Project:	03ME17189
File:	E172861
Date:	2/9/2004
Model:	GT (M) 2065-AABB-C.C-D E) FFF Series

Test Report

On

Electromagnetic Compatibility Testing

Underwriters Laboratories Inc.
1285 Walt Whitman Rd.
Melville, NY 11747

Tel: (631) 271-6200 Fax: (631) 439-6095

A not-for-profit organization dedicated to public safety and committed to quality service for over 100 years

Test Report Details

Tests Performed By:	**Underwriters Laboratories Inc.** **1285 Walt Whitman Rd.** **Melville, NY 11747**
Tests Performed For:	**Globtek Inc.** **186 Veterans Drive** **Northvale, NJ 07647**
Applicant Contact:	**David Rakovsky**
Title:	**N/A**
Phone:	**(201) 784-1000**
Fax:	**(201) 784-0111**
E-mail:	**rakavskyd@globtek.com**
Test Report Date:	**2/11/2004**
Product Type:	**Power Supplies**
Model Number:	**GT (M) 2065-AABB-C.C-D (E) FFF Series**
Sample Serial Number:	**N/A**
Sample Tag Number:	**0544546001**
Sample Receive Date:	**1/9/04**
EUT Category:	**Medical Device / ITE**
Testing Start Date:	**13 January 2004**
Date Testing Complete:	**19 January 2004**

Underwriters Laboratories Inc. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. Underwriters Laboratories Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Underwriters Laboratories Inc. issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP, A2LA, or any agency of the US government.

This report may contain test results that are not covered by the NVLAP or A2LA accreditation. The scope of accreditation is limited to the specific tests that are listed on the NVLAP and/or A2LA certificates provided at the end of this report.

Report Directory

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
11 February 2004	Original	---	---

1.0 G E N E R A L - Product Description

The switching power supplies are open frame and PCB mount with universal input.

The model number depicted throughout the report was the actual sample that was tested. It is the manufacturers responsibility to assure all other model numbers within the 2065 series perform as the sample actually tested.

1.1 Device Configuration During Test

The power supply was loaded with a resistive load based on the manufacturers specifications.

1.1.1 Equipment Used During Test:

Use*	Product Type	Manufacturer	Model	Comments
EUT	Power Supply	Globtek	2065	This was a 5 Volt output supply
SIM	Load	UL	---------	Resistive load

* Use = EUT - Equipment Under Test, ACC - Accessory (Not Subjected to Test), or SIM - Simulator (Not Subjected to Test)

1.1.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
0	Enclosure	N/E	-	-	None
1	Mains	AC	< 3M	No	Standard power cord
2	Output	DC	< 3M	No	---------

*AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
PMC = Process Measurement and Control Port

1.1.3 EUT Internal Operating Frequencies:

Frequency (MHz)	Description	Frequency (MHz)	Description
0.100	Power Supply Freq.	----	----
0.150	Power Supply Freq.	----	----

1.1.4 Power Interface:

Mode #	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
Rated						
1	100	8	0-65	50	1	Note: GTM-2065-4005 was the actual model number tested
2	240	8	0-65	50	1	Note: GTM-2065-4005 was the actual model number tested
3	230	8	0-65	50	1	Note: GTM-2065-4005 was the actual model number tested

1.2 EUT Operation Modes:

Mode #	Description
1	Power Supply Loaded with manufacturer rated output power

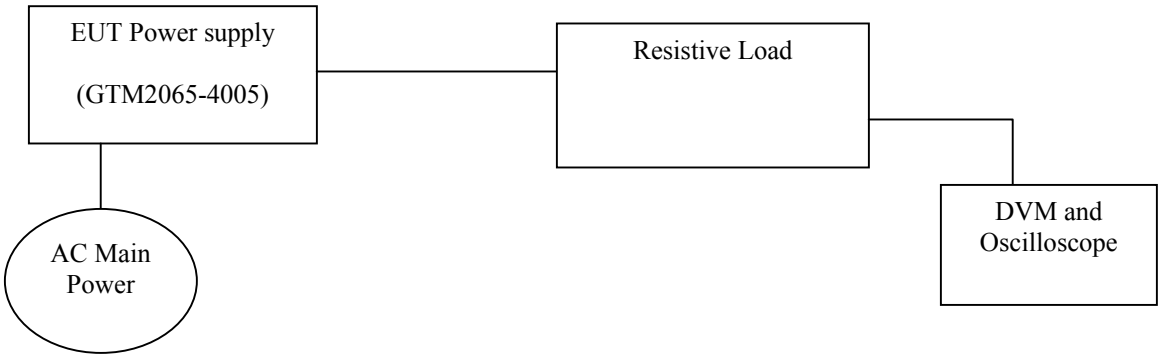
1.3 EUT Configuration Modes:

Mode #	Description
1	The power supply was loaded with a resistive load

"The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report"

1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



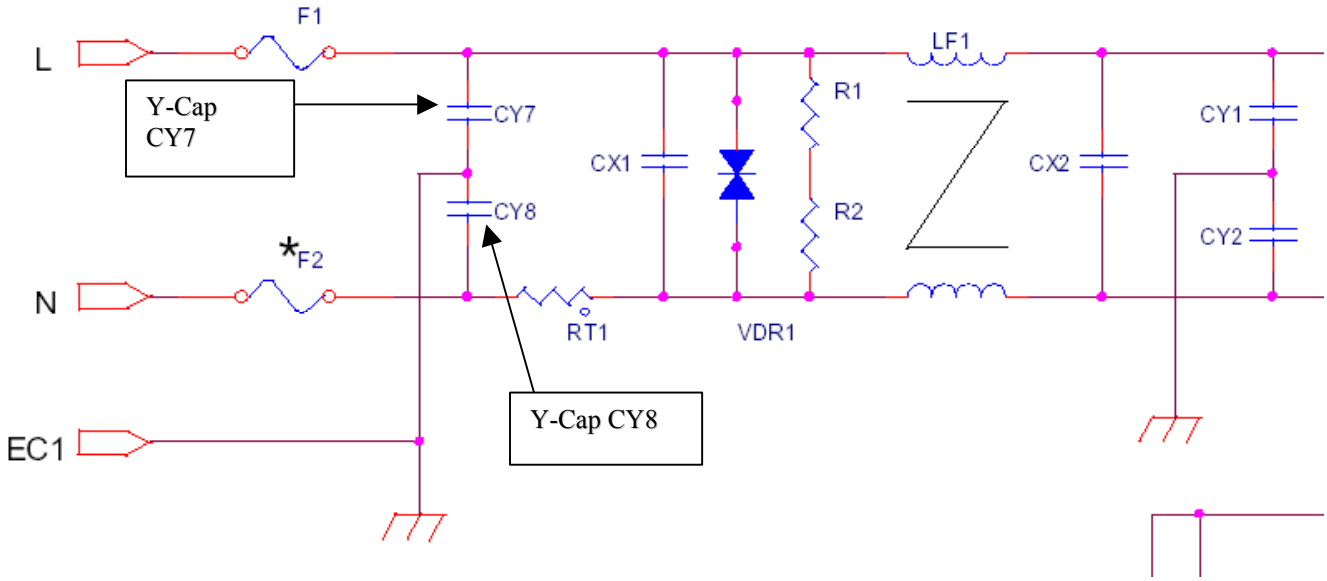
1.5 Deviations from standard test methods.

Not Applicable

1.6 Device Modifications Necessary for Compliance

Yes, See below

Y- Capacitors where added on the power input CY7 and CY8 to ground to meet the Surge test. The Y-Capacitor value utilized for this particular model number was a 470pf.



1.7 Test Summary

Test Name Test Requirement/Specification	Comply	Does Not Comply	See Remark
Radiated Disturbance Emissions - 30 to 1000 MHz Electric Field EN55011, Group 1, Class B EN5022 Class B	✓	-	1
Conducted Disturbance Emissions - Voltage EN5022 Class B EN55011, Group 1, Class B	✓	-	1
Radiated Disturbance Immunity EN55024 ITE Equipment EN55024/EN60601-1-2 / IEC 61000-4-3:2002	✓	-	1
Conducted Disturbance Immunity EN55024/EN60601-1-2 / IEC 61000-4-6:2001	✓	-	1
Power Frequency Magnetic Field Immunity EN55024/EN60601-1-2 / IEC 61000-4-8:2001	✓	-	1
Voltage Dips and Sags Immunity EN55024/EN60601-1-2 / IEC 61000-4-11:2001	✓	-	1
Electrical Fast Transient/Bursts Immunity EN55024/EN60601-1-2 / IEC 61000-4-4:2001	✓	-	1
Electrostatic Discharge Immunity EN55024/EN60601-1-2 / IEC 61000-4-2:2001	✓	-	1
Surge Immunity EN55024/EN60601-1-2 / IEC 61000-4-5:2001	✓	-	2
Voltage Fluctuations/Flicker	✓	-	1

Remarks:

1) No Modifications required for compliance.
2) Modifications required to comply as described in Section 1.5

2.0 Conclusion:

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The Applicant as being applicable to the Equipment Under Test determined the test list. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

The equipment under test has met the technical requirements as defined under sections 5.0 and 6.0.

Test Start Date: 13 January 2004
Test Completion Date: 19 January 2004

Joseph Danisi (Ext.23055)
Senior Engineering Associate
International EMC Services
Conformity Assessment Services-3027EMEL

Robert DeLisi (Ext.22452)
Senior Staff Engineer
International EMC Services
Conformity Assessment Services-3027EMEL

3.0 FCC Labeling Information

Not required under this investigation.

4.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is the manufacturer recommends one year or what whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

5.0 EMISSIONS TEST REGULATIONS

The emissions tests were performed according to following regulations:

---------- International ----------

EMC - Directive 89/336/EEC as amended by 92/31/EEC and 93/68/EEC

EN55011, Group 1, Class B	Industrial, scientific and medical (ISM) radio-frequency equipment - Radio disturbance characteristics - Limits and methods of measurement - Includes amendments A1:1999 and A2:2002; CISPR 11:1997 + A1:1999 + A2:2002, modified
EN55022, Class B	Information Technology Equipment – Radio Disturbance Characteristics – Limits and Measurements of Measurements
EN61000-3-3:	Limitation of voltage change, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 amps per phase and not subject to conditional connection.
EN61000-3-2 Ed.2: 2001	Limits for Harmonic Current Emissions (equipment input current up to and including 16A per phase)

5.1.1 Conducted Emissions Tests

Test Applicable

Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. All power was connected to the system through Line Impedance Stabilization Networks (LISN).

Results

The system met the requirements for conducted emissions. Data Pages follow.

Temperature:	20.0 °C
Humidity:	34 %RH
Pressure:	1002 mbar
Date test performed:	13 January 2004

1 fully configured sample was scanned over the following frequency range

Frequency range on each side of line	Measurement Point	Mode*	
		Power	Operation
150kHz to 30MHz	Voltage, Mains	3	1

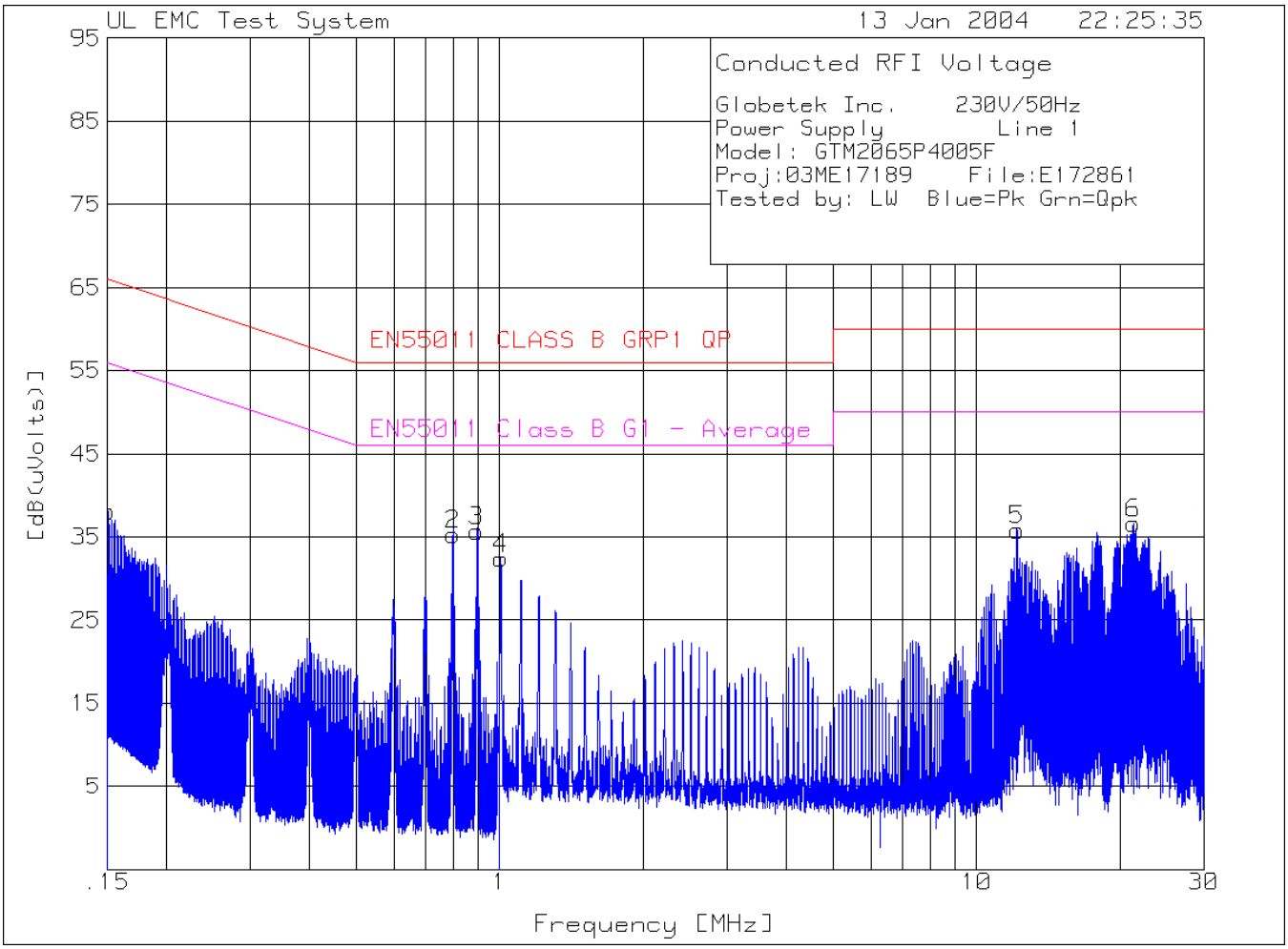
*See Power Interface and EUT Operating Modes for details

