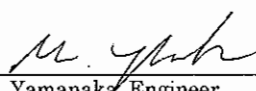
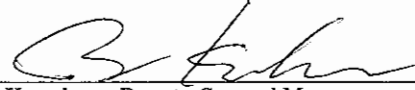


**MEASUREMENT/TECHNICAL REPORT
 FCC Part 15 Subpart C**

Issued: December 14th, 2007

Name and Address of the Applicant:	Konicaminolta Sensing, Inc. 3-91, Daisen, Nishimachi, Sakai-shi, Osaka 590-8551 Japan	
Test Item:	Spectrophotometer / AC Adapter	
Identification:	CM-600d / CM-A305	
Serial No.:	10010003 / G264	
Sample No.:	1	
FCC ID:	---	
Sample Receipt Date:	November 12 th , 2007	
Test Specification:	CFR 47 Part.15 Subpart C 15.247	
Date of Testing:	December 4 th - 13 th , 2007	
Test Result:	PASS	
Report Prepared by:	Cosmos Corporation 2-3571 Ohnogi, Watarai-cho, Watarai-gun, Mie, Japan 516-2102 Phone: +81-596-63-0707 Fax: +81-596-63-0777	
Tested by:	 M. Yamanaka, Engineer	December 14 th , 2007 Date
Reviewed by:	 Y. Kawahara, Deputy General Manager	December 14 th , 2007 Date
Notes:	<ol style="list-style-type: none"> 1. This report should not be reproduced except in full, without the written approval of Cosmos Corporation. 2. All measurement data contained in this report may have uncertainty. A judgment for the limitation should be taken into the count. 3. The report in this report apply only to the sample tested. 	

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1. Description of Equipment Under Test

1.1 Product Description

Manufacturer : Konicaminolta Sensing, Inc.
Model (referred to as the EUT) : CM-600d
Nominal Voltage : 2A, 5Vdc (AC Adapter).5V[?]4 (Batteries)
Type of Modulation : PQUP 1009ZA
Mode of Operation : duplex 1/2 duplex simplex other
The type of the equipment : Stand-alone Combined Equipment
 Plug -In Card Other (Module Unit)
The type of the antenna : Integral external Other
The type of power source : AC mains Dedicated AC adapter (V)
 DC Voltage Battery
The type of battery (if applicable) : N/A
Type of Operation : Continuous Burst Intermittent
Stand by Mode : Available N/A
Intended functions : Bluetooth spectrophotometer
The bandwidth of the IF filters : N/A
Method of Communication Link : Software to make maximum speed transmitting
The operating frequency band : 2.402 to 2.480 MHz
The thermal limitation : Not specified

Note: The difference between CM-700d and CM-600d is only a switch to change the lens position.
CM-700d has this switch and CM-600d does not.

1.2 Antenna Description

No.	Type Name	Gain	Antenna Type	Remarks
1	AHD1403-244ST01	0 dB	On board chip antenna	Originally Integrated.

2. General Information

2.1 Test Methodology

All measurement subject to the present report was carried out according to the procedures in ANSI C63.4: 2003.

2.2 Test Facility

All measurement was performed in the following facility;

Cosmos Corporation EMC Lab. Ohnogi

(2-3571 Ohaza-iwatachi, Ohnogi, Watarai-cho, Watarai-gun, Mie-ken 516-2102, Japan) The test firm has been filed since November 2, 2004 under CFR 47 Part.2.948.

2.3 Traceability

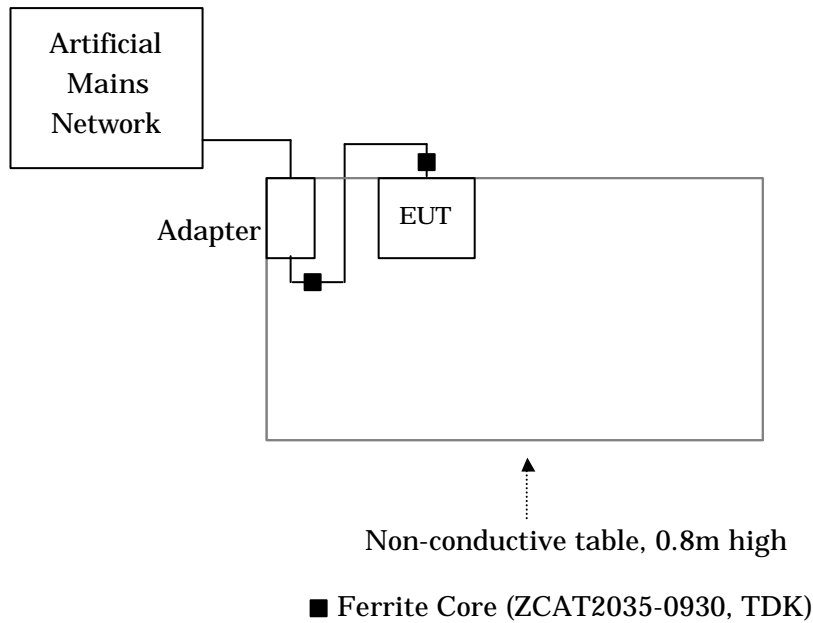
The calibration of measurement equipment used in the test subject to the present report is designed and operated to ensure that the measurement is traceable to national standards of measurement or equivalent abroad.

3. Summary of Test Results

Section	Test Item	Limit	Result
15. 207	AC Power Conducted Emission	See 5.1.2	Pass
15. 247(a)(1)	Spectrum Bandwidth of Frequency Hopping Spread Spectrum System	< 1MHz if using less than 15 non-overlapping channels	Pass
15. 247(a)(1)	Channel Separation	> 2/3 of 20dB BW for systems with output power < 125mW	Pass
15. 247(a)(1)	Number of Channels	> 15 channels	Pass
15. 247(a)(1)	Time of Occupancy	< 0.4 sec in 30 sec period	Pass
15. 247(b)	Maximum Peak Output Power	Max. 30dBm	Pass
15. 247(c)	Transmitter Radiated Emissions	20dB less than the peak value	Pass
15. 247(c)	Band Edge Measurement	See 5.7.2	Pass

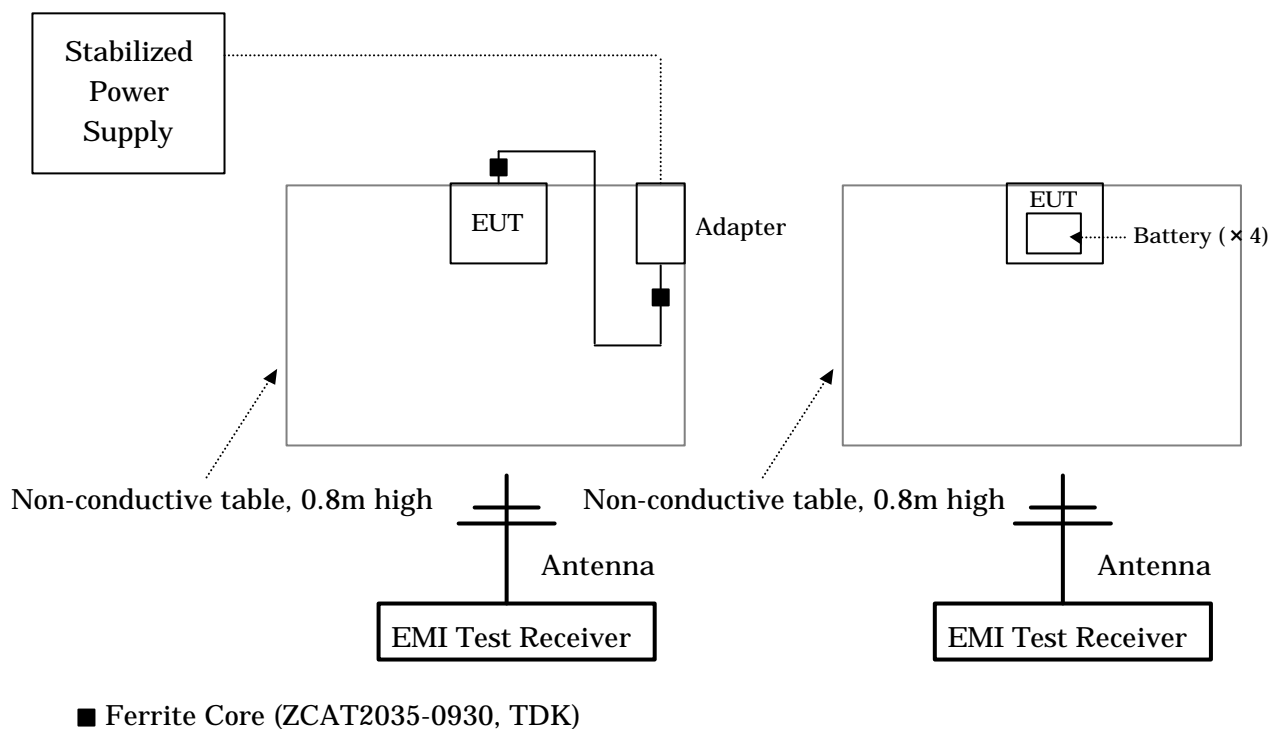
4. Test Configuration

4.1 15. 207 AC Power Conducted Emission in Shield Room

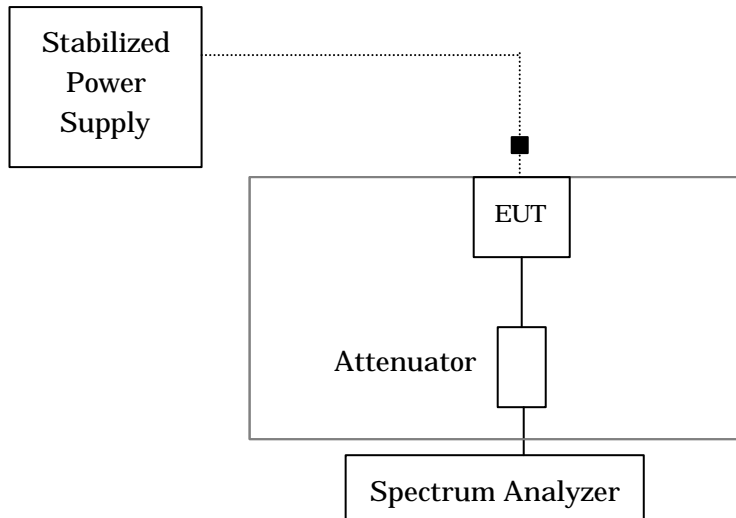


4.2 15. 247(c) Transmitter Radiated Emissions and Band Edge (Radiated) in 3m Anechoic Chamber

With AC Adapter

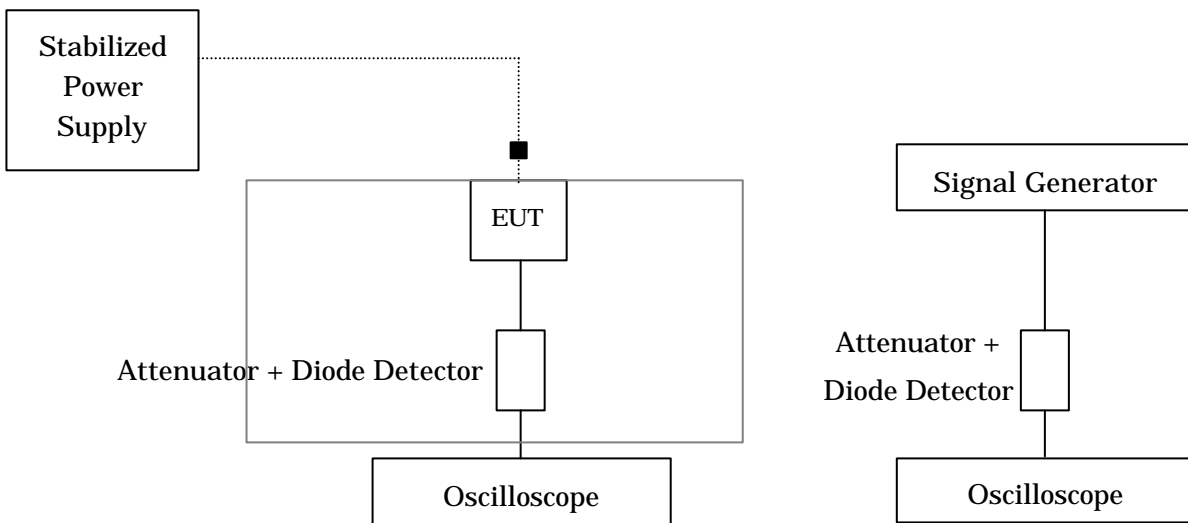


4.3 All Other Test Items (Except Maximum Peak Output Power)



■ Ferrite Core (ZCAT2035-0930, TDK)

4.4 Maximum Peak Output Power



■ Ferrite Core (ZCAT2035-0930, TDK)

4.5 Test Mode

In all test configurations above, EUT makes continuous RF transmitting with maximum power.

All conducted measurement is performed with an external stabilized power supply voltage varied between 85% and 115% of the nominal rated supply voltage in accordance with the section 15.31 (e) of the part.

5. Measurement Result

5.1 15. 207 AC Power Conducted Emission

5.1.1 Setting Remarks

- Configure the EUT System in accordance with ANSI C63.4-2003.
- A wooden test table (1.5m×1.0m, height 0.8m) is used.
- EUT's dedicated AC adapter connected to Artificial Mains Network (AMN).
- Other power cord of support equipment is connected to another AMN to isolate its emission from the measured emission of EUT.
- The measuring port of AMN for support equipment is terminated by the 500
- Activate the EUT System and run the software prepared for the test, if necessary.
- See test configuration figure 4.1.

5.1.2 Minimum Standard

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

5.1.3 Result

EUT complies with the requirement.

