



RADIO TEST REPORT

Test Report No. : 32JE0205-HO-F

Applicant : SAMSUNG ELECTRONICS CO., LTD.
Type of Equipment : GPRS850/1900, EDGE850/1900, WCDMA2,
WCDMA5, LTE4, LTE17 Tablet with 802.11bgn,
BT(EDR, LE)
Model No. : SGH-I497
FCC ID : A3LSGHI497
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.

Date of test: July 3 and 4, 2012

Representative test engineer:

Keisuke Kawamura
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

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.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
<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 : SAMSUNG ELECTRONICS CO., LTD.
Address : 416, MAETAN 3-DONG, YEONGTONG-GU SUWON-CITY,
GYEONGGI-DO 443-742, SOUTH KOREA

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

2.1 Identification of E.U.T.

Type of Equipment : GPRS850/1900, EDGE850/1900, WCDMA2, WCDMA5, LTE4,
LTE17 Tablet with 802.11bgn, BT(EDR, LE)
Model No. : SGH-I497
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC5.0V(USB Power Supply)
DC3.7V/7000mAh, 25.9Wh
Receipt Date of Sample : June 4, 2012
Modification of EUT : No Modification by the test lab

2.2 Product Description

Radio Specification

Bluetooth

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Type	PIFA
Antenna Gain	-4.8 dBi (MAX)

Low Energy

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	DSSS, FHSS
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Type	PIFA
Antenna Gain	-4.8 dBi (MAX)

WLAN (IEEE802.11b/g/n-20)

Equipment Type	Transceiver
Frequency of Operation	2412-2462MHz
Type of Modulation	DSSS, OFDM
Bandwidth & Channel spacing	20MHz & 5MHz
Antenna Type	PIFA
Antenna Gain	-4.8 dBi (MAX)

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GSM

Equipment Type	Transceiver
Frequency of Operation	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz
Type of Modulation	GMSK , 8PSK
Antenna Type	PIFA
Antenna Gain	GSM850: 824-849MHz: -5.73dBi (MAX) 869-894MHz: -5.83dBi (MAX) PCS: 1850-1910MHz: -5.62dBi (MAX) 1930-1990MHz: -5.51dBi (MAX)

W-CDMA

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band V: 824 – 849MHz Band II: 1850 – 1910MHz [Down Link] Band V: 869 – 894MHz Band II: 1930 – 1990MHz
Type of Modulation	QPSK
Antenna Type	PIFA
Antenna Gain	Band V: 824-849MHz: -5.73dBi (MAX) 869-894MHz: -5.83dBi (MAX) Band II: 1850-1910MHz: -5.62dBi (MAX) 1930-1900MHz: -5.51dBi (MAX)

LTE

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band IV: 1710 – 1755MHz Band X VII: 704 – 716MHz [Down Link] Band IV: 2110 – 2155MHz Band X VII: 734 – 746MHz
Type of Modulation	QPSK, 16QAM
Antenna Type	PIFA
Antenna Gain	Band IV: 1710-1755MHz: -5.57dBi (MAX) 2110-2155MHz: -3.86dBi (MAX) Band X VII: 704-716MHz: -5.95dBi (MAX) 734-746MHz: -4.23dBi (MAX)

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2012, final revised on May 17, 2012 and effective June 18, 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 16.4dB, 23.58403MHz, N AV 18.5dB, 6.86039MHz, 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	1.8dB 37.791MHz, QP, Vert.	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.

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.

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	Remarks*
Bluetooth(BT) LE(Low Energy)	Maximum Packet Size, PN9

*The details of Operating mode(s)

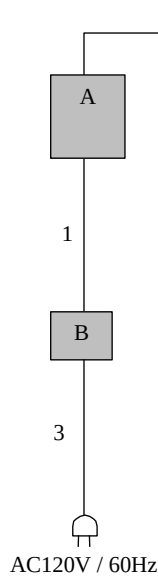
Test Item	Operating Mode	Tested frequency
Conducted Emission	BT LE	2402MHz
Spurious Emission		2440MHz
6dB Bandwidth		2480MHz
Maximum Peak Output Power		
Power Density		
99% Occupied Bandwidth		

Power of the EUT was set by the software as follows:

H/W version: REV0.0
S/W version: I497.001

*The above setting of the 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 and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	GPRS850/1900, EDGE850/1900, WCDMA2, WCDMA5, LTE4, LTE17 Tablet with 802.11bgn, BT(EDR, LE)	SGH-I497	R31C50X3QHR *1) R31C50X3QLM *2)	SAMSUNG	EUT
B	AC Adapter	ETA-P11X	-	SAMSUNG	EUT
C	Ear phone	-	-	SAMSUNG	-

*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		Remarks
			Cable	Connector	
1	USB Cable	1.0	Shielded	Shielded	-
2	Ear phone Cable	1.2	Unshielded	Unshielded	-
3	AC Cable	0.9	Unshielded	Unshielded	-

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SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.5m 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, 1.5m 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	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	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	RBW: 1MHz VBW: 3kHz *1)	RBW: 100kHz VBW: 300kHz (S/A)
Test Distance	3m	3m (below 10GHz), 1m*2) (above 10GHz)		3m (below 10GHz), 1m*2) (above 10GHz)

*1) Used for the band edge of the carrier and the harmonics that can be measured.

VBW is set to 3kHz for LE due to 1/Tx on. (See Appendix)

*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-25GHz
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.

