MEASUREMENT/TECHNICAL REPORT
FCC Part 15 Subpart C

Issued: July 1, 2009

Name and Address of the Applicant:	SHIMANO INC. 3-77 Oimatu-cho, Sakai-ku, Sakai City, Osaka 590-8577, Japan
Test Item:	Cycle Computer
Identification:	SC-7900
Serial No.:	---
FCC ID:	WY701
Sample Receipt Date:	January 23, 2009
Test Specification:	FCC Part 15 Subpart C, 15.249
Date of Testing:	January 29, February 2, and April 8, 2009
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:	O. Itogawa, Engineer	July 1, 2009 Date
Reviewed by:	Y. Kawahara, Deputy General Manager	July, 2009 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	: SHIMANO INC.
Model (referred to as the EUT)	: SC-7900
Nominal Voltage	: DC 3V
Type of Modulation	: MSK
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	: Cycle computer
The bandwidth of the IF filters	: N/A
Method of Communication Link	: Software to make transmitting data
The operating frequency band	: 2402.249481 to 2480.730327MH z
The thermal limitation	: Not specified

1.2 Antenna Description

No.	Type Name	Gain	Antenna Type	Remarks
1	2.4GHz chip antenna	Less than +1dBi	Helical antenna	The product by "TAIYO YUDEN"

1.3 Accompanied Peripherals Description

No.	Equipment Name	Manufacturer	Type Name	Serial Number	Remarks
1	PC	TOSHIBA	PSJ70N-1W401J	98100247H	DC15 V,---, 5 A
2	AC Adapter	TOSHIBA	PA3283U-5ACA	---	AC100 V, 50/60 Hz, 1.5 A
3	Jig	---	---	---	DC3 V, ---, ---

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 March 7, 2008 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.

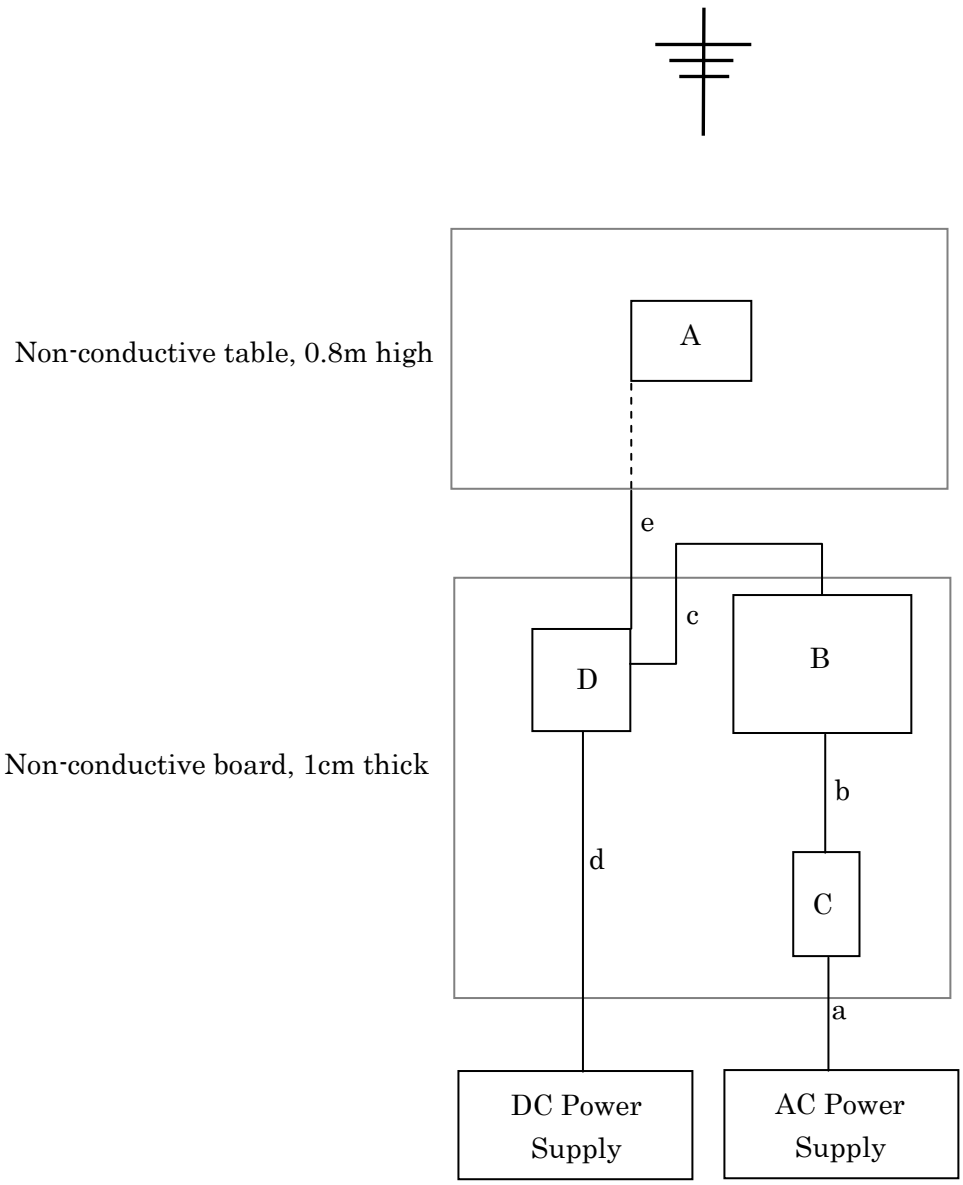
3. Summary of Test Results

Section	Test Item	Limit	Result
15. 215 (c)	20 dB Bandwidth	---	Pass
15. 247 (d)	Band Edge Measurement	See 5.2.2	Pass
15. 249 (a)	The Field Strength of Emissions	See 5.1.2	Pass

4. Test Configuration

	Instrument	Model		Cable	Length	Shield
A	EUT	SC-7900	**a**	AC Power Cable	0.8 m	×
B	PC	PSJ70N-1W401J	**b**	DC Power Cable	1.5 m	×
C	AC Adapter	PA3283U-5ACA	**c**	RS232C Cable	3.0 m	○
D	Jig	---	**d**	DC Power Cable	3.2 m	×
			e	Signal Cable	4.0 m	×

4.1 15. 249 (a) The field strength of emissions



4.2 Test Mode

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

5. Measurement Result

5.1 15. 249(a) The Field Strength of Emissions

5.1.1 Setting Remarks

- The data lists in "5.1.4 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 distance between equipment and antenna is 3 m.
- 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.
- 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 4.1.

5.1.2 Minimum Standard

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (microvolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

5.1.3 Result

EUT complies with the requirement.

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

Note: All measurements was performed with supply voltage varied ±15%, but all results were same. Therefore the data with rated voltage shall be recorded in this report.