Uncertainty of measurement : ± 2.26 dB
 Temperature, Humidity : 23°C, 40%

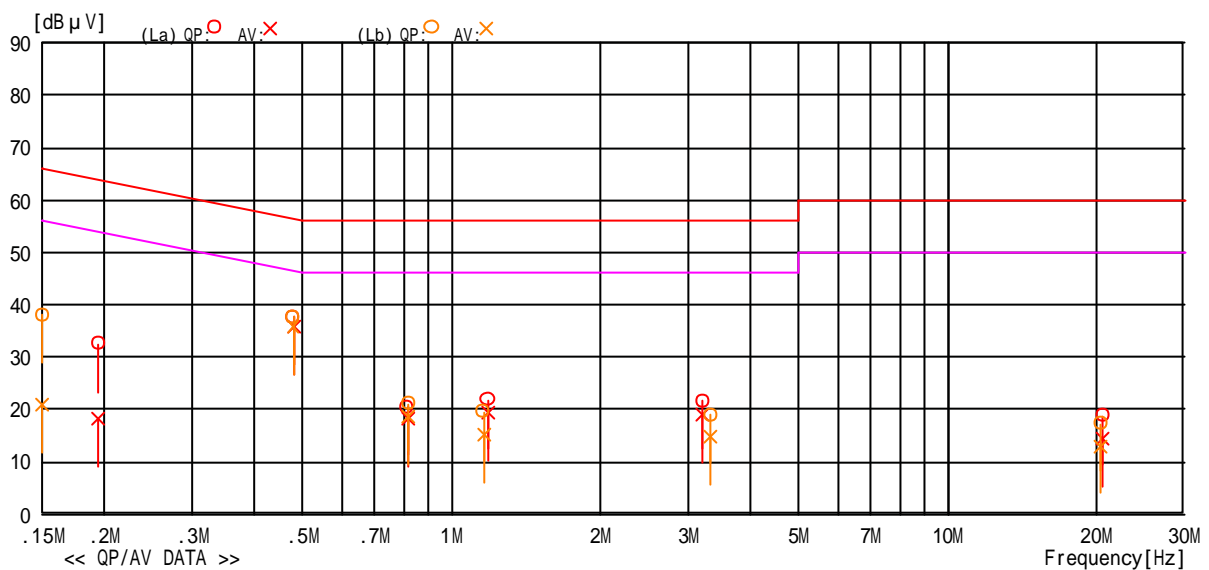
5.1.4 Measured Data

Measured Value Table

Model Name : CM-600d
 Serial No. : 10010007
 Operator : M.Yamanaka
 Power Supply : AC 120V,60Hz
 Memo : RBW:9kHz(150k-30MHz)

Job No : CJ07-060626E
 Temp/Humi : 23 /40%
 Condition : CH39 (2440MHz)
 Remark : Firm Ver.1.0005BT

LIMIT : FCC 15.207(QP)
 FCC 15.207(AV)



No	Freq. [MHz]	Reading Level		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		QP	AV		QP	AV	QP	AV	QP	AV		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.19447	22.4	8.2	10.1	32.5	18.3	63.8	53.8	31.3	35.5	La	
2	0.48020	27.5	25.7	10.1	37.6	35.8	56.3	46.3	18.7	10.5	La	
3	0.81635	10.3	8.2	10.1	20.4	18.3	56.0	46.0	35.6	27.7	La	
4	1.18630	11.7	9.3	10.1	21.8	19.4	56.0	46.0	34.2	26.6	La	
5	3.20650	11.4	8.9	10.2	21.6	19.1	56.0	46.0	34.4	26.9	La	
6	20.49290	7.6	3.2	11.1	18.7	14.3	60.0	50.0	41.3	35.7	La	
7	0.15000	27.8	10.7	10.2	38.0	20.9	66.0	56.0	28.0	35.1	Lb	
8	0.48000	27.5	25.7	10.1	37.6	35.8	56.3	46.3	18.7	10.5	Lb	
9	0.82180	11.0	8.5	10.1	21.1	18.6	56.0	46.0	34.9	27.4	Lb	
10	1.16260	9.4	5.1	10.1	19.5	15.2	56.0	46.0	36.5	30.8	Lb	
11	3.33250	8.8	4.5	10.2	19.0	14.7	56.0	46.0	37.0	31.3	Lb	
12	20.36210	6.3	2.1	11.0	17.3	13.1	60.0	50.0	42.7	36.9	Lb	

5.2 15. 247(a)(1) Spectrum Bandwidth and Channel Separation of Frequency Hopping Spread Spectrum System

5.2.1 Setting Remarks

- The both side of 20dB down value from peak power are measured by using delta-maker function of the spectrum analyzer.
- The spectrum analyzer is set-up as following;

/// Frequency Span	: 10 MHz
/// Resolution bandwidth	: 30 kHz
/// Video bandwidth	: 30 kHz
/// Sweep	: Auto
/// Detector function	: Peak
/// Trace Mode	: Max Hold

- See test configuration figure 4.3.

5.2.2 Minimum Standard

The maximum permissible 20dB bandwidth is 1MHz, unless more than 15 non-overlapping channels are employed.

Frequency hopping systems operating in the 2402-2480 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

5.2.3 Result

EUT complies with the requirement.

Uncertainty of measurement	: ± 1.2 dB
Temperature, Humidity	: 23°C, 40%

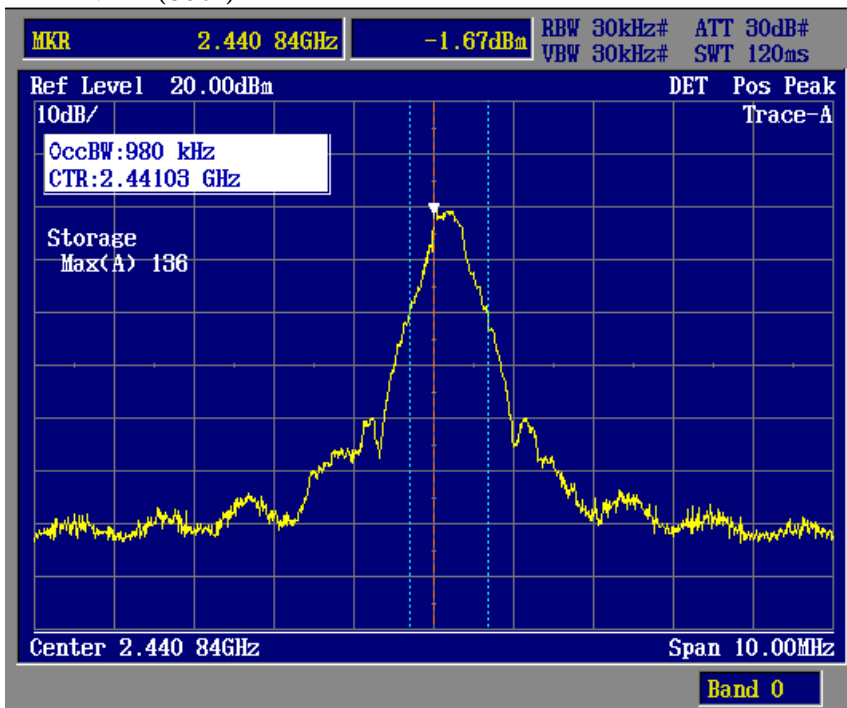
5.2.4 Measured Data

Frequency (MHz)	Measured Bandwidth (kHz)	Limit (MHz)
20 dB band width		
2402 (1ch)	990	< 1
2441 (39ch)	980	< 1
2480 (78ch)	980	< 1
Channel separation		
Hopping channel	830	

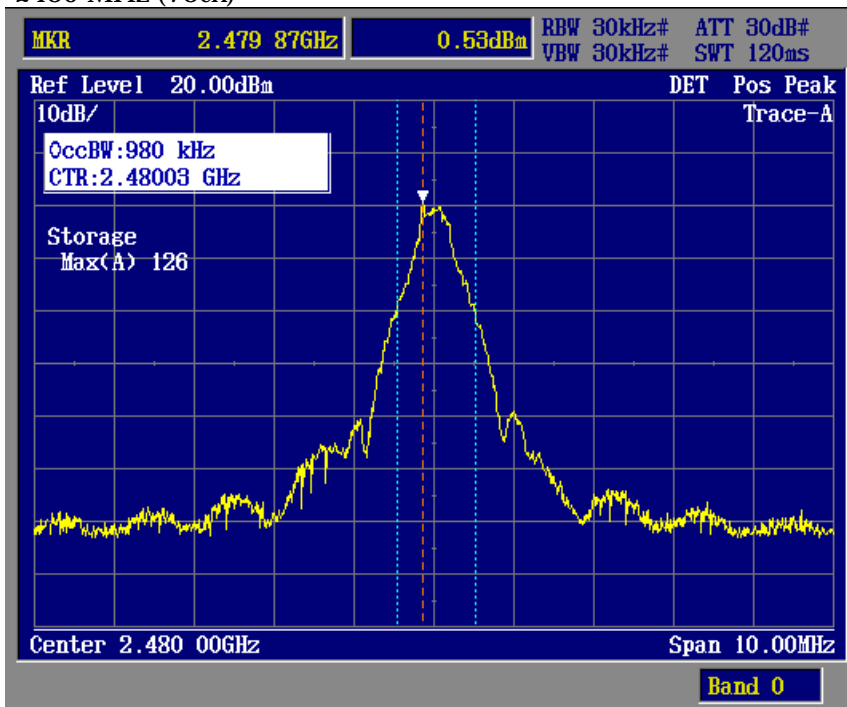
2402 MHz (1ch)



2441 MHz (39ch)



2480 MHz (78ch)



Channel Separation



5.3 15. 247(b) Maximum Peak Output Power

5.3.1 Setting Remarks

- See test configuration figure 4.4.
- The maximum peak output power is measured as following;
 1. The diode detector is inserted between EUT and the oscilloscope.
 2. The oscilloscope is used to read the peak response of the detector.
 3. Replaced EUT by the signal generator (SG).
 4. Adjusted the frequency of SG to the fundamental frequency.
 5. Adjusted the amplitude of SG to be the same peak recorded in 2.
- The oscilloscope is set-up as following;

∞ Voltage level range	: 10 mV / Div
∞ Sampling time	: 1.00GS / s
∞ Function	: Peak search

5.3.2 Minimum Standard

The maximum peak output power shall not exceed 1 watt. If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.3.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 0.5 dB
Temperature, Humidity : 25°C, 40%

5.3.4 Measured Data

(Normal Rated Voltage, 5.0 VDC)

Frequency (MHz)	Peak Power (dBm)	Limit (dB)	Margin (dB)
2402 (1ch)	2.04	30	27.96
2441 (39ch)	2.28	30	27.72
2480 (78ch)	2.85	30	27.15

(High-varied voltage, 5.75 VDC)

Frequency (MHz)	Peak Power (dBm)	Limit (dB)	Margin (dB)
2402 (1ch)	2.05	30	27.95
2441 (39ch)	2.29	30	27.71
2480 (78ch)	2.85	30	27.15

(Low-varied voltage, 4.25 VDC)

Frequency (MHz)	Peak Power (dBm)	Limit (dB)	Margin (dB)
2402 (1ch)	2.03	30	27.97
2441 (39ch)	2.28	30	27.72
2480 (78ch)	2.84	30	27.16

5.4 15. 247(c) Transmitter Radiated Emissions (Conducted)

5.4.1 Setting Remarks

- EUT directly connects to the spectrum analyzer via calibrated coaxial cable and a suitable attenuator.
- The Spectrums are scanned from the lowest generated frequency of EUT up to the 10th harmonics by using the spectrum analyzer.
- The spectrum analyzer is set-up as following;

/// Resolution bandwidth	: 100 kHz
/// Video bandwidth	: 100 kHz
/// Sweep	: Auto
/// Detector function	: Peak
/// Trace Mode	: Max Hold

- See test configuration figure 4.3.

5.4.2 Minimum Standard

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

5.4.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 0.8 dB
 Temperature, Humidity : 23°C, 40%

5.4.4 Measured Data (No emission exceeding the 20dB limit was found)

2402 MHz (1ch)



2441 MHz (39ch)



2480 MHz (78ch)



5.5 15. 247(c) Transmitter Radiated Emissions (Radiated)**5.5.1 Setting Remarks**

- The data lists in “5.5.4 Measured Data “ list the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, plus the limit.
- In the frequency range between 30MHz to 25 GHz (as 10th harmonics), the Electric Field Strength is measured in accordance with ANSI C63.4: 2003 and CISPR22: 1997.
- The test setup is made in accordance with ANSI C63.4: 2003.
- The antenna is measured at 1-4m height.
- The EUT is placed on the non-conductive table in the center of turntable. The height of this table is 0.8m.
- The measurement is carried out with both horizontal and vertical antenna polarization.
- The highest radiation from the equipment is recorded.
- By varying the configuration of the test sample and the cable routing, it is attempted to maximize the emission.
- The test receiver with Quasi Peak and Average detector is in compliance with CISPR 16-1:1993.
- The spectrum analyzer is set-up as following;

Note: Angle 1~3 : Refer to page 48 and 49, Appendix A

(Frequency range : 30 - 1000 MHz)

Resolution bandwidth : 100 kHz
Video bandwidth : 300 kHz
Detector function : Peak
Trace Mode : Max Hold

(Frequency range : Above 1000 MHz)

Resolution bandwidth : 1 MHz
Video bandwidth : 1 MHz
Detector function : Peak
Trace Mode : Max Hold

- EMI Test Receiver analyzer is set-up as following;

IF bandwidth : 120 kHz (Quasi-Peak Detector)
IF bandwidth : 1 MHz (Average Detector)

- See test configuration figure 4.2.
- Measurement distance : 3m

Note: The worst data is attached (Page 21 to 32).

