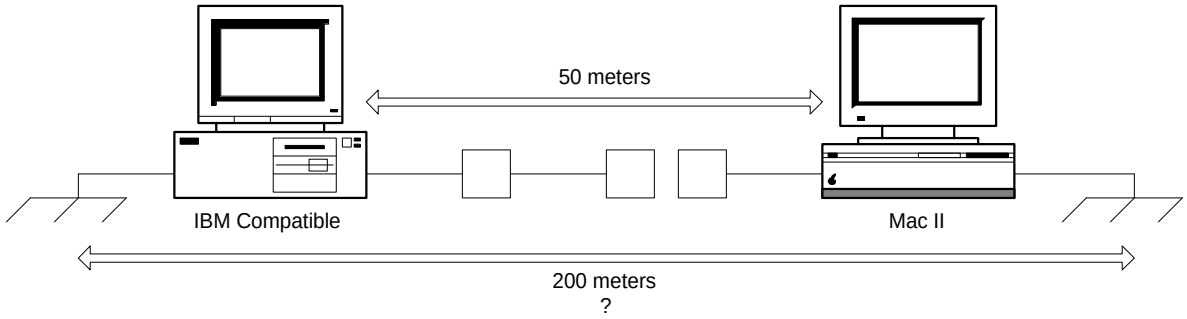
Isolation & IEEE1394.A

- Issues
- Examples
- Recommendation

Issues

- Green Wire (Earth) Grounds Connected at Distances up to 50 meters



- Potential Voltage Differences up to 60VAC

Examples of Possible Failures

- Melting Cables
- Arcing when Connecting / Disconnecting
- Silicon Damage
- Signal Integrity
- Lightning / ESD

Possible Implications

- Customer Dissatisfaction
- Bad Press (FIRE WIRE)
- Safety
- Litigation

Products at Risk

Any Product that has the Potential of Green (Earth) Ground Connected directly to V- or Shield of IEEE1394 Bus Cable

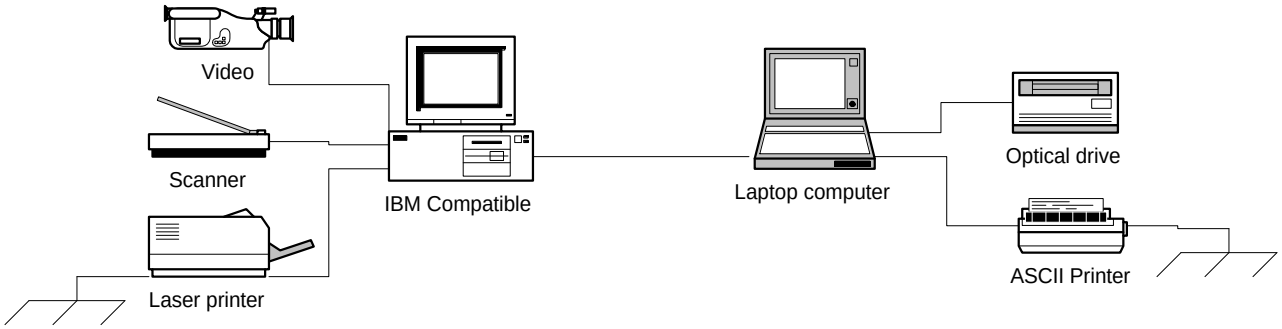
Examples (Obvious / Direct)

- Any device that has 3 wire power cord and Chassis is connected to V-

Examples (Not obvious / indirect)

- IEEE1284 Connections
- RS-232 Connections
- SCSI Connections
- Video Display
- Disc Drive
- Telephone
- Cable TV
- Exposed Coax connections

Product Types Affected



- PC's
- Printers

- Monitor
- Set Top Boxes
- VCR's
- Modems
- Bridges
- Converters
- Cam-corder

Products NOT Affected

- IEEE1394 ONLY Products that have NO Green (Earth) Ground Connections and meet UL requirements

Examples when connected to only the following

- Double Insulated Power Connections
- IEEE802.3 (10 Base2, 10BaseT)
- IEEE802.12
- IEEE802.3U
- Any Isolated Connection