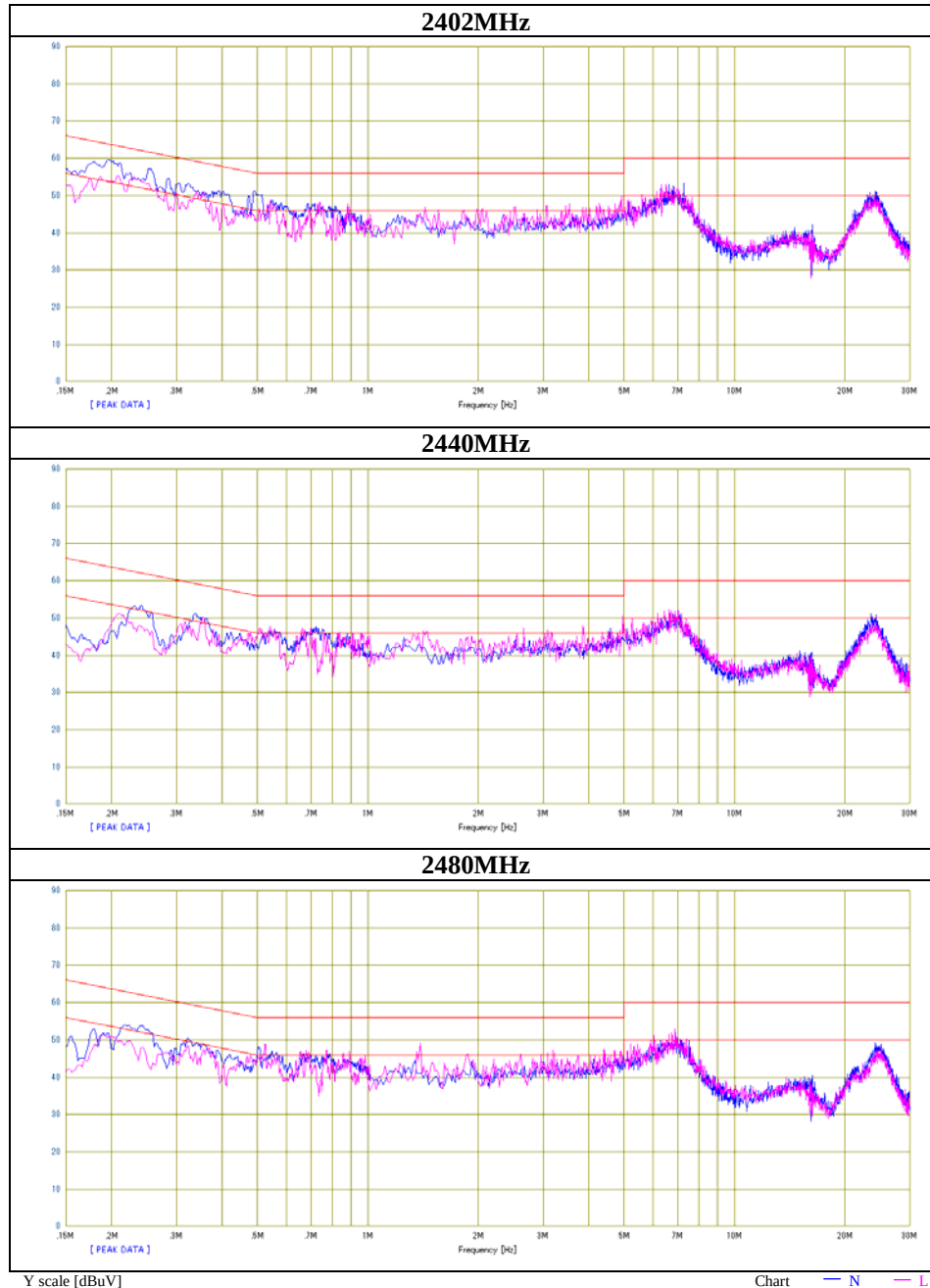
Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
6dB Bandwidth	3MHz	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	1 to 3% of Span	Three times of RBW	Auto	Peak	Max Hold *1)	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak	-	Power Meter (Sensor: 50MHz BW)
Peak Power Density	1.5MHz	3kHz	10kHz	500 sec	Peak	Max Hold	Spectrum Analyzer *2)
Conducted Spurious Emission *3)	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) The measurement was performed with Max Hold since the duty cycle was not 100%. *2) PSD Option 1 of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ". *3) 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

Conducted Emission

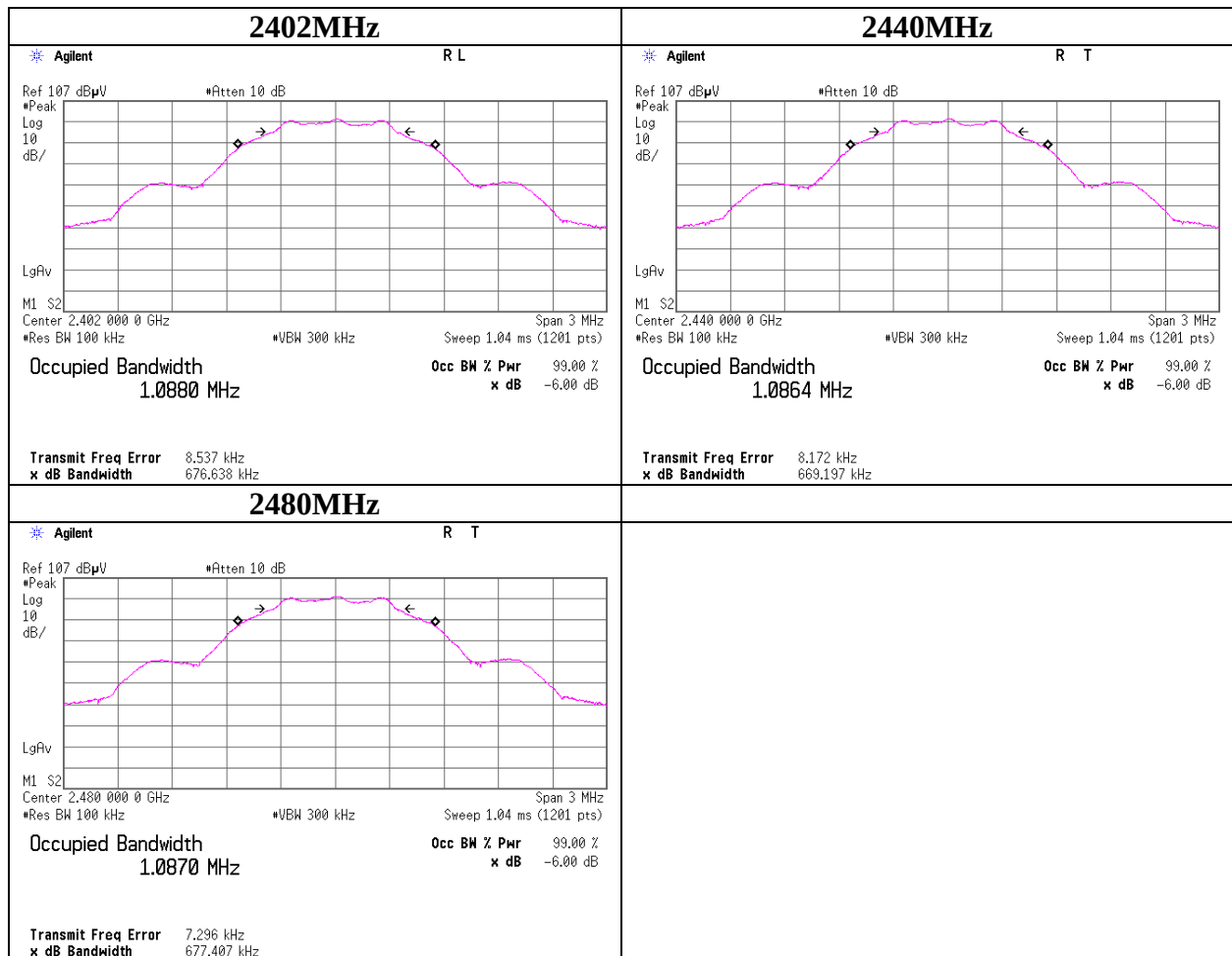
Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	32JE0205-HO
Date	07/03/2012
Temperature/ Humidity	22 deg. C / 63% RH
Engineer	Keisuke Kawamura
Mode	Tx LE



6dB Bandwidth

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32JE0205-HO
Date 07/03/2012
Temperature / Humidity 23 deg. C / 60% RH
Engineer Takayuki Shimada
Mode Tx

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2402	0.677	>500
2440	0.669	>500
2480	0.677	>500



Maximum Peak Output Power

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32JE0205-HO
Date 07/03/2012
Temperature/ Humidity 23 deg. C / 60% RH
Engineer Takayuki Shimada
Mode Tx