5.5.2 Minimum Standard

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.5.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 3.28 dB

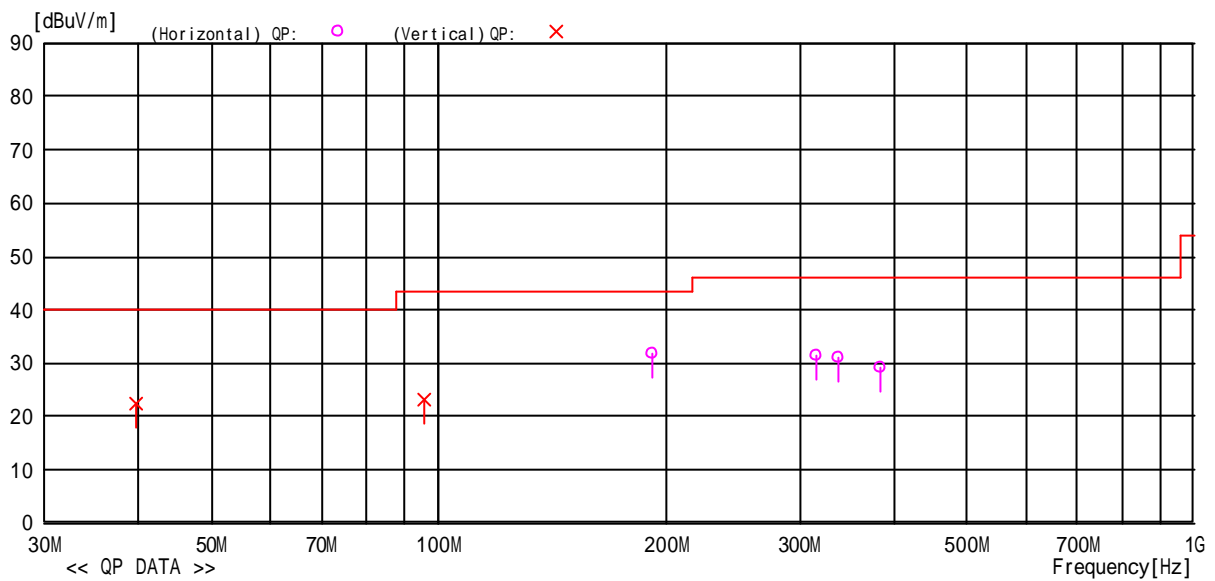
Temperature, Humidity : See each data table

5.4.4 Measured Data

30MHz to 1GHz, Channel 1

Model Name : CM-600d
 Serial No. : 10010007
 Operator : M. Yamanaka
 Power Supply : AC120V,60Hz
 Job No : CJ07-060626E
 Temp./Humi. : 22 /42%
 Condition : CH01 (2402MHz)
 Remark : Angle 1
 Memo : RBW: 30M ~ 1GHz (120kHz)

LIMIT : FCC 15.209 3m



No	Freq.	Reading	C.Fac	Result	Limit	Margin	Pola.	Height	Angle	Ant
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type
1	192.009	39.3	-7.7	31.6	43.5	11.9	Hori.	178	260	BC
2	315.857	37.1	-5.8	31.3	46.0	14.7	Hori.	100	218	LP
3	338.302	36.3	-5.3	31.0	46.0	15.0	Hori.	100	216	LP
4	384.023	33.8	-4.5	29.3	46.0	16.7	Hori.	100	210	LP
5	39.734	34.7	-12.4	22.3	40.0	17.7	Vert.	100	180	BC
6	95.706	36.9	-13.8	23.1	43.5	20.4	Vert.	100	112	BC

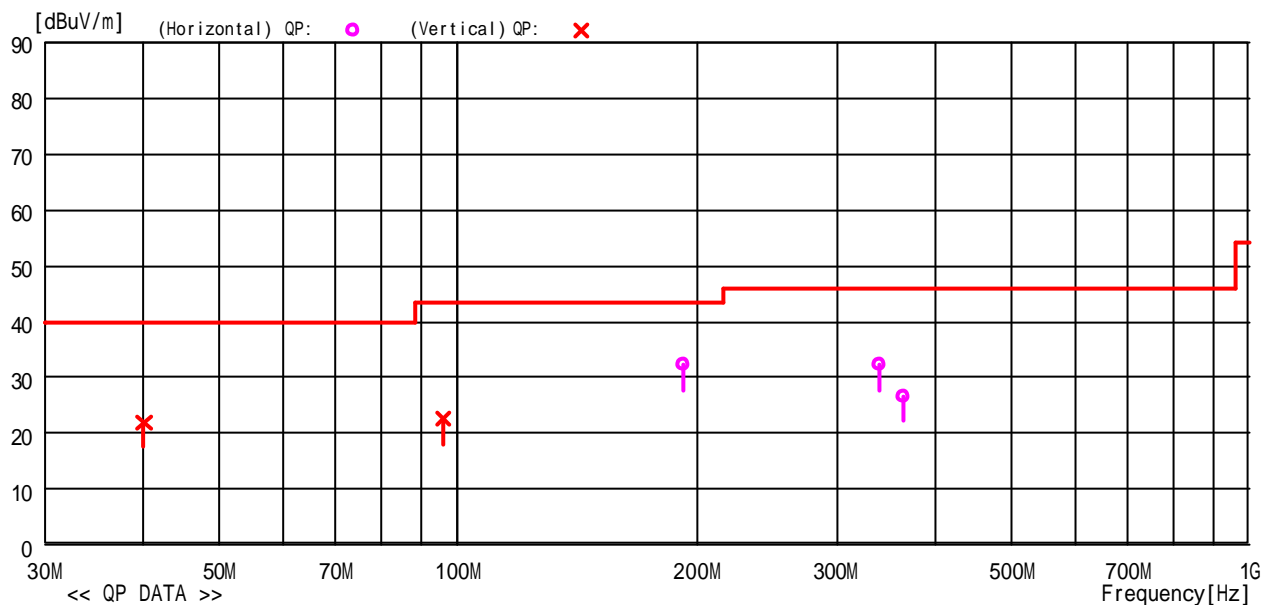
30MHz to 1GHz, Channel 39

Model Name : CM-600d
Serial No. : 10010007
Operator : M.Yamanaka
Power Supply : AC120V,60Hz

Job No : CJ07-060626E
Temp./Humi. : 22 /42%
Condition : CH39 (2441MHz)
Remark : Angle 1

Memo : RBW:30M~1GHz(120kHz)

LIMIT : FCC 15.209 3m



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type
1	191.998	39.9	-7.7	32.2	43.5	11.3	Hori.	181	305	BC
2	339.503	37.5	-5.3	32.2	46.0	13.8	Hori.	100	211	LP
3	364.624	31.6	-4.9	26.7	46.0	19.3	Hori.	100	219	LP
4	40.055	34.3	-12.4	21.9	40.0	18.1	Vert.	100	174	BC
5	95.516	36.3	-13.8	22.5	43.5	21.0	Vert.	100	162	BC

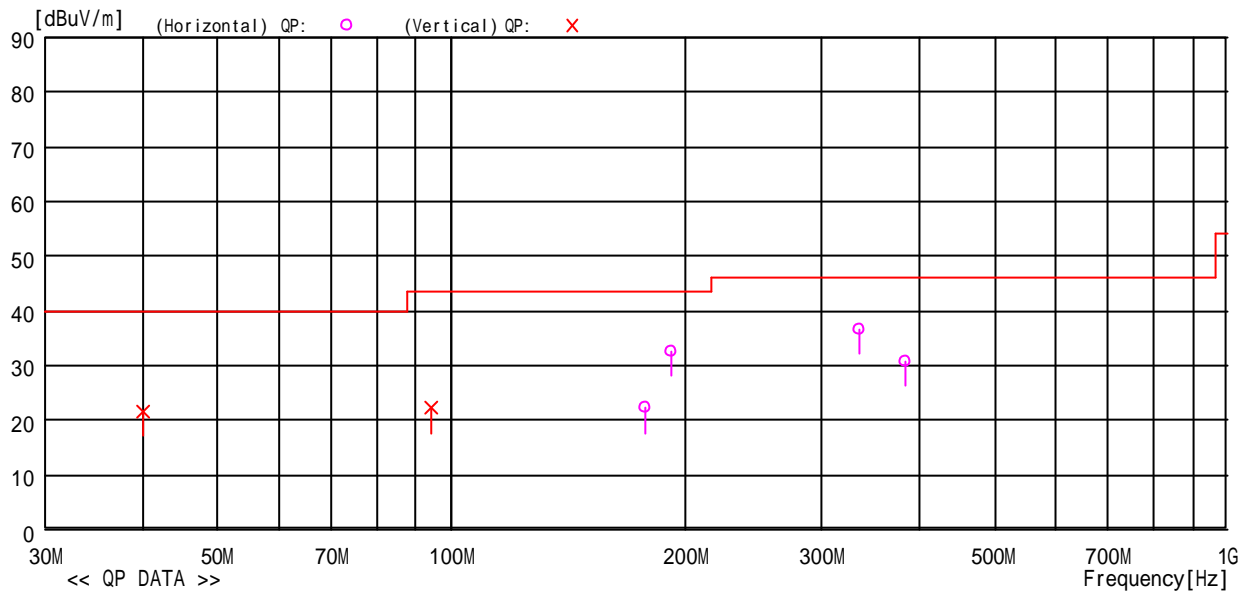
30MHz to 1GHz, Channel 78

Model Name : CM-600d
Serial No. : 10010007
Operator : M.Yamanaka
Power Supply : AC120V,60Hz

Job No : CJ07-060626E
Temp./Humi. : 22 /42%
Condition : CH78 (2480MHz)
Remark : Angle 1

Memo : RBW:30M~1GHz(120kHz)

LIMIT : FCC 15.209 3m



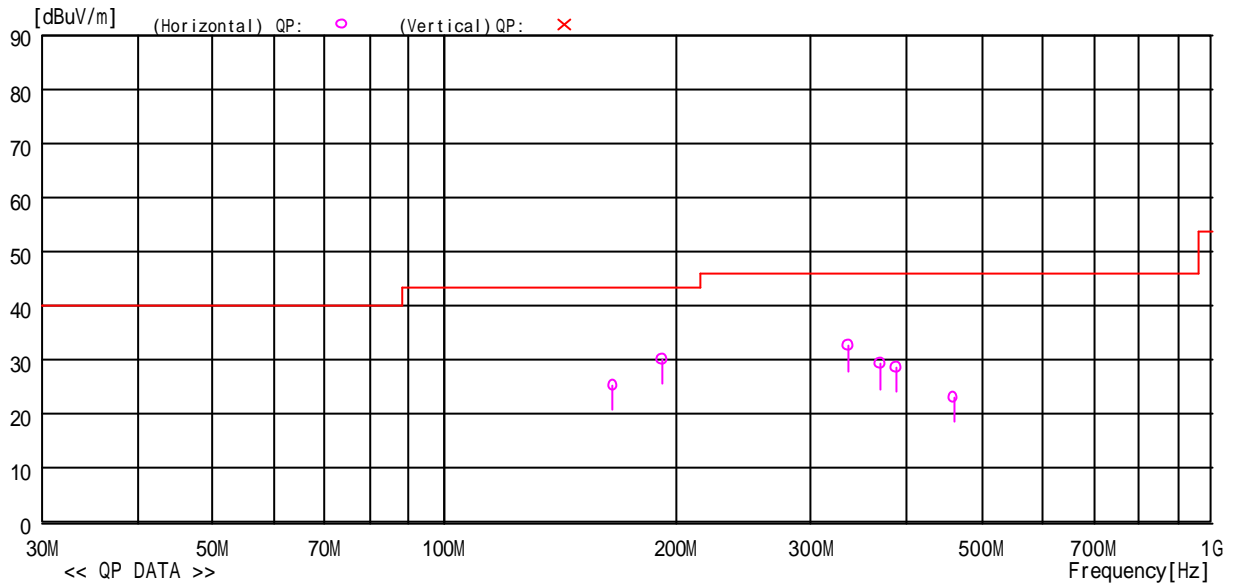
No	Freq.	Reading	C.Fac	Result	Limit	Margin	Pola.	Height	Angle	Ant
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type
1	177.750	31.6	-9.3	22.3	43.5	21.2	Hori.	187	296	BC
2	191.989	40.3	-7.7	32.6	43.5	10.9	Hori.	179	353	BC
3	335.997	42.1	-5.4	36.7	46.0	9.3	Hori.	100	212	LP
4	383.993	35.2	-4.5	30.7	46.0	15.3	Hori.	100	216	LP
5	40.085	34.1	-12.4	21.7	40.0	18.3	Vert.	100	168	BC
6	94.323	36.2	-13.9	22.3	43.5	21.2	Vert.	100	172	BC

30MHz to 1GHz, Channel 78 (Angle1)

Model Name : CM-600d
 Serial No. : 10010007
 Operator : M.Yamanaka
 Power Supply : DC 1.5V X 4 (Battery)
 Memo : RBW: 30M ~ 1GHz(120kHz)

Job No : CJ07-060626E
 Temp./Humi. : 22 /42%
 Condition : CH78 (2480MHz)
 Remark : Angle 1

LIMIT : FCC 15.209 3m



No	Freq.	Reading	C.Fac	Result	Limit	Margin	Pola.	Height	Angle	Ant
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type
1	165.906	35.0	-9.7	25.3	43.5	18.2	Hori.	127	170	BC
2	192.009	38.0	-7.7	30.3	43.5	13.2	Hori.	181	168	BC
3	336.027	38.0	-5.4	32.6	46.0	13.4	Hori.	100	15	LP
4	368.793	34.0	-4.7	29.3	46.0	16.7	Hori.	100	193	LP
5	387.610	33.1	-4.4	28.7	46.0	17.3	Hori.	100	193	LP
6	459.854	26.8	-3.7	23.1	46.0	22.9	Hori.	228	172	LP

* Only fundamental emissions were found.

