FCC ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT CERTIFICATION TO FCC PART 15 REQUIREMENTS

for

INTENTIONAL RADIATOR

of

433.92 MHz Pocket Point RF Remote Transmitter

FCC ID Number : KFR-LSRTS
Trade Name : VISION
Model Number : PPREM
Agency Series : N/A
Report Number : 40707411-RP
Date : July 26, 2004

Prepared for：

Vision Automobile Electronics Industrial Co., Ltd.
No. 17, Alley 92, Lane 189, Sec. 1, An Chung Rd.,
Tainan, Taiwan, R.O.C.

Prepared by：

Compliance Certification Services Inc.
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CNLA 0363 ILAC MRA

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1. VERIFICATION OF COMPLIANCE

COMPANY NAME : Vision Automobile Electronics Industrial Co., Ltd.
No. 17, Alley 92, Lane 189, Sec. 1, An Chung Rd.,
Tainan, Taiwan, R.O.C.

CONTACT PERSON : Joy Wu

TELEPHONE NO. : 06-2551269

EUT DESCRIPTION : 433.92 MHz Pocket Point RF Remote Transmitter

MODEL NAME/NUMBER : PPREM

FCC ID : KFR-LSRTS

DATE TESTED : July 12, 2004

REPORT NUMBER : 40707411-RP

TYPE OF EQUIPMENT	SECURITY EQUIPMENT (INTENTIONAL RADIATOR)
EQUIPMENT TYPE	433.92 MHz Pocket Point RF Remote Transmitter
MEASUREMENT PROCEDURE	ANSI 63.4 / 2001
LIMIT TYPE	CERTIFICATION
FCC RULE	CFR 47, PART 15

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in the FCC CFR 47, PART 15. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties. **Warning**: This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services Inc. will constitute fraud and shall nullify the document.

Approved by:

David Wang
Manager of Hsintien Laboratory
Compliance Certification Services Inc.

Reviewed by:

Vince Chiang
Section Manager of Hsintien Laboratory
Compliance Certification Services Inc.

2. PRODUCT DESCRIPTION

Fundamental Frequency	**433.92 MHz**
Power Source	**3V Battery**
Transmitting Time	**Periodic ≤ 5 seconds**
Associated Receiver	**Model: PPRF64/128 / FCC ID: KFR-LSRRFS**

3. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang, Taoyuan Hsien, Taiwan, R.O.C. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

4. MEASUREMENT STANDARDS

The site is constructed and calibrated in conformance with the requirements of ANSI C63.4/2001.

5. TEST METHODOLOGY

For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 KHz, up to at least the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. (CFR 47 Section 15.33)

6. MEASUREMENT EQUIPMENT USED

Open Area Test Site # J				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
SITE NSA	CCS	J Site	N/A	09/26/2004
MEASURE RECEIVER	SCHAFFNER	SCR3501	330	06/27/2005
SPECTRUM ANALYZER	ADVANTEST	R3132	120900003	11/04/2004
ANTENNA	SCHAFFNER	CBL 6112B	2800	09/27/2004
PRE-AMPLIFIER	SCHAFFNER	CPA9231A	3629	10/10/2004
CABLE	BELDEN	9913	N-TYPE #J1	10/10/2004
ATTENUATOR	MCL	UNAT-6	AT06-8	12/10/2004
THERMO-HYGRO METER	TFA	N/A	NO.3	11/23/2004

Remark: Each piece of equipment is scheduled for calibration once a year.

7. POWERLINE RFI LIMIT

CONNECTED TO AC POWER LINE	SECTION 15.207
CARRIER CURRENT SYSTEM IN THE FREQUENCY RANGE OF 450 KHz TO 30 MHz	SECTION 15.205 AND SECTION 15.209, 15.221, 15.223, 15.225 OR 15.227, AS APPROPRIATE.
BATTERY POWER	NO REQUIRED.

8. RADIATED EMISSION LIMITS

GENERAL REQUIREMENTS	SECTION 15.209
RESTRICTED BANDS OF OPERATION	SECTION 15.205
PERIODIC OPERATION IN THE BAND 40.66 -40.70 MHz AND ABOVE 70 MHz.	SECTION 15.231

9. SYSTEM TEST CONFIGURATION

Use a block of foam and combined it with EUT wrapping rubber band around it. This way it can test X, Y and Z axis. To activate continuous transmitting & receiving, place a small plastic block between rubber band and EUT push button.

Radiated Open Site Test Set-up

10. TEST PROCEDURE

Radiated Emissions, 15.231(4)(b)

Test Set-up for frequency range 30 – 1000 MHz

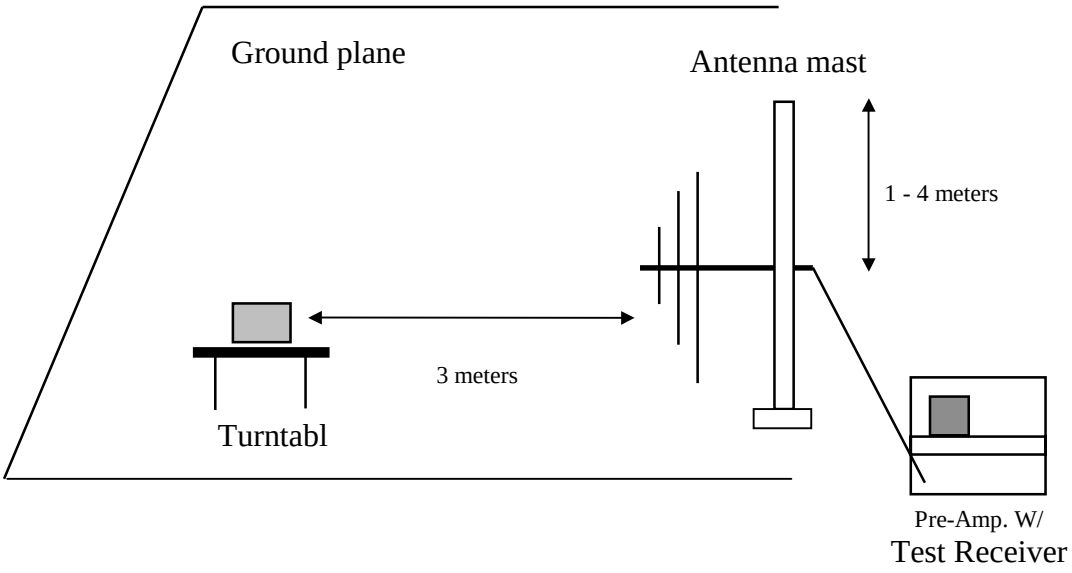


Fig. 1

1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 3-meters from the EUT.

2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205. The EUT was moved throughout the XY, XZ, and YZ planes to maximize emissions received by the search antenna.

