

DATA OF CONDUCTION TEST

A-PEX INTERNATIONAL CO., LTD.
YOKOWA No.2 OPEN TEST SITE
Report No. : 23BE0062-YW-1

Applicant : OMRON Corporation
Kind of Equipment : RADIO FREQUENCY IDENTIFICATION SYSTEM
Model No. : V640-HAM11 (AMP.) / V640-HS61 (HEAD)
Serial No. :
Power : DC12.0V (DC Power Supply : AC120V/60Hz)
Mode : Transmitting
Remarks : FCC ID : E4E6CYCID6400202
Date : 10/7/2002
Phase : Single Phase
Temperature : 22 °C
Humidity : 60 %
Regulation : FCC Part15.207 (02-157)

Engineer : Naoki Sakamoto

No.	FREQ. [MHz]	READING (N)		READING (L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]				QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]
1.	0.1500	41.2	-	41.6	-	0.1	0.1	0.0	41.8	-	66.0	56.0	24.2	-
2.	0.3335	35.5	-	39.1	-	0.1	0.1	0.0	39.3	-	59.4	49.4	20.1	-
3.	0.5268	27.9	-	29.0	-	0.1	0.2	0.0	29.3	-	56.0	46.0	26.7	-
4.	1.8124	27.4	-	26.0	-	0.1	0.2	0.0	27.7	-	56.0	46.0	28.3	-
5.	2.7365	30.8	-	30.4	-	0.2	0.2	0.0	31.2	-	56.0	46.0	24.8	-
6.	3.7674	39.8	-	40.0	-	0.2	0.2	0.0	40.4	-	56.0	46.0	15.6	-
7.	8.8685	34.0	-	34.0	-	0.4	0.3	0.0	34.7	-	60.0	50.0	25.3	-
8.	16.6570	41.7	-	42.2	-	0.7	0.4	0.0	43.3	-	60.0	50.0	16.7	-
9.	27.0931	44.2	-	44.7	-	0.9	0.5	0.0	46.1	-	60.0	50.0	13.9	-

CALCULATION: READING + LISN FACTOR + CABLE LOSS + ATTEN.

All other spurious emissions were less than 20dB for the limit.

DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.

