



## MODEL 8282-1 TRANSIENT PULSE GENERATOR

for conducted transient susceptibility testing, 0.15  $\mu$ S - 5.0  $\mu$ S - 10.0  $\mu$ S up to 600 volts (peak)



### APPLICATION

The **Model 8282-1 Transient Pulse Generator** was designed for screen room use in making conducted spike susceptibility tests. It provides all the waveshapes required by MIL-STD-461B/C and many other military EMI specifications.

### DESCRIPTION

Spike generators required for susceptibility testing have been our specialty since 1962, when our first unit, the **Model 6254-1**, was introduced. The **Model 8282-1** incorporates all the flexibility and technical excellence of the previous models and provides features required by specification MIL-STD-461B/C.

Three different spike durations are provided: 0.15  $\mu$ S, 5.0  $\mu$ S, and 10.0  $\mu$ S. The pulse shape approximates the curve of Figure 19 in MIL-STD-462. The amplitude of the spike voltage is fully adjustable and is displayed on an LED meter.

In the series injection mode on 50, 60 or 400 Hz lines, a phase adjustment allows the spike to

be positioned anywhere on the sine wave of the power line. This feature makes possible the injection of interfering transients at selected points in time to determine the susceptibility of systems which depend upon frequency or time.

The repetition rate of the spike can be adjusted with a panel control to any rate from 0.5 to 50 p.p.s. A single pulse can be injected with the aid of a panel-mounted pushbutton.

All functions are selected by pushbuttons which are lighted when activated.

The **Model 8282-1 Transient Pulse Generator** provides up to 600 volts peak amplitude for each of the 0.15, 5.0 and 10.0  $\mu$ S spikes. The output voltage rises steeply to peak amplitude as adjusted by the panel control, then falls exponentially to cross through zero at the duration of 0.15, 5.0, or 10.0  $\mu$ S as selected by pushbuttons. The voltage falls below zero and "rings" for a period determined by the inductance in the output circuit or the load. **The peak amplitude displayed on the LED meter is the value that would appear across a 5.0 ohm non-inductive load.**

With series injection on 50, 60 or 400 Hz power lines, the spike can be applied to either the positive or negative half cycle of the power frequency sine wave. The spike can be adjusted to fall on the power sine wave from 0° to 360°.

For non-synchronous injection, the repetition rate can be adjusted from 0.5 to 50 p.p.s.

A pushbutton enables the "single spike" feature and the spike can be manually triggered by pushing another button. A connector on the rear panel makes provision for remote triggering of the single spike feature.

Two methods of remote triggering are provided. One method requires the application of 24 volts d.c. to trigger the pulse at rates determined by an external switch up to 550 p.p.s. The second method requires the application of a square wave which can be used to trigger the spike up to 50 p.p.s. for the 0.15  $\mu$ S spike and up to 1000 p.p.s. for the 5.0 and 10.0  $\mu$ S spikes. This latter feature can be used to trigger the spike in sync with some function within the equipment under test.

### FEATURES

- Provides outputs up to 600 volts peak amplitude for the 0.15, 5.0 and 10.0  $\mu$ S spikes into a five ohm resistive load (low source impedance).
- A wide range of repetition rates allows spike injection in terms of the pulse rates of items being tested.
- The single pulse feature enables controlled isolation of transient effects.



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- Adjustable pulse position on a.c. power lines relates the transient susceptibility to the real time aspects of digital circuitry served by a.c. power.
- Transients can be injected in synchronism with repetitive circuit functions as required by **Method CS06** of MIL-STD-462.
- Remote triggering of single or repetitive pulses in terms of particular system characteristics.
- The upper terminals of the PARALLEL pair and the SERIES pair provide a positive-going spike on the 5  $\mu\text{S}$  and the 10  $\mu\text{S}$  modes. These terminals deliver a negative-going spike in the 0.15  $\mu\text{S}$  mode. When the test plan requires both a positive and a negative spike, it is necessary to reverse the connections to the output terminals of the **Model 8282-1 Spike Generator**.

## SPECIFICATIONS

**Spike Durations:** Pushbutton selectable durations of 0.15  $\mu\text{S}$ , 5.0  $\mu\text{S}$  and 10.0  $\mu\text{S}$  ( $\pm 20\%$ ) to zero crossover, into 5.0 ohm resistive load.

**Adjustable Peak Amplitude:** Up to 600 volts for 0.15  $\mu\text{S}$ , 5.0  $\mu\text{S}$  and 10.0  $\mu\text{S}$  durations into five ohm non-inductive load.

**Internal Impedance:** Less than 5.0 ohms for 0.15  $\mu\text{S}$ , less than 2.0 ohms for 5.0  $\mu\text{S}$ , less than 1.0 ohm for 10.0  $\mu\text{S}$ .

**Pulse Repetition Rate:** Manually adjustable up to 50 p.p.s. for all pulse durations.

**Pulse Shape:** Ringing characteristic similar to Figure 19 in MIL-STD-462 when connected to non-inductive load.

**Pulse Position:** Adjustable from 0° to 360° on 50 Hz, 60 Hz or 400 Hz power lines.

**External Sync Operation:** Remotely triggerable up to 50 p.p.s. for 0.15  $\mu\text{S}$ , up to 1000 p.p.s. for 5.0 and 10.0  $\mu\text{S}$ .

**Amplitude Display:** Panel meter is analog LED display of peak amplitude as it would be into a five ohm resistive load.

**Power Current in Series Injection Mode:** Handles up to 50 amperes of current at power frequencies.

**Power Requirements:** 115 volts 60 Hz, 3.0 amperes. (230 volts 50 Hz, 1.5 ampere available.)

**Size:** 12.25" wide, 8.7" high 13" deep. (311 mm x 211 mm x 330 mm.)

**Weight:** 30 pounds.

## USEFUL ACCESSORIES

**Type 7115-2 High Voltage Pulse Transformer.** Plugs into SERIES output terminals to provide transient levels up to 15 KV, peak, into **Type 7510-1** Spark Gap assembly for static discharge tests.

**Type 7512-1 Spike Injection Probe\***

**Type 7519-1 Pulse Shaping Network\***

**Type 7541-1 Spike Receptor Probe\***

**Type 8282-150 Transient Pulse Transformer.** Plugs into SERIES output terminals. Handles up to 150 amperes through the secondary for high current test samples.

**Type 8525-1 Non-Inductive Five Ohm Load**

**Type 8527-2 Transient Pulse Transformer.** Plugs into SERIES output terminals to provide spike levels up to 2 KV, peak, into 50 ohms when using the ten microsecond function.

**Type 8908-1 Transient Pulse Transformer.** Plugs into series output to provide up to 600 V spike into 50 ohms when using 5  $\mu\text{S}$  or 10  $\mu\text{S}$  function.

**Type 9007-1 Transient Pulse Transformer.** Plugs into SERIES output terminals to provide spike levels up to 1200 V into 50 ohms when using the 0.15 microsecond function.

\* See Application Note on Cable Induced Transients

