



FCC ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT CERTIFICATION TO FCC PART 15 REQUIREMENTS

for

INTENTIONAL RADIATOR

of

Car Alarm Transceiver

FCC ID Number : H5OTR11

Trade Name : Advance Security Inc.

Model Number : TRX755DV

Agency Series : N/A

Report Number : 40517409-RP

Date : June 24, 2004

Prepared for :

Advance Security Inc.

3F, 48 Ta An Street, Hsi Chih,

Taipei Hsien, Taiwan, R. O. C.

Prepared by :

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**1. VERIFICATION OF COMPLIANCE**

COMPANY NAME : Advance Security Inc.
3F, 48 Ta An Street, Hsi Chih, Taipei Hsien, Taiwan, R. O. C.

CONTACT PERSON : Michael Chen / President

TELEPHONE NO. : (886-2) 8648-1688

EUT DESCRIPTION : Car Alarm Transceiver

MODEL NAME/NUMBER : TRX755DV

FCC ID : H5OTR11

DATE TESTED : May 28, June 02 & 21, 2004

REPORT NUMBER : 40517409-RP

TYPE OF EQUIPMENT	SECURITY EQUIPMENT (INTENTIONAL RADIATOR)
EQUIPMENT TYPE	433.92 MHz Car Alarm Transceiver
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

Compliance Certification Services Inc.

Reviewed by:

Rick Yeo

Manager

Compliance Certification Services Inc.



2. PRODUCT DESCRIPTION

Fundamental Frequency	433.92 MHz
Power Source	Powered by AAA batteries (Rating: $1 \times 1.5\text{Vdc}$)
Transmitting Time	Periodic ≤ 5 seconds
Associated Transceiver	Model: TRX76 / FCC ID: H5OTR06AM

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 # 4				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	ADVANTEST	R3132	91700456	N.C.R
EMI Test Receiver	R&S	ESVS10	846285/016	04/25/2005
Bilog Antenna	Sunol Sciences	JB1	A111203	01/09/2005
Turn Table	Chance Most	N/A	N/A	N.C.R
Antenna Tower	Chance Most	N/A	N/A	N.C.R
Controller	Chance Most	N/A	N/A	N.C.R
RF Switch	ANRITSU	MP59B	M51067	N.C.R
Site NSA	CCS	N/A	N/A	08/08/2004
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/10/2005
Spectrum Analyzer	HP	8566B	2937A06102	06/25/2005
Horn Antenna	EMCO	3115	5761	02/02/2005
Pre-Amplifier	HP	8449B	3008A01266	02/15/2005

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
RECEIVER MODE	SECTION 15.109

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

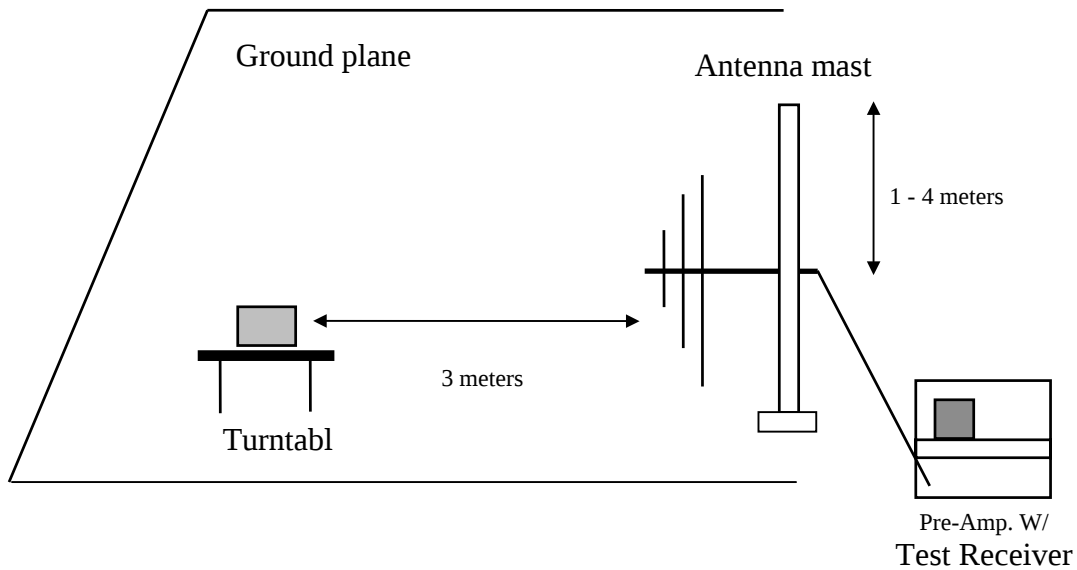


Fig. 1

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.

