RADIO TEST REPORT

Test Report No.: 10043958S-A

Applicant	:	**PIONEER CORPORATION**
Type of Equipment	:	**Car Audio**
Model No.	:	**DEH-3548ZH**
FCC ID	:	**AJDK076**
Test regulation	:	**FCC Part15 Subpart C: 2013**
Test result	:	**Complied**

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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: August 9 to 29, 2013

Tested by:

Akira Sato
Engineer of WiSE Japan,
UL Verification Service

Approved by :

Toyokazu Imamura
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".

Testing
RTL02610

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REVISION HISTORY

Original Test Report No.: 10043958S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10043958S-A	September 26, 2013	-	-

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SECTION 1: Customer information

Company Name	:	PIONEER CORPORATION
Address	:	25-1 Aza Nishimachi, Yamada, Kawagoe-shi, Saitama 350-8555, JAPAN
Telephone Number	:	+81 49 228 6415
Facsimile Number	:	+81 49 228 6493
Contact Person	:	Tomoyuki Tanaka

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

2.1 Identification of E.U.T.

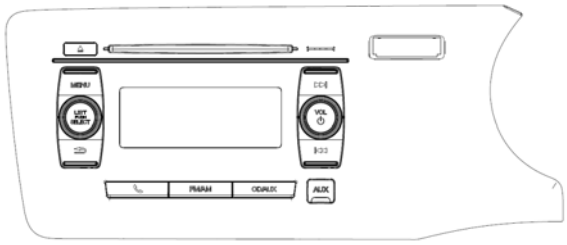
Type of Equipment	:	Car Audio
Model Number	:	DEH-3548ZH
Serial Number	:	Refer to 4.2 of this report.
Rating	:	DC12V (car battery)
Country of Mass-production	:	Thailand
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample	:	August 9, 2013
Modification of EUT	:	No modification by the test lab.

2.2 Product description

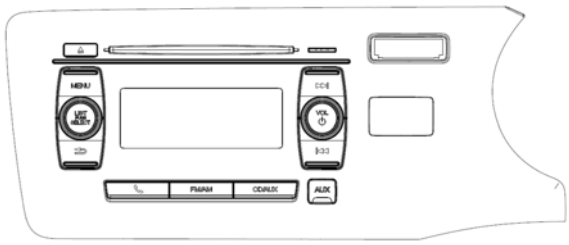
Model: DEH-3548ZH (referred to as the EUT in this report) is a Car Audio.

The EUT has a similar model: DEH-4648ZH
Difference: Front Face Shape
The difference doesn't affect the radio characteristics.

DEH-3548ZH



DEH-4648ZH



Clock frequency(ies) in the system	:	(1) FM/AM Tuner Clock: 62.4MHz (2) Micro Computer Clock: 12MHz (3) BT Module: 26MHz, 25.8048MHz

Bluetooth specification:

Equipment type	:	Transceiver
Frequency of operation	:	2402-2480MHz
Bandwidth & channel spacing	:	79MHz & 1MHz
Type of modulation	:	FHSS (BDR: GFSK Bbt=0.5, EDR: π/4-DQPSK, 8DPSK)
Antenna type	:	Pattern
Antenna connector type	:	None
Antenna gain	:	2.5dBi
ITU code	:	F1D
Operation temperature range	:	-30 to +70 deg.C.

FCC 15.31 (e)
This EUT provides stable voltage (DC 3.3V & DC 1.5V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

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

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2013, final revised on June 11, 2013 and effective July 11, 2013
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

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)	-	-
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	6.0 dB Polarization: Vertical Detection: QP Freq.: 359.996MHz, Mode: Tx 2441MHz, 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	-	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	4.9 dB
	300MHz-1GHz	5.0 dB	5.2 dB	4.9 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	4.6 dB	4.3 dB	4.4 dB

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

The data listed in this test report has enough margin, more than the 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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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 semi-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 test & 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 / 3-DH5) / Inquiry, Payload: PRBS9	-
20dB bandwidth	Transmitting Hopping OFF (DH5 / 3-DH5) / Inquiry, Payload: PRBS9	2402MHz, 2441MHz, 2480MHz
Number of hopping frequency	Transmitting Hopping ON (DH5 / 3-DH5) / Inquiry, Payload: PRBS9	-
Dwell time	Transmitting (Hopping ON), Payload: PRBS9 - DH1, - DH3, - DH5 - 3-DH1, - 3-DH3, - 3-DH5	-
	-Inquiry	
Maximum peak output power	Transmitting Hopping OFF , Payload: PRBS9 - DH5, - 2-DH5, - 3-DH5	2402MHz, 2441MHz, 2480MHz
Band edge compliance & Spurious emission (Conducted)	Transmitting (DH5 / 3-DH5), Payload: PRBS9 -Hopping ON -Hopping OFF	Band edge compliance: 2402MHz, 2480MHz Spurious emission: 2402MHz, 2441MHz, 2480MHz
(Radiated)	Transmitting (DH5 / 3-DH5), Payload: PRBS9 -Hopping OFF	
99% occupied bandwidth	Transmitting (DH5 / 3-DH5), Payload: PRBS9 / Inquiry -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).

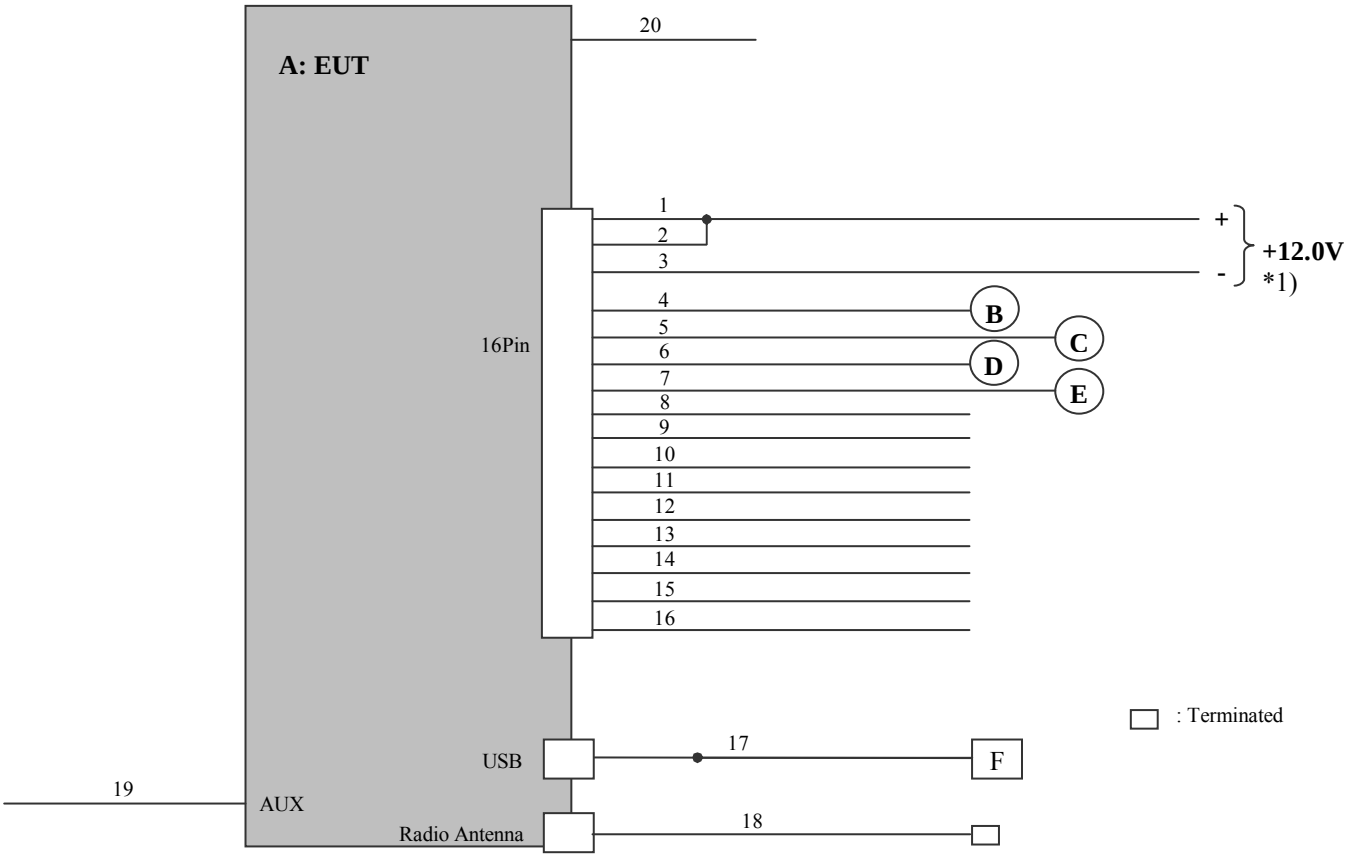
*Remarks: Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not affect the output power and bandwidth of the EUT.
As this device had AFH mode and frequency separation could not meet the requirement of over 20dB BW without 2/3 relaxation, 125mW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

EUT has the power settings by the software as follows;

Power settings	Fixed
Software	HCI Tester2 Ver.0.99le

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

4.2 Configuration and peripherals



* Cabling and setup were taken into consideration and test data was taken under worse case conditions.

*1) DC power supply (Model No.: PAN35-10A) was used for DC 12V input.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Audio	DEH-3548ZH	*2)	Pioneer	EUT
B	Speaker	LV-002	S11014200775	L&V	-
C	Speaker	LV-002	S11014200775	L&V	-
D	Speaker	LV-002	S11014200773	L&V	-
E	Speaker	LV-002	S11014200773	L&V	-
F	iPod touch	A1367	C3LH1SZ4DT75	Apple	-

*2) AABB999997ES: Antenna port conducted tests, AABB999998ES: Radiated emission tests

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	ACC	1.5+1.5	Unshielded	Unshielded	-
2	+B	1.5+1.5	Unshielded	Unshielded	-
3	MAIN GND	1.5+1.5	Unshielded	Unshielded	-
4	Speaker FL	1.5+3.0	Unshielded	Unshielded	-
5	Speaker FR	1.5+3.0	Unshielded	Unshielded	-
6	Speaker RL	1.5+3.0	Unshielded	Unshielded	-
7	Speaker RR	1.5+3.0	Unshielded	Unshielded	-
8	ILL+	1.5	Unshielded	Unshielded	-
9	ILL CANCEL	1.5	Unshielded	Unshielded	-
10	N.C.(TEL MUTE)	1.5	Unshielded	Unshielded	-
11	N.O.(SCTY/CLOCK)	1.5	Unshielded	Unshielded	-
12	REMOTE	1.5	Unshielded	Unshielded	-
13	REMOTE GND	1.5	Unshielded	Unshielded	-
14	SPKR NUM	1.5	Unshielded	Unshielded	-
15	K LINE	1.5	Unshielded	Unshielded	-
16	INFO REMOTE	1.5	Unshielded	Unshielded	-
17	USB	0.5+1.0	Shielded	Shielded	-
18	FM Antenna	0.3	Shielded	Shielded	-
19	AUX(Front)	1.5	Shielded	Shielded	-
20	Signal (Serial)	1.5	Unshielded	Unshielded	-

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 1.

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 1.

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 1.

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 1.

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 1.

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 1.

SECTION 11: Radiated emission

11.1 Operating environment

Test room : See test data (APPENDIX 1)
Temperature : See test data (APPENDIX 1)
Humidity : See test data (APPENDIX 1)

11.2 Test configuration

EUT was placed on a platform of nominal size, 1.0m 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.
Photographs of the set up are shown in APPENDIX 3.

11.3 Test conditions

Frequency range : 30MHz - 25GHz
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.

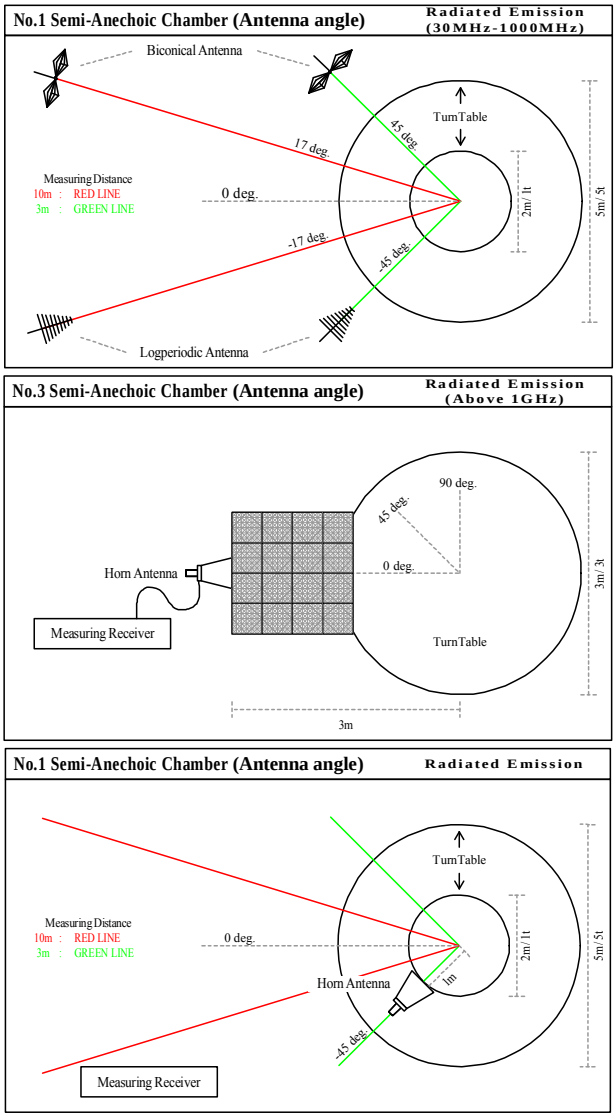
The radiated emission measurements were made with the following detection.

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 34 to 35 deg. based on the product specification to see the position of maximum noise, and the test was made at the position (35 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 1.

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
Dwell time factor Calculation chart
Spurious emission (Antenna port conducted)
Occupied bandwidth

APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Radiated emission

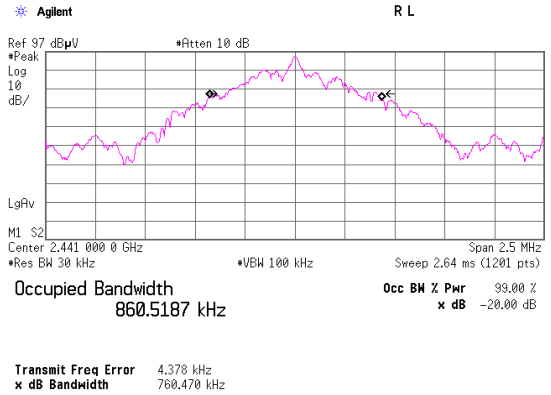
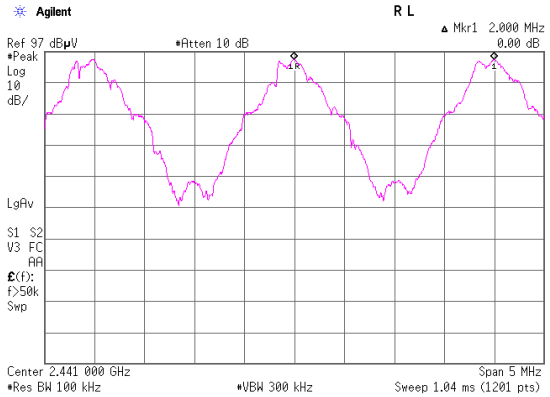
APPENDIX 1: Data of Radio tests

20dB Bandwidth and Carrier Frequency Separation

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 9, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Makoto Hosaka	
Mode	Tx, Bluetooth, BDR, PRBS9	

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
DH5	2402.0	0.925	1.000	>= 0.617
DH5	2441.0	0.927	1.000	>= 0.618
DH5	2480.0	0.919	1.000	>= 0.612
Inquiry	2441.0	0.760	2.000	>= 0.507

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**
	

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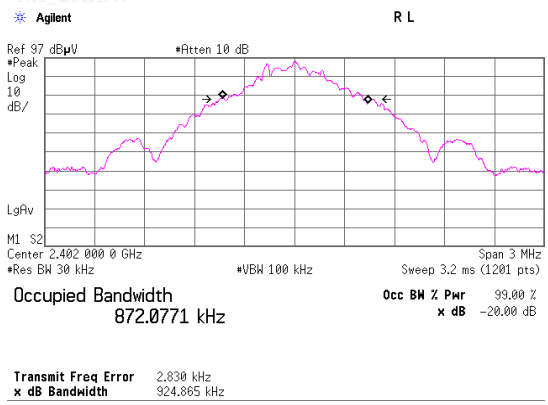
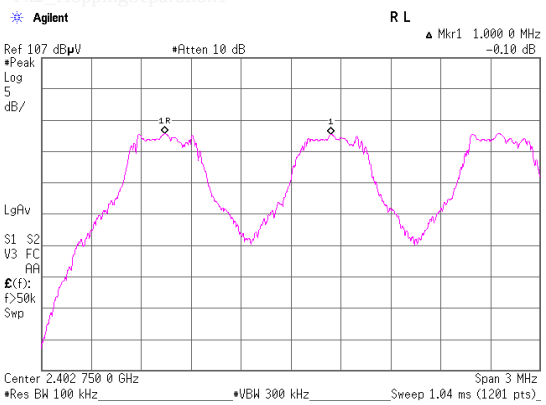
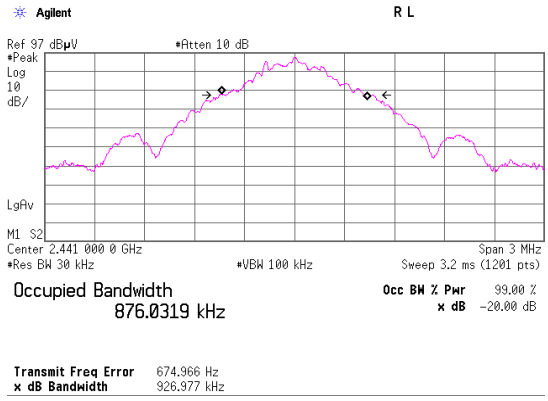
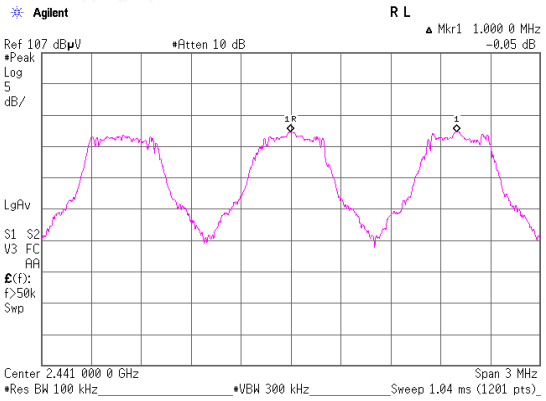
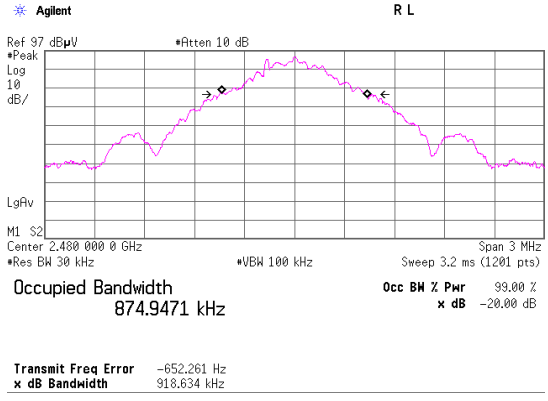
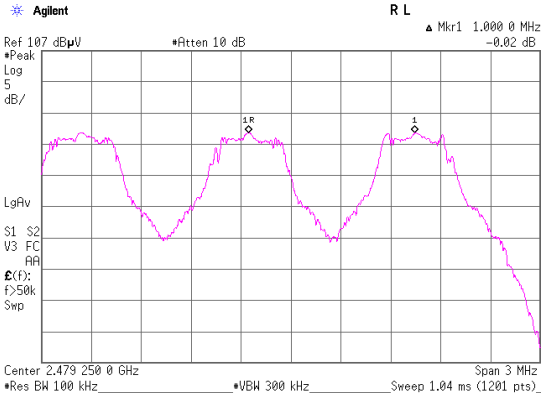
20dB Bandwidth and Carrier Frequency Separation