Test equipment used for conducted emissions

HP 8574A	**Hewlett-Packard**	**EMI Receiver Consisting of:**	**Equipment No.: ME5A-461**	
		HP - 8566B	**Hewlett-Packard Resolution BW: 1MHz Video BW: 1MHz**	**Spectrum Analyzer,**
		HP - 85662A	**Hewlett-Packard**	**Analyzer Display**
		HP - 85650A	**Hewlett-Packard BW: 120kHz**	**Quasi-Peak Adapter,**
		HP - 85685A	**Hewlett-Packard**	**Preselector**
Range: 150k-30MHz	Last Calibration Date: 31 January 2003		Calibration Due Date: 31 January 2004	

Test Accessories for Conducted Emissions

11947A	**Hewlett Packard**	**Transient Limiter**	**Equipment No.: ME5A-443**
Range: 150k-30MHz	Last Calibration Date: 31 January 2003		Calibration Due Date: 31 January 2004
9252-50-R-24-BNC	**Solar Electronics**	**50Ω LISN**	**Equipment No.: ME5A-637**
Range: 150k-30MHz`	Last Calibration Date: 25 March 2003		Calibration Due Date: 25 March 2004
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**
		Ranges	Temp: 0°C-55°C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar
	Last Calibration Date: 27 May 2003		Calibration Due Date: 27 May 2004

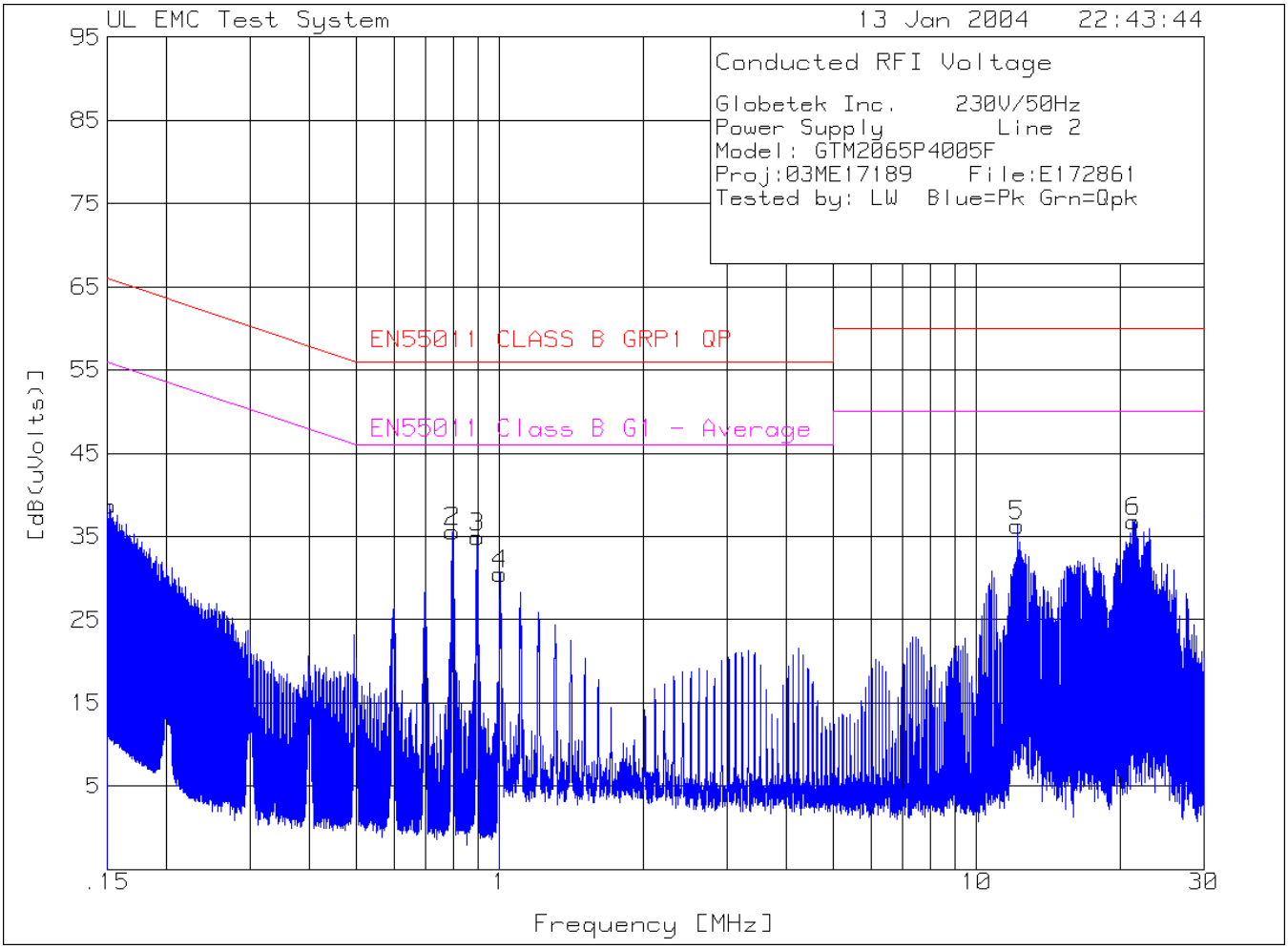

UL EMC Test System
13 Jan 2004 22:25:35
Conducted RFI Voltage
Globetek Inc. 230V/50Hz
Power Supply Line 1
Model: GTM2065P4005F
Proj:03ME17189 File:E172861
Tested by: LW Blue=Pk Grn=Qpk
EN55011 CLASS B GRP1 QP
EN55011 Class B G1 - Average
[dB(uVolts)]
95
85
75
65
55
45
35
25
15
5
.15
1
10
30
Frequency [MHz]

Globetek Inc. 230V/50Hz
Power Supply Line 1
Model: GTM2065P4005F
Proj:03ME17189 File:E172861
Tested by: LW Blue=Pk Grn=Qpk

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
Range: 1 .15 - 1MHz							
1	.15109	27.8 pk	10.3	0	38.1	65.9	55.9
				Margin [dB]		-27.8	-17.8
2	.79861	25 pk	10.3	0	35.3	56	46
				Margin [dB]		-20.7	-10.7
3	.89527	25.4 pk	10.3	0	35.7	56	46
				Margin [dB]		-20.3	-10.3
Range: 1 1 - 30MHz							
4	1.0058	22.1 pk	10.3	0	32.4	56	46
				Margin [dB]		-23.6	-13.6
5	12.18918	25 pk	10.8	0	35.8	60	50
				Margin [dB]		-24.2	-14.2
6	21.3599	25.4 pk	11.2	0	36.6	60	50
				Margin [dB]		-23.4	-13.4

LIMIT 1: EN55011 CLASS B GRP1 QP
LIMIT 2: EN55011 Class B G1 - Average

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result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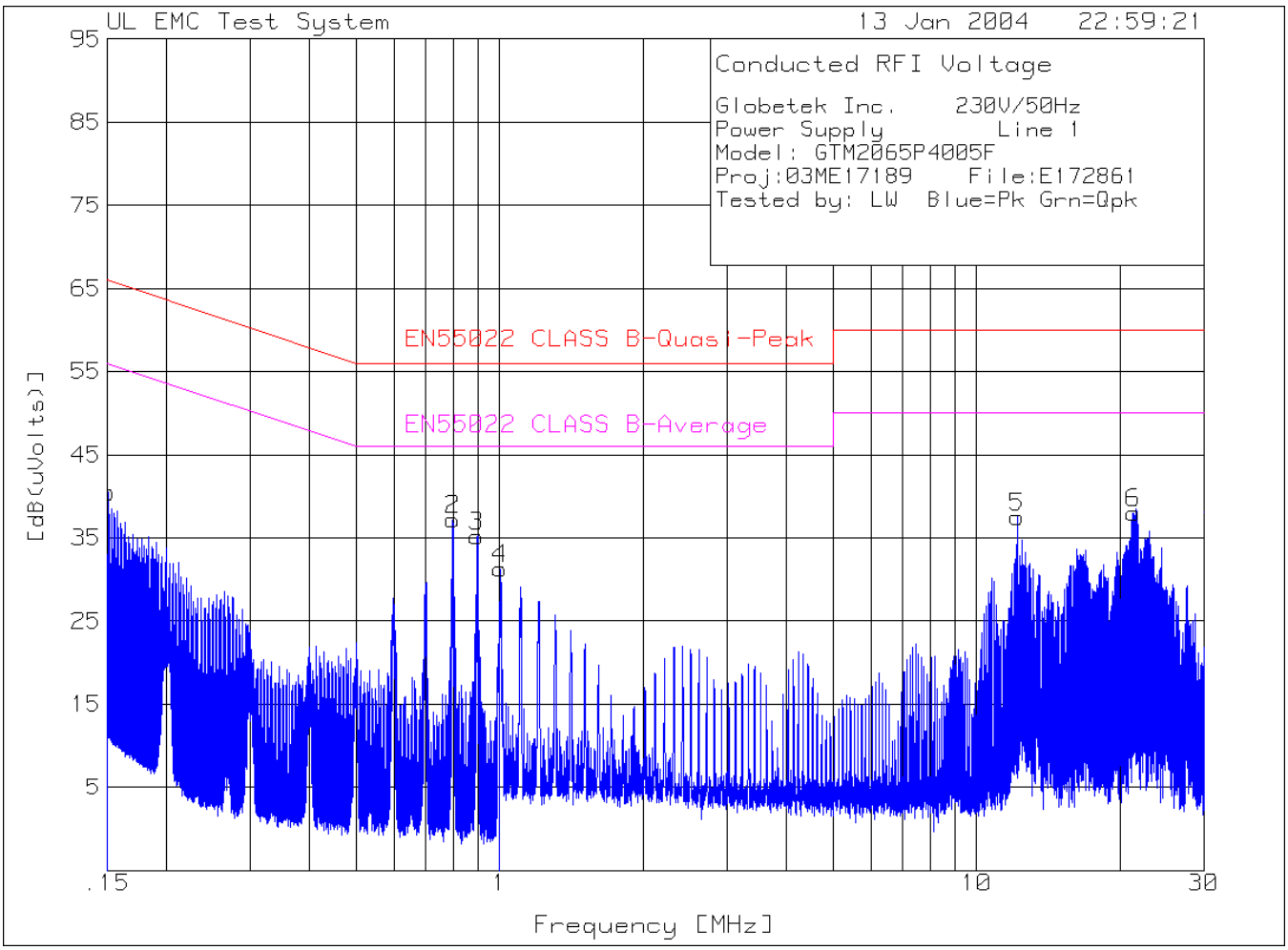
Conducted RFI Voltage
Globetek Inc. 230V/50Hz
Power Supply Line 2
Model: GTM2065P4005F
Proj:03ME17189 File:E172861
Tested by: LW Blue=Pk Grn=Qpk
EN55011 CLASS B GRP1 QP
EN55011 Class B G1 - Average
[dB(uVolts)]
95
85
75
65
55
45
35
25
15
5
.15
1
10
30
Frequency [MHz]

Globetek Inc. 230V/50Hz
Power Supply Line 2
Model: GTM2065P4005F
Proj:03ME17189 File:E172861
Tested by: LW Blue=Pk Grn=Qpk

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
Range: 1 .15 - 1MHz							
1	.15164	28.4 pk	10.3	0	38.7	65.9	55.9
				Margin [dB]		-27.2	-17.2
2	.79663	25.3 pk	10.3	0	35.6	56	46
				Margin [dB]		-20.4	-10.4
3	.89773	24.6 pk	10.3	0	34.9	56	46
				Margin [dB]		-21.1	-11.1
Range: 1 1 - 30MHz							
4	1.00362	20.2 pk	10.3	0	30.5	56	46
				Margin [dB]		-25.5	-15.5
5	12.18628	25.5 pk	10.8	0	36.3	60	50
				Margin [dB]		-23.7	-13.7
6	21.35121	25.6 pk	11.2	0	36.8	60	50
				Margin [dB]		-23.2	-13.2

