



RADIO TEST REPORT

Test Report No.: 29CE0264-HO-01-J-R1

Applicant : SHARP CORPORATION
Type of Equipment : W-CDMA / GSM Mobile Phone
Model No. : PV300
FCC ID : APYNAR0065
Test regulation : FCC Part 27: 2008
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. Original test report number of this report is 29CE0264-HO-01-J.

Date of test: December 8, 2008 to March 24, 2009

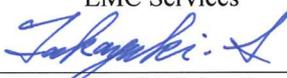
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SECTION 1: Customer information

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Brand name : SHARP
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SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : W-CDMA / GSM Mobile Phone
Model No. : PV300
Serial No. : P3-240, P3-156, P3-040, P3-143
Rating : Battery DC 3.7 - DC 4.2V
(AC Adapter: Input 100 - 240V, 50/60Hz, Output DC 5V)
Receipt Date of Sample : December 5, 2008
Country of Mass-production : Japan
Condition of EUT : Engineering prototype
Modification of EUT : No Modification by the test lab

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2.2 Product Description

This page has been submitted for a separate exhibit.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 27: 2008, final revised on May 8, 2008
Title : FCC 47CFR Part 27
Miscellaneous Wireless Communications Services

3.2 Procedures and results

Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
Peak Output Power	FCC Part2 Section 2.1046	Section 27.50(d)(4)	Conducted/ Radiated	N/A	[Conducted] 7.0dB 1712.4MHz 1732.6MHz (RMC12.2kbps Mode) (HSUPA Subtest 5 Mode) [Radiated] 3.1dB 1752.60MHz Horizontal (RMC12.2kbps Mode) (HSUPA Subtest 5 Mode)	Complied
Emission Bandwidth, 99% Occupied Bandwidth	FCC Part2 Section 2.1049	Section 27.53(h)	Conducted	N/A	-	Complied
Band-Edge	FCC Part2 Section 2.1049	Section 27.53(h)	Conducted/ Radiated	N/A	[Conducted] 7.1dB 1708.75MHz (HSUPA Subtest 5 Mode) [Radiated] 8.3dB 1710.00MHz Vertical (RMC12.2kbps Mode)	Complied
Spurious Emission (Conducted)	FCC Part2 Section 2.1051	Section 27.53(h)	Conducted	N/A	-	Complied
Spurious Emission (Radiated)	FCC Part2 Section 2.1053	Section 27.53(h)	Radiated	N/A	18.4dB 17124.00MHz, Vertical (RMC12.2kbps Mode)	Complied
Frequency Stability (Temperature Variation)	FCC Part2 Section 2.1055(a)(1) and (b)	Section 27.54	Conducted	N/A	-	Complied
Frequency Stability (Voltage Variation)	FCC Part2 Section 2.1055(d)(1) and (2)	Section 27.54	Conducted	N/A	-	Complied

Note: UL Japan, Inc.'s EMI Work Procedures No. QPM05

*These tests were also referred to ANSI/TIA 603-C-2004 "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards."

*These tests were performed without any deviations from test procedure except for additions or exclusions.

3.3 Uncertainty

EMI

Transmitter Spurious Emissions (Radiated)

The measurement uncertainty for this test is 4.62dB(30-1000MHz) and 5.06dB(Above 1GHz).
The data listed in this test report has enough margin, more than the site margin.

Frequency Stability

The measurement uncertainty for this test is 1×10^{-5} .

Other test except Spurious Emission (Radiated) and Frequency Stability

The measurement uncertainty for this test is 3.0dB.

3.4 Test Location

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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.5 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

<W-CDMA Band IV>

Test	Operating mode	Tested frequency	Channel
Peak output Power (Conducted)	Transmitting (Tx) RMC12.2kbps	1712.4MHz	1312
	Transmitting (Tx) AMR	1732.6MHz	1413
	Transmitting (Tx) HSDPA Subtest 1-4	1752.6MHz	1513
	Transmitting (Tx) HSUPA Subtest 1-5		
Peak output Power (Radiated), Emission Bandwidth, 99% Occupied bandwidth, Spurious Emission (Conducted/Radiated)	Transmitting (Tx) RMC12.2kbps	1712.4MHz	1312
	Transmitting (Tx) HSUPA Subtest 5	1732.6MHz	1413
		1752.6MHz	1513
Band Edge (Conducted/Radiated)	Transmitting (Tx) RMC12.2kbps	1712.4MHz	1312
	Transmitting (Tx) HSUPA Subtest 5	1752.6MHz	1513
Frequency Stability (Temperature/Voltage Variation)	Transmitting (Tx) RMC12.2kbps	1732.6MHz	1413
	Transmitting (Tx) HSUPA Subtest 5		

4.1.1 Explanation of the Rel-99 WCDMA and Rel-6 HSPA measurement mode

3GPP defines UE Test Modes and Channel Configurations for Regulatory Testing.

