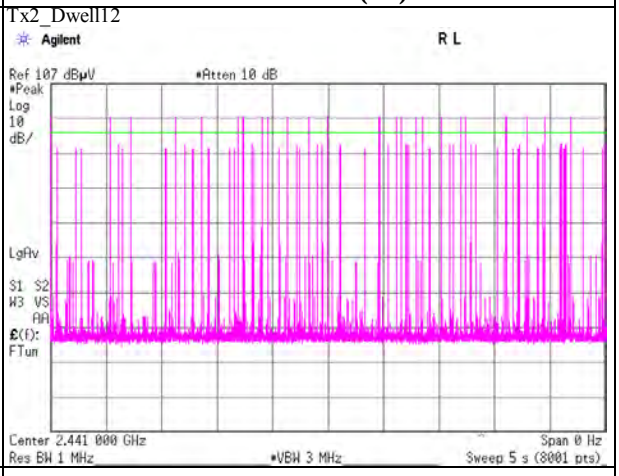
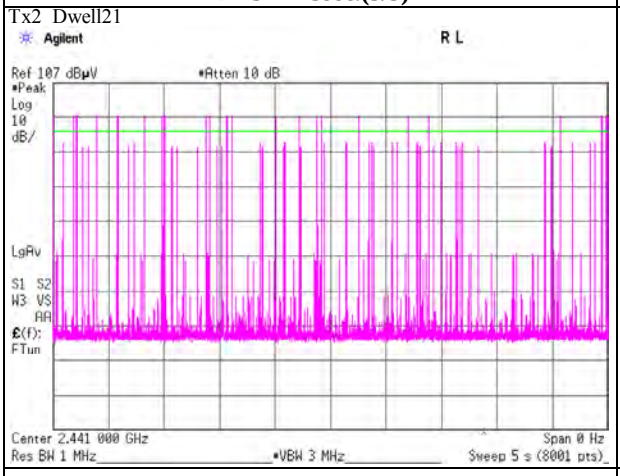
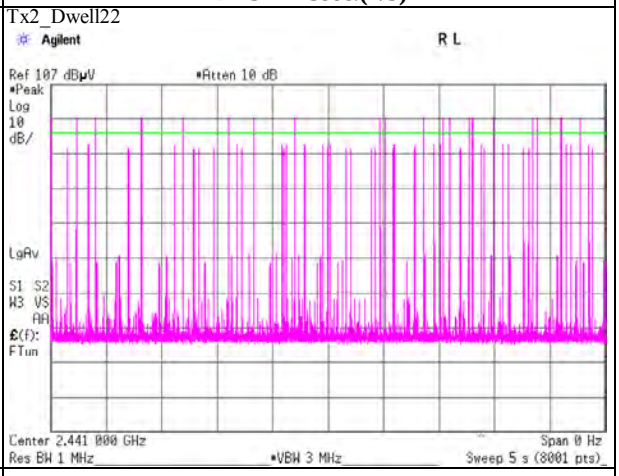
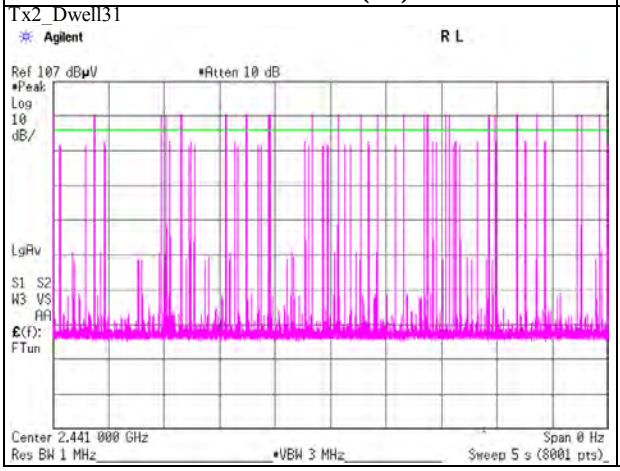
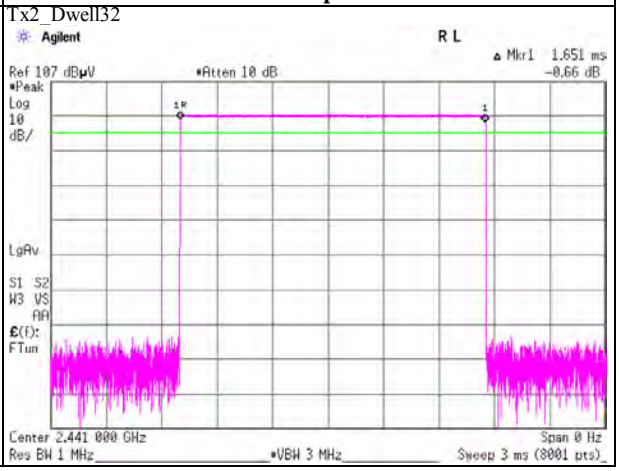
Dwell time

Tx, Bluetooth, BDR, PRBS9

DH3 - in 5sec.(1/5)	DH3 - in 5sec.(2/5)
Tx2_Dwell11	Tx2_Dwell12
	
DH3 - in 5sec.(3/5)	**DH3 - in 5sec.(4/5)**
Tx2_Dwell21	Tx2_Dwell22
	
DH3 - in 5sec.(5/5)	**DH3 - 1pulse**
Tx2_Dwell31	Tx2_Dwell32
	

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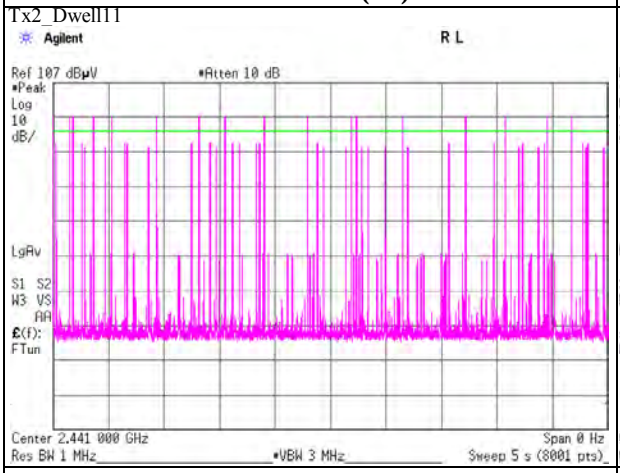
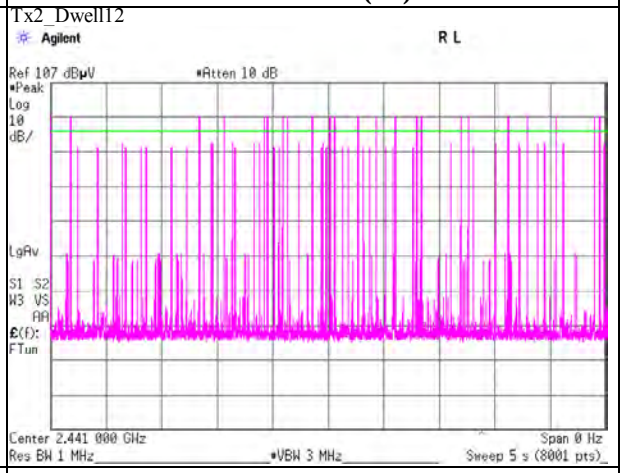
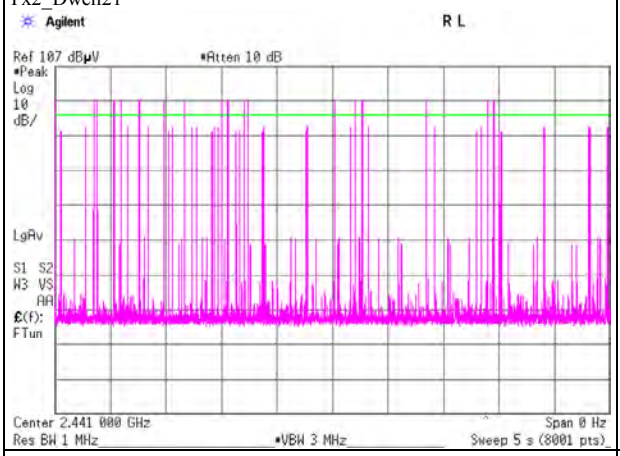
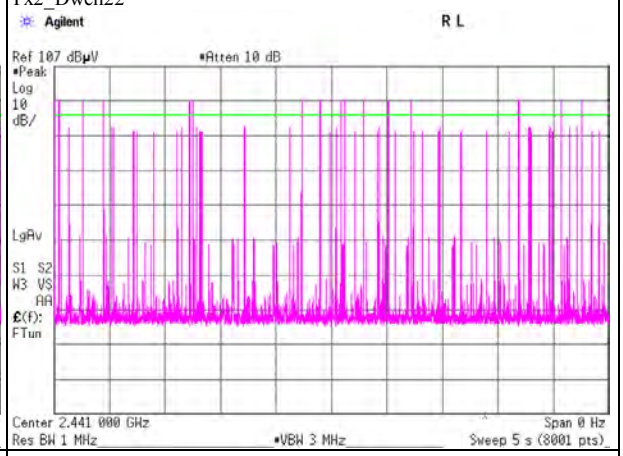
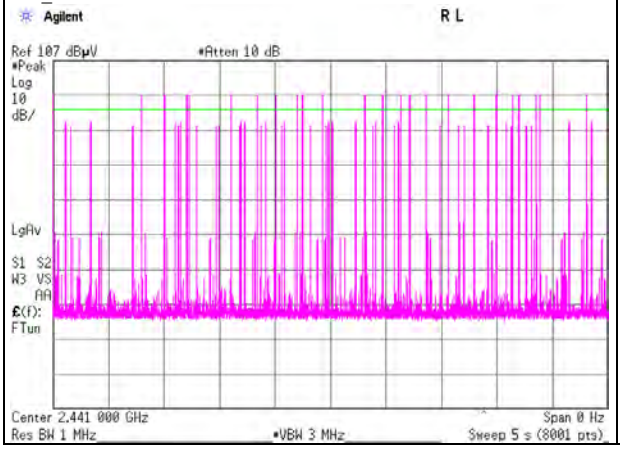
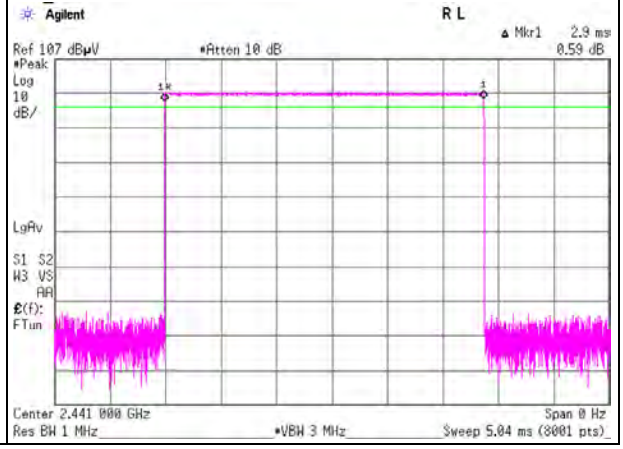
Dwell time

Tx, Bluetooth, BDR, PRBS9

DH5 - in 5sec.(1/5)	DH5 - in 5sec.(2/5)
Tx2_Dwell11 	Tx2_Dwell12 
DH5 - in 5sec.(3/5)	**DH5 - in 5sec.(4/5)**
Tx2_Dwell21 	Tx2_Dwell22 
DH5 - in 5sec.(5/5)	**DH5 - 1pulse**
Tx2_Dwell31 	Tx2_Dwell32 

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Dwell Time

Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date	January 12, 2012
Temperature / Humidity	22deg.C , 33%RH
Engineer	Kenichi Adachi
Mode	Tx, Bluetooth, EDR, PRBS9

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
3-DH1	21.6 / 5.0 sec. x 31.6 sec. = 137 times	0.405	55	400
3-DH3	20.8 / 5.0 sec. x 31.6 sec. = 132 times	1.656	219	400
3-DH5	20.0 / 5.0 sec. x 31.6 sec. = 127 times	2.907	369	400

Sample Calculation

Result = Number of transmission x Length of transmition time

*Average data of 5 tests.(except Inquiry)

Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
3-DH1	20	23	23	21	21	21.6
3-DH3	21	20	19	22	22	20.8
3-DH5	19	16	22	24	19	20.0

Sample Calculation

Average= Summation(Sampling 1 to 5) / 5

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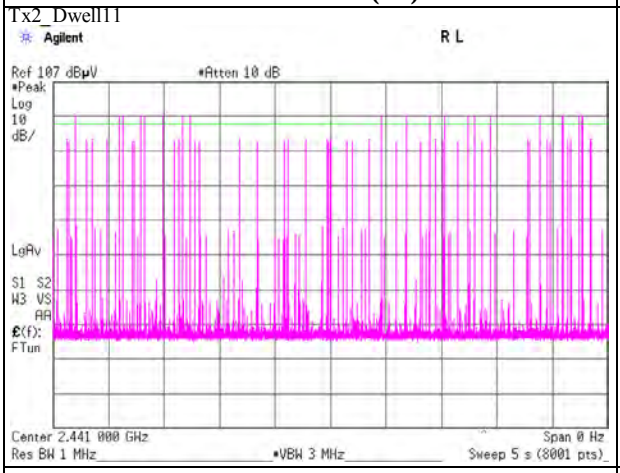
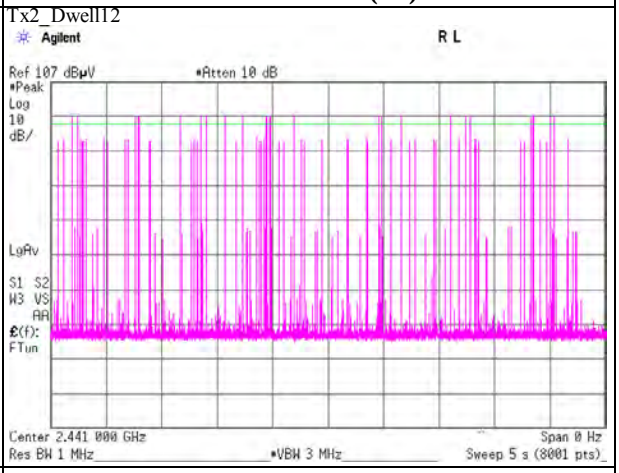
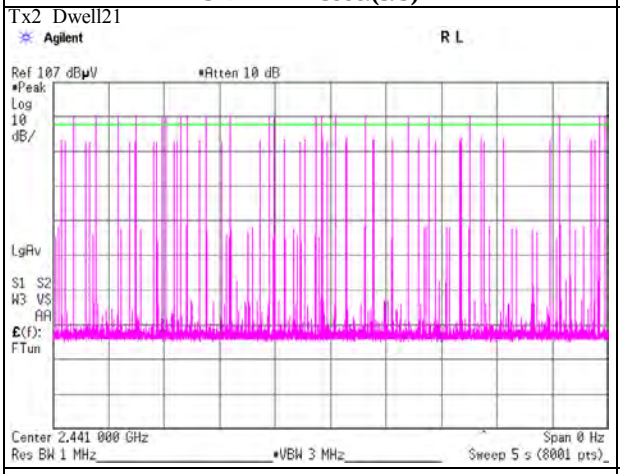
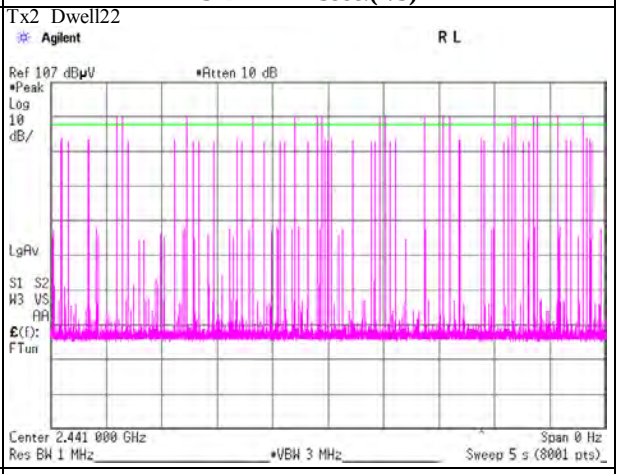
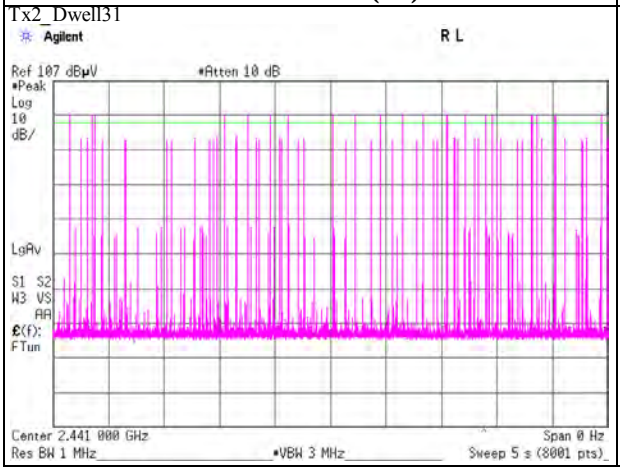
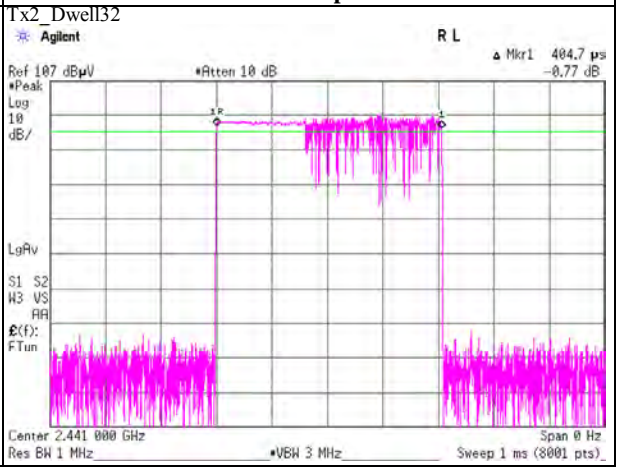
Dwell time

