



Test report No. : 32CE0103-HO-01-R1
Page : 1 of 49
Issued date : April 4, 2012
Revised date : April 5, 2012
FCC ID : WWGZ2210

RADIO TEST REPORT

Test Report No. : 32CE0103-HO-01-R1

Applicant : SUMITOMO PRECISION PRODUCTS CO., LTD.
Type of Equipment : 2.4GHz/10mW TRANSCEIVER MODULE
Model No. : WM-Z2210
FCC ID : WWGZ2210
Test regulation : FCC Part 15 Subpart C: 2012
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This report is a revised version of 32CE0103-HO-01. 32CE0103-HO-01 is replaced with this report.

Date of test: March 13 to 23, 2012

Representative test engineer:

Katsunori Okai
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Masanori Nishiyama
Leader of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

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<http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

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13-EM-F0429

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SECTION 1: Customer information

Company Name	:	SUMITOMO PRECISION PRODUCTS CO., LTD.
Address	:	1-10, FUSO-CHO, AMAGASAKI, HYOGO, 660-0891 JAPAN
Telephone Number	:	+81-6-6489-8264
Facsimile Number	:	+81-6-6489-5910
Contact Person	:	Junya Tada

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

2.1 Identification of E.U.T.

Type of Equipment	:	2.4GHz/10mW TRANSCEIVER MODULE
Model No.	:	WM-Z2210
Serial No.	:	Refer to Section 4, Clause 4.2
Receipt Date of Sample	:	March 12, 2012
Country of Mass-production	:	Japan
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

General Specification

Clock frequency(ies) in the system	:	14.7456MHz
------------------------------------	---	------------

Radio Specification

Radio Type	:	Transceiver
Frequency of Operation	:	2405-2475MHz
Modulation	:	Offset QPSK
Power Supply	:	DC 2.7-3.6V
Type of Antenna	:	Dipole antenna Option (External type): Antenna2 to 6 PCB trace antenna (Inverted F type): Antenna1

Antenna Information

	Antenna1	Antenna2	Antenna3	Antenna4	Antenna5	Antenna6
Model No.	-	ANTB18-187A0	ANTB18-135A0	W1049B	W1049B030	W1030W
Frequency Range	2400~2500	2400~2500	2400~2500	2400~2500	2400~2500	2400~2500
Impedance	50Ω	50Ω	50Ω	50Ω	50Ω	50Ω
Antenna Type	Inverted F	1/2λDipole	1/2λDipole	1/4λDipole	1/4λDipole	1/4λDipole
Antenna Gain	2.0dBi(Max)	2.0dBi (Max)	1.0dBi (Min)	2.0dBi (nominal)	2.0dBi (MAX)	2.0dBi (nominal)
Size	25.0mmx7.5mm	φ7.8x82.8mm	φ7.8x82.8mm	φ7.8x82.5mm	φ7.8x82.5mm	φ9x82.5mm

*Test was performed with Antenna1, Antenna2, and Antenna6 as representative.

Antenna2 was chosen as a representative 1/2λDipole antenna, because it has the higher antenna gain than Antenna3. Antenna6 was chosen as a representative 1/4λDipole antenna, because Antenna6 has the worst data as the result of preliminary check of carrier and noise among Antenna4 to 6.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2012, final revised on February 1, 2012

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.4:2003 7. AC powerline Conducted Emission measurements ----- IC: RSS-Gen 7.2.4	FCC: Section 15.207 ----- IC: RSS-Gen 7.2.4	QP 24.4dB, 7.66352MHz, N (Ant6) AV 20.3dB, 7.66352MHz, N (Ant6)	Complied	-
6dB Bandwidth	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" ----- IC: RSS-Gen 4.6.2	FCC: Section 15.247(a)(2) ----- IC: RSS-210 A8.2(a)	See data.	Complied	Conducted
Maximum Peak Output Power	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" ----- IC: RSS-Gen 4.8	FCC: Section 15.247(b)(3) ----- IC: RSS-210 A8.4(4)		Complied	Conducted
Power Density	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" ----- IC: -	FCC: Section 15.247 (e) ----- IC: RSS-210 A8.2(b)		Complied	Conducted
Spurious Emission Restricted Band Edges	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" ----- IC: RSS-Gen 4.9	FCC: Section15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 7.2.3	1.6dB 2484.811MHz, PK, Hori.	Complied	Conducted/ Radiated

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

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

FCC 15.31 (e)

The Sumitomo Precision Products Co., Ltd. product provides the voltage (DC2.7 to 3.6V) constantly to the EUT and regulated voltages (DC2.1V, 1.8V) are provided with the RF part.
Therefore, the EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

For Antenna1:

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT.

For Antenna2 to Antenna6:

The EUT has a unique coupling/antenna connector (U.FL).

Therefore, the equipment complies with the antenna requirement of Section 15.203/212.

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3.3 Addition to standard

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

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

3.4 Uncertainty

EMI

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

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

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(+dB)				(1m*)(+dB)		(0.5m*)(+dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.2dB	5.0dB	5.1dB	4.7dB	5.7dB	4.4dB	4.3dB
No.2	4.1dB	5.2dB	5.1dB	4.8dB	5.6dB	4.3dB	4.2dB
No.3	4.5dB	5.0dB	5.2dB	4.8dB	5.6dB	4.5dB	4.2dB
No.4	4.7dB	5.2dB	5.2dB	4.8dB	5.6dB	5.1dB	4.2dB

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

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

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

Conducted Emission test

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

Radiated emission test(3m)

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

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3.5 Test Location

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

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Data of EMI, Test instruments, and Test set up

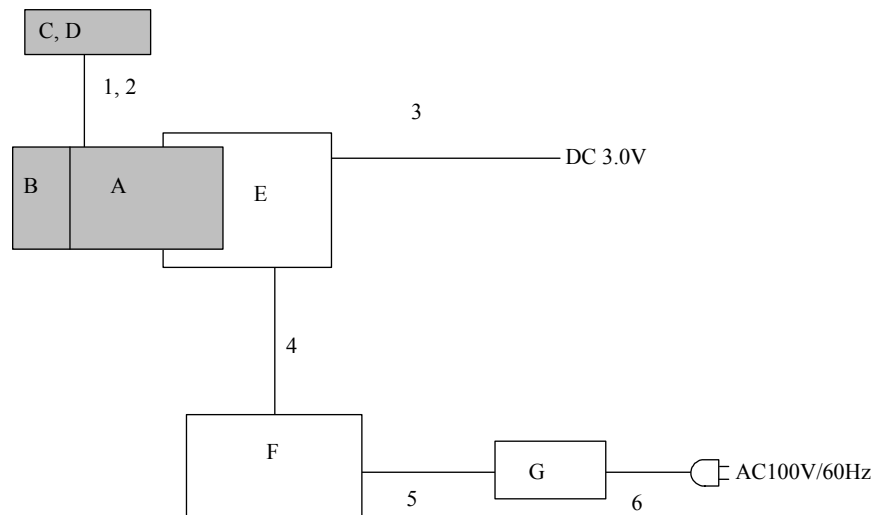
Refer to APPENDIX.

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

4.1 Operating Mode(s)

Mode	Tested Frequency
Transmitting mode (Tx mode)	2405MHz 2440MHz 2475MHz
*Power of the EUT was set by the software as follows; Power settings: C Software: Performance test application (ATmega128RFA1), Ver.B017 (14MHz) *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

4.2 Configuration and peripherals



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

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	2.4GHz/10mW TRANSCIEVER MODULE	WM-Z2210	1112500008 *1) 1112500014 *2)	SUMITOMO PRECISION PRODUCTS	EUT
B	PCB trace antenna (Antenna1)	-	-	SUMITOMO PRECISION PRODUCTS	EUT
C	Dipole antenna (Antenna2)	ANTB18-187A0	-	Sansei Electric Co., Ltd.	EUT
D	Dipole antenna (Antenna6)	W1030W	-	Pulse Electronics	EUT
E	Jig	TWM-01-JIGU2	-	SUMITOMO PRECISION PRODUCTS	-
F	Laptop PC	Compaq nx6120	CNU5460S6P	HP	-
G	AC Adaptor	DC359A	F3-05120749620A	HP	-

*1) Used for all tests other than Duty cycle

*2) Used for Duty cycle test

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List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable (for Antenna2)	0.035	Shielded	Shielded	-
2	Antenna Cable (for Antenna6)	0.07	Shielded	Shielded	
3	DC Cable	1.5	Unshielded	Unshielded	
4	USB Cable	1.5	shielded	shielded	
5	DC Cable	1.7	Unshielded	Unshielded	
6	AC Cable	1.7	Unshielded	Unshielded	

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane.

The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

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

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

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

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

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

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SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "2. Radiated emission test" of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247".

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	Below 30MHz	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

In any 100kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

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

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

*1) For the band edge of the carrier and the harmonics: The Average value was calculated by reducing Duty factor from Peak (Peak value – Duty factor).

For Duty factor, please refer to Page 30.

*2) For other than the band edge of the carrier and the harmonics: Average Detector (RBW: 1MHz, VBW: 10Hz)

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

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT and of X(0 and 90), Y(0 and 90) and Z(0 and 90) axes of antenna to see the position of maximum noise, and the test was made at the position that has the maximum noise.

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

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

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SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

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

*1) PSD Option 1 of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247".

*2) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.

Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz)

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

Test data : APPENDIX

Test result : Pass

APPENDIX 1: Data of EMI test

Conducted Emission Antenna

DATA OF CONDUCTED EMISSION TEST

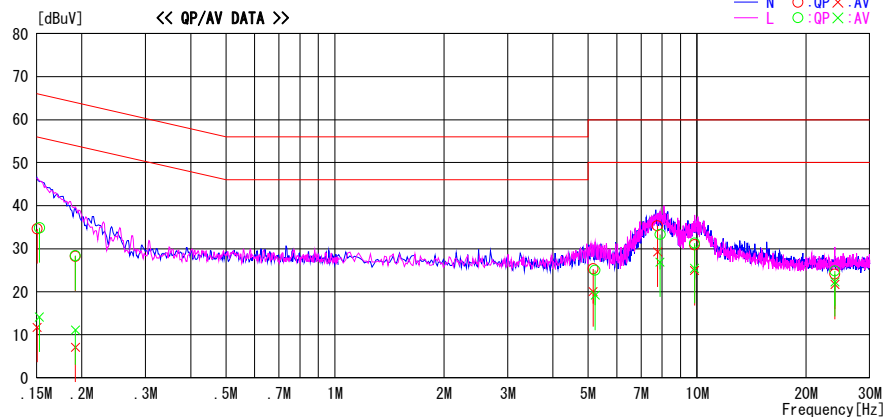
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2012/03/19