Recommendation

ALL Products Implementing the IEEE1394 Bus Standard SHALL have the 1394 Bus ISOLATED from Green (Earth) Ground

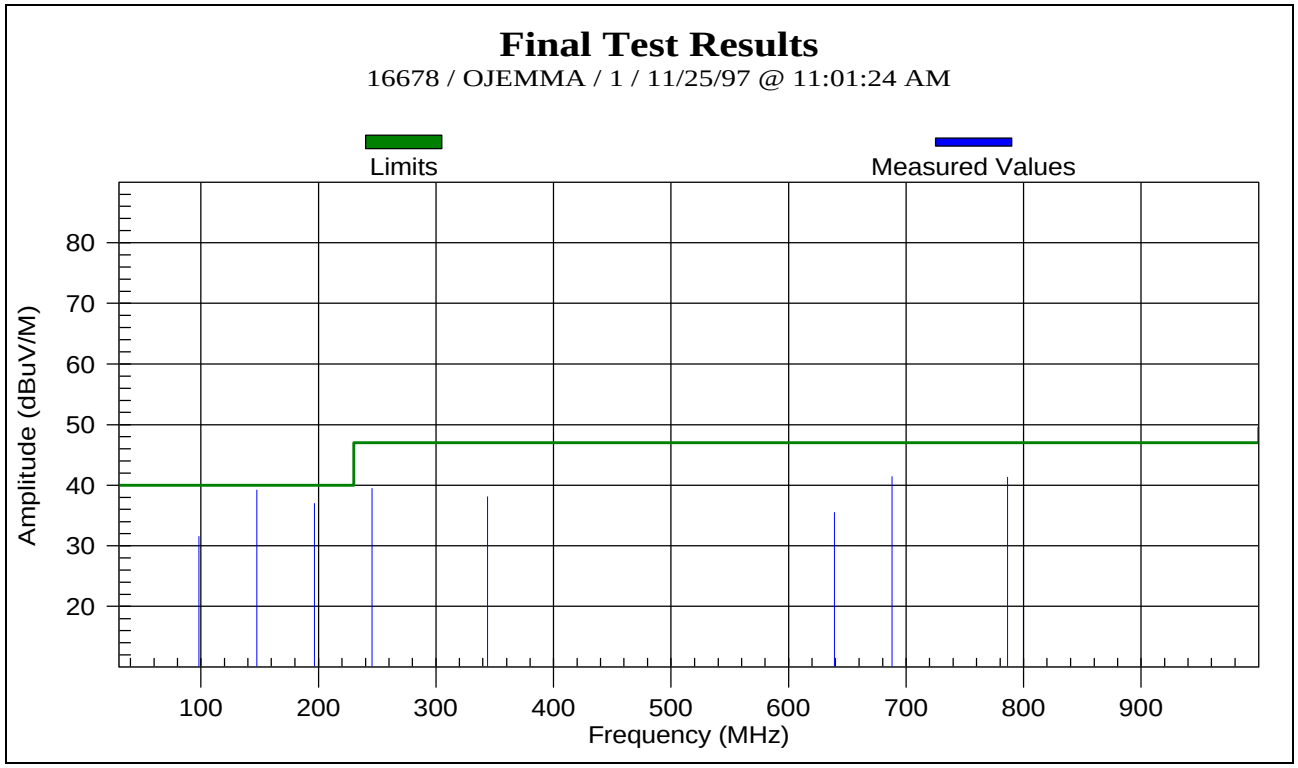
RFI Test Data

Freq		Corrected Value dBuV/m				Margin dB FCC B				
	SN:20_4	SN:1	SN:20	SN:1 GND	SN:13 mod	SN:20_4	SN:1	SN:20	SN:1 GND	SN:13 mod
98.75	18.7	31.6		32.9	21.0	11.3	-1.6		-2.9	9.0
100.00			33.6					-3.6		
148.75	6.3	39.2	40.8	38.9	27.5	23.7	-9.2	-10.8	-8.9	2.5
197.50	8.4	37.0		33.7	21.6	21.6	-7.0		-3.7	8.4
198.75			37.6					-7.6		
247.50	7.6	39.4	41.9	34.7	25.4	29.4	-2.4	-4.9	2.3	11.6
345.00	14.5	38.1	39.4	30.2	19.1	22.5	-1.1	-2.4	6.8	17.9
640.00	31.0	35.5	40.4	33.4	29.0	6.0	1.5	-3.4	3.6	8.0
688.75	20.7	41.4	44.0	38.6	19.7	16.3	-4.1	-7.0	-1.6	17.3
787.50	14.6	41.3	40.7	39.6	22.2	22.4	-4.3	-3.7	-2.6	14.8

SN:20_4	Standard connector, Right angle, surface mount, NO CABLE connected
SN:1	Standard connector, Right angle, surface mount
SN:20	Standard connector, Right angle, surface mount
SN:1GND	Standard connector, Right angle, surface mount, conn shell grounded to chassis at single point
SN:13MOD	Decoupled connector, Right angle, surface mount