LIMIT 1: EN55011 CLASS B GRP1 QP
LIMIT 2: EN55011 Class B G1 - Average

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

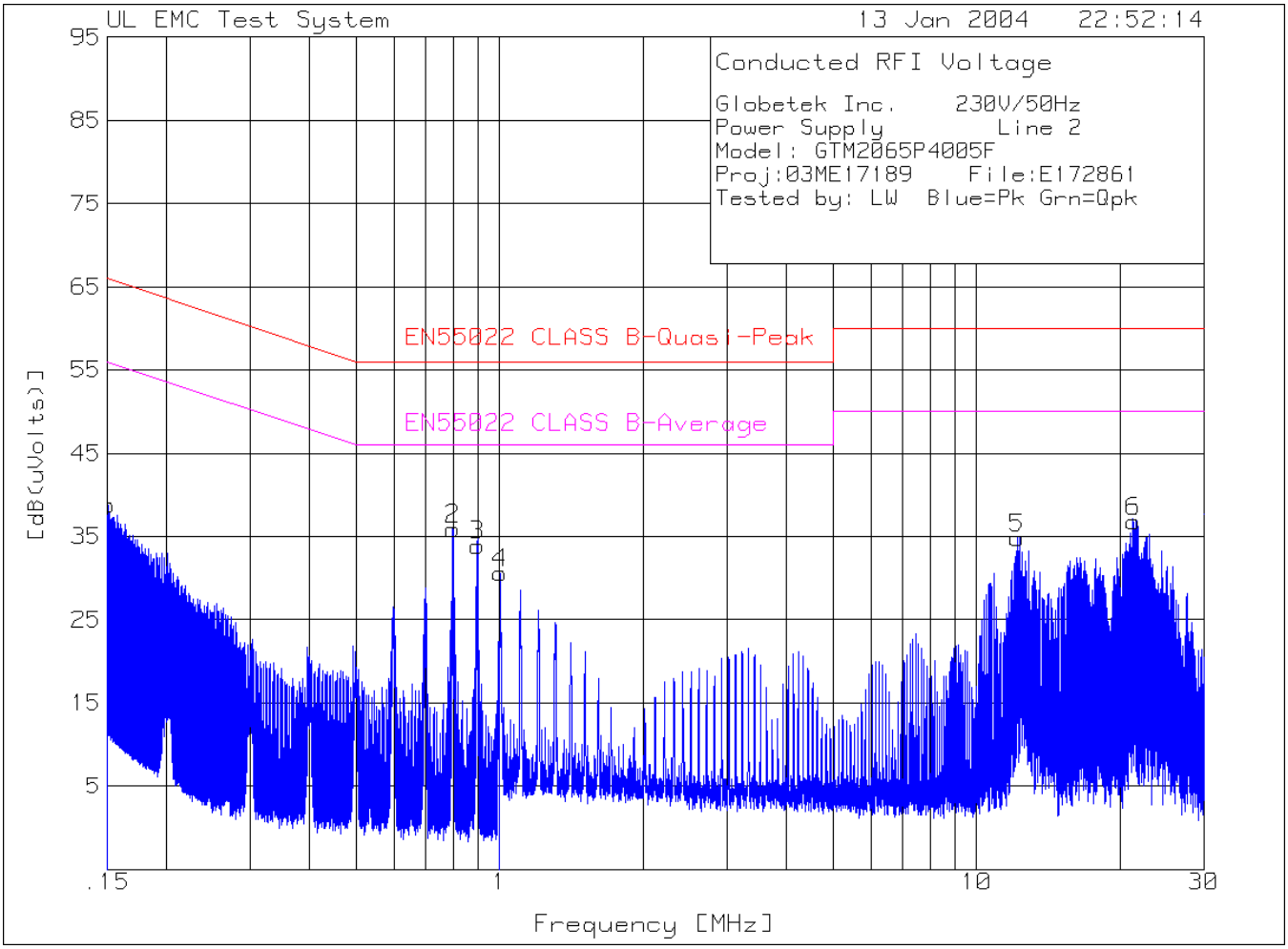

UL EMC Test System
13 Jan 2004 22:59:21
Conducted RFI Voltage
Globetek Inc. 230V/50Hz
Power Supply Line 1
Model: GTM2065P4005F
Proj:03ME17189 File:E172861
Tested by: LW Blue=Pk Grn=Qpk
EN55022 CLASS B-Quasi-Peak
EN55022 CLASS B-Average
[dB(uVolts)]
95
85
75
65
55
45
35
25
15
5
.15
1
10
30
Frequency [MHz]

Globetek Inc. 230V/50Hz
Power Supply Line 1
Model: GTM2065P4005F
Proj:03ME17189 File:E172861
Tested by: LW Blue=Pk Grn=Qpk

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
Range: 1 .15 - 1MHz							
1	.15105	30.2 pk	10.3	0	40.5	65.9	55.9
				Margin [dB]		-25.4	-15.4
2	.79768	26.9 pk	10.3	0	37.2	56	46
				Margin [dB]		-18.8	-8.8
3	.8954	24.9 pk	10.3	0	35.2	56	46
				Margin [dB]		-20.8	-10.8
Range: 1 1 - 30MHz							
4	1.0029	21 pk	10.3	0	31.3	56	46
				Margin [dB]		-24.7	-14.7
5	12.18918	26.7 pk	10.8	0	37.5	60	50
				Margin [dB]		-22.5	-12.5
6	21.3599	26.8 pk	11.2	0	38	60	50
				Margin [dB]		-22	-12

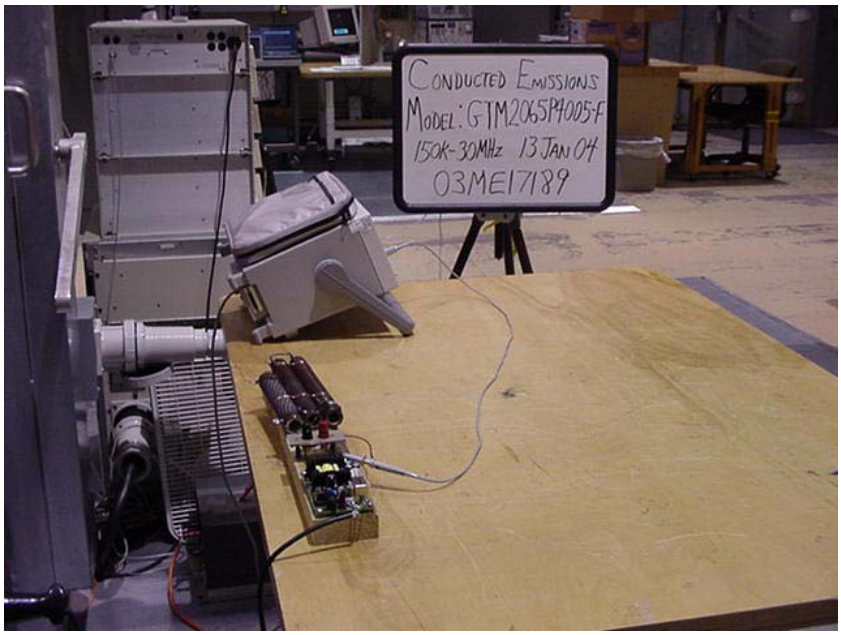
LIMIT 1: EN55022 CLASS B-Quasi-Peak
LIMIT 2: EN55022 CLASS B-Average

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result


UL EMC Test System
13 Jan 2004 22:52:14
Conducted RFI Voltage
Globetek Inc. 230V/50Hz
Power Supply Line 2
Model: GTM2065P4005F
Proj:03ME17189 File:E172861
Tested by: LW Blue=Pk Grn=Qpk
EN55022 CLASS B-Quasi-Peak
EN55022 CLASS B-Average
[dB(uVolts)]
95
85
75
65
55
45
35
25
15
5
.15
1
10
30
Frequency [MHz]

```
 Globetek Inc.    230V/50Hz
 Power Supply        Line 2
 Model: GTM2065P4005F
 Proj:03ME17189    File:E172861
 Tested by: LW  Blue=Pk Grn=Qpk

      Test     Meter     Gain/Loss  Transducer  Level  Limit:1      2
No. Frequency  Reading    Factor     Factor  [dB(uVolts)]
     [MHz]     [dB(uV)]     [dB]      [dB]
==========================================================================
Range: 1 .15 - 1MHz -------------------------------------------------------
1  .15109       28.5 pk      10.3      0         38.8    65.9     55.9
                                     Margin [dB]         -27.1    -17.1
2  .79785       25.6 pk      10.3      0         35.9    56       46
                                     Margin [dB]         -20.1    -10.1
3  .89747       23.6 pk      10.3      0         33.9    56       46
                                     Margin [dB]         -22.1    -12.1

Range: 1 1 - 30MHz --------------------------------------------------------
4  1.0029       20.3 pk      10.3      0         30.6    56       46
                                     Margin [dB]         -25.4    -15.4
5  12.19063     24 pk        10.8      0         34.8    60       50
                                     Margin [dB]         -25.2    -15.2
6  21.3541      25.6 pk      11.2      0         36.8    60       50
                                     Margin [dB]         -23.2    -13.2

LIMIT 1: EN55022 CLASS B-Quasi-Peak
LIMIT 2: EN55022 CLASS B-Average

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result
```

Front



Rear

Conducted Emissions Test Set-Up

5.1.2 Conducted Click Emissions Tests

Test Not Applicable

The EUT does not contain devices that produce transient emissions as defined by the standard.

5.1.3 Radiated Emissions Test (10 Meter Semi-Anechoic Chamber)

Test Applicable

Measurements were made in a 10-meter semi-anechoic chamber that complies to ANSI C63.4. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

Results

The system met the requirements for radiated emissions. Data Pages follow.

Temperature:	20.0 °C
Humidity:	35.0 %RH
Pressure:	995 mbar
Date test performed:	14 January 2004

Mode*	
Power	**Operation**
2	1

1 fully configured sample was scanned over the following frequency range:

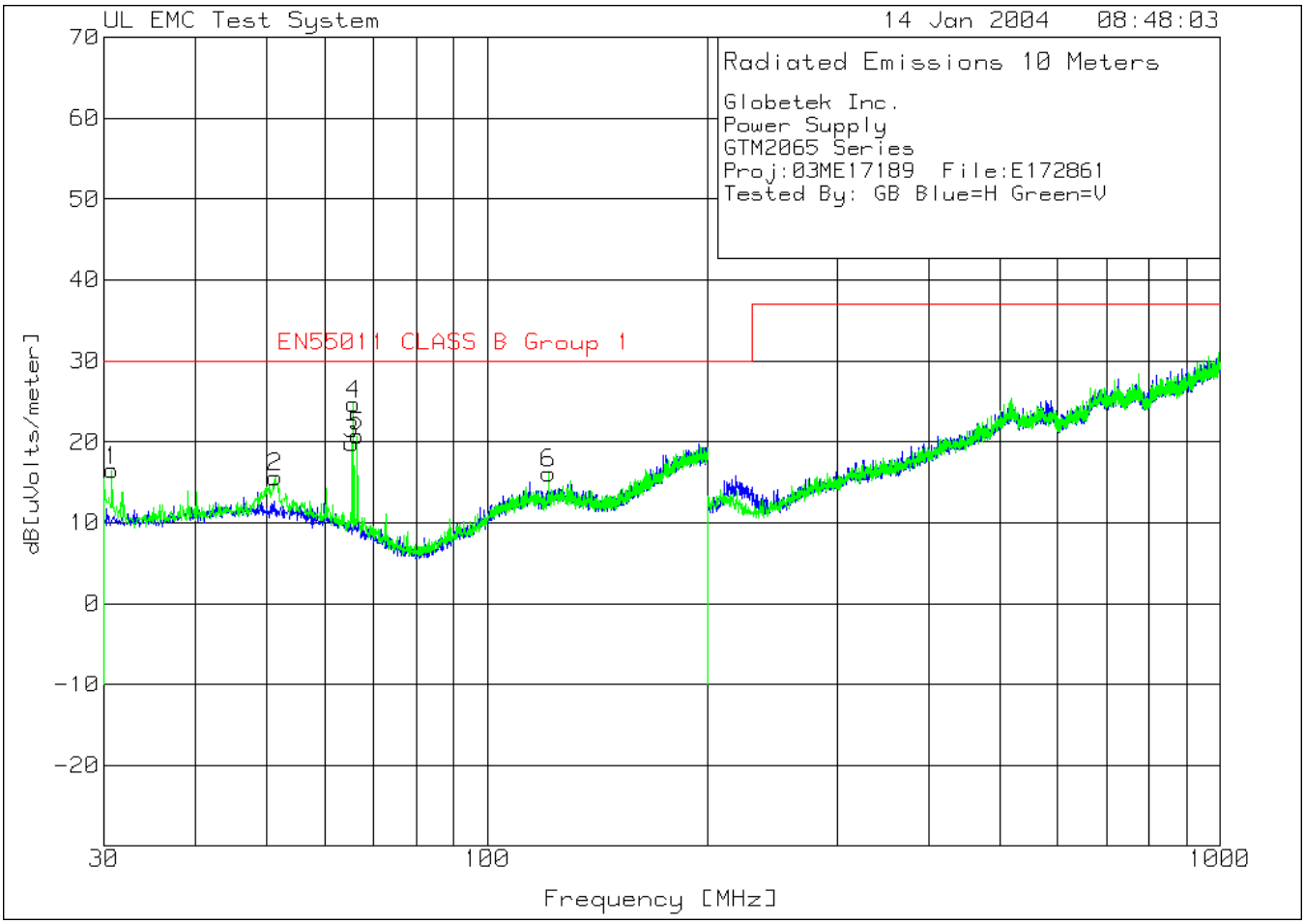
Electric fields:	30MHz - 1GHz	(10 meter measurement distance)

Test equipment used for radiated emissions

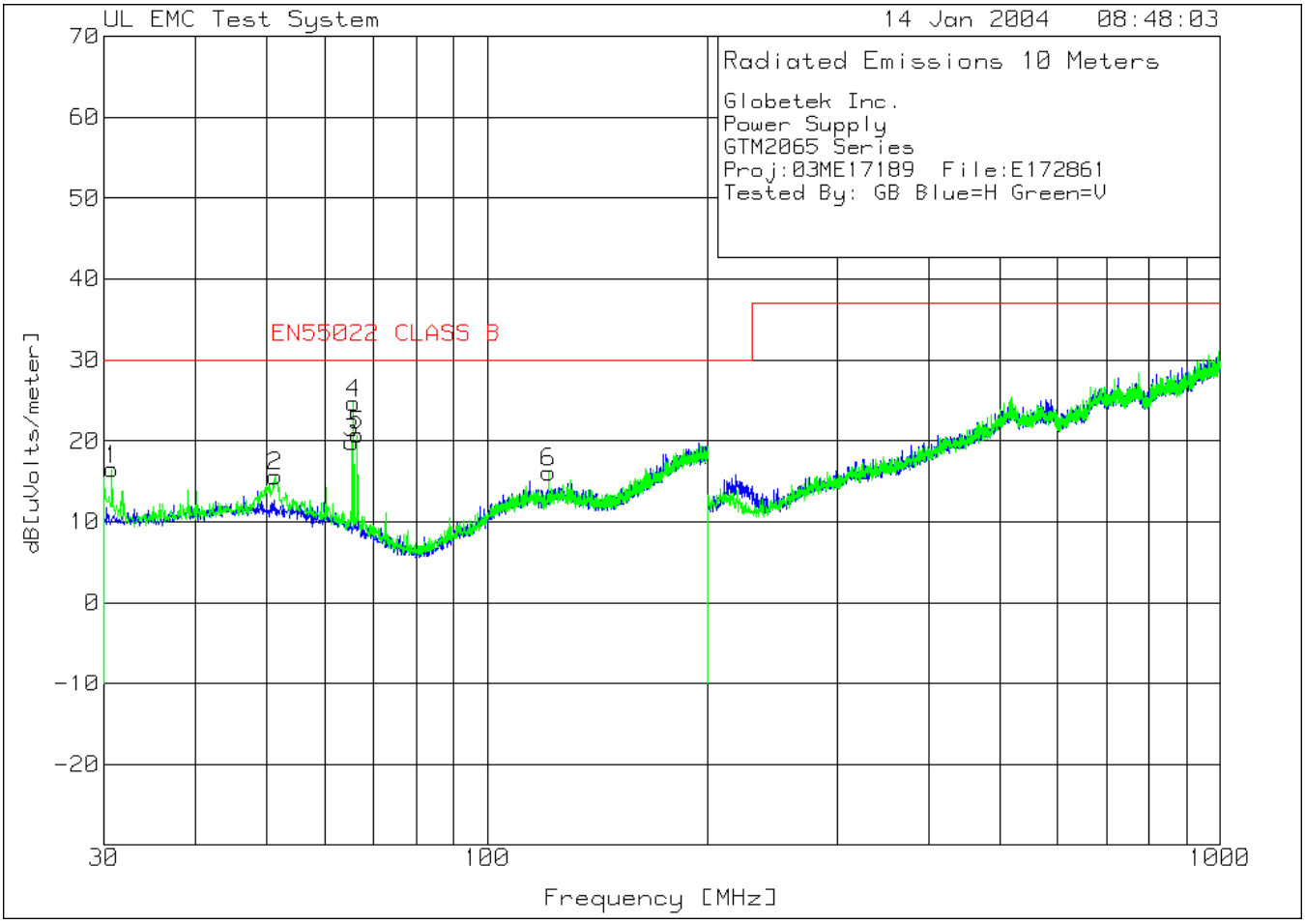
ESI26	**Rhode & Schwartz**	**EMI Receiver**	**Equipment No.: ME5B-081**	
			Quasi Peak BW: 200Hz RBW 10 KHz	**9kHz to 150kHz**
			Quasi Peak BW: 9kHz RBW 100 KHz	**150kHz to 30MHz**
			Quasi Peak BW: 120 kHz RBW 1.0 MHz	**30 to 1000MHz**
Range: 30-1000MHz	Last Calibration Date: 28 August 2003		Calibration Due Date: 31 August 2004	