Tx, Bluetooth, EDR, PRBS9

3-DH1 - in 5sec.(1/5)	3-DH1 - in 5sec.(2/5)
Tx2_Dwell11 	Tx2_Dwell12 
3-DH1 - in 5sec.(3/5)	**3-DH1 - in 5sec.(4/5)**
Tx2_Dwell21 	Tx2_Dwell22 
3-DH1 - in 5sec.(5/5)	**3-DH1 - 1pulse**
Tx2_Dwell31 	Tx2_Dwell32 

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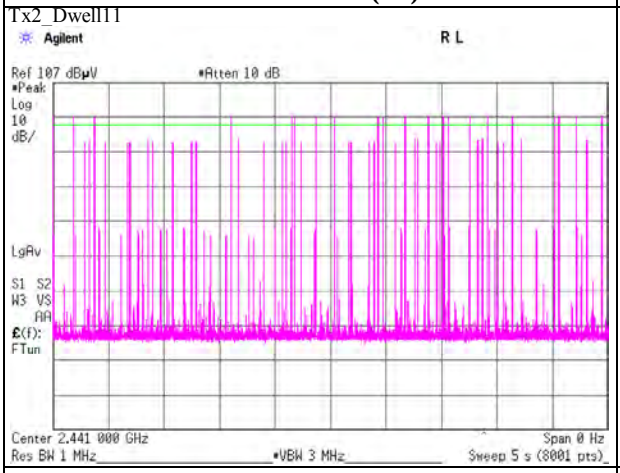
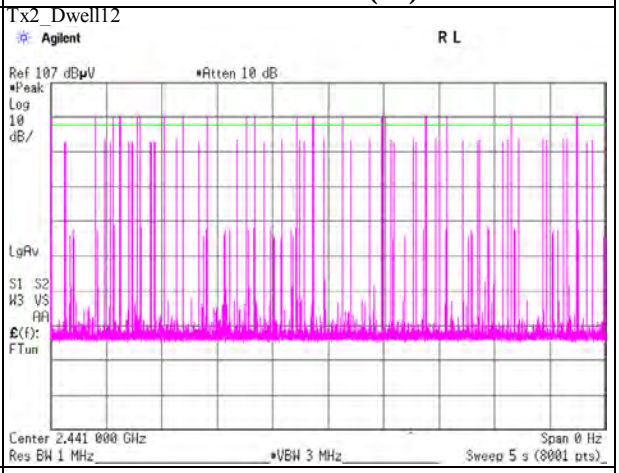
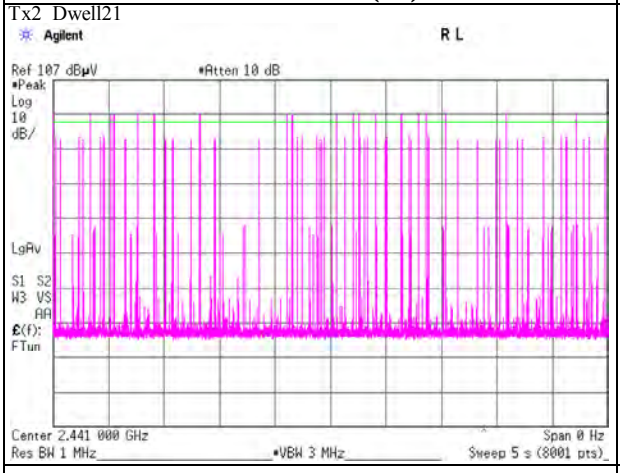
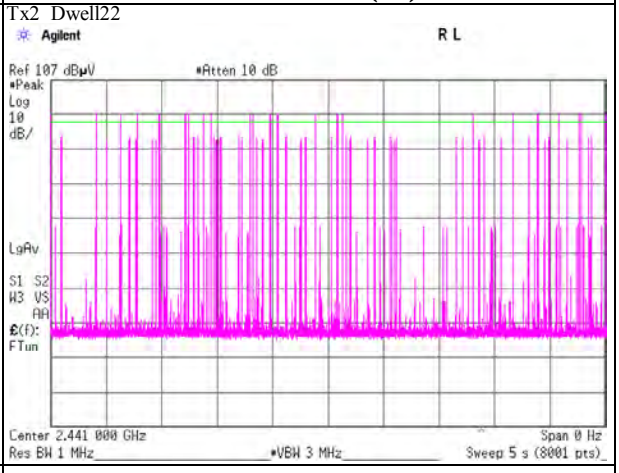
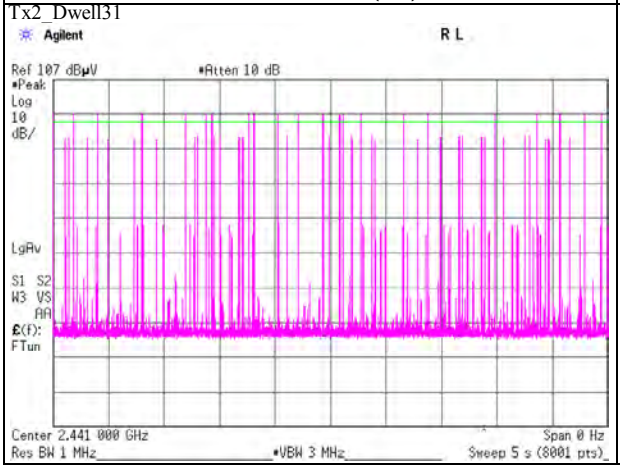
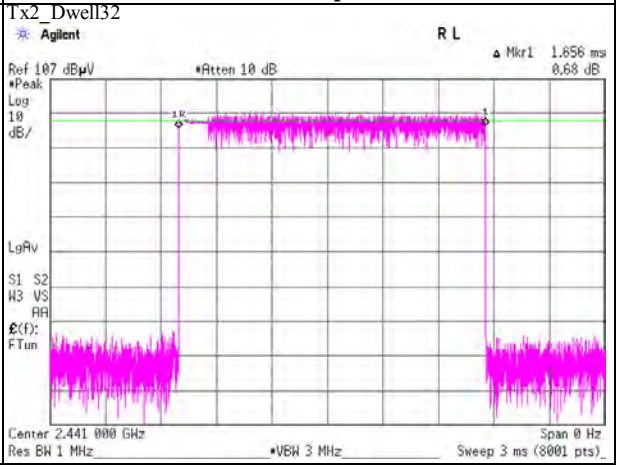
Dwell time

Tx, Bluetooth, EDR, PRBS9

3-DH3 - in 5sec.(1/5)	3-DH3 - in 5sec.(2/5)
Tx2_Dwell11 	Tx2_Dwell12 
3-DH3 - in 5sec.(3/5)	**3-DH3 - in 5sec.(4/5)**
Tx2_Dwell21 	Tx2_Dwell22 
3-DH3 - in 5sec.(5/5)	**3-DH3 - 1pulse**
Tx2_Dwell31 	Tx2_Dwell32 

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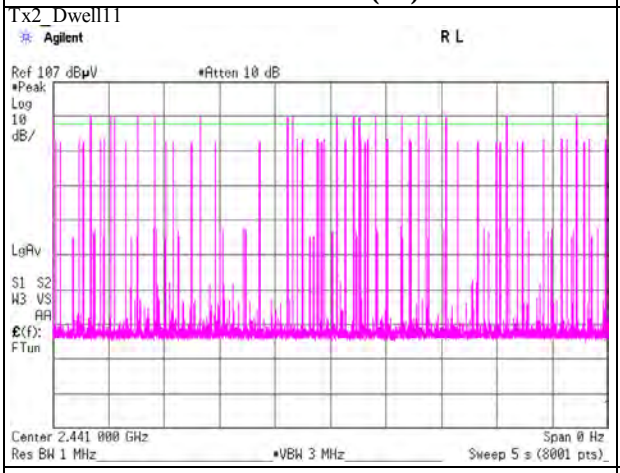
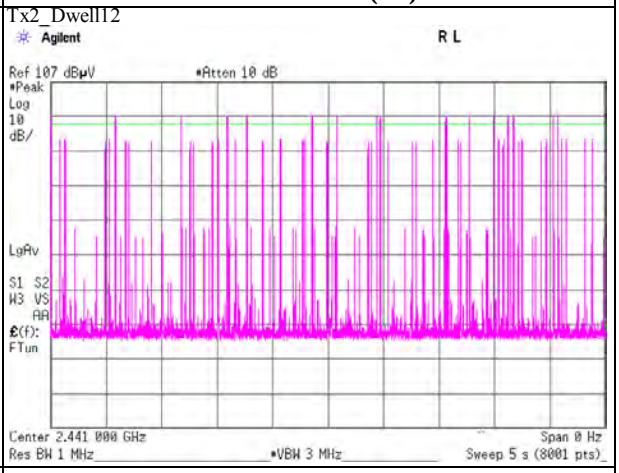
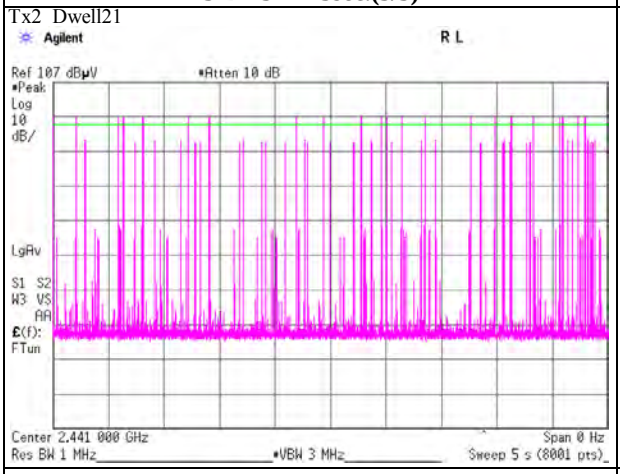
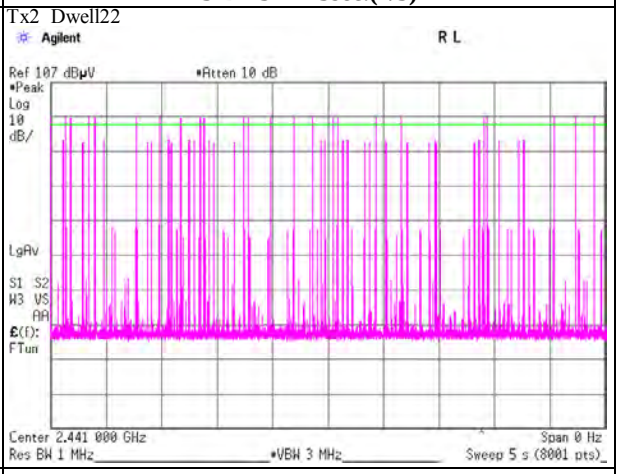
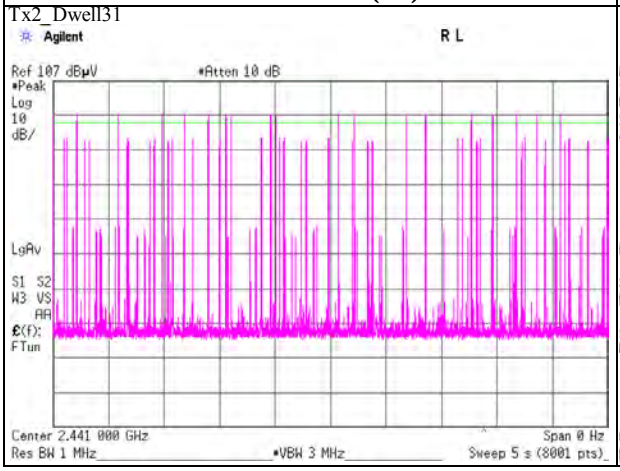
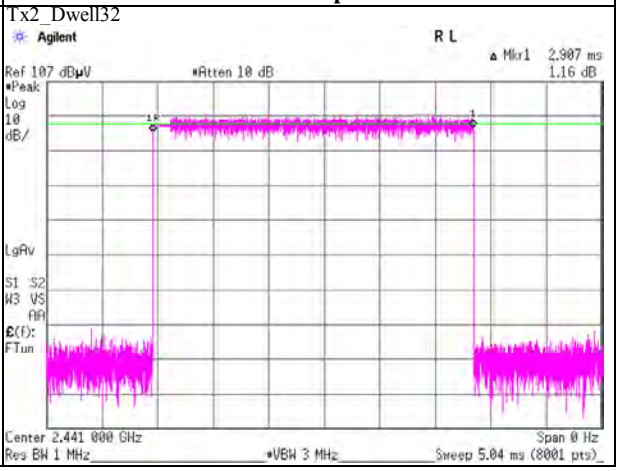
Dwell time

Tx, Bluetooth, EDR, PRBS9

3-DH5 - in 5sec.(1/5)	3-DH5 - in 5sec.(2/5)
Tx2_Dwell11 	Tx2_Dwell12 
3-DH5 - in 5sec.(3/5)	**3-DH5 - in 5sec.(4/5)**
Tx2_Dwell21 	Tx2_Dwell22 
3-DH5 - in 5sec.(5/5)	**3-DH5 - 1pulse**
Tx2_Dwell31 	Tx2_Dwell32 

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Peak Output Power (Conducted)

Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date	January 10, 2012
Temperature / Humidity	22deg.C , 28%RH
Engineer	Hikaru Shirasawa
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	-9.35	1.62	9.87	2.14	1.64	20.97	125	18.83
DH5	2441.0	-9.51	1.64	9.87	2.00	1.58	20.97	125	18.97
DH5	2480.0	-10.85	1.66	9.87	0.68	1.17	20.97	125	20.29
2-DH5	2402.0	-9.79	1.62	9.87	1.70	1.48	20.97	125	19.27
2-DH5	2441.0	-10.03	1.64	9.87	1.48	1.41	20.97	125	19.49
2-DH5	2480.0	-11.34	1.66	9.87	0.19	1.04	20.97	125	20.78
3-DH5	2402.0	-9.57	1.62	9.87	1.92	1.55	20.97	125	19.05
3-DH5	2441.0	-9.69	1.64	9.87	1.82	1.52	20.97	125	19.15
3-DH5	2480.0	-10.50	1.66	9.87	1.03	1.27	20.97	125	19.94

