Electromagnetic Compatibility Test Report

Tests Performed on a Trilithic

Emergency Alert System, Model EASyPLUS-1

Radiometrics Document RP-4700

ACCREDITED
Certification # 1495.01

Product Detail: **FCC ID: P4V-EASYPLUS-1** Equipment type: EAD Emergency Alert Device
Test Standards: US CFR Title 47, Chapter I, FCC Part 15 Subpart B FCC Part 15 CFR Title 47: 2001 This report concerns: Original Grant for Certification FCC Parts 11.32(d) and 15 Subpart B

Tests Performed For:	*Test Facility:*
Trilithic 9202 East 33rd. ST. Indianapolis, IN 46235	**Radiometrics Midwest Corporation** 12 East Devonwood Romeoville, IL 60446 Phone: (815) 293-0772 e-mail: info@radiomet.com

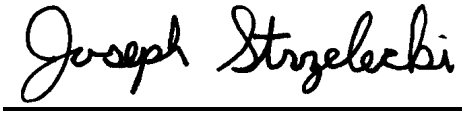
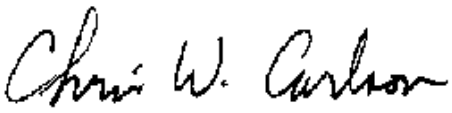
Test Date(s): (Month-Day-Year)
3/4/02 and 3/22/02

Document RP-4700 Revisions:

Rev.	Issue Date	Affected Pages	Revised By	Authorized Signature for Revision
0	May 21, 2002			

Table of Contents

1 ADMINISTRATIVE DATA

Equipment Under Test: A Trilithic, Emergency Alert System Model: EASyPLUS-1 Serial Number: 10001 This will be referred to as the EUT in this Report	
Date EUT Received at Radiometrics: (Month-Day-Year) 2-14-02	*Test Date(s): (Month-Day-Year)* 2/14/02 and 3/22/02
Test Report Written By: Joseph Strzelecki Senior EMC Engineer	*Test Witnessed By:* Allan Studer Trilithic
Radiometrics' Personnel Responsible for Test:  Joseph Strzelecki Senior EMC Engineer NARTE EMC-000877-NE	*Test Report Approved By*  Chris W. Carlson Director of Engineering NARTE EMC-000921-NE

2 TEST SUMMARY AND RESULTS

The EUT (Equipment Under Test) is an Emergency Alert System, Model EASyPLUS-1, manufactured by Trilithic. The detailed test results are presented in a separate section. The following is a summary of the test results.

Tests Results

Environmental Phenomena	Frequency Range	Basic Standard	Test Result
RF Radiated Emissions	30 – 2000 MHz	FCC Part 15	Pass
Conducted Emissions, AC Mains	0.45 - 30 MHz	FCC Part 15	Pass
Antenna Conducted Emissions	0.1 – 2000 MHz	FCC Part 15	Pass
Broadcast frequency Immunity	1 to 787 MHz	FCC Part 11.32(d)	Pass

3 EQUIPMENT UNDER TEST (EUT) DETAILS

3.1 EUT Description

The EUT is an Emergency Alert System, Model EASyPLUS-1, manufactured by Trilithic. The EUT was in good working condition during the tests, with no known defects.

3.2 Related Submittals

Trilithic is not submitting any other products simultaneously for equipment authorization related to the EUT.

4 TESTED SYSTEM DETAILS

4.1 Tested System Configuration

The system was configured for testing in a typical fashion. The EUT was placed on an 80-cm high, nonconductive test stand. The testing was performed in conditions as close as possible to installed conditions. Wiring was consistent with manufacturer's recommendations. Power was supplied at 115 VAC, 60 Hz single-phase.

Tested System Configuration List

Item	Description	Type*	Manufacturer	Model Number	Serial Number
1	EAS Encoder Decoder	E	Trilithic	EASyPLUS-1	10001
2	Video-Audio Switch	E	Trilithic	SW-2A	N/A
3	Power Supply	E	Trilithic	PS-512	9735024
4	Lossless Splitter	E	Trilithic	LS-16P	N/A
5	Character Generator	E	Trilithic	Mini-mesenger	N/A
6	Printer	P	Star	NX-1001	510010542390
7	VAIO Notebook PC	H	Sony, Inc.	PCG-9251	28310531 4024706
8	VAIO Power supply	H	Sony, Inc.	N50	0954552P

* Type: E = EUT, P = Peripheral, S = Support Equipment

List of System Cables

QTY	Length (m)	Cable Description	Connected to (Item #)	Shielded?
3	2.1	AC Cord	#1, #3 and #6	No
1	1.8	RS-232 cable	#1 and #7	Yes
1	1.5	RS-232 cable	#1	Yes
1	1.0	RJ-12 cable	#1	Yes
21	1.0	Audio cable	#3 and #1	Yes
3	1.5	Audio cable	#1 and #3	Yes
2	1.5	Coaxial cable	#1 and #4	Yes
1	1.8	Printer Cable	#7 and #6	Yes

Peripheral Equipment:
PS-512 Power Supply to power the following equipment…
- LS-16P Loss less IF Splitter
  - EAS TTL In connected to EASyPLUS TTL Out 8
  - Master TTL In connected to EASyPLUS TTL Out 7
- Mini Messenger Character Generator
  - RS-485 connected to EASyPLUS RS-485
- SW-2A base band Audio/Video switch
  - TTL In connected to EASyPLUS TTL Out 9 and 10
  - Base Band Audio Aux connected to EASyPLUS Audio Out 3
  - Base Band Video Aux connected to EASyPLUS Video Out

The Notebook Computer running EASy Software connected to COM1 of EASyPLUS
Dot-Matrix Printer connected to Parallel output of the EASyPLUS
1 meter shielded audio wires connected to all other audio connections
1 meter shielded audio wires connected to all contact closure connections
1 meter RG-59 cables connected to Radio Inputs
5' Rs-232 cable connected to COM 2
Grounded (3 wire) Power cable connected to EASyPLUS AC In
Grounded (3 wire) Power cable connected to PS-512 AC In
Notebook Powered by adapter
Printer powered by AC line

4.2 Operating mode

The EASyPLUS-1 was Scanning for EAS FSK. It was in full-page video out mode. The serial communication was via COM1 RS-232 to the host computer. All EAS audio out lines were set to Active Audio output on. The display was active. All internal POTs software was programmed to Max Volume.

During the tests, the EUT was tuned to the following frequencies.

AM Radio	520, 1070, 1340 and 1720 kHz
FM Radio	87.9, 93.5, 94.7 and 107.9 MHz
WRX Weather Radio FM	162.4, 162.425, 162.450, 162.475, 162.500, 162.525 and 162.550 MHz

4.3 Special Accessories

No special accessories were used during the tests in order to achieve compliance.

4.4 Equipment Modifications

No modifications were made to the EUT at Radiometrics' test facility in order to comply with the standards listed in this report.

5 TEST SPECIFICATIONS AND RELATED DOCUMENTS

Test Specifications

Document	Date	Title
FCC CFR Title 47	1999	Code of Federal Regulations Title 47, Chapter 1, Federal Communications Commission, Part 15 - Radio Frequency Devices
ANSI C63.4-1992	1992	Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

The test procedures used are in accordance with the ANSI document C63.4-1992, (July 17, 1992) "Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The specific procedures are described herein. Radiated testing was performed at an antenna to EUT distance of 3 meters. The antenna was raised and lowered from 1 to 4 meters.

6 RADIOMETRICS' TEST FACILITIES

The results of these tests were obtained at Radiometrics Midwest Corp. in Romeoville, Illinois, USA. Radiometrics has been accredited by A2LA (American Association for Laboratory Accreditation) to conform to ISO/IEC 17025: 1999 "General Requirements for the Competence of Calibration and Testing Laboratories". Radiometrics' Lab Code is 121191 and Certification Number is 1495.01. Radiometrics' scope of accreditation includes all of the "basic standards" listed herein. A copy of the accreditation can be accessed on our web site (www.radiomet.com). Radiometrics accreditation status can be verified at A2LA's web site (www.a2la.org).