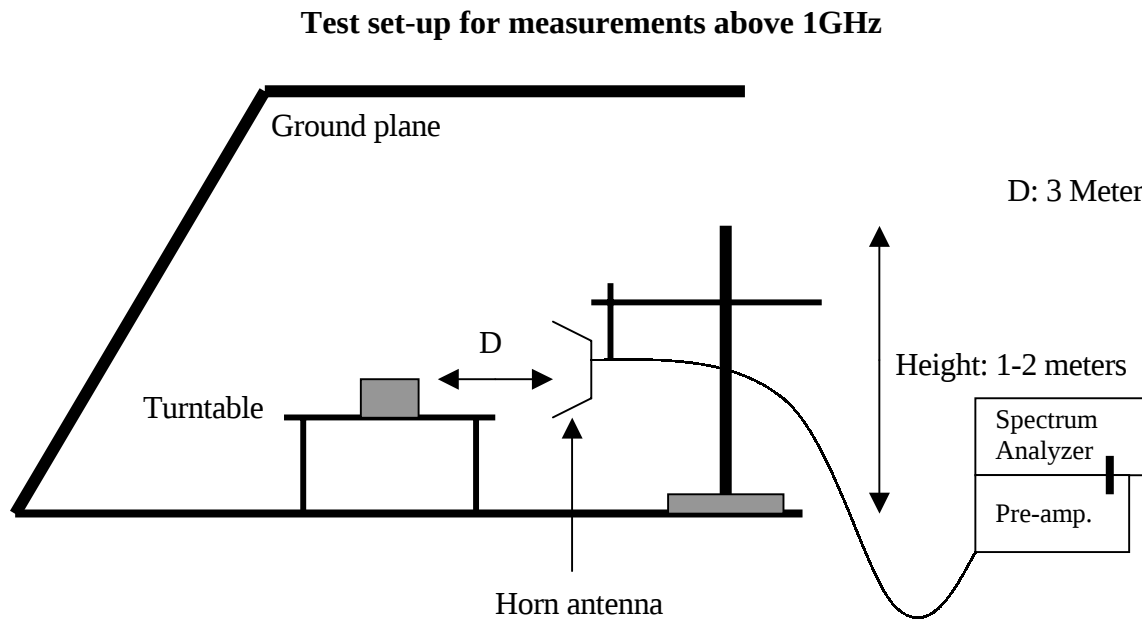


Fig. 2

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	X
BATTERY POWER	X	SECTION 15.231 (b)	X
		SECTION 15.231 (e)	
		SECTION 15.109	

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	64.24	22*0.85+25*0.26 = 25.20	39.23	-8.13 dB
Button#2	64.24	21*0.83+26*0.26 = 24.19	37.66	-8.48 dB
Button#3	64.08	20*0.86+27*0.25 = 23.95	37.38	-8.55 dB
Button#4	64.24	25*0.85+22*0.25 = 26.75	41.64	-7.61 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)	Botton#3 BW (kHz)	Botton#4 BW (kHz)	Limit (MHz)	Result
433.92	560.00	656.00	622.00	600.00	1.0848	PASS



