

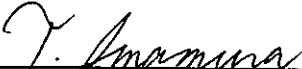
ADDENDUM EMI TEST REPORT

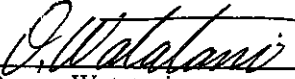
Test Report No. : 22KE0008-YK-A

Applicant: FUKUDA DENSHI CO., LTD.
Type of Equipment: Telemetry Transmitter Module
Model No.: HLX-561
FCC ID: DV8HLX561A
Test standard: FCC Part 15 Subpart C, Section 15.207
FCC Part 95 Subpart H, Section 95.1115
(Except FCC 95.1115(e) Frequency Stability)
FCC Part 2 Subpart J, Section 2.1049 and 2.1051
Test Result: Complied

1. This test report shall not be reproduced except in full or partial, without the written approval of A-Pex International Co., Ltd.
2. The results in this report apply only to the sample tested.

Date of test: July 9-10 and September 5-6, 2002

Tested by: 
Toyokazu Imamura
EMC section

Approved by: 
Osamu Watatani
Site Assistant Manager of Yamakita Lab.

A-pex International Co., Ltd.
YAMAKITA LAB.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone: int +81 465 77 1011
Facsimile: int +81 465 77 2112

MF060b(23.04.02)

2 PRODUCT DESCRIPTION

FUKUDA DENSHI, Model: HLX-561 (referred to as the EUT in this report) is a TELEMETRY TRANSMITTER MODULE.

The clock frequency used in EUT is 9.6MHz (Reference for Carrier Frequency), 84kHz (Clock for Gate Array) and 16MHz (CPU Clock).

Frequency characteristics:	608.0125MHz through 613.9875MHz
No. of channels/ channel spacing:	445 channels/ 12.5kHz channel spacing
Modulation:	FSK
Antenna type:	whip antenna
Antenna Gain:	0.4dBi
Operating Voltage:	DC5.0V

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MF060b(23.04.02)

3 SYSTEM TEST CONFIGURATION

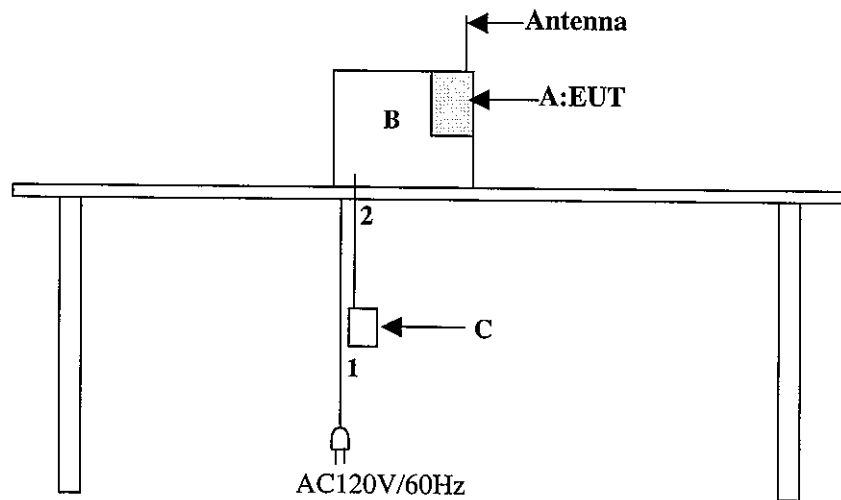
3.1 Justification

The system was configured in typical fashion (as a customer would normally use it) for testing.

Test mode : Transmitting mode
 The EUT transmits under constant modulation.

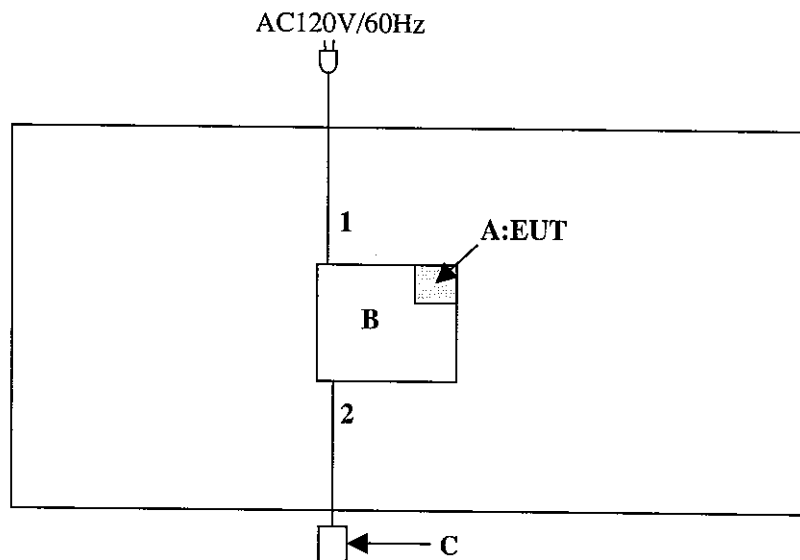
3.2 Configuration of Tested System

Front View



*Cabling was taken into consideration and test data was taken under worse case conditions.

Top View



*Cabling was taken into consideration and test data was taken under worse case conditions.

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MF060b(23.04.02)

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	TELEMETRY TRANSMITTER MODULE	HLX-561	2002012905	FUKUDA DENSHI	DV8HLX561A(EUT)
B	PATIENT MONITOR	DS-5100E	9807-2300	FUKUDA DENSHI	DoC
C	Shorting Bar	-	-	FUKUDA DENSHI	-

Meshed column are represented EUT

List of cables used

No.	Name	Length (m)	Shield	Backshell material
1	AC main Cable	3.5	Unshielded	Polyvinyl chloride
2	ECG cable	3.5	Shielded	Polyvinyl chloride

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MF060b(23.04.02)

5.3 § 95.1115(b) Out of Band Emissions(Radiated)

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged 40cm height to the ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

The Radiated Electric Field Strength intensity has been measured on an open test site 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.

The measurements were performed for both vertical and horizontal antenna polarization.

EUT emission levels were compared when the EUT antenna position was vertical polarization and horizontal polarization. It was opened under transmitting mode.

Radiated Spurious emissions

The result was also satisfied the general limits specified in Sec.95.1115(b).

To determine the level of band-edge spurious, we use the following procedure:

Set the resolution bandwidth to 1 kHz in the peak detector mode. Measure the maximum level of the in-band channel closest to the band edge and the maximum level of the out-of-band emissions close to the same band edge. Determine the ratio of the in-band signal to the out-of-band emissions. Then, measure the level of the in-band channel in CISPR quasi-peak mode with 120 kHz bandwidth. Using the ratio obtained, we calculate the equivalent level of the out-of-band emissions to determine compliance with the limits.

Measurement range : 30MHz to 1000MHz CISPR QP Detector, IF BW 120kHz
: 1GHz to 7GHz AV Detector

Test data : APPENDIX Page27 to 32 (30 –1000MHz)
: APPENDIX Page33 to 38 (1 – 7GHz)
: APPENDIX Page39 to 40 (Band Edges:608MHz/614MHz, Restricted band Charts)

Photographs of test setup : Page14

Test result : Pass

Test instruments : KCC-20/21/22/23/29,KCC-D1/D2,KCC-D3,KBA-02,KLA-02,KHA-02,
KAF-03,KAF-04,KAT6-03,KSA-02,KTR-04,KOTS-02

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MF060b(23.04.02)

5.4 §2.1049 Occupied Bandwidth and 26dB Bandwidth (Antenna Port Conducted)

Test Procedure

The minimum Occupied bandwidth (99%) and 26dB Bandwidth was measured with a spectrum analyzer connected to the antenna port.

The measurement was performed according to the procedures in ANSI C63.4 (2000).

Occupied Bandwidth (99 %)

1. 608.0125MHz (Low) : 7.64kHz
2. 611.0000MHz (Mid) : 7.57kHz
3. 613.9875MHz (High): 7.64kHz

26dB Bandwidth

1. 608.0125MHz (Low) : 31.062kHz
2. 611.0000MHz (Mid) : 31.313kHz
3. 613.9875MHz (High) : 31.062kHz

Test data : APPENDIX Page41

Test instruments : KTR-01,KSA-02,KCC-D5

5.5 § 2.1051 Out of Band Emissions(Antenna Port Conducted)

Test Procedure

The Out of Band Emissions(Conducted) was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX Page42 to 47

Test result : Pass

Test instruments : KTR-01,KCC-D5

A-pex International Co., Ltd.

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MF060b(23.04.02)

DATA OF CONDUCTION TEST

A-PEX INTERNATIONAL CO., LTD.
Yamakita No.2 Open Test Site
Report No. : 22KE0008-YK **A**

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (608.0125MHz)
Remarks : -
Date : 9/6/2002
Phase : Single Phase
Temperature : 21 °C
Humidity : 65 %
Regulation : CISPR Pub. 22 CLASS B


Engineer : Toyokazu Imamura

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.	0.2027	40.8	-	48.4	-	1.1	0.1	0.0	49.6	-	63.5	53.5	13.9	-
2.	0.2691	21.8	-	22.5	-	0.9	0.1	0.0	23.5	-	61.1	51.1	37.6	-
3.	0.3336	35.6	-	30.6	-	0.8	0.1	0.0	36.5	-	59.4	49.4	22.9	-
4.	0.6084	37.7	-	33.3	-	0.4	0.2	0.0	38.3	-	56.0	46.0	17.7	-
5.	1.6916	28.7	-	21.2	-	0.3	0.3	0.0	29.3	-	56.0	46.0	26.7	-
6.	2.1643	23.0	-	20.9	-	0.3	0.4	0.0	23.7	-	56.0	46.0	32.3	-
7.	30.0000	38.8	-	39.0	-	0.7	2.1	0.0	41.8	-	60.0	50.0	18.2	-

CALCULATION: READING[dBμV] + LISN FACTOR[dB] + CABLE LOSS[dB] + ATTEN[dB].

■ LISN: KLS-05 (NSLK8126) ■ COAXIAL CABLE: KCC-24/25/26/28/KPL-02
■ EMI RECEIVER: KTR-03 (ESHS10)

