MEASUREMENT/TECHNICAL REPORT
FCC Part 15 Subpart C

Issued: October 21, 2008

Name and Address of the Applicant:	Tele Power Inc. 3-18-37 MinamiIkebukuro, Toshimaku, Tokyo 171-0022 Japan
Test Item:	Wireless module
Identification:	Model TM24-FS1, TM-24-USB
Serial No.:	A0000000E2, None
FCC ID:	WQYTM24FS1B
Sample Receipt Date:	July 30, 2008
Test Specification:	FCC Part 15 Subpart C, 15.247
Date of Testing:	August 18 ～ September 25, 2008
Test Result:	PASS

Report Prepared by: Cosmos Corporation
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Tested by: M. Yamanaka, Engineer — October 21, 2008 (Date)

Reviewed by: Y. Kawahara, Deputy General Manager — October 21, 2008 (Date)

Notes:
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	: Tele Power Inc.
Model (referred to as the EUT)	: Model TM24-FS1, TM-24-USB
Nominal Voltage	: 2.7-3.4V
Type of Modulation	: O-QPSK
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 ☐ Hopping
Stand by Mode	: ☐ Available ☒ N/A
Intended functions	: Telemetry
The bandwidth of the IF filters	: N/A
Method of Communication Link	: Software to make maximum speed transmitting
The operating frequency band	: 2.4GHz
The thermal limitation	: Not specified

1.2 Antenna Description

No.	Type Name	Gain	Antenna Type	Remarks
1	ANT-2.45-CHP	+0.5 dBi	Omni-divectional	LTCC chip antenna

1.3 Accompanied Peripherals Description

No.	Equipment Name	Manufacturer	Type Name	Serial Number	Remarks
1	Note PC	DELL	PP17L	ON8719-48643 -57F-1500	DC19.5V, 4.62A
2	AC Adapter	DELL	HP-OQ065B83	---	AC100-240V, 50/60Hz, 1.5A

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.

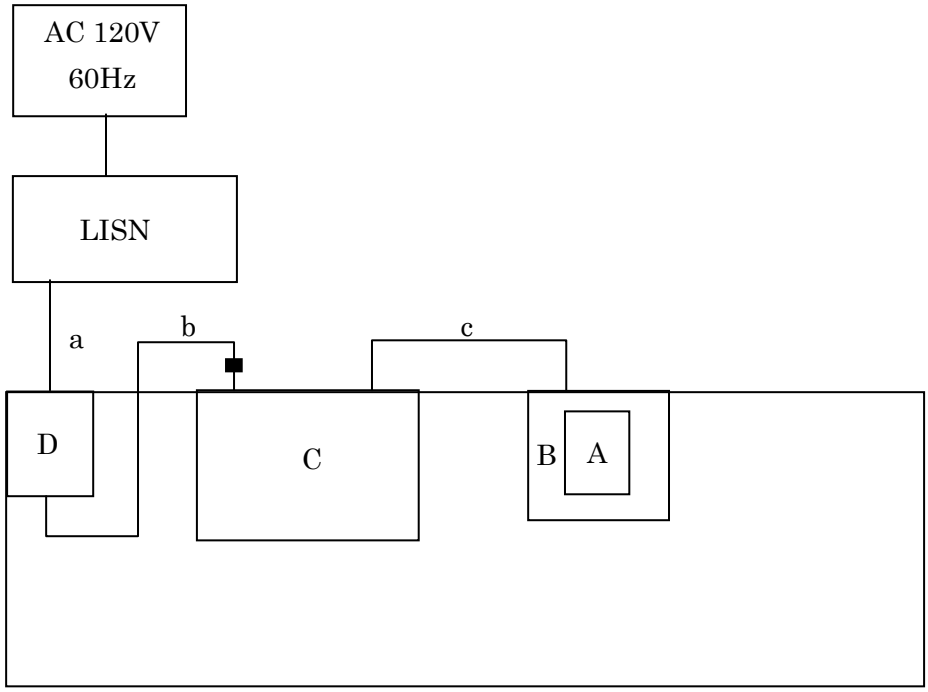
3. Summary of Test Results

Section	Test Item	Limit	Result
15. 207	AC Power Conducted Emission	See 5.1.2	Pass
15. 247(a)(2)	Spectrum Bandwidth of Direct Sequence Spread Spectrum System	Min. 500kHz	Pass
15. 247(b)	Maximum Peak Output Power	Max. 1W (30dBm)	Pass
15. 247(d) 15. 209	Transmitter Radiated Emissions	See 5.4.2 See 5.5.2	Pass
15. 247(e)	Power Spectrum Density	Max. 8dBm	Pass
15. 247(d)	Band Edge Measurement	See 5.7.2	Pass
15.215(c)	20dB Bandwidth	---	---

4. Test Configuration

	Instrument	Model		Cable	Length	Shield
A	EUT (Wireless Module)	Model TM24-FS1	a	AC Power Cable	1.0 m	×
B	EUT (USB Module)	TM-24-USB	b	DC Power Cable	1.8 m	×
C	Note PC	PP17L	c	USB Cable	2.0 m	○
D	AC Adapter	HP-OQ065B83	d	USB Cable	0.5 m	○

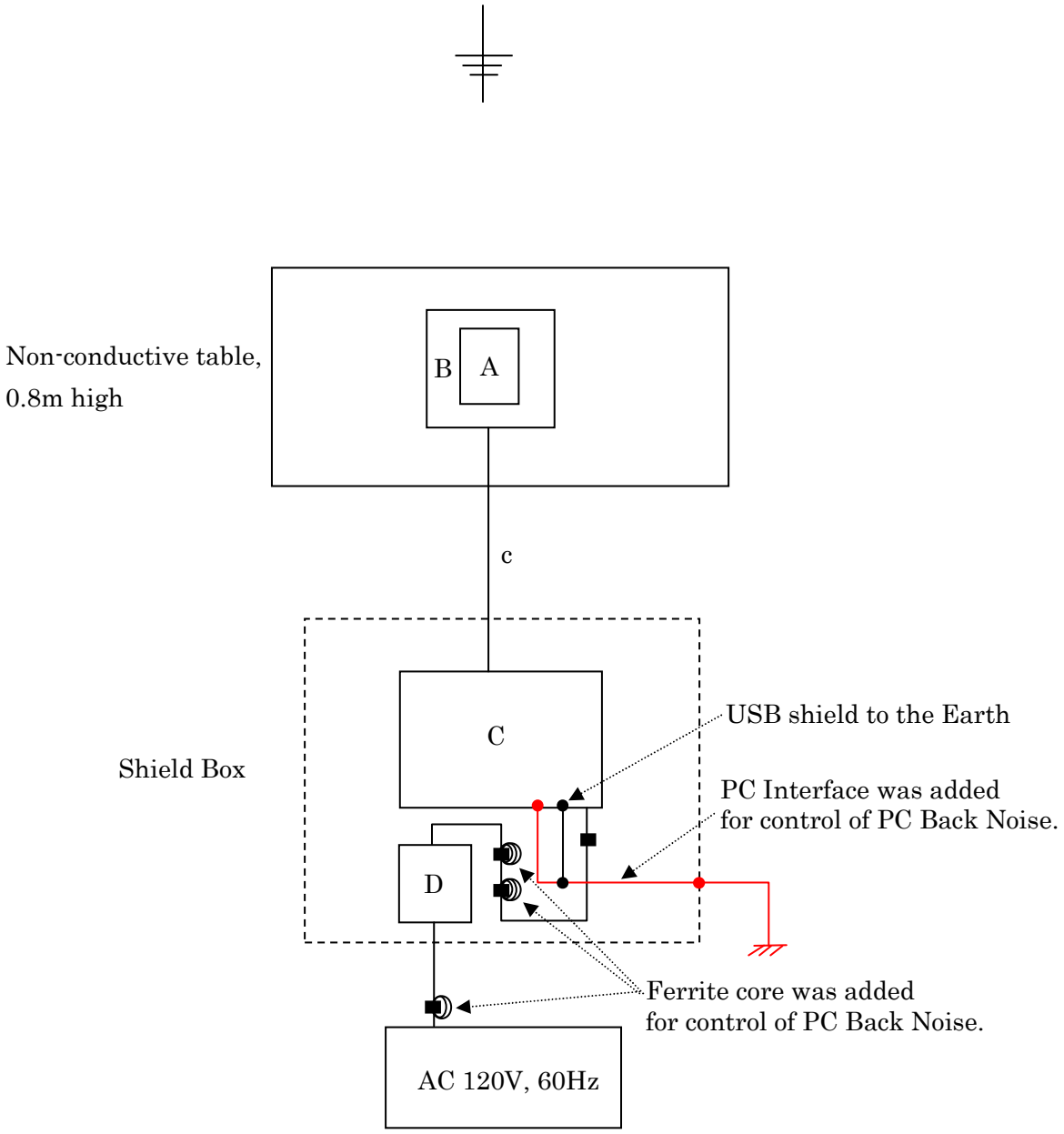
4.1 15. 207 AC Power Conducted Emission in Shield Room



Non-conductive table, 0.8m high

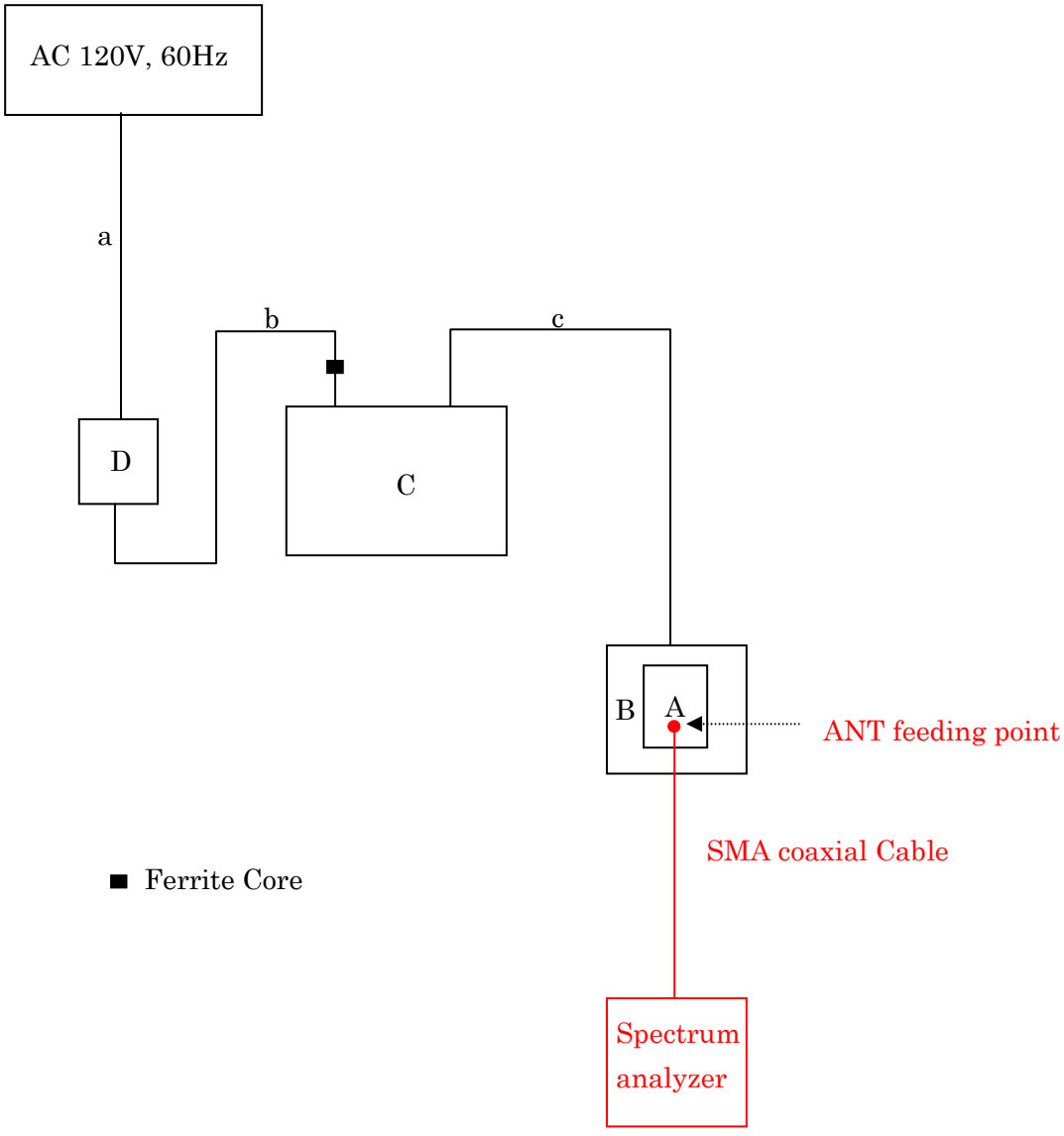
■ Ferrite Core

4.2 15. 247(d), 15.209 Transmitter Radiated Emissions, 15.209 Band Edge (Radiated), and 15.215 (c) 20 dB Bandwidth in 3m Anechoic Chamber

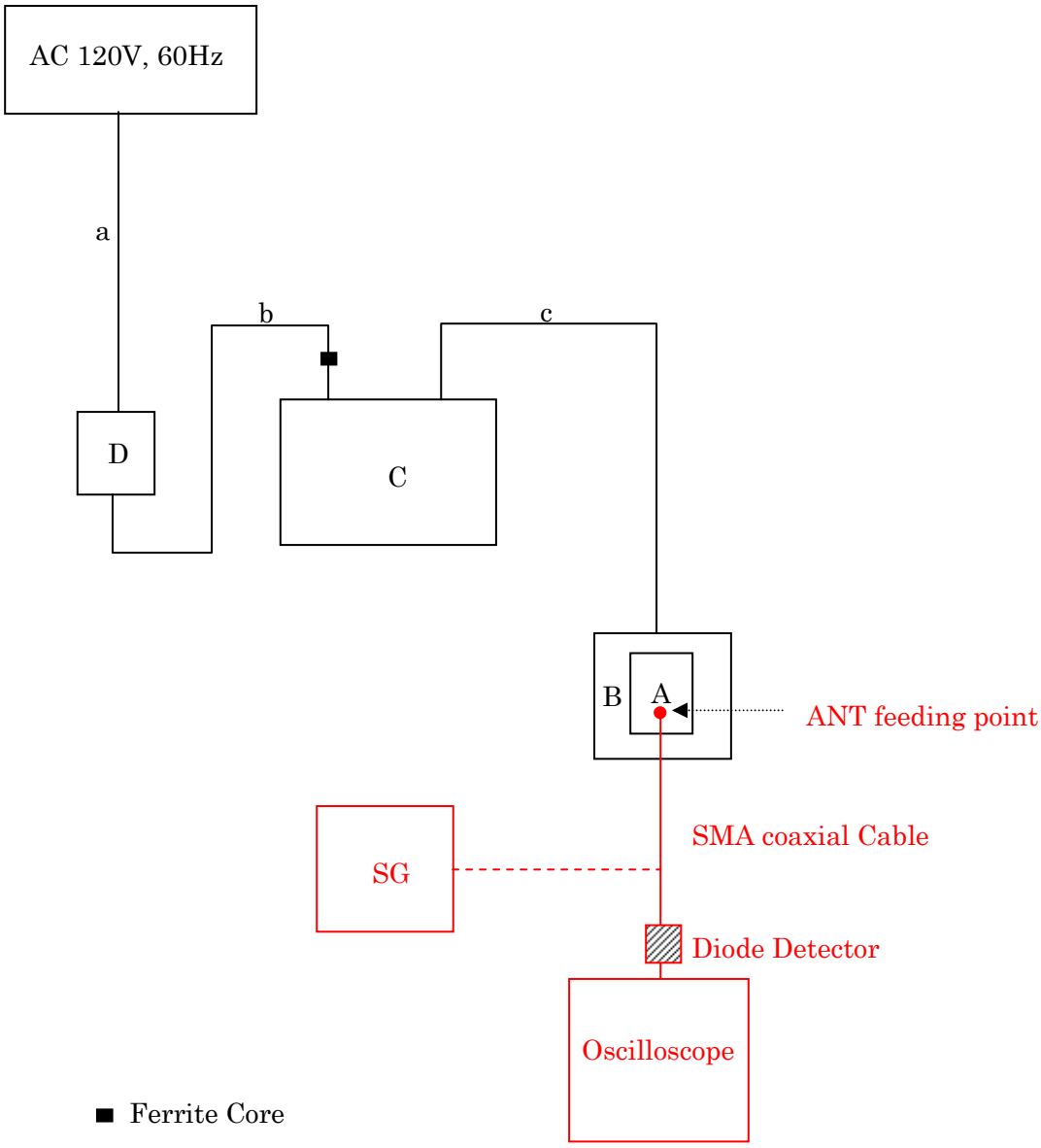


■ Ferrite Core

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



4.4 Maximum Peak Output Power



4.5 Test Mode

In all test configurations above, EUT makes continuous RF transmitting with manufacturer's specified power.

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.
- Non-conductive board (10mm thick) for EUT and non-conductive table (80cm high) for personal computer were used.
- Other power cord of support equipment is connected to another LISN to isolate its emission from the measured emission of EUT.
- The measuring port of LISN for support equipment was terminated by the 50Ω
- Activate the EUT System and run the software prepared for the test, if necessary.
- Refer to test configuration figure 4.1.

5.1.2 Minimum Standard

15. 207 (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 : 24˚C, 41 %

5.1.4 Measured Data

Measured Value Table

CJ08-072834E CE Total02 CH08.CED

<<Conducted Emission>>

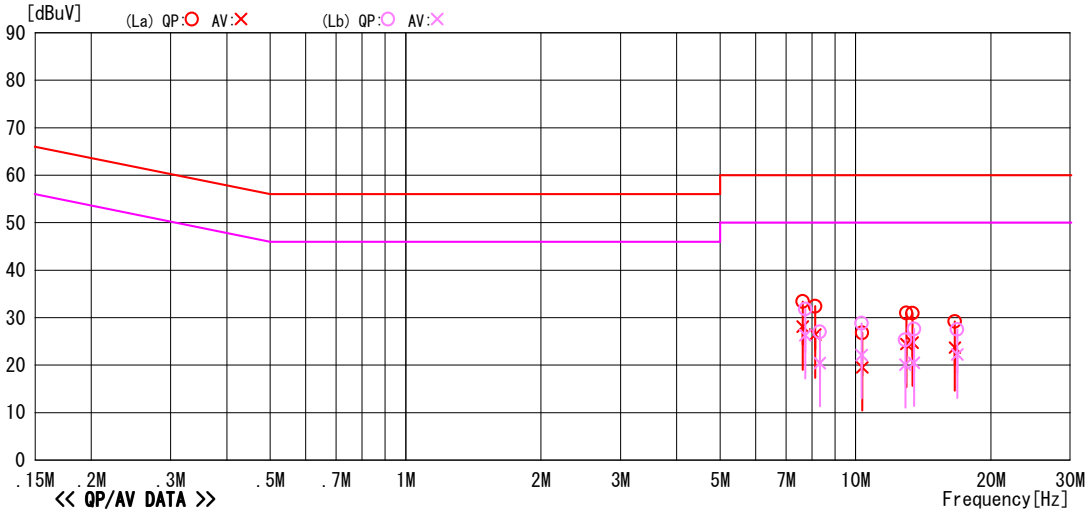
Cosmos Corporation Onoki Lab.

