



RADIO TEST REPORT

Test Report No.: 4786001498S-A

Applicant : PIONEER CORPORATION
Type of Equipment : Car Audio with Bluetooth
Model No. : CVX-2628
FCC ID : AJDK066
Test regulation : FCC Part15 Subpart C: 2012
Test result : Complied

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Date of test: November 27 to December 17, 2012

Tested by:

Tatsuya Arai
Engineer of WiSE Japan,
UL Verification Service

Approved by :

Toyokazu Imamura
Leader of WiSE Japan,
UL Verification Service



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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 4786001498S-A

[illegible]

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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.)

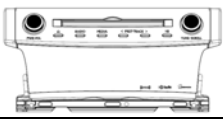
2.1 Identification of E.U.T.

Type of Equipment : Car Audio with Bluetooth
Model No. : CVX-2628
Serial No. : See Section 4.
Rating : DC 12V
Country of Mass-production : Japan
Condition of EUT : Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No modification by the test lab.
Receipt Date of Sample : November 27, 2012

2.2 Product description

Model: CVX-2628 (referred to as the EUT in this report) is a Car Audio with Bluetooth.

The derived model and differences:

Pioneer Number	CVH-2438ZTS1/XHUC	CVX-2628ZT/US
Sell	U.S.A/Canada	U.S.A
Country of Mass-production	U.S.A.	Japan
Audio Amplifier Supplier	internal Amplifier	external Pioneer's Amplifier
Display	6.1InchWVGA	external other's 7 Inch
Front side Design		
Back side Design		

Radio specification:

Wireless LAN:

Equipment type : Transceiver
Frequency of operation : 2412-2462MHz
Bandwidth & channel spacing : 20MHz & 5MHz
Type of modulation : BPSK, QPSK, CCK, 16QAM, 64QAM
Antenna type : Pattern
Antenna gain with cable loss : -2.52dBi (max)
Antenna connector type : U.FL-LP-066
Operation temperature range : -20 to +65 deg.C.

Bluetooth:

Equipment type : Transceiver
Frequency of operation : 2402-2480MHz
Bandwidth & channel spacing : 79MHz & 1MHz
Type of modulation : GFSK, $\pi/4$ DQPSK, 8DPSK
Antenna type : Pattern
Antenna gain with cable loss : -3.74dBi (max)
Antenna connector type : U.FL-LP-066
Operation temperature range : -20 to +65 deg.C.

Refer to the test report: 4786001498S-B for Wireless LAN part.

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FCC 15.31 (e)

The equipment provides the wireless transmitter with stable power supply (DC3.3V). Therefore, the equipment complies with the requirement.

FCC 15.203

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

Clock Frequency:

Reason For Use	Frequency
SYSTEM MICROCOMPUTER	16MHz
CAN MICROCOMPUTER	8MHz
Dirana	41.6MHz
VDEC	32MHz
GVIIF TX	24MHz
GPS RX	26MHz
SoC int CLK (33M PLL)	1066.667MHz
SoC int CLK (48M PLL)	864.0MHz
SoC MASTER CLK	33.33MHz
SoC DOTCLK	37MHz
SoC USBCLK	48.0MHz
VCXO (SoC)	27.0MHz
Audio PLL IC (SoC)	24.576MHz
Audio PLL IC (SoC)	16.934MHz
Audio PLL IC(ADC for MIC)	6.144MHz
DSP MCLK (HD)	24.0MHz
SYS CLK (XM)	24.265MHz
I2C communication SYS uCom ↔E2PROM	100k~400kHz
I2C communication SYS uCom ↔VDEC	0.4MHz
I2C communication SYS uCom ↔LVDS	400kbps
I2C communication SYS uCom ↔GVIIF	100kHz or 400kHz
I2C communication SYS uCom ↔Dirana	0.3MHz
I2C communication Dirana↔L-Dice	0.4MHz
I2C communication Dirana↔Hero	0.4MHz
I2C communication SoC↔iPod	100~400kHz
SPI communication SYS uCom↔KeyScan IC	0.4MHz
SPI communication SYS uCom↔CAN uCom	0.6MHz
SPI communication SYS uCom↔GVIIF	0.4MHz
SPI communication SoC↔HD Module	0.8MHz
UART communication SYS uCom↔HD Module	115kbps
UART communication SYS uCom↔SoC	1.5Mbps
UART communication SYS uCom↔CD Meca	19.2kbps
UART communication SoC↔BT Module	3Mbps
CAN communication	500kbps
LBSC communication Soc↔NorFlash	66.66MHz
DBSC3 communication Soc↔DDR3	533.33MHz
SD IF SoC↔SD Card	48MHz
SD IF SoC↔WiFi Module	24MHz
Audio data (I2S)	3.072MHz
Audio data (SPDIF)	2.82MHz
D.RGB666 (Video)	37.007MHz
Digital IF Dirana↔HD Module	0.65MHz
USB2.0 signal	480Mbps
LVDS signal	500MHz
GVIIF signal	500MHz
Global CAN	500kbps
Local CAN	500kbps
AVC-LAN	12Mbps
DCDC converter	444.444kHz, 480.000kHz
HERO (For HD DATA)	62.4MHz

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SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : Test specification: FCC Part 15 Subpart C: 2012,
final revised on August 13, 2012 and effective September 12, 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 EUT has been tested for compliance with FCC Part 15 Subpart B 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	5.8dB Freq.: 407.078MHz Polarization: Horizontal Detection: Quasi Peak Mode: Tx 2402MHz, 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.						

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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

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%

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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.

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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), Payload: PRBS9	-
20dB bandwidth	Transmitting Hopping OFF (DH5/3-DH5), Payload: PRBS9	2402MHz, 2441MHz, 2480MHz
Number of hopping frequency	Transmitting Hopping ON (DH5/3-DH5), Payload: PRBS9	-
Dwell time	Transmitting (Hopping ON), Payload: PRBS9 - DH1, - DH3, - DH5 - 3-DH1, - 3-DH3, - 3-DH5	-
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	
99% occupied bandwidth	Transmitting (DH5/3-DH5), 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: Power target: 0 (dBm)
BDR: Ext.=0, Int.=57
EDR: Ext.=0, Int.=55
Software: BlueTest3 Ver. 2.4

The EUT does not have Inquiry mode.

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

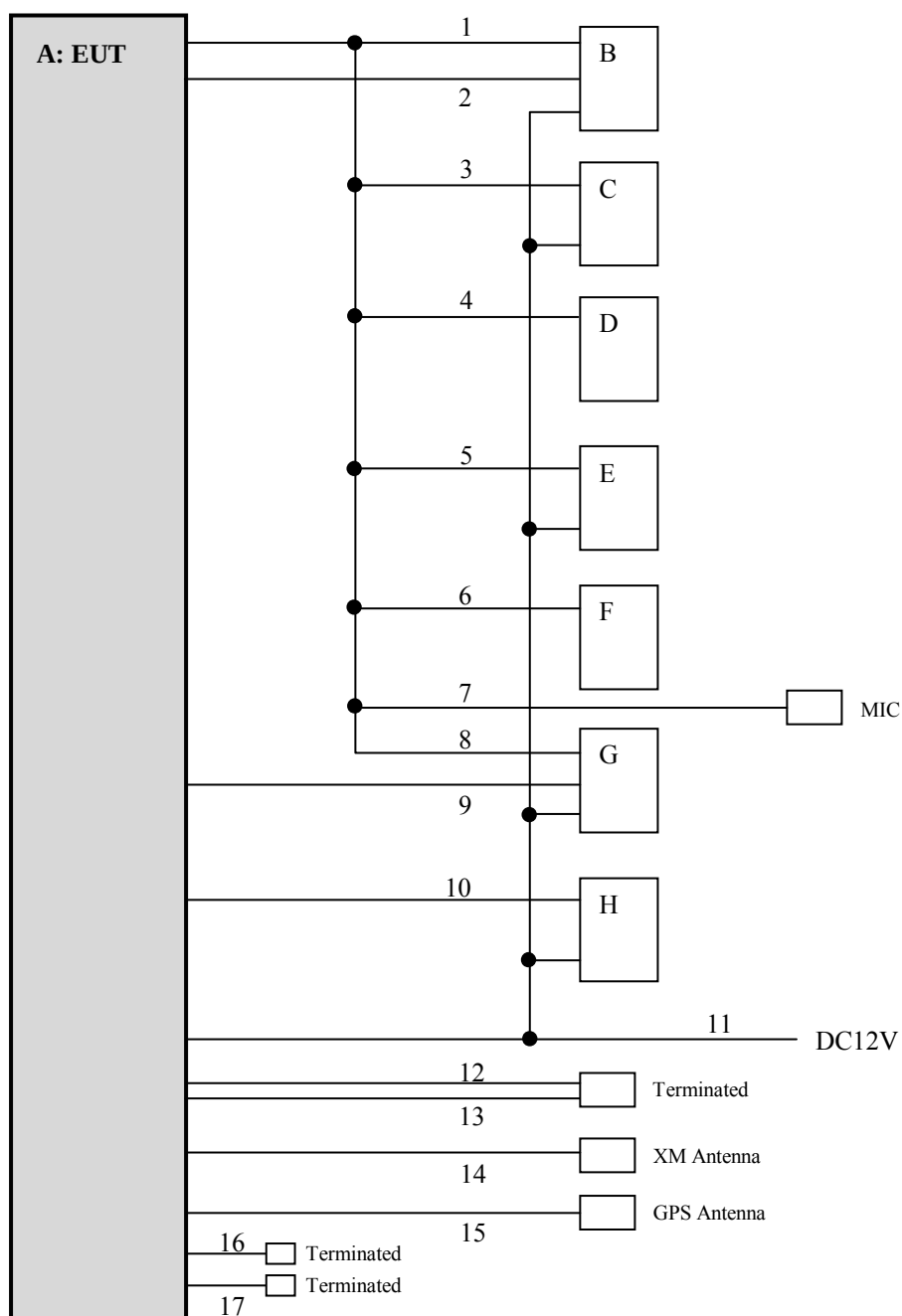
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4.2 Configuration of tested system



* Test data was taken under worse case conditions.

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Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Audio with Bluetooth	CVX-9338	*1)	Pioneer	EUT
B	Display	86110-30330	329003456	DENSO	-
C	Remote Control Device	84780-30080	0244AA	-	-
D	Steering Switch	-	-	-	-
E	Air-Condition ECU	88650-30P80	177700-6524	DENSO	-
F	Rear Camera	-	-	-	-
G	DCM	86741-53040	A1000004900E70	DENSO	-
H	Amplifier	86280-53190	LVD:K1LD014	Pioneer	-

*1) Antenna terminal conducted tests: AAB999998US, Radiated emission tests: AAB999999CA

List of cables used

No.	Cable name	Length (m)	Shield		Remark
			Cable	Connector	
1	Signal cable for Display	2.0	Unshielded	Unshielded	-
2	Image output cable	2.0	Unshielded	Unshielded	-
3	Signal cable for Remote control	2.0	Unshielded	Unshielded	-
4	Signal cable for Steering Switch	2.0	Unshielded	Unshielded	-
5	Signal cable for Air-Condition ECU	2.0	Unshielded	Unshielded	-
6	Signal cable for Rear Camera	2.0	Unshielded	Unshielded	-
7	Signal cable for MIC	4.0	Shielded	Shielded	-
8	Signal cable for DCM	2.0	Unshielded	Unshielded	-
9	Signal cable for DCM	1.2	Unshielded	Unshielded	-
10	Signal cable for Amplifier	2.0	Shielded	Shielded	-
11	DC power cable	4.0	Unshielded	Unshielded	-
12	AV cable	2.0	Unshielded	Unshielded	-
13	USB cable	2.0	Shielded	Shielded	-
14	Antenna cable for XM	2.4	Shielded	Shielded	-
15	Antenna cable for GPS	1.6	Shielded	Shielded	-
16	Antenna cable for Radio	0.15	Shielded	Shielded	-
17	Antenna cable for Radio	0.15	Shielded	Shielded	-

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

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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

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

11.2 Test configuration

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

11.3 Test conditions

Frequency range : 30MHz to 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.

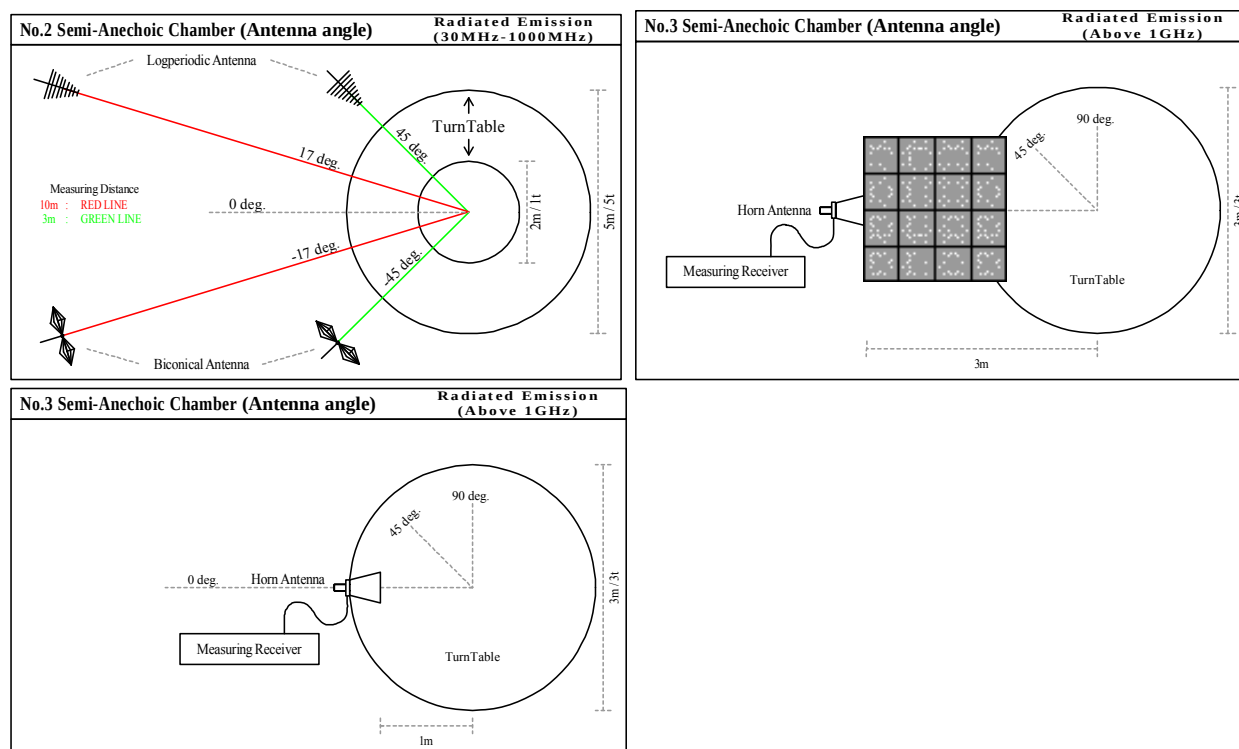
The radiated emission measurements were made with the following detection of the test receiver.

Frequency	30 - 1000MHz	1 - 25GHz		20dBc
Detection Type	: Quasi-Peak	Peak	* Average	Peak
IF Bandwidth	: 120kHz	RBW:1MHz VBW:3MHz	RBW:1MHz VBW:10Hz	RBW: 100kHz, VBW: 300kHz

* 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 fixed at angle of 23.5 deg. based on the product specification.

Figure 1. Antenna angle



11.5 Band edge

Band edge level at 2390MHz and 2483.5MHz is below the limits of FCC 15.209 and band edge level at 2400MHz is below the 20dBc. 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

20dB Bandwidth and Carrier Frequency Separation

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date December 17, 2012
Temperature / Humidity 24deg.C , 35%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	0.956	1.000	>= 0.637
DH5	2441.0	1.015	1.000	>= 0.677
DH5	2480.0	0.946	1.000	>= 0.631

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

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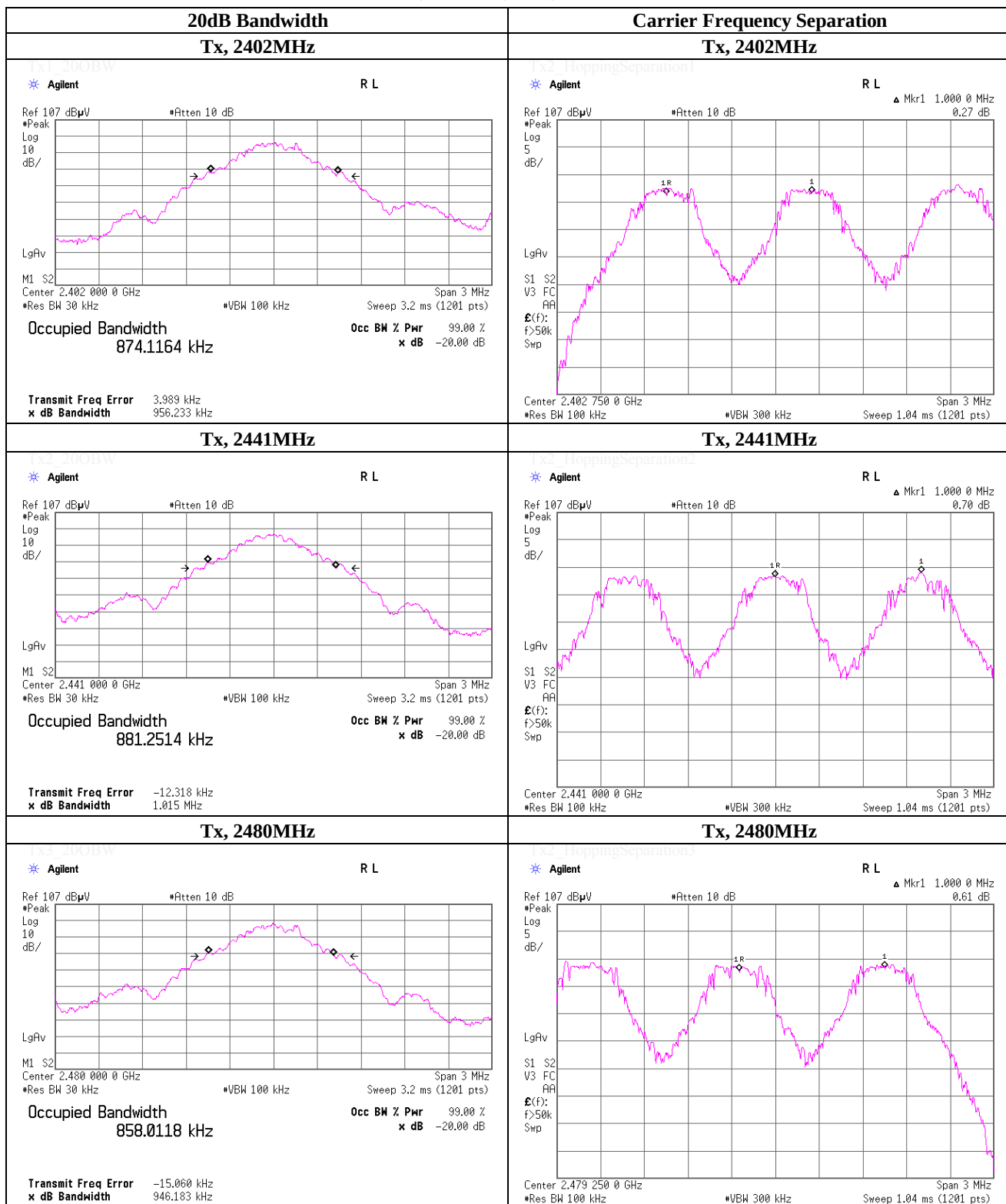
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20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, BDR, PRBS9



