Test report
IEC 61000- 4- 4(2004)
Electromagnetic compatibility (EMC) – part 4.Testing and measurement techniques
Section 4. Electrical fast transient /burst immunity test

Report reference No.…….: PQ8407

Compiled by...……..: Mansour Geraminejad …….

Approved by……..: Mohammad Firouzabadi …….

Tests witnessed by…….: Mr. Mansoorbakht,Mr Taavon …….

Date of issue……..: 2/7/2005

Testing Laboratory Name: Quality Test Laboratory

Accredited by……....: -------

Address……..…: Niroo Research Institute, End of Poonak Bakhtari Blvd., Shahrak Ghods, Tehran, Iran
Tel ……....: (+98-21) 8079401-8

Fax ……....: (+98-21) 8078296

E-mail ……..…..: qtlab@nri.ac.ir

Web-site……: www.nri.ac.ir

Applicant's Name …….: NRI-IBT Co.

Address ……: Niroo Research Institute, End of Poonak Bakhtari Blvd., Shahrak Ghods, Tehran, Iran

Test specification

Standard ……..……: IEC 61000-4-4

Non-standard test method.: N/A

Test report form No. ……: IEC61000_4_4A

The test results presented in this report relate only to the object tested.
This report shall not be reproduced except in full without the written approval of the Quality Test Laboratory.

Test item description …..:Electrical Field Alarm

Trade mark ……..: ---

Manufacturer ……..…: NRI-IBT Co.

Model ……..…: EFA5

Serial numbers……...: EFA0010

Summary of testing

The test has been carried out in compliance with IEC 61000-4-4 and on the basis of a test plan including verification of performance of the EUT as defined in the technical specification.
Applied bursts are normal burst.
The specification of the applied burst are:
Burst period : 300 msec
Burst duration: 15 msec
The preferential range of test levels for the electrical fast transient test, applicable to power supply of the equipment is given in table 1.
The test voltage shall be applied between a reference ground plane and each of the power supply terminals, a.c. or d.c.

Test item particular:

Temperature Limit……..:-5 to 65ºC

Operating Electric Field Treshold…….:2.2 KV/m±10%

Charging Time……..:8-10 Hours

Electric Field Nominal Frequency…….:50/60 Hz

Alarm Type……..:Buzzer,Vibration Alert,Red Flashing Led

Relative Humidity……:Up to 95%

DC Input……:12-16 Vdc Bipolar

Standby Lifetime……..:100 Hours

Alarm Lifetime……:2 Hours

Possible test case verdicts

Test case does not apply to the test object ……: N/A

Test object does meet the requirement……...: Pass

Test object does not meet the requirement…….: Fail

Testing

Date of receipt of test item……..:2/7/2005

Date(s) of performance of test……..…:2/7/2005

General remarks:

The following test report consists of 3 basic sections and one annex:
Section 1:General information (pages 1 to 3)
Section 2:Test case (page 4)
Section 3:Tables (pages 5,6)
Annex :Table A (page 7)
figure A (page 8)

Clause numbers between brackets refer to clauses in IEC61000-4-4.
Number of table in third section of this test report is in compliance with number of table in IEC61000-4-4.Those test conditions are not checked or not applicable to the object are not prsented in this report.
Throughout this report a point is used as the decimal separator.
Throughout this report values with no signs mean positive values.

General product information:

This Equipment is a Electrical Field Alarm which is used for 5KV AC tests.
The manufacturer guarantees that the tested object is manufactured according to its technical specifications.
Quality Test Laboratory checked that this specification adequately represents in shape and dimensions the essential details and the parts of the tested object.
This specification identified by Quality Test Laboratory and a photograghy of its marking plate is attached in page 2 of this report.

IEC 61000-4-4			
Cl.	Requirement –Test	Result	Verdict
3	The repetitive fast transient test is a test with bursts consisting of a number of fast transients, coupled in to power supply, control and signal ports of electrical and electronic equipment.		-
4	**Transient:** A quantity which varies between two steady states during a time interval which is short compared with the time-scale of interest. **Burst:** A sequence of a limited number of pulses or an oscillation of limited duration.		-
5	**Test Level……..……..:**	2	-
6	**Test equipment**	See table C	-
7	**Test set-up**	See figure A	-
8	**Test procedure**		-
8.1	Laboratory reference conditions	See table A	Pass
8.2	Execution of the test	See tables B	-
9	**Test results**		-
	Normal performance within the specification limits.		Pass

Tables

Table 1	Test levels			
Level	On power supply port, PE		On I/O (Input/Output)signal, data and control port	
	Voltage peak KV	Repetition rate KHz	Voltage peak KV	Repetition rate KHz
1	0.5	5	0.25	5
2	1	5	0.5	5
3	2	5	1	5
4	4	2.5	2	5
X	Special	Special	Special	Special
"X" is an open level.the level has to be specified in the dedicated equipment specification.				

Table A	Climatic condition	
	Requirement	Measured
Ambient Temperature	15°C to 35°C	25°C
Relative Humidity	25% to 75%	31 %
Atmospheric pressure	86 Kpa to 106 Kpa	---
Electromagnetic conditions	The electromagnetic conditions of the laboratory do not influence the test results.	