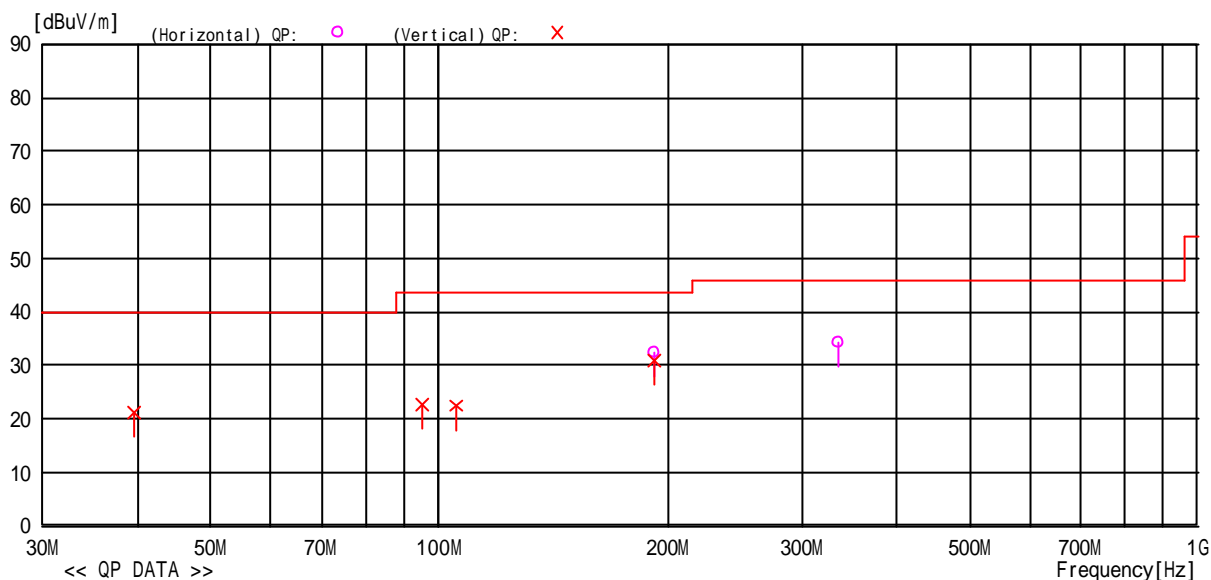
30MHz to 1GHz, Channel 78 (Angle2)

Model Name : CM-600d
 Serial No. : 10010007
 Operator : M.Yamanaka
 Power Supply : AC120V,60Hz

Job No : CJ07-060626E
 Temp./Humi. : 22 /42%
 Condition : CH78 (2480MHz)
 Remark : Angle 2

Memo : RBW:30M ~ 1GHz(120kHz)

LIMIT : FCC 15.209 3m



No	Freq.	Reading	C.Fac	Result	Limit	Margin	Pola.	Height	Angle	Ant
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type
1	191.979	40.1	-7.7	32.4	43.5	11.1	Hori	100	128	RC
2	335.987	39.7	-5.4	34.3	46.0	11.7	Hori	100	95	LP
3	39.694	33.6	-12.3	21.3	40.0	18.7	Vert.	100	176	BC
4	94.835	36.6	-13.9	22.7	43.5	20.8	Vert.	100	87	BC
5	105.466	35.8	-13.3	22.5	43.5	21.0	Vert.	100	134	BC
6	191.989	38.6	-7.7	30.9	43.5	12.6	Vert.	100	346	BC

* Only fundamental emissions were found.

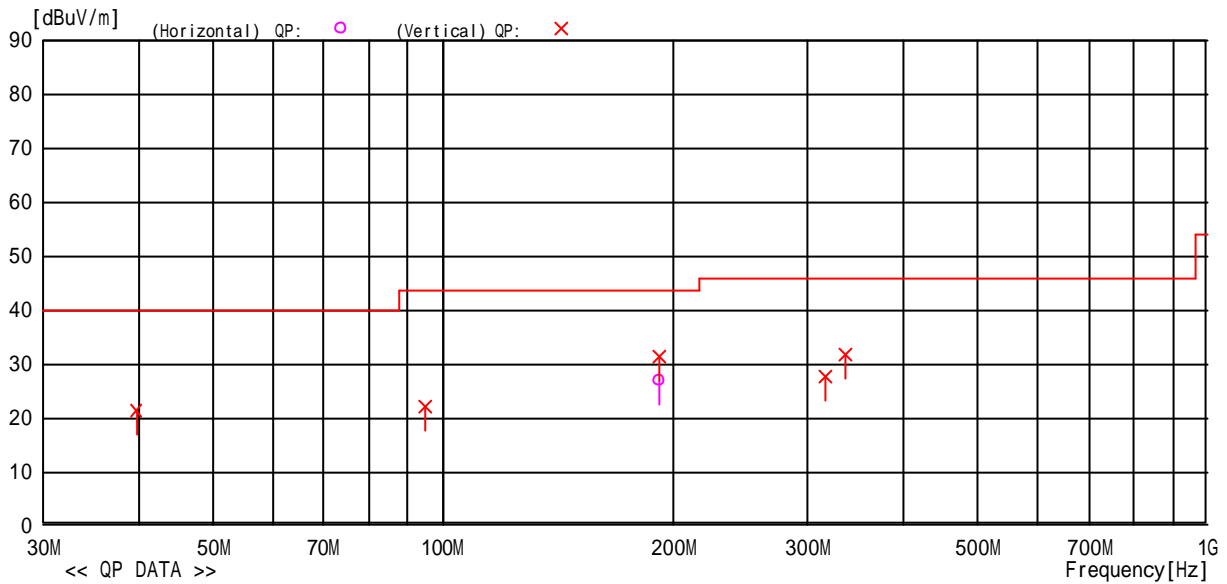
30MHz to 1GHz, Channel 78 (Angle3)

Model Name : CM-600d
Serial No. : 10010007
Operator : M.Yamanaka
Power Supply : AC120V,60Hz

Job No : CJ07-060626E
Temp./Humi. : 22 /42%
Condition : CH78 (2480MHz)
Remark : Angle 3

Memo : RBW:30M~1GHz(120kHz)

LIMIT : FCC 15.209 3m



No	Freq.	Reading	C.Fac	Result	Limit	Margin	Pola.	Height	Angle	Ant
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type
1	191.989	34.5	-7.7	26.8	43.5	16.7	Hori.	254	181	BC
2	39.765	33.7	-12.4	21.3	40.0	18.7	Vert.	100	165	BC
3	94.955	35.8	-13.8	22.0	43.5	21.5	Vert.	100	91	BC
4	191.999	39.1	-7.7	31.4	43.5	12.1	Vert.	100	234	BC
5	315.366	33.3	-5.8	27.5	46.0	18.5	Vert.	141	157	LP
6	336.007	37.0	-5.4	31.6	46.0	14.4	Vert.	140	182	LP

* Only fundamental emissions were found.

1GHz to 18GHz, Channel 78

CJ07-060626E RE 1G-18GHz TotalNoise06 FCC CM-600d 78CH.RED

RADIATED EMISSION

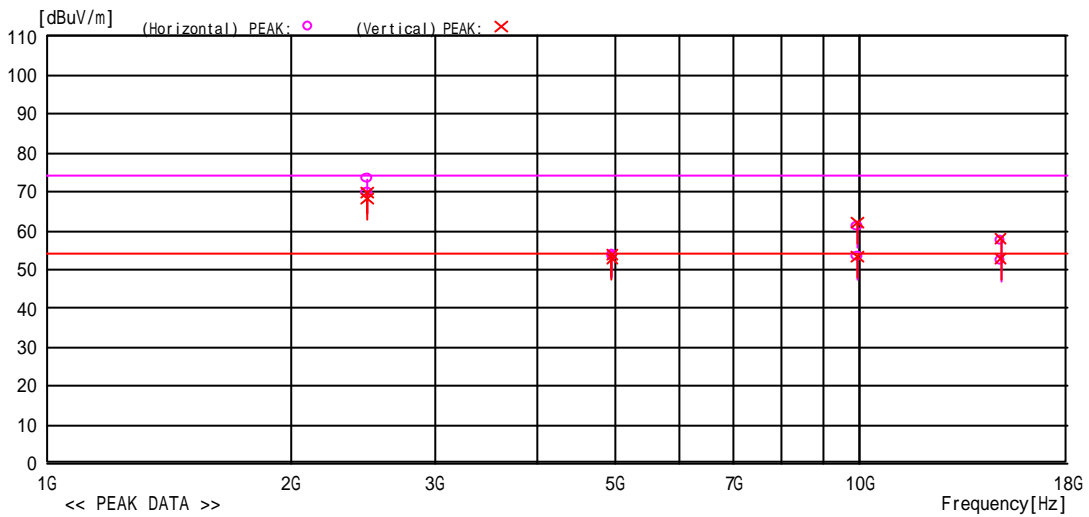
Cosmos Corporation Onoki Lab.

Model Name : CM-600d
Serial No. : 10010007
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ07-060626E
Temp/Humi : 26 /42%
Condition : CH78 (2480MHz)
Remark : Angle 1 Firm Ver.1.0005BT

Memo : RBW:1GHz ~ (1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	2480.169	71.5	-1.6	69.9	54.0	-15.9	Hori.	161	41	HRN	AV Fundamental Frequency
2	2480.169	74.9	-1.6	73.3	54.0	-19.3	Hori.	161	41	HRN	PK Fundamental Frequency
3	4960.313	47.7	5.8	53.5	54.0	0.5	Hori.	100	120	HRN	AV
4	4960.313	47.9	5.8	53.7	54.0	0.3	Hori.	100	120	HRN	PK
5	9919.384	46.4	14.7	61.1	54.0	-7.1	Hori.	100	148	HRN	PK
6	9919.384	38.4	14.7	53.1	54.0	0.9	Hori.	100	148	HRN	AV
7	4879.080	34.0	18.5	52.5	54.0	1.5	Hori.	149	68	HRN	AV Freq:14879.080MHz
8	4879.080	38.9	18.5	57.4	54.0	-3.4	Hori.	149	68	HRN	PK Freq:14879.080MHz
9	2480.134	69.8	-1.6	68.2	54.0	-14.2	Vert.	100	79	HRN	AV Fundamental Frequency
10	2480.134	71.6	-1.6	70.0	54.0	-16.0	Vert.	100	79	HRN	PK Fundamental Frequency
11	4960.343	47.2	5.8	53.0	54.0	1.0	Vert.	113	75	HRN	AV
12	4960.343	48.1	5.8	53.9	54.0	0.1	Vert.	113	75	HRN	PK
13	9919.424	38.8	14.7	53.5	54.0	0.5	Vert.	130	118	HRN	AV
14	9919.424	47.3	14.7	62.0	54.0	-8.0	Vert.	130	118	HRN	PK
15	4881.060	34.2	18.5	52.7	54.0	1.3	Vert.	100	55	HRN	AV Freq:14881.060MHz
16	4881.060	39.3	18.5	57.8	54.0	-3.8	Vert.	100	55	HRN	PK Freq:14881.060MHz

-TEPTO-DV/RE Ver1.80.0020

* Fundamental frequency

18GHz to 26.5GHz, Channel 78

CJ07-060626E RE 18G-26.5GHz TotalNoise02 FCC CM-600d 78CH.RED

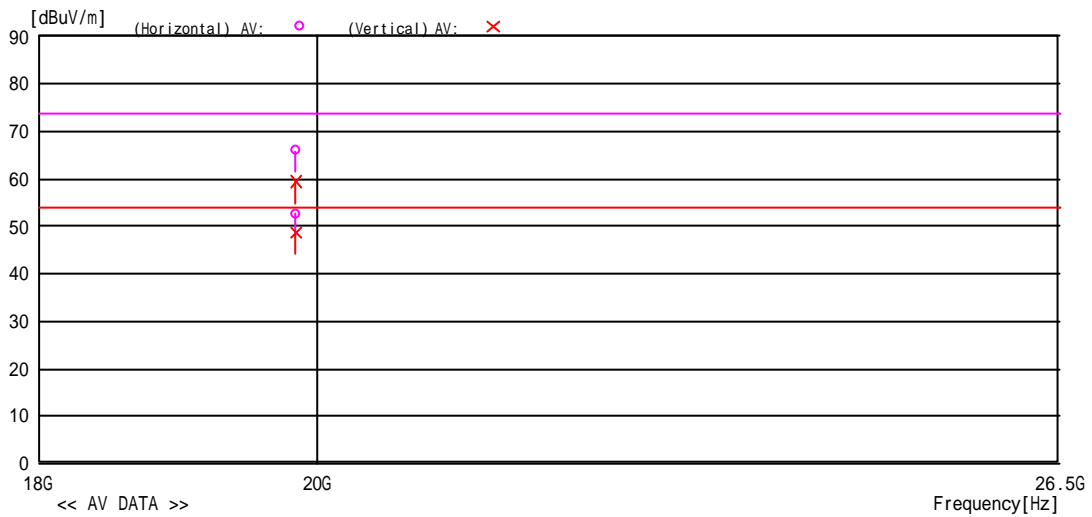
RADIATED EMISSION

Cosmos Corporation Onoki Lab.

Model Name : CM-600d
Serial No. : 10010007
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz
Memo : RBW:1G~ (1MHz)

Job No : CJ07-060626E
Temp/Humi : 26 , 41%
Condition : CH78 (2480MHz)
Remark : Angle1 Firm Ver.1.0005BT

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	9845.020	45.3	20.5	65.8	54.0	-11.8	Hori	100	323	HRN	PK Freq:19845.020MHz
2	9845.020	32.0	20.5	52.5	54.0	1.5	Hori	100	323	HRN	AV Freq:19845.020MHz
3	9844.560	28.2	20.5	48.7	54.0	5.3	Vert.	103	12	HRN	AV Freq:19844.560MHz
4	9844.560	38.9	20.5	59.4	54.0	-5.4	Vert.	103	12	HRN	PK Freq:19844.560MHz

-TEPTO-DV/Ver 1.80.0020

1GHz to 18GHz, Channel 39

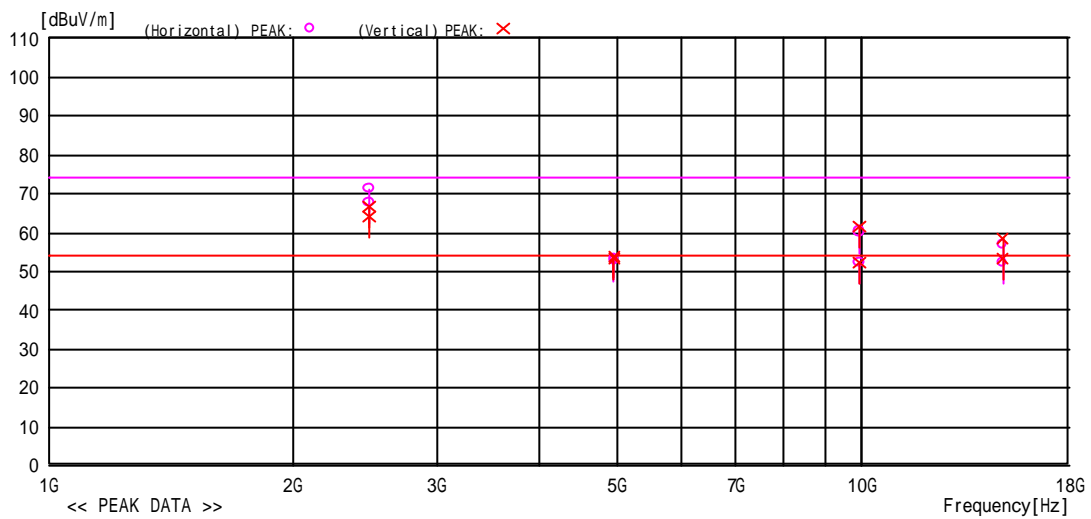
CJ07-060626E RE 1G-18GHz TotalNoise FCC CM-600d 39CH Angle1.RED

RADIATED EMISSION

Cosmos Corporation Onoki Lab.