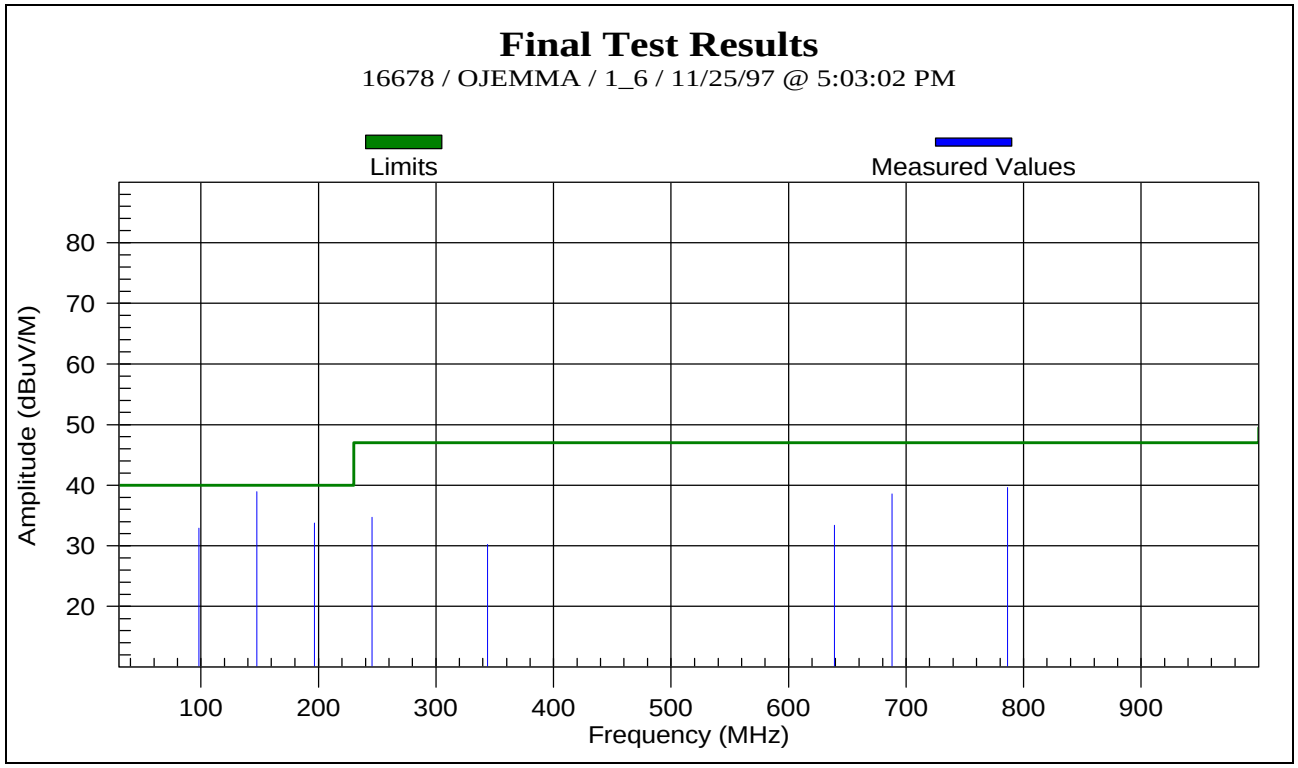
Data for: OJEMMA, Unit: 1

11/25/97 11:01:24 AM, File: C:\TEST DATA\16678\RE_OJEMMA_1\FINALTEST_1.DAT															
Work Order: 16678, Project: OJEMMA, Model: OJEMMA, SN: 1															
22.0 Deg C, 38.0 % RH, 30.1 In-Hg															
"	Freq MHz	Limit dBuV/m	Max Corr Lvl dBuV/m	Margin dB	Pol	Ht cm.	Azm Deg.	Corr Freq MHz	Value dBuV	Corr Value dBuV/m	Cor Mar	RBW	Det	Method	Note
P	247.50	47.0	40.8	6.2	V	100	0	245.69	56.1	39.4	7.6	120	Qpk	"Normal"	
P	197.50	40.0	38.0	2.0	V	100	0	196.53	56.6	37.0	3.0	120	Qpk	"Normal"	
P	345.00	47.0	38.9	8.1	V	100	0	344.00	52.1	38.1	8.9	120	Qpk	"Normal"	
P	640.00	47.0	38.0	9.0	H	100	45	639.01	43.7	35.5	11.5	120	Qpk	"Normal"	
P	98.75	40.0	33.5	6.5	V	150	0	98.30	50.8	31.6	8.4	120	Qpk	"Normal"	
P	688.75	47.0	42.2	4.8	V	200	0	688.11	49.4	41.4	5.6	120	Qpk	"Normal"	
P	787.50	47.0	38.4	8.6	V	350	0	786.38	48.1	41.3	5.7	120	Qpk	"Normal"	
P	148.75	40.0	39.8	0.2	V	400	0	147.46	57.7	39.2	0.8	120	Qpk	"Normal"	


Final Test Results
16678 / OJEMMA / 1 / 11/25/97 @ 11:01:24 AM
Limits
Measured Values
Amplitude (dBuV/M)
80
70
60
50
40
30
20
100
200
300
400
500
600
700
800
900
Frequency (MHz)