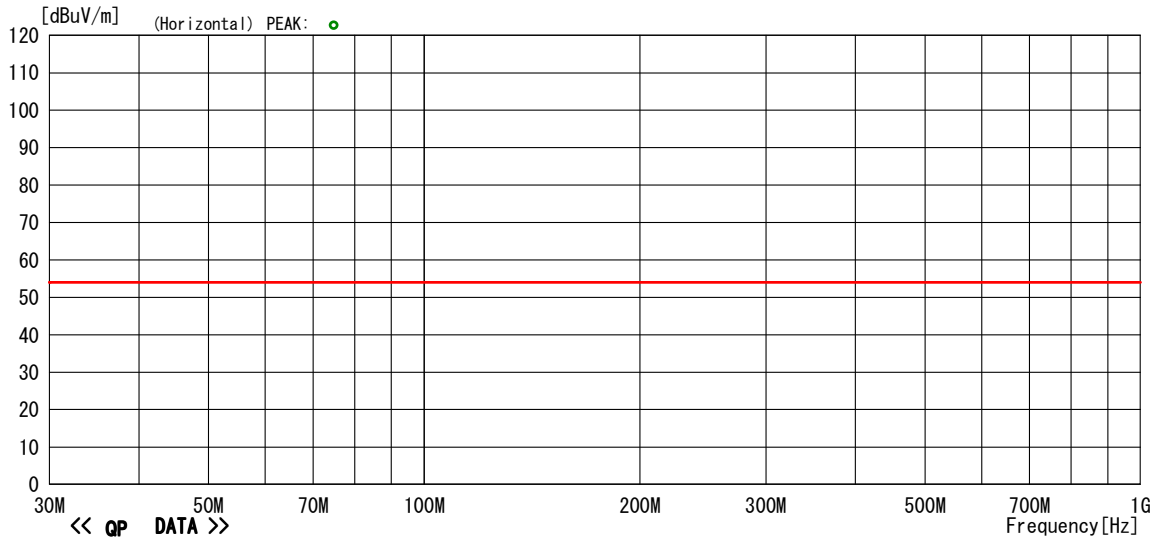
5.1.4 Measured Data

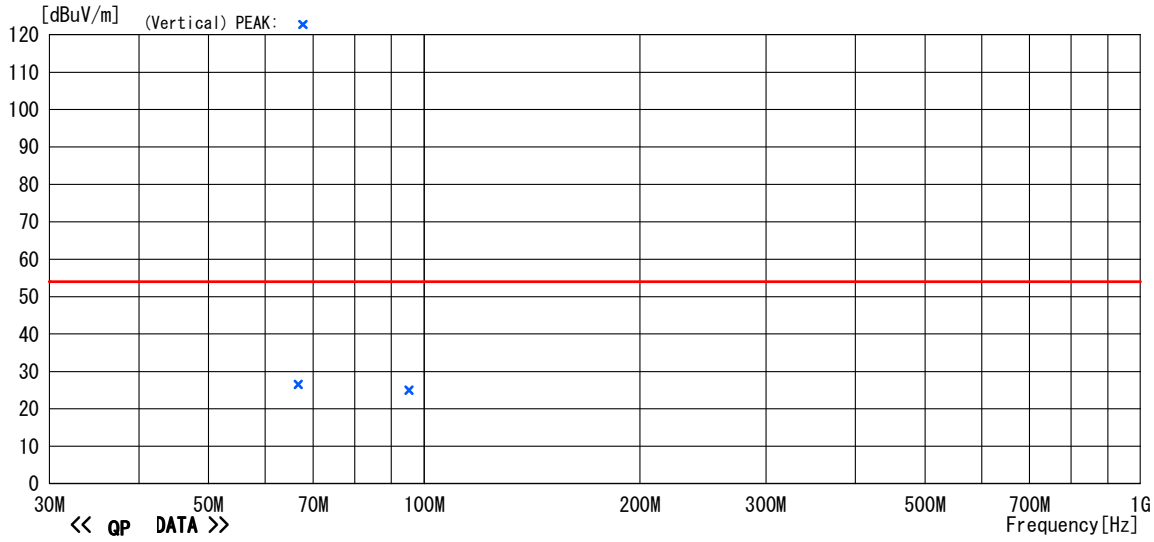
30MHz to 1GHz, CH 08

Model Name	: SC-7900	Job No	: CJ08-069537E
Serial No.	: None	Temp./Humi.	: 24℃/39%
Operator	: O.Itogawa	Condition	: Cycle Computer CH08
Power Supply	: DC3V	Remark	:

Memo : RBW:30M～1GHz(120kHz)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz





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5.1.4 Measured Data (Continued)

30MHz to 1GHz, CH 08

Model Name : SC-7900
Serial No. : None
Operator : O.Itogawa
Power Supply : DC3V

Job No : CJ08-069537E
Temp./Humi. : 24℃/39%
Condition : Cycle Computer CH08
Remark :

Memo : RBW:30M～1GHz(120kHz)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz

<< QP 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	66.759	41.1	-14.6	26.5	54.0	27.5	Vert.	100	20	BC	
2	95.240	38.8	-13.8	25.0	54.0	29.0	Vert.	100	118	BC	

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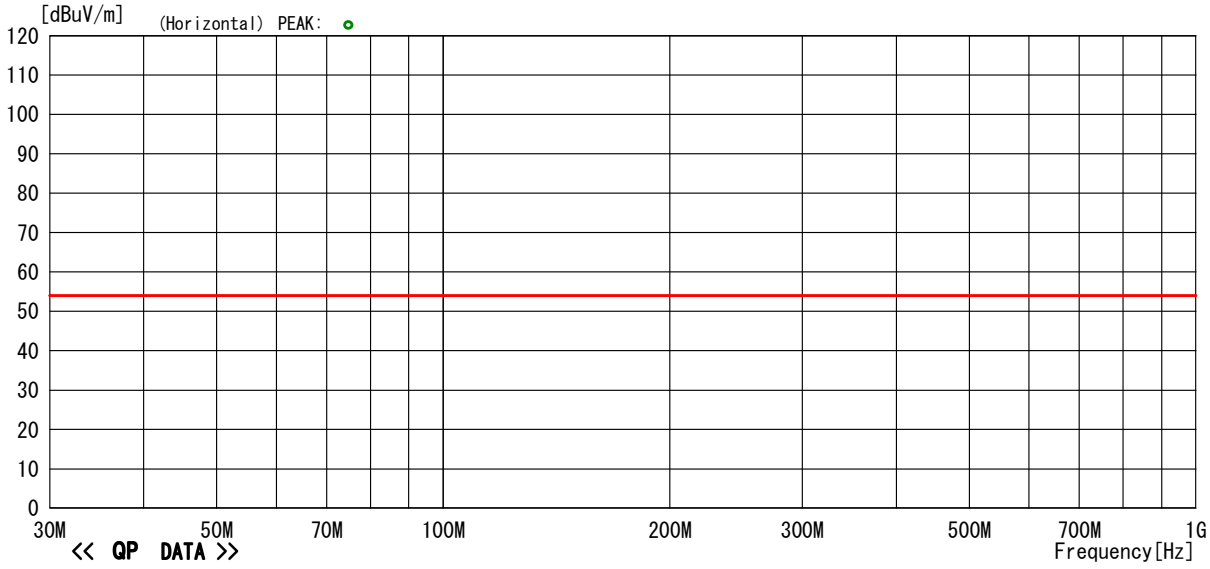
5.1.4 Measured Data (Continued)

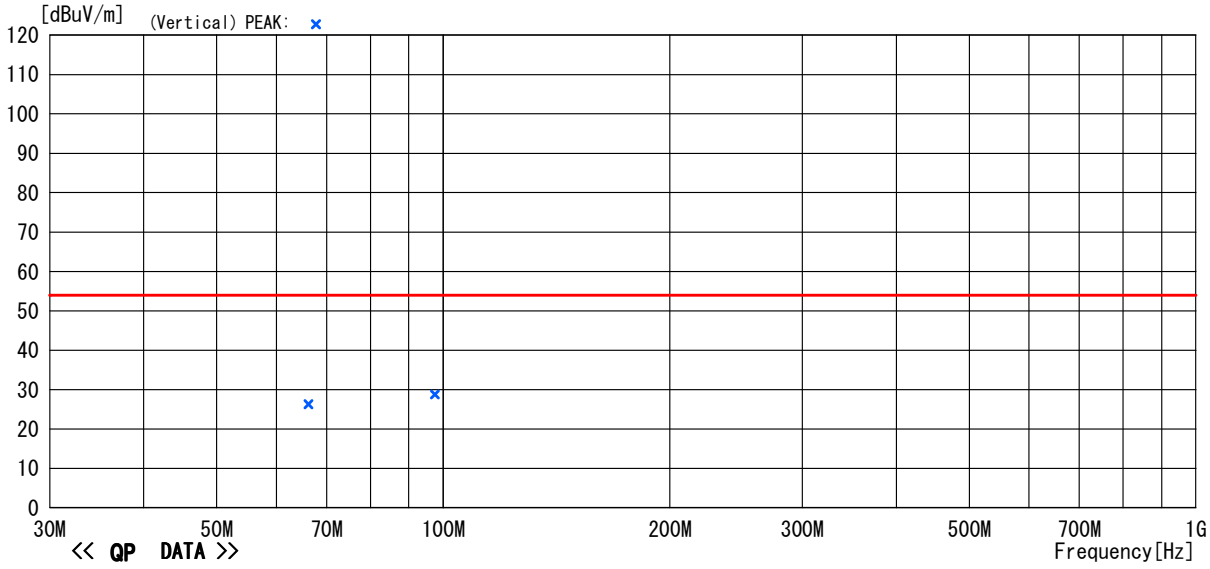
30MHz to 1GHz, CH 166

Model Name	: SC-7900	Job No	: CJ08-069537E
Serial No.	: None	Temp./Humi.	: 24℃/39%
Operator	: O.Itogawa	Condition	: Cycle Computer CH166
Power Supply	: DC3V	Remark	:

Memo : RBW:30M～1GHz(120kHz)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz





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5.1.4 Measured Data (Continued)

30MHz to 1GHz, CH 166

Model Name : SC-7900
Serial No. : None
Operator : O.Itogawa
Power Supply : DC3V

Job No : CJ08-069537E
Temp./Humi. : 24℃/39%
Condition : Cycle Computer CH166
Remark :

Memo : RBW:30M～1GHz(120kHz)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz

<< QP 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	97.484	42.6	-13.8	28.8	54.0	25.2	Vert.	100	147	BC	
2	66.197	41.0	-14.7	26.3	54.0	27.7	Vert.	100	0	BC	

