



Test report No. : 32GE0273-HO-01-E-R1
Page : 1 of 35
Issued date : April 18, 2012
Revised date : May 7, 2012
FCC ID : A98-ROV0164

RADIO TEST REPORT

Test Report No. : 32GE0273-HO-01-E-R1

Applicant : NEC Corporation of America
Type of Equipment : Digital Portable Cellular Telephone
Model No. : KMP7R4E1-2A
FCC ID : A98-ROV0164
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.
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4. The test results in this report are traceable to the national or international standards.
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6. This report is a revised version of 32GE0273-HO-01-E. 32GE0273-HO-01-E is replaced with this report.

Date of test: March 27 to May 7, 2012

Representative test engineer:

Yutaka Yoshida
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service



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This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
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SECTION 1: Customer information

Company Name : NEC Corporation of America
Address : Radio Communications Systems Division
6535N. State Highway 161, Irving, TX 75039-2402 USA
Telephone Number : +1 214 262 4241
Facsimile Number : +1 214 262 4225
Contact Person : Sanjay Wadhwa

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

2.1 Identification of E.U.T.

Type of Equipment : Digital Portable Cellular Telephone
Model No. : KMP7R4E1-2A
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 3.8V
Receipt Date of Sample : March 27, 2012
Country of Mass-production : Japan
Condition of EUT : Production prototype
Modification of EUT : No Modification by the test lab

2.2 Product description

Model No: KMP7R4E1-2A, (referred to as the EUT in this report), is the Digital Portable Cellular Telephone.

Radio Specification [1/2]

Bluetooth (Ver.2.1 + EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Other Clock Frequency	48MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Connector Type	Integrated antenna

Low Energy (Ver.4.0)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Other Clock Frequency	48MHz
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Connector Type	Integrated antenna

WLAN (IEEE802.11b/g/n (SISO/HT20))

Equipment Type	Transceiver
Frequency of Operation	2412-2462MHz
Other Clock Frequency	48MHz
Type of Modulation	DSSS, OFDM
Antenna Connector Type	Integrated antenna

GSM

Equipment Type	Transceiver
Frequency of Operation	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz
Other Clock Frequency	19.2MHz
Type of Modulation	GMSK
Channel spacing	200kHz
Antenna Connector Type	Integrated antenna

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Radio Specification [2/2]

WCDMA

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band V: 824 – 849MHz [Down Link] Band V: 869 – 894MHz
Other Clock Frequency	19.2MHz
Type of Modulation	HPSK
Channel spacing	5MHz
Antenna Connector Type	Integrated antenna

GPS

Equipment Type	Receiver
Receiver Type	Direct Downconversion
Frequency of Operation	1575.42MHz
Other Clock Frequency	57.6MHz
Antenna Connector Type	Integrated antenna

RFID

Equipment Type	Transceiver
Frequency of Operation	13.56MHz
Type of Modulation	ASK
Antenna Connector Type	Integrated antenna

*This test report applies for Low Energy (Ver.4.0).

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 23.3dB, 0.61239MHz, N AV 25.1dB, 1.94335MHz, L	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	10.8dB 9920.000MHz, AV, Vert./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)

This EUT provides stable voltage (DC1.3, 1.8, 3.0V) constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

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.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

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 test report has enough margin, more than the site margin.

3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
 4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
 Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	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

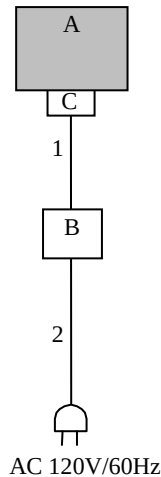
4.1 Operating Mode(s)

Bluetooth (BT) Low Energy(LE): Transmitting (Tx) Advertising Mode

Details of Operating Mode(s)

Test Item	Operating Mode	Tested Frequency
Conducted Emission	Tx BT LE (Advertising Mode)	2402MHz
Spurious Emission		2426MHz
6dB Bandwidth		2480MHz
Maximum Peak Output Power		
Power Density		
99% Occupied Bandwidth		

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 and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Digital Portable Cellular Telephone	KMP7R4E1-2A	004401200900021 *1) 004401200900054 *2)	NEC Corporation of America	EUT
B	AC Adaptor	MAS-BH0008-A002	-	MITSUMI	-
C	Micro USB	FOMA charging microUSB adapter N01	-	NEC Corporation of America	-

*1) Used for Antenna Terminal Conducted test

*2) Used for Conducted Emission and Radiated Emission tests

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	1.6	Shielded	Shielded	-
2	AC Cable	0.6	Unshielded	Unshielded	-

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, 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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Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

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, 1.0m by 1.5m, 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	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Biconical	Logperiodic	Horn

Frequency	Below 1GHz	Above 1GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	PK	AV
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 1.6kHz *1)
Test Distance	3m	3m (below 10GHz), 1m*2) (above 10GHz)	

*1) Used for the band edge of the carrier and the harmonics that can be measured. The VBW is based on the inverse of the duty cycle (see Appendix). 1.6kHz was used for LE.

*2) 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 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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Telephone : +81 596 24 8116

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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	3MHz	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	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak	-	Power Meter (Sensor: 50MHz BW)
Peak Power Density	1.5MHz	3kHz	10kHz	500sec	Peak	Max Hold	Spectrum Analyzer
Conducted Spurious Emission *2)	9kHz to 150kHz	200Hz	620kHz	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

DATA OF CONDUCTED EMISSION TEST

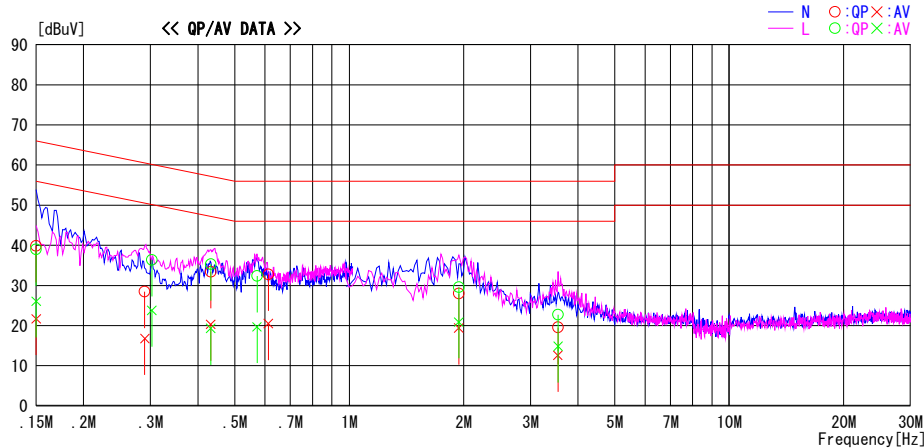
UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2012/05/04

Report No. : 32GE0273-HO-01

Temp./Humi. : 22deg. C / 35% RH
Engineer : Tomohisa Nakagawa

Mode / Remarks : BT Tx LE 2426MHz

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]		
0.15000	26.5	8.4	13.3	39.8	21.7	66.0	56.0	26.2	34.3	N	
0.28948	15.2	3.5	13.3	28.5	16.8	60.5	50.5	32.0	33.7	N	
0.43245	20.1	7.0	13.3	33.4	20.3	57.2	47.2	23.8	26.9	N	
0.61239	19.4	7.2	13.3	32.7	20.5	56.0	46.0	23.3	25.5	N	
1.94335	14.6	6.0	13.4	28.0	19.4	56.0	46.0	28.0	26.6	N	
3.54016	6.0	-1.0	13.6	19.6	12.6	56.0	46.0	36.4	33.4	N	
0.15000	25.7	12.8	13.3	39.0	26.1	66.0	56.0	27.0	29.9	L	
0.30222	23.1	10.5	13.3	36.4	23.8	60.2	50.2	23.8	26.4	L	
0.43245	22.0	6.0	13.3	35.3	19.3	57.2	47.2	21.9	27.9	L	
0.57193	19.1	6.4	13.3	32.4	19.7	56.0	46.0	23.6	26.3	L	
1.94335	16.2	7.5	13.4	29.6	20.9	56.0	46.0	26.4	25.1	L	
3.54286	9.1	1.3	13.6	22.7	14.9	56.0	46.0	33.3	31.1	L	

