

SSRL, Conducted and Radiated Emission Measurements:

A full test report from Criterion Technology (Test Report: INO 99020303) is included with this submission.

Measurement Facilities:

The testing was performed by:

Criterion Technology
1350 County Rd. 16
Rollinsville, CO 80474
Phone: 303-682-6600
Fax: 303-682-6672

The site information for Criterion Technology is on file with the FCC

Description of Photographs:

Photographs have been taken of the transmitter board assembly and of the final assembly:

- A. Photograph A shows the top view of the SSRL transceiver board with the shield removed.
- B. Photograph B shows the top view of the SSRL transceiver board with the shield in place.
- C. Photograph C shows the back view of the SSRL transceiver board.
- D. Photograph D shows the outside view of the completed product with the cover in place.



QUALIFICATION TEST REPORT



EMISSIONS -FCC Part 15

FUJITSU COMPUTER PRODUCTS OF AMERICA, INC.

Test Report Number: INO 9902 0303 Date of Issue: 18 February 1999
Model No: SSRL Date of Test Article Receipt: 15 February 1999
Type of product: Part 15 Intentional Radiator

Manufacturer: Inovonics Corporation

Address: 2100 Central Avenue
Boulder, CO 80301

Test Results: Complies Does Not Comply

John Waller Lab Director
(NVLAP Signatory)

Michael E. Musaker Compliance Engineer

Testing Center
P.O. Box 387
1350 County Road 16
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Longmont, CO 80503
(303) 682-6485
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www.criteriontech.com

Accredited by NIST NVLAP for FCC Part 15

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Section 1 Executive Summary

The test article was in compliance with all the test standards listed below.

FCC Part 15 Subpart A	
FCC Part 15 Subpart B	Conducted Emissions
FCC Part 15 Subpart B	Radiated Emissions
FCC Part 15 Subpart C	Intentional Radiators, Paragraphs 15.247(a)(1)(i) Bandwidth of Hopping
Channel Only, and 15.247(c)*	

All test methods were performed in accordance with the standards listed above.

***Inovonics will prove compliance to the remaining applicable portions CFR 47 Part 15.247.**

Section 2 Emissions Test Standards

The emissions tests were performed according to following standards:

FCC Part 15, Subpart B
FCC Part 15, Subpart C

Class A Class B
Paragraphs 15.247(a)(1)(i) Bandwidth of Hopping Channel
Only, and 15.247(c)

Other:

TEST REPORT

Part 2.2 FCC Part 15 Subpart B -Radiated Emissions

Measurement or radiated emissions (electric field) in the frequency range of 30 MHz-1000 MHz were tested in a horizontal and vertical polarization as indicated below:

Environmental conditions in the lab:

Date(s) of Test: mm/dd/yy 2/15/99
Temperature: 69°F
Rel. Humidity 15%
Test Voltage [X]120 V, 60Hz [] V, Hz

Test location:

- [X] Criterion Technology Open Area Test Site
[] Pre-Scan In Semi-Anechoic Chamber
[] Not applicable

Test distance (antenna - EUT):

- [] 1 meter [] Preliminary Measurement [] Final Measurement
[] 3 meters [] Preliminary Measurement [] Final Measurement
[X] 10 meters [X] Preliminary Measurement [X] Final Measurement
[] 30 meters [] Preliminary Measurement [] Final Measurement
[] Not applicable

Test instruments:

Table with 2 columns: Test instruments and Calibration Due Date. Includes items like Hewlett Packard Spectrum Analyzer, Model 8566B with date 7/12/99.

Test accessories:

- [] Other
[X] Not applicable

Results

Radiated Emissions (Electric Field) 30 MHz - 1000 MHz

The requirements are [X] PASS [] FAIL [] N/A
Min. limit margin 14.32 dB at 100.0 MHz
Max. limit exceeding ___ dB at ___ MHz

Remarks: Reference Section 4 for Data Sheets

TEST REPORT

Remarks: Reference Section 4 for Data Sheets

*See Part 4.5 for a discussion of the specification limits applied to the emission data above 1 GHz.

**The minimum occupied bandwidth was measured at three frequencies within the frequency hopping range of the transmitter: 907.0 MHz, 911.62 MHz and 916.71 MHz which represent the low, mid and high frequencies of the operating band.

Section 4 Original Test Data / Plots

Conducted Emissions
Radiated Emissions

Part 4.2 FCC Conducted Emissions Table

Criterion TechnologyShield Room
Conducted Emissions through ESH2-Z5

15. Feb 99 17:58

EUT: Model: SSRL, Serial: 002
Manuf: Inevonics, Inc.
Op Cond: Transmitting three freqs. Hi, Mid, Low
Operator: MEM per INO 0258, 0260
Test Spec: FCC Class B per ANSI C63.4
Comment: 120v 60 Hz, preaccn L1, L1 & N scanned
Tabletop powered by typical pwr supply

Scan Settings (1 Range)			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	30M	5k	10k	PK	20ms	AUTO	LN	OFF 60dB

Final Measurement Results:

no Results

Note: "No Results" indicates that no points were measured within 25 dB of the specification limit.

TEST REPORT

Table 1: Scan List, sorted by margin to limit FCCB10, -30.0dB filter

<u>Freq. MHz</u>	<u>Value</u>	<u>Sts</u>	<u>FCCB10</u>	<u>TT</u>	<u>Hght</u>	<u>Az</u>	<u>Comment</u>
120.0000	9.82	q	-23.24	180	161	V	4. ck
240.0000	11.19	q	-24.37	0	400	H	4. ck
180.0000	6.67	q	-26.39	270	400	H	4. ck

Table 2: Scan List for FCCB10, sorted by Frequency, -30.0dB filter

<u>Freq. MHz</u>	<u>Value</u>	<u>Sts</u>	<u>FCCB10</u>	<u>TT</u>	<u>Hght</u>	<u>Az</u>	<u>Comment</u>
36.0000	13.58	m	-15.96	120	100	V	4. ck
48.0078	9.57	q	-19.97	90	100	V	4. ck
56.0000	8.85	q	-20.69	0	401	H	4. ck
60.0068	7.65	q	-21.89	0	100	V	4. ck
63.9980	7.36	q	-22.18	279	100	V	4. ck
66.0031	8.11	q	-21.43	279	100	V	.
67.9992	7.73	m	-21.81	279	100	V	4. ck
70.0048	12.95	q	-16.59	270	160	V	.
72.0000	11.56	q	-17.98	270	160	V	4. ck
76.0000	10.29	q	-19.25	270	160	V	4. ck
100.0000	18.74	m	-14.32	22	100	V	4. ck
120.0000	9.82	q	-23.24	180	161	V	4. ck
180.0000	6.67	q	-26.39	270	400	H	4. ck
240.0000	11.19	q	-24.37	0	400	H	4. ck
901.9983	66.15	m	30.59	219	100	H	low adjacent band edge
906.9800	109.37	m	73.81	219	100	H	fo low
911.6765	108.42	m	72.86	221	100	H	fo mid
916.8881	107.60	m	72.04	232	100	H	fo high
928.0038	51.22	m	15.66	232	100	H	f high adjacent band edge

