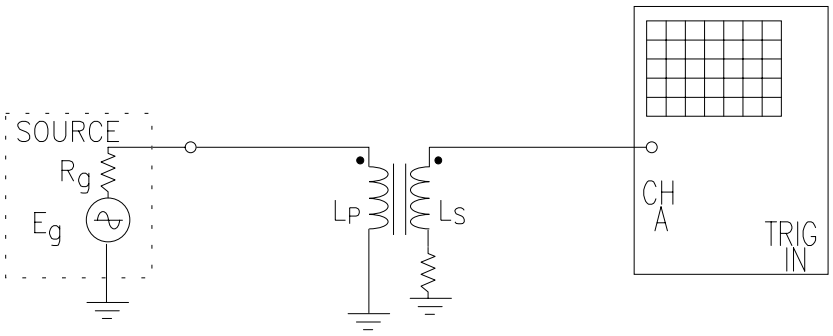
RISE TIME

Rise Time is a parameter of concern in Pulse and Wideband transformers and Passive Delay Lines

RISE TIME MEASUREMENT (Tr): (Pulse Transformers)

The Time required for the pulse amplitude to increase from 10% to 90% amplitude is known as the Rise Time of the pulse transformer. Rise time is controlled by the dynamic parameters of the transformer and the circuit impedances. Rise time is related to the high frequency response of the transformer.

Rhombus Industries standard method for testing risetime of Pulse and Wideband transformers can be seen below in the schematic.



Both input and output impedances must be matched to the transformer.
The input voltage should be comparable to in circuit volatages of the system the transformer is to be used in.
The output signal is then adjusted to be 5 divisions vertical from ground (0% to 100% on scope).
The elapsed time is then measured from 10% to 90% of the leading or rising edge of the pulse.

To obtain the true rise time the rise time of the input signal must be taken into account. (Tr) of the transformer under test use the following equation:

$$Tr = \sqrt{Tro^2 - Tri^2}$$

RISE TIME MEASUREMENT (Tr): (Passive Delay Lines)
Rise Time measurements are very similar to those done with wideband transformers. However, due to the sensitivity of the measurement, special considerations of the test equipment used should be kept in mind.

TEST EQUIPMENT:

The following test equipment is the minimum recommended for testing of passive delay lines:

1) Minimum 350 MHz bandwidth, dual channel oscilloscope.

2) Pulse Generator capable of 1.0 ns Rise Time .

3) Voltage probe with impedance of approximately 10 times the impedance of the delay line under test and capacitance less than 3 pf.