- **UE Test Modes:**
Test Mode 1(Data Loopback Test)
- **Channel Configurations:**
R99 – 12.2kbps Reference Measurement Channel (RMC) channel
HSDPA – Fixed Reference Channel (FRC)
HSUPA – New HSUPA channel configuration (HSDPA data from DL is looped back onto UL)
- **Procedure to configure UE to transmit maximum power:**
Rel99: 3GPP TS 34.121 section 5.2
HSDPA Rel5: 3GPP TS 34.121 section 5.2A
HSDPA Rel6: 3GPP TS 34.121 section 5.2AA
HSUPA Rel6: 3GPP TS 34.121 section 5.2B

* About Rel-99 and HSDPA testing, test equipment send “all up bits” forcing UE max power

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4.1.2 Explanation for HSDPA/HSPA Subtests

3GPP TS 34.121 defines test requirements and procedures for testing all variations of WCDMA. 3GPP TS 34.121 defines 4 HSDPA test configurations and 5 HSPA test configurations (“Subtests”) for various RF Conformance tests. And also FCC KDB941225 D01 is referencing 3GPP Subtest configurations for FCC Type Approval Testing. The Following table shows Release 5 HSDPA and Release 6 HSPA Subtest Configurations per 3GPP TS 34.121.

[HSDPA]

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

[HSPA]

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{OC}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E- TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCCH, DPCCH, HS-DPCCH, E-DPCCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$.

Note 5: In case of testing by UE using E-DPCCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

4.1.3 Maximum Output Power Verification

[HSDPA]

Maximum output power was verified on High, Middle and Low channels according to the Release 5 procedures described in section 5.2 of 3GPP TS 34.121, using an FRC with H-set 1 and 12.2kbps RMC with TPC (transmit power control) set to all "1's". Output power was measured according requirements for HS-DPCCH Sub-test 1-4.

[HUPA]

Maximum output power was verified on the High, Middle and Low channels according to Release 6 procedures in section 5.2 of 3GPP TS 34.121, using the appropriate RMC, FRC and E-DCH configurations. When E-DCH was active, inner loop power control with power control algorithm 2 was used to maintain E-TFCI requirements. Output power for the applicable HSPA modes was measured for E-DCH Sub-test 1-5.

4.1.4 Test Equipment Setting Summary Table

The following table is the key parameters that was configured in test equipment.

Subtest	Mode	Loopback Mode	Rel99 RMC	HSDPA FRC	HSUPA Test	Common Setting		$\beta c/\beta d$	MPR	Power Class 3 limit
						βc	βd			
	Rel99	Test Mode 1	12.2kbps RMC	-	-	-	-	8/15	-	24(+1.7/-3.7dB)
1	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	-	2/15	15/15	2/15	0	24(+1.7/-3.7dB)
2	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	-	12/15	15/15	12/15	0	24(+1.7/-3.7dB)
3	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	-	15/15	8/15	15/8	0.5	23.5(+2.2/-3.7dB)
4	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	-	15/15	4/15	15/4	0.5	23.5(+2.2/-3.7dB)
1	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	HSUPA Loopback	11/15	15/15	11/15	0	24(+1.7/-3.7dB)
2	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	HSUPA Loopback	6/15	15/15	6/15	2	22(+3.7/-3.7dB)
3	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	HSUPA Loopback	15/15	9/15	15/9	1	23(+2.7/-3.7dB)
4	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	HSUPA Loopback	2/15	15/15	2/15	2	22(+3.7/-3.7dB)
5	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	HSUPA Loopback	15/15	15/15	15/15	0	24(+1.7/-3.7dB)