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20dB Bandwidth and Carrier Frequency Separation

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date December 17, 2012
Temperature / Humidity 24deg.C , 35%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	1.278	1.000	>= 0.852
3-DH5	2441.0	1.261	1.000	>= 0.841
3-DH5	2480.0	1.262	1.000	>= 0.841

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

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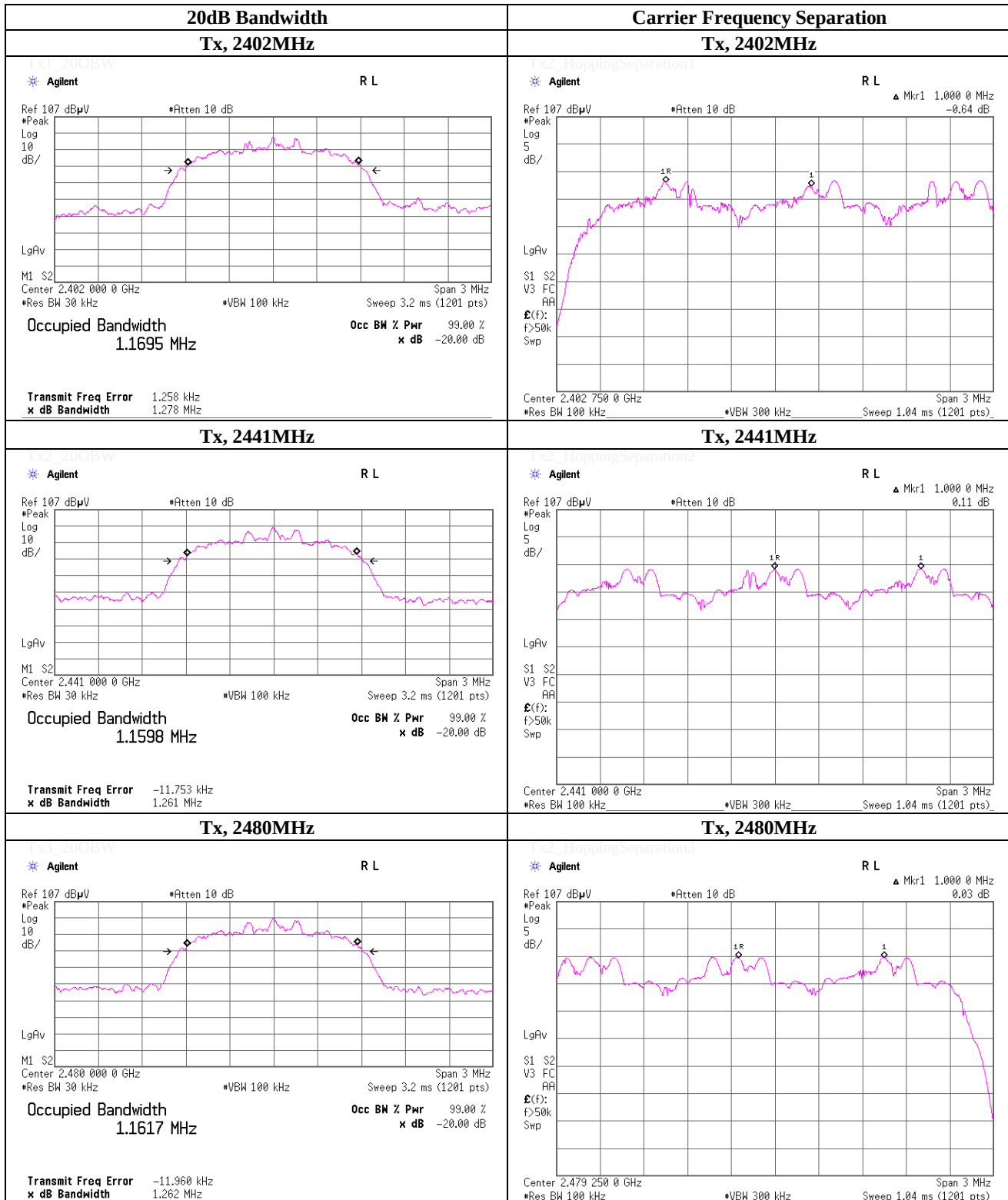
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20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, EDR, PRBS9



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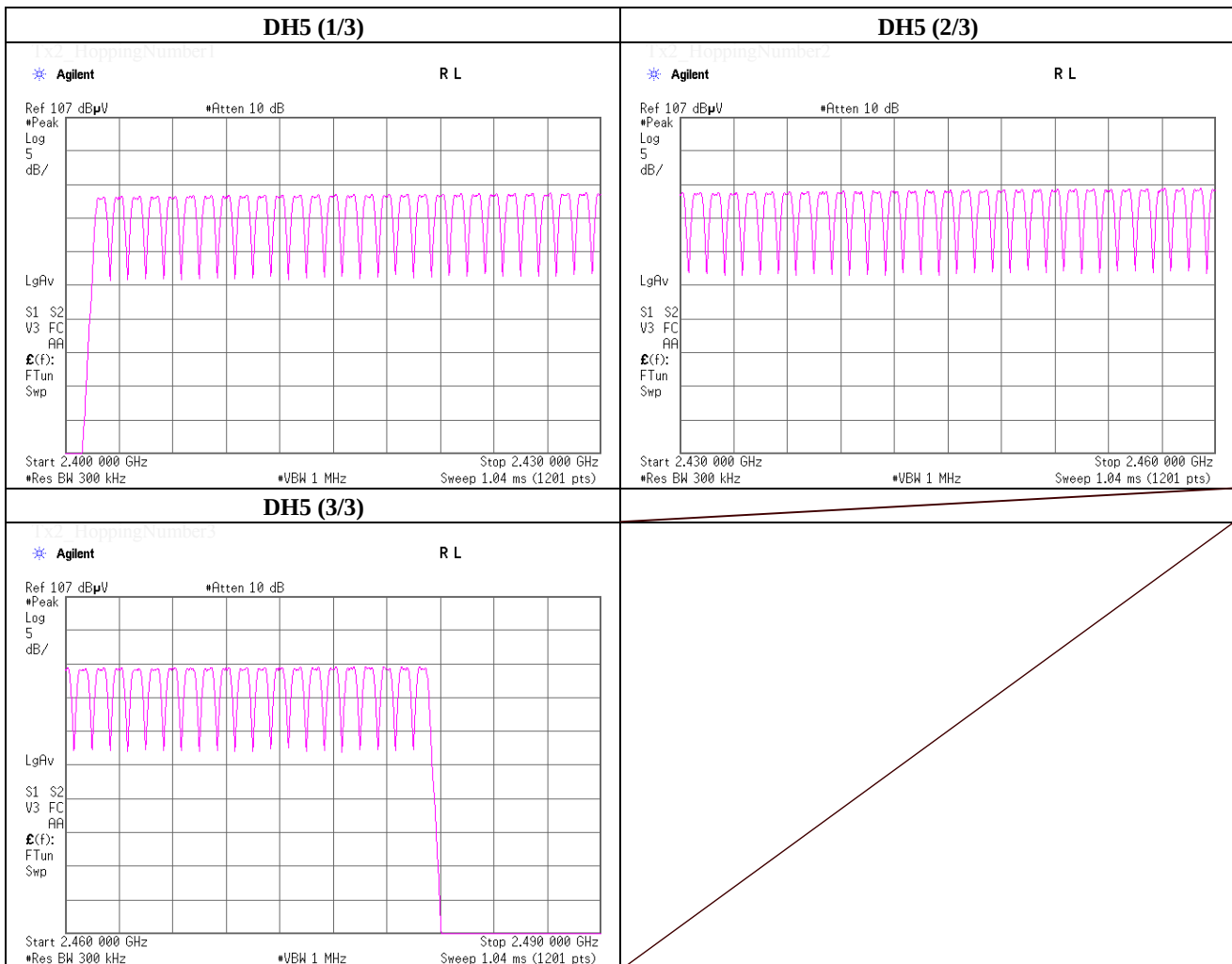
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Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	December 17, 2012	
Temperature / Humidity	24deg.C , 35%RH	
Engineer	Kenichi Adachi	
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.



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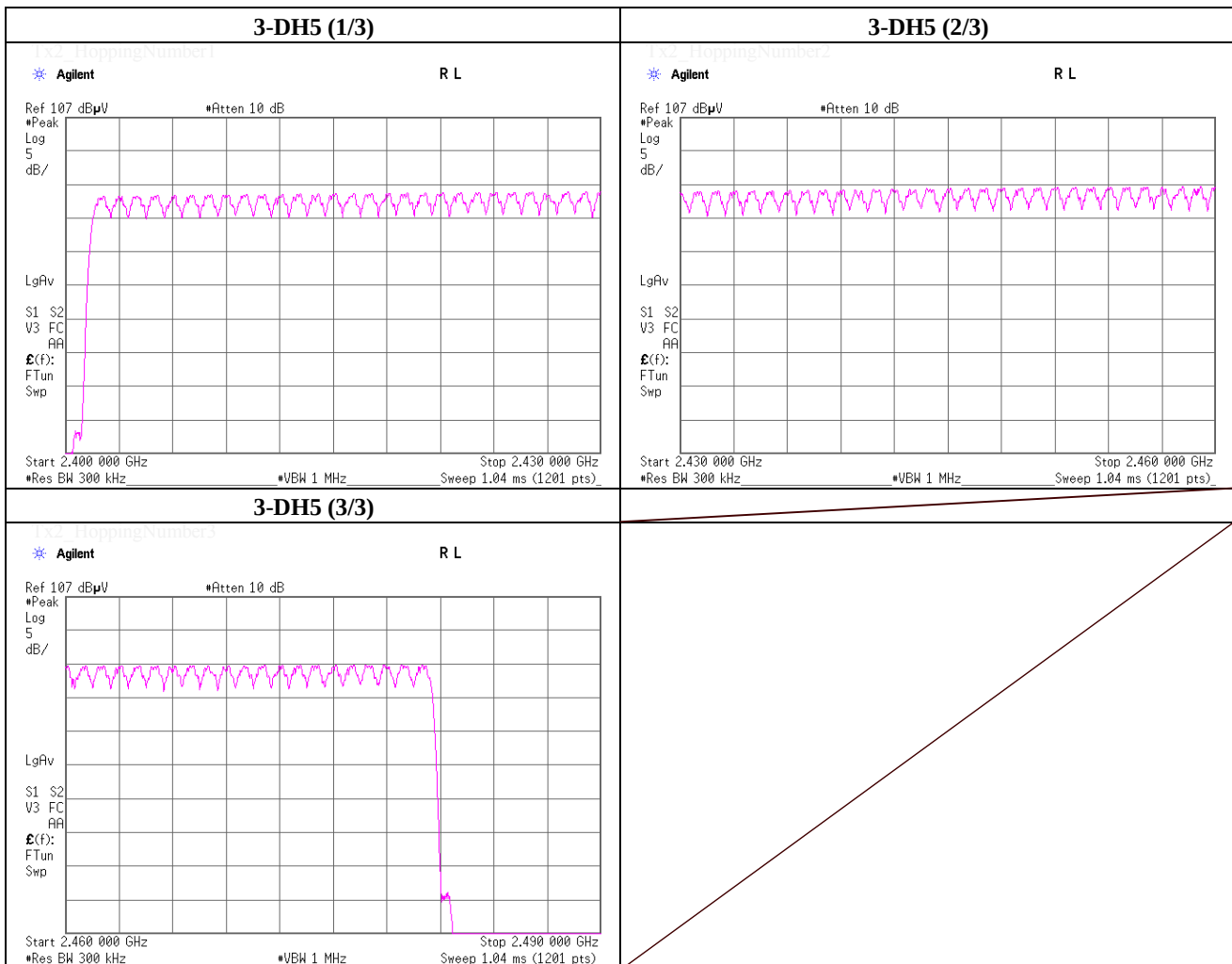
Facsimile : +81 463 50 6401

Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	December 17, 2012	
Temperature / Humidity	24deg.C , 35%RH	
Engineer	Kenichi Adachi	
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.



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Dwell Time

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	December 17, 2012	
Temperature / Humidity	24deg.C , 35%RH	
Engineer	Kenichi Adachi	
Mode	Tx, Bluetooth, BDR, PRBS9	

Mode	Number of transmission in a 31.6 (79 Hopping x 0.4) second	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	50.0 / 5.0 sec. x 31.6 sec. = 316 times	0.402	127	400
DH3	26.0 / 5.0 sec. x 31.6 sec. = 165 times	1.659	274	400
DH5	17.0 / 5.0 sec. x 31.6 sec. = 108 times	2.907	314	400

Sample Calculation

Result = Number of transmission x Length of transmission time

* 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 $N \times 0.4s$, 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 $N=79$.

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Shonan EMC Lab.

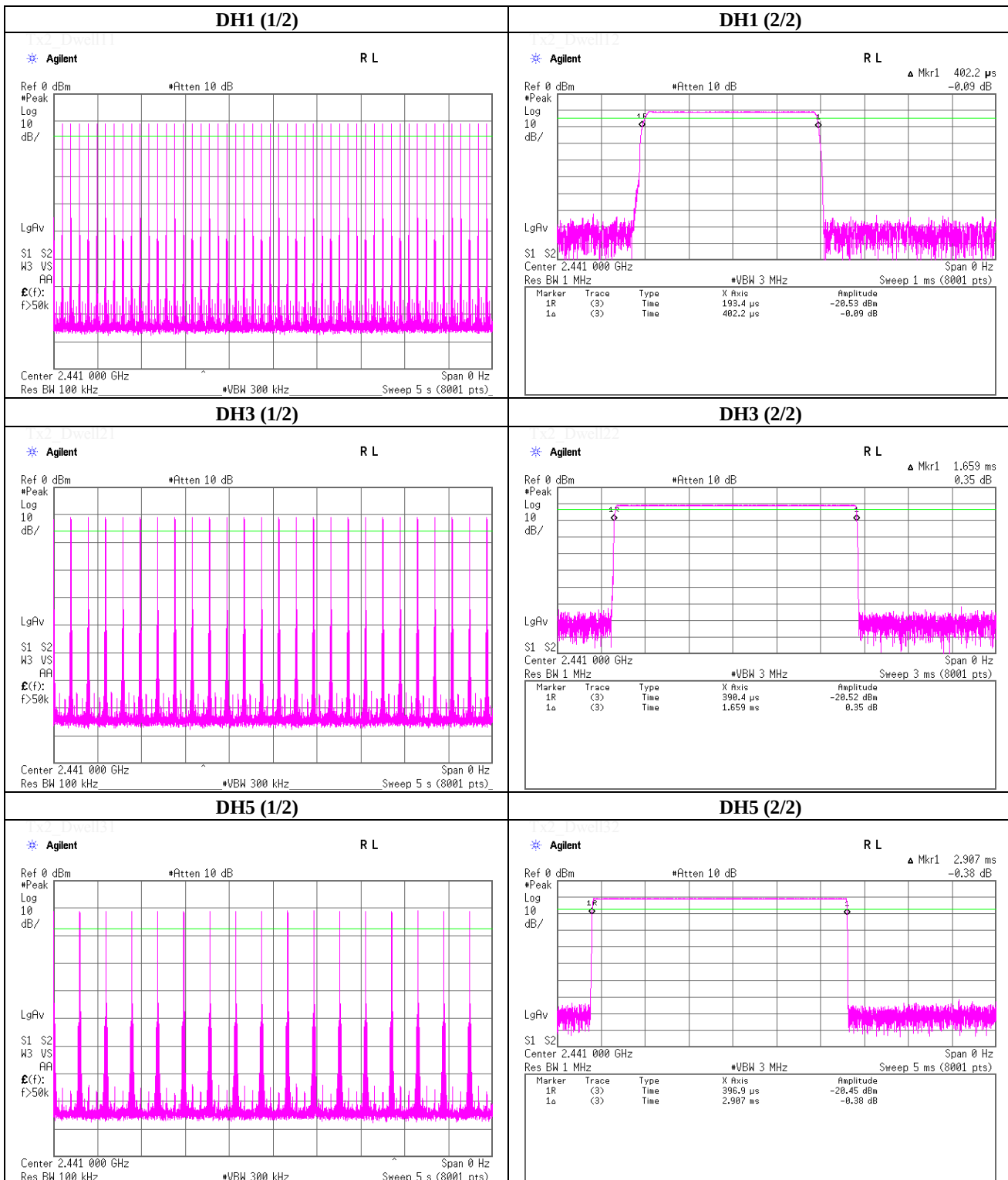
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Dwell time

Tx, Bluetooth, BDR, PRBS9



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Dwell Time

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
 Date December 17, 2012
 Temperature / Humidity 24deg.C , 35%RH
 Engineer Kenichi Adachi
 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	50.0 / 5.0 sec. x 31.6 sec. = 316 times	0.416	131	400
3-DH3	26.0 / 5.0 sec. x 31.6 sec. = 165 times	1.667	275	400
3-DH5	17.0 / 5.0 sec. x 31.6 sec. = 108 times	2.917	315	400

Sample Calculation

Result = Number of transmission x Length of transmission time

* 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 $N \times 0.4s$, 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 $N=79$.

UL Japan, Inc.

Shonan EMC Lab.

