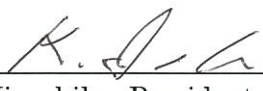


Report No. : FG13-092EAL (1/12)

EMI Test report

CATEGORY : FCC Part15 (2013) ; Class B
VCCI (2013)PRODUCT : Personal computerMODEL : T734
AC adapter A13-090P1A A13-090P2A ADP-90BE _C ADP-90BE _D
ADP-80SB- A ADP-80SB- B PJW1942NA
Port Replicator FPCPR132Grouping model TH734MANUFACTURER : FUJITSU LIMITED
4-1-1, Kamikodanaka, Nakahara-ku, Kawasaki 211-8588 JAPANTEST SITE : FUJITSU GENERAL EMC LABORATORY
1116, Suenaga, Takatsu-ku, Kawasaki 213-8502 JAPAN
2nd semi-anechoic chamber(R-1460 / G-54)
3rd Shielded Room(C-1549/ T-1207)DATE TESTED : September 5, 2013 23℃ 65%TESTED BY : Hiroyuki AikawaEUT conforms to the above mentioning regulation.APPROVED BY :  DATE : September 10, 2013
for Eiji Miyachika, PresidentFUJITSU GENERAL EMC LABORATORY LIMITED
1116, Suenaga, Takatsu-ku, Kawasaki 213-8502 JAPAN
TEL: (044)861-7897 FAX: (044)861-9890CLIENT : Client Product Division I, FUJITSU LIMITED
4-1-1, Kamikodanaka, Nakahara-ku, Kawasaki 211-8588 JAPAN

※ The description of the EUT and the system configuration in this report are provided by the client.



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1. Description of EUT

The EUT: T734 is personal computer using CPU; Core i7-4600M 2.9 GHz microprocessor. The EUT has a 12.5 inch WXGA LCD, selectable storage device HDD (750 GB)/ HDD+SSD Hy-brid (320 GB+8GB). The EUT has the interface for DP(Display port), HDMI, RGB⑨, DVI⑩, Phone-out/ Mic-in ①, LAN④, USB×5 ②⑤⑥⑦⑧, Audio-out③, Memory card slot, Express card slot, Optical drive(DVD-Multi), Bluetooth and wireless LAN module.

The following type code is given according to the type of market.

<Personal computer>

Type code	Market
T734	Commercial
TH734	Consumer

Internal clock frequency: 32.000 kHz, 12.000 MHz, 24.000 MHz, 25.000 MHz, 33.000 MHz, 100.000 MHz

Input power : AC 100 V-240 V, 50 / 60 Hz, Single-phase 2 or 3wiers

The EUT is intended to use generally in the residential / domestic area or commercial and light industrial area; category class B.

1.1 Test system configuration

The emission measurement was performed with the worst case configuration of the preliminary measurement and all related equipments as shown in figure-1.

The radiated emission measurement was performed with the worst case configuration of the preliminary measurement, T734 with Port-replicator, DVI/RGB connection, AC adapter; ADP-80SB A used 1m AC cable, and all related equipments as shown in figure-1.

The conducted emission measurement was performed with each of AC adapter; ADP-80SB A, A13-090P1A, A13-090P2A, ADP-90BE D, ADP-90BE C, ADP-80SB B, PJW1942NA with port-replicator as shown in figure-1.

The EUT was selected from the pre-production line.

1.2 Operating condition

The following EUT and dependent devices were tested using “EMC64.exe” program under continuous operating condition to obtain maximum emission.

① PC-1	LCD-1:	Displaying “H” character on screen (Maximum contrast/ Luminescence Display resolution: LCD-2 & 3 clone 1366×768/ Refresh rate 60Hz)
	LAN:	Continuous transmission and receiving ping command (1000 M Max) Telecommunication line emission : DAT File 390MB, 1000 Mbps
	HDD:	Read/ write the test data
	CAMERA:	Monitoring the video picture of web camera
	ODD:	Read the test data
② SD memory card:		Read/ write the test data
③ Exp memory card:		Read/ write the test data
④ LCD-2:		Displaying LCD-1 clone on screen (Maximum contrast / Luminescence) Display resolution: 1366×768 / Refresh rate 60Hz
⑤ LCD-3:		Displaying LCD-1 clone on screen (Maximum contrast / Luminescence) Display resolution: 1366×768 / Refresh rate 60Hz
⑥ Headset:		Connecting only
⑦ USB Memory (USB2.0):		Read/ write the test data (480 M Max)
⑧ HDD-2, 3 (USB3.0):		Read/ write the test data (5 G Max)
⑨ PC-2:		Continuous transmission and receiving of ping command (1000 M Max)

2. EMI test results summary

Applied standards: FCC Part15 (2013) and VCCI(2013)

Limit value: Class B

The limit of VCCI(2013) was applied limit of CISPR22 (2008).

The limit of radiated emission (30 MHz to 1,000 MHz) of FCC Part15 (2013) was applied limit of CISPR22 (2008).

The limit of conducted emission of FCC Part15 (2013) was the same as limit of CISPR22 (2008).

The test samples met the class B limit of FCC Part15 (2013), VCCI(2013) and CISPR22 (2008) as shown the following highest 6 points of each emission profiles.

The result is effective in only the EUT.

2.1 Radiated emission (30 MHz to 1,000 MHz) : Measured at 10 m distance

Freq. (MHz)	Pol.	Noise level (QP: dB μ V/m)	Class B limit (QP: dB μ V/m)	Margin (dB)
31.65	Vert	26.8	30.0	3.2
101.73	Vert	24.8	30.0	5.2
127.15	Vert	25.0	30.0	5.0
169.57	Vert	24.7	30.0	5.3
768.02	Vert	31.1	37.0	5.9
864.02	Vert	32.3	37.0	4.7

- Limit value ; CISPR22(2008)
- Measurement uncertainty : ± 3.0 dB (K=2, 95 %)

2.2 Over 1 GHz Radiated emission : Measured at 3 m distance

2.2.1 1 to 14.5 GHz for FCC Part15

Freq. (GHz)	Pol.	Noise level (dB μ V/m)		Class B limit (dB μ V/m)		Margin (dB)	
		Peak	AV	Peak	AV	Peak	AV
1.910	Vert	52.4	45.4	74.0	54.0	21.6	8.6
2.490	Vert	50.2	42.9	74.0	54.0	23.8	11.1
2.620	Horiz	50.9	45.0	74.0	54.0	23.1	9.0
2.620	Vert	48.2	41.9	74.0	54.0	25.8	12.1
3.000	Horiz	47.8	41.8	74.0	54.0	26.2	12.2
5.000	Vert	48.9	40.5	74.0	54.0	25.1	13.5

- Limit value ; FCC Part15 (2013)
- Measurement uncertainty : ± 3.4 dB (K=2, 95 %)

2.2.2 1 to 6 GHz for CISPR22

Freq. (GHz)	Pol.	Noise level (dB μ V/m)		Class B limit (dB μ V/m)		Margin (dB)	
		Peak	AV	Peak	AV	Peak	AV
1.910	Vert	52.4	45.4	70.0	50.0	17.6	4.6
2.048	Vert	50.1	39.3	70.0	50.0	19.9	10.7
2.490	Vert	50.2	42.9	70.0	50.0	19.8	7.1
2.620	Horiz	50.9	45.0	70.0	50.0	19.1	5.0
2.620	Vert	48.2	41.9	70.0	50.0	21.8	8.1
3.000	Horiz	47.8	41.8	70.0	50.0	22.2	8.2

- Limit value ; CISPR22(2008)
- Measurement uncertainty : ± 3.4 dB (K=2, 95 %)

2.3 AC power line conducted emission (150 kHz to 30 MHz)**2.3.1 AC adapter ADP-80SB A****<AC120V 60Hz>**

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.150	# 1	50.7	28.7	66.0	56.0	15.3	27.3
0.150	# 2	50.7	28.5	66.0	56.0	15.3	27.5
1.930	# 1	37.7	27.0	56.0	46.0	18.3	19.0
1.930	# 2	39.3	31.2	56.0	46.0	16.7	14.8
2.242	# 2	39.0	30.8	56.0	46.0	17.0	15.2
15.910	# 2	37.3	32.6	60.0	50.0	22.7	17.4

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

<AC100V 50Hz>

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.155	# 1	48.1	28.5	65.7	55.7	17.6	27.2
1.620	# 2	37.1	28.7	56.0	46.0	18.9	17.3
1.800	# 1	37.6	29.4	56.0	46.0	18.4	16.6
1.800	# 2	38.1	28.9	56.0	46.0	17.9	17.1
2.025	# 1	37.5	29.8	56.0	46.0	18.5	16.2
2.025	# 2	38.2	30.3	56.0	46.0	17.8	15.7

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

2.3.2 AC adapter A13-090P1A**<AC120V 60Hz>**

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
2.000	# 1	37.8	32.6	56.0	46.0	18.2	13.4
2.000	# 2	38.4	33.2	56.0	46.0	17.6	12.8
4.500	# 1	36.1	31.1	56.0	46.0	19.9	14.9
4.500	# 2	36.2	32.0	56.0	46.0	19.8	14.0
15.850	# 1	44.5	39.6	60.0	50.0	15.5	10.4
15.850	# 2	44.4	39.7	60.0	50.0	15.6	10.3

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

<AC100V 50Hz>

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
2.000	# 1	37.6	32.7	56.0	46.0	18.4	13.3
2.000	# 2	38.5	33.6	56.0	46.0	17.5	12.4
4.500	# 1	37.2	31.5	56.0	46.0	18.8	14.5
4.500	# 2	37.2	32.3	56.0	46.0	18.8	13.7
16.000	# 1	44.4	38.4	60.0	50.0	15.6	11.6
16.000	# 2	44.3	38.1	60.0	50.0	15.7	11.9

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

2.3.3 AC adapter A13-090P2A**<AC120V 60Hz>**

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.485	# 1	38.2	25.8	56.3	46.3	18.1	20.5
0.485	# 2	40.4	27.5	56.3	46.3	15.9	18.8
2.100	# 1	40.1	34.9	56.0	46.0	15.9	11.1
2.100	# 2	40.1	35.1	56.0	46.0	15.9	10.9
4.500	# 1	39.5	34.1	56.0	46.0	16.5	11.9
4.500	# 2	39.8	35.0	56.0	46.0	16.2	11.0

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

<AC100V 50Hz>

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.400	# 2	41.5	28.7	57.9	47.9	16.4	19.2
2.000	# 1	39.2	34.3	56.0	46.6	16.8	11.7
2.000	# 2	39.2	34.4	56.0	46.0	16.8	11.6
4.515	# 1	39.0	34.1	56.0	46.0	17.0	11.9
4.515	# 2	39.0	34.3	56.0	46.0	17.0	11.7
15.652	# 2	36.6	32.0	60.0	50.0	23.4	18.0

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

2.3.4 AC adapter ADP-90BE C**<AC120V 60Hz>**

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.176	# 1	46.1	26.4	64.7	54.7	18.6	28.3
0.176	# 2	46.0	26.0	64.7	54.7	18.7	28.7
1.591	# 1	35.1	26.1	56.0	46.0	20.9	19.9
2.245	# 2	33.5	26.5	56.0	46.0	22.5	19.5
15.715	# 1	36.2	31.5	60.0	50.0	23.8	18.5
15.715	# 2	26.0	31.2	60.0	50.0	34.0	18.8