3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

Test set-up for measurements above 1GHz

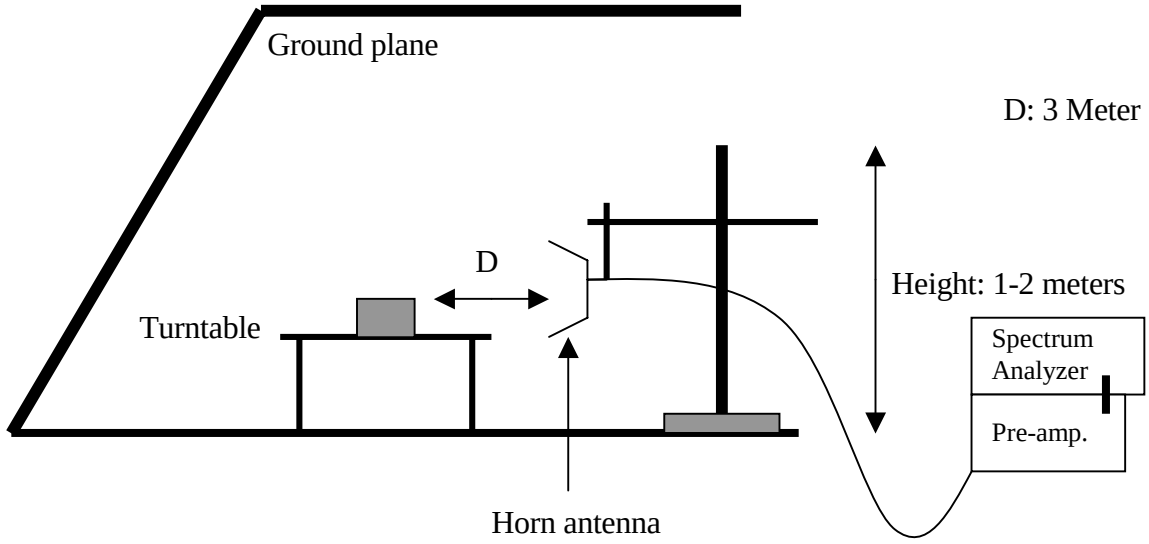


Fig. 2

1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 1-meters from the EUT. The EUT antenna was mounted vertically as per normal installation.

2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205. The EUT was moved throughout the XY, XZ, and YZ planes to maximize emissions received by the search antenna.

3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

11. Equipment Modifications

To achieve compliance to FCC Section 15.231 technical limits, the following change(s) were made during compliance testing:

NONE

12. TEST RESULT

Powerline RFI Class B	Eut	Radiated Emission Limits	Eut
SECTION 15.207		SECTION 15.209	X
SECTION 15.205, 15.209, 15.221, 15.223, x 15.225 OR 15.227		SECTION 15.205	
BATTERY POWER	X	SECTION 15.231 (b)	X
		SECTION 15.231 (e)	

12.1 Maximum Modulation Percentage (M%)

CALCULATION:

Average Reading = Peak Reading (dBuV/m)+ 20log (Duty Cycle)

In order to determine possible Maximum Modulation percentage, alternations are made to the EUT. We measured:

	Tp (ms)	Ton (ms)	M% = (Ton/Tp)*100%	C.F. = 20*log(M%)
Button#1	100	35*0.6375+40*0.2625 = 32.81	32.81	-9.6792 dB
Button#2	100	39*0.5625+39*0.1500 = 27.79	27.79	-11.123 dB

12.2 The Emissions Bandwidth

The bandwidth of the emissions were investigated per 15.231(c)

Frequency (MHz)	Botton#1 BW (kHz)	Botton#2 BW (kHz)	Limit (MHz)	Result
433.92	485.00	390.00	1.0848	PASS

