

VERI50 EFT for EFT calibration applicable to all TRA2000 generators and CDN2000 coupling filters

Revised: 21.December 2010

1 General Information

To oscilloscope | VERI50 EFT | To generator



1.1 Technical data

Input impedance	50 Ohm	± 2%
Maximum power dissipation	1000 spikes per seconds	at 4400 V
Nominal ratio	DSO input 1 MOhm DSO input 50 Ohm	ratio 1:500 54dB ratio 1:1000 60dB
Standard	IEC/EN 61000-4-4	

For further information see „Verification Protocol“.

2 Application of the VERI50 EFT:

- The test generator characteristics shall be verified in order to establish a common reference for all generators. For this purpose, the following procedure shall be undertaken.
- The test generator output shall be connected to a 50 Ω and 1 000 Ω coaxial termination respectively and the voltage monitored with an oscilloscope. The –3 dB bandwidth of the measuring equipment and the test load impedance shall be at least 400 MHz. The rise time, impulse duration and repetition rate of the impulses within one burst shall be monitored as well as the burst duration and burst period.
- For each of the set voltages of Table 2, measure the output voltage at a 50 Ω load - $V_p(50 \Omega)$. This measured voltage shall be $[0.5 \times V_p(\text{open circuit})] \pm 10\%$.

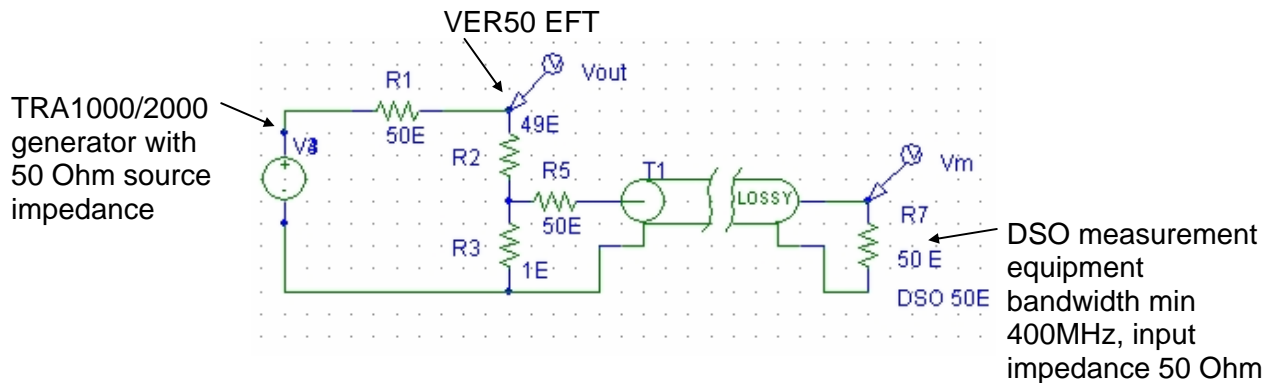
Table 2 – Output voltage peak values and repetition rates

Set voltage kV	V_p (open circuit) kV	V_p (1 000 Ω) kV	V_p (50 Ω) kV	Repetition frequency kHz
0,25	0,25	0,24	0,125	5 or 100
0,5	0,5	0,48	0,25	5 or 100
1	1	0,95	0,5	5 or 100
2	2	1,9	1	5 or 100
4	4	3,8	2	5 or 100

NOTE With the 50 Ω load, the measured output voltage is 0,5 times the value of the unloaded voltage as reflected in the table above.

2.1 Application of the VERI50 EFT for TRA calibration:

Electric diagram of the calibration set up



The voltage ratio of the VERI50 EFT can be calculated as follow:

$V_{out} = V_{ch} \times 0.5$ (explanation see page 1/4 of the instruction sheet or see IEC 61000-4-4 Ed.2)

$n = \text{ratio} = V_{out} / V_m$. The V_{out} and V_m values can be found in the calibration report of the VERI50 EFT.

On the type plate of the VRI50 EFT a ratio of 1:500 is indicated (DSO input 1 MOhm)

The explanation can be given as follow:

The calibration is made with 50 Ohm input impedance of the CRO. The input impedance 50 Ohm of the DSO together with the R5 divide the voltage signal by a factor 2. The real ratio of the VERI50 EFT is therefore the half value 1:1000 as indicated on the type plate. The value on the type plate must be used when the DSO input impedance is 1MOhm. When the input impedance of the DSO is 50 Ohm the ratio 1:500 must be used.

The accuracy of the ratio is calculated by resistor +/- 1 %

The ratio is checked with two methods: Step generator and the Networkanalyser with an accuracy of +/- 2%.