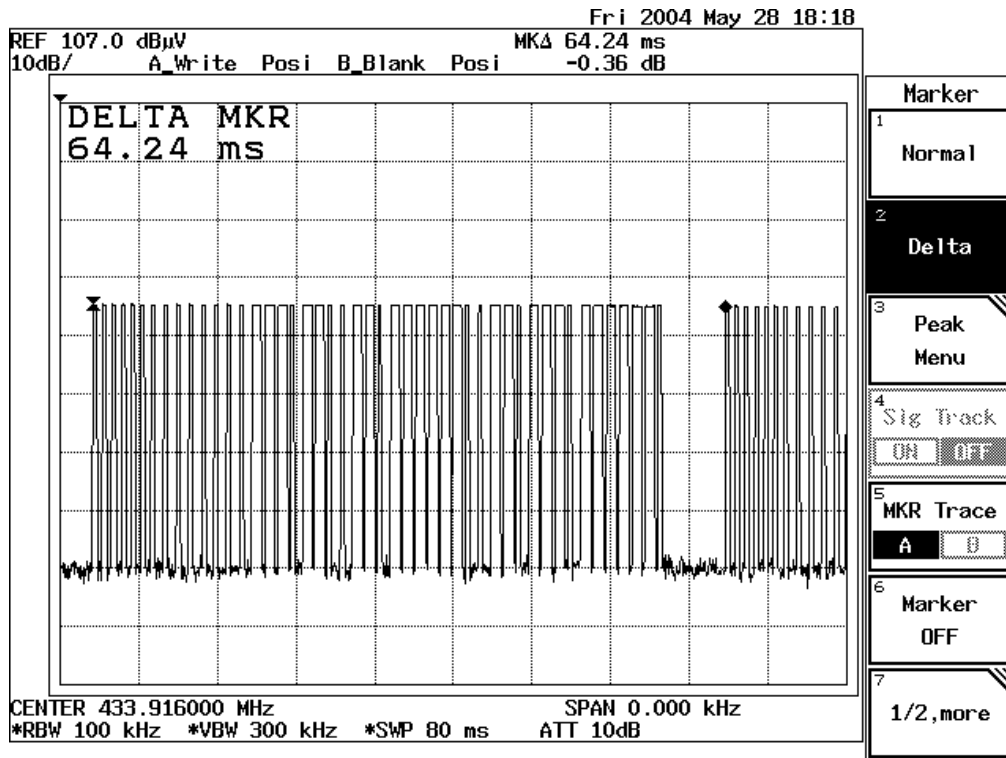
APPENDIX 1

TEST DATA

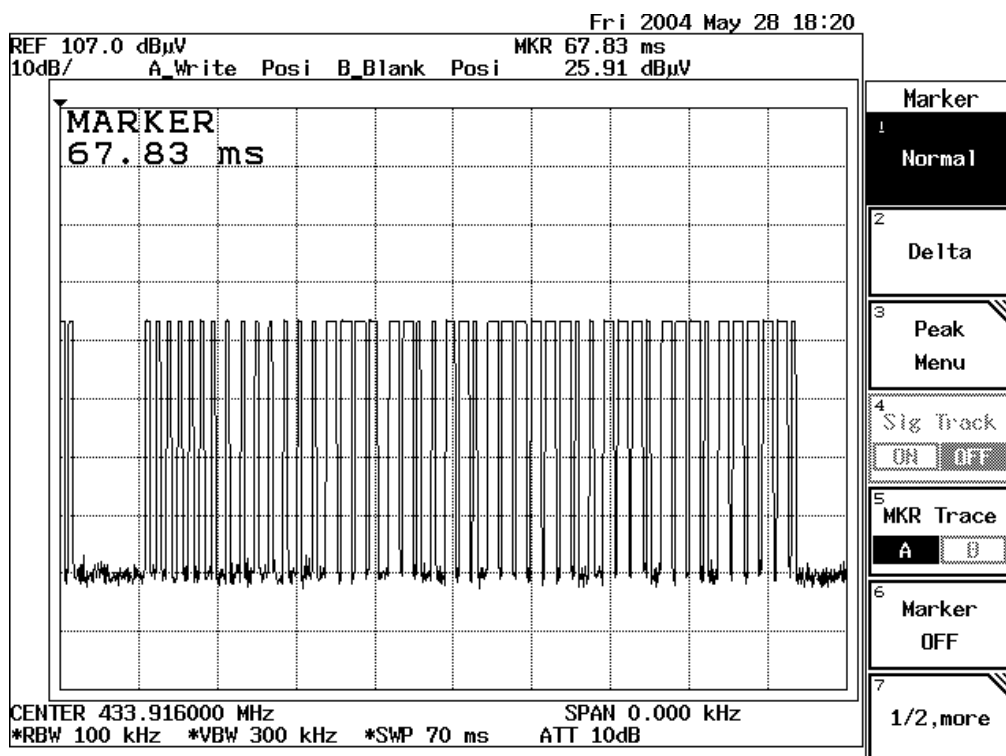


Test Plot: Maximum Modulation Percentage (M%) / (Worst)