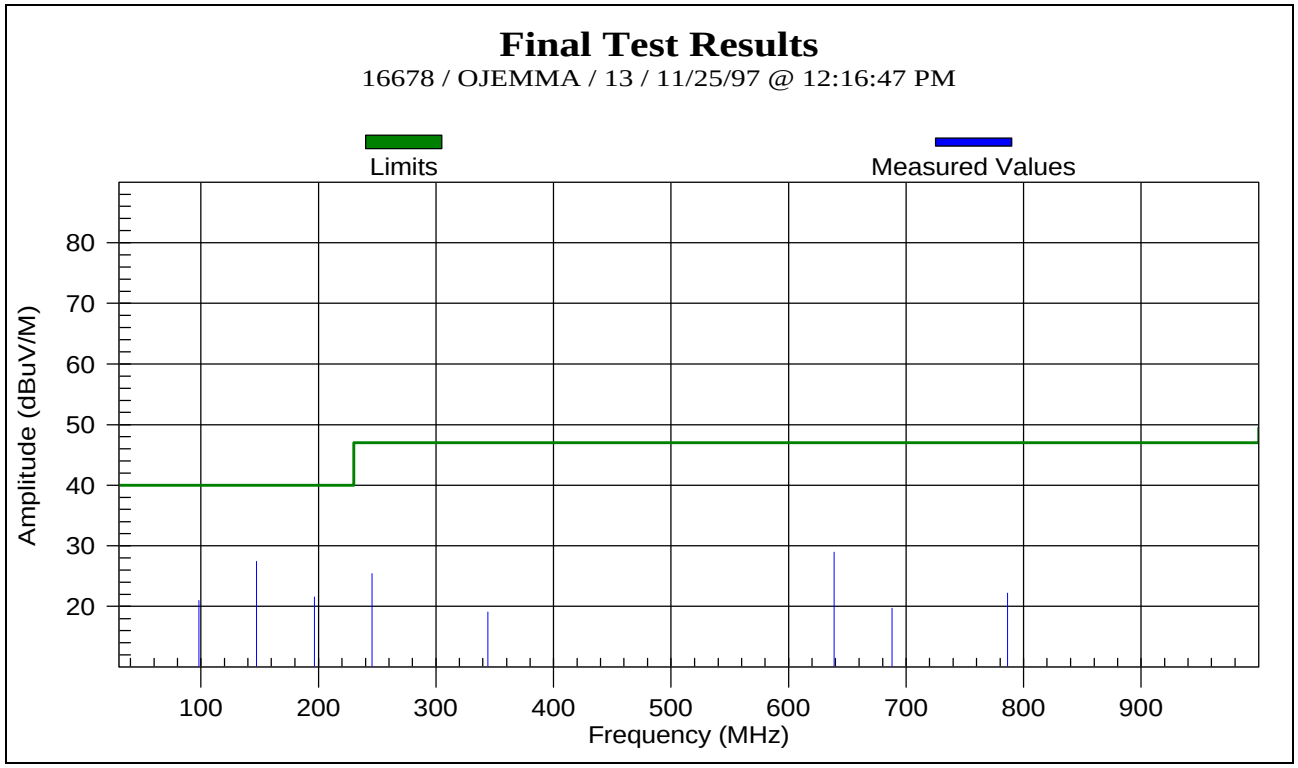
Data for: OJEMMA, Unit: 1_6

11/25/97 5:03:02 PM, File: C:\TEST DATA\16678\RE_OJEMMA_1_6\FINALTEST_1.DAT															
Work Order: 16678, Project: OJEMMA, Model: OJEMMA, SN: 1_6															
25.0 Deg C, 50.0 % RH, 30.0 In-Hg															
"	Freq MHz	Limit dBuV/m	Max Corr Lvl dBuV/m	Margin dB	Pol	Ht cm.	Azm Deg.	Corr Freq MHz	Value dBuV	Corr Value dBuV/m	Cor Mar	RBW	Det	Method	Note
P	197.50	40.0	38.0	2.0	V	100	0	196.53	53.4	33.7	6.3	120	Qpk	"Normal"	
P	345.00	47.0	38.9	8.1	V	100	0	343.96	44.2	30.2	16.8	120	Qpk	"Normal"	
P	247.50	47.0	40.8	6.2	V	100	0	245.67	51.4	34.7	12.3	120	Qpk	"Normal"	
P	640.00	47.0	38.0	9.0	H	100	45	639.02	41.6	33.4	13.6	120	Qpk	"Normal"	
P	98.75	40.0	33.5	6.5	V	150	0	98.30	52.1	32.9	7.1	120	Qpk	"Normal"	
P	688.75	47.0	42.2	4.8	V	200	0	688.06	46.6	38.6	8.4	120	Qpk	"Normal"	
P	787.50	47.0	38.4	8.6	V	350	0	786.38	46.4	39.6	7.4	120	Qpk	"Normal"	
P	148.75	40.0	39.8	0.2	V	400	0	147.48	57.5	38.9	1.1	120	Qpk	"Normal"	