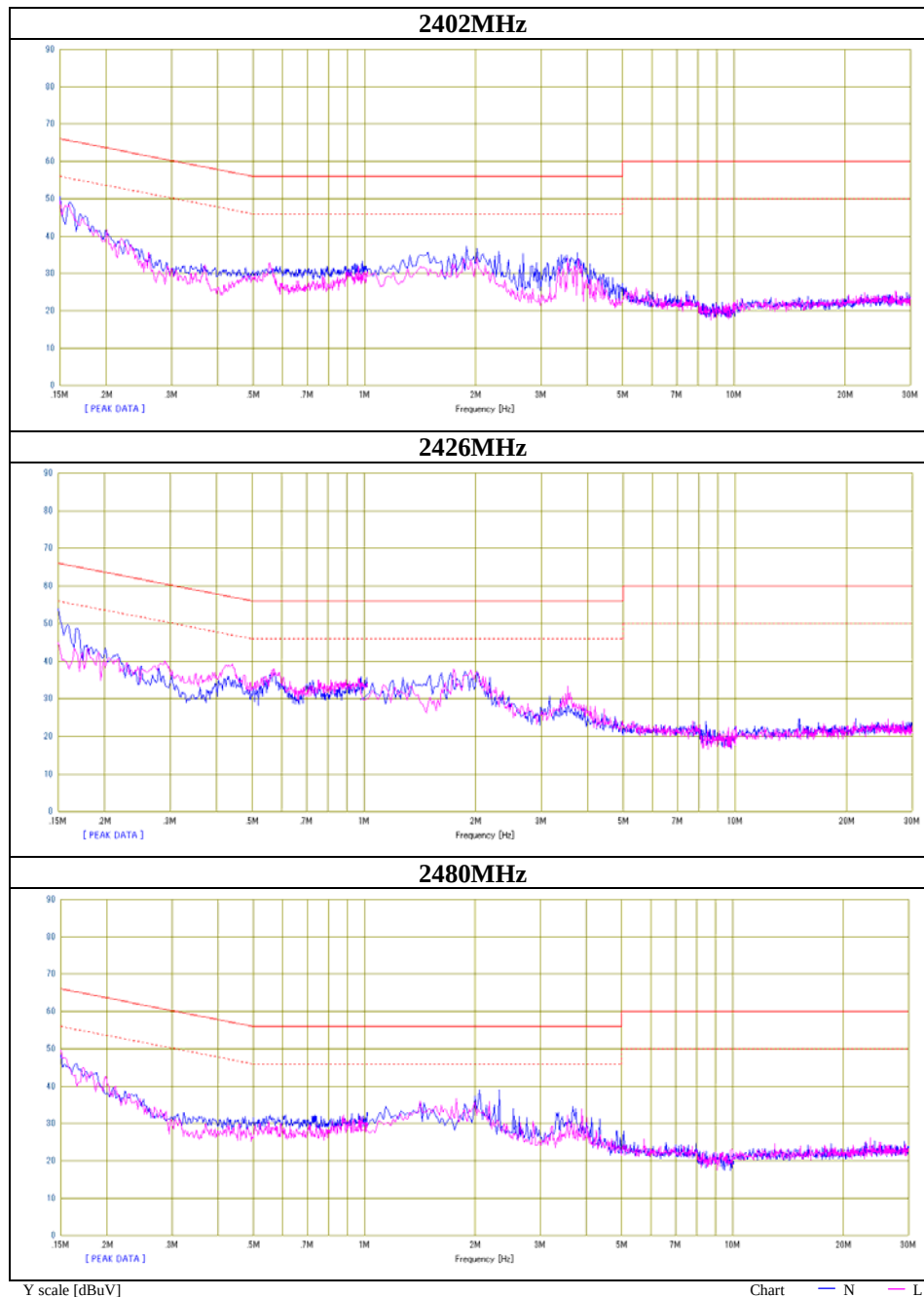
CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT=READING+C.F (LISN LOSS+ATT LOSS +CABLE LOSS)
Except for the above table : adequate margin data below the limits.

*The limit is rounded down to one decimal place.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted Emission

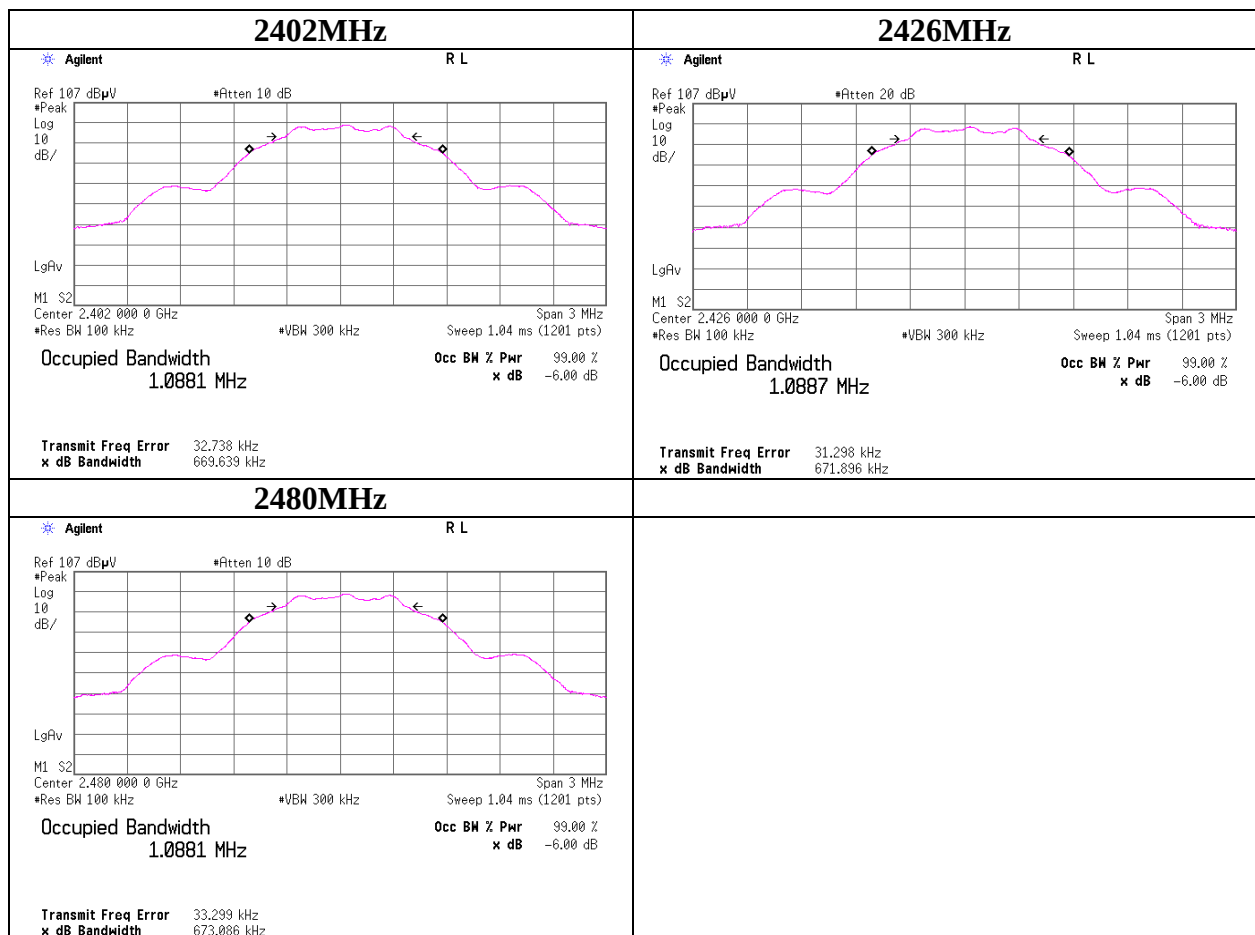
Test place	Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No.	32GE0273-HO-01
Date	04/02/2012
Temperature/ Humidity	21 deg. C / 32% RH
Engineer	Tomohisa Nakagawa
Mode	Tx Bluetooth Low Energy(Advertising Mode)