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2402	-8.35	1.33	10.00	2.98	1.99	30.00	1000	27.02
2440	-8.13	1.34	10.00	3.21	2.09	30.00	1000	26.79
2480	-8.40	1.35	10.00	2.95	1.97	30.00	1000	27.05

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 32JE0205-HO
Date : 07/03/2012
Temperature/ Humidity : 22 deg. C / 63% RH
Engineer : Keisuke Kawamura
Mode : Tx LE 2402MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	30.450	QP	29.8	18.4	7.1	32.2	23.1	40.0	16.9	
Hori	37.650	QP	34.8	15.8	7.2	32.2	25.6	40.0	14.4	
Hori	89.832	QP	37.1	8.4	8.0	32.2	21.3	43.5	22.2	
Hori	2390.000	PK	43.9	27.4	2.2	32.4	41.1	73.9	32.8	
Hori	4804.000	PK	42.4	31.6	4.0	31.4	46.6	73.9	27.4	
Hori	7206.000	PK	46.5	36.3	4.7	32.4	55.1	-	-	See 20dBc Data Sheet
Hori	9608.000	PK	43.4	38.1	5.5	33.0	54.0	73.9	19.9	
Hori	2390.000	AV	33.4	27.4	2.2	32.4	30.6	53.9	23.3	
Hori	4804.000	AV	31.4	31.6	4.0	31.4	35.6	53.9	18.3	
Hori	7206.000	AV	37.8	36.3	4.7	32.4	46.4	-	-	See 20dBc Data Sheet
Hori	9608.000	AV	33.6	38.1	5.5	33.0	44.2	53.9	9.7	
Vert	30.000	QP	44.6	18.6	7.1	32.2	38.1	40.0	1.9	
Vert	37.791	QP	47.5	15.7	7.2	32.2	38.2	40.0	1.8	
Vert	88.951	QP	35.1	8.2	8.0	32.2	19.1	43.5	24.4	
Vert	2390.000	PK	43.6	27.4	2.2	32.4	40.8	73.9	33.1	
Vert	4804.000	PK	40.6	31.6	4.0	31.4	44.8	73.9	29.1	
Vert	7206.000	PK	48.6	36.3	4.7	32.4	57.2	-	-	See 20dBc Data Sheet
Vert	9608.000	PK	44.4	38.1	5.5	33.0	55.0	-	-	See 20dBc Data Sheet
Vert	2390.000	AV	32.8	27.4	2.2	32.4	30.0	53.9	23.9	
Vert	4804.000	AV	31.1	31.6	4.0	31.4	35.3	53.9	18.6	
Vert	7206.000	AV	41.6	36.3	4.7	32.4	50.2	-	-	See 20dBc Data Sheet
Vert	9608.000	AV	36.4	38.1	5.5	33.0	47.0	-	-	See 20dBc Data Sheet

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).

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	2402.000	PK	105.6	27.4	2.2	32.4	102.8	-	-	Carrier
Hori	2400.000	PK	50.2	27.4	2.2	32.4	47.4	82.8	35.4	
Hori	7206.000	PK	39.8	36.3	4.7	32.4	48.4	82.8	34.4	
Vert	2402.000	PK	103.6	27.4	2.2	32.4	100.8	-	-	Carrier
Vert	2400.000	PK	47.9	27.4	2.2	32.4	45.1	80.8	35.7	
Vert	7206.000	PK	44.2	36.3	4.7	32.4	52.8	80.8	28.0	
Vert	9608.000	PK	38.0	38.1	5.5	33.0	48.6	80.8	32.2	

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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 32JE0205-HO
Date : 07/03/2012
Temperature/ Humidity : 22 deg. C / 63% RH
Engineer : Keisuke Kawamura
Mode : Tx LE 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	30.450	QP	29.8	18.4	7.1	32.2	23.1	40.0	16.9	
Hori	37.650	QP	34.8	15.8	7.2	32.2	25.6	40.0	14.4	
Hori	89.832	QP	37.1	8.4	8.0	32.2	21.3	43.5	22.2	
Hori	4880.000	PK	41.9	31.9	3.9	31.4	46.3	73.9	27.6	
Hori	7320.000	PK	45.7	36.5	4.7	32.5	54.4	73.9	19.5	
Hori	9760.000	PK	43.3	38.3	5.5	33.0	54.1	73.9	19.8	
Hori	4880.000	AV	30.8	31.9	3.9	31.4	35.2	53.9	18.7	
Hori	7320.000	AV	36.3	36.5	4.7	32.5	45.0	53.9	8.9	
Hori	9760.000	AV	33.8	38.3	5.5	33.0	44.6	53.9	9.3	
Vert	30.000	QP	44.6	18.6	7.1	32.2	38.1	40.0	1.9	
Vert	37.791	QP	47.3	15.7	7.2	32.2	38.0	40.0	2.0	
Vert	88.951	QP	35.1	8.2	8.0	32.2	19.1	43.5	24.4	
Vert	4880.000	PK	40.8	31.9	3.9	31.4	45.2	73.9	28.7	
Vert	7320.000	PK	46.8	36.5	4.7	32.5	55.5	73.9	18.4	
Vert	9760.000	PK	44.7	38.3	5.5	33.0	55.5	-	-	See 20dBc Data Sheet
Vert	4880.000	AV	30.9	31.9	3.9	31.4	35.3	53.9	18.6	
Vert	7320.000	AV	38.6	36.5	4.7	32.5	47.3	53.9	6.6	
Vert	9760.000	AV	35.6	38.3	5.5	33.0	46.4	-	-	See 20dBc Data Sheet

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).

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
Vert	2440.000	PK	103.8	27.6	2.2	32.4	101.2	-	-	Carrier
Vert	9760.000	PK	36.9	38.3	5.5	33.0	47.7	81.2	33.5	

