

# Certification of Compliance

## CFR 47 Part 15 Subpart C

Test Report File No. : 09-IST-0075      **Date of Issue** : January 23, 2009

Model(s) : PD-100W

Buyer Model(s) :

Kind of Product : Digital Wireless Camera

FCC ID : WHAPD-100W

Applicant : Pentaone Co., Ltd.

Address : Hyo Chang Bldg. 3F, 1013-6, Ingye-dong, Paldal-gu Suwon-si, Gyeonggi-do, Korea

Manufacturer : Pentaone Co., Ltd.

Address : Hyo Chang Bldg. 3F, 1013-6, Ingye-dong, Paldal-gu Suwon-si, Gyeonggi-do, Korea

### Test Result

Positive

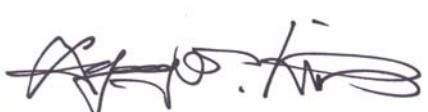
Negative

Reviewed By



S.J.CHO / EMC Group Manager

Approved By



B.S.KIM / Chief

### Comment(s)

- Investigations requested : Measurement to the relevant clauses of FCC rules and regulations Part 15 Subpart C.

- The test report with appendix consists of 44 pages.

- The test result only responds to the tested sample.

- It is not allowed to copy this report even partly without the allowance of IST EMC Laboratory.

- This equipment as for has been shown to be capable of continued compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4

I assume full responsibility for accuracy and completeness of these data.



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Note:

## INFORMATIONS OF TEST LABORATORY

EMC LABORATORY of IST Co., Ltd. (*FCC Filing Lab-400603.*)

Singal-dong, Giheung-gu, Yongin-City

Kyonggi-Do, 400-19, Korea

TEL : +82 31 326 6700

FAX : +82 31 326 6797

## ENVIRONMENTAL CONDITIONS

Temperature 8 °C Humidity 40 %

Atmospheric pressure 1012 mbar

## POWER SUPPLY SYSTEM USED

Power supply system AC 120V(Adaptor)

(Refer to the product information)

## PRODUCT INFORMATION

Item	Fuction	Specification
Camera Module	Image Device Number of Pixels Scanning System S/N Ratio Horizontal Resolution	1/3: Interline CCD (H) 768 * (V) 494 (H) 752 * (V) 582 525 Line, 30 fps 625 Line, 25 fps More than 48 dB(AGC off) 520 TV Line
TX Module	Video Compression Video Resolution Frame Rate Frequency of Operation Receiver Sensitivity Modulation Format Distance(2dB Antenna) Security Video Output	MPEG-4 Standard 704*480 D1:30 fps 2417 ~ 2467 MHz -85 dBm QPSK 100m(Open Sight) Unique Scramble Algorithm RCA Jack Type, CVBS
PD-100W	Operation Temperature Power Consumption Dimension	5 °C ~ 40 °C, RH95% Max DC 12 V ± 10%, 3.5 A 64(W)*62(H)*135(D) mm

- Regards to the frequency band operation; the highest that was included the lowest, middle and highest frequency of channel were selected to perform the test, and then shown on this report.

- Please refer to user's manual.

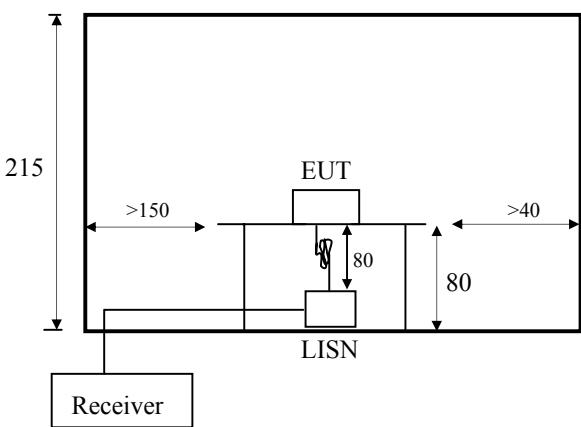
## DESCRIPTION OF TEST

### Conducted Emissions:

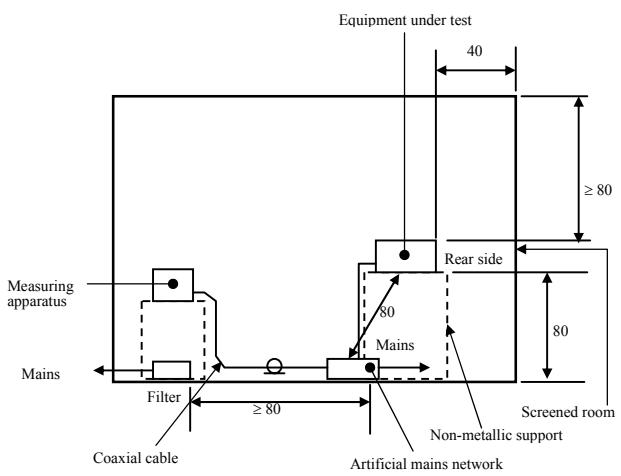
The measurement were performed over the frequency range of 0.15 MHz to 30 MHz using a  $50 \Omega/50 \mu\text{H}$  LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 10 kHz or for "quasi-peak" & "Average" within a bandwidth of 9 KHz.

#### -Procedure of Test

The line-conducted facility is located inside a shielded room No.1. A 1 m X 1.5 m wooden table 80 cm height is placed 40 cm away from the vertical wall and 1.5 m away from the other wall of the shielded room. The R/S ESCI and Hyup-Rip KNW-407 LISN are bonded to bottom of the shielded room. The EUT is located on the wooden table with distance more than 80 cm from the LISN and powered from the EMC LISN. The peripheral equipment is powered from the other LISN. Power to the LISNs are filtered by a noise cut power line filters. All electrical cables are shielded by braided tinned steel tubing with inner  $\phi$  1.2 cm. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the EMC LISN. All interconnecting cables more than 1m were shortened by non-inductive bundling to a 1m length. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating conditions. The RF output of the LISN was connected to the R/S receiver to determine the frequency producing the maximum emission from the EUT. The frequency producing the maximum level was reexamined using Quasi-Peak mode by manual measurement, after scanned by automatic Peak mode for frequency range from 0.15 to 30 MHz. The bandwidth of the receiver was set to 10 kHz. The EUT, peripheral equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.



< Side View >



< Concept Drawing >

## Limits

According to § 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  $\mu$  H/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 Range (MHz)	Limits	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

\* Decreases with the logarithm of the frequency.

Test specification.

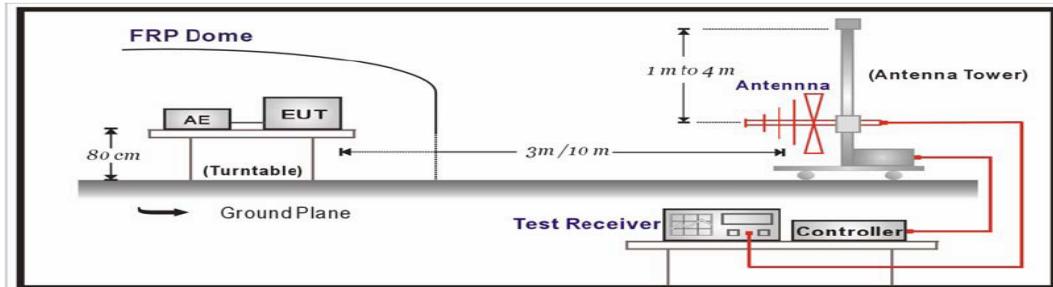
According to FCC CFR Title 47 Part 15 Subpart C Section 15.207 : 2005

## Radiated Emissions:

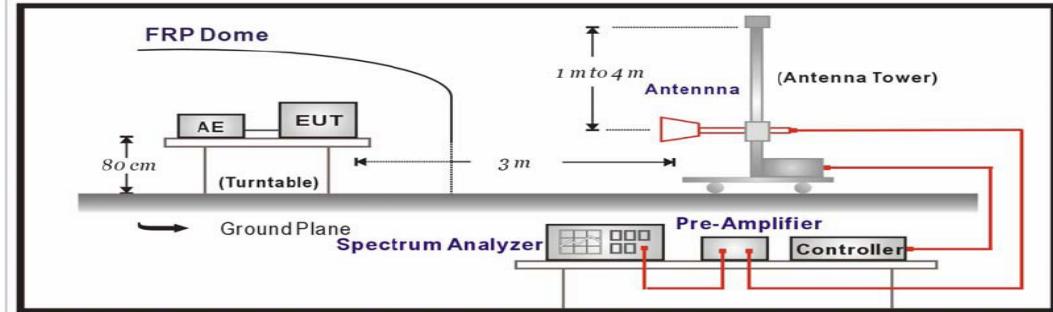
The measurement was performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurement was made with the detector set for "quasi-peak" within a bandwidth of 120kHz. Procedure of Test

Preliminary measurements were made at 3 meter using bi-log antennas, and spectrum analyzer to determine the frequency producing the max. emission in anechoic chamber. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turn-table azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30MHz to 1000MHz using bi-log antenna. Above 1GHz, linearly polarized double ridge horn antennas were used. Final measurements were made at open site with 3-meters test distance using bi-log antenna or horn antenna. The OATS have been verified in regular for its normalized site attenuation. The test equipment was placed on a wooden table. Sufficient time for the EUT, peripheral equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz or 1MHz depending on the frequency of type of signal. The EUT, peripheral equipment and interconnecting cables were re-configured to the set-up producing the max. emission for the frequency and were placed on top of a 0.8-meter high nonmetallic 1 x 1.5 meter table. The EUT, peripheral equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation to the EUT and/or peripheral equipment and changing the polarity of the antenna, whichever determined the worst-case emission. (The bandwidth below 1GHz setting on the field strength meter is 120KHz and above 1GHz is 1MHz.)

### Under 1GHz Test Setup:



### Above 1GHz Test Setup:



## Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, Shall be attenuated by at least 20dB below the level of the fundamental or to the General radiated emission limits in paragraph 15.209, whichever is the lesser attenuation:

FCC Part 15 Subpart C Section 15.209 Limits		
Frequency (MHz)	µV/meter	dBµV/meter
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks :

1. RF Voltage(dBuv)=20log RF Voltage(uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring Instrument antenna and the closed point of any part of the device or System.

Test specification.

According to FCC CFR Title 47 Part 15 Subpart C Section 15.209 : 2005

## Measurement Uncertainty Calculations

The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and NIS 81 (1994).

Contribution (Conducted Emissions)	Probability Distribution	Uncertainty ( $\pm$ dB)
		0.15-30MHz
Receiver Specification	Rectangular	1.5
LISN Coupling Specification	Rectangular	1.5
Cable and Input Attenuator Calibration	Normal (k=2)	0.5
Mismatch to Receiver	U-Shaped	-0.8 / +0.7
System Repeatability	Normal (k=1)	0.2
Combined Standard Uncertainty	Normal (k=2)	-1.85 / +1.71
Expanded Uncertainty U	Normal (k=2)	-3.7 / +3.42

$U_{c,minus} = -1.85$ ,  $U_{c,plus} = 1.71$

**$U = -3.70 / +3.42$  (k=2, 95.45% confidence level)**

Contribution (Radiated Emissions)	Probability Distribution	Uncertainties( $\pm$ dB)
		3 m
Antenna		
Factor	Normal (k=2)	0.9968
Frequency Interpolation	Rectangular	0.1039
Height Variation	Rectangular	-2.6 / +1.5
Directivity Difference	Rectangular	-1.0 / +0
Phase Center Location	Rectangular	1.0
Cable Loss	Normal (k=2)	0.5
Receiver		
Voltage Accuracy	Normal (k=2)	2.0
Pulse Response	Rectangular	1.5
Absolute Repetition Rate	Rectangular	1.5
Mismatch to Receiver		
$ \Gamma_{antenna}  = 0.33$	U-Shaped	-1.0 / +0.9
$ \Gamma_{receiver}  = 0.33$		
System Repeatability	Std Deviation	0.5
Combined Standard Uncertainty	Normal	-2.6048 / 2.2775
Expanded Uncertainty U	Normal (k=2)	-5.21 / +4.55

$U_{c,minus} = -2.6048$ ,  $U_{c,plus} = 2.2775$

**$U = -5.21 / +4.55$  (k=2, 95.45% confidence level)**

## Equipment Under Test

### EUT Type :

- Table-Top.
- Floor-Standing.
- Table-Top and Floor-Standing(Combination).