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.5 Shielded Room
Date	August 9, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Makoto Hosaka	
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	1.270	1.000	>= 0.847
3-DH5	2441.0	1.276	1.000	>= 0.851
3-DH5	2480.0	1.274	1.000	>= 0.849

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

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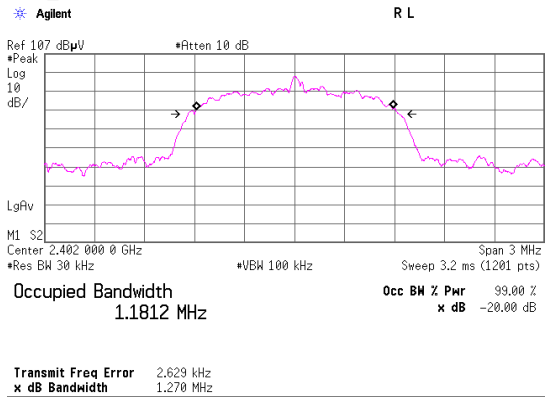
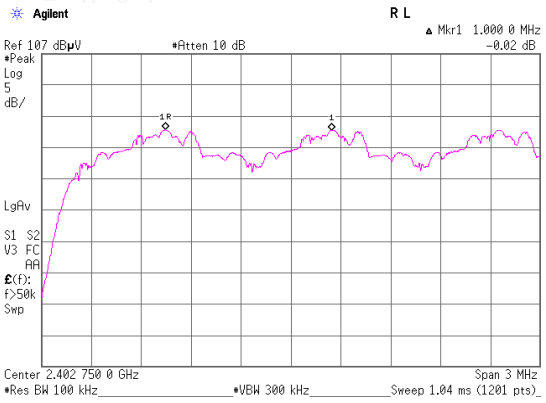
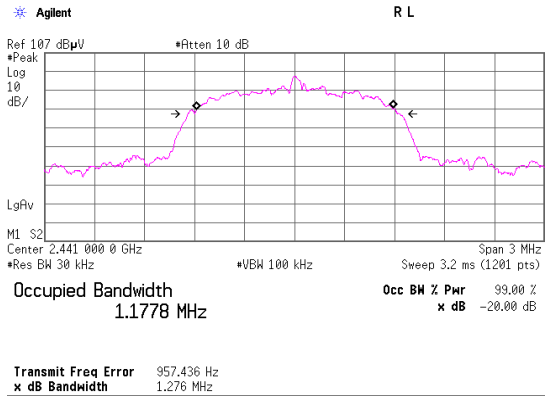
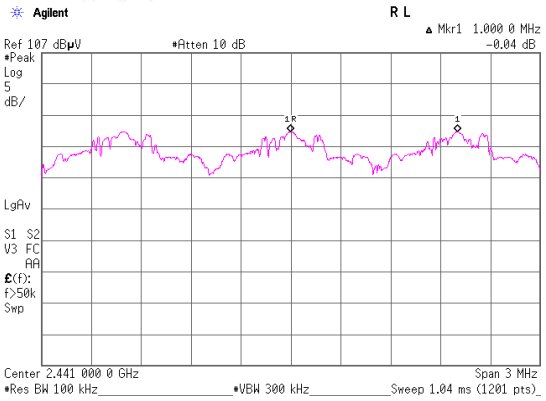
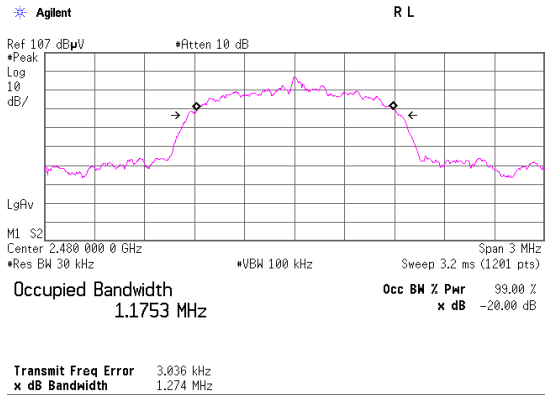
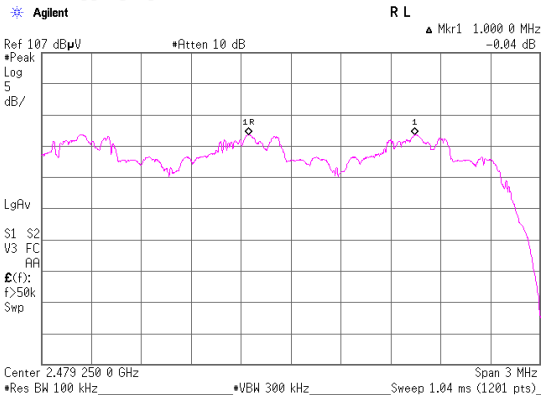
20dB Bandwidth and Carrier Frequency Separation

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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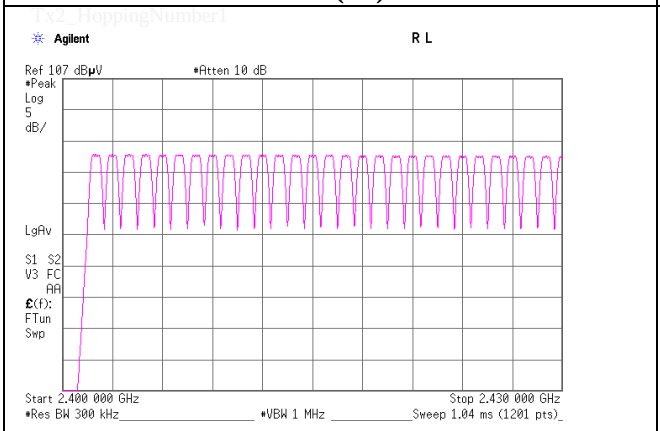
Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 9, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Makoto Hosaka	
Mode	Tx, Bluetooth, BDR, PRBS9	

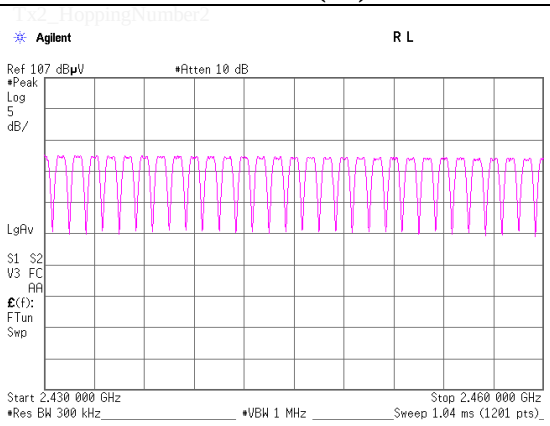
Mode	Number of Channel [times]	Limit [times]
DH5	79	>= 15

* Test was not performed at AFH mode whose number of hopping channel is 20 channels because this Bluetooth radio is in compliance of Bluetooth Specification.

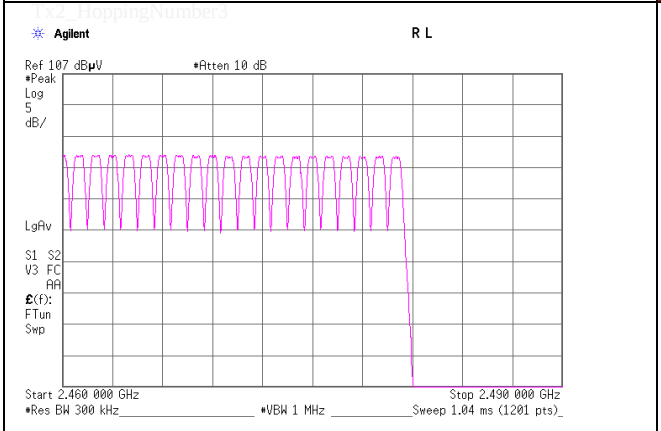
DH5 (1/3)

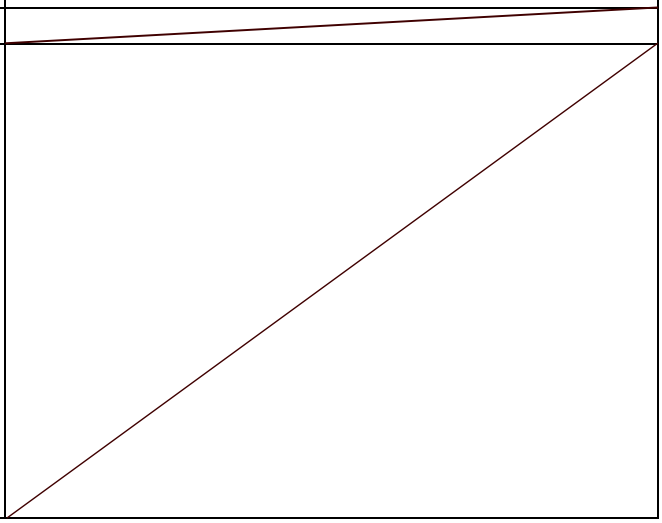


DH5 (2/3)



DH5 (3/3)





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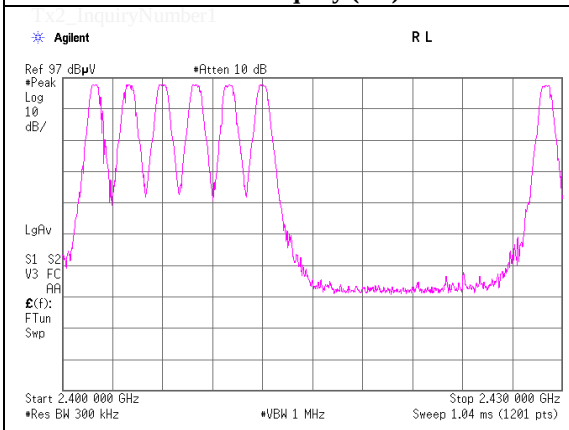
Number of Hopping Frequency

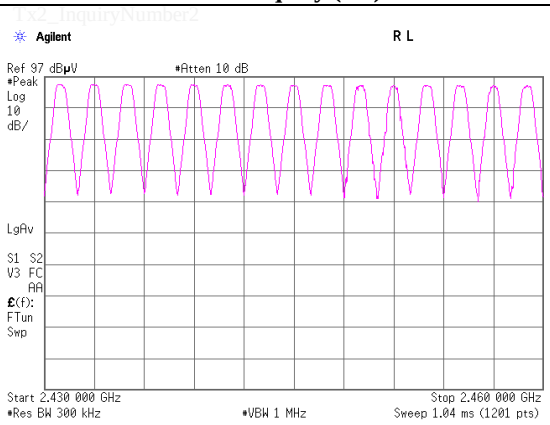
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 9, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Makoto Hosaka	
Mode	Tx, Bluetooth, Inquiry	

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

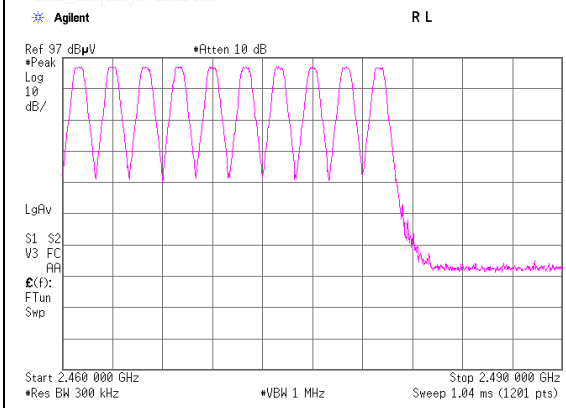
Inquiry (1/3)



Inquiry (2/3)



Inquiry (3/3)



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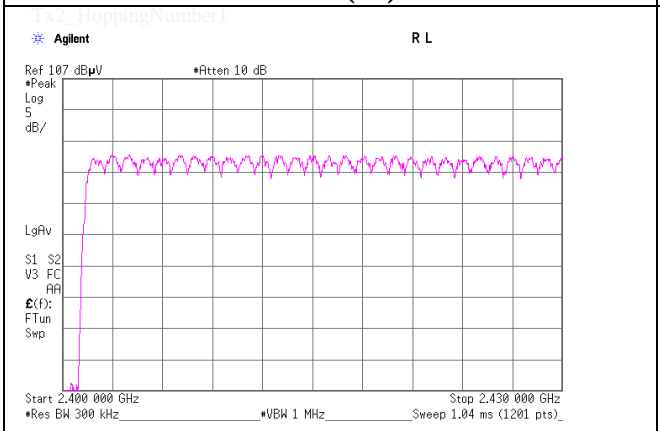
Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 9, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Makoto Hosaka	
Mode	Tx, Bluetooth, EDR, PRBS9	

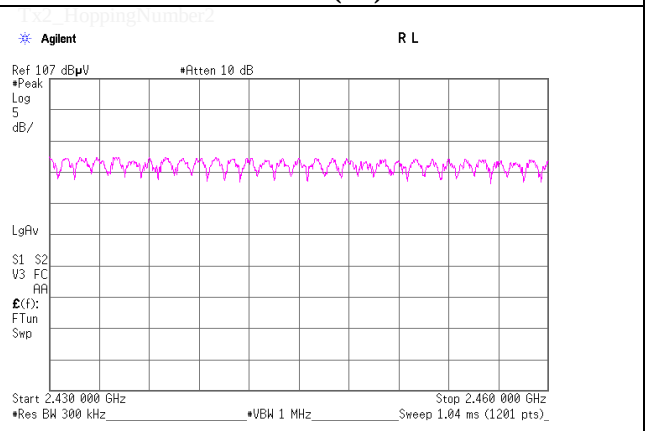
Mode	Number of Channel [times]	Limit [times]
3-DH5	79	>= 15

* Test was not performed at AFH mode whose number of hopping channel is 20 channels because this Bluetooth radio is in compliance of Bluetooth Specification.

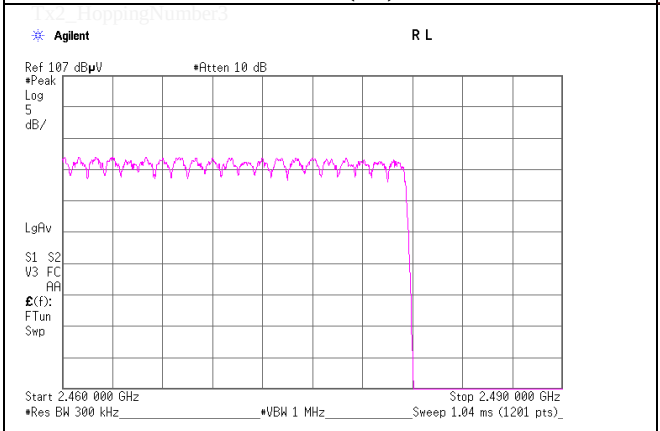
3-DH5 (1/3)



3-DH5 (2/3)



3-DH5 (3/3)



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Dwell Time

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 9, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Makoto Hosaka	
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	49.0 / 5.0 sec. x 31.6 sec. = 310 times	0.453	140	400
DH3	25.8 / 5.0 sec. x 31.6 sec. = 164 times	1.709	280	400
DH5	20.0 / 5.0 sec. x 31.6 sec. = 127 times	2.958	376	400
Inquiry	100.0 / 1.0 sec. x 12.8 sec. = 1280 times	0.143	182	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	48	50	50	49	48	49.0
DH3	26	24	24	29	26	25.8
DH5	20	21	23	16	20	20.0

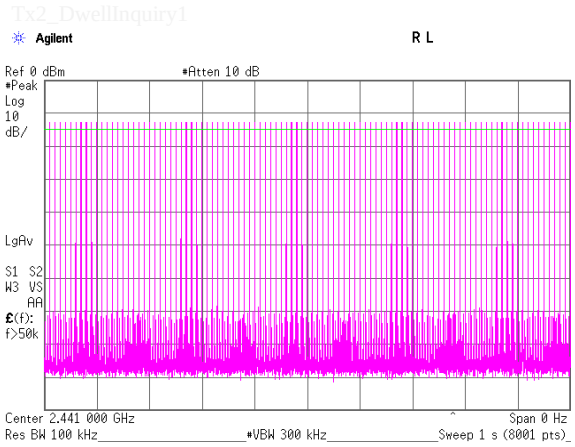
Sample Calculation

Average= Summation(Sampling 1 to 5) / 5

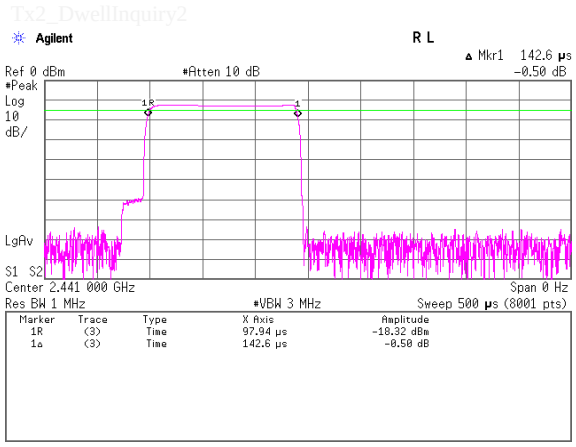
* This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in N x 0.4s, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than 0.4s regardless of packet size (DH1, DH3 or DH5). This is confirmed in the test report for N=79.