YOKOWA No.3 OPEN TEST SITE

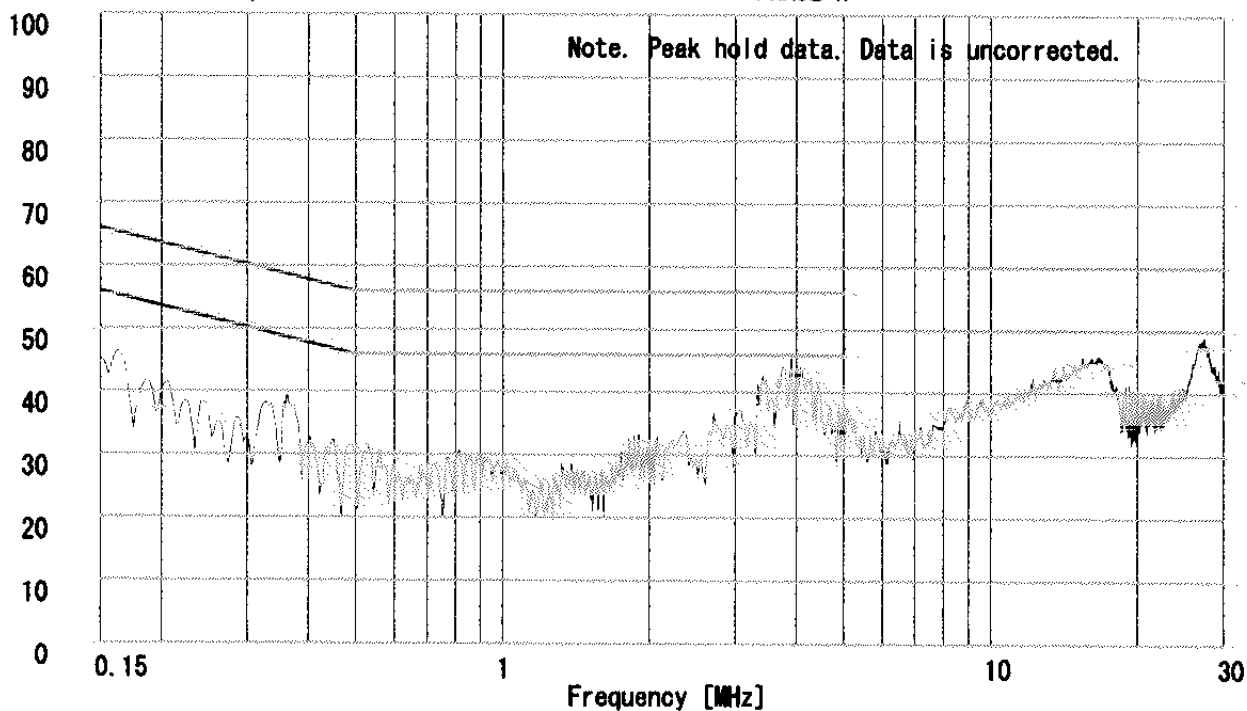
Report No. : 23BE0062-YW-1

Applicant : OMRON Corporation
Kind of Equipment : RADIO FREQUENCY IDENTIFICATION SYSTEM
Model No. : V640-HAM11 (AMP.) / V640-HS61 (HEAD)
Serial No. :
Power : DC12.0V (DC Power Supply : AC120V/60Hz)
Mode : Transmitting
Remarks :
Date : 10/7/2002
Phase : Single Phase
Temperature : 22 °C
Humidity : 60 %
Regulation 1 : FCC Part15.207 (02-157)
Regulation 2 : FCC Part15.207 (02-157)

Engineer : Naoki Sakamoto

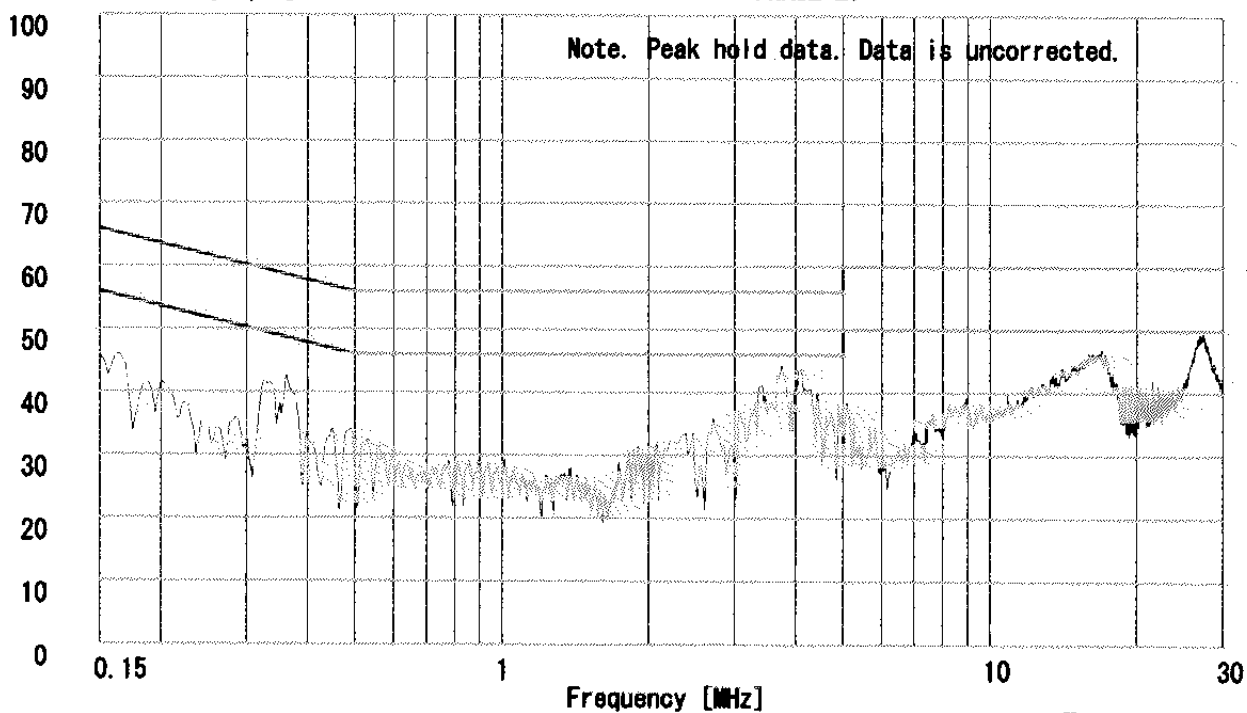
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.