Test Accessories for Radiated Emissions

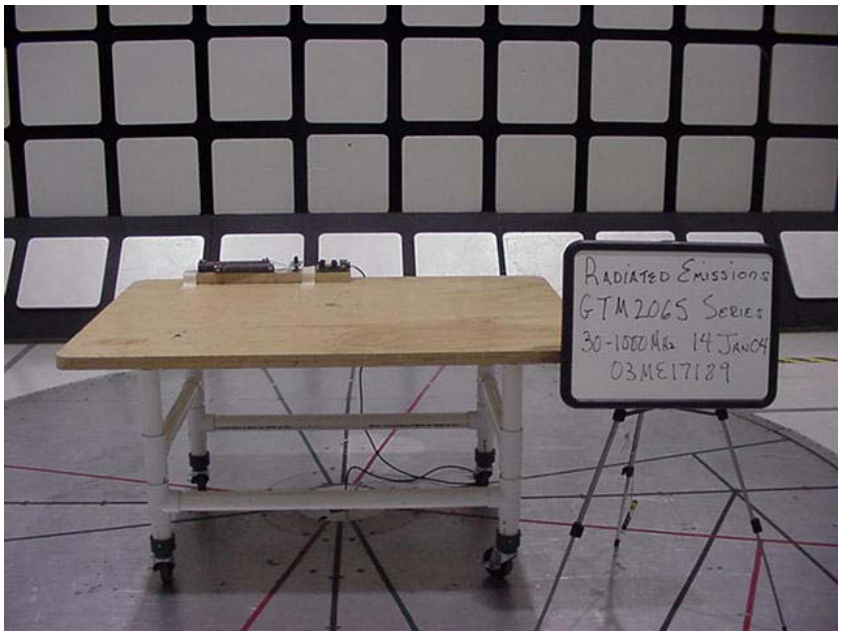
3104C	**EMCO**	**Biconnical Antenna**	**Equipment No.: ME5-810**	
Range: 30-200MHz	Last Calibration Date: 11 March 2003		Calibration Due Date: 11 March 2004	
3146	**EMCO**	**Log Periodic Antenna**	**Equipment No.: ME5-811**	
Range: 200-1000MHz	Last Calibration Date: 27 March 2003		Calibration Due Date: 27 March 2004	
8447D	**Hewlett Packard**	**10k-1.3GHz Pre-Amp**	**Equipment No.: ME5A-652**	
Range: 30-2000MHz				
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**	
		Ranges	Temp: 0°C-55°C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar	
	Last Calibration Date: 27 May 2003		Calibration Due Date: 27 May 2004	


UL EMC Test System
14 Jan 2004 08:48:03
Radiated Emissions 10 Meters
Globetek Inc.
Power Supply
GTM2065 Series
Proj:03ME17189 File:E172861
Tested By: GB Blue=H Green=V
EN55011 CLA$S B Group 1
dB[uVolts/meter]
Frequency [MHz]
70
60
50
40
30
20
10
0
-10
-20
30
100
1000

```
 Globtek Inc.
 Power Supply
 GTM2065 Series
 Proj:03ME17189  File:E172861
 Tested By: GB Blue=H Green=V

      Test     Meter     Gain/Loss  Transducer  Level  Limit:1
No. Frequency  Reading    Factor     Factor  dB[uVolts/meter]
     [MHz]     [dB(uV)]     [dB]      [dB]
================================================================
Vertical 30 - 200MHz -------------------------------------------------------
1  30.7654      32.39 pk     -27.3     11.4      16.49   30
   Azimuth:343   Height:400 Vert     Margin [dB]         -13.51

2  51.3458      30.53 pk     -27       12.1      15.63   30
   Azimuth:109   Height:100 Vert     Margin [dB]         -14.37

3  65.3779      36.94 pk     -26.8     9.7       19.84   30
   Azimuth:26    Height:400 Vert     Margin [dB]         -10.16

4  65.7181      41.82 pk     -26.8     9.7       24.72   30
   Azimuth:192   Height:100 Vert     Margin [dB]         -5.28

5  66.4834      38.03 pk     -26.8     9.5       20.73   30
   Azimuth:275   Height:100 Vert     Margin [dB]         -9.27

6  121.3362     29.61 pk     -26.2     12.7      16.11   30
   Azimuth:17    Height:201 Vert     Margin [dB]         -13.89

LIMIT 1: EN55011 CLASS B Group 1

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result
```


UL EMC Test System
14 Jan 2004 08:48:03
Radiated Emissions 10 Meters
Globetek Inc.
Power Supply
GTM2065 Series
Proj:03ME17189 File:E172861
Tested By: GB Blue=H Green=V
EN55022 CLASS B
dB[uVolts/meter]
Frequency [MHz]
70
60
50
40
30
20
10
0
-10
-20
30
100
1000

```
 Globtek Inc.
 Power Supply
 GTM2065 Series
 Proj:03ME17189  File:E172861
 Tested By: GB Blue=H Green=V

      Test     Meter     Gain/Loss  Transducer  Level  Limit:1
No. Frequency  Reading    Factor     Factor  dB[uVolts/meter]
     [MHz]     [dB(uV)]     [dB]      [dB]
=================================================================
Vertical 30 - 200MHz -------------------------------------------------------
1  30.7654      32.39 pk     -27.3     11.4      16.49   30
   Azimuth:343   Height:400 Vert     Margin [dB]         -13.51

2  51.3458      30.53 pk     -27       12.1      15.63   30
   Azimuth:109   Height:100 Vert     Margin [dB]         -14.37

3  65.3779      36.94 pk     -26.8     9.7       19.84   30
   Azimuth:26    Height:400 Vert     Margin [dB]         -10.16

4  65.7181      41.82 pk     -26.8     9.7       24.72   30
   Azimuth:192   Height:100 Vert     Margin [dB]         -5.28

5  66.4834      38.03 pk     -26.8     9.5       20.73   30
   Azimuth:275   Height:100 Vert     Margin [dB]         -9.27

6  121.3362     29.61 pk     -26.2     12.7      16.11   30
   Azimuth:17    Height:201 Vert     Margin [dB]         -13.89

LIMIT 1: EN55022 CLASS B

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result
```



Front

Rear

Radiated Emissions Test Set-Up

5.1.4 Fluctuating Harmonic Disturbances and Flicker

Test Applicable

Measurements were made with the product connected to a solid state power source which provides the proper voltage and frequency. The measurements of harmonics and flicker are made at the mains connection of the supply. For flicker the impedance network is included in the measurement path.

Results

The system met the requirements for fluctuating harmonic emissions and flicker. Data Pages follow.

Temperature:	20.5 °C
Humidity:	34 %RH
Pressure:	1005 mbar
Date test performed:	14 January 2004

Mode*	
Power	**Operation**
3	1

Equipment Class Multiplier (Fluctuating Harmonics)
1.0 (All other)

Test equipment used for Harmonic Disturbances

PM3000A	**Voltech**	**Power Analyzer**	**Equipment No.: ME5A-250**
Range: 230V/50Hz	Last Calibration Date: 08 December 2003		Calibration Due Date: 08 December 2004
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**
		Ranges	Temp: 0°C-55°C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar
	Last Calibration Date: 27 May 2003		Calibration Due Date: 27 May 2004

Test accessories used for Harmonic Disturbances

360-AMX	**Pacific Power**	**AC Power Source**	**Equipment No.: ME7A-626**

Product:	Globetek Inc.	Jan 14 2004 3:43pm Page 1 of 1
Serial no:		
Description:	GTM2065	
Test Date:	Jan 14 2004 3:36pm	
Result Name:	FLUCT HARMONICS	
Type of Test:	EN61000:2001 Harmonics	
Limits:	Class A	
Power Analyzer:	Voltech PM3000A v2.20 s/n 0000	
AC Source:	Mains / Manual Source	

Harmonic Results Against Chosen Limits:	**Notes:**
PASS	

Test Parameter Details	**User Entered**	**Measured**
Operating Frequency:	50	49.9922
Operating Voltage:	230	230.1000
Specified Power:	0.0000	5.5320
Fundamental Current:	0.0000	0.0305
Power Factor:	0.0000	0.4503
Average Input Current:		0.0532
Maximum POHC:		0.0045
POHC Limit:		0.2514
Maximum THC:		0.0436
Minimum Power:	75	
Class Multiplier:	1.0000	
Test Duration:	00:05:00	

Product:	Globetek Inc.	Jan 14 2004 3:43pm Page 1 of 1
Serial no:		
Description:	GTM2065	
Result Name:	FLUCT HARMONICS	
Voltech IEC1000-3 Windows Software 3.09.06	Test Date:	Jan 14 2004 3:36pm
Type of Test:	Fluctuating Harmonics Test - Source Qualification (2001)	
Power Analyzer:	Voltech PM3000A v2.20 s/n 0000	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**		

	Nominal	Measured	Deviation	Allowed Deviation	Result
Supply Voltage	230.00V	230.10V	0.10V	4.60V	Pass
Supply Frequency	50.00Hz	49.99Hz	0.01Hz	0.25Hz	Pass

Harmonic	Reading	Limit	Result	Harmonic	Reading	Limit	Result
2	0.04%	0.20%	Pass	3	0.04%	0.90%	Pass
4	0.04%	0.20%	Pass	5	0.04%	0.40%	Pass
6	0.04%	0.20%	Pass	7	0.04%	0.30%	Pass
8	0.04%	0.20%	Pass	9	0.04%	0.20%	Pass
10	0.04%	0.20%	Pass	11	0.04%	0.10%	Pass
12	0.04%	0.10%	Pass	13	0.04%	0.10%	Pass
14	0.04%	0.10%	Pass	15	0.04%	0.10%	Pass
16	0.04%	0.10%	Pass	17	0.04%	0.10%	Pass
18	0.04%	0.10%	Pass	19	0.04%	0.10%	Pass
20	0.04%	0.10%	Pass	21	0.04%	0.10%	Pass
22	0.04%	0.10%	Pass	23	0.04%	0.10%	Pass
24	0.04%	0.10%	Pass	25	0.04%	0.10%	Pass
26	0.04%	0.10%	Pass	27	0.04%	0.10%	Pass
28	0.04%	0.10%	Pass	29	0.04%	0.10%	Pass
30	0.04%	0.10%	Pass	31	0.04%	0.10%	Pass
32	0.04%	0.10%	Pass	33	0.04%	0.10%	Pass
34	0.04%	0.10%	Pass	35	0.04%	0.10%	Pass
36	0.04%	0.10%	Pass	37	0.04%	0.10%	Pass
38	0.04%	0.10%	Pass	39	0.04%	0.10%	Pass
40	0.04%	0.10%	Pass				

Product:	Globetek Inc.	Jan 14 2004 3:43pm Page 1 of 1
Serial no:		
Description:	GTM2065	
Result Name:	FLUCT HARMONICS	
Voltech IEC1000-3 Windows Software 3.09.06		Test Date: Jan 14 2004 3:36pm
Type of Test:	Fluctuating Harmonics Test - Worst Case Table (2001)	
Power Analyzer:	Voltech PM3000A v2.20 s/n 0000	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**		