Inquiry

Inquiry (1/2)



Inquiry (2/2)



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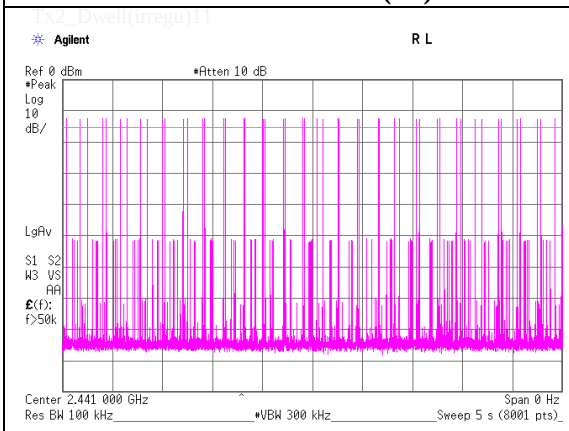
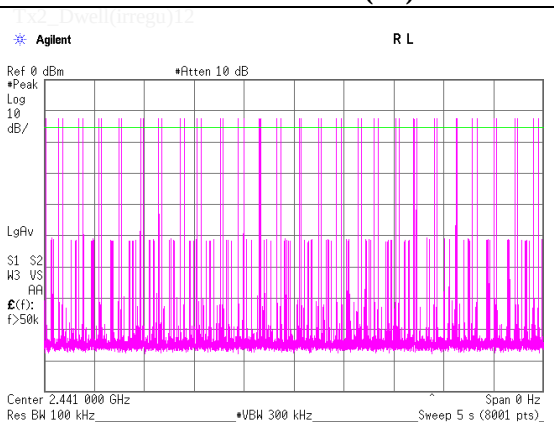
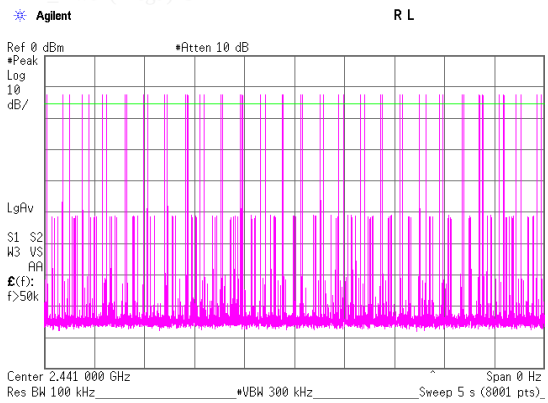
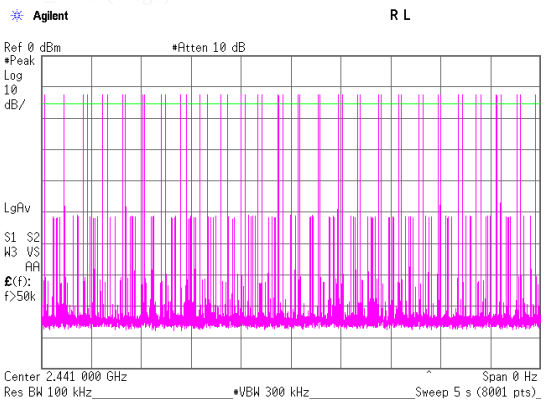
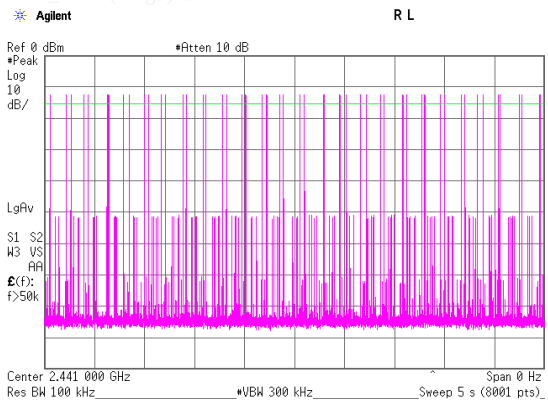
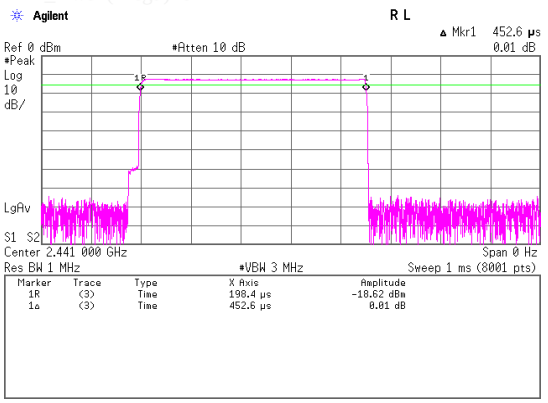
Dwell time

Tx, Bluetooth, BDR, PRBS9

DH1 - in 5sec.(1/5)	DH1 - in 5sec.(2/5)
	
DH1 - in 5sec.(3/5)	**DH1 - in 5sec.(4/5)**
	
DH1 - in 5sec.(5/5)	**DH1 - 1pulse**
	

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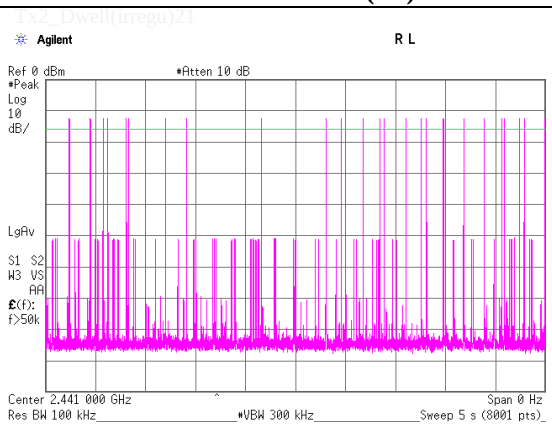
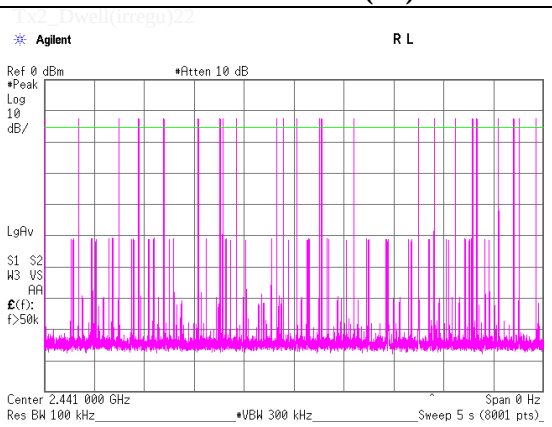
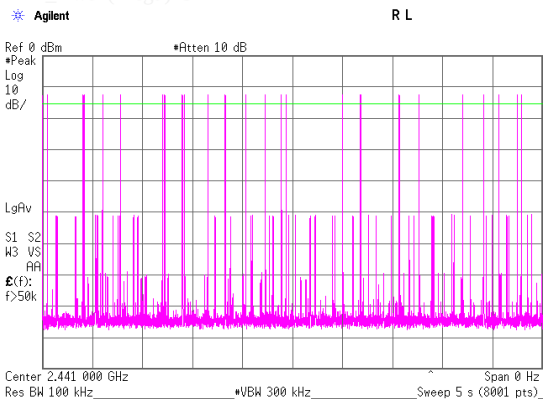
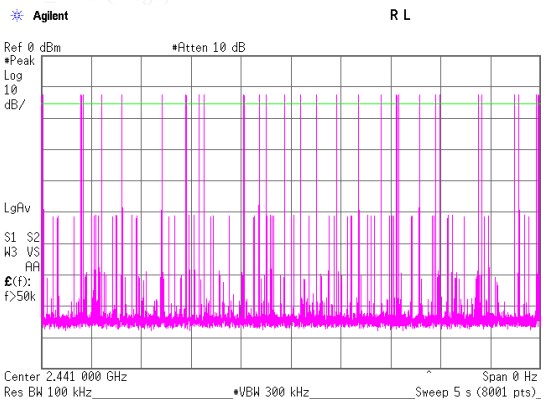
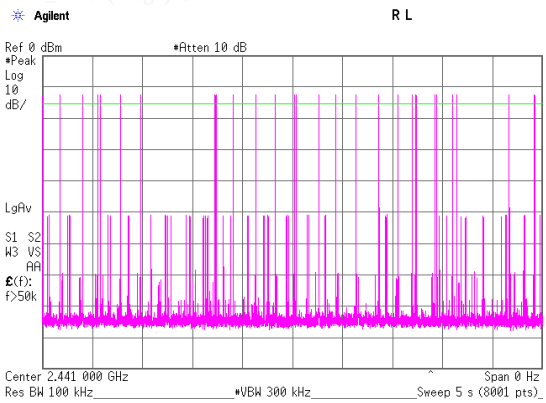
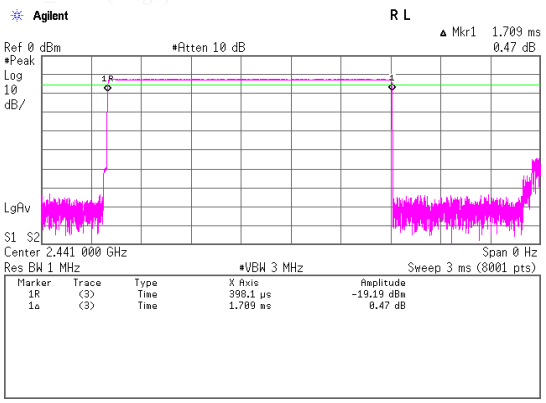
Dwell time

Tx, Bluetooth, BDR, PRBS9

DH3 - in 5sec.(1/5)	DH3 - in 5sec.(2/5)
	
DH3 - in 5sec.(3/5)	**DH3 - in 5sec.(4/5)**
	
DH3 - in 5sec.(5/5)	**DH3 - 1pulse**
	

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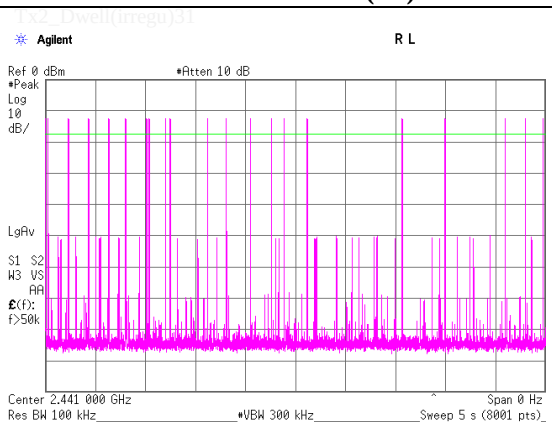
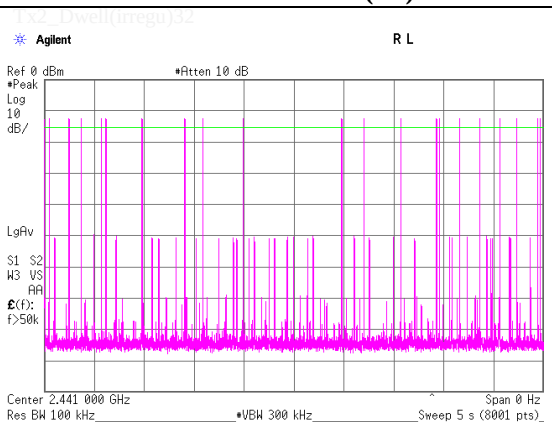
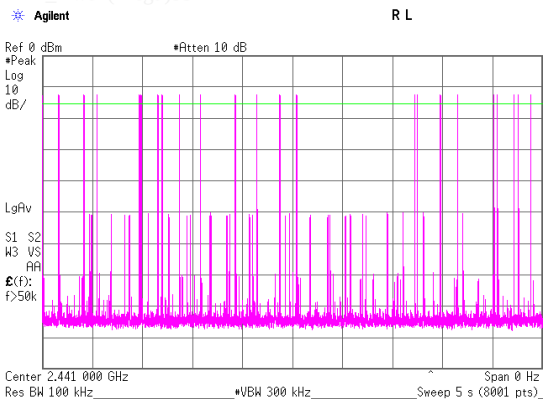
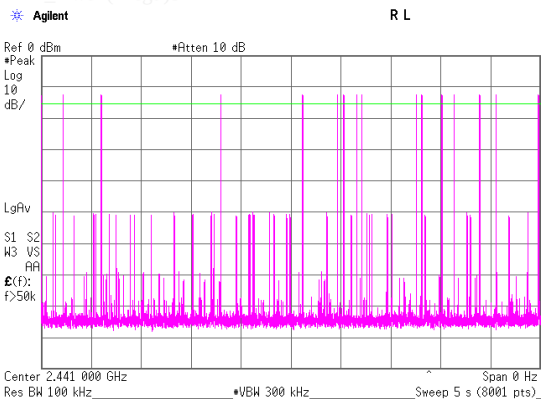
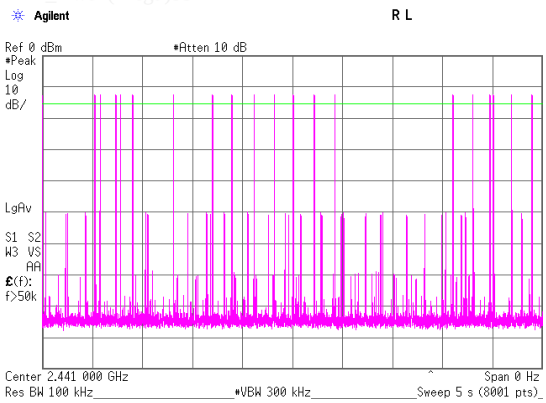
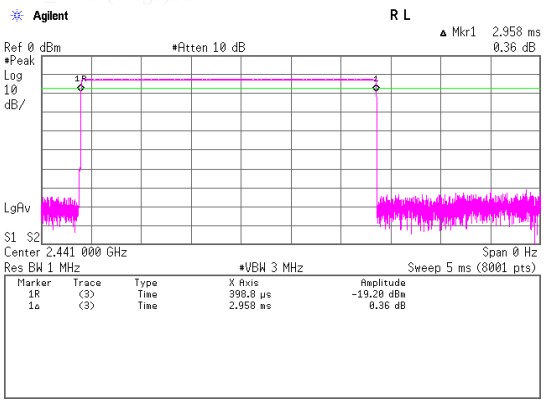
Dwell time

Tx, Bluetooth, BDR, PRBS9

DH5 - in 5sec.(1/5)	DH5 - in 5sec.(2/5)
	
DH5 - in 5sec.(3/5)	**DH5 - in 5sec.(4/5)**
	
DH5 - in 5sec.(5/5)	**DH5 - 1pulse**
	

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Dwell Time

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date August 9, 2013
Temperature / Humidity 25 deg.C , 51 %RH
Engineer Makoto Hosaka
Mode Tx, Bluetooth, EDR, PRBS9

Mode	Number of transmission in a 31.6 (79 Hopping x 0.4) second				Length of transmission time [msec]	Result [msec]	Limit [msec]
3-DH1	49.0	/ 5.0 sec. x 31.6 sec. =	310 times		0.450	139	400
3-DH3	27.0	/ 5.0 sec. x 31.6 sec. =	171 times		1.701	291	400
3-DH5	18.4	/ 5.0 sec. x 31.6 sec. =	117 times		2.951	345	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	47	50	51	50	47	49.0
3-DH3	28	24	28	29	26	27.0
3-DH5	22	15	17	23	15	18.4

Sample Calculation
Average= Summation(Sampling 1 to 5) / 5

* This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in N x 0.4s, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than 0.4s regardless of packet size (3-DH1, 3-DH3 or 3-DH5). This is confirmed in the test report for N=79.

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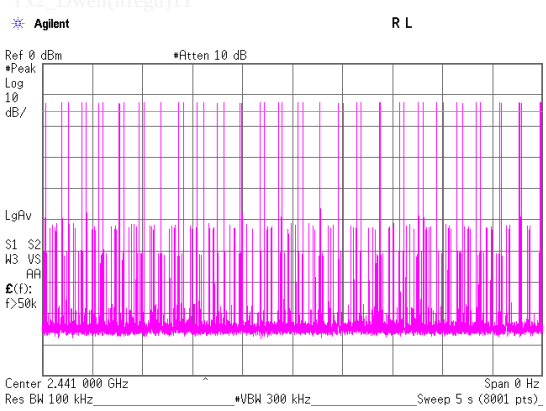
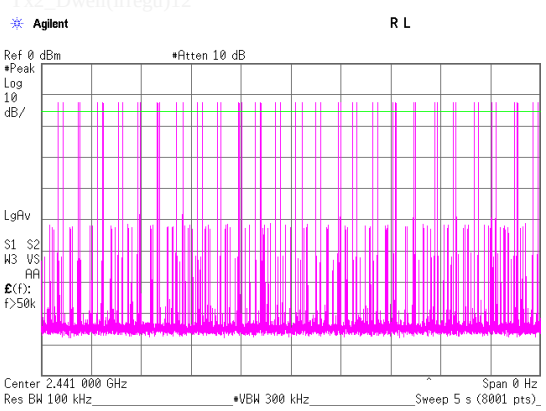
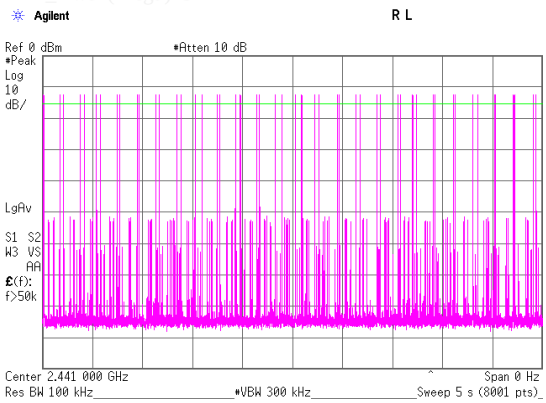
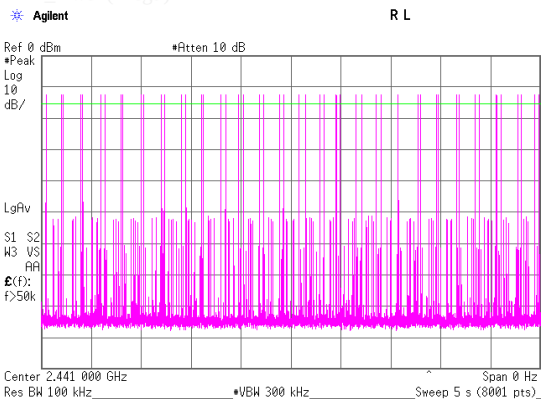
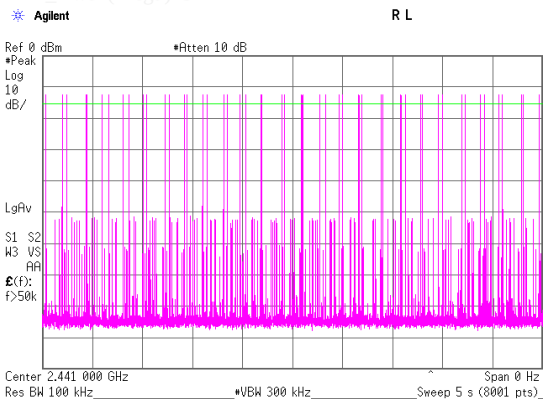
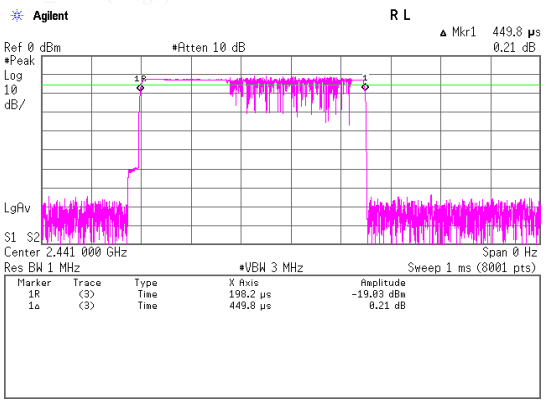
Dwell time