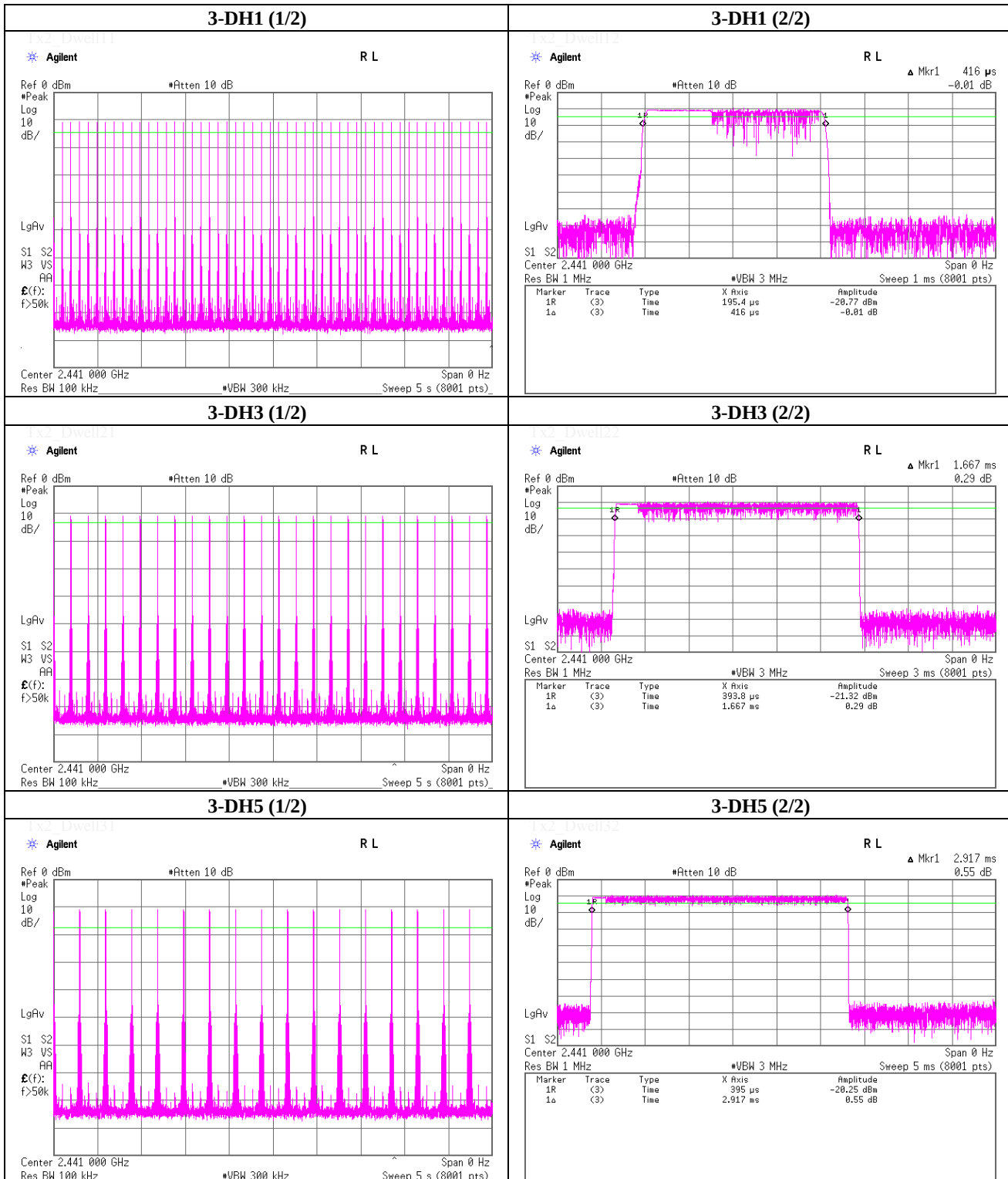
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Dwell time

Tx, Bluetooth, EDR, PRBS9



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Maximum Peak Conducted Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
 Date November 28, 2012
 Temperature / Humidity 23deg.C , 33%RH
 Engineer Kenichi Adachi
 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	-11.76	1.96	9.86	0.06	1.01	20.97	125	20.91
DH5	2441.0	-11.14	1.97	9.86	0.69	1.17	20.97	125	20.28
DH5	2480.0	-10.65	1.98	9.86	1.19	1.32	20.97	125	19.78
2-DH5	2402.0	-10.66	1.96	9.86	1.16	1.31	20.97	125	19.81
2-DH5	2441.0	-9.84	1.97	9.86	1.99	1.58	20.97	125	18.98
2-DH5	2480.0	-9.31	1.98	9.86	2.53	1.79	20.97	125	18.44
3-DH5	2402.0	-10.43	1.96	9.86	1.39	1.38	20.97	125	19.58
3-DH5	2441.0	-9.52	1.97	9.86	2.31	1.70	20.97	125	18.66
3-DH5	2480.0	-9.02	1.98	9.86	2.82	1.91	20.97	125	18.15

Sample Calculation:

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 27, 2012	November 28, 2012	November 29, 2012
Temperature / Humidity	24 deg.C , 30 %RH	22 deg.C , 49 %RH	23 deg.C , 35 %RH
Engineer	Kenich Adachi	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2402.0 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.	144.006	QP	31.5	14.7	8.7	31.8	23.1	43.5	20.4	234	259	
Hori.	240.002	QP	39.4	16.9	10.0	31.8	34.5	46.0	11.5	145	14	
Hori.	333.059	QP	41.4	14.9	7.2	31.7	31.8	46.0	14.2	100	133	
Hori.	407.073	QP	47.7	16.5	7.6	31.7	40.1	46.0	5.9	100	44	
Hori.	1008.000	PK	50.9	25.0	12.7	40.7	47.9	73.9	26.0	100	179	
Hori.	1554.293	PK	49.6	24.9	13.3	40.8	47.0	73.9	26.9	100	221	
Hori.	2390.000	PK	48.0	27.4	14.2	41.4	48.2	73.9	25.7	187	211	
Hori.	2557.995	PK	48.1	27.7	14.3	41.4	48.7	73.9	25.2	100	0	
Hori.	2886.530	PK	54.8	28.2	6.2	41.4	47.8	73.9	26.1	100	161	
Hori.	3126.473	PK	53.7	28.7	5.7	41.5	46.6	73.9	27.3	100	140	
Hori.	3774.690	PK	55.5	29.5	6.0	41.8	49.2	73.9	24.7	100	217	
Hori.	3996.733	PK	52.8	29.7	6.2	41.8	46.9	73.9	27.0	100	211	
Hori.	4804.000	PK	49.5	31.1	6.8	41.2	46.2	73.9	27.7	100	111	
Hori.	7206.000	PK	49.0	36.6	8.3	41.4	52.5	73.9	21.4	100	0	
Hori.	9608.000	PK	45.6	38.5	9.4	38.9	54.6	73.9	19.3	100	0	
Hori.	12010.000	PK	46.1	39.4	10.7	39.4	56.8	73.9	17.1	100	0	
Hori.	1008.000	AV	43.6	25.0	12.7	40.7	40.6	53.9	13.3	100	179	
Hori.	1554.293	AV	40.0	24.9	13.3	40.8	37.4	53.9	16.5	100	221	
Hori.	2390.000	AV	35.1	27.4	14.2	41.4	35.3	53.9	18.6	187	211	
Hori.	2557.995	AV	35.4	27.7	14.3	41.4	36.0	53.9	17.9	100	0	
Hori.	2886.530	AV	48.8	28.2	6.2	41.4	41.8	53.9	12.1	100	161	
Hori.	3126.473	AV	48.9	28.7	5.7	41.5	41.8	53.9	12.1	100	140	
Hori.	3774.690	AV	49.5	29.5	6.0	41.8	43.2	53.9	10.7	100	217	
Hori.	3996.733	AV	45.3	29.7	6.2	41.8	39.4	53.9	14.5	100	211	
Hori.	4804.000	AV	37.8	31.1	6.8	41.2	34.5	53.9	19.4	100	111	
Hori.	7206.000	AV	36.0	36.6	8.3	41.4	39.5	53.9	14.4	100	0	
Hori.	9608.000	AV	32.9	38.5	9.4	38.9	41.9	53.9	12.0	100	0	
Hori.	12010.000	AV	33.0	39.4	10.7	39.4	43.7	53.9	10.2	100	0	
Vert.	52.231	QP	32.7	10.1	7.2	31.9	18.1	40.0	21.9	100	98	
Vert.	144.006	QP	33.6	14.7	8.7	31.8	25.2	43.5	18.3	100	109	
Vert.	240.002	QP	35.9	16.9	10.0	31.8	31.0	46.0	15.0	100	68	
Vert.	407.073	QP	41.1	16.5	7.6	31.7	33.5	46.0	12.5	130	302	
Vert.	1008.000	PK	49.9	25.0	12.7	40.7	46.9	73.9	27.0	195	203	
Vert.	1554.293	PK	49.5	24.9	13.3	40.8	46.9	73.9	27.0	100	145	
Vert.	2390.000	PK	47.9	27.4	14.2	41.4	48.1	73.9	25.8	133	32	
Vert.	2557.995	PK	50.2	27.7	14.3	41.4	50.8	73.9	23.1	100	356	
Vert.	2886.530	PK	53.6	28.2	6.2	41.4	46.6	73.9	27.3	124	144	
Vert.	3126.473	PK	56.9	28.7	5.7	41.5	49.8	73.9	24.1	100	201	
Vert.	3774.690	PK	55.8	29.5	6.0	41.8	49.5	73.9	24.4	100	187	
Vert.	3996.733	PK	53.6	29.7	6.2	41.8	47.7	73.9	26.2	100	218	
Vert.	4804.000	PK	50.2	31.1	6.8	41.2	46.9	73.9	27.0	100	193	
Vert.	7206.000	PK	49.1	36.6	8.3	41.4	52.6	73.9	21.3	100	0	
Vert.	9608.000	PK	45.6	38.5	9.4	38.9	54.6	73.9	19.3	100	0	
Vert.	12010.000	PK	46.0	39.4	10.7	39.4	56.7	73.9	17.2	100	0	
Vert.	1008.000	AV	41.3	25.0	12.7	40.7	38.3	53.9	15.6	195	203	
Vert.	1554.293	AV	38.7	24.9	13.3	40.8	36.1	53.9	17.8	100	145	
Vert.	2390.000	AV	35.0	27.4	14.2	41.4	35.2	53.9	18.7	133	32	
Vert.	2557.995	AV	42.1	27.7	14.3	41.4	42.7	53.9	11.2	100	356	
Vert.	2886.530	AV	47.2	28.2	6.2	41.4	40.2	53.9	13.7	124	144	
Vert.	3126.473	AV	53.7	28.7	5.7	41.5	46.6	53.9	7.3	100	201	
Vert.	3774.690	AV	50.2	29.5	6.0	41.8	43.9	53.9	10.0	100	187	
Vert.	3996.733	AV	46.9	29.7	6.2	41.8	41.0	53.9	12.9	100	218	
Vert.	4804.000	AV	40.0	31.1	6.8	41.2	36.7	53.9	17.2	100	193	
Vert.	7206.000	AV	37.1	36.6	8.3	41.4	40.6	53.9	13.3	100	0	
Vert.	9608.000	AV	32.9	38.5	9.4	38.9	41.9	53.9	12.0	100	0	
Vert.	12010.000	AV	33.1	39.4	10.7	39.4	43.8	53.9	10.1	100	0	

Result = Reading + Ant Factor + Loss(Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

*Distance factor [dB](15GHz - 40GHz)= 20 x log (3.0[m] / 1.0[m]) = 9.5 [dB]

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	82.5	27.4	14.2	41.4	82.7	-	-	carrier
Hori.	481.092	PK	48.9	17.1	8.1	31.7	42.4	62.7	20.3	
Hori.	533.336	PK	46.4	18.0	8.4	31.7	41.1	62.7	21.6	
Hori.	815.999	PK	44.3	21.0	9.7	31.4	43.6	62.7	19.1	
Hori.	2400.000	PK	37.1	27.4	14.2	41.4	37.3	62.7	25.4	
Vert.	2402.000	PK	92.3	27.4	14.2	41.4	92.5	-	-	carrier
Vert.	533.336	PK	41.0	18.0	8.4	31.7	35.7	72.5	36.8	
Vert.	815.999	PK	46.3	21.0	9.7	31.4	45.6	72.5	26.9	
Vert.	2400.000	PK	40.1	27.4	14.2	41.4	40.3	72.5	32.2	

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 27, 2012	November 28, 2012	November 29, 2012
Temperature / Humidity	24 deg.C , 30 %RH	22 deg.C , 49 %RH	23 deg.C , 35 %RH
Engineer	Kenich Adachi	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2441.0 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.	144.003	QP	31.3	14.7	8.7	31.8	22.9	43.5	20.6	231	263	
Hori.	240.001	QP	39.2	16.9	10.0	31.8	34.3	46.0	11.7	143	12	
Hori.	333.062	QP	41.5	14.9	7.2	31.7	31.9	46.0	14.1	100	135	
Hori.	407.075	QP	47.6	16.5	7.6	31.7	40.0	46.0	6.0	100	46	
Hori.	1008.000	PK	50.5	25.0	12.7	40.7	47.5	73.9	26.4	100	180	
Hori.	1554.280	PK	50.0	24.9	13.3	40.8	47.4	73.9	26.5	100	220	
Hori.	2545.000	PK	48.1	27.6	14.3	41.4	48.6	73.9	25.3	184	137	
Hori.	2886.530	PK	54.5	28.2	6.2	41.4	47.5	73.9	26.4	100	163	
Hori.	3126.480	PK	53.6	28.7	5.7	41.5	46.5	73.9	27.4	100	138	
Hori.	3774.700	PK	55.3	29.5	6.0	41.8	49.0	73.9	24.9	100	217	
Hori.	3996.730	PK	53.0	29.7	6.2	41.8	47.1	73.9	26.8	100	211	
Hori.	4882.000	PK	50.0	31.3	6.9	41.1	47.1	73.9	26.8	100	151	
Hori.	7323.000	PK	49.6	36.6	8.6	41.4	53.4	73.9	20.5	100	0	
Hori.	9764.000	PK	47.1	38.7	9.5	38.9	56.4	73.9	17.5	100	0	
Hori.	12205.000	PK	46.3	39.5	10.8	39.3	57.3	73.9	16.6	100	0	
Hori.	1008.000	AV	43.5	25.0	12.7	40.7	40.5	53.9	13.4	100	180	
Hori.	1554.280	AV	40.2	24.9	13.3	40.8	37.6	53.9	16.3	100	220	
Hori.	2545.000	AV	36.1	27.6	14.3	41.4	36.6	53.9	17.3	184	137	
Hori.	2886.530	AV	48.4	28.2	6.2	41.4	41.4	53.9	12.5	100	163	
Hori.	3126.480	AV	48.7	28.7	5.7	41.5	41.6	53.9	12.3	100	138	
Hori.	3774.700	AV	49.6	29.5	6.0	41.8	43.3	53.9	10.6	100	217	
Hori.	3996.730	AV	45.5	29.7	6.2	41.8	39.6	53.9	14.3	100	211	
Hori.	4882.000	AV	39.3	31.3	6.9	41.1	36.4	53.9	17.5	100	151	
Hori.	7323.000	AV	36.1	36.6	8.6	41.4	39.9	53.9	14.0	100	0	
Hori.	9764.000	AV	33.7	38.7	9.5	38.9	43.0	53.9	10.9	100	0	
Hori.	12205.000	AV	33.6	39.5	10.8	39.3	44.6	53.9	9.3	100	0	
Vert.	52.245	QP	32.4	10.1	7.2	31.9	17.8	40.0	22.2	100	102	
Vert.	144.003	QP	33.7	14.7	8.7	31.8	25.3	43.5	18.2	100	110	
Vert.	240.001	QP	36.0	16.9	10.0	31.8	31.1	46.0	14.9	100	78	
Vert.	407.075	QP	41.2	16.5	7.6	31.7	33.6	46.0	12.4	128	300	
Vert.	1008.000	PK	50.3	25.0	12.7	40.7	47.3	73.9	26.6	196	200	
Vert.	1554.280	PK	49.7	24.9	13.3	40.8	47.1	73.9	26.8	100	145	
Vert.	2545.000	PK	49.8	27.6	14.3	41.4	50.3	73.9	23.6	100	358	
Vert.	2886.530	PK	53.9	28.2	6.2	41.4	46.9	73.9	27.0	122	145	
Vert.	3126.480	PK	56.8	28.7	5.7	41.5	49.7	73.9	24.2	100	201	
Vert.	3774.700	PK	55.5	29.5	6.0	41.8	49.2	73.9	24.7	100	188	
Vert.	3996.730	PK	53.7	29.7	6.2	41.8	47.8	73.9	26.1	100	215	
Vert.	4882.000	PK	50.6	31.3	6.9	41.1	47.7	73.9	26.2	100	208	
Vert.	7323.000	PK	48.5	36.6	8.6	41.4	52.3	73.9	21.6	100	0	
Vert.	9764.000	PK	46.4	38.7	9.5	38.9	55.7	73.9	18.2	100	0	
Vert.	12205.000	PK	46.2	39.5	10.8	39.3	57.2	73.9	16.7	100	0	
Vert.	1008.000	AV	41.5	25.0	12.7	40.7	38.5	53.9	15.4	196	200	
Vert.	1554.280	AV	38.6	24.9	13.3	40.8	36.0	53.9	17.9	100	145	
Vert.	2545.000	AV	40.4	27.6	14.3	41.4	40.9	53.9	13.0	100	358	
Vert.	2886.530	AV	47.4	28.2	6.2	41.4	40.4	53.9	13.5	122	145	
Vert.	3126.480	AV	53.5	28.7	5.7	41.5	46.4	53.9	7.5	100	201	
Vert.	3774.700	AV	50.2	29.5	6.0	41.8	43.9	53.9	10.0	100	188	
Vert.	3996.730	AV	46.8	29.7	6.2	41.8	40.9	53.9	13.0	100	215	
Vert.	4882.000	AV	39.9	31.3	6.9	41.1	37.0	53.9	16.9	100	208	
Vert.	7323.000	AV	36.0	36.6	8.6	41.4	39.8	53.9	14.1	100	0	
Vert.	9764.000	AV	33.7	38.7	9.5	38.9	43.0	53.9	10.9	100	0	
Vert.	12205.000	AV	33.5	39.5	10.8	39.3	44.5	53.9	9.4	100	0	

Result = Reading + Ant Factor + Loss(Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

*Distance factor [dB](15GHz - 40GHz)= 20 x log (3.0[m] / 1.0[m]) = 9.5 [dB]

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2441.000	PK	81.1	27.5	14.2	41.4	81.4	-	-	carrier
Hori.	481.094	PK	49.1	17.1	8.1	31.7	42.6	61.4	18.8	
Hori.	533.338	PK	46.5	18.0	8.4	31.7	41.2	61.4	20.2	
Hori.	815.999	PK	44.4	21.0	9.7	31.4	43.7	61.4	17.7	
Vert.	2441.000	PK	91.4	27.5	14.2	41.4	91.7	-	-	carrier
Vert.	533.338	PK	41.0	18.0	8.4	31.7	35.7	71.7	36.0	
Vert.	815.999	PK	46.4	21.0	9.7	31.4	45.7	71.7	26.0	