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

<AC100V 50Hz>

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
1.272	# 1	34.5	34.5	56.0	46.0	21.5	11.5
1.780	# 1	33.0	25.5	56.0	46.0	23.0	20.5
1.910	# 1	34.0	26.9	56.0	46.0	22.0	19.1
1.910	# 2	34.4	26.9	56.0	46.0	21.6	19.1
2.125	# 2	33.6	26.0	56.0	46.0	22.4	20.0
15.779	# 1	35.9	31.5	60.0	50.0	24.1	18.5

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

2.3.5 AC adapter ADP-90BE D**<AC120V 60Hz>**

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.171	# 1	49.7	29.6	64.9	54.9	15.2	25.3
0.171	# 2	48.8	29.3	64.9	54.9	16.1	25.6
0.388	# 2	32.9	27.1	58.1	48.1	25.2	21.0
0.490	# 2	31.5	24.0	56.2	46.2	24.7	22.2
0.680	# 2	31.3	23.3	56.0	46.0	24.7	22.7
1.486	# 2	31.2	23.2	56.0	46.0	24.8	22.8

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

<AC100V 50Hz>

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.171	# 2	43.0	23.5	64.9	54.9	21.9	31.4
0.236	# 1	40.1	26.7	62.2	52.2	22.1	25.5
0.236	# 2	39.4	26.0	62.2	52.2	22.8	26.2
0.382	# 2	33.6	26.2	58.2	48.2	24.6	22.0
1.175	# 1	31.2	23.1	56.0	46.0	24.8	22.9
1.460	# 2	31.3	22.9	56.0	46.0	24.7	23.1

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

2.3.6 AC adapter ADP-80SB B**<AC120V 60Hz>**

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.152	# 1	52.2	38.0	65.9	55.9	13.7	17.9
0.152	# 2	51.1	36.0	65.9	55.9	14.8	19.9
16.040	# 1	40.2	35.6	60.0	50.0	19.8	14.4
16.040	# 2	39.5	35.5	60.0	50.0	20.5	14.5
24.900	# 2	39.1	34.2	60.0	50.0	20.9	15.8
24.900	# 1	38.8	33.5	60.0	50.0	21.2	16.5

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

<AC100V 50Hz>

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.160	# 1	49.7	32.9	65.5	55.5	15.8	22.6
0.160	# 2	48.1	33.0	65.5	55.5	17.4	22.5
15.780	# 1	40.1	35.6	60.0	50.0	19.9	14.4
15.780	# 2	40.4	35.8	60.0	50.0	19.6	14.2
25.000	# 1	39.2	34.6	60.0	50.0	20.8	15.4
25.000	# 2	39.3	34.3	60.0	50.0	20.7	15.7

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

2.3.7 AC adapter PJW1942NA**<AC120V 60Hz>**

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.190	# 1	53.1	48.5	64.0	54.0	10.9	5.5
0.190	# 2	53.2	48.5	64.0	54.0	10.8	5.5
0.280	# 1	48.5	42.9	60.8	50.8	12.3	7.9
0.280	# 2	50.0	42.8	60.8	50.8	10.8	8.0
0.375	# 1	45.4	37.4	58.4	48.4	13.0	11.0
18.500	# 2	44.6	37.5	60.0	50.0	15.4	12.5

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

<AC100V 50Hz>

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.184	# 2	53.1	47.4	64.3	54.3	11.2	6.9
0.283	# 2	44.7	42.0	60.7	50.7	13.0	8.7
0.371	# 1	45.6	38.6	58.5	48.5	12.9	9.9
0.371	# 2	44.0	36.8	58.5	48.5	14.5	11.7
18.300	# 1	45.3	38.3	60.0	50.0	14.7	11.7
18.300	# 2	45.9	38.7	60.0	50.0	14.1	11.3

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

2.4 Telecommunication line conducted emission (150 kHz to 30 MHz)**2.4.1 LAN port ④ (ISN) 1000Base-T CAT-5E, Shielded cable**

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.192	# 1	69.5	65.7	82.0	72.0	12.5	6.3
0.299	# 1	69.4	64.0	78.3	68.3	8.9	4.3
0.485	# 1	66.6	59.5	74.3	64.3	7.7	4.8
0.585	# 1	66.0	59.1	74.0	64.0	8.0	4.9
0.694	# 1	65.0	56.0	74.0	64.0	9.0	8.0
0.796	# 1	64.6	55.9	74.0	64.0	9.4	8.1

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

2.4.2 LAN port ④ (ISN) 1000Base-T CAT-6, LCL adapter: 75 dB

Freq. (MHz)	Line #	Noise level (dB μ V)		Class B limit (dB μ V)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.302	# 1	65.9	59.5	78.2	68.2	12.3	8.7
0.487	# 2	63.8	57.2	74.2	64.2	10.4	7.0
0.496	# 1	63.7	56.2	74.1	64.1	10.4	7.9
0.591	# 2	63.6	56.1	74.0	64.0	10.4	7.9
0.593	# 1	63.5	55.8	74.0	64.0	10.5	8.2
0.770	# 2	62.3	54.3	74.0	64.0	11.7	9.7

- Limit value: CISPR22 (2008)
- Measurement uncertainty : ± 2.3 dB (K=2, 95 %)

3. EUT modification under the test

None.

4. Measurement procedure and test equipment

The measurement was performed without deviation from CISPR22 (2008) and ANSI C63.4 (2009).

4.1 Radiated emission

4.1.1 Radiated emission (30MHz~1,000MHz)

The measurement was performed in the 10 m RF semi-anechoic chamber. The EUT was set on the 80 cm height non-reflective desk (W: 150 cm×D: 100 cm) placed on the turntable. The maximum noise level in the frequency range from 30 MHz to 1,000 MHz were measured by 10 m method with scanning the antenna height from 1 m to 4 m above the ground plane and rotating the EUT through 360 degrees for both horizontal and vertical polarization. The HUB and PC-2 were placed at outside of the chamber to make usual install condition at the different place.

Preliminary measurement using spectrum analyzer peak detection was performed to arrange the minimum margin spectrum. The settings of the interface cables and the mouse were adjusted to obtain maximum level at the minimum margin spectrum. The final measurement was performed using the RFI receiver (CISPR Quasi-peak, 120 kHz band width) and calibrated broadband antennas or dipole antennas for the main spectrum that was obtained by the preliminary measurement.

Test equipment	Manufacturer	Type	S/N	Cal. Date	Due. Date
Dipole antenna	Schwarzbeck	VHA9103	VHA91031573	2012.04.13	2014.04.13
Dipole antenna	Schwarzbeck	UHA9105	UHA91052119	2012.04.13	2014.04.13
Bi Log antenna	Schwarzbeck	VULB9160	3118	2013.05.08	2014.05.08
Field strength meter	Rohde & Schwarz	ESCS30	849650/024	2013.08.26	2014.08.26
Spectrum analyzer	HP	85422E	3746A00243	2012.10.01	2013.10.01
RF switch	Anritsu	MP59B	M87079	2013.04.26	2014.04.26
RF cable	—	TF0207	—	2013.04.26	2014.04.26
2nd semianchoic camber	Riken eletech	TF0202 (NSA)	—	2013.07.05	2014.07.05
EMI test program	FGE	Version 1.3			

4.1.2 Over 1 GHz radiated emission (1.0 GHz~14.5 GHz)

The measurement was performed in the 10 m RF semi-anechoic chamber. The EUT was set on the 80 cm height styrene foam desk (W: 150 cm×D: 100 cm) on the turntable. The radiated emission measurement from 1 GHz to 14.5 GHz (Operating rate 2.9 GHz) was performed using the spectrum analyzer (Peak detection, 1MHz band width) and the horn antenna that was positioned at 3 m from the test volume. The measurement was performed for both horizontal and vertical polarization with rotating the EUT through 360 degrees and fixing the antenna height to 1 m(The horizontal length included 3dB-Beam-Width of the receiving antenna placed at measurement distance:3.05 m is 1.75m).

The measurement was performed using the RF signal “off” mode of the wireless LAN and Bluetooth.

Test equipment	Manufacturer	Type	S/N	Cal. Date	Due. Date
Horn antenna	Schwarzbeck	BBHA9120D	414	2013.04.22	2014.04.22
Spectrum analyzer	Advantest	U3772	161200140	2012.06.14	2014.06.14
Pre amplifier	TSJ	MLA-500M18-B01-40	1725712	2013.08.09	2014.08.09
2nd semianchoic camber	Riken eletech	TF0202(SVSWR)	—	2013.03.24	2014.03.24

4.2 AC power line conducted emission (150 kHz to 30 MHz)

The measurement was performed in the shielded room. The EUT was set on the 80 cm height non-reflective desk and connected to the 50 Ω/50 μ H artificial mains network: AMN. The EUT was operated by AC 120 V/ 60 Hz and AC 100 V/ 50 Hz.

Preliminary measurement using spectrum analyzer peak detection was performed in the frequency range from 150 kHz to 30 MHz to arrange the minimum margin spectrum. The setting of the cables was adjusted to obtain maximum level at the minimum margin spectrum. The final measurement was performed using the RFI receiver (CISPR Quasi-peak, 9 kHz band width) and recorded the maximum value in the monitored interval of the main spectrum that was obtained by the preliminary measurement.

Test equipment	Manufacturer	Type	S/N	Cal. Date	Due. Date
AMN for EUT	Kyoritsu	KNW-407C	8-823-18	2013.01.09	2014.01.09
AMN for AE	Kyoritsu	KNW-242C	8-1387-6	2013.01.09	2014.01.09
Field strength meter	Rohde & Schwarz	ESCS30	849650/003	2013.08.29	2014.08.29
Spectrum analyzer	HP	85422E	3746A00239	2012.09.22	2013.09.22
RF switch	Rohde & Schwarz	PSU	848290/003	2013.04.11	2014.04.11
Band pass filter	Advantest	TR14202	120200240	2013.04.11	2014.04.11
Pulse limiter	Rohde & Schwarz	ESH3-Z2	357.8810.52	2013.04.11	2014.04.11
RF cable	—	TF0602	—	2013.04.11	2014.04.11
EMI test program	FGE	Version 1.3			
3rd shielded room					

4.3 Telecommunication line conducted emission (150 kHz to 30 MHz)

The measurement was performed in the shielded room. The EUT was set on the 40 cm height wooden desk and connected to the impedance stabilization network: ISN (LCL; 75 dB) and the current probe for LAN port.

Preliminary measurement using spectrum analyzer peak detection was performed in the frequency range from 150 kHz to 30 MHz to arrange the minimum margin spectrum. The setting of the cables was adjusted to obtain maximum level at the minimum margin spectrum. The final measurement was performed using the RFI receiver (CISPR Quasi-peak, 9 kHz band width), and recorded the maximum value in the monitored interval of the main spectrum that was obtained by the preliminary measurement.