Report No. : 32CE0103-HO-01

Temp./Humi. : 20deg. C / 40% RH
Engineer : Keisuke Kawamura

Mode / Remarks : Ant-1 Tx 2440MHz

LIMIT : FCC15.207 QP
FCC15.207 AV

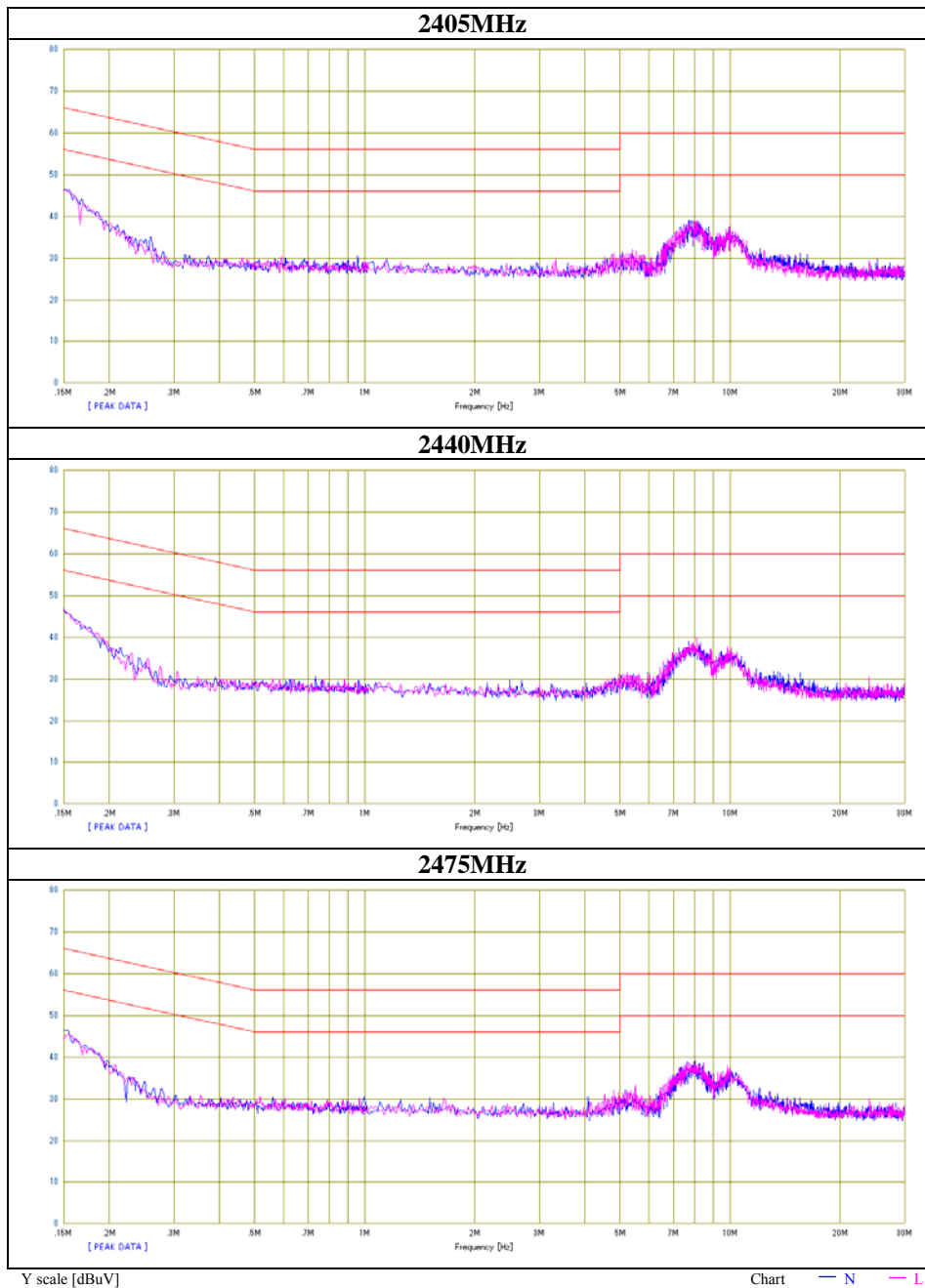


Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15056	21.3	-1.6	13.3	34.6	11.7	66.0	56.0	31.4	44.3	N	
0.19205	14.9	-6.2	13.3	28.2	7.1	63.9	53.9	35.7	46.8	N	
5.16106	11.5	6.2	13.8	25.3	20.0	60.0	50.0	34.7	30.0	N	
7.77404	21.3	15.2	14.0	35.3	29.2	60.0	50.0	24.7	20.8	N	
9.83838	16.8	10.8	14.1	30.9	24.9	60.0	50.0	29.1	25.1	N	
24.00045	9.1	6.7	15.0	24.1	21.7	60.0	50.0	35.9	28.3	N	
0.15290	21.5	0.8	13.3	34.8	14.1	65.8	55.8	31.0	41.7	L	
0.19205	15.1	-2.2	13.3	28.4	11.1	63.9	53.9	35.5	42.8	L	
5.22779	11.2	5.4	13.8	25.0	19.2	60.0	50.0	35.0	30.8	L	
7.90345	19.3	12.9	14.0	33.3	26.9	60.0	50.0	26.7	23.1	L	
9.83838	17.2	11.3	14.1	31.3	25.4	60.0	50.0	28.7	24.6	L	
24.00145	9.8	7.3	15.0	24.8	22.3	60.0	50.0	35.2	27.7	L	

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

Conducted Emission

Test place	Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No.	32CE0103-HO-01
Date	03/19/2012
Temperature/ Humidity	20 deg. C / 40% RH
Engineer	Keisuke Kawamura
Mode	Antenna1 Tx



Conducted Emission Antenna2

DATA OF CONDUCTED EMISSION TEST

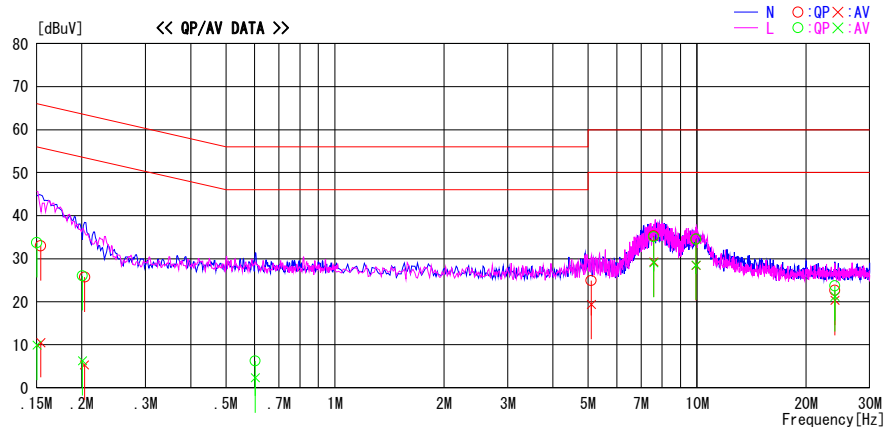
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2012/03/19

Report No. : 32CE0103-HO-01

Temp./Humi. : 20deg. C / 40% RH
Engineer : Keisuke Kawamura

Mode / Remarks : Ant-2 Tx 2440MHz

LIMIT : FCC15.207 QP
FCC15.207 AV

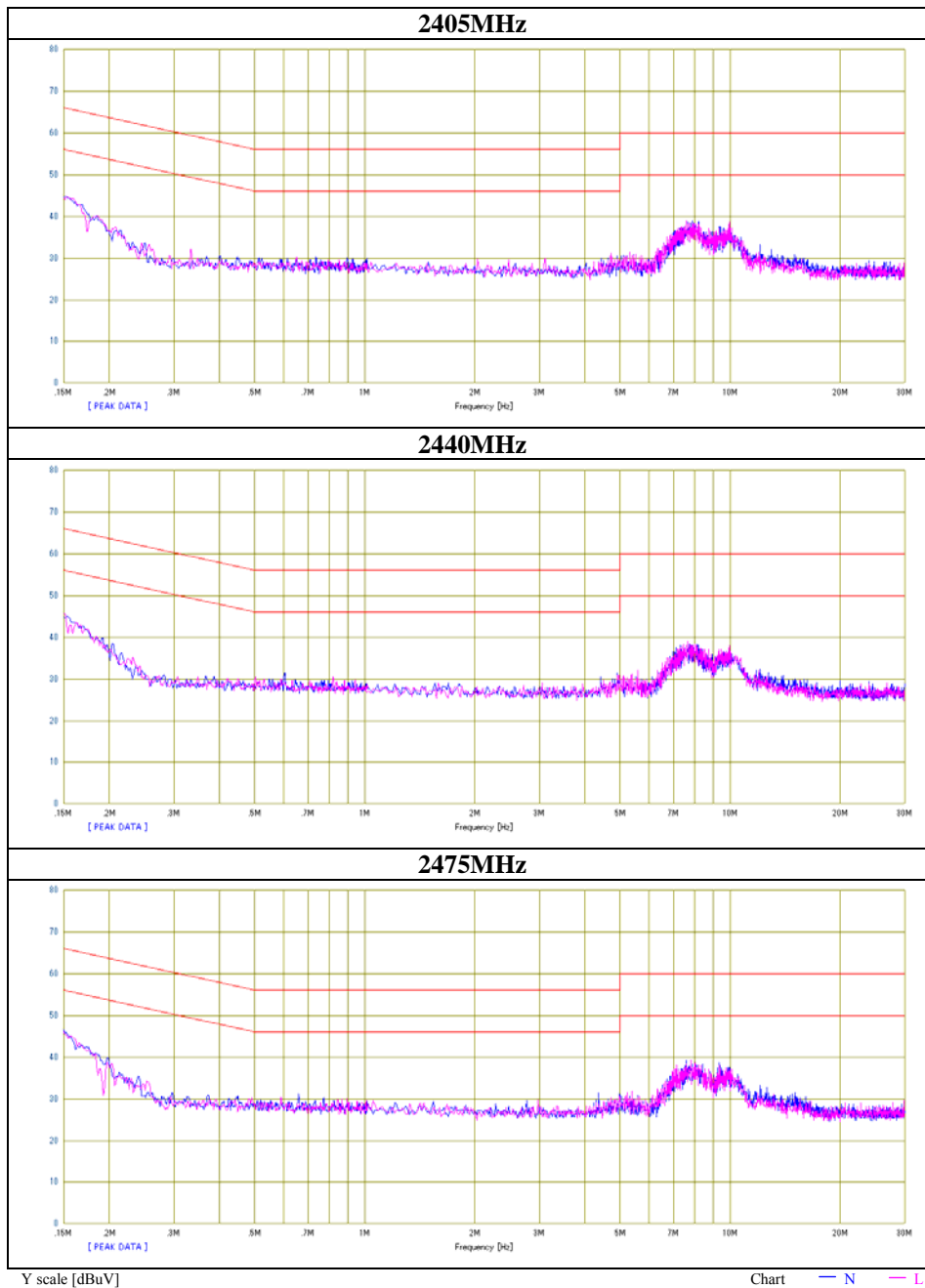


Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15413	19.7	-2.8	13.3	33.0	10.5	65.8	55.8	32.8	45.3	N	
0.20365	12.4	-8.0	13.3	25.7	5.3	63.5	53.5	37.8	48.2	N	
5.10162	11.1	5.6	13.8	24.9	19.4	60.0	50.0	35.1	30.6	N	
7.58603	21.4	15.3	13.9	35.3	29.2	60.0	50.0	24.7	20.8	N	
9.93713	20.4	14.3	14.1	34.5	28.4	60.0	50.0	25.5	21.6	N	
24.00000	7.6	5.3	15.0	22.6	20.3	60.0	50.0	37.4	29.7	N	
0.15036	20.4	-3.4	13.3	33.7	9.9	66.0	56.0	32.3	46.1	L	
0.20075	12.7	-7.0	13.3	26.0	6.3	63.6	53.6	37.6	47.3	L	
0.60240	-7.1	-11.0	13.3	6.2	2.3	56.0	46.0	49.8	43.7	L	
7.58527	21.2	15.2	13.9	35.1	29.1	60.0	50.0	24.9	20.9	L	
9.93753	20.4	14.4	14.1	34.5	28.5	60.0	50.0	25.5	21.5	L	
24.00000	8.7	6.2	15.0	23.7	21.2	60.0	50.0	36.3	28.8	L	

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

Conducted Emission

Test place	Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No.	32CE0103-HO-01
Date	03/19/2012
Temperature/ Humidity	20 deg. C / 40% RH
Engineer	Keisuke Kawamura
Mode	Antenna2 Tx



Conducted Emission Antenna6

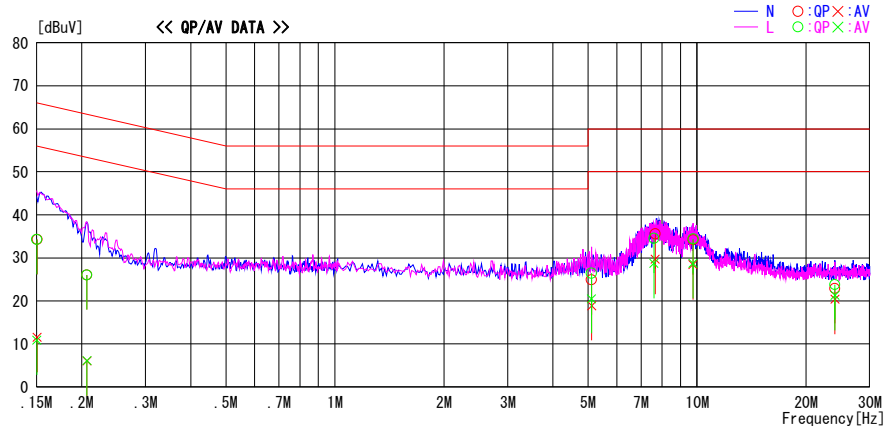
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2012/03/19

Report No. : 32CE0103-HO-01
Temp./Humi. : 20deg. C / 40% RH
Engineer : Keisuke Kawamura