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 27, 2012	November 28, 2012	November 29, 2012
Temperature / Humidity	24 deg.C , 30 %RH	22 deg.C , 49 %RH	23 deg.C , 35 %RH
Engineer	Kenich Adachi	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2480.0 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	31.4	14.7	8.7	31.8	23.0	43.5	20.5	233	254	
Hori.	240.004	QP	39.1	16.9	10.0	31.8	34.2	46.0	11.8	144	18	
Hori.	333.064	QP	41.3	14.9	7.2	31.7	31.7	46.0	14.3	100	131	
Hori.	407.096	QP	47.4	16.5	7.6	31.7	39.8	46.0	6.2	100	45	
Hori.	1008.000	PK	50.4	25.0	12.7	40.7	47.4	73.9	26.5	100	179	
Hori.	1554.280	PK	51.0	24.9	13.3	40.8	48.4	73.9	25.5	100	221	
Hori.	2483.500	PK	48.0	27.5	14.3	41.4	48.4	73.9	25.5	100	166	
Hori.	2635.994	PK	48.3	27.8	14.4	41.4	49.1	73.9	24.8	100	0	
Hori.	2886.530	PK	54.4	28.2	6.2	41.4	47.4	73.9	26.5	100	166	
Hori.	3126.480	PK	54.0	28.7	5.7	41.5	46.9	73.9	27.0	100	135	
Hori.	3774.700	PK	55.5	29.5	6.0	41.8	49.2	73.9	24.7	100	216	
Hori.	3996.730	PK	52.9	29.7	6.2	41.8	47.0	73.9	26.9	100	211	
Hori.	4960.000	PK	49.7	31.6	6.9	41.0	47.2	73.9	26.7	100	150	
Hori.	7440.000	PK	48.8	36.7	8.8	41.5	52.8	73.9	21.1	100	0	
Hori.	9920.000	PK	46.2	39.0	9.7	38.9	56.0	73.9	17.9	100	0	
Hori.	12400.000	PK	45.7	39.5	10.8	39.3	56.7	73.9	17.2	100	0	
Hori.	1008.000	AV	43.7	25.0	12.7	40.7	40.7	53.9	13.2	100	179	
Hori.	1554.280	AV	40.5	24.9	13.3	40.8	37.9	53.9	16.0	100	221	
Hori.	2483.500	AV	35.2	27.5	14.3	41.4	35.6	53.9	18.3	100	166	
Hori.	2635.994	AV	35.6	27.8	14.4	41.4	36.4	53.9	17.5	100	0	
Hori.	2886.530	AV	48.4	28.2	6.2	41.4	41.4	53.9	12.5	100	166	
Hori.	3126.480	AV	48.9	28.7	5.7	41.5	41.8	53.9	12.1	100	135	
Hori.	3774.700	AV	49.6	29.5	6.0	41.8	43.3	53.9	10.6	100	216	
Hori.	3996.730	AV	45.4	29.7	6.2	41.8	39.5	53.9	14.4	100	211	
Hori.	4960.000	AV	39.1	31.6	6.9	41.0	36.6	53.9	17.3	100	150	
Hori.	7440.000	AV	35.8	36.7	8.8	41.5	39.8	53.9	14.1	100	0	
Hori.	9920.000	AV	33.4	39.0	9.7	38.9	43.2	53.9	10.7	100	0	
Hori.	12400.000	AV	33.3	39.5	10.8	39.3	44.3	53.9	9.6	100	0	
Vert.	52.252	QP	32.3	10.1	7.2	31.9	17.7	40.0	22.3	100	99	
Vert.	144.004	QP	33.4	14.7	8.7	31.8	25.0	43.5	18.5	100	96	
Vert.	240.004	QP	35.7	16.9	10.0	31.8	30.8	46.0	15.2	100	77	
Vert.	407.096	QP	41.0	16.5	7.6	31.7	33.4	46.0	12.6	127	303	
Vert.	1008.000	PK	50.1	25.0	12.7	40.7	47.1	73.9	26.8	100	201	
Vert.	1554.280	PK	50.2	24.9	13.3	40.8	47.6	73.9	26.3	100	146	
Vert.	2483.500	PK	48.6	27.5	14.3	41.4	49.0	73.9	24.9	129	33	
Vert.	2635.994	PK	50.2	27.8	14.4	41.4	51.0	73.9	22.9	126	357	
Vert.	2886.530	PK	54.0	28.2	6.2	41.4	47.0	73.9	26.9	123	144	
Vert.	3126.480	PK	57.0	28.7	5.7	41.5	49.9	73.9	24.0	100	202	
Vert.	3774.700	PK	55.5	29.5	6.0	41.8	49.2	73.9	24.7	100	190	
Vert.	3996.730	PK	53.5	29.7	6.2	41.8	47.6	73.9	26.3	100	216	
Vert.	4960.000	PK	51.1	31.6	6.9	41.0	48.6	73.9	25.3	136	44	
Vert.	7440.000	PK	49.1	36.7	8.8	41.5	53.1	73.9	20.8	100	0	
Vert.	9920.000	PK	46.1	39.0	9.7	38.9	55.9	73.9	18.0	100	0	
Vert.	12400.000	PK	45.7	39.5	10.8	39.3	56.7	73.9	17.2	100	0	
Vert.	1008.000	AV	41.5	25.0	12.7	40.7	38.5	53.9	15.4	100	201	
Vert.	1554.280	AV	39.0	24.9	13.3	40.8	36.4	53.9	17.5	100	146	
Vert.	2483.500	AV	35.5	27.5	14.3	41.4	35.9	53.9	18.0	129	33	
Vert.	2635.994	AV	39.7	27.8	14.4	41.4	40.5	53.9	13.4	126	357	
Vert.	2886.530	AV	47.5	28.2	6.2	41.4	40.5	53.9	13.4	123	144	
Vert.	3126.480	AV	53.6	28.7	5.7	41.5	46.5	53.9	7.4	100	202	
Vert.	3774.700	AV	50.3	29.5	6.0	41.8	44.0	53.9	9.9	100	190	
Vert.	3996.730	AV	46.8	29.7	6.2	41.8	40.9	53.9	13.0	100	216	
Vert.	4960.000	AV	42.8	31.6	6.9	41.0	40.3	53.9	13.6	136	44	
Vert.	7440.000	AV	35.6	36.7	8.8	41.5	39.6	53.9	14.3	100	0	
Vert.	9920.000	AV	33.4	39.0	9.7	38.9	43.2	53.9	10.7	100	0	
Vert.	12400.000	AV	33.2	39.5	10.8	39.3	44.2	53.9	9.7	100	0	

Result = Reading + Ant Factor + Loss(Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

*Distance factor [dB](15GHz - 40GHz)= 20 x log (3.0[m] / 1.0[m]) = 9.5 [dB]

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2480.000	PK	82.7	27.5	14.3	41.4	83.1	-	-	carrier
Hori.	481.097	PK	48.7	17.1	8.1	31.7	42.2	63.1	20.9	
Hori.	533.339	PK	46.0	18.0	8.4	31.7	40.7	63.1	22.4	
Hori.	815.999	PK	44.1	21.0	9.7	31.4	43.4	63.1	19.7	
Vert.	2480.000	PK	92.3	27.5	14.3	41.4	92.7	-	-	carrier
Vert.	533.339	PK	41.2	18.0	8.4	31.7	35.9	72.7	36.8	
Vert.	815.999	PK	46.1	21.0	9.7	31.4	45.4	72.7	27.3	

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 27, 2012	November 28, 2012	November 29, 2012
Temperature / Humidity	24 deg.C , 30 %RH	22 deg.C , 49 %RH	23 deg.C , 35 %RH
Engineer	Kenich Adachi	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2402.0 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.	144.002	QP	31.1	14.7	8.7	31.8	22.7	43.5	20.8	239	261	
Hori.	240.003	QP	39.3	16.9	10.0	31.8	34.4	46.0	11.6	146	11	
Hori.	333.063	QP	41.5	14.9	7.2	31.7	31.9	46.0	14.1	100	132	
Hori.	407.078	QP	47.8	16.5	7.6	31.7	40.2	46.0	5.8	100	42	
Hori.	1008.000	PK	51.0	25.0	12.7	40.7	48.0	73.9	25.9	100	180	
Hori.	1554.293	PK	49.8	24.9	13.3	40.8	47.2	73.9	26.7	100	220	
Hori.	2390.000	PK	48.6	27.4	14.2	41.4	48.8	73.9	25.1	185	212	
Hori.	2558.000	PK	48.0	27.7	14.3	41.4	48.6	73.9	25.3	100	0	
Hori.	2886.530	PK	54.6	28.2	6.2	41.4	47.6	73.9	26.3	100	161	
Hori.	3126.470	PK	53.5	28.7	5.7	41.5	46.4	73.9	27.5	100	144	
Hori.	3774.690	PK	56.0	29.5	6.0	41.8	49.7	73.9	24.2	100	220	
Hori.	3996.733	PK	52.5	29.7	6.2	41.8	46.6	73.9	27.3	100	210	
Hori.	4804.000	PK	49.5	31.1	6.8	41.2	46.2	73.9	27.7	119	115	
Hori.	7206.000	PK	48.9	36.6	8.3	41.4	52.4	73.9	21.5	100	0	
Hori.	9608.000	PK	46.0	38.5	9.4	38.9	55.0	73.9	18.9	100	0	
Hori.	12010.000	PK	45.9	39.4	10.7	39.4	56.6	73.9	17.3	100	0	
Hori.	1008.000	AV	43.8	25.0	12.7	40.7	40.8	53.9	13.1	100	180	
Hori.	1554.293	AV	39.6	24.9	13.3	40.8	37.0	53.9	16.9	100	220	
Hori.	2390.000	AV	35.5	27.4	14.2	41.4	35.7	53.9	18.2	185	212	
Hori.	2558.000	AV	35.5	27.7	14.3	41.4	36.1	53.9	17.8	100	0	
Hori.	2886.530	AV	48.9	28.2	6.2	41.4	41.9	53.9	12.0	100	161	
Hori.	3126.470	AV	48.9	28.7	5.7	41.5	41.8	53.9	12.1	100	144	
Hori.	3774.690	AV	49.7	29.5	6.0	41.8	43.4	53.9	10.5	100	220	
Hori.	3996.733	AV	45.0	29.7	6.2	41.8	39.1	53.9	14.8	100	210	
Hori.	4804.000	AV	37.2	31.1	6.8	41.2	33.9	53.9	20.0	119	115	
Hori.	7206.000	AV	35.7	36.6	8.3	41.4	39.2	53.9	14.7	100	0	
Hori.	9608.000	AV	32.9	38.5	9.4	38.9	41.9	53.9	12.0	100	0	
Hori.	12010.000	AV	33.2	39.4	10.7	39.4	43.9	53.9	10.0	100	0	
Vert.	52.237	QP	32.5	10.1	7.2	31.9	17.9	40.0	22.1	100	89	
Vert.	144.002	QP	34.3	14.7	8.7	31.8	25.9	43.5	17.6	100	104	
Vert.	240.003	QP	35.8	16.9	10.0	31.8	30.9	46.0	15.1	100	64	
Vert.	407.078	QP	40.9	16.5	7.6	31.7	33.3	46.0	12.7	130	296	
Vert.	1008.000	PK	50.1	25.0	12.7	40.7	47.1	73.9	26.8	190	200	
Vert.	1554.293	PK	49.5	24.9	13.3	40.8	46.9	73.9	27.0	100	144	
Vert.	2390.000	PK	47.9	27.4	14.2	41.4	48.1	73.9	25.8	134	33	
Vert.	2558.000	PK	50.0	27.7	14.3	41.4	50.6	73.9	23.3	100	354	
Vert.	2886.530	PK	53.3	28.2	6.2	41.4	46.3	73.9	27.6	122	143	
Vert.	3126.470	PK	57.2	28.7	5.7	41.5	50.1	73.9	23.8	100	207	
Vert.	3774.690	PK	55.6	29.5	6.0	41.8	49.3	73.9	24.6	100	188	
Vert.	3996.733	PK	54.0	29.7	6.2	41.8	48.1	73.9	25.8	100	218	
Vert.	4804.000	PK	49.4	31.1	6.8	41.2	46.1	73.9	27.8	100	195	
Vert.	7206.000	PK	48.8	36.6	8.3	41.4	52.3	73.9	21.6	100	0	
Vert.	9608.000	PK	45.6	38.5	9.4	38.9	54.6	73.9	19.3	100	0	
Vert.	12010.000	PK	45.9	39.4	10.7	39.4	56.6	73.9	17.3	100	0	
Vert.	1008.000	AV	41.4	25.0	12.7	40.7	38.4	53.9	15.5	190	200	
Vert.	1554.293	AV	38.8	24.9	13.3	40.8	36.2	53.9	17.7	100	144	
Vert.	2390.000	AV	35.1	27.4	14.2	41.4	35.3	53.9	18.6	134	33	
Vert.	2558.000	AV	42.0	27.7	14.3	41.4	42.6	53.9	11.3	100	354	
Vert.	2886.530	AV	47.4	28.2	6.2	41.4	40.4	53.9	13.5	122	143	
Vert.	3126.470	AV	53.8	28.7	5.7	41.5	46.7	53.9	7.2	100	207	
Vert.	3774.690	AV	50.3	29.5	6.0	41.8	44.0	53.9	9.9	100	188	
Vert.	3996.733	AV	47.0	29.7	6.2	41.8	41.1	53.9	12.8	100	218	
Vert.	4804.000	AV	38.0	31.1	6.8	41.2	34.7	53.9	19.2	100	195	
Vert.	7206.000	AV	36.0	36.6	8.3	41.4	39.5	53.9	14.4	100	0	
Vert.	9608.000	AV	33.0	38.5	9.4	38.9	42.0	53.9	11.9	100	0	
Vert.	12010.000	AV	33.1	39.4	10.7	39.4	43.8	53.9	10.1	100	0	

Result = Reading + Ant Factor + Loss(Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

*Distance factor [dB](15GHz - 40GHz)= 20 x log (3.0[m] / 1.0[m]) = 9.5 [dB]

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	82.5	27.4	14.2	41.4	82.7	-	-	carrier
Hori.	481.094	PK	48.8	17.1	8.1	31.7	42.3	62.7	20.4	
Hori.	533.332	PK	46.3	18.0	8.4	31.7	41.0	62.7	21.7	
Hori.	815.999	PK	44.5	21.0	9.7	31.4	43.8	62.7	18.9	
Hori.	2400.000	PK	36.6	27.4	14.2	41.4	36.8	62.7	25.9	
Vert.	2402.000	PK	92.3	27.4	14.2	41.4	92.5	-	-	carrier
Vert.	533.332	PK	40.9	18.0	8.4	31.7	35.6	72.5	36.9	
Vert.	815.999	PK	46.3	21.0	9.7	31.4	45.6	72.5	26.9	
Vert.	2400.000	PK	41.7	27.4	14.2	41.4	41.9	72.5	30.6	

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 27, 2012	November 28, 2012	November 29, 2012
Temperature / Humidity	24 deg.C , 30 %RH	22 deg.C , 49 %RH	23 deg.C , 35 %RH
Engineer	Kenich Adachi	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2441.0 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.	144.005	QP	31.4	14.7	8.7	31.8	23.0	43.5	20.5	232	263	
Hori.	240.005	QP	39.1	16.9	10.0	31.8	34.2	46.0	11.8	147	10	
Hori.	333.066	QP	41.2	14.9	7.2	31.7	31.6	46.0	14.4	100	128	
Hori.	407.099	QP	47.4	16.5	7.6	31.7	39.8	46.0	6.2	100	44	
Hori.	1008.000	PK	50.6	25.0	12.7	40.7	47.6	73.9	26.3	100	182	
Hori.	1554.280	PK	49.9	24.9	13.3	40.8	47.3	73.9	26.6	100	221	
Hori.	2545.000	PK	48.6	27.6	14.3	41.4	49.1	73.9	24.8	180	136	
Hori.	2886.530	PK	54.6	28.2	6.2	41.4	47.6	73.9	26.3	100	166	
Hori.	3126.580	PK	53.6	28.7	5.7	41.5	46.5	73.9	27.4	100	139	
Hori.	3774.700	PK	55.2	29.5	6.0	41.8	48.9	73.9	25.0	100	218	
Hori.	3996.730	PK	53.3	29.7	6.2	41.8	47.4	73.9	26.5	100	210	
Hori.	4882.000	PK	48.8	31.3	6.9	41.1	45.9	73.9	28.0	100	151	
Hori.	7323.000	PK	49.0	36.6	8.6	41.4	52.8	73.9	21.1	100	0	
Hori.	9764.000	PK	46.5	38.7	9.5	38.9	55.8	73.9	18.1	100	0	
Hori.	12205.000	PK	46.2	39.5	10.8	39.3	57.2	73.9	16.7	100	0	
Hori.	1008.000	AV	43.6	25.0	12.7	40.7	40.6	53.9	13.3	100	182	
Hori.	1554.280	AV	39.8	24.9	13.3	40.8	37.2	53.9	16.7	100	221	
Hori.	2545.000	AV	36.2	27.6	14.3	41.4	36.7	53.9	17.2	180	136	
Hori.	2886.530	AV	48.8	28.2	6.2	41.4	41.8	53.9	12.1	100	166	
Hori.	3126.580	AV	48.3	28.7	5.7	41.5	41.2	53.9	12.7	100	139	
Hori.	3774.700	AV	49.5	29.5	6.0	41.8	43.2	53.9	10.7	100	218	
Hori.	3996.730	AV	45.8	29.7	6.2	41.8	39.9	53.9	14.0	100	210	
Hori.	4882.000	AV	36.9	31.3	6.9	41.1	34.0	53.9	19.9	100	151	
Hori.	7323.000	AV	35.9	36.6	8.6	41.4	39.7	53.9	14.2	100	0	
Hori.	9764.000	AV	33.7	38.7	9.5	38.9	43.0	53.9	10.9	100	0	
Hori.	12205.000	AV	33.6	39.5	10.8	39.3	44.6	53.9	9.3	100	0	
Vert.	52.243	QP	32.9	10.1	7.2	31.9	18.3	40.0	21.7	100	88	
Vert.	144.005	QP	33.8	14.7	8.7	31.8	25.4	43.5	18.1	100	112	
Vert.	240.005	QP	35.6	16.9	10.0	31.8	30.7	46.0	15.3	100	78	
Vert.	407.099	QP	41.3	16.5	7.6	31.7	33.7	46.0	12.3	126	298	
Vert.	1008.000	PK	50.1	25.0	12.7	40.7	47.1	73.9	26.8	192	200	
Vert.	1554.280	PK	49.9	24.9	13.3	40.8	47.3	73.9	26.6	100	146	
Vert.	2545.000	PK	50.0	27.6	14.3	41.4	50.5	73.9	23.4	100	357	
Vert.	2886.530	PK	53.9	28.2	6.2	41.4	46.9	73.9	27.0	122	146	
Vert.	3126.580	PK	56.6	28.7	5.7	41.5	49.5	73.9	24.4	100	195	
Vert.	3774.700	PK	55.0	29.5	6.0	41.8	48.7	73.9	25.2	100	189	
Vert.	3996.730	PK	53.5	29.7	6.2	41.8	47.6	73.9	26.3	100	215	
Vert.	4882.000	PK	49.6	31.3	6.9	41.1	46.7	73.9	27.2	100	195	
Vert.	7323.000	PK	48.8	36.6	8.6	41.4	52.6	73.9	21.3	100	0	
Vert.	9764.000	PK	46.4	38.7	9.5	38.9	55.7	73.9	18.2	100	0	
Vert.	12205.000	PK	46.7	39.5	10.8	39.3	57.7	73.9	16.2	100	0	
Vert.	1008.000	AV	41.0	25.0	12.7	40.7	38.0	53.9	15.9	192	200	
Vert.	1554.280	AV	39.0	24.9	13.3	40.8	36.4	53.9	17.5	100	146	
Vert.	2545.000	AV	40.5	27.6	14.3	41.4	41.0	53.9	12.9	100	357	
Vert.	2886.530	AV	47.5	28.2	6.2	41.4	40.5	53.9	13.4	122	146	
Vert.	3126.580	AV	53.4	28.7	5.7	41.5	46.3	53.9	7.6	100	195	
Vert.	3774.700	AV	50.0	29.5	6.0	41.8	43.7	53.9	10.2	100	189	
Vert.	3996.730	AV	46.2	29.7	6.2	41.8	40.3	53.9	13.6	100	215	
Vert.	4882.000	AV	37.4	31.3	6.9	41.1	34.5	53.9	19.4	100	195	
Vert.	7323.000	AV	35.8	36.6	8.6	41.4	39.6	53.9	14.3	100	0	
Vert.	9764.000	AV	33.8	38.7	9.5	38.9	43.1	53.9	10.8	100	0	
Vert.	12205.000	AV	33.6	39.5	10.8	39.3	44.6	53.9	9.3	100	0	