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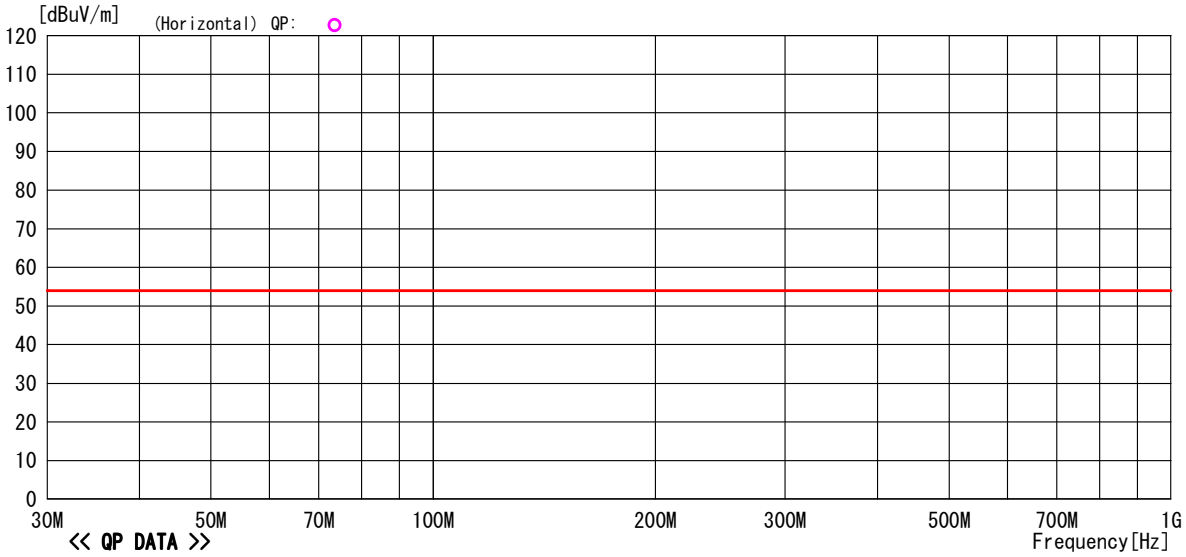
5.1.4 Measured Data (Continued)

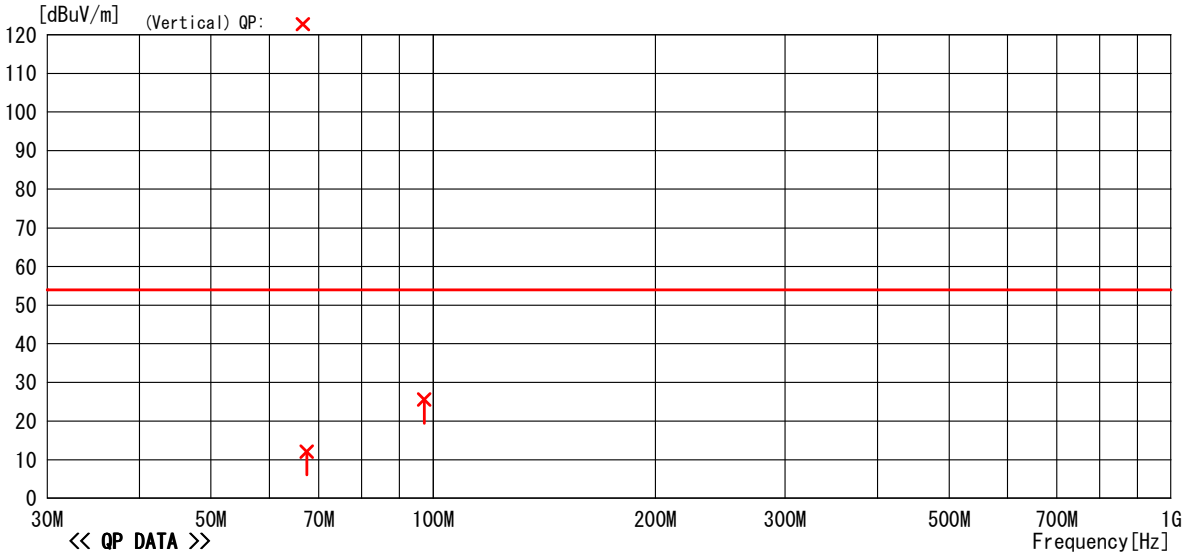
30MHz to 1GHz, CH 321

Model Name	: SC-7900	Job No	: CJ08-069537E
Serial No.	: None	Temp./Humi.	: 24℃/39%
Operator	: O.Itogawa	Condition	: Cycle Computer CH321
Power Supply	: DC3V	Remark	:

Memo : RBW:30M～1GHz(120kHz)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz





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5.1.4 Measured Data (Continued)

30MHz to 1GHz, CH 321

Model Name : SC-7900
Serial No. : None
Operator : O.Itogawa
Power Supply : DC3V

Job No : CJ08-069537E
Temp./Humi. : 24℃/39%
Condition : Cycle Computer CH321
Remark :

Memo : RBW:30M～1GHz(120kHz)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz

<< QP 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	67.600	41.3	-14.6	26.7	54.0	27.3	Vert.	100	1	BC	
2	95.099	39.4	-13.8	25.6	54.0	28.4	Vert.	100	265	BC	

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5.1.4 Measured Data (Continued)