DATA OF CONDUCTION TEST

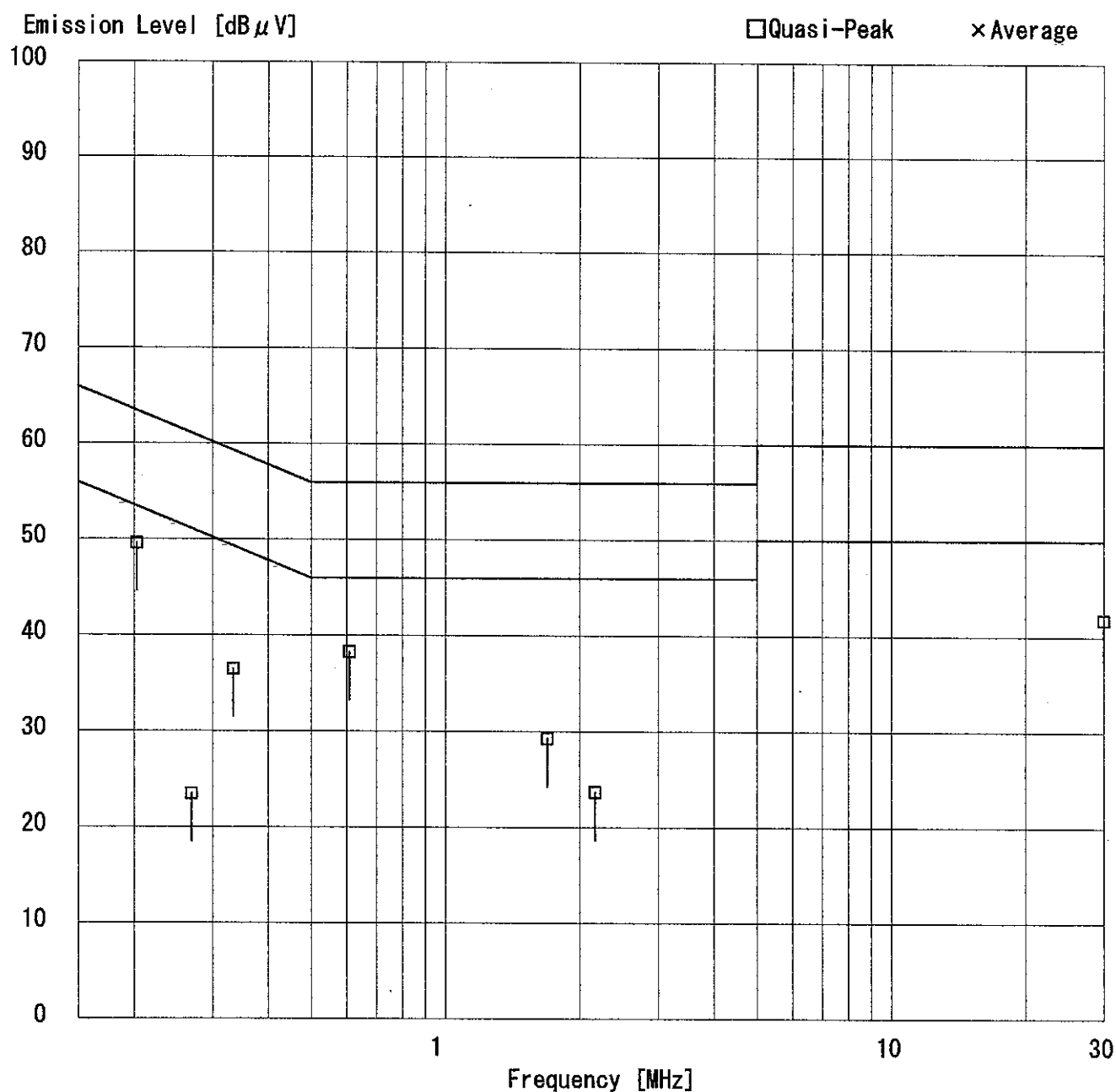
A-PEX INTERNATIONAL CO., LTD.

Yamakita No.2 Open Test Site

Report No. : 22KE0008-YK-A

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (608.0125MHz)
Remarks : -
Date : 9/6/2002
Phase : Single Phase
Temperature : 21 °C
Humidity : 65 %
Regulation : CISPR Pub.22 CLASS B

T. Imamura
Engineer : Toyokazu Imamura



DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.2 Open Test Site

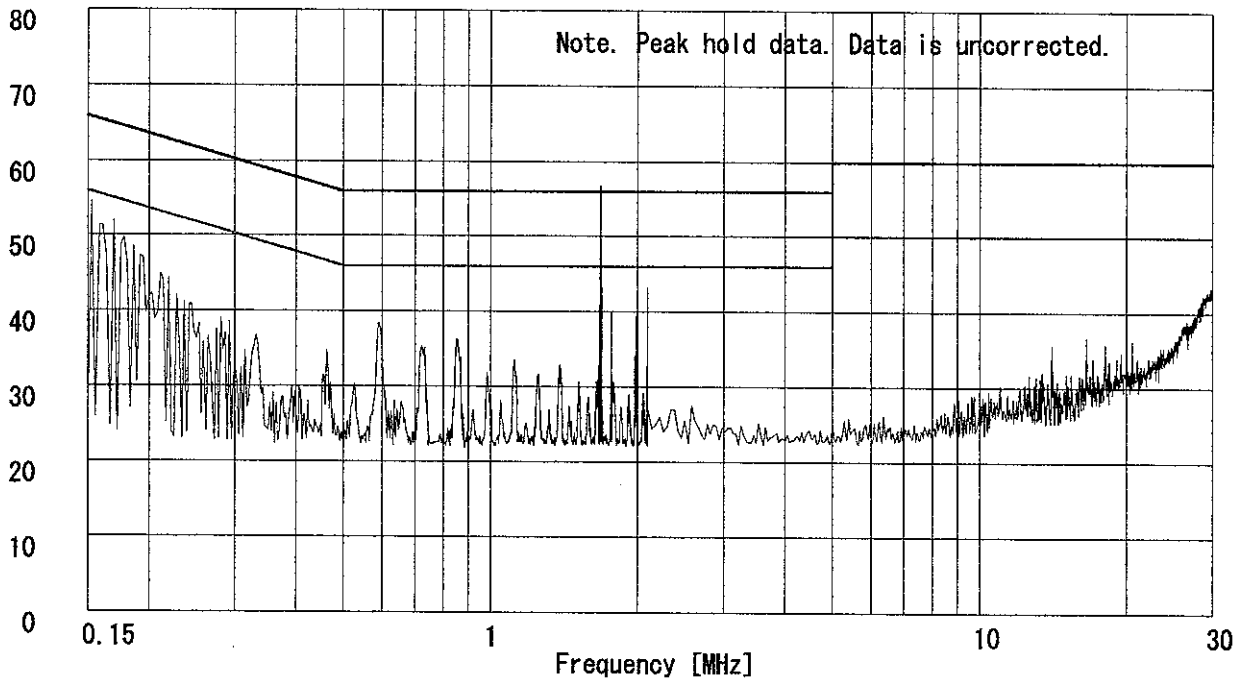
Report No. : 22KE0008-YK-A

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (608.0125MHz)
Remarks : -
Date : 9/6/2002
Phase : Single Phase
Temperature : 21 °C
Humidity : 65 %
Regulation 1 : CISPR Pub.22 CLASS B
Regulation 2 : None

T. Imamura
Engineer : Toyokazu Imamura

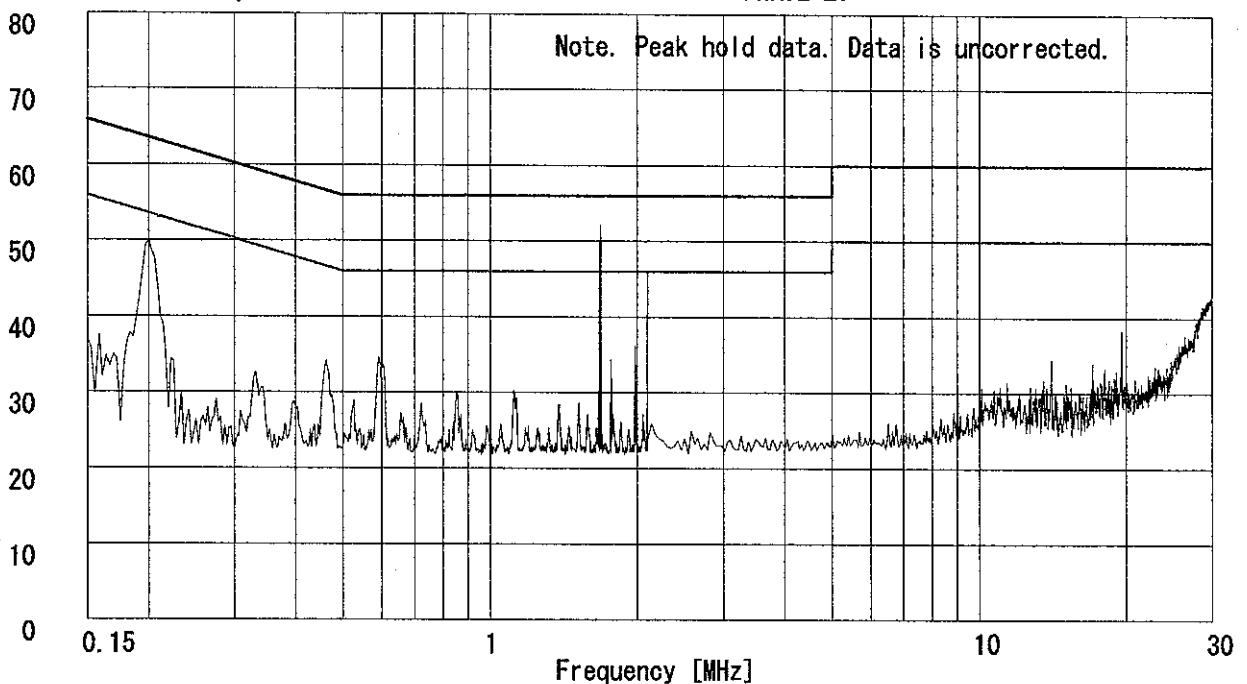
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



Page:

DATA OF CONDUCTION TEST

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.2 Open Test Site

Report No. : 22KE0008-YK-**A**

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting(613.9875MHz)
Remarks : -
Date : 9/6/2002
Phase : Single Phase
Temperature : 21 °C
Humidity : 65 %
Regulation : CISPR Pub.22 CLASS B


Engineer : Toyokazu Imamura

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.	0.2028	40.5	-	48.4	-	1.1	0.1	0.0	49.6	-	63.5	53.5	13.9	-
2.	0.2715	22.1	-	22.1	-	0.9	0.1	0.0	23.1	-	61.1	51.1	38.0	-
3.	0.3376	35.2	-	31.0	-	0.8	0.1	0.0	36.1	-	59.3	49.3	23.2	-
4.	0.6067	37.7	-	32.8	-	0.4	0.2	0.0	38.3	-	56.0	46.0	17.7	-
5.	1.6924	28.4	-	21.0	-	0.3	0.3	0.0	29.0	-	56.0	46.0	27.0	-
6.	2.1643	23.3	-	21.6	-	0.3	0.4	0.0	24.0	-	56.0	46.0	32.0	-
7.	30.0000	30.9	-	31.0	-	0.7	2.1	0.0	33.8	-	60.0	50.0	26.2	-

CALCULATION: READING[dB μ V] + LISN FACTOR[dB] + CABLE LOSS[dB] + ATTEN[dB].

■ LISN: KLS-05 (NSLK8126) ■ COAXIAL CABLE: KCC-24/25/26/28/KPL-02
■ EMI RECEIVER: KTR-03 (ESHS10)

DATA OF CONDUCTION TEST

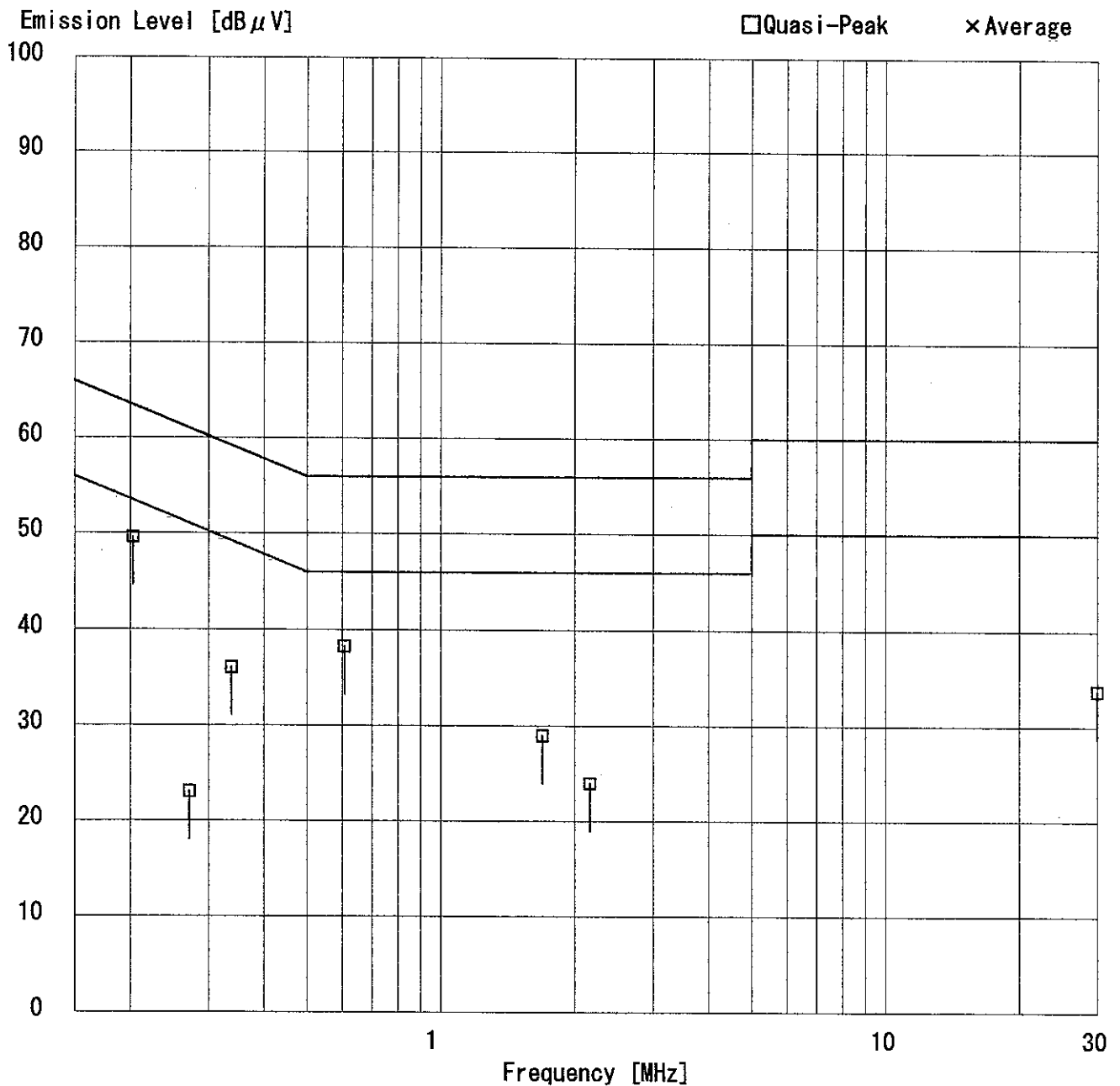
A-PEX INTERNATIONAL CO., LTD.