YOKOWA No.3 OPEN TEST SITE

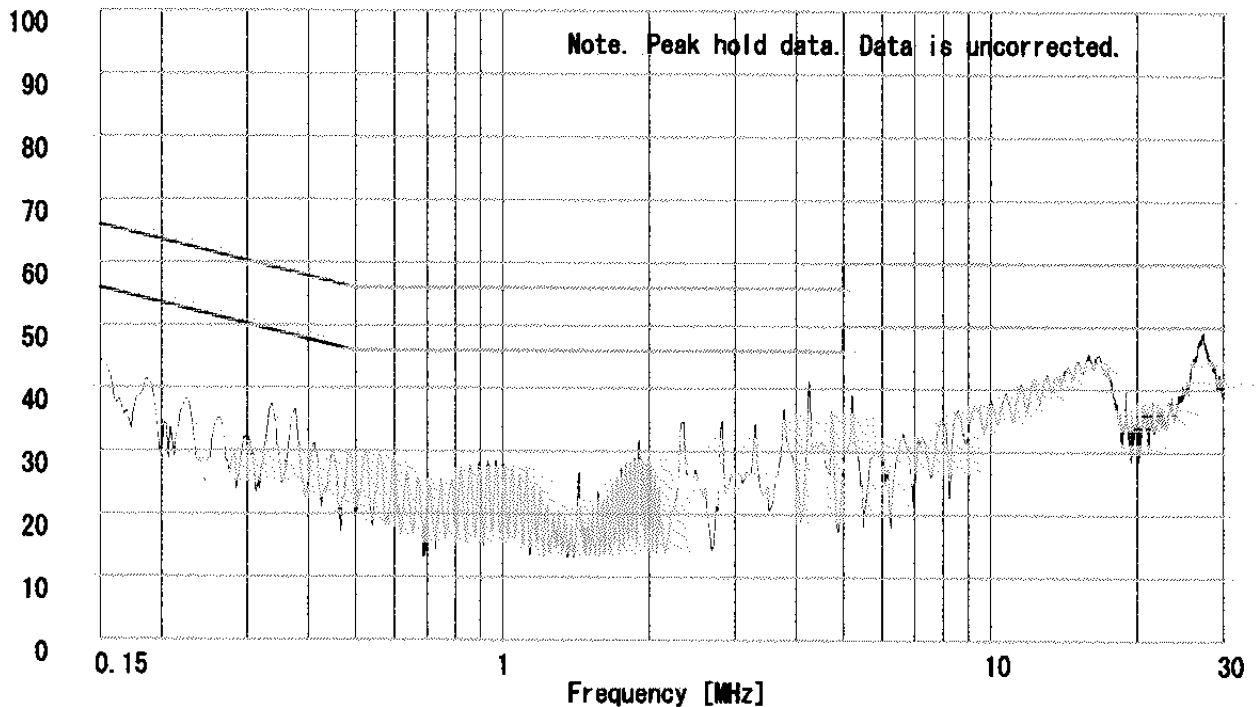
Report No. : 23BE0062-YW-1

Applicant : OMRON Corporation
Kind of Equipment : RADIO FREQUENCY IDENTIFICATION SYSTEM
Model No. : V640-HAM11 (AMP.) / V640-HS61 (HEAD)
Serial No. :
Power : DC12.0V (DC Power Supply : AC120V/60Hz)
Mode : Standby
Remarks :
Date : 10/7/2002
Phase : Single Phase
Temperature : 22 °C
Humidity : 60 %
Regulation 1 : FCC Part15.207 (02-157)
Regulation 2 : FCC Part15.207 (02-157)