The following is a list of shielded enclosures located in Romeoville, Illinois:

Chamber A: Is an anechoic chamber that measures 24' L X 12' W X 12' H. The walls and ceiling are fully lined with ferrite absorber tiles. The floor has a 10' x 10' section of ferrite absorber tiles in the located in the center. Panashield of Rowayton, Connecticut manufactured the chamber. The enclosure is NAMAS certified.

Chamber B: Is a shielded enclosure that measures 24' L X 12' W X 8' H. Erik A. Lindgren & Associates of Chicago, Illinois manufactured the enclosure.

Chamber C: Is a shielded enclosure that measures 20' L X 10' W X 8' H. Lindgren RF Enclosures Inc. of Addison, Illinois manufactured the enclosure.

Chamber D: Is a fully anechoic chamber that measures 22' L X 10' W X 10' H. The walls, ceiling and floor are fully lined with ferrite absorber tiles. Braden Shielding Systems of Tulsa, Oklahoma manufactured the chamber.

A separate ten-foot long, brass plated, steel ground rod attached via a 6 inch copper braid grounds each of the above chambers. Each enclosure is also equipped with low-pass power line filters.

Open Area Test Site (OATS): Is located on 8625 Helmar Road in Newark, Illinois, USA and measures 56' L X 24' W X 17' H. The entire open field test site has a metal ground screen. The FCC has accepted these sites as test site number 31040/SIT 1300F2. The FCC test site Registration Number is 90897. Details of the site characteristics are on file with the Industry Canada as file number IC3124.

A complete list of the test equipment is provided herein. The calibration due dates are indicated on the equipment list. The equipment is calibrated in accordance to ANSI/NCSL Z540-1 with traceability to the National Institute of Standards and Technology (NIST).

7 DEVIATIONS AND EXCLUSIONS FROM THE TEST SPECIFICATIONS

There were no deviations or exclusions from the test specifications.

8 TEST PROCEDURES

The test procedures used are in accordance with the ANSI document C63.4-1992, (July 17, 1992) "Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The specific procedures are described herein. Radiated testing was performed at an antenna to EUT distance of 3 meters. The antenna was raised and lowered from 1 to 4 meters.

8.1 Radiated RF Emissions Measurement Procedures

Radiated emission measurements were performed with linearly polarized broadband antennas. The results obtained with these antennas can be correlated with results obtained with a tuned dipole antenna. Below 1 GHz, when a radiated emission is detected approaching the specification limit, the measurement of the emission is repeated using a tuned dipole antenna with a Roberts Balun.

The radiated emission measurements were performed with a spectrum analyzer. The bandwidth used from 450 kHz to 30 MHz is 9 or 10 kHz, and the bandwidth from 30 MHz to 1000 MHz is 100 or 120 kHz. Above 1 GHz, a 1 MHz bandwidth is used. A 10 dB linearity check is performed prior to start of testing in order to determine if an overload condition exists.

From 30 to 1000 MHz an Anritsu Spectrum analyzer and a MITEQ AM-1431 amplifier with a 10 dB attenuator connected to the input were used. The out of band emissions and the ambient emissions were below the level of input overload (80 dBuV).

Preliminary radiated emission tests were performed inside of an anechoic enclosure. The frequency range from 30 to 1000 MHz was scanned and plotted using the peak detector function. The test antennas were positioned 3 meters from the EUT. The results of the preliminary scans were only used to identify the frequencies being emitted from the EUT and were not used to determine compliance with the test specification. Radiated emission measurements are performed with linearly polarized broadband antennas.

Final radiated emissions measurements were performed in the open area test site at a test distance of 3 meters. Measurements were performed using the peak or quasi-peak detector function. The detected emission levels were maximized by rotating the EUT, adjusting the positions of all cables, and by scanning the measurement antenna from 1 to 4 meters above the ground. The open area test site used to collect the radiated data is located on 8625 Helmar Road in Newark, Illinois. The open field test site has a metal ground screen. All other tests are performed at 12 East Devonwood Ave. Romeoville, Illinois EMI test lab.

The entire frequency range from 30 to 2000 MHz was slowly scanned with particular attention paid to those frequency ranges which appeared high in the preliminary emission scan. Measurements were performed using two antenna polarizations, (vertical and horizontal). The worst case emissions were recorded.

8.1.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and by subtracting the Amplifier Gain from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

Where: FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Attenuation Factor
AG = Amplifier Gain

Assume a receiver reading of 49.5 dBuV is obtained. The Antenna Factor of 8.1 and a Cable Factor of 1.7 is added. The Amplifier Gain of 23.3 dB is subtracted, giving a field strength of 36 dBuV/m. The 36 dBuV/m can be mathematically converted to its corresponding level in uV/m.

FS = 49.5 + 8.1 + 1.7 - 23.3 = 36.0 dBuV/m
Level in uV/m = Common Antilogarithm [(36 dBuV/m)/20] = 63.1 uV/m

8.1.2 Conducted Emission Measurement Procedures

A computer-controlled analyzer was used to perform the conducted emissions measurements. The frequency range was divided into 500 subranges equally spaced on a logarithmic scale. The computer recorded the peak of each subrange. This data was then plotted on semi-log graph paper generated by the computer and plotter. Adjusting the positions of the cables and orientation of the test system then maximizes the highest emissions.

Mains Conducted emission measurements were performed using a 50 Ohm/50 uH Line Impedance Stabilization Network (LISN) as the pick-up device. Measurements were repeated on both leads within the power cord. If the EUT power cord exceeded 80 cm in length, the excess length of the power cord was made into a 30 to 40 cm bundle near the center of the cord. The LISN was placed on the floor at the base of the test platform and electrically bonded to the ground plane.

Broadband conducted emissions may exceed the following limits by no more than 13 dB. An emission is defined as broadband if the average detector amplitude is 6 dB or more under the quasi-peak detector amplitude.

FCC Limits of Conducted Emissions at the AC Mains Ports

Frequency Range (MHz)	Class A, QP Limits (dBuV)	Class B, QP Limit (dBuV)
0.450 - 1.705	60.0	48.0
1.705 - 30	69.5	48.0

9 CERTIFICATION

Radiometrics Midwest Corporation certifies that the data contained herein was taken under conditions that meet or exceed the requirements of the test specification. The results relate only to the EUT listed herein. Any modifications made to the EUT subsequent to the indicated test date will invalidate the data and void this certification.