6dB Bandwidth

Test place	Head Office EMC Lab. No.6 Measurement Room	
Report No.	32GE0273-HO-01	
Date	03/28/2012	05/07/2012
Temperature/ Humidity	23deg. C / 51% RH	19deg. C / 65% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	Tx Bluetooth Low Energy(Advertising Mode)	

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2402	0.670	>500
2426	0.672	>500
2480	0.673	>500



Maximum Peak Output Power

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32GE0273-HO-01
Date 03/28/2012 05/07/2012
Temperature/ Humidity 23deg. C / 51% RH 19deg. C / 65% RH
Engineer Yutaka Yoshida Yutaka Yoshida
Mode Tx Bluetooth Low Energy(Advertising Mode)

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2402	-10.64	1.38	10.07	0.81	1.21	30.00	1000	29.19
2426	-10.93	1.23	10.07	0.37	1.09	30.00	1000	29.63
2480	-10.64	1.40	10.07	0.83	1.21	30.00	1000	29.17

Sample Calculation:

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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	32GE0273-HO-01		
Date	03/27/2012	03/28/2012	03/28/2012
Temperature/ Humidity	23 deg. C / 38% RH	22deg. C / 40% RH	22deg. C / 32% RH
Engineer	Tomohisa Nakagawa	Katsunori Okai	Tomohisa Nakagawa
	(1-10GHz)	(10-26.5GHz)	Below 1GHz
Mode	Tx, 2402MHz (Advertising Mode)		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	49.151	QP	27.9	11.4	7.0	28.6	17.7	40.0	22.3	
Hori	56.030	QP	22.8	9.4	7.1	28.6	10.7	40.0	29.3	
Hori	204.799	QP	27.2	16.4	8.2	28.0	23.8	43.5	19.7	
Hori	364.801	QP	25.2	16.4	9.2	28.1	22.7	46.0	23.3	
Hori	422.401	QP	27.7	17.6	9.5	28.4	26.4	46.0	19.6	
Hori	502.399	QP	25.3	18.3	9.8	28.8	24.6	46.0	21.4	
Hori	2390.000	PK	45.2	27.4	2.2	34.8	40.0	73.9	33.9	
Hori	2400.000	PK	59.2	27.5	2.2	34.8	54.1	73.9	19.8	
Hori	7206.000	PK	42.0	35.9	5.3	34.2	49.0	73.9	24.9	
Hori	9608.000	PK	42.4	38.8	6.1	34.7	52.6	73.9	21.3	
Hori	24020.000	PK	45.3	40.5	-1.8	31.7	52.3	73.9	21.6	
Hori	2390.000	AV	33.3	27.4	2.2	34.8	28.1	53.9	25.8	
Hori	2400.000	AV	42.7	27.5	2.2	34.8	37.6	53.9	16.3	
Hori	4804.000	AV	31.4	31.2	4.4	34.0	33.0	53.9	20.9	
Hori	7206.000	AV	31.4	35.9	5.3	34.2	38.4	53.9	15.5	
Hori	9608.000	AV	32.2	38.8	6.1	34.7	42.4	53.9	11.6	
Hori	24020.000	AV	33.6	40.5	-1.8	31.7	40.6	53.9	13.3	
Vert	49.151	QP	30.9	11.4	7.0	28.6	20.7	40.0	19.3	
Vert	56.030	QP	29.0	9.4	7.1	28.6	16.7	40.0	23.3	
Vert	204.799	QP	27.1	16.4	8.2	28.0	23.7	43.5	19.8	
Vert	364.801	QP	29.3	16.4	9.2	28.1	26.8	46.0	19.2	
Vert	422.401	QP	30.5	17.6	9.5	28.4	29.2	46.0	16.8	
Vert	502.399	QP	27.1	18.3	9.8	28.8	26.4	46.0	19.6	
Vert	2390.000	PK	44.8	27.4	2.2	34.8	39.6	73.9	34.3	
Vert	2400.000	PK	57.2	27.5	2.2	34.8	52.1	73.9	21.8	
Vert	4804.000	PK	41.3	31.2	4.4	34.0	42.9	73.9	31.0	
Vert	9608.000	PK	42.1	38.8	6.1	34.7	52.3	73.9	21.6	
Vert	24020.000	PK	45.1	40.5	-1.8	31.7	52.1	73.9	21.8	
Vert	2390.000	AV	33.4	27.4	2.2	34.8	28.2	53.9	25.7	
Vert	2400.000	AV	40.6	27.5	2.2	34.8	35.5	53.9	18.4	
Vert	4804.000	AV	31.5	31.2	4.4	34.0	33.1	53.9	20.8	
Vert	7206.000	AV	31.5	35.9	5.3	34.2	38.5	53.9	15.4	
Vert	9608.000	AV	32.1	38.8	6.1	34.7	42.3	53.9	11.6	
Vert	24020.000	AV	33.6	40.5	-1.8	31.7	40.6	53.9	13.3	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 32GE0273-HO-01
Date 05/04/2012 05/4/2012
Temperature/ Humidity 23 deg. C / 54% RH 22deg. C / 54% RH
Engineer Tomohisa Nakagawa Tomohisa Nakagawa
Above 1GHz Below 1GHz
Mode Tx, 2426MHz (Advertising Mode)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	51.643	QP	22.7	10.6	7.4	32.1	8.6	40.0	31.4	
Hori	57.054	QP	22.1	8.9	7.5	32.1	6.4	40.0	33.6	
Hori	77.615	QP	22.3	6.5	7.8	32.1	4.5	40.0	35.5	
Hori	401.002	QP	21.7	17.6	10.3	32.0	17.6	46.0	28.4	
Hori	514.629	QP	21.8	19.2	11.0	31.9	20.1	46.0	25.9	
Hori	601.604	QP	21.9	20.6	11.4	32.1	21.8	46.0	24.2	
Hori	4852.000	PK	40.8	31.3	3.8	31.5	44.4	73.9	29.5	
Hori	7278.000	PK	43.1	35.7	4.5	32.5	50.8	73.9	23.1	
Hori	9704.000	PK	42.2	38.4	5.3	32.9	53.0	73.9	20.9	
Hori	24260.000	PK	45.1	38.7	-1.8	32.1	49.9	73.9	24.0	
Hori	4852.000	AV	30.0	31.3	3.8	31.5	33.6	53.9	20.3	
Hori	7278.000	AV	31.9	35.7	4.5	32.5	39.6	53.9	14.3	
Hori	9704.000	AV	31.4	38.4	5.3	32.9	42.2	53.9	11.7	
Hori	24260.000	AV	34.8	38.7	-1.8	32.1	39.6	53.9	14.3	
Vert	51.102	QP	22.4	10.7	7.4	32.1	8.3	40.0	31.7	
Vert	55.431	QP	22.5	9.4	7.5	32.1	7.1	40.0	32.9	
Vert	77.615	QP	22.4	6.5	7.8	32.1	4.9	40.0	35.1	
Vert	406.613	QP	21.8	17.7	10.3	32.0	17.8	46.0	28.2	
Vert	516.032	QP	21.8	19.2	11.0	31.9	20.1	46.0	25.9	
Vert	600.201	QP	22.0	20.6	11.4	32.1	21.9	46.0	24.1	
Vert	4852.000	PK	40.7	31.3	3.8	31.5	44.3	73.9	29.6	
Vert	7278.000	PK	43.2	35.7	4.5	32.5	50.9	73.9	23.0	
Vert	9704.000	PK	42.3	38.4	5.3	32.9	53.1	73.9	20.8	
Vert	24260.000	PK	45.1	38.7	-1.8	32.1	49.9	73.9	24.0	
Vert	4852.000	AV	30.0	31.3	3.8	31.5	33.6	53.9	20.3	
Vert	7278.000	AV	31.7	35.7	4.5	32.5	39.4	53.9	14.5	
Vert	9704.000	AV	31.3	38.4	5.3	32.9	42.1	53.9	11.8	
Vert	24260.000	AV	34.9	38.7	-1.8	32.1	39.7	53.9	14.2	

