

Power-Switching Dynamic Test System for Device Reliability and Performance Characterization

The Accel-RF High Voltage Power Switching Test Platform is capable of measuring device reliability under a variety of conditions for switching power applications up to 1kV (off) and 25A (on) at rates up to 1-MHz switching frequency, dependent on voltage. By leveraging technology developed for fast switching measurement techniques, the HV Platform can support testing of multiple devices at elevated temperature stimulus in a small physical area. The system offers the flexibility to test both soft- and hard-switching applications with an easy to remove, plug-and-play DUT fixture. The Accel-RF Power-Switching System is the most flexible and accurate power-switching platform available for intrinsic reliability and burn-in quality assurance test programs.

Testing Tomorrow's Technology Today

Highlights

PRF

- Up to 20kHz at 600V
- Up to 1MHz maximum
- Dependent on V_{DSOFF} and C_{DS}

Off-State Voltage

- 100V to >1KV pulsed or CW

Supports Multiple Packages

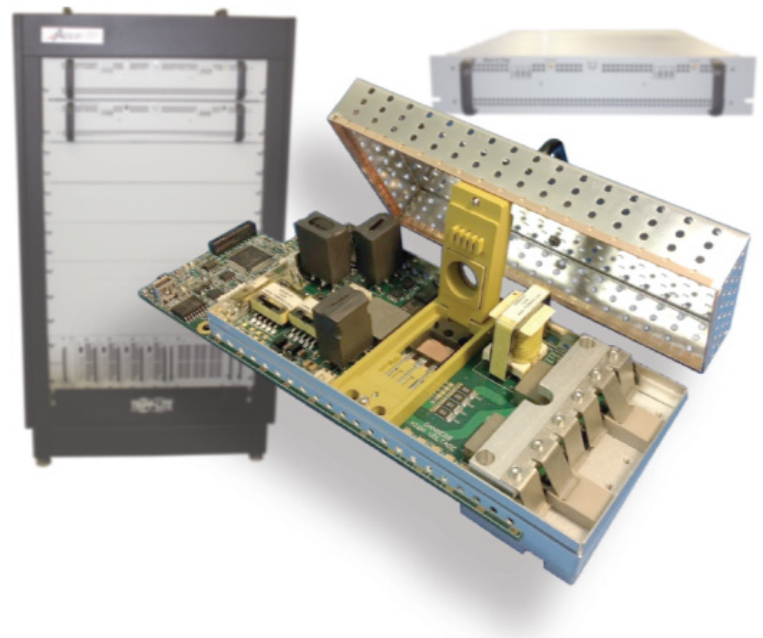
- TO-220
- TO-247
- SMD (e.g. U4A or ThinPAK)
- Custom Package SMD

Multiple Stimulus Modes

- Hard and Soft Switching
- Separate designs

Up to 8 Channels per 3U Rack Tray

Up to 24 Channels per Platform



Heater Control Unit		
Useable Range Settability, Accuracy Stability or Drift	+50°C to 200°C +/-2.5°C <2°C in 200 hrs	After correlation calibration and across the block of two devices assumes constant DUT load power dissipation between 10% and 90% duty factor operation
Setting Time Overshoot	<60 minutes <10°C	Assumes constant DUT load power dissipation
Power Control Unit		
Drain Voltage (ON state) Operational Range Pulsed Measurement Accuracy Pulsed Measurement Drift	+0 to +4V +/-1% FSR (w/ averaging) <1% FSR in 100 hours	Note: Limited by ARF Bias1 supply Assumes 4V at 25A across DUT (maxRON = 0.1Ω) ->+/-40.0mV ->40mV
Drain Current (ON state) Pulsed Operational Range Settability, Resolution (ripple current) Settability, Accuracy Source Drift Pulsed Measurement Accuracy Pulsed Measurement Aperture Pulsed Measurement Settability (time) Pulsed Measurement Drift	0 to +25A +/-5% FSR 1% of target, or 10% FSR <1% FSR in 100 hrs +/-5% FSR (w/averaging) 400ns min 10ns <2% FSR in 100 hrs	Note: Limited by ARF Bias1 supply Peak current at 50% DF (ave. current 12.5A max and V _{DUT} ≤5V) Power Supply (max) = 125W/channel (goal to 250W/channel) DF can be set to 100% for 12.5A CW ->+/-800mA (limited by ripple current) whichever is greater (average current) ->250mA (average) ->+/-1A ->500mA
Drain Voltage (OFF state) Operational Range Settability, Resolution Measurement Accuracy Source Drift Measurement Drift	+100 to +1200V +/-1% FSR +/-2% FSR <1% FSR in 100 hrs <2% FSR in 100 hrs	Note: Sourced by ARF Bias2 supply FSR = 1kV Note: at ps <+ 200uA ->+/-12V ->+/-24V ->12V ->24V
Drain Current (OFF state) Operational Range Measurement Accuracy Measurement Drift	0 to 200 uA +/-1% FSR (w/averaging) <1% FSR in 100 hrs	Note: Sourced by ARF Bias2 supply. Leakage current is measured periodically by halting and pulsing to make this measurement ->+/-2uA ->2uA
Gate Voltage Operational Range Settability, Resolution Measurement Accuracy Source Drift Measurement Drift	-15 to +15V +/-1% FSR +/-1% FSR (w/averaging) <1% FSR in 100 hrs <1% FSR in 100 hrs	Note: Sourced by ARF Bias3 supply ->+/-300 mV ->+/-300.0 mV ->300.0 mV ->300.0 mV
Gate Current Operational Range Measurement FSR (Leakage) Measurement Accuracy (Leakage) Measurement Drift (Leakage)	13μA to +13μA +/-13uA +/-1% FSR (w/averaging) <1% FSR in 100 hrs	Note: Sourced by ARF Bias3 supply. Leakage current is measured periodically by halting the pulsing for up to 100ms to make this measurement Note: Includes gate driver power ->+/-130 nA -> 130 nA
SPA Correlation		
	1% of target, or V _{dif} <2mV (I _{dif} <5μA)	Whichever is greater (as compared to same measurement made on bench setup using resistive load) Note: Due to large ON-state currents, local drain circuitry is always connected; however, MOSFET switches are turned OFF. Some load capacitance must be anticipated.
DC Pulsing		
Pulse Width Pulse Period Duty Factor Drain HV Rise/Fall Time (10-90% points) Edge Settability	0.5μs to 1ms 1μs to 1ms 20% to 80% <200ns 10ns	measured at the 50% points measured at the 50% points; PRF depends on high voltage HV level and DUT C _{DS} for C _{DS} < 100pF; PRF ≤ 7.2e9 / (HV) ² Hz Test condition: +600V (Fall time limited by device Ron dynamics) applies to all rising and falling signals; discrete steps programmable from computer