Model Name	: CM-600d	Job No.	: CJ07-060626E
Serial No.	: 10010007	Temp/Humi	: 26 / 42%
Operator	: M.Yamanaka	Condition	: CH39 (2440MHz)
Power Supply	: AC 120V, 60Hz	Remark	: Angle 1 Firm Ver.1.0005BT
Memo	: RBW:1GHz ~ (1MHz)		

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pol. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	2480.120	69.3	-1.6	67.7	54.0	-13.7	Hori.	148	63	HRN	AV Fundamental Frequency
2	2480.120	72.8	-1.6	71.2	54.0	-17.2	Hori.	148	63	HRN	PK Fundamental Frequency
3	4960.028	47.0	5.8	52.8	54.0	1.2	Hori.	102	141	HRN	AV
4	4960.028	47.5	5.8	53.3	54.0	0.7	Hori.	102	141	HRN	PK
5	9919.284	37.8	14.7	52.5	54.0	1.5	Hori.	100	158	HRN	AV
6	9919.284	45.6	14.7	60.3	54.0	-6.3	Hori.	100	158	HRN	PK
7	4880.520	33.8	18.5	52.3	54.0	1.7	Hori.	100	56	HRN	AV Freq:14880.520MHz
8	4880.520	38.3	18.5	56.8	54.0	-2.8	Hori.	100	56	HRN	PK Freq:14880.520MHz
9	2479.987	65.9	-1.6	64.3	54.0	-10.3	Vert.	100	79	HRN	AV Fundamental Frequency
10	2479.987	68.3	-1.6	66.7	54.0	-12.7	Vert.	100	79	HRN	PK Fundamental Frequency
11	4960.562	48.1	5.8	53.9	54.0	0.1	Vert.	110	53	HRN	PK
12	4960.562	47.5	5.8	53.3	54.0	0.7	Vert.	110	53	HRN	AV
13	9919.423	46.9	14.7	61.6	54.0	-7.6	Vert.	132	118	HRN	PK
14	9919.423	37.5	14.7	52.2	54.0	1.8	Vert.	132	118	HRN	AV
15	4882.000	40.0	18.5	58.5	54.0	-4.5	Vert.	100	73	HRN	PK Freq:14882.000MHz
16	4882.000	34.7	18.5	53.2	54.0	0.8	Vert.	100	73	HRN	AV Freq:14882.000MHz

-TEPTO-DV/RE Ver1.80.0020

18GHz to 26.5GHz, Channel 39

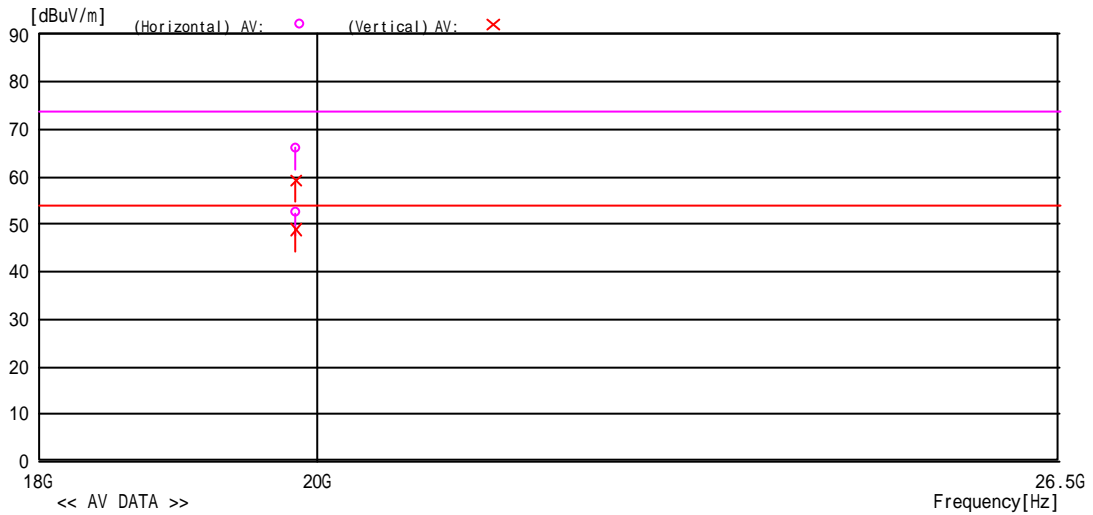
CJ07-060626E RE 18G-26.5GHz TotalNoise FCC CM-600d 39CH.RED

RADIATED EMISSION

Cosmos Corporation Onoki Lab.

Model Name	: CM-600d	Job No	: CJ07-060626E
Serial No.	: 10010007	Temp/Humi	: 26 ,41%
Operator	: M.Yamanaka	Condition	: CH39 (2440MHz)
Power Supply	: AC 120V , 60Hz	Remark	: Angle1 Firm Ver.1.0005BT
Memo	: RBW:1G ~ (1MHz)		

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pol. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	19847.300	31.8	20.5	52.3	54.0	1.7	Hori.	100	314	HRN	AV Freq:19847.300MHz
2	19847.300	45.5	20.5	66.0	54.0	-12.0	Hori.	100	314	HRN	PK Freq:19847.300MHz
3	19844.440	28.3	20.5	48.8	54.0	5.2	Vert.	100	174	HRN	AV Freq:19844.440MHz
4	19844.440	38.7	20.5	59.2	54.0	-5.2	Vert.	100	174	HRN	PK Freq:19844.440MHz

-TEPT0-DV/Ver 1.80.0020

1GHz to18GHz, Channel 1

CJ07-060626E RE 1G-18GHz TotalNoise FCC CM-600d 1CH Angle1.RED

RADIATED EMISSION

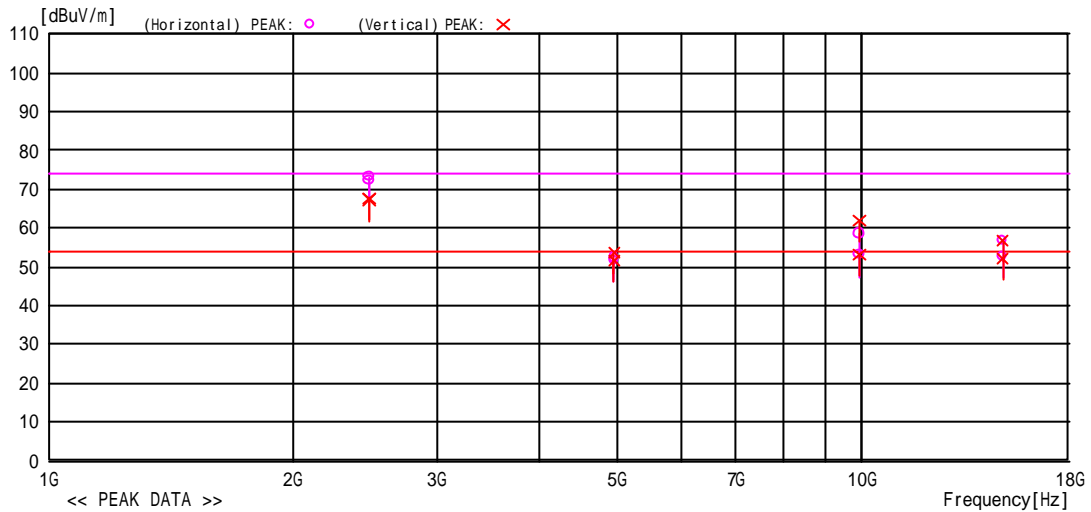
Cosmos Corporation Onoki Lab.

Model Name : CM-600d
Serial No. : 10010007
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ07-060626E
Temp/Humi : 20 /46%
Condition : CH1 (2402MHz)
Remark : Angle 1 Firm Ver.1.0005BT

Memo : RBW:1GHz ~ (1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)



No	Freq.	Reading	C.Fac	Result	Limit	Margin	Pol.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	2480.023	74.8	-1.6	73.2	54.0	-19.2	Hori.	150	56	HRN	PK Fundamental Frequency
2	2480.023	73.8	-1.6	72.2	54.0	-18.2	Hori.	150	56	HRN	AV Fundamental Frequency
3	4959.989	46.6	5.8	52.4	54.0	1.6	Hori.	100	130	HRN	PK
4	4959.989	45.9	5.8	51.7	54.0	2.3	Hori.	100	130	HRN	AV
5	9919.303	38.2	14.7	52.9	54.0	1.1	Hori.	100	161	HRN	AV
6	9919.303	43.9	14.7	58.6	54.0	-4.6	Hori.	100	161	HRN	PK
7	4880.460	34.2	18.5	52.7	54.0	1.3	Hori.	100	62	HRN	AV Freq:14880.460MHz
8	4880.460	38.3	18.5	56.8	54.0	-2.8	Hori.	100	62	HRN	PK Freq:14880.460MHz
9	2480.002	68.9	-1.6	67.3	54.0	-13.3	Vert.	100	80	HRN	AV Fundamental Frequency
10	2480.002	69.3	-1.6	67.7	54.0	-13.7	Vert.	100	80	HRN	PK Fundamental Frequency
11	4960.268	45.8	5.8	51.6	54.0	2.4	Vert.	108	68	HRN	AV
12	4960.268	47.8	5.8	53.6	54.0	0.4	Vert.	108	68	HRN	PK
13	9919.465	38.6	14.7	53.3	54.0	0.7	Vert.	125	123	HRN	AV
14	9919.465	47.2	14.7	61.9	54.0	-7.9	Vert.	125	123	HRN	PK
15	4881.980	33.7	18.5	52.2	54.0	1.8	Vert.	100	69	HRN	AV Freq:14881.980MHz
16	4881.980	38.1	18.5	56.6	54.0	-2.6	Vert.	100	69	HRN	PK Freq:14881.980MHz

-TEPTO-DV/RE Ver1.80.0020

18GHz to26.5GHz, Channel 1

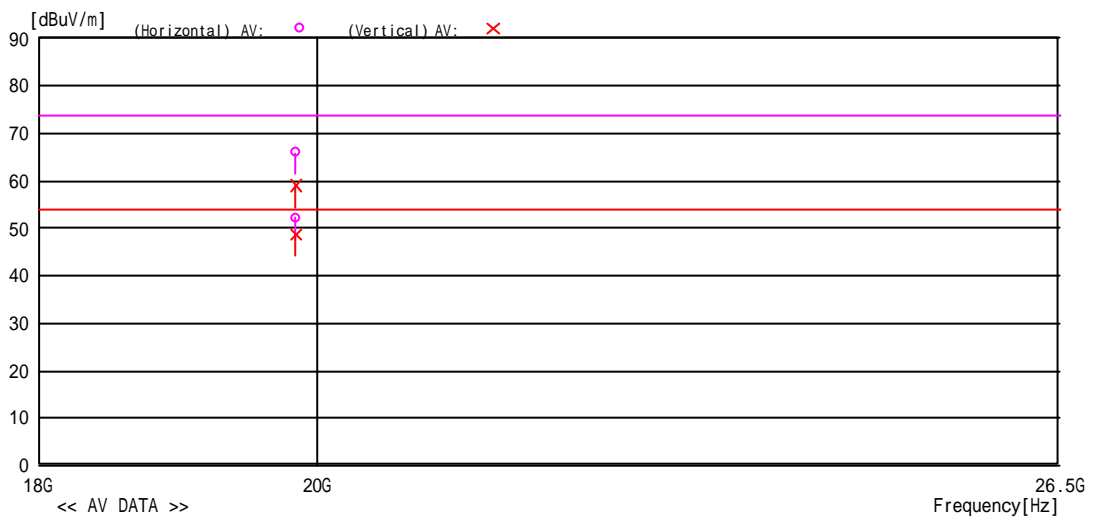
CJ07-060626E RE 18G-26.5GHz TotalNoise FCC CM-600d 1CH.RED

RADIATED EMISSION

Cosmos Corporation Onoki Lab.

Model Name	: CM-600d	Job No	: CJ07-060626E
Serial No.	: 10010007	Temp/Humi	: 26 ,41%
Operator	: M.Yamanaka	Condition	: CH1 (2402MHz)
Power Supply	: AC 120V , 60Hz	Remark	: Angle1 Firm Ver.1.0005BT
Memo	: RBW:1G ~ (1MHz)		

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pol. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	9847.000	31.7	20.5	52.2	54.0	1.8	Hori.	100	301	HRN	AV Freq:19847.000MHz
2	9847.000	45.3	20.5	65.8	54.0	-11.8	Hori.	100	301	HRN	PK Freq:19847.000MHz
3	9845.680	38.5	20.5	59.0	54.0	-5.0	Vert.	100	185	HRN	PK Freq:19845.680MHz
4	9845.680	28.2	20.5	48.7	54.0	5.3	Vert.	100	185	HRN	AV Freq:19845.680MHz

-TEPT0-DV/Ver 1.80.0020

5.6 15. 247(a)(1) Number of Channels and Time of Occupancy

5.6.1 Setting Remarks

- EUT directly connects to the spectrum analyzer via calibrated coaxial cable and a suitable attenuator.
- The Number of Channels is determined by using Max-hold of the spectrum shape of spectrum analyzer.
- Time of Occupancy is determined by using the marker-data function of spectrum analyzer.
- The spectrum analyzer is set-up as following to measure Number of Channels;

/ / Frequency Span	: 79 MHz
/ / Resolution bandwidth	: 1 MHz
/ / Video bandwidth	: 3 MHz
/ / Sweep Time	: Auto
/ / Detector function	: Peak
/ / Trace Mode	: Max Hold

- The spectrum analyzer is set-up as following to measure Time of Occupancy;

/ / Frequency Span	: 0 Hz
/ / Resolution bandwidth	: 30 kHz
/ / Video bandwidth	: 30 kHz
/ / Detector function	: Peak
/ / Trace Mode	: Max Hold

- See test configuration figure 4.3.

5.6.2 Minimum Standard

This frequency hopping system must employ minimum of 15 hopping channels.

The maximum permissible time of occupancy is 400 ms within the minimum time period required to hop through all channels.