Subtest	HSDPA Specific Settings						
	Δ ACK	Δ NACK	Δ CQI	Ack-Nack repetition factor	CQI Feedback	CQI Repetition Factor	Ahs= β hs/ β c
Rel 6 HSDPA							
1	8	8	8	3	4ms	2	30/15
2	8	8	8	3	4ms	2	30/15
3	8	8	8	3	4ms	2	30/15
4	8	8	8	3	4ms	2	30/15

Subtest	HSDPA Specific Settings							HSUPA Specific Settings			HSUPA Additional Info	
	Δ ACK	Δ NACK	Δ CQI	Ack-Nack repetition factor	CQI Feedback	CQI Repetition Factor	Ahs= β hs/ β c	Δ E-DPCCH	Δ HARQ	AG Index	ETFCI (form TS34.121 Table C.11.1.3)	Associated Max UL Data Rate kbps
Rel 6 HSPA												
1	8	8	8	3	4ms	2	30/15	6	0	20	75	242.1
2	8	8	8	3	4ms	2	30/15	8	0	12	67	174.9
3	8	8	8	3	4ms	2	30/15	8	0	15	92	482.8
4	8	8	8	3	4ms	2	30/15	5	0	17	71	205.8
5	8	8	8	3	4ms	2	30/15	7	0	21	81	308.9

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HSUPA Reference E-TFCI Parameters
 [Subtest 1,2,4,5]

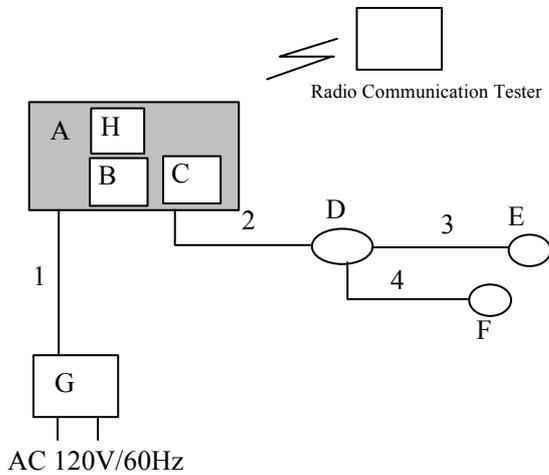
Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	5 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Reference E-TFCI	71
- Reference E-TFCI PO	23
- Reference E-TFCI	75
- Reference E-TFCI PO	26
- Reference E-TFCI	81
- Reference E-TFCI PO	27

[Subtest 3]

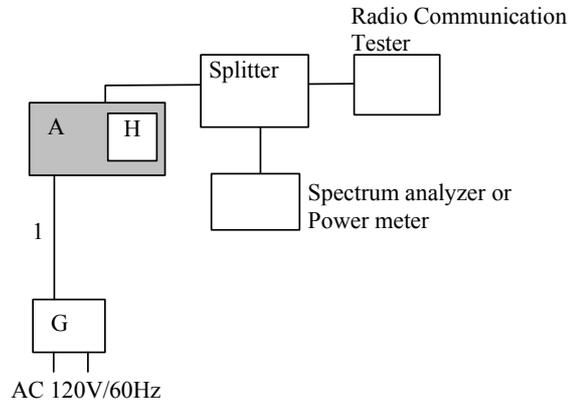
Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	2 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	92
- Reference E-TFCI PO	18

4.2 Configuration and peripherals

<Radiated Emission test>



<Antenna terminal conducted tests>



* Cabling and setup(s) were taken into consideration and test data was taken under worst case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	W-CDMA / GSM Mobile Phone	PV300	P3-240 *1), P3-156 *2), P3-040 *3) P3-143 *4)	SHARP	EUT
B	Battery	PV-BL51	-	SHARP	-
C	Micro SD card (1GB)	-	-	SanDisk	-
D	Microphone & Switch	-	-	SHARP	-
E	Earphone(R)				
F	Earphone(L)				
G	AC Adapter	PV-AC41	RADPA1046YCPZ	SHARP	-
H	TEST USIM Card	-	-	Agilent Technologies	-

*1) Used for Peak Output power (Conducted) test only

*2) Used for Peak Output power (Radiated), Band-Edge (Radiated), and Spurious Emission (Radiated) tests

*3) Used for Emission Bandwidth, Band-Edge (Conducted), Spurious Emission (Conducted), and Frequency Stability tests

*4) Used for Frequency Stability test only

List of cables used

No.	Name	Length (m)	Shield	
			Cable	Connector
1	DC cable	1.5	Shielded	Shielded
2	Microphone & Earphone cable	1.0	Unshielded	Unshielded
3	Earphone cable	0.5	Unshielded	Unshielded
4	Earphone cable	0.2	Unshielded	Unshielded

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SECTION 5: Peak Output Power(Conducted/Radiated)

[Conducted]

Test Procedure

The peak output power (conducted) was measured with a power meter and an attenuator at the antenna port.