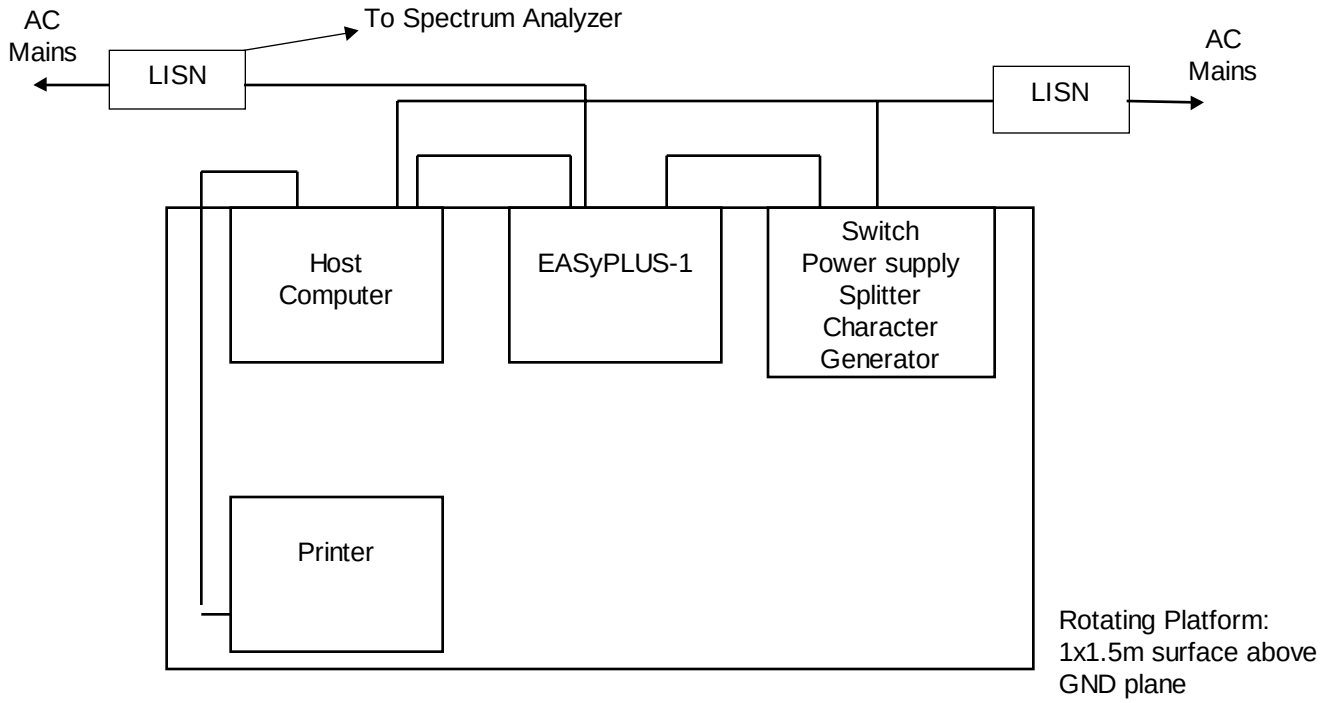
10 TEST EQUIPMENT TABLE

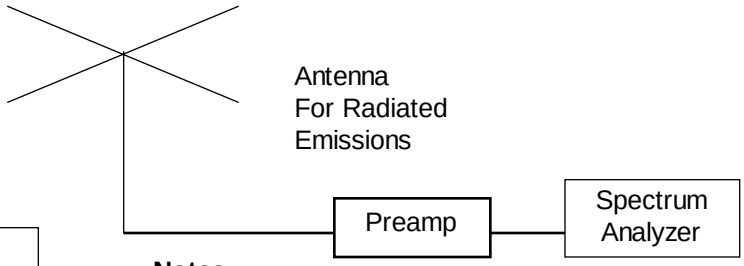
RMC ID	Manufacturer	Description	Model No.	Serial No.	Frequency Range	Cal Period	Cal Date
AMP-02	RF Labs	Power Amplifier	250-145	64884	0.01-220MHz	N/A	NCR
AMP-03	RMC	Power Amplifier	RA1000	1001	20-1000MHz	N/A	NCR
AMP-05	RMC/Celeritek	Pre-amplifier	MW110G	1001	1.0-12GHz	12 Mo.	11/28/01
AMP-12	MITEQ	Pre-amplifier	AM-1431	530935	0.01-1000MHz	12 Mo.	12/28/00
ANT-03	Tensor	Biconical Antenna	4104	2231	20-200MHz	24 Mo.	08/07/01
ANT-06	EMCO	Log-Periodic Ant.	3146	1248	200-1000MHz	24 mo	08/07/01
ANT-11	RMC	Dipole Antennas	HW1010	201	25-1000MHz	12 Mo.	07/10/01
ANT-13	EMCO	Horn Antenna	3115	2502	1.0-18GHz	24 Mo.	9/28/00
ANT-15	Amp. Res.	E-Field Sensor	FP4000	17085	0.01-1000MHz	24 Mo.	10/23/00
ANT-25	ARA	Super Log Antenna	LPB-2520/A	1116	20-2000MHz	24 Mo.	8/30/01
ATT-02	KDI	Attenuator	A710N	RMC1	DC-10GHz	24 Mo.	12/28/00
HPF-01	Solar	High Pass Filter	7930-100	HPF-1	0.15-30MHz	24 Mo.	12/28/00
LSN-01	Electrometrics	LISN	FCC/VDE 50/2	1001	0.01-30MHz	24 Mo.	01/04/01
LSN-02	Electrometrics	LISN	LISN 25/3	1063	0.01-30MHz	24 Mo.	03/30/01
REC-01	Hewlett Packard	Spectrum Analyzer	8566A	2106A02115, 2209A01349	30Hz-22GHz	12 Mo.	06/08/01
REC-03	Anritsu	Spectrum Analyzer	MS2601B	MT94589	0.01-2200MHz	12 Mo.	10/12/01
REC-05	Amp. Res.	Remote Interface	IF4000	16986	0.01-1000MHz	24 Mo.	10/23/00
SIG-03	Gigatronics	RF Synthesizer	6061A	5130395	0.01-1050MHz	12 Mo.	07/27/01
THM-01	Extech Inst.	Temp/Humid Meter	4465CF	001106557	N/A	12 Mo.	12/26/01

Note: All calibrated equipment is subject to periodic checks.
NCR – No Calibration Required. Device monitored by calibrated equipment. N/A: Not Applicable.

11 TEST SETUP DOCUMENTATION

Figure 1. Configuration of RF Emissions Tests





Radiated Emissions:
- LISN's not used
- AC outlet with low-pass filter at the base of the turntable
- No vertical conductive wall
- Antenna height varied from 1 to 4 meters
- Distance from antenna to tested system is 3 meters

Notes:
- Not to Scale

Conducted Emissions:
- LISN's at least 80 cm from EUT chassis
- Vertical conductive plane 40 cm from rear of table top
- EUT power cord bundled
- Test platform is not rotated

12 DETAILED TEST RESULTS

12.1 Radiated Emissions Test Results

Manufacturer	Trilithic	Specification	FCC Part 15 Subpart B Class A
Model	EASyPLUS-1	Test Date	03/04/2002
Serial Number	10001	Test Distance	3 Meters
Notes	Corr. Factors = Cable Loss + distance Factor - Amp Gain		
Abbreviations	Pol = Antenna Polarization; V = Vertical; H = Horizontal; BC = Biconical (ANT-3); LP = Log-Periodic (ANT-6); HN = Horn (ANT-13) P = peak; Q = QP		

Freq. MHz	Meter Reading dBuV	Antenna Factor dB	Antenna Pol/ Type	Corr. Factors dB	Field Strength dBuV/m EUT	Field Strength dBuV/m Limit	Margin Under Limit dB
71.6	53.0 P	5.9	H/BC	-36.0	22.9	39.1	16.2
100.2	58.5 P	11.3	H/BC	-35.5	34.3	43.5	9.2
159.8	50.0 P	14.6	H/BC	-34.6	30.0	43.5	13.5
178.9	46.1 P	16.7	H/BC	-34.3	28.5	43.5	15.0
198.4	47.8 P	16.7	H/BC	-34.0	30.5	43.5	13.0
208.9	59.3 Q	16.0	H/BC	-33.8	41.5	43.5	2.0
232.8	50.3 P	16.1	H/BC	-33.4	32.9	46.4	13.5
244.8	46.5 P	17.4	H/BC	-33.2	30.7	46.4	15.7
258.3	49.7 P	12.9	H/LP	-32.9	29.7	46.4	16.7
270.9	52.8 P	13.4	H/LP	-32.7	33.5	46.4	12.9
297.2	49.8 P	14.8	H/LP	-32.0	32.6	46.4	13.8
319.8	48.6 P	15.1	H/LP	-31.4	32.3	46.4	14.1
332.1	51.3 P	15.2	H/LP	-31.0	35.4	46.4	11.0
368.8	47.1 P	15.5	H/LP	-30.4	32.2	46.4	14.2
381.0	46.6 P	15.6	H/LP	-30.4	31.8	46.4	14.6
417.4	45.0 P	16.2	H/LP	-30.8	30.4	46.4	16.0
712.7	42.3 P	21.7	H/LP	-29.1	34.8	46.4	11.6
71.6	62.2 Q	6.2	V/BC	-36.0	32.5	39.1	6.6
85.9	58.1 Q	9.3	V/BC	-35.7	31.7	39.1	7.4
100.2	57.9 P	11.5	V/BC	-35.5	33.9	43.5	9.6
128.8	49.0 P	13.0	V/BC	-35.0	27.0	43.5	16.5
198.0	44.8 P	16.6	V/BC	-34.0	27.3	43.5	16.2
208.9	57.5 Q	16.3	V/BC	-33.8	40.0	43.5	3.5
217.7	46.3 P	16.1	V/BC	-33.7	28.7	46.4	17.7
270.9	47.6 P	13.4	V/LP	-32.7	28.3	46.4	18.1
297.2	46.3 P	14.8	V/LP	-32.0	29.1	46.4	17.3
332.1	47.0 P	15.2	V/LP	-31.0	31.1	46.4	15.3
372.4	44.8 P	15.5	V/LP	-30.4	29.9	46.4	16.5
417.4	48.0 P	16.2	V/LP	-30.8	33.4	46.4	13.0
479.2	43.0 P	18.1	V/LP	-30.6	30.5	46.4	15.9
688.1	42.4 P	21.5	V/LP	-29.3	34.6	46.4	11.8
737.2	43.5 P	21.7	V/LP	-28.9	36.3	46.4	10.1

Judgment: Passed by 2.0 dB

No Emissions were detected from 800 to 2000 MHz within 15 dB of the limits.