### Operation – mode of the E.U.T. :

The equipment under test was operated during the measurement under following conditions :

- Standby Mode
- Operational Condition : Continue Transmit, Serial Communication

### Configuration of the equipment under test :

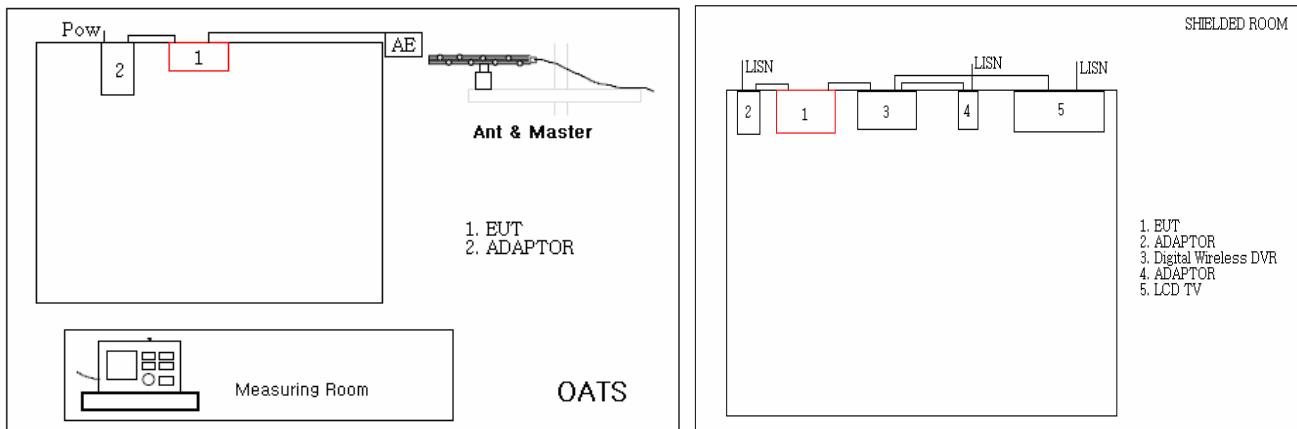
Following peripheral devices and interface cables were connected during the measurement :

Equipment	Type	Brand	Serial No.
Digital Wireless DVR	P-4000WK	Pentaone Co.,Ltd.	N/A
Adaptor	HASU11FB	HUA JUNG COMP. CO.,TLD.	N/A
LCD TV	DSP-20J1NHS	Daewoo Electronics.	N/A

#### Connecting Interface Cables :

- Shielded BNC cable (without ferrite core) : 1.5 m
- Shielded BNC cable (without ferrite core) : 1.5 m
- Unshielded Power cable (without ferrite core) : 1.8 m
- Unshielded Power cable (without ferrite core) : 1.8 m
- Shielded Adaptor cable (with one ferrite core) : 1.2 m

## Test Set-Up Configuration



## Radiated/Conducted Emissions

## SUMMARY

### Test Descriptions

- <b>Conducted Emission</b>	PASS
- <b>Conducted Emission result</b>	
- <b>Radiated Emission</b>	PASS
- <b>Radiated Emission Result</b>	
- <b>Peak power output</b>	PASS
- <b>Test result</b>	
- <b>Band edge</b>	PASS
- <b>Test result</b>	
- <b>6dB Band(Occupied Bandwidth)</b>	PASS
- <b>Test Result</b>	
- <b>Power Density</b>	PASS
- <b>Test Result</b>	

### Test Date

Begin of Testing : Dec. 22, 2008 - End of Testing : Jan. 23, 2009

Prepared By

Note :



- means the test is applicable,
- is not applicable.

J.Y. Choi / Senior Engineer

### Conducted Emissions

[Applicable]

◆ Test Equipment Used

Model Name	Description	Manufacturer	Calibration Date	Serial No.
ESCI	Test Receiver	Rohde & Schwarz	Jun. 26, 2008	100373
ESH3-Z5	LISN	Rohde & Schwarz	Jul. 21, 2008	862770/025
ESH3-Z2	Pulse Limiter	Rohde & Schwarz	May. 21, 2008	357.8810.52

◆ Test Accessories Used

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

◆ Test Program Continue Transmit, Serial Communication

◆ Test Date Dec. 23, 2008

◆ Test Area Conducted Room No.1

Note : The equipment used is calibrated in regular for every year.

Conducted Emissions Result

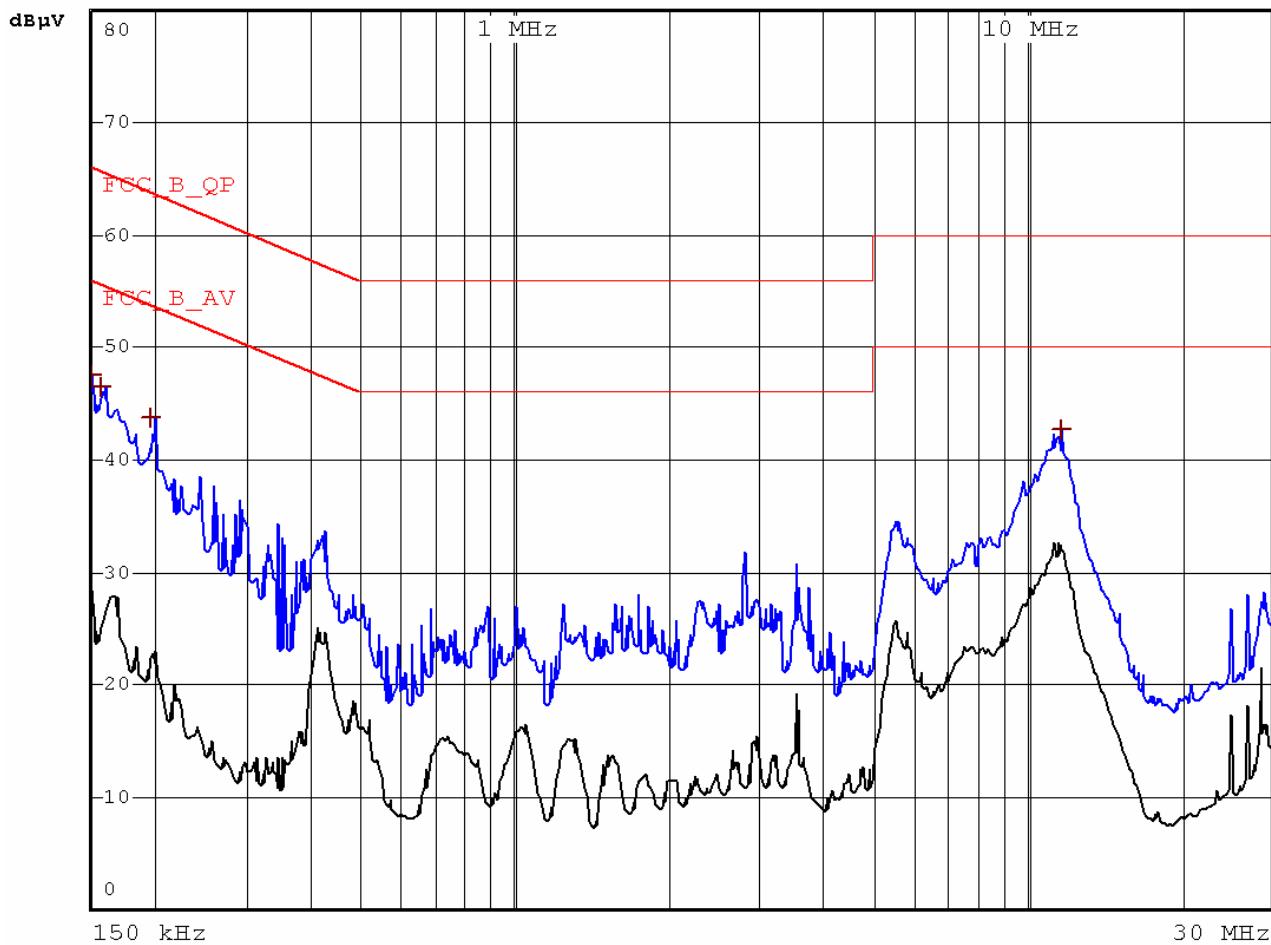
Phase : Live

RBW 9 kHz

MT 100 ms

PREAMP OFF

Att 10 dB



Model : PD-100W Op.con : 120 Vac 60 Hz Phase : Live  
BNC Mode

Freq. [MHz]	Measurement [dB $\mu$ V]		Limit [dB $\mu$ V]		Insertion Loss [dB]	Cable Loss [dB $\mu$ V]	Result [dB $\mu$ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average			Q-peak	Average	Q-peak	Average
0.150	47.91	30.65	66.00	56.00	0.33	0.80	49.04	31.78	16.96	24.22
0.158	41.04	26.43	65.57	55.57	0.33	0.80	42.17	27.56	23.40	28.01
0.200	36.62	21.77	63.61	53.61	0.23	0.80	37.65	22.80	25.96	30.81
11.690	36.43	31.20	60.00	50.00	0.45	0.23	37.11	31.88	22.89	18.12

Note : BNC Mode

Conducted Emissions Result

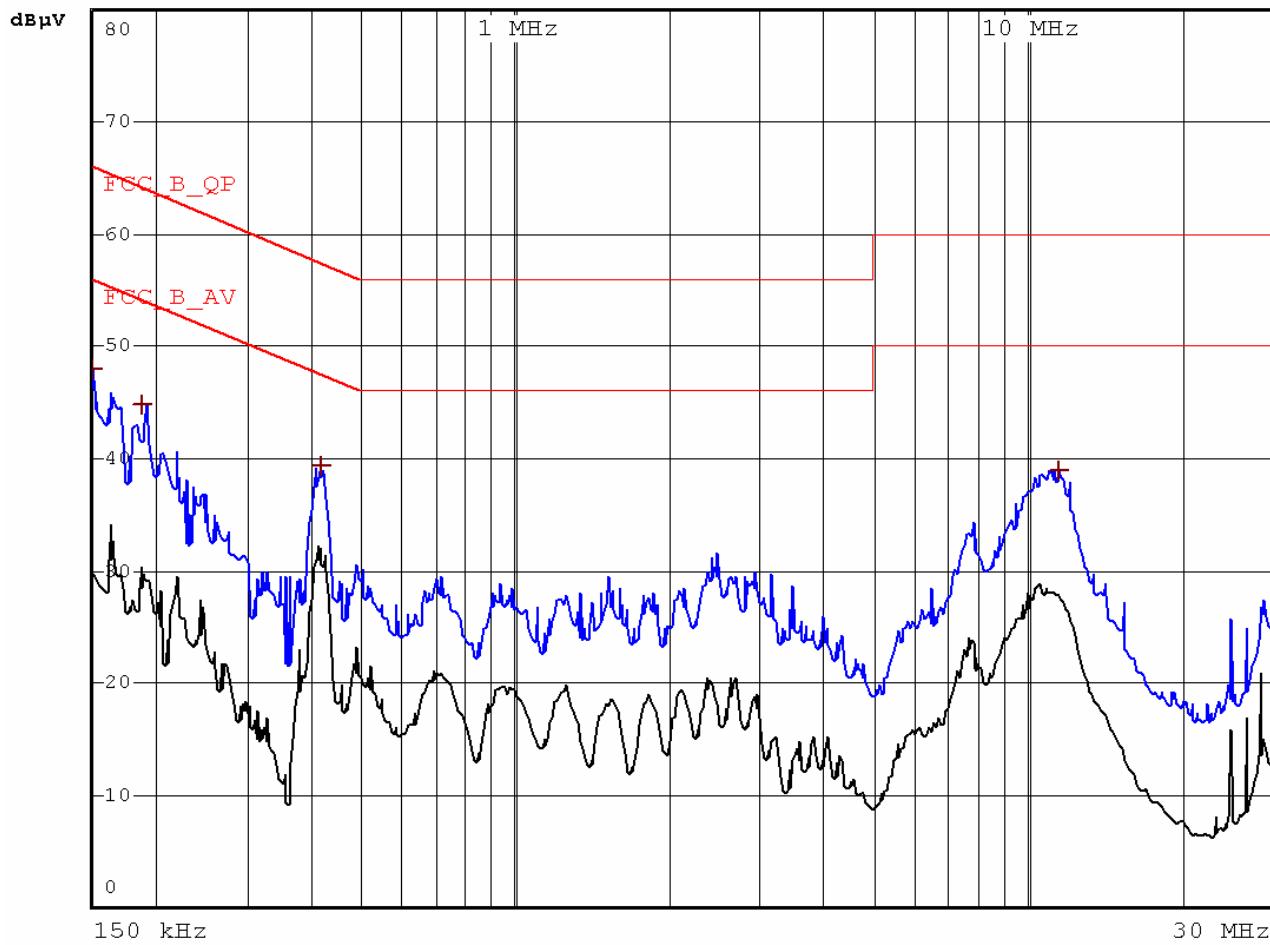
Phase : Neutral

RBW 9 kHz

MT 20 ms

Att 10 dB

PREAMP OFF



Model : PD-100W Op.con : 120 Vac 60 Hz Phase : Neutral  
BNC Mode

Freq. [MHz]	Measurement [dB $\mu$ V]		Limit [dB $\mu$ V]		Insertion Loss [dB]	Cable Loss [dB $\mu$ V]	Result [dB $\mu$ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average			Q-peak	Average	Q-peak	Average
0.150	49.14	31.95	66.00	56.00	0.35	0.80	50.29	33.10	15.71	22.90
0.191	39.33	29.04	63.99	53.99	0.24	0.80	40.37	30.08	23.62	23.91
0.420	36.64	31.25	57.45	47.45	0.22	0.20	37.06	31.67	20.39	15.78
11.360	37.05	31.98	60.00	50.00	0.44	0.26	37.75	32.68	22.25	17.32