Mode / Remarks : Ant-6 Tx 2440MHz

LIMIT : FCC15.207 QP
FCC15.207 AV

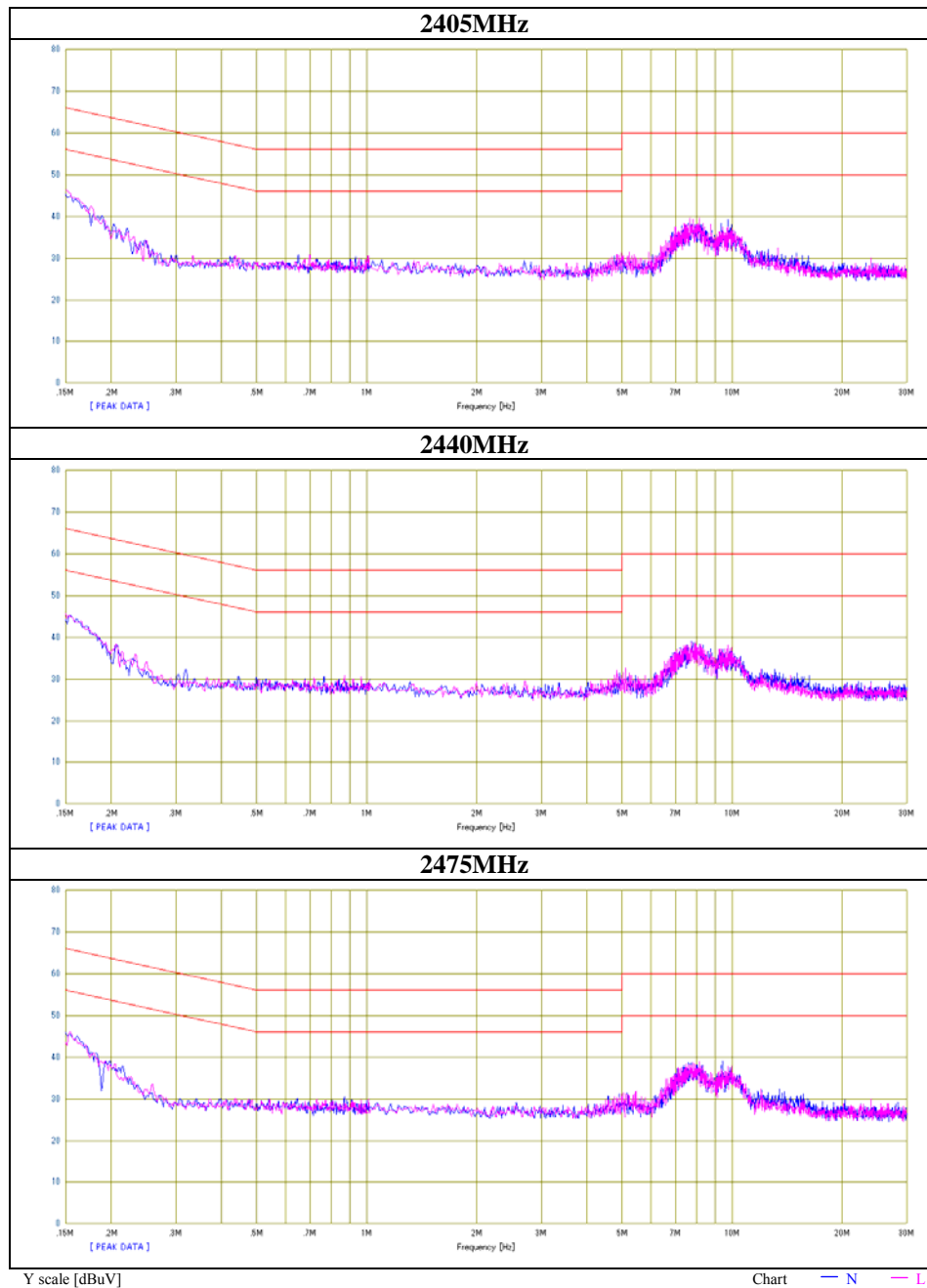


Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15054	21.0	-1.8	13.3	34.3	11.5	66.0	56.0	31.7	44.5	N	
0.20655	12.7	-7.3	13.3	26.0	6.0	63.3	53.3	37.3	47.3	N	
5.11079	11.1	5.1	13.8	24.9	18.9	60.0	50.0	35.1	31.1	N	
7.66352	21.7	15.8	13.9	35.6	29.7	60.0	50.0	24.4	20.3	N	
9.74788	20.1	14.3	14.1	34.2	28.4	60.0	50.0	25.8	21.6	N	
24.00003	7.9	5.4	15.0	22.9	20.4	60.0	50.0	37.1	29.6	N	
0.15026	21.0	-2.4	13.3	34.3	10.9	66.0	56.0	31.7	45.1	L	
0.20655	12.7	-7.2	13.3	26.0	6.1	63.3	53.3	37.3	47.2	L	
5.10811	12.6	6.7	13.8	26.4	20.5	60.0	50.0	33.6	29.5	L	
7.59322	20.6	14.8	13.9	34.5	28.7	60.0	50.0	25.5	21.3	L	
9.74678	20.3	14.6	14.1	34.4	28.7	60.0	50.0	25.6	21.3	L	
24.00003	8.8	6.3	15.0	23.8	21.3	60.0	50.0	36.2	28.7	L	

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

Conducted Emission

Test place	Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No.	32CE0103-HO-01
Date	03/19/2012
Temperature/ Humidity	20 deg. C / 40% RH
Engineer	Keisuke Kawamura
Mode	Antenna6 Tx

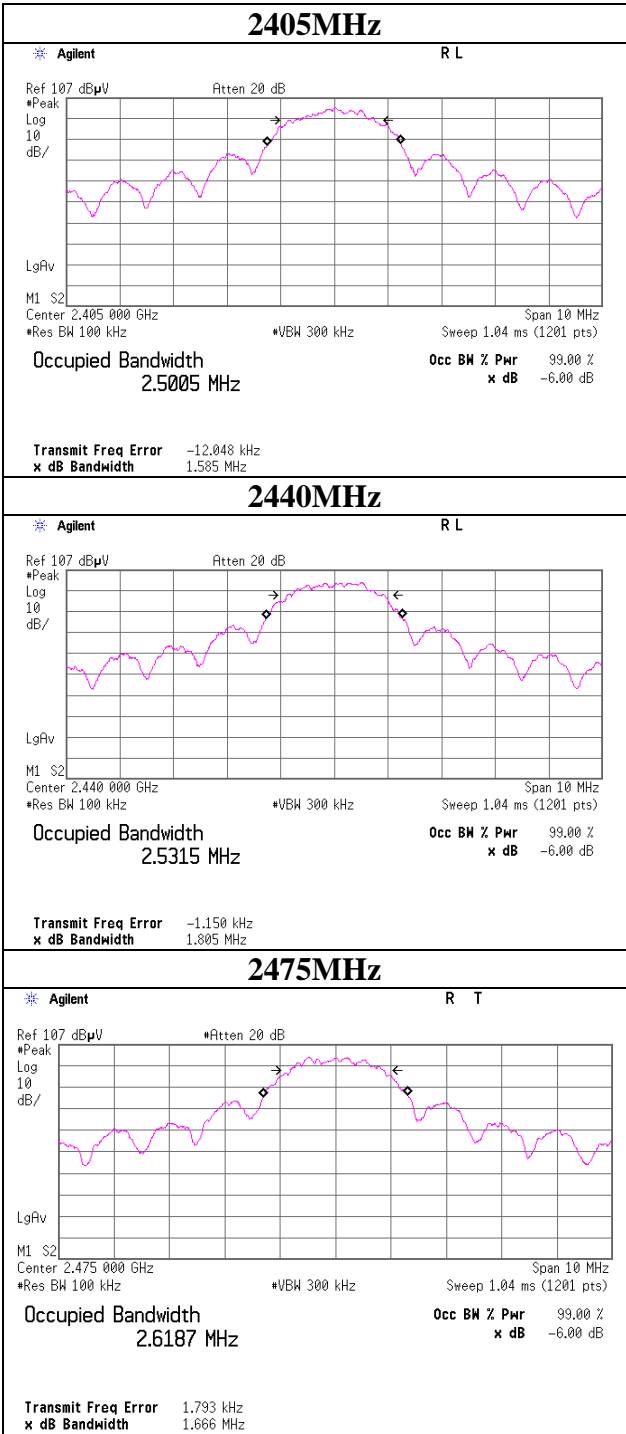


6dB Bandwidth

Test place	Head Office EMC Lab. No.11 Measurement Room	
Report No.	32CE0103-HO-01	
Date	03/13/2012	03/14/2012
Temperature/ Humidity	23 deg. C / 25% RH	22 deg. C / 32% RH
Engineer	Takumi Shimada	Katsunori Okai
Mode	Tx	

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2405	1.585	>500
2440	1.805	>500
2475	1.666	>500

6dB Bandwidth



Maximum Peak Output Power

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 32CE0103-HO-01
Date 03/13/2012 03/14/2012
Temperature/ Humidity 23 deg. C / 25% RH 22 deg. C / 32% RH
Engineer Takumi Shimada Katsunori Okai
Mode Tx

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2405	-2.86	2.10	10.01	9.25	8.41	30.00	1000	20.75
2440	-3.41	2.11	10.01	8.71	7.43	30.00	1000	21.29
2475	-3.68	2.13	10.01	8.46	7.01	30.00	1000	21.54

Radiated Spurious Emission Antenna1

Test place Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber
Report No. 32CE0103-HO-01
Date 03/13/2012 03/22/2012 03/23/2012
Temperature/ Humidity 23 deg. C / 33% RH 22 deg. C / 36% RH 22 deg. C / 38% RH
Engineer Katsunori Okai Hiroshi Kukita Takumi Shimada
(1-10GHz) (10-26.5GHz) (30-1000Hz)
Mode Tx 2405MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	70.850	QP	26.4	6.6	7.8	32.2	8.6	40.0	31.4	
Hori	141.300	QP	25.6	14.5	8.6	32.3	16.4	43.5	27.1	
Hori	168.970	QP	28.8	15.7	8.9	32.2	21.2	43.5	22.3	
Hori	250.000	QP	29.4	17.4	9.6	32.1	24.3	46.0	21.7	
Hori	334.217	QP	35.1	15.6	10.2	32.1	28.8	46.0	17.2	
Hori	719.983	QP	28.4	20.9	12.6	31.9	30.0	46.0	16.0	
Hori	2390.000	PK	59.6	27.4	2.2	34.8	54.4	73.9	19.5	See 20dBc Data Sheet
Hori	2400.000	PK	74.8	27.5	2.2	34.8	69.7	-	-	
Hori	4810.000	PK	47.4	31.2	3.9	34.0	48.5	73.9	25.4	
Hori	7215.000	PK	44.0	35.9	4.5	34.2	50.2	73.9	23.7	
Hori	9620.000	PK	43.7	38.8	5.3	34.7	53.1	73.9	20.8	
Hori	24050.000	PK	44.5	38.6	-1.8	31.6	49.7	73.9	24.2	
Vert	47.283	QP	37.4	12.0	7.4	32.2	24.6	40.0	15.4	
Vert	61.450	QP	40.8	7.8	7.6	32.2	24.0	40.0	16.0	
Vert	70.067	QP	38.8	6.6	7.8	32.2	21.0	40.0	19.0	
Vert	81.920	QP	41.1	6.8	7.9	32.2	23.6	40.0	16.4	
Vert	110.570	QP	38.4	11.6	8.3	32.3	26.0	43.5	17.5	
Vert	143.100	QP	36.7	14.5	8.6	32.3	27.5	43.5	16.0	
Vert	166.870	QP	43.8	15.6	8.9	32.2	36.1	43.5	7.4	
Vert	240.005	QP	34.3	17.3	9.5	32.1	29.0	46.0	17.0	
Vert	333.817	QP	30.7	15.5	10.2	32.1	24.3	46.0	21.7	
Vert	527.993	QP	30.0	18.6	11.5	32.0	28.1	46.0	17.9	
Vert	624.007	QP	28.3	19.7	12.0	32.0	28.0	46.0	18.0	
Vert	719.977	QP	30.2	20.9	12.6	31.9	31.8	46.0	14.2	
Vert	2390.000	PK	60.0	27.4	2.2	34.8	54.8	73.9	19.1	See 20dBc Data Sheet
Vert	2400.000	PK	75.7	27.5	2.2	34.8	70.6	-	-	
Vert	4810.000	PK	48.3	31.2	3.9	34.0	49.4	73.9	24.5	
Vert	7215.000	PK	48.5	35.9	4.5	34.2	54.7	73.9	19.2	
Vert	9620.000	PK	43.2	38.8	5.3	34.7	52.6	73.9	21.3	
Vert	24050.000	PK	44.4	38.6	-1.8	31.6	49.6	73.9	24.3	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2405.000	PK	110.6	27.5	2.2	34.8	105.5	-	-	Carrier
Hori	2400.000	PK	70.9	27.5	2.2	34.8	65.8	85.5	19.7	
Vert	2405.000	PK	108.6	27.5	2.2	34.8	103.5	-	-	Carrier
Vert	2400.000	PK	68.7	27.5	2.2	34.8	63.6	83.5	19.9	

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

PK with Duty factor

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
		Hor	Ver					Hor	Ver		Hor	Ver
2390.000	PK	59.6	60.0	27.4	2.2	34.8	-13.3	41.1	41.5	53.9	12.8	12.4
4810.000	PK	47.4	48.3	31.2	3.9	34.0	-13.3	35.2	36.1	53.9	18.7	17.8
7215.000	PK	44.0	48.5	35.9	4.5	34.2	-13.3	36.9	41.4	53.9	17.0	12.5
9620.000	PK	43.7	43.2	38.8	5.3	34.7	-13.3	39.8	39.3	53.9	14.1	14.6
24050.000	PK	44.5	44.4	38.6	-1.8	31.6	-13.3	36.4	36.3	53.9	17.5	17.6

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Duty factor (Refer to Duty factor data sheet)