12.2 AC Conducted Emission Test Results

The initial step in collecting conducted data is a peak detector scan and the plotting of the measurement range. Significant peaks are then marked as shown on the following table, and these signals are then measured with the quasi-peak detector. The following represents the worst case emissions from all modes of operation from the EUT's power cord.

Test Date: 3/4/02

Power Cord Tested	Line Tested	Freq. MHz	Strength of Signal dBuV		Margin Under Limit dB
			EUT	Limit	
EASyPLUS-1	AC Hot	0.685	20.6	48	27.4
EASyPLUS-1	AC Hot	1.593	19.8	48	28.2
EASyPLUS-1	AC Hot	6.099	19.7	48	28.3
EASyPLUS-1	AC Hot	25.15	24.2	48	23.8
EASyPLUS-1	AC Hot	25.90	37.4	48	20.6
EASyPLUS-1	AC Neutral	1.069	20.0	48	28.0
EASyPLUS-1	AC Neutral	3.002	19.7	48	28.3
EASyPLUS-1	AC Neutral	17.59	21.1	48	26.9
EASyPLUS-1	AC Neutral	24.45	26.5	48	21.5
EASyPLUS-1	AC Neutral	25.89	37.0	48	21.0
PS-512	AC Hot	0.602	36.5	48	11.5
PS-512	AC Hot	1.417	36.9	48	11.1
PS-512	AC Hot	25.21	38.4	48	9.6
PS-512	AC Neutral	1.210	38.3	48	9.7
PS-512	AC Neutral	1.412	38.4	48	9.6
PS-512	AC Neutral	4.812	41.5	48	6.5
PS-512	AC Neutral	25.22	39.2	48	8.8

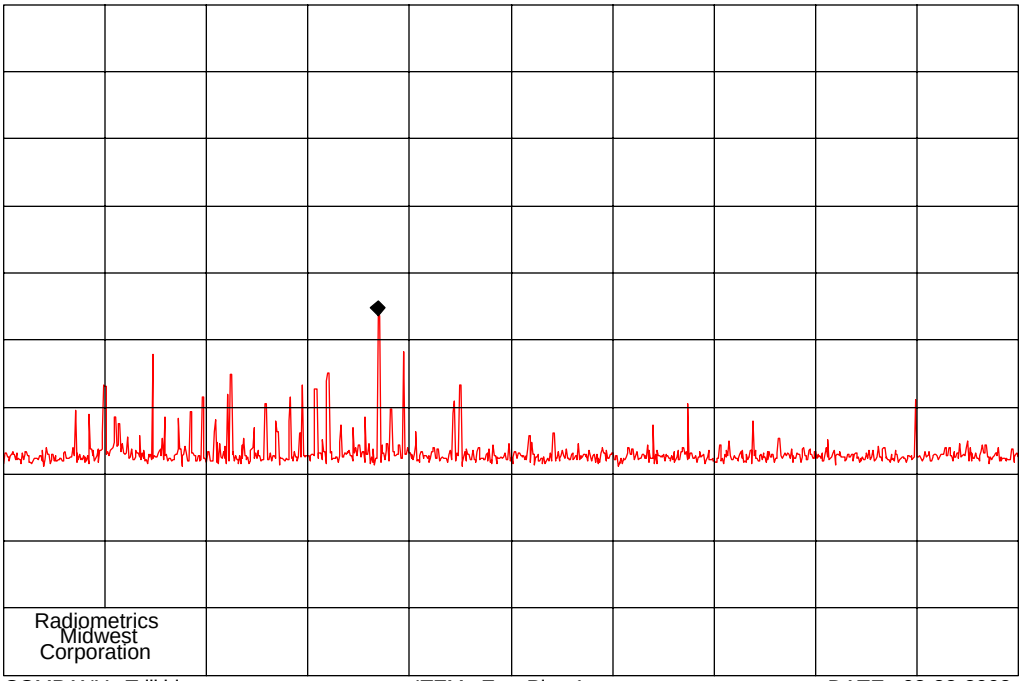
* All reading are quasi-peak with a 9 kHz bandwidth and no video filter.
Changing the frequency of the Receiver did not affect the emissions listed above
Judgment: Passed by 6.5 dB

12.3 Antenna Conducted Test Results

For each plot, the EUT was tuned to the low, middle, and high frequencies in each band while the analyzer was in Max hold mode.
The frequency range from 0.15 to 2000 MHz was scanned and plotted using the peak detector function. The EUT was connected to the spectrum analyzer via a 6 inch coaxial cable with less than 1 dB of loss at 2000 MHz. A separate plot was produced for each antenna port.

Limit = -54dBm= 2 nW
Judgment: passed by 6.6 dB

MKR 369 MHz -66.30 dBm

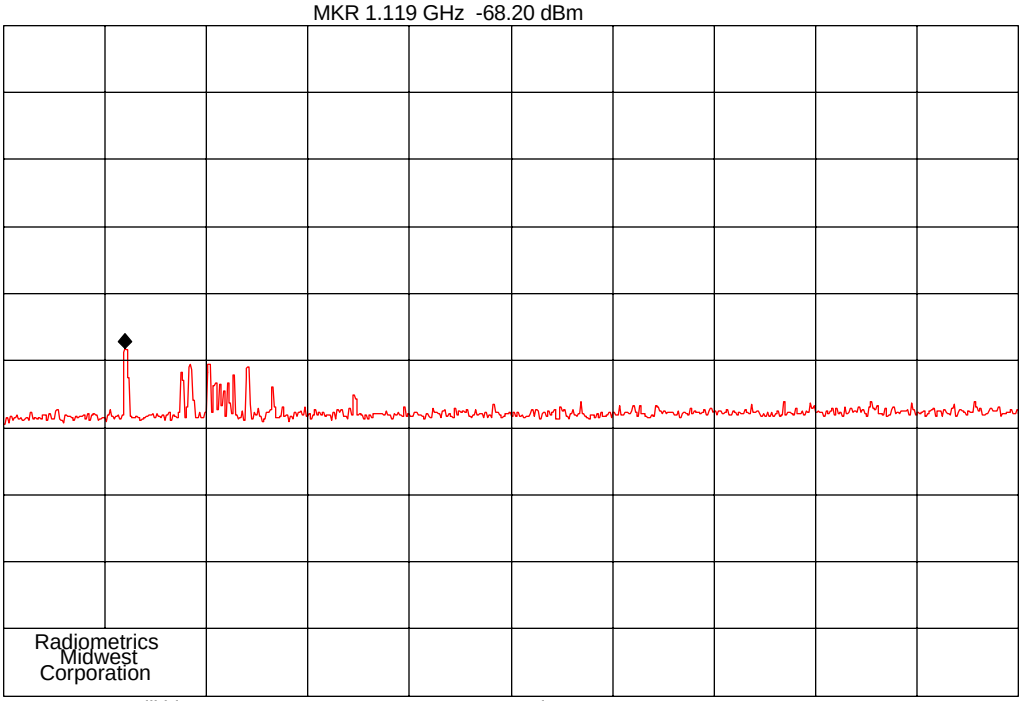


COMPANY : Trilithic
START 2 MHz
RES BW 100 kHz
10 dB/
NOTES : Antenna port 3, Tuned to all Frequencies

