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Premier II Specifications include

- » $\pm 10V$, 30V, 100V, 200V and 500V built in output (10kV option)
- » 16-bit Arbitrary Waveform Generator output
- » 100 points in 100 μs direct capture
- » 100 points in 10 μs using interlace feature
- » 1000 points in 30 seconds
- » Pulse Widths down to 0.5 μs and up to 1s
- » 2 COMM channels for controlling high voltage amplifiers.
- » 2 external 18-bit, $\pm 10V$ SENSOR voltage inputs.

Premier II Ferroelectric Test System

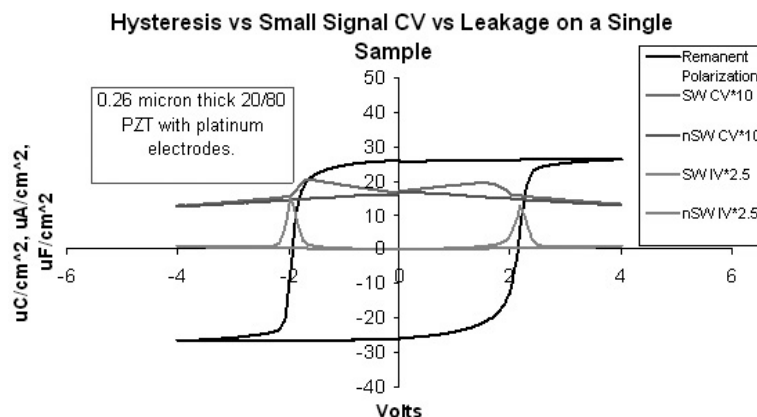
Premier II Performance Summary

The Precision Premier II, is one of Radiant's most advanced testers. The Premier II offers one of the largest test envelopes in terms of frequency response, voltage range, and accuracy of any ferroelectric tester in the world.

- The Precision Premier II tester is capable of executing a single pass hysteresis loop in 100 μs 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 maximum hysteresis frequency of the Premier II is 250kHz .
- The driver for the Premier II interlaces multiple loops to generate an effective capture rate of 10MHz on hysteresis and a total loop period of 10 μs . This hysteresis measurement is 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 0.5 μs up to 1s on capacitors with areas ranging from 0.5u2 up to multiple square centimeters.

Vision Software Operating System

- The Premier II is driven by Vision Software. Vision Software tasks include, but are limited to small signal capacitance, CV, IV, leakage, remanent hysteresis, fatigue, waveform, imprint, retention, voltage breakdown, piezoelectric displacement, and others. Optional Testing Packages for Magnetoelectric, Piezoelectric, Transistor, Pyroelectric/Thermal applications are available.
- 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.





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)	±10V, 30V, 100V, 200V, 500V
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)	0.08μm2*
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	250KHz*
Min Hysteresis Frequency	0.03Hz
Minimum Pulse Width	0.5μs
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 - +/-3.5% accuracy 1pA- +/-15% accuracy
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. 250KHz on 100 sq micron capacitor