



EN 61000-4-6 (1996) Immunity to Conducted Disturbances TEST REPORT

Applicant: Advanced Fiber Solutions
45 Franklin Street
Milton, MA 02186

Equipment Under Test: Product: UOR-200 Series
Model: UOR-200

Test Location: Marlboro Test Labs
257 Simarano Drive
Marlboro, MA 01752-1298

Test Date: October 25, 2005

This report contains the results of an investigation of the product tested. This report may only be used to document the EN61000-4-6 testing herein and may only be reproduced in full. Any distribution of the information contained in this report requires prior approval from Advanced Fiber Solutions.

Tested & Reviewed By:

G. Abboud
Test Engineer

Reviewed By:

Charles Nasser



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1.0 OVERVIEW

This report has been compiled to document the Conducted Immunity test parameters, effects and results of the Advanced Fiber Solutions UOR-200, in comparison to the requirements for equipment, as specified in the following documents:

89/336/EEC (3 May 1989) Official Journal of the European Communities
Council Directive on Electromagnetic Compatibility

92/31/EEC (28 April 1992) Official Journal of the European Communities
Amending Directive 89/336/EEC on:
Council Directive on Electromagnetic Compatibility

EN61326 (1998) Electrical equipment for measurement, control and
laboratory use EMC requirements

EN61000-4-6 (1996) Electromagnetic compatibility (EMC)
A1 Part 4: Testing and measurement techniques -
Section 6: Immunity to conducted disturbances, induced by
radio-frequency fields

2.0 PRODUCT IDENTIFICATION

Equipment Under Test: Advanced Fiber Solutions UOR-200

Type: The UOR-200 is an optical time domain reflectometer used to test fiber optic cables.

Model	Serial Number
UOR-200	N/A

EUT Power Requirements
USB powered

EUT Internal Board(s)					
Description	Clock Freq.(s)	P/N	S/N	Rev.	Slot #
	33MHz, 66MHz, 100MHz				

Modifications made to Equipment Required for Compliance

No modifications were necessary.

Performance Criteria:

Criteria A: Laptop display shows fiber measurement data.

Criteria B: Laptop stops displaying fiber measurement information. EUT reboots on its own and laptop displays readings again.

Criteria C: EUT hangs and displays an error message on the laptop. The EUT will not reboot and requires a manual reboot.

Criteria D: EUT hangs up. The EUT will not continue to function after a manual reboot. The EUT is broken.

3.0 TEST DESCRIPTION

The EUT was connected as shown in Section 8.0 of this report. All testing and verification for EUT operation was monitored utilizing the application software. The customer was not present during testing.

The EUT set up was placed in an RF ferrite tile shielded room in accordance with the EN61000-4-6 standard, with the following environmental conditions:

Temperature: 22 degrees C
Relative Humidity: 44 %

The EUT was placed above the ground plane on a .1 m insulating support platform. To achieve coupling of intentional electrical and magnetic fields (See Section 7 for a diagram of this signal), the I/O cables were routed through an EMI Injection Clamp. The functionality of the EUT was then monitored. See Section 8 for photographs of typical set-ups.

The Conducted Immunity test parameters:

- Frequency range: 150 KHz to 80 MHz
- Modulation: 80% amplitude modulated 1 KHz sine wave
- Frequency sweep rate: Not to exceed 1.5 x 0.001 decades per second

NOTE: See Section 7, Figure 1 for typical RF wave shapes.

Test Level (Severity Level): Severity Level 2 was applied for this particular product, the Advanced Fiber Solutions UOR-200, which means the field strength is set to 3 V.

Deviations: There were no deviations to the test procedure.

Mode of EUT Operation: EUT was measuring fiber during testing.

4.0 TEST RESULTS

The Advanced Fiber Solutions UOR-200 met the requirements of EN61326 using the test methods described in EN61000-4-6 (1996).

5.0 TEST DATA

The following testing was performed on the I/O cables of the EUT, the Advanced Fiber Solutions UOR-200.

Parameters:

Severity Level: Level 2 (3 Volts & 80% AM Modulation @ 1 KHz)
 Frequency Sweep: 1 % increments of previous frequency
 0.150-80 MHz
 Dwell Time: 2s

Results:

I/O Cables – Coupling Clamp

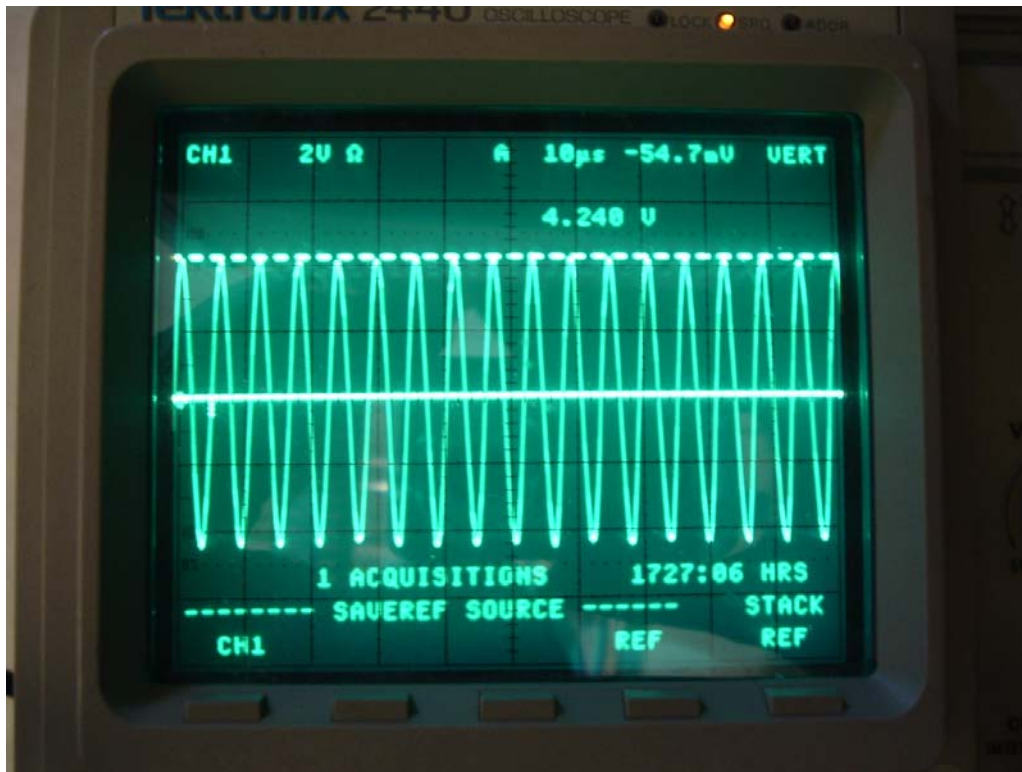
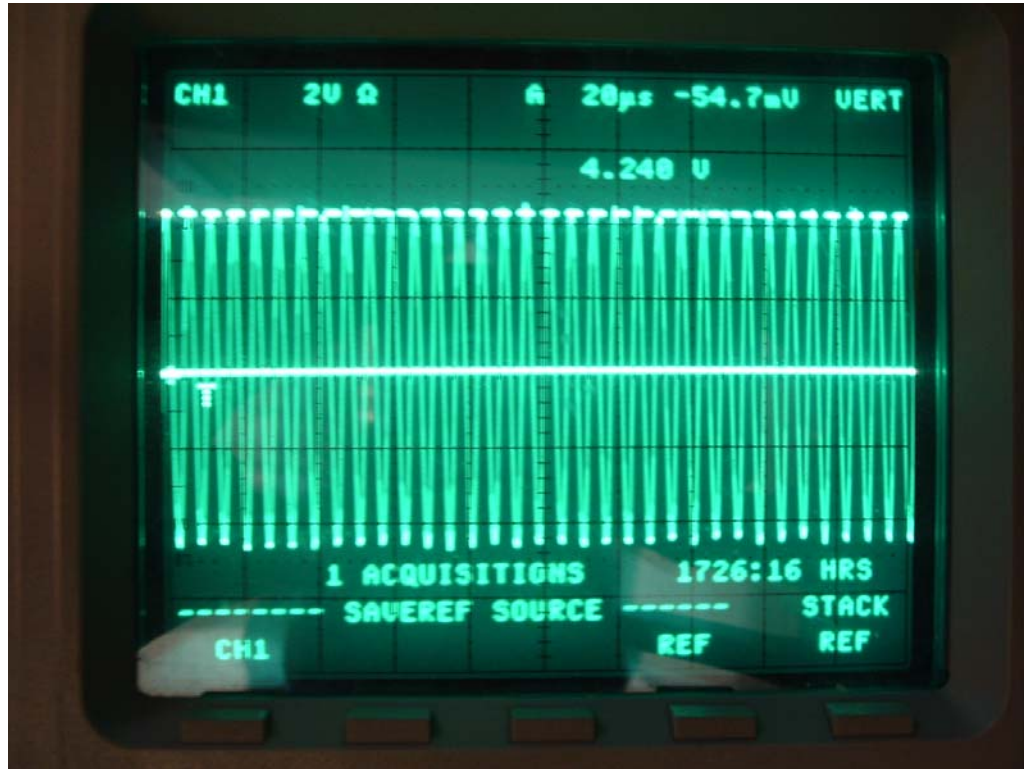
MHz	Field	Modulation	Observed Effect
0.150-80	3V	1 KHz, 80%	No change in performance

Location	1V	3V	10V
I/O Cables:		A	

Results Key:

Performance Criterion A: Normal performance within the specification limits without operator intervention
 Performance Criterion B: Temporary degradation, or loss of function or performance, which is self-recovering.
 Performance Criterion C: Temporary degradation, or loss of function or performance, which requires intervention or system reset to occur.
 Performance Criterion D: Degradation or loss of function, which is not recoverable due to damage to equipment, components, software, or loss of data

5.0 TEST DATA (Test Equipment Verification)



6.0 TEST EQUIPMENT for EN 61000-4-6

TEST EQUIPMENT for EN 61000-4-6 (1996)

	Equipment	Serial #	Most Recent Calibration Date	Calibration Due Date
X	Amplifier Research 100A-100 RF Amplifier	2031	not req'd	not req'd
X	HP 8648C Signal Generator	3642U01959	02/27/04	02/27/06
	FCC CDN P3 P/N FCC-801-M3-25	76	2/23/2005	2/23/2006
	FCC CDN P/N FCC-801-M3-25	99119	2/23/2005	2/23/2006
	FCC CDN P/N FCC-801-M3-25	99120	2/23/2005	2/23/2006
	FCC CDN P/N FCC-801-S25	9951	2/23/2005	2/23/2006
	FCC CDN P/N FCC-801-S25	9952	2/23/2005	2/23/2006
	FCC CDN P2 P/N FCC-801-M2-32A	9883	2/23/2005	2/23/2006
	FCC CDN P1 P/N FCC-801-M3-32A	9882	2/23/2005	2/23/2006
	FCC CDN C1 P/N FCC-801-T2	9834	2/23/2005	2/23/2006
	FCC CDN C3 P/N FCC-801-T4	9835	2/23/2005	2/23/2006
	FCC CDN C4 P/N FCC-801-T8	9836	2/23/2005	2/23/2006
	FCC CDN C2 P/N FCC-801-AF2	9829	2/23/2005	2/23/2006
	FCC CDN P/N FCC-801-M4-32A	2010	2/23/2005	2/23/2006
	FCC CDN P/N FCC-801-M5-32A	2011	2/23/2005	2/23/2006
X	FCC F-2031 EMI Injection Clamp	94	2/23/2005	2/23/2006
	F-120-9A Bulk Injection Probe	222	2/23/2005	2/23/2006
	F-201 (30mm) Absorbing Clamp	363	2/23/2005	2/23/2006

	MISC.TEST EQUIPMENT	Serial #	Most Recent Calibration Date	Calibration Due Date
	Dickson TH603 Temp/Humidity Recorder	9197458	2/18/2004	2/18/2005
X	Dickson TH603 Temp/Humidity Recorder	9197457	2/14/05	2/14/07
	Fluke 79 Series II Multimeter	67700905	1/15/04	1/15/05
	FCC F-201-32mm Absorbing Clamp	363	N/A	N/A
	Omega Temp/Humd Recorder	CT485B-704013039W1	2/12/2005	2/12/2006

X Indicates equipment used for this testing

All equipment used for testing has been calibrated according to methods and procedures defined by the National Institute of Standards and Technology (NIST).

7.0 FIGURES

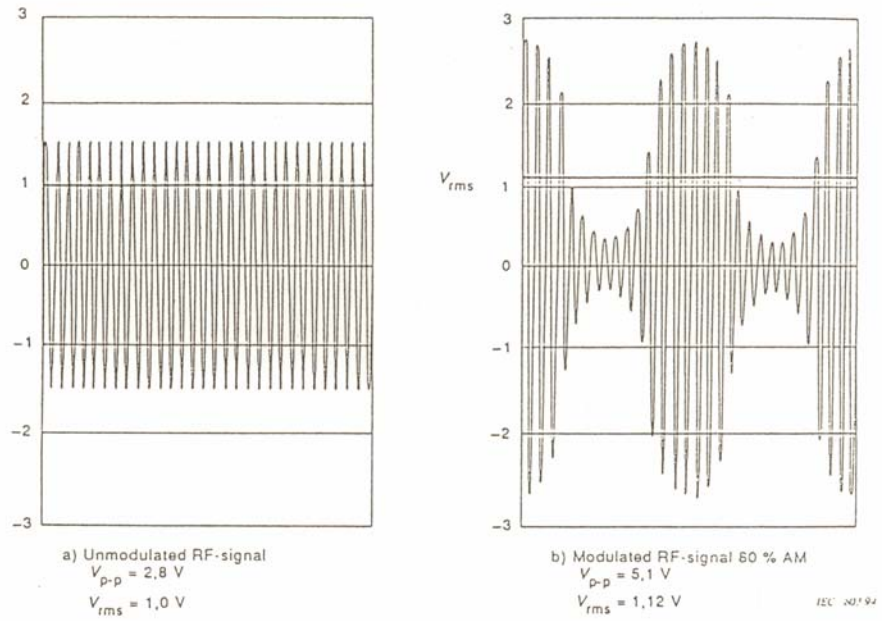


Figure 1 – Definition of the test level and the waveshapes occurring at the output of the signal generator (test level 1)

8.0 PHOTOGRAPHS