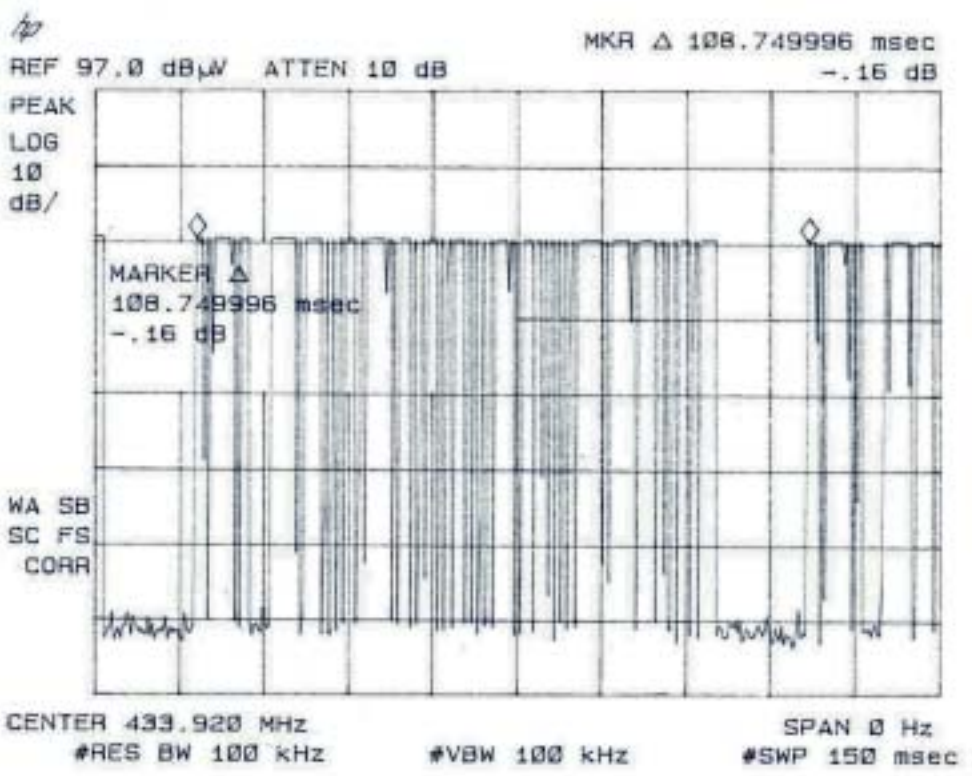
APPENDIX I

TEST DATA

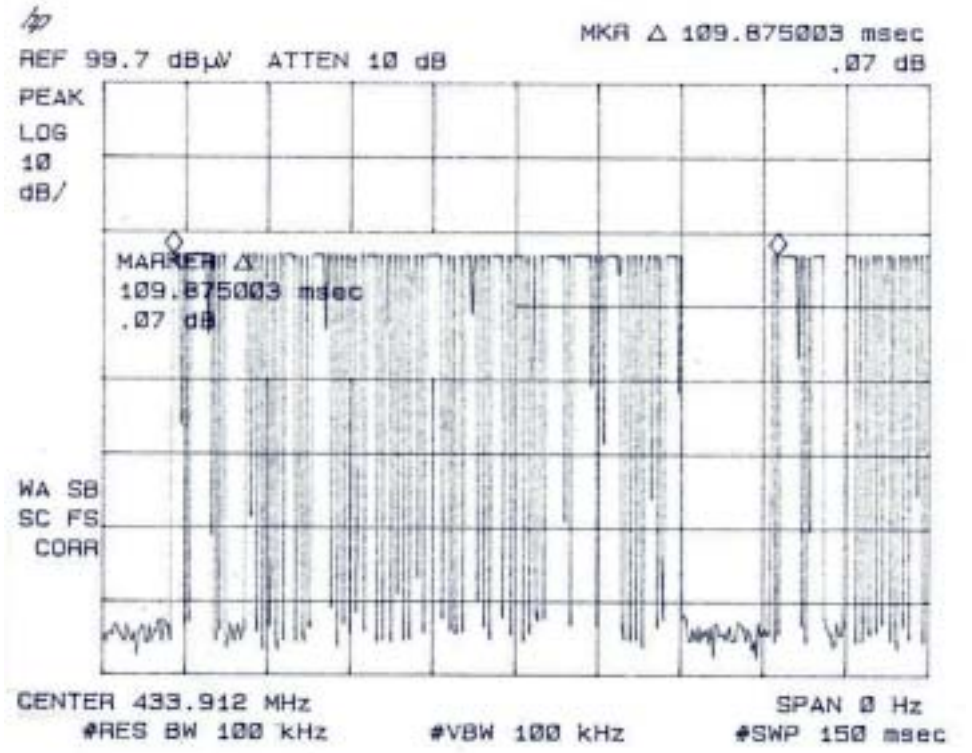
Test Plot: Maximum Modulation Percentage (M%)