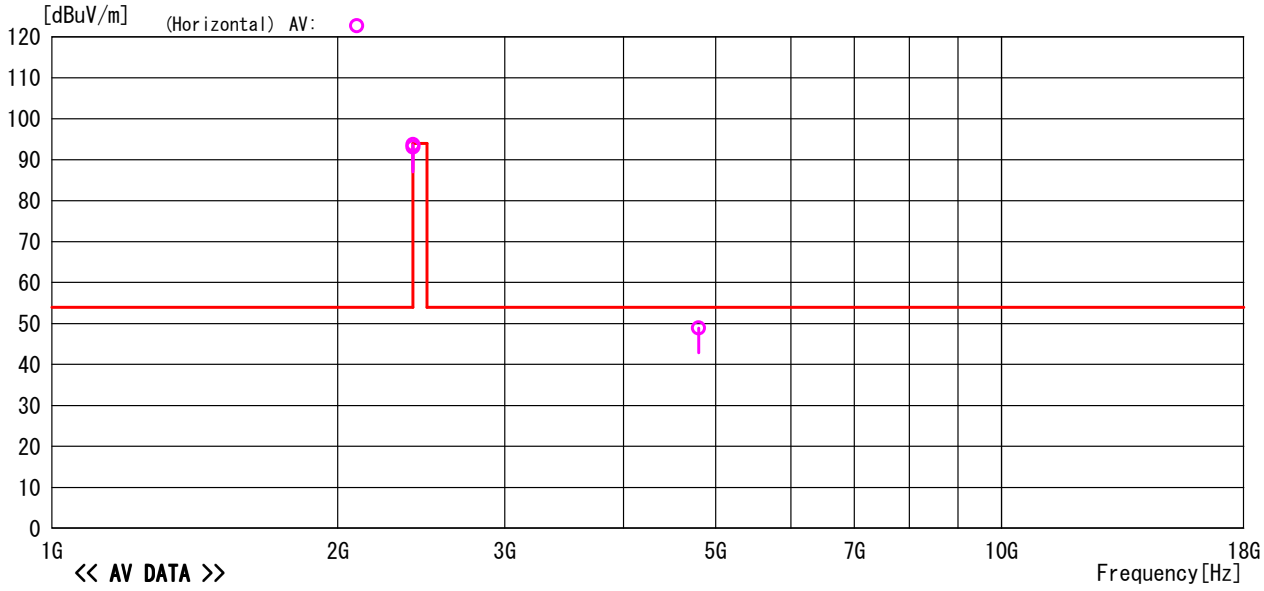
1GHz to 18GHz, CH 08

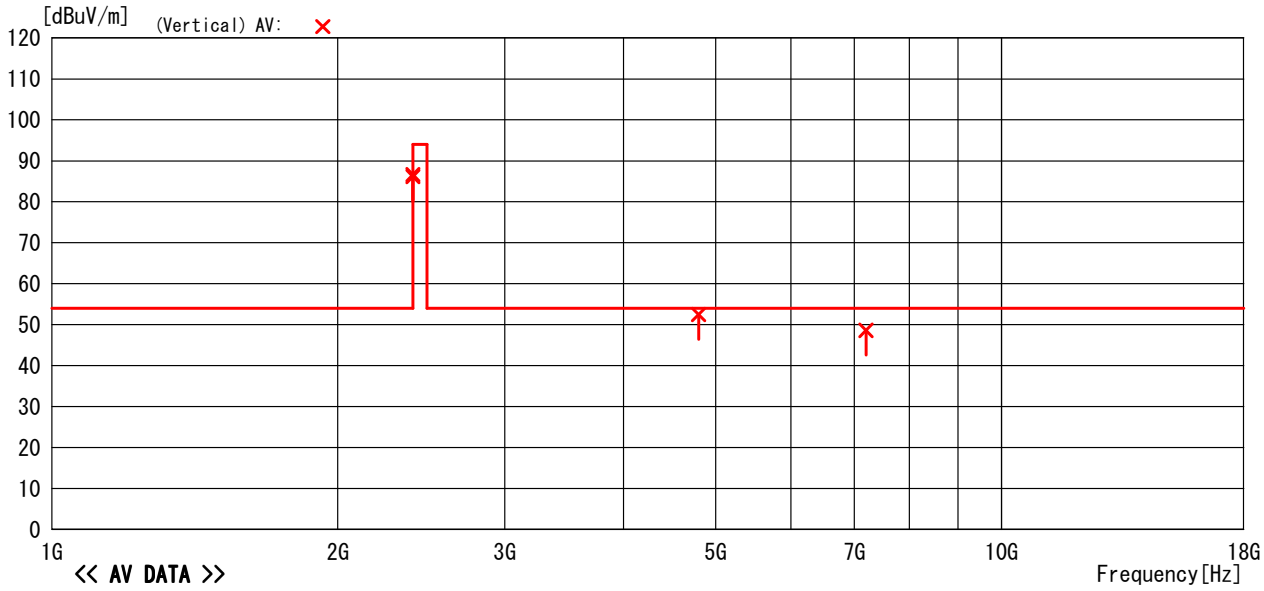
Model Name : SC-7900
Serial No. : None
Operator : O.Itogawa
Power Supply : DC3V

Job No. : CJ08-069537E
Temp/Humi : 21℃/40%
Condition : Cycle Computer CH08
Remark :

Memo : RBW:1GHz～(1MHz)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz





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5.1.4 Measured Data (Continued)

1GHz to 18GHz, CH 08

Model Name : SC-7900
Serial No. : None
Operator : O.Itogawa
Power Supply : DC3V

Job No. : CJ08-069537E
Temp/Humi : 21℃/40%
Condition : Cycle Computer CH08
Remark :

Memo : RBW:1GHz～(1MHz)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz

<<AV DATA>>

No	Freq.	Reading	Ant. Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	2402.001	94.8	28.1	-29.8	0.0	93.1	94.0	0.9	Hori.	100	1	HRN	AV Fundamental Frequency
2	4804.002	44.2	32.1	-27.4	0.0	48.9	54.0	5.1	Hori.	100	22	HRN	AV
3	2402.001	87.8	28.1	-29.8	0.0	86.1	94.0	7.9	Vert.	100	260	HRN	AV Fundamental Frequency
4	4804.002	47.8	32.1	-27.4	0.0	52.5	54.0	1.6	Vert.	100	291	HRN	AV
5	7206.003	37.1	36.7	-25.2	0.0	48.6	54.0	5.4	Vert.	100	322	HRN	AV

<<PEAK DATA>>

No	Freq.	Reading	Ant. Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	2402.001	95.4	28.1	-29.8	0.0	93.7	114.0	20.3	Hori.	100	1	HRN	PK Fundamental Frequency
2	4804.002	44.4	32.1	-27.4	0.0	49.1	74.0	24.9	Hori.	100	22	HRN	PK
3	2402.001	88.3	28.1	-29.8	0.0	86.6	114.0	27.4	Vert.	100	260	HRN	PK Fundamental Frequency
4	4804.002	45.0	32.1	-27.4	0.0	52.7	74.0	21.4	Vert.	100	291	HRN	PK
5	7206.003	40.5	36.7	-25.2	0.0	48.8	74.0	25.2	Vert.	100	322	HRN	PK

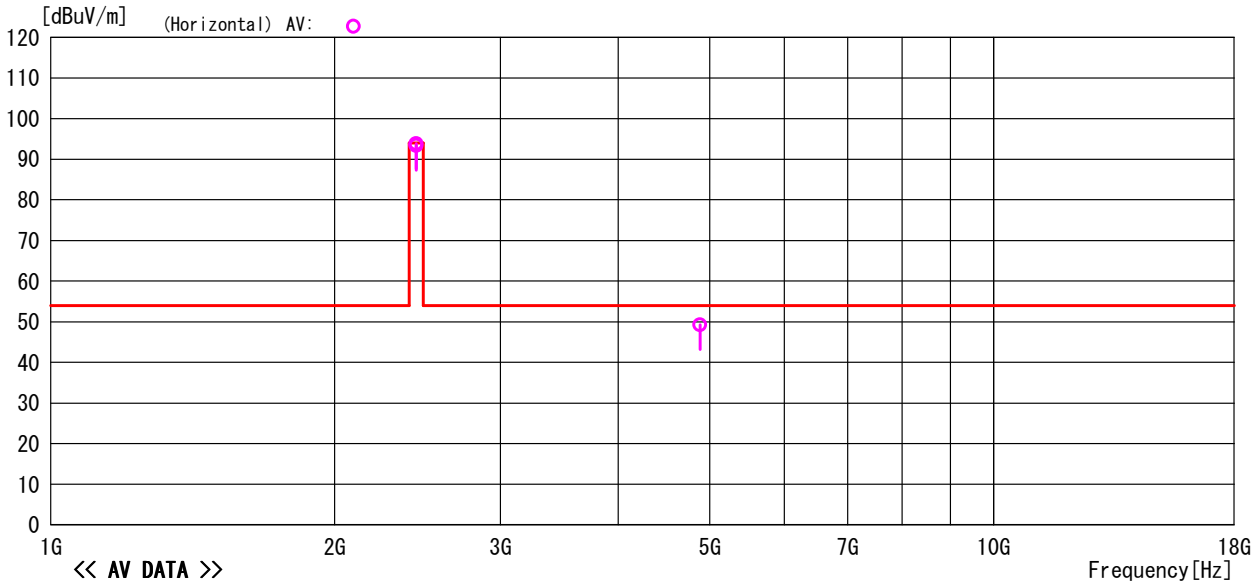
5.1.4 Measured Data (Continued)

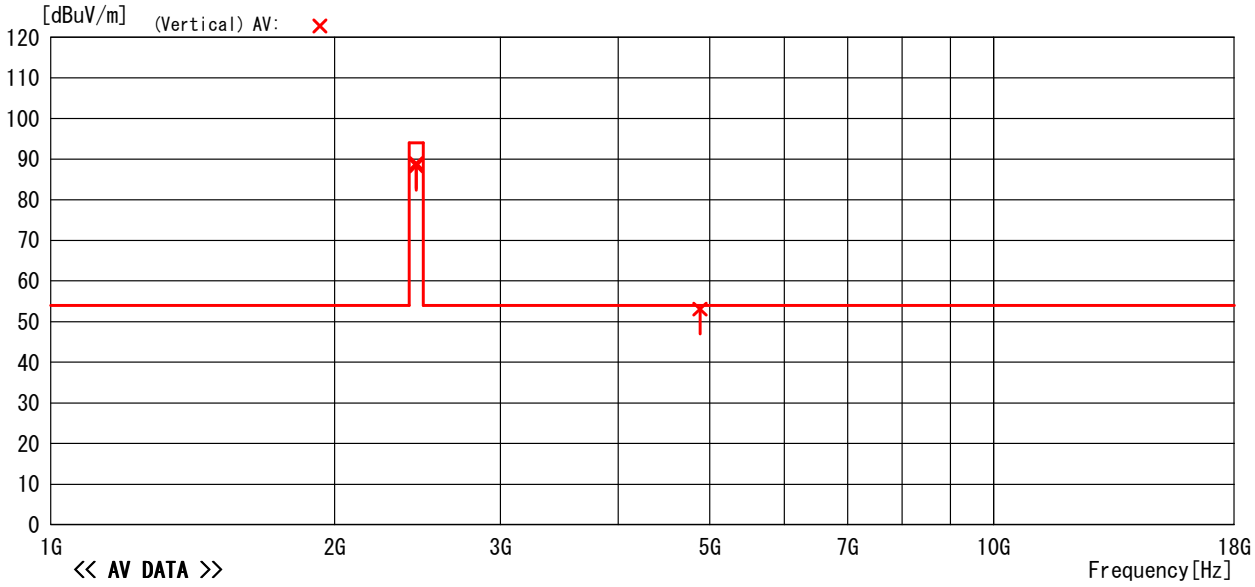
1GHz to 18GHz, CH 166

Model Name	: SC-7900	Job No.	: CJ08-069537E
Serial No.	: None	Temp/Humi	: 21℃/40%
Operator	: O.Itogawa	Condition	: Cycle Computer CH166
Power Supply	: DC3V	Remark	:

Memo : RBW:1GHz～(1MHz)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz





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5.1.4 Measured Data (Continued)