Tp

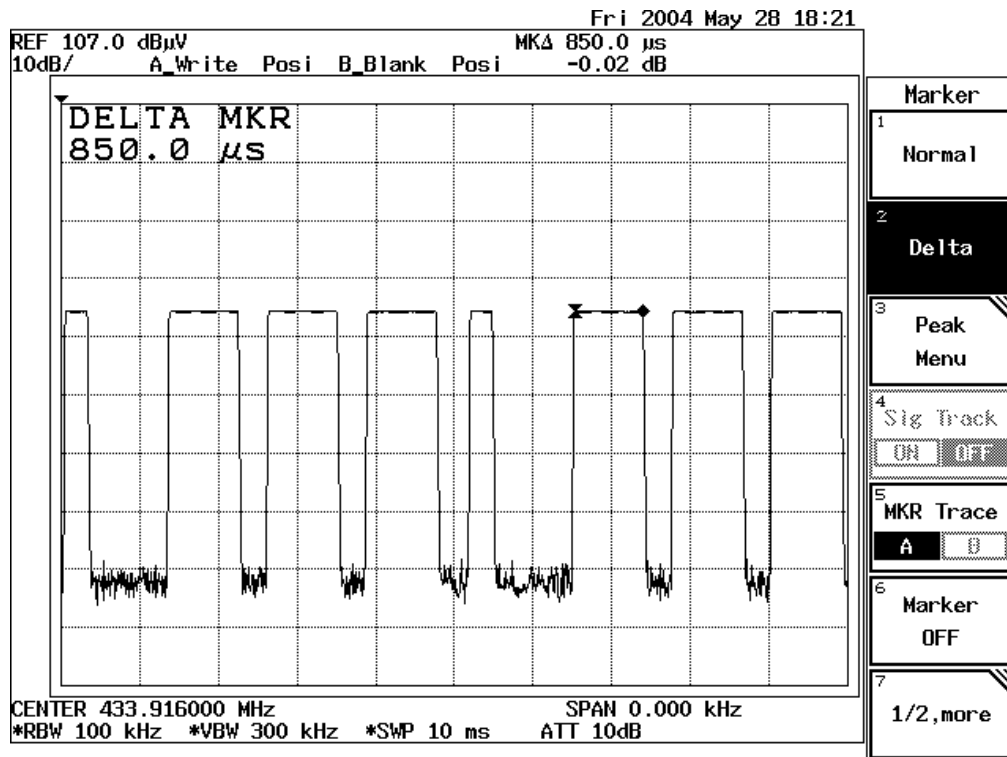


Channel Number

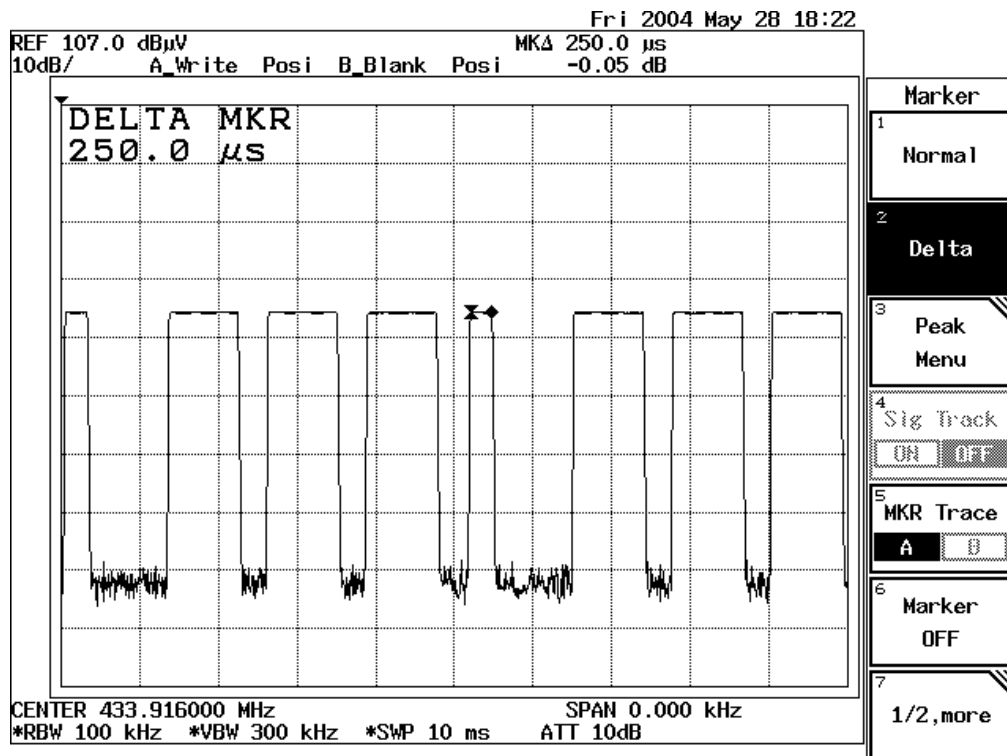