Tp

Button#1

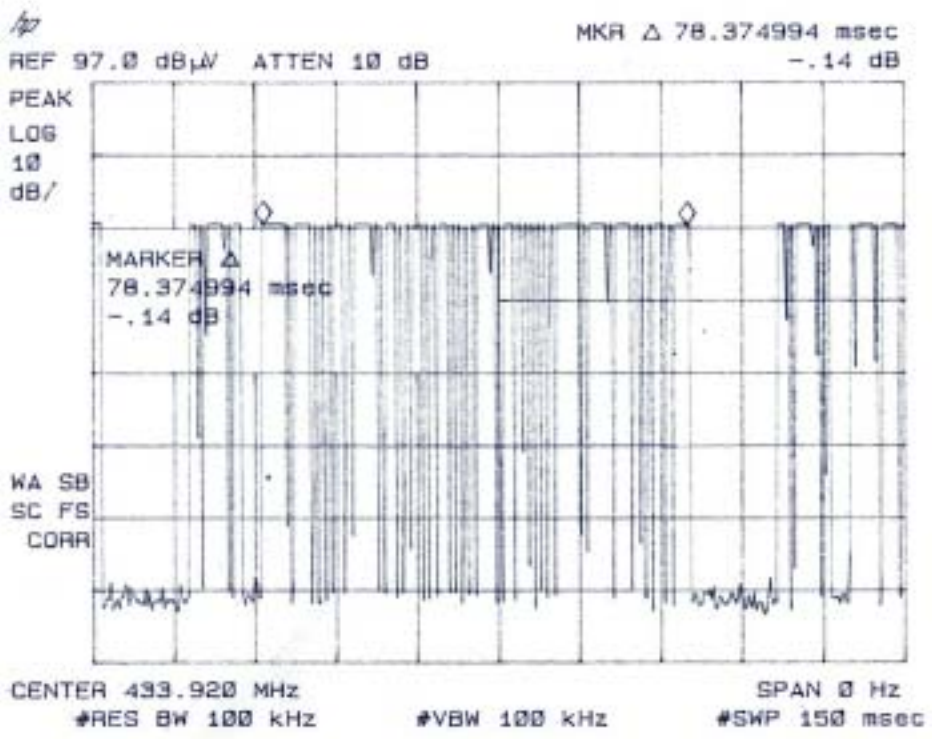


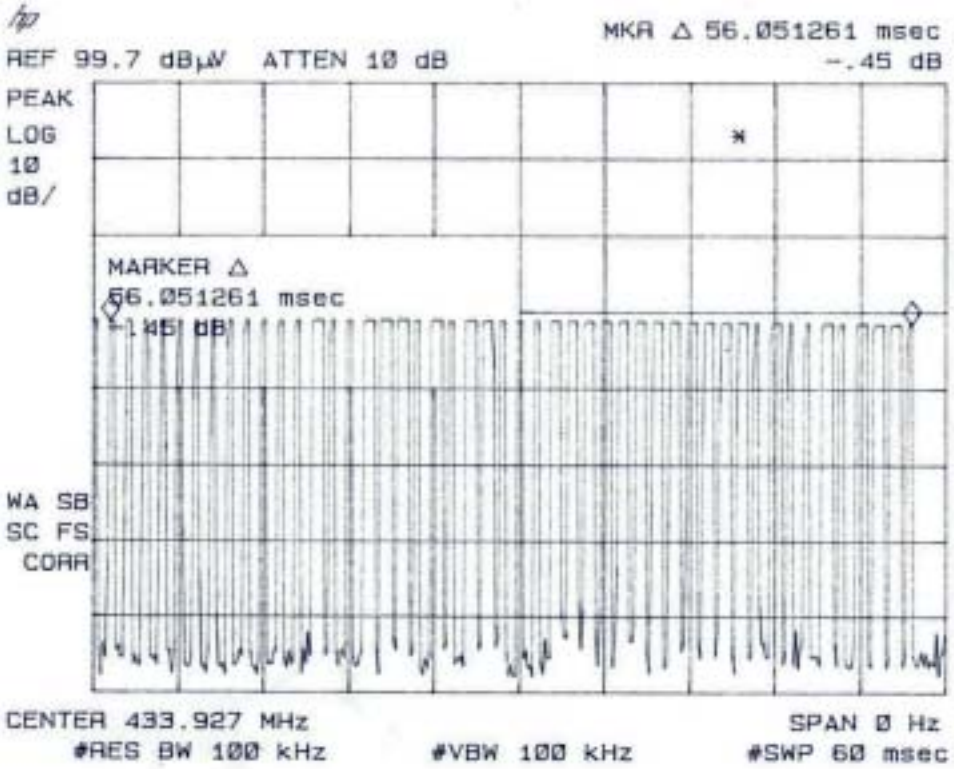
Button#2

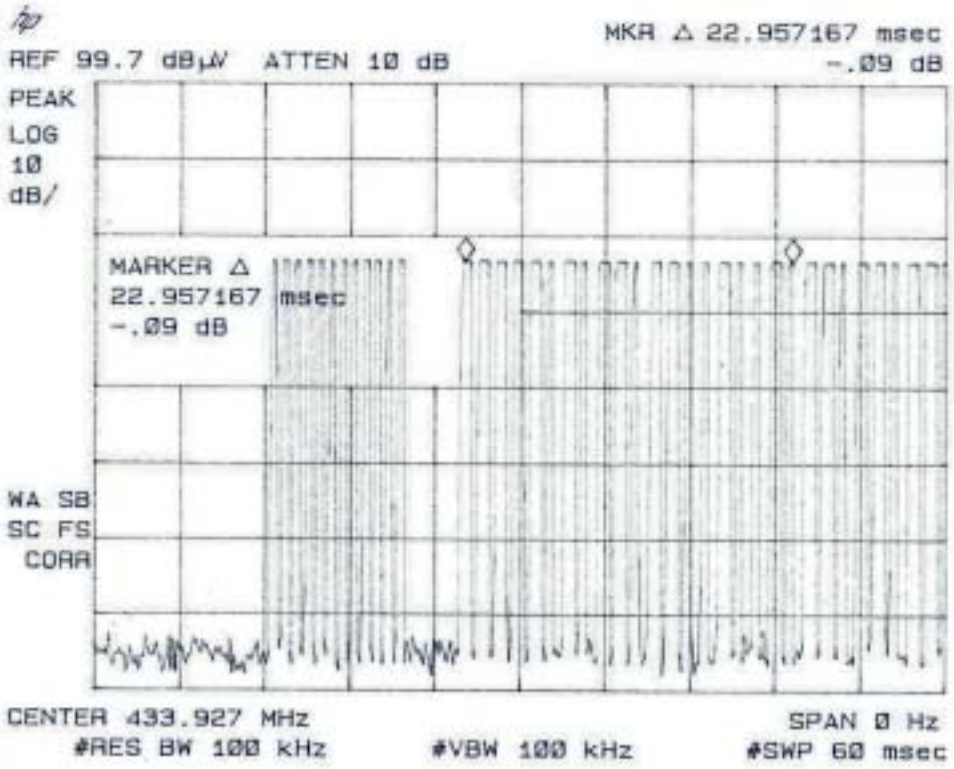


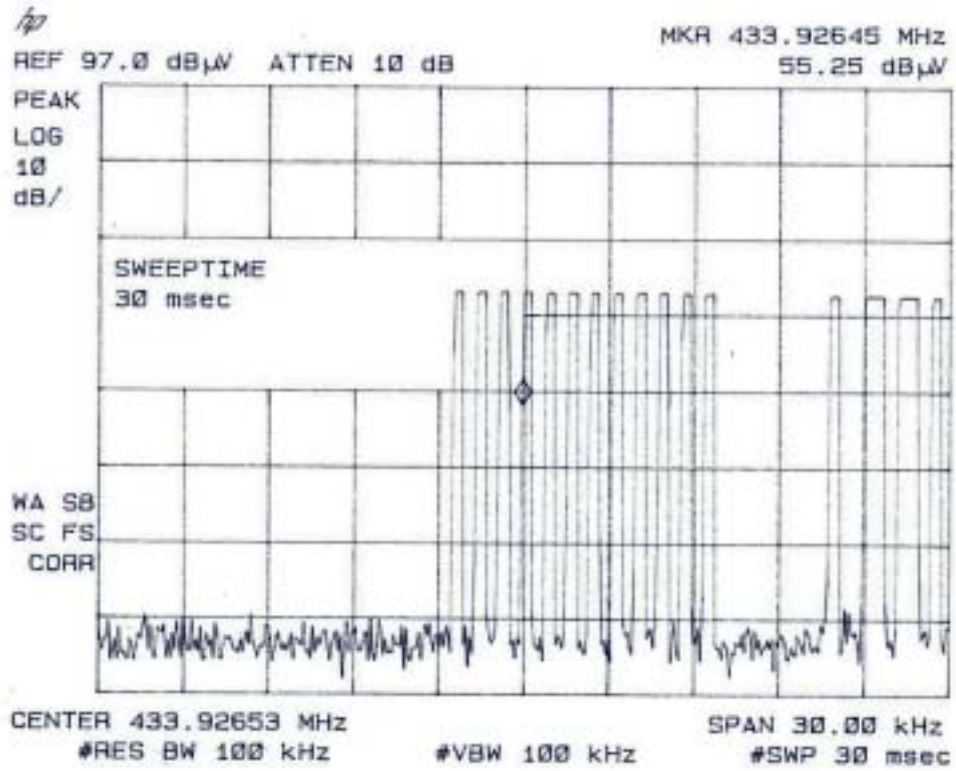
Channel Number

Button#1

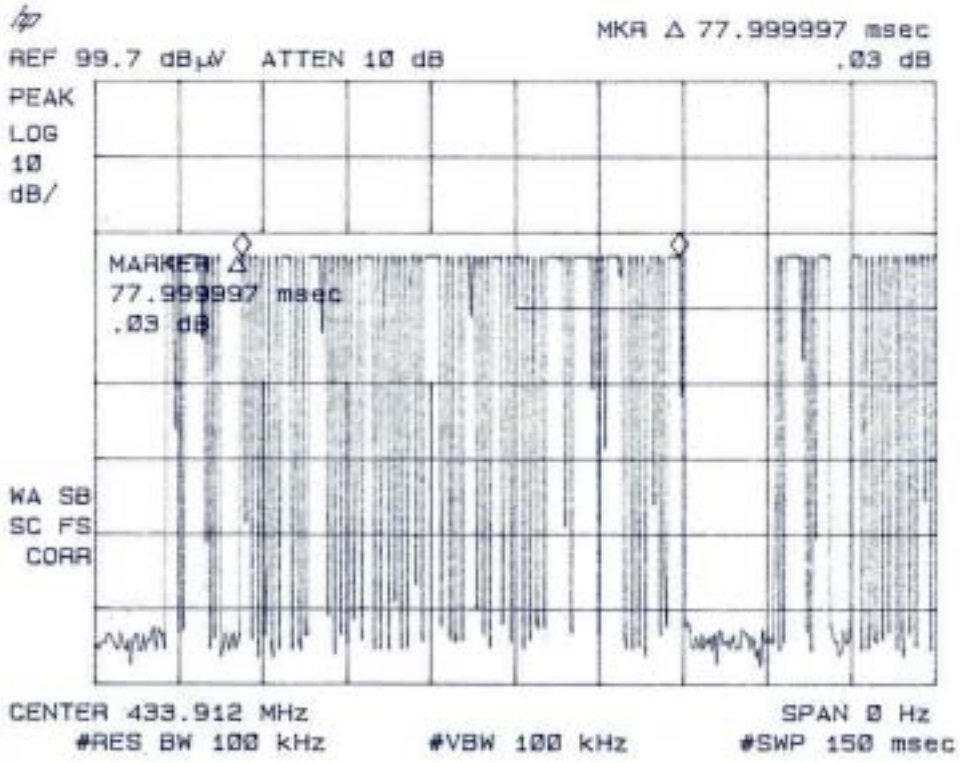


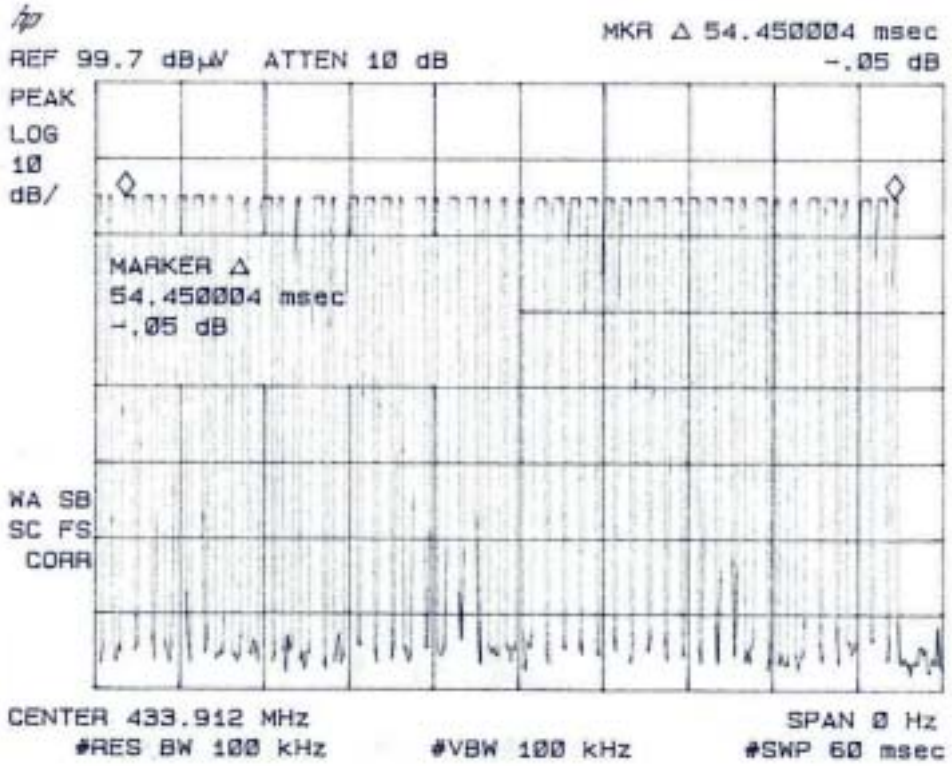


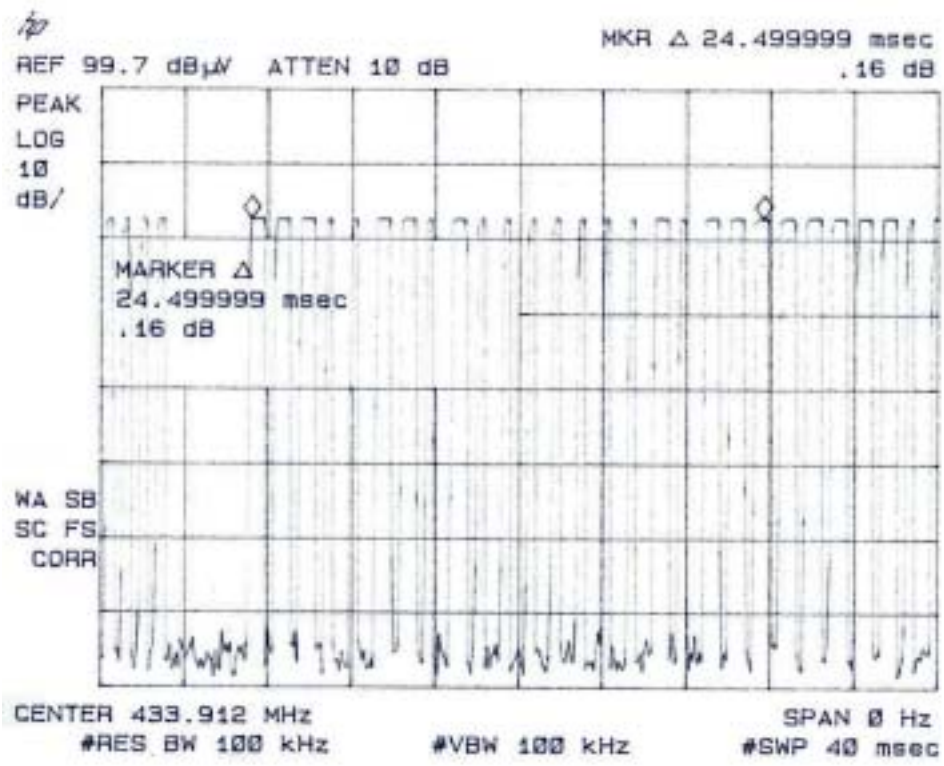

MKR Δ 22.957167 msec
REF 99.7 dBμV ATTEN 10 dB