Note : BNC Mode

Conducted Emissions Result

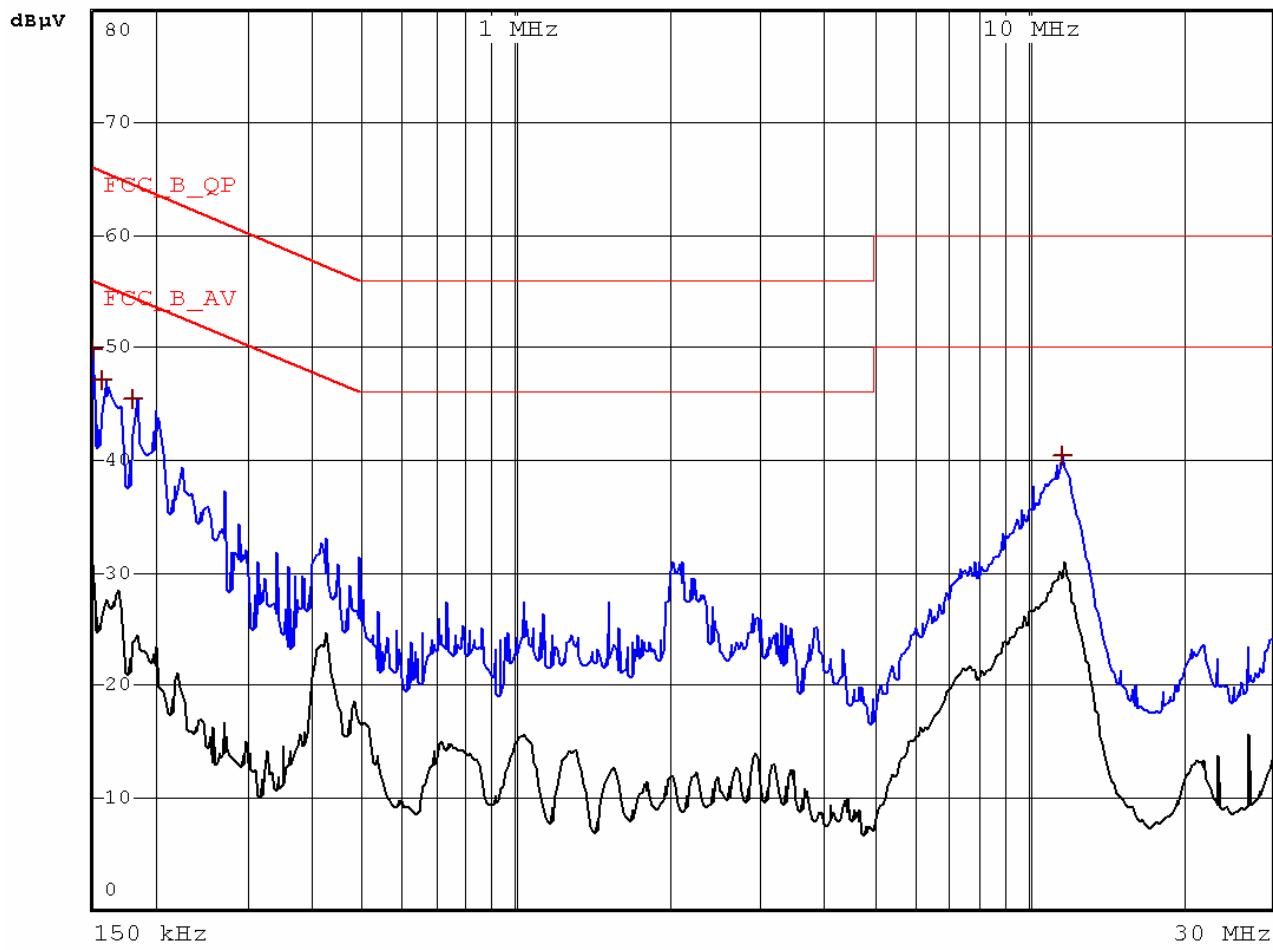
Phase : Live

RBW 9 kHz

MT 20 ms

PREAMP OFF

Att 10 dB



150 kHz 30 MHz  
Model : PD-100W Op.con : 120 Vac 60 Hz Phase : Live  
RF Mode

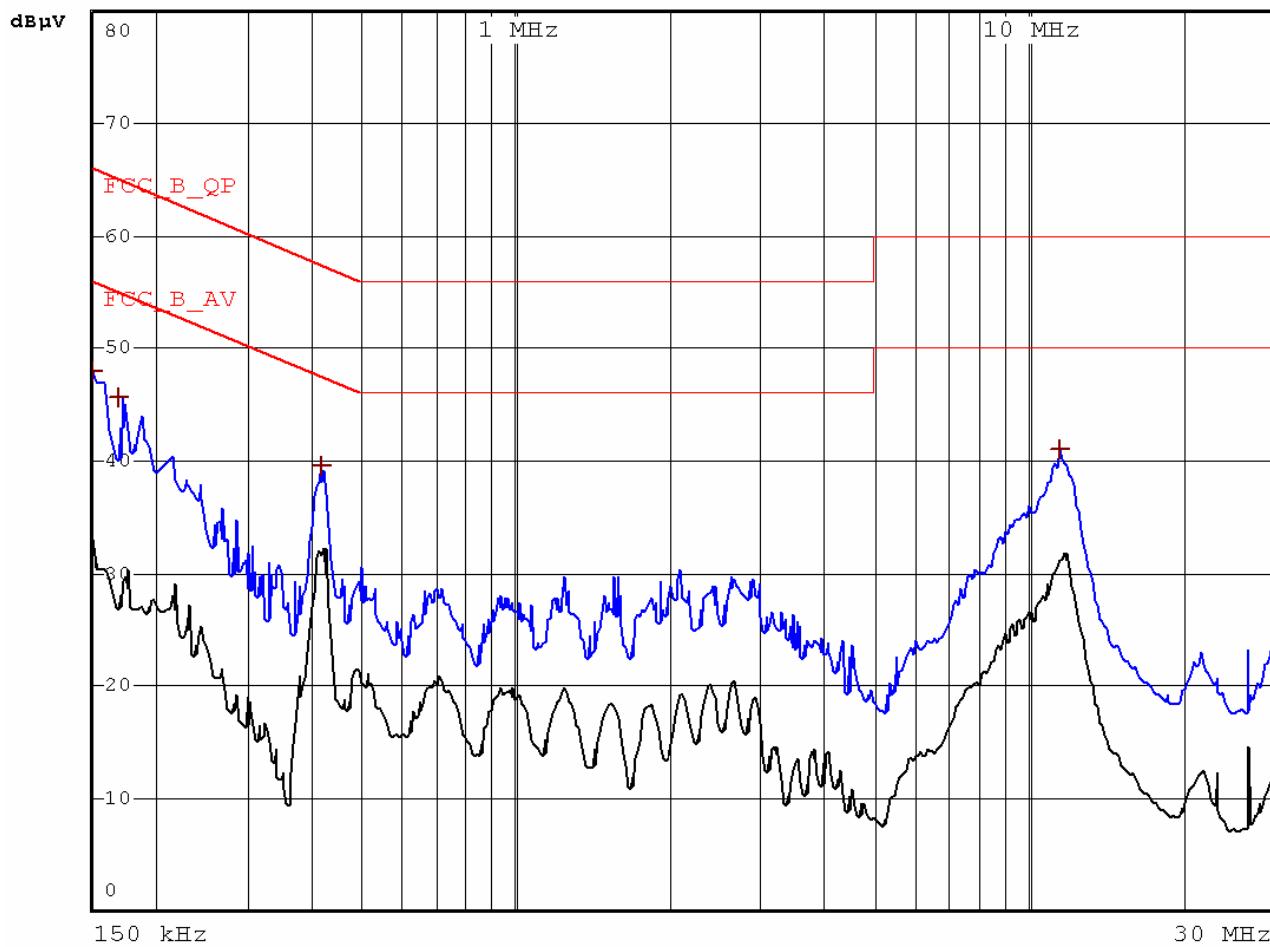
Freq. [MHz]	Measurement [dB $\mu$ V]		Limit [dB $\mu$ V]		Insertion Loss [dB]	Cable Loss [dB $\mu$ V]	Result [dB $\mu$ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average			Q-peak	Average	Q-peak	Average
0.150	49.31	31.52	66.00	56.00	0.33	0.80	50.44	32.65	15.56	23.35
0.162	43.14	27.42	65.36	55.36	0.31	0.80	44.25	28.53	21.11	26.83
0.180	40.35	25.14	64.49	54.49	0.27	0.80	41.42	26.21	23.07	28.28
11.630	34.46	29.45	60.00	50.00	0.45	0.24	35.14	30.13	24.86	19.87

Note : Continue Transmit Mode

Conducted Emissions Result

Phase : Neutral

RBW 9 kHz  
MT 20 ms  
Att 10 dB PREAMP OFF



Model : PD-100W Op.con : 120 Vac 60 Hz Phase : Neutral  
RF Mode

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Insertion Loss	Cable Loss	Result [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average			Q-peak	Average	Q-peak	Average
0.150	48.01	32.60	66.00	56.00	0.35	0.80	49.16	33.75	16.84	22.25
0.170	41.23	29.70	64.96	54.96	0.29	0.80	42.32	30.79	22.64	24.17
0.418	37.23	32.12	57.49	47.49	0.22	0.20	37.65	32.54	19.84	14.95
11.550	36.92	30.93	60.00	50.00	0.44	0.24	37.61	31.62	22.39	18.38

Note : Continue Transmit Mode

**Radiated Emission**

[Applicable]

◆ Test Equipment Used

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESCS30	EMI Receiver	Rohde & Schwarz	Aug. 10, 2008	100373
SPECTRUM ANALYZER	R3273	ADVANTEST	Oct. 01, 2008	MY420000092
BICONILOG Antenna	VULB 9160	Schwarz beck	Aug. 28, 2008	3047
HORN-Antenna	3115	EMCO	Dec. 26, 2008	9012-3602
HORN-Antenna	SAS-571	A.H. SYSTEMS	Dec. 26, 2008	500
PRE AMPLIFIER	8449B OPT H02	Rohde & Schwarz	Oct. 17, 2008	3008A0530

Note : 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to RRL, KRISS, KTL and HCT.  
 2. The calibration interval of horn ant. and loop ant. is 24 months

**Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

$$\text{Peak} = \text{Reading} + \text{Corrected Factor}$$

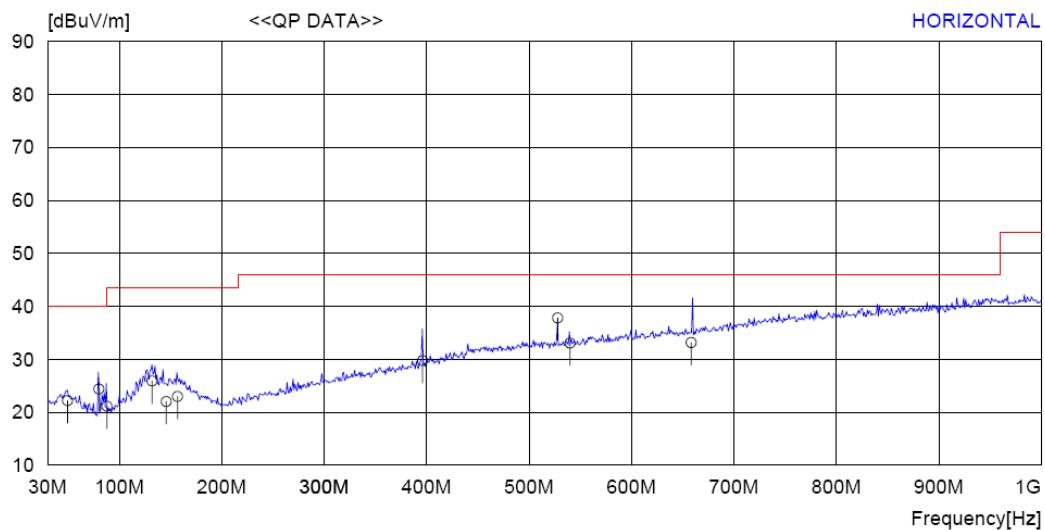
Where

Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)

### Radiated Emission Result

[Applicable]