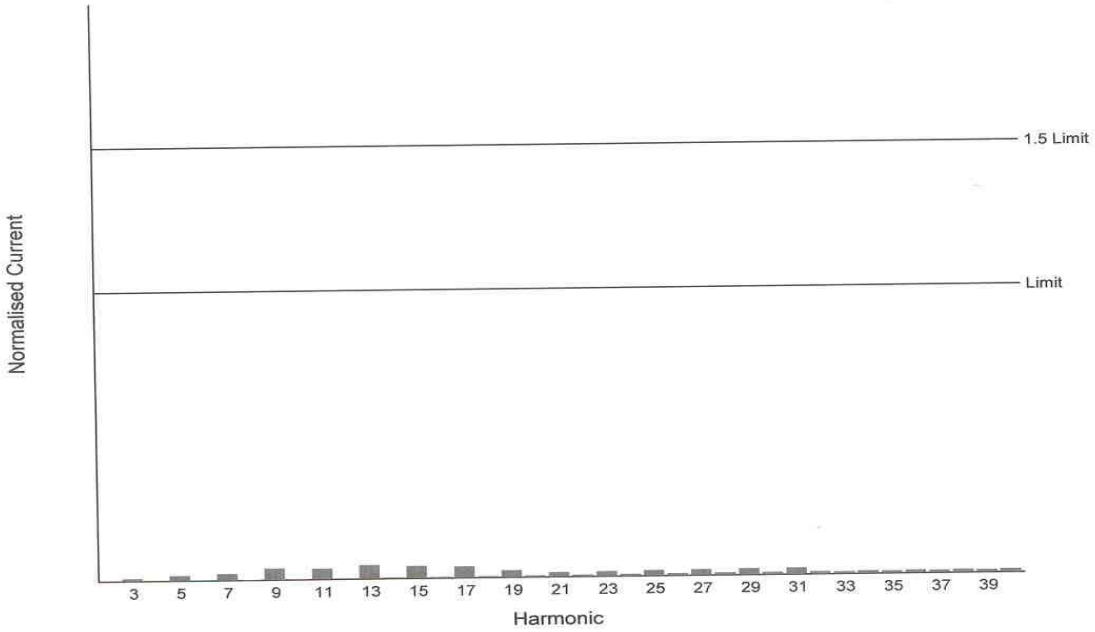
Class	Class A
Class Multiplier	1

Harm	Limit 1	Limit 2	Average Reading	<L1	<L2	Max Reading	<L2	Pass FAIL	Harm	Limit 1	Limit 2	Average Reading	<L1	<L2	Max Reading	<L2	Pass FAIL
2	1.0800A	1.6200A	0.597mA	✓	✓	0.597mA	✓	N/A	3	2.3000A	3.4500A	22.12mA	✓	✓	22.24mA	✓	Pass
4	430.0mA	645.0mA	0.597mA	✓	✓	0.597mA	✓	N/A	5	1.1400A	1.7100A	20.92mA	✓	✓	20.92mA	✓	Pass
6	300.0mA	450.0mA	0.597mA	✓	✓	0.597mA	✓	N/A	7	770.0mA	1.1550A	18.53mA	✓	✓	18.53mA	✓	Pass
8	230.0mA	345.0mA	0.597mA	✓	✓	0.597mA	✓	N/A	9	400.0mA	600.0mA	16.14mA	✓	✓	16.14mA	✓	Pass
10	184.0mA	276.0mA	0.597mA	✓	✓	0.597mA	✓	N/A	11	330.0mA	495.0mA	12.55mA	✓	✓	12.55mA	✓	Pass
12	153.3mA	230.0mA	0.597mA	✓	✓	0.597mA	✓	N/A	13	210.0mA	315.0mA	10.16mA	✓	✓	10.16mA	✓	Pass
14	131.4mA	197.1mA	0.597mA	✓	✓	0.597mA	✓	N/A	15	150.0mA	225.0mA	6.577mA	✓	✓	6.580mA	✓	Pass
16	115.0mA	172.5mA	0.597mA	✓	✓	0.597mA	✓	N/A	17	132.3mA	198.5mA	5.125mA	✓	✓	5.309mA	✓	Pass
18	102.2mA	153.3mA	0.597mA	✓	✓	0.597mA	✓	N/A	19	118.4mA	177.6mA	2.989mA	✓	✓	2.989mA	✓	N/A
20	92.00mA	138.0mA	0.597mA	✓	✓	0.597mA	✓	N/A	21	107.1mA	160.7mA	1.793mA	✓	✓	1.793mA	✓	N/A
22	83.63mA	125.4mA	0.597mA	✓	✓	0.597mA	✓	N/A	23	97.82mA	146.7mA	1.793mA	✓	✓	1.793mA	✓	N/A
24	76.66mA	115.0mA	0.597mA	✓	✓	0.597mA	✓	N/A	25	90.00mA	135.0mA	1.793mA	✓	✓	1.793mA	✓	N/A
26	70.76mA	106.1mA	0.597mA	✓	✓	0.597mA	✓	N/A	27	83.33mA	125.0mA	1.793mA	✓	✓	1.793mA	✓	N/A
28	65.71mA	98.57mA	0.597mA	✓	✓	0.597mA	✓	N/A	29	77.58mA	116.3mA	1.793mA	✓	✓	1.793mA	✓	N/A
30	61.33mA	92.00mA	0.597mA	✓	✓	0.597mA	✓	N/A	31	72.58mA	108.8mA	1.573mA	✓	✓	1.719mA	✓	N/A
32	57.50mA	86.25mA	0.597mA	✓	✓	0.597mA	✓	N/A	33	68.18mA	102.2mA	0.597mA	✓	✓	0.597mA	✓	N/A
34	54.11mA	81.17mA	0.597mA	✓	✓	0.597mA	✓	N/A	35	64.28mA	96.42mA	0.597mA	✓	✓	0.597mA	✓	N/A
36	51.11mA	76.66mA	0.597mA	✓	✓	0.597mA	✓	N/A	37	60.81mA	91.21mA	0.597mA	✓	✓	0.597mA	✓	N/A
38	48.42mA	72.63mA	0.597mA	✓	✓	0.597mA	✓	N/A	39	57.69mA	86.53mA	0.597mA	✓	✓	0.597mA	✓	N/A
40	46.00mA	69.00mA	0.597mA	✓	✓	0.597mA	✓	N/A									

<L1 : Reading is below limit 1.
<L2 : Reading is below limit 2.
N/A : Harmonic current below 0.6% of rated current or 5mA, whichever is greater, are disregarded.

Product:	Globetek Inc.	Jan 14 2004 3:43pm Page 1 of 1
Serial no:		
Description:	GTM2065	
Result Name:	FLUCT HARMONICS	
Voltech IEC1000-3 Windows Software 3.09.06		Test Date: Jan 14 2004 3:36pm
Type of Test:	Fluctuating Harmonics Test - Normalised Worst Case Bar Chart (2001)	
Power Analyzer:	Voltech PM3000A v2.20 s/n 0000	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**		

Class	Class A
Class Multiplier	1

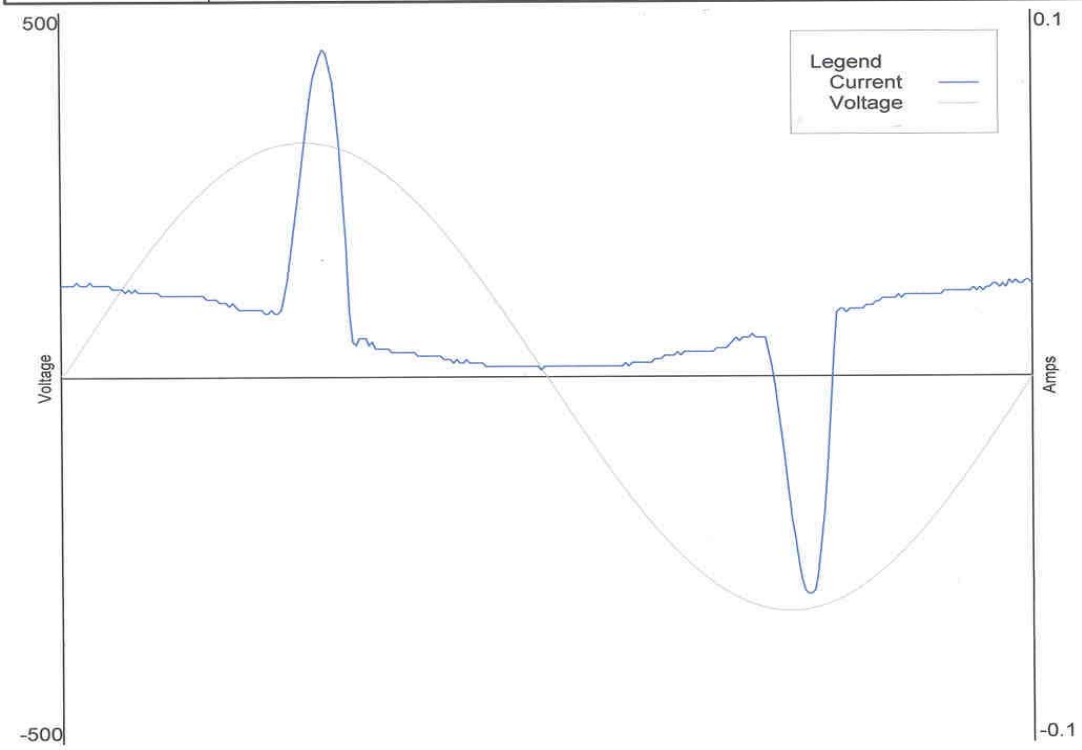


Product:	GLOBETEK INC.	Jan 14 2004 6:03pm Page 1 of 1
Serial no:	None	
Description:	Power Supply - Model: GTM2065 Series	
Result Name:	FLICKER	
Voltech IEC1000-3 Windows Software 3.09.06		Test Date: Jan 14 2004 3:56pm
Type of Test:	Flickermeter Test - Table	
Power Analyzer:	Voltech PM3000A v2.20 s/n 0000	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**	Notes: Plt test duration 120 minutes Measurement method - Voltage	

	Plt
Limit	0.650
Reading	0.071

	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.071	0.017	0.038	0
Reading 2	0.071	0.017	0.038	0
Reading 3	0.071	0.017	0.038	0
Reading 4	0.071	0.017	0.046	0
Reading 5	0.071	0.017	0.046	0
Reading 6	0.071	0.017	0.038	0
Reading 7	0.071	0.017	0.038	0
Reading 8	0.071	0.017	0.038	0
Reading 9	0.071	0.017	0.046	0
Reading 10	0.071	0.017	0.038	0
Reading 11	0.071	0.017	0.038	0
Reading 12	0.071	0.017	0.038	0

Product:	Globetek Inc.	Jan 14 2004 3:34pm Page 1 of 1
Serial no:		
Description:	GTM2065	
Result Name:	GTM2065 WAVEFORM	
Voltech IEC1000-3 Windows Software 3.09.06		Test Date: Jan 14 2004 3:33pm
Type of Test:	Waveform	
Power Analyzer:	Voltech PM3000A v2.20 s/n 0000	
AC Source:	Mains / Manual Source	
	Notes: FAIL. Use normal limits only	



Harmonic Disturbances and Flicker Test Set-Up

6.0 IMMUNITY TEST REGULATIONS

The immunity tests were performed according to following regulations:

---------- Europe ----------

EN60601-1-2	Medical Electrical Equipment Part 1-2: General Requirements for Safety - Collateral Standard: Electromagnetic Compatibility - Requirements and Tests - IEC 60601-1-2: 2001
EN55024	Information Technology Equipment-Immunity Characteristics-Limits and Methods of Measurements.

In accordance with:

EN 61000-4-2	1995	(Electrostatic Discharge) including A1: 1998 and A2: 2001
IEC 61000-4-2	1995	(Electrostatic Discharge) including A1: 1998 and A2: 2000
EN 61000-4-3	1996	(Radiated) including A1: 1998 and A2: 2000)
IEC 61000-4-3	1995	(Radiated) including A1: 1998 and A2: 2000)
EN 61000-4-4	1995	(Electrical Fast Transient/Burst) including A1: 2001 and A2: 2001
IEC 61000-4-4	1995	(Electrical Fast Transient/Burst) including A1: 2000 and A2: 2001
EN 61000-4-5	1995	(Surge) including A1: 2001
IEC 61000-4-5	1995	(Surge) including A1: 2000
EN 61000-4-6	1996	(Conducted) including A1: 2001
IEC 61000-4-6	1996	(Conducted) including A1: 2000
EN 61000-4-11	1994	(Voltage Dips and Interrupts) including A1: 2001
IEC 61000-4-11	1994	(Voltage Dips and Interrupts) including A1: 2002

6.1 Immunity Performance Criteria

Performance Criteria A: The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the manufacturer does not specify the minimum performance level or the permissible performance loss then either of these may be derived from the product description and documentation and what the user may reasonable expect from the apparatus if used as intended.

Performance Criteria B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the manufacturer does not specify the minimum performance level or the permissible performance loss then either of these may be derived from the product description and documentation and what the user may reasonable expect from the apparatus if used as intended.

Performance Criteria C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

6.1.1 Manufacturer's Criteria for Immunity

(Supporting above criteria for each test)

The power supply was monitored for the DC output voltage to not exceed +/- 5% and ripple to not exceed +/- 1% ripple change from the start reading.

6.1.2 Electrostatic Discharge (ESD) Test

Test Applicable

Performance Criteria A

Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. Air discharges were applied to non-metallic parts of the system. Contact discharges were applied to all accessible metallic parts. Each discharge was applied at a rate of one (1) discharge per second.

Results

The system met the requirements for ESD. Data Pages follow.

Temperature:	21.5 °C
Humidity:	34 %RH
Pressure:	1002 mbar
Date test performed:	19 January 2004

1 fully configured sample was subjected to the following discharge levels.

Discharge Type	Discharge Level/Polarity (KV)	Number of Discharges per level and location	Mode*	
			Power	Operation
Air	±2, ±4, ±8	10	2	1
Contact	±2, ±4	50	2	1
Contact	±6	10	2	1

*See Power Interface and EUT Operating Modes for details

Test equipment for ESD

MZ-15/EC	**Keytek**	**ESD Simulator**	**Equipment No.: ME5A-143**
Range: 2-8kV	Last Calibration Date: 30 September 2003		Calibration Due Date: 30 September 2004
TPC-2A	**Tektronix**	**IEC Omni-Tip**	**Equipment No.: ME5A-143A**
Range: 2-8kV	Last Calibration Date: 30 September 2003		Calibration Due Date: 30 September 2004
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**
		Ranges	Temp: 0°C-55°C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar
	Last Calibration Date: 27 May 2003		Calibration Due Date: 27 May 2004

Discharge Method: **Contact**

Discharge Polarity: **Positive / Negative**

Discharge Potential: **2kV, 4kV**

Test Point **Observations**

	Number of Discharge/Results	Observations
Discharge Location	50 Per Location	
HCP	Pass	2
VCP	Pass	2

OBSERVATIONS:
1. No Discharge Observed, No Observed Response.
2. Discharge Observed, No Observed Response.