-.09 dB
PEAK
LOG
10
dB/
MARKER Δ
22.957167 msec
-.09 dB
WA SB
SC FS
CORR
CENTER 433.927 MHz
SPAN 0 Hz
#RES BW 100 kHz
#VBW 100 kHz
#SWP 60 msec

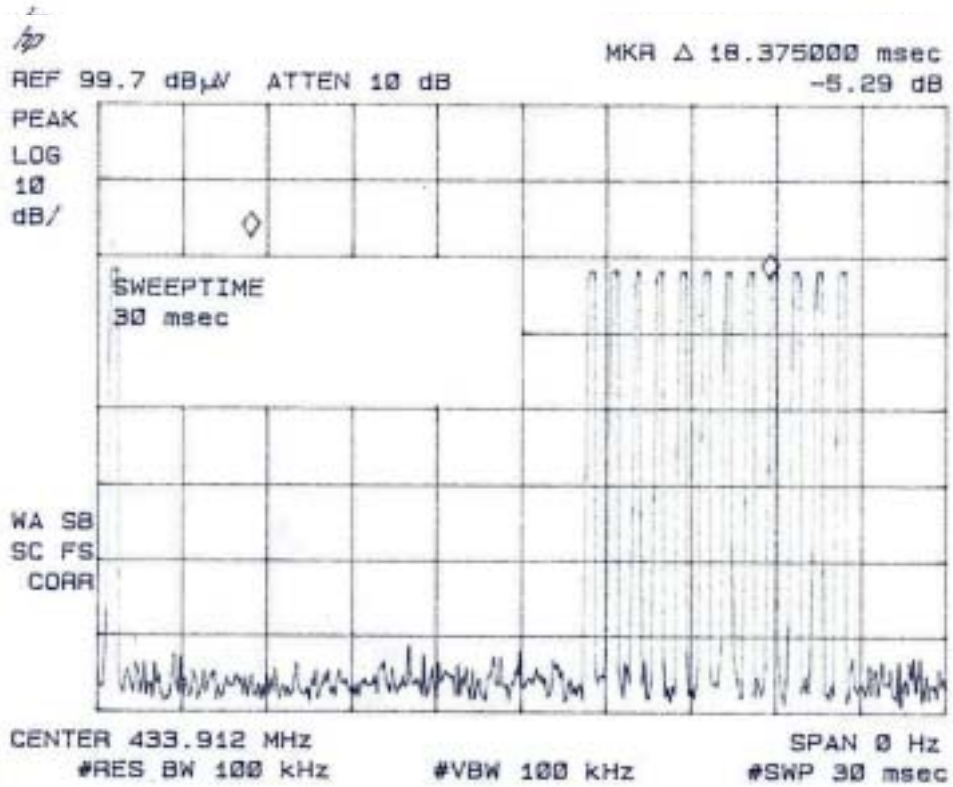

MKR 433.92645 MHz
REF 97.0 dBμV ATTEN 10 dB
55.25 dBμV
PEAK
LOG
10
dB/
SWEEPTIME
30 msec
WA SB
SC FS
CORR
CENTER 433.92653 MHz
SPAN 30.00 kHz
#RES BW 100 kHz
#VBW 100 kHz
#SWP 30 msec

