

RADIANT'S THIN FILM PIEZOELECTRIC TEST BUNDLE (e31)

Radiant's Thin Film Piezoelectric Test Bundle accurately determines the e31, d31 and e33 coefficients for piezoelectric thin films with 2% reload uniformity.

THE THIN FILM PIEZOELECTRIC TEST BUNDLE MEASURES THE PIEZOELECTRIC COEFFICIENTS OF THIN PIEZOELECTRIC FILMS DEPOSITED ON CANTILEVERS. VOLTAGES APPLIED TO THE PIEZOELECTRIC FILM WILL BEND THE SUBSTRATE IN VARIOUS DIRECTIONS. THE DISPLACEMENT IS CAPTURED BY A PHOTONIC SENSOR CONFIGURED TO CAPTURE THE MOTION OF THE CANTILEVER TIP. RADIANT'S BUNDLE ACCOMMODATES 72MM (4") AND 43MM (2") CANTILIVERS.



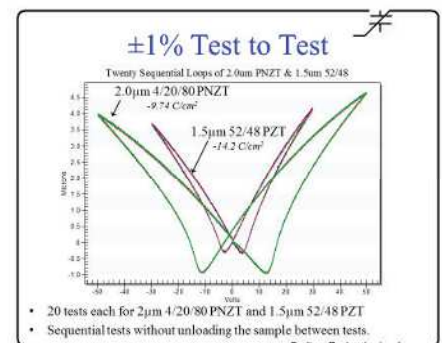
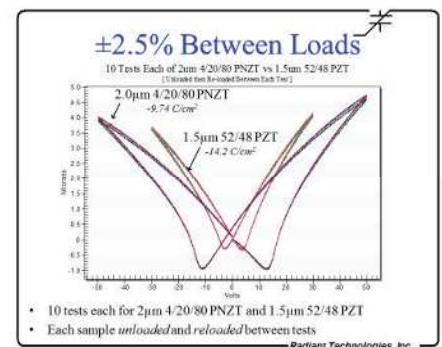
Standard TF-PTB Test Fixture

Three types of measurements can be taken with the Thin Film Piezoelectric Test Bundle and a Radiant Precision Test System.

- 1). Determines cantilever tip displacement as a function of voltage.
- 2). The second type of test that can be executed is a direct d31 measurement. This is accomplished by forcing the cantilever tip to move while recording the charge generated by the piezoelectric capacitor as it is stressed.
- 3). Measures e33 if interdigitated electrodes are used..

Features:

- **ACCURATE**
Reproducible to 1%, unload and reload to 2%.
- **INEXPENSIVE**
- **REPRODUCIBLE**
No variance for re-loading same sample.
- **SIMPLE TO OPERATE**
- **VERSATILE**
Thin film or bulk, production or research.
- **FLEXIBLE**
The Thin Film Piezoelectric Test Bundle will accommodate various sample geometries.



Measurements with the Thin Film Piezoelectric Test Bundle Include but are not limited to:

■ e31, d31, e33 vs Thickness

■ Displacement vs Voltage

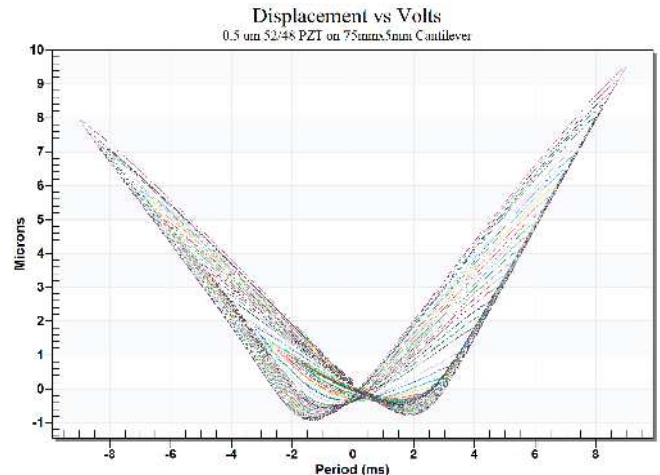
■ Piezoelectric Fatigue

■ Piezoelectric Ageing

■ Composition Comparison

■ Process Monitoring

■ Multiple Plotting and Averaging



Thin Film Piezoelectric Test Bundle Includes:

■ THIN FILM PIEZOELECTRIC TEST FIXTURE

■ PIEZOELECTRIC DISPLACEMENT SENSOR

Radiant's Piezoelectric Photonic Specifications:

1 micron with a range of 6mm. The Piezoelectric Displacement Sensor analog output is calibrated to generate 5 microns/volt (or $\approx 0.2V/\text{micron}$) on the near side slope. When the Piezoelectric Displacement Sensor analog output is connected to a Precision Test System Sensor port that output voltage is measured by an ADC whose resolution is 0.3mV per step.

■ ADVANCED PIEZOELECTRIC SOFTWARE

Advanced piezoelectric software executes automated tests and provides clean displacement measurements for thin piezoelectric films or piezoelectric MEMs. The software can be configured for different measurements and generate multiple plots at the touch of a button. It corrects multiple measurements for test stand drift and then averages/smooths the measurements to correct high and low frequency noise.

Radiant provides prefabricated bottom electrodes and other services to assist the researchers to measure the piezoelectric coefficients of their films.

For more information about Radiant Technologies, Inc product line, see www.FerroDevices.com