Radiated Spurious Emission Antenna1

Test place Head Office EMC Lab. No. 2 and 3 Semi Anechoic Chamber
Report No. 32CE0103-HO-01
Date 03/16/2012 03/22/2012 03/23/2012
Temperature/ Humidity 20 deg. C / 30% RH 22 deg. C / 36% RH 22 deg. C / 38% RH
Engineer Katsunori Okai Hiroshi Kukita Takumi Shimada
(1-10GHz) (10-26.5GHz) (30-1000Hz)
Mode Tx 2440MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	72.017	QP	33.5	6.6	7.8	32.2	15.7	40.0	24.3	
Hori	107.640	QP	24.8	11.2	8.2	32.3	11.9	43.5	31.6	
Hori	167.220	QP	39.4	15.7	8.9	32.2	31.8	43.5	11.7	
Hori	196.750	QP	26.8	16.8	9.1	32.2	20.5	43.5	23.0	
Hori	331.770	QP	34.4	15.5	10.2	32.1	28.0	46.0	18.0	
Hori	719.992	QP	32.3	20.9	12.6	31.9	33.9	46.0	12.1	
Hori	4880.000	PK	51.5	31.4	3.8	34.0	52.7	73.9	21.2	
Hori	7320.000	PK	48.8	36.0	4.6	34.2	55.2	73.9	18.7	
Hori	9760.000	PK	41.0	38.9	5.3	34.7	50.5	73.9	23.4	
Hori	24400.000	PK	44.5	38.8	-1.7	31.4	50.2	73.9	23.7	
Vert	48.007	QP	42.9	11.8	7.4	32.2	29.9	40.0	10.1	
Vert	61.450	QP	41.4	7.8	7.6	32.2	24.6	40.0	15.4	
Vert	71.867	QP	41.9	6.6	7.8	32.2	24.1	40.0	15.9	
Vert	82.420	QP	40.5	6.9	7.9	32.2	23.1	40.0	16.9	
Vert	166.700	QP	47.8	15.6	8.9	32.2	40.1	43.5	3.4	
Vert	183.883	QP	33.5	16.3	9.0	32.2	26.6	43.5	16.9	
Vert	250.039	QP	31.2	17.4	9.6	32.1	26.1	46.0	19.9	
Vert	335.017	QP	32.7	15.6	10.2	32.1	26.4	46.0	19.6	
Vert	400.927	QP	28.6	17.7	10.7	32.1	24.9	46.0	21.1	
Vert	497.900	QP	30.1	18.3	11.3	32.0	27.7	46.0	18.3	
Vert	720.003	QP	33.1	20.9	12.6	31.9	34.7	46.0	11.3	
Vert	4880.000	PK	51.9	31.4	3.8	34.0	53.1	73.9	20.8	
Vert	7320.000	PK	47.2	36.0	4.6	34.2	53.6	73.9	20.3	
Vert	9760.000	PK	42.7	38.9	5.3	34.7	52.2	73.9	21.7	
Vert	24400.000	PK	44.5	38.8	-1.7	31.4	50.2	73.9	23.7	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

PK with Duty factor

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
		Hor	Ver					Hor	Ver		Hor	Ver
4880.000	PK	51.5	51.9	31.4	3.8	34.0	-13.3	39.4	39.8	53.9	14.5	14.1
7320.000	PK	48.8	47.2	36.0	4.6	34.2	-13.3	41.9	40.3	53.9	12.0	13.6
9760.000	PK	41.0	42.7	38.9	5.3	34.7	-13.3	37.2	38.9	53.9	16.7	15.0
24400.000	PK	44.5	44.5	38.8	-1.7	31.4	-13.3	36.9	36.9	53.9	17.0	17.0

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Duty factor (Refer to Duty factor data sheet)

Radiated Spurious Emission Antenna1

Test place Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber
Report No. 32CE0103-HO-01
Date 03/16/2012 03/22/2012 03/23/2012
Temperature/ Humidity 20 deg. C / 30% RH 22 deg. C / 36% RH 22 deg. C / 38% RH
Engineer Katsunori Okai Hiroshi Kukita Takumi Shimada
(1-10GHz) (10-26.5GHz) (30-1000Hz)
Mode Tx 2475MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	46.433	QP	28.6	12.4	7.4	32.2	16.2	40.0	23.8	
Hori	50.450	QP	29.3	10.9	7.5	32.2	15.5	40.0	24.5	
Hori	72.003	QP	36.9	6.6	7.8	32.2	19.1	40.0	20.9	
Hori	167.100	QP	33.0	15.7	8.9	32.2	25.4	43.5	18.1	
Hori	432.133	QP	27.6	17.9	10.9	32.0	24.4	46.0	21.6	
Hori	720.002	QP	29.6	20.9	12.6	31.9	31.2	46.0	14.8	
Hori	2483.500	PK	70.3	27.5	2.3	34.8	65.3	73.9	8.6	
Hori	2484.811	PK	70.6	27.5	2.3	34.8	65.6	73.9	8.1	
Hori	4950.000	PK	53.9	31.6	3.9	34.0	55.4	73.9	18.5	
Hori	7425.000	PK	48.9	36.2	4.6	34.3	55.4	73.9	18.5	
Hori	9900.000	PK	42.9	39.1	5.4	34.7	52.7	73.9	21.2	
Hori	24750.000	PK	45.7	39.0	-1.7	31.2	51.8	73.9	22.1	
Vert	47.080	QP	45.3	12.1	7.4	32.2	32.6	40.0	7.4	
Vert	62.500	QP	45.8	7.7	7.7	32.2	29.0	40.0	11.0	
Vert	69.950	QP	43.2	6.6	7.8	32.2	25.4	40.0	14.6	
Vert	83.420	QP	45.0	7.1	7.9	32.2	27.8	40.0	12.2	
Vert	96.017	QP	41.6	9.4	8.1	32.3	26.8	43.5	16.7	
Vert	166.470	QP	41.6	15.6	8.9	32.2	33.9	43.5	9.6	
Vert	192.000	QP	33.2	16.7	9.1	32.2	26.8	43.5	16.7	
Vert	432.000	QP	31.6	17.9	10.9	32.0	28.4	46.0	17.6	
Vert	719.983	QP	30.9	20.9	12.6	31.9	32.5	46.0	13.5	
Vert	2483.500	PK	67.2	27.5	2.3	34.8	62.2	73.9	11.7	
Vert	2484.823	PK	65.2	27.5	2.3	34.8	60.2	73.9	13.7	
Vert	4950.000	PK	51.6	31.6	3.9	34.0	53.1	73.9	20.8	
Vert	7425.000	PK	46.2	36.2	4.6	34.3	52.7	73.9	21.2	
Vert	9900.000	PK	42.5	39.1	5.4	34.7	52.3	73.9	21.6	
Vert	24750.000	PK	45.7	39.0	-1.7	31.2	51.8	73.9	22.1	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

PK with Duty factor

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
		Hor	Ver					Hor	Ver		Hor	Ver
2483.500	PK	70.3	67.2	27.5	2.3	34.8	-13.3	52.0	48.9	53.9	1.9	5.0
2484.811	PK	70.6	65.2	27.5	2.3	34.8	-13.3	52.3	46.9	53.9	1.6	7.0
4950.000	PK	53.9	51.6	31.6	3.9	34.0	-13.3	42.1	39.8	53.9	11.8	14.1
7425.000	PK	48.9	46.2	36.2	4.6	34.3	-13.3	42.1	39.4	53.9	11.8	14.5
9900.000	PK	42.9	42.5	39.1	5.4	34.7	-13.3	39.4	39.0	53.9	14.5	14.9
24750.000	PK	45.7	45.7	39.0	-1.7	31.2	-13.3	38.5	38.5	53.9	15.4	15.4

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Duty factor (Refer to Duty factor data sheet)

Radiated Spurious Emission Antenna2

Test place : Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber
Report No. : 32CE0103-HO-01
Date : 03/16/2012 03/22/2012 03/22/2012
Temperature/ Humidity : 20 deg. C / 30% RH 22 deg. C / 36% RH 22 deg. C / 36% RH
Engineer : Keisuke Kawamura Hiroshi Kukita Hiroshi Kukita
(1-10GHz) (10-26.5GHz) (30-1000MHz)
Mode : Tx 2405MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.342	QP	27.7	8.8	7.6	32.2	11.9	40.0	28.1	
Hori	61.437	QP	26.6	7.8	7.6	32.2	9.8	40.0	30.2	
Hori	81.917	QP	31.0	6.8	7.9	32.2	13.5	40.0	26.5	
Hori	458.174	QP	33.2	18.1	11.0	32.0	30.3	46.0	15.7	
Hori	500.000	QP	31.7	18.4	11.3	32.0	29.4	46.0	16.6	
Hori	623.987	QP	32.5	19.7	12.0	32.0	32.2	46.0	13.8	
Hori	2390.000	PK	56.3	27.4	2.2	34.8	51.1	73.9	22.9	- See 20dBc Data Sheet
Hori	2400.000	PK	73.0	27.5	2.2	34.8	67.9	-	-	
Hori	4810.000	PK	47.2	31.2	3.9	34.0	48.3	73.9	25.7	
Hori	7215.000	PK	44.7	35.9	4.5	34.2	50.9	73.9	23.1	
Hori	9620.000	PK	42.0	38.8	5.3	34.7	51.4	73.9	22.5	
Hori	24050.000	PK	44.4	38.6	-1.8	31.6	49.6	73.9	24.3	
Vert	57.341	QP	44.0	8.8	7.6	32.2	28.2	40.0	11.8	
Vert	61.437	QP	43.6	7.8	7.6	32.2	26.8	40.0	13.2	
Vert	81.918	QP	49.3	6.8	7.9	32.2	31.8	40.0	8.2	
Vert	458.176	QP	34.0	18.1	11.0	32.0	31.1	46.0	14.9	
Vert	500.162	QP	36.4	18.4	11.3	32.0	34.1	46.0	11.9	
Vert	623.989	QP	34.1	19.7	12.0	32.0	33.8	46.0	12.2	
Vert	2390.000	PK	60.0	27.4	2.2	34.8	54.8	73.9	19.1	- See 20dBc Data Sheet
Vert	2400.000	PK	75.5	27.5	2.2	34.8	70.4	-	-	
Vert	4810.000	PK	49.5	31.2	3.9	34.0	50.6	73.9	23.3	
Vert	7215.000	PK	45.8	35.9	4.5	34.2	52.0	73.9	21.9	
Vert	9620.000	PK	42.2	38.8	5.3	34.7	51.6	73.9	22.3	
Vert	24050.000	PK	44.5	38.6	-1.8	31.6	49.7	73.9	24.2	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2405.000	PK	109.3	27.5	2.2	34.8	104.2	-	-	Carrier
Hori	2400.000	PK	69.0	27.5	2.2	34.8	63.9	84.2	20.3	
Vert	2405.000	PK	110.9	27.5	2.2	34.8	105.8	-	-	Carrier
Vert	2400.000	PK	71.6	27.5	2.2	34.8	66.5	85.8	19.3	

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

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
		Hor	Ver					Hor	Ver		Hor	Ver
2390.000	PK	56.3	60.0	27.4	2.2	34.8	-13.3	37.8	41.5	53.9	16.1	12.4
4810.000	PK	47.2	49.5	31.2	3.9	34.0	-13.3	35.0	37.3	53.9	18.9	16.6
7215.000	PK	44.7	45.8	35.9	4.5	34.2	-13.3	37.6	38.7	53.9	16.3	15.2
9620.000	PK	42.0	42.2	38.8	5.3	34.7	-13.3	38.1	38.3	53.9	15.8	15.6
24050.000	PK	44.4	44.5	38.6	-1.8	31.6	-13.3	36.3	36.4	53.9	17.6	17.5

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Duty factor (Refer to Duty factor data sheet)

Radiated Spurious Emission Antenna2

Test place : Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber
Report No. : 32CE0103-HO-01
Date : 03/16/2012 03/22/2012 03/22/2012
Temperature/ Humidity : 20 deg. C / 30% RH 22 deg. C / 36% RH 22 deg. C / 36% RH
Engineer : Keisuke Kawamura Hiroshi Kukita Hiroshi Kukita
 (1-10GHz) (10-26.5GHz) (30-1000MHz)
Mode : Tx 2440MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.342	QP	27.1	8.8	7.6	32.2	11.3	40.0	28.7	
Hori	61.438	QP	28.0	7.8	7.6	32.2	11.2	40.0	28.8	
Hori	81.918	QP	31.0	6.8	7.9	32.2	13.5	40.0	26.5	
Hori	458.175	QP	32.5	18.1	11.0	32.0	29.6	46.0	16.4	
Hori	500.001	QP	32.2	18.4	11.3	32.0	29.9	46.0	16.1	
Hori	623.988	QP	31.0	19.7	12.0	32.0	30.7	46.0	15.3	
Hori	4880.000	PK	47.6	31.4	3.8	34.0	48.8	73.9	25.1	
Hori	7320.000	PK	46.0	36.0	4.6	34.2	52.4	73.9	21.6	
Hori	9760.000	PK	41.4	38.9	5.3	34.7	50.9	73.9	23.0	
Hori	24400.000	PK	44.5	38.8	-1.7	31.4	50.2	73.9	23.7	
Vert	57.341	QP	42.4	8.8	7.6	32.2	26.6	40.0	13.4	
Vert	61.436	QP	42.2	7.8	7.6	32.2	25.4	40.0	14.6	
Vert	81.916	QP	48.0	6.8	7.9	32.2	30.5	40.0	9.5	
Vert	458.174	QP	34.0	18.1	11.0	32.0	31.1	46.0	14.9	
Vert	500.160	QP	35.5	18.4	11.3	32.0	33.2	46.0	12.8	
Vert	623.988	QP	34.0	19.7	12.0	32.0	33.7	46.0	12.3	
Vert	4880.000	PK	50.0	31.4	3.8	34.0	51.2	73.9	22.7	
Vert	7320.000	PK	46.1	36.0	4.6	34.2	52.5	73.9	21.4	
Vert	9760.000	PK	41.4	38.9	5.3	34.7	50.9	73.9	23.0	
Vert	24400.000	PK	44.4	38.8	-1.7	31.4	50.1	73.9	23.8	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

PK with Duty factor

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit dBuV/m	Margin [dB]	
		Hor	Ver					Hor	Ver		Hor	Ver
4880.000	PK	47.6	50.0	31.4	3.8	34.0	-13.3	35.5	37.9	53.9	18.4	16.0
7320.000	PK	46.0	46.1	36.0	4.6	34.2	-13.3	39.1	39.2	53.9	14.8	14.7
9760.000	PK	41.4	41.4	38.9	5.3	34.7	-13.3	37.6	37.6	53.9	16.3	16.3
24400.000	PK	44.5	44.4	38.8	-1.7	31.4	-13.3	36.9	36.8	53.9	17.0	17.1