Yamakita No.2 Open Test Site

Report No. : 22KE0008-YK **A**

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (613.9875MHz)
Remarks : -
Date : 9/6/2002
Phase : Single Phase
Temperature : 21 °C
Humidity : 65 %
Regulation : CISPR Pub.22 CLASS B

T. Imamura
Engineer : Toyokazu Imamura



DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.2 Open Test Site

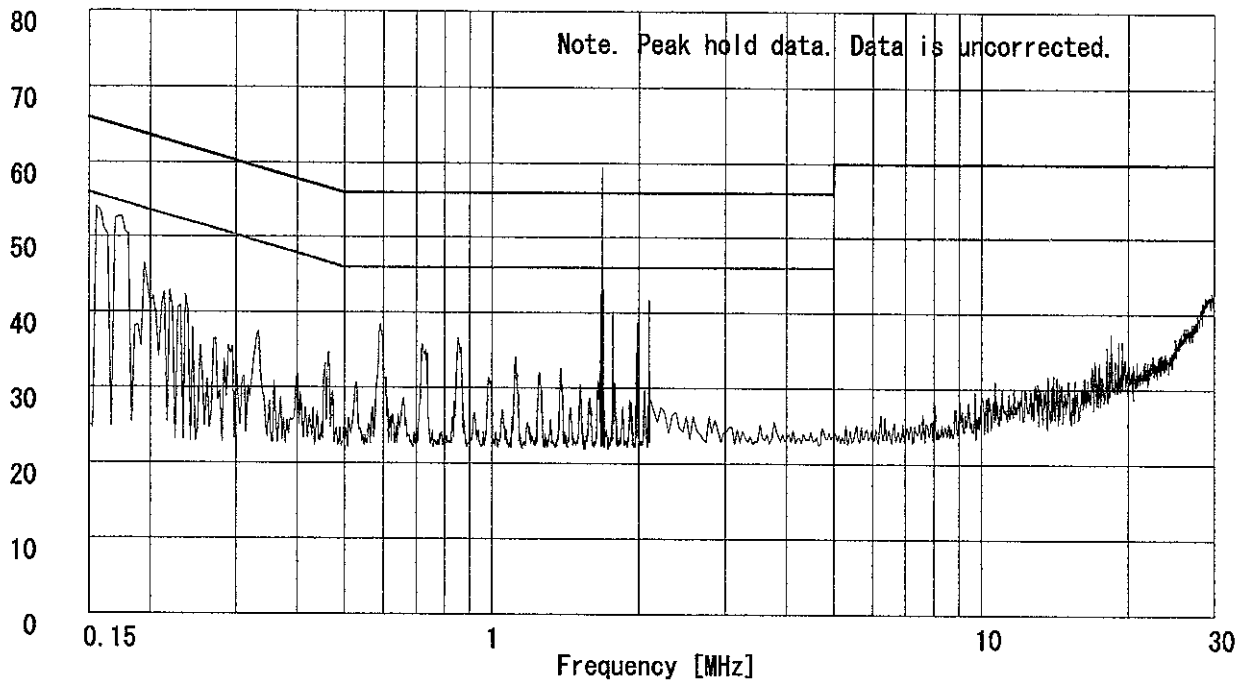
Report No. : 22KE0008-YK **A**

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (613.9875MHz)
Remarks : -
Date : 9/6/2002
Phase : Single Phase
Temperature : 21 °C
Humidity : 65 %
Regulation 1 : CISPR Pub.22 CLASS B
Regulation 2 : None

T. Imamura
Engineer : Toyokazu Imamura

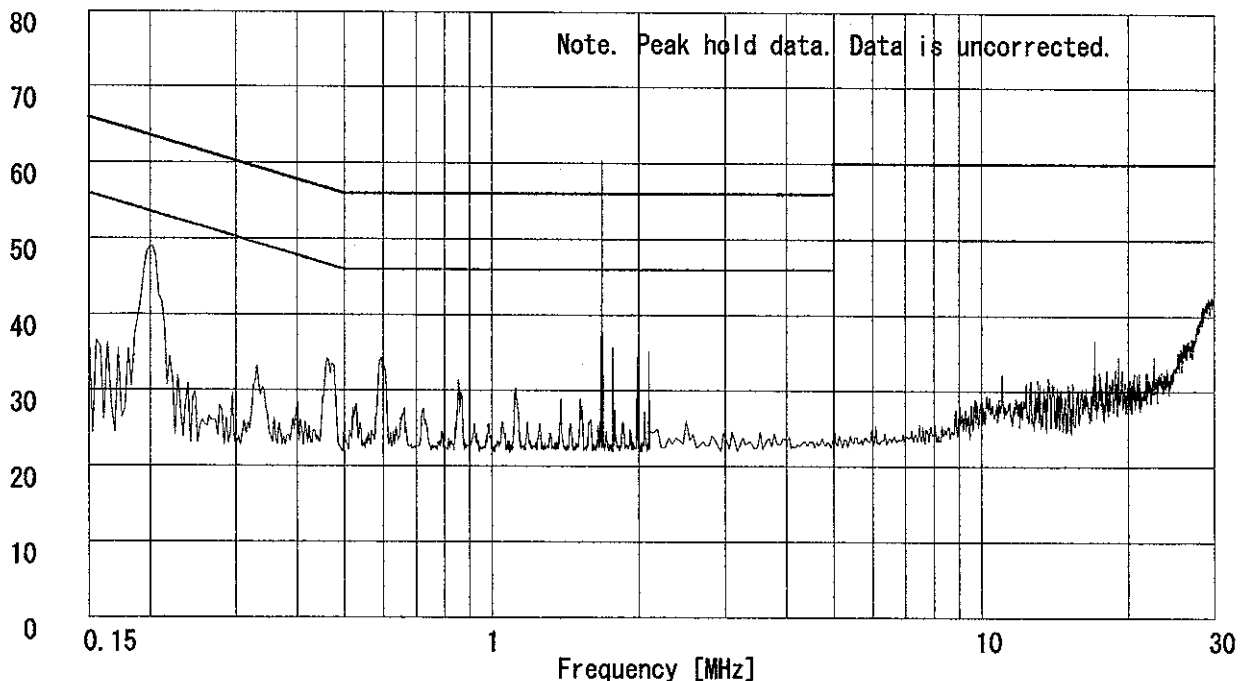
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1

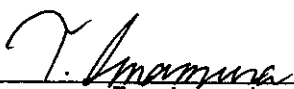


Page:

DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.
Yamakita No.2 Open Test Site
Report No. : 22KE0008-YK-A

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (608.0125MHz)
Remarks : -
Date : 9/5/2002
Test Distance : 3 m
Temperature : 24 °C
Humidity : 56 %
Regulation : FCC Part95H § 95.1115(a)


Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	608.01	BB	88.3	90.1	19.9	29.6	5.7	5.8	90.1	91.9	106.0	15.9	14.1

CALCULATION: $\text{READING}[\text{dB } \mu\text{V}] + \text{ANT. FACTOR}[\text{dB/m}] + \text{CABLE LOSS}[\text{dB}] - \text{AMP. GAIN}[\text{dB}] + \text{ATTEN}[\text{dB}]$.

■ ANTENNA: KBA-02 (BBA9106) 30-299MHz/KLA-02 (USLP9143) 300-1000MHz
■ AMP: KAF-03 (8447D) ■ RECEIVER: KTR-04 (ESVS10) ■ CABLE: KCC-20/21/22/23/29

DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.2 Open Test Site

Report No. : 22KE0008-YK A

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (611.0000MHz)
Remarks : -
Date : 9/5/2002
Test Distance : 3 m
Temperature : 24 °C
Humidity : 56 %
Regulation : FCC Part95H § 95.1115(a)


Engineer : Toyokazu Imamura

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.	611.00	BB	88.3	90.1	19.9	29.6	5.7	5.8	90.1	91.9	106.0	15.9	14.1

CALCULATION: READING[dB μ V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

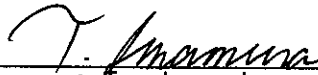
■ ANTENNA: KBA-02 (BBA9106) 30-299MHz/KLA-02 (USLP9143) 300-1000MHz

■ AMP: KAF-03 (8447D) ■ RECEIVER: KTR-04 (ESVS10) ■ CABLE: KCC-20/21/22/23/29

DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.
Yamakita No.2 Open Test Site
Report No. : 22KE0008-YK-A

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting(613.9875MHz)
Remarks : -
Date : 9/5/2002
Test Distance : 3 m
Temperature : 24 °C
Humidity : 56 %
Regulation : FCC Part95H § 95.1115(a)


Engineer : Toyokazu Imamura

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.	613.99	BB	88.3	89.7	19.9	29.6	5.7	5.8	90.1	91.5	106.0	15.9	14.5

CALCULATION: $\text{READING}[\text{dB } \mu \text{V}] + \text{ANT. FACTOR}[\text{dB/m}] + \text{CABLE LOSS}[\text{dB}] - \text{AMP. GAIN}[\text{dB}] + \text{ATTEN}[\text{dB}]$.