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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	32GE0273-HO-01		
Date	03/27/2012	03/28/2012	03/28/2012
Temperature/ Humidity	23 deg. C / 38% RH	22deg. C / 40% RH	22deg. C / 32% RH
Engineer	Tomohisa Nakagawa	Katsunori Okai	Tomohisa Nakagawa
	(1-10GHz)	(10-26.5GHz)	Below 1GHz
Mode	Tx, 2480MHz (Advertising Mode)		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	49.153	QP	24.9	11.4	7.0	28.6	14.7	40.0	25.3	
Hori	55.730	QP	23.0	9.5	7.1	28.6	11.0	40.0	29.0	
Hori	211.198	QP	26.6	16.5	8.3	27.9	23.5	43.5	20.0	
Hori	361.601	QP	26.3	16.3	9.2	28.0	23.8	46.0	22.2	
Hori	425.603	QP	27.5	17.6	9.5	28.4	26.2	46.0	19.8	
Hori	505.332	QP	25.2	18.4	9.8	28.8	24.6	46.0	21.4	
Hori	2483.500	PK	48.4	27.5	2.2	34.8	43.3	73.9	30.6	
Hori	2483.750	PK	47.9	27.5	2.2	34.8	42.8	73.9	31.1	
Hori	4960.000	PK	41.6	31.6	4.5	34.0	43.7	73.9	30.2	
Hori	7440.000	PK	43.2	36.2	5.6	34.3	50.7	73.9	23.2	
Hori	9920.000	PK	42.5	39.1	6.3	34.7	53.2	73.9	20.7	
Hori	24800.000	PK	45.6	40.6	-1.6	32.7	51.9	73.9	22.0	
Hori	2483.500	AV	34.6	27.5	2.2	34.8	29.5	53.9	24.4	
Hori	2483.750	AV	34.4	27.5	2.2	34.8	29.3	53.9	24.6	
Hori	4960.000	AV	32.3	31.6	4.5	34.0	34.4	53.9	19.5	
Hori	7440.000	AV	32.2	36.2	5.6	34.3	39.7	53.9	14.2	
Hori	9920.000	AV	32.4	39.1	6.3	34.7	43.1	53.9	10.8	
Hori	24800.000	AV	34.5	40.6	-1.6	32.7	40.8	53.9	13.1	
Vert	49.153	QP	30.9	11.4	7.0	28.6	20.7	40.0	19.3	
Vert	55.730	QP	29.0	9.5	7.1	28.6	16.8	40.0	23.2	
Vert	211.198	QP	26.5	16.5	8.3	27.9	23.4	43.5	20.1	
Vert	361.601	QP	29.0	16.3	9.2	28.0	26.5	46.0	19.5	
Vert	425.603	QP	30.5	17.6	9.5	28.4	29.2	46.0	16.8	
Vert	505.332	QP	27.4	18.4	9.8	28.8	26.8	46.0	19.2	
Vert	2483.500	PK	46.8	27.5	2.2	34.8	41.7	73.9	32.2	
Vert	2483.750	PK	45.3	27.5	2.2	34.8	40.2	73.9	33.7	
Vert	4960.000	PK	41.8	31.6	4.5	34.0	43.9	73.9	30.0	
Vert	7440.000	PK	43.2	36.2	5.6	34.3	50.7	73.9	23.2	
Vert	9920.000	PK	42.5	39.1	6.3	34.7	53.2	73.9	20.7	
Vert	24800.000	PK	45.7	40.6	-1.6	32.7	52.0	73.9	21.9	
Vert	2483.500	AV	34.0	27.5	2.2	34.8	28.9	53.9	25.0	
Vert	2483.750	AV	33.8	27.5	2.2	34.8	28.7	53.9	25.2	
Vert	4960.000	AV	32.3	31.6	4.5	34.0	34.4	53.9	19.5	
Vert	7440.000	AV	32.1	36.2	5.6	34.3	39.6	53.9	14.3	
Vert	9920.000	AV	32.4	39.1	6.3	34.7	43.1	53.9	10.8	
Vert	24800.000	AV	34.5	40.6	-1.6	32.7	40.8	53.9	13.1	

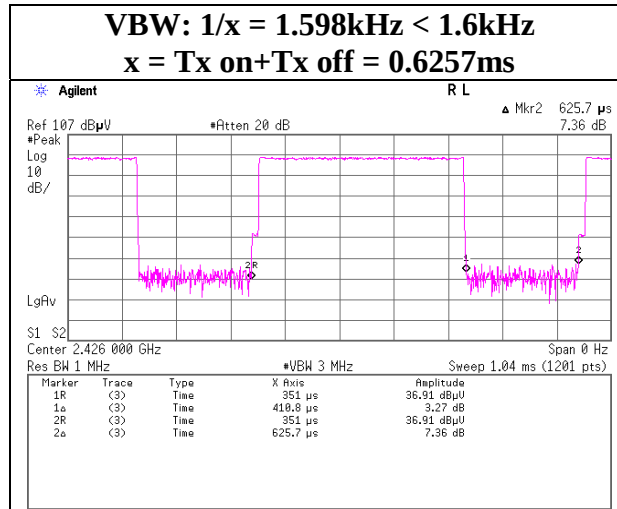
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*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.

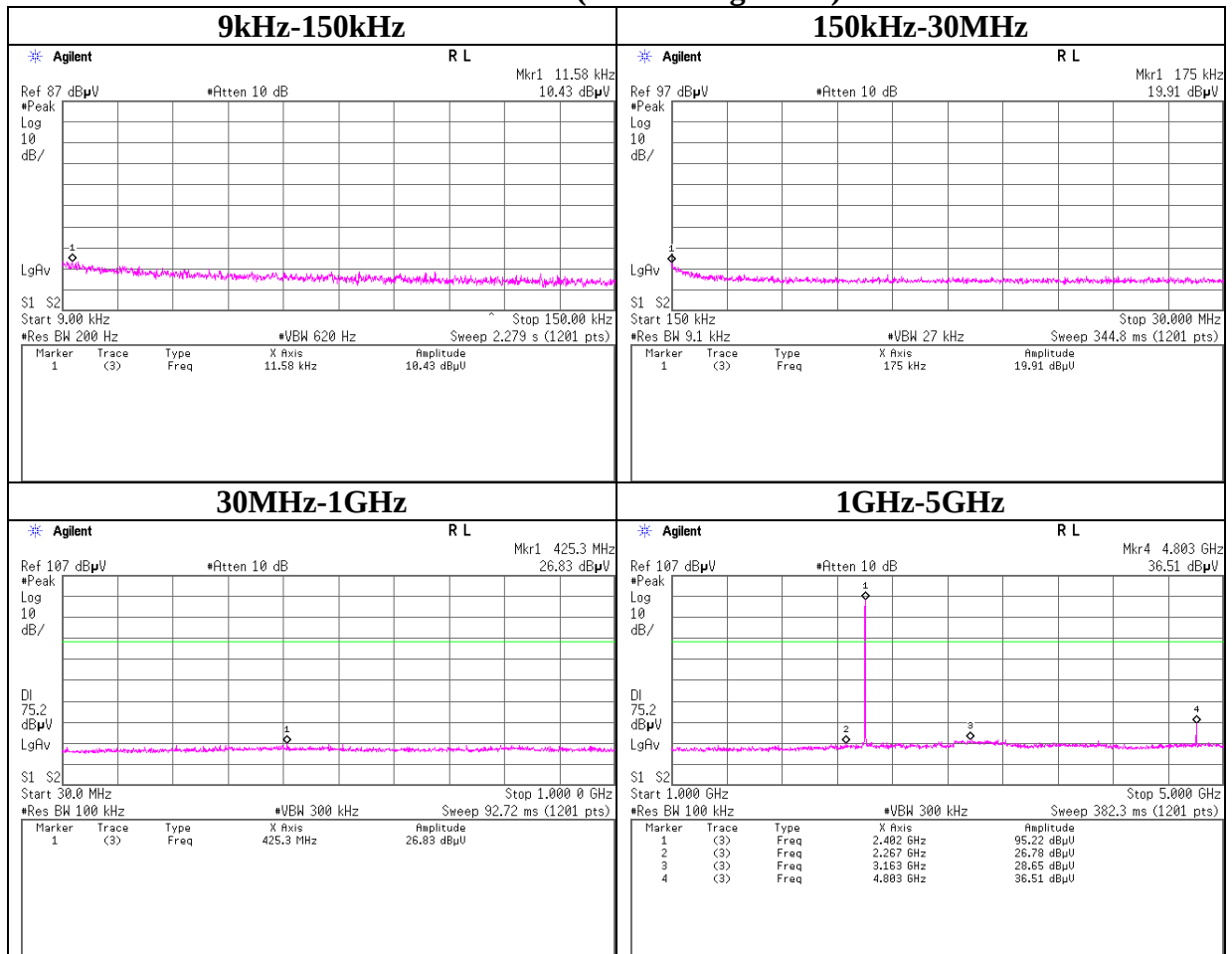
Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