1GHz to 18GHz, CH 166

Model Name : SC-7900
Serial No. : None
Operator : O.Itogawa
Power Supply : DC3V

Job No. : CJ08-069537E
Temp/Humi : 21℃/40%
Condition : Cycle Computer CH166
Remark :

Memo : RBW:1GHz～(1MHz)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz

<<AV DATA>>

No	Freq.	Reading	Ant. Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	2441.417	95.0	28.2	-29.8	0.0	93.4	94.0	0.6	Hori.	100	20	HRN	AV Fundamental Frequency
2	4883.099	43.9	32.2	-26.9	0.0	49.2	54.0	4.8	Hori.	107	318	HRN	AV
3	2441.427	90.0	28.2	-29.8	0.0	88.4	94.0	5.6	Vert.	107	31	HRN	AV Fundamental Frequency
4	4883.048	47.8	32.2	-26.9	0.0	53.1	54.0	0.9	Vert.	110	280	HRN	AV

<<PEAK DATA>>

No	Freq.	Reading	Ant. Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	2441.417	95.4	28.2	-29.8	0.0	93.8	114.0	20.2	Hori.	100	20	HRN	PK Fundamental Frequency
2	4883.099	44.4	32.2	-26.9	0.0	49.4	74.0	24.6	Hori.	107	318	HRN	PK
3	2441.427	90.5	28.2	-29.8	0.0	88.9	114.0	25.1	Vert.	107	31	HRN	PK Fundamental Frequency
4	4883.048	47.9	32.2	-26.9	0.0	53.3	74.0	20.7	Vert.	110	280	HRN	PK

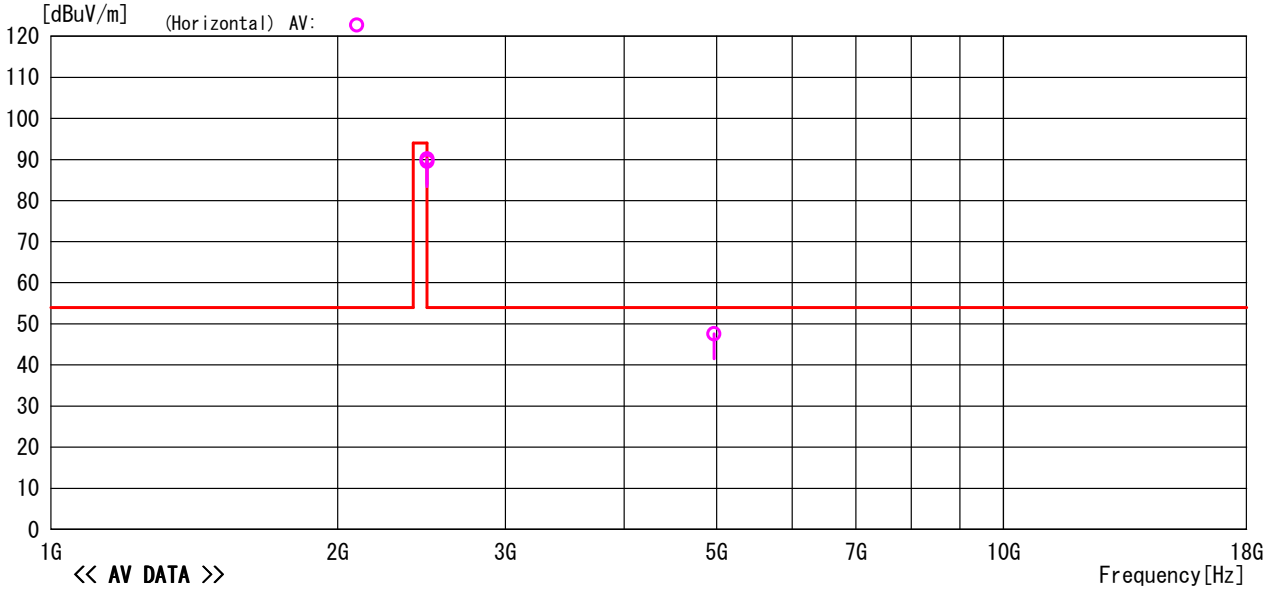
5.1.4 Measured Data (Continued)

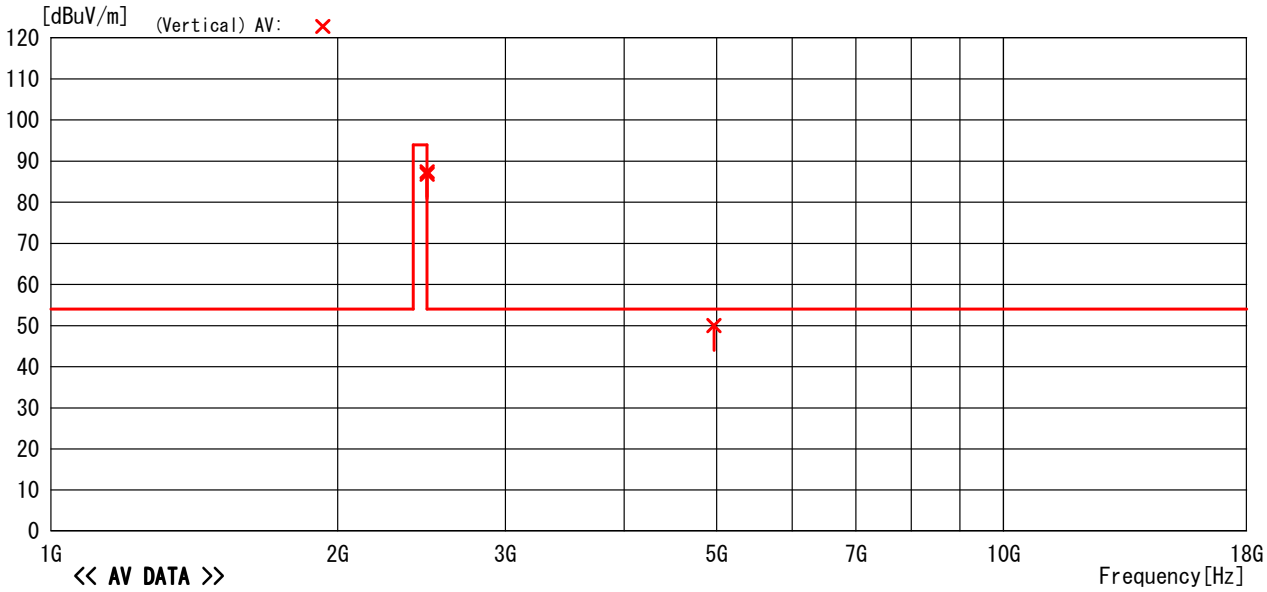
1GHz to 18GHz, CH 321

Model Name	: SC-7900	Job No.	: CJ08-069537E
Serial No.	: None	Temp/Humi	: 21℃/40%
Operator	: O.Itogawa	Condition	: Cycle Computer CH321
Power Supply	: DC3V	Remark	:

Memo : RBW:1GHz～(1MHz)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz





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5.1.4 Measured Data (Continued)

1GHz to 18GHz, CH 321

Model Name : SC-7900
Serial No. : None
Operator : O.Itogawa
Power Supply : DC3V

Job No. : CJ08-069537E
Temp/Humi : 21℃/40%
Condition : Cycle Computer CH321
Remark :

Memo : RBW:1GHz～(1MHz)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz

<<AV DATA>>

No	Freq.	Reading	Ant. Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	2480.193	91.1	28.2	-29.8	0.0	89.5	94.0	4.5	Hori.	100	19	HRN	AV Fundamental Frequency
2	4960.386	41.7	32.3	-26.4	0.0	47.6	54.0	6.4	Hori.	100	159	HRN	AV
3	2480.204	88.5	28.2	-29.8	0.0	86.9	94.0	7.1	Vert.	108	104	HRN	AV Fundamental Frequency
4	4960.408	44.1	32.3	-26.4	0.0	50.0	54.0	4.0	Vert.	100	317	HRN	AV

<<PEAK DATA>>

No	Freq.	Reading	Ant. Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	2480.193	91.7	28.2	-29.8	0.0	90.1	114.0	23.9	Hori.	100	19	HRN	PK Fundamental Frequency
2	4960.386	42.2	32.3	-26.4	0.0	47.8	74.0	26.2	Hori.	100	159	HRN	PK
3	2480.204	89.0	28.2	-29.8	0.0	87.4	114.0	26.6	Vert.	108	104	HRN	PK Fundamental Frequency
4	4960.408	44.3	32.3	-26.4	0.0	50.2	74.0	23.8	Vert.	100	317	HRN	PK