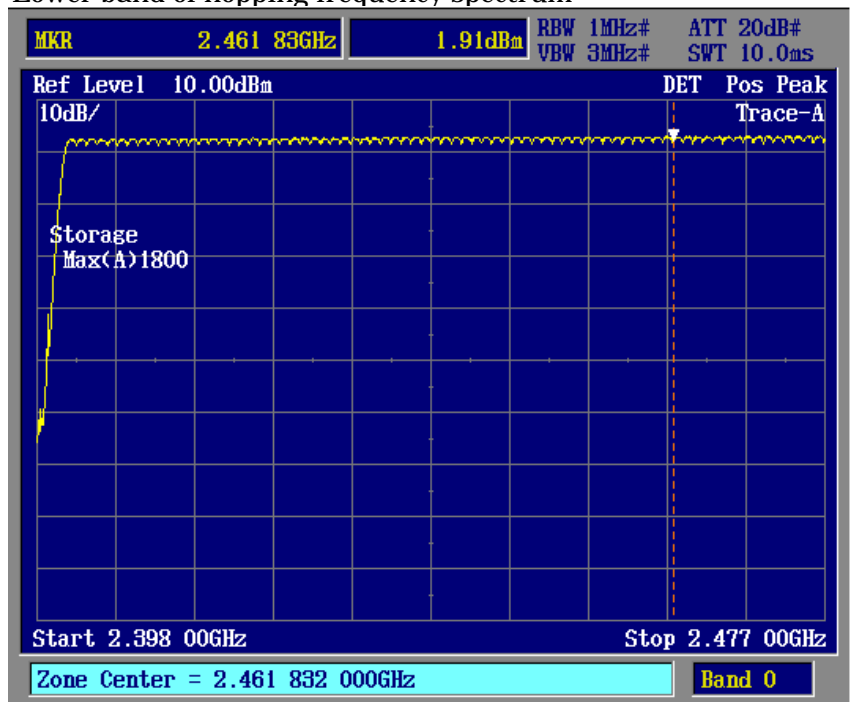
5.6.3 Result

EUT complies with the requirement.

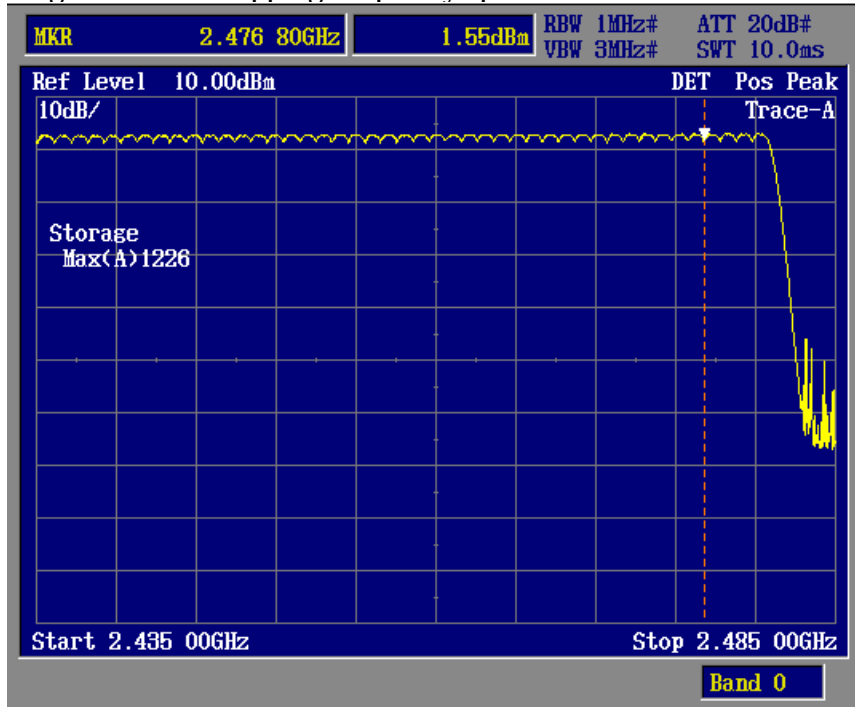
Uncertainty of measurement result: 1 usec
 Temperature, Humidity : 23°C, 40%

5.6.4 Measured Data

Lower band of hopping frequency spectrum

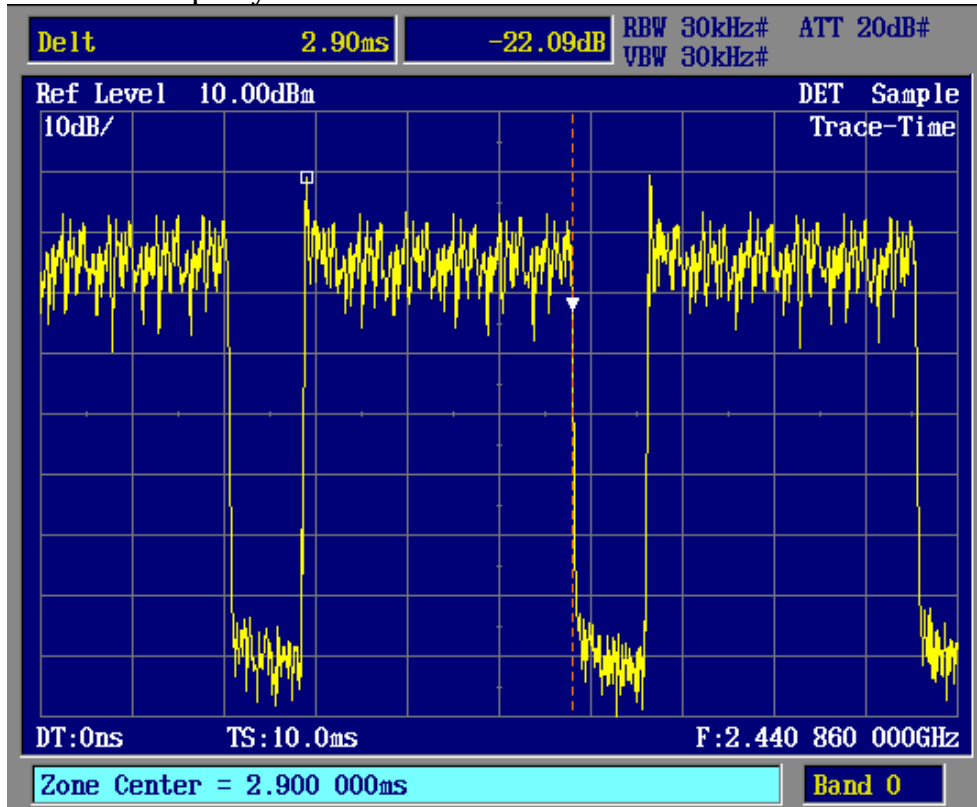


Higher band of hopping frequency spectrum



Number of observed channels	79
-----------------------------	----

Time of Occupancy



The dwell time within a 31.6sec period in data mode is 1 inside the packet type.

Channel Hopping Rate: 1600 hops / sec
 Number of channels: 79
 Time slot length: 2.9 msec

The calculation for a 31.6sec period is as follows;

Dwell time = time slot length x hoprate / number of channels x period time

Time of occupancy (dwell time) is as follows;

(DH5 Time slot Dwell time) = 2.9msec x (1600/(6x79)) x 31.6sec = 0.309sec

5.7 15. 247(c) Band Edge Measurement

5.7.1 Setting Remarks

- EUT directly connects to the spectrum analyzer via calibrated coaxial cable and 10 dB attenuator.
- The emission at the band edge is measured by using the marker function of spectrum analyzer.
- The peak of the in-band emission is measured by using the marker to peak function of spectrum analyzer.
- This measurement is repeated in both side of the spectrum.
- The spectrum analyzer is set-up as following;

- ~~///~~ Resolution bandwidth : Equal or less than 1% of frequency span
- ~~///~~ Video bandwidth : > RBW
- ~~///~~ Sweep : Auto
- ~~///~~ Detector function : Peak
- ~~///~~ Trace Mode : Max Hold

- Where bandedge spectrum is too rough to find precise edge point, larger RBW i.e. 1MHz, 3MHz shall be applied as severer condition.
- See test configuration figure 4.3.

5.7.2 Minimum Standard

In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits. Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:

Frequency of Emission (MHz)	Limit of the band edge spurious emission (dBμV)	
	Peak	Average
Below 2,390.0		
Above 2,483.5	74	54

5.7.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 2.6 dB
 Temperature, Humidity : 23°C, 40%

5.7.4 Measured Data

The band edge emissions are calculated as following;

(Angle 1)

Lower frequency 2,390 MHz (FH) Vertical		Higher frequency 2,483.5 MHz (FH) Vertical	
	Level (dBuV/m)		Level (dBuV/m)
P _{max}	77.38	P _{max}	74.55
P _{av}	73.51	P _{av}	71.15
P _{dev}	40.04	P _{dev}	36.11

	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)		Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
E _{be}	37.34	74.00	36.66	E _{be}	38.44	74.00	35.56
E _{av}	33.47	54.00	20.53	E _{av}	35.04	54.00	18.96

- P_{max} : Maximum peak power of the fundamental.
- P_{dev} : The amplitude delta between the peak power and the band edge emission.
- E_{be} : Band edge emission.
- E_{av} : Average of the band edge emission.

(Angle 2)

Lower frequency 2,390 MHz (FH) Vertical

	Level (dBuV/m)
P_{max}	76.62
P_{av}	73.72
P_{dev}	38.22

Higher frequency 2,483.5 MHz (FH) Vertical

	Level (dBuV/m)
P_{max}	70.25
P_{av}	58.45
P_{dev}	32.40

	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
E_{be}	38.40	74.00	35.60
E_{av}	35.50	54.00	18.50

	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
E_{be}	37.85	74.00	36.15
E_{av}	26.05	54.00	27.95

- P_{max} : Maximum peak power of the fundamental.
- P_{dev} : The amplitude delta between the peak power and the band edge emission.
- E_{be} : Band edge emission.
- E_{av} : Average of the band edge emission.

(Angle 3)

Lower frequency 2,390 MHz (FH) Vertical

	Level (dBuV/m)
P_{max}	79.02
P_{av}	72.14
P_{dev}	41.26

Higher frequency 2,483.5 MHz (FH) Vertical


	Level (dBuV/m)
P_{max}	77.05
P_{av}	69.92
P_{dev}	40.80

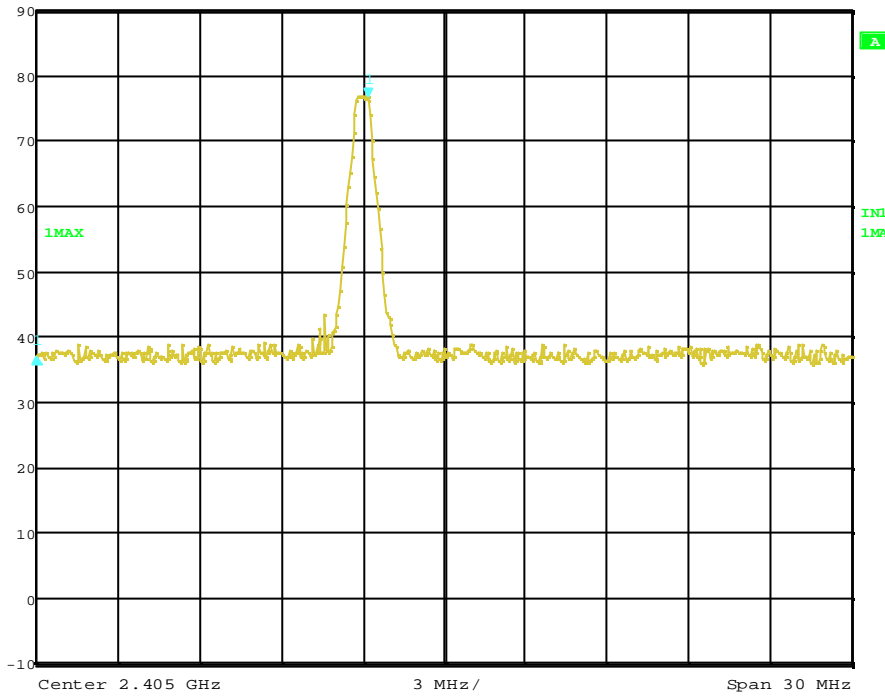
	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
E_{be}	37.76	74.00	36.24
E_{av}	30.88	54.00	23.12

	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
E_{be}	36.25	74.00	37.75
E_{av}	29.12	54.00	24.88

- P_{max} : Maximum peak power of the fundamental.
- P_{dev} : The amplitude delta between the peak power and the band edge emission.
- E_{be} : Band edge emission.
- E_{av} : Average of the band edge emission.