Table 3: Complete Scan List Sorted by Frequency

<u>Freq. MHz</u>	<u>I-val</u>	<u>Final</u>	<u>Sts</u>	<u>TT</u>	<u>Hght</u>	<u>Az</u>	<u>Time</u>	<u>Comment</u>
36.0000	21.33	13.58	m	120	100	V	Mon Feb 15 17:10:47 1999	4. ck
48.0078	23.46	9.57	q	90	100	V	Mon Feb 15 16:44:04 1999	4. ck
56.0000	25.60	8.85	q	0	401	H	Mon Feb 15 16:34:50 1999	4. ck
60.0068	24.57	7.65	q	0	100	V	Mon Feb 15 16:30:45 1999	4. ck
63.9980	24.22	7.36	q	279	100	V	Mon Feb 15 17:15:40 1999	4. ck
66.0031	24.93	8.11	q	279	100	V	Mon Feb 15 17:15:42 1999	.
67.9992	24.32	7.73	m	279	100	V	Mon Feb 15 17:15:16 1999	4. ck
70.0048	29.37	12.95	q	270	160	V	Mon Feb 15 16:58:36 1999	.
72.0000	27.89	11.56	q	270	160	V	Mon Feb 15 16:58:38 1999	4. ck
76.0000	26.26	10.29	q	270	160	V	Mon Feb 15 16:58:40 1999	4. ck

Part 4.4 Radiated Emissions Data, 1 GHz to 10 GHz**Notes:**

The third column below contains alpha characters which pertain to the type of measurements made. The following are the definitions for those characters: q = Quasi Peak, m = Maximized (cable, rotation and antenna height), s = scanned but no data taken, a = average and p = peak. For the first character in column four, a '-' indicates that value is below the limit while an '*' indicates that value is above the limit

If the list is sorted using "I-sort", then quasi-peak and average levels are weighted higher than peak levels and are moved to the front of the scan list.

The following keys help to better understand the data:

TT: Turntable position in degrees

Hght: Height of antenna in centimeters

Az: Azimuth, V = Vertical, H= Horizontal

Criterion Technology

EUT: Model: SSRL, Serial: 002

Manufacturer: Inovonics Corporation

Tester: MEM

EUT Level: 12 VDC from external source. Plug-in transformer/converter supplied

EUT Information: Pulsed 902-928 MHz

Test information: Normal Operation, 3m, 12 VDC, FCC Class B, FCC 15.247

Tue Mar 30 13:54:59 1999

Special ID: INO 260

Table 4: Scan List, sorted by margin to limit SPCL, -30.0dB filter

<u>Freq, MHz</u>	<u>Value</u>	<u>Sts</u>	<u>SPCL</u>	<u>TT</u>	<u>Hght</u>	<u>Az</u>	<u>Comment</u>
1814.2000	68.91	p	-5.09	71	112	V	2fo
1823.6420	67.78	p	-6.22	73	134	V	2fo
1834.0000	65.75	p	-8.25	73	134	V	2fo
3668.0000	63.43	p	-10.57	276	114	V	4fo
3628.4000	62.70	p	-11.30	289	100	V	4fo
3647.2839	62.32	p	-11.68	289	100	V	4fo
4585.0000	60.93	p	-13.07	71	100	V	5fo
6382.7465	59.28	p	-14.72	128	109	V	7fo
4559.1049	58.69	p	-15.31	163	100	V	5fo
7336.0000	58.30	p	-15.70	127	179	V	8fo
4535.5000	57.86	p	-16.14	107	100	V	5fo
9070.6160	57.85	p	-16.15	228	141	V	10fo
8206.1985	57.79	p	-16.21	87	123	V	9fo
8253.0000	57.69	p	-16.31	67	131	V	9fo

TEST REPORT

Table 5: Scan List for SPCL, sorted by Frequency, -30.0dB filter

<u>Freq, MHz</u>	<u>Value</u>	<u>Sts</u>	<u>SPCL</u>	<u>TT</u>	<u>Hght</u>	<u>Az</u>	<u>Comment</u>
8163.5160	56.83	p	-17.17	165	161	V	9fo
8206.1985	57.79	p	-16.21	87	123	V	9fo
8253.0000	57.69	p	-16.31	67	131	V	9fo
9070.6160	57.85	p	-16.15	228	141	V	10fo
9117.9985	54.53	p	-19.47	204	172	V	10fo
9170.0000	50.36	p	-23.64	96	143	V	10fo, noise floor

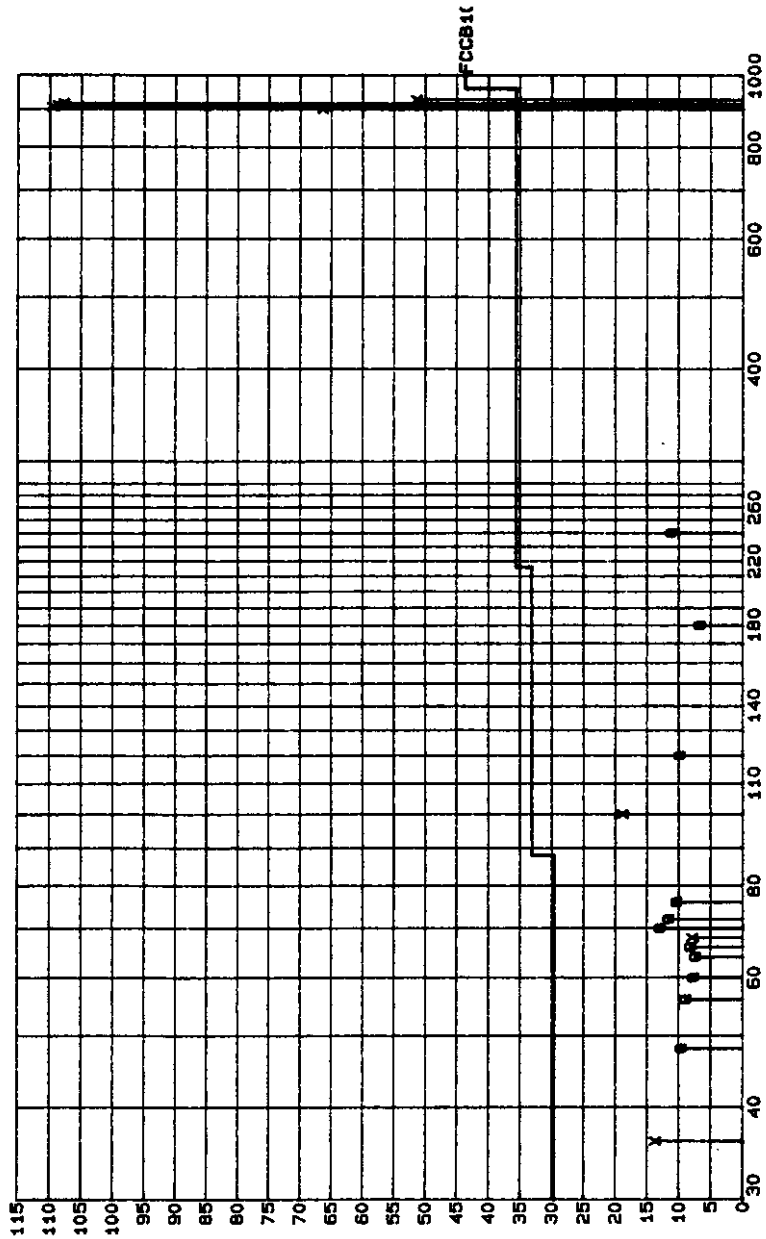
Table 6: Complete Scan List Sorted by Frequency