Tx, Bluetooth, EDR, PRBS9

3-DH1 - in 5sec.(1/5)	3-DH1 - in 5sec.(2/5)
	
3-DH1 - in 5sec.(3/5)	**3-DH1 - in 5sec.(4/5)**
	
3-DH1 - in 5sec.(5/5)	**3-DH1 - 1pulse**
	

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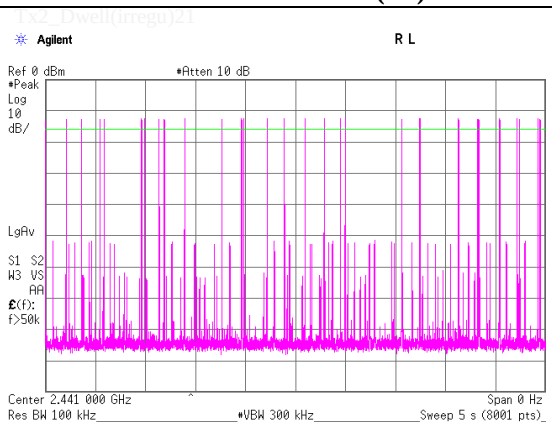
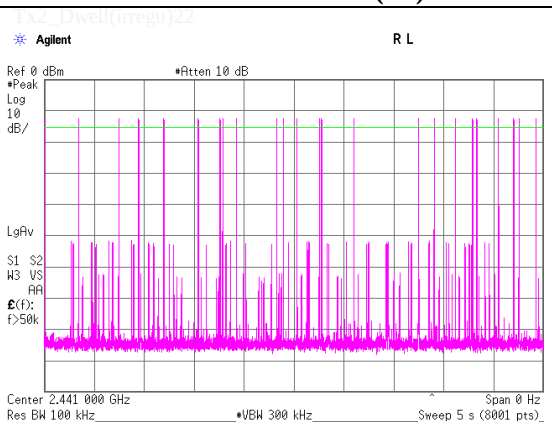
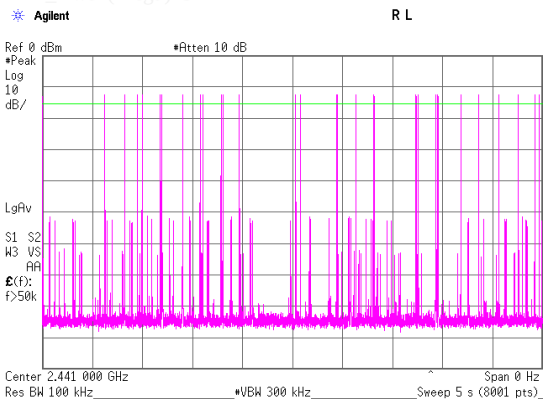
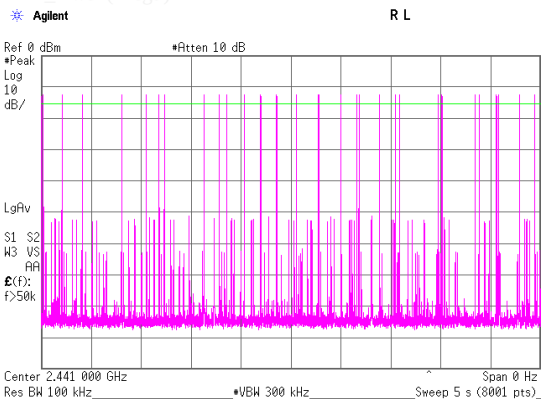
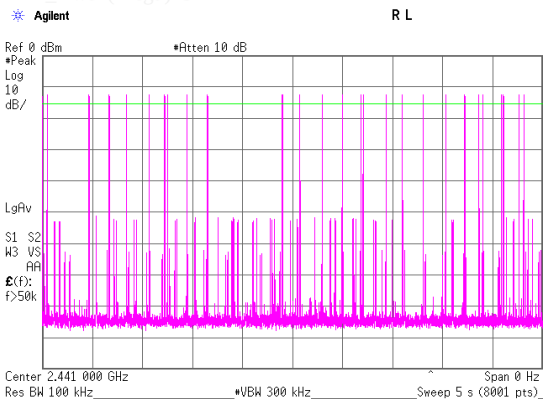
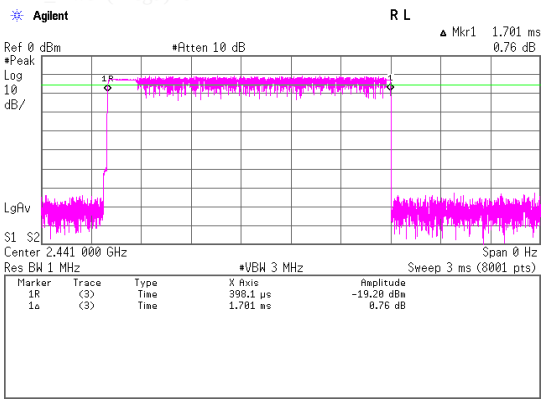
Dwell time

Tx, Bluetooth, EDR, PRBS9

3-DH3 - in 5sec.(1/5)	3-DH3 - in 5sec.(2/5)
	
3-DH3 - in 5sec.(3/5)	**3-DH3 - in 5sec.(4/5)**
	
3-DH3 - in 5sec.(5/5)	**3-DH3 - 1pulse**
	

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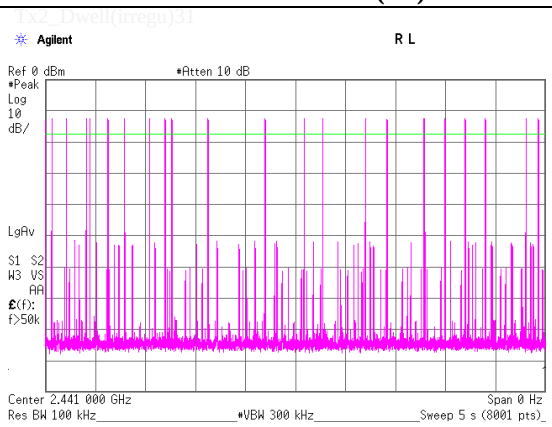
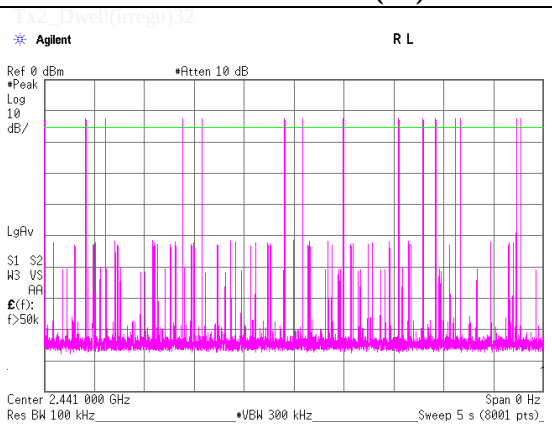
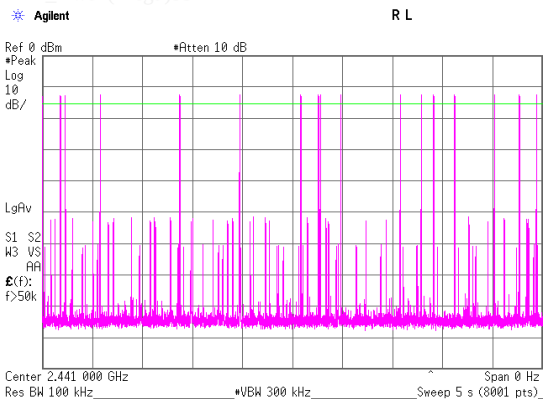
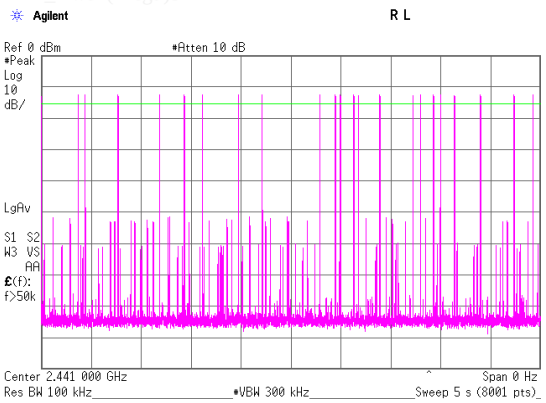
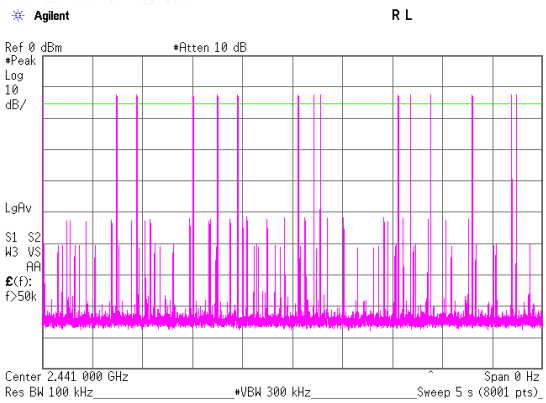
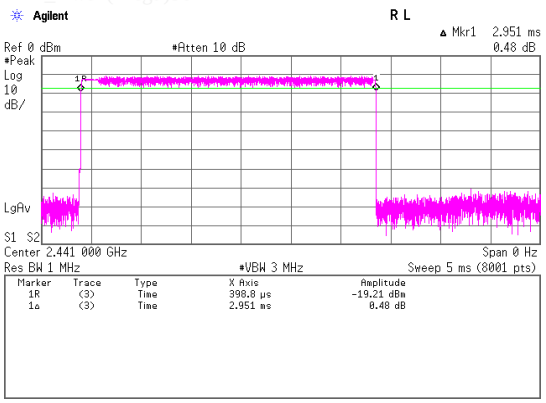
Dwell time

Tx, Bluetooth, EDR, PRBS9

3-DH5 - in 5sec.(1/5)	3-DH5 - in 5sec.(2/5)
	
3-DH5 - in 5sec.(3/5)	**3-DH5 - in 5sec.(4/5)**
	
3-DH5 - in 5sec.(5/5)	**3-DH5 - 1pulse**
	

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Maximum Peak Conducted Output Power (Conducted)

Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date	August 9, 2013
Temperature / Humidity	25 deg.C , 51 %RH
Engineer	Makoto Hosaka
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	-11.78	1.47	10.04	-0.27	0.94	20.97	125	21.24
DH5	2441.0	-12.16	1.48	10.04	-0.64	0.86	20.97	125	21.61
DH5	2480.0	-12.77	1.49	10.04	-1.24	0.75	20.97	125	22.21
2-DH5	2402.0	-10.14	1.47	10.04	1.37	1.37	20.97	125	19.60
2-DH5	2441.0	-10.58	1.48	10.04	0.94	1.24	20.97	125	20.03
2-DH5	2480.0	-11.15	1.49	10.04	0.38	1.09	20.97	125	20.59
3-DH5	2402.0	-9.78	1.47	10.04	1.73	1.49	20.97	125	19.24
3-DH5	2441.0	-10.24	1.48	10.04	1.28	1.34	20.97	125	19.69
3-DH5	2480.0	-10.78	1.49	10.04	0.75	1.19	20.97	125	20.22