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ08-072834E
Temp/Humi : 24℃/41%
Condition : Transmitter Modulated
Remark : CH08 (2440MHz)

Memo : RBW:9kHz(150k-30MHz)

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



No	Freq.	Reading Level		C.Fac	Results		Limit		Margin		Phase	Comment
		QP	AV		QP	AV	QP	AV	QP	AV		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	7.63470	22.9	17.6	10.5	33.4	28.1	60.0	50.0	26.6	21.9	La	
2	8.13182	21.9	15.9	10.5	32.4	26.4	60.0	50.0	27.6	23.6	La	
3	10.34416	16.1	8.8	10.7	26.8	19.5	60.0	50.0	33.2	30.5	La	
4	12.95400	20.2	13.6	10.8	31.0	24.4	60.0	50.0	29.0	25.6	La	
5	13.37530	20.1	13.9	10.8	30.9	24.7	60.0	50.0	29.1	25.3	La	
6	16.63030	18.2	12.7	11.0	29.2	23.7	60.0	50.0	30.8	26.3	La	
7	7.73100	21.3	15.8	10.5	31.8	26.3	60.0	50.0	28.2	23.7	Lb	
8	8.32352	16.5	9.9	10.5	27.0	20.4	60.0	50.0	33.0	29.6	Lb	
9	10.31146	18.2	11.5	10.6	28.8	22.1	60.0	50.0	31.2	27.9	Lb	
10	12.90030	14.6	9.4	10.7	25.3	20.1	60.0	50.0	34.7	29.9	Lb	
11	13.47820	16.9	9.8	10.7	27.6	20.5	60.0	50.0	32.4	29.5	Lb	
12	16.81600	16.6	11.3	10.9	27.5	22.2	60.0	50.0	32.5	27.8	Lb	

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5.2 15. 247(a)(2) Spectrum Bandwidth of Direct Sequence Spread Spectrum System

5.2.1 Setting Remarks

- The both side of 6dB 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	: 100 kHz
✓	Video bandwidth	: 300 kHz
✓	Sweep	: 1sec
✓	Detector function	: Peak
✓	Trace Mode	: Max Hold

- See test configuration figure 4.3.

5.2.2 Minimum Standard

15.247 (a) (2) Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.2.3 Result

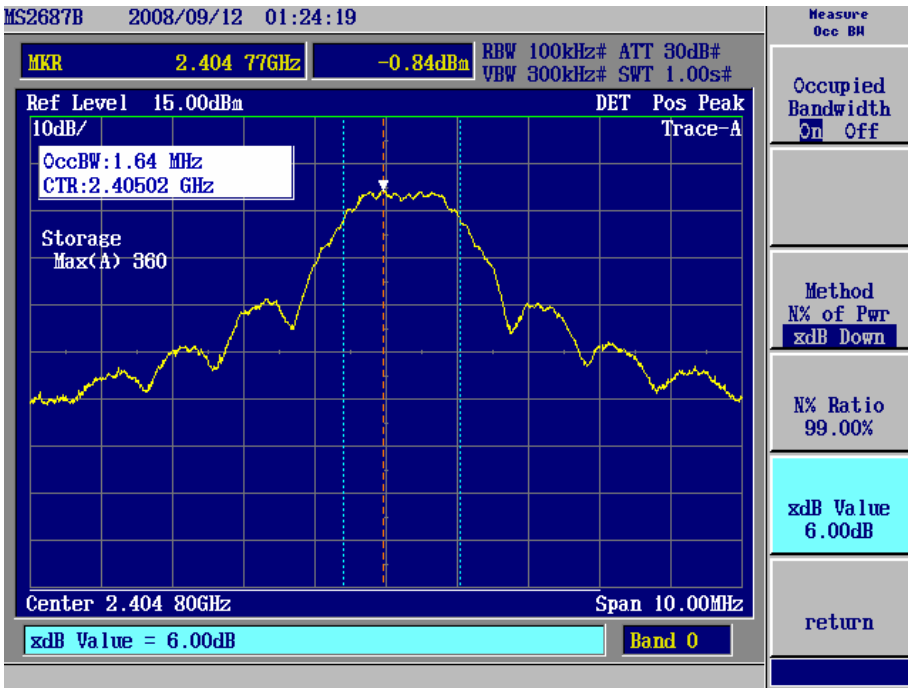
EUT complies with the requirement.

Uncertainty of measurement result: ± 0.8 dB
Temperature, Humidity : 25˚C, 53 %

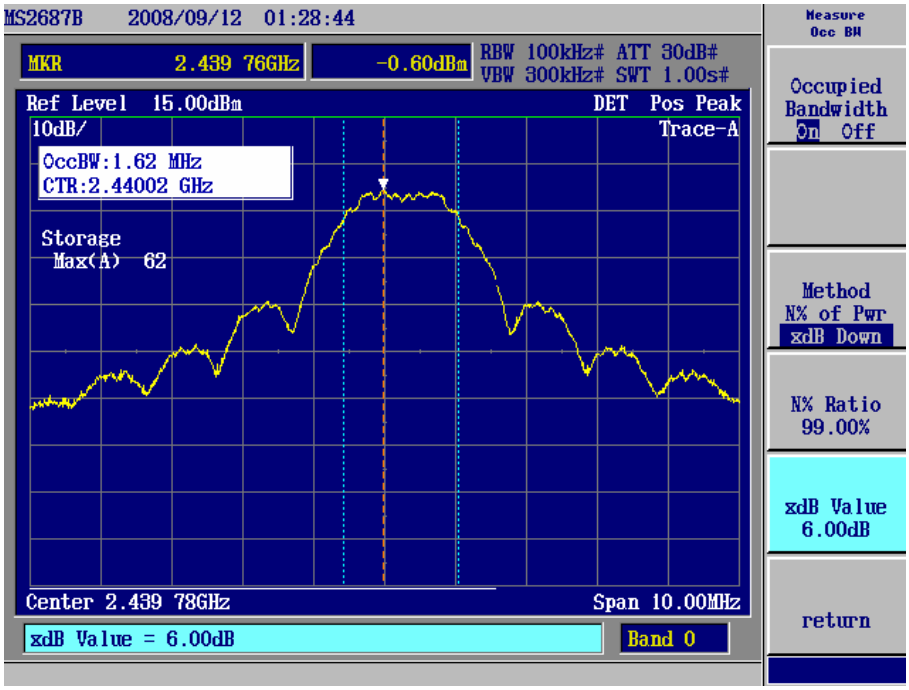
5.2.4 Measured Data

Frequency (MHz)	Measured Bandwidth (MHz)	Limit (MHz)
2405 (1ch)	1.64	> 0.5
2440 (8ch)	1.62	> 0.5
2480 (16ch)	1.68	> 0.5

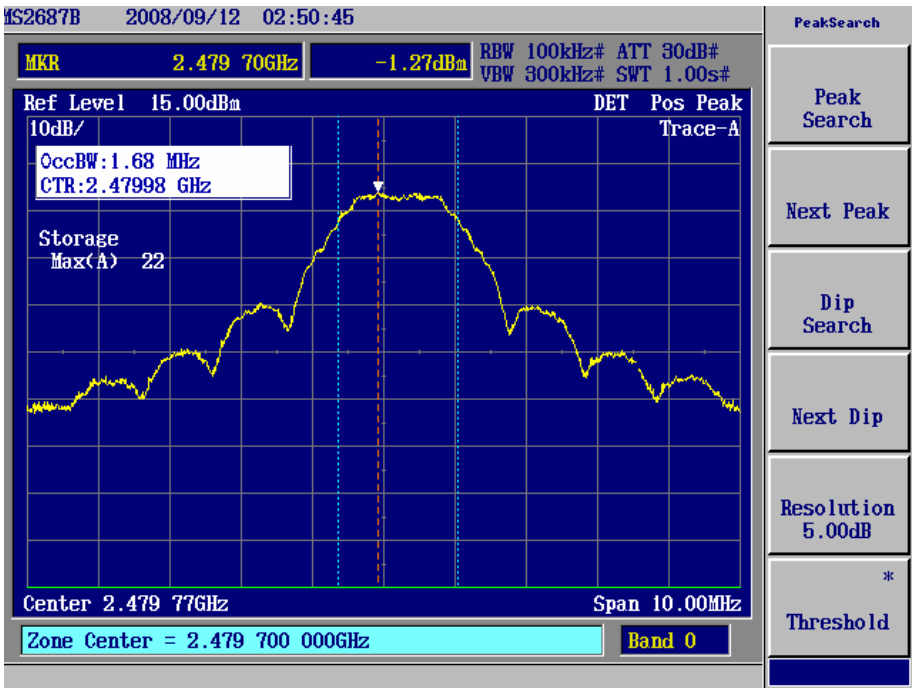
2405MHz (1ch)



2440 MHz (8ch)



2480 MHz (16ch)



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, 53%

5.3.4 Measured Data

(Normal Rated Voltage, 5 VDC) Modulated

Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
2405 (1ch)	3.43	30	26.57
2440 (8ch)	2.48	30	27.52
2480 (16ch)	2.21	30	30.00

(Normal Rated Voltage, 5 VDC) Unmodulated

Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
2405 (1ch)	3.50	30	26.50
2440 (8ch)	2.49	30	27.51
2480 (16ch)	2.18	30	30.00

(High-varied Voltage, 5.75VDC) Modulated

Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
2405 (1ch)	1.40	30	28.60
2440 (8ch)	0.68	30	29.32
2480 (16ch)	-0.08	30	30.00

(High-varied Voltage, 5.75VDC) Unmodulated

Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
2405 (1ch)	1.40	30	28.60
2440 (8ch)	0.68	30	29.32
2480 (16ch)	-0.06	30	30.00

(Low-varied Voltage,4.25VDC) Modulated

Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
2405 (1ch)	1.38	30	28.62
2440 (8ch)	0.66	30	29.34
2480 (16ch)	-0.10	30	30.00

(Low-varied Voltage,4.25VDC) Unmodulated

Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
2405 (1ch)	1.38	30	28.62
2440 (8ch)	0.64	30	29.36
2480 (16ch)	-0.10	30	30.00

5.4 15. 247(d) Transmitter Suprious Emissions (Conducted)

5.4.1 Setting Remarks

- EUT directly connects to the spectrum analyzer via calibrated coaxial cable and 10 dB 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

15.247 (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

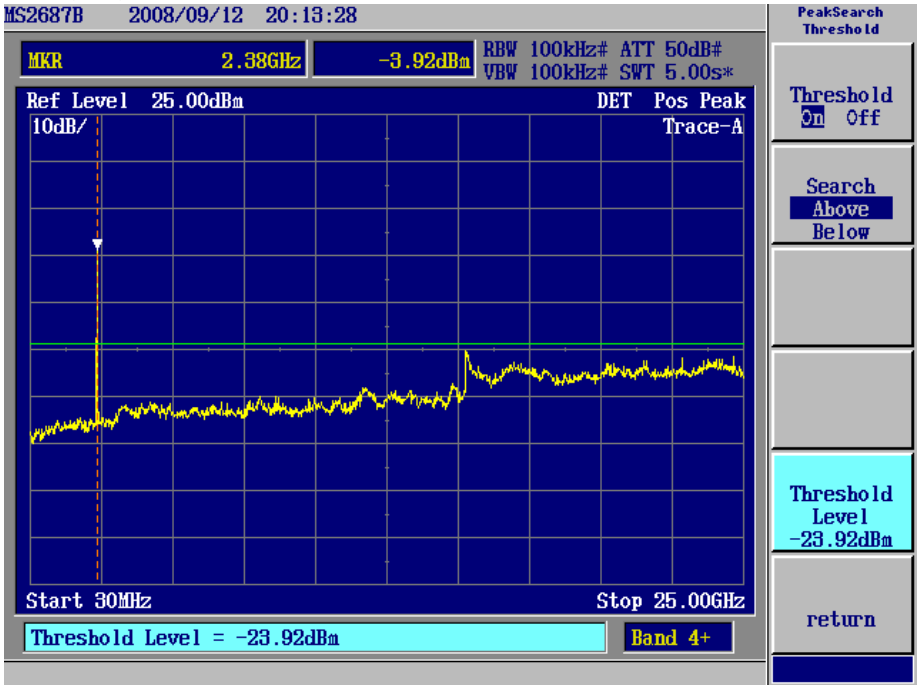
EUT complies with the requirement.

Uncertainty of measurement result: ± 0.8 dB
Temperature, Humidity : 25˚C, 53%

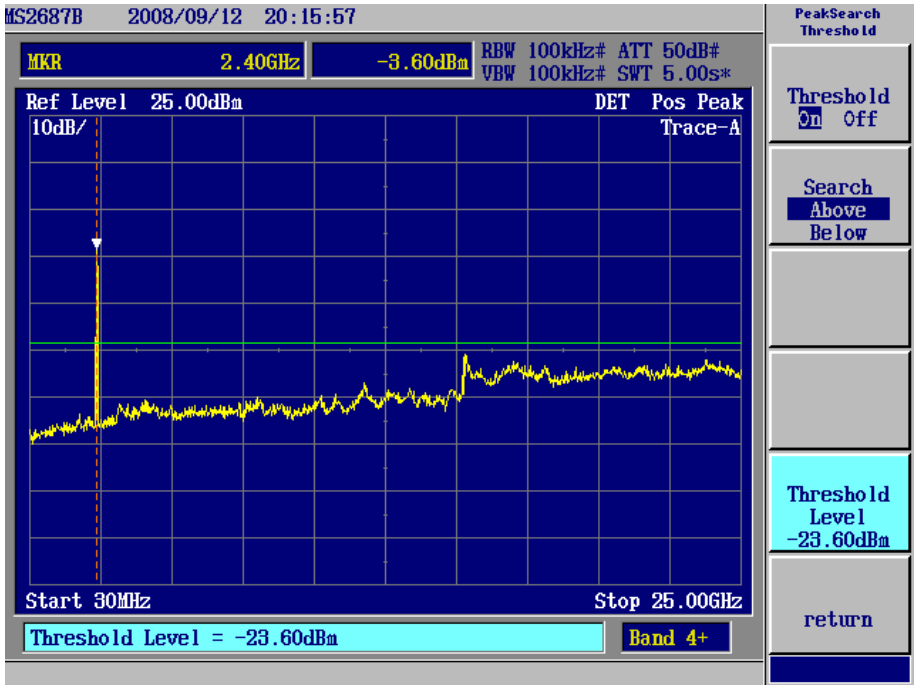
5.4.4 Measured Data

(No emission exceeding the 20dB limit was found)

2405MHz (1ch)



2440 MHz (8ch)



2480 MHz (16ch)

5.5 15. 247(d) 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;

  (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.

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)).

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., § § 15.231 and 15.241.

5.5.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 3.28 dB
Temperature, Humidity : Refer to each data table

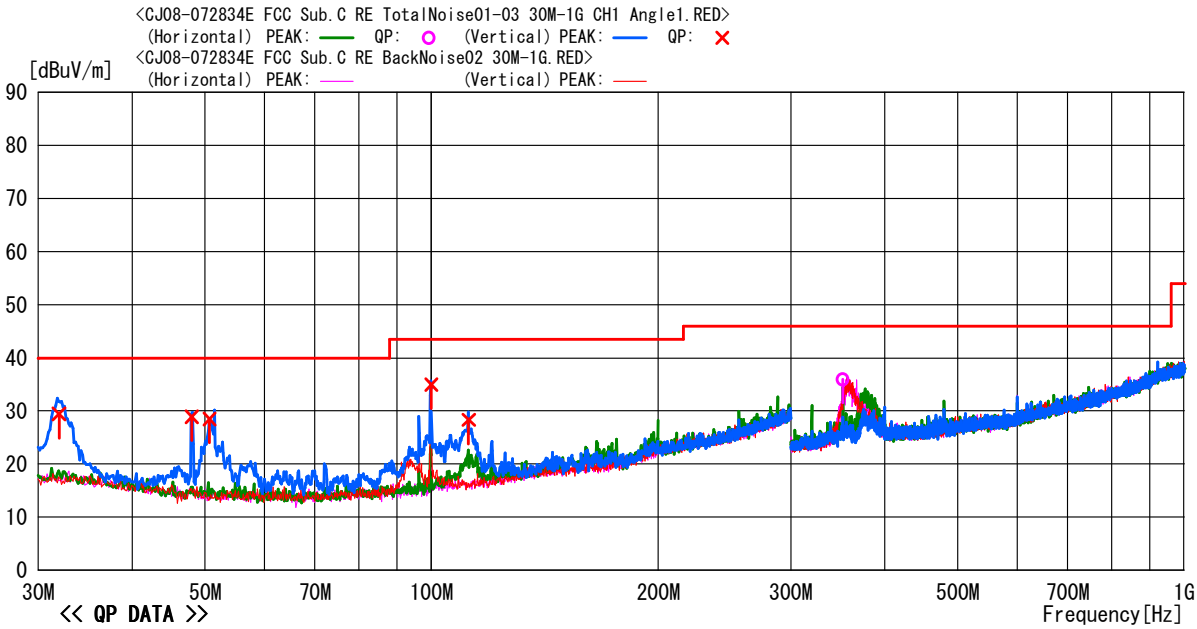
5.5.4 Measured Data

30MHz to 1GHz, CH 1 Angle 1

Model Name	: TM24-FS1	Job No	: CJ08-072834E
Serial No.	: A0000000E2	Temp./Humi.	: 24℃/35%
Operator	: M.Yamanaka	Condition	: Transmitter Modulated
Power Supply	: AC 120V, 60Hz	Remark	: CH:01(2405MHz) Angle1

Memo : RBW:30M～1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m) 30MHz-1000MHz



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	351.999	41.2	-5.2	36.0	46.0	10.0	Hori.	100	218	LP	
2	31.989	40.3	-10.9	29.4	40.0	10.6	Vert.	100	320	BC	
3	48.024	42.7	-13.8	28.9	40.0	11.1	Vert.	100	146	BC	
4	50.689	42.6	-14.1	28.5	40.0	11.5	Vert.	100	159	BC	
5	99.914	48.5	-13.6	34.9	43.5	8.6	Vert.	100	0	BC	
6	112.019	41.4	-13.1	28.3	43.5	15.2	Vert.	100	0	BC	

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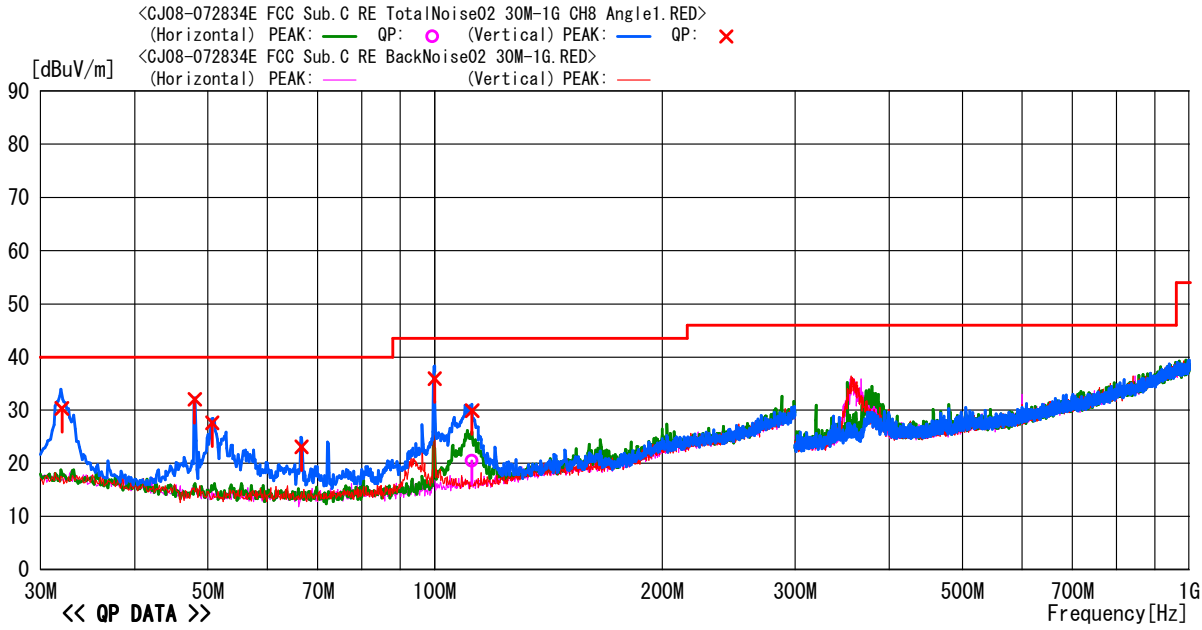
30MHz to 1GHz, CH 8 Angle 1