Test equipment	Manufacturer	Type	S/N	Cal. Date	Due. Date
ISN	Kyoritsu	KNW-2208	8S-2972-5	2013.04.10	2014.04.10
ISN (Shield)	TSEQ	ST08	32277	2013.03.12	2014.03.12
Field strength meter	Rohde & Schwarz	ESCS30	849650/003	2013.08.29	2014.08.29
Spectrum analyzer	HP	85422E	3746A00239	2012.09.22	2013.09.22
RF switch	Rohde & Schwarz	PSU	848290/003	2013.04.11	2014.04.11
Band pass filter	Advantest	TR14202	120200240	2013.04.11	2014.04.11
Pulse limiter	Rohde & Schwarz	ESH3-Z2	357.8810.52	2013.04.11	2014.04.11
RF cable	—	TF0602	—	2013.04.11	2014.04.11
EMI test program	FGE	Version 1.3			
3rd shielded room					

5. Test site and traceability

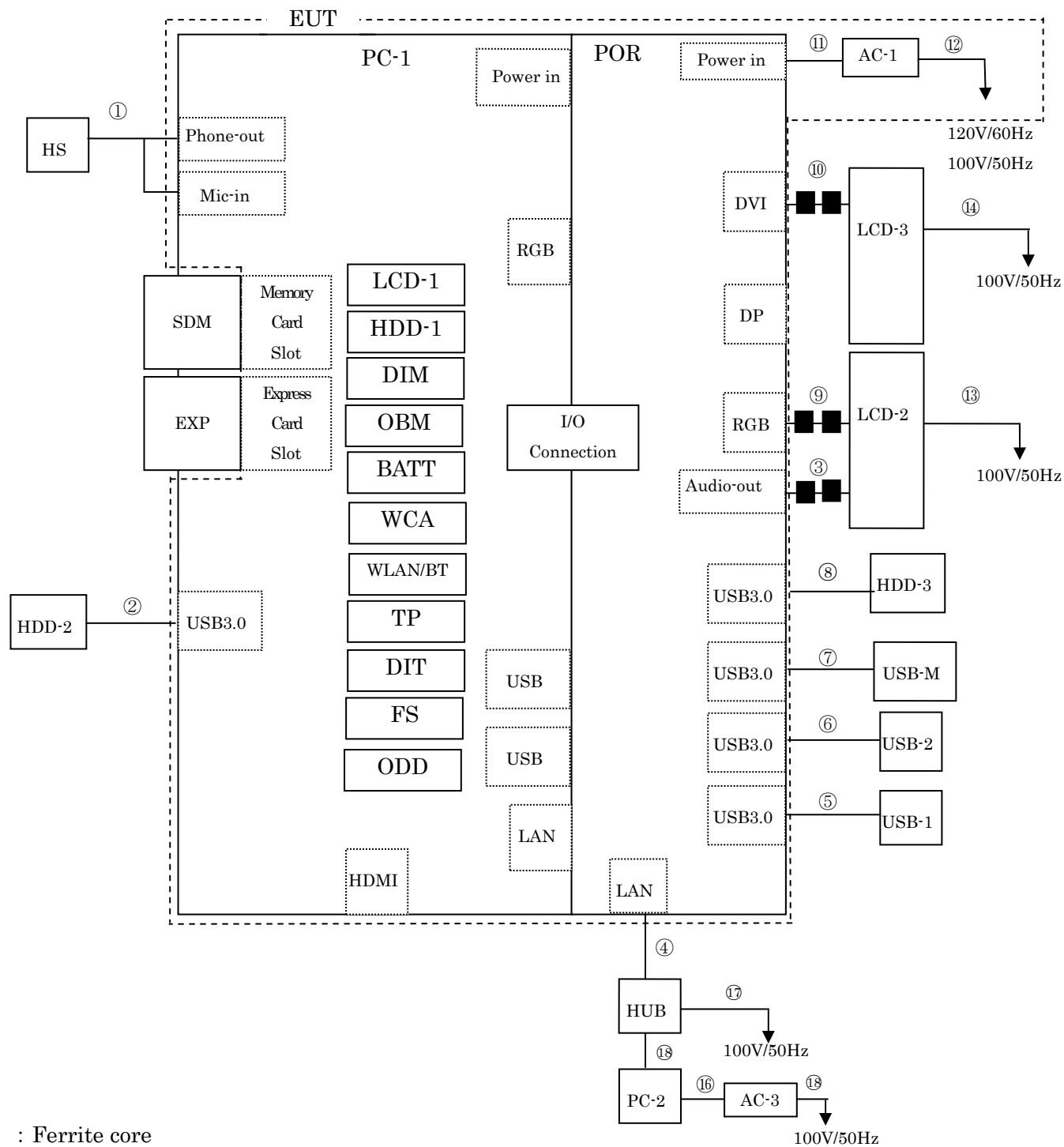
The Fujitsu General EMC Laboratory performs testing under VCCI / EN / CISPR regulations and Fujitsu / Fujitsu General internal regulations. Test procedures and test facilities comply with the following international standards. The laboratory is filed on VCCI (Japan), accredited from NVLAP (USA), authorized from TÜV SÜD PS (Germany) and appointed from TÜV Rheinland.

VCCI: 1stSemi-Anechoic Chamber(R-753/G-53/C-776/T-1686)
1stShielded Room(C-777/T-1687)
2ndSemi-Anechoic Chamber(R-1460/G-54/C-1547/T-1688)
2nd Shielded Room(C-1548/T-1689)
3rd Shielded Room(C-1549/T-1207)

NVLAP: Dec.1st 1998 (Lab code: 200373-0)
TÜV SÜD PS: Jan.29th 1999
TÜV Rheinland Japan: Aug.25th 2005

The measuring equipments using in the laboratory and test data are under national and international standards. All equipment is maintained by regular inspection and daily check as whole measurement system in order to keep accuracy.

Figure-1 System configuration and cables



■ : Ferrite core

Main EUT

Code	Name	Type	S/N	Product
PC-1	Personal computer	T734	Pre-production sample	Fujitsu

Related EUT

POR	Port Replicator	FPCPR132	_____	Fujitsu
AC-1	AC adapter	ADP-80SB A	_____	Fujitsu
AC-1	AC adapter	A13-090P1A	_____	Fujitsu
AC-1	AC adapter	A13-090P2A	_____	Fujitsu
AC-1	AC adapter	ADP-90BE C	_____	Fujitsu
AC-1	AC adapter	ADP-90BE D	_____	Fujitsu
AC-1	AC adapter	ADP-80SB B	_____	Fujitsu
AC-1	AC adapter	PJW1942NA	_____	Fujitsu

Included device; PC-1

Code	Name	Type	S/N	Product
LCD-1	12.5 inch WXGA	LP125WH2	_____	LGD
HDD-1	Herd Disk Drive	WD7500BPVX(750GB)	_____	WD
DIMM	DDR Memory	HMT41GS6AFR8A-PB(8GB)	_____	SKhynix
BATT	Battery(4 Cell)	FPCBP373 10.8V 6700 mA/h	_____	Fujitsu
WCA	Web-camera	CKFB23621005131LH	_____	Chicony
WLAN/BT	W-LAN/ Bluetooth	7260HMW AN(11a/b/g/n+BT)	_____	Intel
TP	Touch panel	FTU4-12H06U-02X	_____	WACOM
DIT	Digitizer	SU6C-12H012AS-01X	_____	WACOM
FS	Finger print sensor	VAL1204_R01-HF	_____	Validity
ODD	DVD-Multi	UJ8E2	_____	Panasonic

Assisted equipment

Code	Name	Type	S/N	Product
LCD-2	LCD display	P22W-5 ECO	YE7G213217	FSC
LCD-3	LCD display	P23T6- LED	YV4E011111	FSC
HDD-2	USB3.0 Hard disk drive	LCH-RK500U3	13791104201207QR	LACIE
HDD-3	USB3.0 Hard disk drive	LCH-RK500U3	13791104201189QR	LACIE
HS	Head set	GN 501FSC	_____	FSC
USB-1	USB Mouse	M-U0002-FSC1	LZ1393303LR	Fujitsu
USB-2	USB Mouse	M-U0002-FSC1	LZ1393303NA	Fujitsu
USB-M	USB memory	USM512H 512MB	_____	Sony
SDM	SD memory card	RP-SDAB08 Class10	_____	Panasonic
HUB	Switching Hub	LSW-GT-5NS	16483054411663	Buffalo
AC-3	AC adapter	FMV-AC322	_____	Fujitsu
PC-2	Personal computer	FMV	_____	Fujitsu

Cables SLD: Shielded NSLD: Non-shielded CAX: Coaxial

Connector MC: Metal NMC: Non-metal PMC: Point contact metal

No.	I/O Port	Name	Type	Length	Cable type
①	Phone-out/ Mic-in	Headset cable	_____	2.2 m	NSLD, MC
②	USB3.0	USB cable	_____	1.0 m	SLD, MC
③	Audio-out	Audio cable	_____	2.0 m	SLD, MC
④	LAN	LAN cable	_____	5.0 m	SLD, MC
⑤	USB3.0	USB mouse cable	_____	1.9 m	SLD, MC
⑥	USB3.0	USB mouse cable	_____	1.9 m	SLD, MC
⑦	USB3.0	USB cable	_____	1.0 m	SLD, MC
⑧	USB3.0	USB cable	_____	1.0 m	SLD, MC
⑨	RGB	RGB cable	_____	2.0 m	SLD, MC fixed core
⑩	DVI	DVI cable	_____	2.0 m	SLD, MC fixed core
⑪	Power-in	AC adaptor cable	_____	1.8 m	2P NSLD, NMC
⑫	_____	AC power cable	_____	1.0 m	2P-NSLD
	_____	AC power cable	_____	2.0 m	3P-NSLD
⑬	_____	AC power cable	_____	2.0 m	3P-NSLD
⑭	_____	AC power cable	_____	2.0 m	3P-NSLD
⑮	_____	LAN cable	_____	20.0 m	NSLD, MC
⑯	_____	AC adaptor cable	_____	1.8 m	2P NSLD, NMC
⑰	_____	AC power cable	_____	2.0 m	3P-NSLD
⑱	_____	AC power cable	_____	2.0 m	2P NSLD

Appendix data (#13-092E: Total 27 pages)

1. Photograph #13-092E (8 pages)

• Radiated emission measurement	30-1000 MHz (Front)	: Photo-1.1
	(Back)	: Photo-1.2
	Over 1 GHz	: Photo-1.3
• Power line conducted emission measurement		: Photo-2.1
• Telecommunication line conducted emission measurement	LAN port (ISN-Shield)	: Photo-2.2
	LAN port (ISN)	: Photo-2.3
• Label	Personal computer T734	: Photo-3.1
	Port-replicator FPCPR132	: Photo-3.2
	AC adapter ADP-80SB A	: Photo-3.3
	AC adapter A13-090P1A	: Photo-3.4
	AC adapter A13-090P2A	: Photo-3.5
	AC adapter ADP-90BE D	: Photo-3.6
	AC adapter ADP-90BE C	: Photo-3.7
	AC adapter ADP-80SB B	: Photo-3.8
	AC adapter PJW1942NA	: Photo-3.9

2. Test data (19 pages)

2.1 Radiated emission

30-1000 MHz	: #13-092E-RE1 (1 page)
1-14.5GHz (FCC)	: #13-092E-GH1 (1 page)
1-6 GHz (CISPR, VCCI)	: #13-092E-GH2 (1 page)

