Attachment C

The EIRP measurement was performed under the test configuration.

Test Configuration : Refer to pages 5 - 7 and Test-Setup Photographs.
This setup is the condition that a secondary adaptive array is introduced to the near field of the original antenna.

Transmitter Power(EIRP) Measurement (§24.232)

The measurement were performed shown as follows.

Step 1) The test was set-up shown as Fig.1(a). In order to obtain the maximum emission, the EUT is placed at the height 1.0m on the non-conducted support and the center of the Adaptive Array Antenna is set to 2.3m at the distance 3m from the receiving antenna(Horn Antenna) and rotated around 360 degrees. The receiving antenna height was varied from 1m to 4 m . Then the meter reading of the spectrum analyzer at the maximum emission was A dB(μV).
The Details of Test-Arrangement on Radiated emission test (Drawings) is shown in pages 5-7.

Step 2) The test was set-up shown as Fig.1(b). the center of the Adaptive Array Antenna was replaced to Horn antenna at the same polarized under the same condition as step 1. The RF power was fed to the transmitting Antenna(horn Antenna) through the RF amplifier from the signal generator. In order to obtain the maximum emission level, the height of the receiving antenna is varied from 1m to 4 m. The level of the signal generator was adjusted so that the meter reading of the spectrum analyzer at the maximum emission was A dB(μV) ,same as the recorded level in Step1. Then the RF power into the substitution horn antenna was P(dBm).
The EIRP is calculated in the following equation.

$$EIRP(dBm) = P(dBm) + Gh(dBi)$$

Where, Gh(dBi) : Gain of the substitution horn antenna

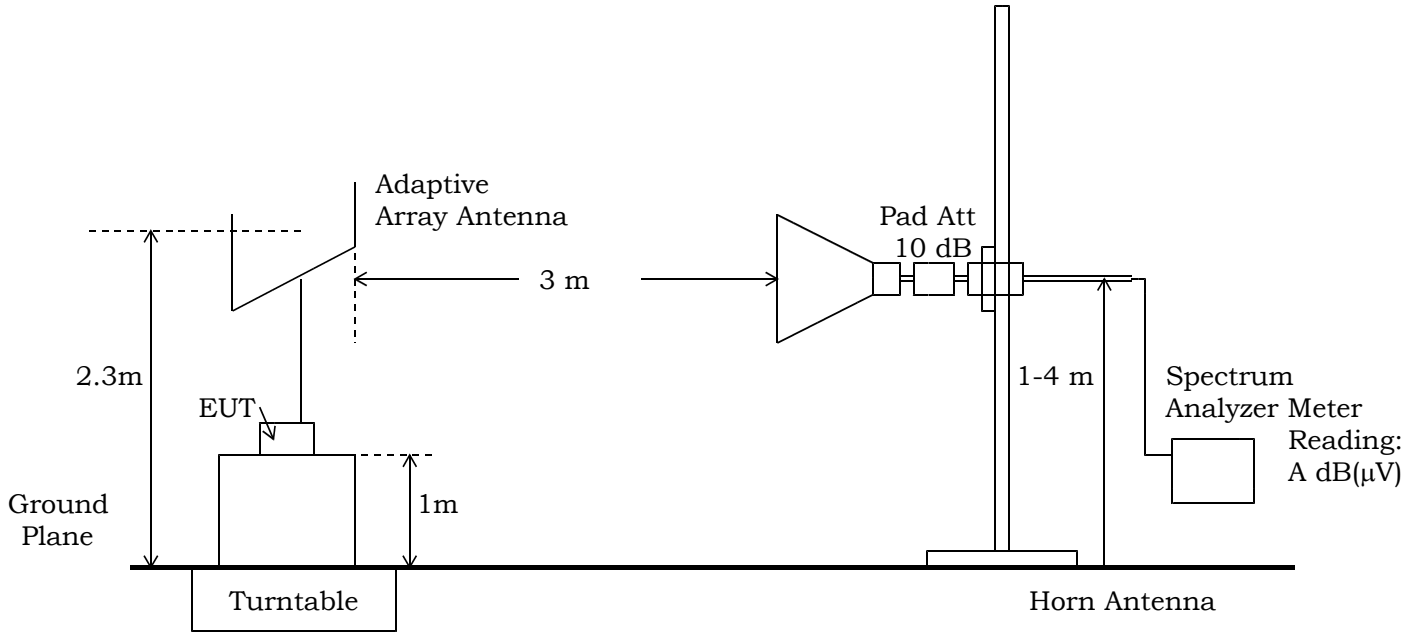
Test location:

KITA-KANSAI Testing Center
7-7, Ishimaru, 1-Chome, Mino-Shi, Osaka, 562-0027, Japan
○ - 1st open test site (3 meters)
KAMEOKA EMC Branch
9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan
● - 1st open test site ● - 3 m ○ - 10 m ○ - 30 m
○ - 2nd open test site ○ - 3 m ○ - 10 m

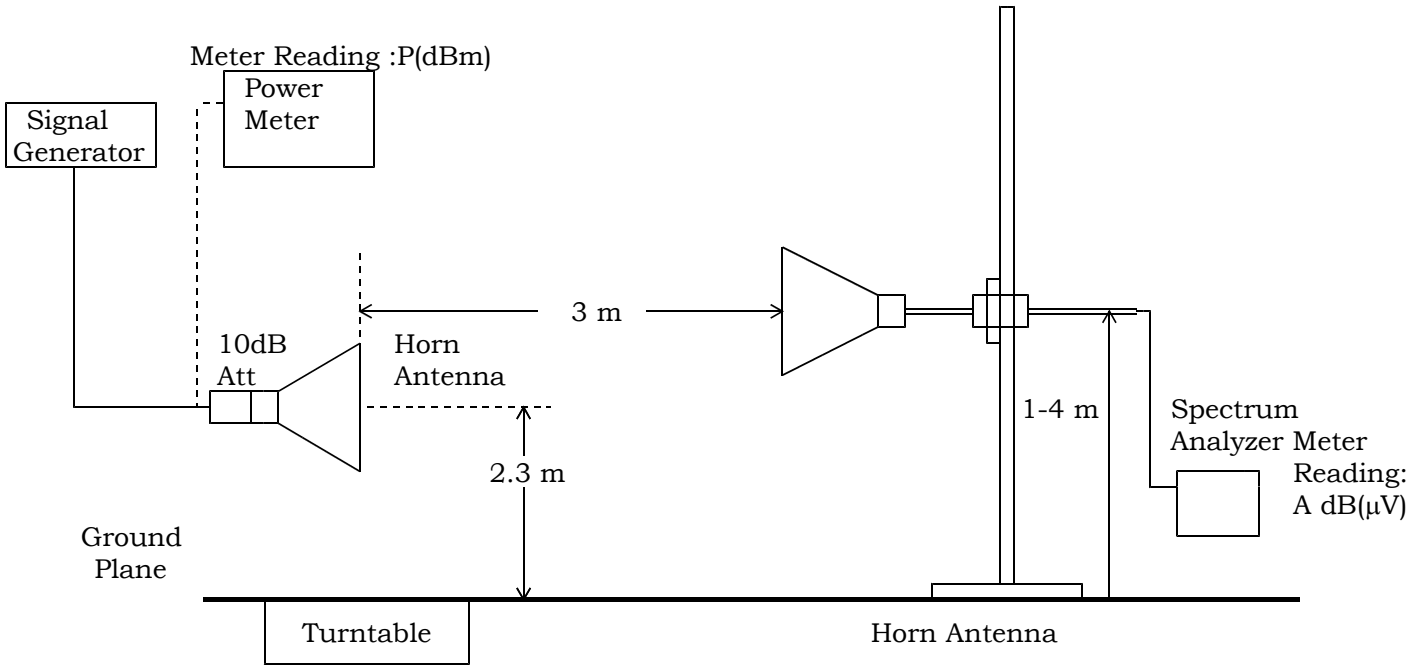
Used test instruments:

Model No.	Device ID	Last Cal. Date	Cal. Interval
○ - ESCS 30	A - 1		
○ - ESCS 30	A - 9		
● - 8566B	A - 13	February, 2003	1 Year
○ - 8593A	A - 15		
○ - ESV	A - 6		
● - 4T-10	D - 73	May, 2003	1 Year
○ - 4T-10	D - 74		
○ - 2-10	D - 79		
○ - 2-10	D - 80		
○ - WJ-6611-513	A - 23		
○ - WJ-6882-824	A - 21		
○ - DBL-0618N515	A - 33		
● - 91888-2	C - 40 - 1	May, 2003	1 Year
● - 91888-2	C - 41 - 1	May, 2003	1 Year
○ - 91889-2	C - 41 - 2		
○ - 94613-1	C - 41 - 3		
○ - 91891-2	C - 41 - 4		
○ - 94614-1	C - 41 - 5		
○ - 3160-09	C - 48		
○ - 355C	D - 22		
○ - 355D	D - 23		
○ - MZ5010C	D - 81		
● - Cable	C - 40 - 11	May, 2003	1 Year
● - Cable	C - 40 - 12	May, 2003	1 Year
○ - 432B/8478B	B - 24/B-43		
● - E4417A	B - 51	August, 2003	1 Year
● - E9321A	B - 52	May, 2003	1 Year
○ - ML2437A/ML2444A	B - 10/B-11		
○ - 8673D	B - 2		
○ - MG3681A	B - 3		
● - 6062A	B - 44	May, 2003	1 Year