Ton

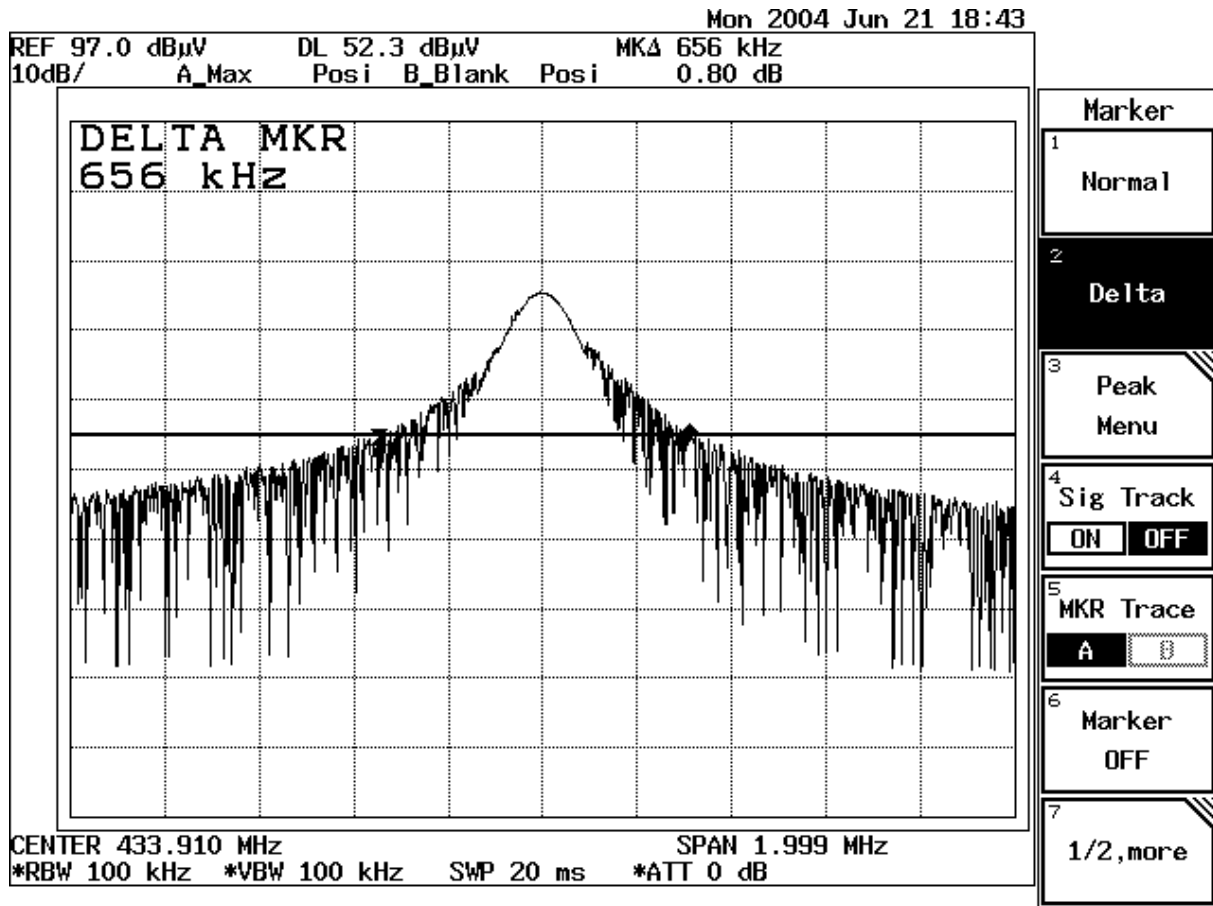


Ton





Test Plot: The Emissions Bandwidth / (Worst)