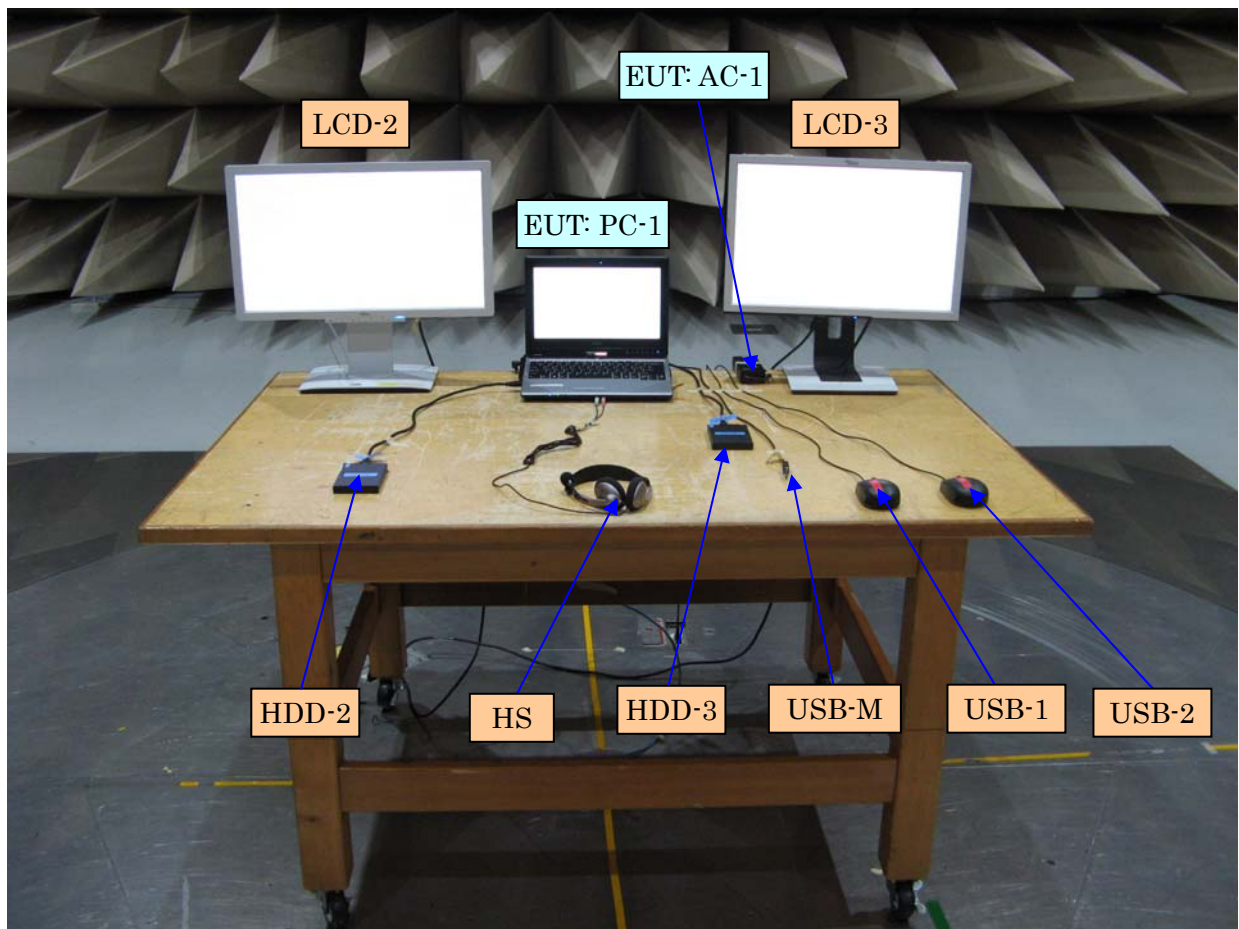
2.2 Power line conducted emission

AC adapter: ADP-80SB A	AC 120V/ 60Hz	: #13-092E-CE1 (1 page)
	AC 100V/ 50Hz	: #13-092E-CE2 (1 page)
AC adapter: A13-090P1A	AC 120V/ 60Hz	: #13-092E-CE3 (1 page)
	AC 100V/ 50Hz	: #13-092E-CE4 (1 page)
AC adapter: A13-090P2A	AC 120V/ 60Hz	: #13-092E-CE5 (1 page)
	AC 100V/ 50Hz	: #13-092E-CE6 (1 page)
AC adapter: ADP-90BE C	AC 120V/ 60Hz	: #13-092E-CE7 (1 page)
	AC 100V/ 50Hz	: #13-092E-CE8 (1 page)
AC adapter: ADP-90BE D	AC 120V/ 60Hz	: #13-092E-CE9 (1 page)
	AC 100V/ 50Hz	: #13-092E-CE10 (1 page)
AC adapter: ADP-80SB B	AC 120V/ 60Hz	: #13-092E-CE11 (1 page)
	AC 100V/ 50Hz	: #13-092E-CE12 (1 page)
AC adapter: PJW1942NA	AC 120V/ 60Hz	: #13-092E-CE13 (1 page)
	AC 100V/ 50Hz	: #13-092E-CE14 (1 page)

2.3 Telecommunication line conducted emission

LAN port (ISN-Shield)	: #13-092E-TE1 (1 page)
LAN port (ISN)	: #13-092E-TE2 (1 page)

Photo-1.1 Radiated emission measurement for 30-1000 MHz (Front)



- HUB and PC-2 were set at outside of the chamber.

Photo-1.2 Radiated emission measurement for 30-1000 MHz (Back)