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ08-072834E
Temp./Humi. : 24℃/35%
Condition : Transmitter Modulated
Remark : CH:08(2440MHz) Angle1

Memo : RBW:30M～1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m) 30MHz-1000MHz



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	112.001	33.6	-13.1	20.5	43.5	23.0	Hori.	100	253	BC	
2	32.029	41.1	-10.8	30.3	40.0	9.7	Vert.	100	0	BC	
3	48.059	45.8	-13.8	32.0	40.0	8.0	Vert.	100	172	BC	
4	50.694	41.7	-14.1	27.6	40.0	12.4	Vert.	100	178	BC	
5	66.597	37.8	-14.7	23.1	40.0	16.9	Vert.	100	179	BC	
6	99.922	49.5	-13.6	35.9	43.5	7.6	Vert.	100	0	BC	
7	111.979	43.0	-13.1	29.9	43.5	13.6	Vert.	100	0	BC	

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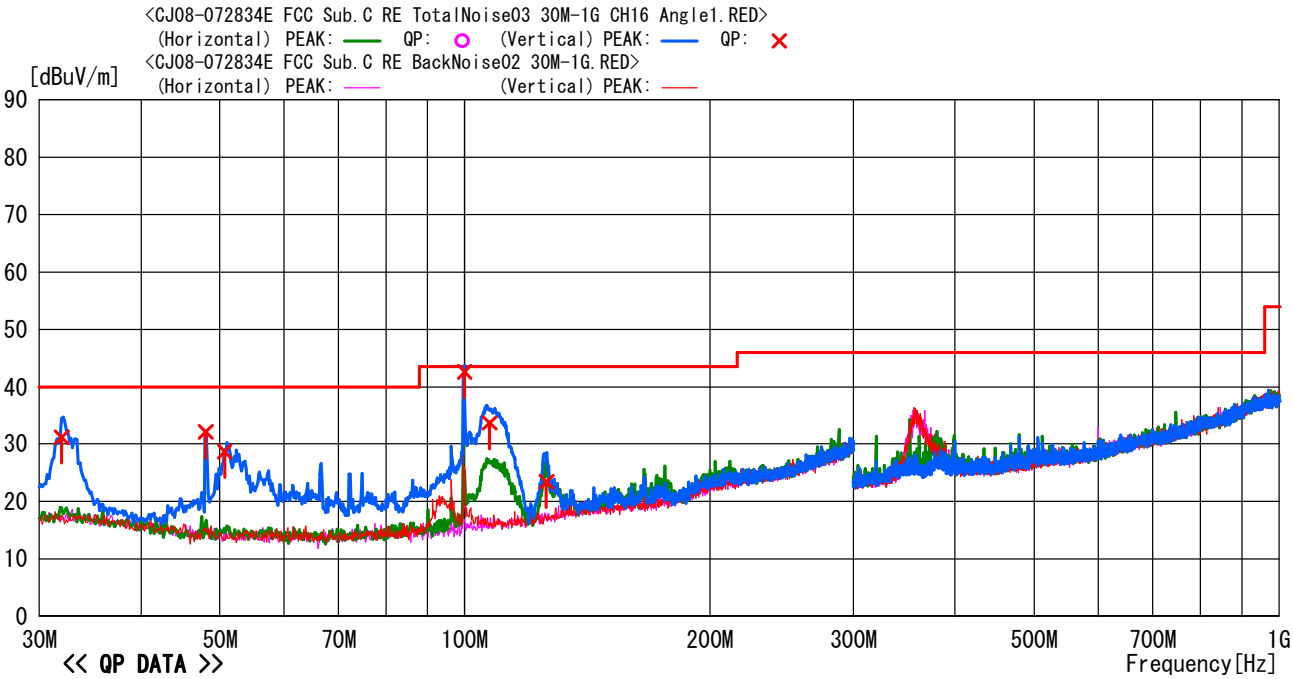
30MHz to 1GHz, CH 16 Angle 1

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ08-072834E
Temp./Humi. : 24℃/35%
Condition : Transmitter Modulated
Remark : CH:16(2480MHz) Angle1

Memo : RBW:30M～1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m) 30MHz-1000MHz



No	Freq.	Reading	C.Fac	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	31.979	42.1	-10.9	31.2	40.0	8.8	Vert.	100	38	BC	
2	48.046	45.9	-13.8	32.1	40.0	7.9	Vert.	100	162	BC	
3	50.689	42.8	-14.1	28.7	40.0	11.3	Vert.	100	176	BC	
4	99.905	56.2	-13.6	42.6	43.5	0.9	Vert.	100	298	BC	
5	107.194	46.9	-13.2	33.7	43.5	9.8	Vert.	100	357	BC	
6	125.962	35.5	-12.1	23.4	43.5	20.1	Vert.	100	183	BC	

-TEPTO-DV/RE Ver 1.80.0020

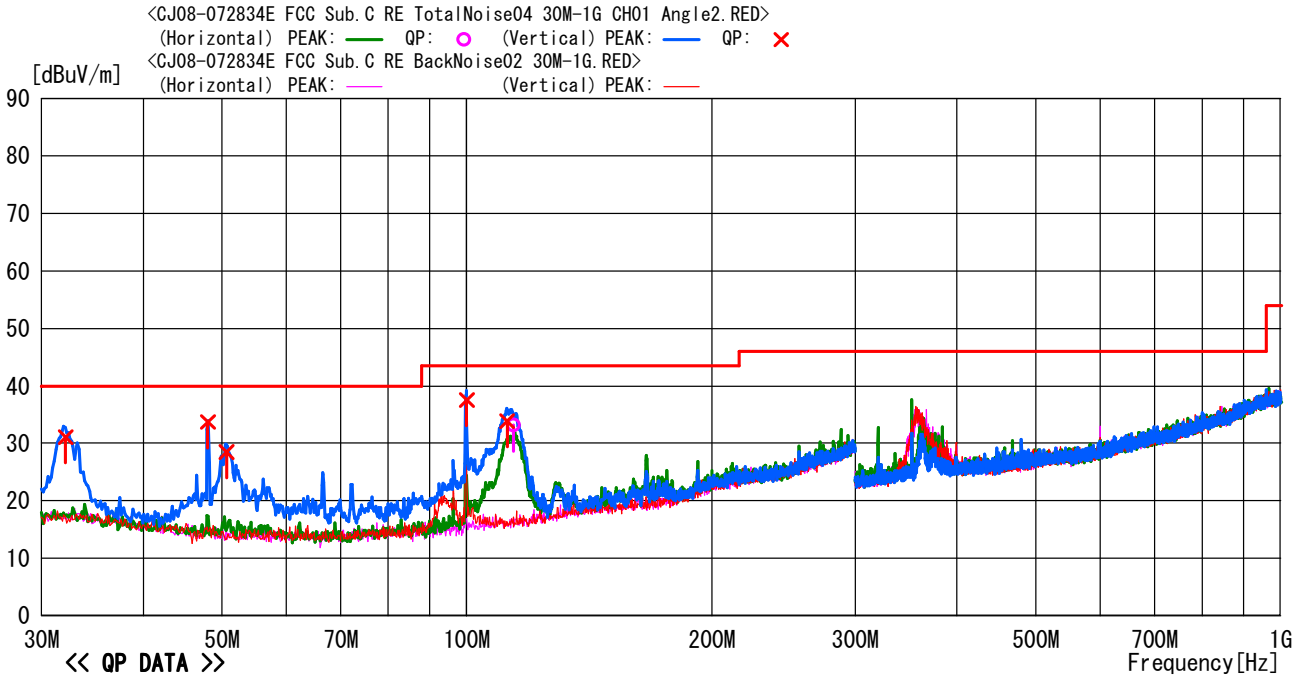
30MHz to 1GHz, CH 1 Angle 2

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ08-072834E
Temp./Humi. : 24℃/35%
Condition : Transmitter Modulated
Remark : CH:01(2405MHz) Angle2

Memo : RBW:30M～1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m) 30MHz-1000MHz



No	Freq.	Reading	C.Fac	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	114.128	45.9	-12.8	33.1	43.5	10.4	Hori.	179	248	BC	
2	32.139	41.9	-10.8	31.1	40.0	8.9	Vert.	100	305	BC	
3	48.054	47.5	-13.8	33.7	40.0	6.3	Vert.	100	210	BC	
4	50.682	42.6	-14.1	28.5	40.0	11.5	Vert.	100	157	BC	
5	99.940	51.1	-13.6	37.5	43.5	6.0	Vert.	100	291	BC	
6	112.054	47.0	-13.1	33.9	43.5	9.6	Vert.	100	351	BC	

-TEPTO-DV/RE Ver 1.80.0020

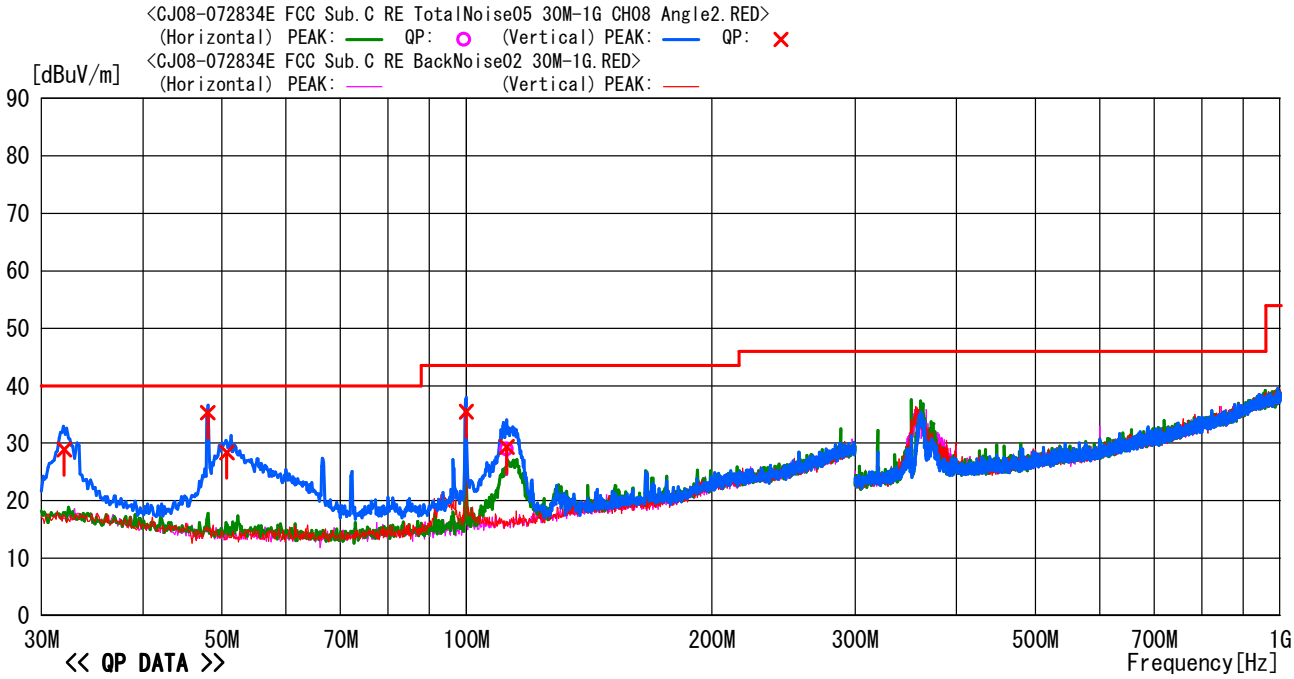
30MHz to 1GHz, CH 8 Angle 2

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ08-072834E
Temp./Humi. : 24℃/35%
Condition : Transmitter Modulated
Remark : CH:08(2440MHz) Angle2

Memo : RBW:30M～1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m) 30MHz-1000MHz



No	Freq.	Reading	C.Fac	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	111.994	42.1	-13.1	29.0	43.5	14.5	Hori.	191	239	BC	
2	32.019	39.7	-10.8	28.9	40.0	11.1	Vert.	100	0	BC	
3	48.065	49.1	-13.8	35.3	40.0	4.7	Vert.	100	157	BC	
4	50.710	42.5	-14.1	28.4	40.0	11.6	Vert.	100	181	BC	
5	99.905	49.1	-13.6	35.5	43.5	8.0	Vert.	100	327	BC	
6	112.039	42.4	-13.1	29.3	43.5	14.2	Vert.	100	0	BC	

-TEPTO-DV/RE Ver 1.80.0020

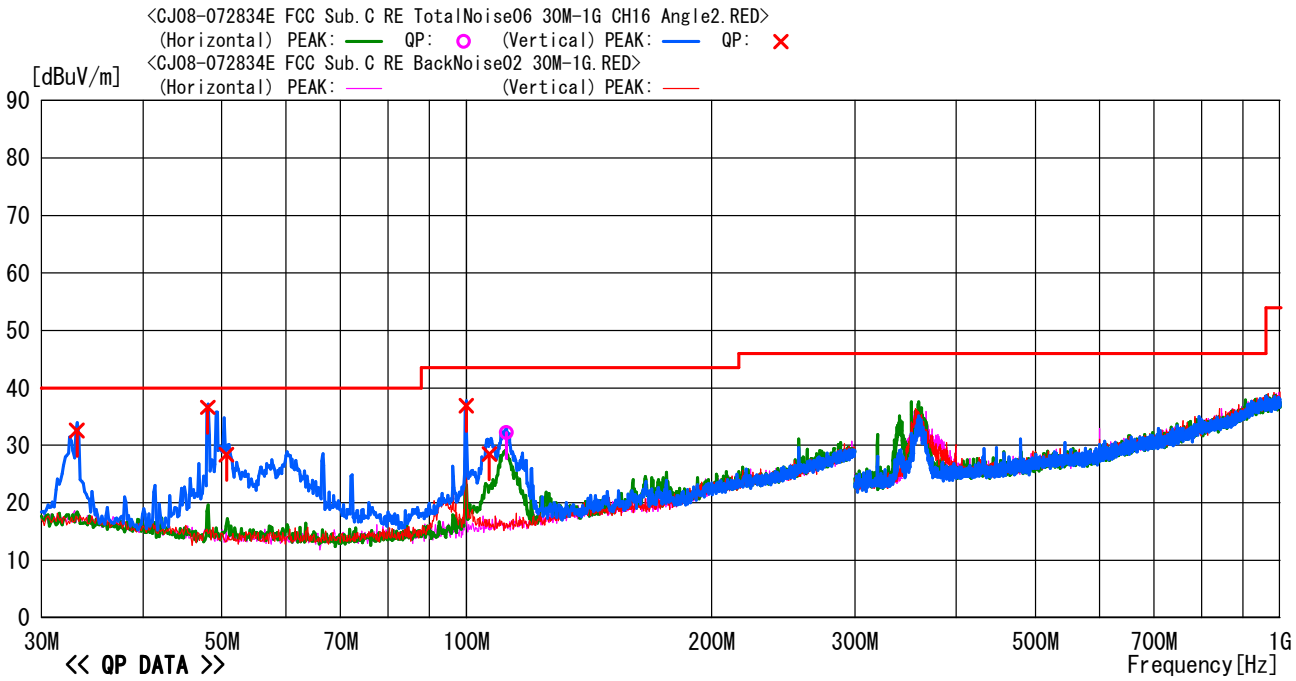
30MHz to 1GHz, CH 16 Angle 2

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ08-072834E
Temp./Humi. : 23℃/39%
Condition : Transmitter Modulated
Remark : CH:16(2480MHz) Angle2

Memo : RBW:30M～1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m) 30MHz-1000MHz



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	111.894	45.3	-13.1	32.2	43.5	11.3	Hori.	172	103	BC	
2	33.180	43.6	-11.0	32.6	40.0	7.4	Vert.	100	0	BC	
3	48.054	50.4	-13.8	36.6	40.0	3.4	Vert.	100	226	BC	
4	50.654	42.5	-14.1	28.4	40.0	11.6	Vert.	100	236	BC	
5	99.915	50.5	-13.6	36.9	43.5	6.6	Vert.	100	0	BC	
6	106.643	41.8	-13.3	28.5	43.5	15.0	Vert.	100	0	BC	

-TEPTO-DV/RE Ver 1.80.0020

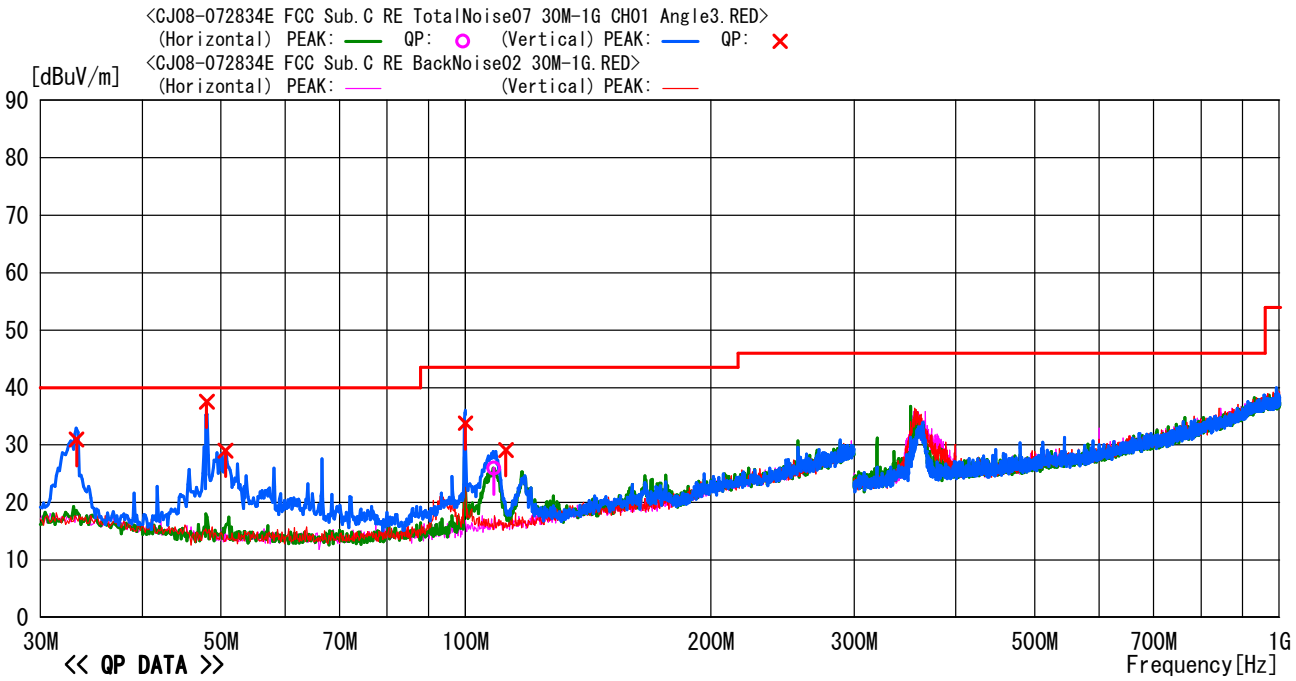
30MHz to 1GHz, CH 1 Angle 3

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ08-072834E
Temp./Humi. : 23℃/39%
Condition : Transmitter Modulated
Remark : CH:01(2405MHz) Angle3

Memo : RBW:30M～1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m) 30MHz-1000MHz