ITEM : EasyPlus-1
REF -20.0 dBm
VBW 300 kHz
TIME : 15:11

DATE : 03-22-2002
STOP 1.00 GHz
ATTEN 0 dB
SWP 299 msec

MKR 1.119 GHz -68.20 dBm

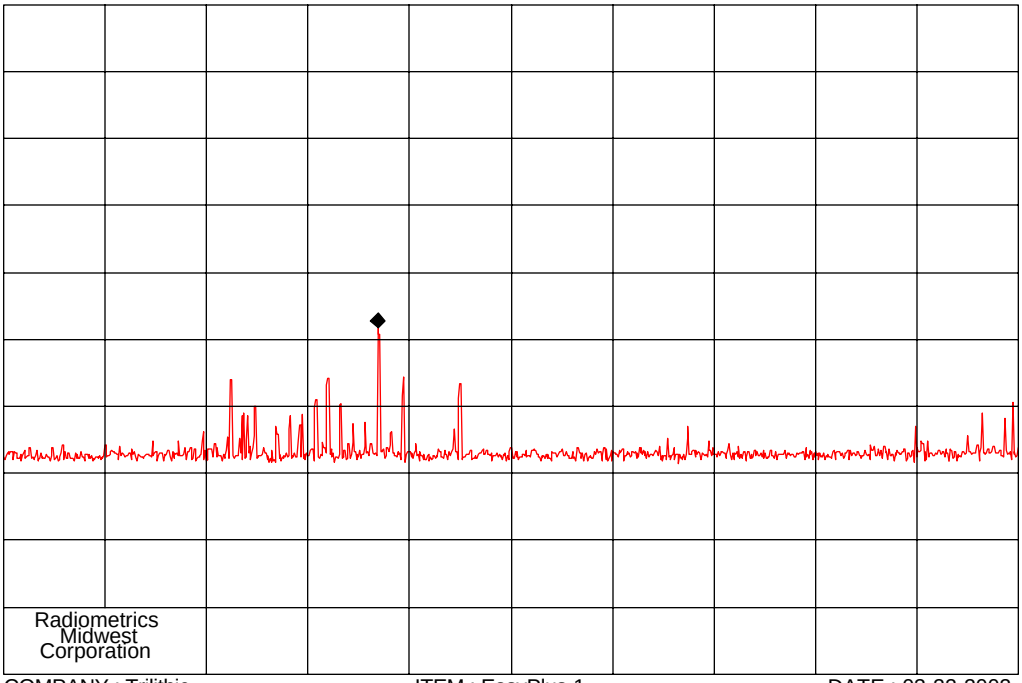


COMPANY : Trilithic
START 1.00 GHz
RES BW 1 MHz
10 dB/
NOTES : Antenna port 3, Tuned to all Frequencies

ITEM : EasyPlus-1
REF -20.0 dBm
VBW 3 MHz
TIME : 15:10

DATE : 03-22-2002
STOP 2.00 GHz
ATTEN 0 dB
SWP 25.0 msec

MKR 369 MHz -68.30 dBm

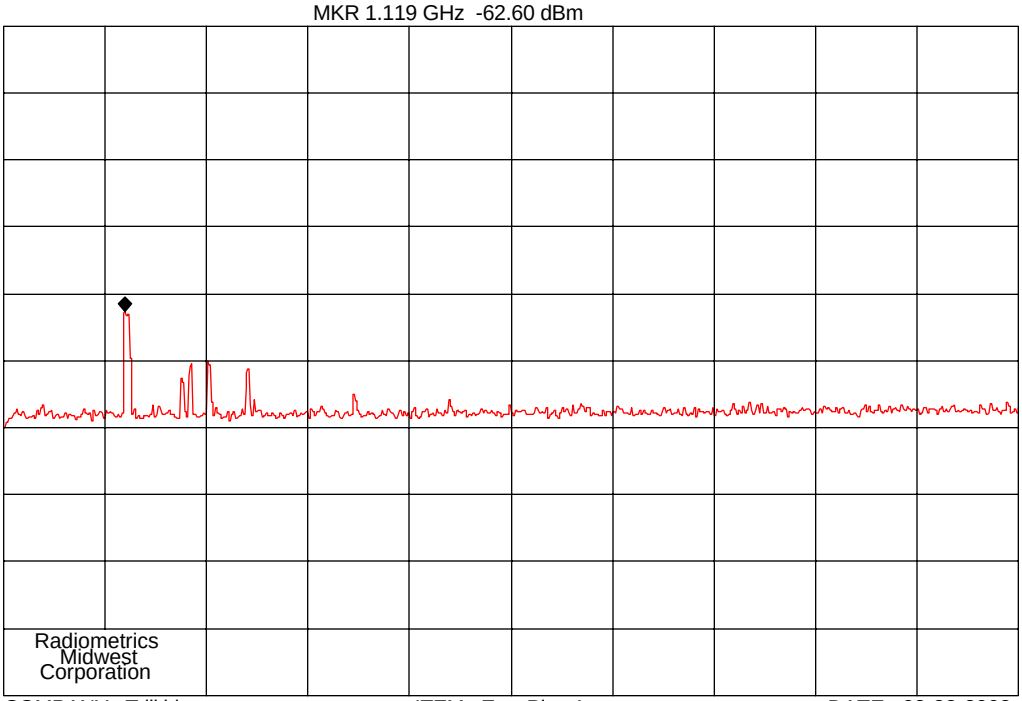


COMPANY : Trilithic
START 2 MHz
RES BW 100 kHz
10 dB/
NOTES : Antenna port 4, Tuned to all Frequencies

ITEM : EasyPlus-1
REF -20.0 dBm
VBW 300 kHz
TIME : 15:08

DATE : 03-22-2002
STOP 1.00 GHz
ATTEN 0 dB
SWP 299 msec

MKR 1.119 GHz -62.60 dBm

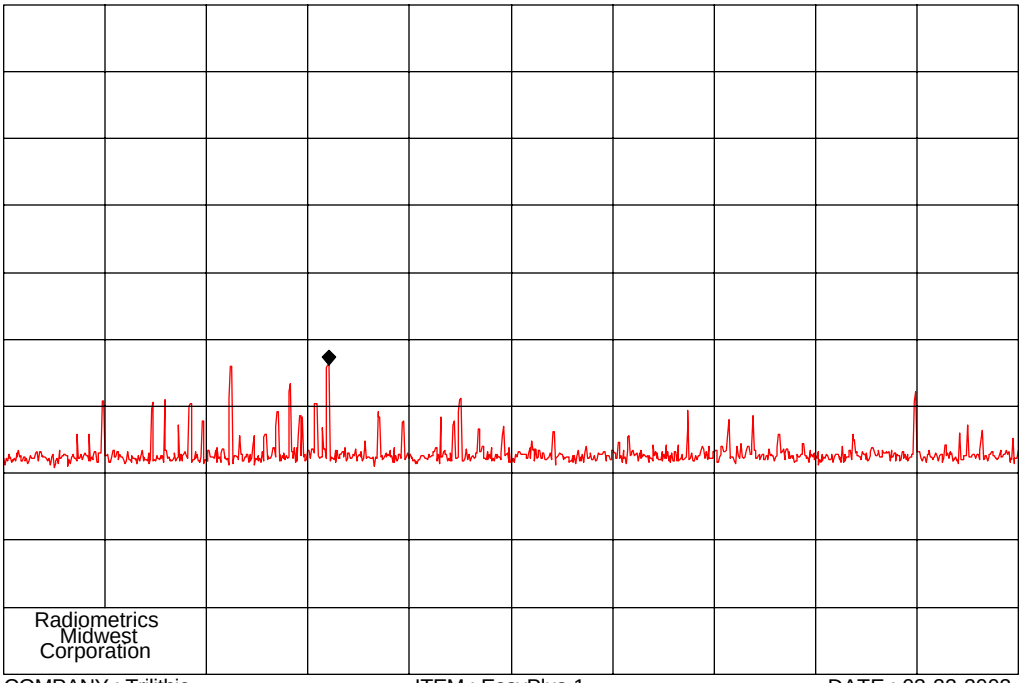


COMPANY : Trilithic
START 1.00 GHz
RES BW 1 MHz
10 dB/
NOTES : Antenna port 4, Tuned to all Frequencies