Discharge Method: **Contact**

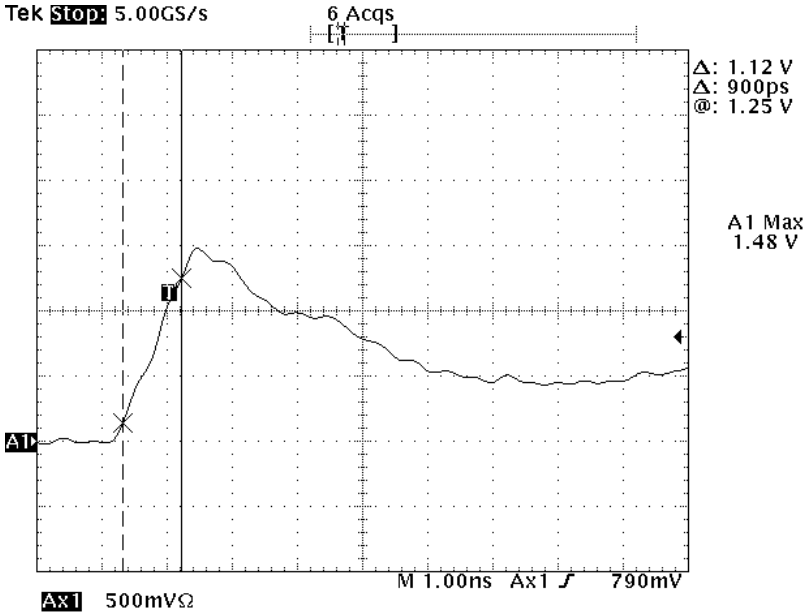
Discharge Polarity: **Positive / Negative**

Discharge Potential: **6kV**

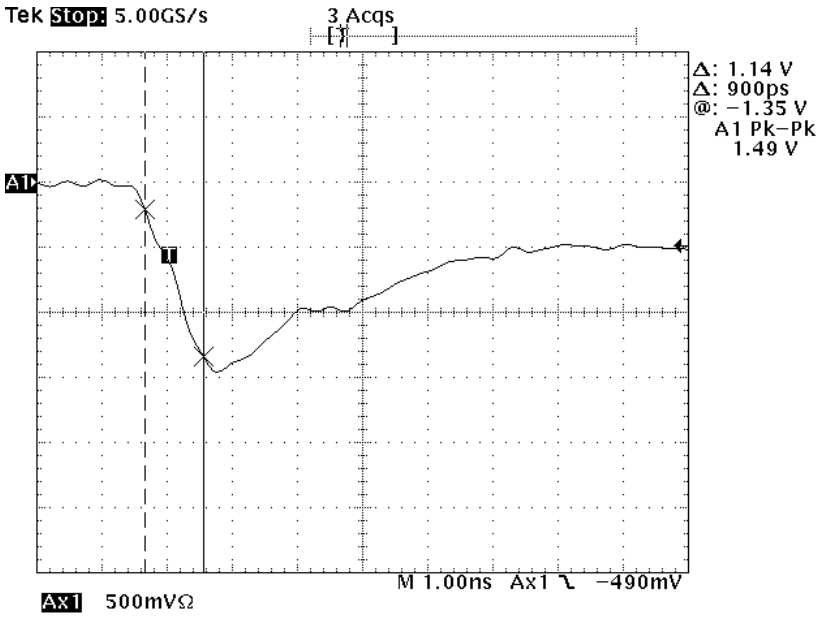
Test Point **Observations**

	Number of Discharge/Results	Observations
Discharge Location	10 Per Location	
HCP	Pass	2
VCP	Pass	2

OBSERVATIONS:
1. No Discharge Observed, No Observed Response.
2. Discharge Observed, No Observed Response.

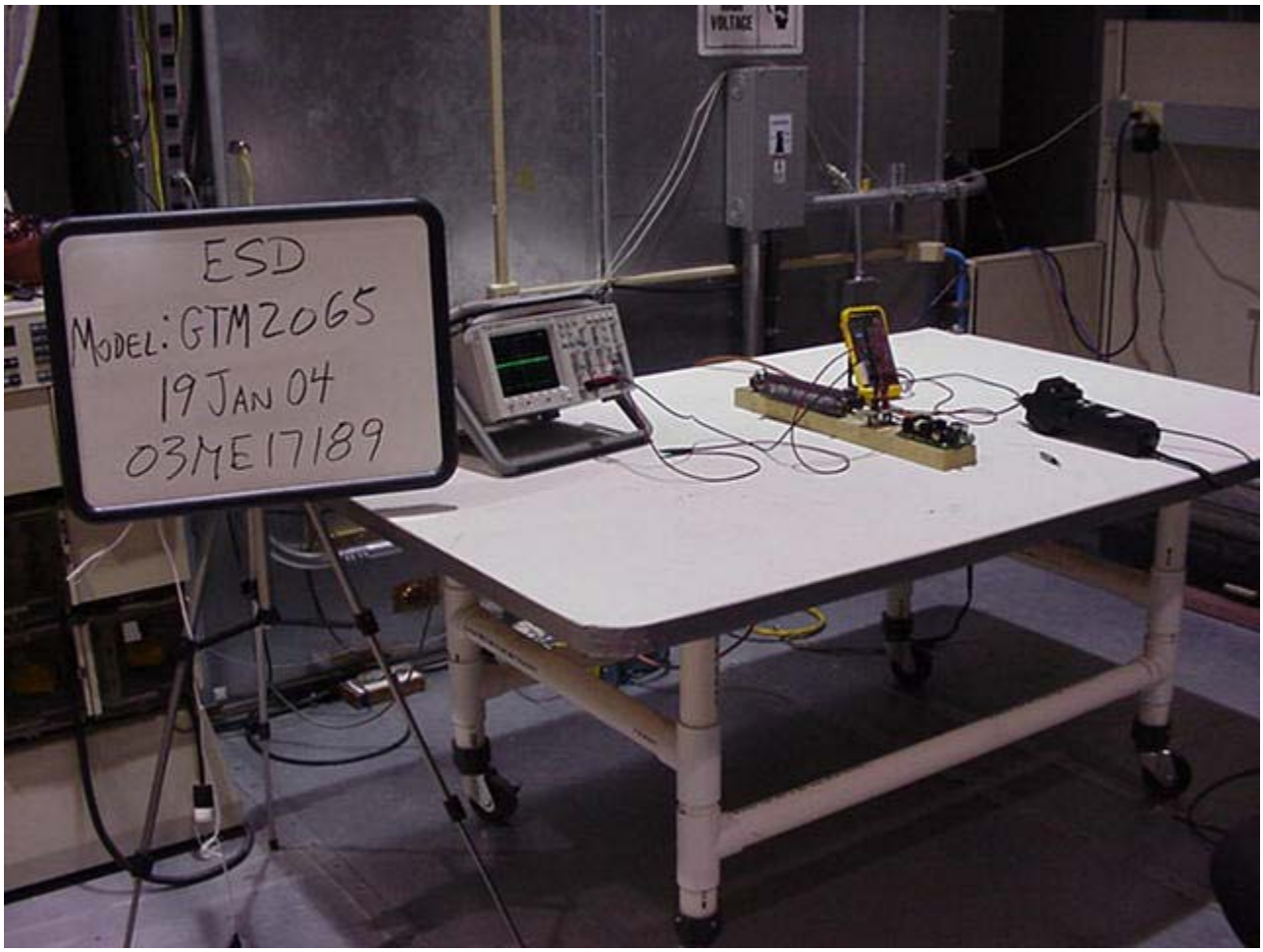


ESD Positive 4kV Amplitude and Rise Time



ESD Negative 4kV Amplitude and Rise Time

ESD WAVEFORM VERIFICATIONS



ESD Test Set-Up

6.1.3 Radiated Field (RF Immunity) Test

Test Applicable

Performance Criteria A

Measurements were made in a fully anechoic chamber and the indicated field strength was pre-calibrated prior to placement of the system under test. Tests were performed in both the horizontal and vertical polarities, where applicable. The antenna was placed 3 meters from the product under test. All sides of the EUT were investigated for anomalies.

Results

The system met the requirements for RF Immunity. Data Pages follow.

Temperature:	20.0 °C
Humidity:	34 %RH
Pressure:	996 mbar
Date test performed:	15 January 2004

1 fully configured sample was scanned over the following frequency range

Frequency Range	Field Strength	Modulation	Mode*	
			Power	Operation
80MHz to 2500MHz	10V/m	AM 1kHz, 80% depth	2	1
900MHz ± 5MHz	10V/m	AM 1kHz, 80% depth	2	1

*See Power Interface and EUT Operating Modes for details

Observations during Testing:

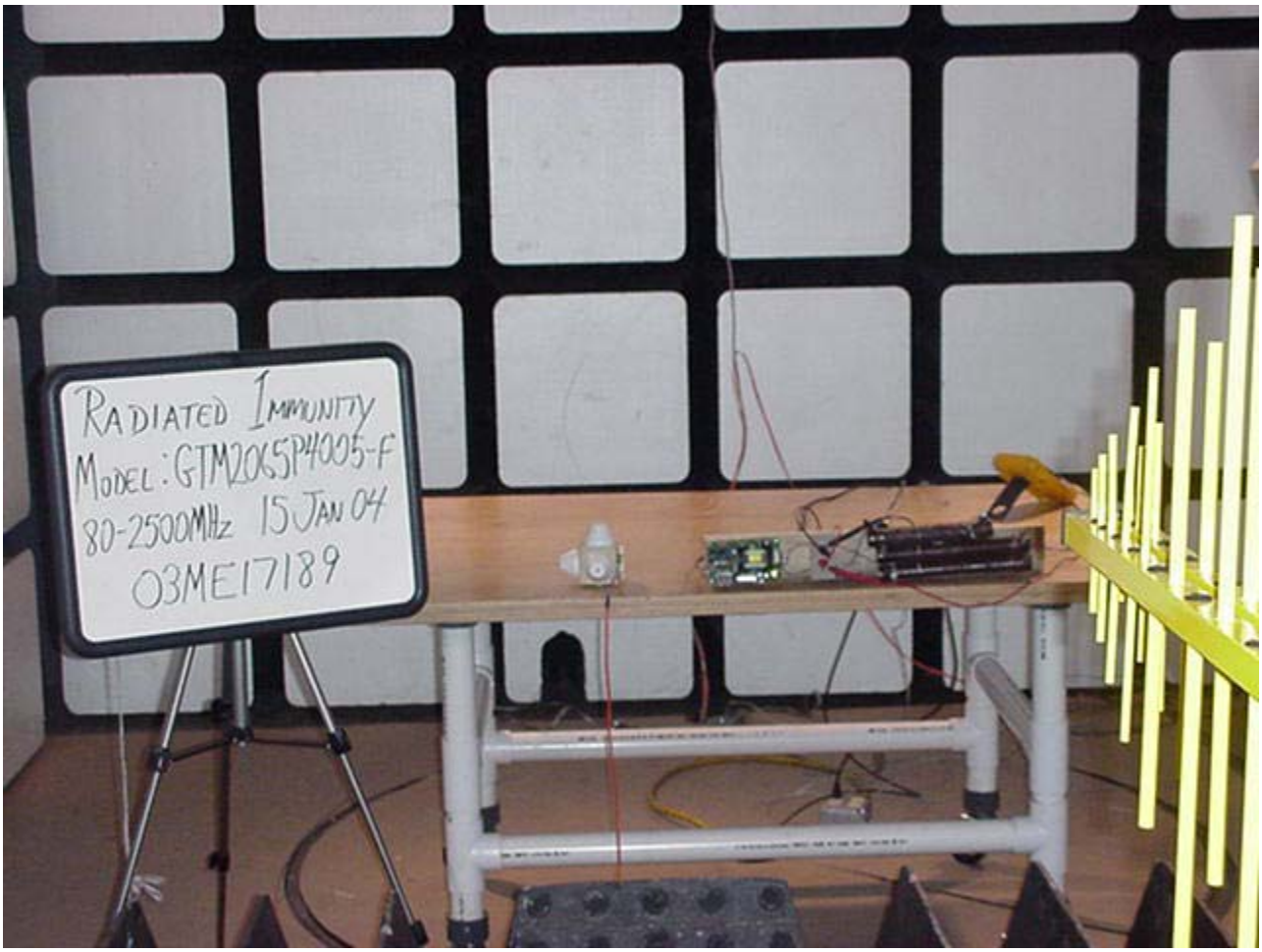
Side	Polarity	Observations
Front	Horizontal	EUT operated normally.
Rear	Horizontal	EUT operated normally.
Front	Vertical	EUT operated normally.
Rear	Vertical	EUT operated normally.

Test equipment for Radiated Immunity

SMT03	**Rhode &Schwarz**	**Signal Generator**	**Equipment No.: ME5A-285**
Range: 80-2500MHz	Last Calibration Date: 16 January 2003	Calibration Due Date: 31 January 2004	
HI-4422	**Holaday**	**Isotropic Field Probe**	**Equipment No.: ME5A-346**
Range: 80-1000MHz	Last Calibration Date: 29 July 2003	Calibration Due Date: 29 July 2004	
HI-4450	**Holaday**	**Isotropic Field Probe**	**Equipment No.: ME5A-456**
Range: 80-40GHz	Last Calibration Date: 10June 2003	Calibration Due Date: 10June 2004	

Test Accessories for Radiated Immunity

CBL6140A	**Chase**	**BiconiLog Antenna**	**Equipment No.: ME7A-559**
Range: 80-2500MHz			
440917	**Conn. Microwave**	**Directional Coupler**	**Equipment No.: ME7A-489**
500W100A	**Amplifier Research**	**80-1000 MHz Amplifier**	**Equipment No.: ME7A-798**
25S1G4A	**Amplifier Research**	**0.8-4.2 GHz Amplifier**	**Equipment No.: ME7A-492**
NRVD	**Rhode & Schwarz**	**Power Meter**	**Equipment No.: ME5B-132**
Range: 80-2500MHz	Last Calibration Date: 11 September 2003	Calibration Due Date: 30 September 2004	
NRV-Z51	**Rhode & Schwarz**	**Power Meter Sensor**	**Equipment No.: ME5B-133**
Range: 80-2500MHz	Last Calibration Date: 11 September 2003	Calibration Due Date: 30 September 2004	
NRV-Z51	**Rhode & Schwarz**	**Power Meter Sensor**	**Equipment No.: ME5B-134**
Range: 80-2500MHz	Last Calibration Date: 11 September 2003	Calibration Due Date: 30 September 2004	
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**
		Ranges	Temp: 0°C-55°C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar
	Last Calibration Date: 27 May 2003	Calibration Due Date: 27 May 2004	



Radiated Immunity Test Set-Up

6.1.4 Electrical Fast Transient (EFT)/Burst Test

Test Applicable

Performance Criteria A

Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN) and signal lines were tested, individually, in a capacitive coupling clamp. One of each unique interface was tested for a period of one (1) minute per polarity.

Results

The system met the requirements for EFT. Data Pages follow.

Temperature:	20.5 °C
Humidity:	34 %RH
Pressure:	998 mbar
Date test performed:	16 January 2004

1 fully configured sample subjected to the levels indicated.