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	108.226	39.1	-13.2	25.9	43.5	17.6	Hori.	191	97	BC	
2	33.242	41.9	-11.0	30.9	40.0	9.1	Vert.	100	8	BC	
3	48.054	51.3	-13.8	37.5	40.0	2.5	Vert.	100	209	BC	
4	50.685	43.1	-14.1	29.0	40.0	11.0	Vert.	100	248	BC	
5	99.925	47.4	-13.6	33.8	43.5	9.7	Vert.	100	310	BC	
6	111.979	42.2	-13.1	29.1	43.5	14.4	Vert.	100	192	BC	

-TEPTO-DV/RE Ver 1.80.0020

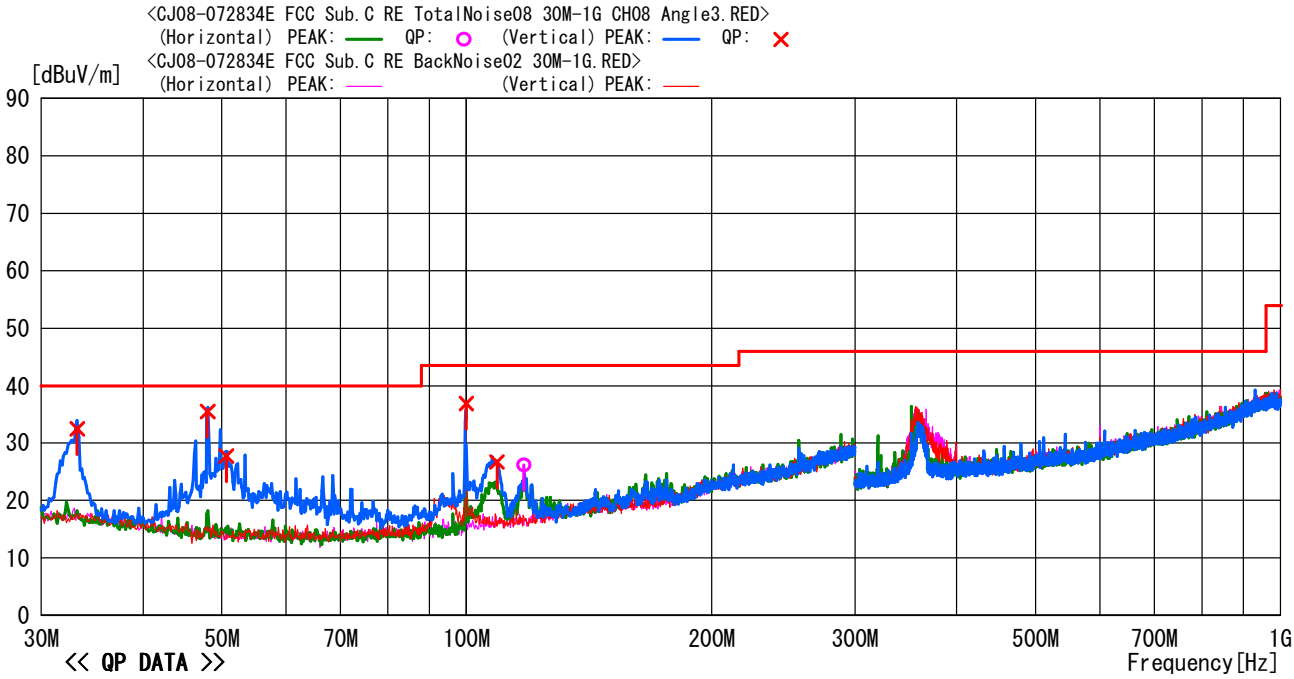
30MHz to 1GHz, CH 8 Angle 3

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ08-072834E
Temp./Humi. : 23℃/39%
Condition : Transmitter Modulated
Remark : CH:08(2440MHz) Angle3

Memo : RBW:30M～1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m) 30MHz-1000MHz



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	117.480	38.9	-12.7	26.2	43.5	17.3	Hori.	237	267	BC	
2	33.212	43.5	-11.0	32.5	40.0	7.5	Vert.	100	355	BC	
3	48.049	49.3	-13.8	35.5	40.0	4.5	Vert.	100	220	BC	
4	50.679	41.8	-14.1	27.7	40.0	12.3	Vert.	100	244	BC	
5	99.902	50.5	-13.6	36.9	43.5	6.6	Vert.	100	299	BC	
6	108.968	39.9	-13.2	26.7	43.5	16.8	Vert.	100	176	BC	

-TEPTO-DV/RE Ver 1.80.0020

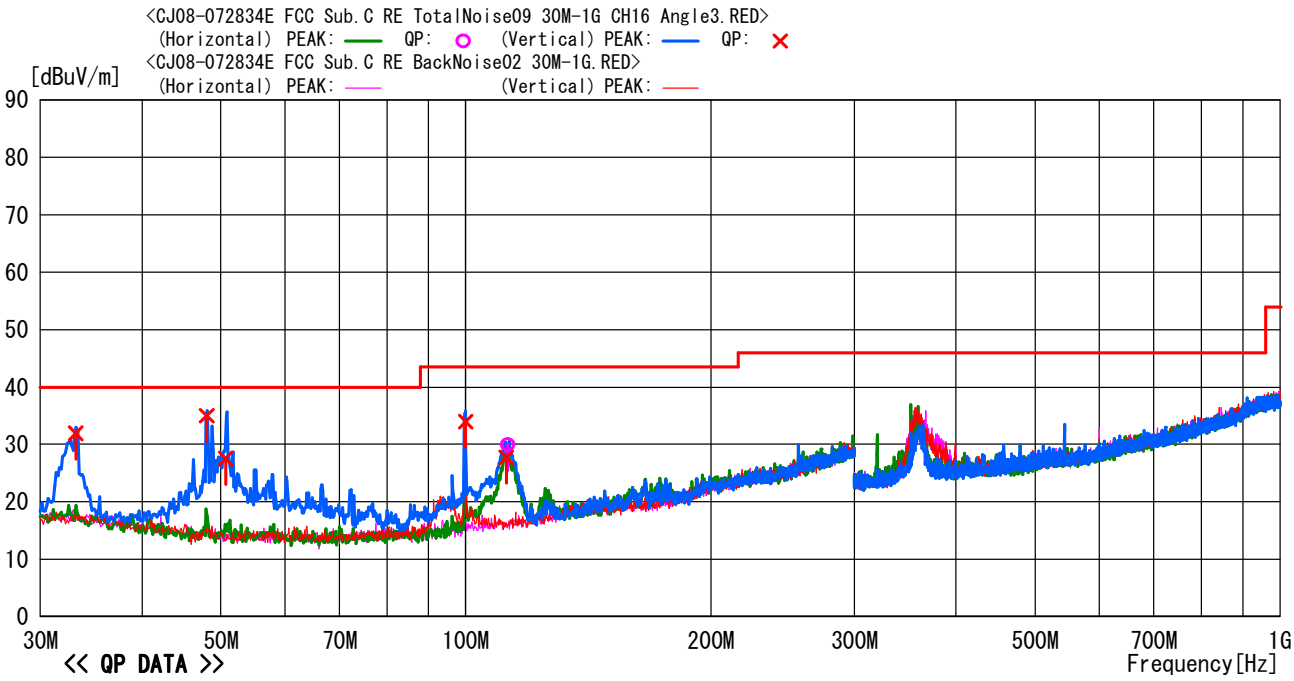
30MHz to 1GHz, CH 16 Angle 3

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ08-072834E
Temp./Humi. : 23℃/39%
Condition : Transmitter Modulated
Remark : CH:16(2480MHz) Angle3

Memo : RBW:30M～1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m) 30MHz-1000MHz



No	Freq.	Reading	C.Fac	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	112.655	42.9	-13.0	29.9	43.5	13.6	Hori.	194	97	BC	
2	33.181	42.9	-11.0	31.9	40.0	8.1	Vert.	100	0	BC	
3	48.044	48.8	-13.8	35.0	40.0	5.0	Vert.	100	183	BC	
4	50.695	41.6	-14.1	27.5	40.0	12.5	Vert.	100	245	BC	
5	99.914	47.6	-13.6	34.0	43.5	9.5	Vert.	100	0	BC	
6	112.054	40.8	-13.1	27.7	43.5	15.8	Vert.	100	0	BC	

-TEPTO-DV/RE Ver 1.80.0020

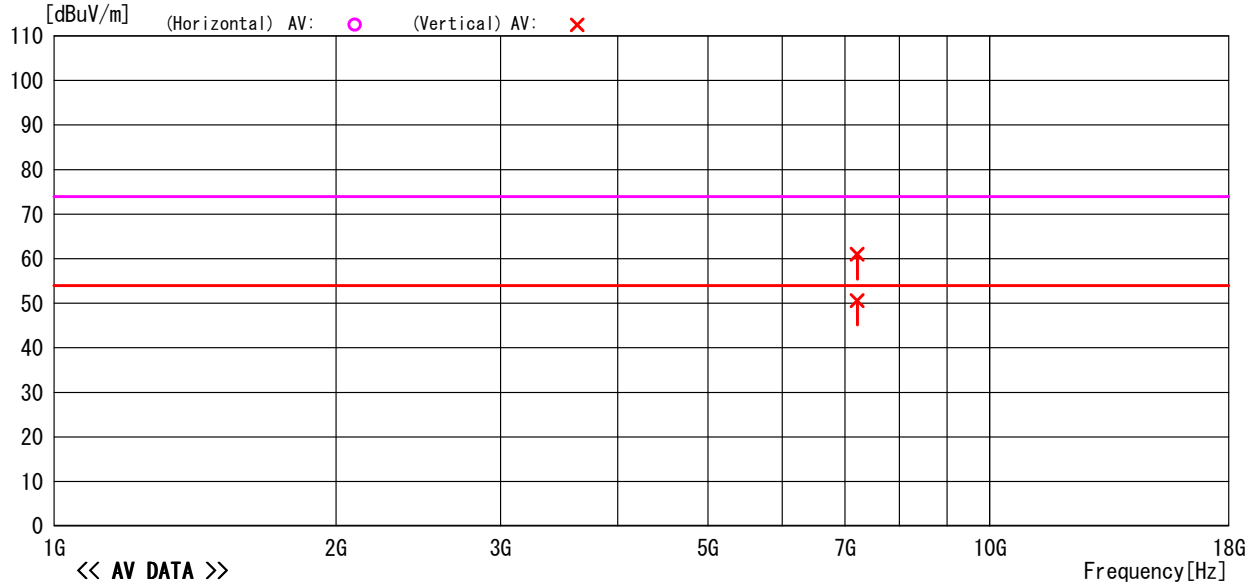
1GHz to 18GHz, CH1 Angle 1

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ08-072834E
Temp/Humi : 24℃/43%
Condition : Transmitter Modulated
Remark : CH:01 (2405MHz) Angle1

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	7213.481	39.1	11.5	50.6	54.0	3.4	Vert.	100	246	HRN	AV
2	7213.481	49.4	11.5	60.9	54.0	-6.9	Vert.	100	246	HRN	PK

-TEPTO-DV/RE Ver1.80.0020

Note: Except for measured point, AV was within a limit.

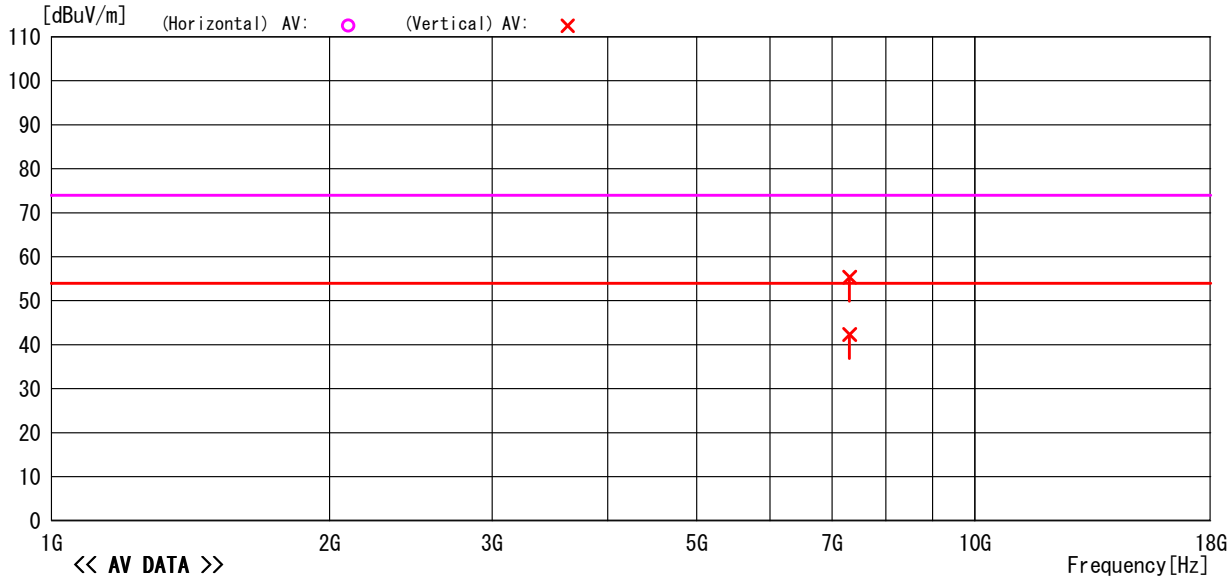
1GHz to 18GHz, CH8 Angle 1

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ08-072834E
Temp/Humi : 24℃/43%
Condition : Transmitter Modulated
Remark : CH:08 (2440MHz) Angle1

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	7315.745	30.6	11.7	42.3	54.0	11.7	Vert.	100	1	HRN	AV
2	7315.745	43.6	11.7	55.3	54.0	-1.3	Vert.	100	1	HRN	PK

-TEPTO-DV/RE Ver1.80.0020

Note: Except for measured point, AV was within a limit.

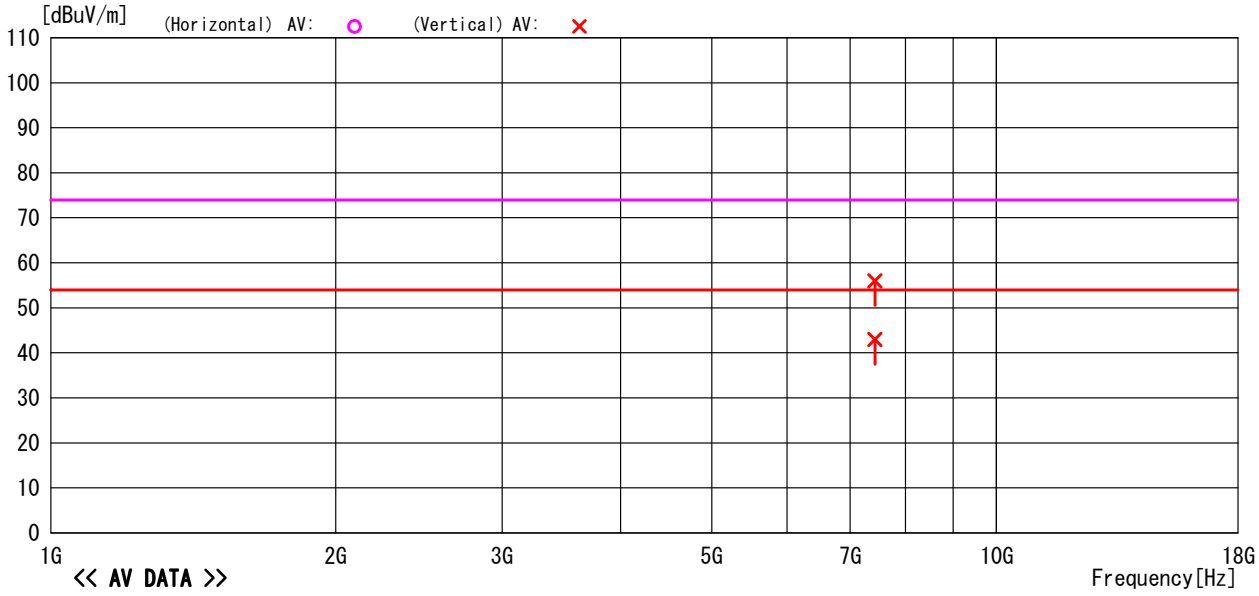
1GHz to 18GHz, CH16 Angle 1

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ08-072834E
Temp/Humi : 24℃/43%
Condition : Transmitter Modulated
Remark : CH:16 (2480MHz) Angle1

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	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	7435.879	31.1	11.8	42.9	54.0	11.1	Vert.	100	358	HRN	AV
2	7435.879	44.2	11.8	56.0	54.0	-2.0	Vert.	100	358	HRN	PK

-TEPTO-DV/RE Ver1.80.0020

Note: Except for measured point, AV was within a limit.

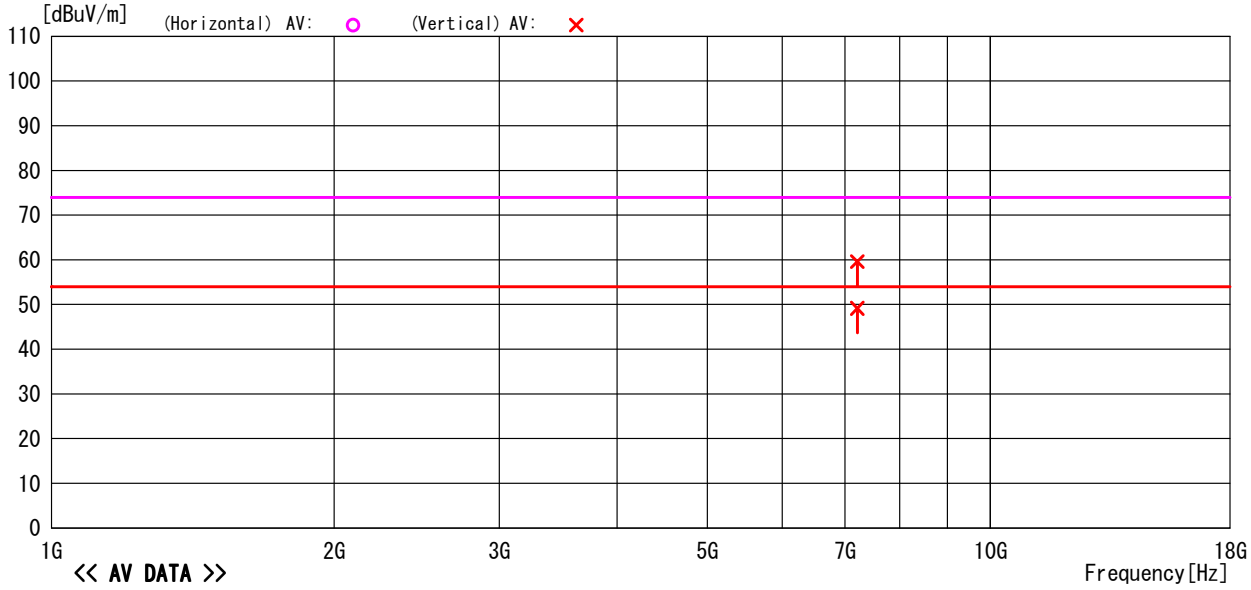
1GHz to 18GHz, CH1 Angle 2

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ08-072834E
Temp/Humi : 24℃/43%
Condition : Transmitter Modulated
Remark : CH:01 (2405MHz) Angle2

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	7216.462	37.7	11.5	49.2	54.0	4.8	Vert.	189	181	HRN	AV
2	7216.462	48.1	11.5	59.6	54.0	-5.6	Vert.	189	181	HRN	PK

-TEPTO-DV/RE Ver1.80.0020

Note: Except for measured point, AV was within a limit.