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Duty factor (Refer to Duty factor data sheet)

Radiated Spurious Emission Antenna2

Test place : Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber
Report No. : 32CE0103-HO-01
Date : 03/16/2012 03/22/2012 03/22/2012
Temperature/ Humidity : 20 deg. C / 30% RH 22 deg. C / 36% RH 22 deg. C / 36% RH
Engineer : Keisuke Kawamura Hiroshi Kukita Hiroshi Kukita
(1-10GHz) (10-26.5GHz) (30-1000MHz)
Mode : Tx 2475MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.342	QP	27.0	8.8	7.6	32.2	11.2	40.0	28.8	
Hori	61.437	QP	27.2	7.8	7.6	32.2	10.4	40.0	29.6	
Hori	81.918	QP	29.8	6.8	7.9	32.2	12.3	40.0	27.7	
Hori	458.174	QP	33.3	18.1	11.0	32.0	30.4	46.0	15.6	
Hori	500.001	QP	31.8	18.4	11.3	32.0	29.5	46.0	16.5	
Hori	623.988	QP	32.0	19.7	12.0	32.0	31.7	46.0	14.3	
Hori	2483.500	PK	67.8	27.5	2.3	34.8	62.8	73.9	11.1	
Hori	4950.000	PK	50.7	31.6	3.9	34.0	52.2	73.9	21.7	
Hori	7425.000	PK	44.7	36.2	4.6	34.3	51.2	73.9	22.7	
Hori	9900.000	PK	42.5	39.1	5.4	34.7	52.3	73.9	21.6	
Hori	24750.000	PK	45.7	39.0	-1.7	31.2	51.8	73.9	22.1	
Vert	57.341	QP	43.3	8.8	7.6	32.2	27.5	40.0	12.5	
Vert	61.437	QP	42.1	7.8	7.6	32.2	25.3	40.0	14.7	
Vert	81.918	QP	48.4	6.8	7.9	32.2	30.9	40.0	9.1	
Vert	458.174	QP	32.6	18.1	11.0	32.0	29.7	46.0	16.3	
Vert	500.160	QP	35.5	18.4	11.3	32.0	33.2	46.0	12.8	
Vert	623.988	QP	34.0	19.7	12.0	32.0	33.7	46.0	12.3	
Vert	2483.500	PK	67.8	27.5	2.3	34.8	62.8	73.9	11.2	
Vert	4950.000	PK	50.2	31.6	3.9	34.0	51.7	73.9	22.2	
Vert	7425.000	PK	46.4	36.2	4.6	34.3	52.9	73.9	21.0	
Vert	9900.000	PK	42.8	39.1	5.4	34.7	52.6	73.9	21.3	
Vert	24750.000	PK	45.7	39.0	-1.7	31.2	51.8	73.9	22.1	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

PK with Duty factor

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit dBuV/m	Margin [dB]	
		Hor	Ver					Hor	Ver		Hor	Ver
2483.500	PK	67.8	67.8	27.5	2.3	34.8	-13.3	49.5	49.5	53.9	4.4	4.4
4950.000	PK	50.7	50.2	31.6	3.9	34.0	-13.3	38.9	38.4	53.9	15.0	15.5
7425.000	PK	44.7	46.4	36.2	4.6	34.3	-13.3	37.9	39.6	53.9	16.0	14.3
9900.000	PK	42.5	42.8	39.1	5.4	34.7	-13.3	39.0	39.3	53.9	14.9	14.6
24750.000	PK	45.7	45.7	39.0	-1.7	31.2	-13.3	38.5	38.5	53.9	15.4	15.4

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Duty factor (Refer to Duty factor data sheet)

Radiated Spurious Emission Antenna6

Test place	Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber		
Report No.	32CE0103-HO-01		
Date	03/16/2012	03/22/2012	03/22/2012
Temperature/ Humidity	20 deg. C / 30% RH	22 deg. C / 36% RH	22 deg. C / 36% RH
Engineer	Katsunori Okai	Hiroshi Kukita	Hiroshi Kukita
	(1-10GHz)	(10-26.5GHz)	(30-1000MHz)
Mode	Tx 2405MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.342	QP	26.6	8.8	7.6	32.2	10.8	40.0	29.2	
Hori	61.436	QP	26.9	7.8	7.6	32.2	10.1	40.0	29.9	
Hori	81.917	QP	31.0	6.8	7.9	32.2	13.5	40.0	26.5	
Hori	458.173	QP	31.4	18.1	11.0	32.0	28.5	46.0	17.5	
Hori	500.002	QP	31.3	18.4	11.3	32.0	29.0	46.0	17.0	
Hori	623.986	QP	31.0	19.7	12.0	32.0	30.7	46.0	15.3	
Hori	2390.000	PK	67.3	27.4	2.2	34.8	62.1	73.9	11.8	See 20dBc Data Sheet
Hori	2400.000	PK	77.0	27.5	2.2	34.8	71.9	-	-	
Hori	4810.000	PK	48.1	31.2	3.9	34.0	49.2	73.9	24.7	
Hori	7215.000	PK	46.1	35.9	4.5	34.2	52.3	73.9	21.6	
Hori	9620.000	PK	42.2	38.8	5.3	34.7	51.6	73.9	22.3	
Hori	24050.000	PK	44.4	38.6	-1.8	31.6	49.6	73.9	24.3	
Vert	57.341	QP	44.4	8.8	7.6	32.2	28.6	40.0	11.4	
Vert	61.432	QP	42.2	7.8	7.6	32.2	25.4	40.0	14.6	
Vert	81.918	QP	47.9	6.8	7.9	32.2	30.4	40.0	9.6	
Vert	458.174	QP	34.2	18.1	11.0	32.0	31.3	46.0	14.7	
Vert	500.161	QP	35.0	18.4	11.3	32.0	32.7	46.0	13.3	
Vert	623.989	QP	33.9	19.7	12.0	32.0	33.6	46.0	12.4	
Vert	2390.000	PK	59.0	27.4	2.2	34.8	53.8	73.9	20.1	See 20dBc Data Sheet
Vert	2400.000	PK	75.2	27.5	2.2	34.8	70.1	-	-	
Vert	4810.000	PK	49.4	31.2	3.9	34.0	50.5	73.9	23.4	
Vert	7215.000	PK	46.4	35.9	4.5	34.2	52.6	73.9	21.3	
Vert	9620.000	PK	41.9	38.8	5.3	34.7	51.3	73.9	22.6	
Vert	24050.000	PK	44.4	38.6	-1.8	31.6	49.6	73.9	24.3	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2405.000	PK	111.1	27.5	2.2	34.8	106.0	-	-	Carrier
Hori	2400.000	PK	71.5	27.5	2.2	34.8	66.4	86.0	19.6	
Vert	2405.000	PK	110.0	27.5	2.2	34.8	104.9	-	-	Carrier
Vert	2400.000	PK	70.8	27.5	2.2	34.8	65.7	84.9	19.2	

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

PK with Duty factor

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
		Hor	Ver					Hor	Ver		Hor	Ver
2390.000	PK	67.3	59.0	27.4	2.2	34.8	-13.3	48.8	40.5	53.9	5.1	13.4
4810.000	PK	48.1	49.4	31.2	3.9	34.0	-13.3	35.9	37.2	53.9	18.0	16.7
7215.000	PK	46.1	46.4	35.9	4.5	34.2	-13.3	39.0	39.3	53.9	14.9	14.6
9620.000	PK	42.2	41.9	38.8	5.3	34.7	-13.3	38.3	38.0	53.9	15.6	15.9
24050.000	PK	44.4	44.4	38.6	-1.8	31.6	-13.3	36.3	36.3	53.9	17.6	17.6

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Duty factor (Refer to Duty factor data sheet)

Radiated Spurious Emission

Antenna6

Test place : Head Office EMC Lab. No.2 and 3Semi Anechoic Chamber
Report No. : 32CE0103-HO-01
Date : 03/16/2012 03/22/2012 03/22/2012
Temperature/ Humidity : 20 deg. C / 30% RH 22 deg. C / 36% RH 22 deg. C / 36% RH
Engineer : Katsunori Okai Hiroshi Kukita Hiroshi Kukita
 (1-10GHz) (10-26.5GHz) (30-1000MHz)
Mode : Tx 2440MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.342	QP	27.2	8.8	7.6	32.2	11.4	40.0	28.6	
Hori	61.437	QP	27.1	7.8	7.6	32.2	10.3	40.0	29.7	
Hori	81.915	QP	29.7	6.8	7.9	32.2	12.2	40.0	27.8	
Hori	458.175	QP	31.3	18.1	11.0	32.0	28.4	46.0	17.6	
Hori	500.002	QP	33.0	18.4	11.3	32.0	30.7	46.0	15.3	
Hori	623.986	QP	32.6	19.7	12.0	32.0	32.3	46.0	13.7	
Hori	4880.000	PK	48.1	31.4	3.8	34.0	49.3	73.9	24.6	
Hori	7320.000	PK	45.4	36.0	4.6	34.2	51.8	73.9	22.1	
Hori	9760.000	PK	43.8	38.9	5.3	34.7	53.3	73.9	20.6	
Hori	24400.000	PK	44.4	38.8	-1.7	31.4	50.1	73.9	23.8	
Vert	57.341	QP	44.2	8.8	7.6	32.2	28.4	40.0	11.6	
Vert	61.437	QP	43.5	7.8	7.6	32.2	26.7	40.0	13.3	
Vert	81.917	QP	47.8	6.8	7.9	32.2	30.3	40.0	9.7	
Vert	458.174	QP	34.4	18.1	11.0	32.0	31.5	46.0	14.5	
Vert	500.162	QP	35.9	18.4	11.3	32.0	33.6	46.0	12.4	
Vert	623.990	QP	33.2	19.7	12.0	32.0	32.9	46.0	13.1	
Vert	4880.000	PK	51.1	31.4	3.8	34.0	52.3	73.9	21.6	
Vert	7320.000	PK	44.6	36.0	4.6	34.2	51.0	73.9	22.9	
Vert	9760.000	PK	41.6	38.9	5.3	34.7	51.1	73.9	22.8	
Vert	24400.000	PK	44.5	38.8	-1.7	31.4	50.2	73.9	23.7	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

PK with Duty factor

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
		Hor	Ver					Hor	Ver		Hor	Ver
4880.000	PK	48.1	51.1	31.4	3.8	34.0	-13.3	36.0	39.0	53.9	17.9	14.9
7320.000	PK	45.4	44.6	36.0	4.6	34.2	-13.3	38.5	37.7	53.9	15.4	16.2
9760.000	PK	43.8	41.6	38.9	5.3	34.7	-13.3	40.0	37.8	53.9	13.9	16.1
24400.000	PK	44.4	44.5	38.8	-1.7	31.4	-13.3	36.8	36.9	53.9	17.1	17.0

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Duty factor (Refer to Duty factor data sheet)

Radiated Spurious Emission

Antenna6

Test place : Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber
Report No. : 32CE0103-HO-01
Date : 03/16/2012 03/22/2012 03/22/2012
Temperature/ Humidity : 20 deg. C / 30% RH 22 deg. C / 36% RH 22 deg. C / 36% RH
Engineer : Katsunori Okai Hiroshi Kukita Hiroshi Kukita
 (1-10GHz) (10-26.5GHz) (30-1000MHz)
Mode : Tx 2475MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.341	QP	27.6	8.8	7.6	32.2	11.8	40.0	28.2	
Hori	61.438	QP	27.1	7.8	7.6	32.2	10.3	40.0	29.7	
Hori	81.918	QP	30.6	6.8	7.9	32.2	13.1	40.0	26.9	
Hori	458.174	QP	32.9	18.1	11.0	32.0	30.0	46.0	16.0	
Hori	500.000	QP	32.8	18.4	11.3	32.0	30.5	46.0	15.5	
Hori	623.988	QP	31.2	19.7	12.0	32.0	30.9	46.0	15.1	
Hori	2483.500	PK	66.5	27.5	2.3	34.8	61.5	73.9	12.4	
Hori	2485.008	PK	65.4	27.5	2.3	34.8	60.4	73.9	13.5	
Hori	4950.000	PK	48.0	30.6	3.9	31.9	50.6	73.9	23.3	
Hori	7425.000	PK	45.7	35.2	4.6	32.4	53.1	73.9	20.8	
Hori	9900.000	PK	42.5	38.5	5.6	32.9	53.7	73.9	20.2	
Hori	24750.000	PK	45.7	39.0	-1.7	31.2	51.8	73.9	22.1	
Vert	57.343	QP	43.6	8.8	7.6	32.2	27.8	40.0	12.2	
Vert	61.438	QP	43.1	7.8	7.6	32.2	26.3	40.0	13.7	
Vert	81.918	QP	49.0	6.8	7.9	32.2	31.5	40.0	8.5	
Vert	458.174	QP	33.8	18.1	11.0	32.0	30.9	46.0	15.1	
Vert	500.160	QP	36.0	18.4	11.3	32.0	33.7	46.0	12.3	
Vert	623.989	QP	34.5	19.7	12.0	32.0	34.2	46.0	11.8	
Vert	2483.500	PK	67.1	27.5	2.3	34.8	62.1	73.9	11.8	
Vert	2484.522	PK	65.3	27.5	2.3	34.8	60.3	73.9	13.6	
Vert	4950.000	PK	47.6	30.6	3.9	31.9	50.2	73.9	23.7	
Vert	7425.000	PK	44.3	35.2	4.6	32.4	51.7	73.9	22.2	
Vert	9900.000	PK	42.6	38.5	5.6	32.9	53.8	73.9	20.1	
Vert	24750.000	PK	45.8	39.0	-1.7	31.2	51.9	73.9	22.0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