Application Point	Level	Frequency	Mode*	
			Power	Operation
AC Mains	±0.5kV, ±1kV, ±2kV	5.0 kHz	1	1
AC Mains	±0.5kV, ±1kV, ±2kV	5.0 kHz	2	1

*See Power Interface and EUT Operating Modes for details

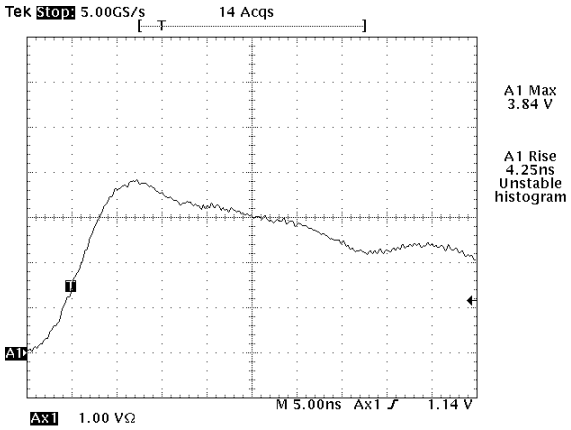
Observations during Testing:

Coupling	Polarity	Observations
L-PE	Positive	EUT operated normally.
L-PE	Negative	EUT operated normally.
N-PE	Positive	EUT operated normally.
N-PE	Negative	EUT operated normally.
PE	Positive	EUT operated normally.
PE	Negative	EUT operated normally.

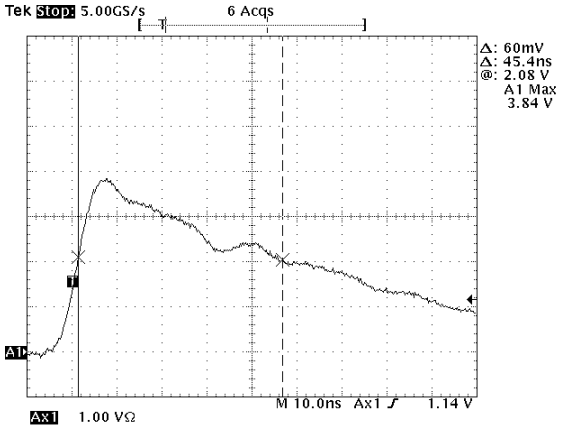
Coupling	Polarity	Description of degradation in performance.
L-PE	Positive	No change at the ripple output, but the EFT pulse was displayed measurement equipment.

Test equipment used for EFT

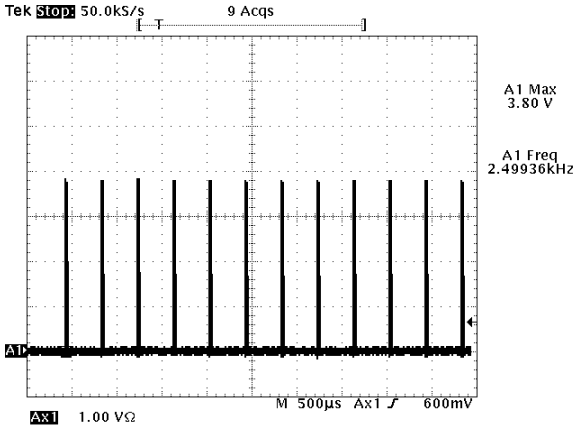
E4554	**Keytek**	**Mains Coupler/Decoupler(32A)**	**Equipment No.: ME5B-328**
Range: 500V-2kV	Last Calibration Date: 31 July 2003	Calibration Due Date: 31 July 2004	
E411	**Keytek**	**EFT/Burst Generator**	**Equipment No.: ME5B-326**
Range: 500V-2kV	Last Calibration Date: 31 July 2003	Calibration Due Date: 31 July 2004	
54610B	**Agilent**	**Oscilloscope**	**Equipment No.: ME5A-850**
Range: 0-300V	Last Calibration Date: 14 January 2003	Calibration Due Date: 14 January 2004	
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**
		Ranges	Temp: 0°C-55°C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar
	Last Calibration Date: 27 May 2003	Calibration Due Date: 27 May 2004	



EFT 4000V Amplitude and Rise Time

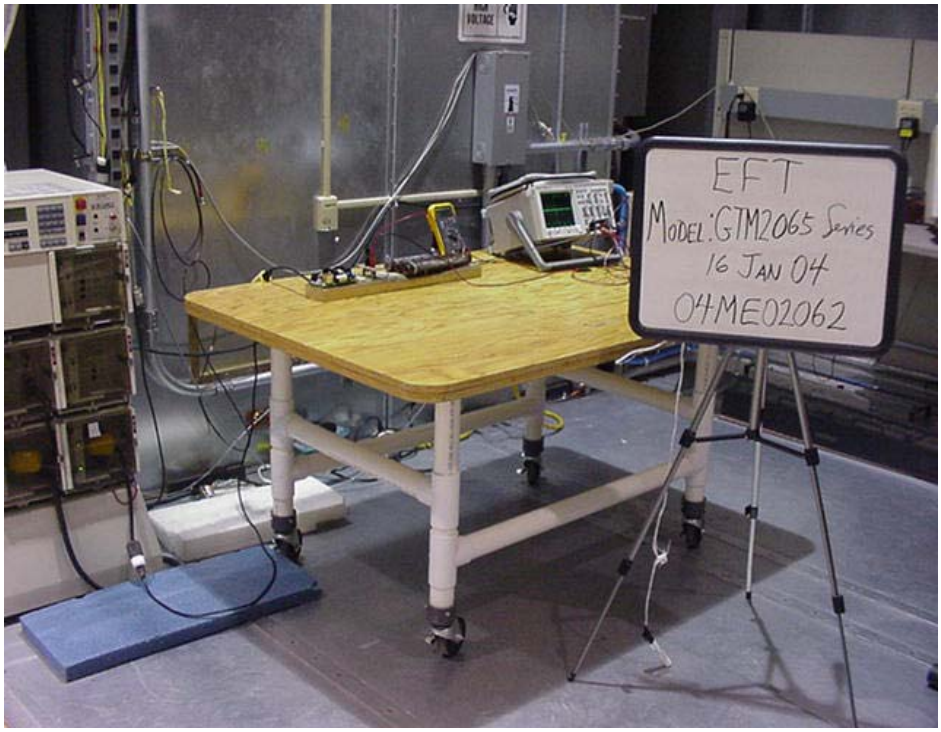


EFT 4000V Duration at 50% Amplitude



EFT 4000V Repetition Frequency

EFT WAVEFORM VERIFICATIONS



EFT Test Set-Up

6.1.5 Conducted Immunity Test

Test Applicable

Performance Criteria A

Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. The EUT was located 10cm above the reference ground plane and the indicated field was pre-calibrated prior to placement of the system under test. All unique I/O lines that leave the EUT were investigated for anomalies.

Results

The system met the requirements for Conducted Immunity. Data Pages follow.

Temperature:	19.5 °C
Humidity:	34 %RH
Pressure:	1001 mbar
Date test performed:	14 January 2004

1 fully configured sample was scanned over the following frequency range and test levels.

Frequency Range	Field	Modulation	Mode*	
			Power	Operation
150kHz to 80MHz	10Vrms	AM 1kHz, 80% depth	2	1

*See Power Interface and EUT Operating Modes for details

In addition to the scanned frequencies, the following internal system frequencies were investigated and dwelled on for 60 seconds.

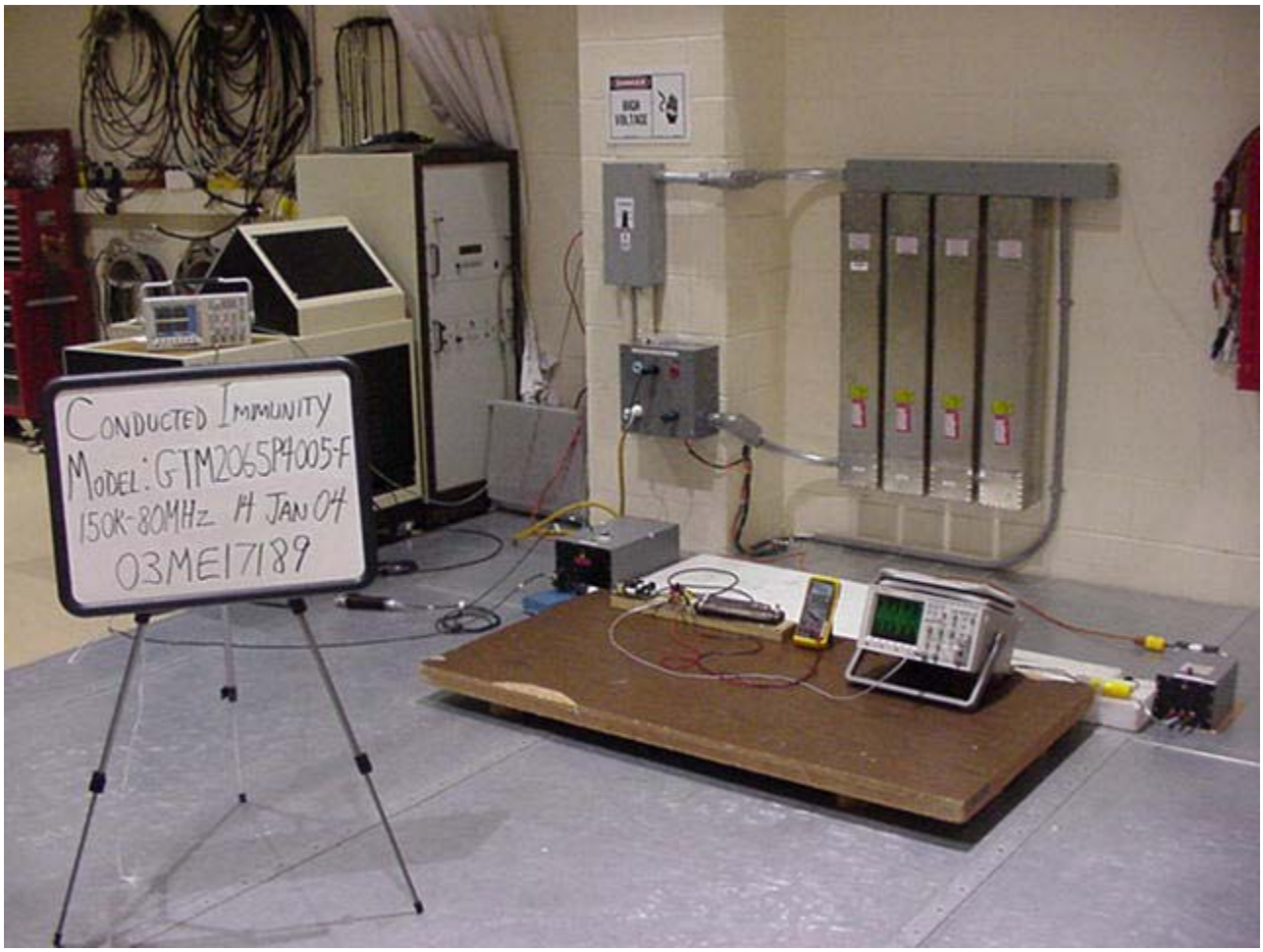
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (MHz)
0.2	13.56	0.150	--	--	--
1	21	--	--	--	--
7.1	40.68	--	--	--	--

Observations during Testing:

Point of application	Observations
Mains	EUT operated normally.

Test equipment for Radiated Immunity

2031	**IFR**	**Signal Generator**	**Equipment No.: ME5A-775**
Range: 150k-80MHz	Last Calibration Date: 17 October 2003		Calibration Due Date: 17 October 2004
M75	**IFI**	**Amplifier**	**Equipment No.: ME7A-669**
801- M2-50	**FCC**	**CDN**	**Equipment No.: ME5A-221**
Range: 150k-80MHz	Last Calibration Date: 04 September 2003		Calibration Due Date: 04 September 2004
TDS3054	**Tektronix**	**Oscilloscope**	**Equipment No.: ME5B-173**
Range: 150k-80MHz	Last Calibration Date: 26 February 2003		Calibration Due Date: 26 February 2004
54610B	**Tektronix**	**Oscilloscope**	**Equipment No.: ME5A-850**
Range: 150k-80MHz	Last Calibration Date: 31 January 2003		Calibration Due Date: 31 January 2004
G5100	**Werlatone**	**Directional Coupler**	**Equipment No.: ME7A-539**
NRVD	**Rhode & Schwarz**	**Power Meter**	**Equipment No.: ME5B-080**
Range: 150k-80MHz	Last Calibration Date: 31 January 2003		Calibration Due Date: 31 January 2004
NRV-Z51	**Rhode & Schwarz**	**Power Meter Sensor**	**Equipment No.: ME5A-079**
Range: 150k-80MHz	Last Calibration Date: 29 May 2003		Calibration Due Date: 29 May 2004
NRV-Z51	**Rhode & Schwarz**	**Power Meter Sensor**	**Equipment No.: ME5A-078**
Range: 150k-80MHz	Last Calibration Date: 29 May 2003		Calibration Due Date: 29 May 2004
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**
		Ranges	Temp: 0°C-55°C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar
	Last Calibration Date: 27 May 2003		Calibration Due Date: 27 May 2004



Conducted Immunity Test Set-Up

6.1.6 Voltage Surge Test

Test Applicable

Performance Criteria A

Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). The test voltage was increased from the lowest indicated level up to the maximum level. Signal lines were tested, individually through a coupling network for unshielded cables and shielded cables were connected to the generator by a capacitor. The capacitor was connected between the cables shield and the generator output to ground. Each surge was applied 60 seconds after the previous surge.

Results

The system met the requirements for Surge. Data Pages follow.

Temperature:	21 °C
Humidity:	33 %RH
Pressure:	1001 mbar
Date test performed:	16 January 2004 and 19 January 2004

1 fully configured sample was subjected to the levels indicated.