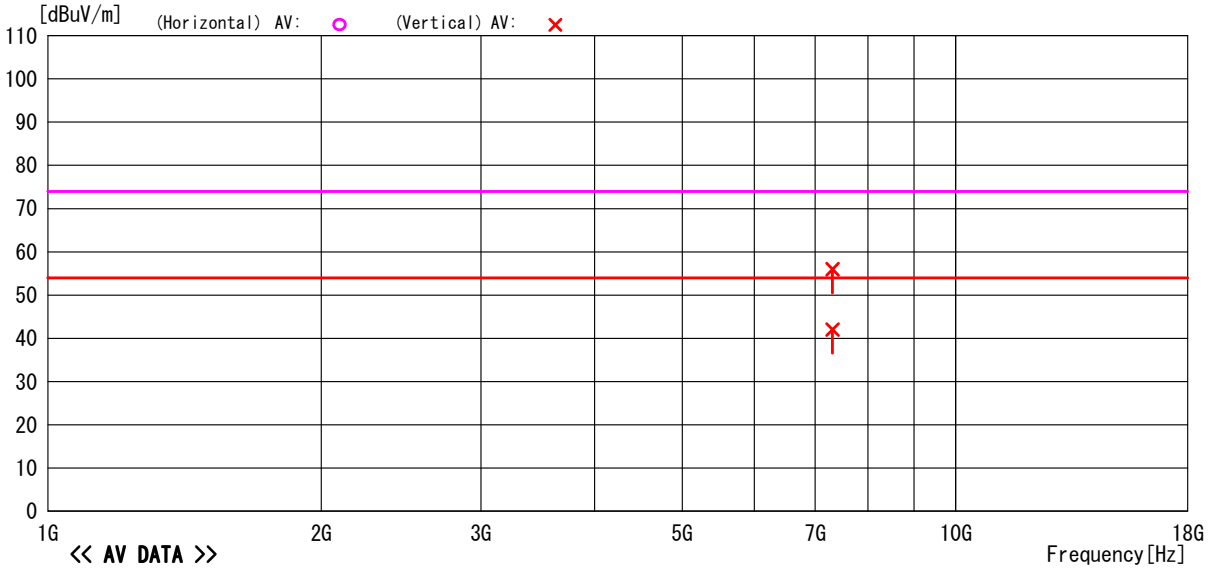
1GHz to 18GHz, CH8 Angle 2

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ08-072834E
Temp/Humi : 24℃/43%
Condition : Transmitter Modulated
Remark : CH:08 (2440MHz) Angle2

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	7315.685	30.4	11.7	42.1	54.0	11.9	Vert.	100	358	HRN	AV
2	7315.685	44.3	11.7	56.0	54.0	-2.0	Vert.	100	358	HRN	PK

-TEPTO-DV/RE Ver1.80.0020

Note: Except for measured point, AV was within a limit.

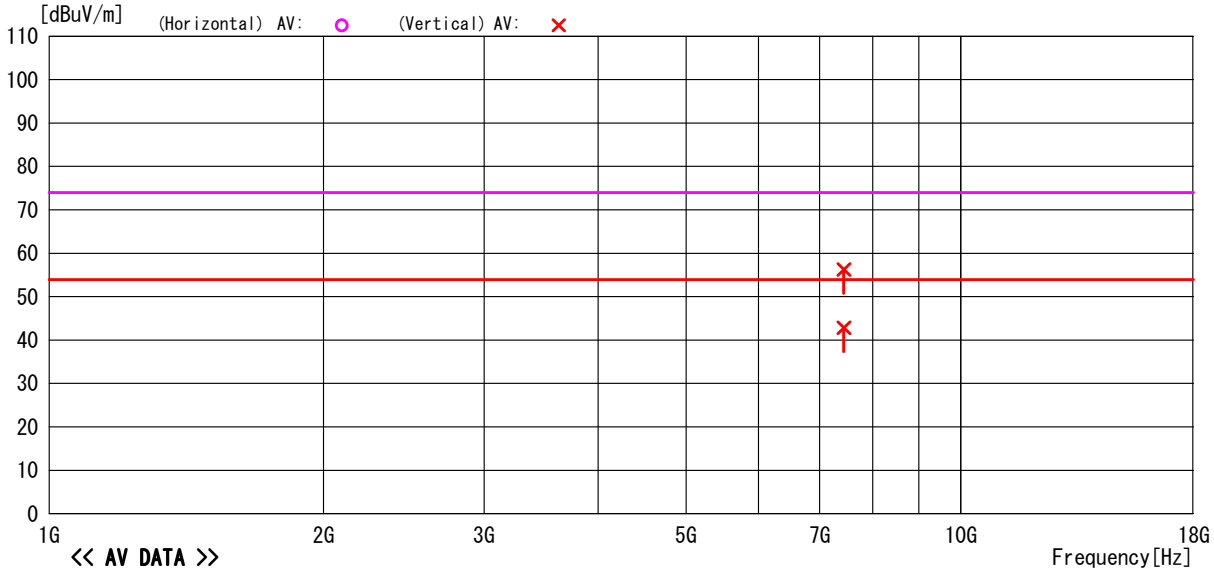
1GHz to 18GHz, CH16 Angle 2

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ08-072834E
Temp/Humi : 24℃/43%
Condition : Transmitter Modulated
Remark : CH:16 (2480MHz) Angle2

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	7440.845	31.0	11.8	42.8	54.0	11.2	Vert.	100	294	HRN	AV
2	7440.845	44.5	11.8	56.3	54.0	-2.3	Vert.	100	294	HRN	PK

-TEPTO-DV/RE Ver1.80.0020

Note: Except for measured point, AV was within a limit.

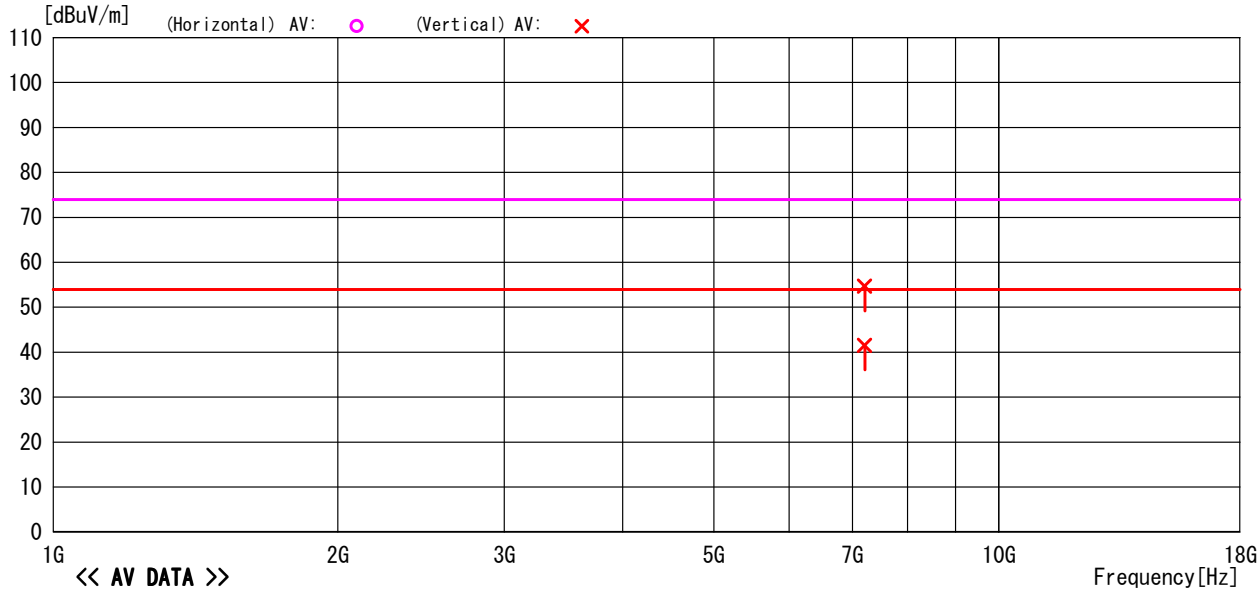
1GHz to 18GHz, CH1 Angle 3

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ08-072834E
Temp/Humi : 24℃/43%
Condition : Transmitter Modulated
Remark : CH:01 (2405MHz) Angle3

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	7215.000	30.0	11.5	41.5	54.0	12.5	Vert.	100	0	HRN	AV
2	7215.000	43.2	11.5	54.7	54.0	-0.7	Vert.	100	0	HRN	PK

-TEPTO-DV/RE Ver1.80.0020

Note: Except for measured point, AV was within a limit.

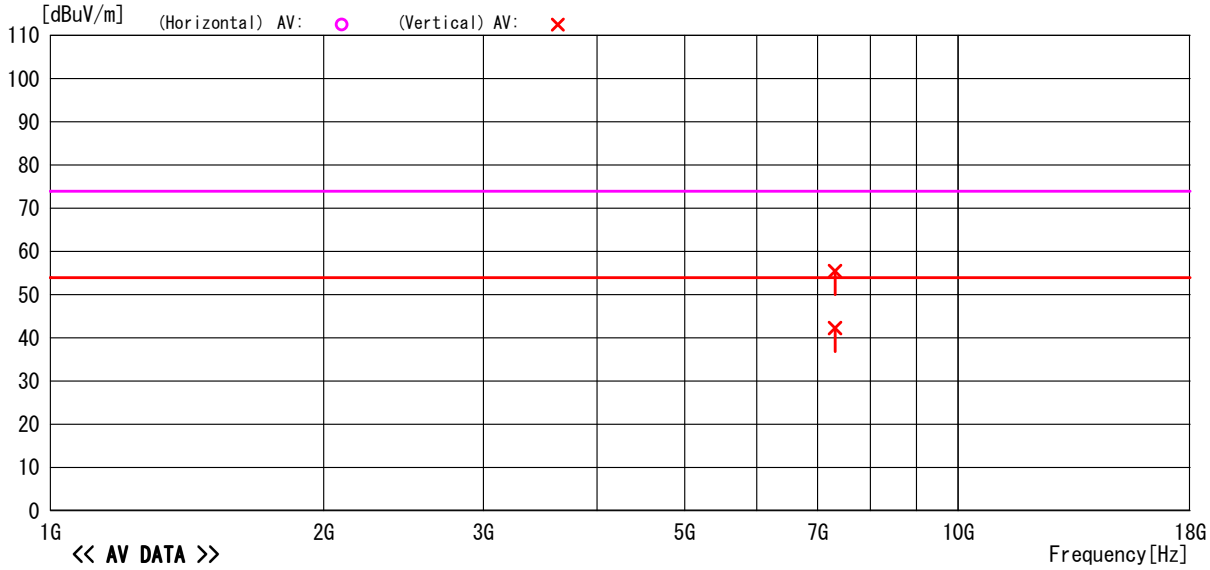
1GHz to 18GHz, CH8 Angle 3

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ08-072834E
Temp/Humi : 24℃/43%
Condition : Transmitter Modulated
Remark : CH:08 (2440MHz) Angle3

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	7320.577	30.6	11.7	42.3	54.0	11.7	Vert.	100	287	HRN	AV
2	7320.577	43.8	11.7	55.5	54.0	-1.5	Vert.	100	287	HRN	PK

-TEPTO-DV/RE Ver1.80.0020

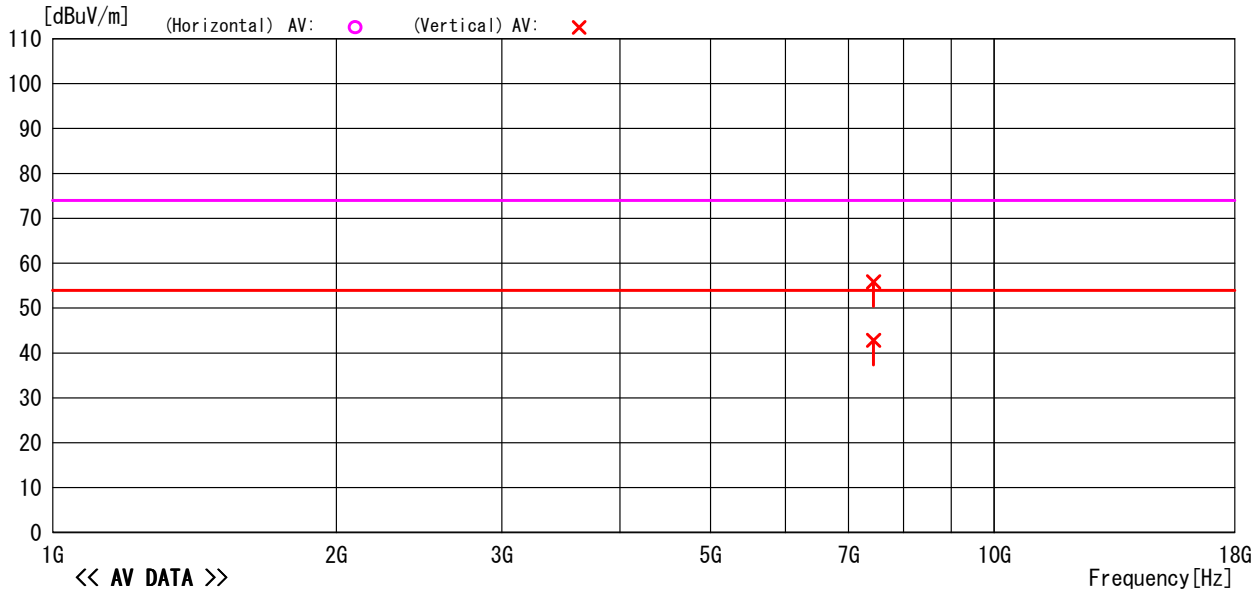
Note: Except for measured point, AV was within a limit.

1GHz to 18GHz, CH16 Angle 3

Model Name	: TM24-FS1	Job No.	: CJ08-072834E
Serial No.	: A0000000E2	Temp/Humi	: 24℃/43%
Operator	: M.Yamanaka	Condition	: Transmitter Modulated
Power Supply	: AC 120V, 60Hz	Remark	: CH:16 (2480MHz) Angle3

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	7440.304	31.1	11.8	42.9	54.0	11.1	Vert.	100	358	HRN	AV
2	7440.304	44.0	11.8	55.8	54.0	-1.8	Vert.	100	358	HRN	PK

-TEPTO-DV/RE Ver1.80.0020

Note: Except for measured point, AV was within a limit.

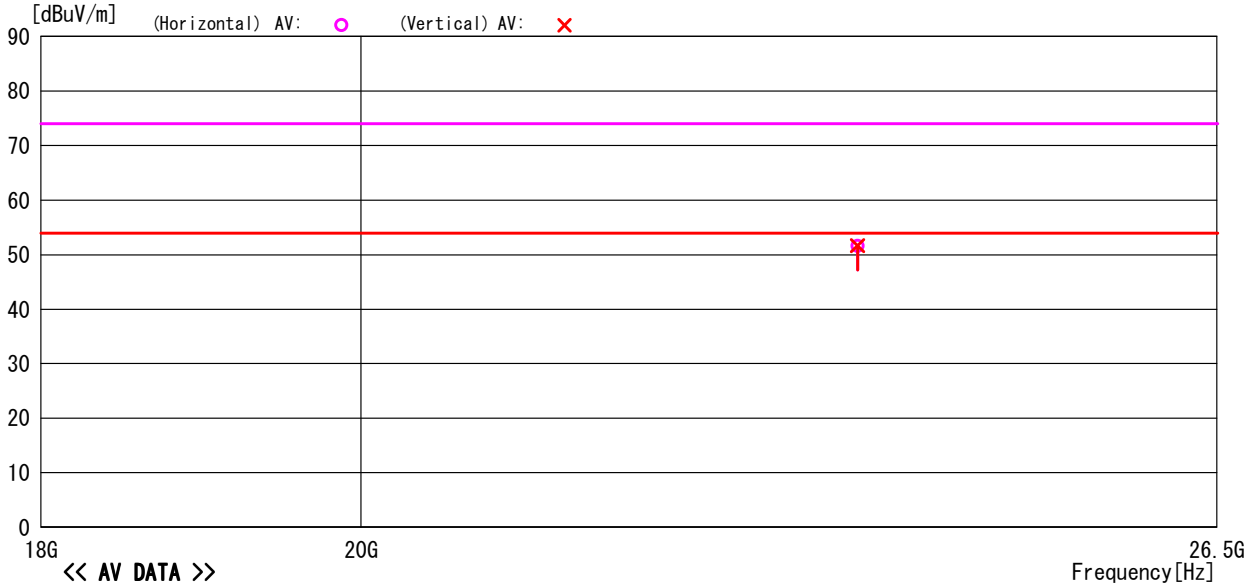
18GHz to 26.5GHz, CH1 Angle 1

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ08-072834E
Temp/Humi : 22℃,39%
Condition : Transmitter Modulated
Remark : CH:01 (2405MHz) Angle1

Memo : RBW:1MHz(1G～)

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	3547.860	30.6	21.0	51.6	54.0	2.4	Hori.	100	0	HRN	AV Freq:23547.860MHz
2	3547.860	30.6	21.0	51.6	54.0	2.4	Vert.	100	0	HRN	AV Freq:23547.860MHz

-TEPTO-DV/Ver 1.80.0020

Note: Except for measured point, AV was within a limit.

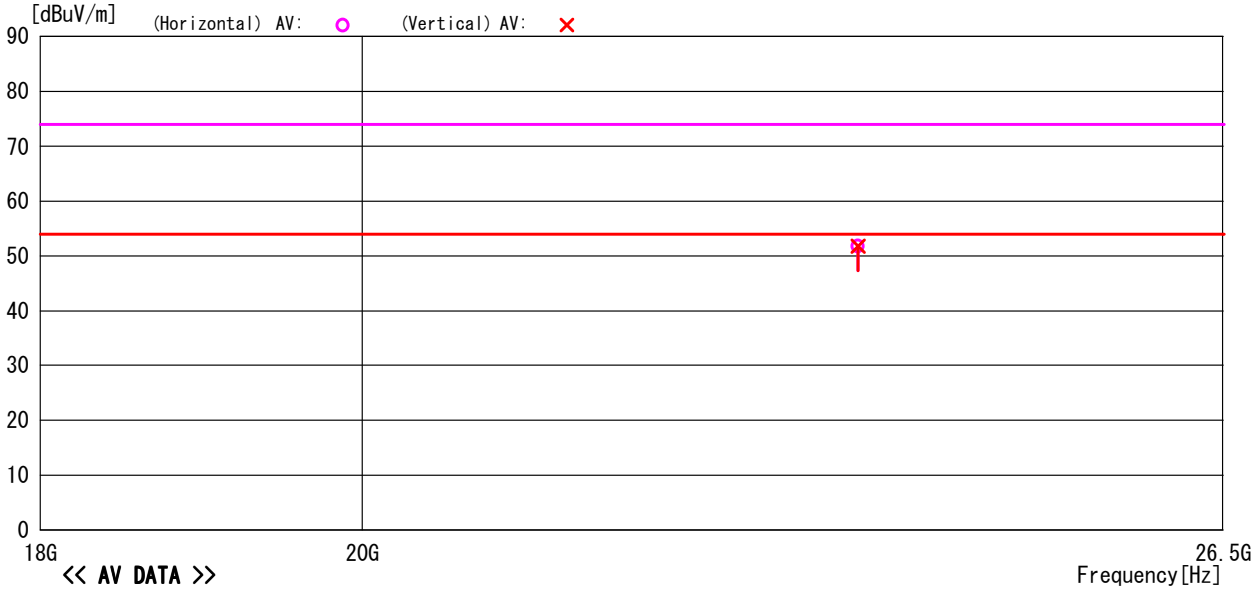
18GHz to 26.5GHz, CH8 Angle 1

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ08-072834E
Temp/Humi : 22℃,39%
Condition : Transmitter Modulated
Remark : CH:08 (2440MHz) Angle1

Memo : RBW:1MHz(1G～)

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	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	3519.790	30.8	21.0	51.8	54.0	2.2	Hori.	100	0	HRN	AV Freq:23519.790MHz
2	3519.790	30.7	21.0	51.7	54.0	2.3	Vert.	100	0	HRN	AV Freq:23519.790MHz

-TEPTO-DV/Ver 1.80.0020

Note: Except for measured point, AV was within a limit.