Test data : **APPENDIX 2**
Test result : **Pass**

[Radiated]

Test Procedure

- 1) EUT was placed on a platform of nominal size, 1.0 by 0.5m, raised 80cm above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The Radiated Electric Field Strength intensity has been measured in a semi anechoic chamber with a ground plane and at a distance of 3m (for the Peak Output Power for the Radiated). The measuring antenna height varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
- 2) Exchanged the EUT to the Substitution Antenna, the measurement was set for the same height 1m as the EUT. The frequency above 1GHz of the Substitution antenna was used with Horn antenna calibrated with the Half wave dipole antenna, which is harmonized with the measured frequency in 1). The Substitution Antenna was connected with the Signal Generator, and the polarized electromagnetic radiation of the Substitution Antenna was matched with the one of the measuring Antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field is equal to the measured value in 1). The measuring antenna height varied between 1 and 4m to obtain the maximum receiving level. Its Output power of Signal Generator was recorded.
- 3) Equivalent isotropic radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).

Test data : **APPENDIX 2**
Test result : **Pass**

SECTION 6: Bandwidth and Band-Edge (Conducted)

Test Procedure

The Emission Bandwidth, 99% Occupied Bandwidth and Band-Edge was measured with a spectrum analyzer and attenuator connected to the antenna port.

Test data : APPENDIX 2
Test result : Pass

SECTION 7: Spurious Emission (Conducted)

Test Procedure

The Spurious Emission was measured with a spectrum analyzer and attenuator connected to the antenna port.

Test data : APPENDIX 2
Test result : Pass

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SECTION 8: Spurious Radiation and Band-Edge (Radiated)

Test Procedure

- 1) EUT was placed on a platform of nominal size, 1.0m by 0.5m, raised 80cm above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The Radiated Electric Field Strength intensity has been measured in a semi anechoic chamber with a ground plane and at a distance of 3m.
The measuring antenna height was varied between 1 to 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

- 2) Exchanged the EUT to the Substitution Antenna, the antenna was set for the same height as EUT on the table.
The frequency below 1GHz of the Substitution antenna was used as the Half wave dipole antenna and Shorted dipole antenna calibrated with the Half wave dipole antenna, which is harmonized with the measured frequency in 1). The frequency above 1GHz of the Substitution antenna was used with Horn antenna calibrated with the Half wave dipole antenna.
The Substitution antenna was connected with the Signal Generator, and the polarized electromagnetic radiation of the Substitution antenna was matched with the one of the measuring antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field is equal to the measured value in 1).
The measuring antenna height varied between 1 and 4m to obtain the maximum receiving level.
Its Output power of Signal Generator was recorded.

- 3) Equivalent isotropic radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).

- The carrier level and noise levels were confirmed at each position of X, Y and Z axis of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Test data : **APPENDIX 2**
Test result : **Pass**

SECTION 9: Frequency Stability

Test Procedure

The Frequency Stability was measured with a spectrum analyzer and attenuator connected to the antenna port. The Frequency Drift was measured with the 10 deg. C. steps from -30 deg. C. to 50 deg. C., and it is presented as the ppm unit. The Frequency Drift was measured with the normal temperature (20 deg. C.) and Voltage tolerance (DC 3.7V to DC 4.2V), and it is presented as the ppm unit.

Temperature : -30deg.C to +50deg.C (10 deg. C. step)
Voltage : Vnom:DC 3.9V, Vmin:DC 3.7V, Vmax:DC 4.2V : Operating voltage range of EUT *

*The voltage supply beyond DC 4.2V exceeds the operating voltage range of EUT.
In case of the voltage supply below DC 3.7V, the EUT stops operation by low battery detection function.
Therefore, Frequency Stability test was performed under the above condition.

Test data : **APPENDIX 2**
Test result : **Pass**