GRUND TECHNICAL SOLUTIONS

Superior ESD Testing Solutions

PurePulse Transmission Line Pulse Module

PurePulse Foundation

"All Waveform" ESD System

A unified modular system that provides ALL 2-pin ESD testing for packaged parts, bare die, and wafer level devices

Expandable **to provide** ***comprehensive testing*** **for Compliance to ESD Standards and Engineering Evaluation of design issues and new technologies**

PurePulse TLP provides high resolution testing of packaged and wafer IC devices by applying 100 nanosecond rectangular pulses of increasing amplitude for device characterizations per the Electrostatic Discharge Association's Standard Test Method ANSI/ESD STM 5.5.1.

Using the GTS PurePulse foundation resources, both the current into the DUT and the voltage across the DUT are measured during each pulse. All waveforms are recorded and saved and a pulsed I-V curve is produced. Excel® reports are automatically generated.

A 50 Ω cable output and controlled impedance path through the PurePulse Smart Router provides repeatable pulse delivery and minimizes pulse reflection distortions.

Typical TLP data is used to evaluate HBM protection designs, so software switchable rise times of 2 ns and 10 ns is provided to evaluate the full range of HBM stressing. High current pulses allow stress testing to current levels of 20 kV HBM pulses.

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PurePulse TLP Advantages

High accuracy 100 nanosecond TLP testing

- Pulses without overshoot or ringing for repeatable data
- Pulse resolution supports steps of 0.1 V for high resolution

Low noise current and voltage measurements

- Current measurement with wide range inductive probes
- Measurement *at the DUT* with a voltage pickoff probe

Flexible wafer probes

- Compatible with all packaged and wafer DUTs
- Also cable connections for DUTs on test fixture boards

Flexible stress induced failure detection

- Define limits on increase and/or decrease of DC parameters in any combination percentages changes or absolute amounts
- Device measured between TLP pulses with 5 digit resolution DC leakage at an unlimited number of voltages
- Programmable DC curve tracing
- Choice of forcing currents or voltages with compliance limits

Member of the GTS PurePulse family of products

- Maestro control and analysis application software
- Easy to use graphical interface software
- Intelligent oscilloscope setting optimization with algorithms for noise reduction
- Microprocessor controlled high voltage supply for voltage stepping and pulse timing
- Network capable for data transfer and remote analysis
- Optional automation with probe station and/or flying probes

Performance backed by the GTS team support

- Over 25 years of combined TLP design experience
- GTS engineers developed the first commercial systems providing Kelvin probing, high impedance switched TLP, and TLP probe cards with local matrix switching

PurePulse Transmission Line Pulse Module

TECHNICAL DETAILS

The Transmission Line Pulse test is unique in ESD testing because of its highly accurate measurement of DUT response from milliamperes to many amperes at short time frames that can't be done with DC curve tracing. This allows users to trace device characteristics showing the turn-on of snapback devices, diode clamping, and high current breakdown of ESD protection structures.

The GTS PurePulse TLP module is a new design to generate rectangular stress pulses which can be applied to ICs in a consistent and reproducible manner. Low noise measurements are made at the DUT for voltage and current during the pulse and these waveforms as a function of time is displayed. The traditional current vs. voltage diagrams with multiple leakage measurements are generated from a user defined set of stress levels.

GTS TLP pulse generator is unique in not using mercury or other restricted or dangerous materials in its construction. Mercury is a banned substance on airlines and its use is limited or regulated in many states. GTS employs an advanced reflected pulse attenuation method that reduces the risk of DUT damage from re-reflected pulses that otherwise can produce false failures and erroneous measurements. Advanced calibration methods provide higher accuracy.

TLP options support special testing needs, and new device testing requirements are welcomed at GTS. Available options include multiple TLP impedances, multiple pulse widths, and multiple pulse rise times, all under Maestro software control. Optional Kelvin voltage measurements provide exceptional DUT voltage measurements. GTS' advanced design allows options and other ESD pulse waveforms (HBM, MM and HMM) to be switched in and out under software control and without changing cables. This eliminates operator error.

SPECIFICATIONS

Pulse Rise Times	2 and 10 ns (10% to 90%) rise times, computer selectable
Pulse Width	100ns ±1 ns
Impedance	50 Ω delivery standard
TLP style	TDR-O pulse measurement standard
Current	50 A maximum into a short circuit, 25A into a 50 Ω load
Voltage	0.5 to 20 V in 0.1 V steps, 20 to 100V in 0.5 V steps, 100 to 2500 V in 1 V steps, into an open circuit, positive and negative
Power and Control	Provided through GTS PurePulse platform (all-in-one PC with Maestro software, System Controller for high voltage, Gigabit Switch for PoE and 24V, and Smart Router)

OPTIONS

Failure Detection	Any Keithley 2400/2600 series or Keysight B2901A SMU (K2400 standard)
Wafer Test Kits	Probes and cables and micropositioners
High Impedance	100 and 500 Ω operation for low currents at high voltages/low reflections
True Kelvin Probes	Replacing the standard quasi-Kelvin probes
Pulse Rise Times	Custom rise times, selectable through software (2ns and 10 ns standard)
Pulse Widths	Custom widths available, changeable manually or through automation

It's not how fast you test, it's how accurately you test fast!

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