ITEM : EasyPlus-1
REF -20.0 dBm
VBW 3 MHz
TIME : 15:09

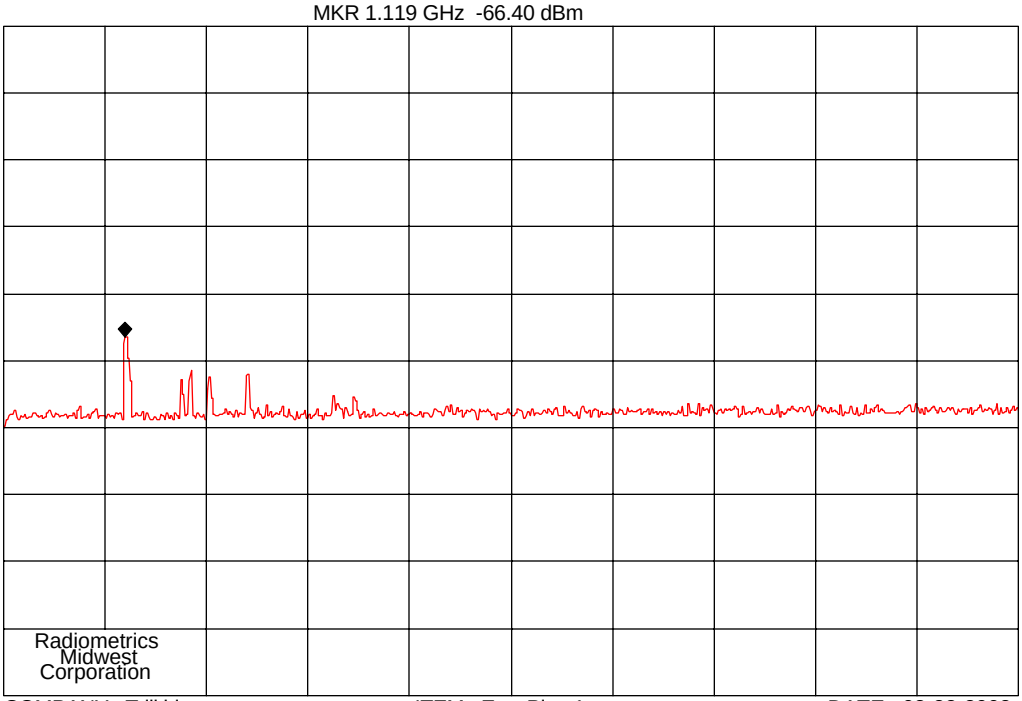
DATE : 03-22-2002
STOP 2.00 GHz
ATTEN 0 dB
SWP 25.0 msec

MKR 321 MHz -73.80 dBm



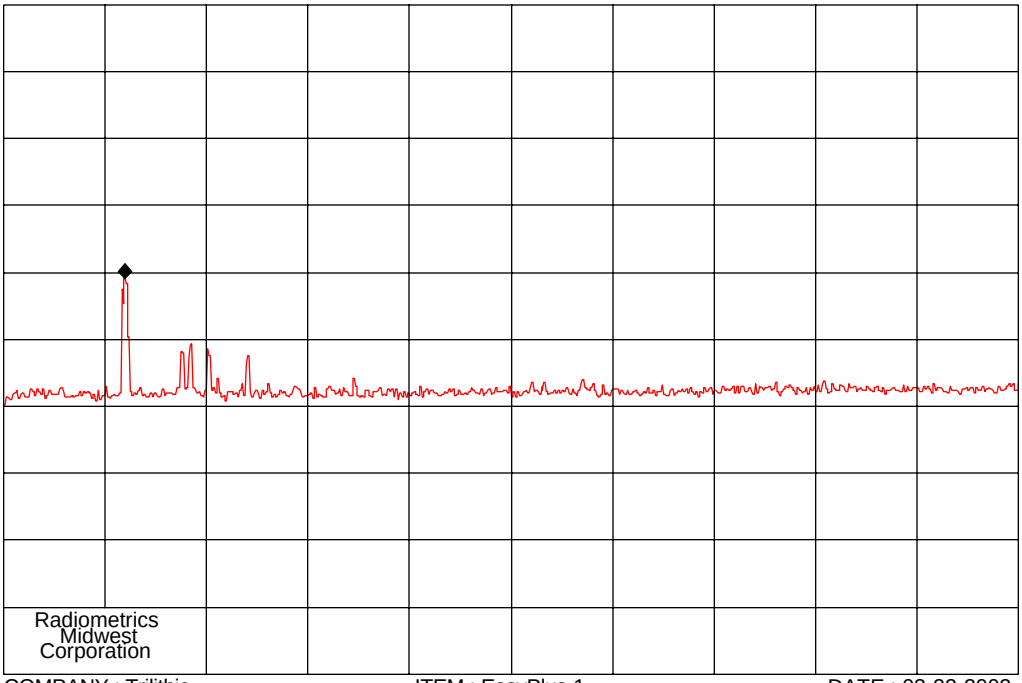
COMPANY : Trilithic
START 2 MHz
RES BW 100 kHz
10 dB/
ITEM : EasyPlus-1
REF -20.0 dBm
VBW 300 kHz
TIME : 15:06
DATE : 03-22-2002
STOP 1.00 GHz
ATTEN 0 dB
SWP 299 msec
NOTES : Antenna port 5, Tuned to all Frequencies

MKR 1.119 GHz -66.40 dBm



COMPANY : Trilithic
START 1.00 GHz
RES BW 1 MHz
10 dB/
ITEM : EasyPlus-1
REF -20.0 dBm
VBW 3 MHz
TIME : 15:05
DATE : 03-22-2002
STOP 2.00 GHz
ATTEN 0 dB
SWP 25.0 msec
NOTES : Antenna port 5, Tuned to all Frequencies

MKR 1.119 GHz -60.90 dBm

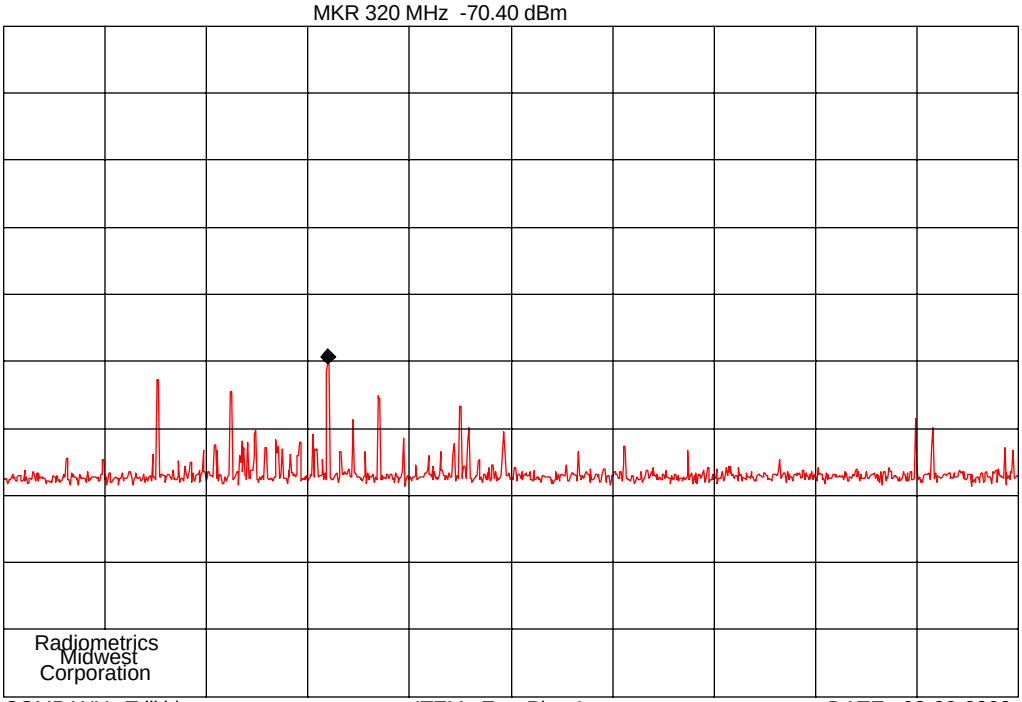


COMPANY : Trilithic
START 1.00 GHz
RES BW 1 MHz
10 dB/
NOTES : Antenna port 6, Tuned to all Frequencies