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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 32JE0205-HO
Date : 07/03/2012
Temperature/ Humidity : 22 deg. C / 63% RH
Engineer : Keisuke Kawamura
Mode : Tx LE 2480MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	30.450	QP	29.8	18.4	7.1	32.2	23.1	40.0	16.9	
Hori	37.650	QP	34.8	15.8	7.2	32.2	25.6	40.0	14.4	
Hori	89.832	QP	37.1	8.4	8.0	32.2	21.3	43.5	22.2	
Hori	2483.500	PK	52.4	27.7	2.2	32.3	50.0	73.9	23.9	
Hori	4960.000	PK	40.6	32.2	4.0	31.4	45.4	73.9	28.6	
Hori	7440.000	PK	46.3	36.7	4.8	32.6	55.2	73.9	18.7	
Hori	9920.000	PK	43.3	38.6	5.6	33.1	54.4	73.9	19.5	
Hori	2483.500	AV	38.0	27.7	2.2	32.3	35.6	53.9	18.3	
Hori	4960.000	AV	31.4	32.2	4.0	31.4	36.2	53.9	17.7	
Hori	7440.000	AV	38.7	36.7	4.8	32.6	47.6	53.9	6.3	
Hori	9920.000	AV	33.9	38.6	5.6	33.1	45.0	53.9	8.9	
Vert	30.000	QP	44.6	18.6	7.1	32.2	38.1	40.0	1.9	
Vert	37.791	QP	47.4	15.7	7.2	32.2	38.1	40.0	1.9	
Vert	88.951	QP	35.1	8.2	8.0	32.2	19.1	43.5	24.4	
Vert	2483.500	PK	52.1	27.7	2.2	32.3	49.7	73.9	24.3	
Vert	4960.000	PK	41.7	32.2	4.0	31.4	46.5	73.9	27.4	
Vert	7440.000	PK	46.1	36.7	4.8	32.6	55.0	73.9	18.9	
Vert	9920.000	PK	44.3	38.6	5.6	33.1	55.4	-	-	See 20dBc Data Sheet
Vert	2483.500	AV	39.2	27.7	2.2	32.3	36.8	53.9	17.1	
Vert	4960.000	AV	31.2	32.2	4.0	31.4	36.0	53.9	17.9	
Vert	7440.000	AV	37.4	36.7	4.8	32.6	46.3	53.9	7.6	
Vert	9920.000	AV	34.8	38.6	5.6	33.1	45.9	-	-	See 20dBc Data Sheet

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).

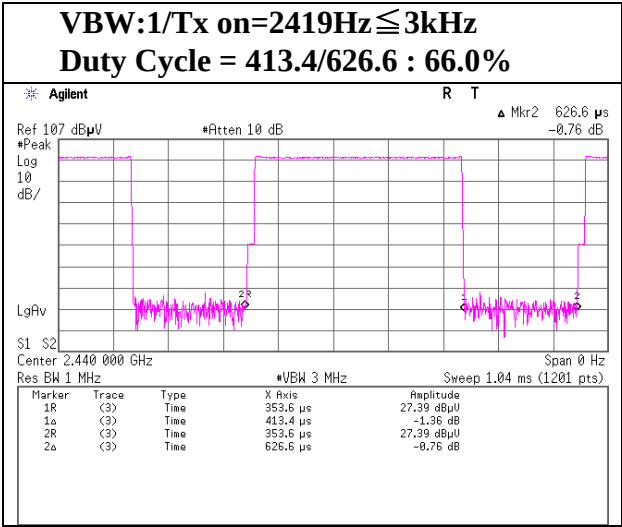
Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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
Vert	2480.000	PK	102.9	27.7	2.2	32.3	100.5	-	-	Carrier
Vert	9920.000	PK	35.3	38.6	5.6	33.1	46.4	80.5	34.1	

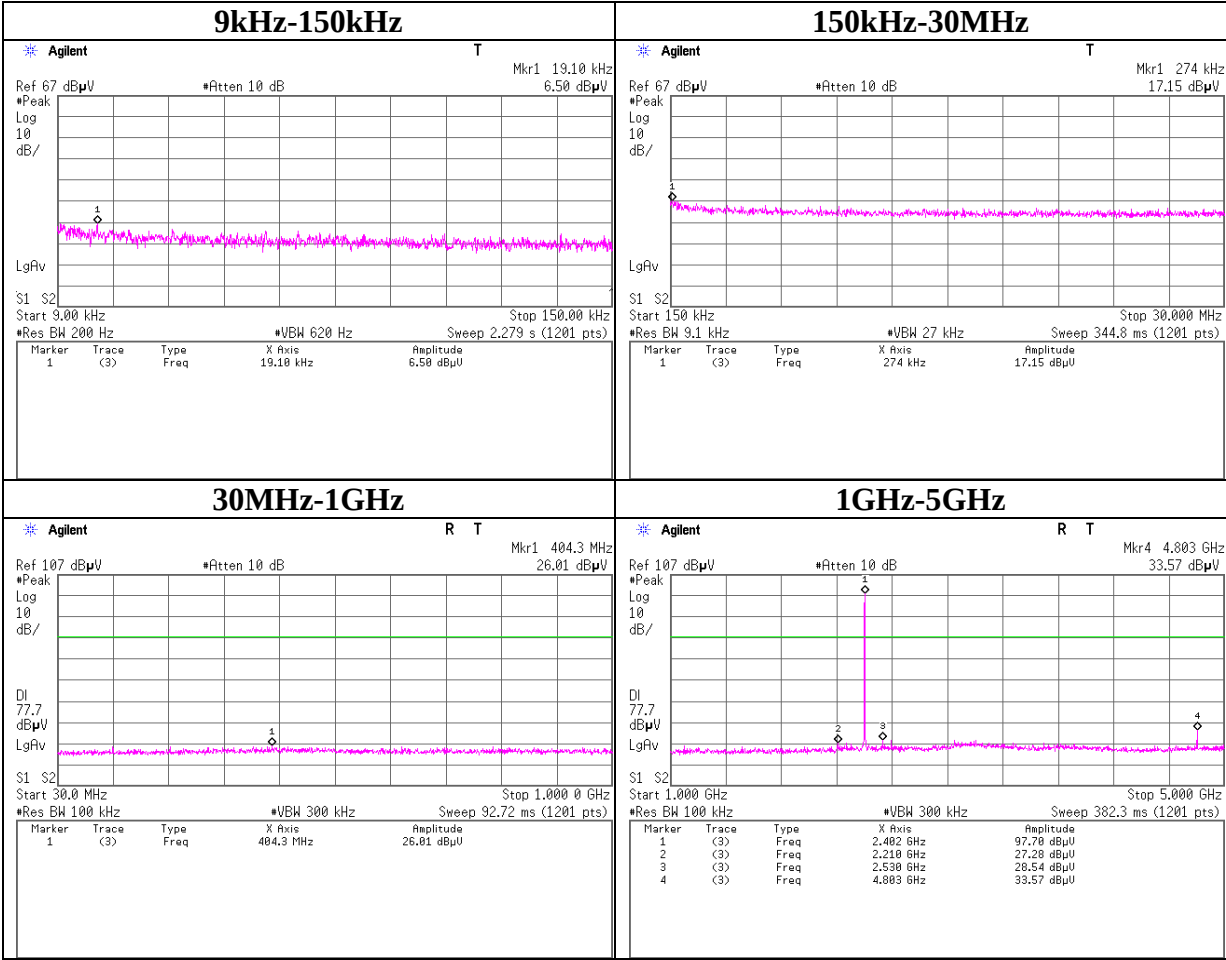
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

