Marlboro Test Labs

EN 61000-4-4 (1995-01) Electrical Fast Transient/Burst 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 has been prepared to record the Electrical Fast Transient/Burst Immunity results of the product tested, as identified above and may only be used to document the testing as identified herein. This report may only be reproduced in full. Any distribution of the information contained in this document requires the prior approval from: Advanced Fiber Solutions.

Tested & Reviewed By:

G. Abboud
Test Engineer

Reviewed By:

Charles Nasser

ACCREDITED
Certificate: 2053-01

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1.0 OVERVIEW

This report has been compiled to document the Electrical Fast Transient/Burst 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
EN61000-4-4 (1995-01) A1, A2	Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques - Section 4: Electrical fast transient/burst immunity test

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 setup was placed in the EFT/B test laboratory in accordance with the IEC standard, with the following climatic conditions:

Temperature:	22 degrees C
Relative Humidity:	44 %

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 was placed on a non-conductive table, 0.8 meters high. See Section 8 for photographs of typical set-ups

EFT/B tests on the I/O cables were performed by placing the unshielded cables in the capacitive coupling clamp. The impulses were applied incrementally, up to 0.5KV, starting at 0.25 KV. Both positive and negative voltages were tested. A burst duration of 15ms and repetition rate of 5 KHz were used during testing. There was a pause of 60 seconds between applications of each EFT/B event.

NOTE: See Section 7, for typical EFT/B wave shapes.

Test Level(Severity Level): The Severity Levels specified in EN61326 were applied on this particular product, Advanced Fiber Solutions UOR-200. The maximum voltage peak was 0.5KV for the I/O cables.

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 EN61000-4-4 (1995-01).

5.0 TEST DATA

Customer: Advanced Fiber Solutions
Product: UOR-200
Test Date: October 25, 2005

EFT/B

		V EFT	+	-	V EFT	+	-	V EFT	+	-	V EFT	+	-
	Test Points	V EFT	+	-	V EFT	+	-	V EFT	+	-	V EFT	+	-
I/O Lines	USB	.25 KV	**A**	**A**	.5KV	**A**	**A**	1KV			2KV		
											2KV		
											2KV		

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)

61000-4-4
EFT Immunity

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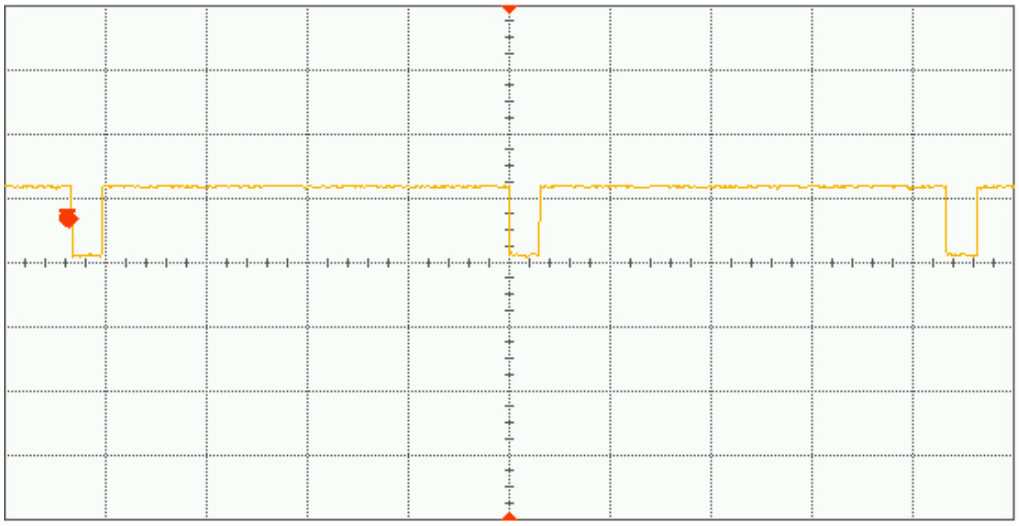

Time base Scale 50.0 ms/div Position 0.0 s Reference center

Measure

	current	mean	std dev	min	max
Period(1♦)	216.80 ms	216.80 ms	0.0 s	216.80 ms	216.80 ms
Frequency(1●)	4.6125 Hz	4.6125 Hz	0.0 Hz	4.6125 Hz	4.6125 Hz
V p-p(1)	5.61 V	5.61 V	0.0 V	5.61 V	5.61 V
- width(1▾)	14.80 ms	14.80 ms	0.0 s	14.80 ms	14.80 ms

