RADIANT TECHNOLOGIES, INC.

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# Premier II

World's leader in **Ferroelectric Technology**

*The Precision Premier II, Radiant's most advanced tester, has the largest envelope in terms of frequency response, voltage range, and accuracy of any ferroelectric tester in the world.*


## Premier II Specifications include

- ±10V output (100V and 200V optional)
- 16-bit Arbitrary Waveform Generator output
- 100 points in 100µs direct capture
- 100 points in 10µs using interlace feature
- 1000 points in 30 seconds
- Pulse Widths down to 1µs and up to 1s
- 2 COMM channels for controlling high voltage amplifiers.
- 2 external 18-bit, ±10V SENSOR voltage inputs.

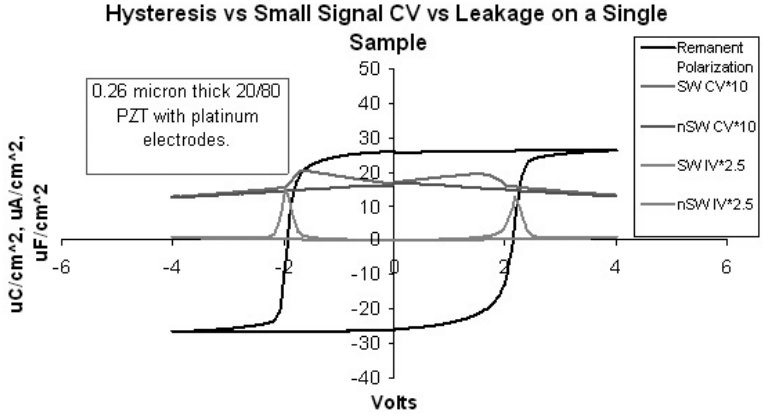
## Premier II Performance Summary

The Precision Premier II tester is capable of executing a single pass hysteresis loop in 100µs with no interlacing of the data acquisition. The Premier II uses a 40MHz clock through a down counter resulting in an effective maximum clock rate of 10MHz. The capture rate for the 18bit ADCs in the system is 2MHz.

The driver for the Premier II will be able to interlace multiple loops to generate an effective capture rate of 10MHz on hysteresis and a total loop period of 10µs. This hysteresis measurement will be compatible with the loops measured by all of the Precision testers made by Radiant. The Premier II will execute a PUND pulse measurement with pulse widths ranging from 1µs up to 1s on capacitors with areas ranging from 0.5µ2 up to multiple square centimeters. The Premier II will run all of the other measurement tasks now available in Vision including small signal CV, IV, leakage, remanent hysteresis, fatigue, imprint, retention, voltage breakdown, piezoelectric displacement, and others.

## Vision Software Operating System

Vision can construct complex programs with any number of tests to characterize all aspects of the sample in one execution while keeping track of the measurement results and the history of the sample being tested. Each Radiant tester is an extension of Vision and can execute any of the measurement tasks in the Vision Library. The type of tester determines the range of voltages, frequencies, and sample sizes that Vision may characterize with that tester. Only with a Radiant Precision tester can the researcher produce the plot below, executed in one hour on a Precision II. The data shows the relationship in a single sample between the remanent polarization state and the values of its small signal capacitance and leakage.



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## The Vision Task Library Includes:

- Hysteresis, Leakage, Charge, Retain, Resist,
- Fatigue, C(V), PUND, Imprint and Leakage Current
- Link multiple tasks to create a custom program
- Networking features allow researcher to share data from anywhere in the world
- Continuously variable pulse widths and hysteresis periods

## Dimensions:

- Width-17” x Depth-13” x Height-4”
- Weight 20lbs

## Hardware Specifications

| TESTER PARAMETER | MULTIFERROIC |
|---|---|
| Voltage Range (no external amp) | ±200V |
| Voltage Range (w/external amp) | ±10KV |
| Number of ADC Bits | 18 |
| Minimum Charge Resolution | 0.8fC |
| Minimum Area Resolution (assuming 1 ADC bit = 1μC/cm2) | 0.08μ2* |
| Maximum Charge Resolution | 5.26mC |
| Maximum Area Resolution (assuming saturation polarization = 100μC/cm2) | 52.6cm2 |
| Max Charge Resolution w/HVI | 526mC |
| Maximum Area Resolution (assuming saturation polarization = 100μC/cm2 | >100cm2 |
| Max Hysteresis Frequency | 100KHz |
| Min Hysteresis Frequency | 0.03Hz |
| Minimum Pulse Width | 1.0μs |
| Minimum Pulse Rise Time (5V) | 400ns |
| Max Pulse Width | 1s |
| Max Delay between Pulses | 40ks |
| Internal Clock | 25ns |
| Minimum Leakage Current (assuming maximum current integration period = 20 seconds) | 2pA |
| Maximum Small Signal Cap Freq. | 1MHz |
| Minimum Small Signal Cap Freq | 1Hz |
| Output Rise Time Control | 105 scaling |
| Input Capacitance | ~60fF |
| Electrometer Input | Yes |

**Minimum Area under actual test conditions will be higher*

 