EUT	PD-100W	PROBE	0.3GHz~1GHz-HOR
POWER	AC 120 V	NOTE	BNC Mode



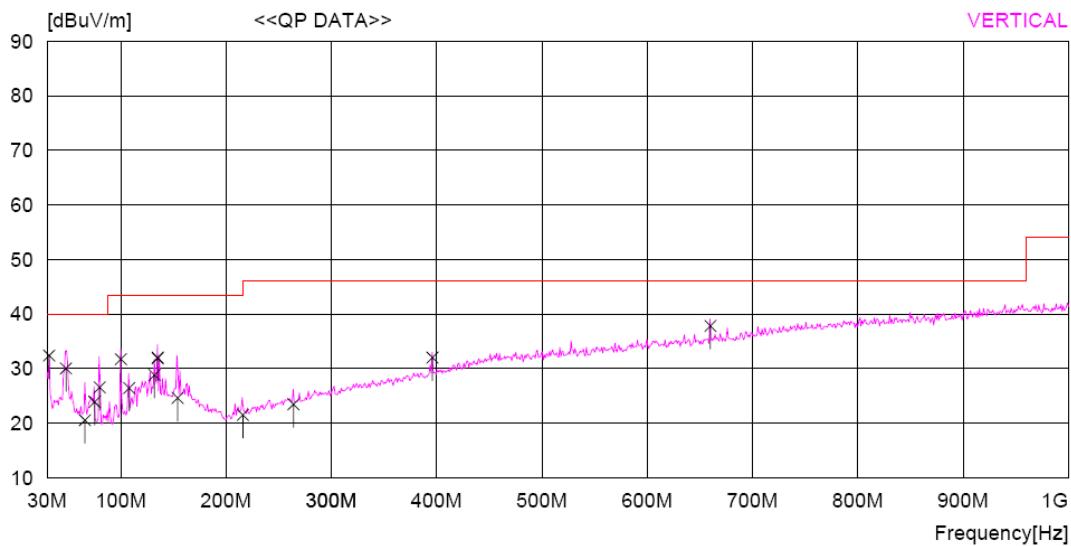
Frequency MHz	Reading dB <sub>uV</sub>	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Limit dB <sub>uV</sub>	Total dB <sub>uV</sub>	Margin dB
80.001	15.50	H	7.84	1.00	0.0	40.00	24.34	-15.66
*527.996	16.60	H	17.59	3.51	0.0	46.00	37.70	-8.30
539.998	11.60	H	17.90	3.55	0.0	46.00	33.05	-12.95

Note :

1. Remark "\*" means that the data is the worst emission level.
2. All reading levels are Quasi-peak value.
3. Measurement level = reading level + correct factor

**[Applicable]**

EUT	PD-100W	PROBE	0 . 3GHz~1GHz-VER
POWER	AC 120 V	NOTE	BNC Mode



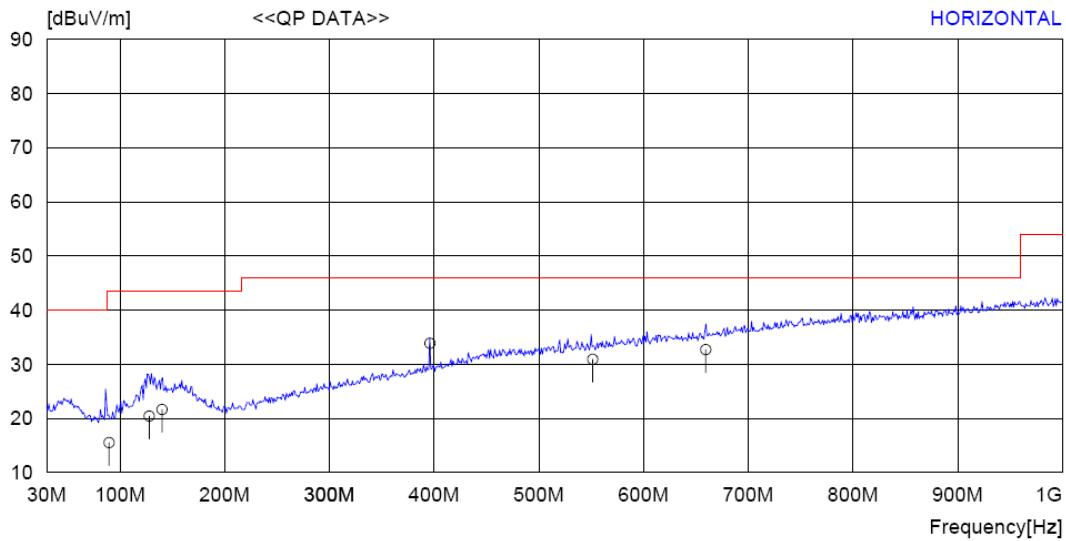
Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Limit dBuV	Total dBuV	Margin dB
*32.001	20.80	V	11.20	0.40	0.0	40.00	32.40	-7.60
48.000	17.20	V	12.20	0.40	0.0	40.00	29.80	-10.20
75.053	14.40	V	8.50	1.00	0.0	40.00	23.90	-16.10
87.997	17.70	V	8.34	1.23	0.0	40.00	27.27	-12.73
100.020	21.00	V	9.17	1.20	0.0	43.50	31.37	-12.13
108.002	14.80	V	10.06	1.32	0.0	43.50	26.18	-17.32
131.999	15.00	V	12.02	1.55	0.0	43.50	28.57	-14.93
135.003	17.80	V	12.18	1.57	0.0	43.50	31.55	-11.95
396.000	14.40	V	14.62	2.98	0.0	46.00	32.00	-14.00
659.995	14.10	V	19.81	4.05	0.0	46.00	37.96	-8.04

*Note :*

1. Remark "\*" means that the data is the worst emission level.
2. All reading levels are Quasi-peak value.
3. Measurement level = reading level + correct factor

**[Applicable]**

EUT	PD-100W	PROBE	0 . 3GHz~1GHz-HOR
POWER	AC 120 V	NOTE	TX-CH1 ( 2417 MHz )



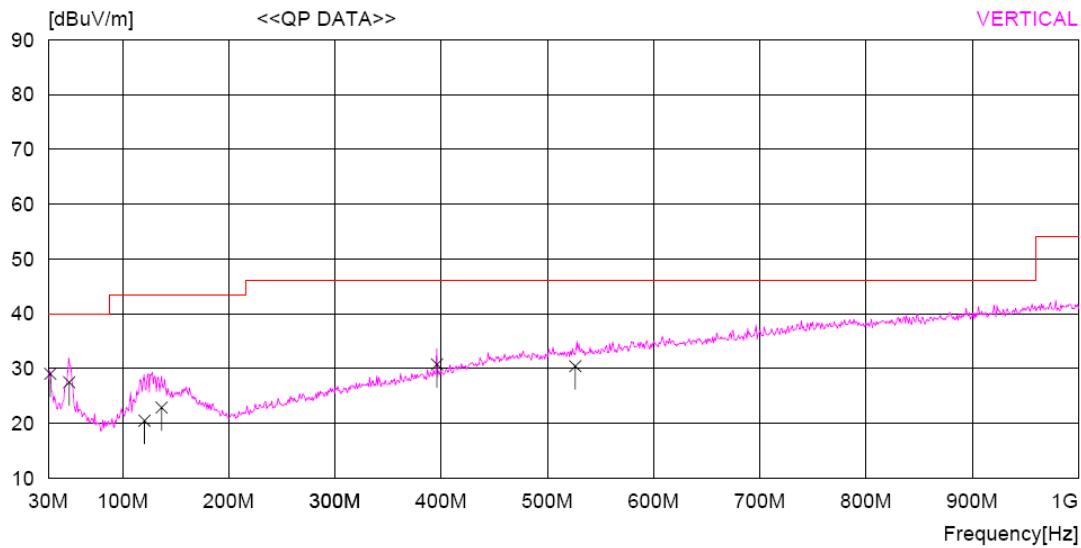
Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Limit dBuV	Total dBuV	Margin dB
551.530	9.30	H	18.19	3.60	0.0	46.00	31.09	-14.91
*659.443	9.00	H	19.81	4.05	0.0	46.00	32.86	-13.14

*Note :*

1. Remark "\*" means that the data is the worst emission level.
2. All reading levels are Quasi-peak value.
3. Measurement level = reading level + correct factor

[Applicable]

EUT	PD-100W	PROBE	0.3GHz~1GHz-VER
POWER	AC 120 V	NOTE	TX-CH1 ( 2417 MHz )



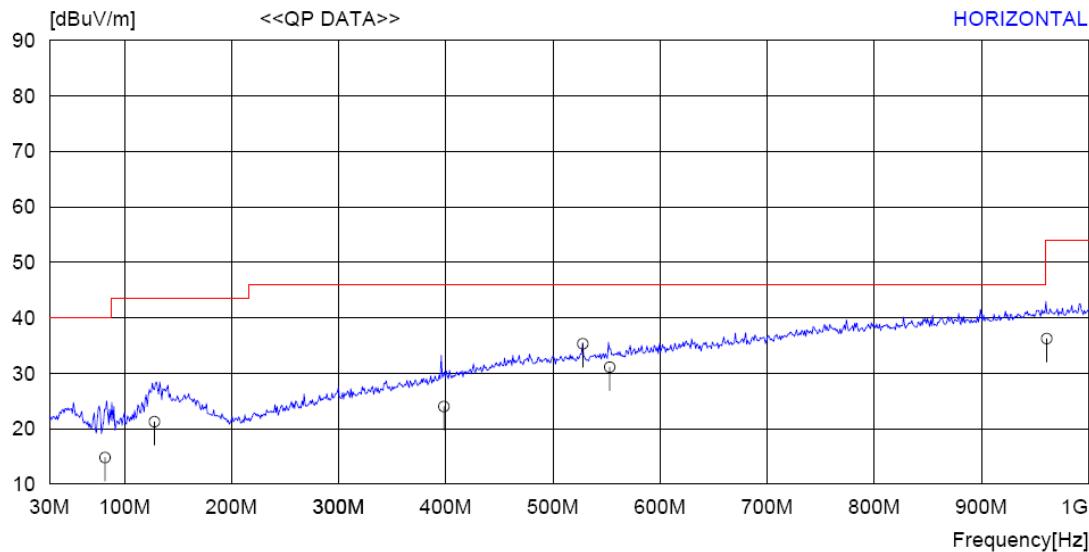
Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Limit dBuV	Total dBuV	Margin dB
*32.000	17.50	V	11.20	0.40	0.0	40.00	29.10	-10.90
49.766	14.60	V	12.20	0.40	0.0	40.00	27.20	-12.80
395.999	16.20	V	8.50	2.98	0.0	46.00	27.68	-18.32

*Note :*

1. Remark “\*” means that the data is the worst emission level.
2. All reading levels are Quasi-peak value.
3. Measurement level = reading level + correct factor

[Applicable]

EUT	PD-100W	PROBE	0.3GHz~1GHz-HOR
POWER	AC 120 V	NOTE	TX-CH6 ( 2442 MHz )



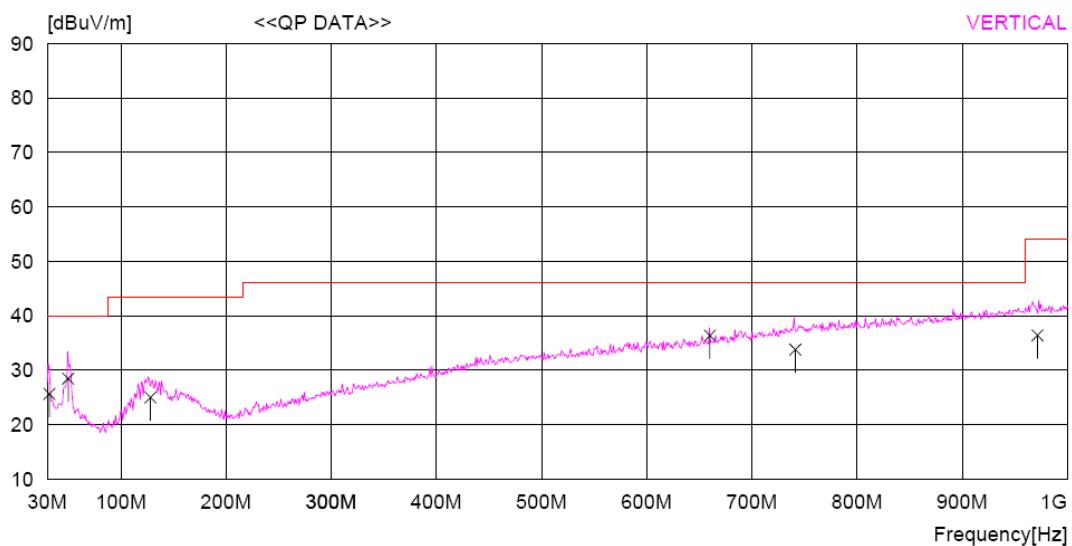
Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Limit dBuV	Total dBuV	Margin dB
*527.997	14.10	H	17.59	3.51	0.0	46.00	35.20	-10.80
552.973	9.40	H	18.21	3.61	0.0	46.00	31.22	-14.78

*Note :*

1. Remark “\*” means that the data is the worst emission level.
2. All reading levels are Quasi-peak value.
3. Measurement level = reading level + correct factor

[Applicable]

EUT	PD-100W	PROBE	0 . 3GHz~1GHz-VER
POWER	AC 120 V	NOTE	TX-CH6 (2442 MHz)