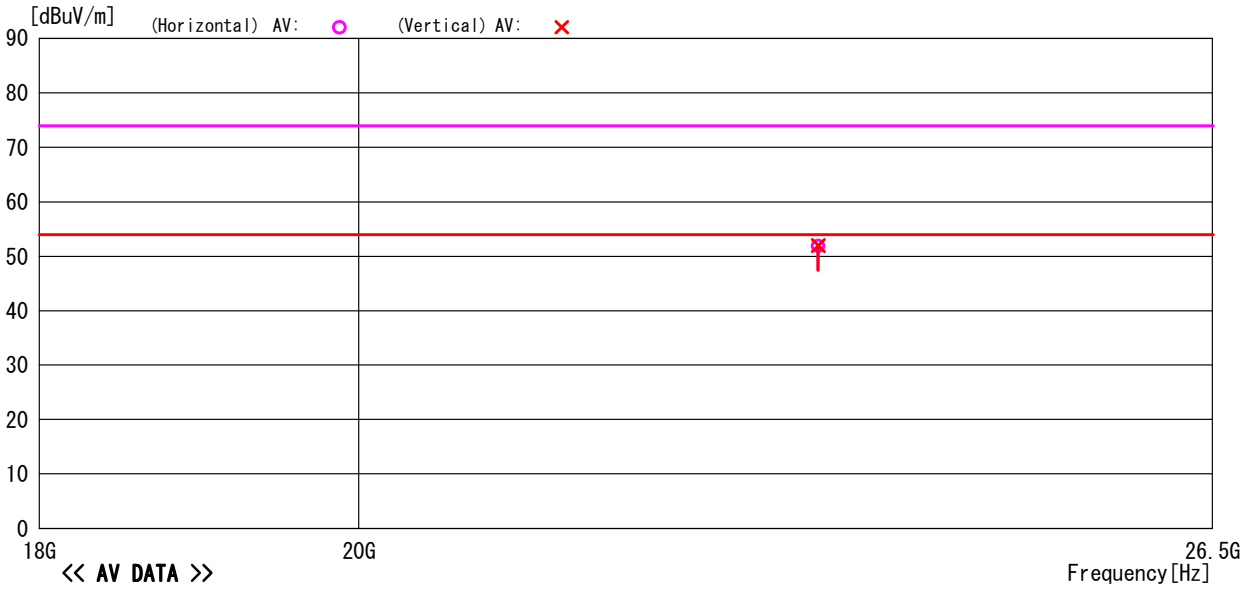
18GHz to 26.5GHz, CH16 Angle 1

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ08-072834E
Temp/Humi : 22℃,39%
Condition : Transmitter Modulated
Remark : CH:16 (2480MHz) Angle1

Memo : RBW:1MHz(1G～)

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	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	3271.170	31.0	20.9	51.9	54.0	2.1	Hori.	100	0	HRN	AV Freq:23271.170MHz
2	3271.170	31.1	20.9	52.0	54.0	2.0	Vert.	100	0	HRN	AV Freq:23271.170MHz

-TEPTO-DV/Ver 1.80.0020

Note: Except for measured point, AV was within a limit.

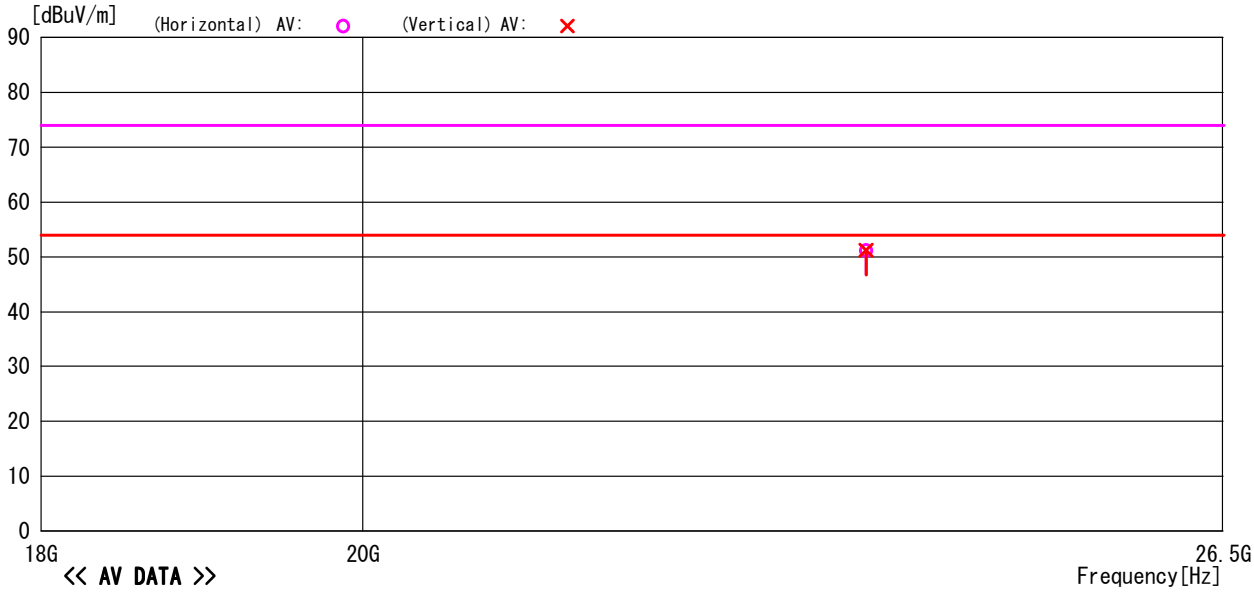
18GHz to 26.5GHz, CH1 Angle 2

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ08-072834E
Temp/Humi : 22℃,39%
Condition : Transmitter Modulated
Remark : CH:01 (2405MHz) Angle2

Memo : RBW:1MHz(1G～)

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



<< AV DATA >>

No	Freq.	Reading	C.Fac	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	3579.940	30.3	20.9	51.2	54.0	2.8	Hori.	100	0	HRN	AV Freq:23579.940MHz
2	3579.940	30.3	20.9	51.2	54.0	2.8	Vert.	100	0	HRN	AV Freq:23579.940MHz

-TEPTO-DV/Ver 1.80.0020

Note: Except for measured point, AV was within a limit.

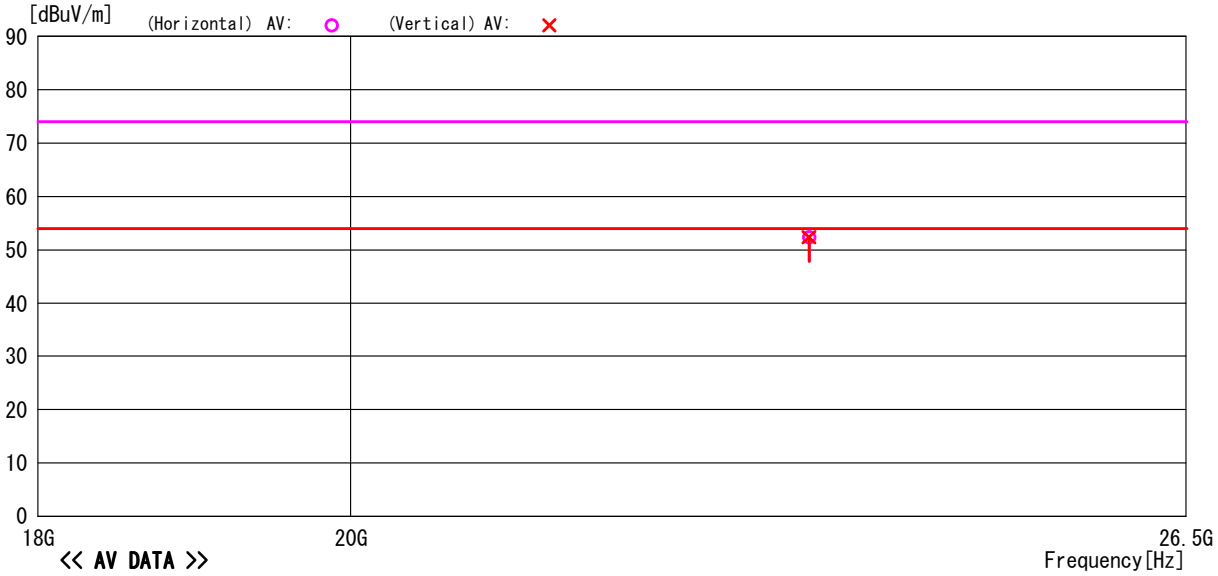
18GHz to 26.5GHz, CH8 Angle 2

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ08-072834E
Temp/Humi : 22℃,39%
Condition : Transmitter Modulated
Remark : CH:08 (2440MHz) Angle2

Memo : RBW:1MHz(1G～)

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	3339.340	31.3	21.0	52.3	54.0	1.7	Hori.	100	0	HRN	AV Freq:23339.340MHz
2	3339.340	31.3	21.0	52.3	54.0	1.7	Vert.	100	0	HRN	AV Freq:23339.340MHz

-TEPTO-DV/Ver 1.80.0020

Note: Except for measured point, AV was within a limit.

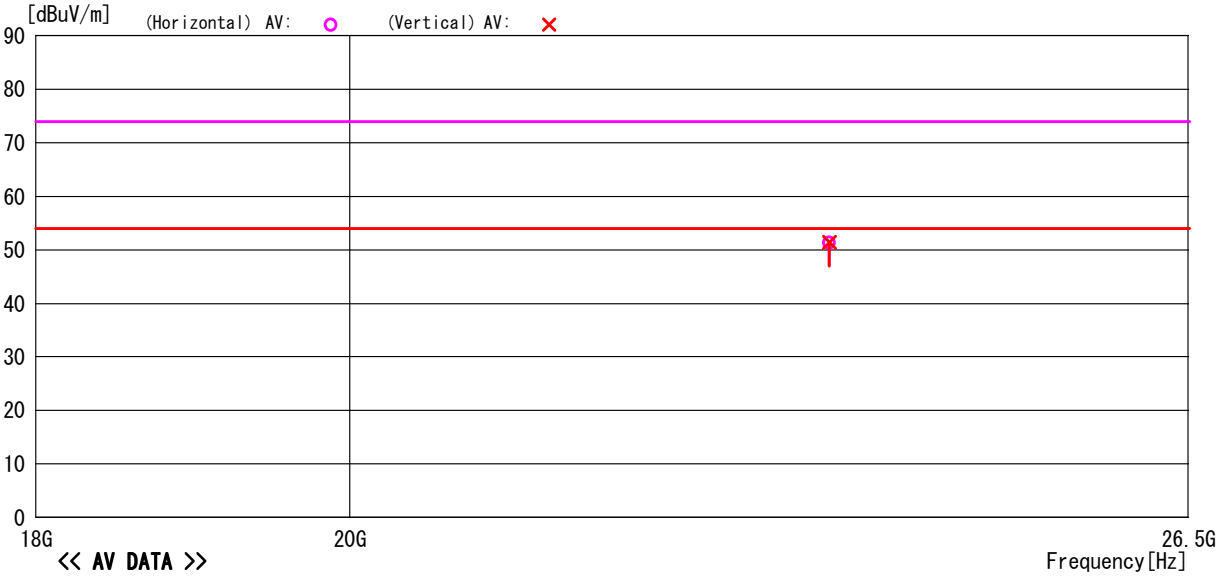
18GHz to 26.5GHz, CH16 Angle 2

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ08-072834E
Temp/Humi : 22℃,39%
Condition : Transmitter Modulated
Remark : CH:16 (2480MHz) Angle2

Memo : RBW:1MHz(1G～)

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	3491.720	30.5	20.9	51.4	54.0	2.6	Hori.	100	0	HRN	AV Freq:23491.720MHz
2	3491.720	30.5	20.9	51.4	54.0	2.6	Vert.	100	0	HRN	AV Freq:23491.720MHz

-TEPTO-DV/Ver 1.80.0020

Note: Except for measured point, AV was within a limit.

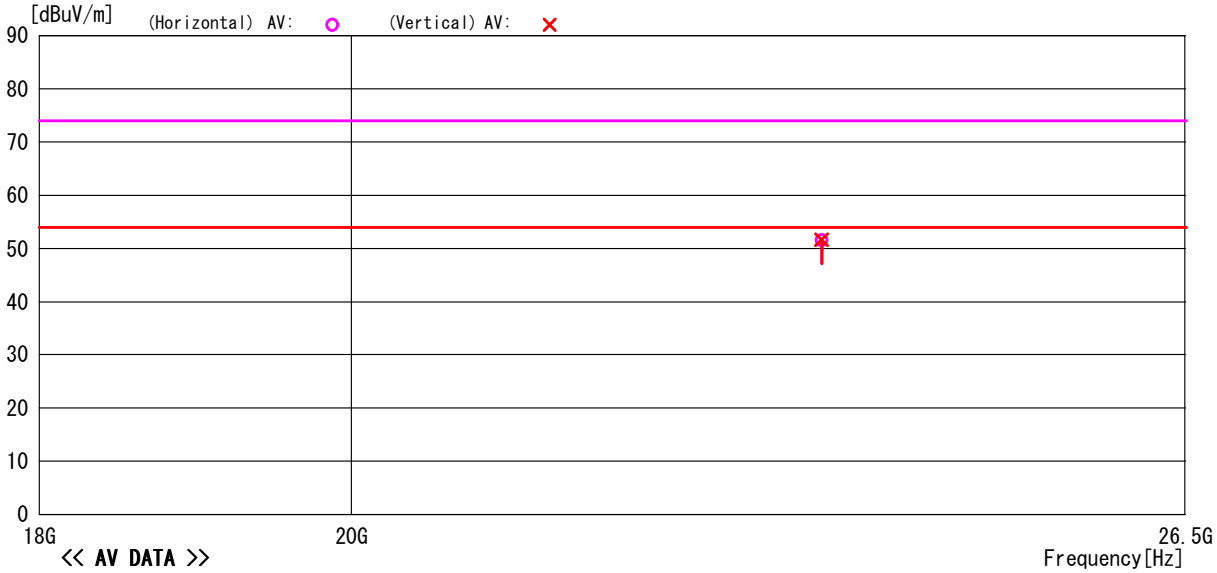
18GHz to 26.5GHz, CH1 Angle 3

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ08-072834E
Temp/Humi : 22℃,39%
Condition : Transmitter Modulated
Remark : CH:01 (2405MHz) Angle3

Memo : RBW:1MHz(1G～)

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	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	3439.590	30.7	20.9	51.6	54.0	2.4	Hori.	100	0	HRN	AV Freq:23439.590MHz
2	3439.590	30.7	20.9	51.6	54.0	2.4	Vert.	100	0	HRN	AV Freq:23439.590MHz

-TEPTO-DV/Ver 1.80.0020

Note: Except for measured point, AV was within a limit.

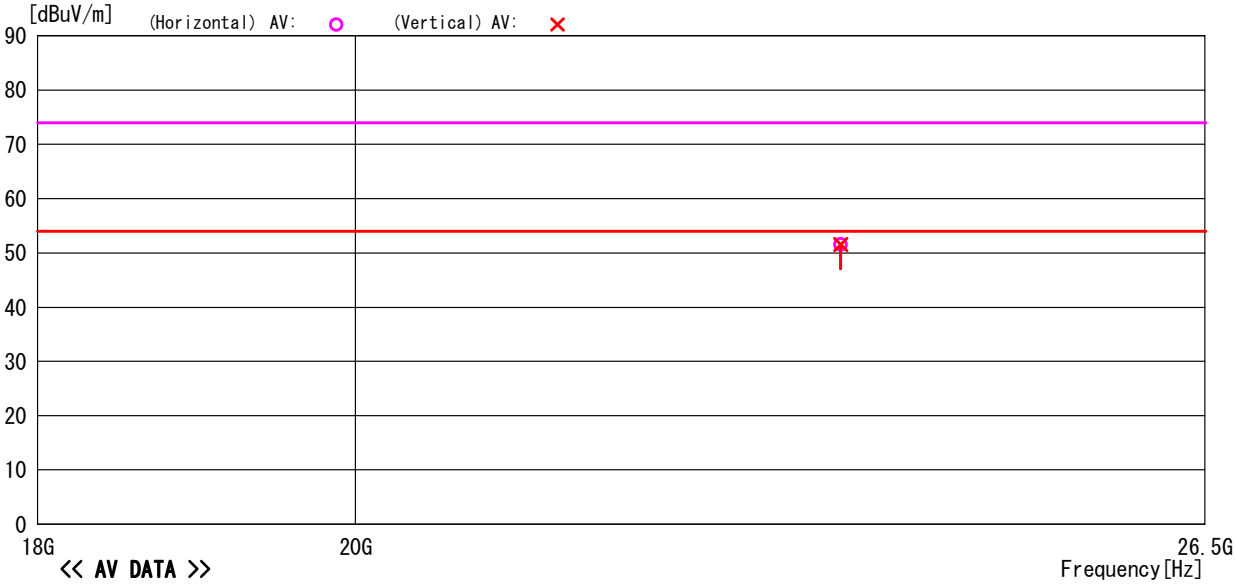
18GHz to 26.5GHz, CH8 Angle 3

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ08-072834E
Temp/Humi : 22℃,39%
Condition : Transmitter Modulated
Remark : CH:08 (2440MHz) Angle3

Memo : RBW:1MHz(1G～)

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	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	3487.710	30.6	20.9	51.5	54.0	2.5	Hori.	100	0	HRN	AV Freq:23487.710MHz
2	3487.710	30.6	20.9	51.5	54.0	2.5	Vert.	100	0	HRN	AV Freq:23487.710MHz

-TEPTO-DV/Ver 1.80.0020

Note: Except for measured point, AV was within a limit.

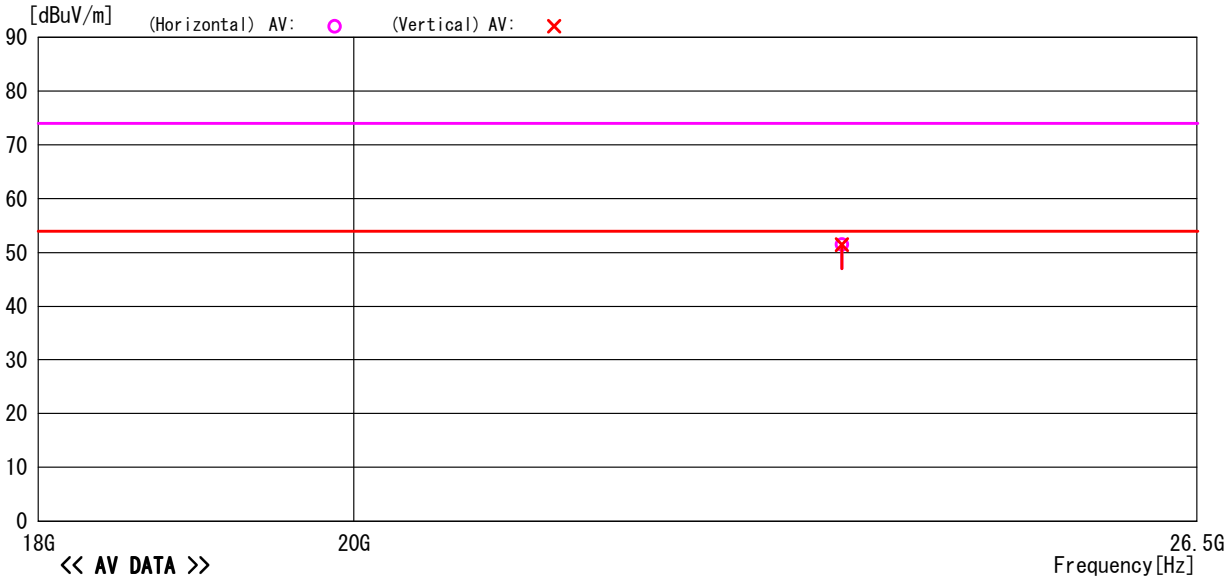
18GHz to 26.5GHz, CH16 Angle 3

Model Name : TM24-FS1
Serial No. : A0000000E2
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ08-072834E
Temp/Humi : 22℃,39%
Condition : Transmitter Modulated
Remark : CH:16 (2480MHz) Angle3

Memo : RBW:1MHz(1G～)

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	3539.840	30.4	21.0	51.4	54.0	2.6	Hori.	100	0	HRN	AV Freq:23539.840MHz
2	3539.840	30.4	21.0	51.4	54.0	2.6	Vert.	100	0	HRN	AV Freq:23539.840MHz

-TEPTO-DV/Ver 1.80.0020

Note: Except for measured point, AV was within a limit.