Temperature: 24 °C Humidity: 60 %



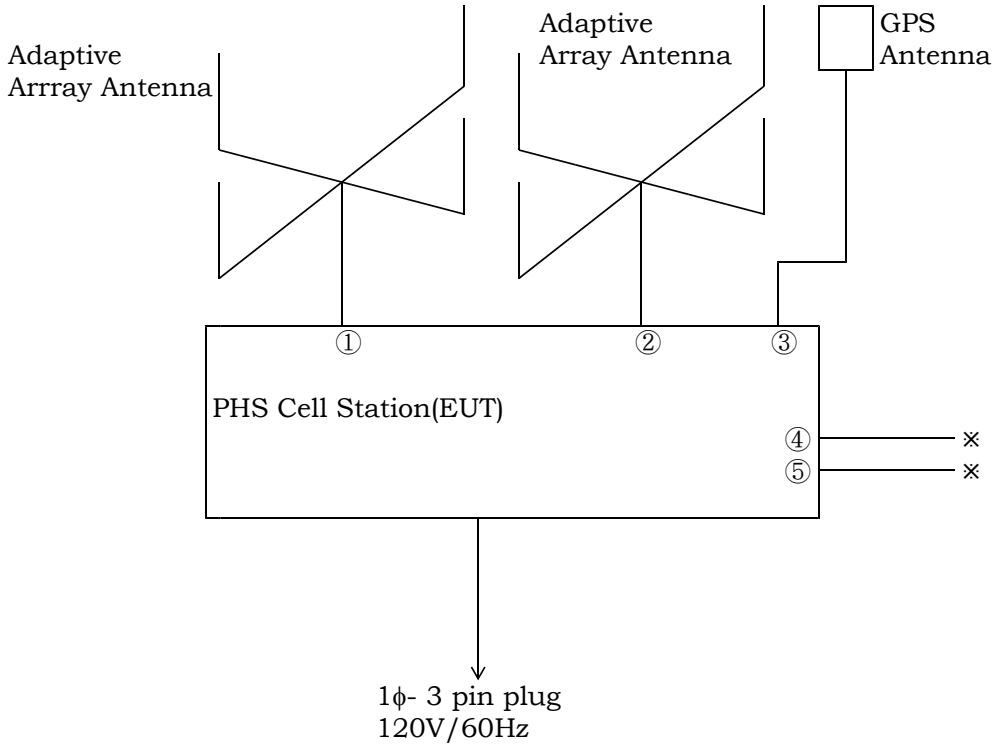
(a) EUT



(b) Substitution Horn Antenna

Fig.3 Maximum Transmitter Power (EIRP) Measurement

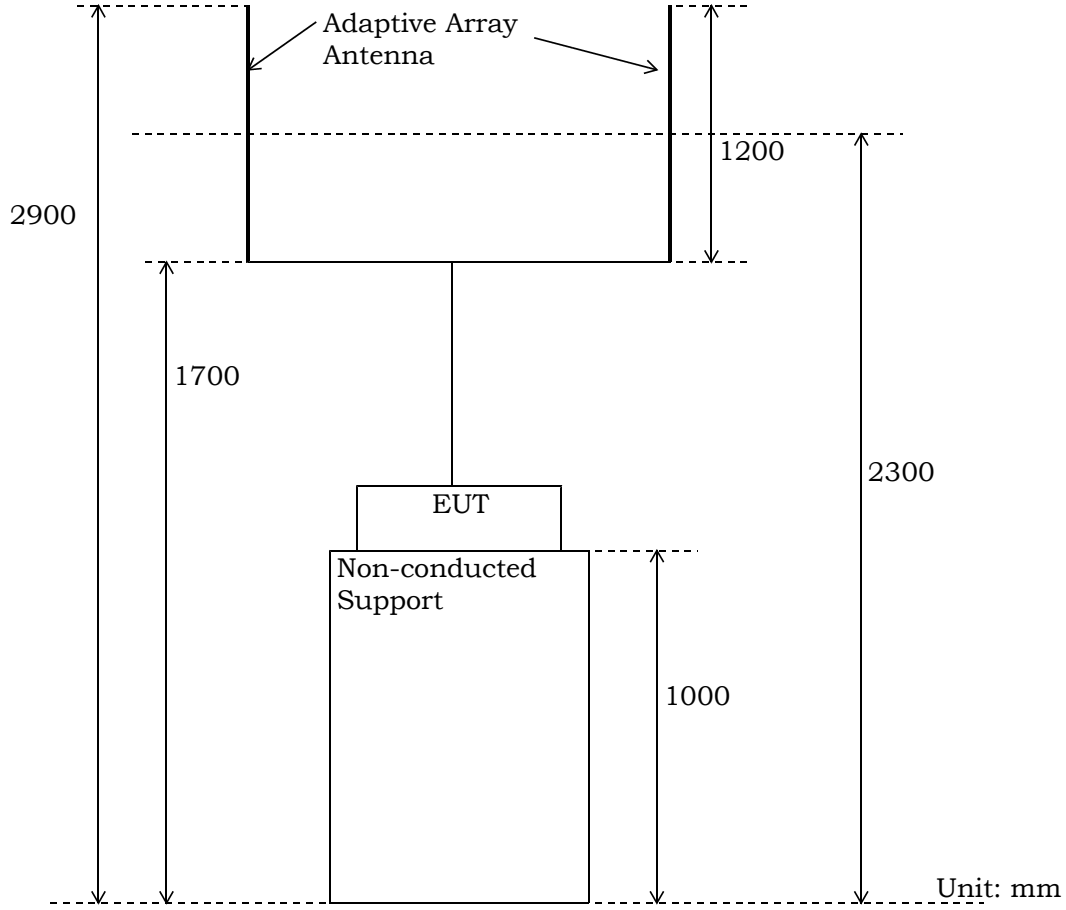
Test System-Arrangement (Drawings)

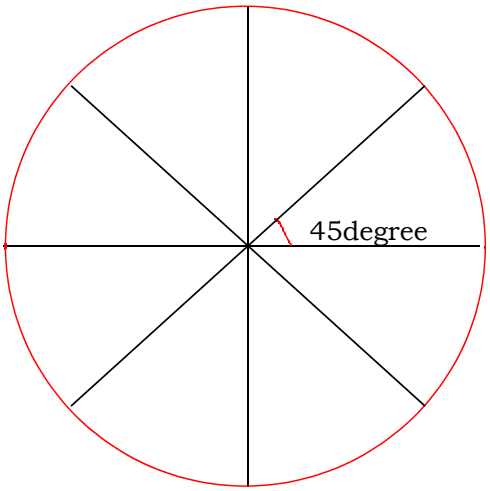


Note:

※ : No temination
① : ANT1/ANT2/ANT3/ANT4
② : ANT5/ANT6/ANT7/ANT8