Application Point	Level	Coupling Mode	Mode*	
			Power	Operation
AC Mains	±0.5kV, ±1kV	Differential	1	1
AC Mains	±0.5kV, ±1kV, ±2kV	Common	1	1
AC Mains	±0.5kV, ±1kV	Differential	2	1
AC Mains	±0.5kV, ±1kV, ±2kV	Common	2	1

*See Power Interface and EUT Operating Modes for details

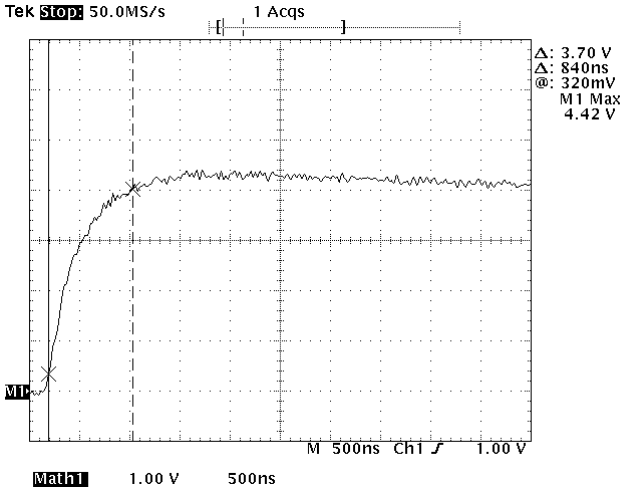
Waveform Applied			Source Impedance	Coupling Mode	Sync Angle	Surges/ Polarity
	Voltage	Current				
	1.2µS x 50µS	8µS x 20µS	2Ω + 18µF	Differential	0º, 90º, 180º, 270º	5
	1.2µS x 50µS	8µS x 20µS	12Ω + 9µF	Common	0º, 90º, 180º, 270º	5

Observations during Testing:

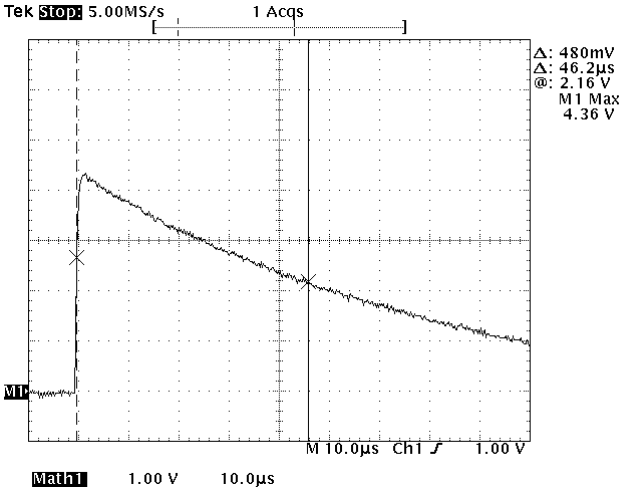
Coupling	Polarity	Observations
L-N	Positive	EUT operated normally.
L-N	Negative	EUT operated normally.
L-PE	Positive	EUT operated normally.
L-PE	Negative	EUT operated normally.
N-PE	Positive	EUT operated normally.
N-PE	Negative	EUT operated normally.

Test equipment used for Surge

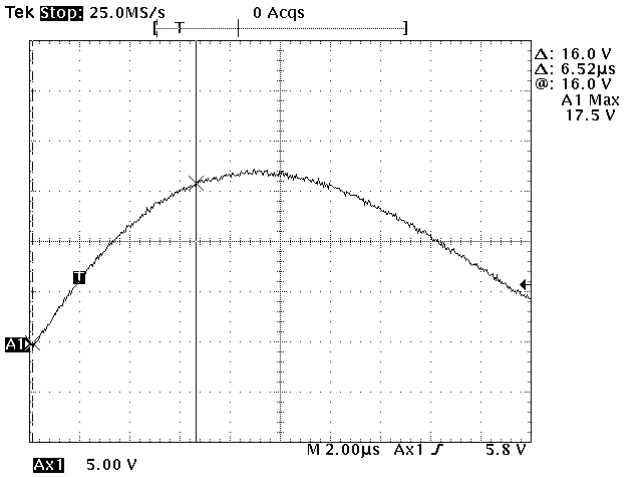
E4554	**Keytek**	**Mains Coupler/Decoupler(32A)**	**Equipment No.: ME5B-328**
Range: 500V-2kV	Last Calibration Date: 31 July 2003	Calibration Due Date: 31 July 2004	
E501A	**Keytek**	**Surge Generator**	**Equipment No.: ME5B-327**
Range: 500V-2kV	Last Calibration Date: 01 August 2003	Calibration Due Date: 01 August 2004	
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**
		Ranges	Temp: 0°C-55°C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar
	Last Calibration Date: 27 May 2003	Calibration Due Date: 27 May 2004	



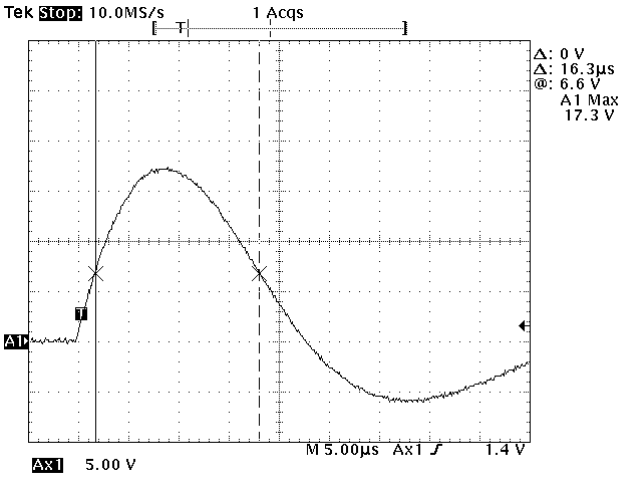
Surge Voltage Amplitude and Rise Time 4kV



Surge Voltage Duration at 50% Amplitude 4kV



Surge Current Amplitude and Rise Time 4kV



Surge Current Duration at 50% Amplitude 4kV

SURGE WAVEFORM VERIFICATIONS

Voltage Surge Test Set-Up

6.1.7 Voltage Dips and Interruptions

Test Applicable

Performance Criteria C
The product was subjected to voltage dips and interruptions.

Results

The system met the requirements for Voltage Dips and Interruptions. Data Pages follow.

1 fully configured sample subjected to the levels indicated.

Interrupt	Period (Cycles)	Sync Angle
100%	0.5	All angles with 45º delta
100%	250	All angles with 45º delta
60%	5	All angles with 45º delta
30%	25	All angles with 45º delta

Observations during Testing: GTM-2065 100Vac, 50Hz

Interrupt	Observations
100%@0.5	EUT operated normally.
100%@250	When Interrupt voltage was applied, the EUT shut down. Recovered when nominal voltage was applied
60%@5	EUT operated normally.
30%@25	EUT operated normally.

Interrupt	Description of degradation in performance.
100%@250	When Interrupt voltage was applied, the EUT shut down. Recovered when nominal voltage was applied

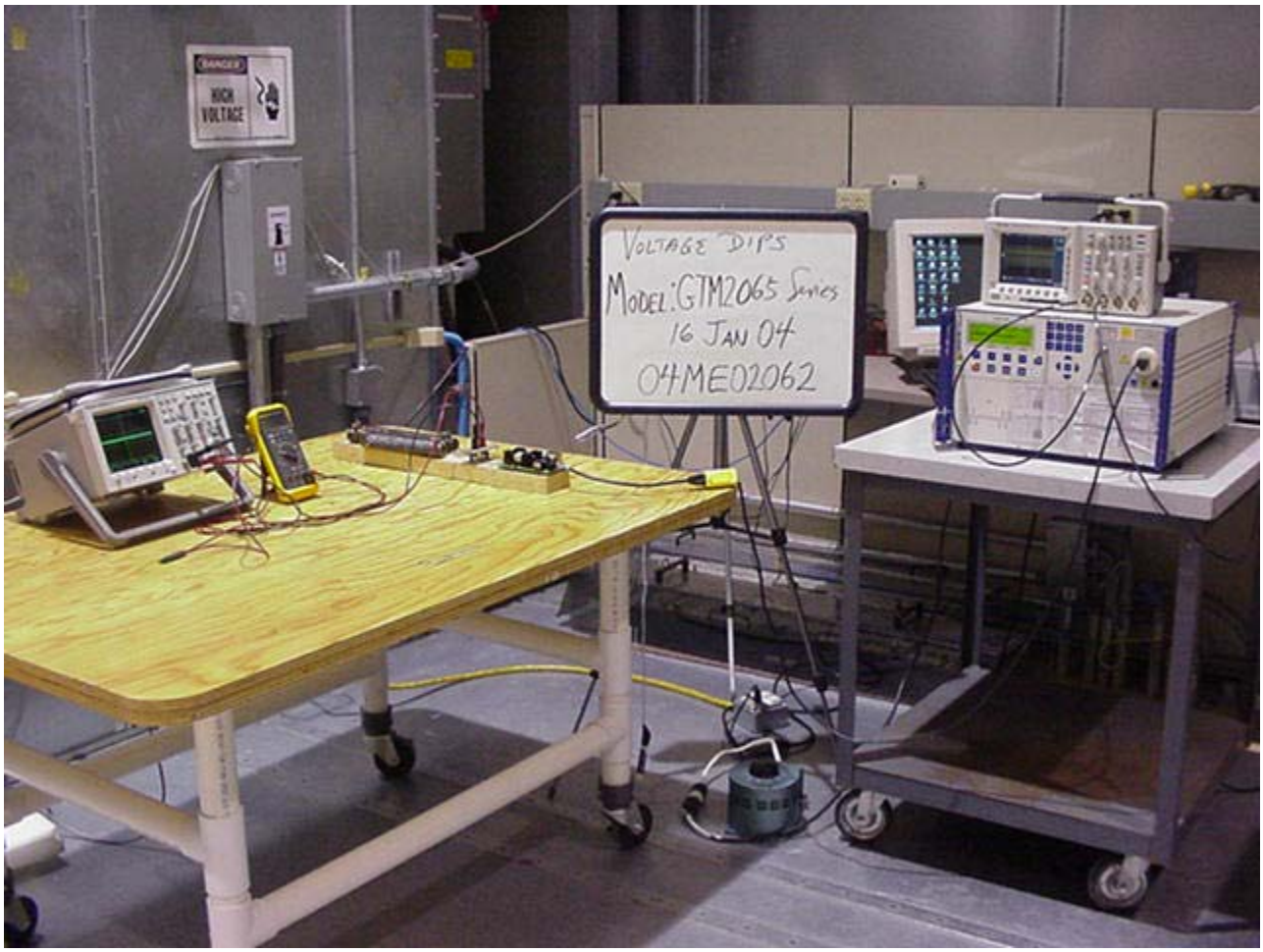
Observations during Testing: GTM-2065 240Vac, 50Hz

Interrupt	Observations
100%@0.5	EUT operated normally.
100%@250	When Interrupt voltage was applied, the EUT shut down. Recovered when nominal voltage was applied
60%@5	EUT operated normally.
30%@25	EUT operated normally.

Interrupt	Description of degradation in performance.
100% @250	When Interrupt voltage was applied, the EUT shut down. Recovered when nominal voltage was applied

Test equipment used for Voltage Dips and Interruptions tests

PLINE 1610	**Haefley**	**VDS Generator**	**Equipment No.: ME5A-118**
Range: 0-300V	Last Calibration Date: 05 September 2003		Calibration Due Date: 05 September 2004
TDS3054	**Tektroniz**	**Oscilloscope**	**Equipment No.: ME5B-173**
Range: -----	Last Calibration Date: 26 February 2003		Calibration Due Date: 26 February 2004
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**
		Ranges	Temp: 0°C-55°C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar
	Last Calibration Date: 27 May 2003		Calibration Due Date: 27 May 2004



Voltage Dips and Interruptions Test Set-Up

6.1.8 Magnetic Field Immunity Test

Test Applicable

Performance Criteria A

Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. The field was applied in 3 orthogonal axis for a period of one (1) minute in each direction.

Results

The system met the requirements for Magnetic Field Immunity. Data Pages follow.

Temperature:	21.0 °C
Humidity:	33 %RH
Pressure:	987 mbar
Date test performed:	19 January 2004

1 fully configured sample was subjected to the following levels.

Test Frequency	Field Strength			Application Axis	Mode*	
					Power	Operation
50Hz		3 A/m		X, Y, Z	2	1
60Hz		3 A/m		X, Y, Z	2	1

*See Power Interface and EUT Operating Modes for details

Observations during Testing: 50Hz 60Hz

Axis	Observations	Observations
X	EUT operated normally.	EUT operated normally.
Y	EUT operated normally.	EUT operated normally.
Z	EUT operated normally.	EUT operated normally.

Test equipment used for Magnetic Immunity

87III	**Fluke**	**Multimeter**	**Equipment No.: ME5B-219**
Range: 5VDC	Last Calibration Date: 29 August 2003		Calibration Due Date: 29 August 2004
8012A	**Weston**	**AC Ammeter**	**Equipment No.: ME2-051**
Range: 2000mA	Last Calibration Date: 28 August 2003		Calibration Due Date: 28 August 2004
PM3000A	**Voltech**	**Power Analyzer**	**Equipment No.: ME5A-250**
	Last Calibration Date: 08 December 2003		Calibration Due Date: 08 December 2004
3PN126	**Power Stat**	**Variac**	**Equipment No.: ME7-988**
MLA	**Underwriters Laboratories**	**Magnetic Loop Antenna**	**Equipment No.: ME7A-455**
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**
		Ranges	Temp: 0°C-55°C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar
	Last Calibration Date: 27 May 2003		Calibration Due Date: 27 May 2004

Magnetic Field Immunity Test Set-Up

Appendix A

Accreditations and Authorizations

NVLAP: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC EN17025 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. The specific scope includes IEC/CISPR 22:1997, Amendment 1:1995, Amendment 2:1997, EN 55022:1998, AS/NZS 1044, CNS 13438:1997, ANSI C63.4, FCC Method - 47 CFR Part 15, FCC Method –47 CFR Part 68, AS/NZS 3548, IEC 61000-3-2, EN 61000-3-2, CISPR 14-1, EN 55014-1, AS/NZS 1044, CNS 13783-1, CISPR 22, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, and IEC 61000-4-11 testing. NVLAP Lab code: 100255-0.

FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland and accepted in a letter dated September 24, 1997 (Ref. No. 91040).

Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2181

VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: (Radiated Emissions) R-797, (Conducted Emissions) C-832, C-833, C-834 and (Conducted Emissions - Telecommunications Ports) T-160.

ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).

NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.
NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).
NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6.
U.S. Identifier Number: US0113

Underwriters Laboratories Inc. 1285 Walt Whitman Rd. Melville, New York 11747 USA Tel.: 631 271-6200 Fax: 631 439-6095 Rev. No 1.0