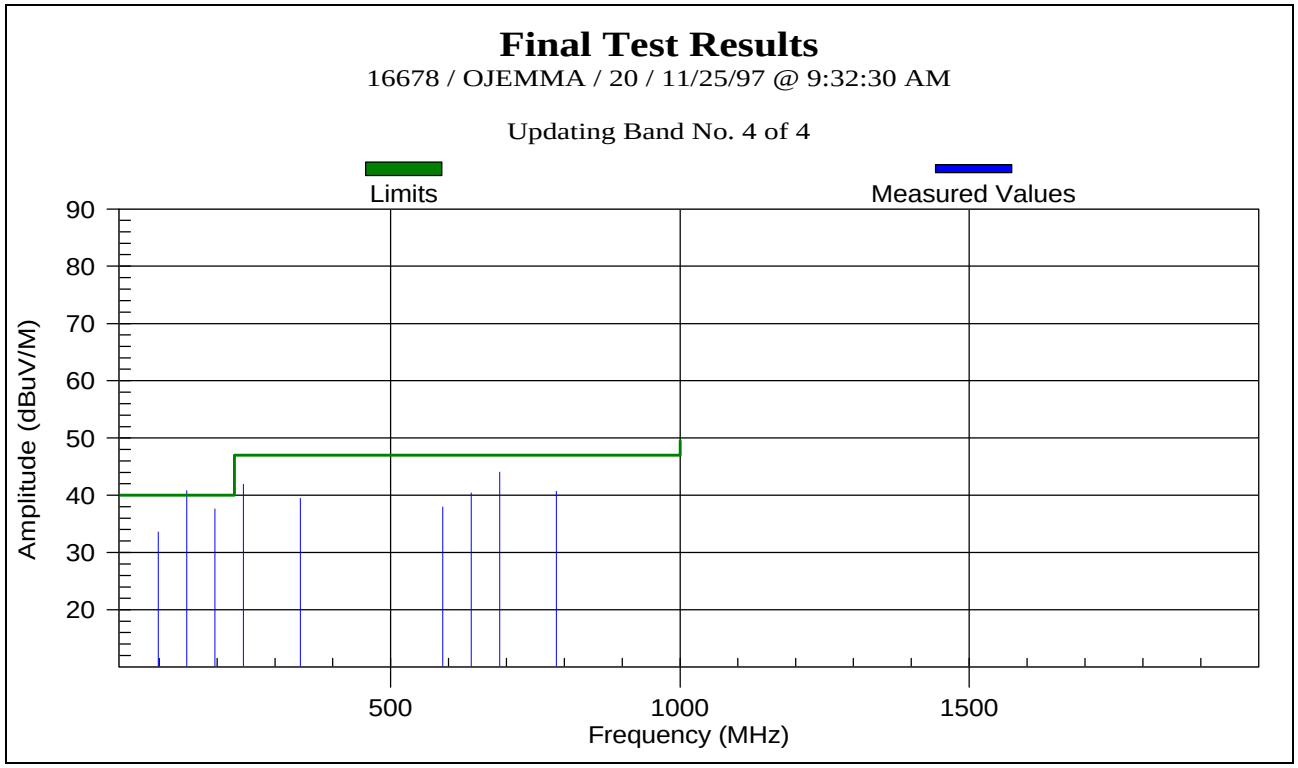

Final Test Results
16678 / OJEMMA / 1_6 / 11/25/97 @ 5:03:02 PM
Limits
Measured Values
Amplitude (dBuV/M)
80
70
60
50
40
30
20
100
200
300
400
500
600
700
800
900
Frequency (MHz)

Data for: OJEMMA, Unit: 13

11/25/97 12:16:47 PM, File: C:\TEST DATA\16678\RE_OJEMMA_13\FINALTEST_1.DAT															
Work Order: 16678, Project: OJEMMA, Model: OJEMMA, SN: 13															
22.0 Deg C, 38.0 % RH, 30.1 In-Hg															
"	Freq MHz	Limit dBuV/m	Max Corr Lvl dBuV/m	Margin dB	Pol	Ht cm.	Azm Deg.	Corr Freq MHz	Value dBuV	Corr Value dBuV/m	Cor Mar	RBW	Det	Method	Note
P	247.50	47.0	40.8	6.2	V	100	0	245.67	42.1	25.4	21.6	120	Qpk	"Normal"	
P	197.50	40.0	38.0	2.0	V	100	0	196.52	41.2	21.6	18.4	120	Qpk	"Normal"	
P	345.00	47.0	38.9	8.1	V	100	0	344.09	33.1	19.1	27.9	120	Qpk	"Normal"	
P	640.00	47.0	38.0	9.0	H	100	45	638.93	37.2	29.0	18.0	120	Qpk	"Normal"	
P	98.75	40.0	33.5	6.5	V	150	0	98.31	40.2	21.0	19.0	120	Qpk	"Normal"	
P	688.75	47.0	42.2	4.8	V	200	0	688.01	27.7	19.7	27.3	120	Qpk	"Normal"	
P	787.50	47.0	38.4	8.6	V	350	0	786.50	29.0	22.2	24.8	120	Qpk	"Normal"	
P	148.75	40.0	39.8	0.2	V	400	0	147.37	46.0	27.5	12.5	120	Qpk	"Normal"	