■ ANTENNA: KBA-02 (BBA9106) 30-299MHz/KLA-02 (USLP9143) 300-1000MHz
■ AMP: KAF-03 (8447D) ■ RECEIVER: KTR-04 (ESVS10) ■ CABLE: KCC-20/21/22/23/29

DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.
Yamakita No.2 Open Test Site
Report No. : 22KE0008-YK-A

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (608. 0125MHz)
Remarks : -
Date : 9/5/2002
Test Distance : 3 m
Temperature : 21 °C
Humidity : 70 %
Regulation : FCC Part95H § 95.1115 (b) (1)


Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	100.00	BB	36.7	39.9	9.9	28.4	2.1	5.8	26.1	29.3	46.0	19.9	16.7
2.	104.01	BB	35.7	41.1	10.5	28.4	2.2	5.8	25.8	31.2	46.0	20.2	14.8
3.	150.00	BB	29.7	32.3	14.3	28.3	2.7	5.8	24.2	26.8	46.0	21.8	19.2
4.	200.00	BB	30.6	30.9	16.3	27.9	3.1	5.8	27.9	28.2	46.0	18.1	17.8
5.	208.00	BB	28.6	31.7	16.3	27.9	3.1	5.8	25.9	29.0	46.0	20.1	17.0
6.	240.00	BB	30.4	29.1	16.5	27.8	3.4	5.8	28.3	27.0	46.0	17.7	19.0
7.	250.01	BB	29.3	28.0	16.5	27.7	3.5	5.8	27.4	26.1	46.0	18.6	19.9
8.	300.01	BB	29.5	30.0	14.6	27.8	3.8	5.8	25.9	26.4	46.0	20.1	19.6
9.	608.00	BB	33.2	36.5	19.9	29.6	5.7	5.8	35.0	38.3	46.0	11.0	7.7

CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KBA-02 (BBA9106) 30-299MHz/KLA-02 (USLP9143) 300-1000MHz

■ AMP: KAF-03 (8447D) ■ RECEIVER: KTR-04 (ESVS10) ■ CABLE: KCC-20/21/22/23/29

DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.2 Open Test Site

Report No. : 22KE0008-YK-A

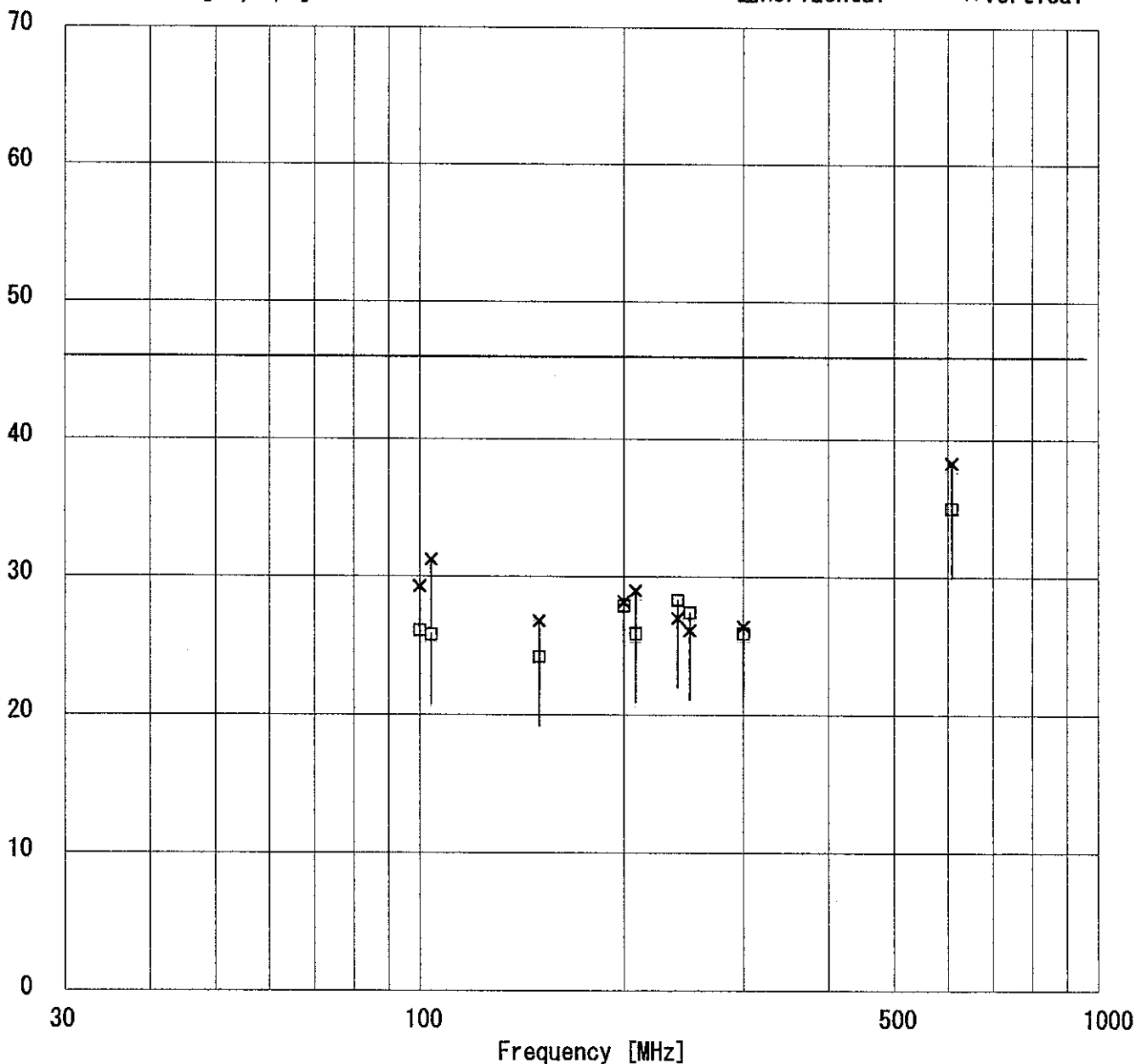
Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (608.0125MHz)
Remarks : -
Date : 9/5/2002
Test Distance : 3 m
Temperature : 21 °C
Humidity : 70 %
Regulation : FCC Part95H § 95.1115(b) (1)

T. Imamura
Engineer : Toyokazu Imamura

Emission Level [dB μ V/m]

□ Horizontal

× Vertical



DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.2 Open Test Site

Report No. : 22KE0008-YK-A

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (613.9875MHz)
Remarks : -
Date : 9/5/2002
Test Distance : 3 m
Temperature : 24 °C
Humidity : 56 %
Regulation : FCC Part95H § 95.1115(b) (1)


Engineer : Toyokazu Imamura

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.	100.00	BB	37.0	39.7	9.9	28.4	2.1	5.8	26.4	29.1	46.0	19.6	16.9
2.	150.01	BB	32.4	35.4	14.3	28.3	2.7	5.8	26.9	29.9	46.0	19.1	16.1
3.	200.00	BB	30.1	28.1	16.3	27.9	3.1	5.8	27.4	25.4	46.0	18.6	20.6
4.	208.02	BB	38.4	31.0	16.3	27.9	3.1	5.8	35.7	28.3	46.0	10.3	17.7
5.	240.02	BB	36.4	28.0	16.5	27.8	3.4	5.8	34.3	25.9	46.0	11.7	20.1
6.	250.01	BB	32.0	31.3	16.5	27.7	3.5	5.8	30.1	29.4	46.0	15.9	16.6
7.	300.02	BB	28.6	28.2	14.6	27.8	3.8	5.8	25.0	24.6	46.0	21.0	21.4
8.	614.00	BB	35.1	36.9	19.9	29.6	5.7	5.8	36.9	38.7	46.0	9.1	7.3

CALCULATION: READING[dB μ V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KBA-02 (BBA9106) 30-299MHz/KLA-02 (USLP9143) 300-1000MHz

■ AMP: KAF-03 (8447D) ■ RECEIVER: KTR-04 (ESVS10) ■ CABLE: KCC-20/21/22/23/29

DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.2 Open Test Site

Report No. : 22KE0008-YK-A

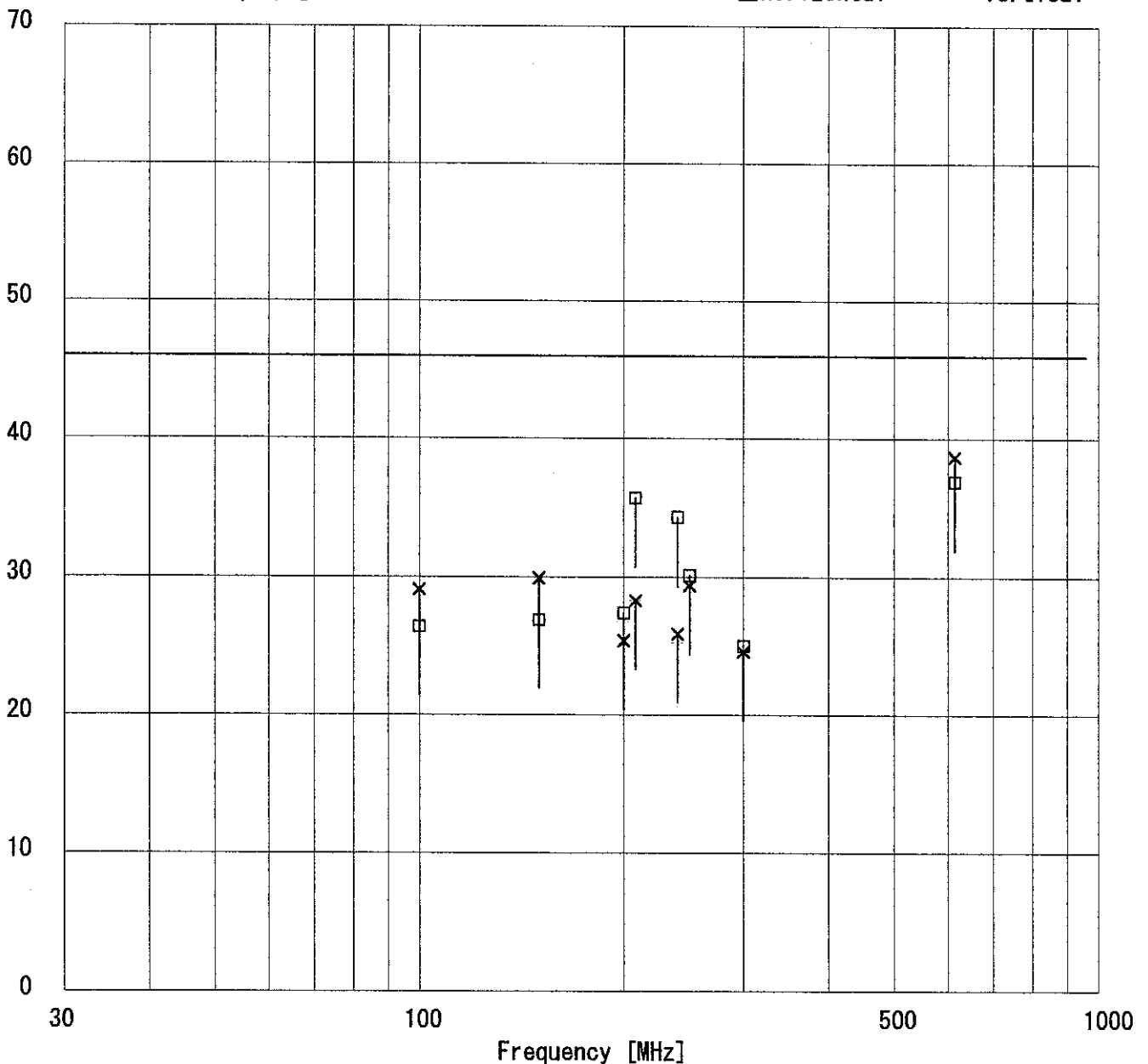
Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (613.9875MHz)
Remarks : -
Date : 9/5/2002
Test Distance : 3 m
Temperature : 24 °C
Humidity : 56 %
Regulation : FCC Part95H § 95.1115 (b) (1)

T. Imamura
Engineer : Toyokazu Imamura

Emission Level [dB μ V/m]

□ Horizontal

× Vertical



DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.
Yamakita No.2 Open Test Site
Report No. : 22KE0008-YK-A

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (608.0125MHz)
Remarks : AV Detected mode
Date : 9/6/2002
Test Distance : 3 m
Temperature : 25 °C
Humidity : 62 %
Regulation : FCC Part95H § 95.1115 (b) (2)


Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	1216.03	BB	48.0	50.1	26.5	35.8	1.7	0.0	40.4	42.5	53.9	13.5	11.4
2.	1824.04	BB	34.2	34.0	27.8	35.1	2.1	0.0	29.0	28.8	53.9	24.9	25.1
3.	2432.05	BB	31.6	32.0	29.9	34.9	2.4	0.0	29.0	29.4	53.9	24.9	24.5
4.	3040.06	BB	34.6	40.8	30.0	34.9	2.7	0.0	32.4	38.6	53.9	21.5	15.3
5.	3648.08	BB	41.2	45.2	30.5	35.3	2.9	0.0	39.3	43.3	53.9	14.6	10.6
6.	4256.09	BB	41.4	41.1	32.3	35.5	3.3	0.0	41.5	41.2	53.9	12.4	12.7
7.	4864.10	BB	28.6	28.0	33.7	34.7	3.5	0.0	31.1	30.5	53.9	22.8	23.4
8.	5472.11	BB	28.1	27.9	33.9	34.5	3.7	0.0	31.2	31.0	53.9	22.7	22.9
9.	6080.13	BB	28.4	28.4	36.6	34.2	3.8	0.0	34.6	34.6	53.9	19.3	19.3

CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KHA-02 (1-18GHz)

■ AMP: KAF-04 (8449B) ■ RECEIVER: KTR-01 ■ CABLE: KCC-D3

DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.2 Open Test Site

Report No. : 22KE0008-YK-A

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (608.0125MHz)
Remarks : AV Detected mode
Date : 9/6/2002
Test Distance : 3 m
Temperature : 25 °C
Humidity : 62 %
Regulation : FCC Part95H § 95.1115 (b) (2)


Engineer : Toyokazu Imamura

Emission Level [dB μ V/m]

□ Horizontal

× Vertical

70

60

50

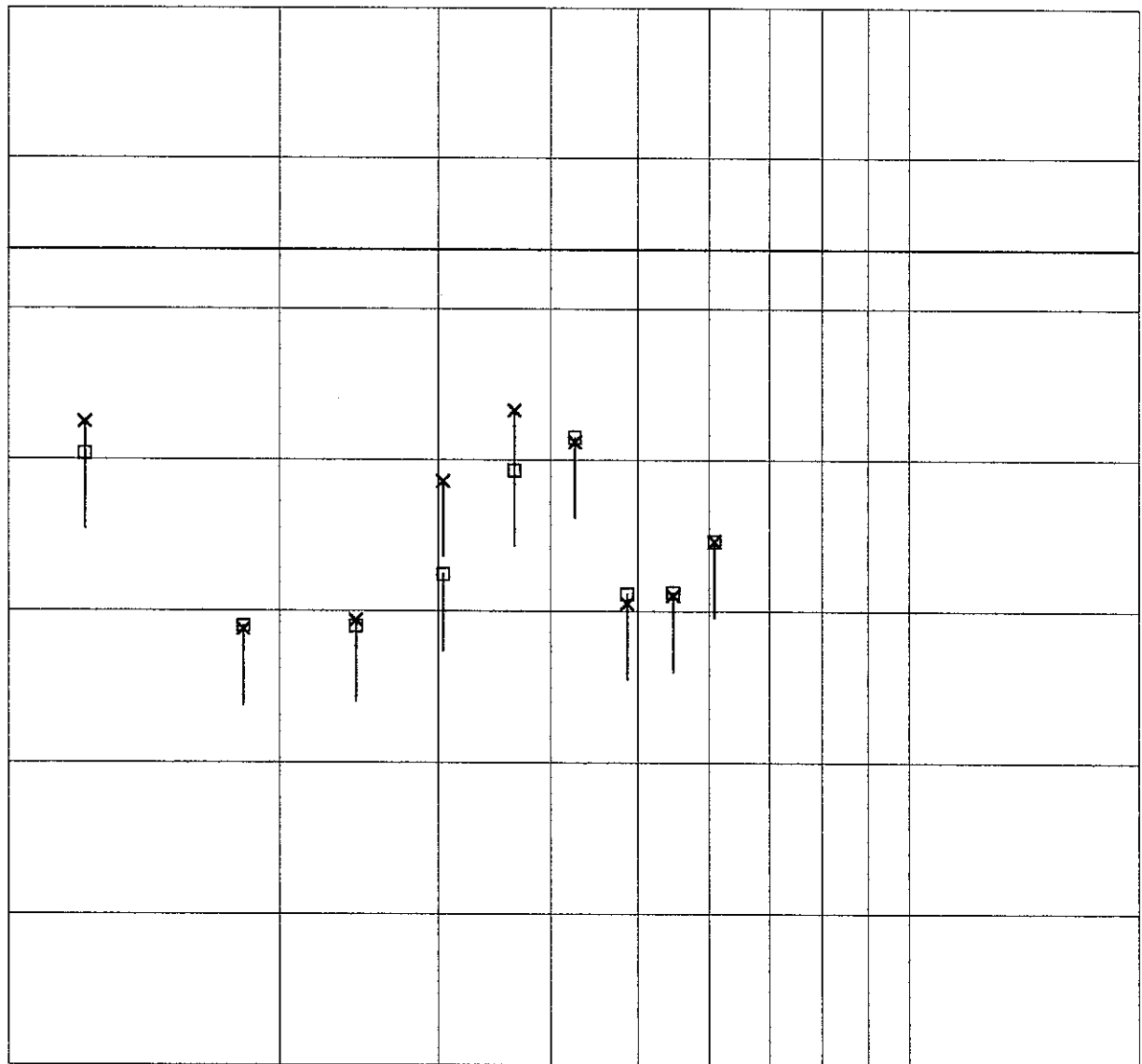
40

30

20

10

0



1000

2000

5000

10000

18000

Frequency [MHz]

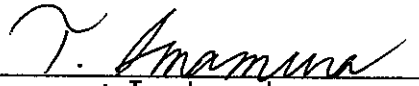
Page:

34 of 48

DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.
Yamakita No.2 Open Test Site
Report No. : 22KE0008-YK-A

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting(613.9875MHz)
Remarks : AV Detected mode
Date : 9/6/2002
Test Distance : 3 m
Temperature : 25 °C
Humidity : 62 %
Regulation : FCC Part95H § 95.1115(b) (2)


Engineer : Toyokazu Imamura

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.	1227.98	BB	47.0	50.8	26.5	35.8	1.8	0.0	39.5	43.3	53.9	14.4	10.6
2.	1841.96	BB	32.8	31.5	27.9	35.1	2.1	0.0	27.7	26.4	53.9	26.2	27.5
3.	2455.95	BB	32.8	31.8	30.0	34.9	2.4	0.0	30.3	29.3	53.9	23.6	24.6
4.	3069.94	BB	38.3	37.8	30.0	34.9	2.7	0.0	36.1	35.6	53.9	17.8	18.3
5.	3683.93	BB	40.7	34.9	30.7	35.3	3.0	0.0	39.1	33.3	53.9	14.8	20.6
6.	4297.91	BB	39.8	38.1	32.3	35.5	3.4	0.0	40.0	38.3	53.9	13.9	15.6
7.	4911.90	BB	28.2	28.2	33.9	34.6	3.5	0.0	31.0	31.0	53.9	22.9	22.9
8.	5525.89	BB	28.3	28.1	34.0	34.4	3.7	0.0	31.6	31.4	53.9	22.3	22.5
9.	6139.88	BB	28.3	28.3	36.5	34.2	3.8	0.0	34.4	34.4	53.9	19.5	19.5

CALCULATION: READING[dB μ V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KHA-02 (1-18GHz)

■ AMP: KAF-04 (8449B) ■ RECEIVER: KTR-01 ■ CABLE: KCC-D3

DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.2 Open Test Site

Report No. : 22KE0008-YK-A

Applicant : FUKUDA DENSHI CO., LTD.
Kind of Equipment : TELEMETRY TRANSMITTER MODULE
Model No. : HLX-561
Serial No. : 2002012905
Power : AC120V/60Hz
Mode : Transmitting (613.9875MHz)
Remarks : AV Detected mode
Date : 9/6/2002
Test Distance : 3 m
Temperature : 25 °C
Humidity : 62 %
Regulation : FCC Part95H § 95.1115(b) (2)

T. Imamura
Engineer : Toyokazu Imamura

Emission Level [dB μ V/m]