Button#2


MKR Δ 77.999997 msec
REF 99.7 dBμV ATTEN 10 dB
.03 dB
PEAK
LOG
10
dB/
MARKER Δ
77.999997 msec
.03 dB
WA SB
SC FS
CORR
CENTER 433.912 MHz
SPAN 0 Hz
#RES BW 100 kHz
#VBW 100 kHz
#SWP 150 msec

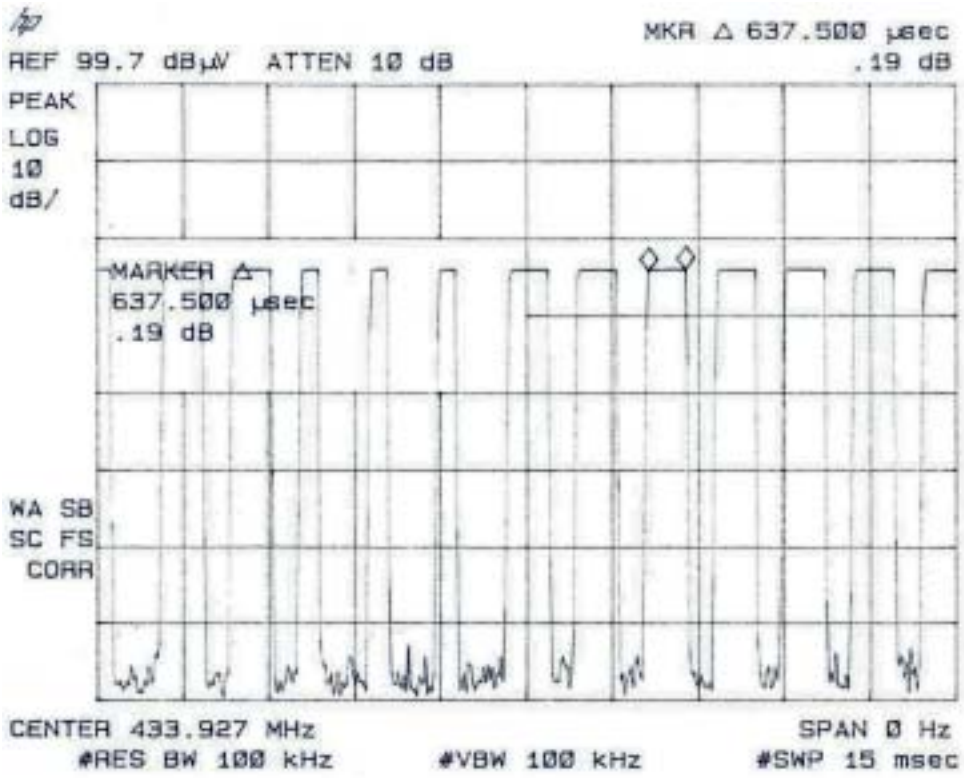

MKR Δ 54.450004 msec
REF 99.7 dBμV ATTEN 10 dB
-.05 dB
PEAK
LOG
10
dB/
MARKER Δ
54.450004 msec
-.05 dB
WA SB
SC FS
CORR
CENTER 433.912 MHz
SPAN 0 Hz
#RES BW 100 kHz
#VBW 100 kHz
#SWP 60 msec


MKR Δ 24.499999 msec
REF 99.7 dBμV ATTEN 10 dB
.16 dB
PEAK
LOG
10
dB/
MARKER Δ
24.499999 msec
.16 dB
WA SB
SC FS
CORR
CENTER 433.912 MHz
SPAN 0 Hz
#RES BW 100 kHz
#VBW 100 kHz
#SWP 40 msec

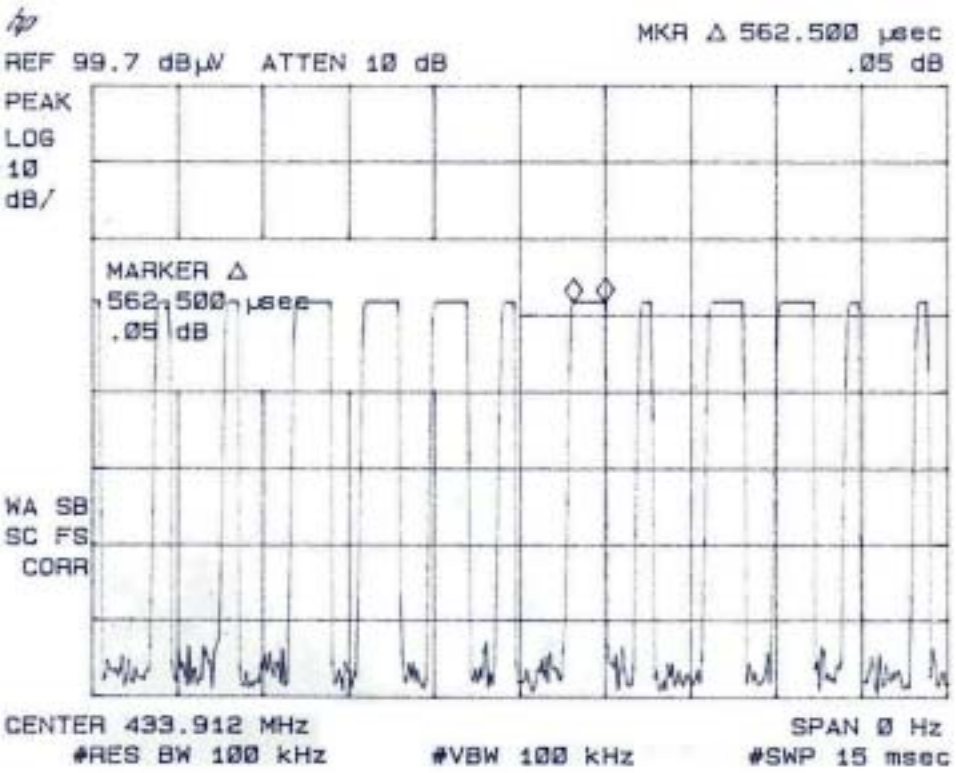

MKR Δ 18.375000 msec
REF 99.7 dBμV ATTEN 10 dB
-5.29 dB
PEAK
LOG
10
dB/
SWEEPTIME
30 msec
WA SB
SC FS
CORR
CENTER 433.912 MHz
SPAN 0 Hz
#RES BW 100 kHz
#VBW 100 kHz
#SWP 30 msec