<u>Freq, MHz</u>	<u>I-val</u>	<u>Final</u>	<u>Sts</u>	<u>TT</u>	<u>Hght</u>	<u>Az</u>	<u>Time</u>	<u>Comment</u>
1814.2000	72.00	68.91	p	71	112	V	Mon Feb 15 13:51:46 1999	2fo
1823.6420	70.80	67.78	p	73	134	V	Mon Feb 15 13:58:01 1999	2fo
1834.0000	68.70	65.75	p	73	134	V	Mon Feb 15 13:56:16 1999	2fo
2721.0000	47.20	47.44	p	347	100	V	Mon Feb 15 14:09:02 1999	3fo
2735.4629	49.70	49.91	p	320	131	V	Mon Feb 15 14:01:33 1999	3fo
2751.0000	48.20	48.38	p	353	100	V	Mon Feb 15 13:19:07 1999	3fo
3628.4000	61.50	62.70	p	289	100	V	Mon Feb 15 14:10:25 1999	4fo
3647.2839	61.10	62.32	p	289	100	V	Mon Feb 15 14:11:22 1999	4fo
3668.0000	62.20	63.43	p	276	114	V	Mon Feb 15 14:51:44 1999	4fo
4535.5000	53.30	57.86	p	107	100	V	Mon Feb 15 14:13:58 1999	5fo
4559.1049	54.00	58.69	p	163	100	V	Mon Feb 15 14:15:06 1999	5fo
4585.0000	56.10	60.93	p	71	100	V	Mon Feb 15 14:55:49 1999	5fo
5442.6000	44.10	51.73	p	209	100	V	Mon Feb 15 14:57:26 1999	6fo
5470.9259	48.00	55.79	p	211	100	V	Mon Feb 15 14:59:10 1999	6fo
5502.0000	45.90	53.83	p	211	100	V	Mon Feb 15 15:00:43 1999	6fo
6349.7000	47.60	56.64	p	129	101	V	Mon Feb 15 14:25:23 1999	7fo
6382.7465	50.10	59.28	p	128	109	V	Mon Feb 15 14:26:56 1999	7fo
6419.0000	46.50	55.94	p	217	100	V	Mon Feb 15 15:03:40 1999	7fo
7256.8000	46.50	57.49	p	150	103	V	Mon Feb 15 15:07:37 1999	8fo
7294.3985	45.70	56.73	p	127	164	V	Mon Feb 15 14:32:52 1999	8fo
7336.0000	46.80	58.30	p	127	179	V	Mon Feb 15 13:40:39 1999	8fo
8163.5160	44.80	56.83	p	165	161	V	Mon Feb 15 11:09:59 1999	9fo
8206.1985	45.80	57.79	p	87	123	V	Mon Feb 15 12:02:07 1999	9fo
8253.0000	45.30	57.69	p	67	131	V	Mon Feb 15 15:20:32 1999	9fo
9070.6160	42.30	57.85	p	228	141	V	Mon Feb 15 11:17:14 1999	10fo
9117.9985	39.00	54.53	p	204	172	V	Mon Feb 15 12:05:39 1999	10fo
9170.0000	34.48	50.36	p	96	143	V	Mon Feb 15 13:47:09 1999	10fo, noise floor

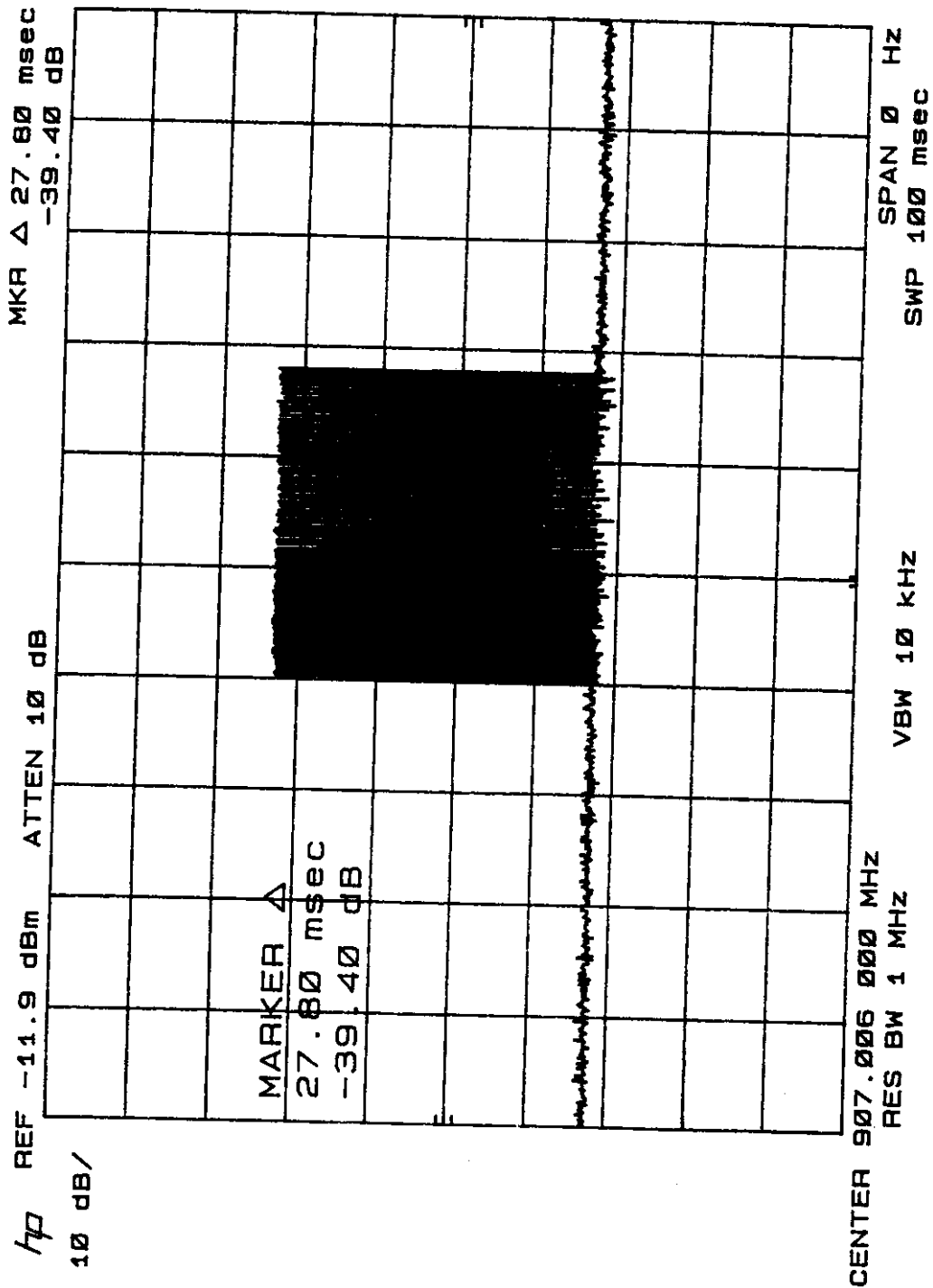
Part 4.6 Radiated Emissions Plot, 30 MHz to 1000 MHz