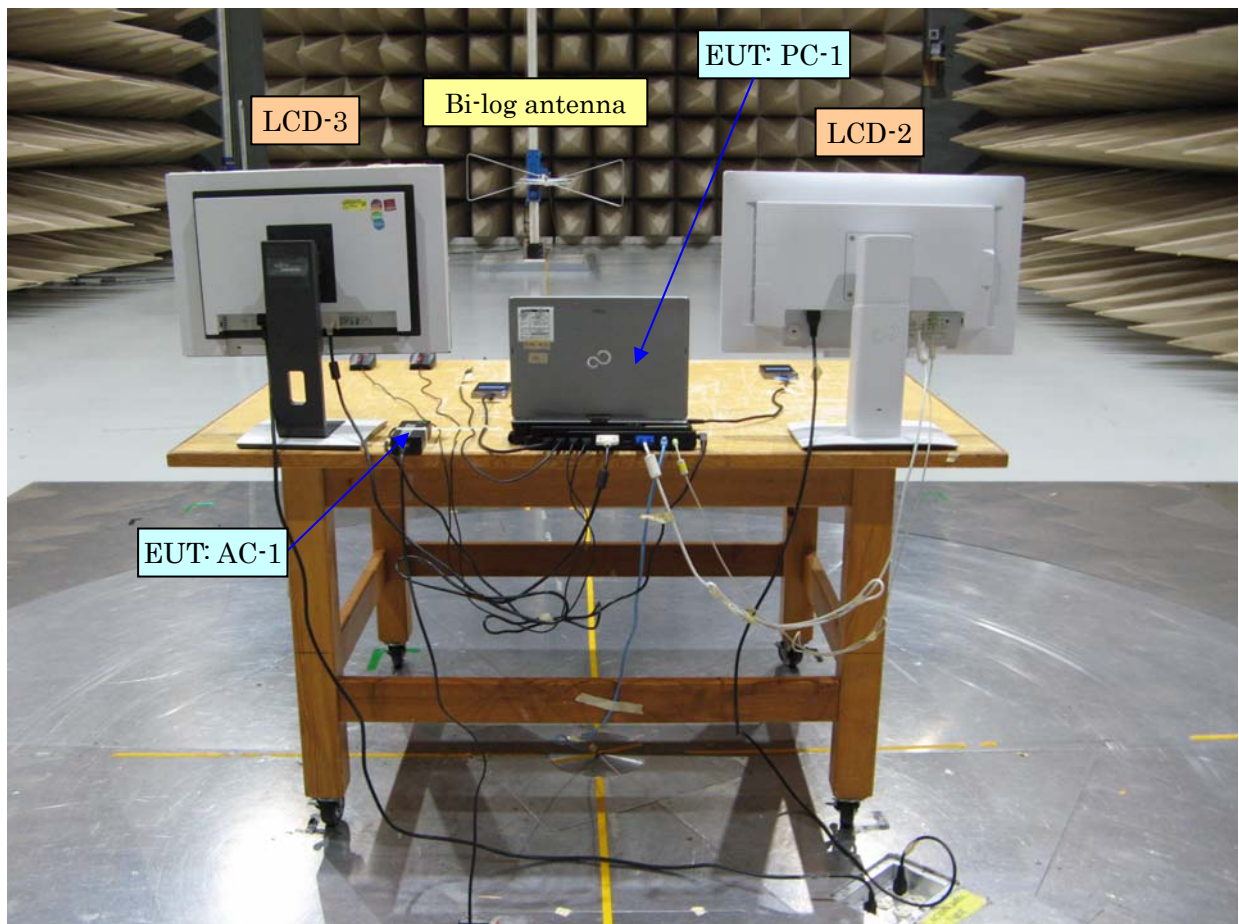


Photo-1.3 Over 1 GHz Radiated emission measurement

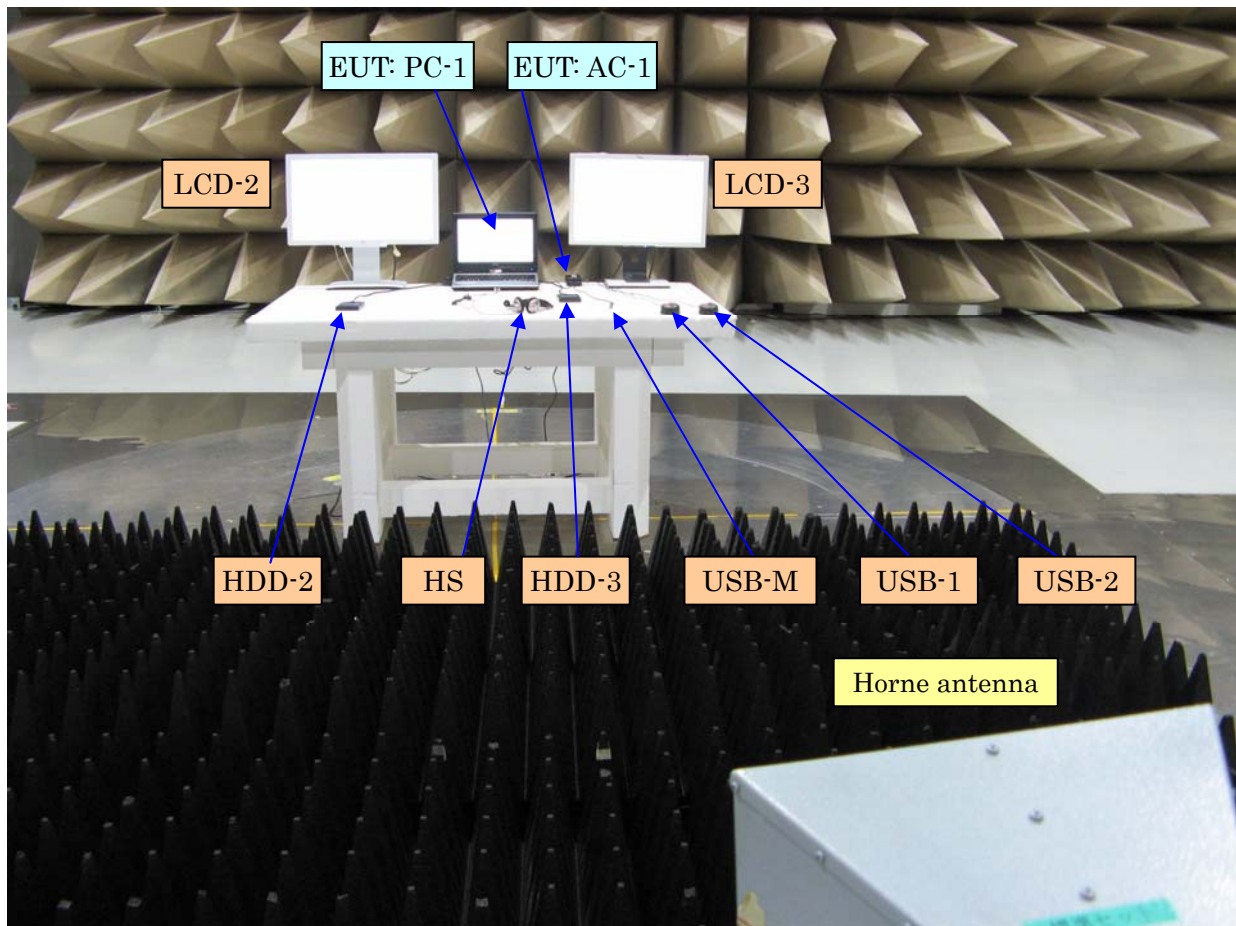


Photo-2.1 Power line conducted emission measurement: AC power port

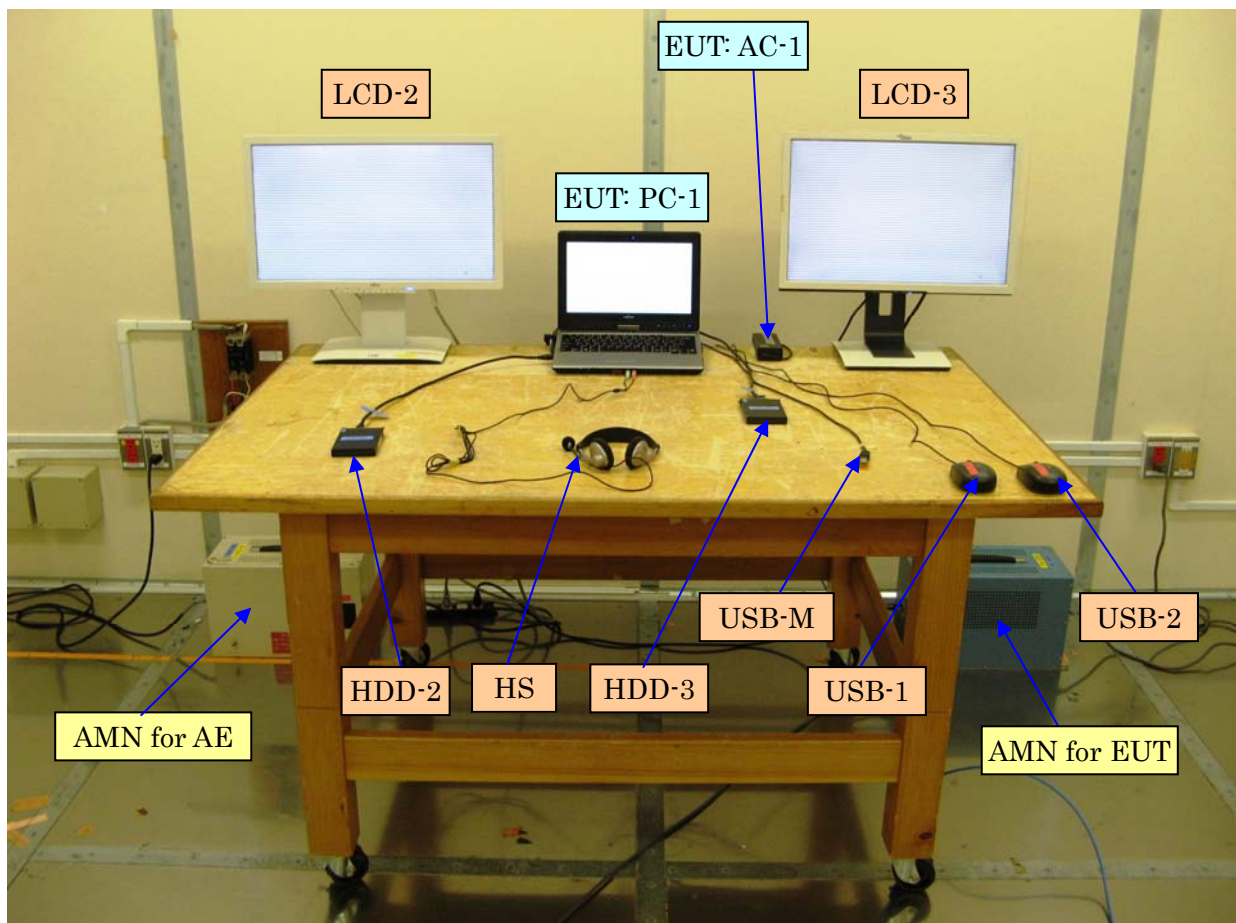


Photo-2.2 Telecommunication line conducted emission measurement: LAN port
(ISN for shielded cable)

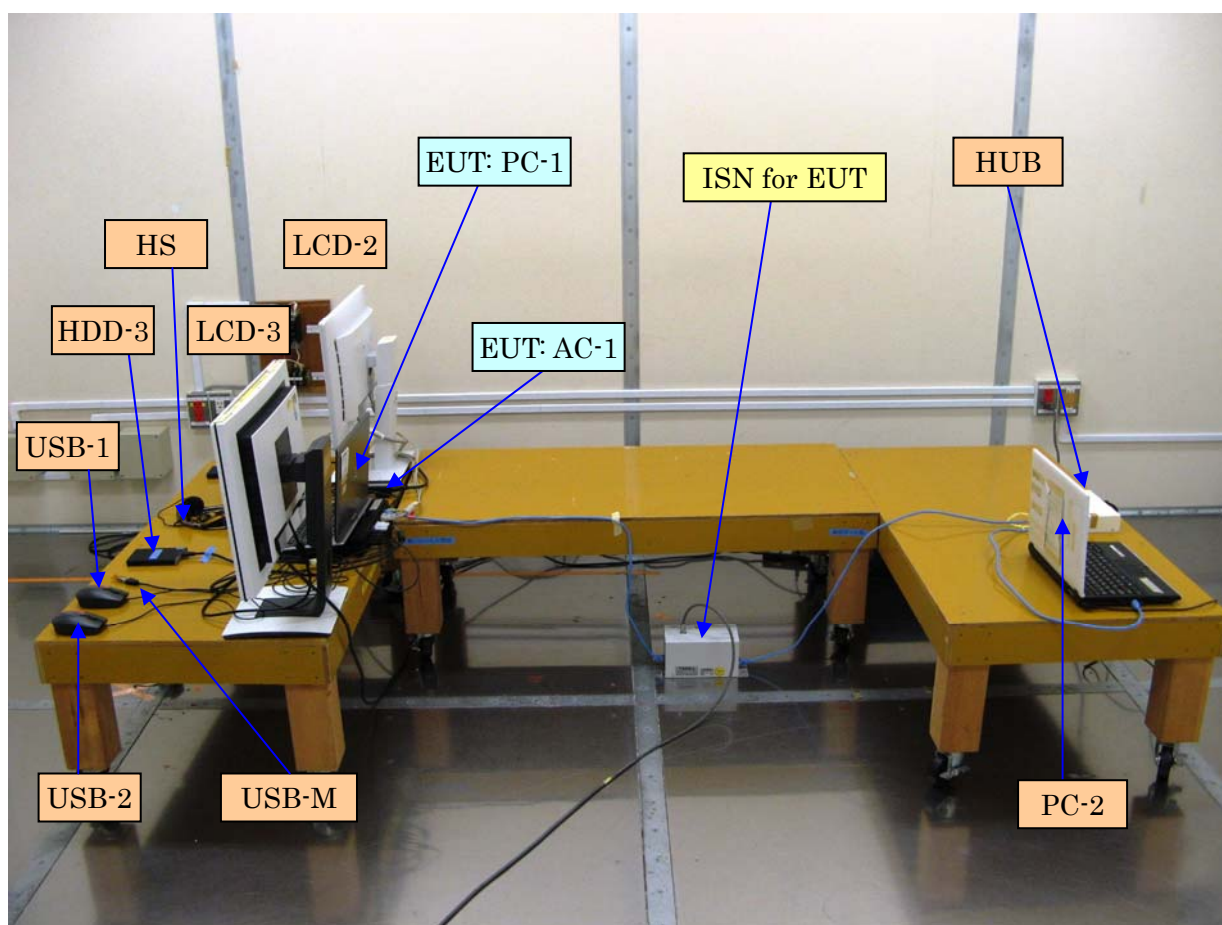


Photo-2.3 Telecommunication line conducted emission measurement: LAN port
(ISN for none shielded cable)