5.1.4 Measured Data (Continued)

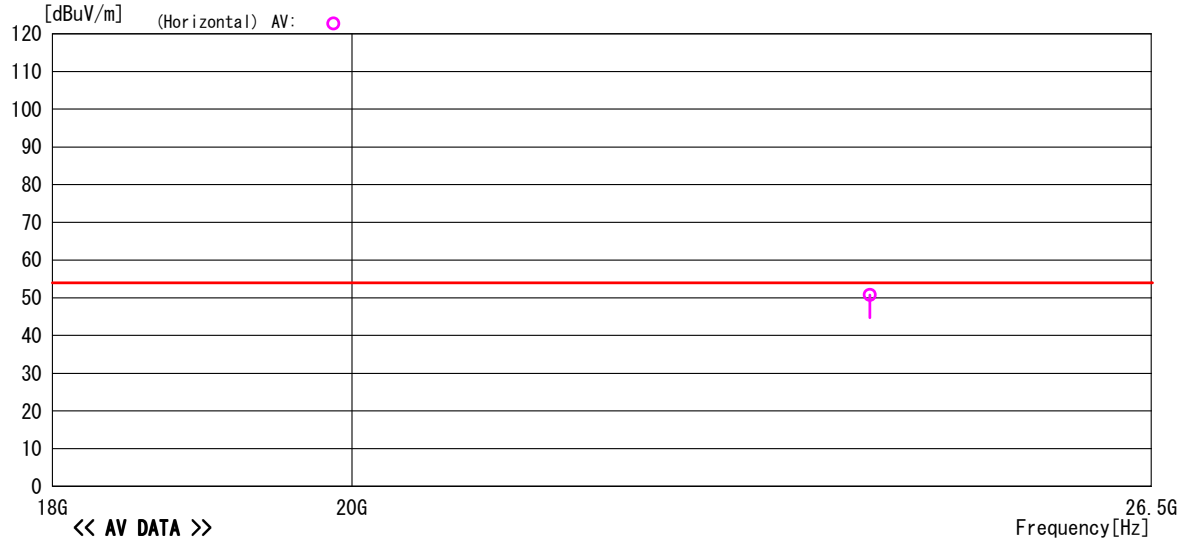
18GHz to 26.5GHz, CH 08

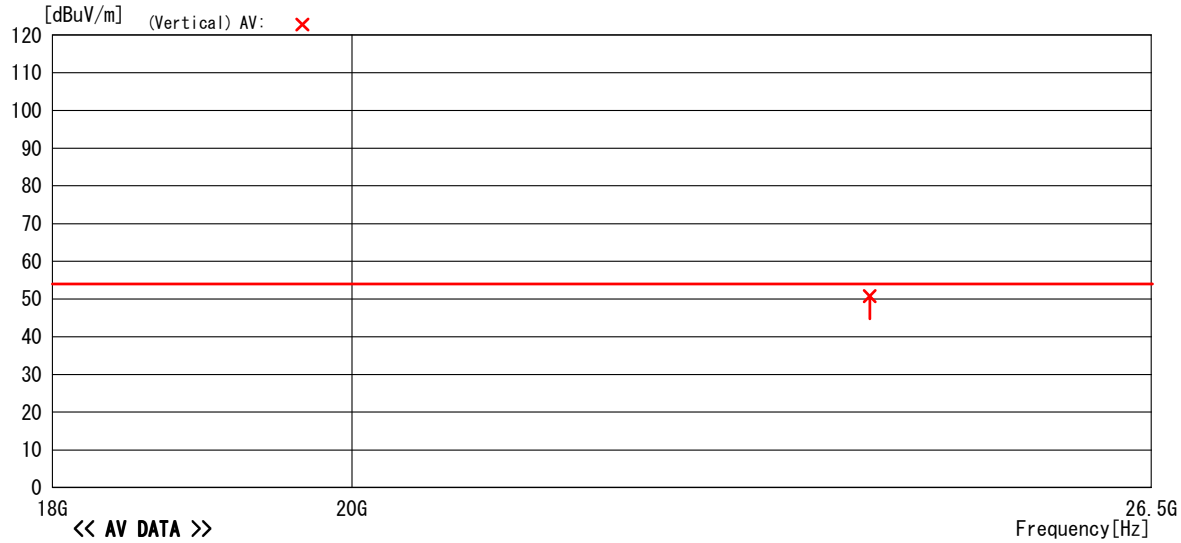
Model Name : SC-7900
Serial No. : None
Operator : O.Itogawa
Power Supply : DC3V

Job No : CJ08-069537E
Temp/Humi : 24℃/39%
Condition : Cycle Computer CH08
Remark :

Memo : RBW:1MHz(1G～)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz





-TEPTO-DV/Ver 1.80.0020

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

5.1.4 Measured Data (Continued)

18GHz to 26.5GHz, CH 08

Model Name : SC-7900
Serial No. : None
Operator : O.Itogawa
Power Supply : DC3V

Job No : CJ08-069537E
Temp/Humi : 24℃/39%
Condition : Cycle Computer CH08
Remark :

Memo : RBW:1MHz(1G～)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz

<<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	24000.000	30.1	20.7	50.8	54.0	3.2	Hori.	100	0	HRN	AV Freq:24000MHz
2	24000.000	30.1	20.7	50.8	54.0	3.2	Vert.	100	0	HRN	AV Freq:24000MHz

<<PEAK 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	24000.000	30.2	20.7	50.9	74.0	23.1	Hori.	100	0	HRN	PK Freq:24000MHz
2	24000.000	30.2	20.7	50.9	74.0	23.1	Vert.	100	0	HRN	PK Freq:24000MHz

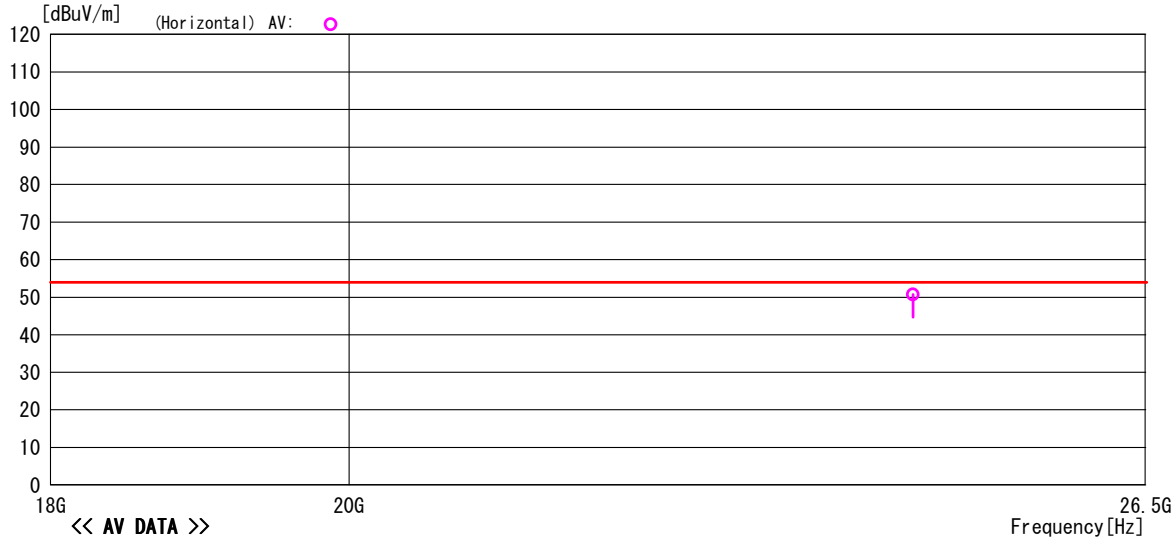
5.1.4 Measured Data (Continued)

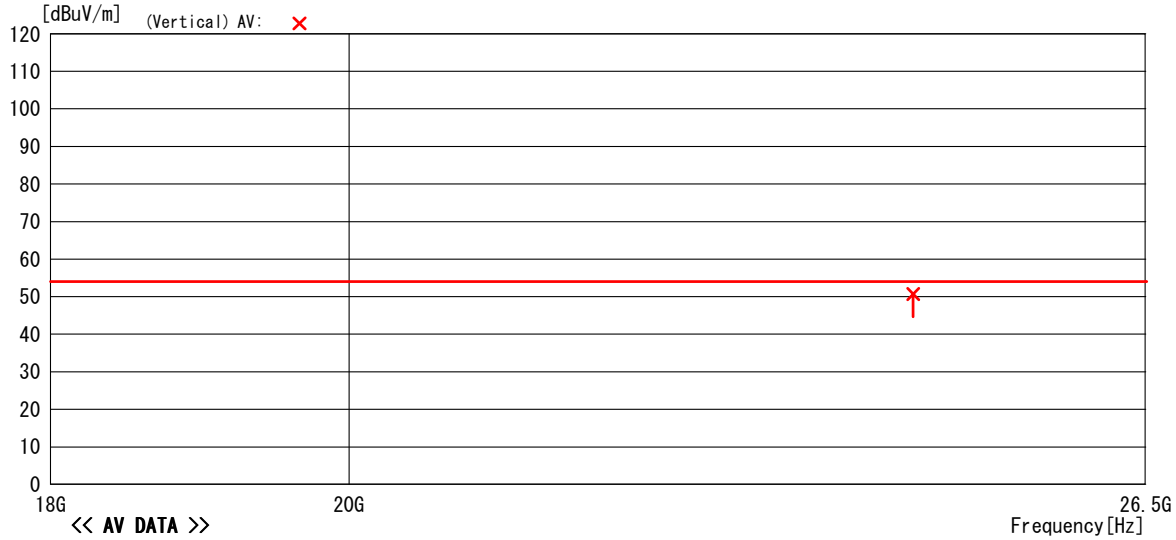
18GHz to 26.5GHz, CH 166

Model Name	: SC-7900	Job No	: CJ08-069537E
Serial No.	: None	Temp/Humi	: 24℃/39%
Operator	: O.Itogawa	Condition	: Cycle Computer CH166
Power Supply	: DC3V	Remark	:

Memo : RBW:1MHz(1G～)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz





-TEPTO-DV/Ver 1.80.0020

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

5.1.4 Measured Data (Continued)

18GHz to 26.5GHz, CH 166

Model Name : SC-7900
Serial No. : None
Operator : O.Itogawa
Power Supply : DC3V

Job No : CJ08-069537E
Temp/Humi : 24℃/39%
Condition : Cycle Computer CH166
Remark :

Memo : RBW:1MHz(1G～)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz

<<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	24410.000	30.1	20.6	50.7	54.0	3.3	Hori.	100	0	HRN	AV Freq:24410.000MHz
2	24410.000	30.1	20.6	50.7	54.0	3.3	Vert.	100	0	HRN	AV Freq:24410.000MHz

<<PEAK 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	24410.000	30.2	20.6	50.8	74.0	23.2	Hori.	100	0	HRN	PK Freq:24410.000MHz
2	24410.000	30.2	20.6	50.8	74.0	23.2	Vert.	100	0	HRN	PK Freq:24410.000MHz

5.1.4 Measured Data (Continued)

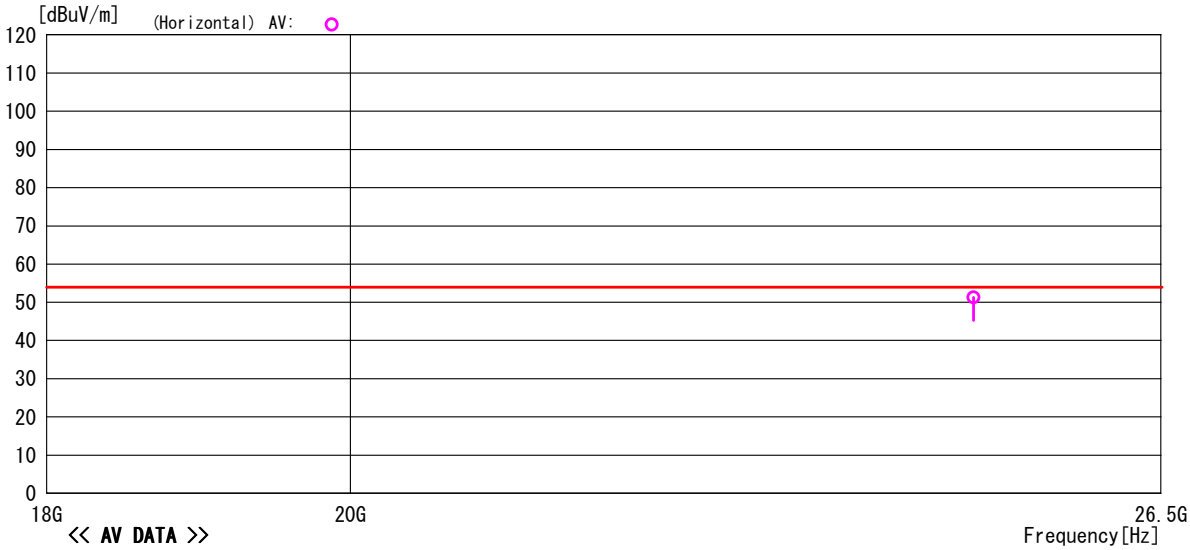
18GHz to 26.5GHz, CH 321

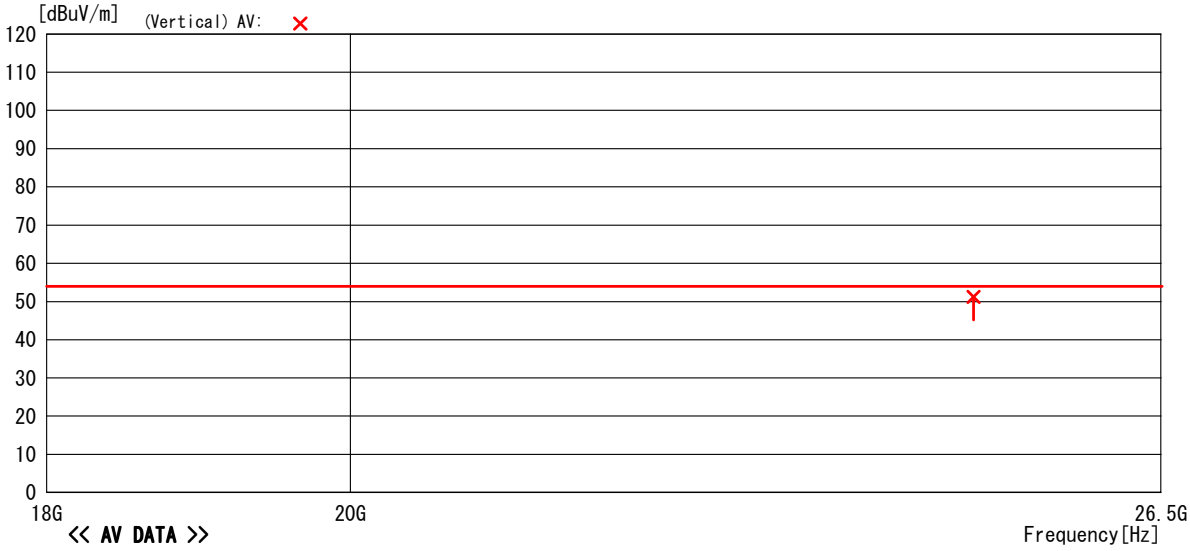
Model Name : SC-7900
Serial No. : None
Operator : O.Itogawa
Power Supply : DC3V

Job No : CJ08-069537E
Temp/Humi : 24℃/39%
Condition : Cycle Computer CH321
Remark :

Memo : RBW:1MHz(1G～)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz





-TEPTO-DV/Ver 1.80.0020

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

5.1.4 Measured Data (Continued)

18GHz to 26.5GHz, CH 321

Model Name : SC-7900
Serial No. : None
Operator : O.Itogawa
Power Supply : DC3V

Job No : CJ08-069537E
Temp/Humi : 24℃/39%
Condition : Cycle Computer CH321
Remark :

Memo : RBW:1MHz(1G～)

LIMIT : FCC Part15 C 15.249(3m)30MHz-26.5GHz

<<AV DATA>>

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	24830.000	30.5	20.8	51.3	54.0	2.7	Hori.	100	0	HRN	AV Freq:24830.000MHz
2	24830.000	30.4	20.8	51.2	54.0	2.8	Vert.	100	0	HRN	AV Freq:24830.000MHz

<<PEAK DATA>>

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	24830.000	30.6	20.8	51.4	74.0	22.6	Hori.	100	0	HRN	PK Freq:24830.000MHz
2	24830.000	30.5	20.8	51.3	74.0	22.7	Vert.	100	0	HRN	PK Freq:24830.000MHz

5.2 15. 247(d) Band Edge Measurement

5.2.1 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 4.1.