Intellistor OATS
Date: Tue Mar 30 13:48:43 1999
EUT: Model: SSR1, Serial: 002
Manufacturer: Inovonics Corporation
Tester: MEM SPID: INO 0259
EUT Level: 12 VDC from external source. Plug-in transformer/converter supplied
EUT Information: Pulsed 902-928 MHz
Test Information: Normal Operation, 10m, 12 VDC, FCC Class B, FCC 15.247

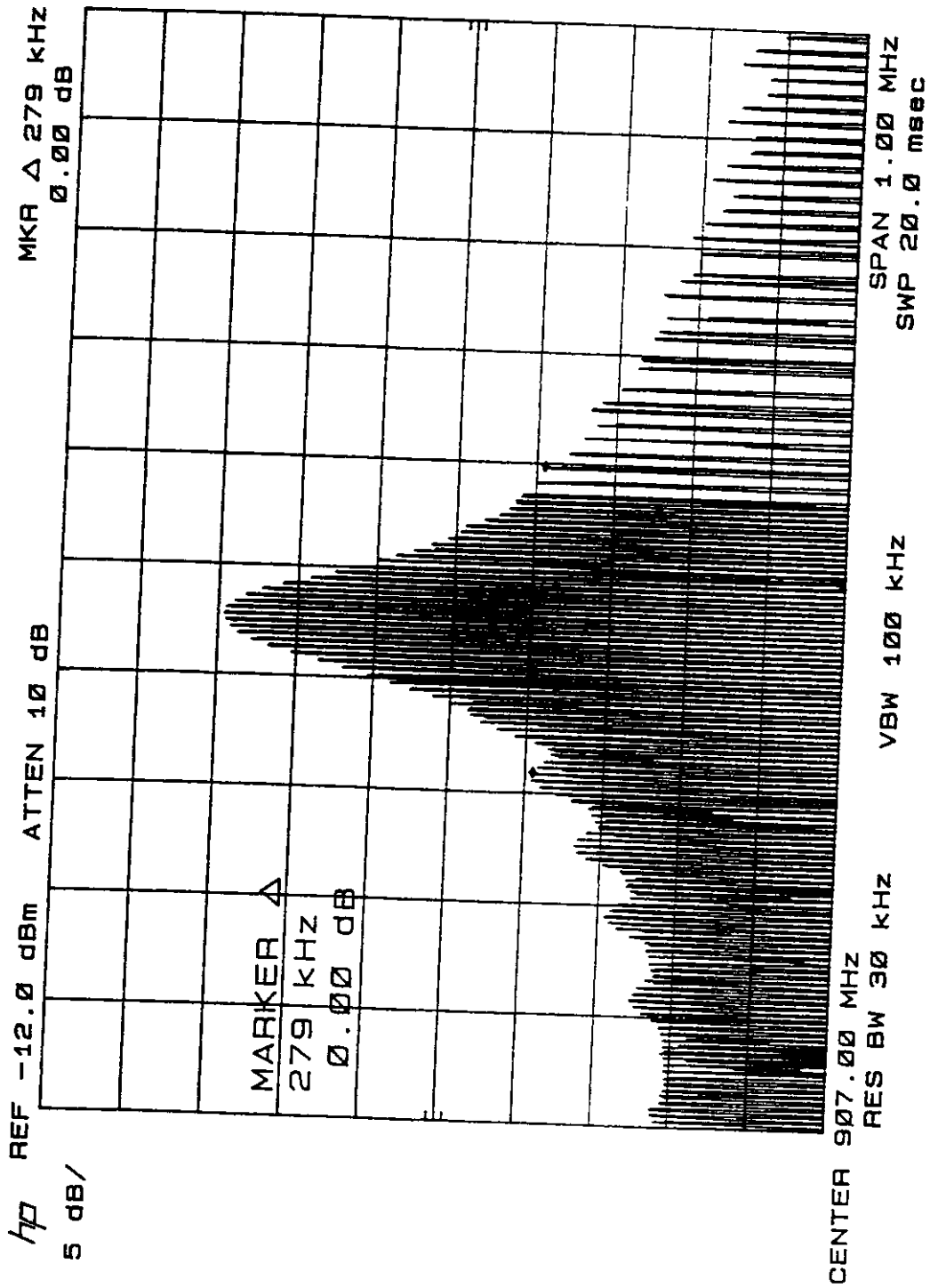
Test Results (in dBUV/m)



Part 4.8 Pulse Train Timing Plot



Part 4.10 Occupied Bandwidth Measurement at fo Low:

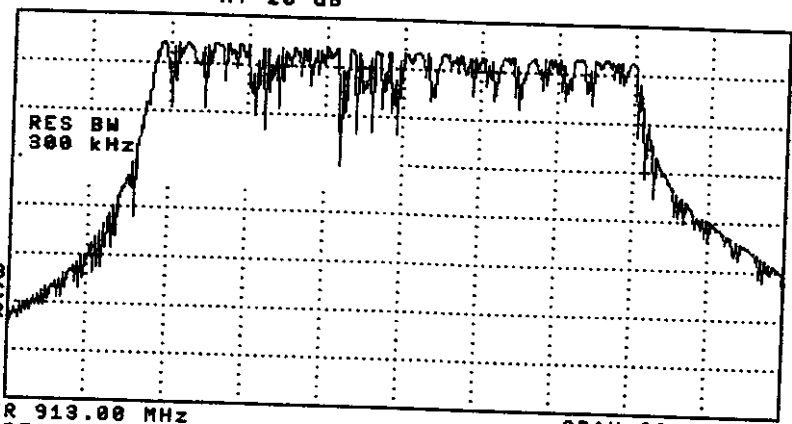


09:47:20 APR 16, 1999

REF 10.0 dBm AT 20 dB

PEAK
LOG
10
dB/

VA SB
SC FC
CORR



CENTER 913.00 MHz
*RES BW 300 kHz
VBW 100 kHz
SPAN 20.00 MHz
SMP 20.0 msec

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

Section 5 Product Information Forms

CRITERION PRODUCT INFORMATION FORM

Date: February 8, 1999

General Information

Company Name: Isotronics Corporation
 Company Address: 2100 Central Ave
 Company Address: Boulder, CO 80301
 Customer Contacts (and phone numbers):
 Compliance Eng. _____
 Design Engineer: Don Hume

General Instrument Information

Model/s: SSRL
 Serial Number: 002

Test Facility

Name: Criterion Technology
 Location: Rollinsville, Colorado 80474

TEST DESCRIPTION: Development Initial Design Verification
 Design Change Production Model
 Applicable Standards (FCC 15, 24, ETSI, etc) FCC 15.247

CIRCUIT BOARD

Oscillator Frequency: 906 - 919 MHz Transmitter, 262 - 277 MHz First L. O., 46.3 MHz Second L. O.
 Oscillator Manufacturer/s: _____
 Clock Frequency: 4 MHz
 Other: _____

POWER

Power Supply Topology: 12 Volts DC from external source. Plug-in transformer/converter supplied
 Switching Frequency: N/A
 Power supply Primary Frequency and Voltage: _____
 Number of Input Phases: _____
 Current Draw: 80 mA
 Manufacturer: _____
 Model Number: _____

INTENTIONAL RADIATOR PRODUCTS

Fundamental Frequency(ies) : 906 - 919 MHz
 Output Power Levels: +25 dBm
 Modulation Techniques (AM, FM, Pulsed, Spread Spectrum, etc): Pulsed
 Frequency Band: 902 - 928 MHz
 Frequency Range: _____
 Support Equipment Required: _____

Test Report Number: xxxx_xxxx

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Date Of Report:

RECEIVER PRODUCTS

Receiver Type (Superregen., Superheterodyne, etc): Superheterodyne, dual conversion
Source Type (battery or AC PS): _____
Detector Techniques (AM, FM, Pulsed, Spread Spectrum, etc): Pulsed
Frequency Band: _____
Additional Interfaces: _____
Support Equipment Required: _____

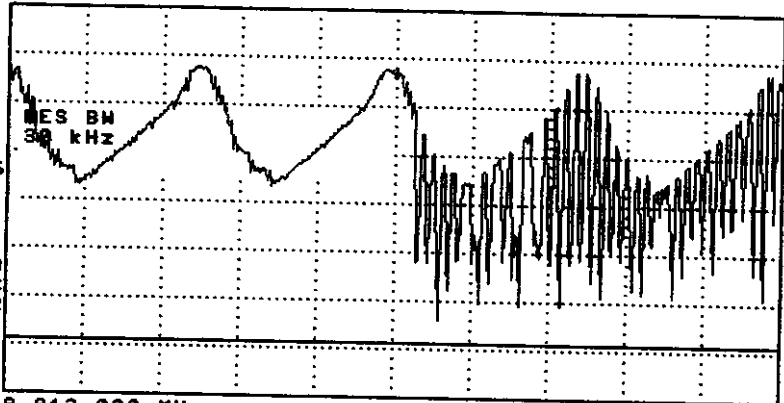
16:09:07 APR 16, 1999

REF 10.0 dBm AT 20 dB

PEAK
LOG
10
dB/

DL
-58.6
dBm

VA SB
SC VC
CORR



CENTER 913.000 MHz
#RES BW 30 kHz

VBW 30 kHz

SPAN 2.000 MHz
SWP 20.0 nsec

CLEAR
WRITE A

MAX
HOLD A

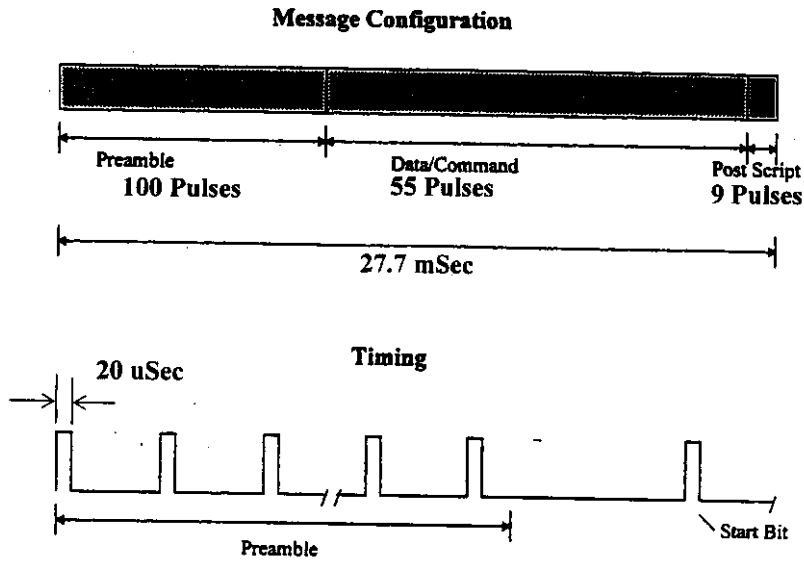
VIEW A

BLANK A

Trace
A B C

More
1 of 3

Part 4.9 Pulse Train Timing Diagram



Duty Cycle Calculation:

Total Number of Pulses = 164

Pulse Width = 20 uSec

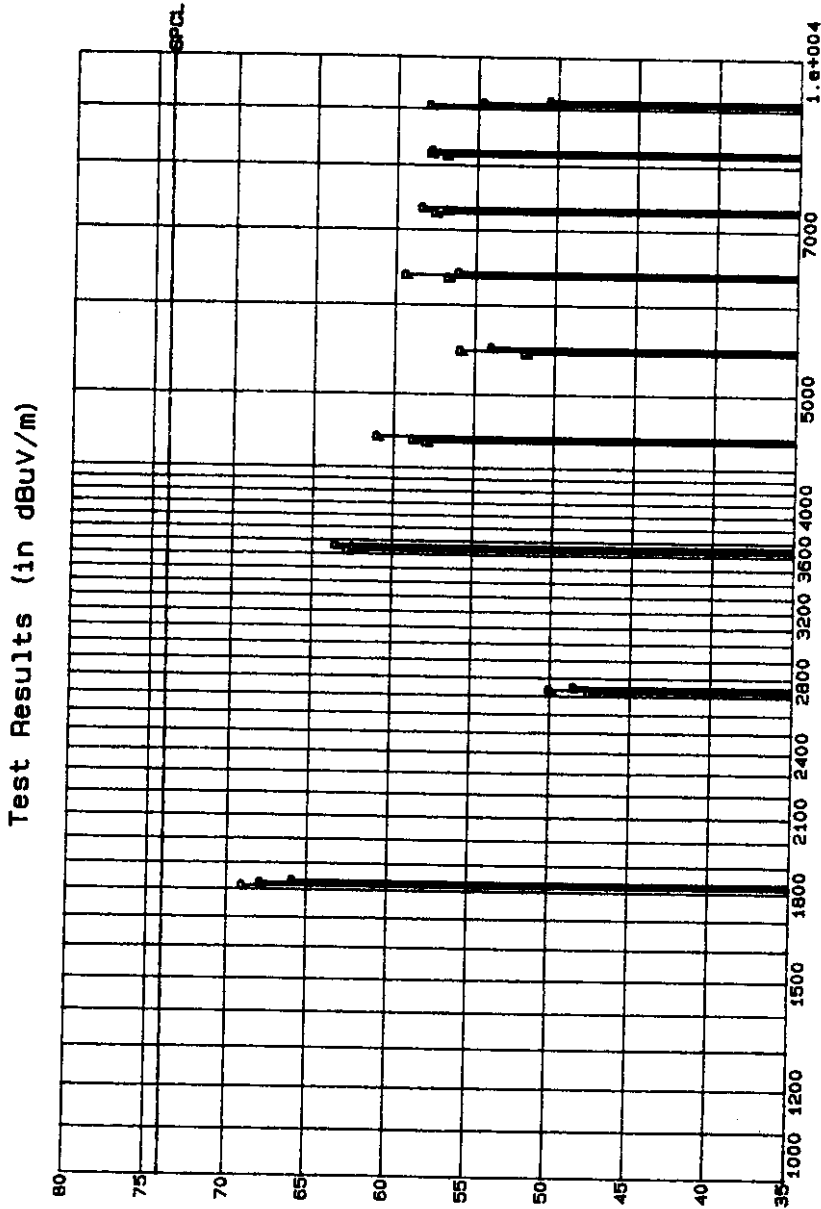
Pulse Train Duration (including blanking intervals) > 100 mSec

$$\text{Duty Cycle} = \frac{164 * 0.02}{100} = 0.032 = 3.2\%$$

Average Power Correction Factor = $20 * \text{Log}(0.032) = -29.7 \text{ dB}$
 maximum correction allowed = -20 dB

Part 4.7 Radiated Emissions Plot, 1 GHz to 10 GHz

Intellistor OATS
Date: Tue Mar 30 13:54:41 1999
EUT: Model: SSR1, Serial: 002
Manufacturer: Inovonics Corporation
Tester: MEM SPID: INO 260
EUT Level: 12 VDC from external source. Plug-in transformer/converter supplied
EUT Information: Pulsed 902-928 MHz
Test Information: Normal Operation, 3m, 12 VDC, FCC Class B, FCC 15.247



Part 4.5 Radiated Emissions, Intentional Radiator Data

Intentional Radiator, Margin to Limit Calculation

INO 9902_0303

2/15/99

Freq. (MHz)	Level (dBuV/m)	Duty Cycle (dB)	Calc. Average (dBuV/m)	Spec. Limit (dBuV/m)	Spec. Margin (dB)
901.9983	66.15	NA	NA	89.37	23.22
928.0038	51.22	NA	NA	89.37	38.15
1814.2000	68.91	20	48.91	54.00	5.09
1823.6420	67.78	20	47.78	54.00	6.22
1834.0000	65.75	20	45.75	54.00	8.25
2721.0000	47.44	20	27.44	54.00	26.56
2735.4629	49.91	20	29.91	54.00	24.09
2751.0000	48.38	20	28.38	54.00	25.62
3628.4000	62.7	20	42.70	54.00	11.30
3647.2839	62.32	20	42.32	54.00	11.68
3668.0000	63.43	20	43.43	54.00	10.57
4535.5000	57.86	20	37.86	54.00	16.14
4559.1049	58.69	20	38.69	54.00	15.31
4585.0000	60.93	20	40.93	54.00	13.07
5442.6000	51.73	20	31.73	54.00	22.27
5470.9259	55.79	20	35.79	54.00	18.21
5502.0000	53.83	20	33.83	54.00	20.17
6349.7000	56.64	20	36.64	54.00	17.36
6382.7465	59.28	20	39.28	54.00	14.72
6419.0000	55.94	20	35.94	54.00	18.06
7256.8000	57.49	20	37.49	54.00	16.51
7294.3985	56.73	20	36.73	54.00	17.27
7336.0000	58.3	20	38.30	54.00	15.70
8163.5160	56.83	20	36.83	54.00	17.17
8206.1985	57.79	20	37.79	54.00	16.21
8253.0000	57.69	20	37.69	54.00	16.31
9070.6160	57.85	20	37.85	54.00	16.15
9117.9985	54.53	20	34.53	54.00	19.47
9170.0000	Noise Floor	20	-	54.00	-

Note: Emissions below 1 GHz were measured with a CISPR quasi peak detector. Emissions above 1 GHz were measured with a peak detector and average levels were calculated per Appendix I of ANSI C63.4 1992.

Because the fundamental frequency levels were not measured with a peak detector, it was not possible to calculate the out-of-band limit for spurious emissions above 1 GHz per CFR 47 Part 15.247 (c). Limits were taken from Part 15.209(a) as the worse case requirements.