PK with Duty factor

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
		Hor	Ver					Hor	Ver		Hor	Ver
2483.500	PK	66.5	67.1	27.5	2.3	34.8	-13.3	48.2	48.8	53.9	5.7	5.1
2485.008	PK	65.4	65.3	27.5	2.3	34.8	-13.3	47.1	47.0	53.9	6.8	6.9
4950.000	PK	48.0	47.6	30.6	3.9	31.9	-13.3	37.3	36.9	53.9	16.6	17.0
7425.000	PK	45.7	44.3	35.2	4.6	32.4	-13.3	39.8	38.4	53.9	14.1	15.5
9900.000	PK	42.5	42.6	38.5	5.6	32.9	-13.3	40.4	40.5	53.9	13.5	13.4
24750.000	PK	45.7	45.8	39.0	-1.7	31.2	-13.3	38.5	38.6	53.9	15.4	15.3

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Duty factor (Refer to Duty factor data sheet)

Duty Cycle

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	32CE0103-HO
Date	03/22/2012
Temperature/ Humidity	22 deg. C./ 36%
Engineer	Hiroshi Kukita
Mode	Tx

Times	ON time(One pulse) [ms]	ON time(in 100ms) [ms]
5	4.33	21.6650

*1)ON time(in 100ms) = Times * ON time(One pulse)

(Total)

ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
21.67	100.00	0.217	-13.3

*2)Duty = $20\log_{10}(\text{ON time/Cycle})$

*Blank(a) is intentional OFF time.

*Duty factor was calculated based on the assumption of the worst condition in 100m sec.

Below is the calculation for Duty cycle specification (Appendix 3).

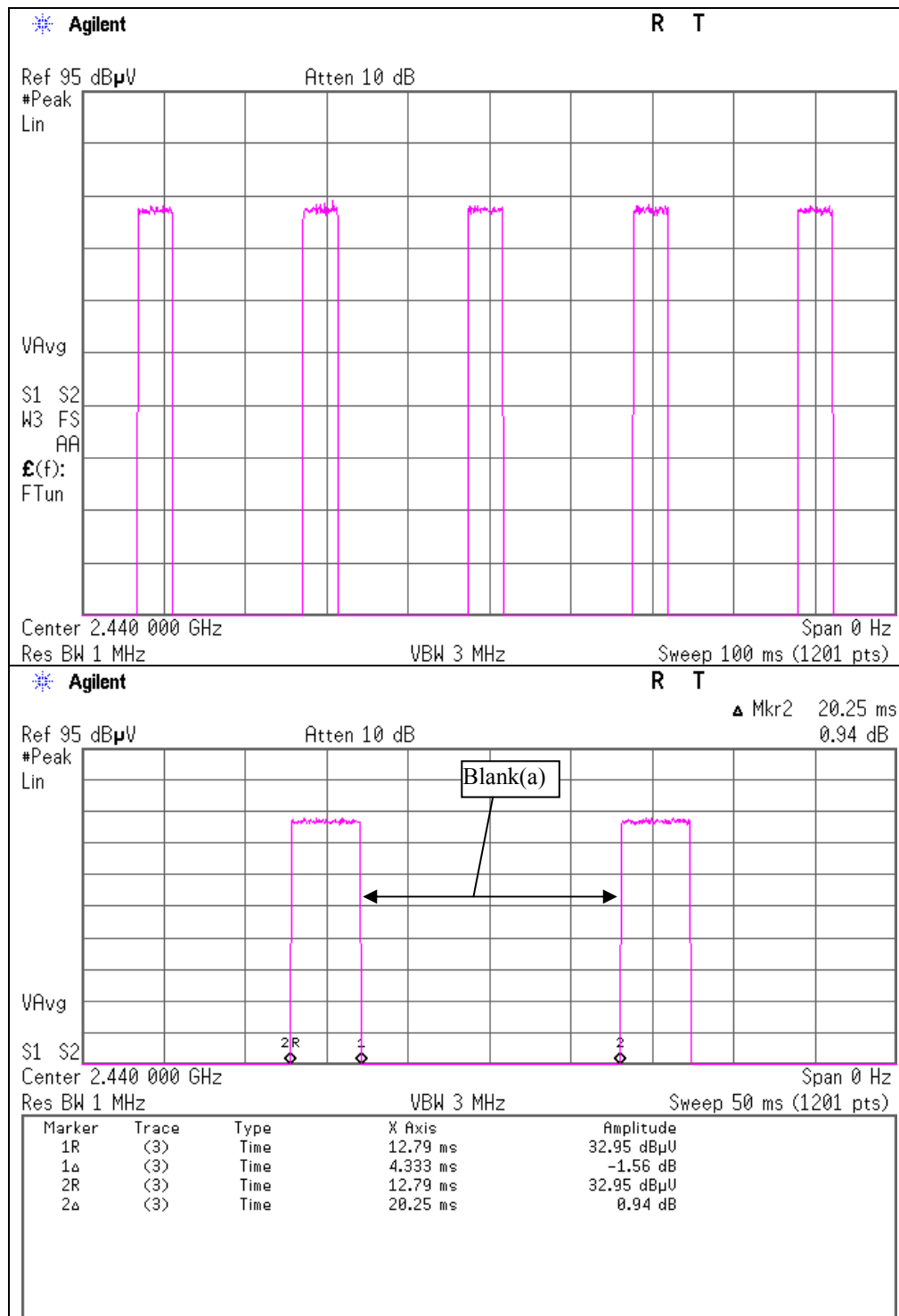
*The value of the theoretical worst duty condition for signal pattern in the specification is as follows.

ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
21.50	100.00	0.215	-13.4

Duty = $20\log_{10}(\text{ON time/Cycle})$

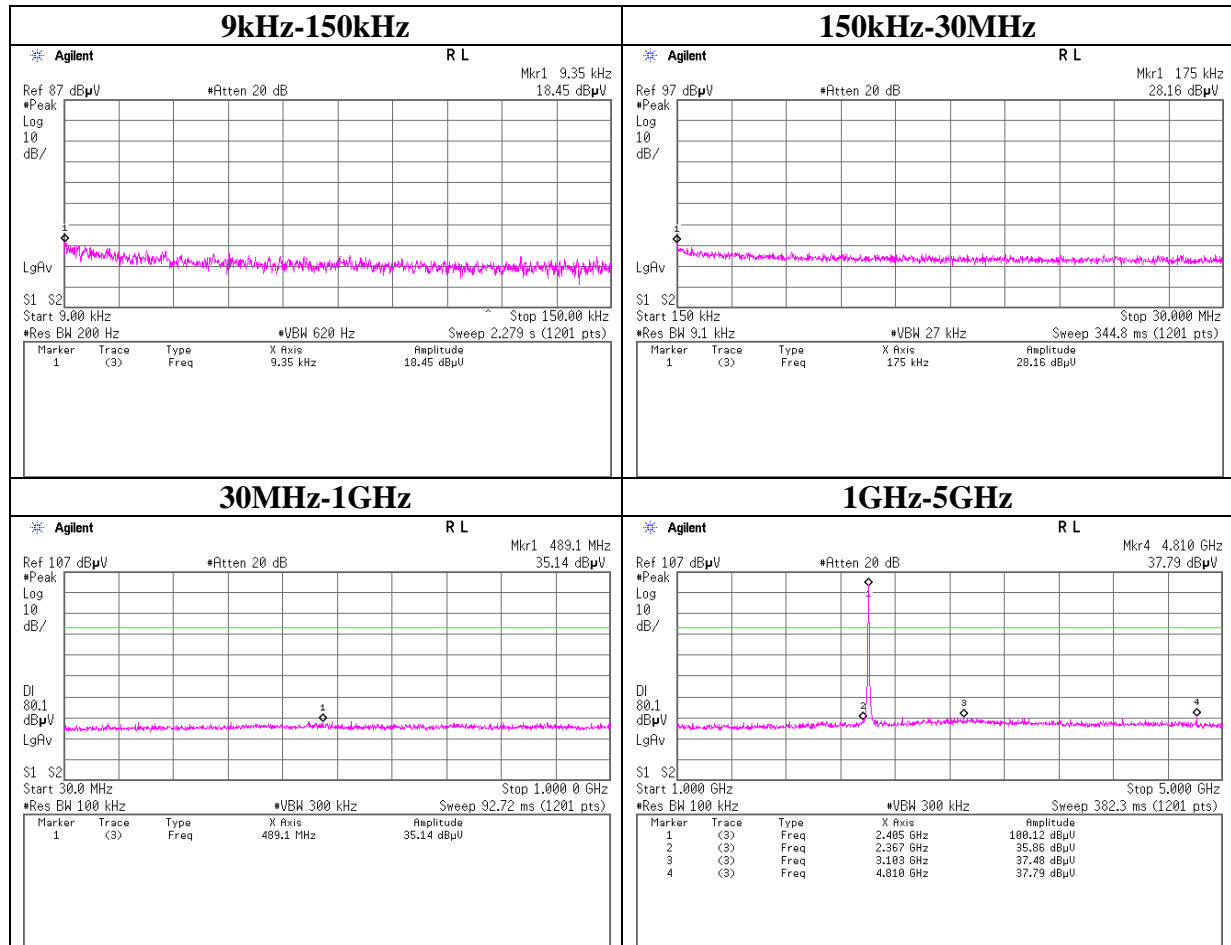
Duty “-13.3dB” which was the measurement value was applied since the average value was more strict for limit when it was calculated by duty factor of the measurement value.

