

# Barth Model 4003 TLP+™

## Pulse Curve Tracer



### System Components

- ☞ Tektronix 1 GHz, 2 channel, digitizing oscilloscope
- ☞ High reliability Barth Electronics control box/pulse generator
- ☞ Keithley Picoammeter/voltage source
- ☞ Dell Precision Workstation - Test control computer
- ☞ LabView® runtime control and analysis software
- ☞ One year warranty on the entire system
- ☞ One year BSSP Barth Software Subscription Program

### Accuracy

Special Barth wide bandwidth pulse current and voltage sensors provide a high standard of measurement capability for ESD test equipment.

The complete system has been built with special attention paid to minimizing losses in the test circuitry and the coaxial cable connections. This results in low internal resistance at the device under test (DUT), for high accuracy measurements.

Barth's software allows users to make manual leakage delay adjustments, and allow for leakage test voltages up to 500V.

The software includes voltage & current waveform capture, automatic calibration / compensation, automatic data save, save / recall operator set-ups, auto or manual axis scaling, single or multi-point leakage testing (configurable), adjustable measurement window, dynamic resistance calculator, recall data function for compare & analyze of multiple tests, 2 channel scope (4 channel optional), save / recall pulsing "profiles", scope auto-SPC (signal path compensation), and numerous other features.

The BSSP (Barth Software Subscription Program) provides periodic software updates and improvements. This assures your system is in peak operating condition. Test speed increases and efficiency improves. Improve system capability with regard to calibration, reporting, and system diagnostics: all available with BSSP.

The Barth Model 4003 TLP+™

Pulse Curve Tracer precisely characterizes the ESD robustness of silicon chip protection circuitry.

Programmed rectangular pulses are applied to the device under test, resulting in a computerized plot of current vs voltage.

A leakage measurement can be made after each pulse to obtain the leakage evolution current versus pulse voltage.

Set up for packaged device testing; an optional dual wafer probe (Model 45002WP), permits wafer level testing. Other options and accessories are also available.

### How It Works

To use the Pulse Curve Tracer, the operator enters the desired test parameters via keyboard, such as starting voltage, current and voltage limits, voltage step increments, pulse risetime, leakage test voltage, and pulse width. The test then proceeds automatically, controlled by Barth software developed with National Instruments Labview®. The operator can halt and resume the testing and can view the plotted test data points as the test proceeds. The operator can also view (during testing or afterward), voltage & current waveforms, single point or multi-point leakage evolution, test set-up parameters, or numerical data information. The active test and several previous tests' data points may be viewed simultaneously on the I/V plot.

Hardcopy printouts listing data point values and showing plotted results using operator selected scaling are immediately available in a presentation ready format at the end of a test.

## Specifications

- Ⓢ Pulse current: 20 amps @ short circuit; 0-10 amps @ 50Ω load, 30A options available
- Ⓢ Pulse width: 75ns to 150ns standard; 500 ns option available
- Ⓢ Standard pulse width of 100ns (and 75ns) is supplied with the tester. Pulse width is manually selectable
- Ⓢ Pulse voltage: 0-500 v @ 50Ω load, 1000 v @ open circuit (step increments:  $\geq 0.05v$ )
- Ⓢ Pulse risetime: (10-90%): 0.2, 2, 10 ns (built-in, software selectable) optional rise time filter values are available
- Ⓢ Pulse rate: Up to 20 test pulses per minute
- Ⓢ Leakage voltage: 0 to +/-500v (Model 6487), +/-200v (Model 2400),
- Ⓢ Leakage current sensitivity: 10-12 to  $2.5 \times 10^{-3}$  amps (Model 6487)
- Ⓢ Source impedance: 50Ω
- Ⓢ Load Impedance: any load
- Ⓢ Selectable mains power: 100,120 vac@5amps; 220,240 vac@3amps, 50 to 60 Hz (USA default:120 vac; 60 Hz)
- Ⓢ Switching control for 2 external channels is standard; switching control allows bias voltages to be applied or removed during the leakage test.

## Features and Benefits

### 50 Ohm Test System

Controlled 50-ohm impedance throughout the complete measurement chain of the test system minimizes the measurement errors associated with the usual 500-ohm resistor connections for ordinary TLP testers. Making measurements at 50-ohm impedance minimizes the effects of parasitics.

Just as the Barth 4003 TLP Pulse Curve Tracer connections to the packaged device sockets are constructed with a controlled 50-ohm impedance, the Barth TLP wafer probe also has a controlled 50-ohm impedance throughout its connections to the two needle contacts at any two pads.

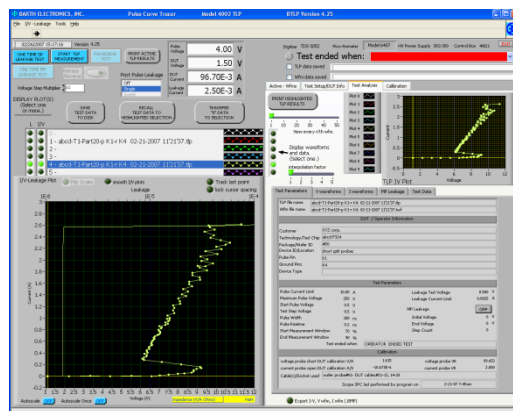
Testing the DUT directly from an, inherently low 50-ohm source impedance provides inherently higher pulse currents from a clean test pulse with no ringing or overshoot. A perfect sub nanosecond risetime pulse generator combined with low distortion measurement probes and controlled impedance connections allows the Barth Pulse Curve Tracer test system to gather accurate TLP data either on wafer or on packages.

### Screen Displays

One of the 8 display screens is shown below.

All 8 screens display the active I-V test data and data for up to 5 recalled tests (on the left half of the screen).

The left side display shows both the I/V curve and leakage evolution. The right side display can also show: V & I waveforms, single or multi-point leakage evolution, operator info, test parameters, numerical test-point data, or calibration values.



This Product  
Features  
**ZAPLESS™**  
Barth Resistors

### Data Storage

Data is automatically stored to hard disk in comma delimited format and can be recalled for viewing or transferring to disk. Data is automatically time/date stamped when saved.


### Hardcopy Printout

Hardcopy color printouts list data point values and show plotted results using operator selected scaling; they are immediately available in a presentation ready format at the end of a test.

### Size and Weight

System is approximately 19" x 19" x 19" w/scope. Total weight including Control Box and scope is approximately 75 lbs. (Weight does not include computer.)

- Ⓢ Options and Accessories are available.

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