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

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Radiated Emission

Test place	No.1 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	August 28, 2013	August 29, 2013
Temperature / Humidity	24 deg.C, 54 %RH	22 deg.C, 56 %RH
Engineer	Makoto Hosaka	Akira Sato
Mode	Tx, 2402 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.	144.004	QP	39.8	14.8	8.6	31.8	31.4	43.5	12.1	238	319	
Hori.	215.999	QP	35.3	16.8	9.3	31.8	29.6	43.5	13.9	152	4	
Hori.	287.995	QP	35.9	19.0	10.1	31.8	33.2	46.0	12.8	121	197	
Hori.	359.997	QP	45.9	15.3	7.3	31.8	36.7	46.0	9.3	168	342	
Hori.	431.999	QP	38.8	16.6	7.8	31.9	31.3	46.0	14.7	100	12	
Hori.	647.991	QP	36.1	20.0	8.8	32.1	32.8	46.0	13.2	100	162	
Hori.	829.517	QP	23.0	22.0	9.5	31.7	22.8	46.0	23.2	100	354	
Hori.	935.990	QP	32.5	23.1	9.9	31.1	34.4	46.0	11.6	153	121	
Hori.	1152.030	PK	45.7	24.2	13.2	40.9	42.2	73.9	31.7	100	86	
Hori.	1295.991	PK	46.5	24.8	13.4	40.8	43.9	73.9	30.0	100	189	
Hori.	2390.000	PK	46.1	26.8	14.7	41.1	46.5	73.9	27.4	100	305	
Hori.	2400.000	PK	46.9	26.8	14.7	41.1	47.3	73.9	26.6	100	305	
Hori.	4804.000	PK	46.5	30.9	7.5	41.2	43.7	73.9	30.2	100	80	
Hori.	7206.000	PK	47.6	37.1	9.1	41.0	52.8	73.9	21.1	100	0	
Hori.	9608.000	PK	44.0	38.6	10.2	38.9	53.9	73.9	20.0	100	0	
Hori.	12010.000	PK	45.1	39.6	11.5	39.1	57.1	73.9	16.8	100	0	
Hori.	1152.030	AV	35.8	24.2	13.2	40.9	32.3	53.9	21.6	100	86	
Hori.	1295.991	AV	35.7	24.8	13.4	40.8	33.1	53.9	20.8	100	189	
Hori.	2390.000	AV	34.3	26.8	14.7	41.1	34.7	53.9	19.2	100	305	
Hori.	2400.000	AV	34.8	26.8	14.7	41.1	35.2	53.9	18.7	100	305	
Hori.	4804.000	AV	37.1	30.9	7.5	41.2	34.3	53.9	19.6	100	80	
Hori.	7206.000	AV	35.7	37.1	9.1	41.0	40.9	53.9	13.0	100	0	
Hori.	9608.000	AV	32.9	38.6	10.2	38.9	42.8	53.9	11.1	100	0	
Hori.	12010.000	AV	34.5	39.6	11.5	39.1	46.5	53.9	7.4	100	0	
Vert.	143.996	QP	42.3	14.8	8.5	31.8	33.8	43.5	9.7	100	5	
Vert.	359.997	QP	48.5	15.3	7.3	31.8	39.3	46.0	6.7	100	66	
Vert.	431.999	QP	37.2	16.6	7.8	31.9	29.7	46.0	16.3	100	191	
Vert.	829.517	QP	23.0	22.0	9.5	31.7	22.8	46.0	23.2	100	358	
Vert.	935.990	QP	30.9	23.1	9.9	31.1	32.8	46.0	13.2	100	314	
Vert.	1152.058	PK	48.1	24.2	13.2	40.9	44.6	73.9	29.3	100	194	
Vert.	1295.956	PK	46.5	24.8	13.4	40.8	43.9	73.9	30.0	230	1	
Vert.	2390.000	PK	46.6	26.8	14.7	41.1	47.0	73.9	26.9	100	193	
Vert.	2400.000	PK	48.6	26.8	14.7	41.1	49.0	73.9	24.9	100	193	
Vert.	4804.000	PK	46.6	30.9	7.5	41.2	43.8	73.9	30.1	100	44	
Vert.	7206.000	PK	47.3	37.1	9.1	41.0	52.5	73.9	21.4	100	0	
Vert.	9608.000	PK	44.6	38.6	10.2	38.9	54.5	73.9	19.4	100	0	
Vert.	12010.000	PK	45.9	39.6	11.5	39.1	57.9	73.9	16.0	100	0	
Vert.	1152.058	AV	38.9	24.2	13.2	40.9	35.4	53.9	18.5	100	194	
Vert.	1295.956	AV	36.0	24.8	13.4	40.8	33.4	53.9	20.5	230	1	
Vert.	2390.000	AV	33.8	26.8	14.7	41.1	34.2	53.9	19.7	100	193	
Vert.	2400.000	AV	34.4	26.8	14.7	41.1	34.8	53.9	19.1	100	193	
Vert.	4804.000	AV	38.9	30.9	7.5	41.2	36.1	53.9	17.8	100	44	
Vert.	7206.000	AV	35.7	37.1	9.1	41.0	40.9	53.9	13.0	100	0	
Vert.	9608.000	AV	33.3	38.6	10.2	38.9	43.2	53.9	10.7	100	0	
Vert.	12010.000	AV	34.7	39.6	11.5	39.1	46.7	53.9	7.2	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.1 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	August 28, 2013	August 29, 2013
Temperature / Humidity	24 deg.C, 54 %RH	22 deg.C, 56 %RH
Engineer	Makoto Hosaka	Akira Sato
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.	143.998	QP	40.1	14.8	8.5	31.8	31.6	43.5	11.9	233	326	
Hori.	215.995	QP	36.0	16.8	9.3	31.8	30.3	43.5	13.2	152	98	
Hori.	287.998	QP	36.2	19.0	10.1	31.8	33.5	46.0	12.5	119	197	
Hori.	360.000	QP	46.2	15.3	7.3	31.8	37.0	46.0	9.0	176	335	
Hori.	431.999	QP	39.4	16.6	7.8	31.9	31.9	46.0	14.1	100	14	
Hori.	647.994	QP	35.9	20.0	8.8	32.1	32.6	46.0	13.4	100	160	
Hori.	817.139	QP	23.3	21.8	9.5	31.8	22.8	46.0	23.2	150	139	
Hori.	935.990	QP	32.6	23.1	9.9	31.1	34.5	46.0	11.5	158	120	
Hori.	1151.987	PK	47.4	24.2	13.2	40.9	43.9	73.9	30.0	100	80	
Hori.	4882.000	PK	47.3	31.4	7.5	41.1	45.1	73.9	28.8	100	83	
Hori.	7323.000	PK	46.7	37.2	9.0	41.1	51.8	73.9	22.1	100	0	
Hori.	9764.000	PK	43.4	38.8	10.1	38.8	53.5	73.9	20.4	100	0	
Hori.	12205.000	PK	44.5	39.6	11.4	39.1	56.4	73.9	17.5	100	0	
Hori.	1151.987	AV	35.8	24.2	13.2	40.9	32.3	53.9	21.6	100	80	
Hori.	4882.000	AV	37.8	31.4	7.5	41.1	35.6	53.9	18.3	100	83	
Hori.	7323.000	AV	35.4	37.2	9.0	41.1	40.5	53.9	13.4	100	0	
Hori.	9764.000	AV	32.7	38.8	10.1	38.8	42.8	53.9	11.1	100	0	
Hori.	12205.000	AV	33.3	39.6	11.4	39.1	45.2	53.9	8.7	100	0	
Vert.	143.998	QP	42.3	14.8	8.5	31.8	33.8	43.5	9.7	100	3	
Vert.	360.000	QP	49.0	15.3	7.3	31.8	39.8	46.0	6.2	100	253	
Vert.	431.999	QP	37.7	16.6	7.8	31.9	30.2	46.0	15.8	100	66	
Vert.	817.139	QP	23.3	21.8	9.5	31.8	22.8	46.0	23.2	100	119	
Vert.	935.990	QP	31.0	23.1	9.9	31.1	32.9	46.0	13.1	100	315	
Vert.	1151.988	PK	48.4	24.2	13.2	40.9	44.9	73.9	29.0	100	196	
Vert.	4882.000	PK	49.2	31.4	7.5	41.1	47.0	73.9	26.9	100	224	
Vert.	7323.000	PK	46.3	37.2	9.0	41.1	51.4	73.9	22.5	100	0	
Vert.	9764.000	PK	44.3	38.8	10.1	38.8	54.4	73.9	19.5	100	0	
Vert.	12205.000	PK	44.5	39.6	11.4	39.1	56.4	73.9	17.5	100	0	
Vert.	1151.988	AV	39.0	24.2	13.2	40.9	35.5	53.9	18.4	100	196	
Vert.	4882.000	AV	40.9	31.4	7.5	41.1	38.7	53.9	15.2	100	224	
Vert.	7323.000	AV	35.2	37.2	9.0	41.1	40.3	53.9	13.6	100	0	
Vert.	9764.000	AV	32.5	38.8	10.1	38.8	42.6	53.9	11.3	100	0	
Vert.	12205.000	AV	33.3	39.6	11.4	39.1	45.2	53.9	8.7	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.1 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	August 28, 2013	August 29, 2013
Temperature / Humidity	24 deg.C, 54 %RH	22 deg.C, 56 %RH
Engineer	Makoto Hosaka	Akira Sato
Mode	Tx, 2480 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.	143.999	QP	39.7	14.8	8.5	31.8	31.2	43.5	12.3	233	322	
Hori.	215.994	QP	35.2	16.8	9.3	31.8	29.5	43.5	14.0	154	100	
Hori.	287.994	QP	36.4	19.0	10.1	31.8	33.7	46.0	12.3	119	195	
Hori.	360.001	QP	46.2	15.3	7.3	31.8	37.0	46.0	9.0	176	335	
Hori.	431.998	QP	39.1	16.6	7.8	31.9	31.6	46.0	14.4	100	10	
Hori.	647.993	QP	35.7	20.0	8.8	32.1	32.4	46.0	13.6	100	170	
Hori.	828.647	QP	23.0	22.0	9.5	31.7	22.8	46.0	23.2	150	2	
Hori.	935.993	QP	32.4	23.1	9.9	31.1	34.3	46.0	11.7	161	123	
Hori.	1151.999	PK	46.2	24.2	13.2	40.9	42.7	73.9	31.2	100	70	
Hori.	2483.500	PK	46.1	26.9	14.8	41.0	46.8	73.9	27.1	100	148	
Hori.	4960.000	PK	45.5	31.8	7.5	41.1	43.7	73.9	30.2	100	199	
Hori.	7440.000	PK	46.2	37.4	9.0	41.1	51.5	73.9	22.4	100	0	
Hori.	9920.000	PK	43.3	38.9	10.0	38.8	53.4	73.9	20.5	100	0	
Hori.	12400.000	PK	43.3	39.7	11.3	39.1	55.2	73.9	18.7	100	0	
Hori.	1151.999	AV	35.9	24.2	13.2	40.9	32.4	53.9	21.5	100	70	
Hori.	2483.500	AV	33.9	26.9	14.8	41.0	34.6	53.9	19.3	100	148	
Hori.	4960.000	AV	35.4	31.8	7.5	41.1	33.6	53.9	20.3	100	199	
Hori.	7440.000	AV	34.9	37.4	9.0	41.1	40.2	53.9	13.7	100	0	
Hori.	9920.000	AV	31.6	38.9	10.0	38.8	41.7	53.9	12.2	100	0	
Hori.	12400.000	AV	32.1	39.7	11.3	39.1	44.0	53.9	9.9	100	0	
Vert.	143.999	QP	41.4	14.8	8.5	31.8	32.9	43.5	10.6	100	357	
Vert.	360.001	QP	48.8	15.3	7.3	31.8	39.6	46.0	6.4	100	60	
Vert.	431.998	QP	37.5	16.6	7.8	31.9	30.0	46.0	16.0	100	155	
Vert.	828.647	QP	23.0	22.0	9.5	31.7	22.8	46.0	23.2	100	13	
Vert.	935.993	QP	30.9	23.1	9.9	31.1	32.8	46.0	13.2	100	329	
Vert.	1151.989	PK	47.3	24.2	13.2	40.9	43.8	73.9	30.1	100	196	
Vert.	2483.500	PK	46.2	26.9	14.8	41.0	46.9	73.9	27.0	100	160	
Vert.	4960.000	PK	46.7	31.8	7.5	41.1	44.9	73.9	29.0	174	358	
Vert.	7440.000	PK	46.9	37.4	9.0	41.1	52.2	73.9	21.7	100	0	
Vert.	9920.000	PK	43.5	38.9	10.0	38.8	53.6	73.9	20.3	100	0	
Vert.	12400.000	PK	44.6	39.7	11.3	39.1	56.5	73.9	17.4	100	0	
Vert.	1151.989	AV	39.5	24.2	13.2	40.9	36.0	53.9	17.9	100	196	
Vert.	2483.500	AV	34.0	26.9	14.8	41.0	34.7	53.9	19.2	100	160	
Vert.	4960.000	AV	39.2	31.8	7.5	41.1	37.4	53.9	16.5	174	358	
Vert.	7440.000	AV	34.8	37.4	9.0	41.1	40.1	53.9	13.8	100	0	
Vert.	9920.000	AV	31.5	38.9	10.0	38.8	41.6	53.9	12.3	100	0	
Vert.	12400.000	AV	32.0	39.7	11.3	39.1	43.9	53.9	10.0	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.1 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	August 28, 2013	August 29, 2013
Temperature / Humidity	24 deg.C, 54 %RH	22 deg.C, 56 %RH
Engineer	Makoto Hosaka	Akira Sato
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.	143.998	QP	38.1	14.8	8.5	31.8	29.6	43.5	13.9	231	325	
Hori.	215.996	QP	35.3	16.8	9.3	31.8	29.6	43.5	13.9	161	104	
Hori.	287.995	QP	35.6	19.0	10.1	31.8	32.9	46.0	13.1	121	192	
Hori.	359.998	QP	46.2	15.3	7.3	31.8	37.0	46.0	9.0	176	339	
Hori.	431.996	QP	39.5	16.6	7.8	31.9	32.0	46.0	14.0	100	6	
Hori.	647.989	QP	35.8	20.0	8.8	32.1	32.5	46.0	13.5	100	160	
Hori.	823.623	QP	23.1	21.9	9.5	31.8	22.7	46.0	23.3	150	359	
Hori.	935.990	QP	32.0	23.1	9.9	31.1	33.9	46.0	12.1	156	123	
Hori.	1151.990	PK	46.6	24.2	13.2	40.9	43.1	73.9	30.8	100	70	
Hori.	2390.000	PK	45.9	26.8	14.7	41.1	46.3	73.9	27.6	231	0	
Hori.	2400.000	PK	49.0	26.8	14.7	41.1	49.4	73.9	24.5	231	0	
Hori.	4804.000	PK	47.3	30.9	7.5	41.2	44.5	73.9	29.4	100	206	
Hori.	7206.000	PK	48.0	37.1	9.1	41.0	53.2	73.9	20.7	100	0	
Hori.	9608.000	PK	45.2	38.6	10.2	38.9	55.1	73.9	18.8	100	0	
Hori.	12010.000	PK	47.9	39.6	11.5	39.1	59.9	73.9	14.0	100	0	
Hori.	1151.990	AV	35.6	24.2	13.2	40.9	32.1	53.9	21.8	100	70	
Hori.	2390.000	AV	33.9	26.8	14.7	41.1	34.3	53.9	19.6	231	0	
Hori.	2400.000	AV	35.8	26.8	14.7	41.1	36.2	53.9	17.7	231	0	
Hori.	4804.000	AV	37.9	30.9	7.5	41.2	35.1	53.9	18.8	100	206	
Hori.	7206.000	AV	35.8	37.1	9.1	41.0	41.0	53.9	12.9	100	0	
Hori.	9608.000	AV	33.4	38.6	10.2	38.9	43.3	53.9	10.6	100	0	
Hori.	12010.000	AV	34.8	39.6	11.5	39.1	46.8	53.9	7.1	100	0	
Vert.	143.998	QP	41.4	14.8	8.5	31.8	32.9	43.5	10.6	100	2	
Vert.	359.998	QP	48.9	15.3	7.3	31.8	39.7	46.0	6.3	100	242	
Vert.	431.999	QP	38.1	16.6	7.8	31.9	30.6	46.0	15.4	100	150	
Vert.	823.623	QP	23.1	21.9	9.5	31.8	22.7	46.0	23.3	100	18	
Vert.	935.990	QP	30.9	23.1	9.9	31.1	32.8	46.0	13.2	100	296	
Vert.	1151.965	PK	48.3	24.2	13.2	40.9	44.8	73.9	29.1	116	183	
Vert.	2390.000	PK	46.2	26.8	14.7	41.1	46.6	73.9	27.3	139	160	
Vert.	2400.000	PK	47.5	26.8	14.7	41.1	47.9	73.9	26.0	139	160	
Vert.	4804.000	PK	47.0	30.9	7.5	41.2	44.2	73.9	29.7	117	148	
Vert.	7206.000	PK	46.8	37.1	9.1	41.0	52.0	73.9	21.9	100	0	
Vert.	9608.000	PK	46.6	38.6	10.2	38.9	56.5	73.9	17.4	100	0	
Vert.	12010.000	PK	46.2	39.6	11.5	39.1	58.2	73.9	15.7	100	0	
Vert.	1151.965	AV	39.2	24.2	13.2	40.9	35.7	53.9	18.2	116	183	
Vert.	2390.000	AV	33.9	26.8	14.7	41.1	34.3	53.9	19.6	139	160	
Vert.	2400.000	AV	35.3	26.8	14.7	41.1	35.7	53.9	18.2	139	160	
Vert.	4804.000	AV	39.8	30.9	7.5	41.2	37.0	53.9	16.9	117	148	
Vert.	7206.000	AV	35.8	37.1	9.1	41.0	41.0	53.9	12.9	100	0	
Vert.	9608.000	AV	33.3	38.6	10.2	38.9	43.2	53.9	10.7	100	0	
Vert.	12010.000	AV	34.7	39.6	11.5	39.1	46.7	53.9	7.2	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.1 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	August 28, 2013	August 29, 2013
Temperature / Humidity	24 deg.C, 54 %RH	22 deg.C, 56 %RH
Engineer	Makoto Hosaka	Akira Sato
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.	143.999	QP	38.1	14.8	8.5	31.8	29.6	43.5	13.9	231	330	
Hori.	215.996	QP	35.6	16.8	9.3	31.8	29.9	43.5	13.6	160	102	
Hori.	287.997	QP	35.8	19.0	10.1	31.8	33.1	46.0	12.9	117	195	
Hori.	359.996	QP	46.5	15.3	7.3	31.8	37.3	46.0	8.7	169	338	
Hori.	431.997	QP	39.6	16.6	7.8	31.9	32.1	46.0	13.9	100	8	
Hori.	647.999	QP	35.5	20.0	8.8	32.1	32.2	46.0	13.8	100	149	
Hori.	823.781	QP	23.1	21.9	9.5	31.8	22.7	46.0	23.3	150	210	
Hori.	935.993	QP	32.4	23.1	9.9	31.1	34.3	46.0	11.7	154	121	
Hori.	1008.010	PK	47.0	23.6	13.1	40.9	42.8	73.9	31.1	100	274	
Hori.	1151.975	PK	46.4	24.2	13.2	40.9	42.9	73.9	31.0	100	71	
Hori.	1296.020	PK	46.3	24.8	13.4	40.8	43.7	73.9	30.2	100	193	
Hori.	4882.000	PK	47.4	31.4	7.5	41.1	45.2	73.9	28.7	100	83	
Hori.	7323.000	PK	46.2	37.2	9.0	41.1	51.3	73.9	22.6	100	0	
Hori.	9764.000	PK	46.7	38.8	10.1	38.8	56.8	73.9	17.1	100	0	
Hori.	12205.000	PK	44.6	39.6	11.4	39.1	56.5	73.9	17.4	100	0	
Hori.	1008.010	AV	35.7	23.6	13.1	40.9	31.5	53.9	22.4	100	274	
Hori.	1151.975	AV	35.8	24.2	13.2	40.9	32.3	53.9	21.6	100	71	
Hori.	1296.020	AV	35.9	24.8	13.4	40.8	33.3	53.9	20.6	100	193	
Hori.	4882.000	AV	38.5	31.4	7.5	41.1	36.3	53.9	17.6	100	83	
Hori.	7323.000	AV	35.2	37.2	9.0	41.1	40.3	53.9	13.6	100	0	
Hori.	9764.000	AV	32.7	38.8	10.1	38.8	42.8	53.9	11.1	100	0	
Hori.	12205.000	AV	33.1	39.6	11.4	39.1	45.0	53.9	8.9	100	0	
Vert.	143.999	QP	41.6	14.8	8.5	31.8	33.1	43.5	10.4	100	8	
Vert.	359.996	QP	49.2	15.3	7.3	31.8	40.0	46.0	6.0	100	170	
Vert.	431.997	QP	38.1	16.6	7.8	31.9	30.6	46.0	15.4	100	74	
Vert.	823.781	QP	23.2	21.9	9.5	31.8	22.8	46.0	23.2	100	239	
Vert.	935.993	QP	30.9	23.1	9.9	31.1	32.8	46.0	13.2	100	320	
Vert.	1008.011	PK	45.9	23.6	13.1	40.9	41.7	73.9	32.2	100	57	
Vert.	1152.015	PK	48.5	24.2	13.2	40.9	45.0	73.9	28.9	100	191	
Vert.	1296.054	PK	47.9	24.8	13.4	40.8	45.3	73.9	28.6	102	207	
Vert.	4882.000	PK	48.0	31.4	7.5	41.1	45.8	73.9	28.1	117	149	
Vert.	7323.000	PK	46.5	37.2	9.0	41.1	51.6	73.9	22.3	100	0	
Vert.	9764.000	PK	44.0	38.8	10.1	38.8	54.1	73.9	19.8	100	0	
Vert.	12205.000	PK	44.7	39.6	11.4	39.1	56.6	73.9	17.3	100	0	
Vert.	1008.011	AV	35.3	23.6	13.1	40.9	31.1	53.9	22.8	100	57	
Vert.	1152.015	AV	39.3	24.2	13.2	40.9	35.8	53.9	18.1	100	191	
Vert.	1296.054	AV	35.6	24.8	13.4	40.8	33.0	53.9	20.9	102	207	
Vert.	4882.000	AV	39.5	31.4	7.5	41.1	37.3	53.9	16.6	117	149	
Vert.	7323.000	AV	35.1	37.2	9.0	41.1	40.2	53.9	13.7	100	0	
Vert.	9764.000	AV	32.7	38.8	10.1	38.8	42.8	53.9	11.1	100	0	
Vert.	12205.000	AV	33.2	39.6	11.4	39.1	45.1	53.9	8.8	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.1 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	August 28, 2013	August 29, 2013
Temperature / Humidity	24 deg.C, 54 %RH	22 deg.C, 56 %RH
Engineer	Makoto Hosaka	Akira Sato
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.	143.998	QP	38.4	14.8	8.5	31.8	29.9	43.5	13.6	238	329	
Hori.	216.000	QP	35.5	16.8	9.3	31.8	29.8	43.5	13.7	159	104	
Hori.	287.998	QP	35.6	19.0	10.1	31.8	32.9	46.0	13.1	118	196	
Hori.	359.998	QP	46.4	15.3	7.3	31.8	37.2	46.0	8.8	175	336	
Hori.	432.000	QP	39.7	16.6	7.8	31.9	32.2	46.0	13.8	100	10	
Hori.	647.996	QP	35.4	20.0	8.8	32.1	32.1	46.0	13.9	100	152	
Hori.	828.477	QP	23.0	22.0	9.5	31.7	22.8	46.0	23.2	150	8	
Hori.	935.999	QP	32.4	23.1	9.9	31.1	34.3	46.0	11.7	160	121	
Hori.	1152.034	PK	46.1	24.2	13.2	40.9	42.6	73.9	31.3	113	105	
Hori.	1199.768	PK	46.4	24.4	13.3	40.8	43.3	73.9	30.6	100	350	
Hori.	1295.970	PK	48.4	24.8	13.4	40.8	45.8	73.9	28.1	100	359	
Hori.	2483.500	PK	45.5	26.9	14.8	41.0	46.2	73.9	27.7	120	119	
Hori.	4960.000	PK	46.1	31.8	7.5	41.1	44.3	73.9	29.6	112	91	
Hori.	7440.000	PK	46.1	37.4	9.0	41.1	51.4	73.9	22.5	100	0	
Hori.	9920.000	PK	43.4	38.9	10.0	38.8	53.5	73.9	20.4	100	0	
Hori.	12400.000	PK	42.6	39.7	11.3	39.1	54.5	73.9	19.4	100	0	
Hori.	1152.034	AV	35.5	24.2	13.2	40.9	32.0	53.9	21.9	113	105	
Hori.	1199.768	AV	35.3	24.4	13.3	40.8	32.2	53.9	21.7	100	350	
Hori.	1295.970	AV	35.0	24.8	13.4	40.8	32.4	53.9	21.5	100	359	
Hori.	2483.500	AV	33.9	26.9	14.8	41.0	34.6	53.9	19.3	120	119	
Hori.	4960.000	AV	35.8	31.8	7.5	41.1	34.0	53.9	19.9	112	91	
Hori.	7440.000	AV	34.6	37.4	9.0	41.1	39.9	53.9	14.0	100	0	
Hori.	9920.000	AV	31.1	38.9	10.0	38.8	41.2	53.9	12.7	100	0	
Hori.	12400.000	AV	31.9	39.7	11.3	39.1	43.8	53.9	10.1	100	0	
Vert.	143.998	QP	41.3	14.8	8.5	31.8	32.8	43.5	10.7	100	11	
Vert.	359.998	QP	49.0	15.3	7.3	31.8	39.8	46.0	6.2	100	76	
Vert.	432.000	QP	38.1	16.6	7.8	31.9	30.6	46.0	15.4	100	193	
Vert.	828.477	QP	23.1	22.0	9.5	31.7	22.9	46.0	23.1	100	173	
Vert.	935.999	QP	30.7	23.1	9.9	31.1	32.6	46.0	13.4	100	324	
Vert.	1151.976	PK	48.0	24.2	13.2	40.9	44.5	73.9	29.4	102	191	
Vert.	1200.047	PK	46.7	24.4	13.3	40.8	43.6	73.9	30.3	112	43	
Vert.	1295.988	PK	48.6	24.8	13.4	40.8	46.0	73.9	27.9	116	182	
Vert.	2483.500	PK	45.6	26.9	14.8	41.0	46.3	73.9	27.6	100	147	
Vert.	4960.000	PK	48.0	31.8	7.5	41.1	46.2	73.9	27.7	177	357	
Vert.	7440.000	PK	46.1	37.4	9.0	41.1	51.4	73.9	22.5	100	0	
Vert.	9920.000	PK	42.8	38.9	10.0	38.8	52.9	73.9	21.0	100	0	
Vert.	12400.000	PK	42.5	39.7	11.3	39.1	54.4	73.9	19.5	100	0	
Vert.	1151.976	AV	39.2	24.2	13.2	40.9	35.7	53.9	18.2	102	191	
Vert.	1200.047	AV	35.0	24.4	13.3	40.8	31.9	53.9	22.0	112	43	
Vert.	1295.988	AV	37.3	24.8	13.4	40.8	34.7	53.9	19.2	116	182	
Vert.	2483.500	AV	34.1	26.9	14.8	41.0	34.8	53.9	19.1	100	147	
Vert.	4960.000	AV	39.7	31.8	7.5	41.1	37.9	53.9	16.0	177	357	
Vert.	7440.000	AV	34.7	37.4	9.0	41.1	40.0	53.9	13.9	100	0	
Vert.	9920.000	AV	31.2	38.9	10.0	38.8	41.3	53.9	12.6	100	0	
Vert.	12400.000	AV	31.8	39.7	11.3	39.1	43.7	53.9	10.2	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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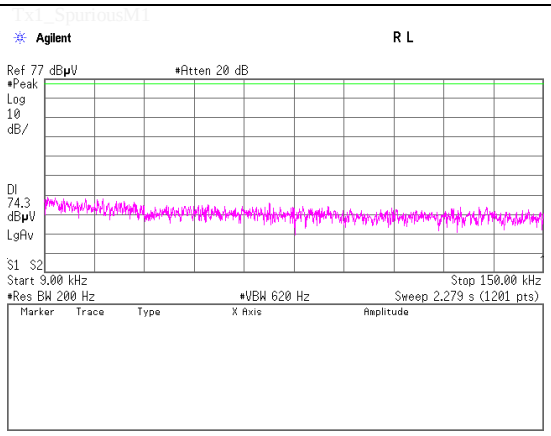
Spurious emission (Conducted)