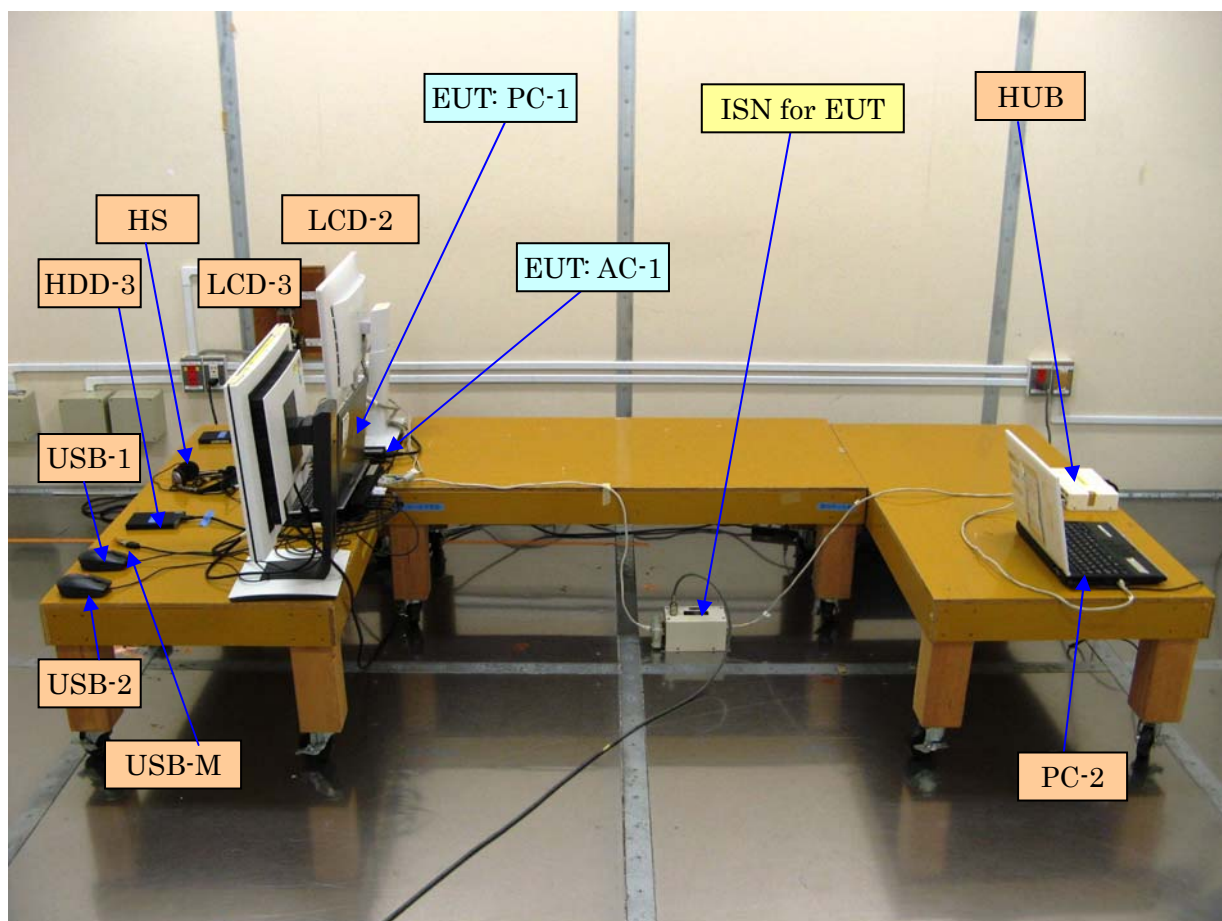


Photo-3.1 Label: Personal computer: T734

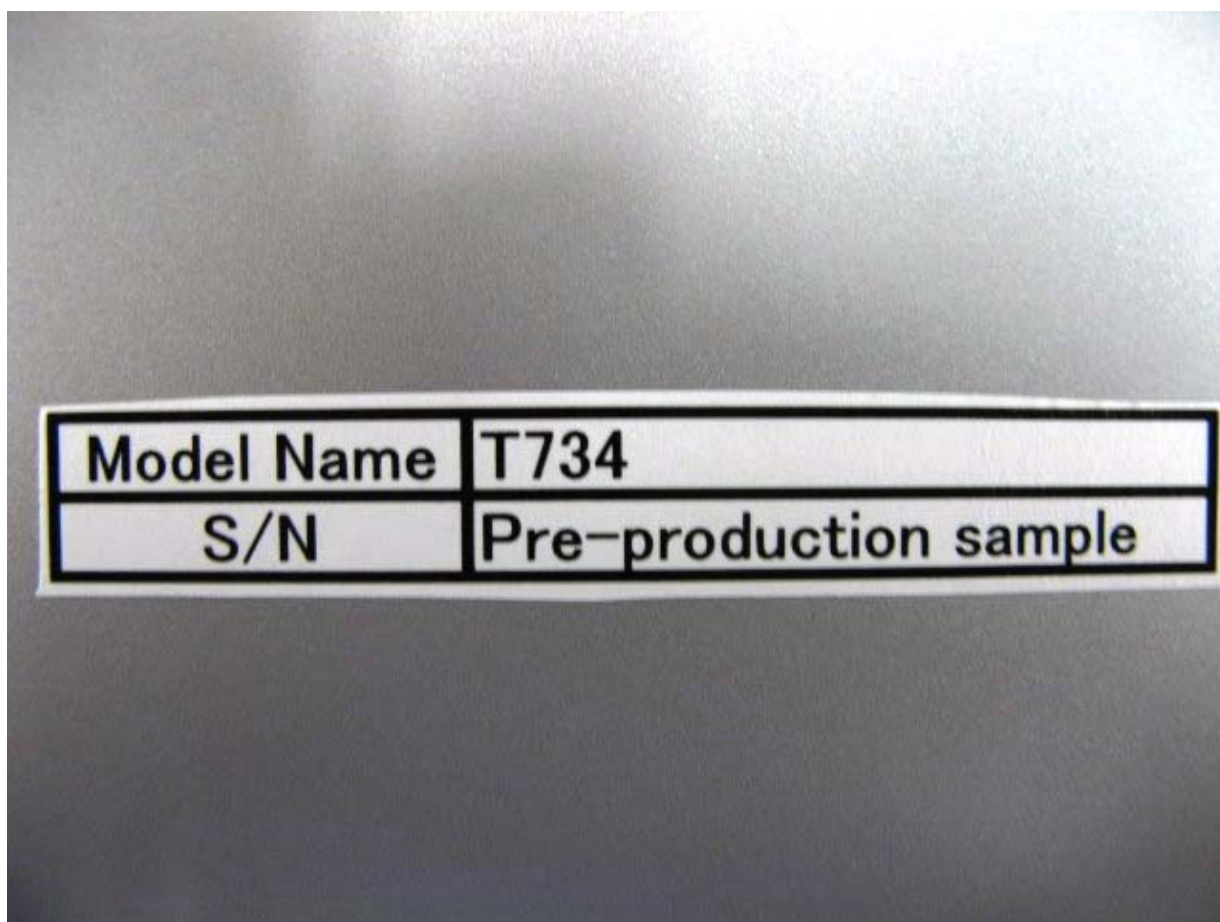


Photo-3.2 Label: Port-replicator: FPCPR132

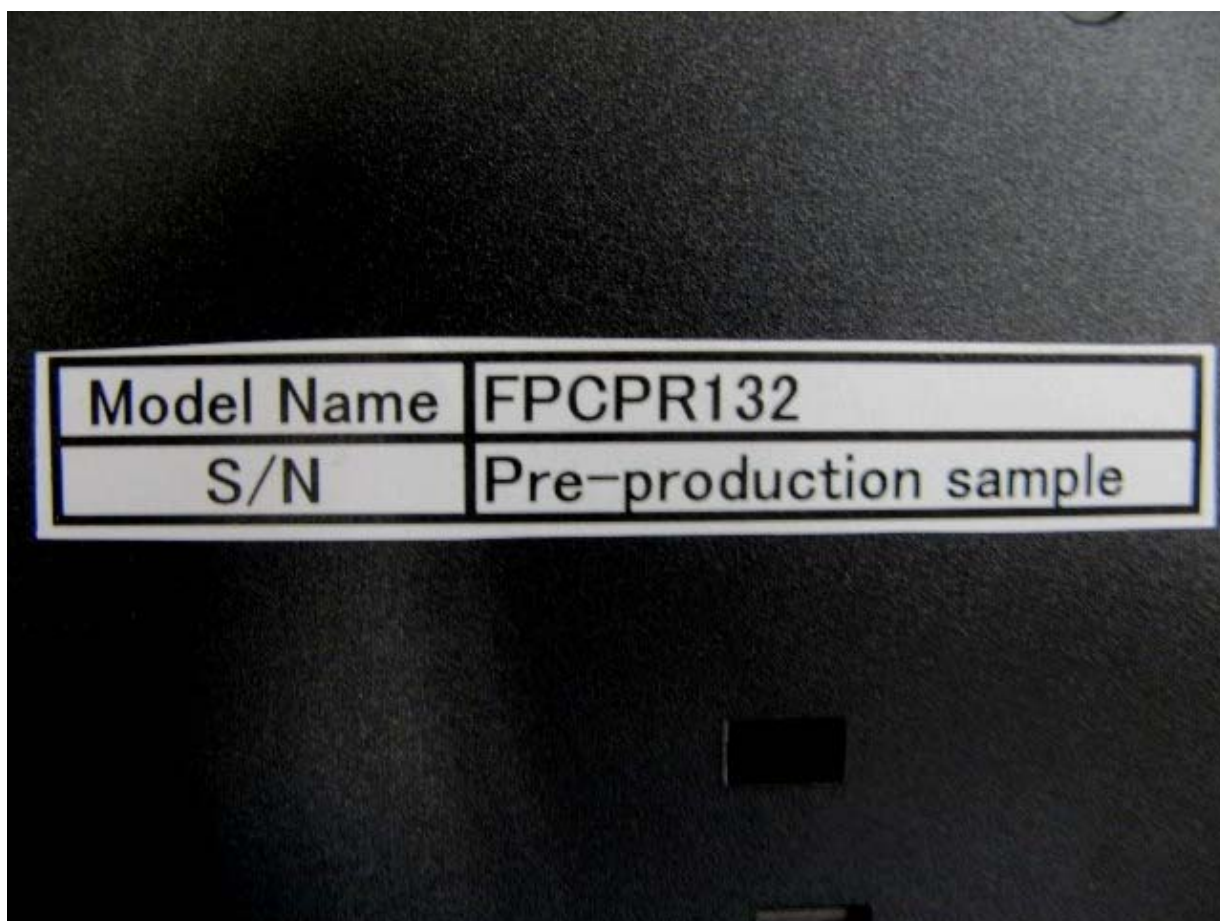


Photo-3.3 Label: AC Adapter ADP-80SB A



Photo-3.4 Label: AC Adapter A13-090P1A



Photo-3.5 Label: AC Adapter A13-090P2A



Photo-3.6 Label: AC Adapter ADP-90BE C



Photo-3.7 Label: AC Adapter ADP-90BE D



Photo-3.8 Label: AC Adapter ADP-80SB B



Photo-3.9 Label: AC Adapter PJW1942NA



RADIATED EMISSION MEASUREMENT (30MHz~1000MHz)

EUT Name: Personal computer

Limit: CISPR22 Class B

Test date: 2013/9/2

Antenna: SME Bi-log VULB9160 S/N:3118

Test site: 2nd semianechoic chamber

Type: T734(ADP-80SB A) S/N: Pre Production Sample

Measurement distance is 10m

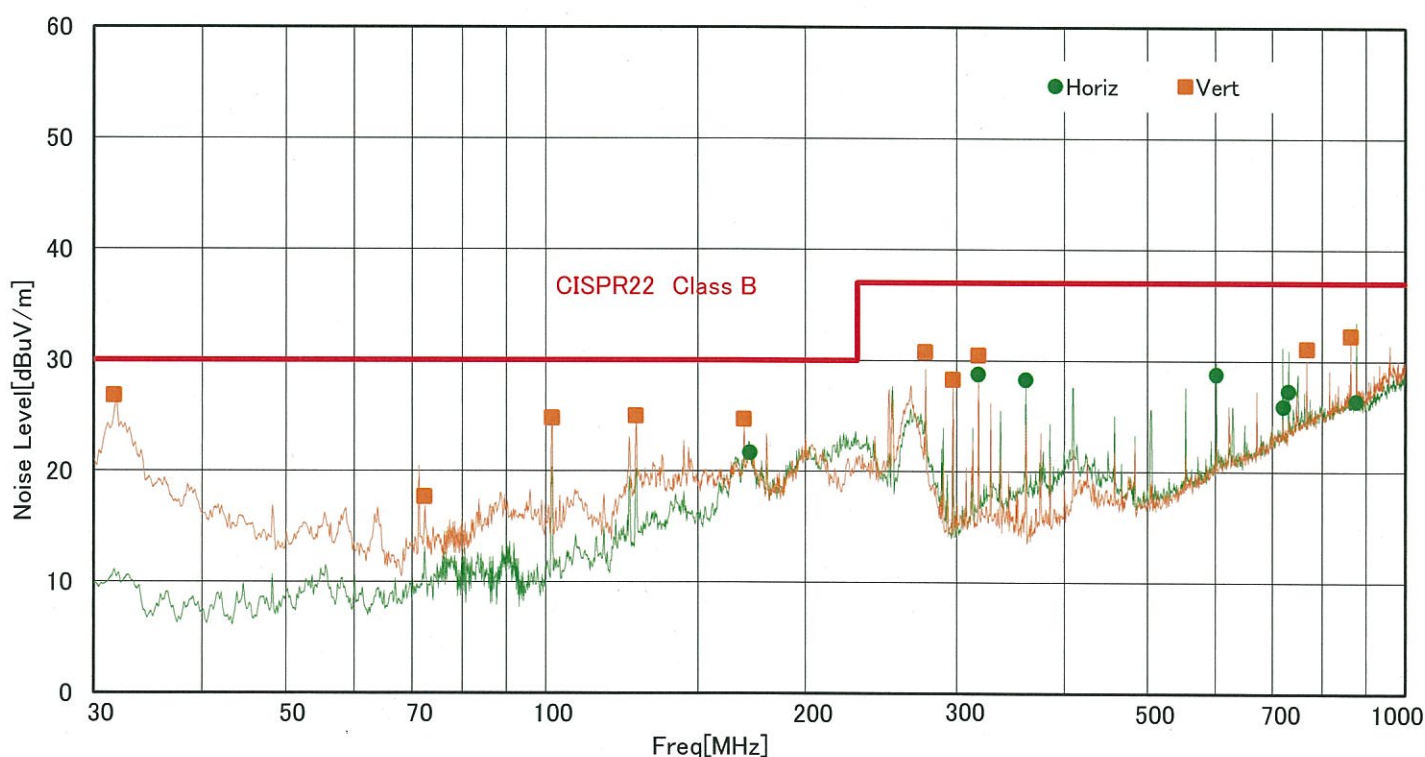
Temp: 23 °C

R/H: 60 %

Receiver: HP 85422E S/N:3746A00243

Software: EMI measurement software of Version 1.3

Freq [MHz]	Pol.	Meter Reading [QP:dBuV]	Factor [dB/m]	Noise Level [QP:dBuV/m]	Limit [QP:dBuV/m]	Margin [dB]	Height [cm]	Angle [°]
31.65	Vert	14.1	12.7	26.8	30.0	3.2	100	120
72.28	Vert	5.8	11.9	17.7	30.0	12.3	200	60
101.73	Vert	13.2	11.6	24.8	30.0	5.2	150	270
127.15	Vert	10.5	14.5	25.0	30.0	5.0	100	300
169.57	Vert	8.9	15.8	24.7	30.0	5.3	100	180
172.44	Horiz	6.2	15.5	21.7	30.0	8.3	350	300
275.79	Vert	14.4	16.4	30.8	37.0	6.2	100	180
296.90	Vert	11.1	17.2	28.3	37.0	8.7	100	0
318.02	Horiz	11.0	17.8	28.8	37.0	8.2	300	330
318.02	Vert	12.7	17.8	30.5	37.0	6.5	100	180
361.36	Horiz	9.3	19.0	28.3	37.0	8.7	300	150
602.37	Horiz	3.2	25.6	28.8	37.0	8.2	150	270
721.79	Horiz	-1.8	27.7	25.9	37.0	11.1	200	60
731.25	Horiz	-0.6	27.9	27.3	37.0	9.7	150	150
768.02	Vert	2.4	28.7	31.1	37.0	5.9	200	0
864.02	Vert	2.1	30.2	32.3	37.0	4.7	200	0
877.13	Horiz	-4.0	30.4	26.4	37.0	10.6	100	60