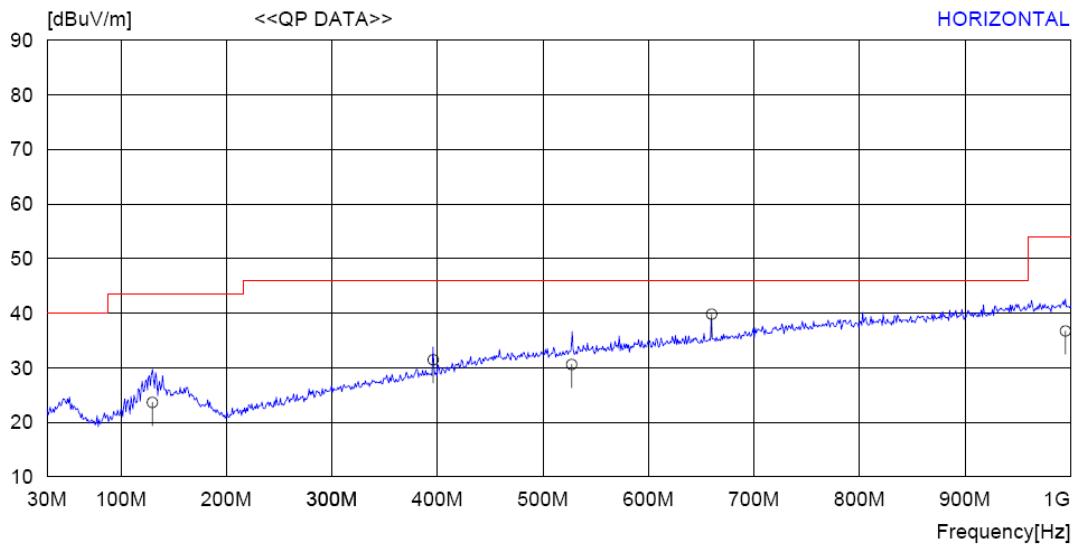
Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Limit dBuV	Total dBuV	Margin dB
31.806	14.10	V	11.20	0.40	0.0	40.00	25.70	-14.30
49.815	15.60	V	12.20	0.40	0.0	40.00	28.20	-11.80
128.000	11.50	V	8.50	1.54	0.0	43.50	21.54	-21.96
*659.992	12.70	V	19.81	4.05	0.0	46.00	36.56	-9.44

Note :

1. Remark "\*" means that the data is the worst emission level.
2. All reading levels are Quasi-peak value.
3. Measurement level = reading level + correct factor

**[Applicable]**

EUT	PD-100W	PROBE	0 . 3GHz~1GHz-HOR
POWER	AC 120 V	NOTE	TX-CH11 (2467 MHz)



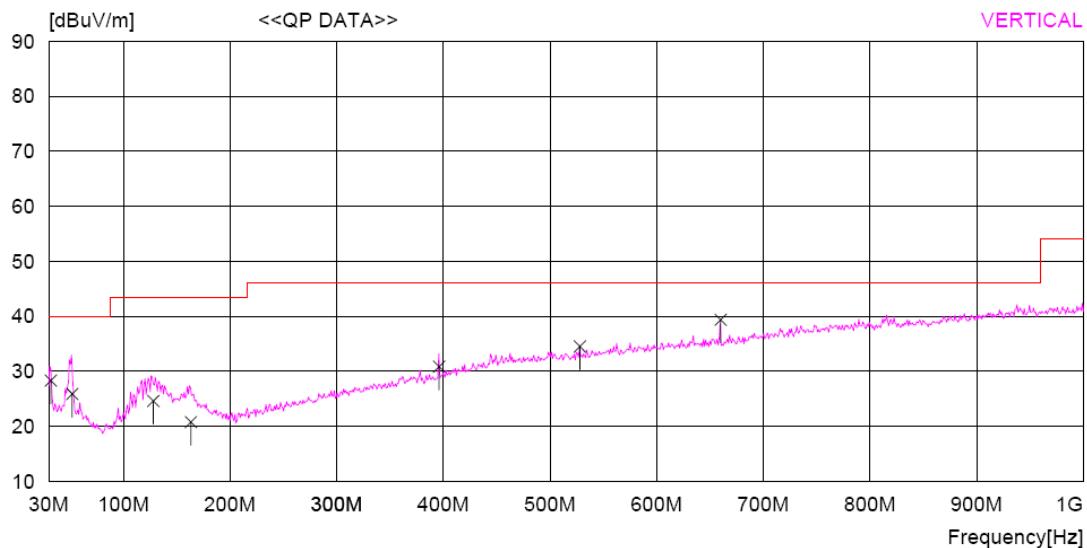
Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Limit dBuV	Total dBuV	Margin dB
129.873	10.00	H	11.91	1.54	0.0	43.50	23.45	-20.05
395.997	13.80	H	14.62	2.98	0.0	46.00	31.40	-14.60
*659.995	16.10	H	19.81	4.05	0.0	46.00	39.96	-6.04

*Note :*

1. Remark "\*" means that the data is the worst emission level.
2. All reading levels are Quasi-peak value.
3. Measurement level = reading level + correct factor

[Applicable]

EUT	PD-100W	PROBE	0.3GHz~1GHz-VER
POWER	AC 120 V	NOTE	TX-CH11(2467 MHz)



Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Limit dBuV	Total dBuV	Margin dB
32.001	16.70	V	11.20	0.40	0.0	40.00	28.30	-11.70
52.033	13.20	V	12.20	0.40	0.0	40.00	25.80	-14.20
127.999	11.10	V	8.50	1.53	0.0	43.50	21.13	-22.37
*527.994	13.30	V	17.59	3.51	0.0	46.00	34.40	-11.60

*Note :*

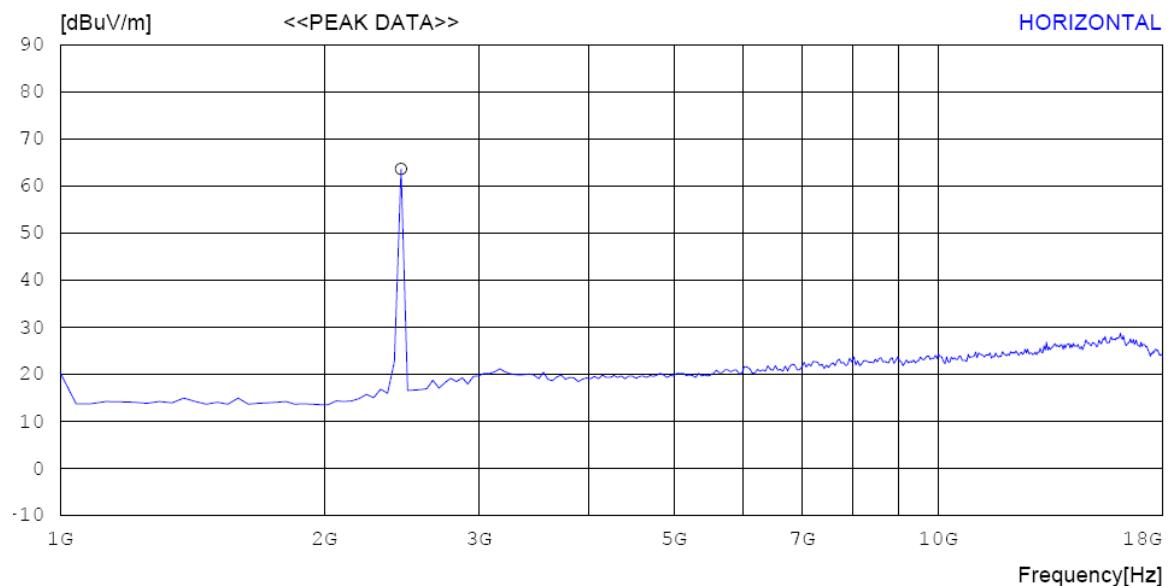
1. Remark “\*” means that the data is the worst emission level.
2. All reading levels are Quasi-peak value.
3. Measurement level = reading level + correct factor

**Radiated Emissions Result**

(Disturbance Radiation)

**[Applicable]**

EUT	PD-100W	PROBE	RF 1GHZ~26GHz-HOR
POWER	AC 120 V	NOTE	TX-CH1 ( 2417 MHz )

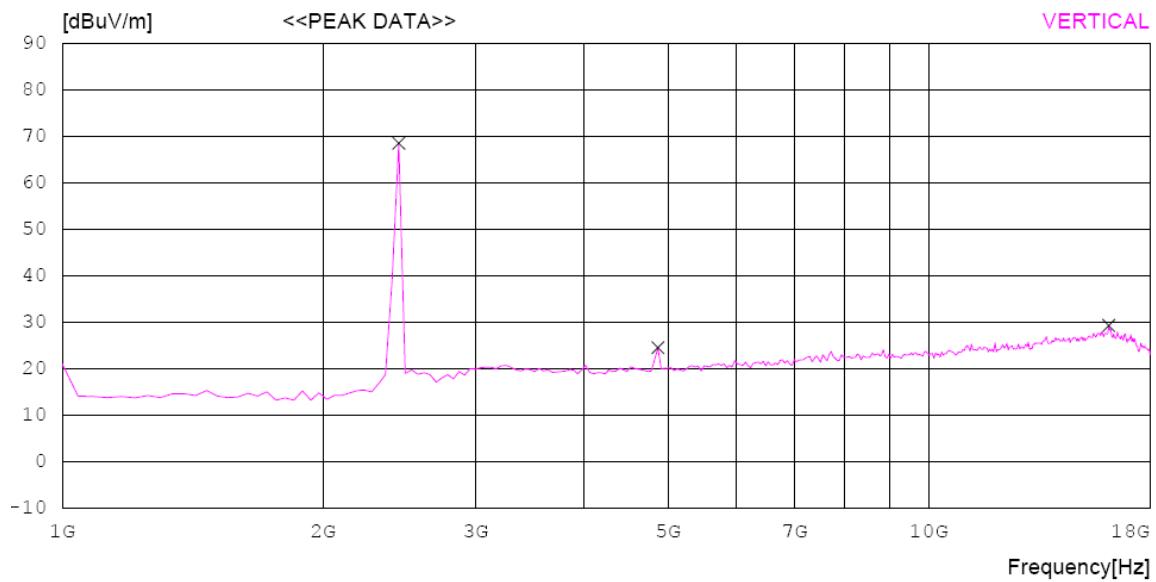


Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Total dBuV	Limit dBuV	Margin dB
-	-	-	-	-	-	-	-	-

Note : Other emissions don't exceed the level of 20 dB below the applicable Limit.

**[Applicable]**

EUT	PD-100W	PROBE	RF 1GHZ~26GHz-VER
POWER	AC 120 V	NOTE	TX-CH1 ( 2417 MHz )

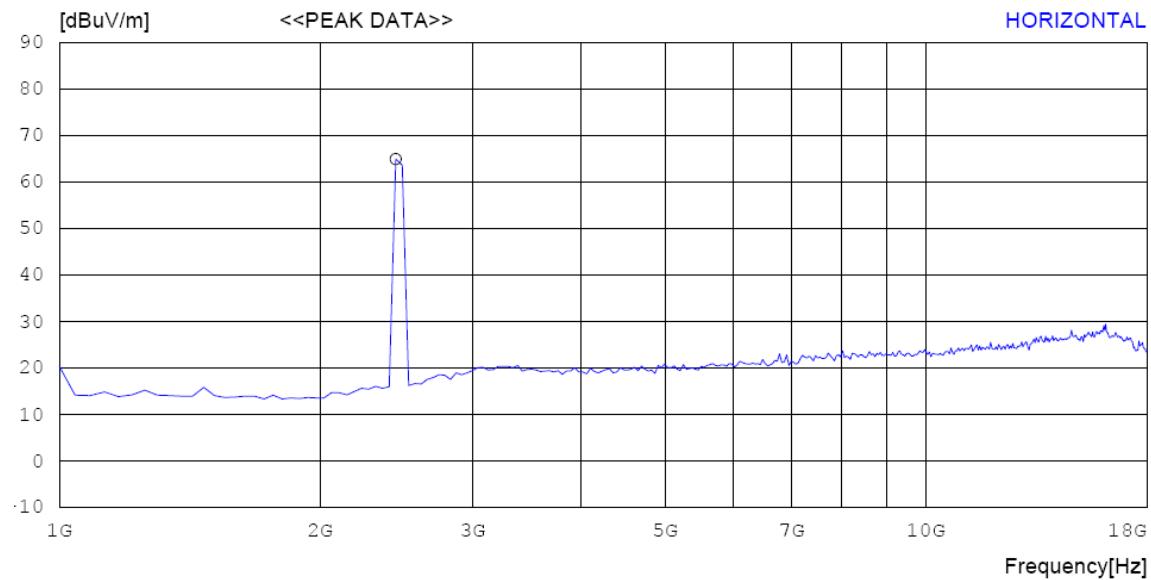


Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Total dBuV	Limit dBuV	Margin dB
-	-	-	-	-	-	-	-	-

Note : Other emissions don't exceed the level of 20 dB below the applicable Limit.