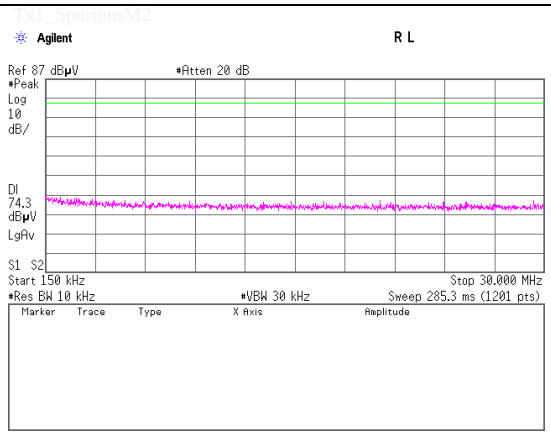
Tx, Bluetooth, BDR, PRBS9

Tx, 2402MHz (below 1GHz)

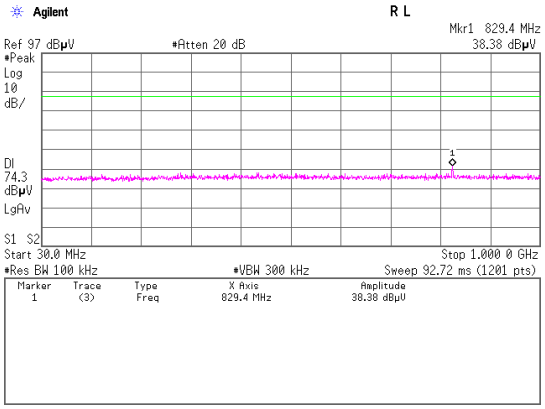
9kHz - 150kHz



150kHz - 30MHz



30MHz - 1GHz



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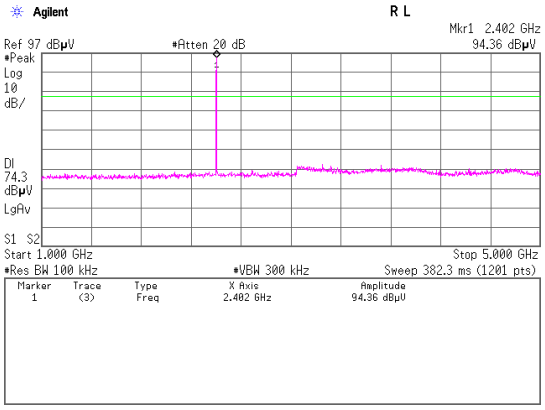
Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2402MHz (above 1GHz)

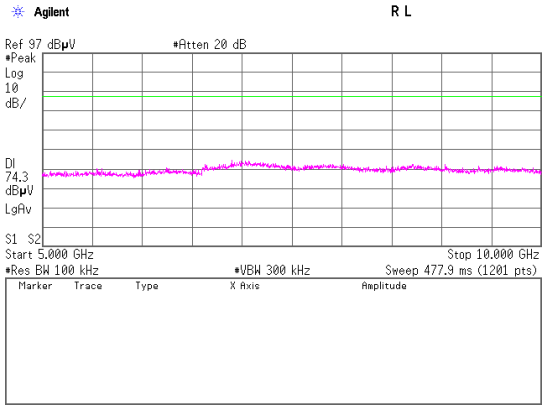
1GHz - 5GHz

Tx1_SpuriousG1



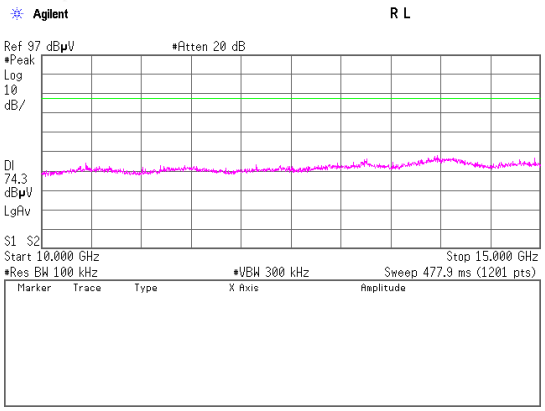
5GHz - 10GHz

Tx1_SpuriousG2



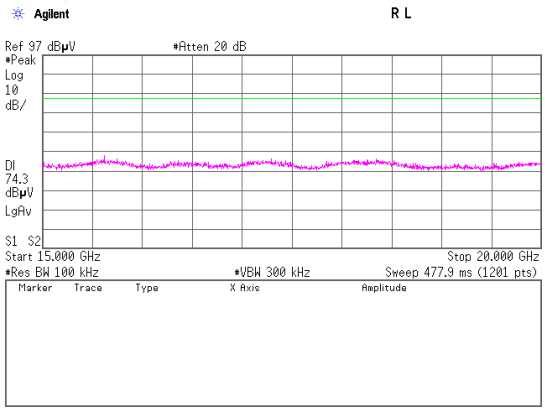
10GHz - 15GHz

Tx1_SpuriousG3



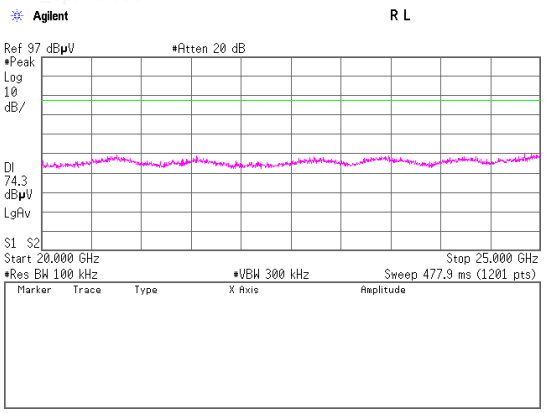
15GHz - 20GHz

Tx1_SpuriousG4



20GHz - 25GHz

Tx1_SpuriousG5



Tx1_SpuriousG6

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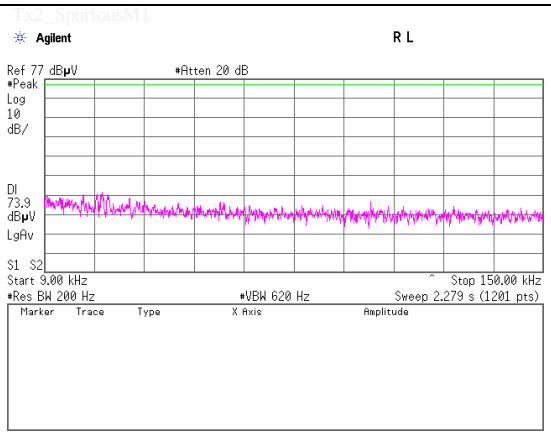
Spurious emission (Conducted)

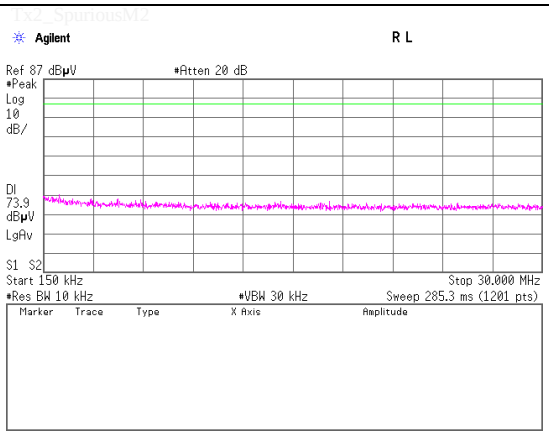
Tx, Bluetooth, BDR, PRBS9

Tx, 2441MHz (below 1GHz)

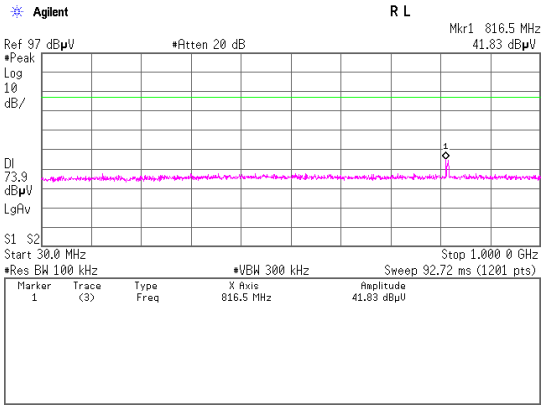
9kHz - 150kHz



150kHz - 30MHz



30MHz - 1GHz



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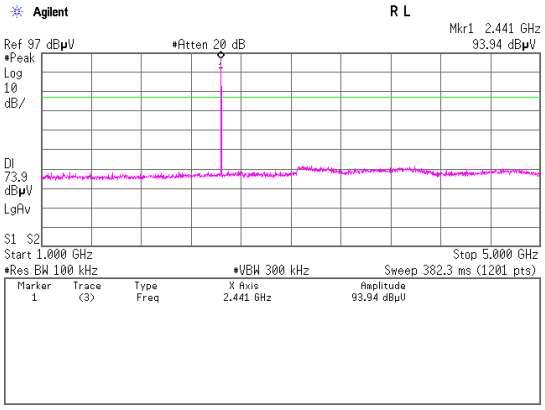
Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2441MHz (above 1GHz)

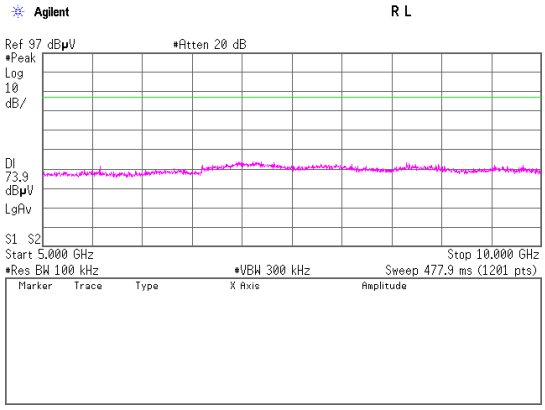
1GHz - 5GHz

Tx2_SpuriousG1



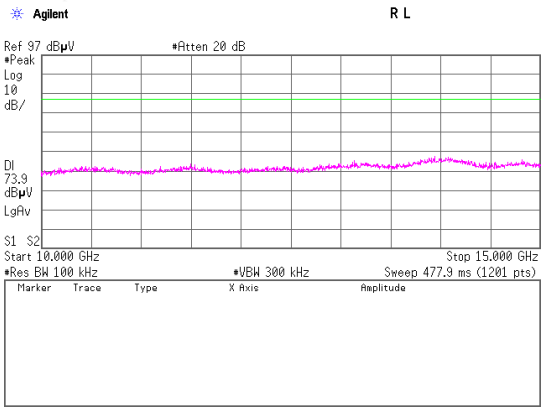
5GHz - 10GHz

Tx2_SpuriousG2



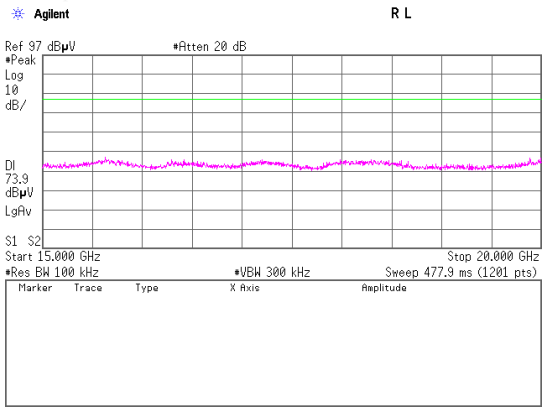
10GHz - 15GHz

Tx2_SpuriousG3



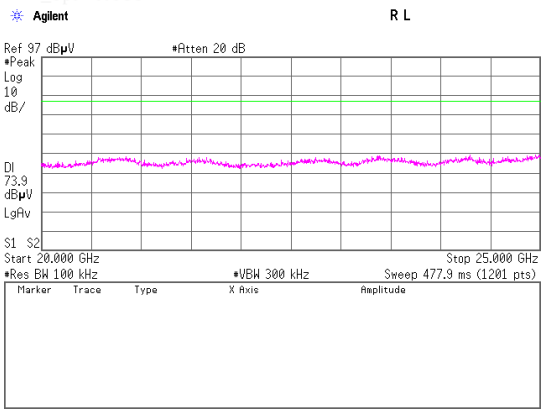
15GHz - 20GHz

Tx2_SpuriousG4



20GHz - 25GHz

Tx2_SpuriousG5



Tx2_SpuriousG6

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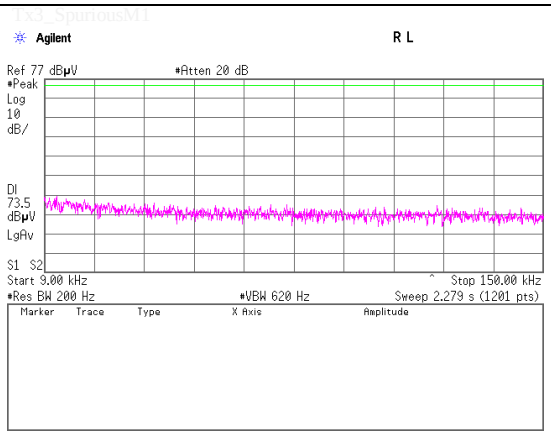
Spurious emission (Conducted)

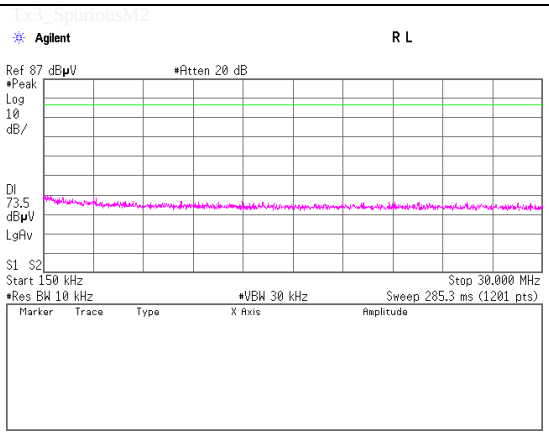
Tx, Bluetooth, BDR, PRBS9

Tx, 2480MHz (below 1GHz)

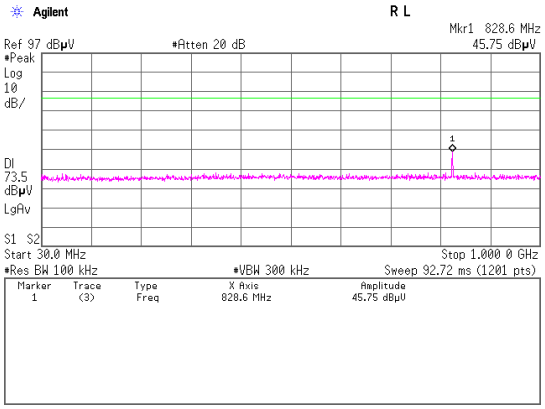
9kHz - 150kHz



150kHz - 30MHz



30MHz - 1GHz



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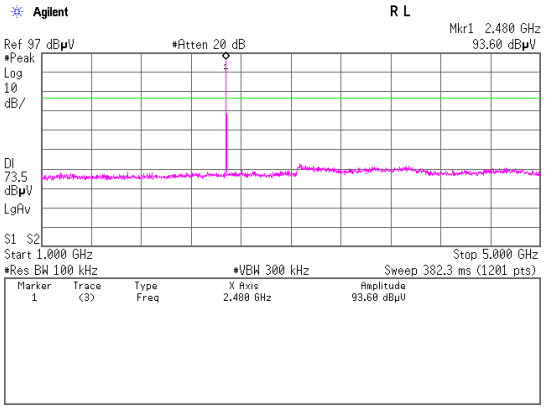
Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2480MHz (above 1GHz)