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.3 Semi Anechoic Chamber
Date	January 13, 2012	January 13, 2012
Temperature / Humidity	20deg.C , 20%RH	20deg.C , 20%RH
Engineer	Hikaru Shirasawa	Yasumasa Owaki
Mode	Tx, 2402 MHz	S/N: 17KK010
	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.	174.722	QP	42.5	15.7	7.8	32.0	34.0	43.5	9.5	185	316	PK:VBW 3MHz
Hori.	377.979	QP	46.5	15.8	9.1	31.9	39.5	46.0	6.5	100	56	AV:VBW 10Hz
Hori.	566.654	QP	42.3	18.6	9.7	31.9	38.7	46.0	7.3	100	263	
Hori.	699.988	QP	41.1	20.5	10.1	31.8	39.9	46.0	6.1	100	139	
Hori.	733.326	QP	39.2	20.7	10.2	31.7	38.4	46.0	7.6	100	114	
Hori.	1266.378	PK	49.5	24.7	12.8	40.7	46.3	73.9	27.6	114	52	
Hori.	2377.000	PK	47.4	27.2	13.8	41.1	47.3	73.9	26.6	100	359	
Hori.	2388.967	PK	47.1	27.2	13.8	41.1	47.0	73.9	26.9	100	0	
Hori.	2390.000	PK	47.5	27.2	13.8	41.1	47.4	73.9	26.5	100	0	
Hori.	2400.000	PK	47.9	27.3	13.8	41.1	47.9	73.9	26.0	100	0	
Hori.	2427.000	PK	47.8	27.3	13.8	41.1	47.8	73.9	26.1	100	359	
Hori.	3144.832	PK	51.8	28.9	5.4	41.5	44.6	73.9	29.3	158	133	
Hori.	4804.000	PK	48.5	31.1	5.9	41.1	44.4	73.9	29.5	100	196	
Hori.	7206.000	PK	47.4	36.5	7.4	41.3	50.0	73.9	23.9	100	359	
Hori.	9608.000	PK	45.0	38.2	8.6	38.8	53.0	73.9	20.9	100	0	
Hori.	12010.000	PK	45.8	39.3	10.2	39.2	56.1	73.9	17.8	100	359	
Hori.	1266.378	AV	43.2	24.7	12.8	40.7	40.0	53.9	13.9	114	52	
Hori.	2377.000	AV	35.8	27.2	13.8	41.1	35.7	53.9	18.2	100	359	
Hori.	2388.967	AV	35.8	27.2	13.8	41.1	35.7	53.9	18.2	100	0	
Hori.	2390.000	AV	35.3	27.2	13.8	41.1	35.2	53.9	18.7	100	0	
Hori.	2400.000	AV	35.6	27.3	13.8	41.1	35.6	53.9	18.3	100	0	
Hori.	2427.000	AV	35.2	27.3	13.8	41.1	35.2	53.9	18.7	100	359	
Hori.	3144.832	AV	44.2	28.9	5.4	41.5	37.0	53.9	16.9	158	133	
Hori.	4804.000	AV	38.4	31.1	5.9	41.1	34.3	53.9	19.6	100	196	
Hori.	7206.000	AV	36.7	36.5	7.4	41.3	39.3	53.9	14.6	100	359	
Hori.	9608.000	AV	34.0	38.2	8.6	38.8	42.0	53.9	11.9	100	0	
Hori.	12010.000	AV	35.2	39.3	10.2	39.2	45.5	53.9	8.4	100	359	
Vert.	174.696	QP	41.7	15.7	7.8	32.0	33.2	43.5	10.3	100	196	
Vert.	699.984	QP	39.5	20.5	10.1	31.8	38.3	46.0	7.7	119	359	
Vert.	2377.000	PK	47.2	27.2	13.8	41.1	47.1	73.9	26.8	100	358	
Vert.	2388.967	PK	47.5	27.2	13.8	41.1	47.4	73.9	26.5	100	0	
Vert.	2390.000	PK	46.9	27.2	13.8	41.1	46.8	73.9	27.1	100	0	
Vert.	2400.000	PK	47.3	27.3	13.8	41.1	47.3	73.9	26.6	100	0	
Vert.	2427.000	PK	47.4	27.3	13.8	41.1	47.4	73.9	26.5	100	181	
Vert.	3144.832	PK	48.6	28.9	5.4	41.5	41.4	73.9	32.5	100	12	
Vert.	4804.000	PK	48.4	31.1	5.9	41.1	44.3	73.9	29.6	137	123	
Vert.	7206.000	PK	48.5	36.5	7.4	41.3	51.1	73.9	22.8	100	0	
Vert.	9608.000	PK	44.6	38.2	8.6	38.8	52.6	73.9	21.3	100	359	
Vert.	12010.000	PK	46.1	39.3	10.2	39.2	56.4	73.9	17.5	100	0	
Vert.	2377.000	AV	35.8	27.2	13.8	41.1	35.7	53.9	18.2	100	358	
Vert.	2388.967	AV	35.8	27.2	13.8	41.1	35.7	53.9	18.2	100	0	
Vert.	2390.000	AV	35.2	27.2	13.8	41.1	35.1	53.9	18.8	100	0	
Vert.	2400.000	AV	35.5	27.3	13.8	41.1	35.5	53.9	18.4	100	0	
Vert.	2427.000	AV	35.8	27.3	13.8	41.1	35.8	53.9	18.1	100	181	
Vert.	3144.832	AV	42.0	28.9	5.4	41.5	34.8	53.9	19.1	100	12	
Vert.	4804.000	AV	37.4	31.1	5.9	41.1	33.3	53.9	20.6	137	123	
Vert.	7206.000	AV	36.9	36.5	7.4	41.3	39.5	53.9	14.4	100	0	
Vert.	9608.000	AV	34.2	38.2	8.6	38.8	42.2	53.9	11.7	100	359	
Vert.	12010.000	AV	35.2	39.3	10.2	39.2	45.5	53.9	8.4	100	0	

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

*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 13, 2012	January 13, 2012
Temperature / Humidity	20deg.C , 20%RH	20deg.C , 20%RH
Engineer	Hikaru Shirasawa	Yasumasa Owaki
Mode	Tx, 2441 MHz	S/N: 17KK010
	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.	174.636	QP	42.3	15.7	7.8	32.0	33.8	43.5	9.7	178	320	PK:VBW 3MHz
Hori.	377.980	QP	46.8	15.8	9.1	31.9	39.8	46.0	6.2	100	56	AV:VBW 10Hz
Hori.	566.661	QP	42.7	18.6	9.7	31.9	39.1	46.0	6.9	100	259	
Hori.	699.993	QP	41.3	20.5	10.1	31.8	40.1	46.0	5.9	100	135	
Hori.	733.332	QP	39.3	20.7	10.2	31.7	38.5	46.0	7.5	100	116	
Hori.	2413.000	PK	47.4	27.3	13.8	41.1	47.4	73.9	26.5	100	359	
Hori.	2467.000	PK	47.5	27.4	13.8	41.1	47.6	73.9	26.3	100	0	
Hori.	3145.817	PK	49.6	28.9	5.4	41.5	42.4	73.9	31.5	193	131	
Hori.	4882.000	PK	48.7	31.2	5.9	40.9	44.9	73.9	29.0	136	196	
Hori.	7323.000	PK	47.9	36.8	7.5	41.4	50.8	73.9	23.1	100	359	
Hori.	9764.000	PK	45.5	38.5	8.6	38.8	53.8	73.9	20.1	100	0	
Hori.	12205.000	PK	46.1	39.3	10.2	39.2	56.4	73.9	17.5	100	359	
Hori.	2413.000	AV	35.3	27.3	13.8	41.1	35.3	53.9	18.6	100	359	
Hori.	2467.000	AV	35.6	27.4	13.8	41.1	35.7	53.9	18.2	100	0	
Hori.	3145.817	AV	42.3	28.9	5.4	41.5	35.1	53.9	18.8	193	131	
Hori.	4882.000	AV	37.7	31.2	5.9	40.9	33.9	53.9	20.0	136	196	
Hori.	7323.000	AV	35.8	36.8	7.5	41.4	38.7	53.9	15.2	100	359	
Hori.	9764.000	AV	33.5	38.5	8.6	38.8	41.8	53.9	12.1	100	0	
Hori.	12205.000	AV	34.5	39.3	10.2	39.2	44.8	53.9	9.1	100	359	
Vert.	174.604	QP	41.6	15.7	7.8	32.0	33.1	43.5	10.4	100	186	
Vert.	699.993	QP	39.4	20.5	10.1	31.8	38.2	46.0	7.8	116	359	
Vert.	1266.674	PK	49.5	24.7	12.8	40.7	46.3	73.9	27.6	100	190	
Vert.	2413.000	PK	46.9	27.3	13.8	41.1	46.9	73.9	27.0	100	0	
Vert.	2467.000	PK	47.6	27.4	13.8	41.1	47.7	73.9	26.2	100	359	
Vert.	3144.813	PK	50.4	28.9	5.4	41.5	43.2	73.9	30.7	100	10	
Vert.	4882.000	PK	48.1	31.2	5.9	40.9	44.3	73.9	29.6	102	155	
Vert.	7323.000	PK	47.5	36.8	7.5	41.4	50.4	73.9	23.5	100	0	
Vert.	9764.000	PK	46.0	38.5	8.6	38.8	54.3	73.9	19.6	100	359	
Vert.	12205.000	PK	46.3	39.3	10.2	39.2	56.6	73.9	17.3	100	0	
Vert.	1266.674	AV	42.9	24.7	12.8	40.7	39.7	53.9	14.2	100	190	
Vert.	2413.000	AV	35.3	27.3	13.8	41.1	35.3	53.9	18.6	100	0	
Vert.	2467.000	AV	35.2	27.4	13.8	41.1	35.3	53.9	18.6	100	359	
Vert.	3144.813	AV	44.1	28.9	5.4	41.5	36.9	53.9	17.0	100	10	
Vert.	4882.000	AV	36.5	31.2	5.9	40.9	32.7	53.9	21.2	102	155	
Vert.	7323.000	AV	35.8	36.8	7.5	41.4	38.7	53.9	15.2	100	0	
Vert.	9764.000	AV	33.7	38.5	8.6	38.8	42.0	53.9	11.9	100	359	
Vert.	12205.000	AV	34.5	39.3	10.2	39.2	44.8	53.9	9.1	100	0	

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

*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 13, 2012	January 13, 2012
Temperature / Humidity	20deg.C , 20%RH	20deg.C , 20%RH
Engineer	Hikaru Shirasawa	Yasumasa Owaki
Mode	Tx, 2480 MHz	S/N: 17KK010
	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.	174.611	QP	42.5	15.7	7.8	32.0	34.0	43.5	9.5	183	317	PK:VBW 3MHz
Hori.	377.980	QP	46.9	15.8	9.1	31.9	39.9	46.0	6.1	100	61	AV:VBW 10Hz
Hori.	566.660	QP	42.4	18.6	9.7	31.9	38.8	46.0	7.2	100	263	
Hori.	699.992	QP	41.2	20.5	10.1	31.8	40.0	46.0	6.0	100	138	
Hori.	733.328	QP	39.2	20.7	10.2	31.7	38.4	46.0	7.6	100	113	
Hori.	1333.330	PK	48.9	24.8	12.8	40.8	45.7	73.9	28.2	109	139	
Hori.	2453.000	PK	47.6	27.4	13.8	41.1	47.7	73.9	26.2	100	0	
Hori.	2483.500	PK	47.1	27.5	13.8	41.1	47.3	73.9	26.6	100	359	
Hori.	2507.000	PK	47.5	27.5	14.0	41.1	47.9	73.9	26.0	100	0	
Hori.	3144.842	PK	50.0	28.9	5.4	41.5	42.8	73.9	31.1	160	131	
Hori.	4960.000	PK	47.2	31.4	5.9	40.8	43.7	73.9	30.2	102	169	
Hori.	7440.000	PK	47.5	37.0	7.5	41.5	50.5	73.9	23.4	100	0	
Hori.	9920.000	PK	45.2	38.8	8.6	38.8	53.8	73.9	20.1	100	359	
Hori.	12400.000	PK	45.4	39.4	10.1	39.2	55.7	73.9	18.2	100	0	
Hori.	1333.330	AV	42.7	24.8	12.8	40.8	39.5	53.9	14.4	109	139	
Hori.	2453.000	AV	35.3	27.4	13.8	41.1	35.4	53.9	18.5	100	0	
Hori.	2483.500	AV	35.3	27.5	13.8	41.1	35.5	53.9	18.4	100	359	
Hori.	2507.000	AV	35.2	27.5	14.0	41.1	35.6	53.9	18.3	100	0	
Hori.	3144.842	AV	44.5	28.9	5.4	41.5	37.3	53.9	16.6	160	131	
Hori.	4960.000	AV	36.0	31.4	5.9	40.8	32.5	53.9	21.4	102	169	
Hori.	7440.000	AV	35.6	37.0	7.5	41.5	38.6	53.9	15.3	100	0	
Hori.	9920.000	AV	33.1	38.8	8.6	38.8	41.7	53.9	12.2	100	359	
Hori.	12400.000	AV	33.8	39.4	10.1	39.2	44.1	53.9	9.8	100	0	
Vert.	174.600	QP	41.7	15.7	7.8	32.0	33.2	43.5	10.3	100	189	
Vert.	699.992	QP	39.4	20.5	10.1	31.8	38.2	46.0	7.8	113	359	
Vert.	2453.000	PK	47.2	27.4	13.8	41.1	47.3	73.9	26.6	100	0	
Vert.	2483.500	PK	47.1	27.5	13.8	41.1	47.3	73.9	26.6	100	359	
Vert.	2507.000	PK	47.2	27.5	14.0	41.1	47.6	73.9	26.3	100	0	
Vert.	3144.842	PK	48.9	28.9	5.4	41.5	41.7	73.9	32.2	100	321	
Vert.	4960.000	PK	47.2	31.4	5.9	40.8	43.7	73.9	30.2	100	168	
Vert.	7440.000	PK	48.3	37.0	7.5	41.5	51.3	73.9	22.6	100	0	
Vert.	9920.000	PK	45.2	38.8	8.6	38.8	53.8	73.9	20.1	100	359	
Vert.	12400.000	PK	45.6	39.4	10.1	39.2	55.9	73.9	18.0	100	0	
Vert.	2453.000	AV	35.3	27.4	13.8	41.1	35.4	53.9	18.5	100	0	
Vert.	2483.500	AV	35.3	27.5	13.8	41.1	35.5	53.9	18.4	100	359	
Vert.	2507.000	AV	35.3	27.5	14.0	41.1	35.7	53.9	18.2	100	0	
Vert.	3144.842	AV	41.7	28.9	5.4	41.5	34.5	53.9	19.4	100	321	
Vert.	4960.000	AV	35.8	31.4	5.9	40.8	32.3	53.9	21.6	100	168	
Vert.	7440.000	AV	35.9	37.0	7.5	41.5	38.9	53.9	15.0	100	0	
Vert.	9920.000	AV	33.2	38.8	8.6	38.8	41.8	53.9	12.1	100	359	
Vert.	12400.000	AV	33.8	39.4	10.1	39.2	44.1	53.9	9.8	100	0	