Engineer : Naoki Sakamoto

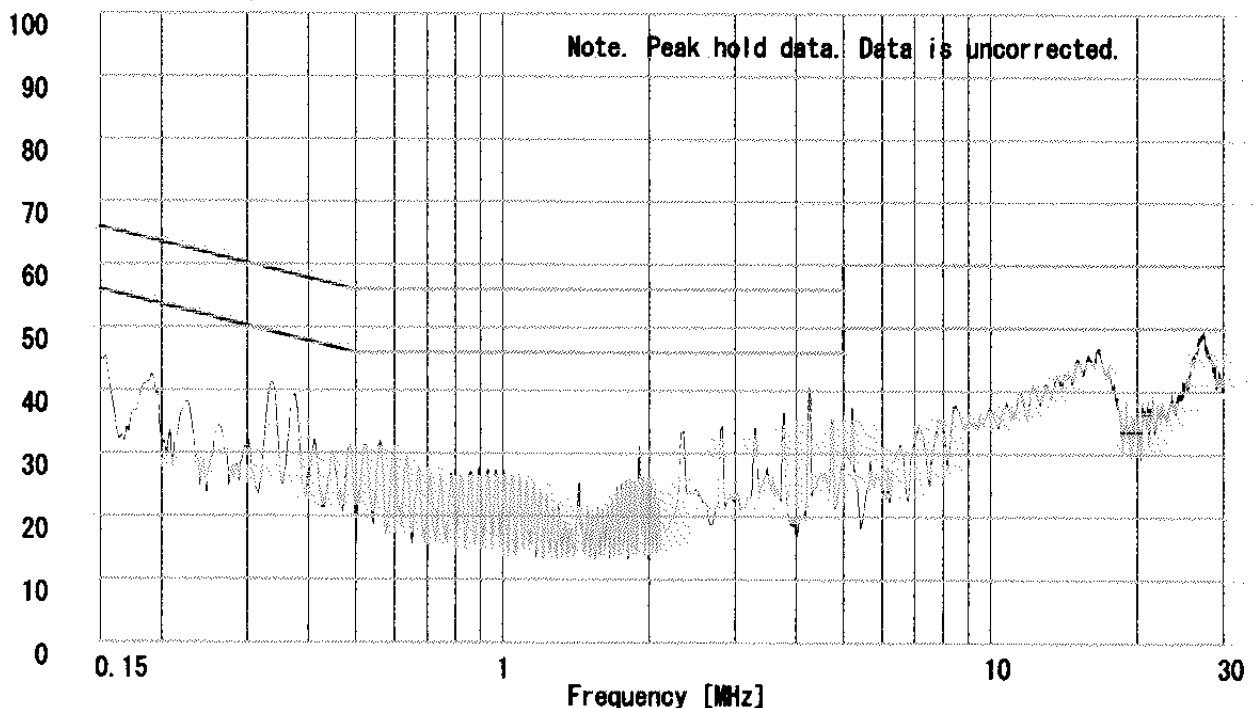
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



Date of carrier and supurious emissions(9kHz to 30MHz)

A-PEX INTERNATIONAL CO., LTD.

Head office No.1 Anechoic chamber

Company : OMRON Corporation
Equipment : RF ID System
Model : V640-HS61/V640-HAM11
Power : DC12.0V
Mode : Transmitting (134kHz)
Temperature : 23deg.C
Humidity : 52%

Report No. : 23BE0062-YW-1
Regulation : FCC 15.209(a)
Test Distance : 3m
Date : 2002/9/30
FCC ID : E4E6CYCID6400202



ENGINEER : Naoki Sakamoto

Frequency Rage :9kHz-90kHz PK/AV DETECT(Test Receiver: BW 200Hz)

Frequency Rage :90kHz-110kHz QP DETECT(Test Receiver: BW 200Hz)

Frequency Rage :110kHz-150kHz PK/AV DETECT(Test Receiver: BW 200Hz)

Frequency Rage :150kHz-490kHz PK/AV DETECT(Test Receiver: BW 10kHz)

Frequency Rage :490kHz-30MHz QP DETECT(Test Receiver: BW 10kHz)