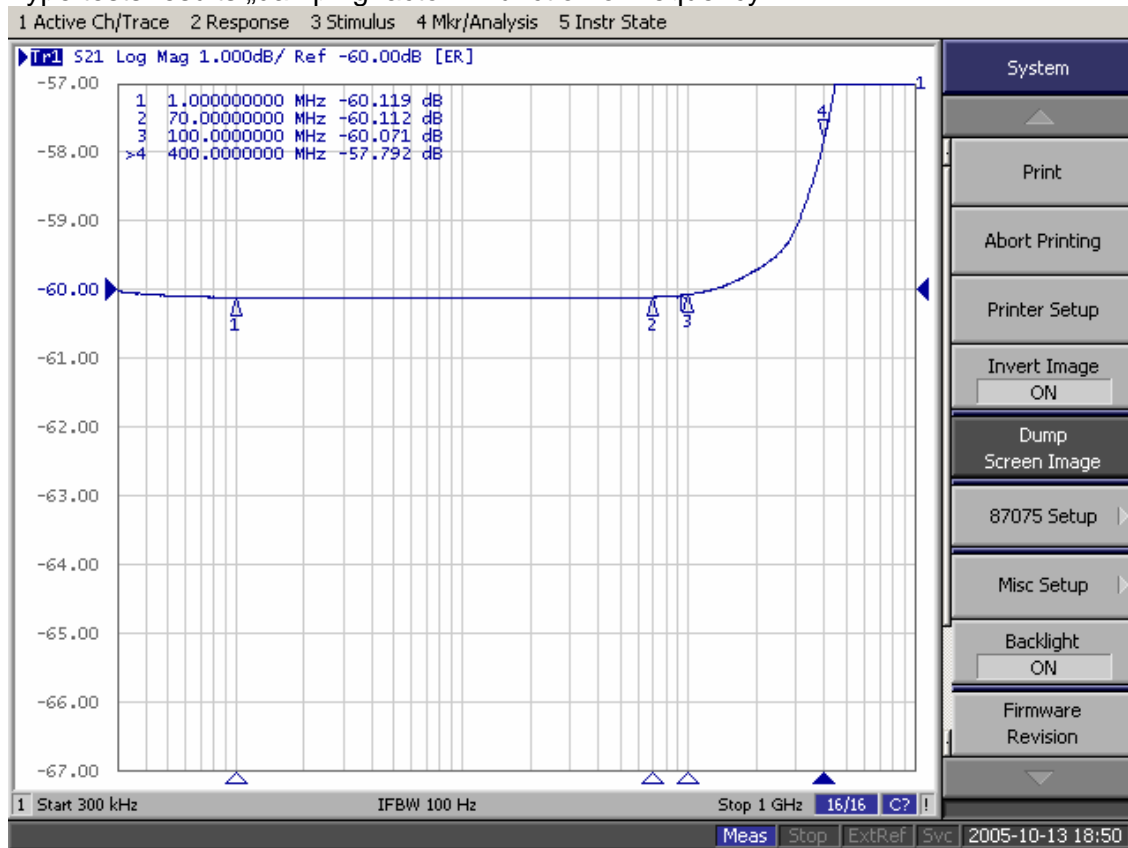
With the step voltage generator >850V the time response and the voltage influence are checked. With the Networkanalyser the frequency response is measured. The VERI1k is o.k. when both calibration are within +/- 2%.

$$\text{dB} = 20 \log V_{out}/V_m$$

The plot shows 60 dB

The ratio calculation results in $n = 10^{60/20} = 1000$ as indicated on the type plate.

Type tests results „damping factor in function of frequency“



The 4 Marker indicate the following:

Marker 1: 1 MHz nominal. The ratio calculation results in $n = 10^{60.119/20} = 1013$

Marker 2: 70 MHz corresponds to rise time at the lower tolerances 6.5ns. The ratio calculation results $n = 10^{60.112/20} = 1012$. Deviation 1.2%

Marker 3: 100 MHz corresponds to rise time at the highest tolerances 3.5 ns. The ratio calculation results $n = 10^{60.071/20} = 1008$. Deviation less than 1%

Marker 4: 400 MHz check to +/-3dB point as specified in the IEC 61000-4-4 Ed.2

3 Standard accessory, dimensions

3.1 Included articles, dimensions

VERI50 EFT (Article No. 103472)

Mechanical Dimensions

Unit Height: B
Length: 0 cm
Width: 0 cm
Height: 0 cm
Net Weight: 0.2 kg

Included Articles

According to STL-Variante 20, STL-Version 1

<i>Qty</i>	<i>PN</i>	<i>Description</i>
1	100002	Broschüre Transient Test System
1	104802	Standard calibration report
1	103194	CD-UM-IN-ALL includes all User Manuals and Instruction sheets of all EMC PARTNER AG sales products.

4 Recycling / Disposal

4.1 RoHS directive 2002/95/EG

The VERI50 EFT complies with the directive 2002/95/EG (RoHS - Restriction of certain Hazardous Substances).

From December 2005, all EMC Partner products either hand soldered or by machine are produced using lead-free solder.

4.2 WEEE directive 2002/96/EG

The EMC Partner VERI50 EFT, is exempted from the directive 2002/96/EG (WEEE) under category 9.

The product should be recycled through a professional organisation with appropriate experience for the disposal and recycling of electronic products. EMC Partner are also available to help with questions relating to the recycling of this product.

4.3 Information for dismantling



Remove always power cord fist.

There is no special danger involved in dismantling the VERI50 EFT.

4.4 Parts which can be recycled

The VERI50 EFT contains parts made from steel, aluminium, PVC, two-component sealing compound. The impulse capacitors are filled with non-poisonous mineral oil. The various parts can be separated and recycled.

4.5 Parts which can not be recycled

All parts in the VERI50 EFT can be recycled.

5 Service Information

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