Lower frequency of the band edge 2,390.0 MHz, Angle 1

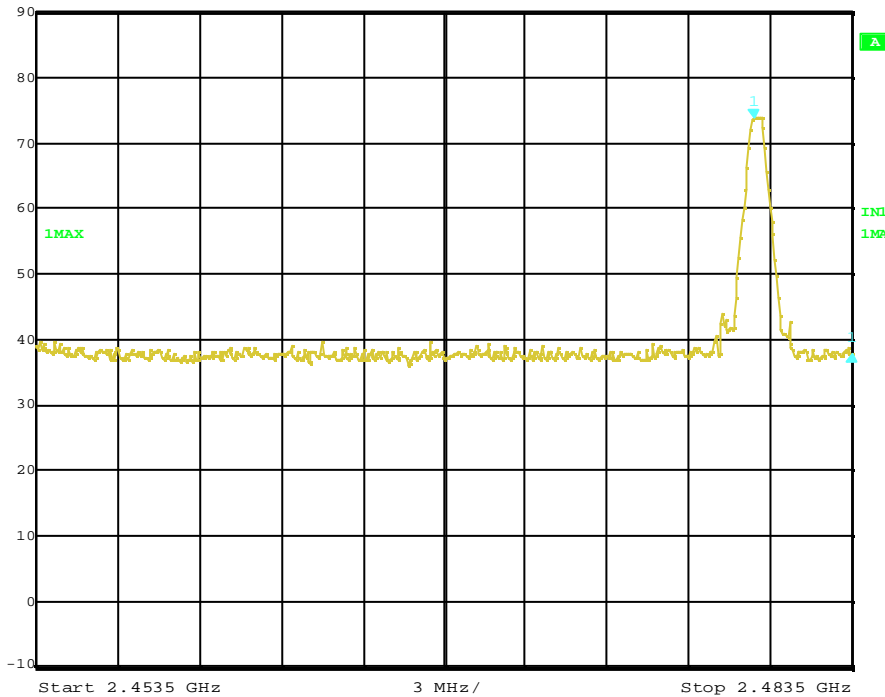
 Delta 1 [T1] RBW 300 kHz RF Att 10 dB
Ref Lvl -40.04 dB VBW 300 kHz
90 dB μ V -12.20440882 MHz SWT 5 ms Unit dB μ V



Date: 12.DEC.2007 02:52:51


Higher frequency of the band edge 2.483.5 MHz, Angle 1

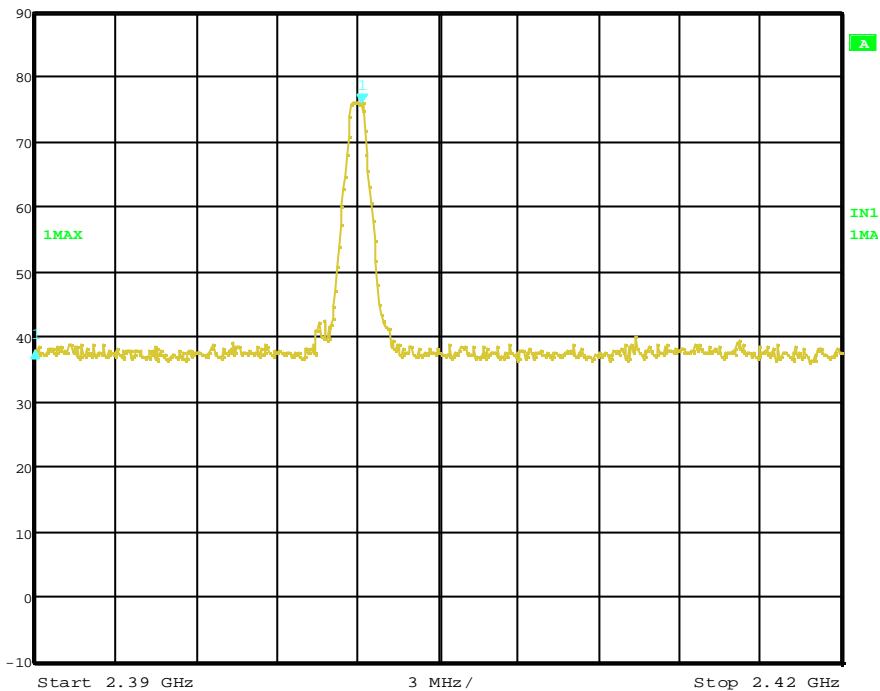
 Delta 1 [T1] RBW 300 kHz RF Att 10 dB
Ref Lvl -36.11 dB VBW 300 kHz
90 dB μ V 3.60721443 MHz SWT 5 ms Unit dB μ V



Date: 12.DEC.2007 02:39:20


Lower frequency of the band edge 2,390.0 MHz, Angle 2

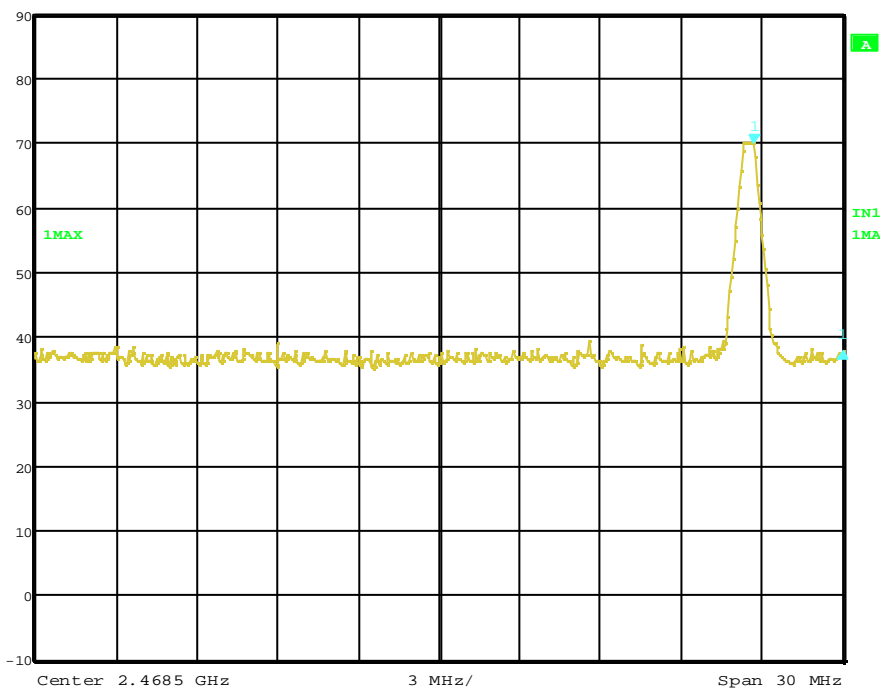
	Ref Lvl	Delta 1 [T1]	RBW	RF Att	10 dB
	90 dB μ V	-38.22 dB	300 kHz	VBW	300 kHz
		-12.14428858 MHz	SWT	5 ms	Unit



Date: 14.DEC.2007 02:09:09


Higher frequency of the band edge 2,483.5 MHz, Angle 2

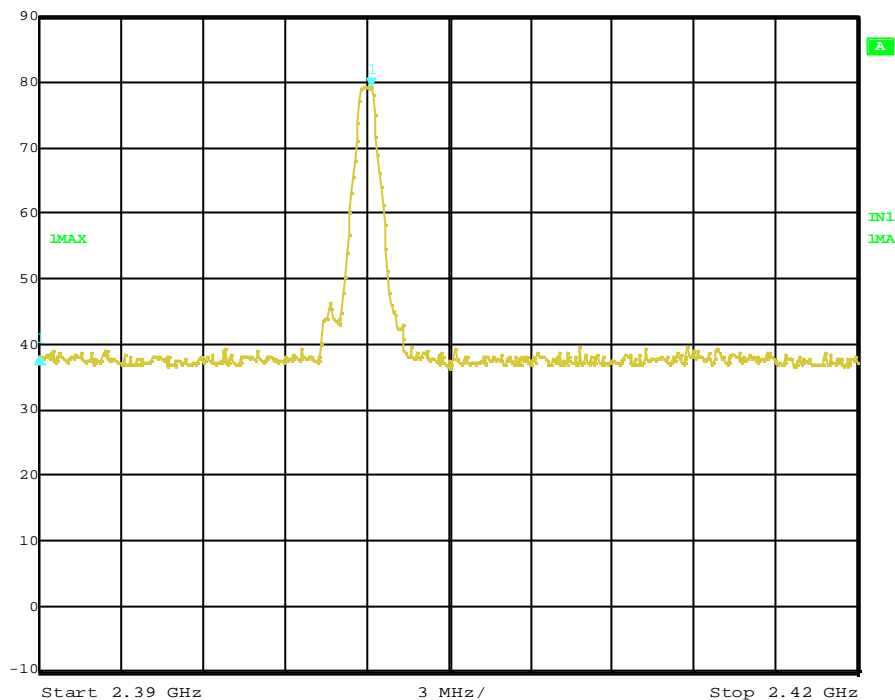
	Ref Lvl	Delta 1 [T1]	RBW	RF Att	10 dB
	90 dB μ V	-32.40 dB	300 kHz	VBW	300 kHz
		3.30661323 MHz	SWT	5 ms	Unit



Date: 14.DEC.2007 02:20:33


Lower frequency of the band edge 2,390.0 MHz, Angle 3

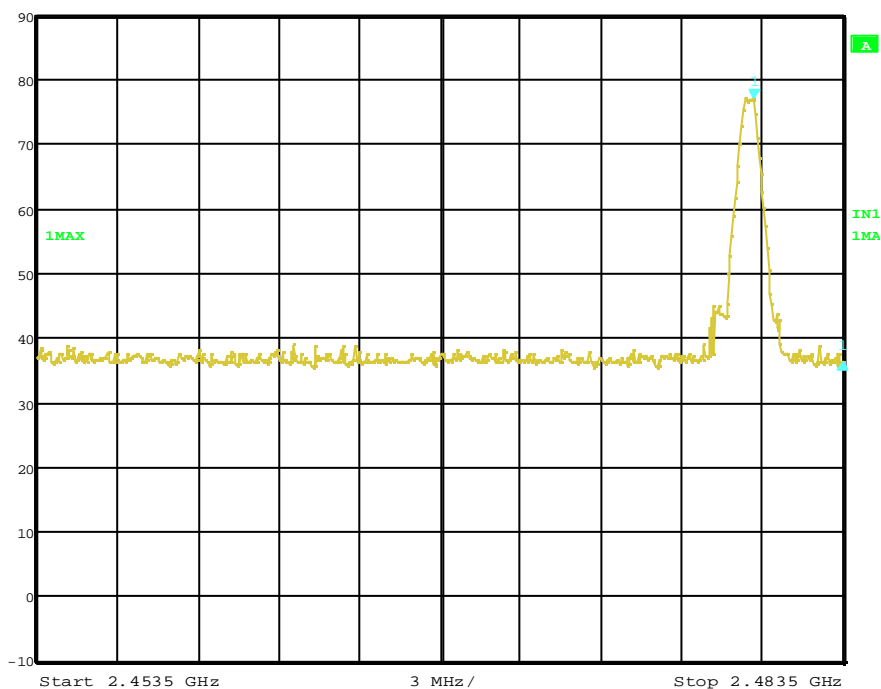
 Delta 1 [T1] -41.26 dB RBW 300 kHz RF Att 10 dB
Ref Lvl 90 dB μ V -12.14428858 MHz VBW 300 kHz Unit dB μ V
SWT 5 ms



Date: 14.DEC.2007 02:39:13

Higher frequency of the band edge 2,483.5 MHz, Angle 3

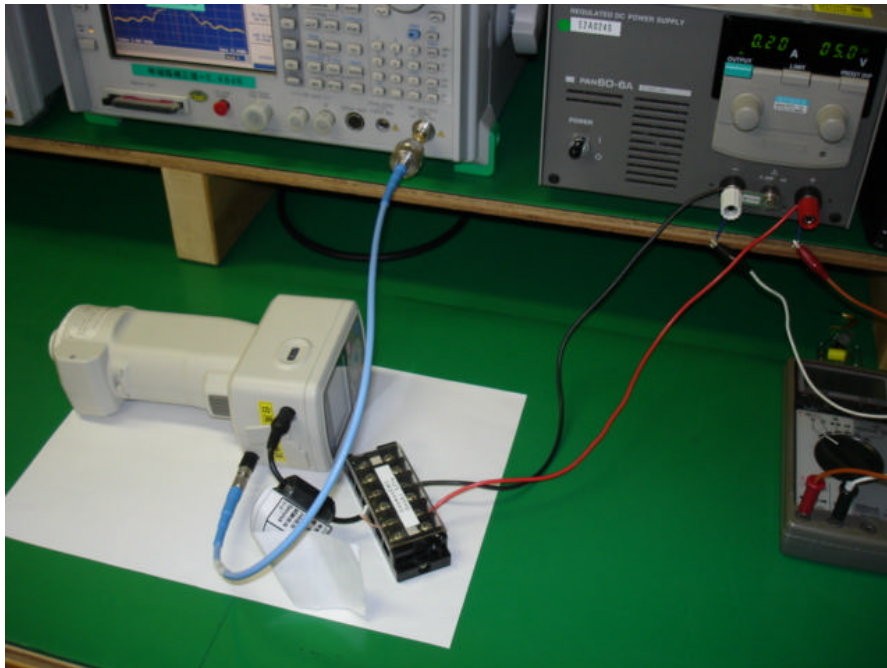
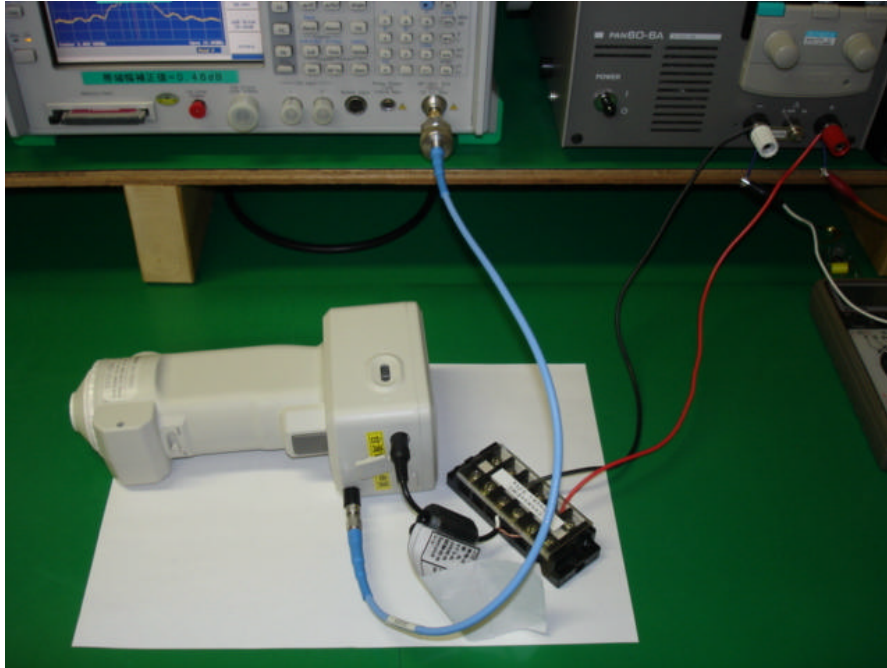
 Delta 1 [T1] -40.80 dB RBW 300 kHz RF Att 10 dB
Ref Lvl 90 dB μ V 3.30661323 MHz VBW 300 kHz Unit dB μ V
SWT 5 ms