TEST RESULTS

Below 1 GHz

Operation Mode: TX Mode / Button#1

Test Date: June 02, 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)
433.88	62.20	54.07	-8.07	46.00	80.82	-34.82	3mV_X
867.78	41.18	33.05	-1.57	31.48	60.82	-29.34	3mV_X
433.88	67.71	59.58	-8.07	51.51	80.82	-29.31	3mV_Y
867.77	43.54	35.41	-1.57	33.84	60.82	-26.98	3mV_Y
433.88	73.73	65.60	-8.07	57.53	80.82	-23.29	3mV_Z
867.77	42.45	34.32	-1.57	32.75	60.82	-28.07	3mV_Z
433.87	70.96	62.83	-8.07	54.76	80.82	-26.06	3mH_X
867.77	45.34	37.21	-1.57	35.64	60.82	-25.18	3mH_X
433.88	72.64	64.51	-8.07	56.44	80.82	-24.38	3mH_Y
867.78	46.28	38.15	-1.57	36.58	60.82	-24.24	3mH_Y
433.88	61.72	53.59	-8.07	45.52	80.82	-35.30	3mH_Z
867.78	44.33	36.20	-1.57	34.63	60.82	-26.19	3mH_Z
Factor = Antenna Factor + Cable Loss - Pre Amplifier							
Av Rdg = Pk Rdg -8.1276dB							

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: June 02, 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)
433.88	61.21	52.73	-8.07	44.66	80.82	-36.16	3mV_X
867.35	39.60	31.12	-1.57	29.55	60.82	-31.27	3mV_X
433.89	66.90	58.42	-8.07	50.35	80.82	-30.47	3mV_Y
867.78	44.20	35.72	-1.57	34.15	60.82	-26.67	3mV_Y
433.88	73.43	64.95	-8.07	56.88	80.82	-23.94	3mV_Z
867.75	43.21	34.73	-1.57	33.16	60.82	-27.66	3mV_Z
433.88	70.30	61.82	-8.07	53.75	80.82	-27.07	3mH_X
867.36	44.90	36.42	-1.57	34.85	60.82	-25.97	3mH_X
433.85	72.40	63.92	-8.07	55.85	80.82	-24.97	3mH_Y
867.24	45.81	37.33	-1.57	35.76	60.82	-25.06	3mH_Y
433.88	62.58	54.10	-8.07	46.03	80.82	-34.79	3mH_Z
867.77	43.58	35.10	-1.57	33.53	60.82	-27.29	3mH_Z
Factor = Antenna Factor + Cable Loss - Pre Amplifier							
Av Rdg = Pk Rdg -8.4824dB							

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#3

Test Date: June 02, 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)
433.87	62.85	54.30	-8.07	46.23	80.82	-34.59	3mV_X
867.76	41.25	32.70	-1.57	31.13	60.82	-29.69	3mV_X
433.89	67.66	59.11	-8.07	51.04	80.82	-29.78	3mV_Y
867.75	43.50	34.95	-1.57	33.38	60.82	-27.44	3mV_Y
433.87	74.10	65.55	-8.07	57.48	80.82	-23.34	3mV_Z
867.77	43.20	34.65	-1.57	33.08	60.82	-27.74	3mV_Z
433.87	69.67	61.12	-8.07	53.05	80.82	-27.77	3mH_X
867.77	45.22	36.67	-1.57	35.10	60.82	-25.72	3mH_X
433.87	72.90	64.35	-8.07	56.28	80.82	-24.54	3mH_Y
867.78	46.38	37.83	-1.57	36.26	60.82	-24.56	3mH_Y
433.87	61.80	53.25	-8.07	45.18	80.82	-35.64	3mH_Z
867.77	43.89	35.34	-1.57	33.77	60.82	-27.05	3mH_Z
Factor = Antenna Factor + Cable Loss - Pre Amplifier							
Av Rdg = Pk Rdg -8.5472dB							