Table 4: Scan List, sorted by margin to limit SPCL, -30.0dB filter

<u>Freq. MHz</u>	<u>Value</u>	<u>Sts</u>	<u>SPCL</u>	<u>TT</u>	<u>Hght</u>	<u>Az</u>	<u>Comment</u>
7256.8000	57.49	p	-16.51	150	103	V	8fo
8163.5160	56.83	p	-17.17	165	161	V	9fo
7294.3985	56.73	p	-17.27	127	164	V	8fo
6349.7000	56.64	p	-17.36	129	101	V	7fo
6419.0000	55.94	p	-18.06	217	100	V	7fo
5470.9259	55.79	p	-18.21	211	100	V	6fo
9117.9985	54.53	p	-19.47	204	172	V	10fo
5502.0000	53.83	p	-20.17	211	100	V	6fo
5442.6000	51.73	p	-22.27	209	100	V	6fo
9170.0000	50.36	p	-23.64	96	143	V	10fo, noise floor
2735.4629	49.91	p	-24.09	320	131	V	3fo
2751.0000	48.38	p	-25.62	353	100	V	3fo
2721.0000	47.44	p	-26.56	347	100	V	3fo

Table 5: Scan List for SPCL, sorted by Frequency, -30.0dB filter

<u>Freq. MHz</u>	<u>Value</u>	<u>Sts</u>	<u>SPCL</u>	<u>TT</u>	<u>Hght</u>	<u>Az</u>	<u>Comment</u>
1814.2000	68.91	p	-5.09	71	112	V	2fo
1823.6420	67.78	p	-6.22	73	134	V	2fo
1834.0000	65.75	p	-8.25	73	134	V	2fo
2721.0000	47.44	p	-26.56	347	100	V	3fo
2735.4629	49.91	p	-24.09	320	131	V	3fo
2751.0000	48.38	p	-25.62	353	100	V	3fo
3628.4000	62.70	p	-11.30	289	100	V	4fo
3647.2839	62.32	p	-11.68	289	100	V	4fo
3668.0000	63.43	p	-10.57	276	114	V	4fo
4535.5000	57.86	p	-16.14	107	100	V	5fo
4559.1049	58.69	p	-15.31	163	100	V	5fo
4585.0000	60.93	p	-13.07	71	100	V	5fo
5442.6000	51.73	p	-22.27	209	100	V	6fo
5470.9259	55.79	p	-18.21	211	100	V	6fo
5502.0000	53.83	p	-20.17	211	100	V	6fo
6349.7000	56.64	p	-17.36	129	101	V	7fo
6382.7465	59.28	p	-14.72	128	109	V	7fo
6419.0000	55.94	p	-18.06	217	100	V	7fo
7256.8000	57.49	p	-16.51	150	103	V	8fo
7294.3985	56.73	p	-17.27	127	164	V	8fo
7336.0000	58.30	p	-15.70	127	179	V	8fo

Table 3: Complete Scan List Sorted by Frequency

Freq, MHz	I-val	Final	Sts	TT	Hght	Az	Time	Comment
100.0000	31.74	18.74	m	22	100	V	Mon Feb 15 17:08:27 1999	4. ck
120.0000	20.75	9.82	q	180	161	V	Mon Feb 15 16:47:35 1999	4. ck
180.0000	19.91	6.67	q	270	400	H	Mon Feb 15 16:56:59 1999	4. ck
240.0000	21.66	11.19	q	0	400	H	Mon Feb 15 16:35:21 1999	4. ck
901.9983	50.47	66.15	m	219	100	H	Mon Feb 15 17:24:50 1999	low adjacent band edge
906.9800	93.50	109.37	m	219	100	H	Mon Feb 15 17:26:14 1999	fo low
911.6765	92.40	108.42	m	221	100	H	Mon Feb 15 17:27:53 1999	fo mid
916.8881	91.34	107.60	m	232	100	H	Mon Feb 15 17:29:42 1999	fo high
928.0038	34.66	51.22	m	232	100	H	Mon Feb 15 17:30:59 1999	f high adjacent band edge

Part 4.3 Radiated Emissions Data, 30 MHz to 1000 MHz

Notes:

The third column below contains alpha characters which pertain to the type of measurements made. The following are the definitions for those characters: q = Quasi Peak, m = Maximized (cable, rotation and antenna height), s = scanned but no data taken, and a = average. For the first character in column four, a '-' indicates that value is below the limit while an '*' indicates that value is above the limit

If the list is sorted using "I-sort", then quasi-peak and average levels are weighted higher than peak levels and are moved to the front of the scan list.

The following keys help to better understand the data:

TT: Turntable position in degrees
 Hght: Height of antenna in centimeters
 Az: Azimuth, V = Vertical, H= Horizontal

Criterion Technology

Tue Mar 30 13:49:03 1999

EUT: Model: SSRL, Serial: 002

Manufacturer: Inovonics Corporation

Tester: MEM

Special ID: INO Q259

EUT Level: 12 VDC from external source. Plug-in transformer/converter supplied

EUT Information: Pulsed 902-928 MHz

Test information: Normal Operation, 10m, 12 VDC, FCC Class B, FCC 15.247

Table 1: Scan List, sorted by margin to limit FCCB10, -30.0dB filter

<u>Freq. MHz</u>	<u>Value</u>	<u>Sts</u>	<u>FCCB10</u>	<u>TT</u>	<u>Hght</u>	<u>Az</u>	<u>Comment</u>
906.9800	109.37	m	73.81	219	100	H	fo low
911.6765	108.42	m	72.86	221	100	H	fo mid
916.8881	107.60	m	72.04	232	100	H	fo high
901.9983	66.15	m	30.59	219	100	H	low adjacent band edge
928.0038	51.22	m	15.66	232	100	H	f high adjacent band edge
100.0000	18.74	m	-14.32	22	100	V	4. ck
36.0000	13.58	m	-15.96	120	100	V	4. ck
70.0048	12.95	q	-16.59	270	160	V	.
72.0000	11.56	q	-17.98	270	160	V	4. ck
76.0000	10.29	q	-19.25	270	160	V	4. ck
48.0078	9.57	q	-19.97	90	100	V	4. ck
56.0000	8.85	q	-20.69	0	401	H	4. ck
66.0031	8.11	q	-21.43	279	100	V	.
67.9992	7.73	m	-21.81	279	100	V	4. ck
60.0068	7.65	q	-21.89	0	100	V	4. ck
63.9980	7.36	q	-22.18	279	100	V	4. ck