Table B	Execution of the test

The EUT arranged in accordance with the manufacturer's instruction for installation.
The test set up includes the following equipment:
-Ground reference plane
-Coupling device (network or clamp)
-Decoupling network
-Test generator
EUT placed on a ground reference plane and insulated from it by an insulating support 0.1m ± 0.01m thick.
In the case of table-top equipment, the EUT located 0.8m ± 0.08m above the ground plane.
The size of the reference ground plane is 1.25m*2.5m.
The reference ground plane projected beyond the EUT by at least 0.1m on all sides.
The reference ground plane connected to the protective earth.
The minimum distance between the EUT and all other conductive surfaces is more than 0.5m.
The EUT connected to the earthing system in accordance with the manufacturer's installation specification without any additional earthing connections.
The connections of the test equipment ground cables to the ground reference plane provide minimum inductance.
The length of the signal and power lines between the coupling device and the EUT is 1m or less.
The test voltage applied between a reference ground plane and each of the power supply terminals and on the terminal for protective or function earth on the cabinet of The EUT.
If the manufacturer provides a non-detachable supply cable more than 1 m long with the equipment, the excess length of this cable shall be gathered into a flat coil with a 0.4 m diameter. If the EUT is on the ground reference plane the flat coil shall be situated at a distance of 0.1 m above the ground reference plane.
A capacitive coupling clamp used for the coupling the test voltage into the lines.
The test carried out in climatic and electromagnetic reference condition.
The test carried out on the basis of a test plan including verification of the performances of the EUT as defined in the technical specification.

Annex

Table C	Test equipment Technical Specifications
Manufacturer Model Serial No. Calibration Date	Haefely PEFT 4010 150830 08.07.2003
EFT generator	
Wave shape 50 Ω Wave shape 1 KΩ Voltage range Spike frequency Burst duration Burst repetition Polarity Impulsea per burst Impulses per second Output type	5 / 50 ns ± 30 % 5 / 35 to 150 ns 0.10 – 4.5 KV 1 Hz 0.01 to 999 ms 0.1 to 400 Hz or 2.5 ms to 10 s or1 to 500 period Positive / Negative / Alt 1000 max 12000 max Coaxial 50 Ω
Single phase CDN	
Maximum AC voltage Maximum AC current Maximum DC voltage Maximum DC current Frequency range Coupling attenuation Decoupling attenuation	250 V 16 A 110 V 16 A 1 to 100 MHz < 2dB > 20dB
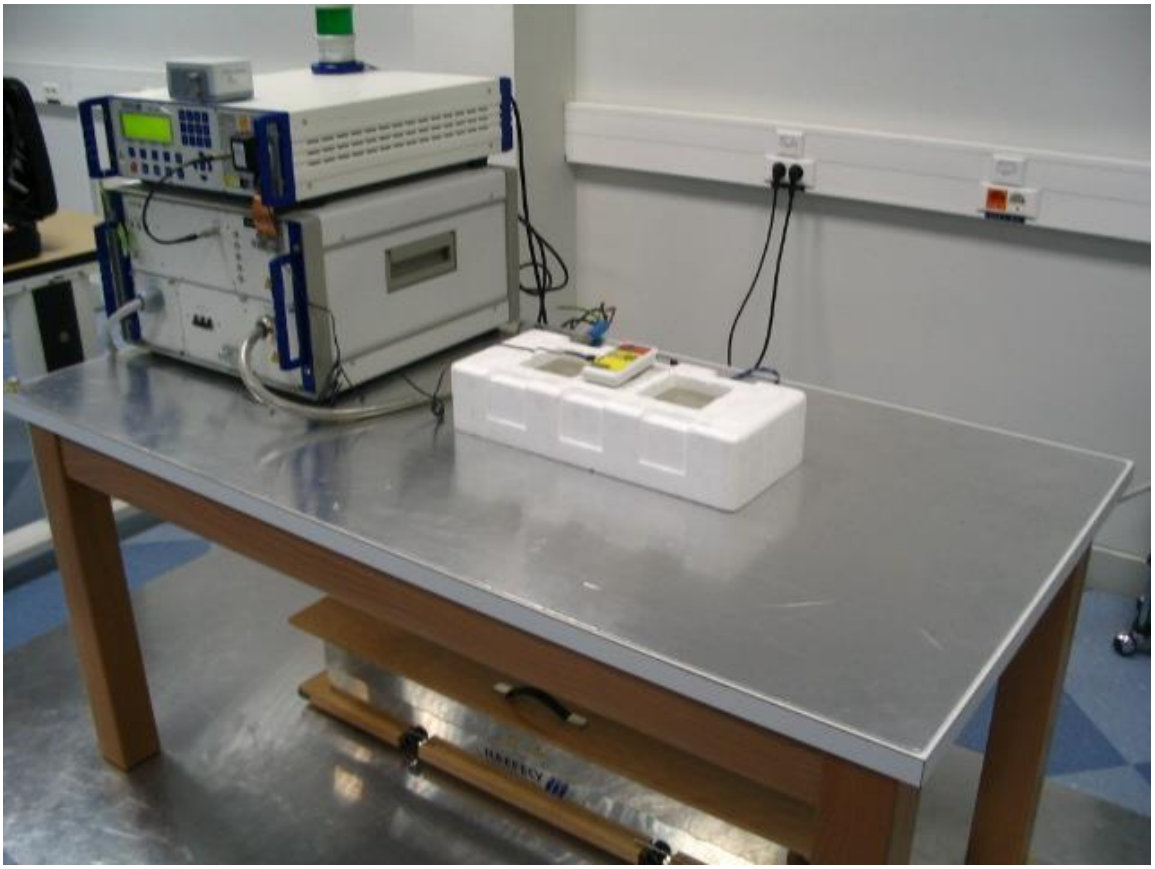
Figure A	Test set - up for fast transient burst test