VBW (AV) Calculation



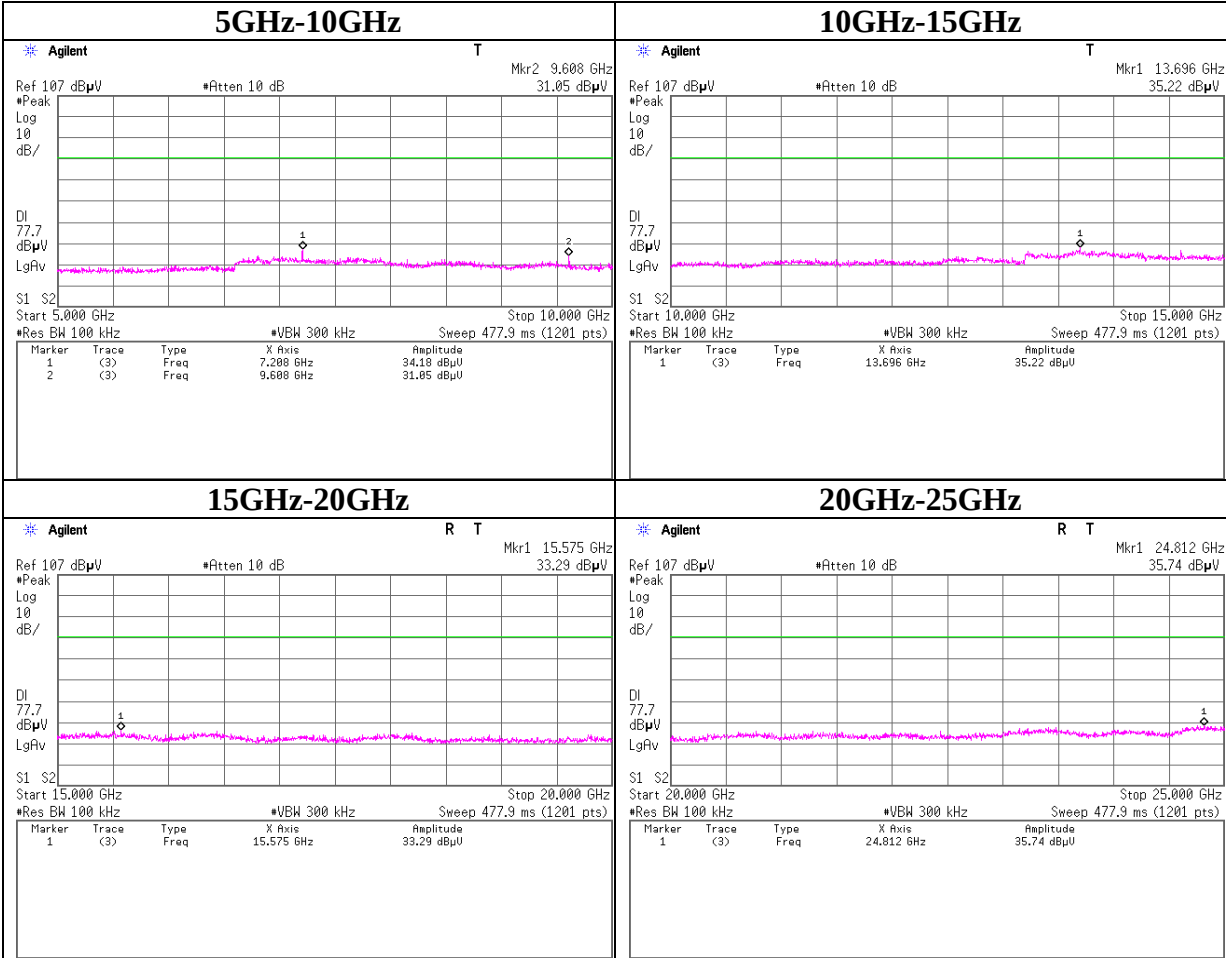
Conducted Spurious Emission

Tx 2402MHz



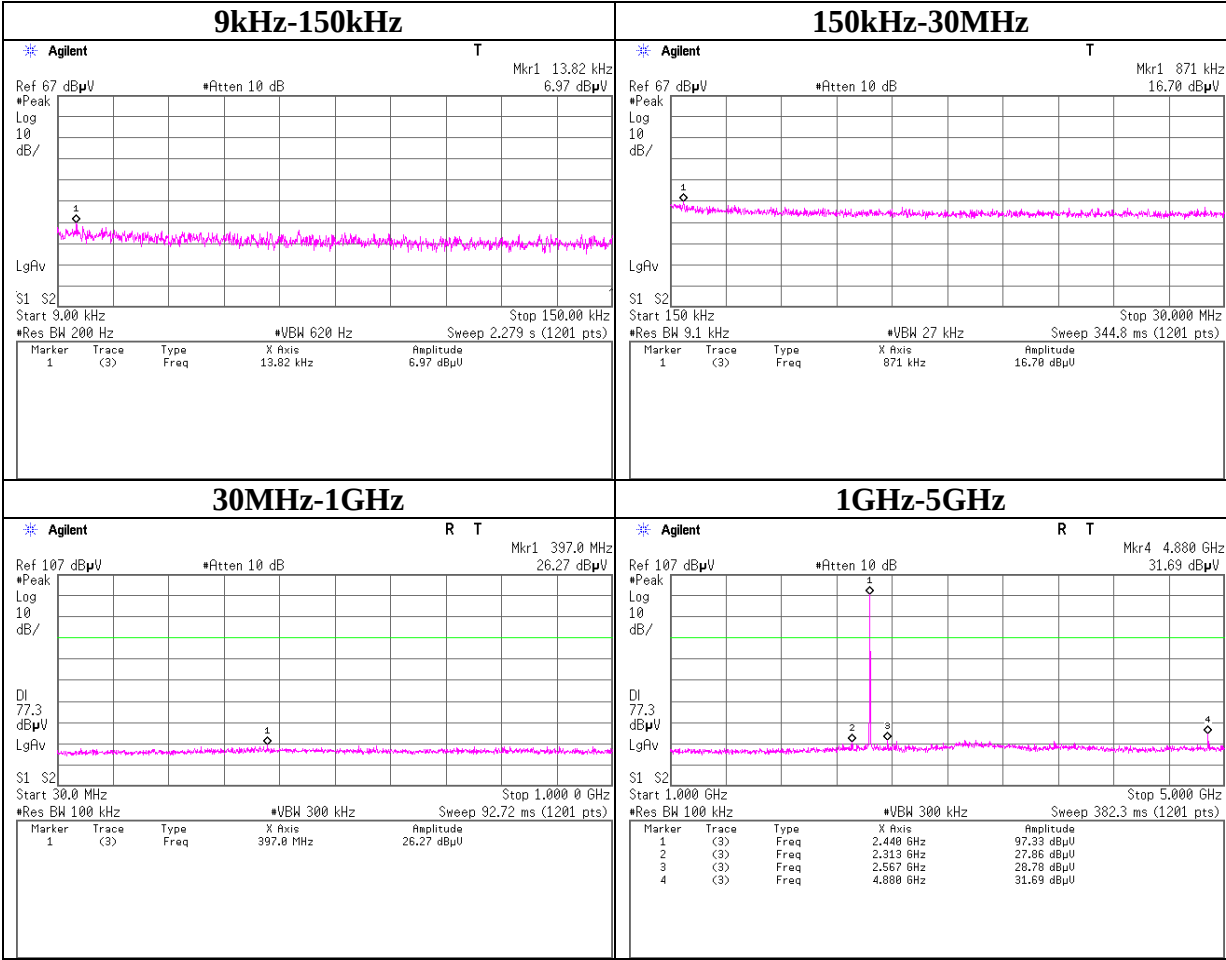
Conducted Spurious Emission

Tx 2402MHz



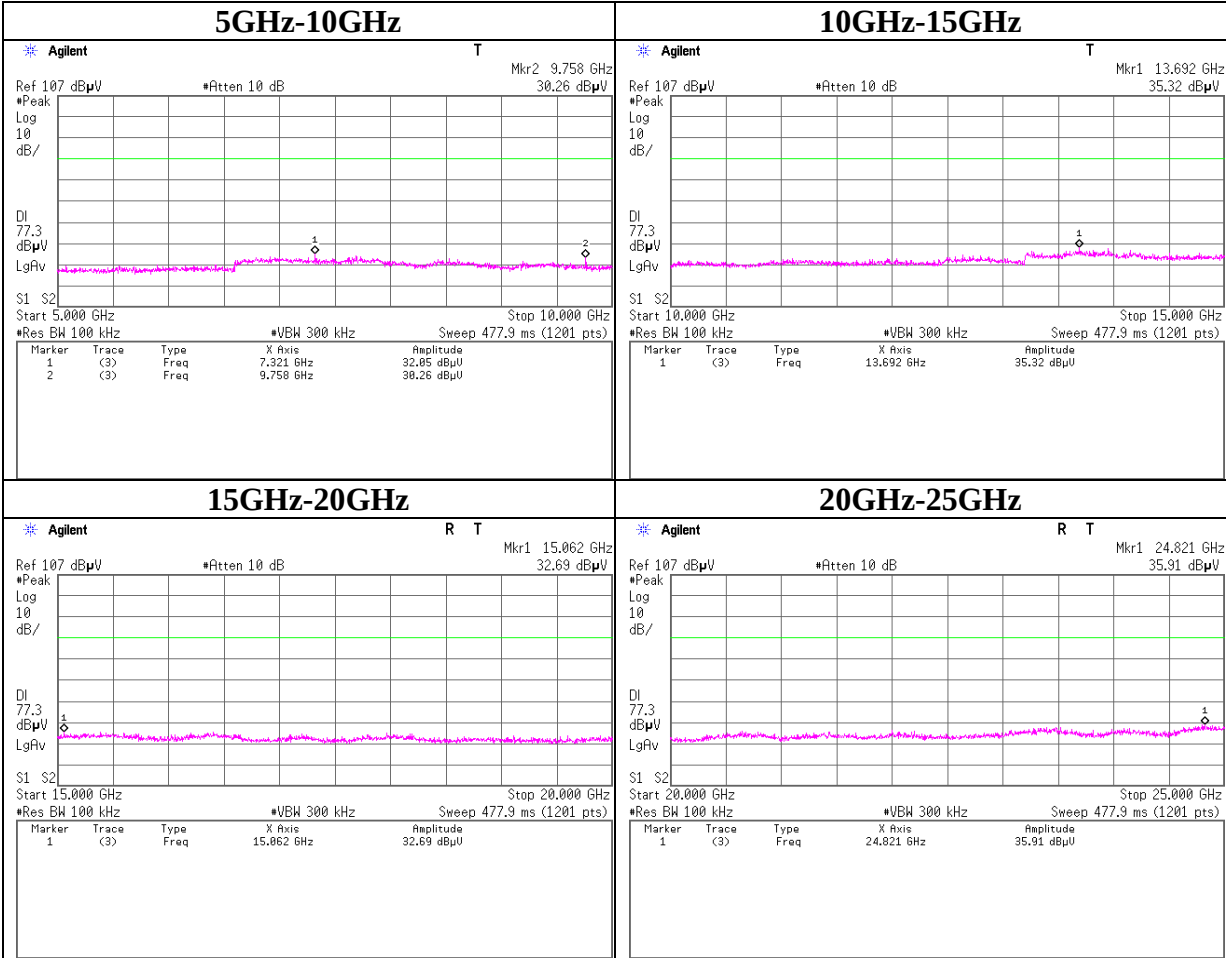
Conducted Spurious Emission

Tx 2440MHz



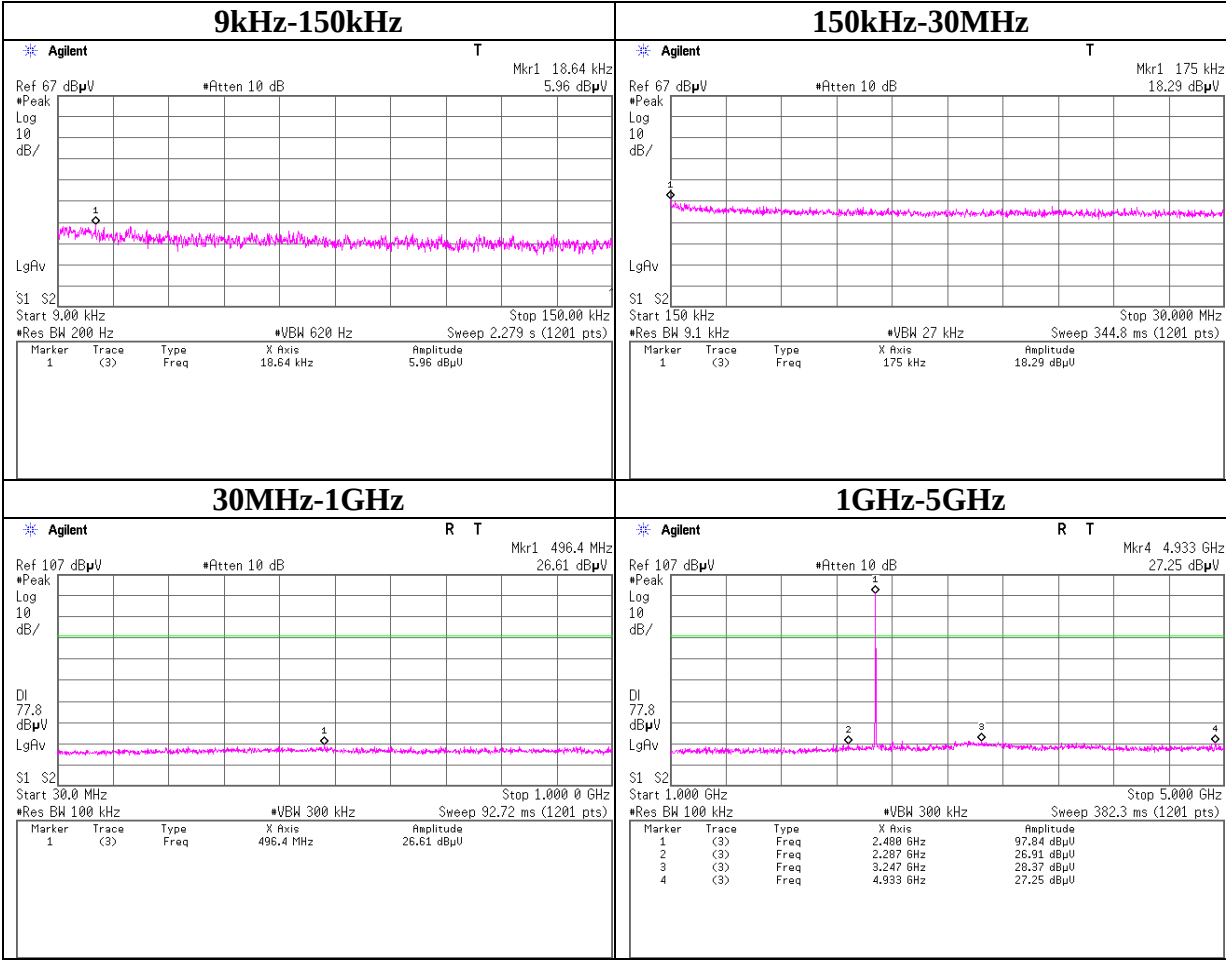
Conducted Spurious Emission

Tx 2440MHz



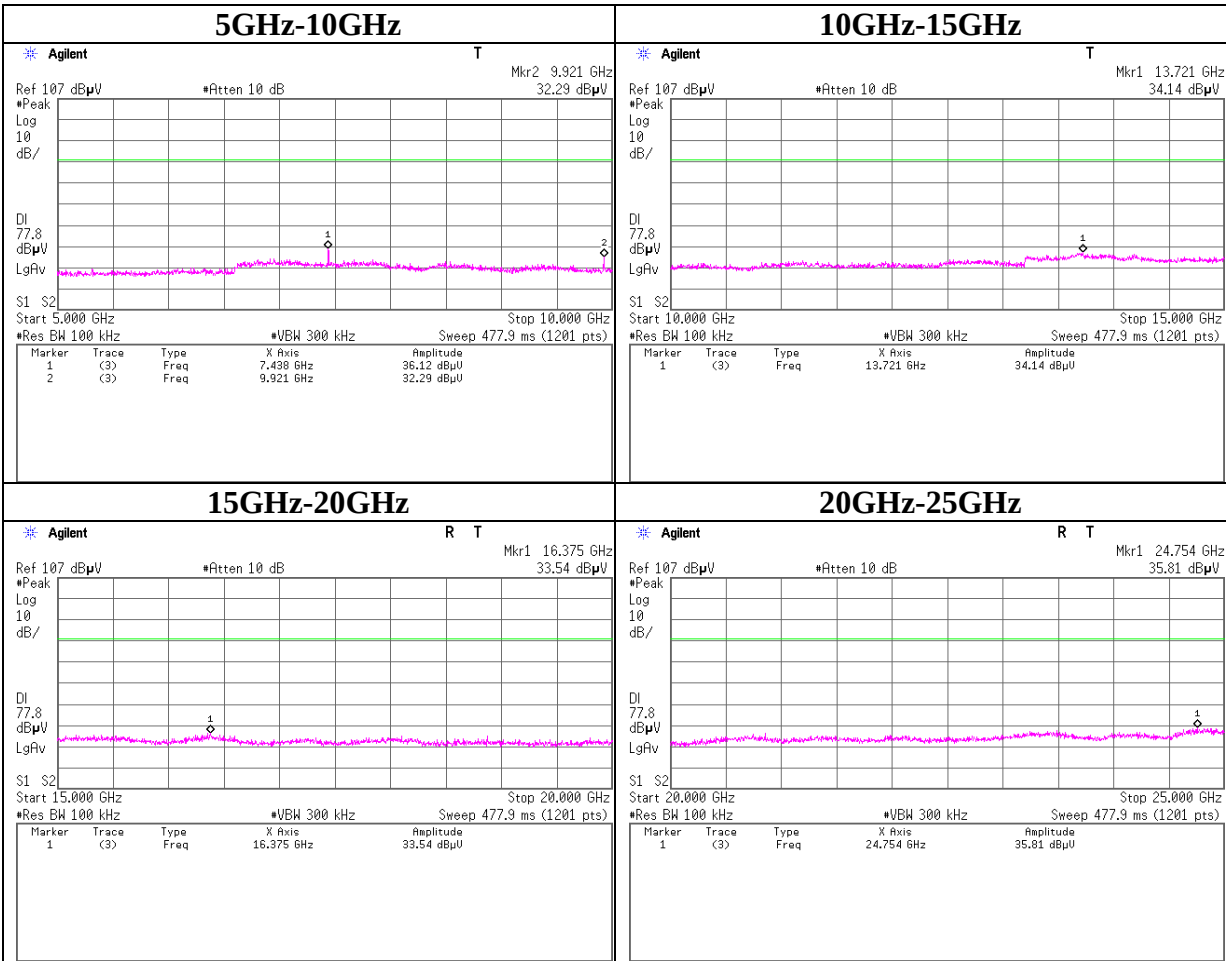
Conducted Spurious Emission

Tx 2480MHz

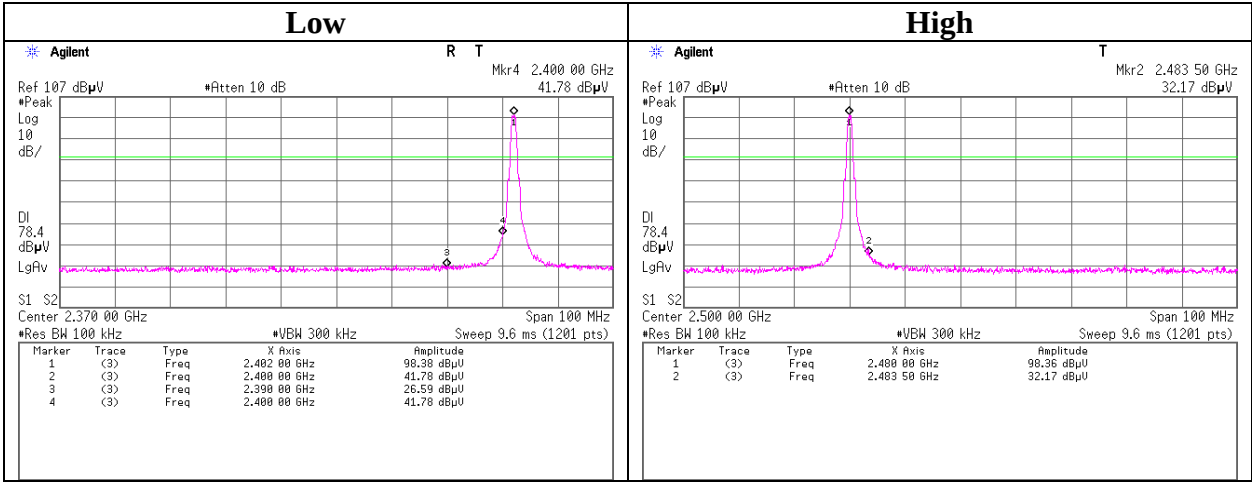


Conducted Spurious Emission

Tx 2480MHz



Conducted Emission Band Edge compliance



Power Density