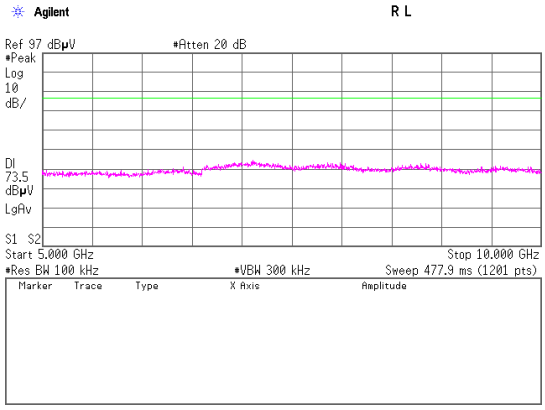
1GHz - 5GHz

Tx3_SpuriousG1



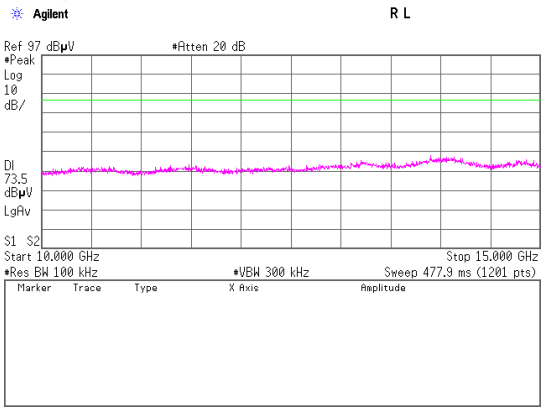
5GHz - 10GHz

Tx3_SpuriousG2



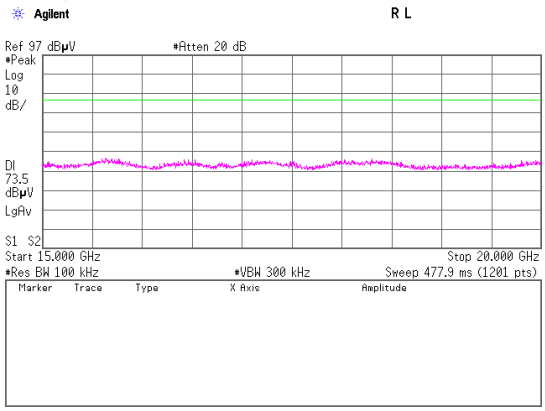
10GHz - 15GHz

Tx3_SpuriousG3



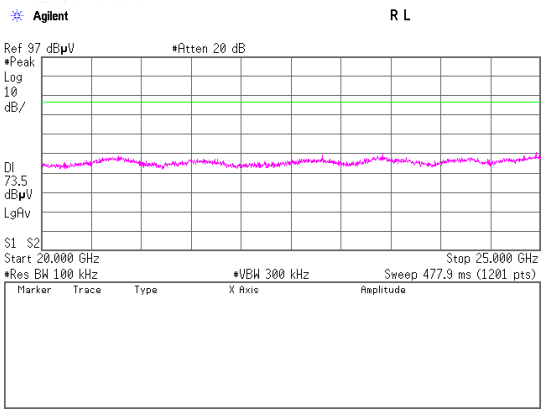
15GHz - 20GHz

Tx3_SpuriousG4



20GHz - 25GHz

Tx3_SpuriousG5



Tx3_SpuriousG6

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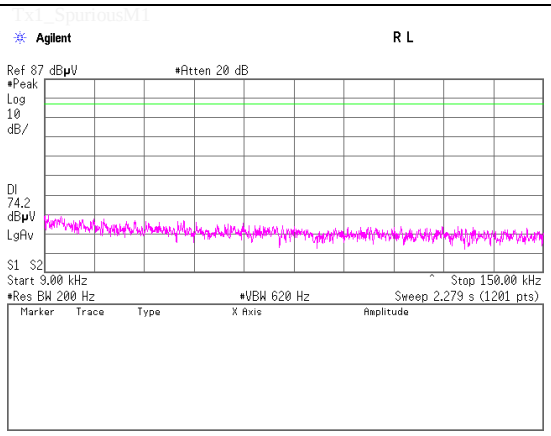
Spurious emission (Conducted)

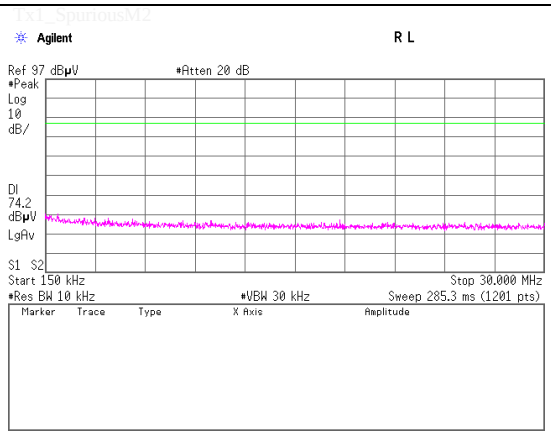
Tx, Bluetooth, EDR, PRBS9

Tx, 2402MHz (below 1GHz)

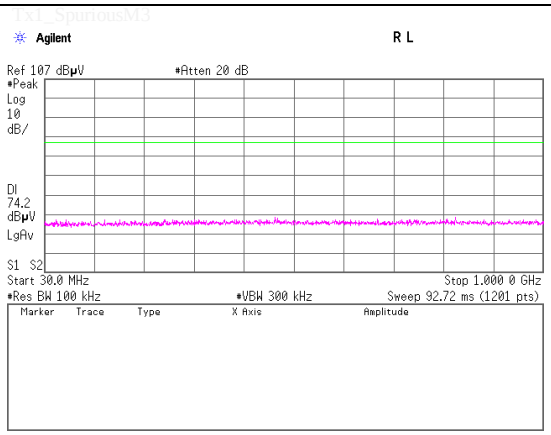
9kHz - 150kHz



150kHz - 30MHz



30MHz - 1GHz



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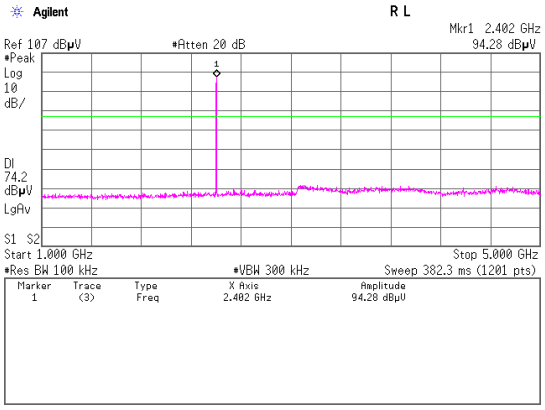
Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2402MHz (above 1GHz)

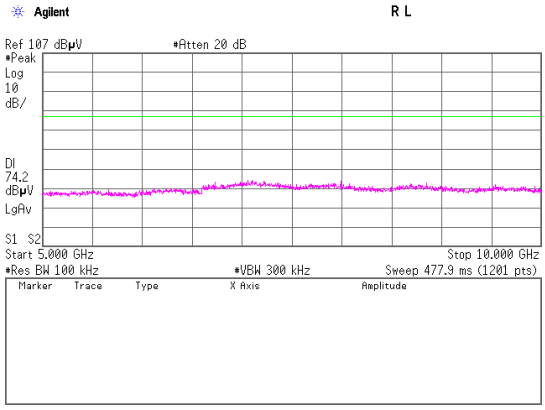
1GHz - 5GHz

Tx1_SpuriousG1



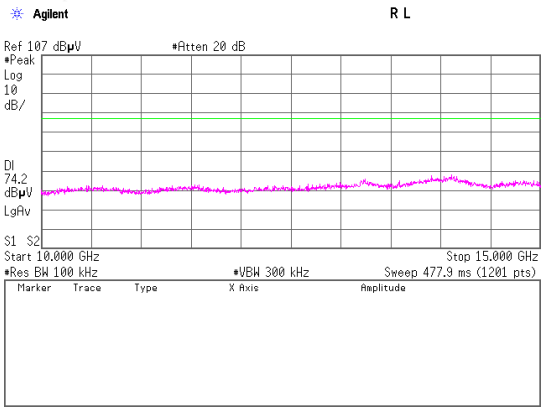
5GHz - 10GHz

Tx1_SpuriousG2



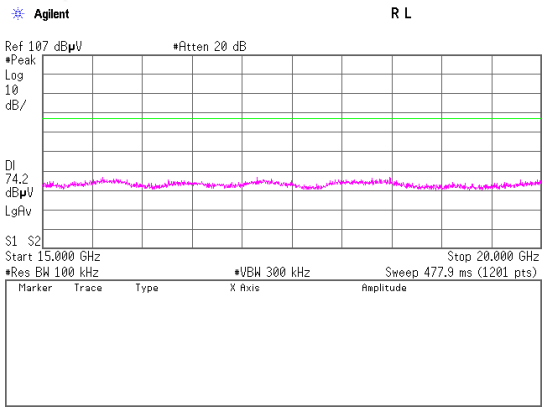
10GHz - 15GHz

Tx1_SpuriousG3



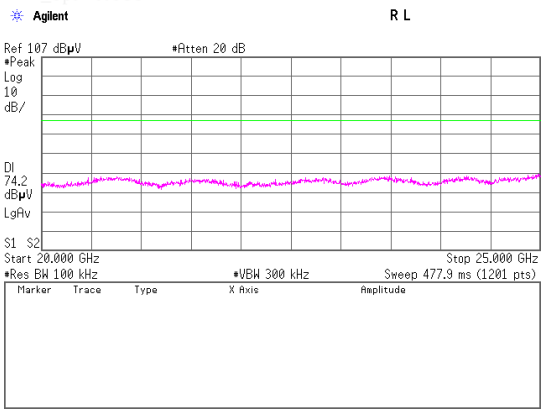
15GHz - 20GHz

Tx1_SpuriousG4



20GHz - 25GHz

Tx1_SpuriousG5



Tx1_SpuriousG6

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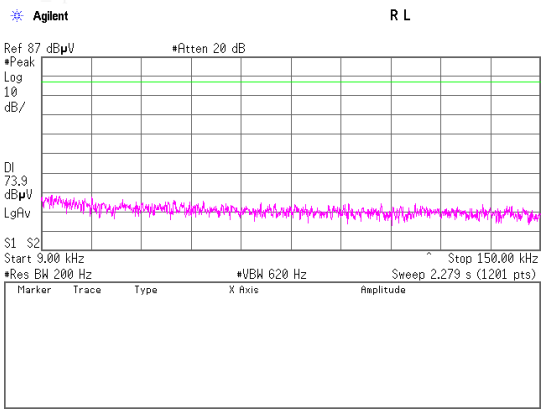
Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2441MHz (below 1GHz)

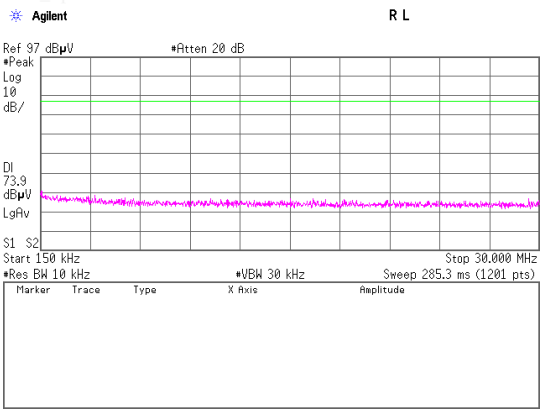
9kHz - 150kHz

Tx2_SpuriousM1



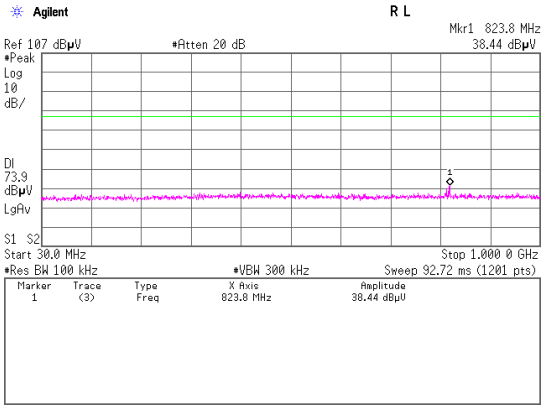
150kHz - 30MHz

Tx2_SpuriousM2



30MHz - 1GHz

Tx2_SpuriousM3



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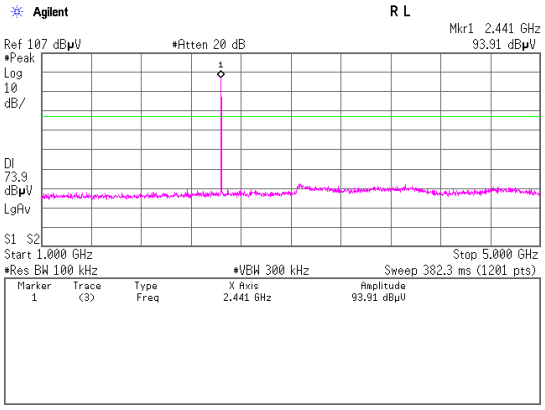
Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2441MHz (above 1GHz)

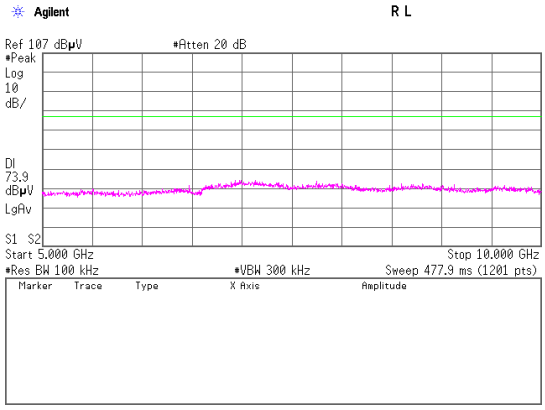
1GHz - 5GHz

Tx2_SpuriousG1



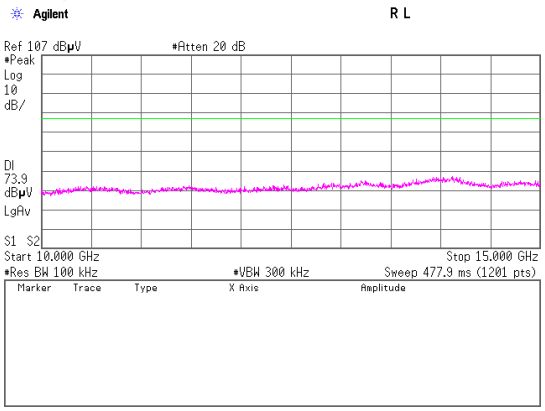
5GHz - 10GHz

Tx2_SpuriousG2



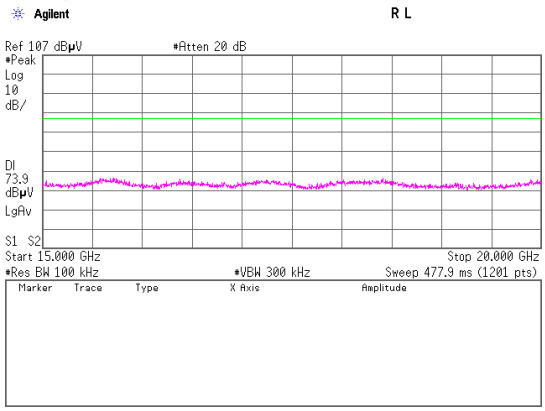
10GHz - 15GHz

Tx2_SpuriousG3



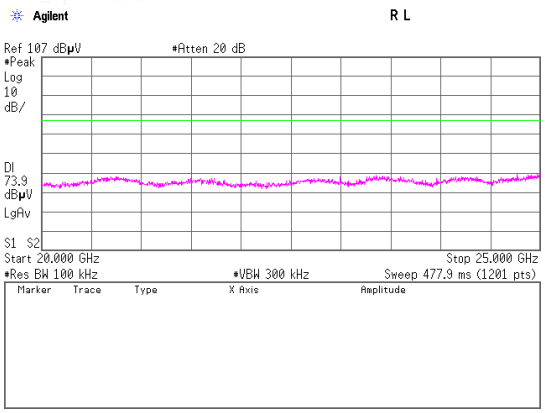
15GHz - 20GHz

Tx2_SpuriousG4



20GHz - 25GHz

Tx2_SpuriousG5



Tx2_SpuriousG6

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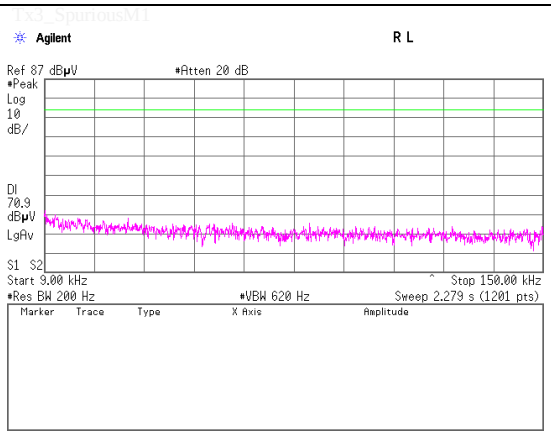
Spurious emission (Conducted)

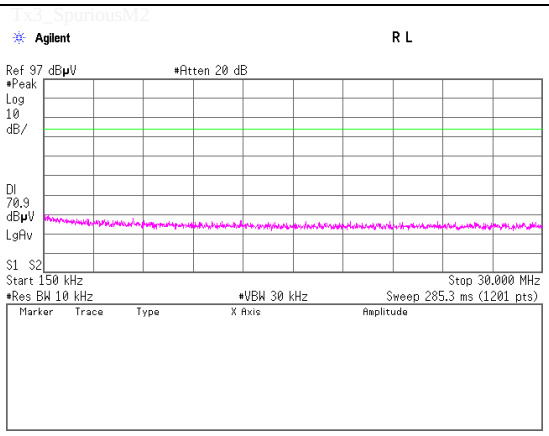
Tx, Bluetooth, EDR, PRBS9

Tx, 2480MHz (below 1GHz)

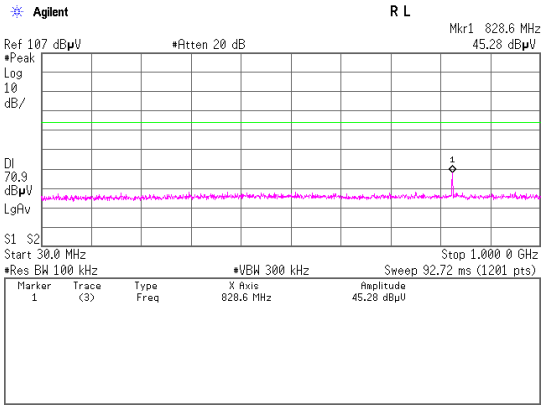
9kHz - 150kHz



150kHz - 30MHz



30MHz - 1GHz



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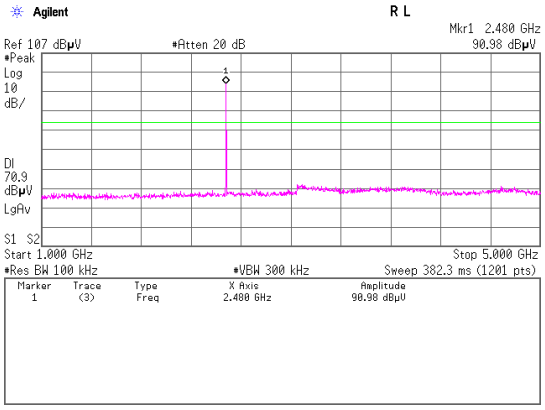
Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2480MHz (above 1GHz)