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#4

Test Date: June 02, 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)
433.87	62.58	54.97	-8.07	46.90	80.82	-33.92	3mV_X
867.78	42.33	34.72	-1.57	33.15	60.82	-27.67	3mV_X
433.88	66.98	59.37	-8.07	51.30	80.82	-29.52	3mV_Y
867.76	42.55	34.94	-1.57	33.37	60.82	-27.45	3mV_Y
433.87	74.22	66.61	-8.07	58.54	80.82	-22.28	3mV_Z
867.76	43.50	35.89	-1.57	34.32	60.82	-26.50	3mV_Z
433.87	71.26	63.65	-8.07	55.58	80.82	-25.24	3mH_X
867.76	45.29	37.68	-1.57	36.11	60.82	-24.71	3mH_X
433.87	72.11	64.50	-8.07	56.43	80.82	-24.39	3mH_Y
867.77	46.66	39.05	-1.57	37.48	60.82	-23.34	3mH_Y
433.87	61.25	53.64	-8.07	45.57	80.82	-35.25	3mH_Z
867.78	44.69	37.08	-1.57	35.51	60.82	-25.31	3mH_Z
Factor = Antenna Factor + Cable Loss - Pre Amplifier							
Av Rdg = Pk Rdg -7.6098dB							

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: RX Mode

Test Date: May 28, 2004

Temperature: 27°C

Humidity: 72 % RH

Tested by: Jason Lee

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
433.93	V	Peak	69.03	-8.05	60.98	---	---
430.85	V	Peak	36.02	-8.14	27.88	46.00	-18.12
432.16	V	Peak	38.66	-8.03	30.63	46.00	-15.37
435.43	V	Peak	38.13	-7.99	30.14	46.00	-15.86
435.70	V	Peak	36.68	-7.99	28.69	46.00	-17.31
437.32	V	Peak	35.74	-7.99	27.75	46.00	-18.25
438.21	V	Peak	43.84	-7.99	35.85	46.00	-10.15
433.93	H	Peak	69.11	-8.05	61.06	---	---
429.79	H	Peak	35.21	-8.12	27.09	46.00	-18.91
430.99	H	Peak	34.11	-8.14	25.97	46.00	-20.03
432.07	H	Peak	36.98	-8.03	28.95	46.00	-17.05
432.47	H	Peak	38.10	-8.04	30.06	46.00	-15.94
435.65	H	Peak	38.61	-7.99	30.62	46.00	-15.38
437.41	H	Peak	34.14	-7.99	26.15	46.00	-19.85

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#4(Worst)

Test Date: June 02, 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)
1301	58.80	---	-8.77	50.03	74.00	-23.97	3mV
1301	---	43.20	-8.77	34.43	54.00	-19.57	3mV
1736	54.90	47.29	-6.37	40.92	60.82	-19.90	3mV
1943	43.53	---	-5.04	38.49	74.00	-35.51	3mV
1943	---	33.10	-5.04	28.06	54.00	-25.94	3mV
2170	51.10	43.49	-3.79	39.70	60.82	-21.12	3mV
1301	57.40	---	-8.77	48.63	74.00	-25.37	3mH
1301	---	43.00	-8.77	34.23	54.00	-19.77	3mH
1736	51.70	44.09	-6.37	37.72	60.82	-23.10	3mH
1850	43.09	---	-5.64	37.45	74.00	-36.55	3mH
1850	---	32.80	-5.64	27.16	54.00	-26.84	3mH
2170	47.20	39.59	-3.79	35.80	60.82	-25.02	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 – 7.6098dB) for not restricted frequency bands.



Operation Mode: RX Mode
Temperature: 27°C
Tested by: Jason Lee

Test Date: May 28, 2004
Humidity: 72 % RH

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
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* No Any Emissions Were Found Within 20dB Below Limits From 1 GHz To 2 GHz.										

Notes:

1. Measuring frequencies from 1 GHz to 2 GHz.
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 and average detector mode of the emission shown in Actual FS column.
4. Spectrum Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.
5. Spectrum AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.