ITEM : EasyPlus-1
REF -20.0 dBm
VBW 3 MHz
TIME : 15:03

DATE : 03-22-2002
STOP 2.00 GHz
ATTEN 0 dB
SWP 25.0 msec

MKR 320 MHz -70.40 dBm

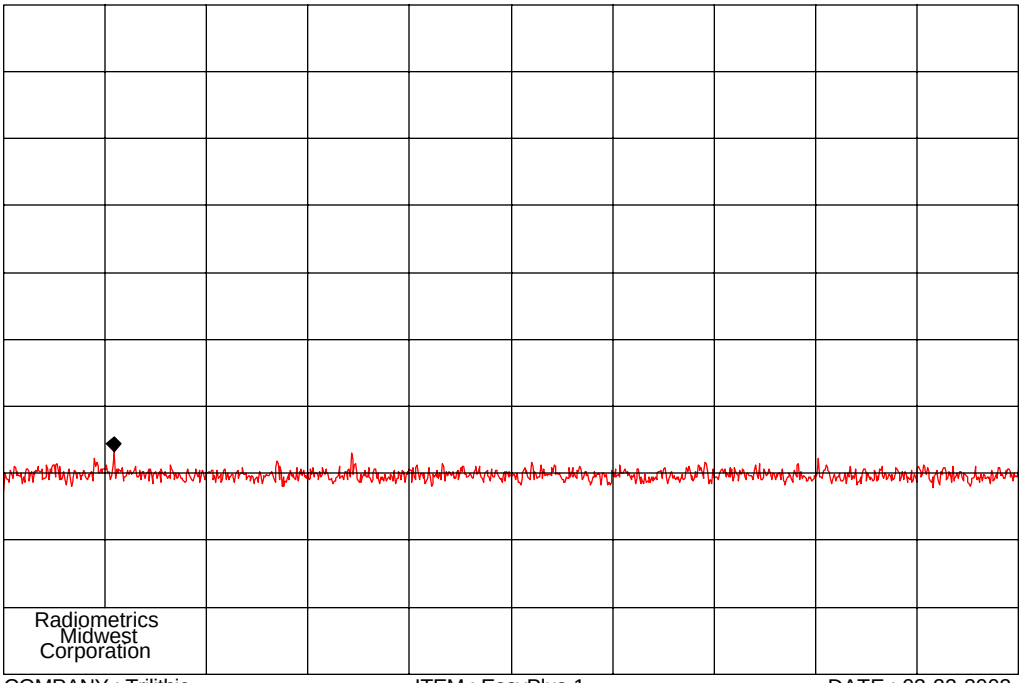


COMPANY : Trilithic
START 2 MHz
RES BW 100 kHz
10 dB/
NOTES : Antenna port 6, Tuned to all Frequencies

ITEM : EasyPlus-1
REF -20.0 dBm
VBW 300 kHz
TIME : 15:26

DATE : 03-22-2002
STOP 1.00 GHz
ATTEN 0 dB
SWP 299 msec

MKR 305 kHz -86.70 dBm

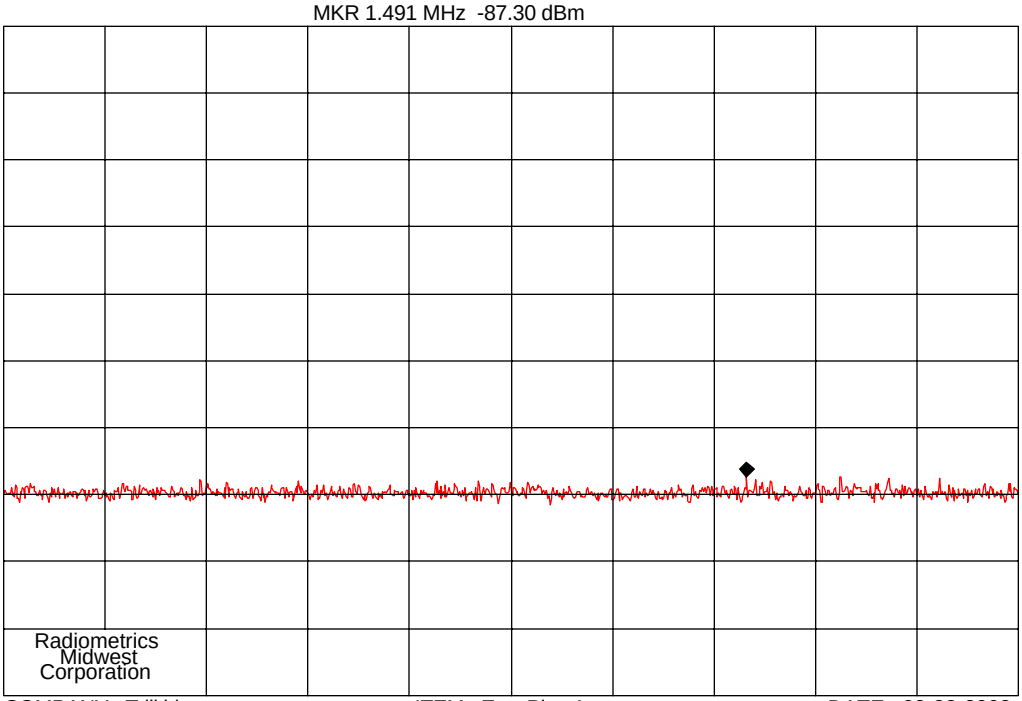


COMPANY : Trilithic
START 100 kHz
RES BW 10 kHz
10 dB/
NOTES : Antenna port 6, Tuned to all Frequencies

ITEM : EasyPlus-1
REF -20.0 dBm
VBW 30 kHz
TIME : 14:54

DATE : 03-22-2002
STOP 2.00 MHz
ATTEN 10 dB
SWP 57.0 msec

MKR 1.491 MHz -87.30 dBm

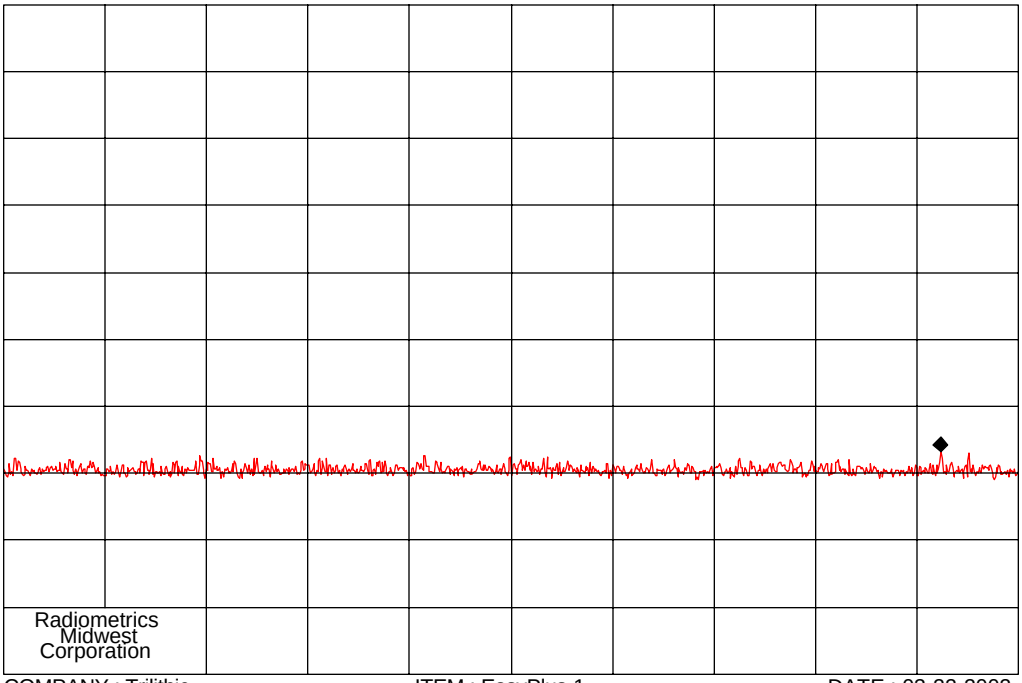


COMPANY : Trilithic
START 100 kHz
RES BW 10 kHz
10 dB/
NOTES : Antenna port 5, Tuned to all Frequencies