**[Applicable]**

EUT	PD-100W	PROBE	RF 1GHZ~26GHz-HOR
POWER	AC 120 V	NOTE	TX-CH6 (2442 MHz)

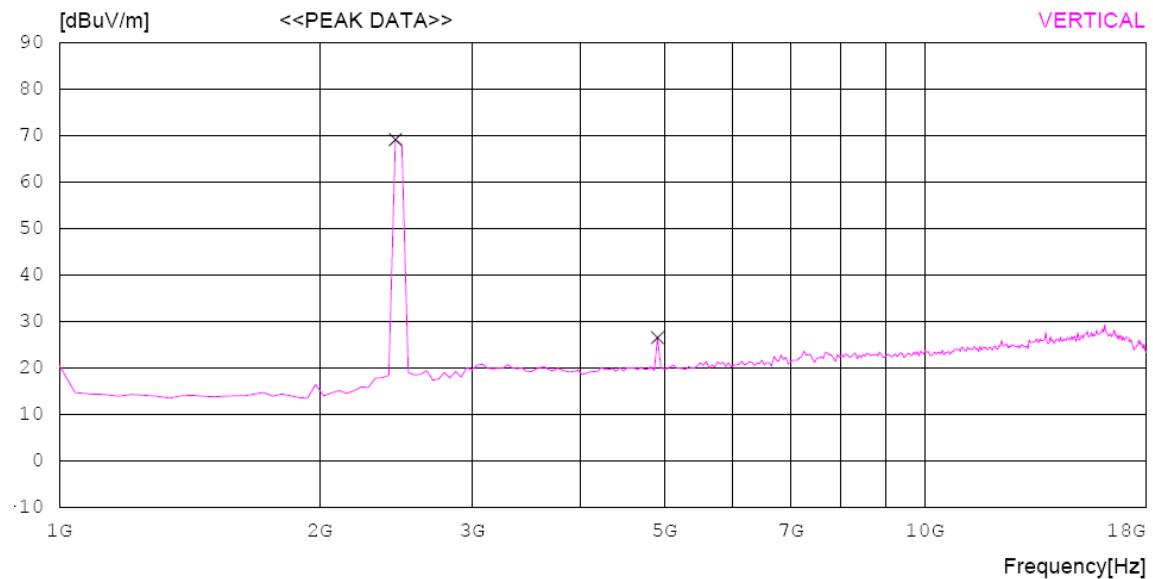


Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Total dBuV	Limit dBuV	Margin dB
-	-	-	-	-	-	-	-	-

Note : Other emissions don't exceed the level of 20 dB below the applicable Limit.

**[Applicable]**

EUT	PD-100W	PROBE	RF 1GHZ~26GHz-VER
POWER	AC 120 V	NOTE	TX-CH6 ( 2442 MHz )

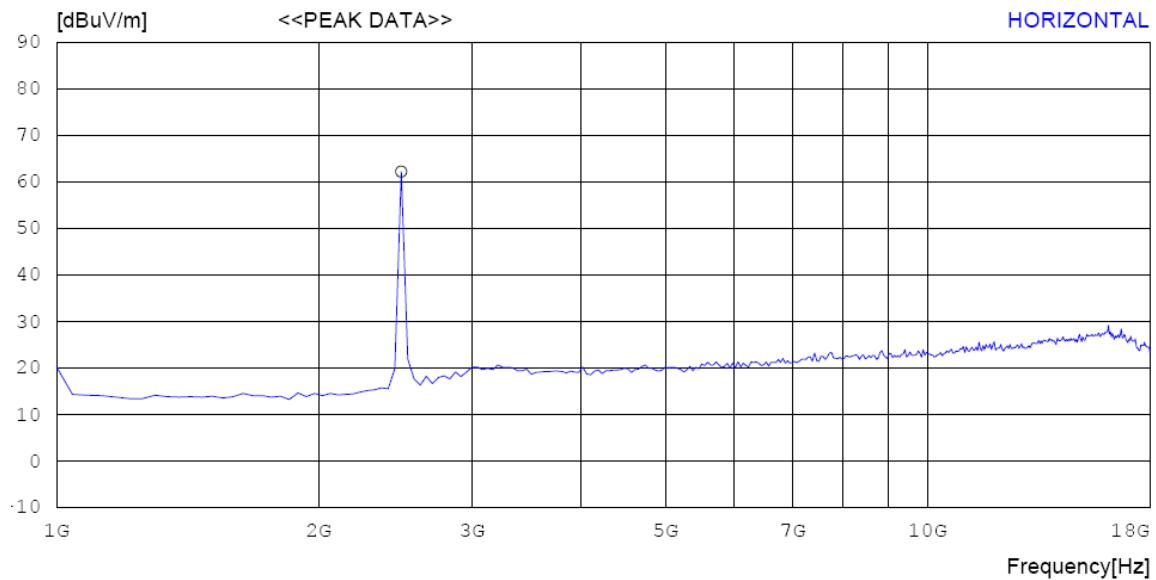


Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Total dBuV	Limit dBuV	Margin dB
-	-	-	-	-	-	-	-	-

Note : Other emissions don't exceed the level of 20 dB below the applicable Limit.

**[Applicable]**

EUT	PD-100W	PROBE	RF 1GHZ~26GHz-HOR
POWER	AC 120 V	NOTE	TX-CH11 (2467 MHz)

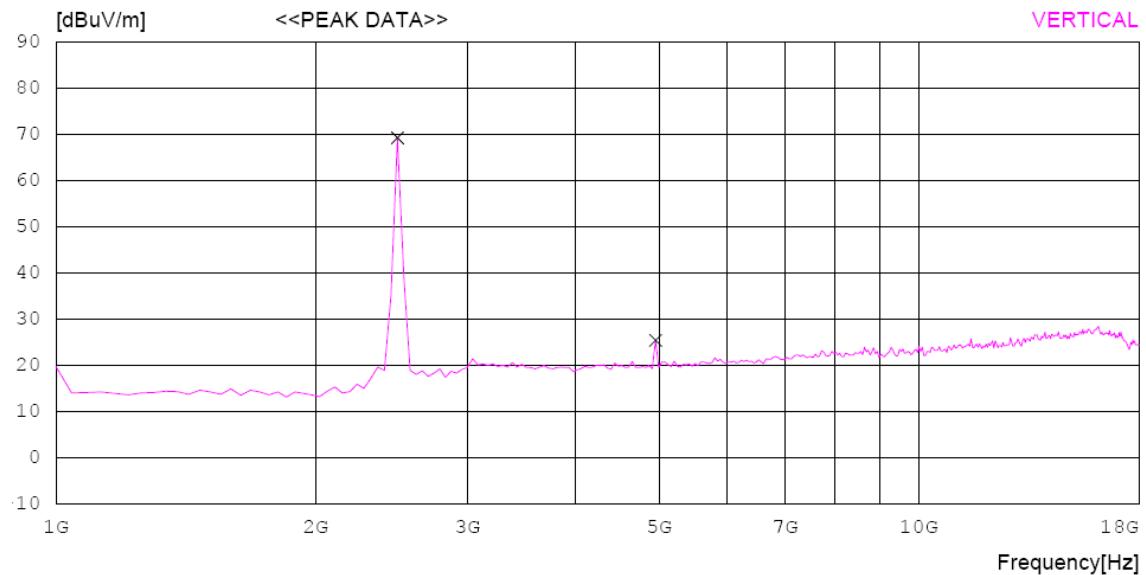


Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Total dBuV	Limit dBuV	Margin dB
-	-	-	-	-	-	-	-	-

Note : Other emissions don't exceed the level of 20 dB below the applicable Limit.

**[Applicable]**

EUT	PD-100W	PROBE	RF 1GHZ~26GHz-VER
POWER	AC 120 V	NOTE	TX-CH11 (2467 MHz)



Frequency MHz	Reading dBuV	P (H, V)	Ant. Factor dB	Cable Loss dB	AMP GAIN dB	Total dBuV	Limit dBuV	Margin dB
-	-	-	-	-	-	-	-	-

Note : Other emissions don't exceed the level of 20 dB below the applicable Limit.

### Peak Power Output

#### ◆Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model no/Serial No.	Last Cal.
1	Spectrum Analyzer	ADVANTEST	R3273 / 95090431	Aug. 01, 2008
2	RF ROOM			

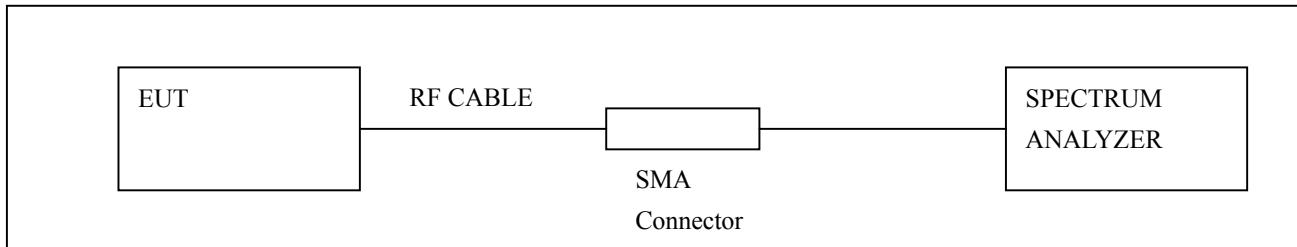
*Note : All equipment upon which need to calibrated are with calibration period of 1 year.*

#### ◆Limits

The maximum peak output power of the intentional radiator shall not exceed the following :

1. According to § 15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz : 1Watt.
2. According to § 15.247(b)(4), the conducted output power limit specified in paragraph(b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph(c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs(b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi

#### ◆Test Setup



#### ◆Test Procedure

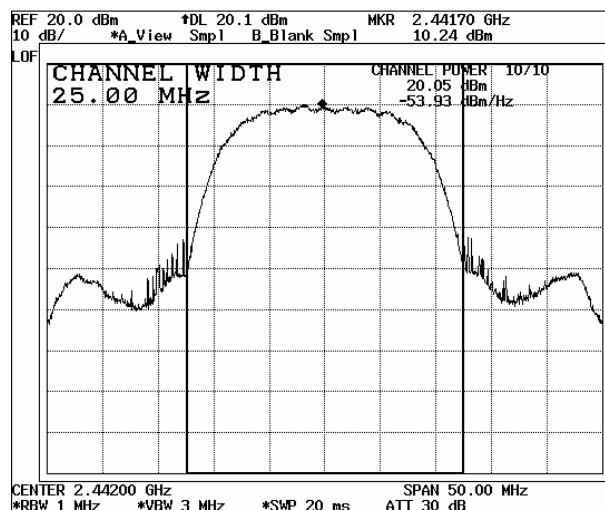
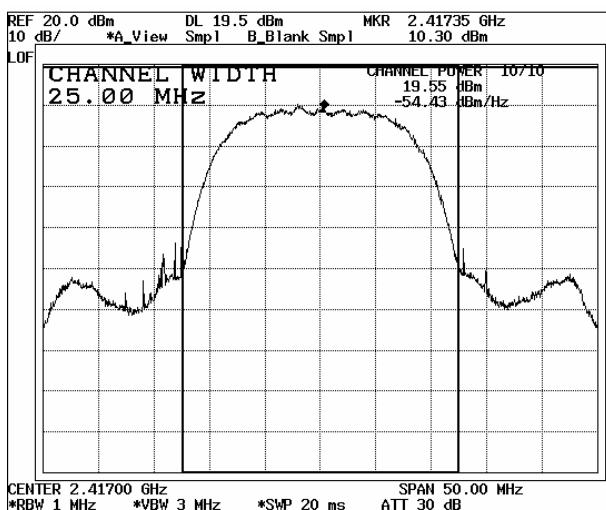
The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.

### Peak Power Test result

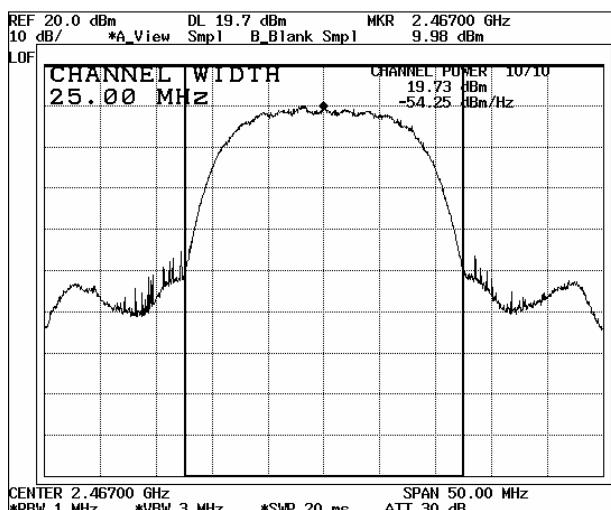
Product	PD-100W
Test Item	Peak Power Output
Test Mode	Transmit
Test Site	RF Room
Measurement Method	Conducted

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2417	19.55	1Watt=30dBm	Pass
6	2442	20.05	1Watt=30dBm	Pass
11	2467	19.73	1Watt=30dBm	Pass

Channel 1.