5.6 15. 247(e) Power Spectrum Density

5.6.1 Setting Remarks

- EUT directly connects to the spectrum analyzer via calibrated coaxial cable and 10 dB attenuator.
- The loss of the coaxial cable is maximum 1 dB.
- The peak output power is determined by using the marker-data function of spectrum analyzer.
- The spectrum analyzer is set-up as following;

✓	Frequency Span	: 1.5 MHz
✓	Resolution bandwidth	: 3 kHz
✓	Video bandwidth	: 3 MHz
✓	Sweep	: 500sec
✓	Detector function	: Peak
✓	Trace Mode	: Max Hold

- See test configuration figure 4.3.

5.6.2 Minimum Standard

15.247 (e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

5.6.3 Result

EUT complies with the requirement.

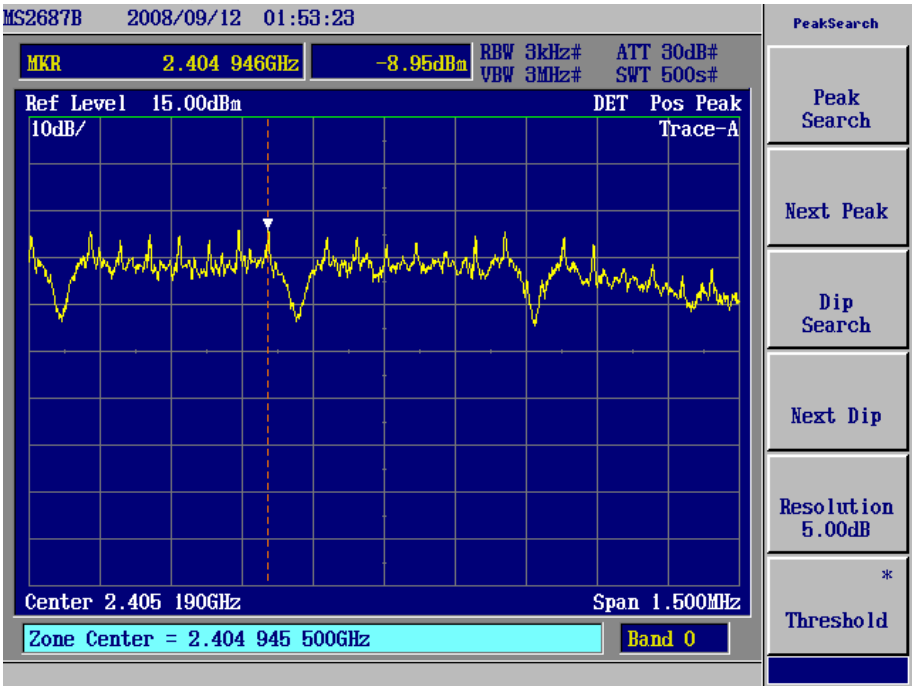
Uncertainty of measurement result: ± 0.8 dB
Temperature, Humidity : 25˚C, 53%

5.6.4 Measured Data

Frequency (MHz)	Correction Factor (dB)	Reading (dBm)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
2405 (1ch)	0.88	-8.95	-8.07	8	16.07
2440 (8ch)	0.89	-7.89	-7.00	8	15.00
2480 (16ch)	0.89	-7.90	-7.01	8	15.01

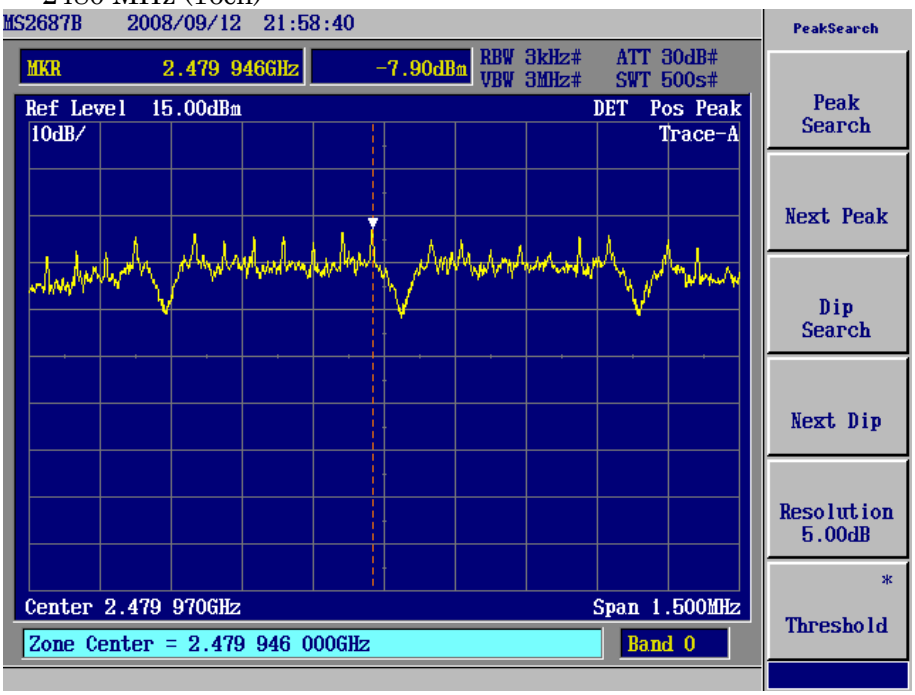
* Correction Factor = Cable Loss (dB) + External Attenuator (dB)

2405 MHz (1ch)



2440 MHz (8ch)

2480 MHz (16ch)



5.7 15. 247(d) Band Edge Measurement

5.7.1 Setting Remarks

- EUT directly connects to the spectrum analyzer via calibrated coaxial cable and 10 dB attenuator.
- The loss of the coaxial cable is maximum 1 dB.
- 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;

  - ✓ Frequency Span : 30MHz
  - ✓ Resolution bandwidth : 300kHz (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 4.2.

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)	
Below 2,390.0	Peak	Average
Above 2,483.5	74	54

5.7.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 2.6 dB
Temperature, Humidity : 24˚C, 42%

5.7.4 Measured Data

The band edge emissions are calculated as following;

Angle1 (Vertical)

CH	Pmax	Pav	Pdev	c.f.	Ebe	Eav	Limit(Ebe)	Limit(Eav)	Margin(Ebe)	Margin(Eav)
1	98.5	92.8	50.24	−3.2	45.1	39.4	74.0	54.0	28.9	14.6
16	95.9	92.6	40.79	−3.1	52.0	48.7	74.0	54.0	22.0	5.3

Angle2 (Vertical)

CH	Pmax	Pav	Pdev	c.f.	Ebe	Eav	Limit(Ebe)	Limit(Eav)	Margin(Ebe)	Margin(Eav)
1	103.3	98.0	49.88	−3.2	50.2	44.9	74.0	54.0	23.8	9.1
16	98.0	95.2	39.93	−3.1	55.0	52.2	74.0	54.0	19.0	1.8

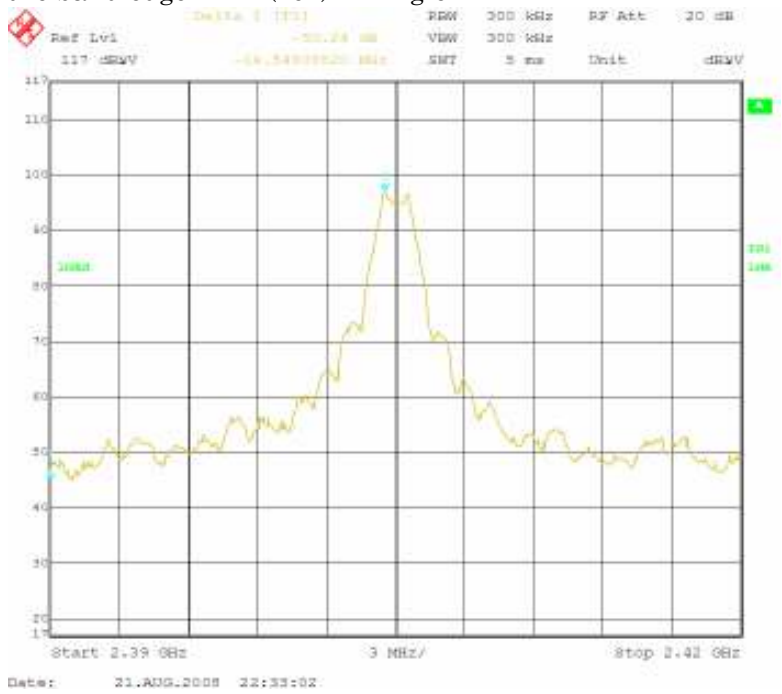
Angle3 (Vertical)

CH	Pmax	Pav	Pdev	c.f.	Ebe	Eav	Limit(Ebe)	Limit(Eav)	Margin(Ebe)	Margin(Eav)
1	101.3	95.6	54.61	−3.2	43.5	37.8	74.0	54.0	30.5	16.2
16	93.4	89.4	40.66	−3.1	49.6	45.6	74.0	54.0	24.4	8.4

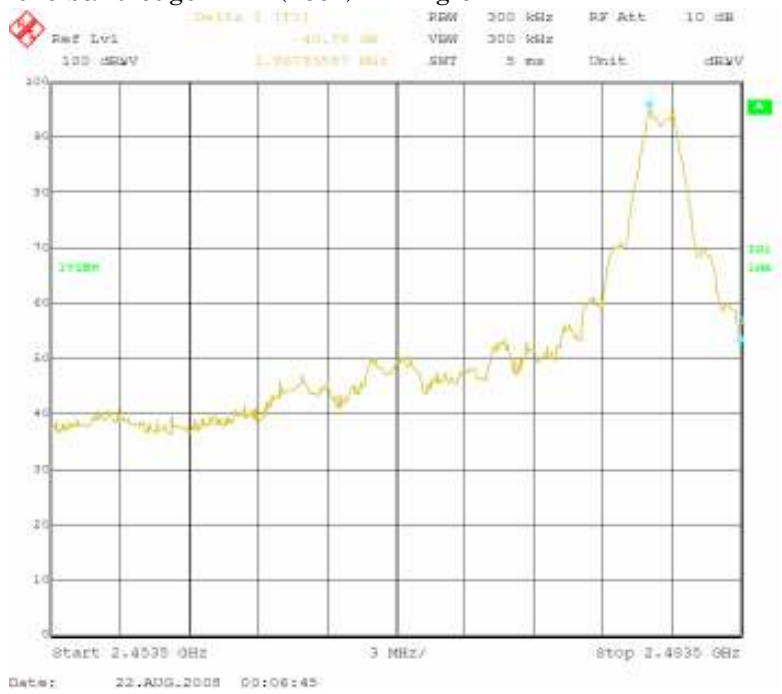
NOTE Vertical and Horizontal were measured and Vertical was confirmed as the worst.

P_{max} : Maximum peak power of the fundamental.
P_{av} : Average 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.

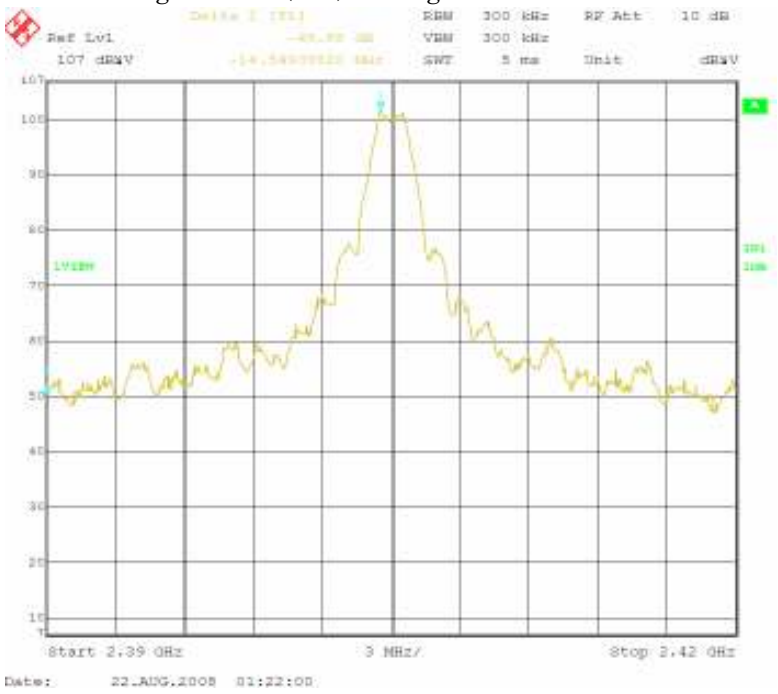
Lower frequency of the band edge MHz (1ch) ＜Angle1＞



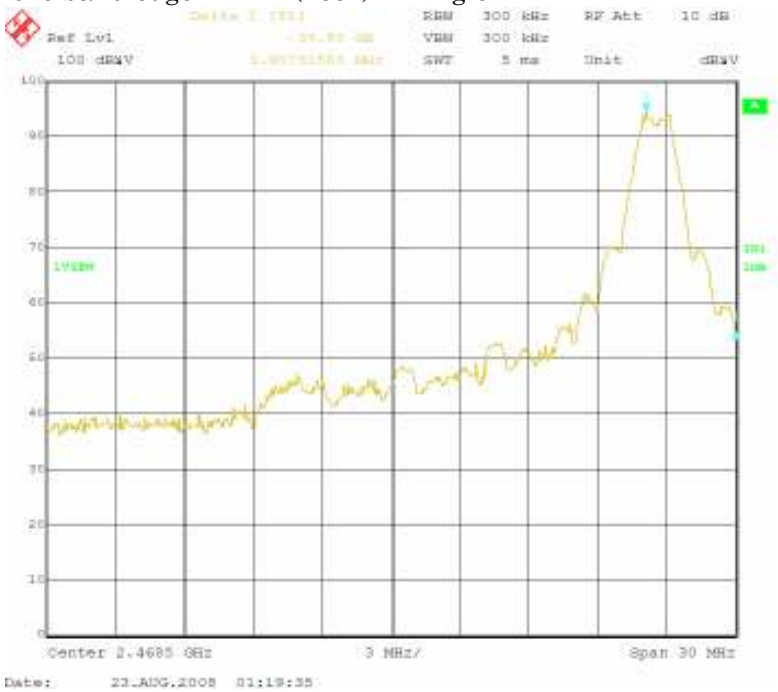
Higher frequency of the band edge MHz (16ch) ＜Angle1＞



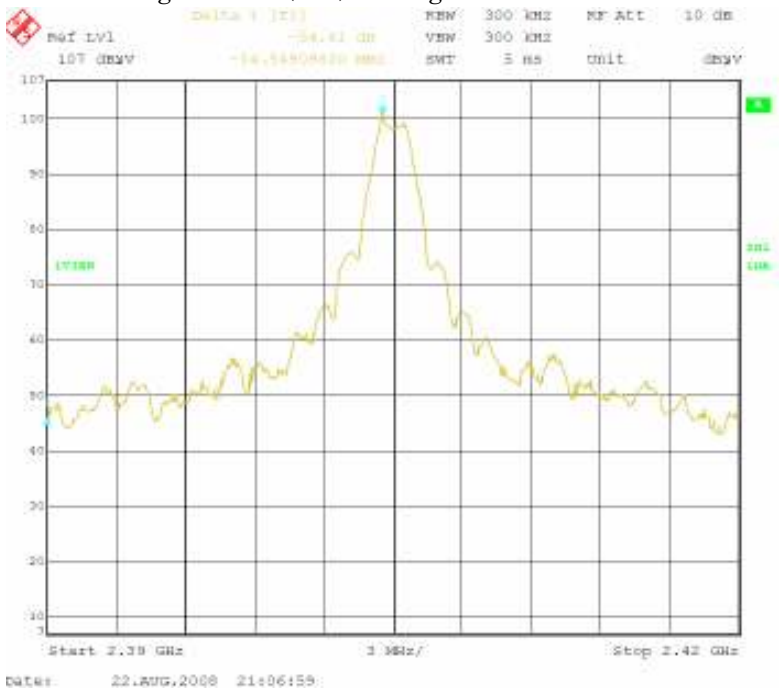
Lower frequency of the band edge　MHz (1ch) ＜Angle2＞



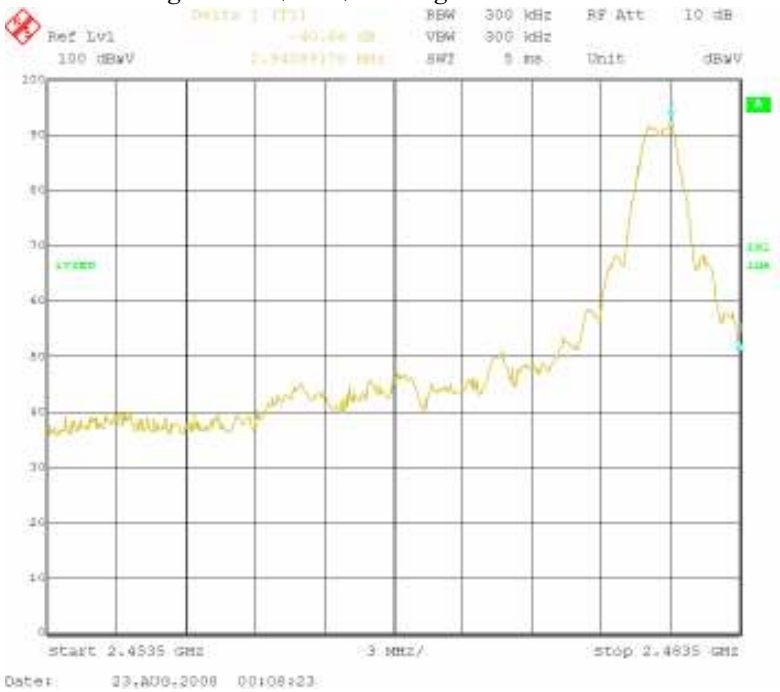
Higher frequency of the band edge　MHz (16ch) ＜Angle2＞