□ Horizontal

× Vertical

70

60

50

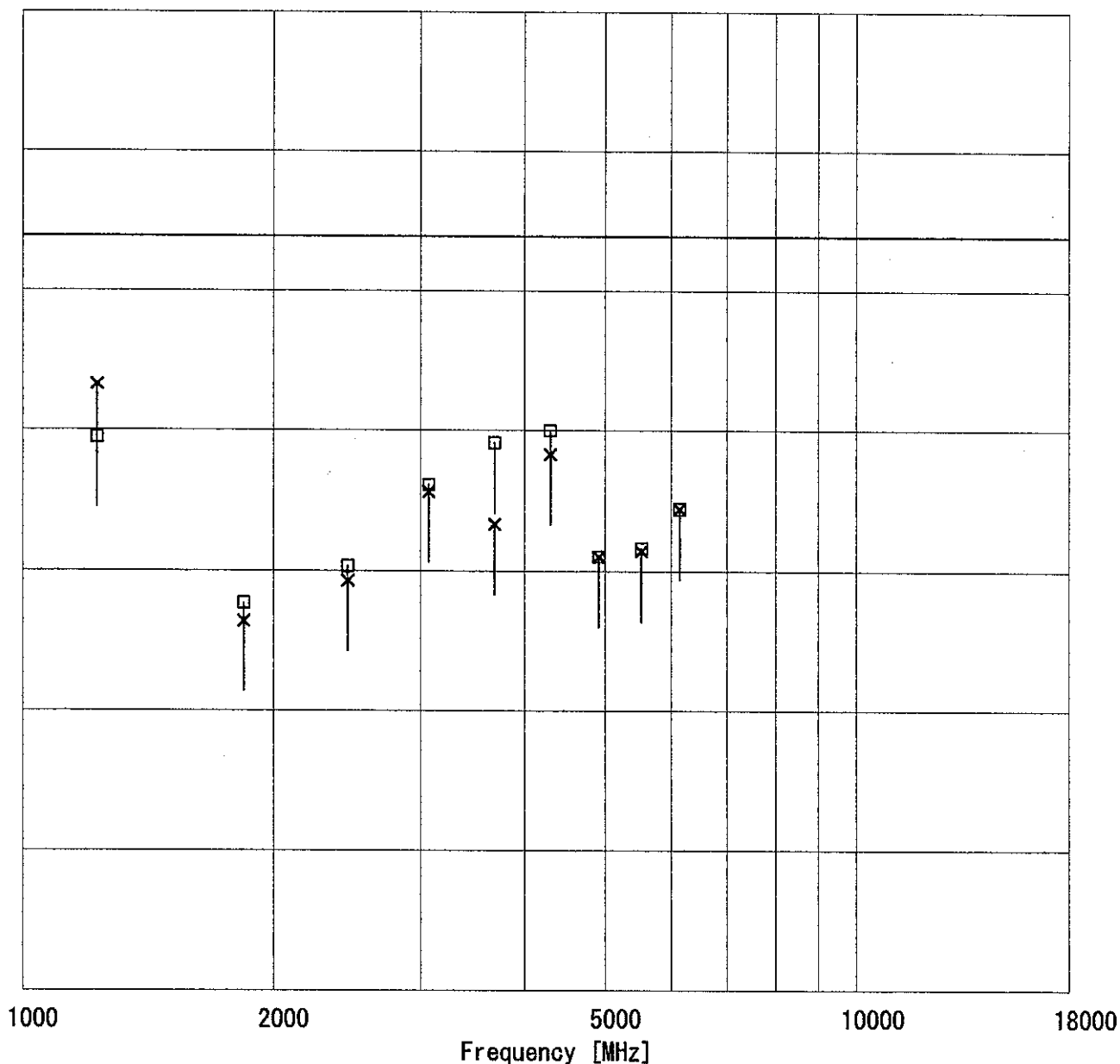
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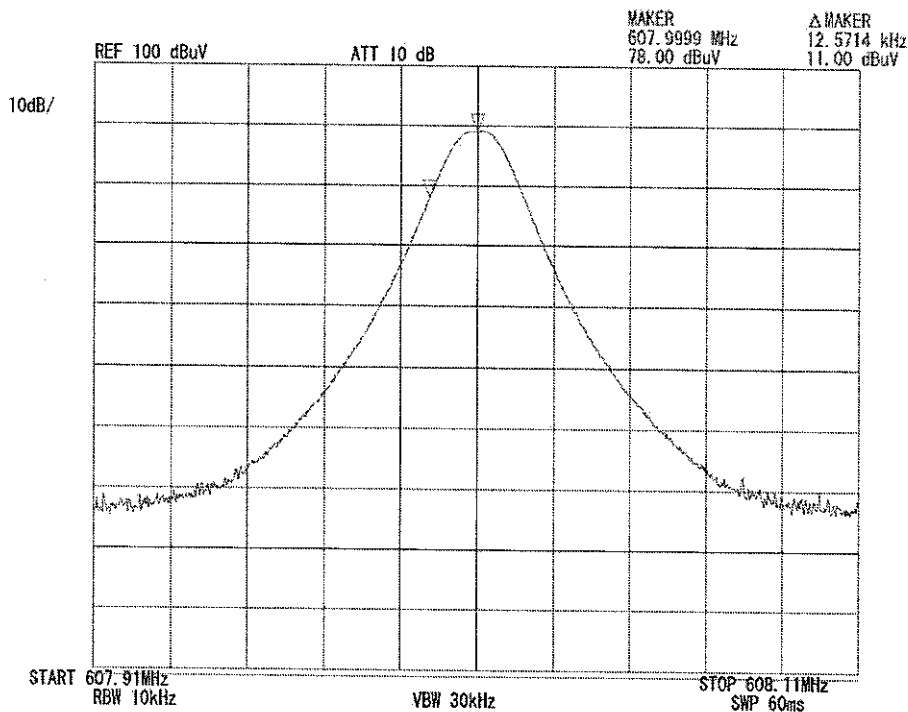
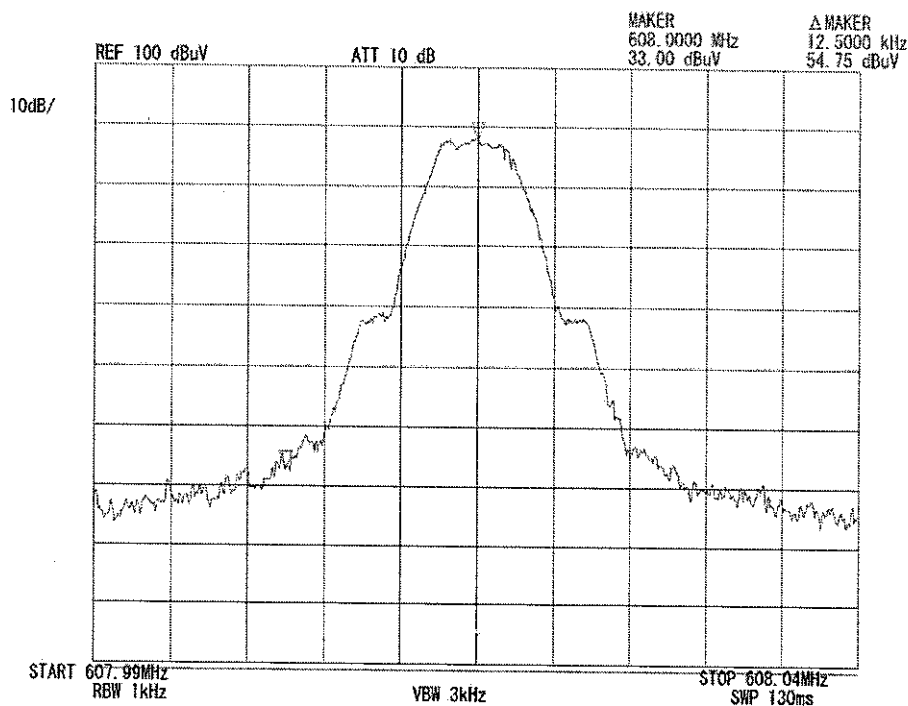
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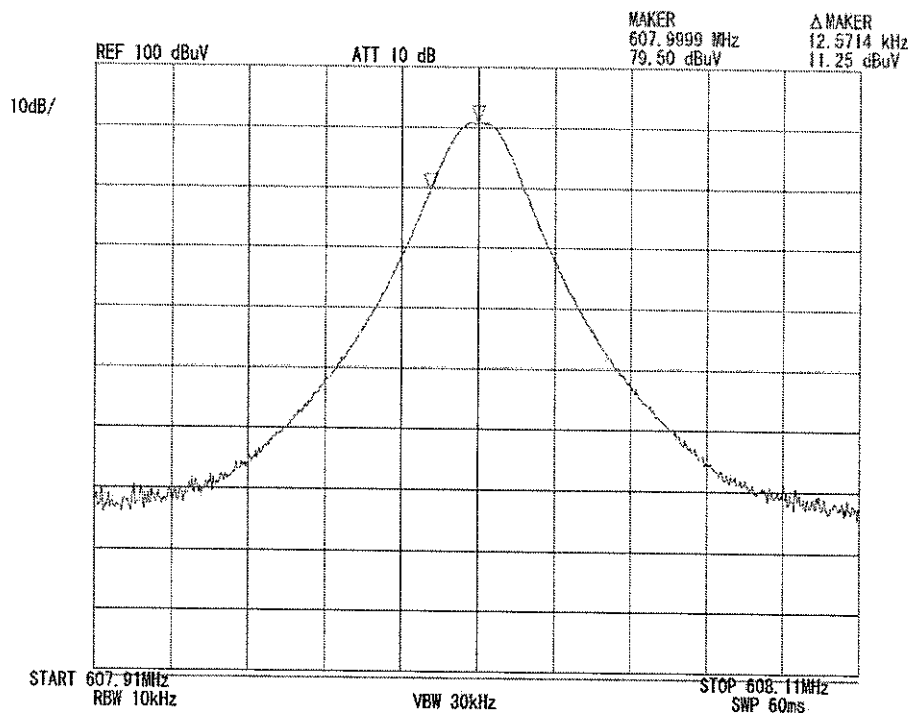
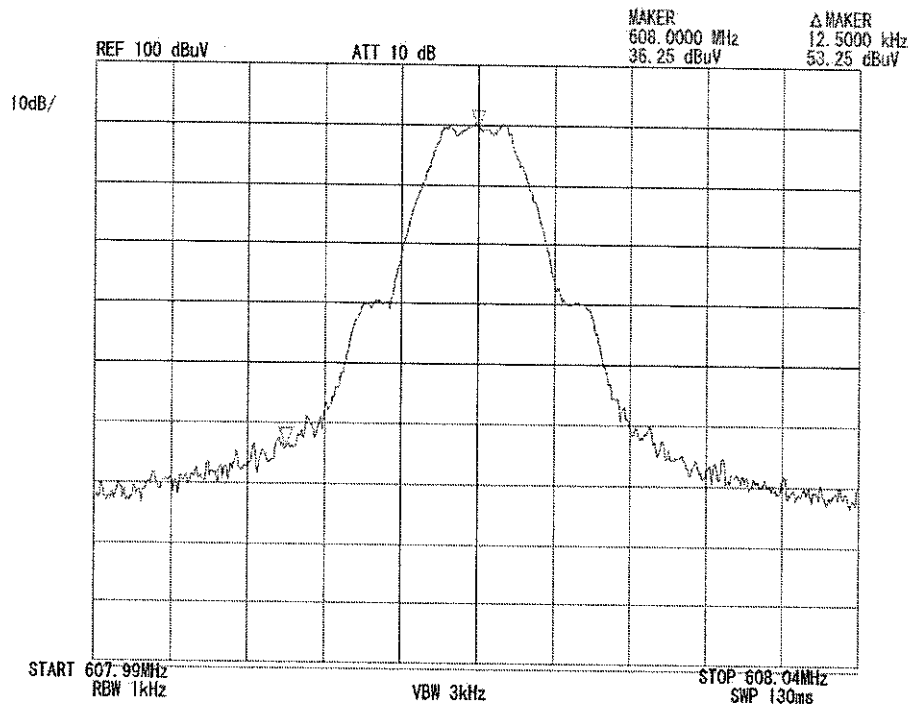


608.00MHz

1. Horizontal/PK

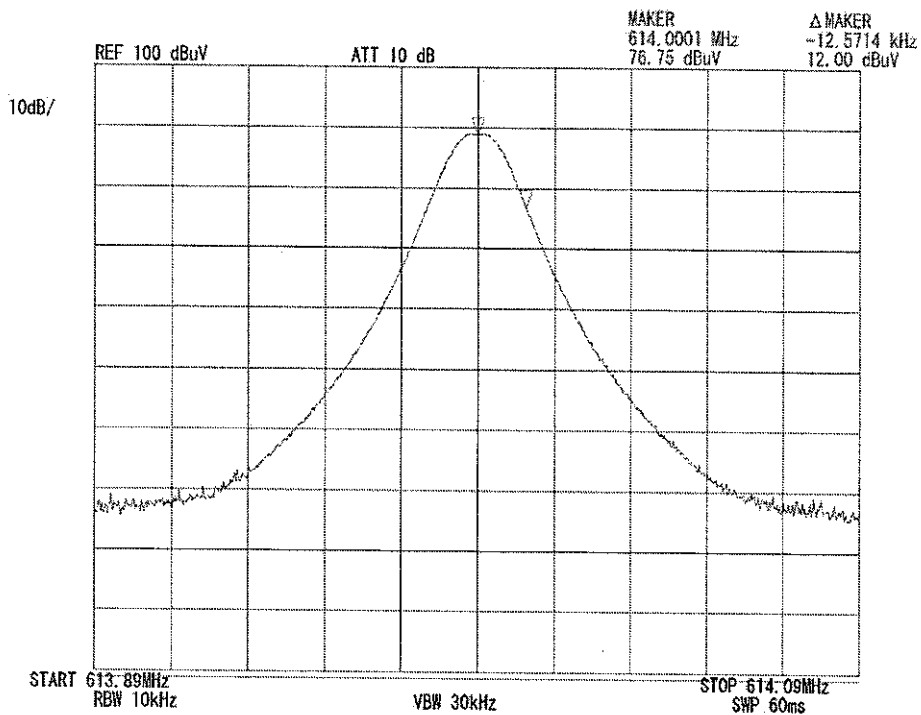
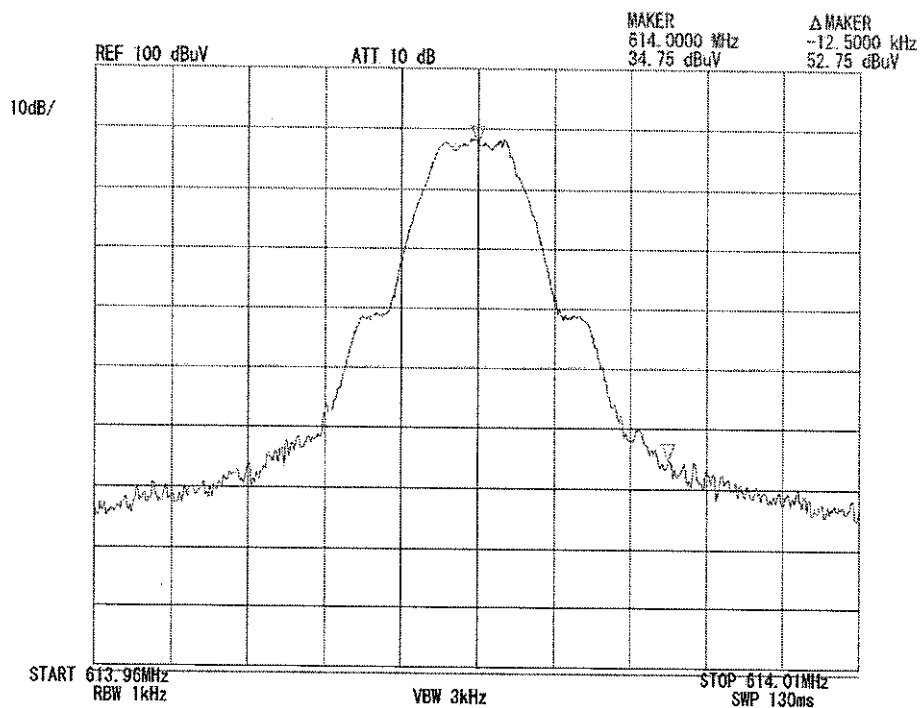