VBW Calculation



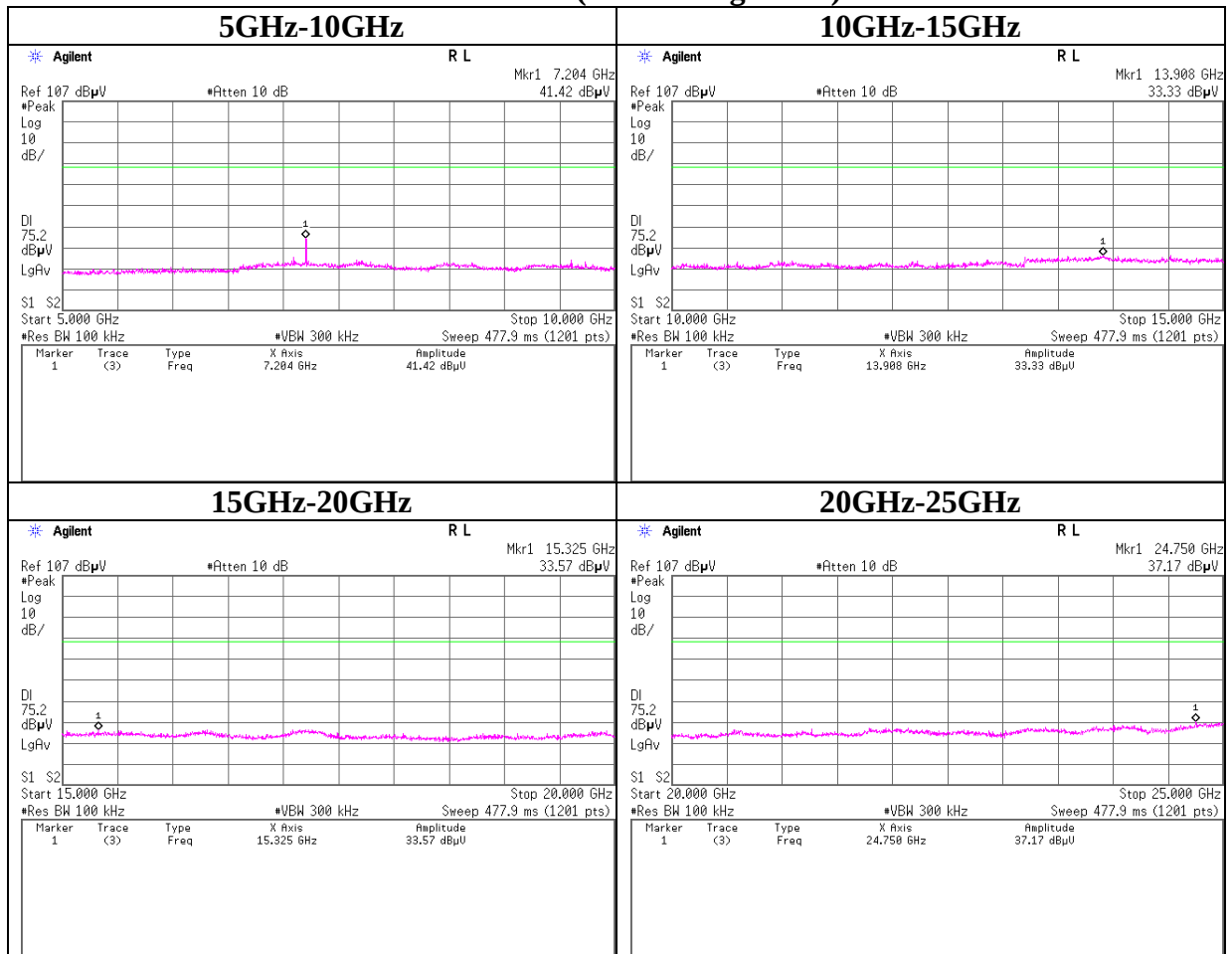
Conducted Spurious Emission

Tx 2402MHz (Advertising Mode)



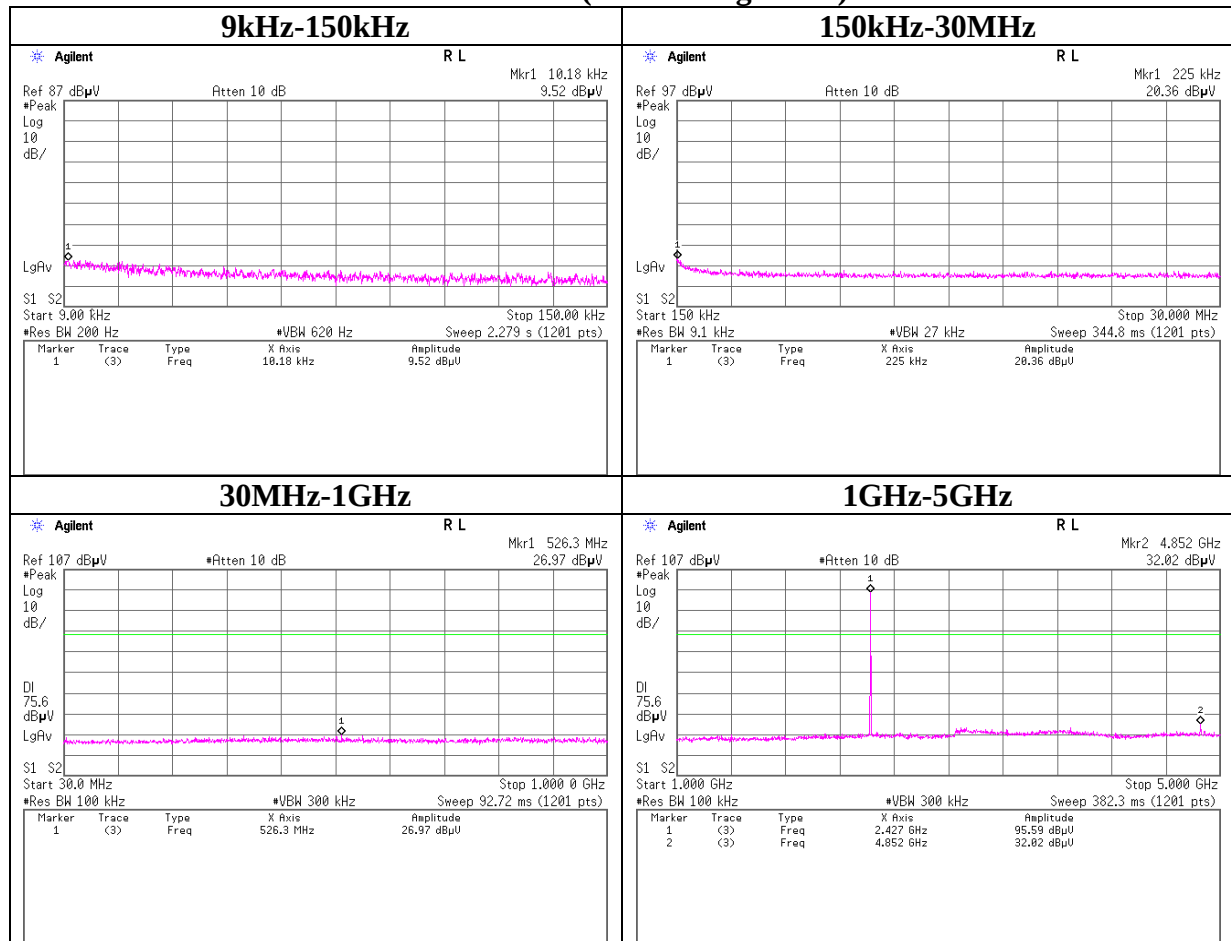
Conducted Spurious Emission

Tx 2402MHz (Advertising Mode)