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

*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 13, 2012	January 13, 2012
Temperature / Humidity	20deg.C , 20%RH	20deg.C , 20%RH
Engineer	Hikaru Shirasawa	Yasumasa Owaki
Mode	Tx, 2402 MHz	S/N: 17KK010
	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.	174.597	QP	42.3	15.7	7.8	32.0	33.8	43.5	9.7	183	319	PK:VBW 3MHz
Hori.	377.980	QP	46.8	15.8	9.1	31.9	39.8	46.0	6.2	100	55	AV:VBW 10Hz
Hori.	566.659	QP	42.6	18.6	9.7	31.9	39.0	46.0	7.0	100	262	
Hori.	699.992	QP	41.3	20.5	10.1	31.8	40.1	46.0	5.9	100	138	
Hori.	733.328	QP	39.3	20.7	10.2	31.7	38.5	46.0	7.5	100	116	
Hori.	1333.339	PK	49.0	24.8	12.8	40.8	45.8	73.9	28.1	100	146	
Hori.	2377.000	PK	47.3	27.2	13.8	41.1	47.2	73.9	26.7	100	0	
Hori.	2388.950	PK	47.4	27.2	13.8	41.1	47.3	73.9	26.6	100	359	
Hori.	2390.000	PK	46.6	27.2	13.8	41.1	46.5	73.9	27.4	100	0	
Hori.	2400.000	PK	47.5	27.3	13.8	41.1	47.5	73.9	26.4	100	0	
Hori.	2427.000	PK	47.7	27.3	13.8	41.1	47.7	73.9	26.2	100	359	
Hori.	3144.829	PK	50.1	28.9	5.4	41.5	42.9	73.9	31.0	111	195	
Hori.	4804.000	PK	48.4	31.1	5.9	41.1	44.3	73.9	29.6	100	195	
Hori.	7206.000	PK	48.5	36.5	7.4	41.3	51.1	73.9	22.8	100	359	
Hori.	9608.000	PK	45.8	38.2	8.6	38.8	53.8	73.9	20.1	100	0	
Hori.	12010.000	PK	46.6	39.3	10.2	39.2	56.9	73.9	17.0	100	359	
Hori.	1333.339	AV	40.1	24.8	12.8	40.8	36.9	53.9	17.0	100	146	
Hori.	2377.000	AV	33.3	27.2	13.8	41.1	33.2	53.9	20.7	100	0	
Hori.	2388.950	AV	33.3	27.2	13.8	41.1	33.2	53.9	20.7	100	359	
Hori.	2390.000	AV	32.8	27.2	13.8	41.1	32.7	53.9	21.2	100	0	
Hori.	2400.000	AV	33.1	27.3	13.8	41.1	33.1	53.9	20.8	100	0	
Hori.	2427.000	AV	32.8	27.3	13.8	41.1	32.8	53.9	21.1	100	359	
Hori.	3144.829	AV	43.8	28.9	5.4	41.5	36.6	53.9	17.3	111	195	
Hori.	4804.000	AV	36.7	31.1	5.9	41.1	32.6	53.9	21.3	100	195	
Hori.	7206.000	AV	36.3	36.5	7.4	41.3	38.9	53.9	15.0	100	359	
Hori.	9608.000	AV	33.5	38.2	8.6	38.8	41.5	53.9	12.4	100	0	
Hori.	12010.000	AV	34.9	39.3	10.2	39.2	45.2	53.9	8.7	100	359	
Vert.	174.616	QP	41.3	15.7	7.8	32.0	32.8	43.5	10.7	100	190	
Vert.	699.990	QP	39.2	20.5	10.1	31.8	38.0	46.0	8.0	118	359	
Vert.	2377.000	PK	47.6	27.2	13.8	41.1	47.5	73.9	26.4	100	359	
Vert.	2388.950	PK	47.1	27.2	13.8	41.1	47.0	73.9	26.9	100	359	
Vert.	2390.000	PK	47.1	27.2	13.8	41.1	47.0	73.9	26.9	100	0	
Vert.	2400.000	PK	47.5	27.3	13.8	41.1	47.5	73.9	26.4	100	0	
Vert.	2427.000	PK	46.9	27.3	13.8	41.1	46.9	73.9	27.0	100	0	
Vert.	3144.821	PK	49.7	28.9	5.4	41.5	42.5	73.9	31.4	159	342	
Vert.	4804.000	PK	48.5	31.1	5.9	41.1	44.4	73.9	29.5	100	322	
Vert.	7206.000	PK	49.1	36.5	7.4	41.3	51.7	73.9	22.2	100	0	
Vert.	9608.000	PK	45.4	38.2	8.6	38.8	53.4	73.9	20.5	100	359	
Vert.	12010.000	PK	46.5	39.3	10.2	39.2	56.8	73.9	17.1	100	0	
Vert.	2377.000	AV	32.8	27.2	13.8	41.1	32.7	53.9	21.2	100	359	
Vert.	2388.950	AV	32.8	27.2	13.8	41.1	32.7	53.9	21.2	100	359	
Vert.	2390.000	AV	32.8	27.2	13.8	41.1	32.7	53.9	21.2	100	0	
Vert.	2400.000	AV	33.5	27.3	13.8	41.1	33.5	53.9	20.4	100	0	
Vert.	2427.000	AV	32.8	27.3	13.8	41.1	32.8	53.9	21.1	100	0	
Vert.	3144.821	AV	42.6	28.9	5.4	41.5	35.4	53.9	18.5	159	342	
Vert.	4804.000	AV	36.2	31.1	5.9	41.1	32.1	53.9	21.8	100	322	
Vert.	7206.000	AV	36.5	36.5	7.4	41.3	39.1	53.9	14.8	100	0	
Vert.	9608.000	AV	33.8	38.2	8.6	38.8	41.8	53.9	12.1	100	359	
Vert.	12010.000	AV	35.0	39.3	10.2	39.2	45.3	53.9	8.6	100	0	

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

*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 13, 2012	January 13, 2012
Temperature / Humidity	20deg.C , 20%RH	20deg.C , 20%RH
Engineer	Hikaru Shirasawa	Yasumasa Owaki
Mode	Tx, 2441 MHz	S/N: 17KK010
	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.	174.636	QP	42.3	15.7	7.8	32.0	33.8	43.5	9.7	187	313	PK:VBW 3MHz
Hori.	377.980	QP	46.8	15.8	9.1	31.9	39.8	46.0	6.2	100	55	AV:VBW 10Hz
Hori.	566.661	QP	42.7	18.6	9.7	31.9	39.1	46.0	6.9	100	261	
Hori.	699.993	QP	41.3	20.5	10.1	31.8	40.1	46.0	5.9	100	135	
Hori.	733.332	QP	39.3	20.7	10.2	31.7	38.5	46.0	7.5	100	117	
Hori.	2413.000	PK	47.4	27.3	13.8	41.1	47.4	73.9	26.5	100	359	
Hori.	2467.000	PK	47.5	27.4	13.8	41.1	47.6	73.9	26.3	100	0	
Hori.	3145.817	PK	49.6	28.9	5.4	41.5	42.4	73.9	31.5	129	122	
Hori.	4882.000	PK	48.7	31.2	5.9	40.9	44.9	73.9	29.0	100	172	
Hori.	7323.000	PK	47.9	36.8	7.5	41.4	50.8	73.9	23.1	100	359	
Hori.	9764.000	PK	45.5	38.5	8.6	38.8	53.8	73.9	20.1	100	0	
Hori.	12205.000	PK	46.1	39.3	10.2	39.2	56.4	73.9	17.5	100	359	
Hori.	2413.000	AV	35.3	27.3	13.8	41.1	35.3	53.9	18.6	100	359	
Hori.	2467.000	AV	35.6	27.4	13.8	41.1	35.7	53.9	18.2	100	0	
Hori.	3145.817	AV	42.3	28.9	5.4	41.5	35.1	53.9	18.8	129	122	
Hori.	4882.000	AV	37.7	31.2	5.9	40.9	33.9	53.9	20.0	100	172	
Hori.	7323.000	AV	35.8	36.8	7.5	41.4	38.7	53.9	15.2	100	359	
Hori.	9764.000	AV	33.5	38.5	8.6	38.8	41.8	53.9	12.1	100	0	
Hori.	12205.000	AV	34.5	39.3	10.2	39.2	44.8	53.9	9.1	100	359	
Vert.	174.604	QP	41.6	15.7	7.8	32.0	33.1	43.5	10.4	100	190	
Vert.	699.993	QP	39.4	20.5	10.1	31.8	38.2	46.0	7.8	113	359	
Vert.	1266.674	PK	49.5	24.7	12.8	40.7	46.3	73.9	27.6	129	194	
Vert.	2413.000	PK	46.9	27.3	13.8	41.1	46.9	73.9	27.0	100	0	
Vert.	2467.000	PK	47.6	27.4	13.8	41.1	47.7	73.9	26.2	100	359	
Vert.	3144.813	PK	50.4	28.9	5.4	41.5	43.2	73.9	30.7	159	1	
Vert.	4882.000	PK	48.1	31.2	5.9	40.9	44.3	73.9	29.6	100	153	
Vert.	7323.000	PK	47.5	36.8	7.5	41.4	50.4	73.9	23.5	100	0	
Vert.	9764.000	PK	46.0	38.5	8.6	38.8	54.3	73.9	19.6	100	359	
Vert.	12205.000	PK	46.3	39.3	10.2	39.2	56.6	73.9	17.3	100	0	
Vert.	1266.674	AV	42.9	24.7	12.8	40.7	39.7	53.9	14.2	129	194	
Vert.	2413.000	AV	35.3	27.3	13.8	41.1	35.3	53.9	18.6	100	0	
Vert.	2467.000	AV	35.2	27.4	13.8	41.1	35.3	53.9	18.6	100	359	
Vert.	3144.813	AV	44.1	28.9	5.4	41.5	36.9	53.9	17.0	159	1	
Vert.	4882.000	AV	36.5	31.2	5.9	40.9	32.7	53.9	21.2	100	153	
Vert.	7323.000	AV	35.8	36.8	7.5	41.4	38.7	53.9	15.2	100	0	
Vert.	9764.000	AV	33.7	38.5	8.6	38.8	42.0	53.9	11.9	100	359	
Vert.	12205.000	AV	34.5	39.3	10.2	39.2	44.8	53.9	9.1	100	0	

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

*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 13, 2012	January 13, 2012	
Temperature / Humidity	20deg.C , 20%RH	20deg.C , 20%RH	
Engineer	Hikaru Shirasawa	Yasumasa Owaki	
Mode	Tx, 2480 MHz		S/N: 17KK010
	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.	174.631	QP	42.3	15.7	7.8	32.0	33.8	43.5	9.7	183	317	PK:VBW 3MHz
Hori.	377.981	QP	46.9	15.8	9.1	31.9	39.9	46.0	6.1	100	60	AV:VBW 10Hz
Hori.	566.663	QP	42.5	18.6	9.7	31.9	38.9	46.0	7.1	100	264	
Hori.	699.993	QP	41.3	20.5	10.1	31.8	40.1	46.0	5.9	100	138	
Hori.	733.329	QP	39.2	20.7	10.2	31.7	38.4	46.0	7.6	100	114	
Hori.	1333.348	PK	48.5	24.8	12.8	40.8	45.3	73.9	28.6	108	194	
Hori.	2453.000	PK	47.7	27.4	13.8	41.1	47.8	73.9	26.1	100	359	
Hori.	2483.500	PK	47.4	27.5	13.8	41.1	47.6	73.9	26.3	100	0	
Hori.	2507.000	PK	47.7	27.5	14.0	41.1	48.1	73.9	25.8	100	359	
Hori.	3144.832	PK	50.3	28.9	5.4	41.5	43.1	73.9	30.8	193	132	
Hori.	4960.000	PK	47.8	31.4	5.9	40.8	44.3	73.9	29.6	100	200	
Hori.	7440.000	PK	46.9	37.0	7.5	41.5	49.9	73.9	24.0	100	0	
Hori.	9920.000	PK	45.2	38.8	8.6	38.8	53.8	73.9	20.1	100	0	
Hori.	12400.000	PK	45.5	39.4	10.1	39.2	55.8	73.9	18.1	100	359	
Hori.	1333.348	AV	41.0	24.8	12.8	40.8	37.8	53.9	16.1	108	194	
Hori.	2453.000	AV	35.9	27.4	13.8	41.1	36.0	53.9	17.9	100	359	
Hori.	2483.500	AV	35.3	27.5	13.8	41.1	35.5	53.9	18.4	100	0	
Hori.	2507.000	AV	35.3	27.5	14.0	41.1	35.7	53.9	18.2	100	359	
Hori.	3144.832	AV	44.4	28.9	5.4	41.5	37.2	53.9	16.7	193	132	
Hori.	4960.000	AV	35.8	31.4	5.9	40.8	32.3	53.9	21.6	100	200	
Hori.	7440.000	AV	35.9	37.0	7.5	41.5	38.9	53.9	15.0	100	0	
Hori.	9920.000	AV	33.2	38.8	8.6	38.8	41.8	53.9	12.1	100	0	
Hori.	12400.000	AV	33.6	39.4	10.1	39.2	43.9	53.9	10.0	100	359	
Vert.	174.645	QP	41.4	15.7	7.8	32.0	32.9	43.5	10.6	100	188	
Vert.	699.992	QP	39.5	20.5	10.1	31.8	38.3	46.0	7.7	112	359	
Vert.	2453.000	PK	47.4	27.4	13.8	41.1	47.5	73.9	26.4	100	0	
Vert.	2483.500	PK	47.7	27.5	13.8	41.1	47.9	73.9	26.0	100	359	
Vert.	2507.000	PK	47.3	27.5	14.0	41.1	47.7	73.9	26.2	100	0	
Vert.	3144.832	PK	49.6	28.9	5.4	41.5	42.4	73.9	31.5	132	339	
Vert.	4960.000	PK	47.5	31.4	5.9	40.8	44.0	73.9	29.9	100	0	
Vert.	7440.000	PK	47.2	37.0	7.5	41.5	50.2	73.9	23.7	100	0	
Vert.	9920.000	PK	44.6	38.8	8.6	38.8	53.2	73.9	20.7	100	359	
Vert.	12400.000	PK	46.0	39.4	10.1	39.2	56.3	73.9	17.6	100	0	
Vert.	2453.000	AV	35.4	27.4	13.8	41.1	35.5	53.9	18.4	100	0	
Vert.	2483.500	AV	35.3	27.5	13.8	41.1	35.5	53.9	18.4	100	359	
Vert.	2507.000	AV	35.3	27.5	14.0	41.1	35.7	53.9	18.2	100	0	
Vert.	3144.832	AV	42.7	28.9	5.4	41.5	35.5	53.9	18.4	132	339	
Vert.	4960.000	AV	35.5	31.4	5.9	40.8	32.0	53.9	21.9	100	0	
Vert.	7440.000	AV	35.6	37.0	7.5	41.5	38.6	53.9	15.3	100	0	
Vert.	9920.000	AV	33.1	38.8	8.6	38.8	41.7	53.9	12.2	100	359	
Vert.	12400.000	AV	33.6	39.4	10.1	39.2	43.9	53.9	10.0	100	0	

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

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

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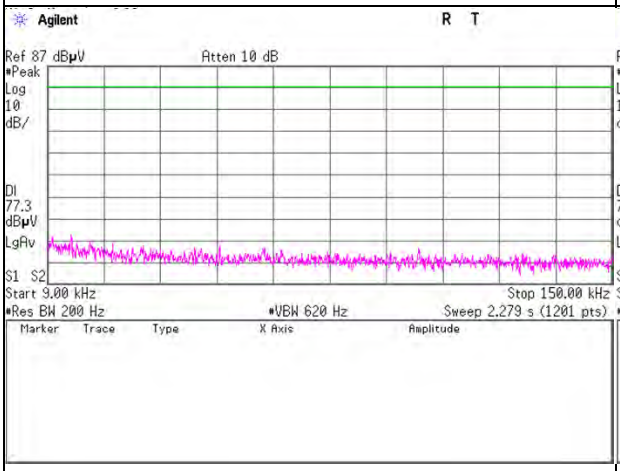
Spurious emission (Conducted)

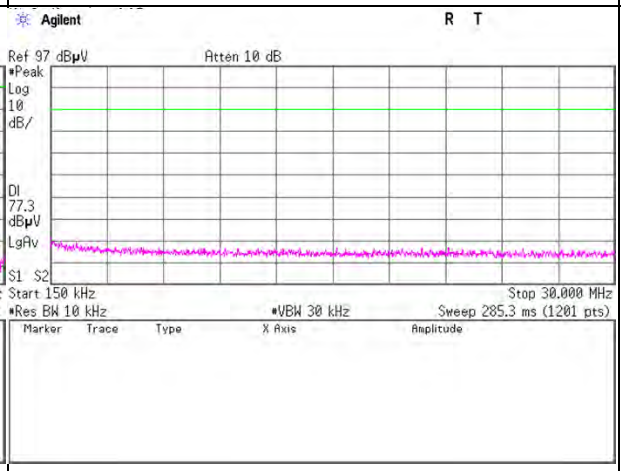
Tx, Bluetooth, BDR, PRBS9

Tx, 2402MHz (1/2)