2. Vertical/PK

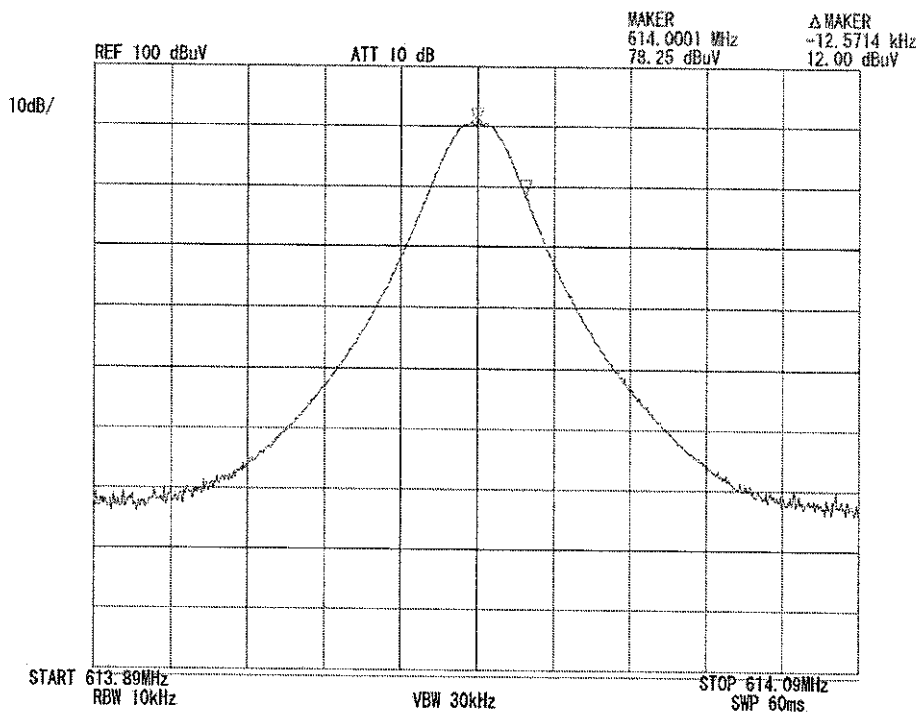
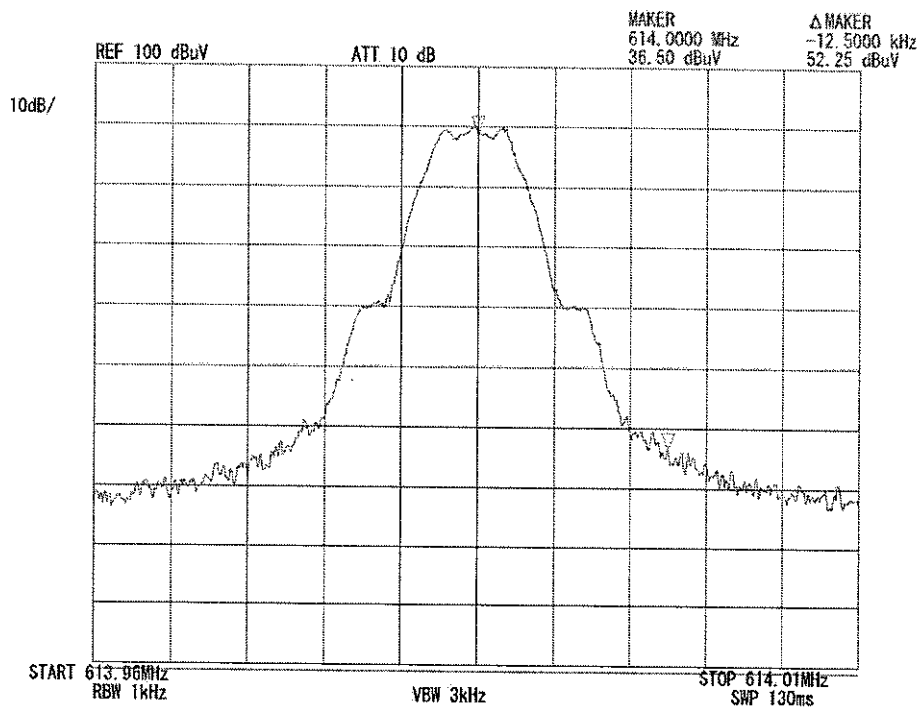