Lower frequency of the band edge　MHz (1ch) ＜Angle3＞



Higher frequency of the band edge MHz (16ch) ＜Angle3＞

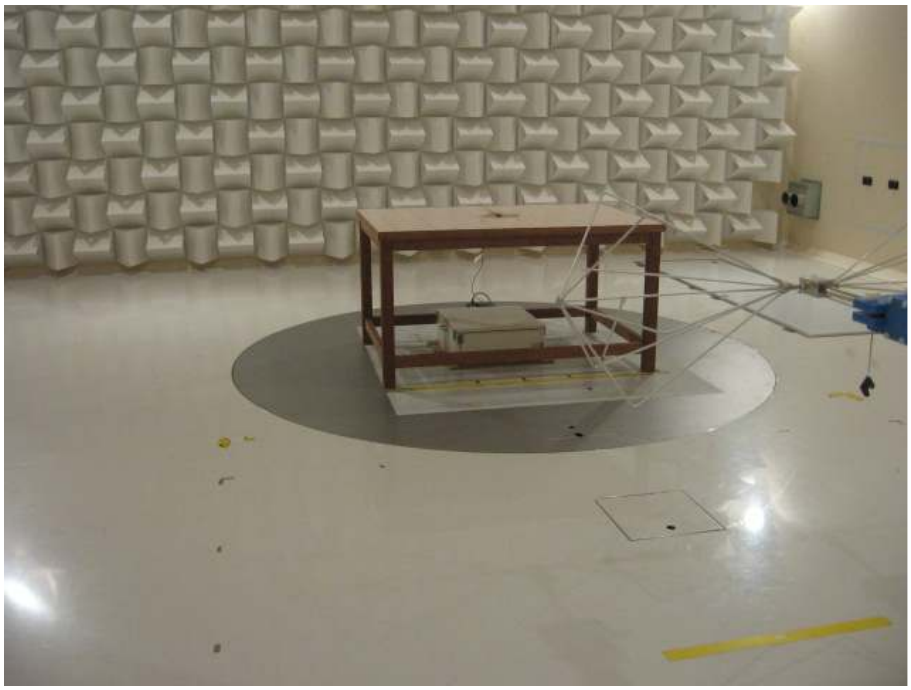


6. Photos

6.1 Setup Photo (Conducted Emission)

6.2 Setup Photo (Radiated Emission)

Angle1

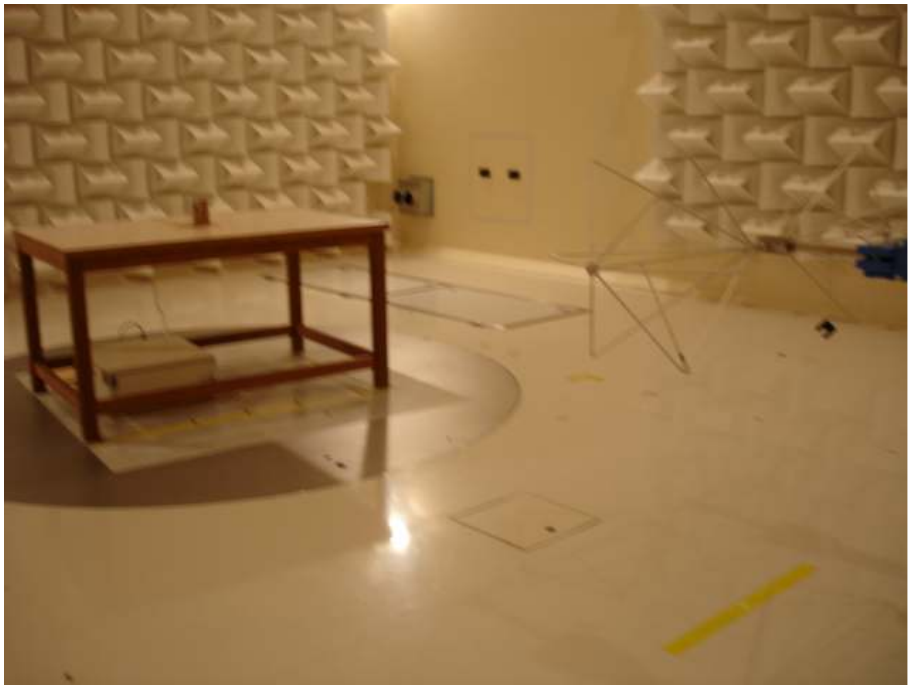


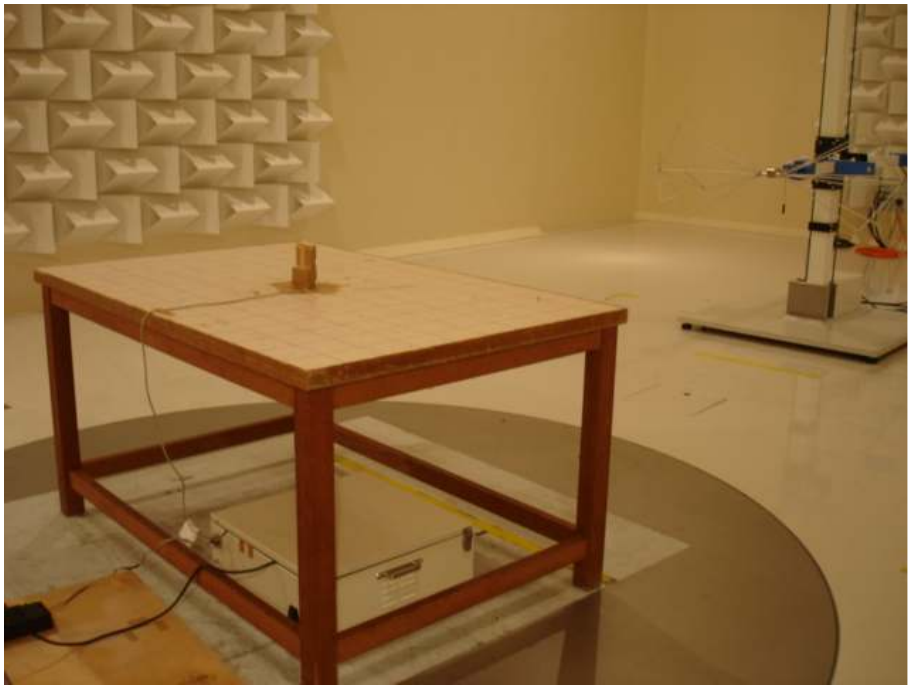
6.2 Setup Photo (Radiated Emission)

Angle2

6.2 Setup Photo (Radiated Emission)

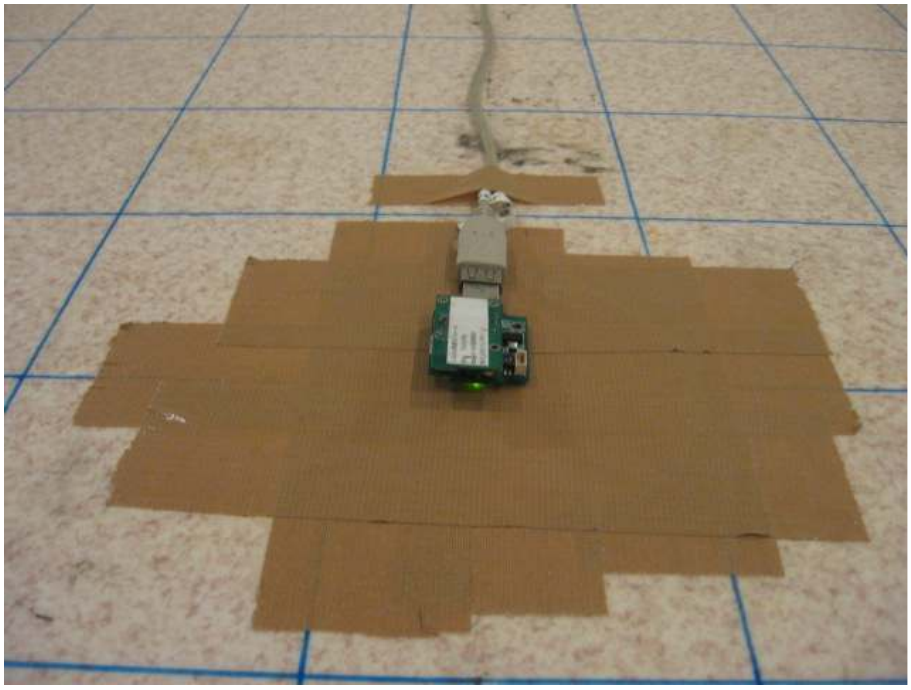
Angle3



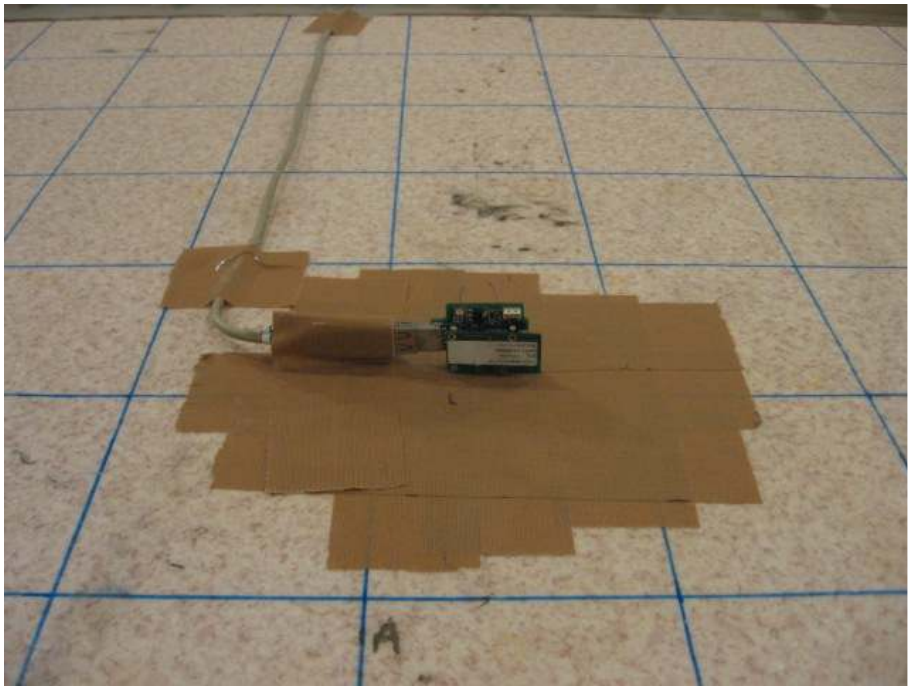


6.2 Setup Photo (Radiated Emission)

Angle 1

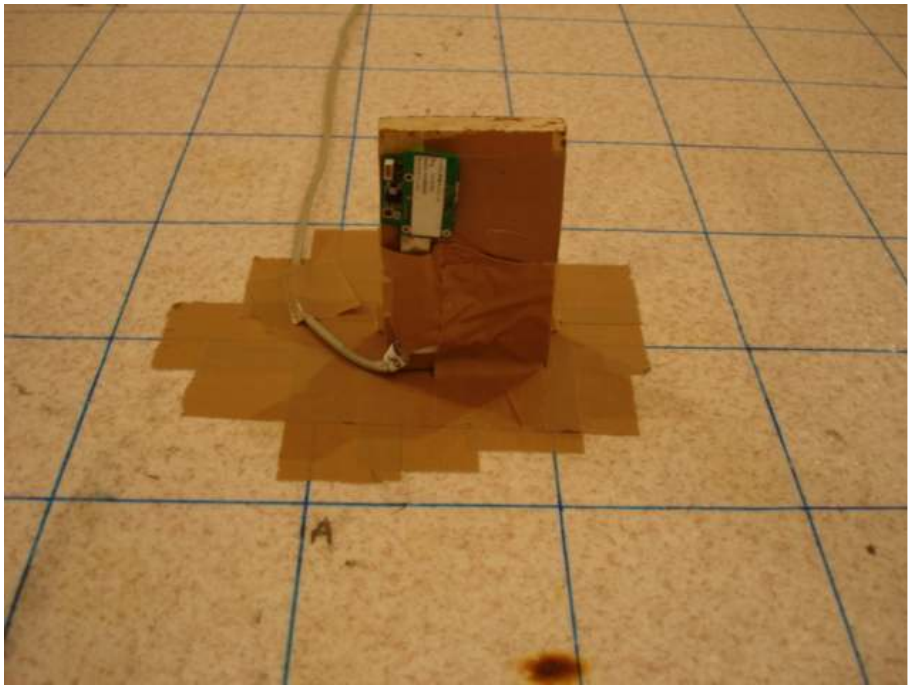


Angle 2

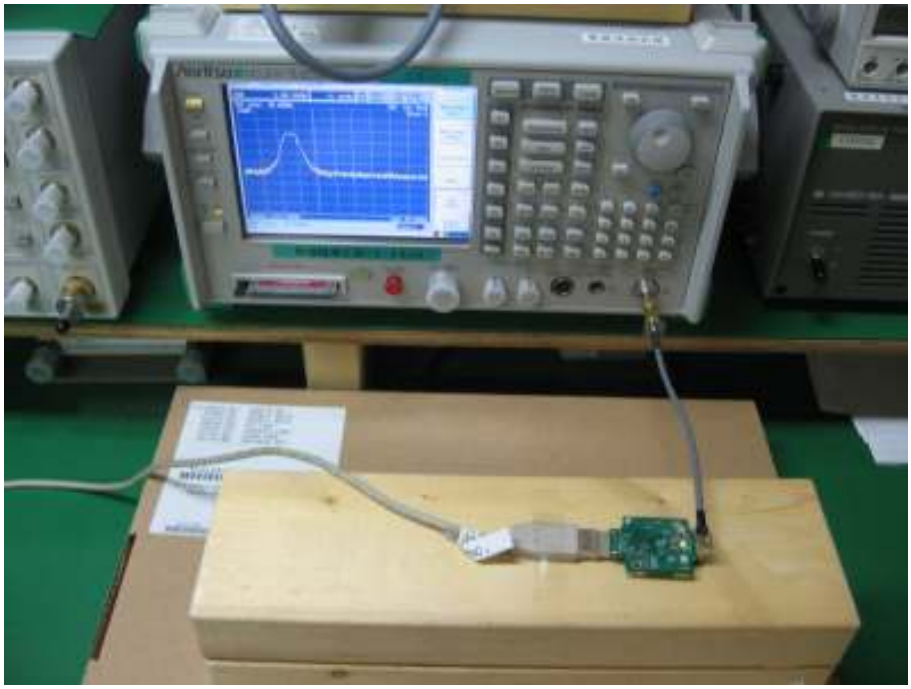


6.2 Setup Photo (Radiated Emission)

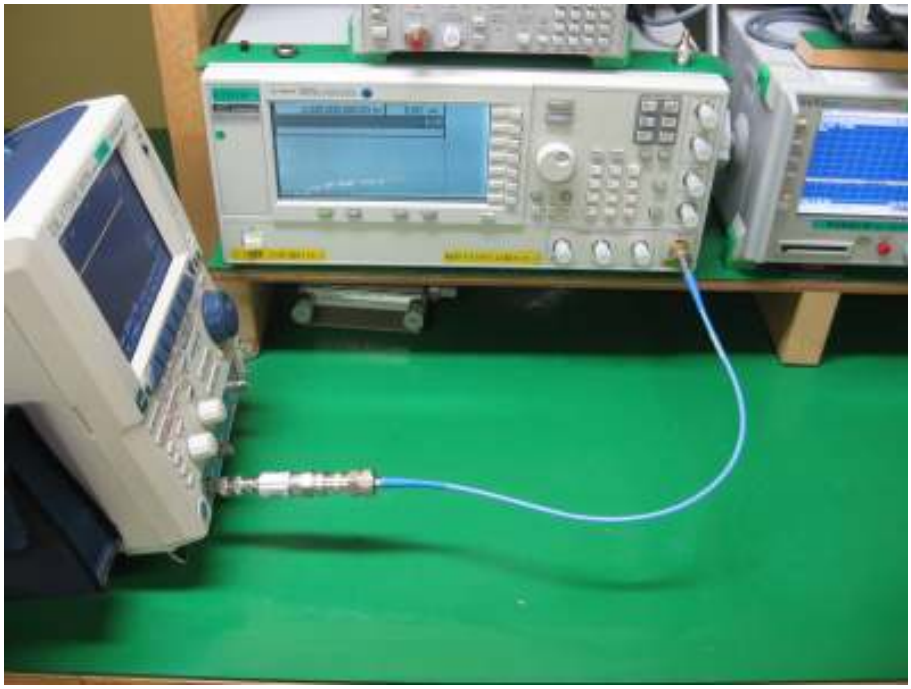
Angle 3

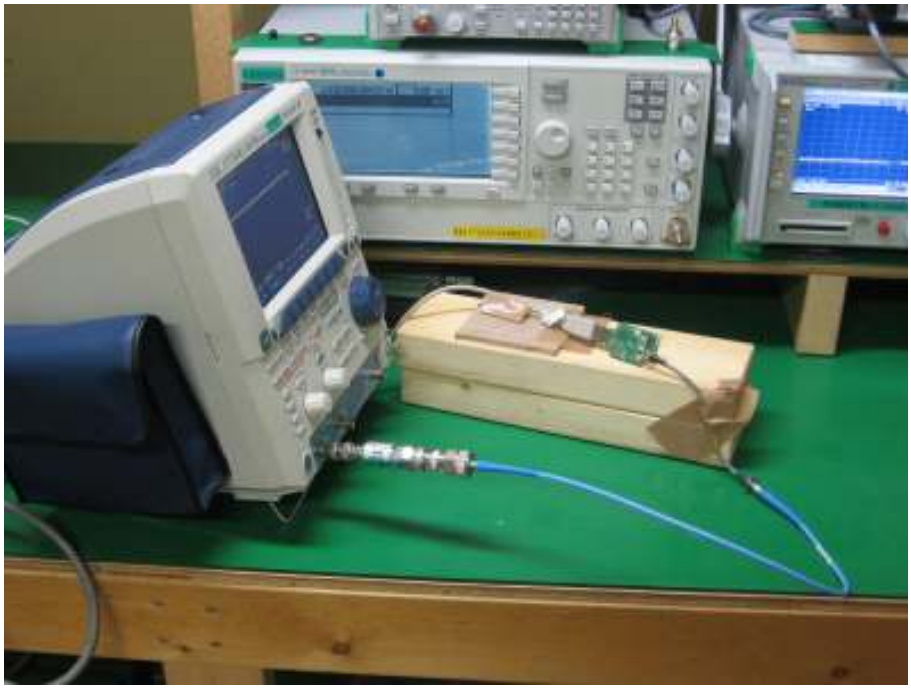


6.3 Setup Photo (All Other Test Items)



6.4 Setup Photo (Maximum Peak Output Power)





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, 2008 July, 2010
EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100335	August, 2008 August, 2009
Artificial-Mains Network	KYORITSU CORPORATION	KNW-341C (for EUT)	8-1659-1	July, 2008 July, 2009
Transient Limiter	AGILENT TECHNOLOGIES	11947A	3107A03745	October, 2007 October, 2008
RF Selector	Techno Science Japan Corp.	RFM-E221	3148	Confirmed before Test

7.2 Radiated Emission Measurement

Instruments	Manufacturer	Model / Type	Serial No.	Calibration Date Next Calibration
Programmable AC/DC Power Source	NF Corporation	ES18000W	425779	Confirmed before Test
EMI Test Receiver	ROHDE & SCHWARZ	ESIB40	100211	April, 2008 April, 2009
Biconical Antenna (30 to 300MHz)	SCHWARZBECK	VHBB9124(Balun) BBA9106(Elements)	311	September, 2007 September, 2009
Log.-Periodic Antenna (300 MHz to 1 GHz)	SCHWARZBECK	UHALP 9108 A	645	September, 2007 September, 2009
Horn Antenna	SCHWARZBECK	BBHA 9120 D	443	September, 2008 September, 2009
Horn Antenna	ETS LINDGREN	3160-08	00033782	September, 2008 September, 2009
Horn Antenna	ETS LINDGREN	3160-09	00034723	September, 2008 September, 2009

7.3 Conducted Radio Measurement

Instruments	Manufacturer	Model / Type	Serial No.	Calibration Date Next Calibration
DC Power Source	KIKUSUI	PAN60-6A	JK002503	---
Spectrum Analyzer	Anritsu	MS2687B	620016270 6	April, 2008 April, 2009
Signal Generator	Agilent Technology	E8254A	US411401 86	June, 2008 June, 2009
Oscilloscope	Tektronix	TDS794D	B031832	June, 2008 June, 2009
Diode Detector	Agilent Technology	423B	MY422418 36	March, 2008 March, 2009