Result = Reading + Ant Factor + Loss(Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

*Distance factor [dB](15GHz - 40GHz)= 20 x log (3.0[m] / 1.0[m]) = 9.5 [dB]

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2441.000	PK	81.2	27.5	14.2	41.4	81.5	-	-	carrier
Hori.	481.096	PK	48.7	17.1	8.1	31.7	42.2	61.5	19.3	
Hori.	533.341	PK	46.2	18.0	8.4	31.7	40.9	61.5	20.6	
Hori.	815.999	PK	44.2	21.0	9.7	31.4	43.5	61.5	18.0	
Vert.	2441.000	PK	92.2	27.5	14.2	41.4	92.5	-	-	carrier
Vert.	533.341	PK	40.8	18.0	8.4	31.7	35.5	72.5	37.0	
Vert.	815.999	PK	46.0	21.0	9.7	31.4	45.3	72.5	27.2	

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 27, 2012	November 28, 2012	November 29, 2012
Temperature / Humidity	24 deg.C , 30 %RH	22 deg.C , 49 %RH	23 deg.C , 35 %RH
Engineer	Kenich Adachi	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2480.0 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.	144.003	QP	31.6	14.7	8.7	31.8	23.2	43.5	20.3	237	256	
Hori.	240.002	QP	39.5	16.9	10.0	31.8	34.6	46.0	11.4	148	9	
Hori.	333.069	QP	41.3	14.9	7.2	31.7	31.7	46.0	14.3	100	136	
Hori.	407.078	QP	47.6	16.5	7.6	31.7	40.0	46.0	6.0	100	43	
Hori.	1008.000	PK	50.6	25.0	12.7	40.7	47.6	73.9	26.3	100	179	
Hori.	1554.280	PK	50.7	24.9	13.3	40.8	48.1	73.9	25.8	100	220	
Hori.	2483.500	PK	48.3	27.5	14.3	41.4	48.7	73.9	25.2	100	0	
Hori.	2635.990	PK	46.3	27.8	14.4	41.4	47.1	73.9	26.8	100	0	
Hori.	2886.530	PK	54.2	28.2	6.2	41.4	47.2	73.9	26.7	100	167	
Hori.	3126.480	PK	54.2	28.7	5.7	41.5	47.1	73.9	26.8	100	133	
Hori.	3774.700	PK	55.6	29.5	6.0	41.8	49.3	73.9	24.6	100	217	
Hori.	3996.730	PK	53.1	29.7	6.2	41.8	47.2	73.9	26.7	100	210	
Hori.	4960.000	PK	50.0	31.6	6.9	41.0	47.5	73.9	26.4	163	151	
Hori.	7440.000	PK	49.1	36.7	8.8	41.5	53.1	73.9	20.8	100	0	
Hori.	9920.000	PK	46.8	39.0	9.7	38.9	56.6	73.9	17.3	100	0	
Hori.	12400.000	PK	45.9	39.5	10.8	39.3	56.9	73.9	17.0	100	0	
Hori.	1008.000	AV	43.6	25.0	12.7	40.7	40.6	53.9	13.3	100	179	
Hori.	1554.280	AV	40.0	24.9	13.3	40.8	37.4	53.9	16.5	100	220	
Hori.	2483.500	AV	35.1	27.5	14.3	41.4	35.5	53.9	18.4	100	0	
Hori.	2635.990	AV	34.6	27.8	14.4	41.4	35.4	53.9	18.5	100	0	
Hori.	2886.530	AV	48.5	28.2	6.2	41.4	41.5	53.9	12.4	100	167	
Hori.	3126.480	AV	49.0	28.7	5.7	41.5	41.9	53.9	12.0	100	133	
Hori.	3774.700	AV	49.8	29.5	6.0	41.8	43.5	53.9	10.4	100	217	
Hori.	3996.730	AV	45.2	29.7	6.2	41.8	39.3	53.9	14.6	100	210	
Hori.	4960.000	AV	37.0	31.6	6.9	41.0	34.5	53.9	19.4	163	151	
Hori.	7440.000	AV	35.7	36.7	8.8	41.5	39.7	53.9	14.2	100	0	
Hori.	9920.000	AV	33.5	39.0	9.7	38.9	43.3	53.9	10.6	100	0	
Hori.	12400.000	AV	33.4	39.5	10.8	39.3	44.4	53.9	9.5	100	0	
Vert.	52.273	QP	32.6	10.1	7.2	31.9	18.0	40.0	22.0	100	96	
Vert.	144.003	QP	33.4	14.7	8.7	31.8	25.0	43.5	18.5	100	108	
Vert.	240.002	QP	36.0	16.9	10.0	31.8	31.1	46.0	14.9	100	78	
Vert.	407.078	QP	41.2	16.5	7.6	31.7	33.6	46.0	12.4	131	301	
Vert.	1008.000	PK	50.0	25.0	12.7	40.7	47.0	73.9	26.9	100	205	
Vert.	1554.280	PK	49.7	24.9	13.3	40.8	47.1	73.9	26.8	100	146	
Vert.	2483.500	PK	48.2	27.5	14.3	41.4	48.6	73.9	25.3	129	35	
Vert.	2635.990	PK	47.4	27.8	14.4	41.4	48.2	73.9	25.7	119	353	
Vert.	2886.530	PK	54.1	28.2	6.2	41.4	47.1	73.9	26.8	121	144	
Vert.	3126.480	PK	57.4	28.7	5.7	41.5	50.3	73.9	23.6	100	202	
Vert.	3774.700	PK	55.7	29.5	6.0	41.8	49.4	73.9	24.5	100	190	
Vert.	3996.730	PK	53.8	29.7	6.2	41.8	47.9	73.9	26.0	100	212	
Vert.	4960.000	PK	49.9	31.6	6.9	41.0	47.4	73.9	26.5	145	41	
Vert.	7440.000	PK	48.5	36.7	8.8	41.5	52.5	73.9	21.4	100	0	
Vert.	9920.000	PK	45.8	39.0	9.7	38.9	55.6	73.9	18.3	100	0	
Vert.	12400.000	PK	45.8	39.5	10.8	39.3	56.8	73.9	17.1	100	0	
Vert.	1008.000	AV	41.6	25.0	12.7	40.7	38.6	53.9	15.3	100	205	
Vert.	1554.280	AV	39.3	24.9	13.3	40.8	36.7	53.9	17.2	100	146	
Vert.	2483.500	AV	35.5	27.5	14.3	41.4	35.9	53.9	18.0	129	35	
Vert.	2635.990	AV	37.5	27.8	14.4	41.4	38.4	53.9	15.5	119	353	
Vert.	2886.530	AV	47.6	28.2	6.2	41.4	40.6	53.9	13.3	121	144	
Vert.	3126.480	AV	54.0	28.7	5.7	41.5	46.9	53.9	7.0	100	202	
Vert.	3774.700	AV	50.2	29.5	6.0	41.8	43.9	53.9	10.0	100	190	
Vert.	3996.730	AV	47.1	29.7	6.2	41.8	41.2	53.9	12.7	100	212	
Vert.	4960.000	AV	39.0	31.6	6.9	41.0	36.5	53.9	17.4	145	41	
Vert.	7440.000	AV	35.6	36.7	8.8	41.5	39.6	53.9	14.3	100	0	
Vert.	9920.000	AV	33.6	39.0	9.7	38.9	43.4	53.9	10.5	100	0	
Vert.	12400.000	AV	33.4	39.5	10.8	39.3	44.4	53.9	9.5	100	0	

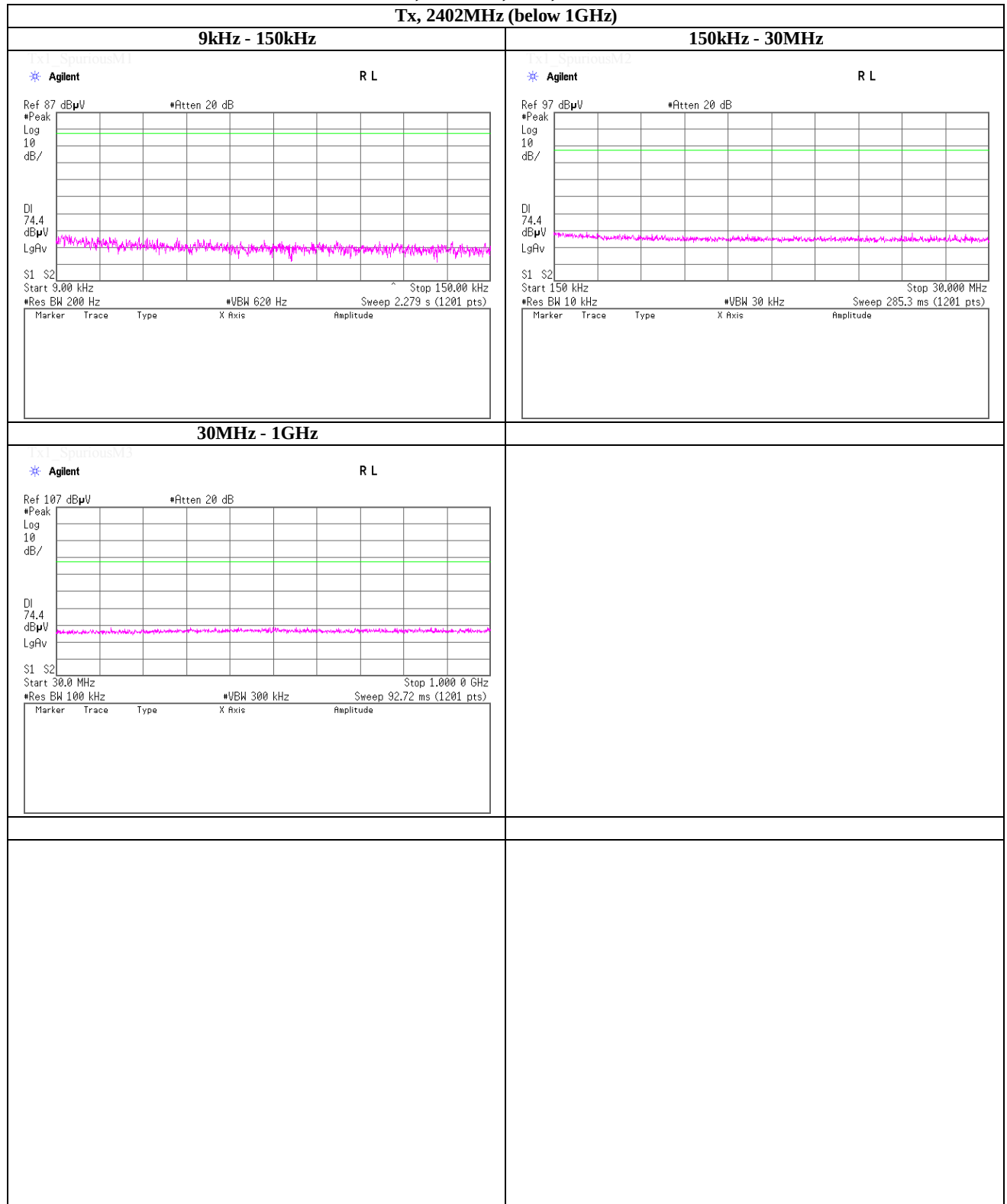
Result = Reading + Ant Factor + Loss(Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

*Distance factor [dB](15GHz - 40GHz)= 20 x log (3.0[m] / 1.0[m]) = 9.5 [dB]

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2480.000	PK	83.1	27.5	14.3	41.4	83.5	-	-	carrier
Hori.	481.099	PK	48.5	17.1	8.1	31.7	42.0	63.5	21.5	
Hori.	533.335	PK	46.6	18.0	8.4	31.7	41.3	63.5	22.2	
Hori.	815.999	PK	44.1	21.0	9.7	31.4	43.4	63.5	20.1	
Vert.	2480.000	PK	92.7	27.5	14.3	41.4	93.1	-	-	carrier
Vert.	533.335	PK	41.5	18.0	8.4	31.7	36.2	73.1	36.9	
Vert.	815.999	PK	45.9	21.0	9.7	31.4	45.2	73.1	27.9	

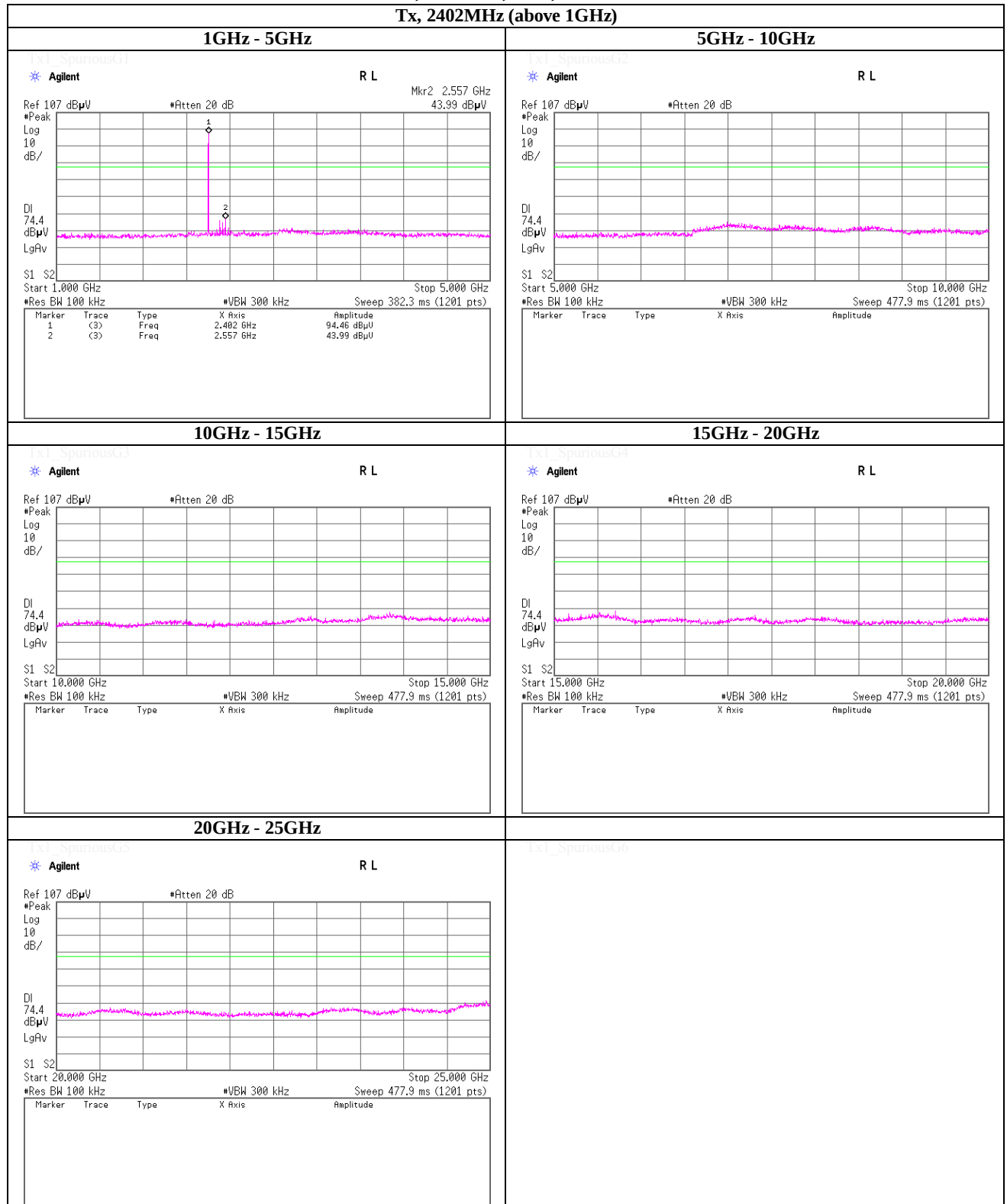
Result = Reading + Ant Factor + Loss(Cable+Attenuator+Filter) - Gain(Amplifier)