Duty Cycle



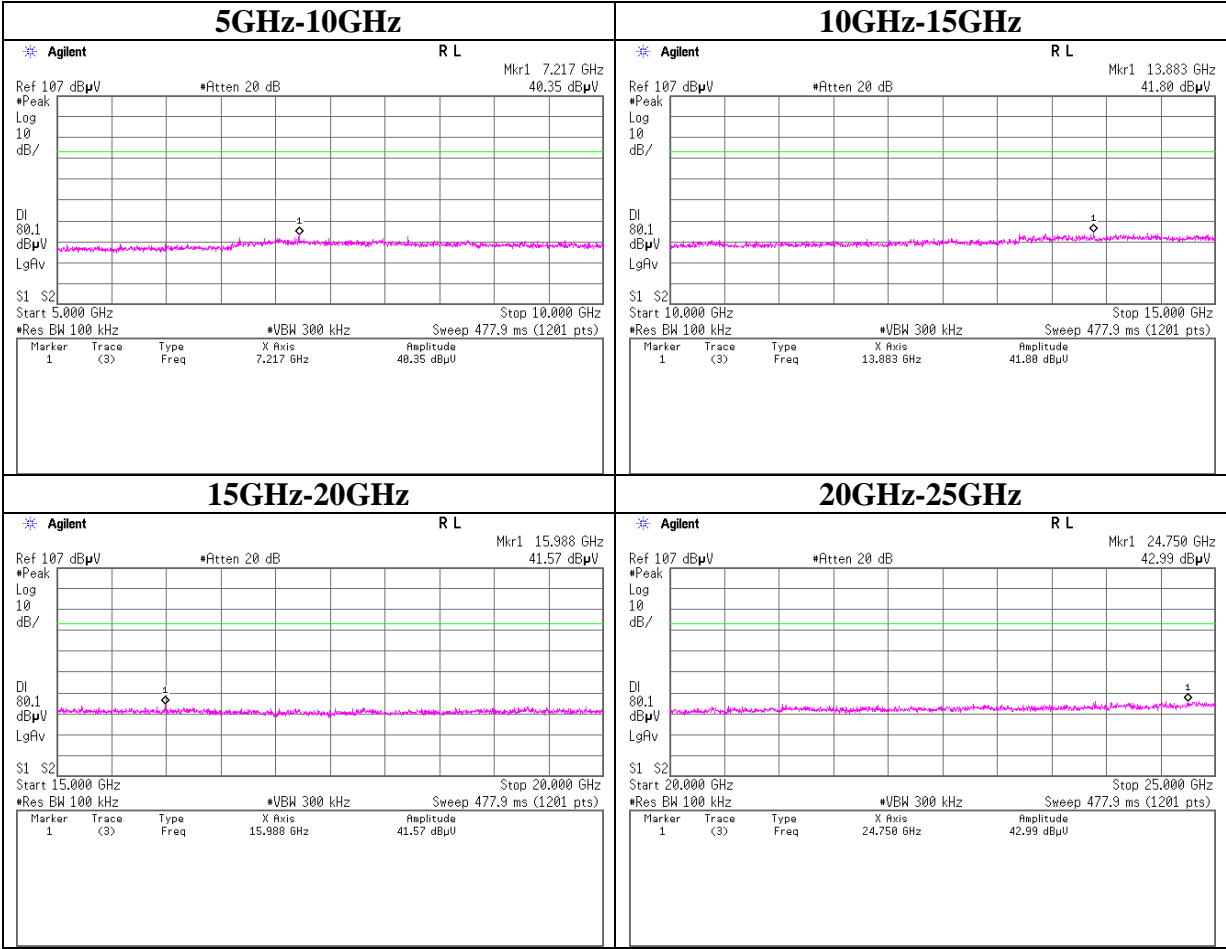
Conducted Spurious Emission

Tx 2405MHz



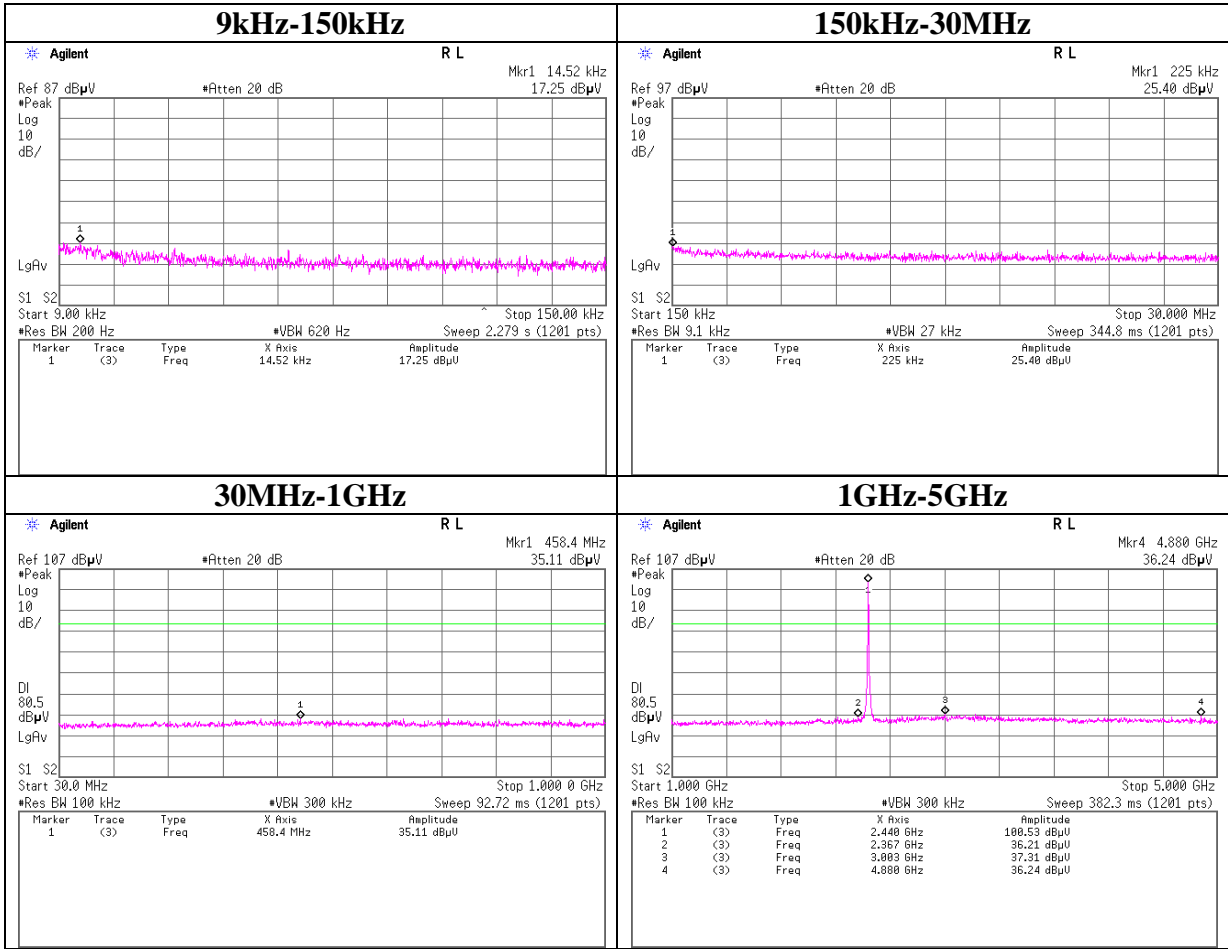
Conducted Spurious Emission

Tx 2405MHz



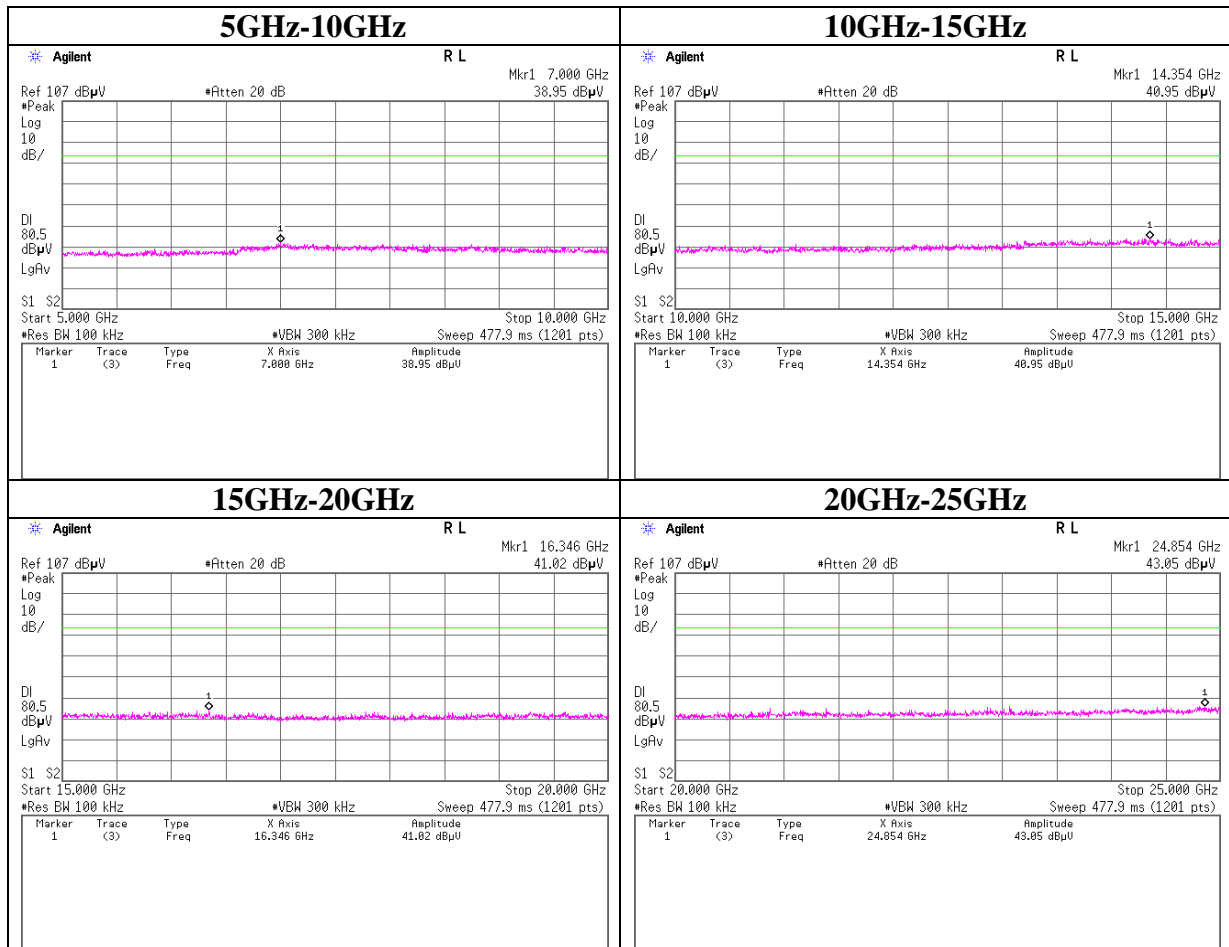
Conducted Spurious Emission

Tx 2440MHz



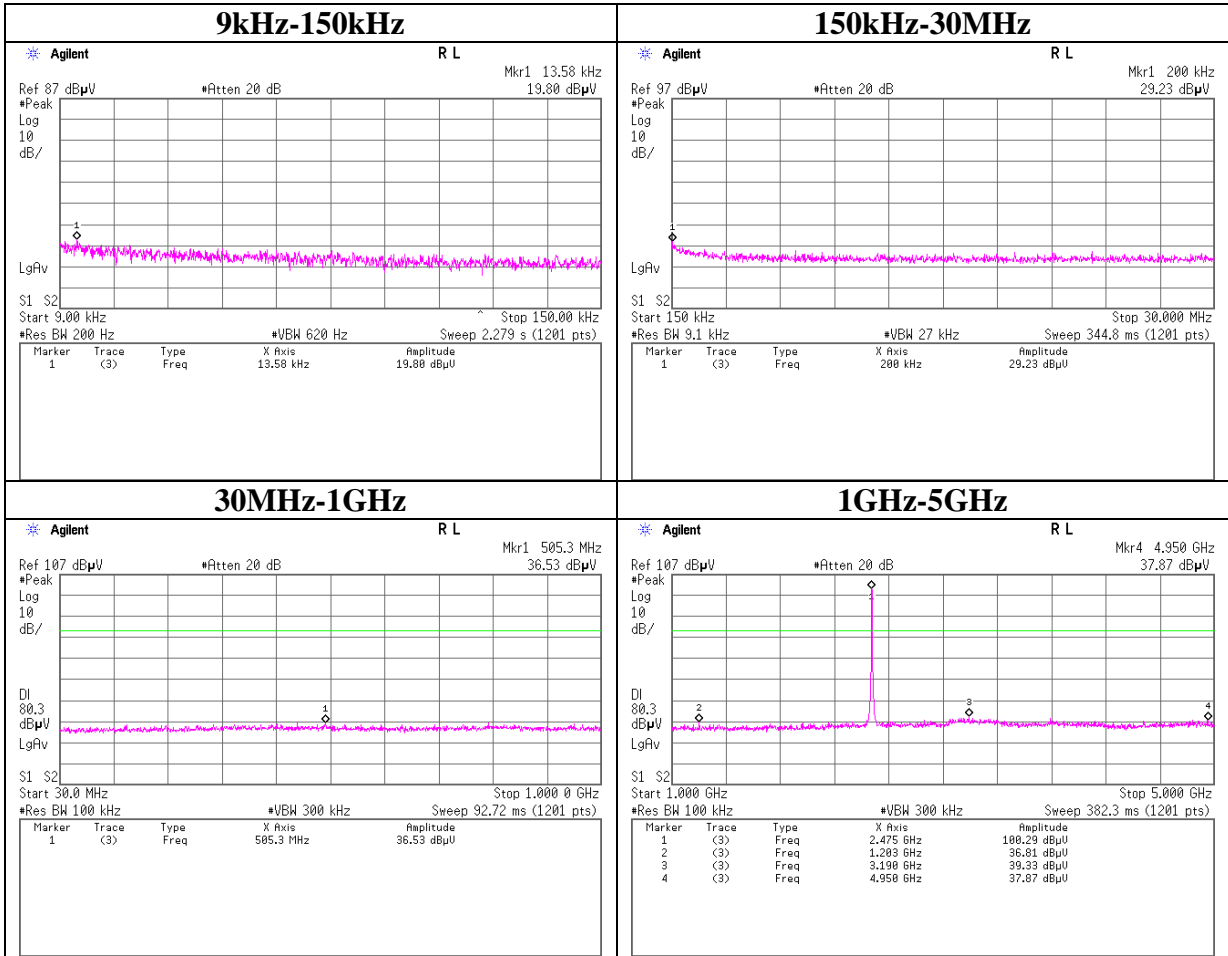
Conducted Spurious Emission

Tx 2440MHz



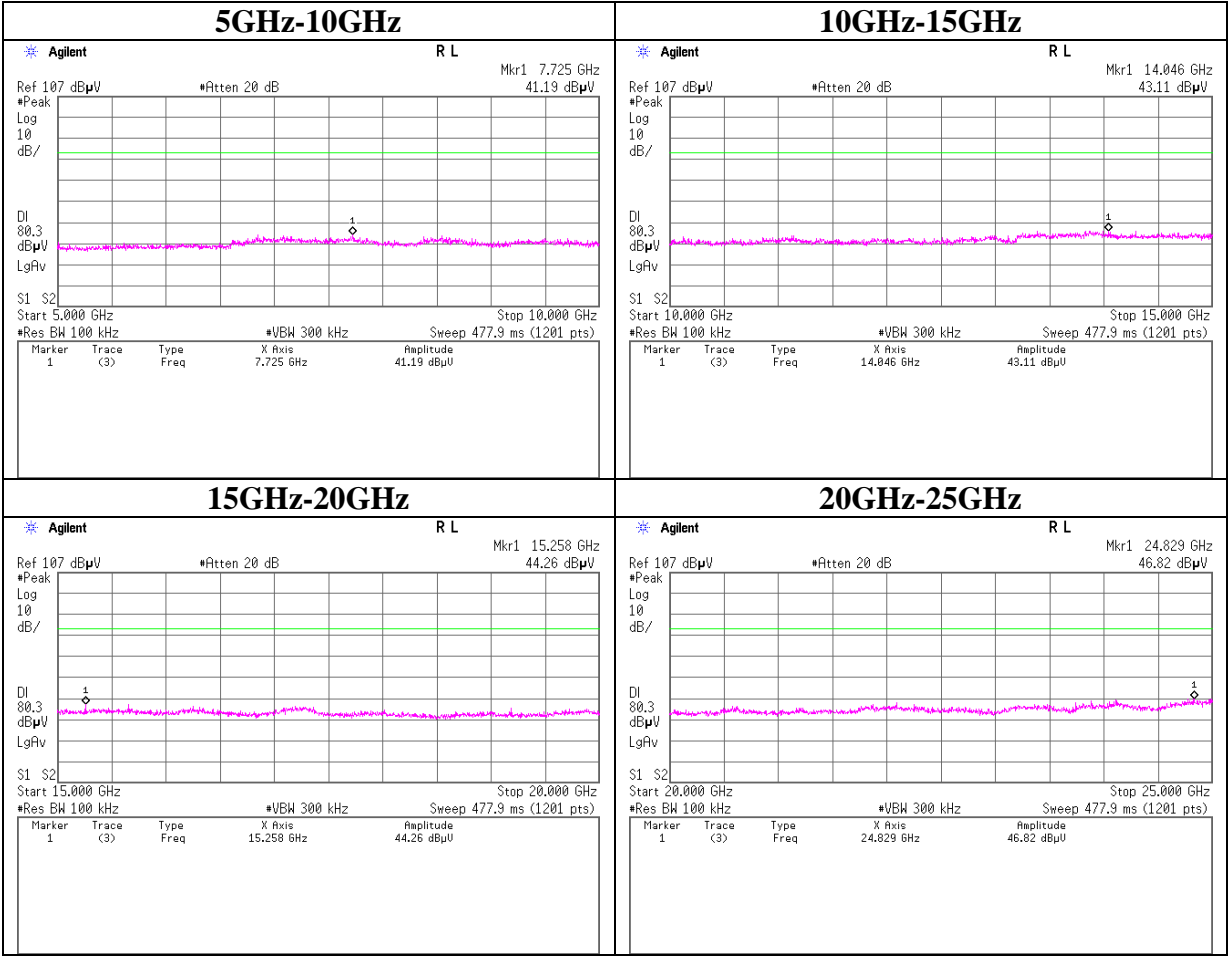
Conducted Spurious Emission

Tx 2475MHz

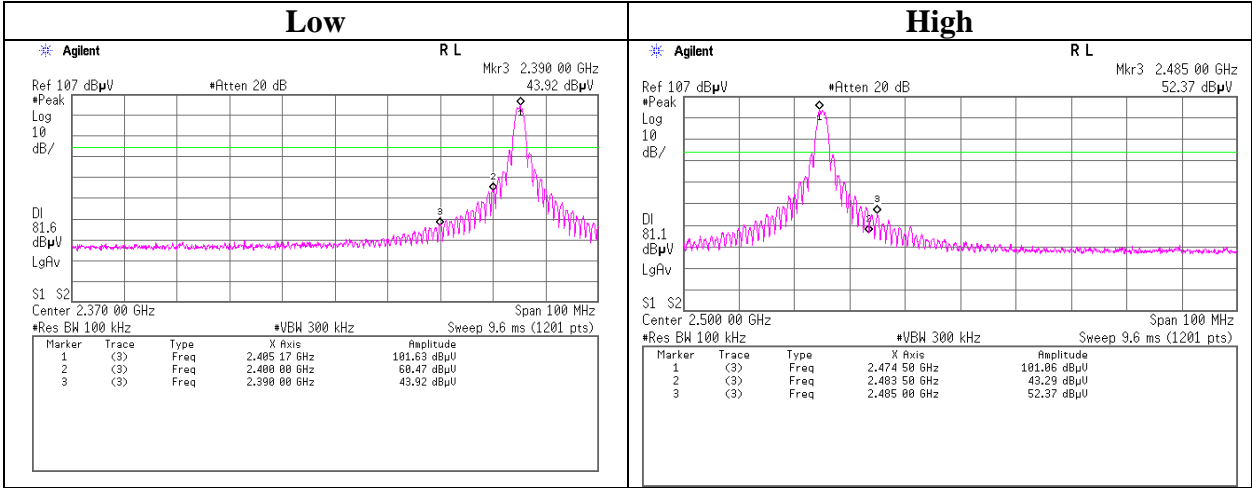


Conducted Spurious Emission

Tx 2475MHz



Conducted Emission Band Edge compliance



Power Density

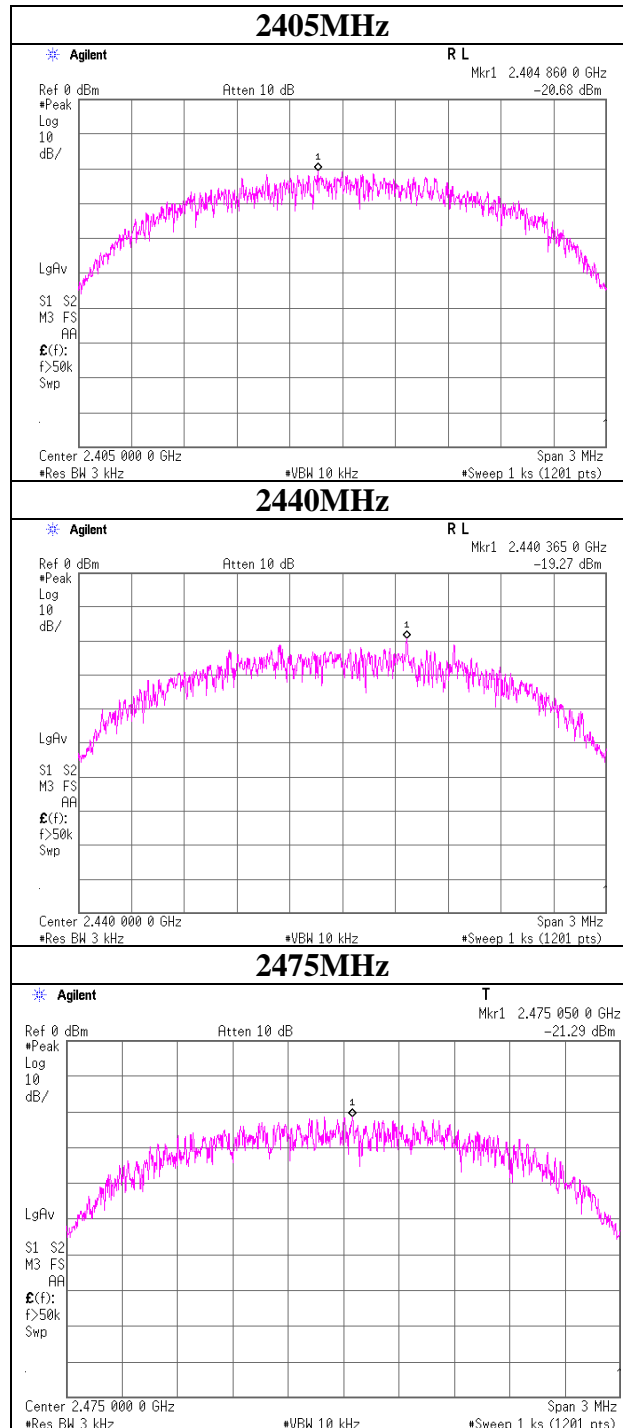
Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 32CE0103-HO-01
Date 03/13/2012 03/14/2012
Temperature/ Humidity 23 deg.C / 25% RH 22 deg.C / 32% RH
Engineer Takumi Shimada Katsunori Okai
Mode Tx

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2405.00	-20.68	2.10	10.01	-8.57	8.00	16.57
2440.00	-19.27	2.11	10.01	-7.15	8.00	15.15
2475.00	-21.29	2.13	10.01	-9.15	8.00	17.15

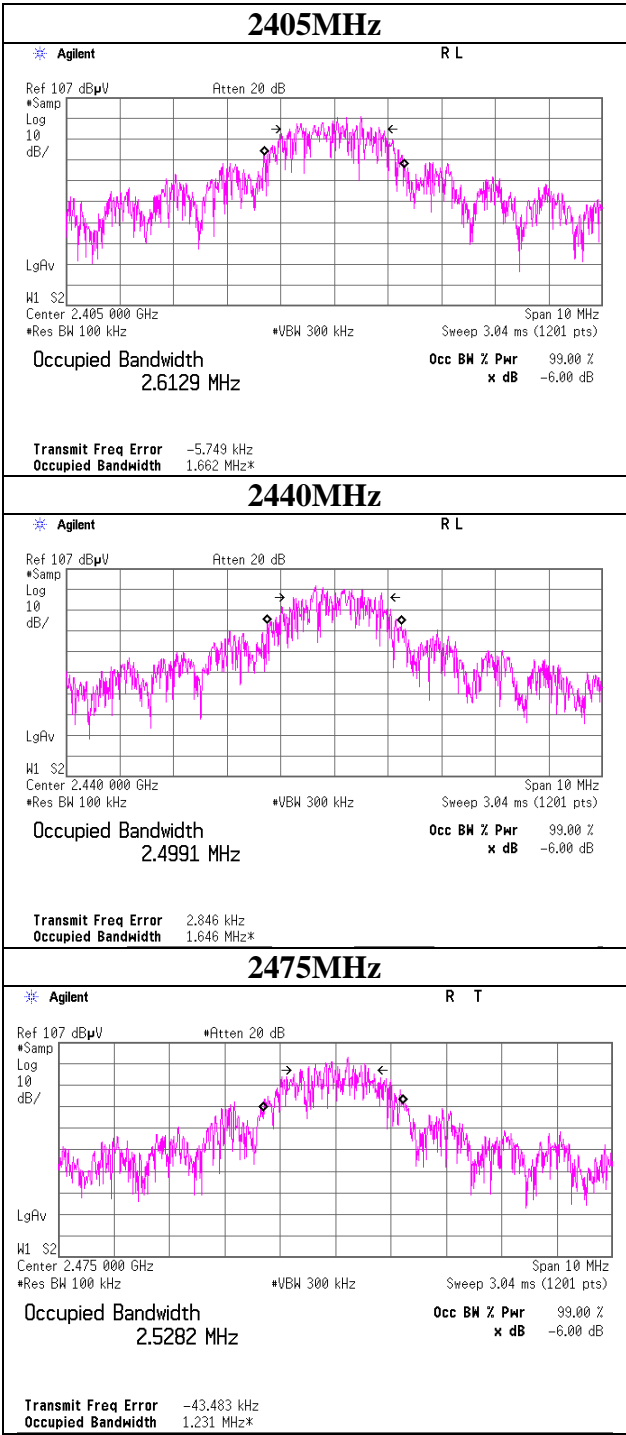
Sample Calculation:

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

Power Density



99%Occupied Bandwidth



APPENDIX 2: Test instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	AT	2011/06/30 * 12
MCC-35	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2011/09/30 * 12
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2011/10/28 * 12
MAT-25	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71642	AT	2011/06/23 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2011/09/13 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2011/09/13 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2011/12/09 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2011/06/21 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2012/02/06 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2011/04/08 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2011/04/15 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2011/10/23 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2011/10/23 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2012/02/16 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2011/11/02 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2011/09/26 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2012/01/25 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2011/05/16 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2011/09/06 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	AT/RE	2011/11/23 * 12