Channel 11



Note : Measurement level = reading level + correct factor

### Band Edge

#### ◆TEST Equipment

The following test equipment are used during the test:

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESCS30	EMI Receiver	Rohde & Schwarz	Aug. 10, 2008	100373
SPECTRUM ANALYZER	R3273	ADVANTEST	Oct. 01, 2008	MY420000092
BICONILOG Antenna	VULB 9160	Schwarz beck	Aug. 28, 2008	3047
HORN-Antenna	3115	EMCO	Dec. 26, 2008	9012-3602
HORN-Antenna	SAS-571	A.H. SYSTEMS	Dec. 26, 2008	500
PRE AMPLIFIER	8449B OPT H02	Rohde & Schwarz	Oct. 17, 2008	3008A0530

*Note : 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to RRL, KRISS, KTL and HCT.  
 2. The calibration interval of horn ant. and loop ant. is 24 months*

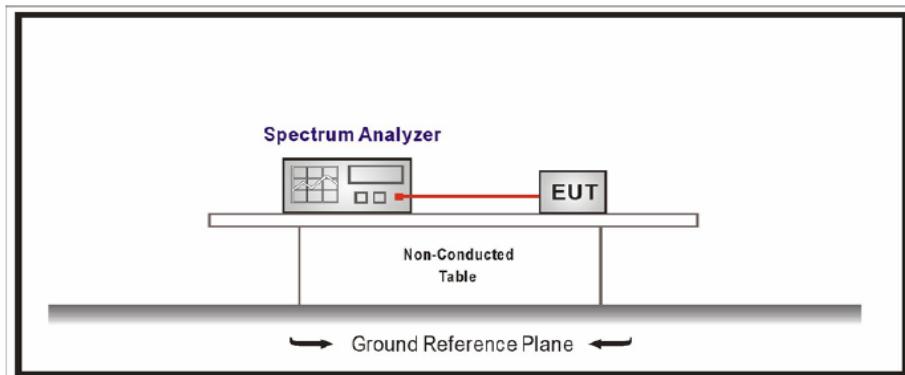
#### ◆Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

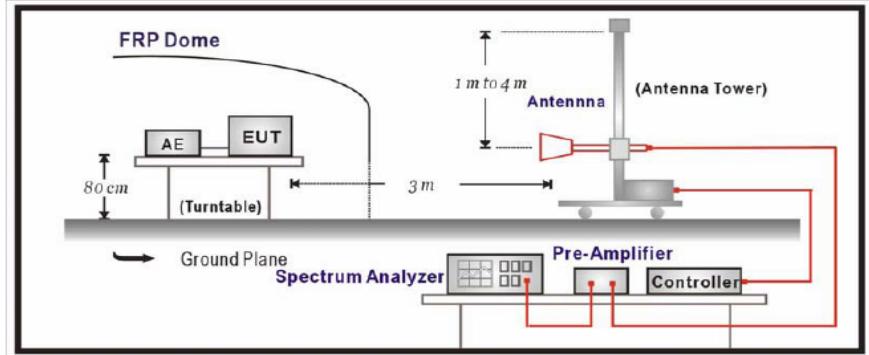
Attenuation below the general limits specified in section 15.209(a) is not required. In addition, radiated emission which fall in the restricted bands, as defined in section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a)(see Section 15.205(c)).

## ◆Test setup

### RF Conducted Measurement:



### RF Radiated Measurement:



## ◆Test procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna can move up and down between 1 meter and 4 meters to fine out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

The bandwidth below 1 GHz setting on the field strength meter is 120 kHz, above 1GHz are 1MHz.

Test specification

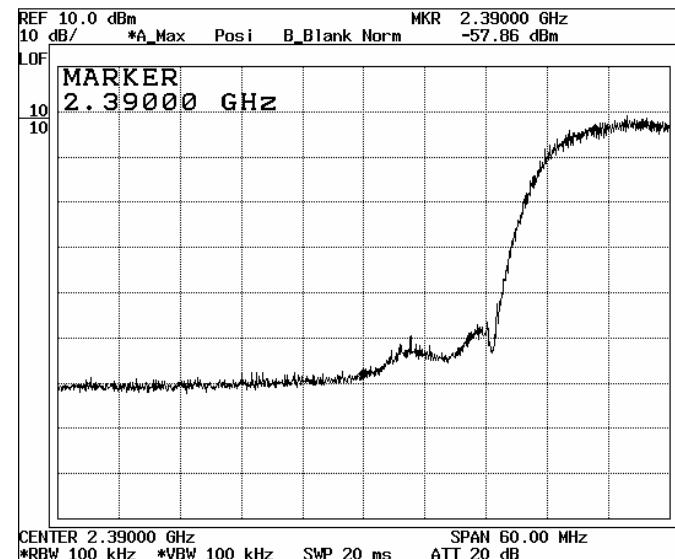
According to FCC Part 15 Subpart C paragraph 15.247:2005

Band Edge Test result

Product	PD-100W
Test Item	Band Edge
Test Mode	Transmit
Test Site	Radiated Measure Room #1
Measurement Method	Radiated-Enclosure

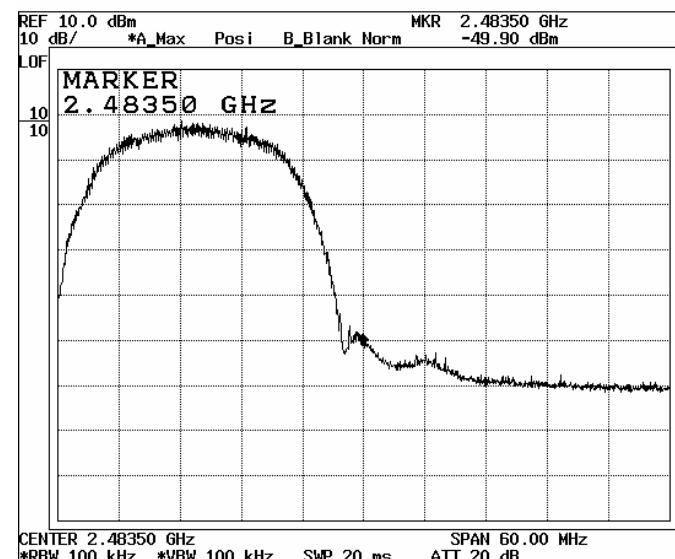
Detect mode : Peak

Channel : 1 CH(2417 MHz)



Detect mode : Peak

Channel : 11 CH(2467 MHz)



## 6dB Band

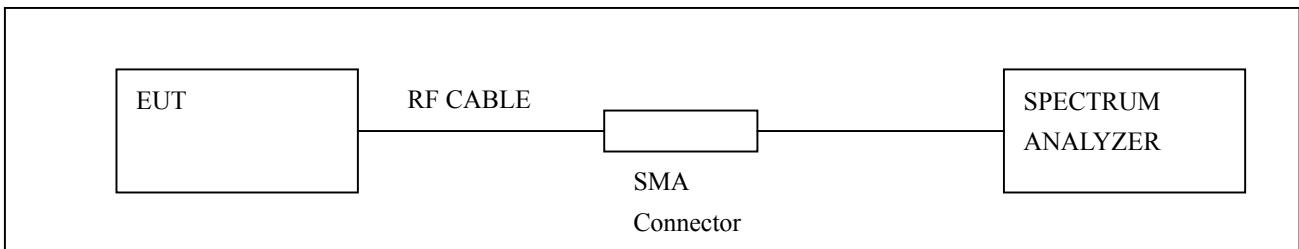
### ◆Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model no/Serial No.	Last Cal.
1	Spectrum Analyzer	ADVANTEST	R3273 / 95090431	Aug. 01, 2008
2	RF ROOM			

*Note : All equipment upon which need to calibrated are with calibration period of 1 year.*

### ◆Test Setup



### ◆Limits

(a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions :

(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.

### ◆Test Procedure

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the 6dB Band(Occupied Bandwidth). According to FCC CFR Title 47 Part 15 Subpart C Section 15.247:2005

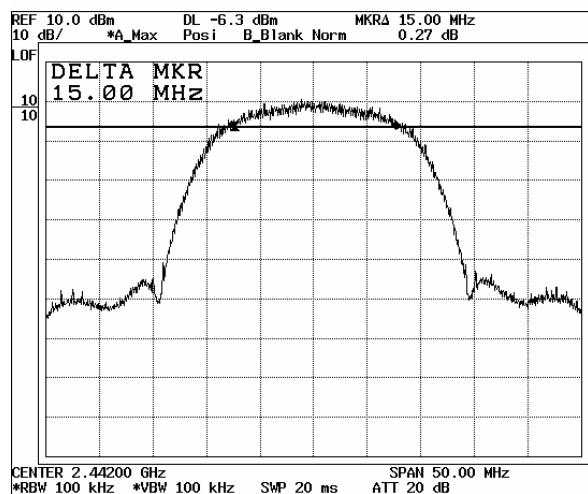
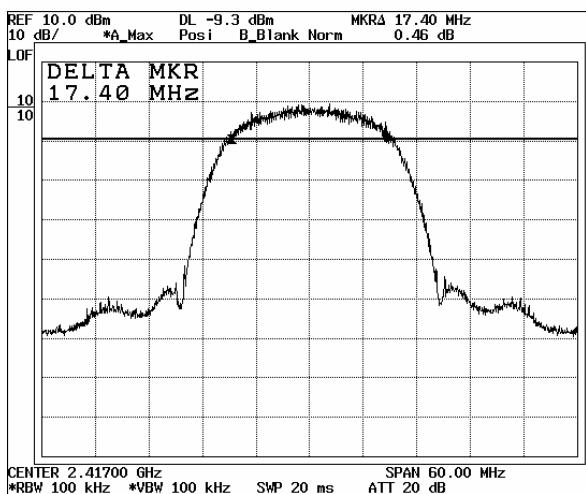
Test result

Product	PD-100W
Test Item	6dB Band
Test Mode	Transmit
Test Site	RF Room
Measurement Method	Conducted

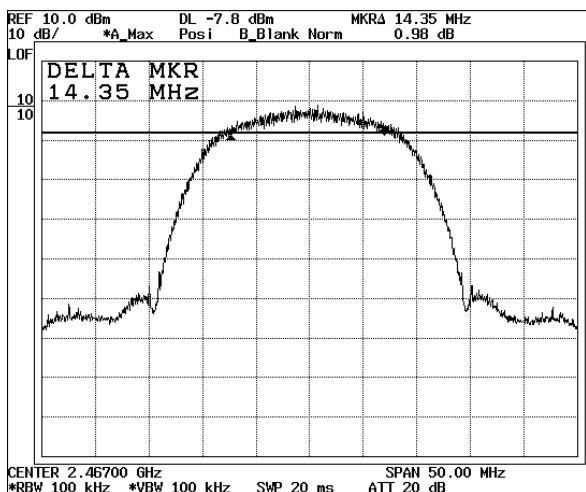
Channel No.	Frequency (MHz)	Measure Level (KHz)	Limit (KHz)	Result
1	2417	17400	>500	Pass
6	2442	15000	>500	Pass
11	2467	14350	>500	Pass

Channel 1.

Channel 6.



Channel 11.



### Power Density

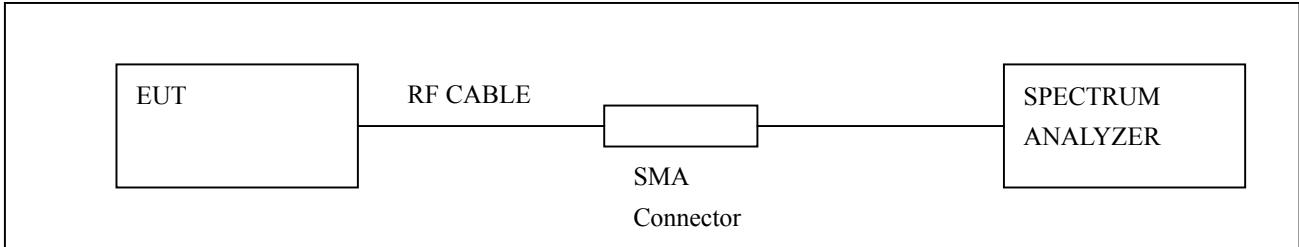
#### ◆Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model no/Serial No.	Last Cal.
1	Spectrum Analyzer	ADVANTEST	R3273 / 95090431	Aug. 01, 2008
2	RF ROOM			

*Note : All equipment upon which need to calibrated are with calibration period of 1 year.*

#### ◆Test Setup



#### ◆Limits

Section 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 (v) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

#### ◆Test Procedure

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the 6dB Band(Occupied Bandwidth). According to FCC CFR Title 47 Part 15 Subpart C Section 15.247:2005