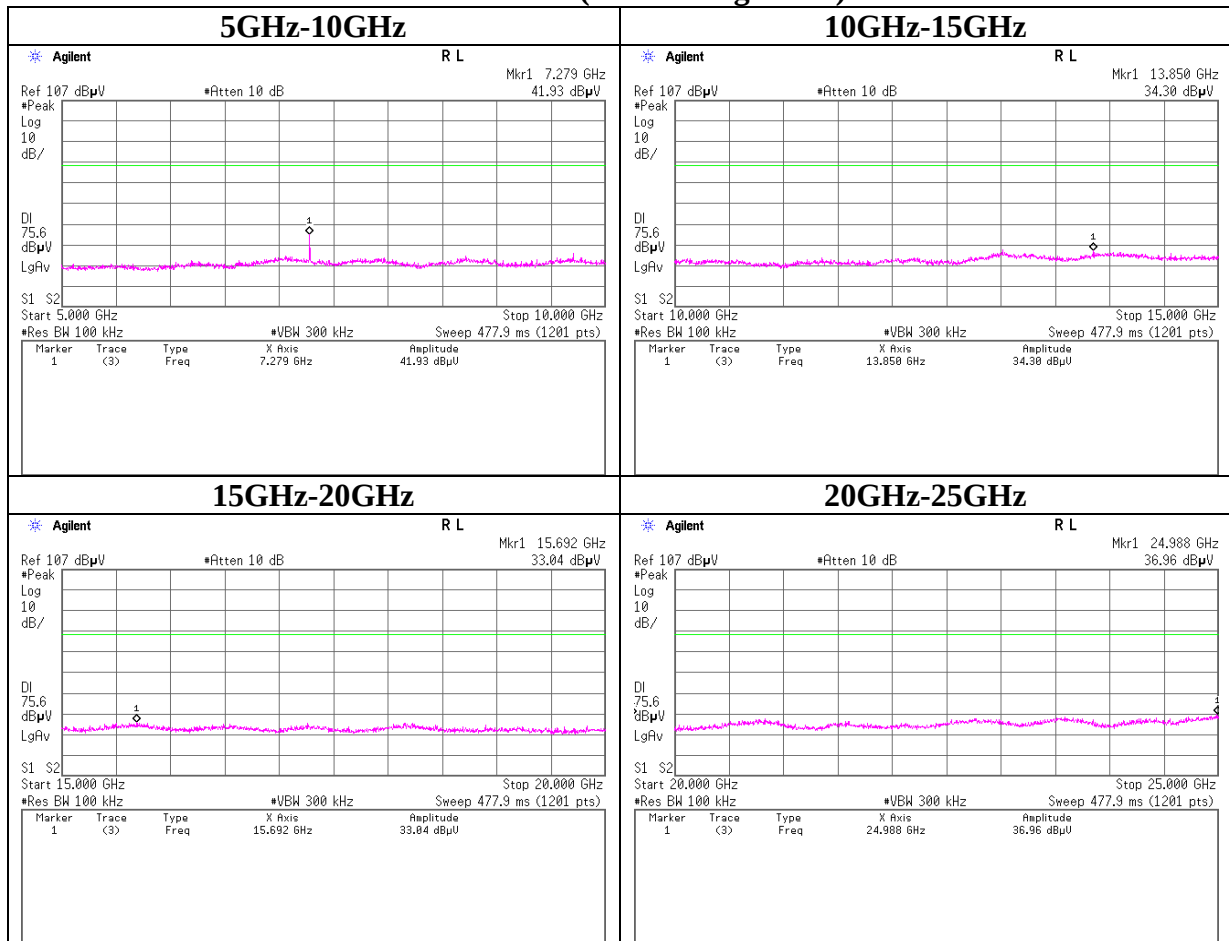
Conducted Spurious Emission

Tx 2426MHz (Advertising Mode)



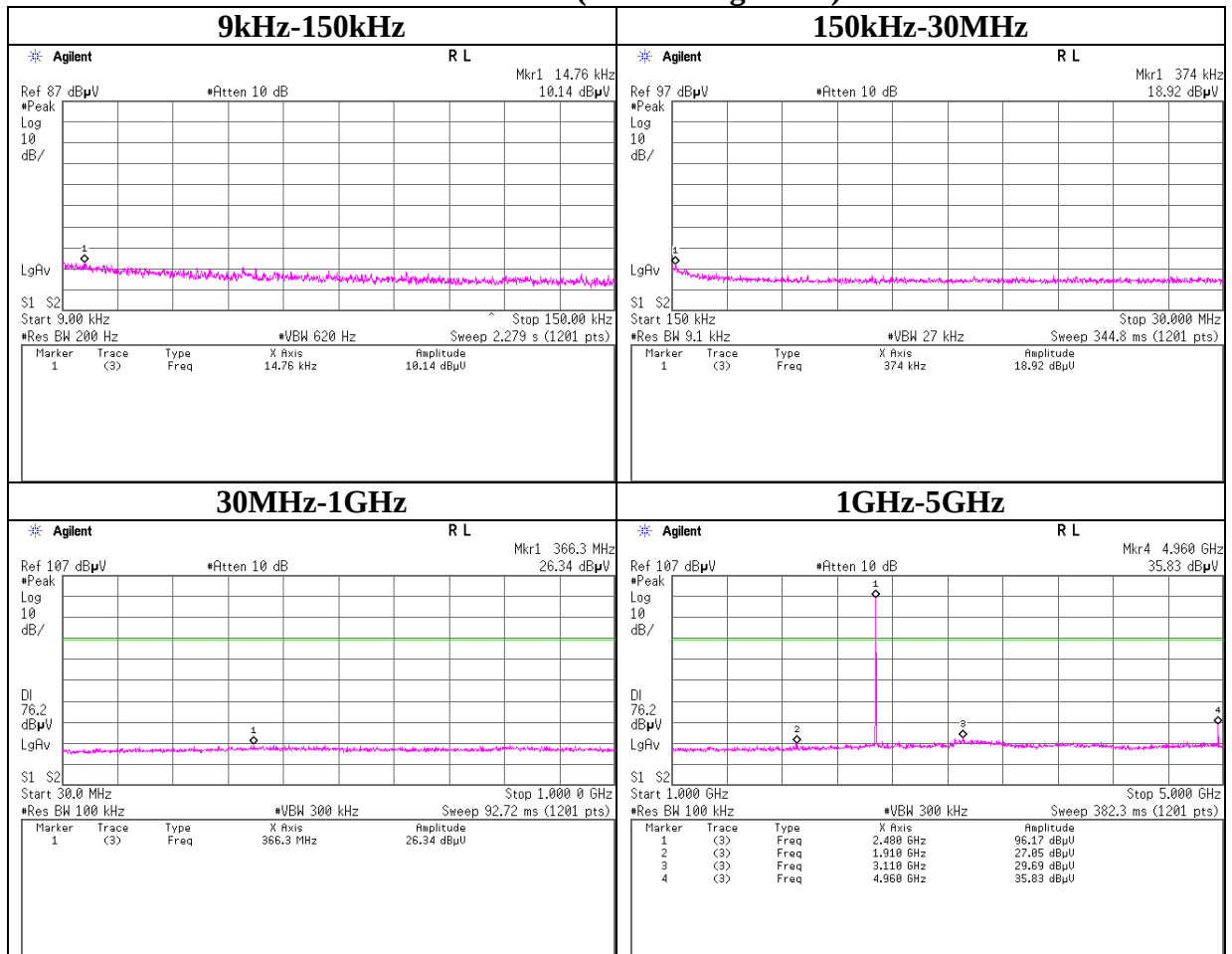
Conducted Spurious Emission

Tx 2426MHz (Advertising Mode)