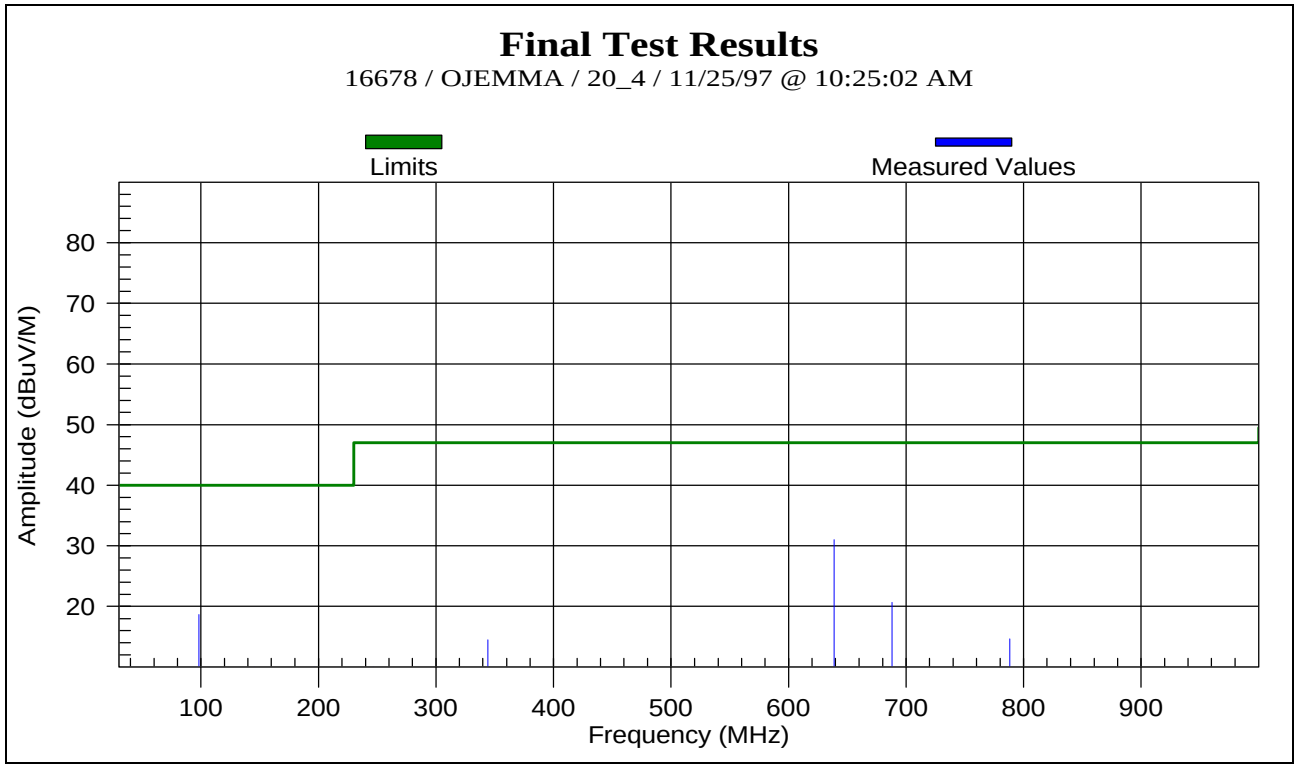

Final Test Results
16678 / OJEMMA / 13 / 11/25/97 @ 12:16:47 PM
Limits
Measured Values
Amplitude (dBuV/M)
80
70
60
50
40
30
20
100
200
300
400
500
600
700
800
900
Frequency (MHz)