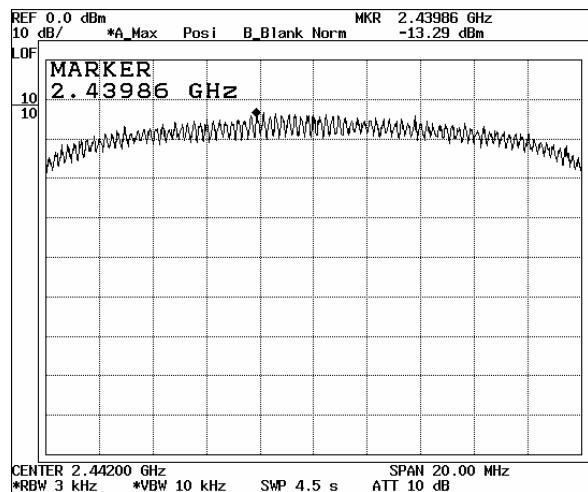
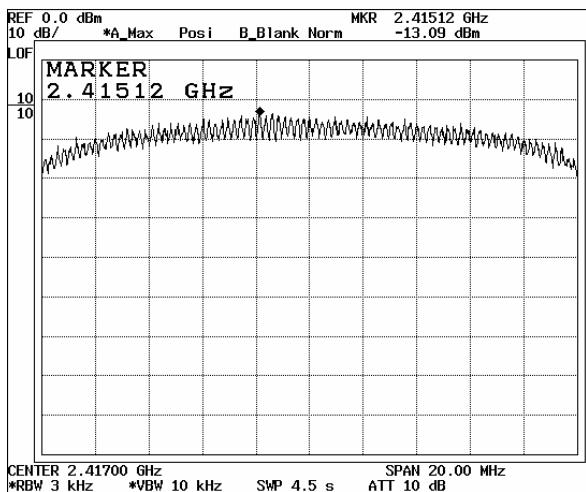
Test result

Product	PD-100W
Test Item	Power Density
Test Mode	Transmit
Test Site	RF Room
Measurement Method	Conducted

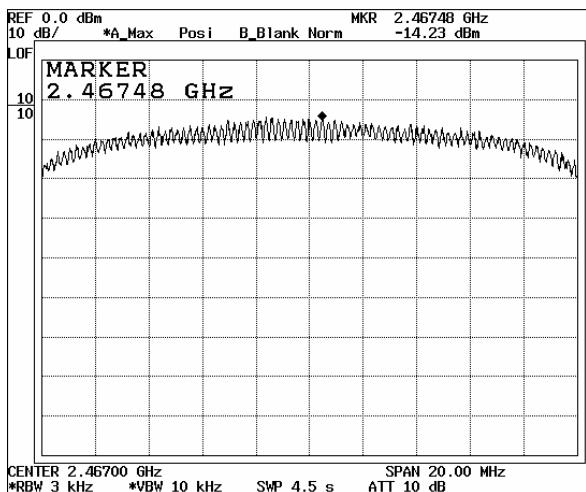
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2417	-13.09	< 8	Pass
6	2442	-13.29	< 8	Pass
11	2467	-14.23	< 8	Pass

Channel 1.

Channel 6.



Channel 11.



*Note : Measurement level = reading level + correct factor*

**Appendix A. The Photos of Test Setup**



**Conducted Emissions(BNC Mode) - Front View**



**Conducted Emissions(BNC Mode) - Rear View**

**Appendix A. The Photos of Test Setup**

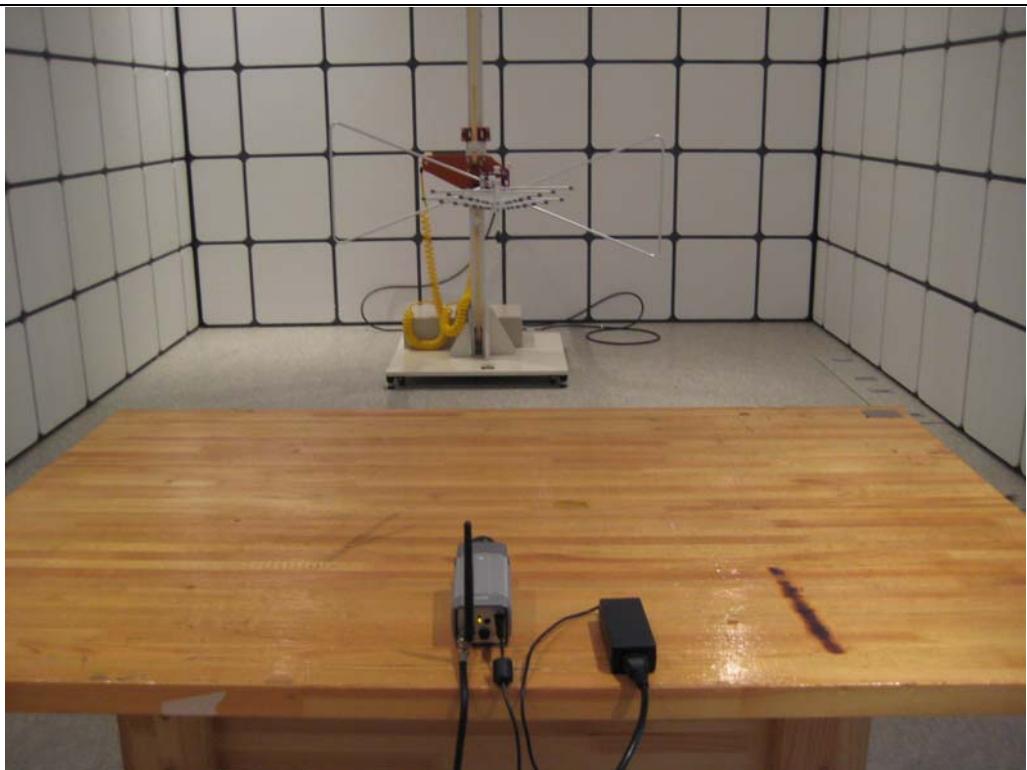


**Conducted Emissions(RF Mode) - Front View**

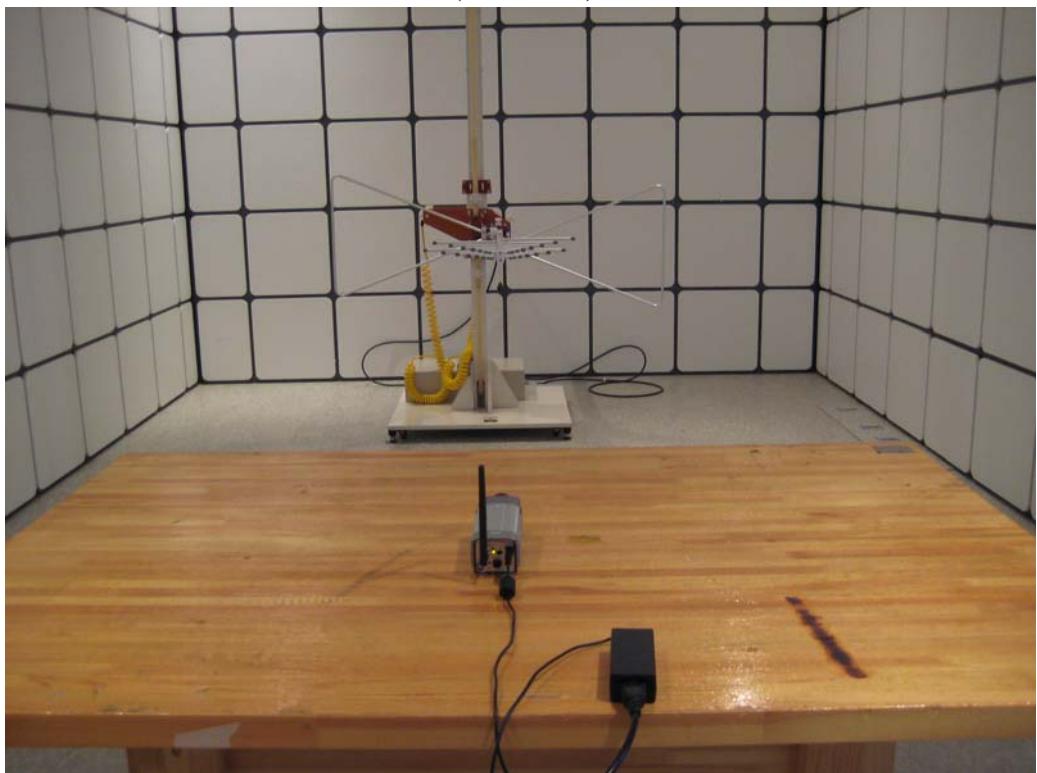


**Conducted Emissions(RF Mode) - Front View**

**Appendix A. The Photos of Test Setup**

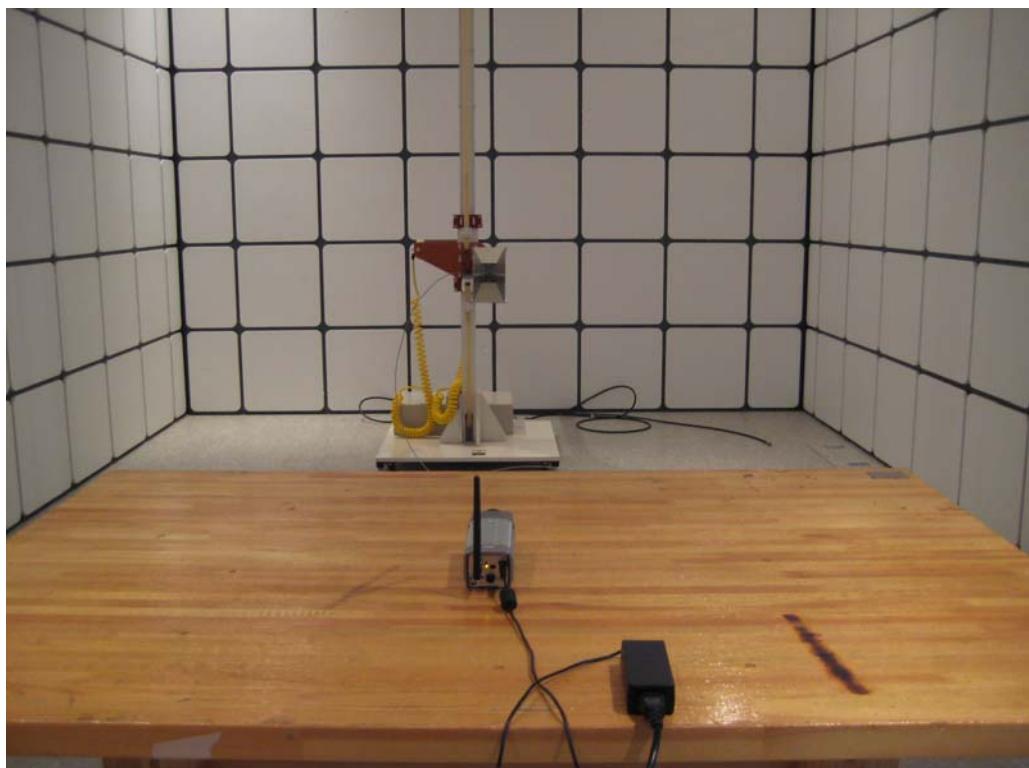


**Radiated Emissions(BNC Mode)-30MHz~1000MHz**



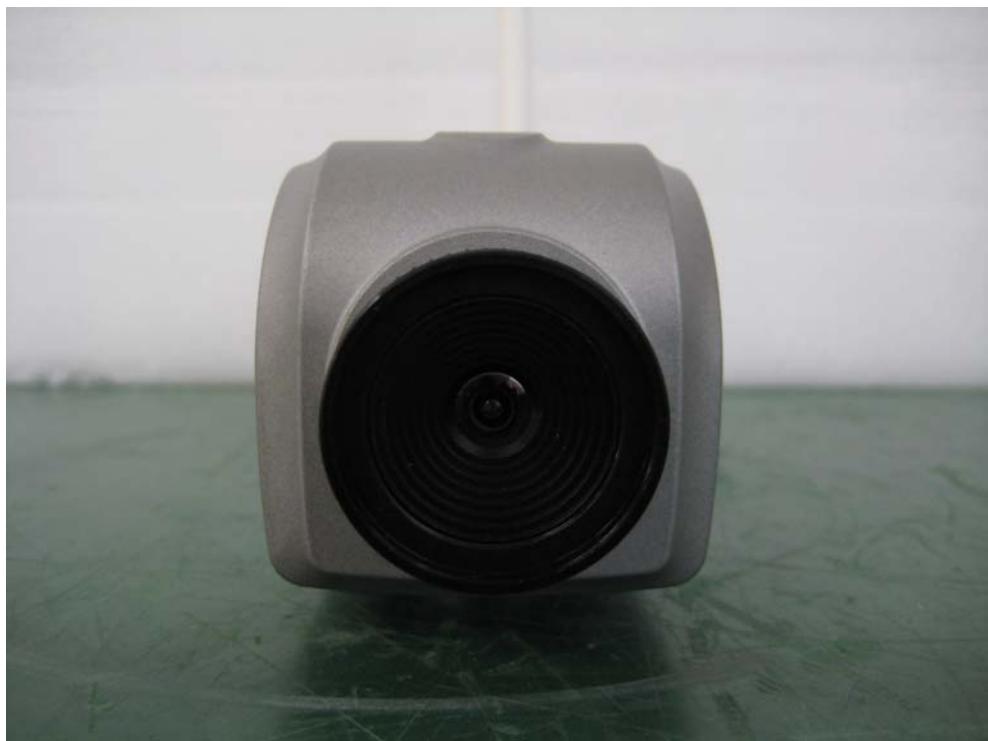
**Radiated Emissions(RF Mode)-30MHz~1000MHz**

**Appendix A. The Photos of Test Setup**



**Radiated Emissions-1000MHz~18000MHz**

Appendix B. The Photos of Equipment Under Test



Front view



Rear view