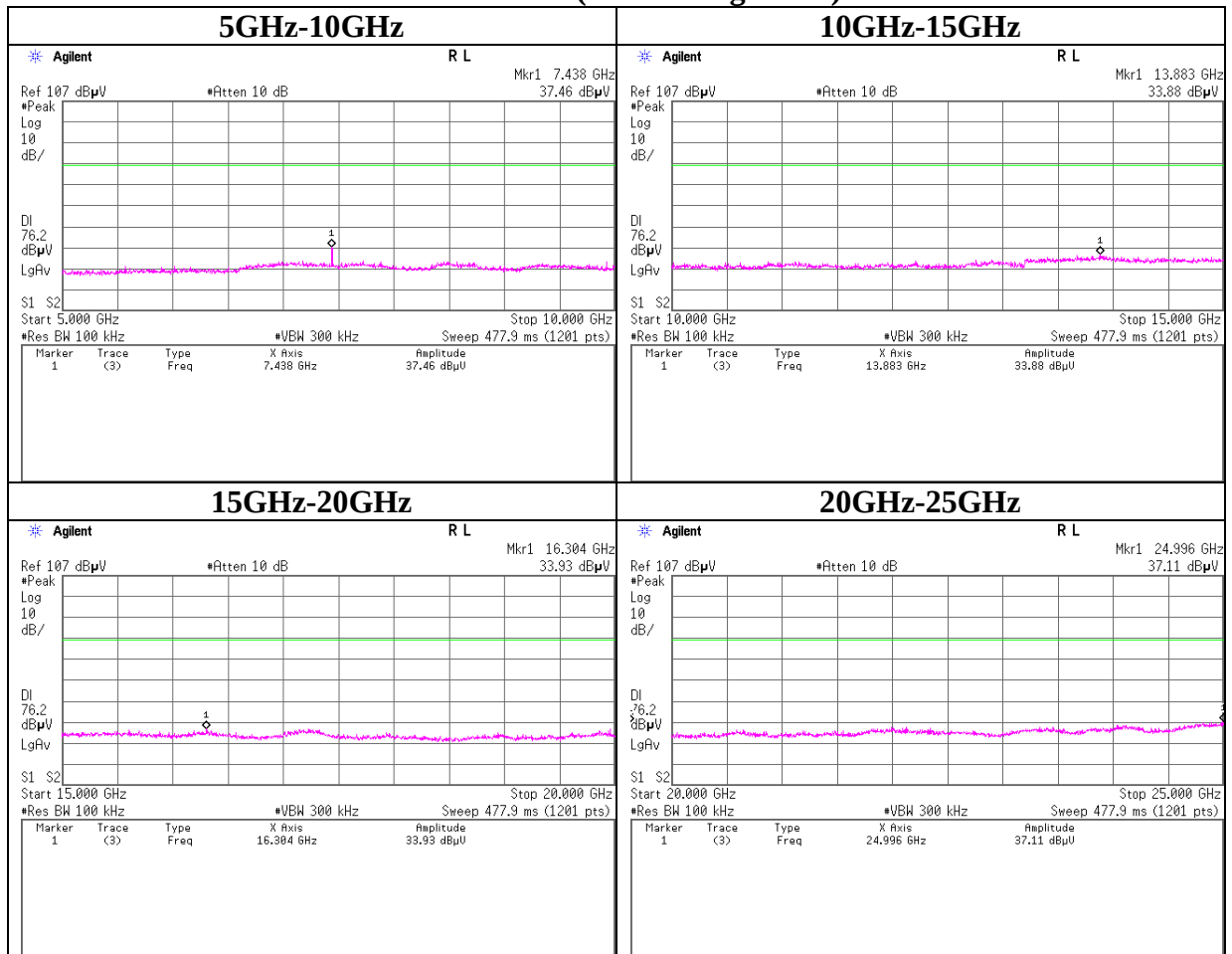
Conducted Spurious Emission

Tx 2480MHz (Advertising Mode)



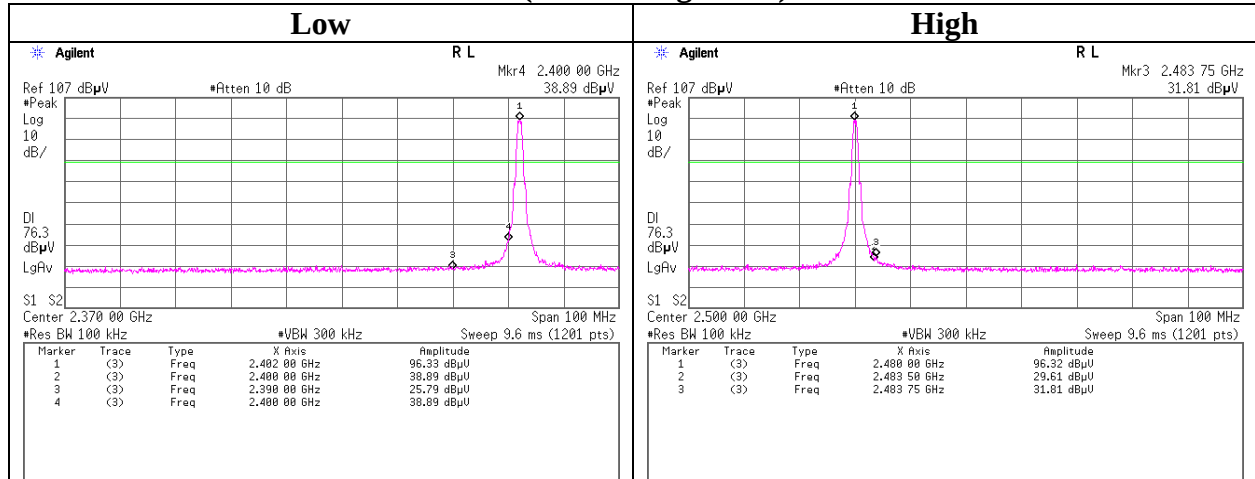
Conducted Spurious Emission

Tx 2480MHz (Advertising Mode)



Conducted Emission Band Edge compliance

Tx (Advertising Mode)



Power Density

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32GE0273-HO-01
Date 03/28/2012 05/07/2012
Temperature/ Humidity 23deg. C / 51% RH 19deg. C / 65% RH
Engineer Yutaka Yoshida Yutaka Yoshida
Mode Tx Bluetooth Low Energy(Advertising Mode)