* Measurement uncertainty: ± 3.0 dB(K=2, 95 %)

24. Aikawa
Tested by

RADIATED EMISSION MEASUREMENT (1GHz-14.5GHz)

EUT Name: Personal computer

Type: T734(ADP-80SB A)

S/N: Pre-production sample

Limit: FCC ClassB 3m

Measurement distance: 3.05 m

Temp: 23 °C

Test date: 2013/09/05

(Noise Level is calculated for 3m distance)

R/H: 65 %

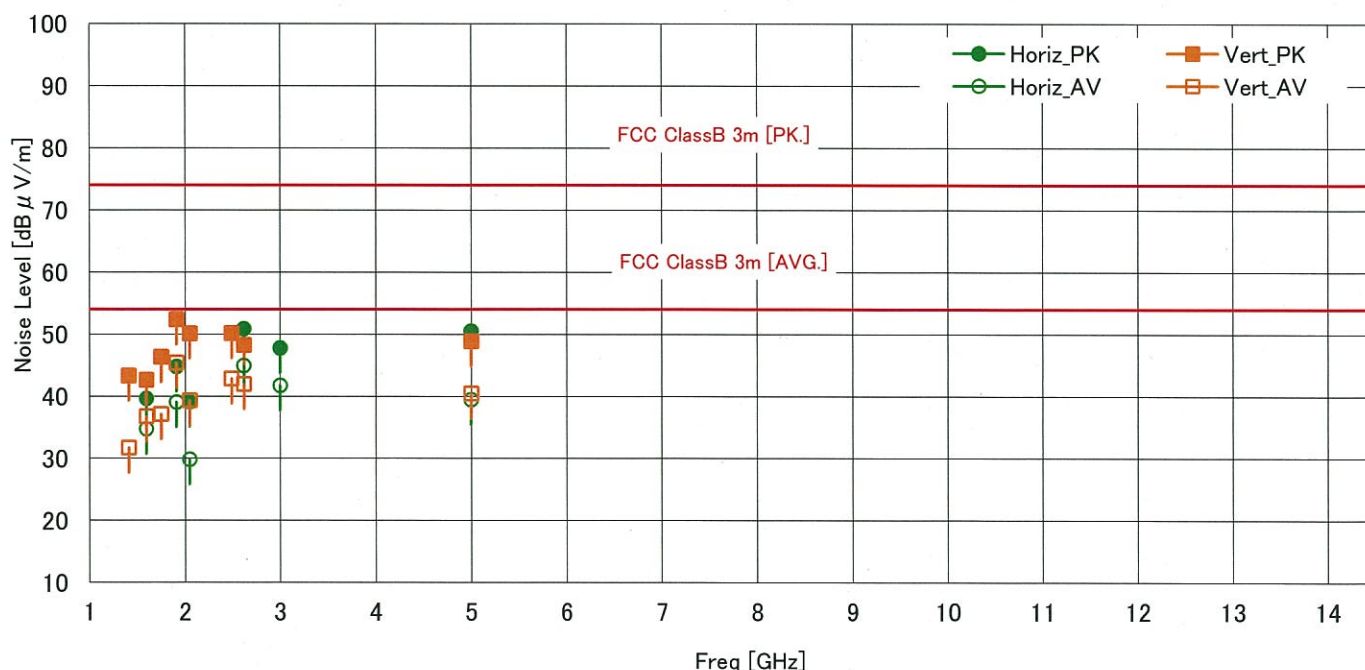
Antenna: Schwarzbeck BBHA9120D S/N: 414

Spectrum analyzer: Advantest U3772 S/N: 161200140

Test site: 2nd semi-anechoic chamber

Freq [GHz]	Pol	Meter Reading [dBuV]		Factor [dB/m]	Noise Level [dBuV]		Limit [dBuV]		Margin [dB]	
		PK	AV		PK	AV	PK	AV	PK	AV
1.413	Vert	62.2	50.6	-18.9	43.3	31.7	74.0	54.0	30.7	22.3
1.599	Horiz	57.9	53.0	-18.2	39.7	34.8	74.0	54.0	34.3	19.2
1.599	Vert	60.9	55.0	-18.2	42.7	36.8	74.0	54.0	31.3	17.2
1.755	Vert	64.2	55.0	-17.9	46.3	37.1	74.0	54.0	27.7	16.9
1.910	Horiz	62.3	56.6	-17.5	44.8	39.1	74.0	54.0	29.2	14.9
1.910	Vert	69.9	62.9	-17.5	52.4	45.4	74.0	54.0	21.6	8.6
2.048	Horiz	56.2	46.9	-17.1	39.1	29.8	74.0	54.0	34.9	24.2
2.048	Vert	67.2	56.4	-17.1	50.1	39.3	74.0	54.0	23.9	14.7
2.490	Vert	65.2	57.9	-15.0	50.2	42.9	74.0	54.0	23.8	11.1
2.620	Horiz	65.6	59.7	-14.7	50.9	45.0	74.0	54.0	23.1	9.0
2.620	Vert	63.0	56.7	-14.7	48.2	41.9	74.0	54.0	25.8	12.1
3.000	Horiz	61.7	55.7	-13.9	47.8	41.8	74.0	54.0	26.2	12.2
5.000	Horiz	61.1	50.0	-10.5	50.5	39.5	74.0	54.0	23.5	14.5
5.000	Vert	59.4	51.0	-10.5	48.9	40.5	74.0	54.0	25.1	13.5

* Noise Level = Meter Reading + Factor (= Antenna Factor + Preamp Gain + Cable Loss + Distance Conversion Value)

* Measurement uncertainty: ± 3.4 dB (K=2, 95%)

A. Aikawa
Tested by

RADIATED EMISSION MEASUREMENT (1GHz-6GHz)

EUT Name: Personal computer

Type: T734(ADP-80SB A)

S/N: Pre-production sample

Limit: CISPR22 ClassB 3m

Measurement distance: 3.05 m

Temp: 23 °C

Test date: 2013/09/05

(Noise Level is calculated for 3m distance)

R/H: 65 %

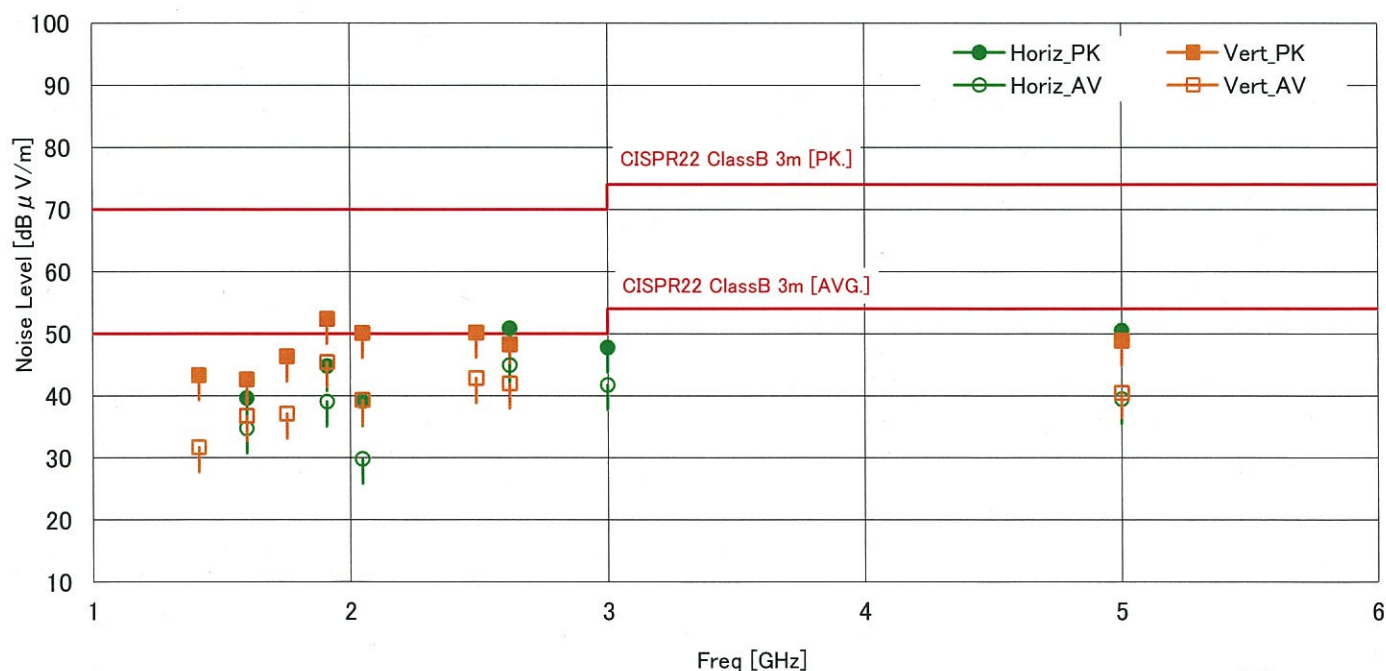
Antenna: Schwarzbeck BBHA9120D S/N: 414

Spectrum analyzer: Advantest U3772 S/N: 161200140

Test site: 2nd semi-anechoic chamber

Freq [GHz]	Pol	Meter Reading [dBuV]		Factor [dB/m]	Noise Level [dBuV]		Limit [dBuV]		Margin [dB]	
		PK	AV		PK	AV	PK	AV	PK	AV
1.413	Vert	62.2	50.6	-18.9	43.3	31.7	70.0	50.0	26.7	18.3
1.599	Horiz	57.9	53.0	-18.2	39.7	34.8	70.0	50.0	30.3	15.2
1.599	Vert	60.9	55.0	-18.2	42.7	36.8	70.0	50.0	27.3	13.2
1.755	Vert	64.2	55.0	-17.9	46.3	37.1	70.0	50.0	23.7	12.9
1.910	Horiz	62.3	56.6	-17.5	44.8	39.1	70.0	50.0	25.2	10.9
1.910	Vert	69.9	62.9	-17.5	52.4	45.4	70.0	50.0	17.6	4.6
2.048	Horiz	56.2	46.9	-17.1	39.1	29.8	70.0	50.0	30.9	20.2
2.048	Vert	67.2	56.4	-17.1	50.1	39.3	70.0	50.0	19.9	10.7
2.490	Vert	65.2	57.9	-15.0	50.2	42.9	70.0	50.0	19.8	7.1
2.620	Horiz	65.6	59.7	-14.7	50.9	45.0	70.0	50.0	19.1	5.0
2.620	Vert	63.0	56.7	-14.7	48.2	41.9	70.0	50.0	21.8	8.1
3.000	Horiz	61.7	55.7	-13.9	47.8	41.8	70.0	50.0	22.2	8.2
5.000	Horiz	61.1	50.0	-10.5	50.5	39.5	74.0	54.0	23.5	14.5
5.000	Vert	59.4	51.0	-10.5	48.9	40.5	74.0	54.0	25.1	13.5