Part 4.1 FCC Conducted Emissions Plot

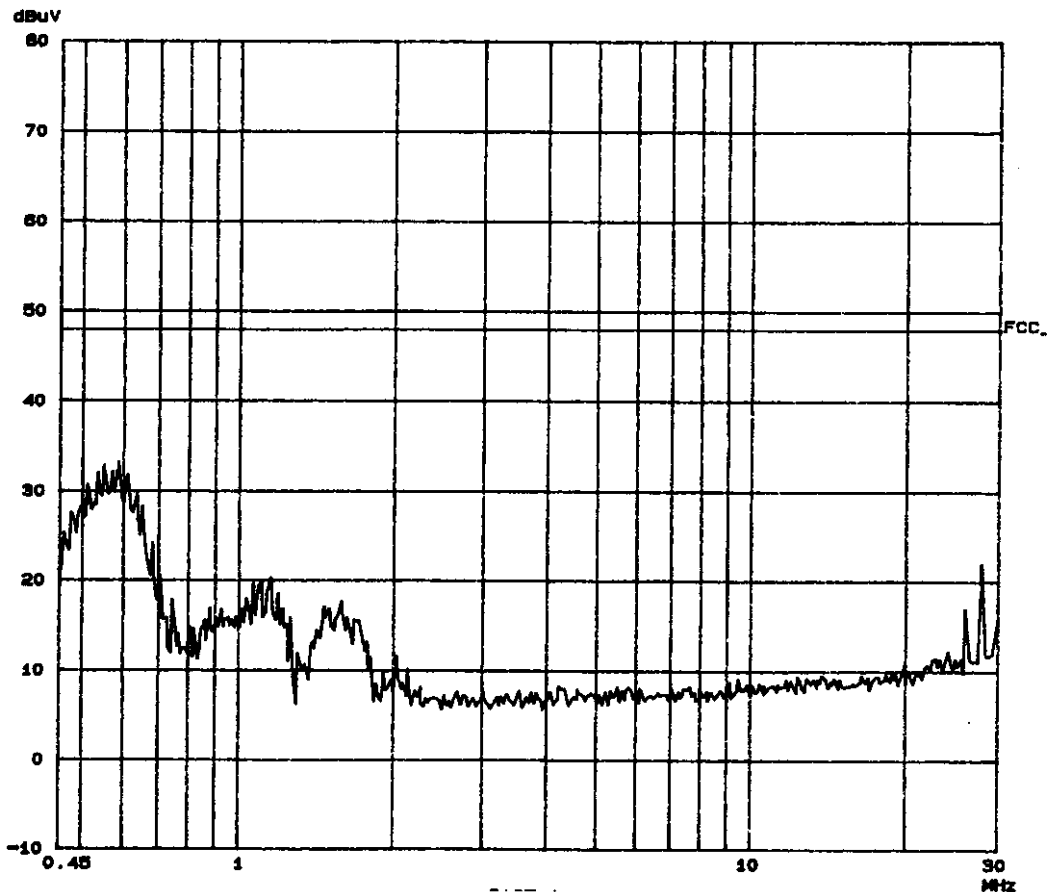
Criterion TechnologyShield Room
 Conducted Emissions through ESH2-Z5

15. Feb 99 17:56

EUT: Model: 88RL, Serial: 002
 Manuf: Invenica, Inc.
 Op Cond: Transmitting three freqs. Hi, Mid, Low
 Operator: MEM per INO 9250, 9260
 Test Spec: FCC Class B per ANSI C83.4
 Comment: 120v 60 Hz, prescan L1, L1 & N scanned
 Tabletop powered by typical pwr supply

Scan Settings (1 Range)			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
400k	30M	5k	10k	PK	20ms	AUTO	LN OFF	80dB

Final Measurement: x QP Transducer No. Start Stop Name
 Meas Time: 8 s 4 1 10k 30M SR_w3dB
 Subranges: 25 6 10k 30M LIAN
 Acc Margin: 25dB



TEST REPORT

Part 2.3 FCC Part 15 Subpart C –Intentional Radiated Fields

Measurement or radiated emissions (electric field) in the frequency range of 30 MHz-10,000 MHz were tested in a horizontal and vertical polarization as indicated below:

Environmental conditions in the lab:

Date(s) of Test: mm/dd/yy 2/15/99
Temperature: 69°F
Rel. Humidity 15%
Test Voltage [X]120 V, 60Hz [] V, Hz

Test location:

[X] Criterion Technology Open Area Test Site
[] Pre-Scan In Semi-Anechoic Chamber
[] Not applicable

Test distance (antenna - EUT):

[] 1 meter [] Preliminary Measurement [] Final Measurement
[X] 3 meters [X] Preliminary Measurement [X] Final Measurement
[] 10 meters [] Preliminary Measurement [] Final Measurement
[] 30 meters [] Preliminary Measurement [] Final Measurement
[] Not applicable

Test instruments:

Table with 2 columns: Test instruments and Calibration Due Date. Includes items like Hewlett Packard Spectrum Analyzer, Model 8566B (7/12/99), Rohde and Schwarz Receiver, Model, ESHS-30 (8/26/99), etc.

Test accessories:

[X] Other HP 8445B Preselector Filter 2/14/00
[] Not applicable

Results

Radiated Emissions (Electric Field) 30 MHz - 10,000 MHz

The requirements are [X] PASS [] FAIL [] N/A
Min. limit margin 5.09 dB at 1814.2 MHz*
Max. limit exceeding ___ dB at ___ MHz

Bandwidth (CFR 47 Part 15.247 (a)(1)(i))

Minimum Hopping Channel 20 dB Bandwidth: 200 KHz at 911.62 MHz **

TEST REPORT

Part 2.1 FCC Part 15 Subpart B - Conducted Emissions

Measurement of *conducted emissions* was performed as indicated below:

Environmental conditions in the lab:

Date(s) of Test: mm/dd/yy 2/15/99

Temperature: 70°F

Rel. Humidity: 15%

Test Voltage [X]120 V, 60Hz [] ___ V, Hz

Test location:

- Criterion OATS Test Area
- Criterion Shield Room
- Not applicable

Test instruments:

Calibration Due Date

- | | | |
|-------------------------------------|--|----------|
| <input checked="" type="checkbox"/> | Hewlett Packard Spectrum Analyzer, Model 8566B | 7/12/99 |
| <input type="checkbox"/> | Hewlett Packard Quasi Peak Adapter, Model 85650A | 12/17/99 |
| <input checked="" type="checkbox"/> | Rohde and Schwarz Receiver, Model, ESHS-30 | 8/26/99 |
| <input type="checkbox"/> | Rohde and Schwarz Model Receiver, ESVS-30 | 9/1/99 |
| <input type="checkbox"/> | Rohde and Schwarz Model LISN, ESH2-Z5 | 7/24/99 |
| <input type="checkbox"/> | Not applicable | |

Test results:

Conducted Emission: 450 kHz - 30 MHz

The requirements are [X] PASS [] FAIL [] N/A

Min. limit margin > 25 dB at 0.590 MHz

Max. limit exceeding ___ dB at ___ MHz

TEST REPORT

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The client is aware that Criterion Technology has performed testing in accordance with the applicable standard(s). Test data is accurate within ANSI uncertainty parameters for Emissions testing, unless a specific level of accuracy has been defined in writing prior to testing, by Criterion Technology and the client.

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Total liability is limited to the amount invoiced for the testing of this EUT and the contents of this report are not warranted.

Compliance with the appropriate governmental standards is the responsibility of the manufacturer. Any questions regarding this report should be directed to:

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