Ton

Button#1

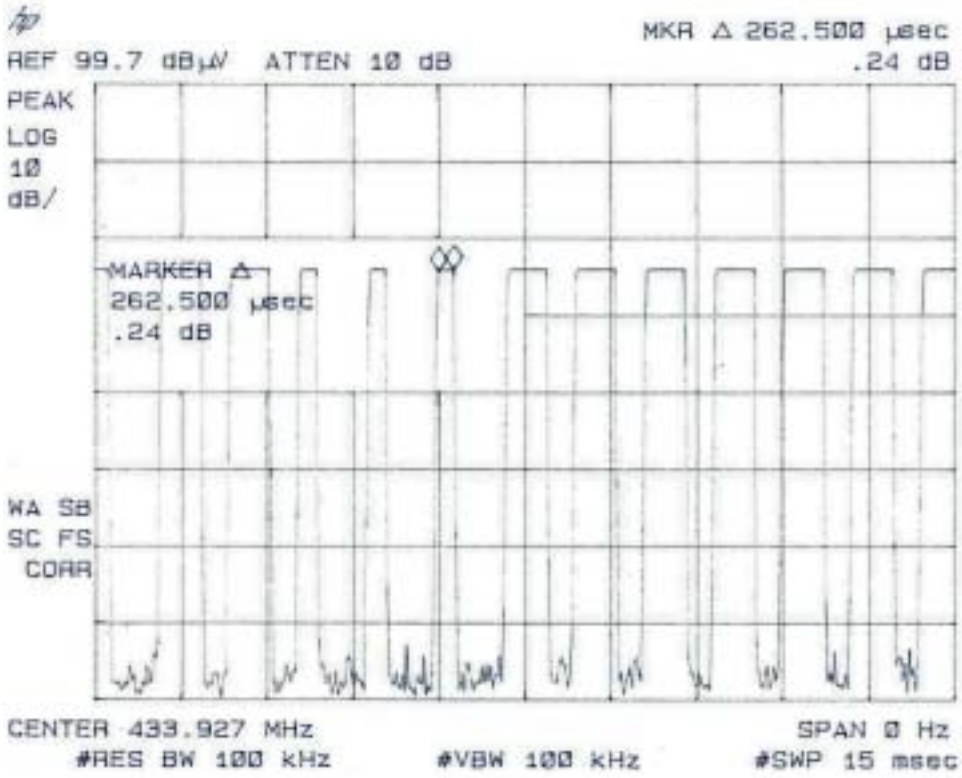


Button#2

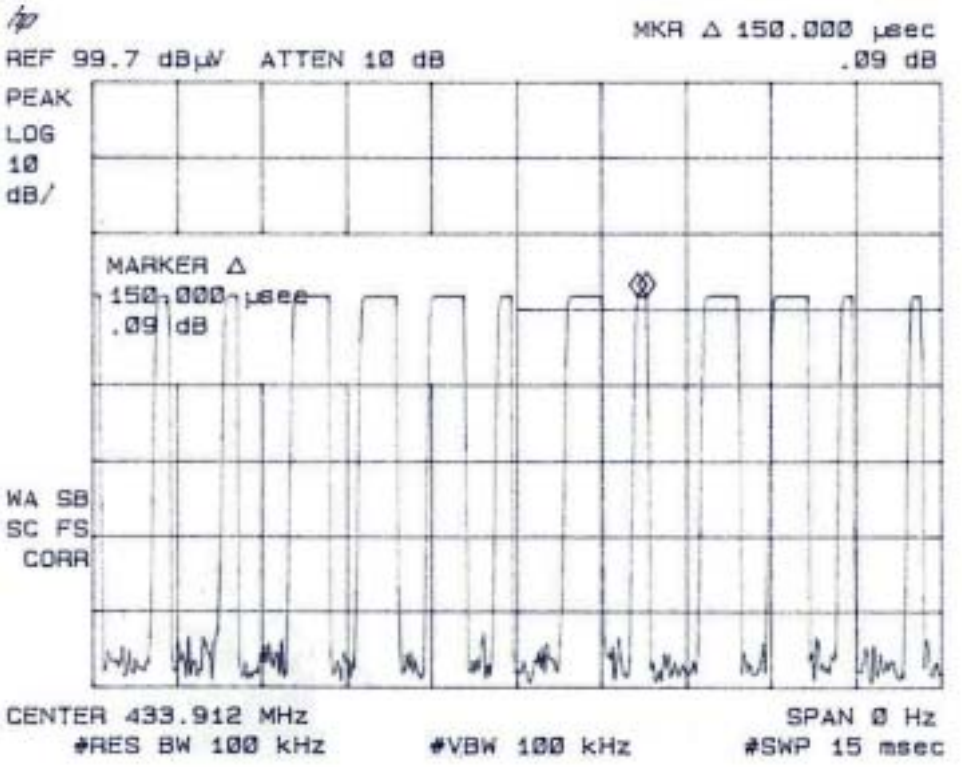


Ton

Button#1

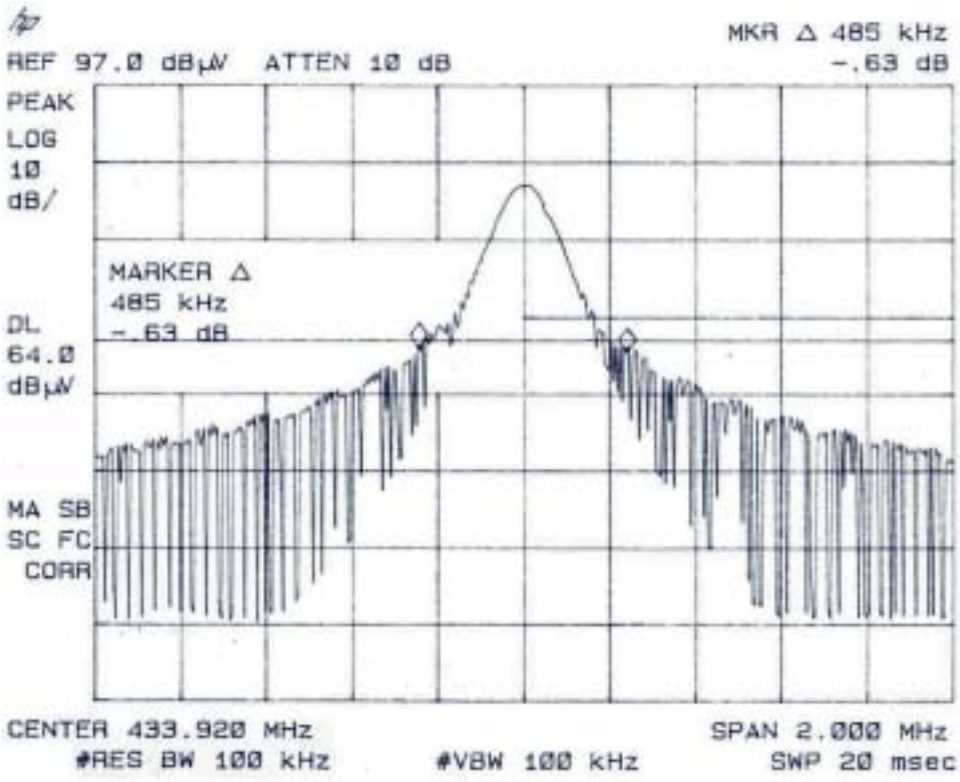


Button#2

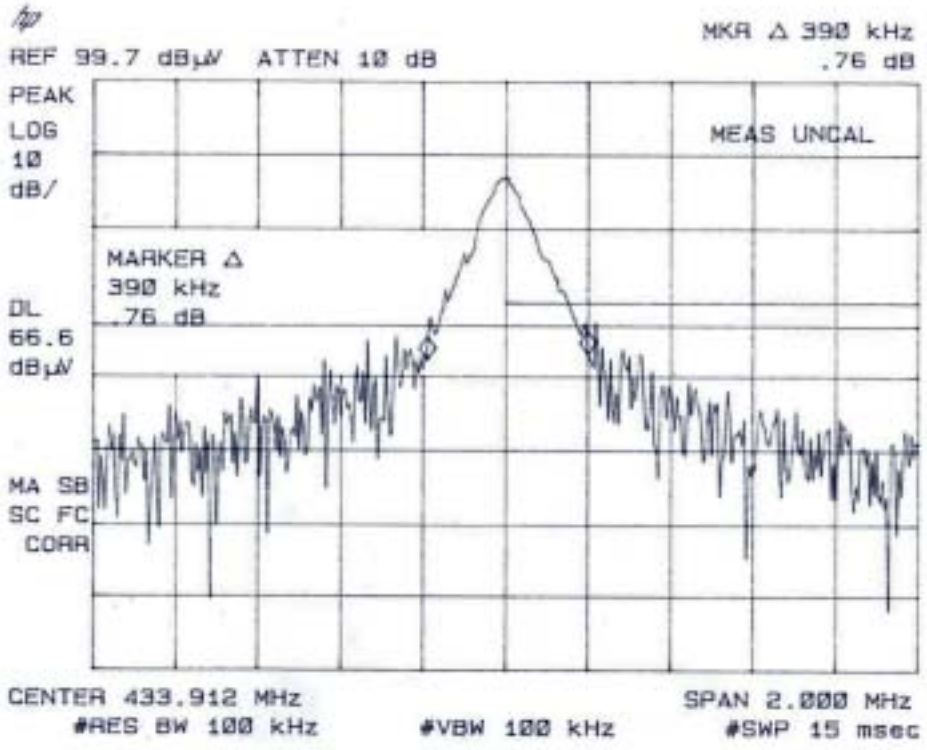


Test Plot: The Emissions Bandwidth

Button#1



Button#2



TEST RESULTS

Below 1 GHz

Operation Mode: TX Mode / Button#1 **Test Date:** July 12, 2004

Temperature: 28°C **Humidity:** 68 % RH

Tested by: Jason Lee

Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol (H/V)
433.92	57.62	47.94	-4.16	43.78	80.83	-37.05	3mV_X
867.83	41.73	32.05	2.86	34.91	60.83	-25.92	3mV_X
433.92	73.69	64.01	-4.16	59.85	80.83	-20.98	3mV_Y
867.83	48.24	38.56	2.86	41.42	60.83	-19.41	3mV_Y
433.92	76.36	66.68	-4.16	62.52	80.83	-18.31	3mV_Z
867.85	50.29	40.61	2.86	43.47	60.83	-17.36	3mV_Z
433.91	68.49	58.81	-4.16	54.65	80.83	-26.18	3mH_X
867.81	49.00	39.32	2.86	42.18	60.83	-18.65	3mH_X
433.91	70.27	60.59	-4.16	56.43	80.83	-24.40	3mH_Y
867.83	50.32	40.64	2.86	43.50	60.83	-17.33	3mH_Y
433.92	71.24	61.56	-4.16	57.40	80.83	-23.43	3mH_Z
867.84	47.63	37.95	2.86	40.81	60.83	-20.02	3mH_Z

Factor = Antenna Factor + Cable Loss - Pre Amplifier
Av Rdg = Pk Rdg -9.6792dB

Notes:

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.*

Operation Mode: TX Mode / Button#2 **Test Date:** July 12, 2004

Temperature: 28°C **Humidity:** 68 % RH

Tested by: Jason Lee

Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol (H/V)
433.92	59.78	48.66	-4.16	44.50	80.83	-36.33	3mV_X
867.84	42.06	30.94	2.86	33.80	60.83	-27.03	3mV_X