* Noise Level = Meter Reading + Factor (= Antenna Factor + Preamp Gain + Cable Loss + Distance Conversion Value)

* Measurement uncertainty: ± 3.4 dB (K=2, 95%)

Tested by

POWER LINE CONDUCTED EMISSION MEASUREMENT (150kHz~30MHz)

EUT Name: Personal computer

Limit: CISPR22 Class B

Test date 2013/8/27

AMN: Kyoritsu KNW-407 S/N: 8-823-18

Test site: 3rd shielded room

Type: T734(ADP-80RB A)

S/N: Pre-production sample

Test voltage: 120 VAC Single Phase

Temp: 23 °C

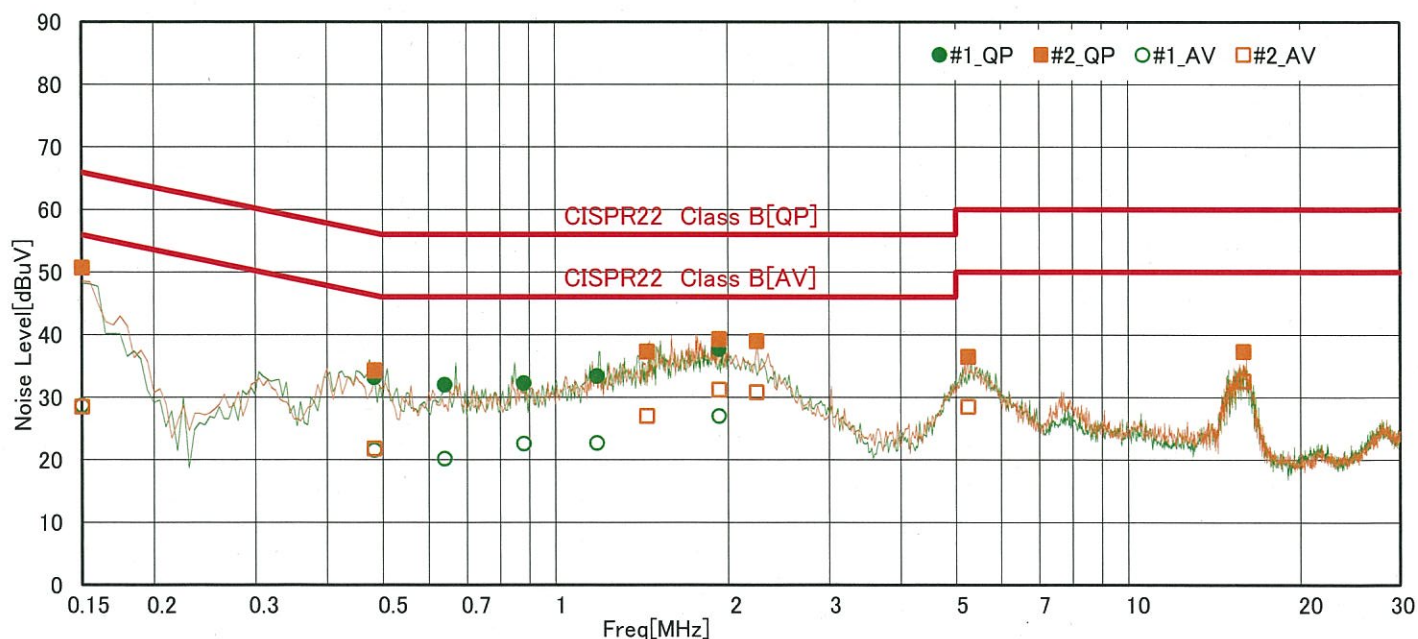
R/H: 50 %

Receiver: HP 85422E S/N: 3746A00239

Software: EMI measurement software of Version 1.3

Freq [MHz]	Line	Meter Reading [dBuV]		Factor [dB]	Noise Level [dBuV]		Limit [dBuV]		Margin [dB]	
		QP	AV		QP	AV	QP	AV	QP	AV
0.150	# 1	40.0	18.0	10.7	50.7	28.7	66.0	56.0	15.3	27.3
0.150	# 2	40.0	17.8	10.7	50.7	28.5	66.0	56.0	15.3	27.5
0.484	# 1	23.1	11.5	10.1	33.2	21.6	56.3	46.3	23.1	24.7
0.484	# 2	24.2	11.7	10.1	34.3	21.8	56.3	46.3	22.0	24.5
0.641	# 1	21.9	10.1	10.1	32.0	20.2	56.0	46.0	24.0	25.8
0.881	# 1	22.2	12.5	10.1	32.3	22.6	56.0	46.0	23.7	23.4
1.181	# 1	23.3	12.6	10.1	33.4	22.7	56.0	46.0	22.6	23.3
1.444	# 2	27.2	16.9	10.1	37.3	27.0	56.0	46.0	18.7	19.0
1.930	# 1	27.5	16.8	10.2	37.7	27.0	56.0	46.0	18.3	19.0
1.930	# 2	29.1	21.0	10.2	39.3	31.2	56.0	46.0	16.7	14.8
2.242	# 2	28.8	20.6	10.2	39.0	30.8	56.0	46.0	17.0	15.2
5.249	# 2	26.2	18.2	10.3	36.5	28.5	60.0	50.0	23.5	21.5
15.910	# 2	26.4	21.7	10.9	37.3	32.6	60.0	50.0	22.7	17.4

* Noise Level = Meter Reading + Factor(=AMN factor + 10dB pad + cable loss)

* Measurement uncertainty: ± 2.3 dB (K=2, 95%)

Tested by

POWER LINE CONDUCTED EMISSION MEASUREMENT (150kHz~30MHz)

EUT Name: Personal computer

Limit: CISPR22 Class B

Test date 2013/8/27

AMN: Kyoritsu KNW-407 S/N:8-823-18

Test site: 3rd shielded room

Type: T734(ADP-80SB A)

S/N: Pre-production sample

Test voltage: 100 VAC Single Phase

Temp: 23 °C

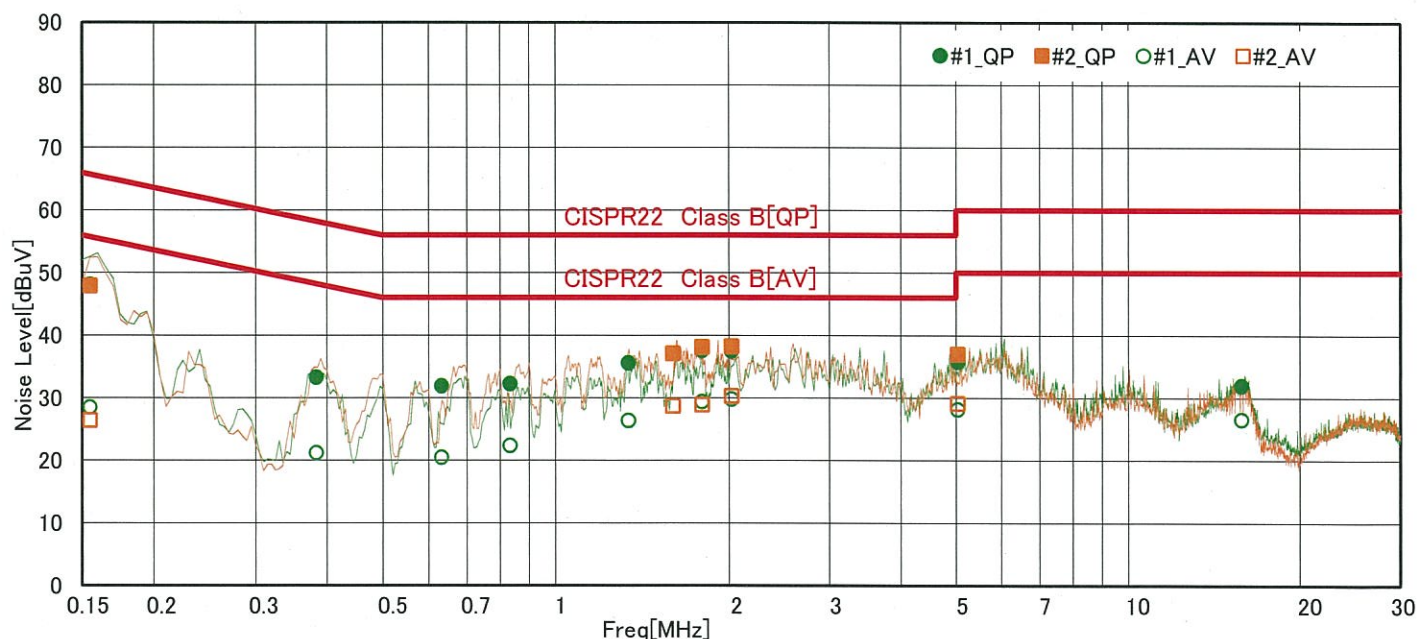
R/H: 50 %

Receiver: HP 85422E S/N:3746A00239

Software: EMI measurement software of Version 1.3

Freq [MHz]	Line	Meter Reading [dBuV]		Factor [dB]	Noise Level [dBuV]		Limit [dBuV]		Margin [dB]	
		QP	AV		QP	AV	QP	AV	QP	AV
0.155	# 1	37.4	17.8	10.7	48.1	28.5	65.7	55.7	17.6	27.2
0.155	# 2	37.2	15.7	10.7	47.9	26.4	65.7	55.7	17.8	29.3
0.383	# 1	23.0	10.9	10.3	33.3	21.2	58.2	48.2	24.9	27.0
0.633	# 1	21.8	10.4	10.1	31.9	20.5	56.0	46.0	24.1	25.5
0.833	# 1	22.2	12.3	10.1	32.3	22.4	56.0	46.0	23.7	23.6
1.341	# 1	25.5	16.3	10.1	35.6	26.4	56.0	46.0	20.4	19.6
1.602	# 2	27.0	18.6	10.1	37.1	28.7	56.0	46.0	18.9	17.3
1.800	# 1	27.4	19.2	10.2	37.6	29.4	56.0	46.0	18.4	16.6
1.800	# 2	27.9	18.7	10.2	38.1	28.9	56.0	46.0	17.9	17.1
2.025	# 1	27.3	19.6	10.2	37.5	29.8	56.0	46.0	18.5	16.2
2.025	# 2	28.0	20.1	10.2	38.2	30.3	56.0	46.0	17.8	15.7
5.035	# 1	25.5	17.9	10.3	35.8	28.2	60.0	50.0	24.2	21.8
5.035	# 2	26.7	18.8	10.3	37.0	29.1	60.0	50.0	23.0	20.9
15.830	# 1	21.1	15.7	10.9	32.0	26.6	60.0	50.0	28.0	23.4

* Noise Level = Meter Reading + Factor(=AMN factor + 10dB pad + cable loss)

* Measurement uncertainty: ± 2.3 dB (K=2, 95%)

Aikawa
Tested by