③ : GPS
④ : NT1
⑤ : COMM

Details of Test-Arrangement on Radiated emission test (Drawings)

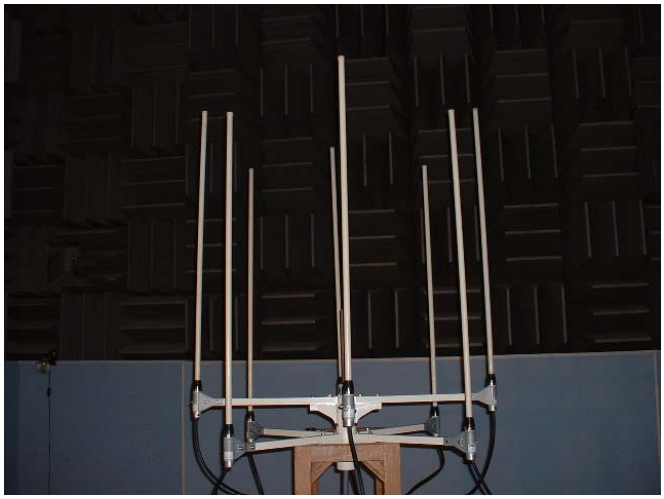




Top View of Antenna Configuration

Test-Setup (Photographs) at worst case

Side View



Side View

Transmitter Power(EIRP) Measurement

Test Date: Octobere 31, 2003
Temp.: 24 °C ; Humi.: 60 %

Measurement Results:

A)Transmission Antenna System : ANT1-ANT4

1)Emission Measurement in Fig.3(a)

CH	Frequency [MHz]	Meter Reading [dBuV] Horizontal Mh	Vertical Mv
206	1880.150	98.10	124.70
255	1894.850	98.20	125.50
49	1909.550	98.10	125.70

2)Substitution Measurement in Fig.3(b)

CH	Frequency [MHz]	Meter Reading [dBuV] Horizontal Msh	Vertical Msv	Supplied Power to Substitution Antenna [dBm] Ps	Gain of Substitution Antenna [dBi] Gs
206	1880.150	85.40	85.45	-2.08	14.22
255	1894.850	85.55	85.45	-2.02	14.28
49	1909.550	85.85	85.95	-1.95	14.36

3)Calculated Result

CH	Frequency [MHz]	Peak EIRP [dBm] Horizontal EIRPh	Vertical EIRPv	Maximum Peak EIRP [W]	Limits [W]	Margin [dB]
512	1880.150	24.84	51.39	137.72	1640.0	+10.8
661	1894.850	24.91	52.31	170.22	1640.0	+ 9.8
49	1909.550	24.66	52.16	164.44	1640.0	+10.0

Sample of calculated result at 1894.850 MHz, as the Minimum Margin point:

	Meter Reading Mh in Fig.3(a)	=	125.50 dB(μV)
	Meter Reading -Msh in Fig.3(b)	=	-85.45 dB(μV)
	Supplied Power to Sub. Ant.	=	-2.02 dB
+)	Gain of Sub. Ant.	=	14.28 dB
	Result	=	52.31 dBm

Peak EIRP = 52.31 dBm : $10^{((52.31-30)/10)}$ = 170.22 (W)

EIRPh = Mh - Msh + Ps + Gs

EIRPv = Mv - Msv + Ps + Gs

Minimum Margin : 10log(1640/170.22) = 9.8(dB)

The point shown on "___ " is the Minimum Margin Point.

Remarks:

Note 3	Detector Function	RES. B.W	V.B.W	Sweep T	Span
A	Peak (SP)	1 MHz	3MHz	20 msec	0 Hz

Tester : Akio Hosoda

Transmitter Power(EIRP) Measurement

Test Date: Octobere 31, 2003
Temp.: 24 °C ; Humi.: 60 %

Measurement Results:

B)Transmission Antenna System : ANT5-ANT8

1)Emission Measurement in Fig.3(a)

CH	Frequency [MHz]	Meter Reading [dBuV] Horizontal Mh	Vertical Mv
206	1880.150	98.20	125.20
255	1894.850	98.30	125.30
49	1909.550	98.00	125.60

2)Substitution Measurement in Fig.3(b)

CH	Frequency [MHz]	Meter Reading [dBuV] Horizontal Msh	Vertical Msv	Supplied Power to Substitution Antenna [dBm] Ps	Gain of Substitution Antenna [dBi] Gs
206	1880.150	85.40	85.45	-2.08	14.22
255	1894.850	85.55	85.45	-2.02	14.28
49	1909.550	85.85	85.95	-1.95	14.36

3)Calculated Result

CH	Frequency [MHz]	Peak EIRP [dBm] Horizontal EIRPh	Vertical EIRPv	Maximum Peak EIRP [W]	Limits [W]	Margin [dB]
512	1880.150	24.94	51.89	154.53	1640.0	+10.3
661	1894.850	25.01	52.11	162.55	1640.0	+10.0
49	1909.550	24.56	52.06	160.69	1640.0	+10.1

Sample of calculated result at 1894.850 MHz, as the Minimum Margin point:

	Meter Reading Mh in Fig.3(a)	=	125.30 dB(μV)
	Meter Reading -Msh in Fig.3(b)	=	-85.45 dB(μV)
	Supplied Power to Sub. Ant.	=	-2.02 dB
+)	Gain of Sub. Ant.	=	14.28 dB
	Result	=	52.11 dBm

Peak EIRP = 52.11 dBm : $10^{((52.11-30)/10)}$ = 162.55 (W)

EIRPh = Mh - Msh + Ps + Gs

EIRPv = Mv - Msv + Ps + Gs

Minimum Margin : 10log(1640/162.55) = 10.0(dB)

The point shown on "___ " is the Minimum Margin Point.

Remarks:

Note 3	Detector Function	RES. B.W	V.B.W	Sweep T	Span
A	Peak (SP)	1 MHz	3MHz	20 msec	0 Hz

Tester : Akio Hosoda