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	CE	2012/02/29 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	CE	2012/02/06 * 12
MJM-09	Measure	KDS	E19-55	-	CE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	CE / RE	2012/02/03 * 12
APRCV05	Test Receiver	Rohde & Schwarz	ESS	840456/008	CE	2012/01/16 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE(EUT)	2012/02/06 * 12
MLS-10	LISN	Kyoritsu	KNW-407	8-1851-1	CE(AE)	2011/12/12 * 12
MTA-30	Terminator	TME	CT-01	-	CE	2012/01/11 * 12
MAT-67	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(5m)/421-010(1m)/sucoform141-PE(1m)/RFM-E121(Switcher)	-/04178	CE	2011/07/04 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2012/02/24 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2012/02/06 * 12
MJM-06	Measure	PROMART	SEN1955	-	RE	

UL Japan, Inc.

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EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2011/08/11 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2011/10/15 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2011/10/15 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2011/07/15 * 12
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2011/11/02 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2012/03/16 * 12
MHA-20	Horn Antenna 1- 18GHz	Schwarzbeck	BBHA9120D	258	RE	2011/05/23 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2011/09/07 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2011/03/10 * 12
MHA-16	Horn Antenna 15- 40GHz	Schwarzbeck	BBHA9170	BBHA917030 6	RE	2011/05/23 * 12

The expiration date of the calibration is the end of the expired month.

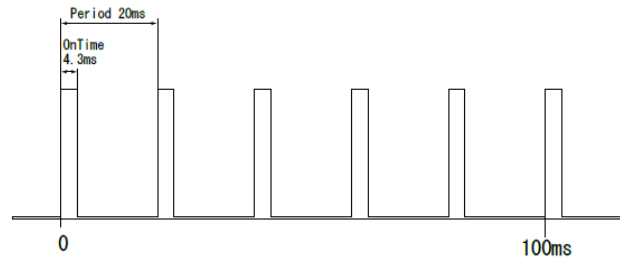
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

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

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

APPENDIX 3: Duty cycle specification

Duty cycle
(Burst mode)



DataRate:250kbits/sec
Max Length:127bytes
Maximum TX Time (PKT):0.004256sec
Burst period:20ms
Duty cycle:21.5%