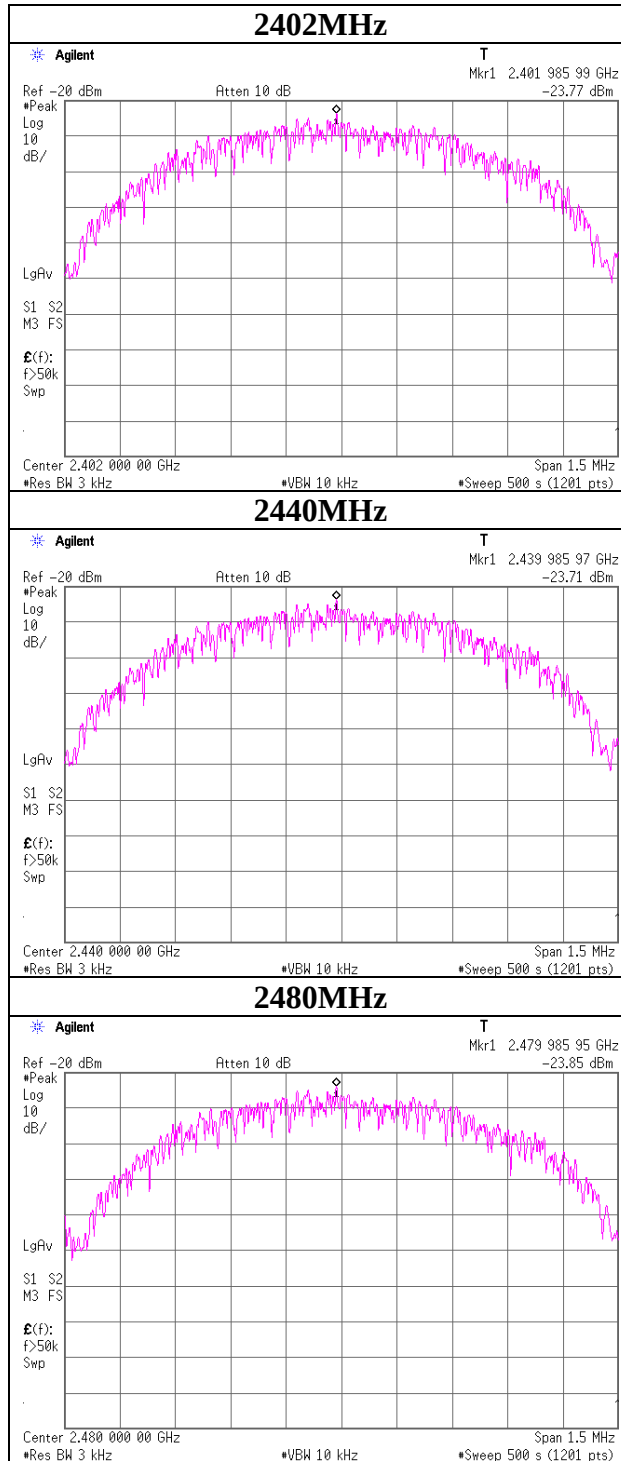
Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32JE0205-HO
Date 07/03/2012
Temperature / Humidity 23 deg. C / 60% RH
Engineer Takayuki Shimada
Mode Tx

Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2402.00	-23.77	1.33	10.00	-12.44	8.00	20.44
2440.00	-23.71	1.34	10.00	-12.37	8.00	20.37
2480.00	-23.85	1.35	10.00	-12.50	8.00	20.50

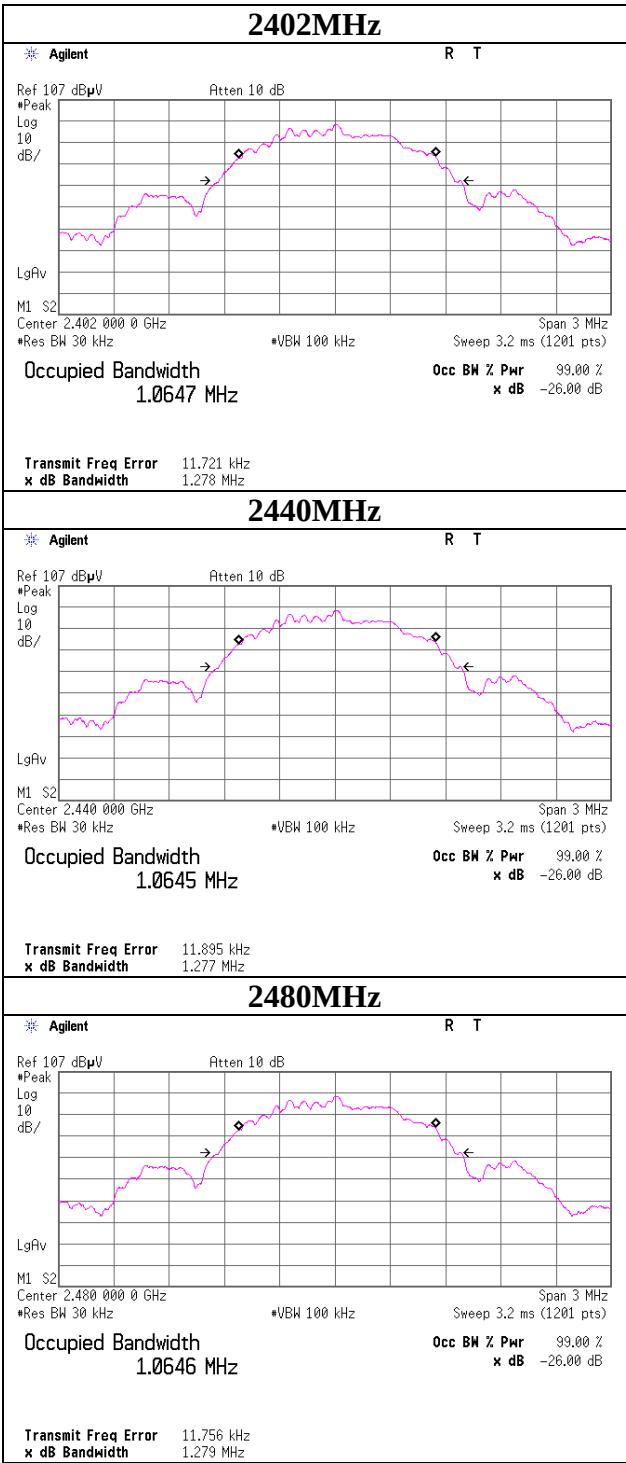
Sample Calculation:

Result = Reading + Cable Loss + Attenuator

Power Density



99%Occupied Bandwidth



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2012/02/06 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2012/02/03 * 12
MPM-13	Power Meter	Anritsu	ML2495A	0824014	AT	2011/11/07 * 12
MPSE-18	Power sensor	Anritsu	MA2411B	0738174	AT	2011/11/07 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2012/03/27 * 12
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2011/10/28 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2012/02/24 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE/CE	2012/02/06 * 12
MJM-15	Measure	KOMELON	KMC-36	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE/CE	2012/04/06 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	RE/CE	2012/04/05 * 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
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE(EUT)	2012/02/06 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(3m)/sucoform141-PE(1m)/421-010(1.5m)/RFM-E321(Switcher)	-/00640	CE	2011/07/15 * 12
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2012/05/25 * 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	2012/03/29 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2012/05/21 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22 * 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