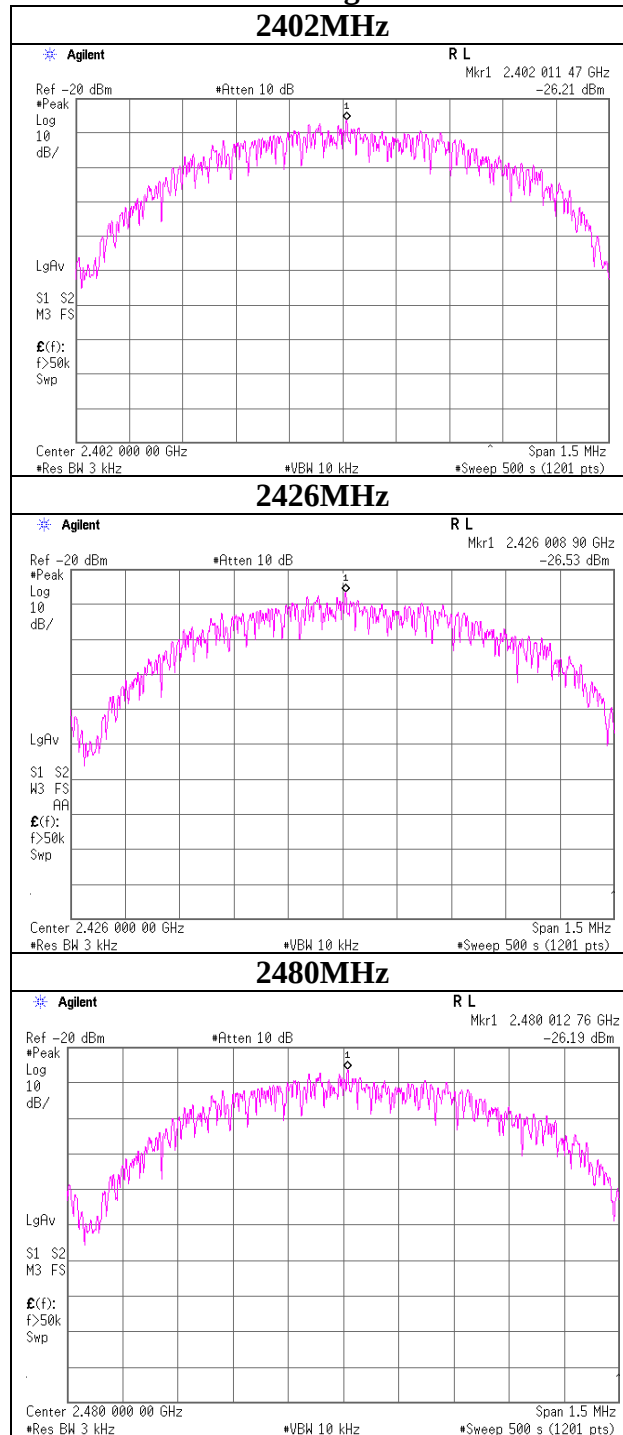
Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2402.00	-26.21	1.38	10.07	-14.76	8.00	22.76
2426.00	-26.53	1.23	10.07	-15.23	8.00	23.23
2480.00	-26.19	1.40	10.07	-14.72	8.00	22.72

Sample Calculation:

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

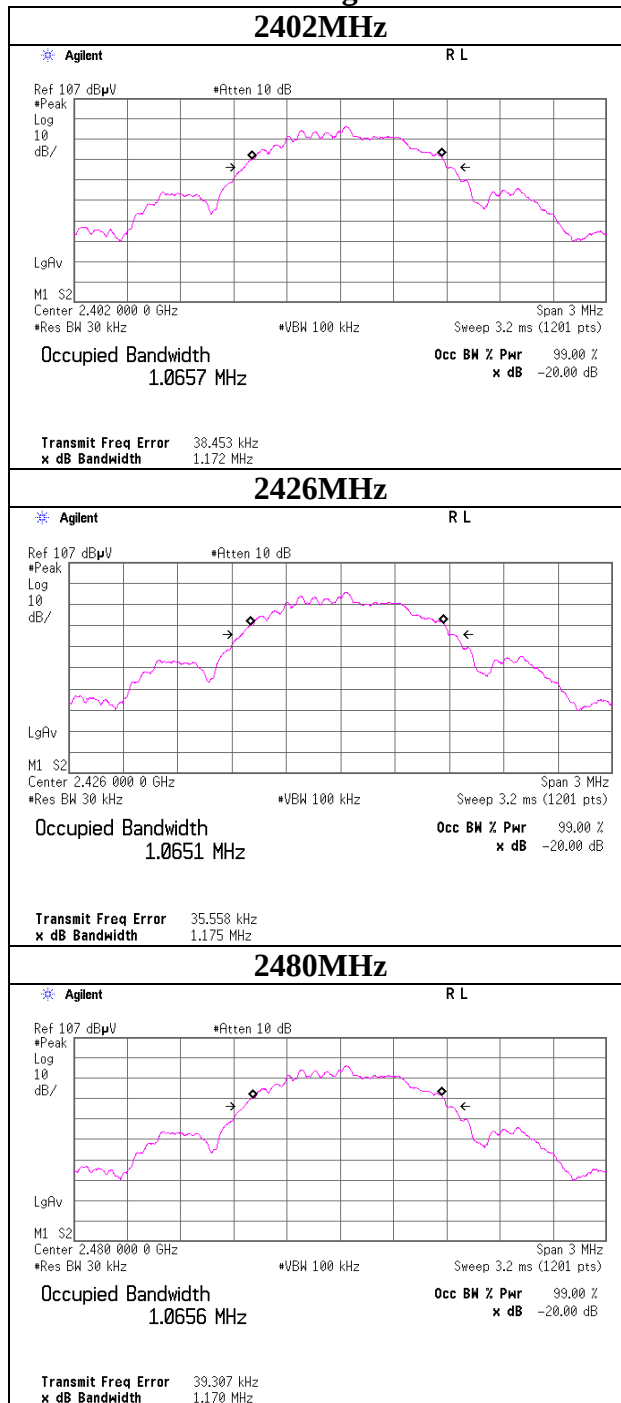
Power Density

Advertising Mode



99% Occupied Bandwidth

Advertising Mode



APPENDIX 2: Test instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date	Expiration date of the calibration
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE/CE	2011/06/21	2012/06/30
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE/CE	2012/02/06	2013/02/28
MJM-14	Measure	KOMELON	KMC-36	-	RE/CE	-	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-	-
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	RE/CE	2011/06/30	2012/06/30
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22	2013/02/28
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2012/01/25	2013/01/31
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2011/09/07	2012/09/30
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2012/02/03	2013/02/28
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2011/08/09	2012/08/31
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2011/08/09	2012/08/31
MCC-67	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28635/2	AT	2011/04/22	2012/04/30 *1)
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2012/03/27	2013/03/31
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2012/02/06	2013/02/28
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2012/02/22	2013/02/28
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE/CE	2011/04/15	2012/04/30 *1)
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2011/10/23	2012/10/31
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2011/10/23	2012/10/31
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2012/02/16	2013/02/28
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2011/11/02	2012/11/30
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2011/09/26	2012/09/30
APRCV05	Test Receiver	Rohde & Schwarz	ESS	840456/008	RE	2012/01/16	2013/01/31
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE	2012/02/06	2013/02/28
MTA-31	Terminator	TME	CT-01	-	CE	2012/01/11	2013/01/31
MCC-13	Coaxial Cable	Fujikura	3D-2W(12m)/5D-2W(5m)/5D-2W(0.8m)/5D-2W(1m)	-	CE	2012/02/16	2013/02/28
MAT-65	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28	2013/01/31

*1) This test equipment was used for the tests before the expiration date of the calibration.

EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date	Expiration date of the calibration
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2012/02/29	2013/02/28
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE/CE	2012/02/06	2013/02/28
MJM-07	Measure	PROMART	SEN1955	-	RE/CE	-	-
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	RE/CE	2011/11/23	2012/11/30
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	RE/CE	2012/04/05	2013/04/30
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2011/11/16	2012/11/30
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2011/11/16	2012/11/30
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2012/03/15	2013/03/31
AT-38	Attenuator	Anritsu	MP721B	6200961025	RE	2011/12/08	2012/12/31
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2012/03/05	2013/03/31
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2011/08/11	2012/08/31
MCC-134	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336167/4(1m) / 340641(5m)	RE	2011/09/07	2012/09/30
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2012/03/28	2013/03/31
MHA-17	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170307	RE	2011/06/17	2012/06/30
MAT-67	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28	2013/01/31
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(5m)/421-010(1m)/sucoform 141-PE(1m)/RFM-E121(Switcher)	-/04178	CE	2011/07/04	2012/07/31

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