

EFT/Burst Verification Attenuators PAT 50A, PAT 1000

Introduction

EFT/Burst generators are verified according to the standard IEC / EN 61000-4-4. Measurements of individual impulse parameters are performed using a termination to match the EFT/Burst generator output impedance (50Ω) and a voltage divider to reduce the impulse level so it can be displayed on commercial oscilloscopes. An oscilloscope with minimum 400MHz bandwidth is required to properly display the EFT impulse.

The PAT attenuator series has been developed in response to the IEC 61000-4-4 amendment 2 (2001) and Edition 2 (2004) which extends the verification requirement to also include impulse measurement using a 1kΩ load.

Safety Information

Refer to the EFT/Burst generator manual for instrument specific safety requirements.



PAT 50A and PAT 1000 attenuators must not be used for measurements on a power line CDN when AC voltage is applied!

Technical Data



Specification	PAT 50A	PAT 1000
U nominal max.	8kV	
max. Impulses per second (continuous)	12000 @ 1.0kV 5000 @ 2.0kV 1000 @ 4.5kV 250 @ 8.0kV	
nominal attenuation *	54dB	60dB
nominal divider ratio *	500:1	1000:1
input impedance	50Ω ±2%	1000Ω ±2% // ≤6pF
output impedance	50Ω ±2%	
bandwidth -3dB	400MHz	
Input connector	SHV plug	
Output connector	50Ω BNC socket	

* The nominal attenuation and the nominal divider ratio are achieved when the output of the attenuators is terminated with 50Ω

Test set-up for Burst Verification

To verify an EFT/Burst generator proceed as below:

1. connect the attenuator input directly to the EFT/Burst generator high voltage output
2. using 1m cable provided (RG58), connect output of the attenuator to a suitable oscilloscope
3. set the oscilloscope input to 50Ω.

If the EFT/Burst impulse is to be verified at the output of a CDN, a suitable adaptor is required.

Both the generator and the oscilloscope must be connected to the ground plane properly.

Calculating EFT/Burst output voltage

Using the impulse amplitude measured on the oscilloscope, the actual EFT/Burst output voltage can be calculated as follows:

$$(\text{measured value} \times \text{divider ratio}) = \text{EFT/Burst(V)}$$

divider ratio is dependant on the PAT being used. PAT 50A has a typical attenuation of 54dB which reduces the impulse by 500 times (the divider ratio). PAT 1000 has a typical attenuation of 60dB which reduces the impulse by 1000 times.

Example using PAT 50A with Test voltage 4000V

$$(4V \times 500) = \underline{2000V}$$

Because the EFT generator is terminated with 50 ohms, exactly half the amplitude is displayed. In this case the actual impulse voltage is $4000V / 2 = \underline{2000V}$



The attenuation value written on the attenuator must be used for this calculation!