Spurious emission (Conducted)**Tx, Bluetooth, BDR, PRBS9****Tx, 2402MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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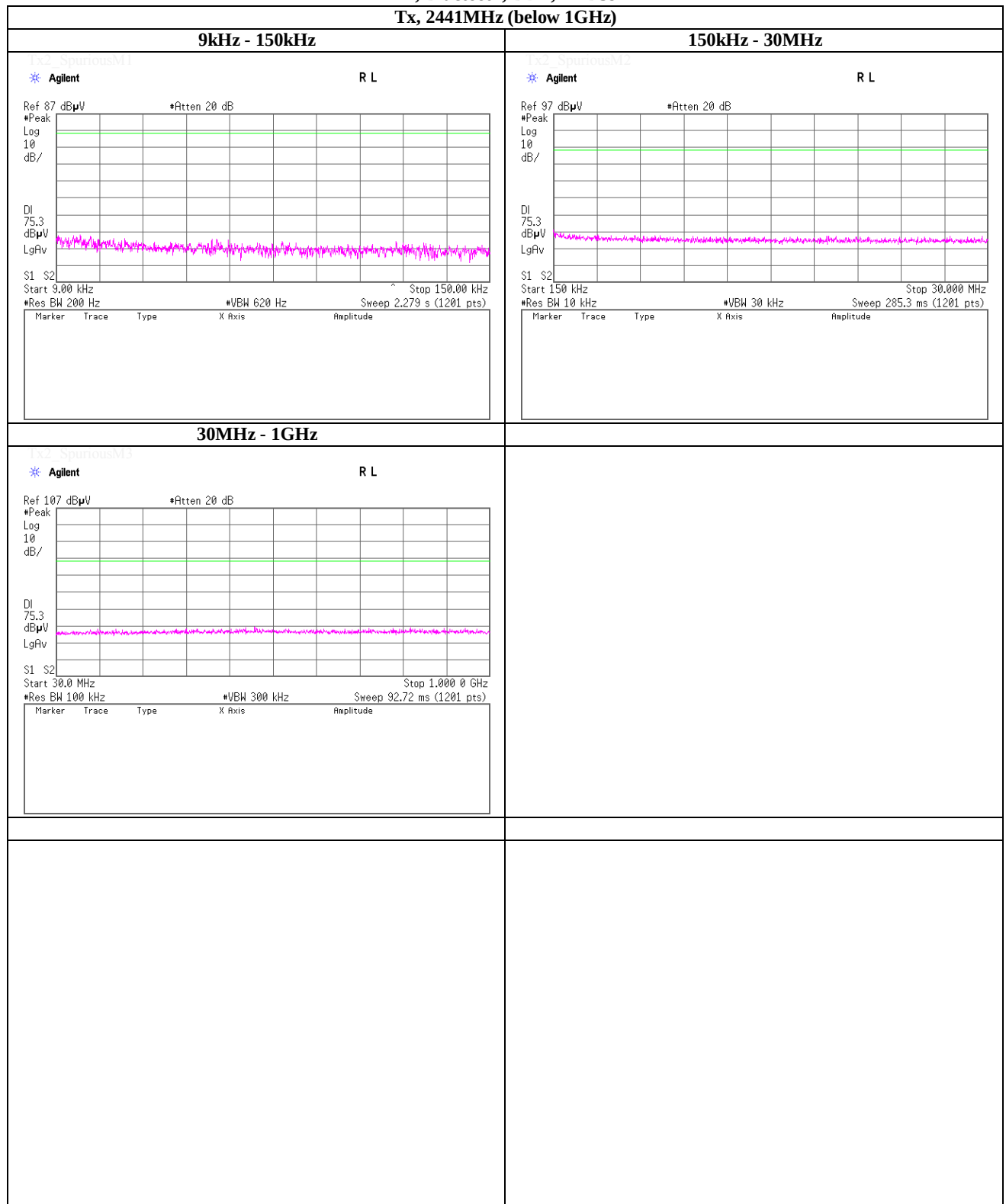
Facsimile : +81 463 50 6401

Spurious emission (Conducted)**Tx, Bluetooth, BDR, PRBS9****Tx, 2402MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

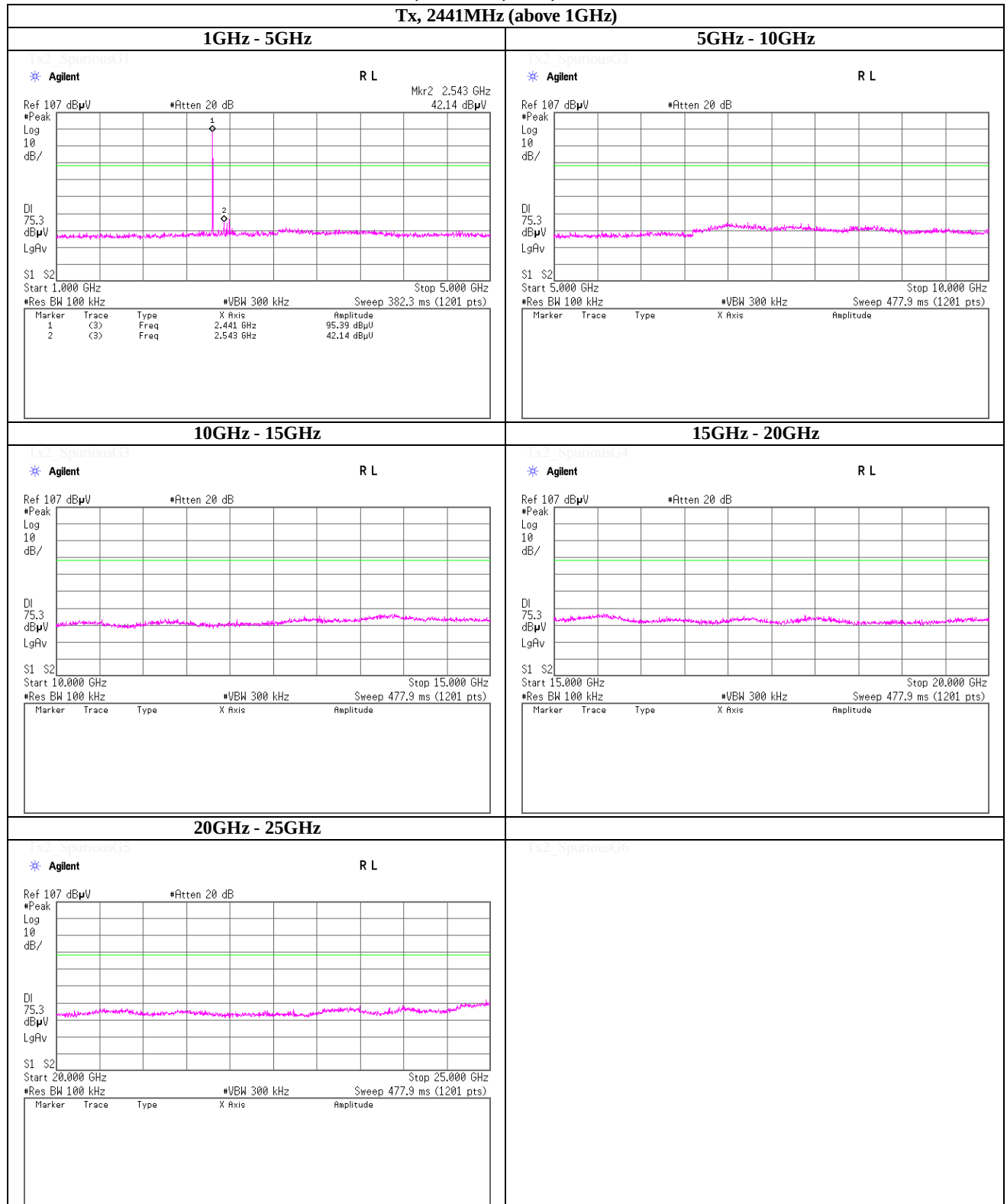
Tx, 2441MHz (below 1GHz)

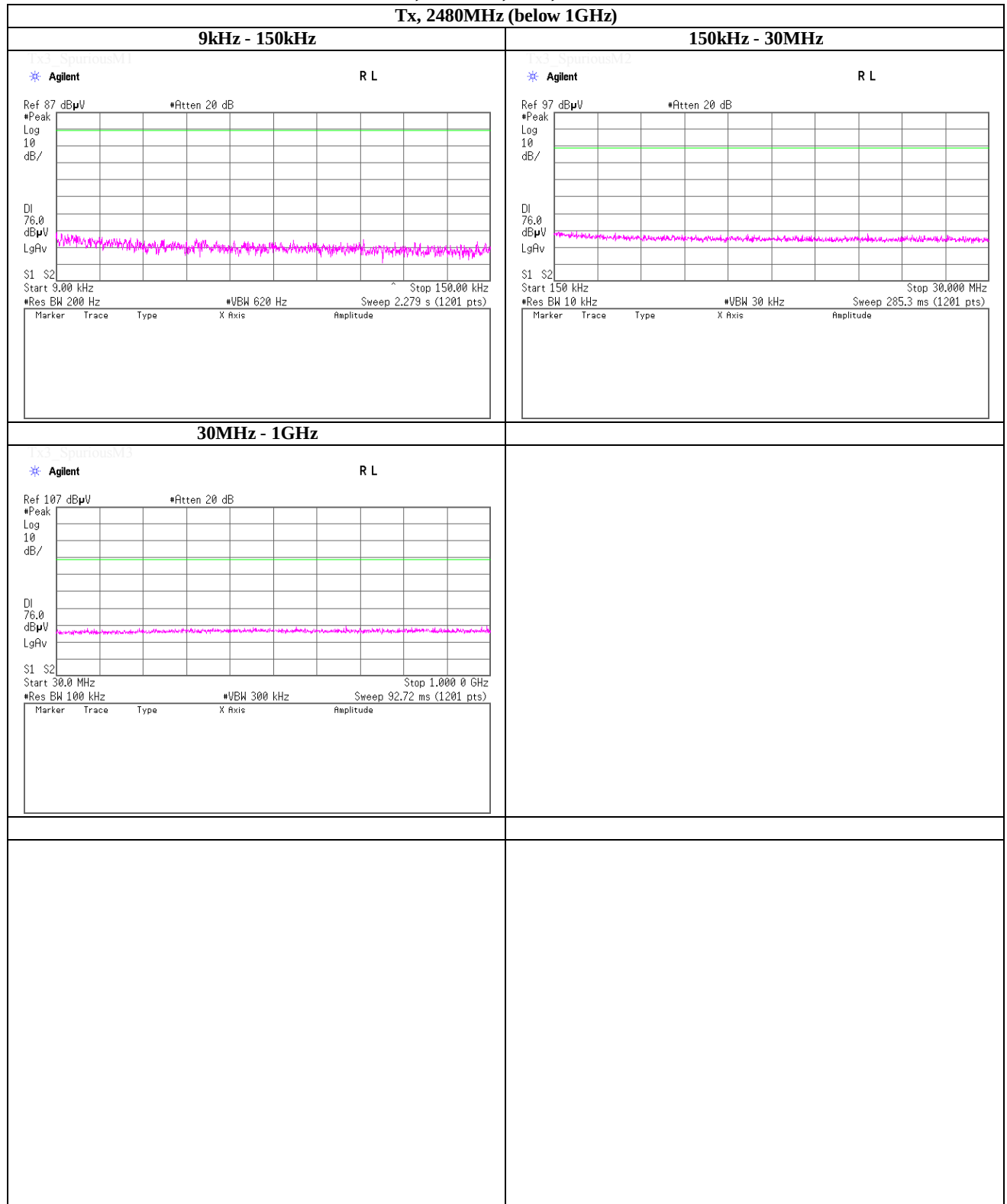
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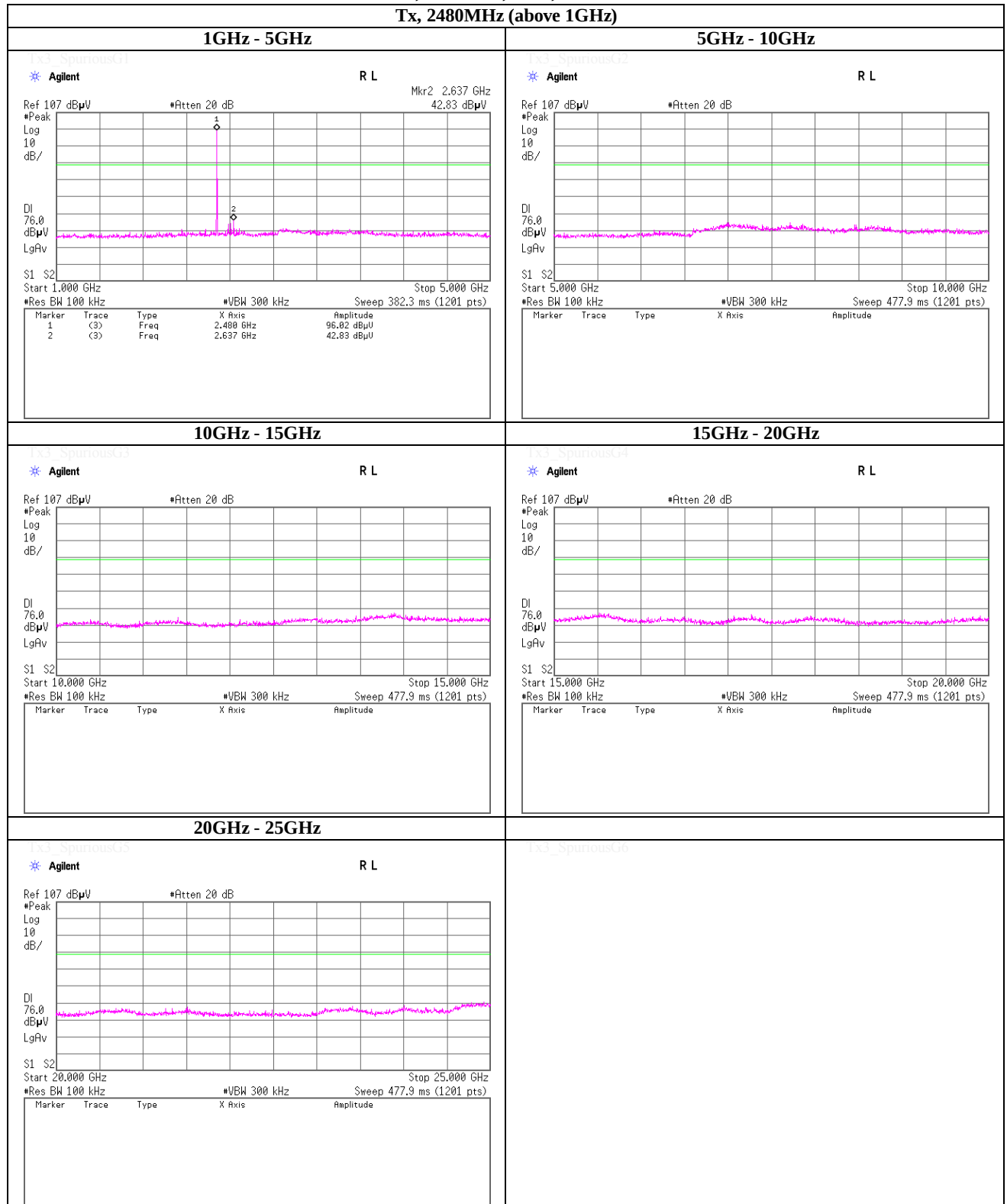
Spurious emission (Conducted)**Tx, Bluetooth, BDR, PRBS9****Tx, 2441MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

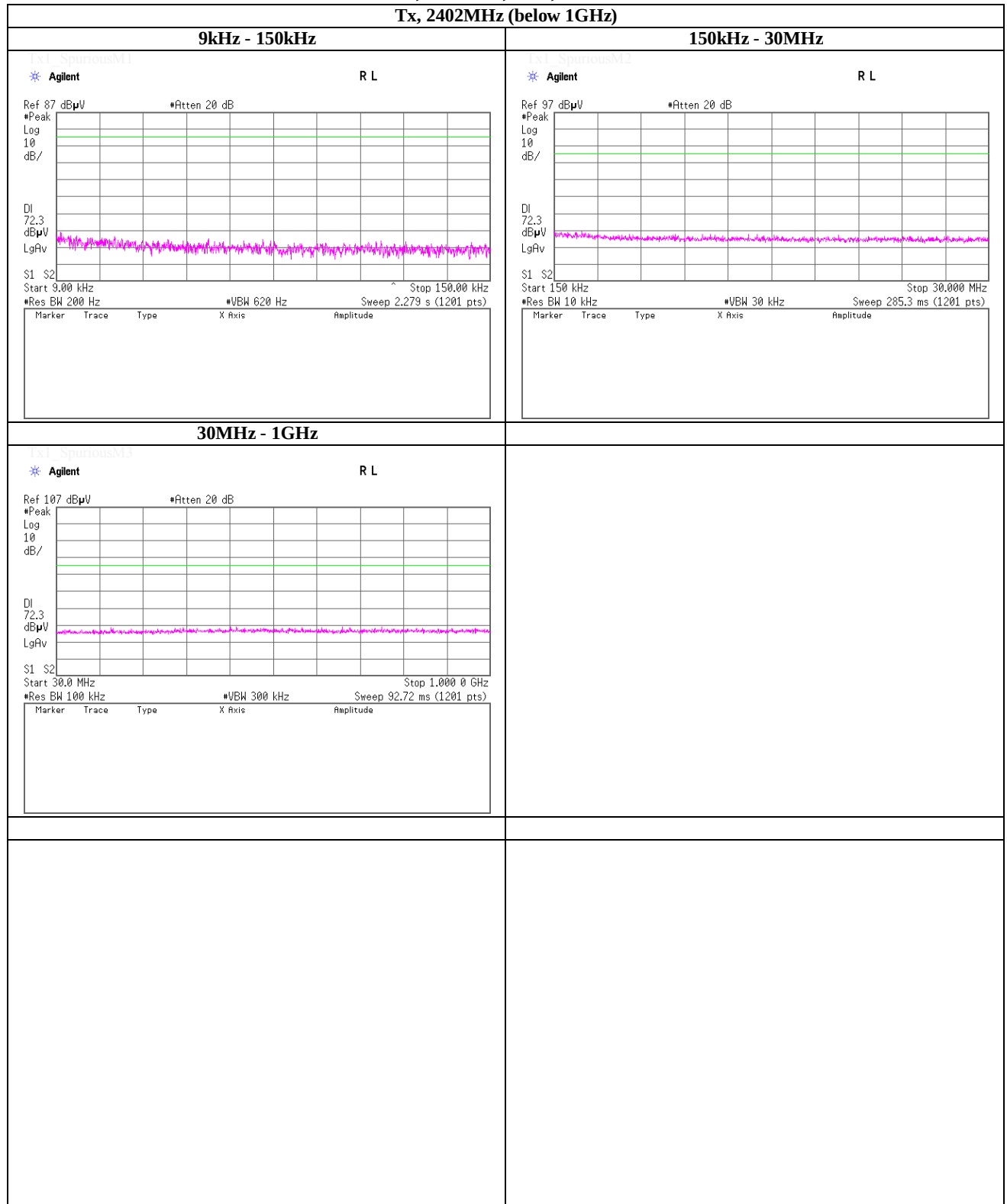
Spurious emission (Conducted)**Tx, Bluetooth, BDR, PRBS9****Tx, 2480MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