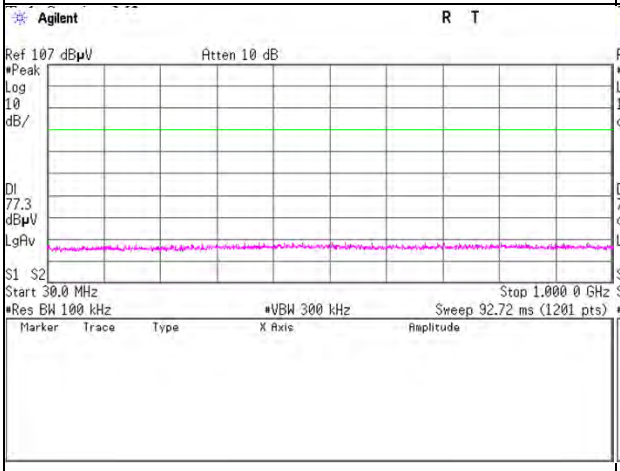
9kHz - 150kHz



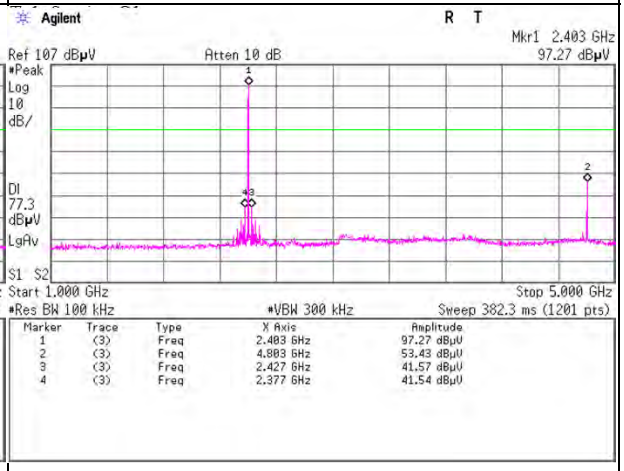
150kHz - 30MHz



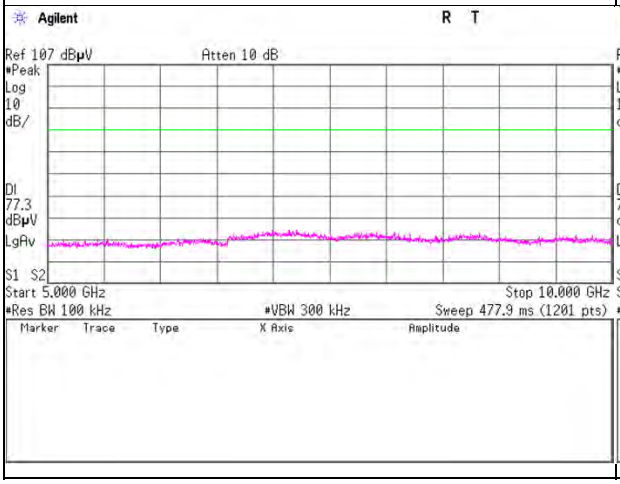
30MHz - 1GHz



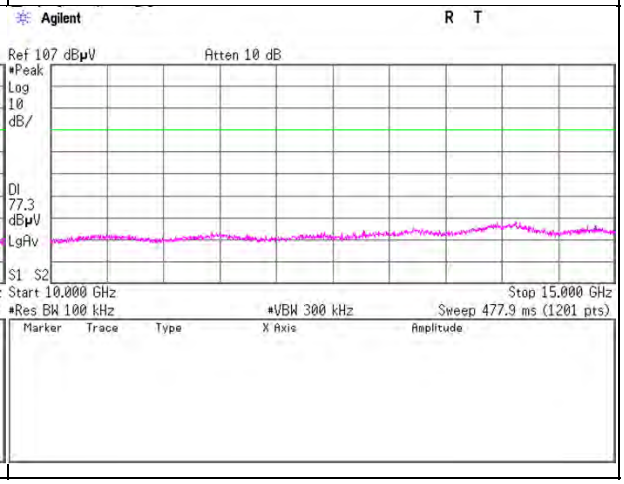
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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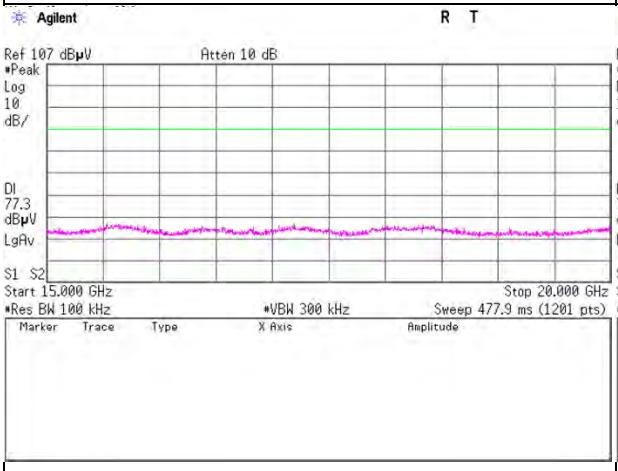
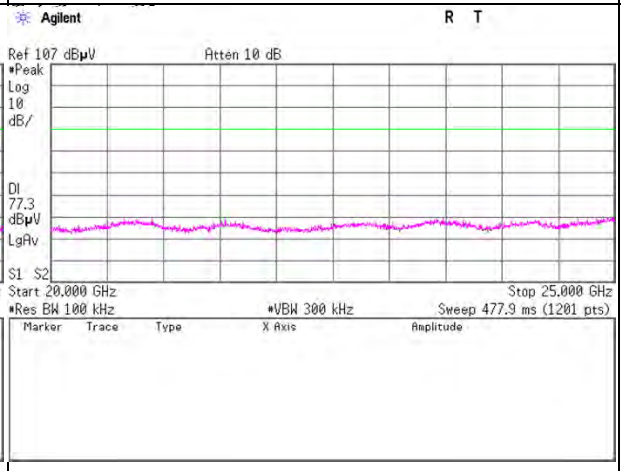
Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

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

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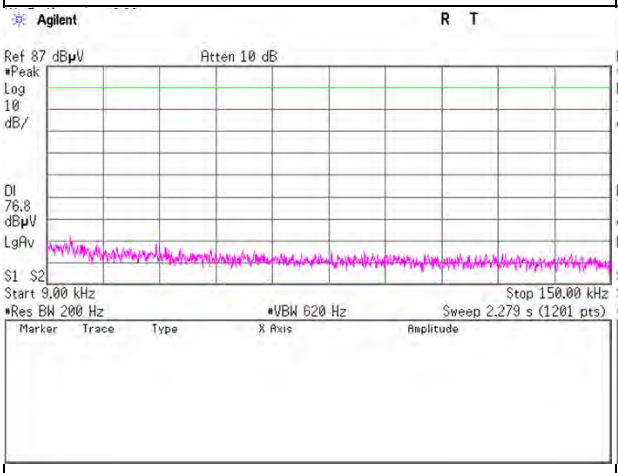
Spurious emission (Conducted)

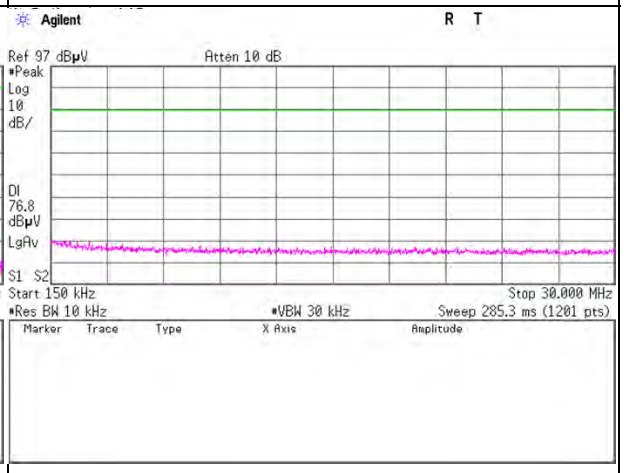
Tx, Bluetooth, BDR, PRBS9

Tx, 2441MHz (1/2)

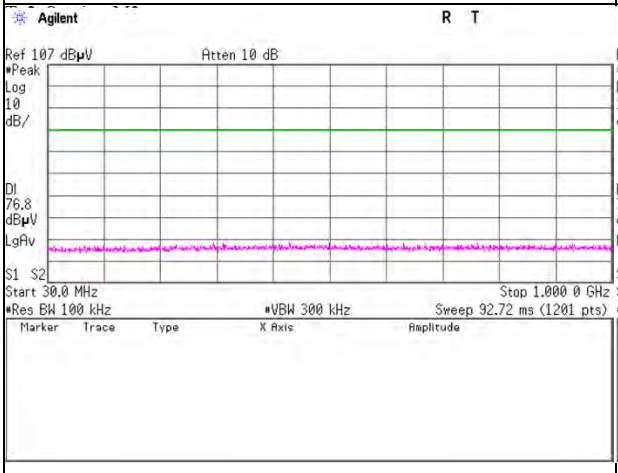
9kHz - 150kHz



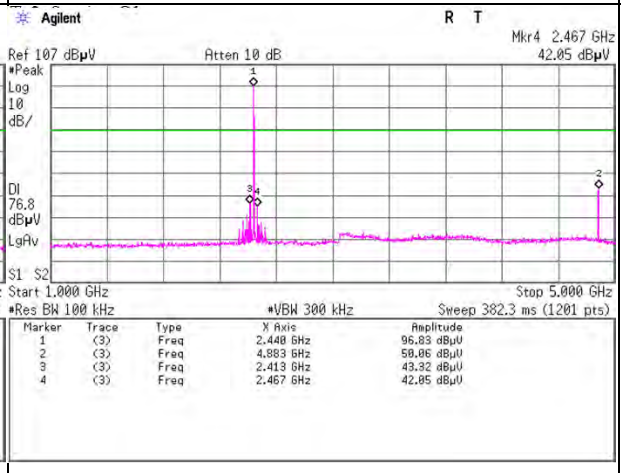
150kHz - 30MHz



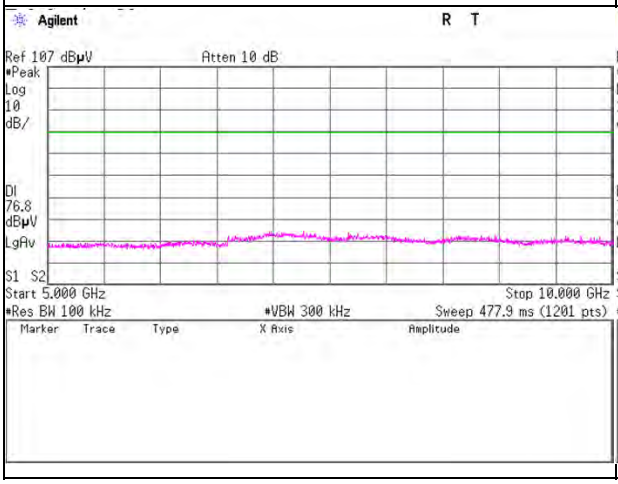
30MHz - 1GHz



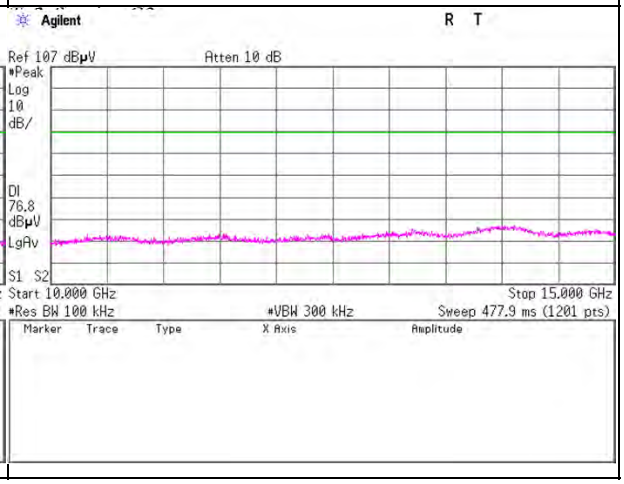
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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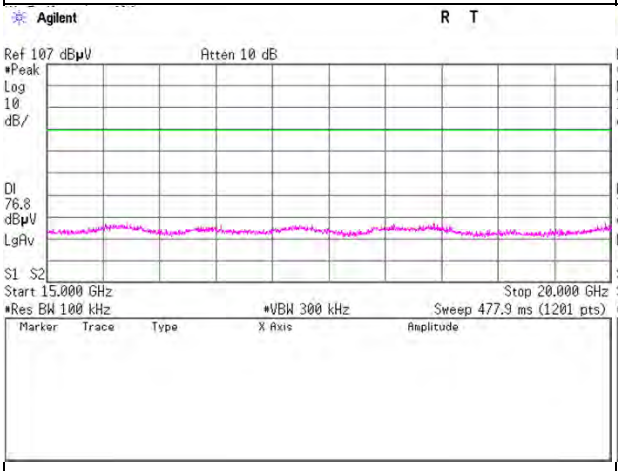
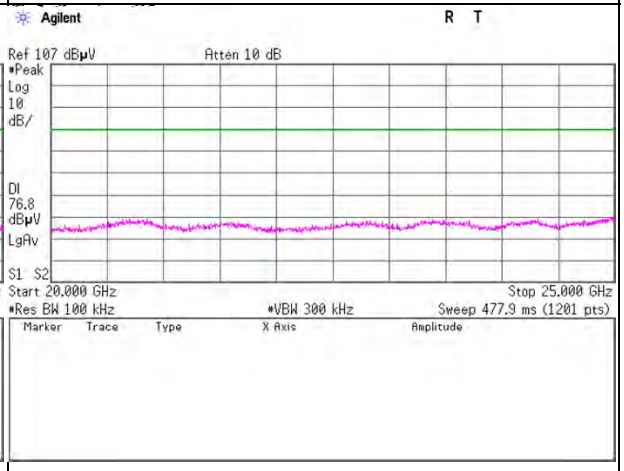
Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

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

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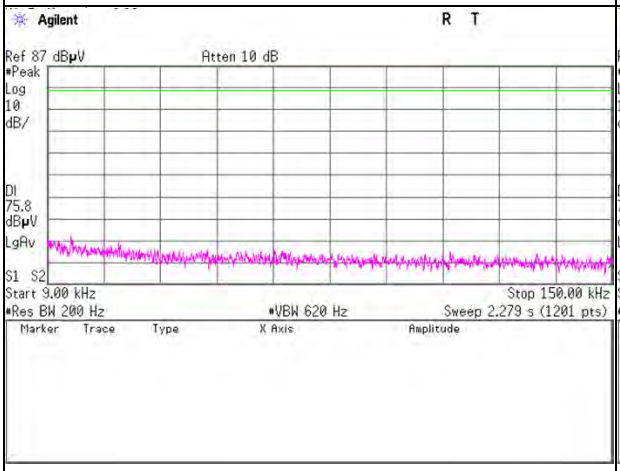
Spurious emission (Conducted)

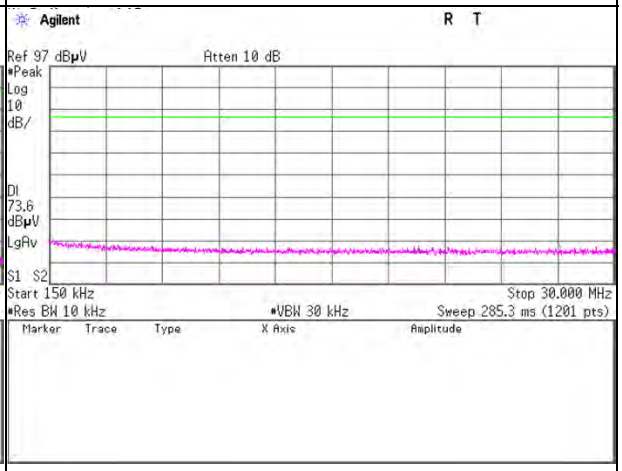
Tx, Bluetooth, BDR, PRBS9

Tx, 2480MHz (1/2)