433.93	72.94	61.82	-4.16	57.66	80.83	-23.17	3mV_Y
867.84	48.54	37.42	2.86	40.28	60.83	-20.55	3mV_Y
433.93	74.34	63.22	-4.16	59.06	80.83	-21.77	3mV_Z
867.77	49.66	38.54	2.86	41.40	60.83	-19.43	3mV_Z
433.91	67.06	55.94	-4.16	51.78	80.83	-29.05	3mH_X
867.71	46.84	35.72	2.86	38.58	60.83	-22.25	3mH_X
433.93	69.38	58.26	-4.16	54.10	80.83	-26.73	3mH_Y
867.83	49.52	38.40	2.86	41.26	60.83	-19.57	3mH_Y
433.84	71.03	59.91	-4.16	55.75	80.83	-25.08	3mH_Z
867.91	46.66	35.54	2.86	38.40	60.83	-22.43	3mH_Z

Factor = Antenna Factor + Cable Loss - Pre Amplifier
Av Rdg = Pk Rdg -11.123dB

Notes:

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.*

Above 1 GHz

Operation Mode: TX Mode / Button#1 (Worst) **Test Date:** July 12, 2004

Temperature: 28°C **Humidity:** 68 % RH

Tested by: Jason Lee

Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol (H/V)
1300	60.90	---	-8.77	52.13	74.00	-21.87	3mV
1300	---	54.83	-8.77	46.06	54.00	-7.94	3mV
1735	62.49	52.81	-6.38	46.43	60.82	-14.39	3mV
2170	54.10	44.42	-3.79	50.31	60.82	-10.51	3mV
1300	61.60	---	-8.77	52.83	74.00	-21.17	3mH
1300	---	55.53	-8.77	46.76	54.00	-7.24	3mH
1840	49.60	39.92	-5.70	34.22	60.82	-26.60	3mH
2254	48.40	---	-3.33	45.07	74.00	-28.93	3mH
2254	---	42.33	-3.33	39.00	54.00	-15.00	3mH

Factor = Antenna Factor + Cable Loss - Pre Amplifier

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode (RBW=VBW=1MHz) of the emission shown in Rdg column.
4. Average detector mode (RBW=1MHz, VBW=10Hz) for restricted frequency bands.
5. Average measured mode (Pk Rdg – 9.6792dB) for not restricted frequency bands.