ITEM : EasyPlus-1
REF -20.0 dBm
VBW 30 kHz
TIME : 14:53

DATE : 03-22-2002
STOP 2.00 MHz
ATTEN 10 dB
SWP 57.0 msec

MKR 1.854 MHz -86.80 dBm

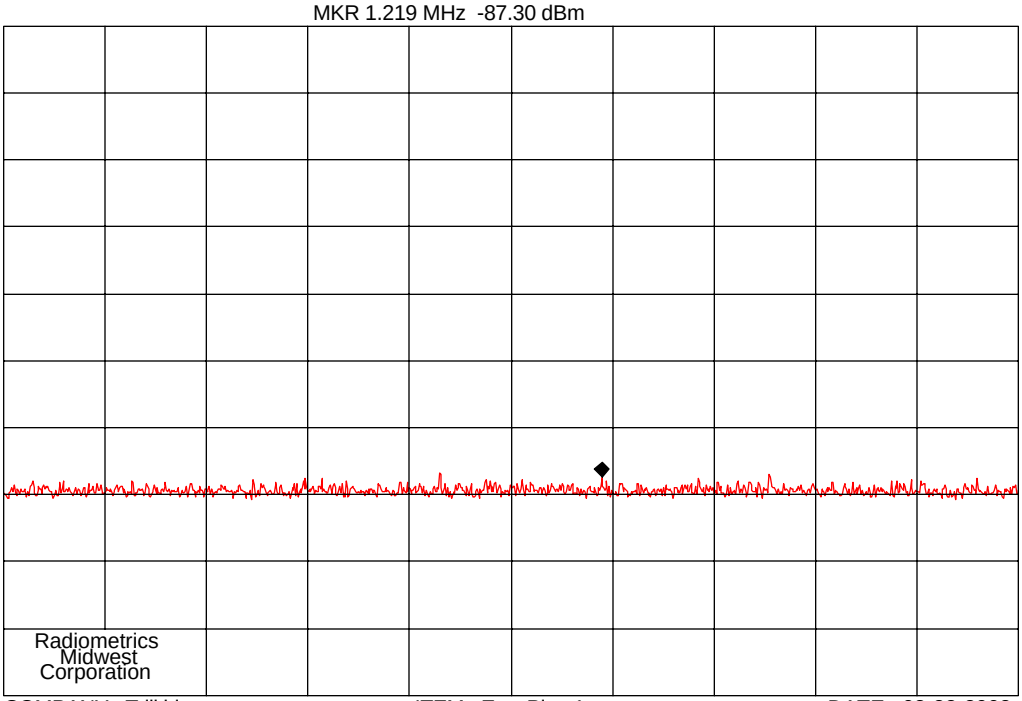


COMPANY : Trilithic
START 100 kHz
RES BW 10 kHz
10 dB/
NOTES : Antenna port 4, Tuned to all Frequencies

ITEM : EasyPlus-1
REF -20.0 dBm
VBW 30 kHz
TIME : 14:51

DATE : 03-22-2002
STOP 2.00 MHz
ATTEN 10 dB
SWP 57.0 msec

MKR 1.219 MHz -87.30 dBm



COMPANY : Trilithic
START 100 kHz
RES BW 10 kHz
10 dB/
NOTES : Antenna port 3, Tuned to all Frequencies

ITEM : EasyPlus-1
REF -20.0 dBm
VBW 30 kHz
TIME : 14:38

DATE : 03-22-2002
STOP 2.00 MHz
ATTEN 10 dB
SWP 57.0 msec

12.3.1 Radiated RF Immunity Test Results

The field intensity was monitored using an Amplifier Research isotropic field sensor. The field sensor was positioned adjacent to the case of the EUT. The amplitude of the applied field was relayed to a remote indicator outside of the enclosure via fiber optic cable. The field strength measured is equivalent to the RMS level. If the EUT responded to the applied signal, the amplitude of the signal was reduced and then slowly raised until the threshold of response was determined. The nature of the response was recorded in addition to the frequency and threshold amplitude of the applied signal. The EUT operation was constantly monitored during the tests.

RF signals in the frequency range from 26 to 1000 MHz were generated using an ARA Super-Log antenna. At 1.0 MHz, an E-Field generating antenna was used.

Manufacturer:	Trilithic	Specification:	FCC part 11.32 (d)
Model:	ATC100-1000	Description:	Radiated RF Immunity
Serial Number:	None	Test Date:	3/22/2002
Test Personnel	Joseph Strzelecki	Test Location	Chamber D
Test Requirements	10 V/m in the AM band; 0.5 V/m in FM or TV frequency band		
Applied Modulation	Continuous Wave		
Notes:	AM = 80% 1kHz; FM = 10 kHz dev at 1 kHz; Each tested seperately		

Modulaton	Frequency MHz	Applied V/m	Antenna Polarization	EUT Mode	Test Results
CW and AM	1.0	10.5	Vertical	Encode	No malfunctions
CW and AM	1.0	10.5	Vertical	Decode	No malfunctions
FM and CW	59.7	1.0	Horizontal	Encode	No malfunctions
FM and CW	59.7	1.0	Horizontal	Decode	No malfunctions
FM and CW	59.7	1.0	Vertical	Encode	No malfunctions
FM and CW	59.7	1.0	Vertical	Decode	No malfunctions
FM and CW	81.8	1.0	Horizontal	Encode	No malfunctions
FM and CW	81.8	1.0	Horizontal	Decode	No malfunctions
FM and CW	81.8	1.0	Vertical	Encode	No malfunctions
FM and CW	81.8	1.0	Vertical	Decode	No malfunctions
FM and CW	100.1	1.0	Horizontal	Encode	No malfunctions
FM and CW	100.1	1.0	Horizontal	Decode	No malfunctions
FM and CW	100.1	1.0	Vertical	Encode	No malfunctions
FM and CW	100.1	1.0	Vertical	Decode	No malfunctions
FM and CW	199.3	1.0	Horizontal	Encode	No malfunctions
FM and CW	199.3	1.0	Horizontal	Decode	No malfunctions
FM and CW	199.3	1.0	Vertical	Encode	No malfunctions
FM and CW	199.3	1.0	Vertical	Decode	No malfunctions
FM and CW	567.4	1.0	Horizontal	Encode	No malfunctions
FM and CW	567.4	1.0	Horizontal	Decode	No malfunctions
FM and CW	567.4	1.0	Vertical	Encode	No malfunctions
FM and CW	567.4	1.0	Vertical	Decode	No malfunctions
FM and CW	787.8	1.0	Horizontal	Encode	No malfunctions
FM and CW	787.8	1.0	Horizontal	Decode	No malfunctions
FM and CW	787.8	1.0	Vertical	Encode	No malfunctions
FM and CW	787.8	1.0	Vertical	Decode	No malfunctions
Overall Result	Pass The EUT was fully functional during and after the test.				