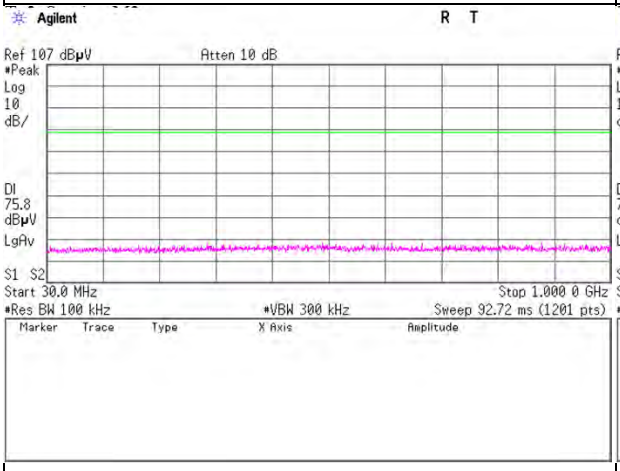
9kHz - 150kHz



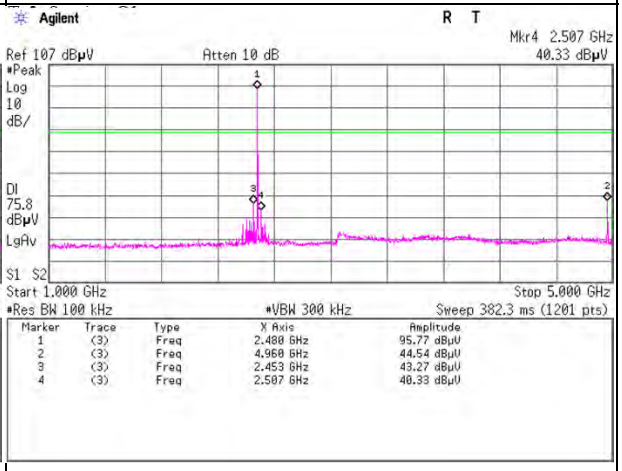
150kHz - 30MHz



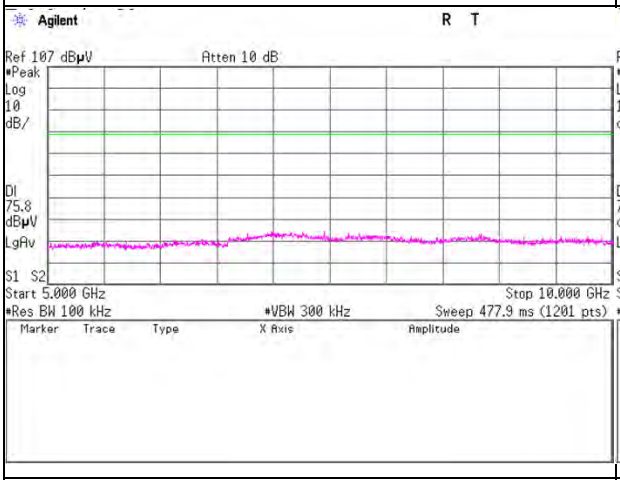
30MHz - 1GHz



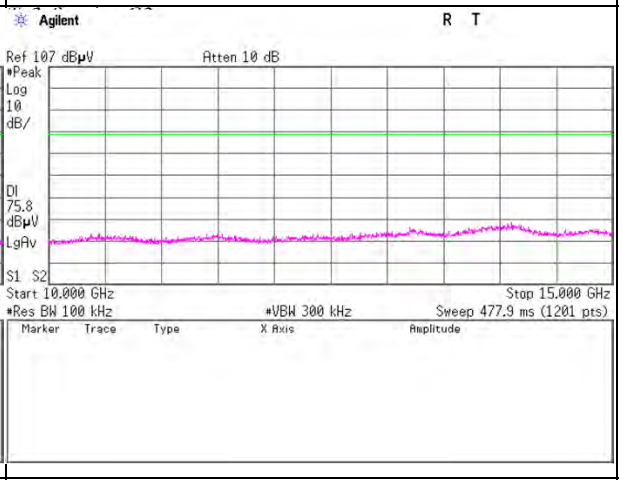
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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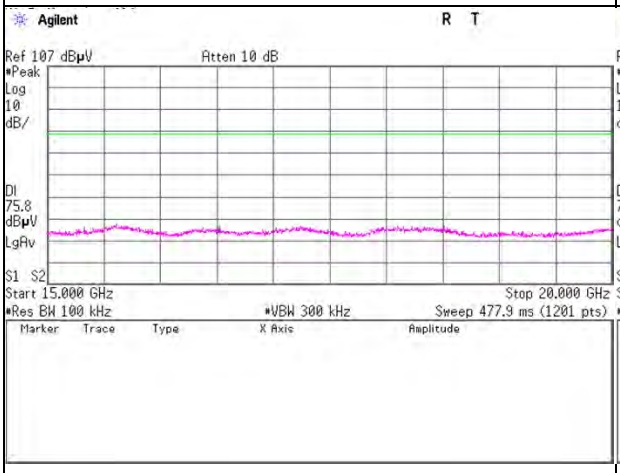
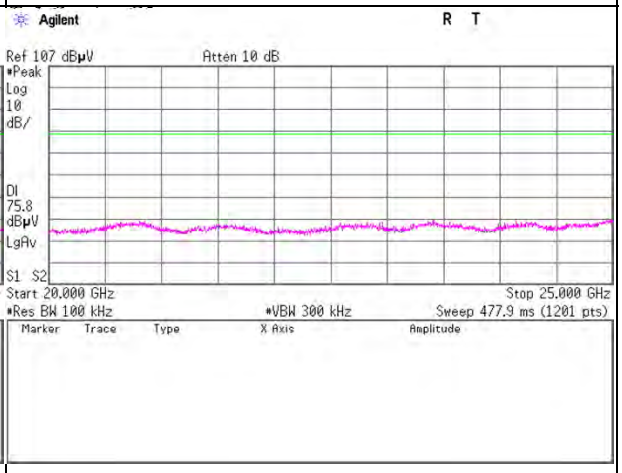
Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

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

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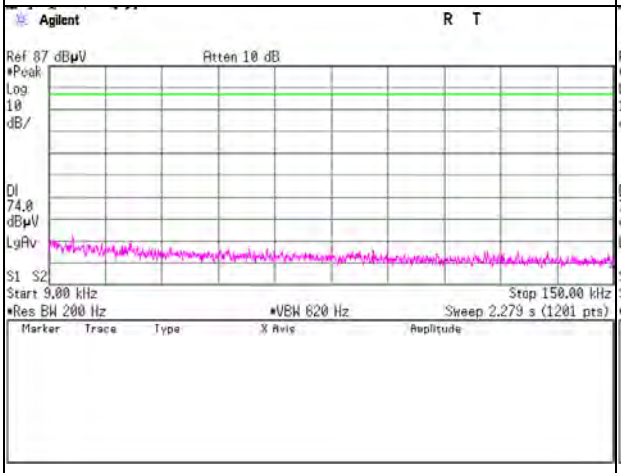
Spurious emission (Conducted)

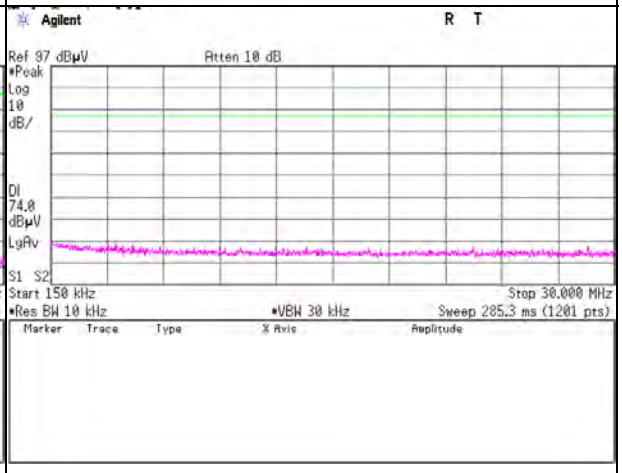
Tx, Bluetooth, EDR, PRBS9

Tx, 2402MHz (1/2)

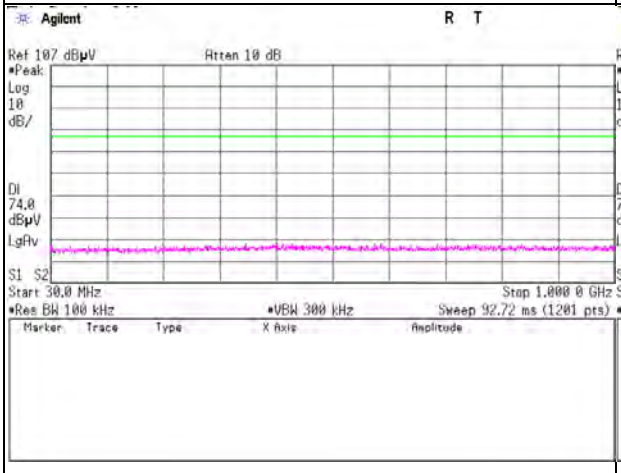
9kHz - 150kHz



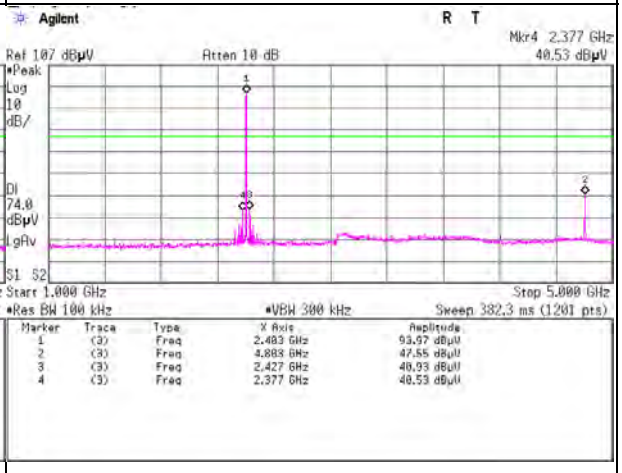
150kHz - 30MHz



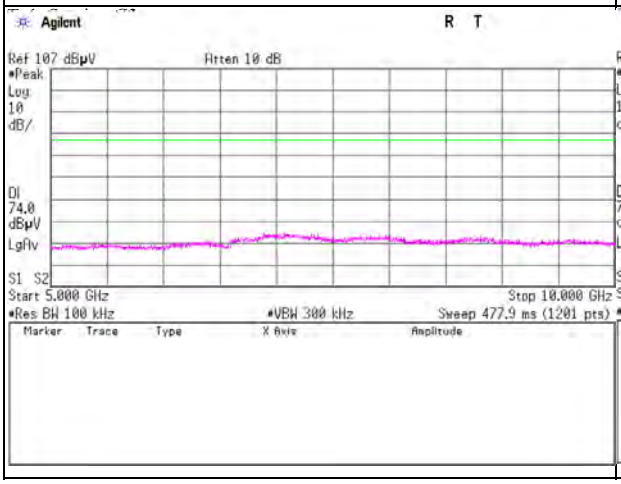
30MHz - 1GHz



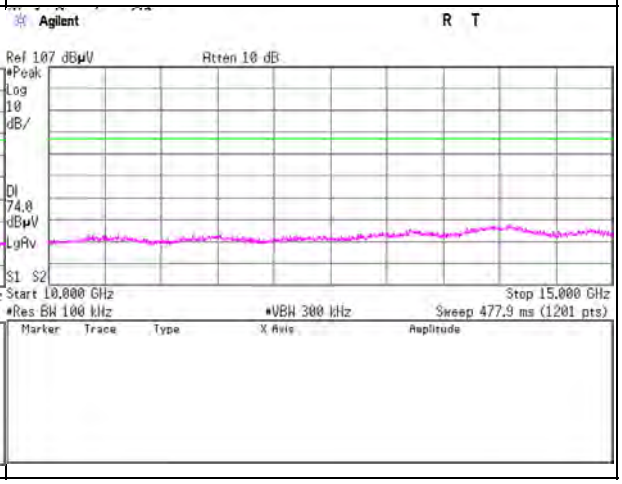
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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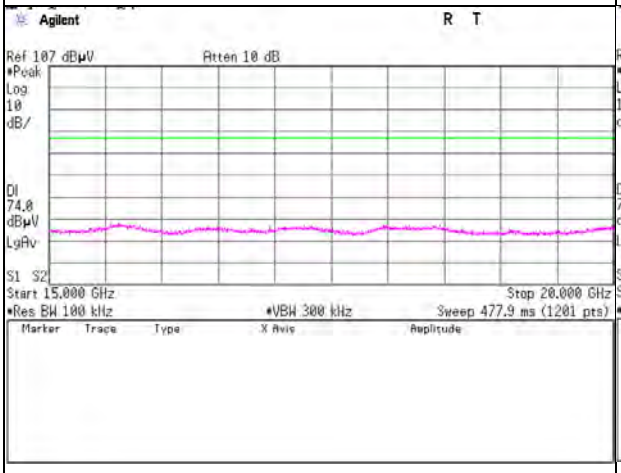
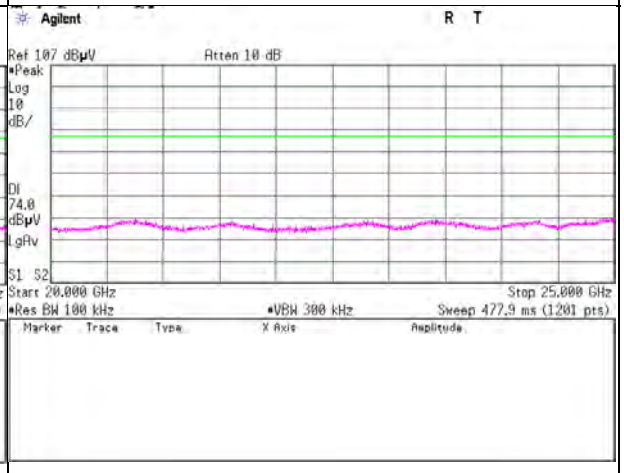
Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

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

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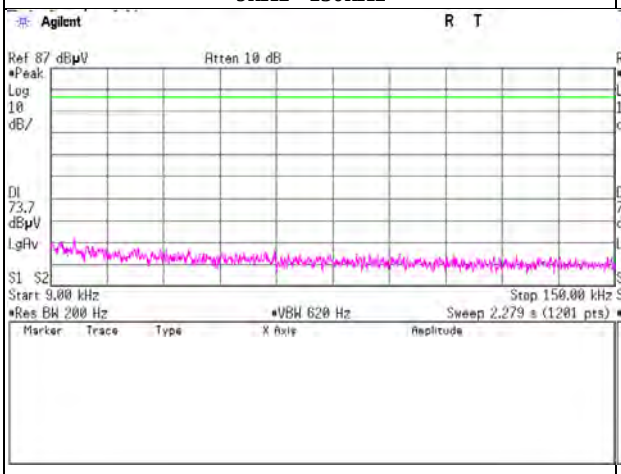
Spurious emission (Conducted)

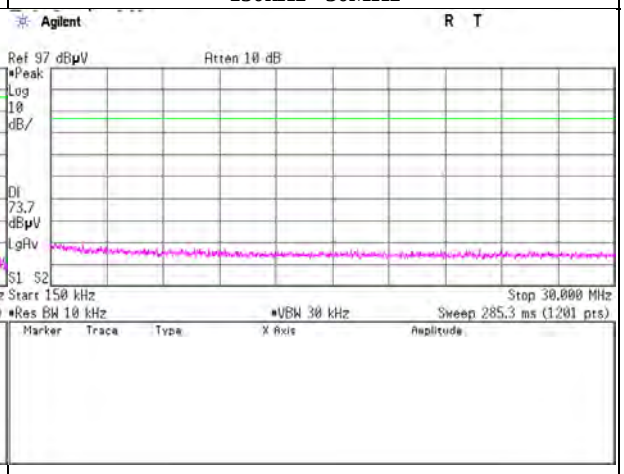
Tx, Bluetooth, EDR, PRBS9

Tx, 2441MHz (1/2)