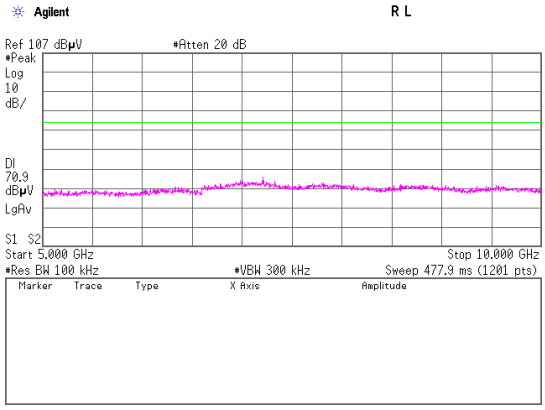
1GHz - 5GHz

Tx3_SpuriousG1



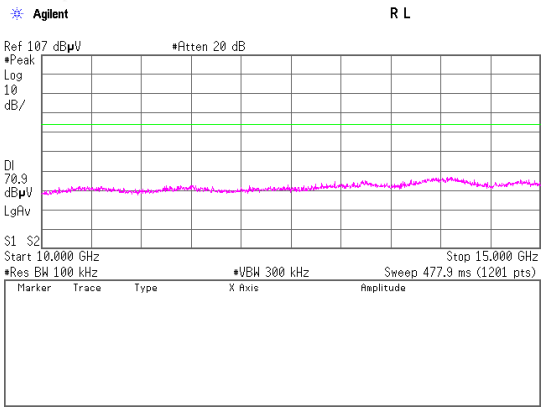
5GHz - 10GHz

Tx3_SpuriousG2



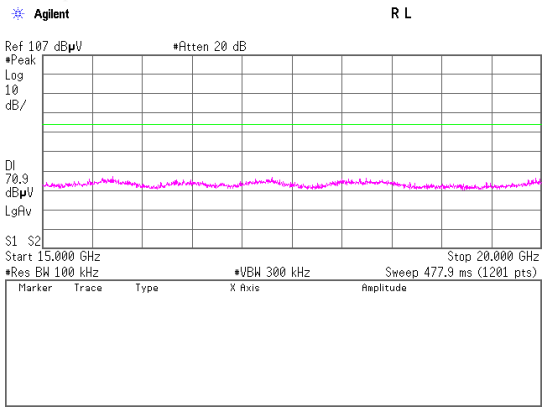
10GHz - 15GHz

Tx3_SpuriousG3



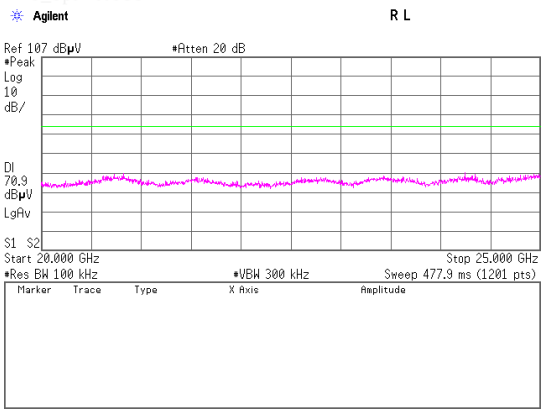
15GHz - 20GHz

Tx3_SpuriousG4



20GHz - 25GHz

Tx3_SpuriousG5



Tx3_SpuriousG6

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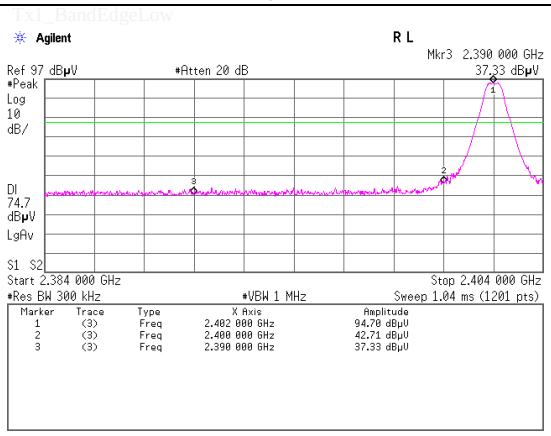
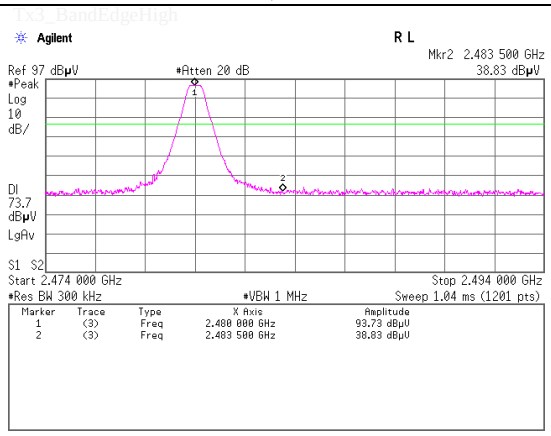
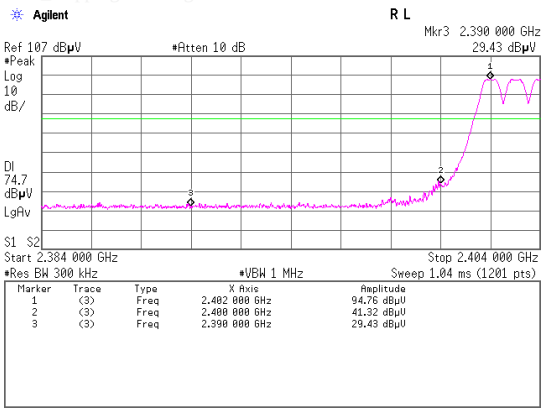
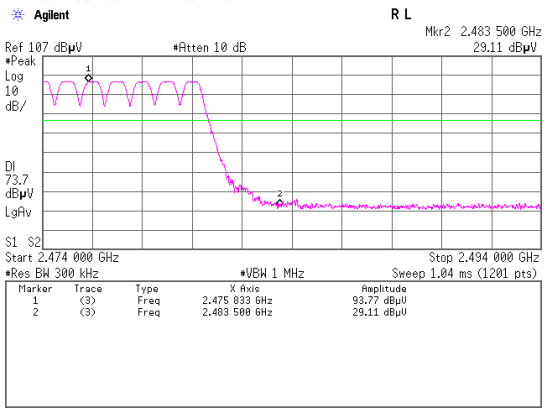
Spurious emission (Conducted)

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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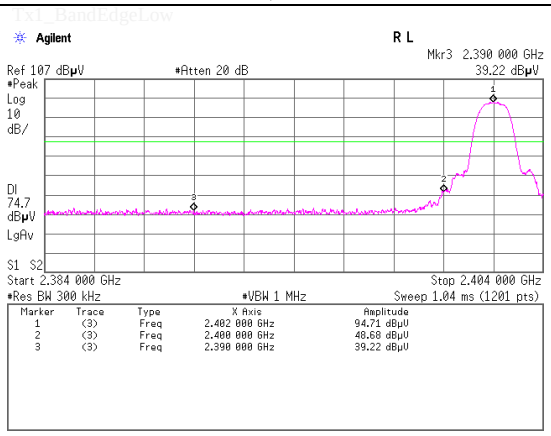
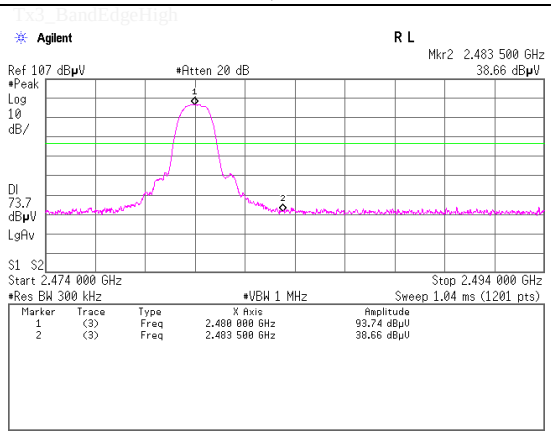
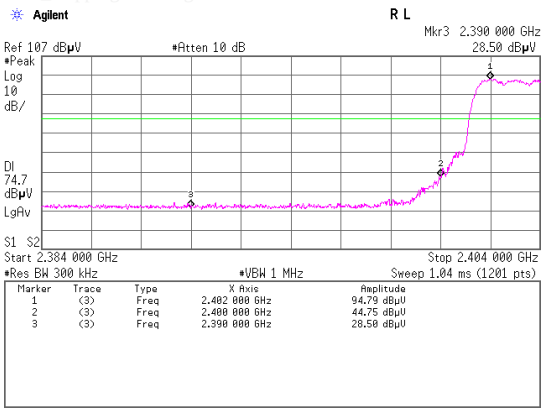
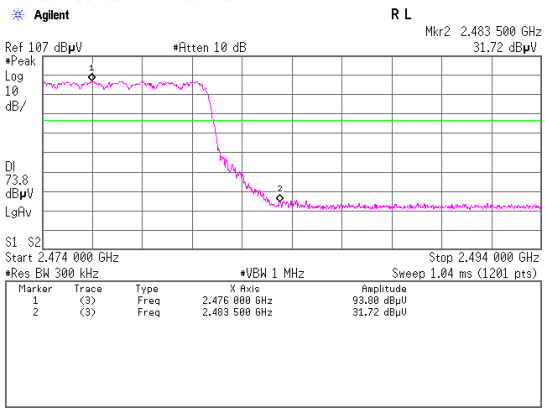
Spurious emission (Conducted)

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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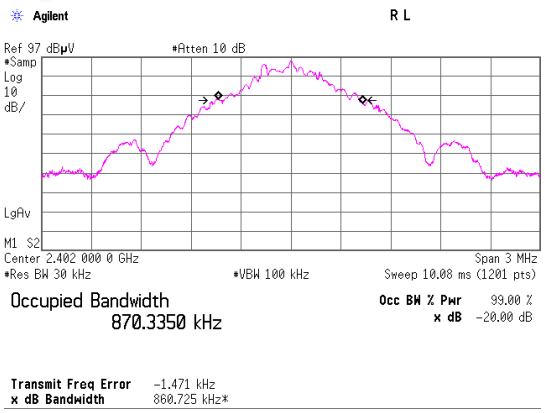
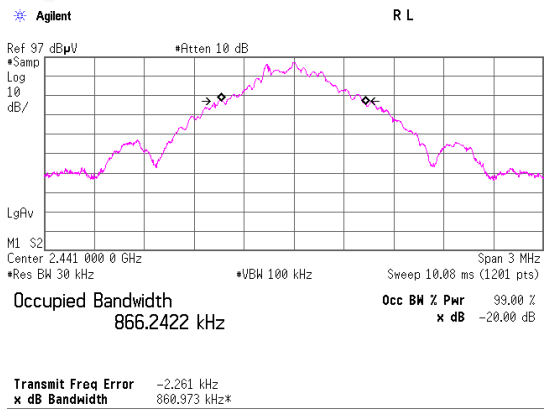
99% Occupied Bandwidth

Tx, Bluetooth, BDR, PRBS9

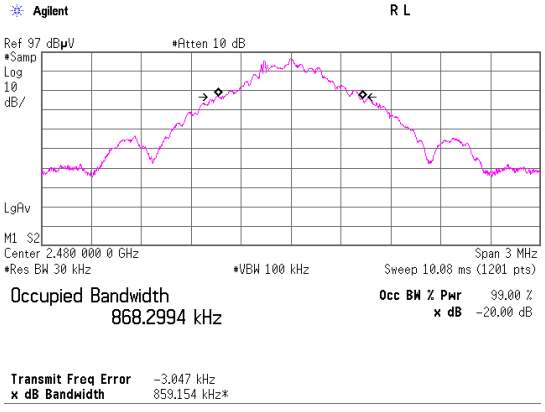
Tx, 2402MHz



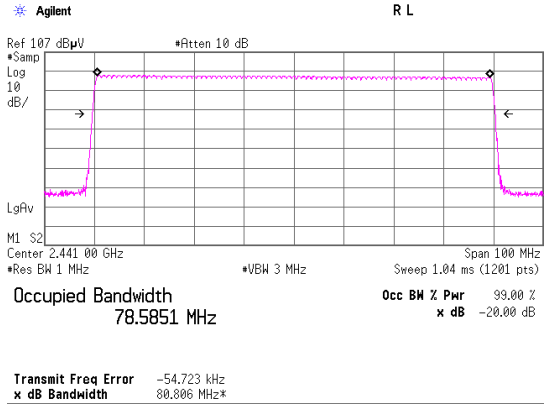
Tx, 2441MHz



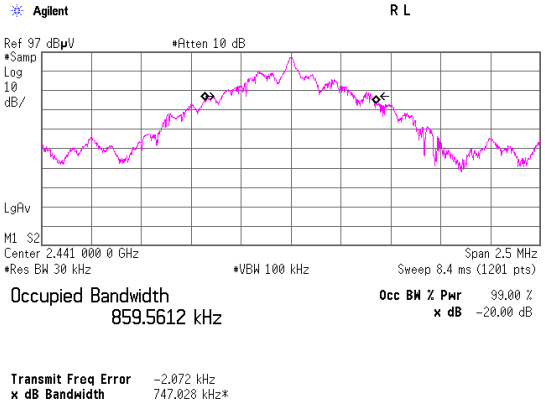
Tx, 2480MHz



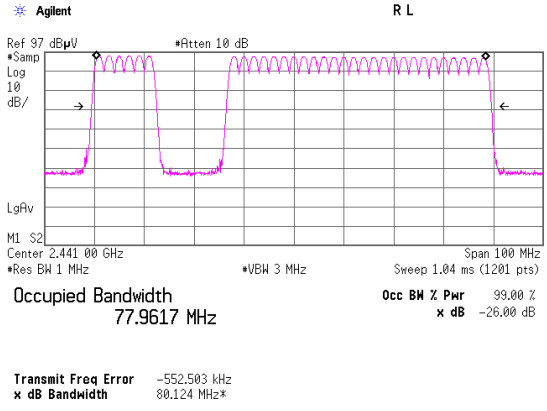
Tx, Hopping On



(Reference) Tx, Inquiry



(Reference) Tx, Inquiry, Hopping



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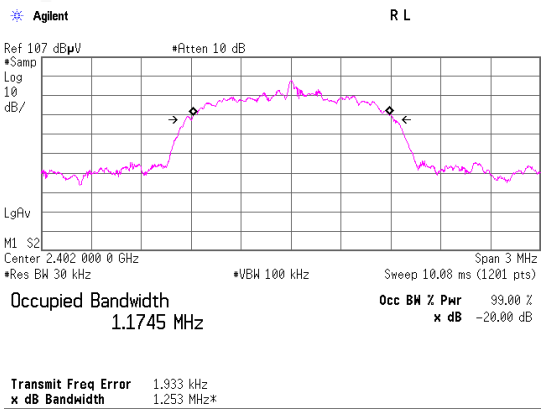
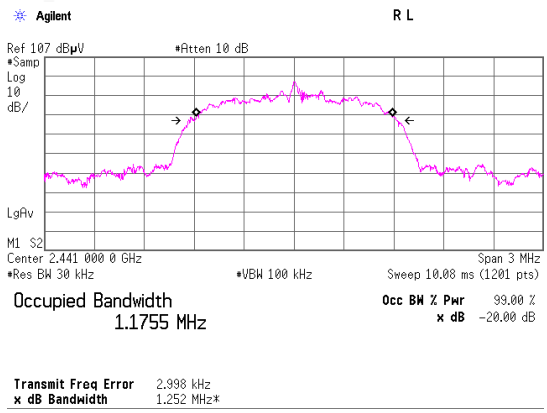
99% Occupied Bandwidth

Tx, Bluetooth, EDR, PRBS9

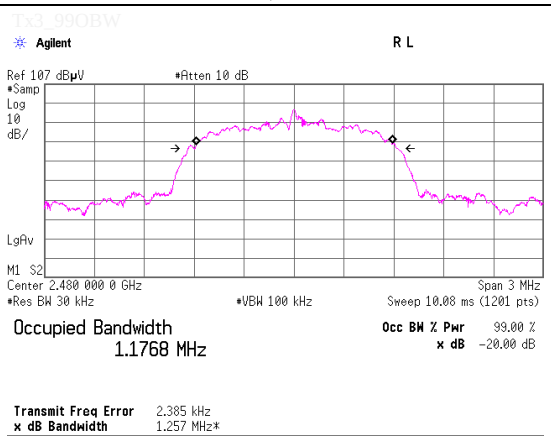
Tx, 2402MHz



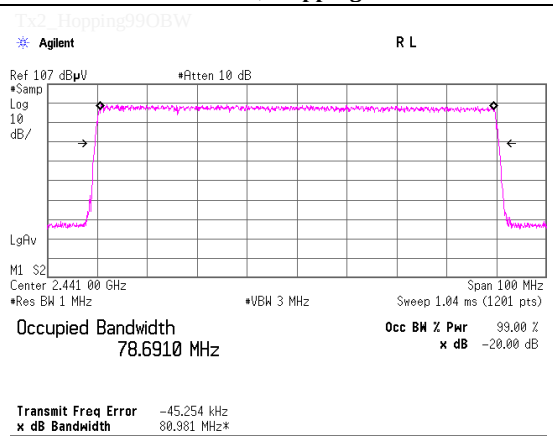
Tx, 2441MHz



Tx, 2480MHz



Tx, Hopping On



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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)
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2013/04/09 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2013/04/09 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2013/01/08 * 12
SAT10-11	Attenuator	Weinschel Corp.	54A-10	37588	AT	2013/04/09 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2013/03/16 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2013/03/07 * 12
SAF-01	Pre Amplifier	SONOMA	310N	290211	RE	2013/02/12 * 12
SAT6-05	Attenuator	JFW	50HF-006N	-	RE	2013/02/12 * 12
KAT3-09	Attenuator	JFW IND. INC.	50HF-003N	-	RE	2013/08/23 * 12
SBA-01	Biconical Antenna	Schwarzbeck	BBA9106	91032664	RE	2012/10/08 * 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	2013/04/04 * 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	2013/04/04 * 12
SLA-01	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0888	RE	2012/11/18 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2013/02/27 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2012/10/04 * 12
SJM-08	Measure	PROMART	SEN1935	-	RE	-
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2013/07/03 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2013/03/19 * 12
SCC-G01	Coaxial Cable	Suhner	SUCOFLEX 104A	46497/4A	RE	2013/04/09 * 12
SCC-G21	Coaxial Cable	Suhner	SUCOFLEX 104	296169/4	RE	2013/05/22 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2013/08/12 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2012/12/18 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2013/03/28 * 12
SHA-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2013/03/14 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2013/03/19 * 12
SCC-G18	Coaxial Cable	Suhner	SUCOFLEX 104A	46292/4A	RE	2013/03/16 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2013/07/09 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2013/07/22 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2013/04/11 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2013/05/22 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2013/08/19 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2013/02/27 * 12
SJM-11	Measure	PROMART	SEN1935	-	RE	-
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2012/12/18 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2012/12/18 * 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 conducted