No.	FREQ [kHz]	Loop Max Angle [deg]	detector	T/R	ANT Factor	ATTEN [dB]	CABLE LOSS [dB]	AMP GAIN [dB]	RESULT	LIMIT	MARGIN
			type	READING [dBuV]					[dBuV/m]	[dBuV/m]	[dB]
1	134.20	0	PK	80.7	19.8	0.0	0.2	26.9	73.8	105.0	31.2
1	134.20	90	PK	80.7	19.8	0.0	0.2	26.9	73.8	105.0	31.2
1	134.20	180	PK	80.7	19.8	0.0	0.2	26.9	73.8	105.0	31.2
1	134.20	0	AV	75.5	19.8	0.0	0.2	26.9	68.6	105.0	36.4
2	268.40	0	PK	51.8	19.8	0.0	0.2	27.5	44.3	99.0	54.7
2	268.40	0	AV	44.4	19.8	0.0	0.2	27.5	36.9	99.0	62.1
3	402.60	0	PK	61.5	19.8	0.0	0.2	27.9	53.6	95.5	41.9
3	402.60	0	AV	54.8	19.8	0.0	0.2	27.9	46.9	95.5	48.7
4	536.80	0	QP	36.4	19.8	0.0	0.2	28.0	28.4	73.0	44.6
5	671.00	0	QP	51.8	19.7	0.0	0.2	28.1	43.6	71.1	27.5
6	805.20	0	QP	34.6	19.7	0.0	0.2	28.1	26.4	69.5	43.1
7	939.40	0	QP	46.1	19.7	0.0	0.3	28.1	38.0	68.1	30.1
8	1073.60	0	QP	34.3	19.7	0.0	0.3	28.1	26.2	67.0	40.8
9	1206.00	0	QP	42.6	19.7	0.0	0.3	28.1	34.5	66.0	31.5
10	1340.00	0	QP	33.9	19.7	0.0	0.4	28.1	25.9	65.1	39.2

REMARKS

ANTENNA TYPE : Loop Antenna

CALCULATION : READING + ANT Factor + ATTEN + Cable Loss - AMP Gain

Limits 9kHz to 490kHz : 300m limits + 40log(300/3)

490kHz to 30MHz : 30m limits + 40log(30/3)

All other spurious emissions are more than 20dB below the limits.

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DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.
YOKOWA No.3 OPEN TEST SITE
Report No. : 23BE0062-YW-1

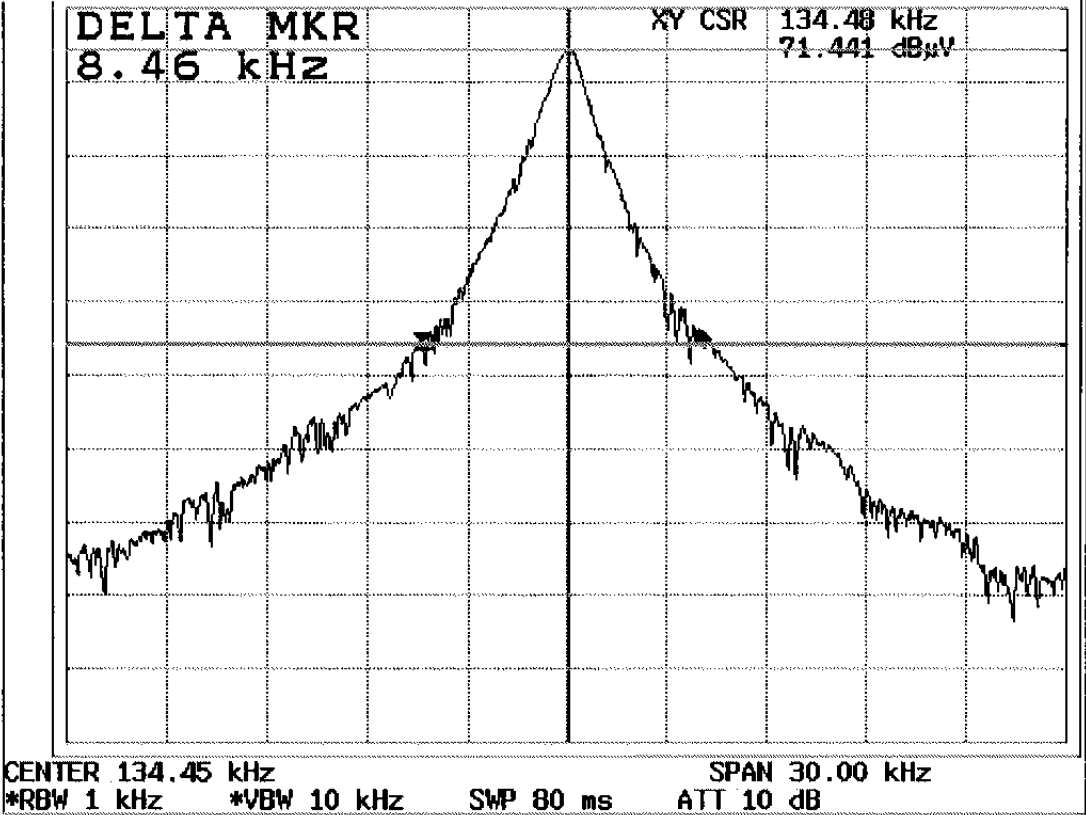
Applicant : OMRON Corporation
Kind of Equipment : RADIO FREQUENCY IDENTIFICATION SYSTEM
Model No. : V640-HAM11 (AMP.) / V640-HS61 (HEAD)
Serial No. :
Power : DC24V 0.1A
Mode : Transmitting
Remarks :
Date : 9/24/2002
Test Distance : 3 m
Temperature : 24 °C
Humidity : 52 %
Regulation : Fcc 15C § 15.209(a)