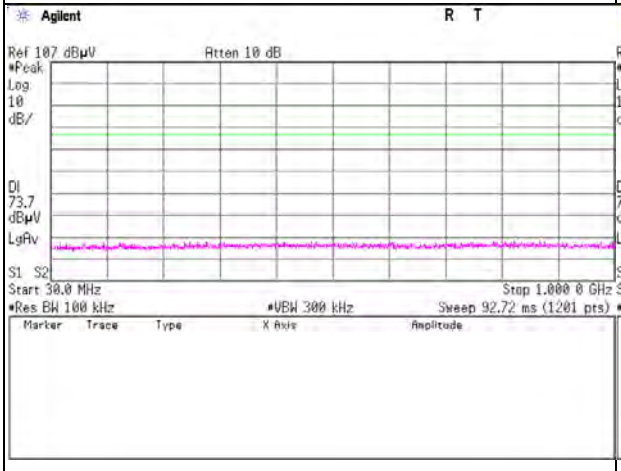
9kHz - 150kHz



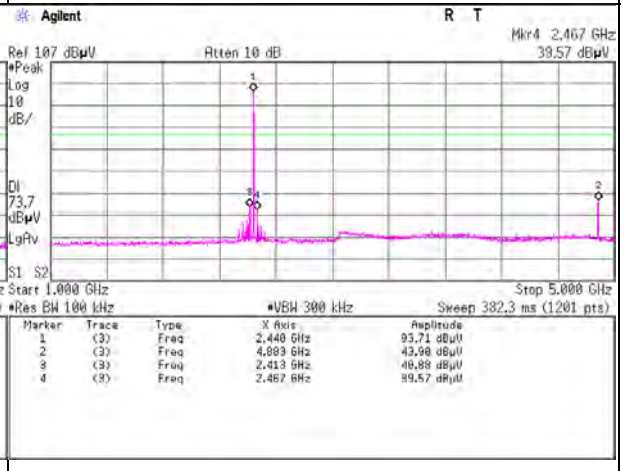
150kHz - 30MHz



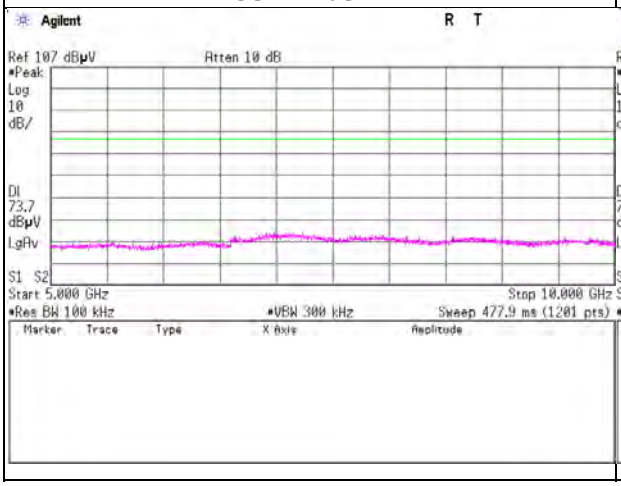
30MHz - 1GHz



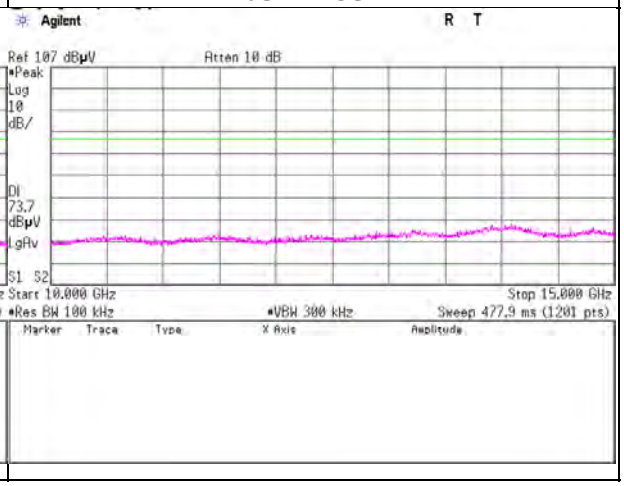
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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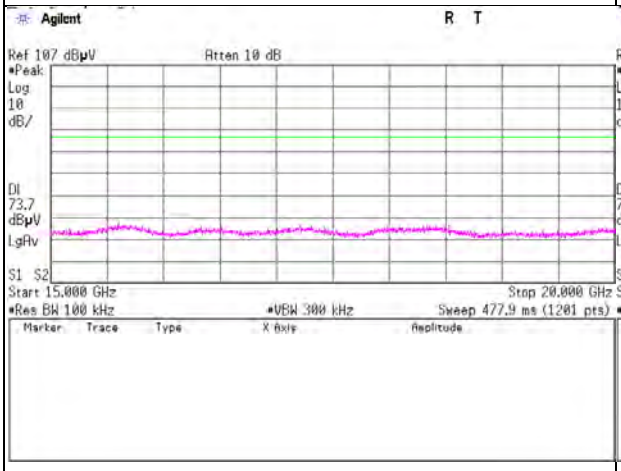
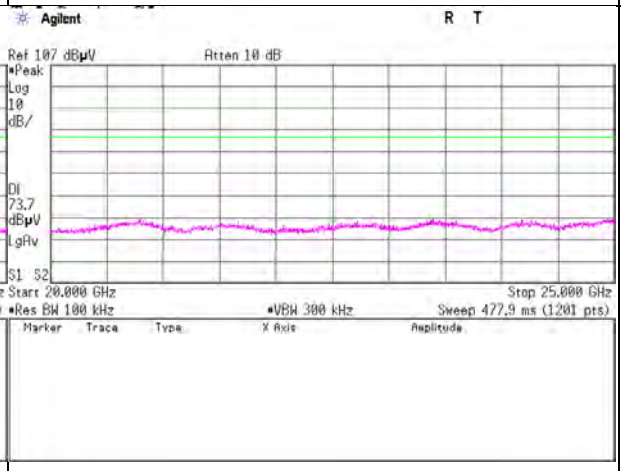
Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

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

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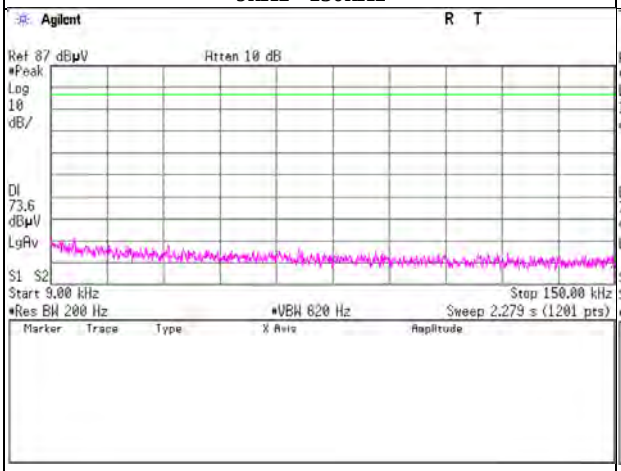
Spurious emission (Conducted)

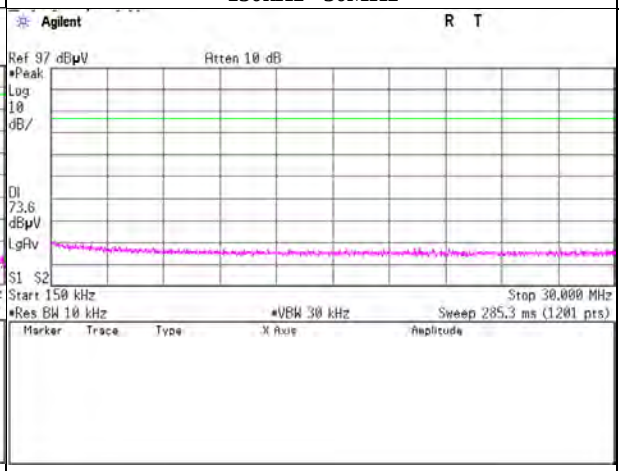
Tx, Bluetooth, EDR, PRBS9

Tx, 2480MHz (1/2)

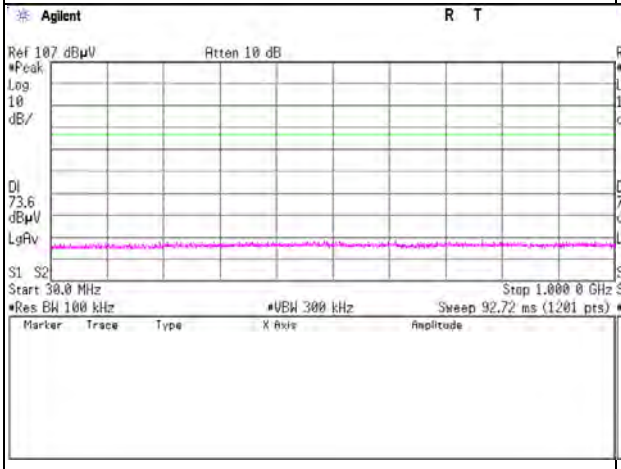
9kHz - 150kHz



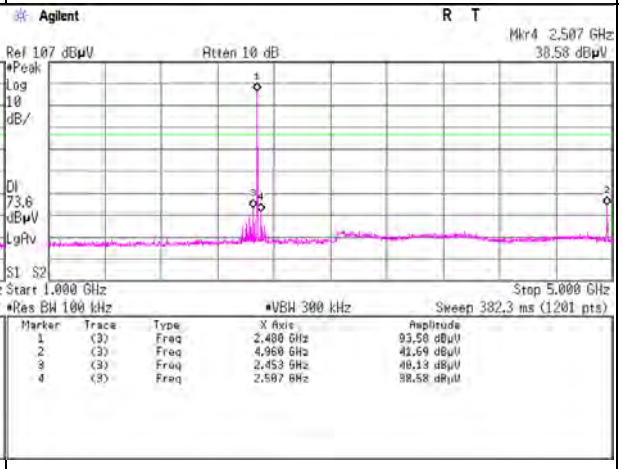
150kHz - 30MHz



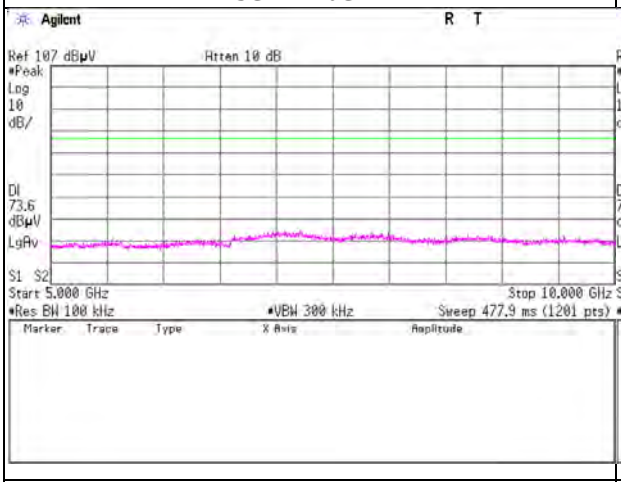
30MHz - 1GHz



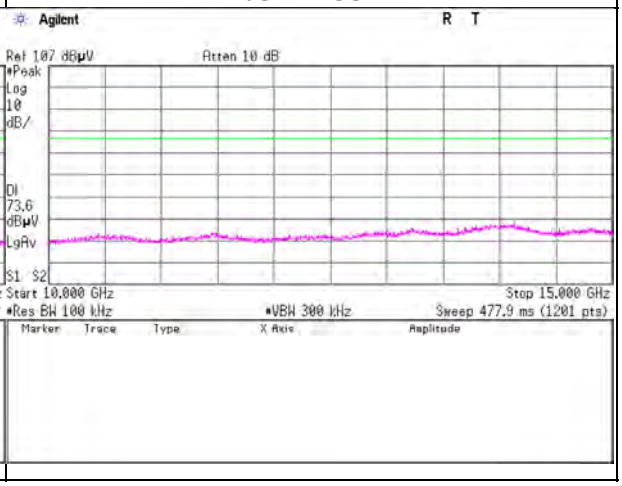
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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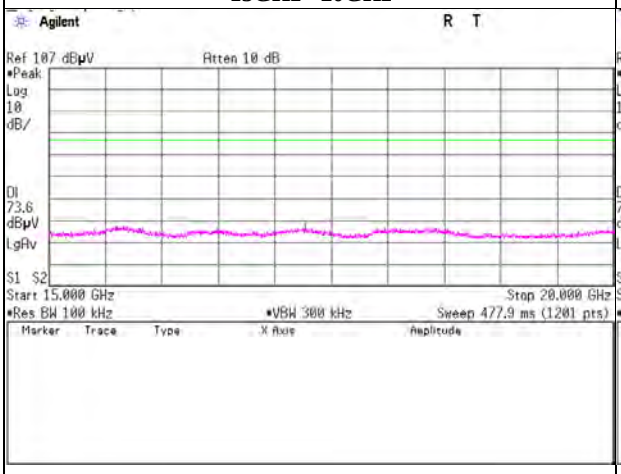
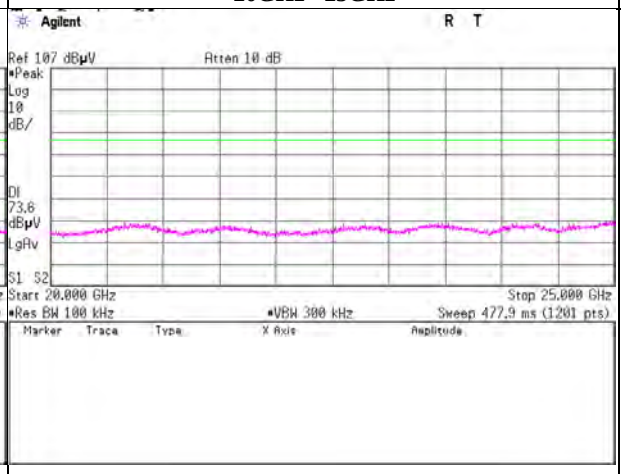
Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

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

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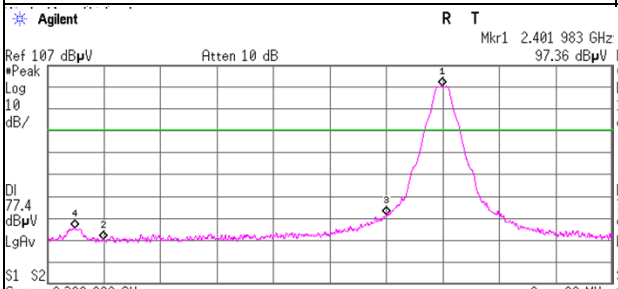
Spurious emission (Conducted)

Band Edge compliance

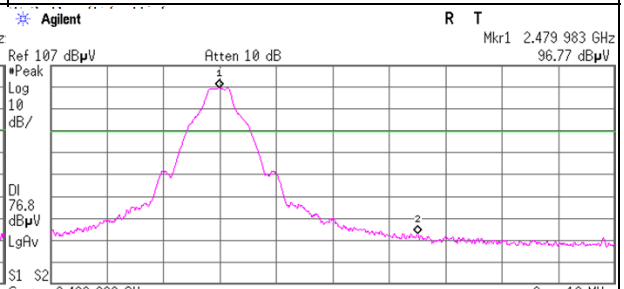
Tx, Bluetooth, BDR, PRBS9

Tx, 2402MHz



Marker	Trace	Type	X Axis	Amplitude
1	(3)	Freq	2.401 983 GHz	97.36 dBµV
2	(3)	Freq	2.390 000 GHz	27.49 dBµV
3	(3)	Freq	2.400 000 GHz	38.43 dBµV
4	(3)	Freq	2.388 967 GHz	32.71 dBµV

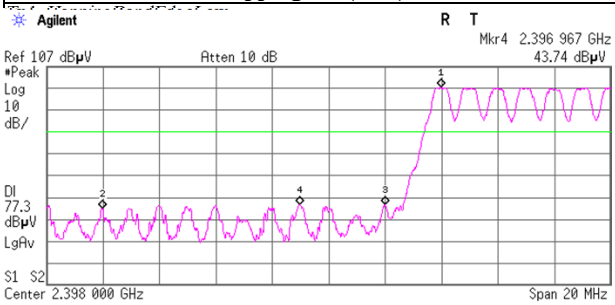
Tx, 2480MHz



Marker	Trace	Type	X Axis	Amplitude
1	(3)	Freq	2.479 983 GHz	96.77 dBµV
2	(3)	Freq	2.483 500 GHz	29.77 dBµV

Tx, Bluetooth, BDR, PRBS9

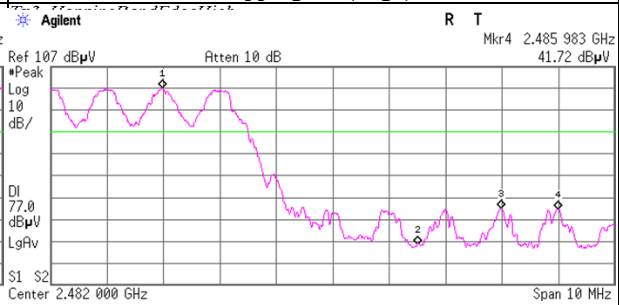
Hopping On (Low)



Marker	Trace	Type	X Axis	Amplitude
1	(3)	Freq	2.401 967 GHz	97.29 dBµV
2	(3)	Freq	2.390 000 GHz	41.88 dBµV
3	(3)	Freq	2.400 000 GHz	43.60 dBµV
4	(3)	Freq	2.396 967 GHz	43.74 dBµV

The radiated emission of the 2396.967MHz noise was measured as the floor noise.