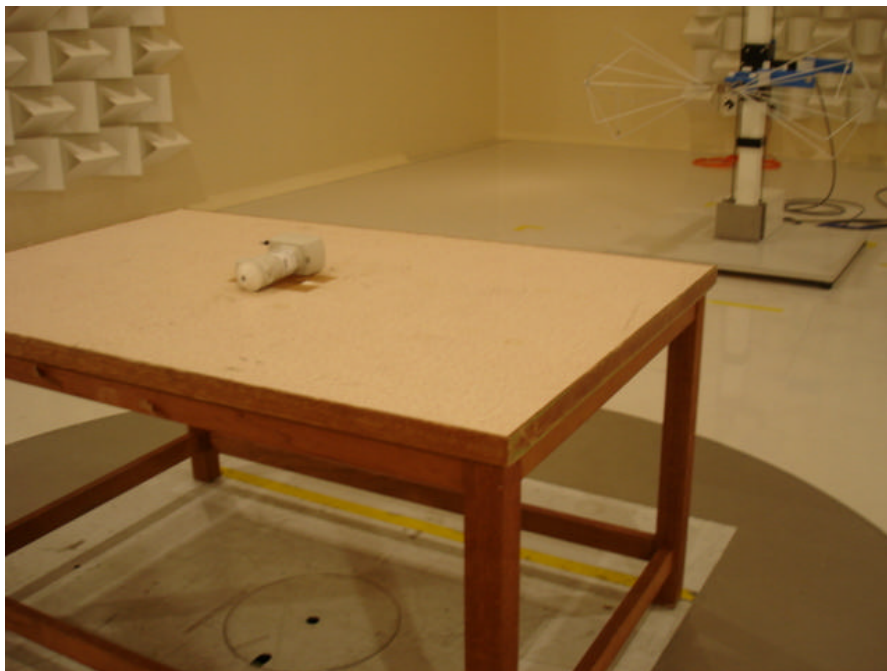
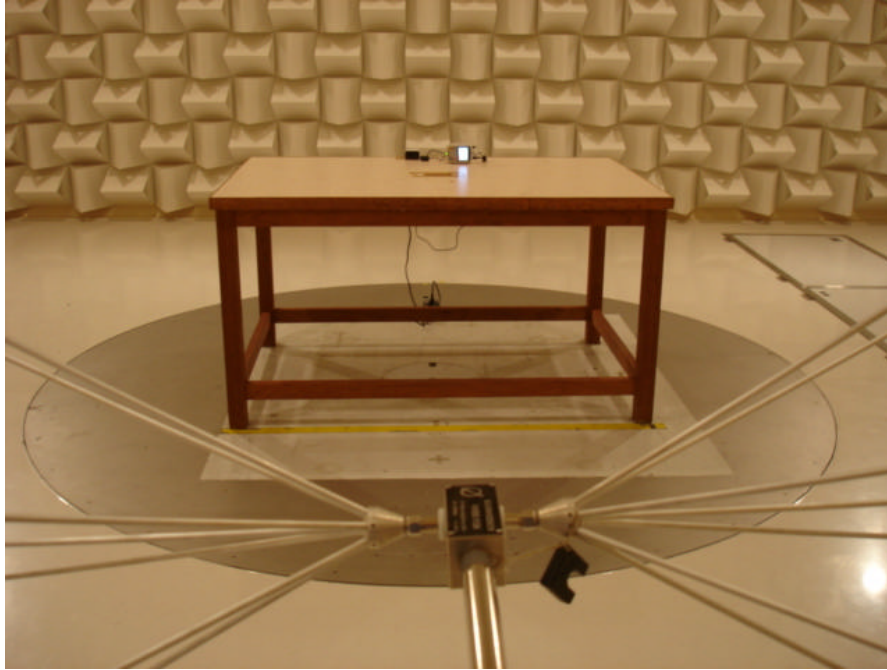
Date: 14.DEC.2007 02:30:46

6. Photos

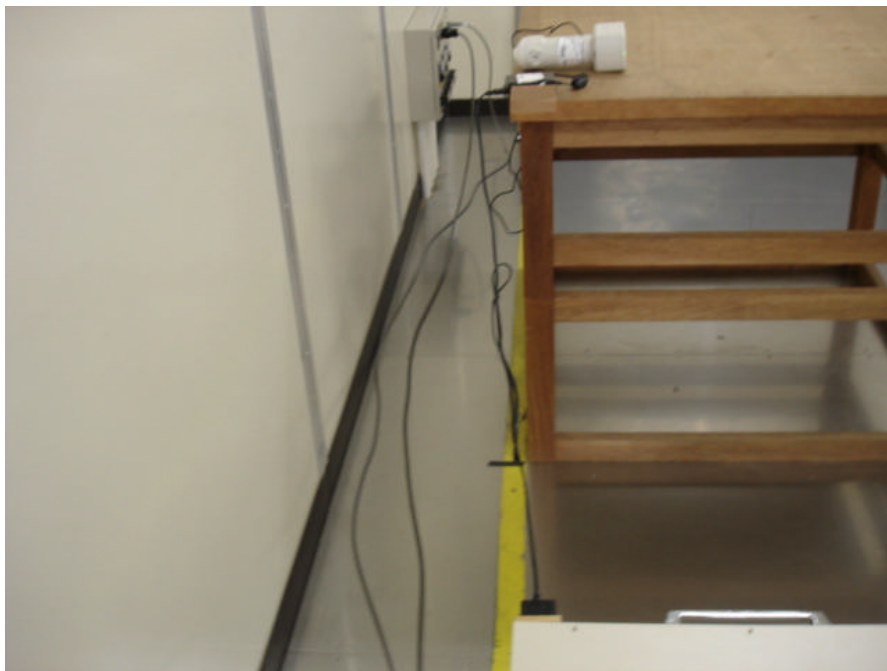
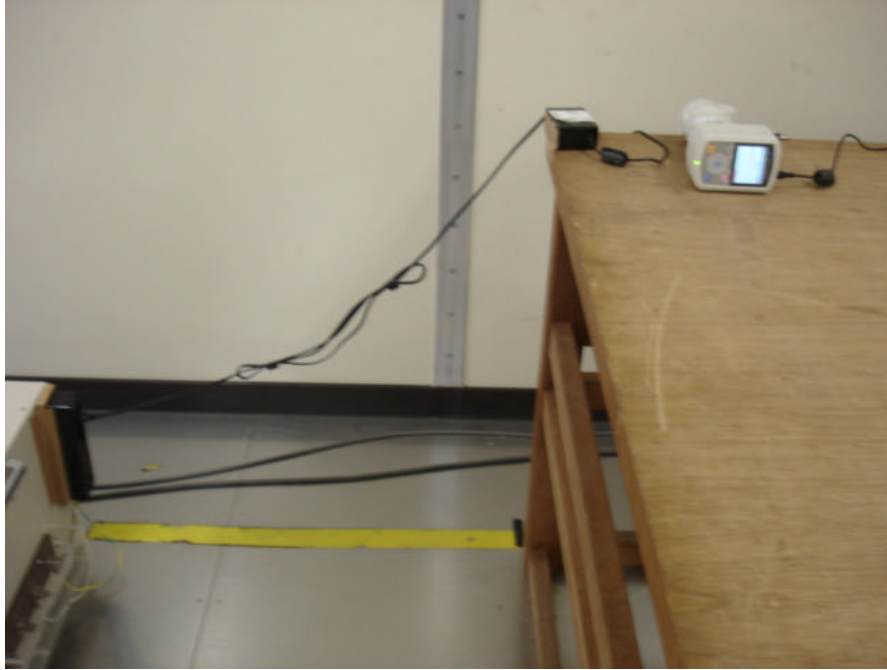
6.1 Setup Photo (All Other Test Items)



6.2 Setup Photo (Radiated Emission)



6.3 Setup Photo (Conducted Emission)



7. List of Test Measurement Instruments

7.1 Conducted Emission

Instruments	Manufacturer	Model / Type	Serial No.	Calibration Date Next Calibration
Spectrum Analyzer	ADVANTEST CORPORATION	R3132	140501174	July, 2007 July, 2008
EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100335	May, 2007 May, 2008
Artificial-Mains Network	KYORITSU CORPORATION	KNW-341C	8-1659-1	September, 2007 September, 2008
Transient Limiter	AGILENT TECHNOLOGIES	11947A	3107A03745	July, 2007 July, 2008
RF Selector	Techno Science Japan Corp.	RFM-E221	3148	---

7.2 Radiated Emission Measurement

Instruments	Manufacturer	Model / Type	Serial No.	Calibration Date Next Calibration
Programmable AC/DC Power Source	NF Corporation	ES18000W	425779	---
EMI Test Receiver	ROHDE & SCHWARZ	ESIB40	100211	April, 2007 April, 2008
Biconical Antenna (30 to 300MHz)	SCHWARZBECK	VHBB9124(Balun) BBA9106(Elements)	311	September, 2007 September, 2008
Log.-Periodic Antenna (300 MHz to 1 GHz)	SCHWARZBECK	UHALP 9108 A	645	September, 2007 September, 2008
Horn Antenna	SCHWARZBECK	BBHA 9120 D	446	September, 2007 September, 2008
Horn Antenna	ETS LINDGREN	3160-08	00033778	September, 2007 September, 2008
Horn Antenna	ETS LINDGREN	3160-09	00034723	September, 2007 September, 2008
Pre-Amplifier	HEWLETT PACKARD	8447D OPT 010	2944A 07891	September, 2007 September, 2008
Pre-Amplifier (1 GHz to 18GHz)	HEWLETT PACKARD	8449B	3008A 01251	July, 2007 July, 2008
Pre-Amplifier (18 GHz to 26.5 GHz)	Techno Science Japan Corp.	MLA-1826POM-30	---	January, 2007 January, 2008

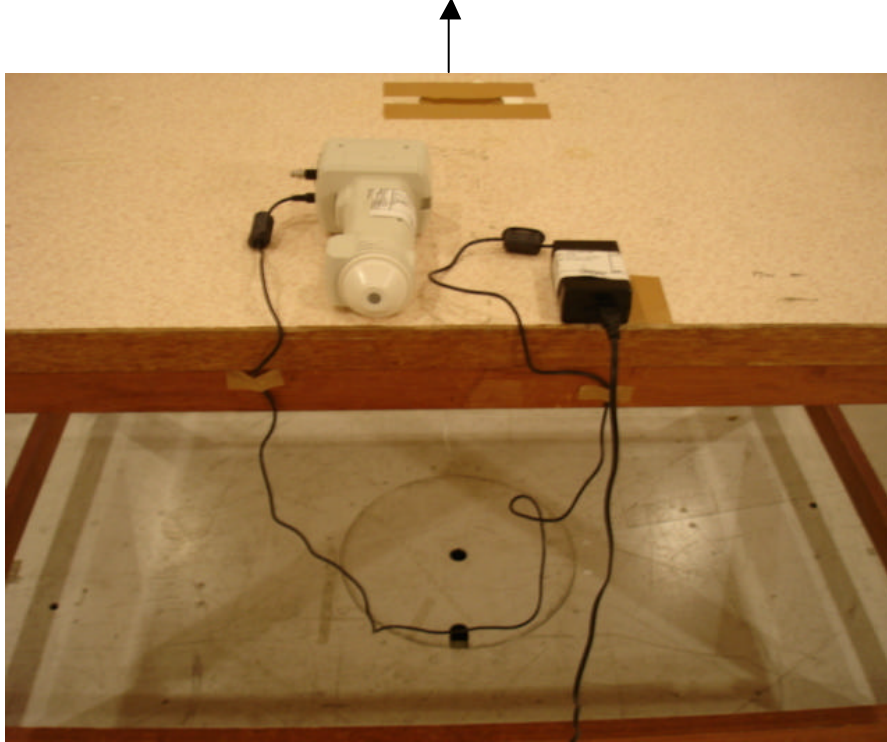
7.3 Conducted Radio Measurement

Instruments	Manufacturer	Model / Type	Serial No.	Calibration Date Next Calibration
DC Power Source	Diamond Antenna	GSV3000	01101481	---
Spectrum Analyzer	Anritsu	MS2687B	620016270 6	April, 2007 April, 2008
Signal Generator	Agilent Technology	E8254A	US411401 86	June, 2008 June, 2008
Oscilloscope	Tektronix	TDS794D	B031832	June, 2007 June, 2008
Diode Detector	Agilent Technology	423B	MY422418 36	March, 2007 March, 2008

Appendix A

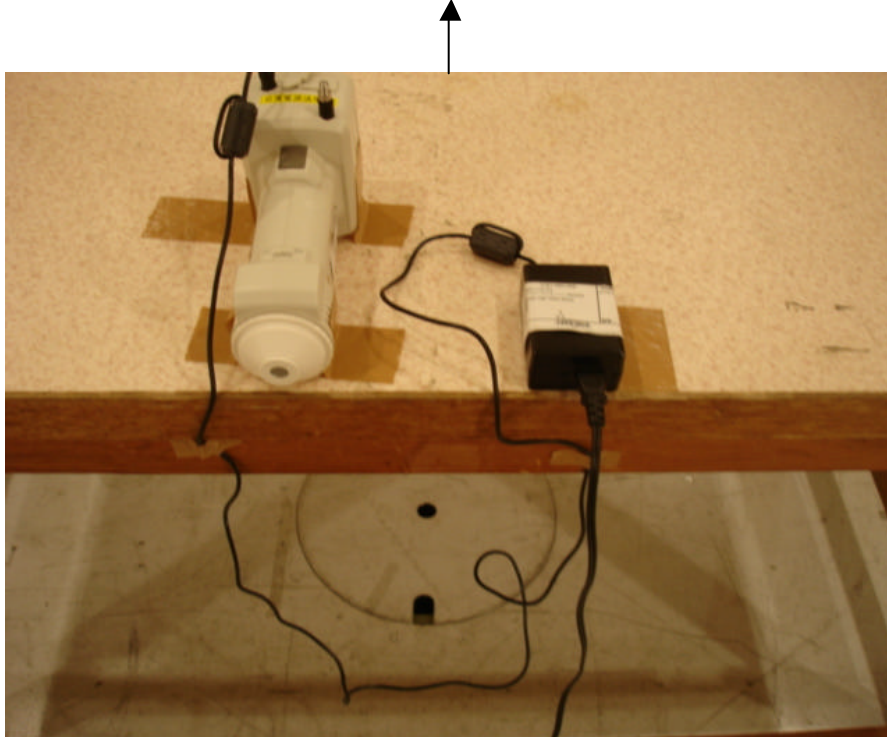
Angle 1

Antenna



Angle 2

Antenna



Appendix A (Continued)

Angle 3

Antenna