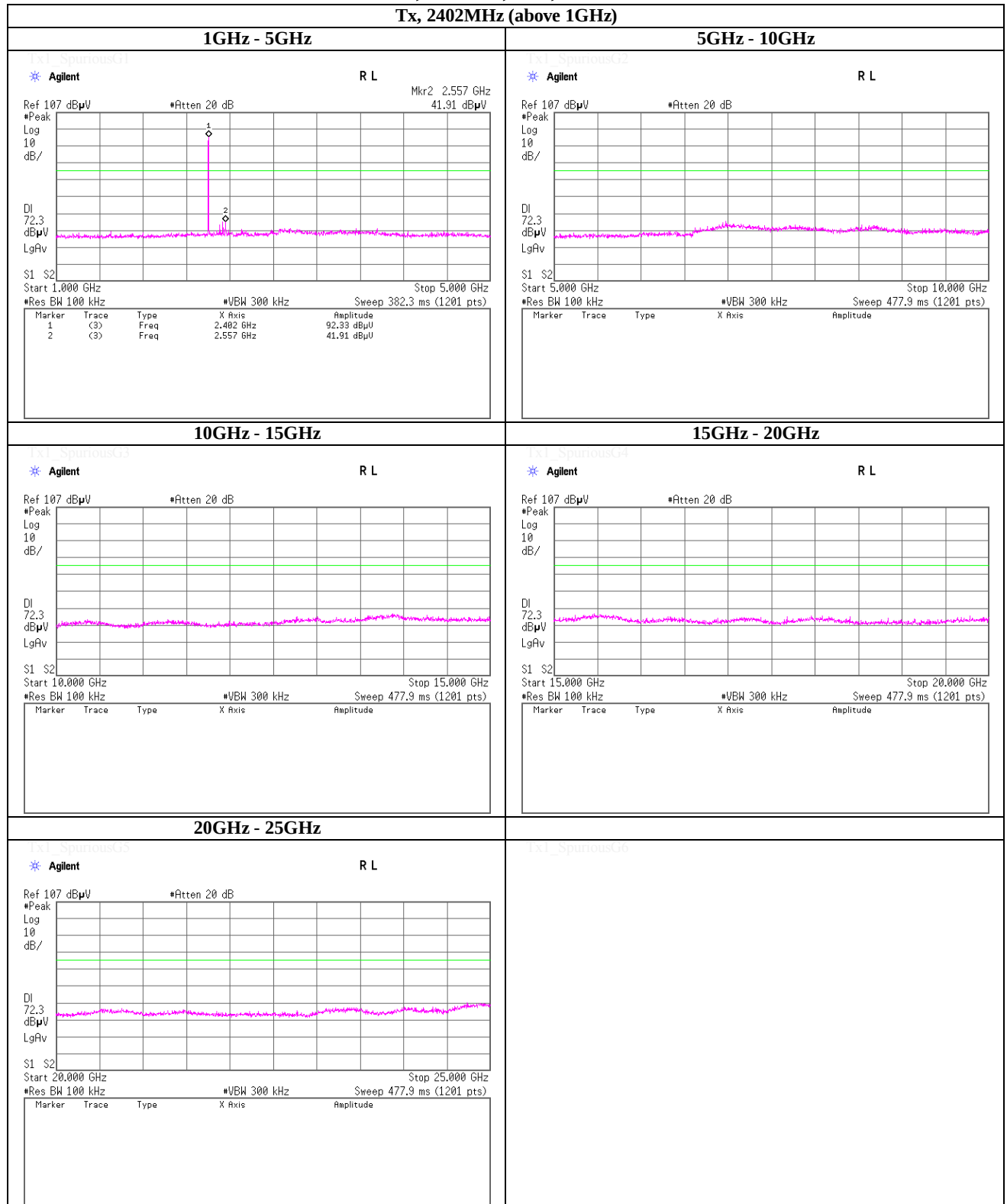
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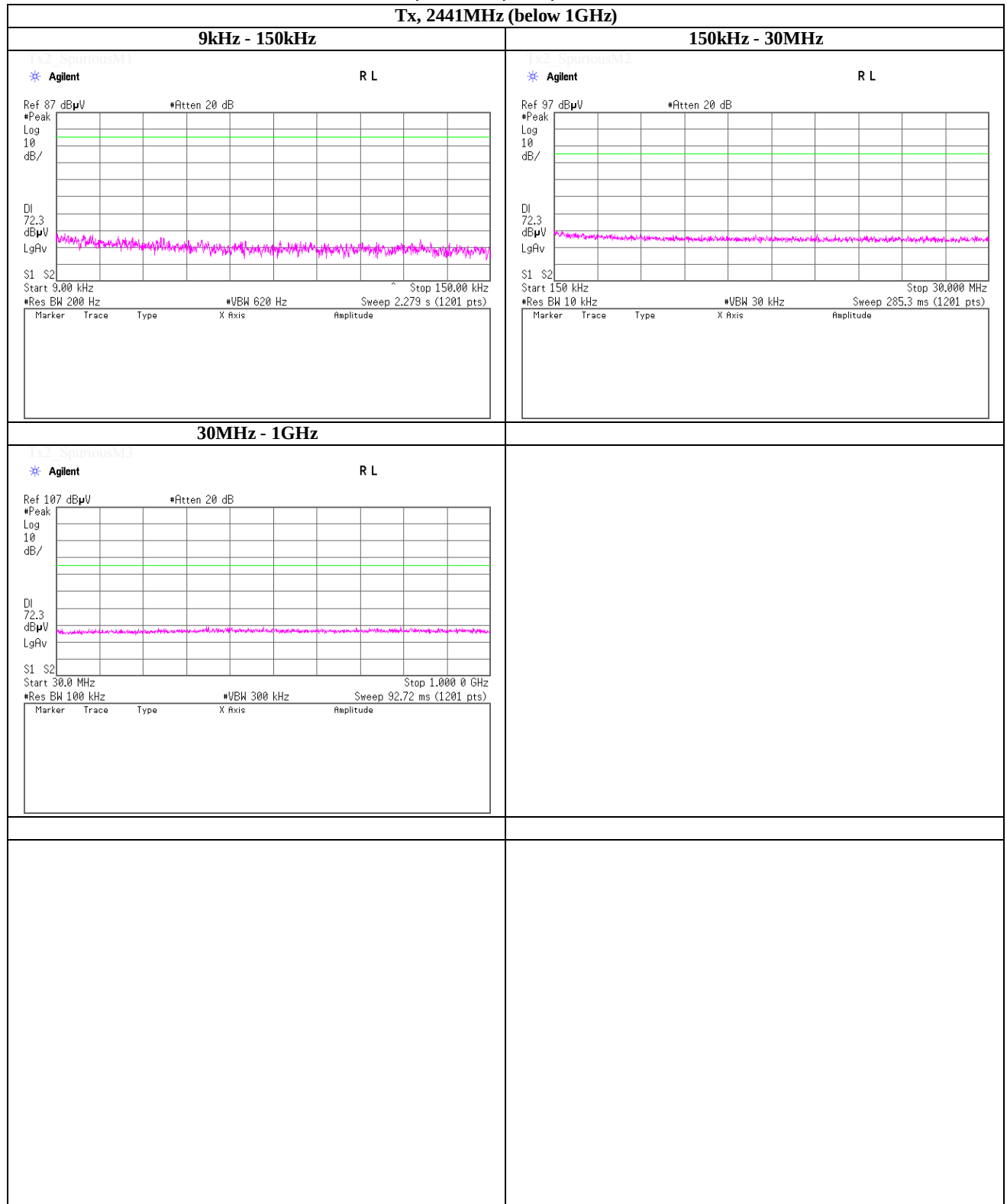
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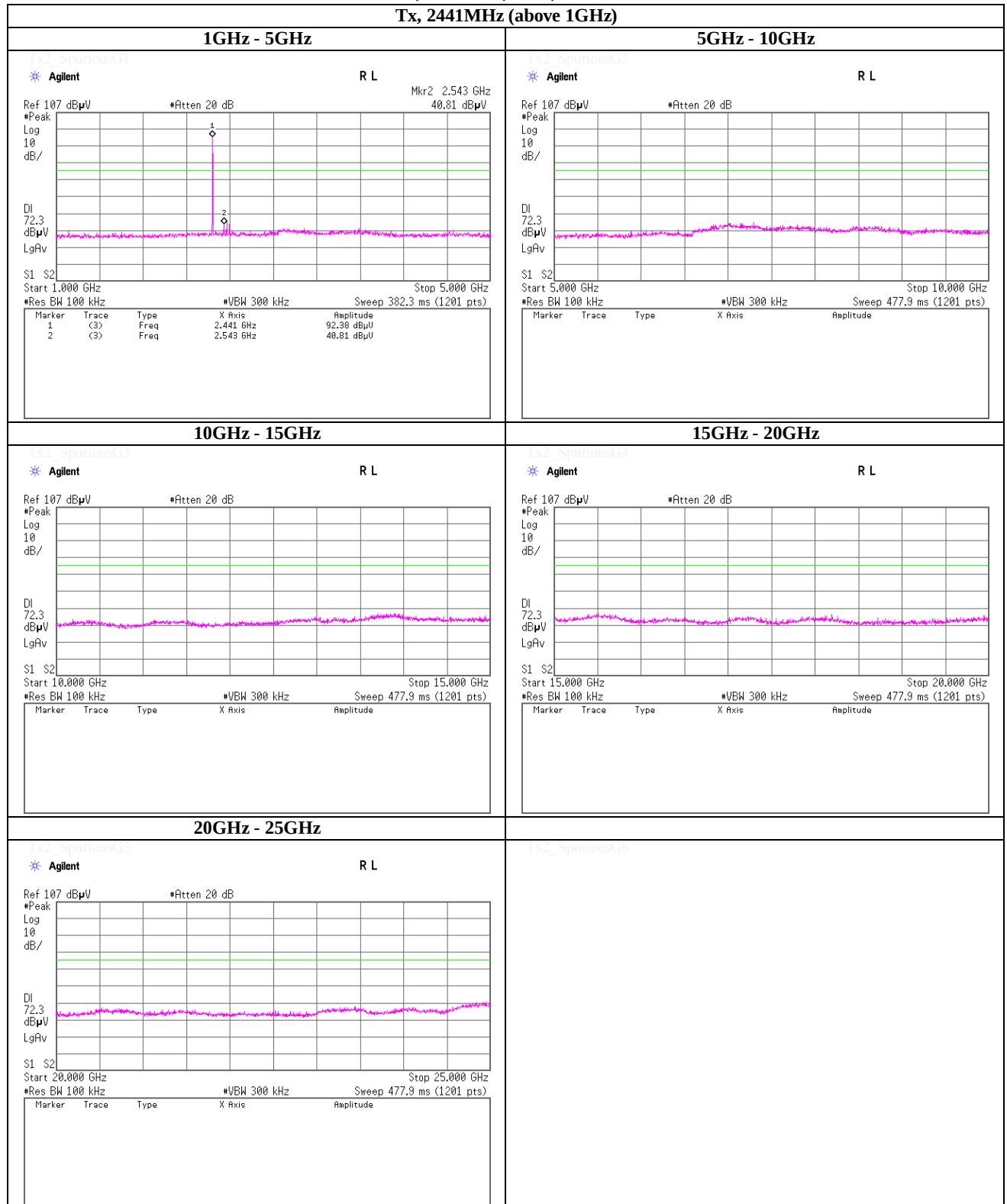
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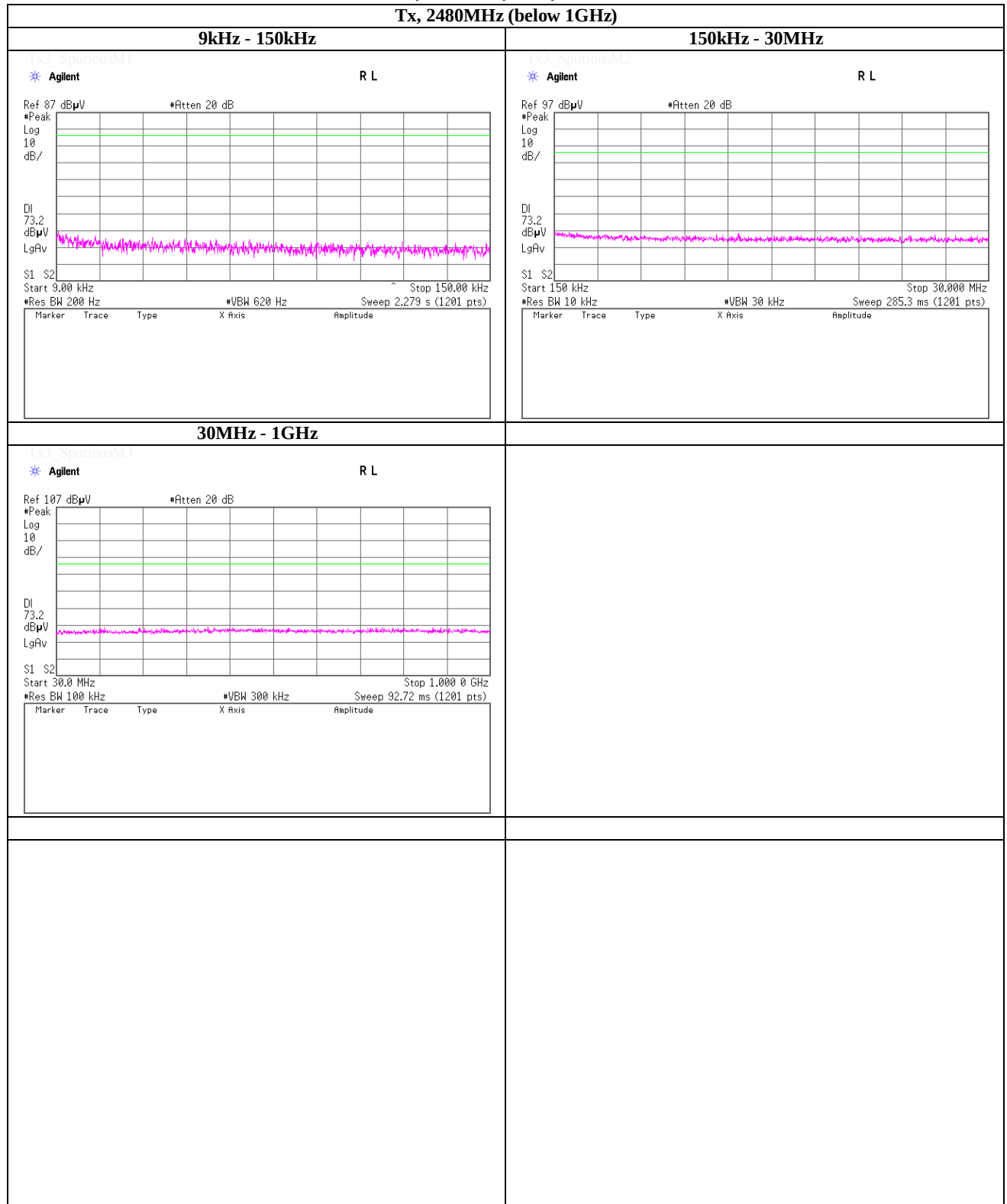
Spurious emission (Conducted)**Tx, Bluetooth, BDR, PRBS9****Tx, 2480MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

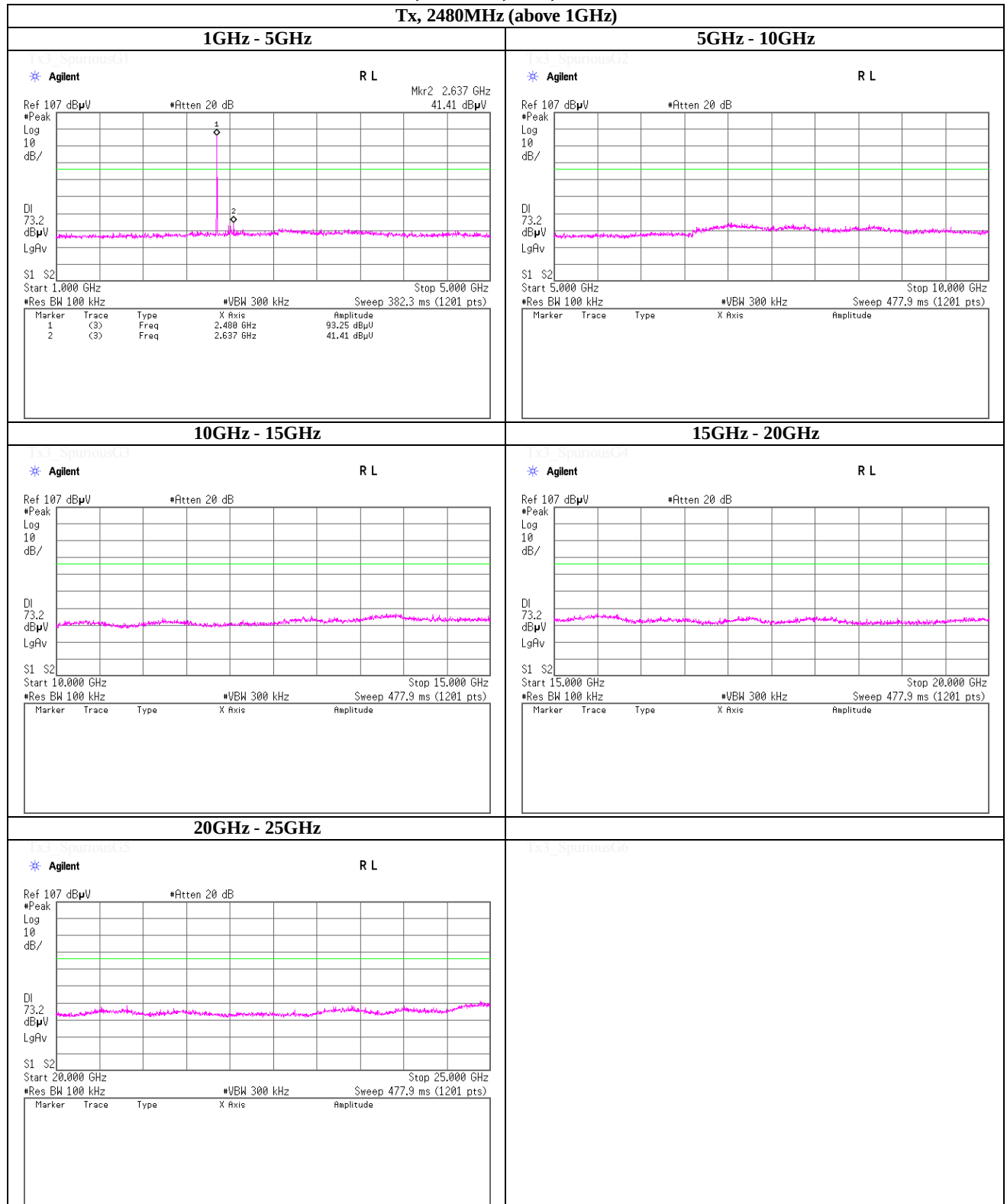
Spurious emission (Conducted)**Tx, Bluetooth, EDR, PRBS9****Tx, 2402MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

Spurious emission (Conducted)**Tx, Bluetooth, EDR, PRBS9****Tx, 2402MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

Spurious emission (Conducted)**Tx, Bluetooth, EDR, PRBS9****Tx, 2441MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