5.2.2 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 2,400.0	Peak	Average
Above 2,483.5	74	54

5.2.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 2.6 dB
Temperature, Humidity : 24˚C, 40%

5.2.4 Measured Data

The band edge emissions are calculated as following;

(Horizontal)

CH	Pmax	Pav	Pdev	c.f.	Ebe	Eav	Limit(Ebe)	Limit(Eav)	Margin(Ebe)	Margin(Eav)
8 CH (2402.50 MHz)	93.56	92.24	40.05	−1.7	51.8	50.5	74.0	54.0	22.2	3.5
321 CH (2480.75 MHz)	94.20	93.64	43.47	−1.7	49.0	48.5	74.0	54.0	25.0	5.5

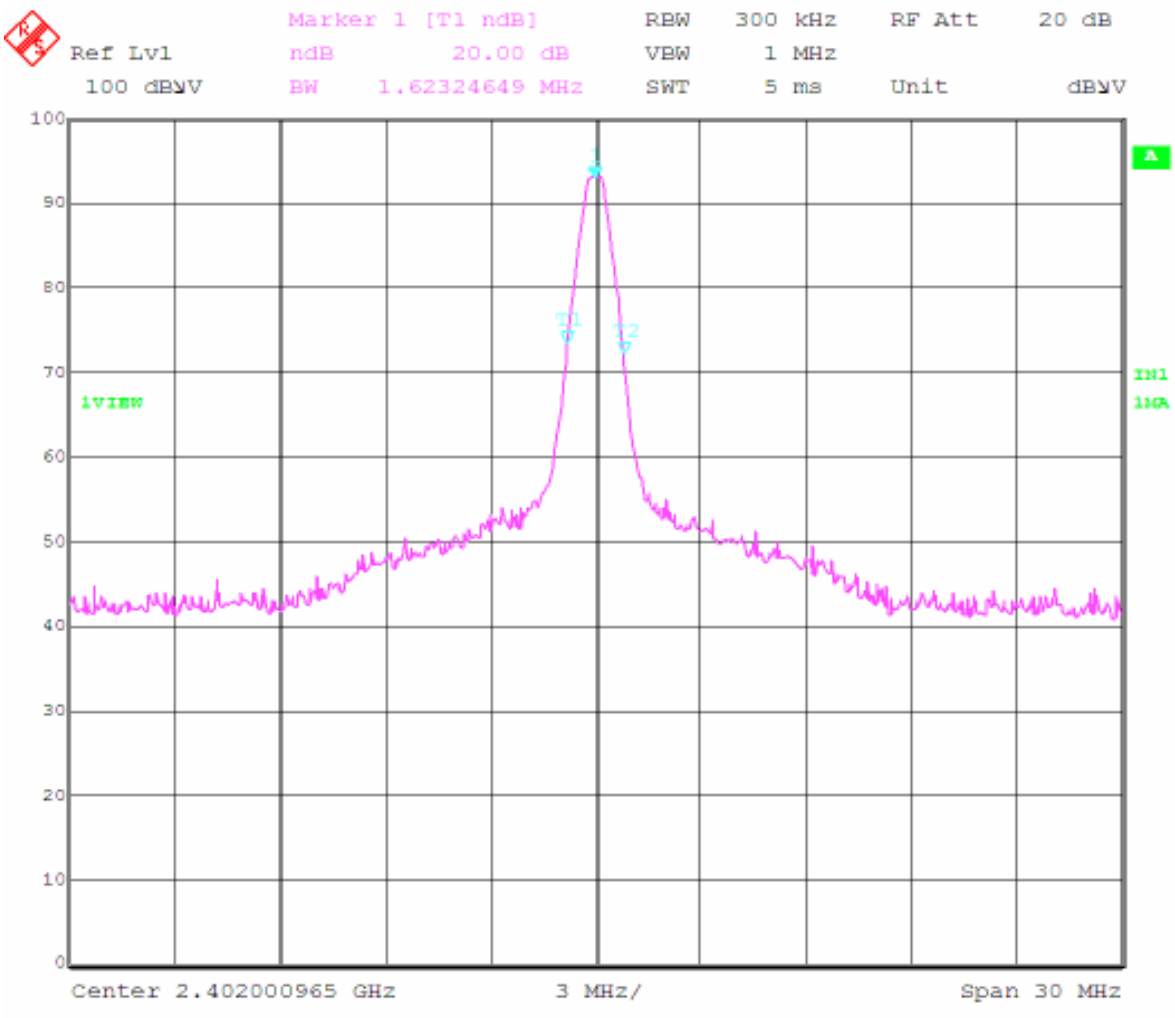
(Vertical)

CH	Pmax	Pav	Pdev	c.f.	Ebe	Eav	Limit(Ebe)	Limit(Eav)	Margin(Ebe)	Margin(Eav)
8 CH (2402.50 MHz)	89.33	88.73	41.02	−1.7	46.6	46.0	74.0	54.0	27.4	8.0
321 CH (2480.75 MHz)	89.72	88.92	41.86	−1.7	46.2	45.4	74.0	54.0	27.8	8.6

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

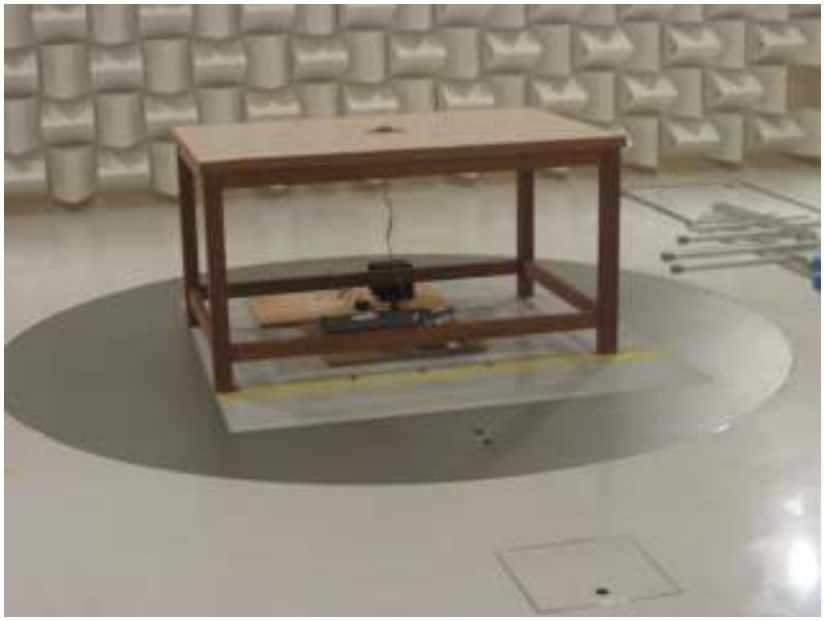
P_{max} : Maximum peak power of the fundamental.
P_{av} : Average of the fundamental.
P_{dev} : The amplitude delta between the peak power and the band edge emission.
E_{be} : Band edge emission.
E_{av} : Average of the band edge emission.

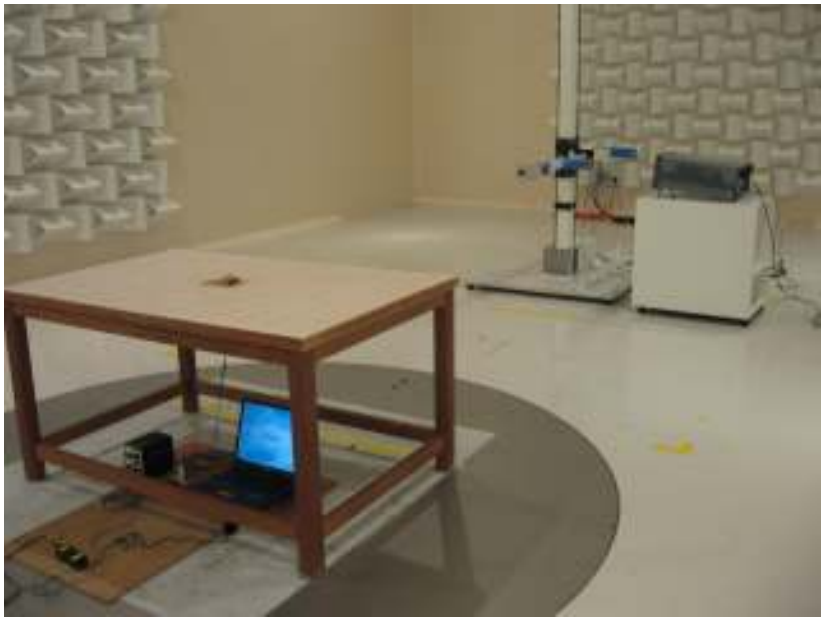
5.3 15. 215 (c) 20 dB Bandwidth



6. Photos

6.1 Setup Photo





7. List of Test Measurement Instruments

7.1 Radiated Emission Measurement

Instruments	Manufacturer	Model / Type	Serial No.	Calibration Date Next Calibration
Programmable AC/DCPower Source	NF Corporation	ES18000W	425779	Confirmed Before Test
EMI Test Receiver	ROHDE& SCHWARZ	ESIB40	100211	February, 2009 February, 2010
Biconical Antenna (30to 300MHz)	SCHWARZBECK	VHBB9124(Balun) BBA9106(Elements)	9124-311	September,2008 September,2009
Log.-Periodic Antena (300MHz to1GHz)	SCHWARZBECK	UHALP9108A	645	September,2008 September,2009
Horn Antenna	SCHWARZBECK	BBHA9120D	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