Hopping On (High)



Marker	Trace	Type	X Axis	Amplitude
1	(3)	Freq	2.478 983 GHz	96.96 dBµV
2	(3)	Freq	2.483 500 GHz	25.67 dBµV
3	(3)	Freq	2.484 983 GHz	41.99 dBµV
4	(3)	Freq	2.485 983 GHz	41.72 dBµV

The radiated emission of the 2484.983MHz and 2485.983MHz noises was measured as the floor noise.

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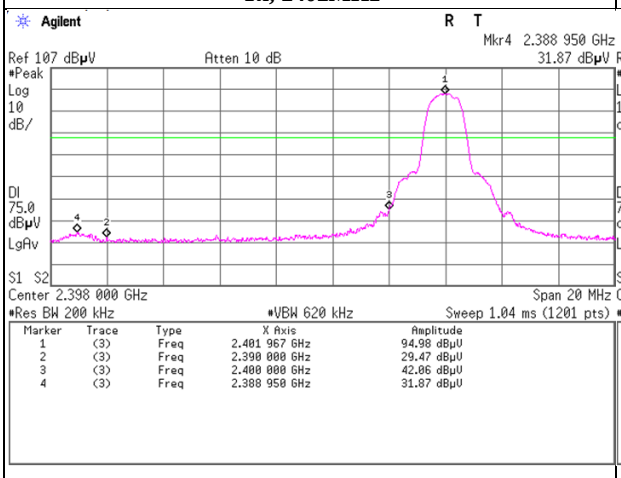
Spurious emission (Conducted)

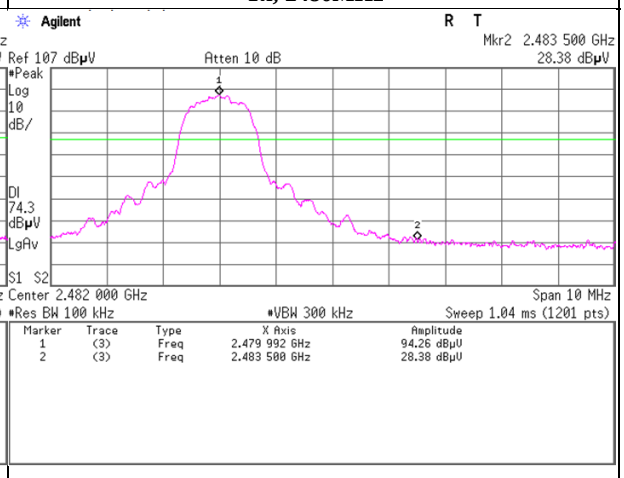
Band Edge compliance

Tx, Bluetooth, EDR, PRBS9

Tx, 2402MHz

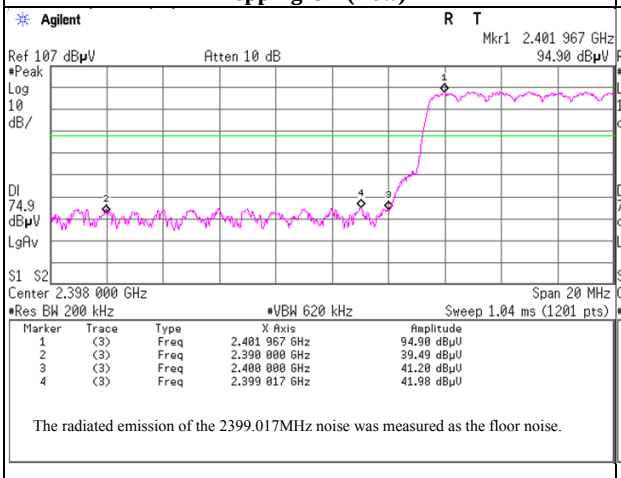


Tx, 2480MHz



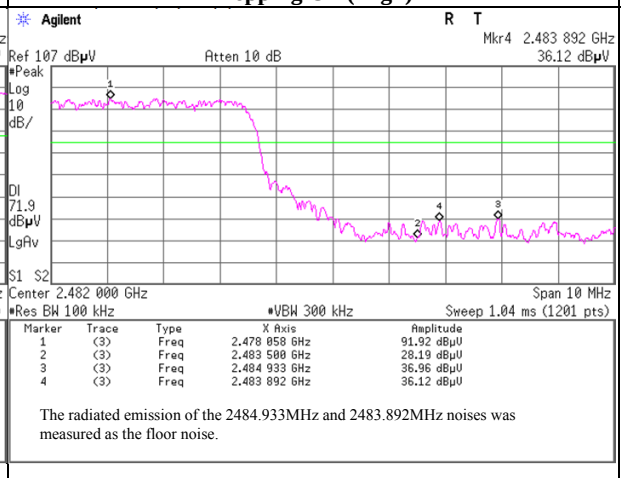
Tx, Bluetooth, EDR, PRBS9

Hopping On (Low)



The radiated emission of the 2399.017MHz noise was measured as the floor noise.

Hopping On (High)



The radiated emission of the 2484.933MHz and 2483.892MHz noises was measured as the floor noise.

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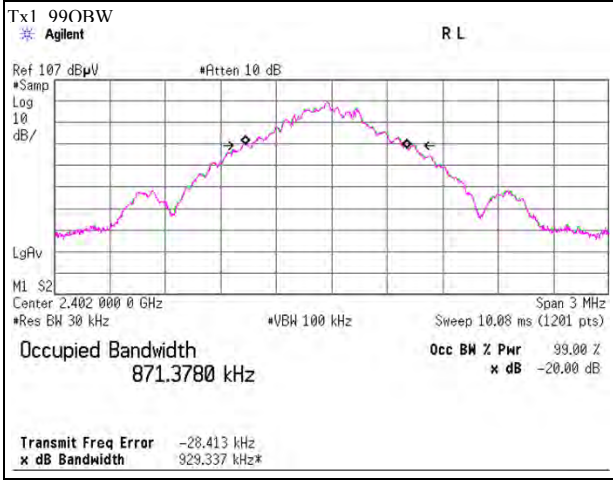
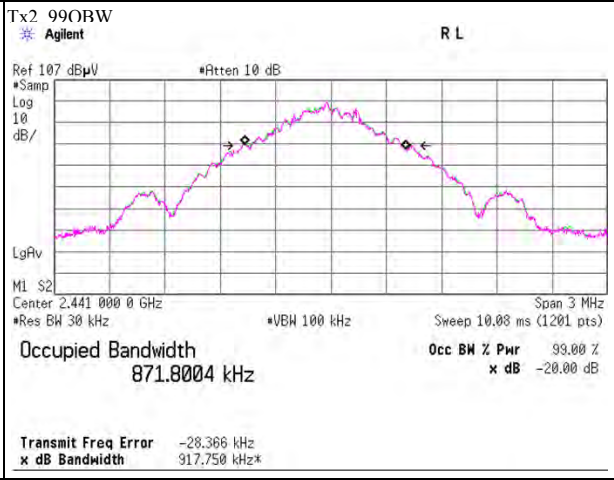
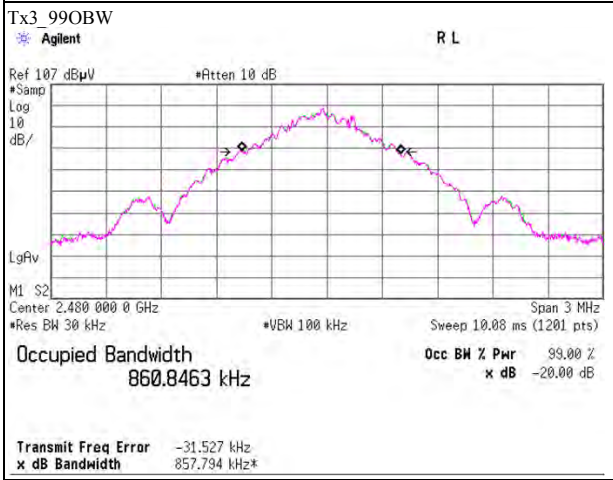
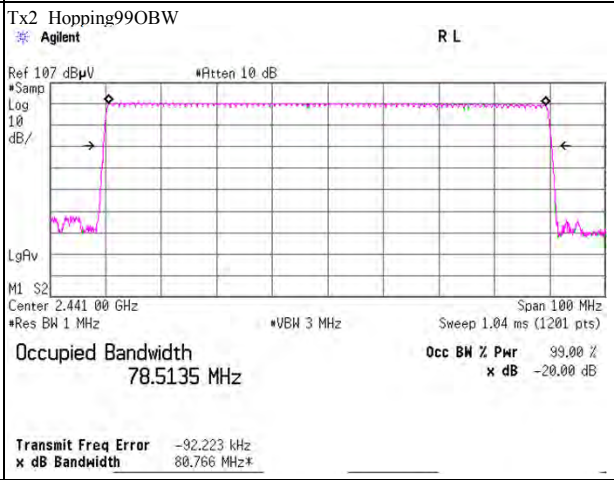
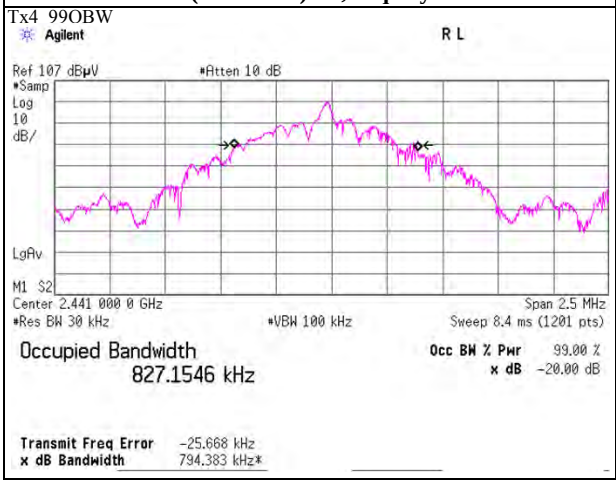
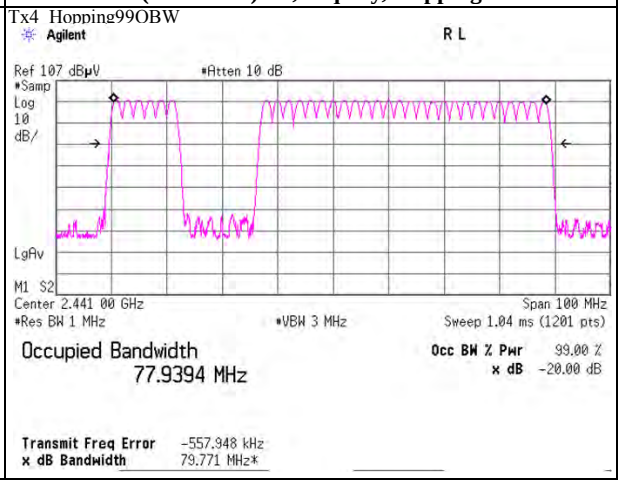
99% Occupied Bandwidth

Tx, Bluetooth, BDR, PRBS9	
Tx, 2402MHz	**Tx, 2441MHz**
	
Tx, 2480MHz	**Tx, Hopping On**
	
(Reference) Tx, Inquiry	**(Reference) Tx, Inquiry, Hopping**
	

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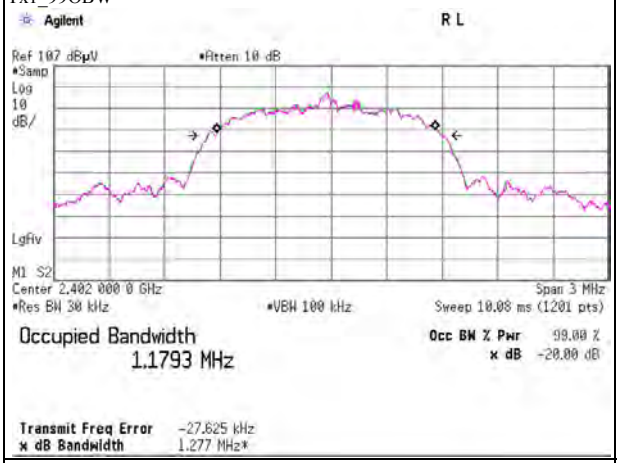
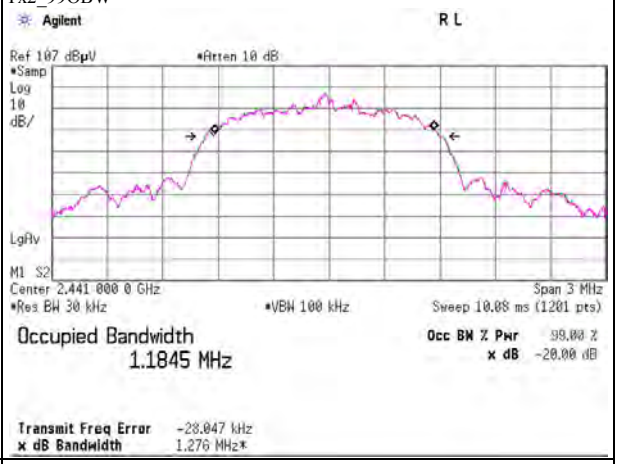
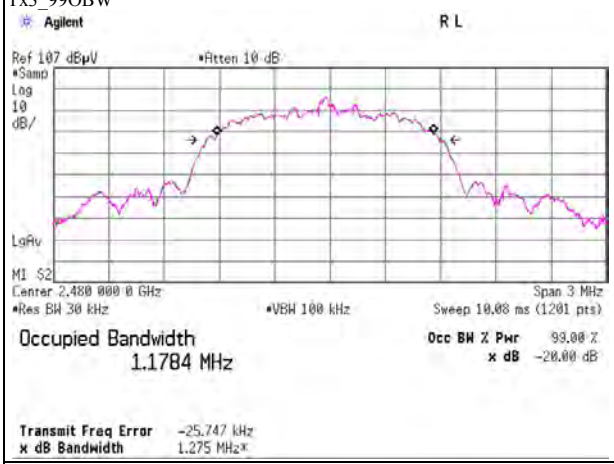
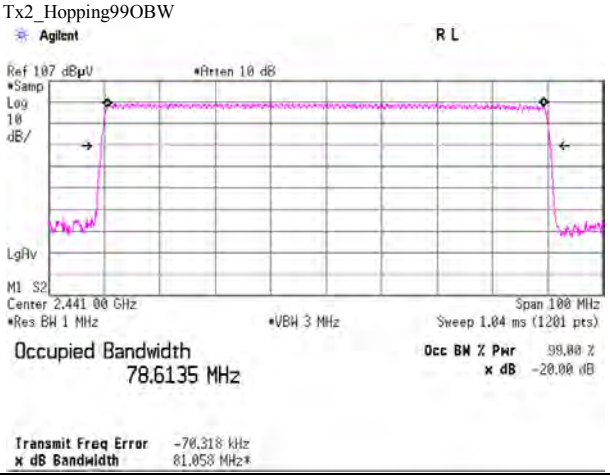
99% Occupied Bandwidth

Tx, Bluetooth, EDR, PRBS9	
Tx, 2402MHz	**Tx, 2441MHz**
Tx1_99OBW 	Tx2_99OBW 
Tx, 2480MHz	**Tx, Hopping On**
Tx3_99OBW 	Tx2_Hopping99OBW 
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)
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2011/12/05 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2011/03/23 * 12
SAT10-08	Attenuator	Weinschel	W54-10	-	AT	2011/03/23 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2011/04/12 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2011/04/12 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2011/03/02 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2011/07/19 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2011/04/28 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2011/05/27 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2011/08/28 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2011/02/23 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2011/03/07 * 12
SJM-10	Measure	PROMART	SEN1935	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFI,MF)	-	RE	-
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2011/12/27 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2011/12/27 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2011/03/15 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2011/03/16 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	2011/03/16 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2011/02/17 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	2011/02/17 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2011/10/23 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2011/04/28 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2011/10/23 * 12
STR-03	Test Receiver	Rohde & Schwarz	ESI40	100054/040	RE	2011/07/28 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2011/09/23 * 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