6.0 TEST EQUIPMENT

	Equipment	Serial #	Last Cal	Cal Due
*	Haefely PEFT.1 - Burst-Tester	082 106-07	02/13/05	02/13/06
	Haefley FP-EFT 32.1 - Coupling Filter	080 169-04	not req'd	not req'd
	Haefely IP4A-Capacitive Coupling Clamp	082 315-17	not req'd	not req'd
	Haefely Coupling Clamp	N/A	N/A	N/A
*	Dickson TH603 Temp/Humidity Recorder	9197457	02/14/05	02/14/07
	Omega Temp/Humd Recorder	CT485B-704013039W1	02/12/05	02/12/06

* 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

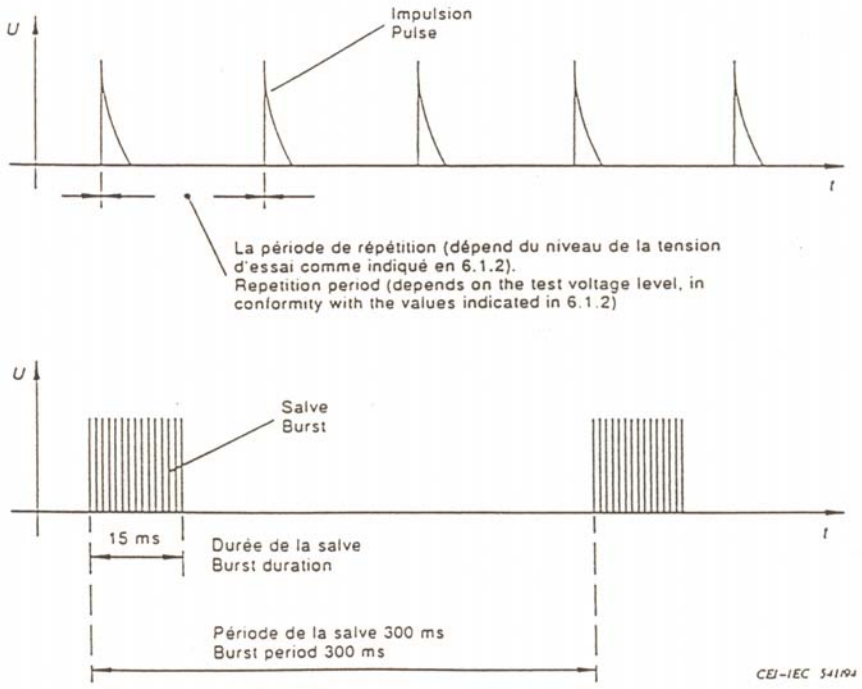

Figure 2 – Allure générale d'un transitoire rapide en salve

General graph of a fast transient/burst

7.0 FIGURES

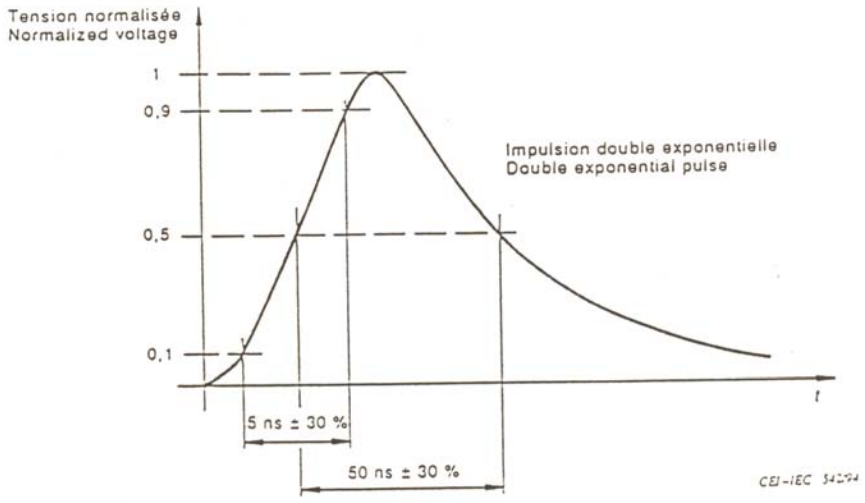

Figure 3 – Forme d'onde d'une impulsion unique sur une charge de 50 Ω
Waveshape of a single pulse into a 50 Ω load

8.0 PHOTOGRAPHS