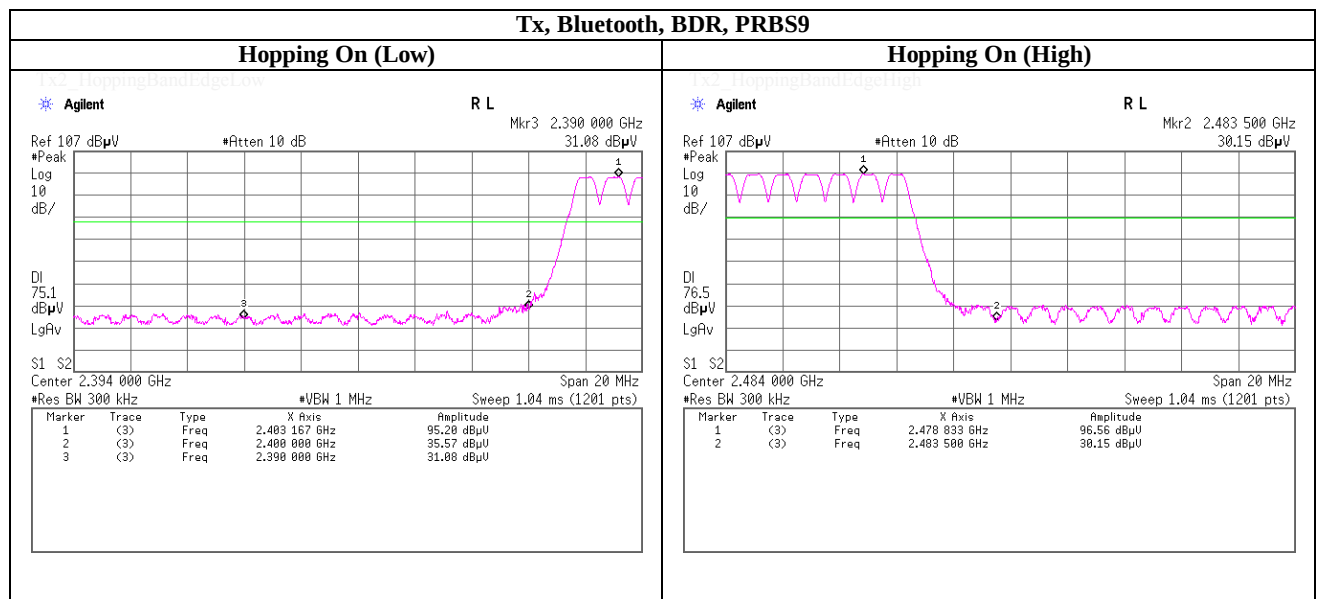
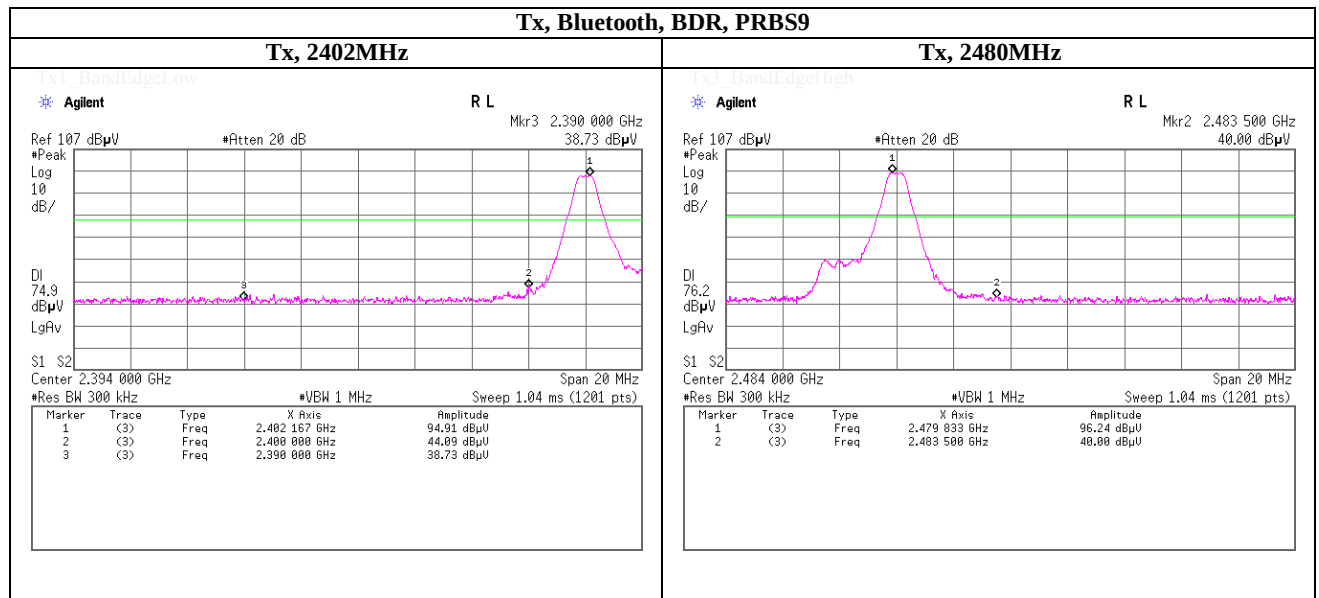
Spurious emission (Conducted)**Tx, Bluetooth, EDR, PRBS9****Tx, 2441MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

Spurious emission (Conducted)**Tx, Bluetooth, EDR, PRBS9****Tx, 2480MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

Spurious emission (Conducted)**Tx, Bluetooth, EDR, PRBS9****Tx, 2480MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

Spurious emission (Conducted)

Band Edge compliance



UL Japan, Inc.

Shonan EMC Lab.

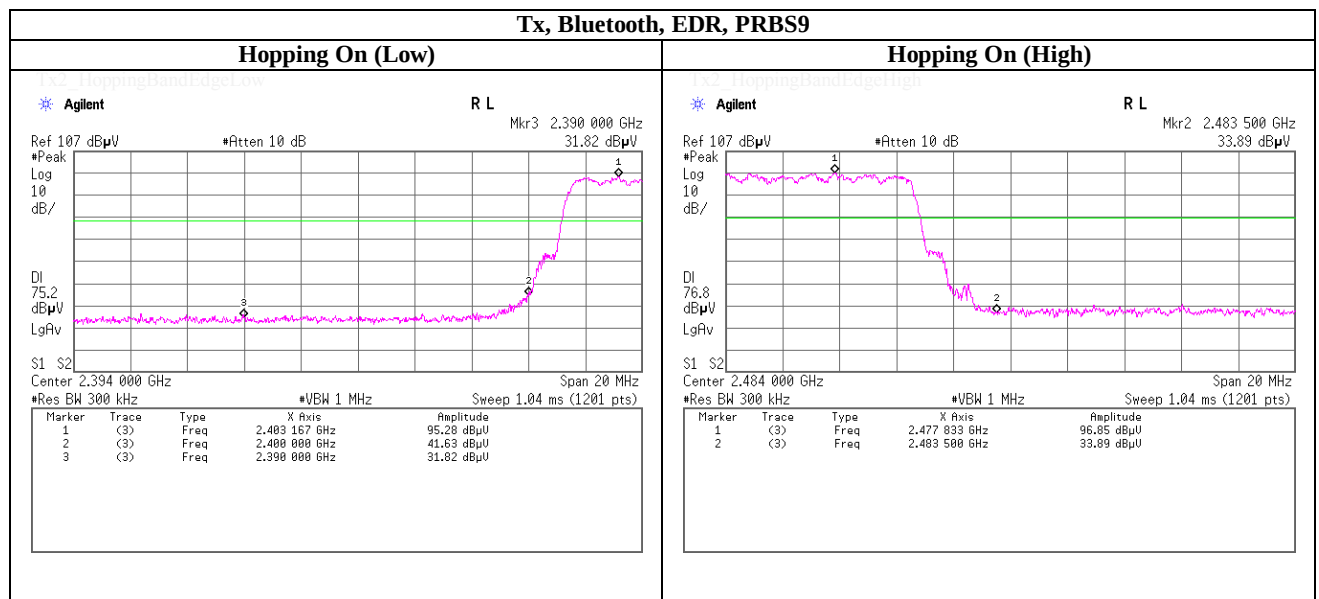
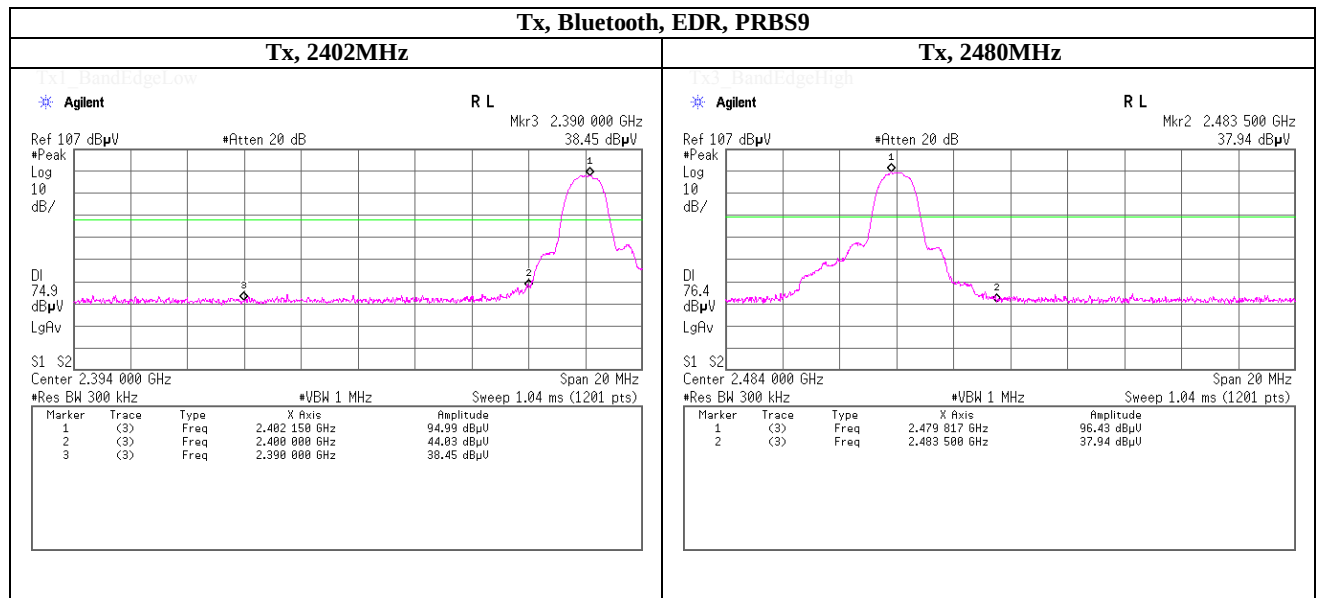
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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Band Edge compliance



UL Japan, Inc.

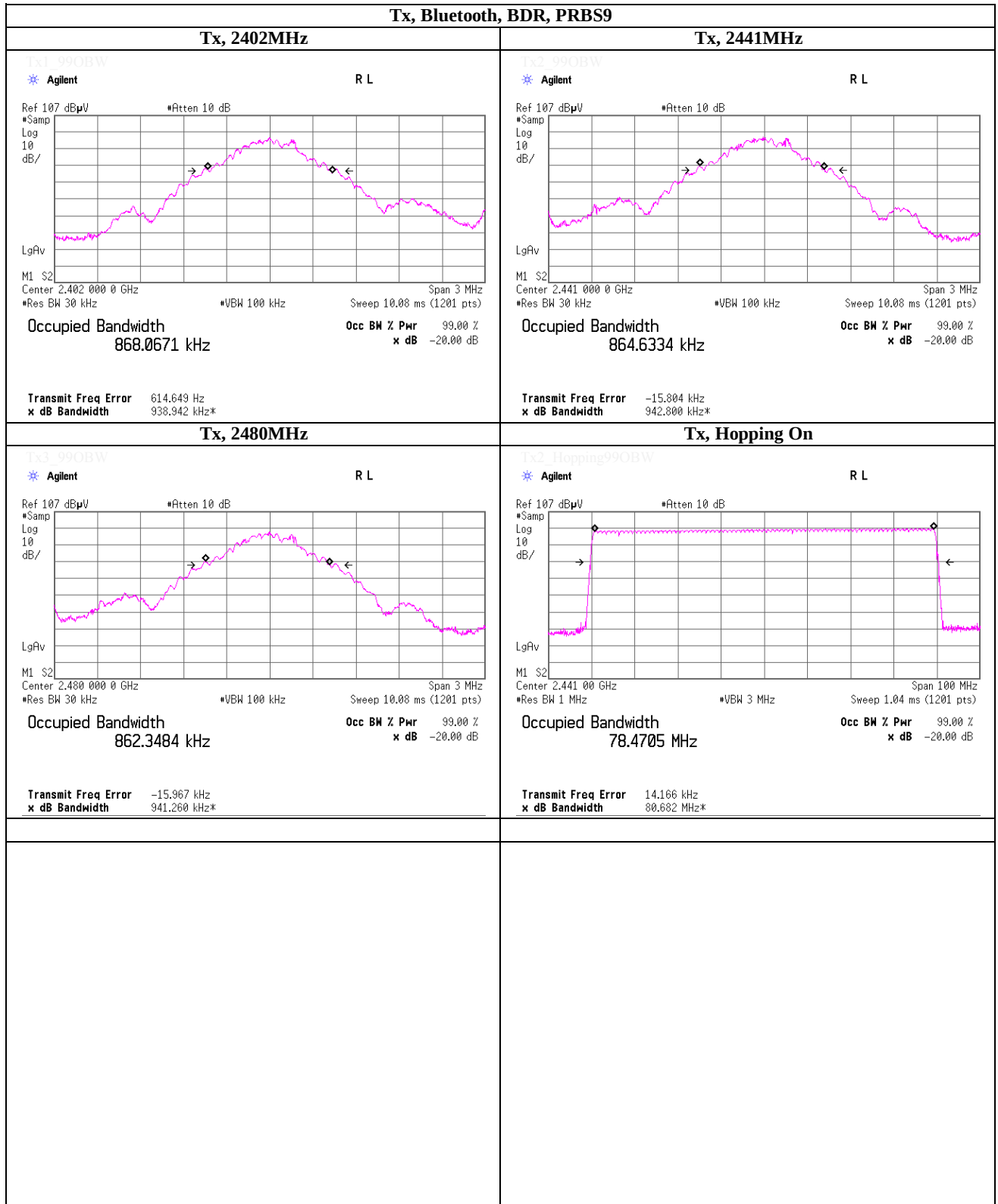
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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

99% Occupied Bandwidth



UL Japan, Inc.

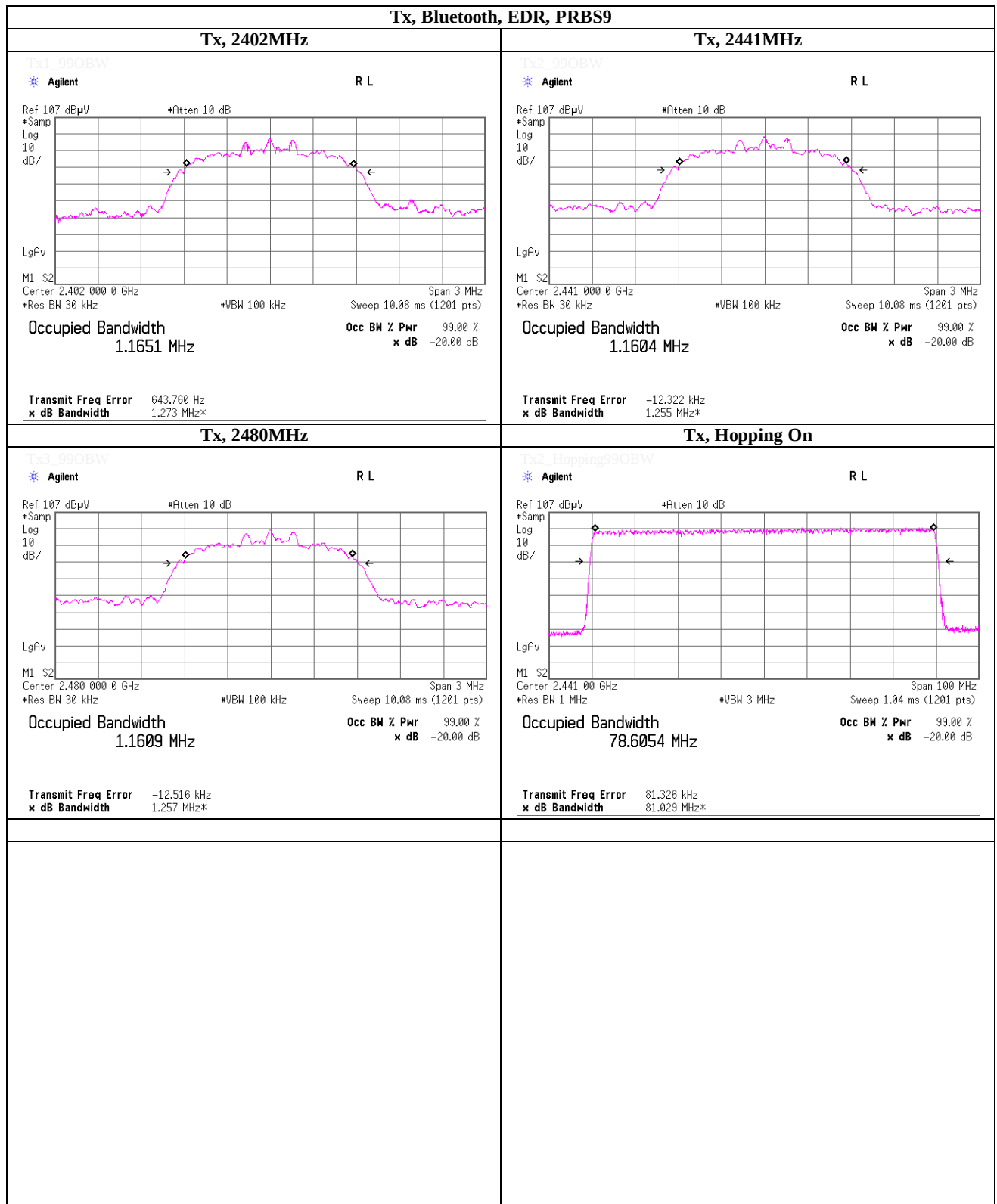
Shonan EMC Lab.

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Facsimile : +81 463 50 6401

99% Occupied Bandwidth



UL Japan, Inc.

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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)
SAF-02	Pre Amplifier	SONOMA	310N	290212	RE	2012/02/10 * 12
SAT6-02	Attenuator	JFW	50HF-006N	-	RE	2012/02/10 * 12
KAT3-11	Attenuator	JFW IND. INC.	50HF-003N	-	RE	2012/08/07 * 12
SBA-02	Biconical Antenna	Schwarzbeck	BBA9106	91032665	RE	2012/11/18 * 12
SCC-B1/B3/B5/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2012/04/10 * 12
SCC-B2/B4/B6/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2012/04/10 * 12
SLA-02	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0893	RE	2012/11/18 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2012/02/06 * 12
STR-02	Test Receiver	Rohde & Schwarz	ESCI	100575	RE	2012/09/03 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2012/09/21 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RF,IMF)	-	RE	-
SSA-01	Spectrum Analyzer	Agilent	N9010A-526	MY48031482	RE	2012/04/11 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	2012/03/12 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2012/03/12 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2012/03/30 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2012/09/21 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2012/07/18 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2012/04/10 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2012/05/22 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2012/08/17 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2012/02/06 * 12
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
SJM-11	Measure	PROMART	SEN1935	-	RE	-
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2012/04/19 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2012/04/19 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	2012/02/16 * 12
SAT10-08	Attenuator	Weinschel	W54-10	-	AT	2012/03/12 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2012/03/12 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	AT	2012/03/26 * 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 tests ,