Engineer : Naoki Sakamoto

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	30.19	BB	25.3	36.1	17.5	28.0	1.4	6.1	22.3	33.1	40.0	17.7	6.9
2.	45.49	BB	32.0	47.2	12.5	27.9	1.3	6.0	23.9	39.1	40.0	16.1	0.9
3.	58.66	BB	38.9	50.8	8.4	27.9	1.6	5.9	26.9	38.8	40.0	13.1	1.2
4.	64.00	BB	43.2	51.2	7.4	27.8	1.7	6.0	30.5	38.5	40.0	9.5	1.5
5.	98.66	BB	41.4	46.5	9.6	27.8	2.1	6.0	31.3	36.4	43.5	12.2	7.1
6.	120.27	BB	35.0	39.4	13.0	27.9	2.3	6.0	28.4	32.8	43.5	15.1	10.7
7.	137.44	BB	47.2	43.0	14.4	27.9	2.5	6.0	42.2	38.0	43.5	1.3	5.5
8.	171.81	BB	42.0	46.0	15.4	27.9	2.8	6.0	38.3	42.3	43.5	5.2	1.2
9.	188.98	BB	37.9	40.2	15.9	27.8	3.0	6.0	35.0	37.3	43.5	8.5	6.2
10.	206.17	BB	35.1	33.7	16.4	27.8	3.1	6.0	32.8	31.4	43.5	10.7	12.1
11.	223.34	BB	34.3	33.5	16.6	27.8	3.2	6.0	32.3	31.5	46.0	13.7	14.5
12.	480.01	BB	25.5	28.5	19.4	27.8	5.0	6.1	28.2	31.2	46.0	17.8	14.8

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

All other spurious emissions were less than 20dB for the limits.
ANT. TYPE: 30-300MHz:Biconical , 300-1000MHz:Logperiodic



Test Report No : 23BE0062-YW-1

APPENDIX 3 Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No.	Test Item	Calibration Date * Interval(month)
AF-01	Pre Amplifier	Hewlett Packard	8447D	RE	2002/04/01 * 12
AT-06	Attenuator	Anritsu	MP721B	RE	2002/04/04 * 12
BA-06	Biconical Antenna	Schwarzbeck	BBA9106	RE	2002/02/16 * 12
LA-07	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	RE	2002/09/09 * 12
SA-06	Spectrum Analyzer	Advantest	R3273	RE / CE	2001/11/20 * 12
TR-05	Test Receiver	Rohde & Schwarz	ESHS10	CE	2002/08/22 * 12
TR-06	Test Receiver	Rohde & Schwarz	ESVS10	RE	2001/11/22 * 12
CC-3ORC	Yokowa No.3 open coaxial(0.01-1000MHz)	A-PEX	CC-31,CC-32,C C-33,CC-34,CC -35,CC-36,CC-3 7,SW-31,SW-32	RE	2002/03/30 * 12
CC-3S	Yokowa No.3 shield coaxial(0.01-1000MHz)	A-PEX	CC-34,CC-35,C C-36,CC-38,SW -31,SW-32	CE	2002/03/30 * 12
YOATS-03	Open Test Site	JSE	3m, 10m	RE	2002/05/01 * 12
LS-04	LISN	Rohde & Schwarz	ESH3-Z5	CE	2001/11/06 * 12
LS-07	LISN	Schwarzbeck	NSLK8126	CE	2001/11/06 * 12
OS-11	Digital Humidity Indicator	SATO	PC-5000TRH	CE	2002/05/09 * 12
OS-16	Digital Humidity Indicator	SATO	PC-5000TRH	RE	2002/05/16 * 12
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	RE	2001/12/29 * 12
MPA-04	Pre Amplifier	Agilent	8447D	RE	2002/03/13 * 12
MLPA-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	RE	2001/12/18 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	RE	2001/11/13 * 12

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Test Item:

CE: Conducted emission,
RE: Radiated emission