614.00MHz

1. Horizontal/PK

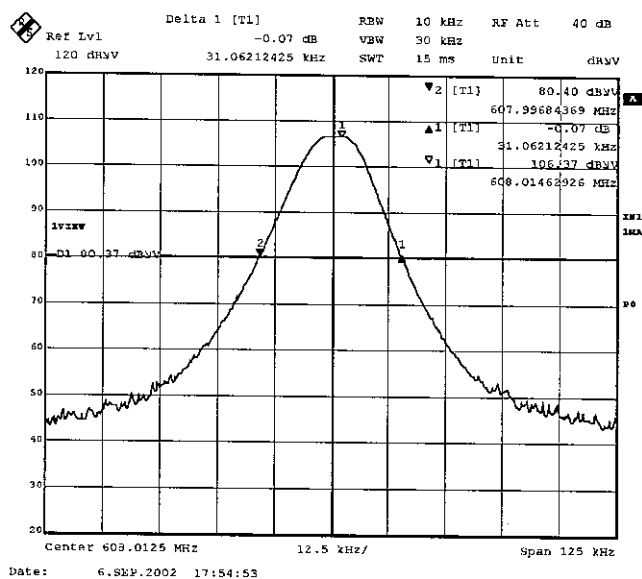


2. Vertical/PK



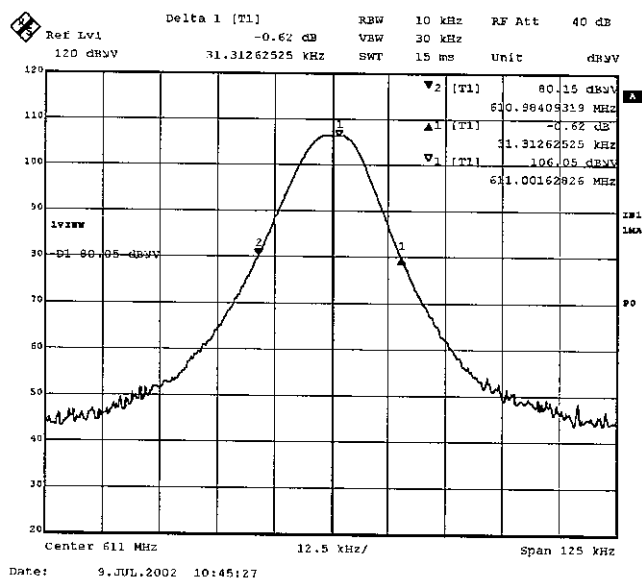
1. ch : 608.0125MHz

BW:31.062kHz



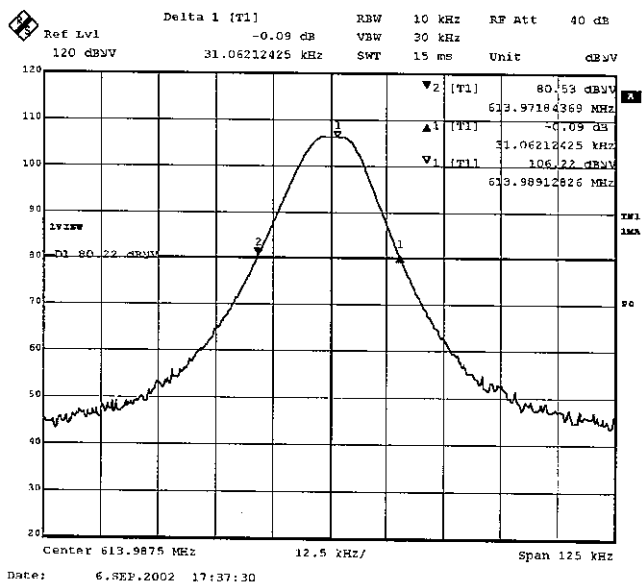
2. ch : 611.0000MHz

BW:31.313kHz



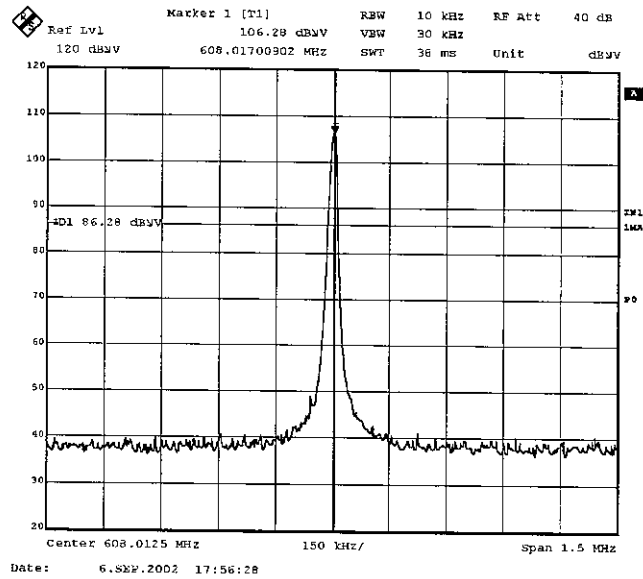
3. ch : 613.9875MHz

BW:31.062kHz

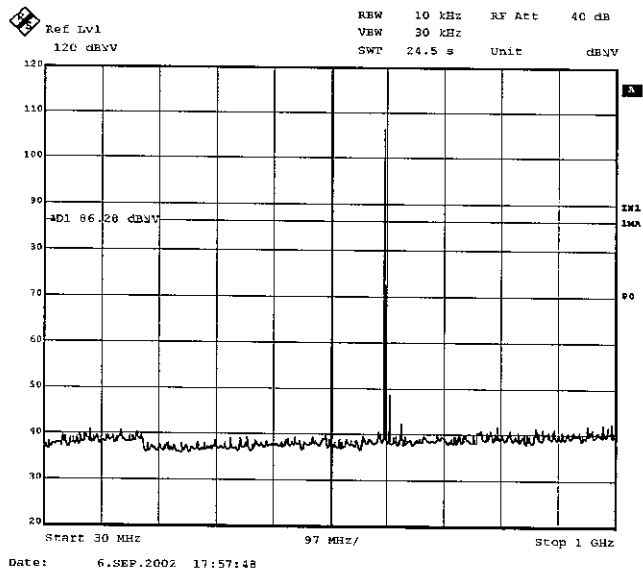


Ch 608.0125MHz

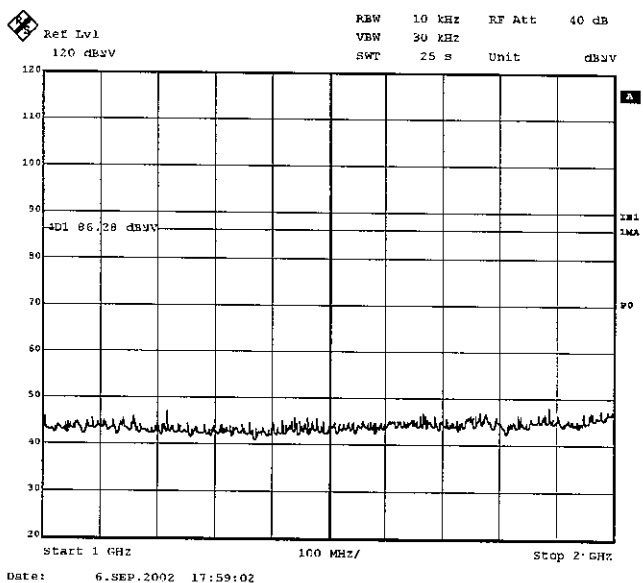
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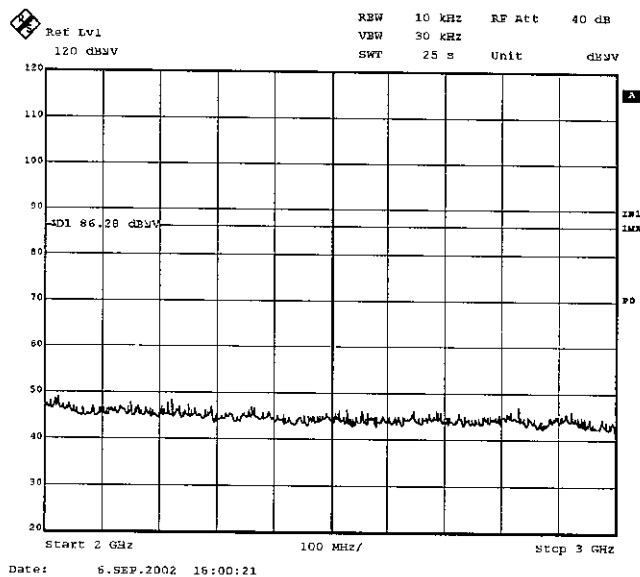
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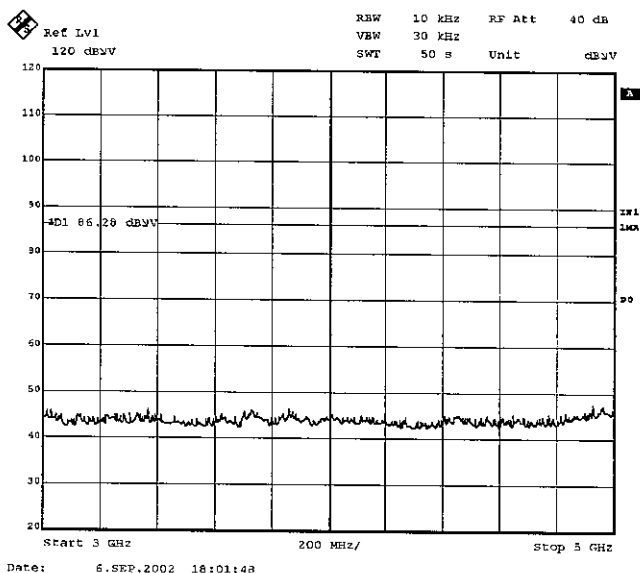
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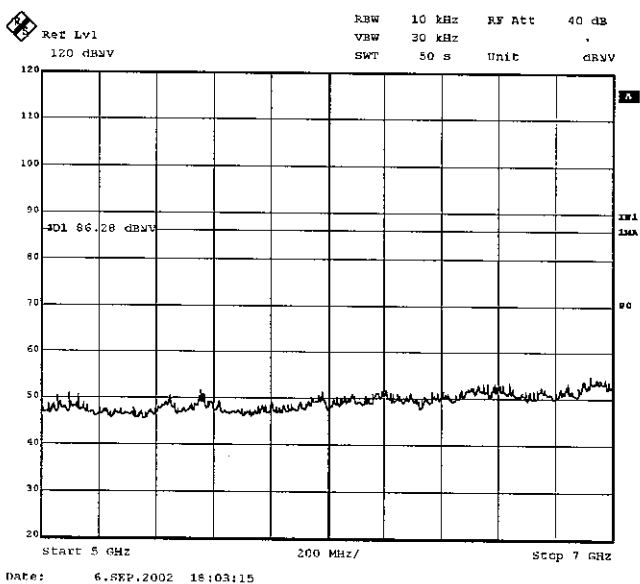
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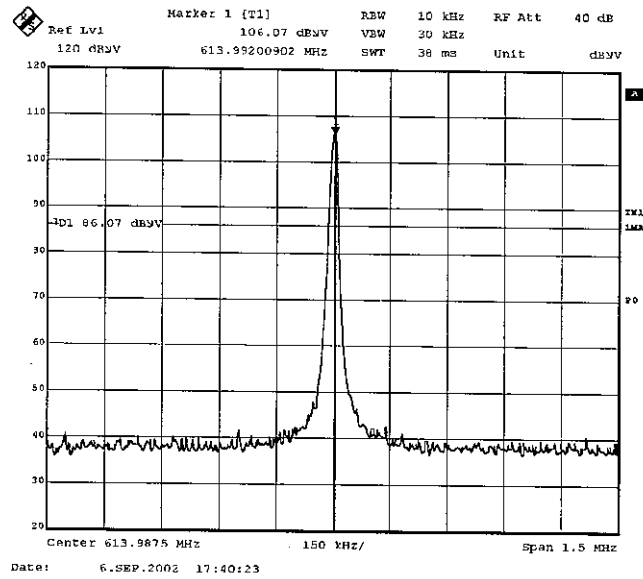


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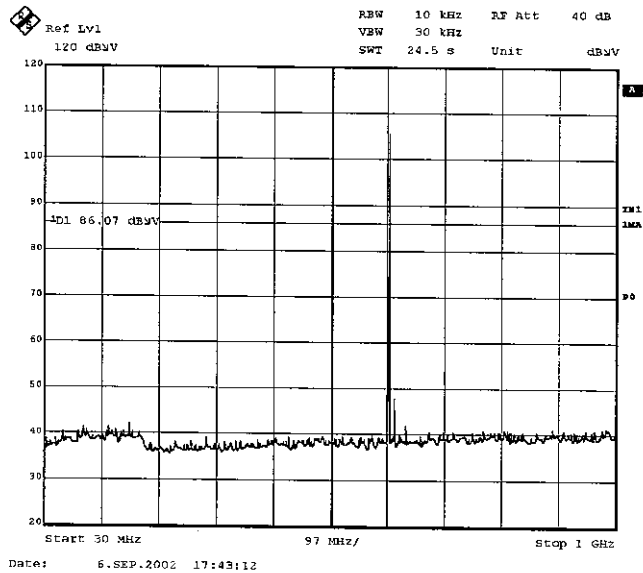


Ch 613.9875MHz

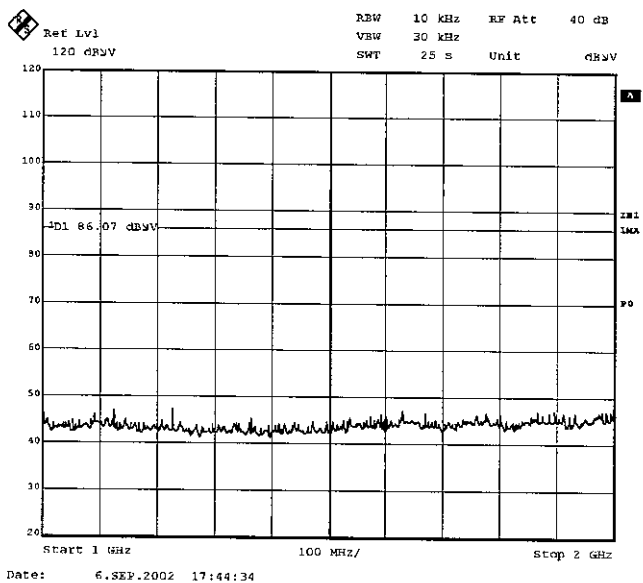
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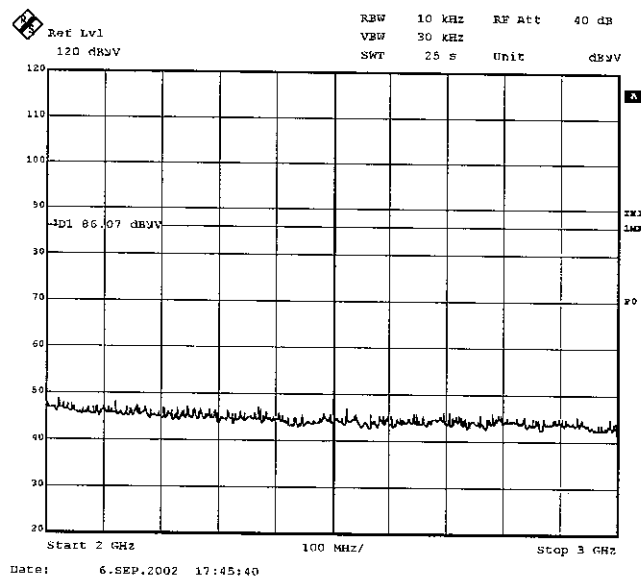
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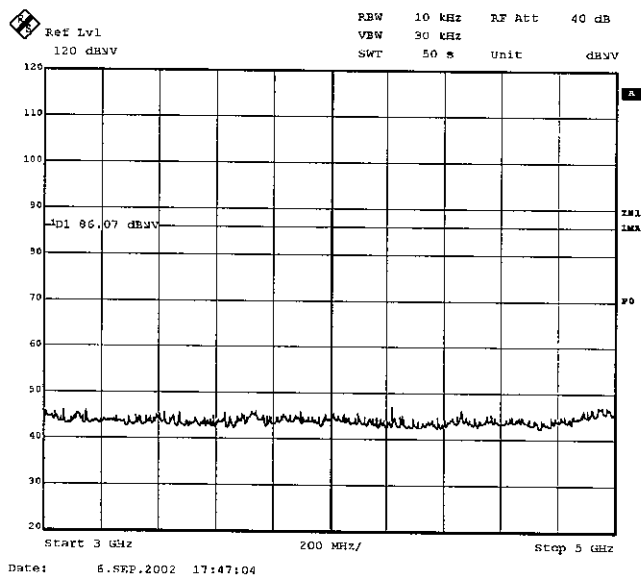
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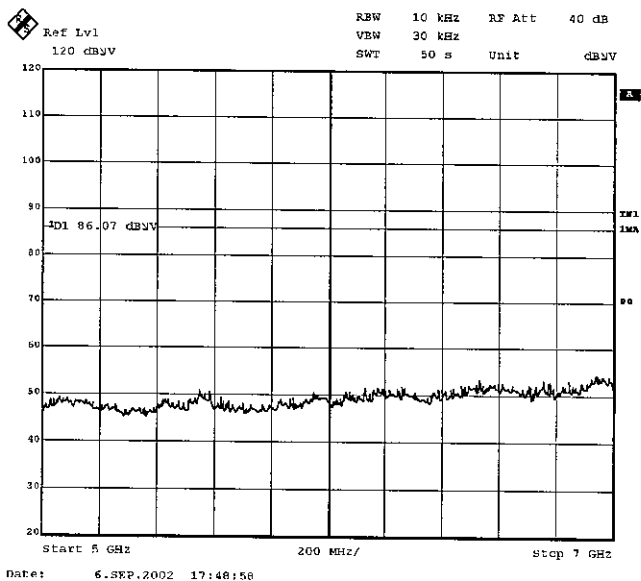
4.



5.



6.



Test Report No : 22KE0008-YK-A

APPENDIX 3 Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
KAF-03	Pre Amplifier	Hewlett Packard	8447D	RE	2001/10/19 * 12
KAF-04	Pre Amplifier	Agilent	8449B	RE	2002/05/07 * 12
KAT6-03	Attenuator	INMET	18N-6dB	RE	2002/06/20 * 12
KBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2002/08/25 * 12
KCC-20/21/22/23/29	Coaxial Cable	Fujikura/Suhner	8D-2W/12D-SF A/S04272B/S04272B	RE	2001/10/23 * 12
KCC-24/25/26/28/KPL-02	Coaxial Cable/Pulse Limiter	Fujikura/Suhner/PMM	5D-2W/5D-2W/S04272B/S04272B/PL01	CE	2001/10/23 * 12
KCC-D1/D2	Coaxial Cable	Suhner/storm	SCOFLEX103/90-388-020	RE	2001/09/05 * 12
KHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2002/08/17 * 12
KLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2002/08/17 * 12
KLS-05	LISN	Schwarzbeck	NSLK8126	CE	2001/10/23 * 12
KOTS-02	Open Test Site	JSE	10m	RE	2002/08/20 * 12
KSA-02	Spectrum Analyzer	Advantest	R3265A	CE/RE/AT	2001/12/03 * 12
KTR-01	Test Receiver	Rohde & Schwarz	ESL40	AT/RE	2002/07/22 * 12
KTR-03	Test Receiver	Rohde & Schwarz	ESHS10	CE	2002/05/14 * 12
KTR-04	Test Receiver	Rohde & Schwarz	ESVS10	CE	2001/10/15 * 12
KCC-D5	Coaxial Cable	Storm	421-011(2m)	AT	2002/04/16 * 12
KCC-D3	Coaxial Cable	Rosenberger	2201	RE	2002/06/28 * 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,
- AT: Antenna terminal disturbance voltage