11/25/97 9:32:30 AM, File: C:\TEST DATA\16678\RE_OJEMMA_20\FINALTEST_2.DAT															
Work Order: 16678, Project: OJEMMA, Model: OJEMMA, SN: 20															
22.0 Deg C, 38.0 % RH, 30.1 In-Hg															
"	Freq MHz	Limit dBuV/m	Max Corr Lvl dBuV/m	Margin dB	Pol	Ht cm.	Azm Deg.	Corr Freq MHz	Value dBuV	Corr Value dBuV/m	Cor Mar	RBW	Det	Method	Note
P	345.00	47.0	38.8	8.2	V	100	341	343.98	53.5	39.4	7.6	120	Qpk	"Normal"	
P	688.75	47.0	42.1	4.9	V	201	345	688.19	52.0	44.0	3.0	120	Qpk	"Normal"	
P	591.25	47.0	37.4	9.6	V	268	330	589.88	46.6	38.0	9.0	120	Qpk	"Normal"	
P	198.75	40.0	37.1	2.9	V	103	153	196.65	57.2	37.6	2.4	120	Qpk	"Normal"	
P	787.50	47.0	39.2	7.8	V	177	159	786.52	47.4	40.7	6.3	120	Qpk	"Normal"	
P	247.50	47.0	41.7	5.3	V	104	325	245.69	58.6	41.9	5.1	120	Qpk	"Normal"	
P	100.00	40.0	35.5	4.5	V	143	335	98.30	52.8	33.6	6.4	120	Qpk	"Normal"	
P	640.00	47.0	38.9	8.1	V	238	323	639.03	48.6	40.4	6.6	120	Qpk	"Normal"	
F	148.75	40.0	41.8	-1.8	V	395	343	147.47	59.3	40.8	-0.8	120	Qpk	"Normal"	


Final Test Results
16678 / OJEMMA / 20 / 11/25/97 @ 9:32:30 AM
Updating Band No. 4 of 4
Limits
Measured Values
Amplitude (dBuV/M)
90
80
70
60
50
40
30
20
500
1000
1500
Frequency (MHz)

Data for: OJEMMA, Unit: 20_4

11/25/97 10:25:02 AM, File: C:\TEST DATA\16678\RE_OJEMMA_20_4\FINALTEST_1.DAT															
Work Order: 16678, Project: OJEMMA, Model: OJEMMA, SN: 20_4															
22.0 Deg C, 38.0 % RH, 30.1 In-Hg															
"	Freq MHz	Limit dBuV/m	Max Corr Lvl dBuV/m	Margin dB	Pol	Ht cm.	Azm Deg.	Corr Freq MHz	Value dBuV	Corr Value dBuV/m	Cor Mar	RBW	Det	Method	Note
P	247.50	47.0	40.8	6.2	V	100	0	246.61	24.2	7.6	39.4	120	Qpk	"Normal"	
P	197.50	40.0	38.0	2.0	V	100	0	196.55	28.1	8.4	31.6	120	Qpk	"Normal"	
P	345.00	47.0	38.9	8.1	V	100	0	344.03	28.5	14.5	32.5	120	Qpk	"Normal"	
P	640.00	47.0	38.0	9.0	H	100	45	638.91	39.2	31.0	16.0	120	Qpk	"Normal"	
P	98.75	40.0	33.5	6.5	V	150	0	98.31	37.9	18.7	21.3	120	Qpk	"Normal"	
P	688.75	47.0	42.2	4.8	V	200	0	688.02	28.7	20.7	26.3	120	Qpk	"Normal"	
P	787.50	47.0	38.4	8.6	V	350	0	788.47	21.4	14.6	32.4	120	Qpk	"Normal"	
P	148.75	40.0	39.8	0.2	V	400	0	145.79	24.9	6.3	33.7	120	Qpk	"Normal"	


Final Test Results
16678 / OJEMMA / 20_4 / 11/25/97 @ 10:25:02 AM
Limits
Measured Values
Amplitude (dBuV/M)
80
70
60
50
40
30
20
100
200
300
400
500
600
700
800
900
Frequency (MHz)