



# SMT Electrical Lab Capabilities

AS6171 // ISO 17025 Certified

12/16/2022

## 1. In-House Design

- PCB/Hardware
- Software Development

## 2. Passive Components

- Frequency Range: 10Hz to 120MHz
- Resistance, Capacitance, Inductance, Impedance, Q Factor.
- Surface Mount Fixtures: Chip (0201 to 1206), Tweezer (0402 and larger)
- Through Hole Fixtures (Alligator Clips, Radial Lead)

## 3. RF

- Frequency Range: 300kHz to 13GHz Frequency Range
- Device Examples:
  1. MMICs, Power Amplifiers, Filters, Multiplexers, Quadrature Modulators

## 4. Discrete Semiconductors

- 3000V to 50A testing capability
- ~1pA current measurement capability
- DC and Pulse (300 $\mu$ s) capability
- Lecroy WavePro 7300 Oscilloscopes - 3GHz Bandwidth for timing measurements
- Diode Reverse Recovery Time

## 5. Integrated Circuits (Small and Large Scale)

- National Instruments PXIe 6555/6556 - 200MHz up to 192 Channels
- National Instruments PXIe 4 Channel SMUs ( $\pm 6V$  to  $\pm 24V$ ,  $\pm 500mA$  to  $\pm 150mA$ )
- Lecroy WavePro 7300 Oscilloscopes - 3GHz Bandwidth for timing measurements
- Advantest V93000 - 1.6Gbs Data Rate, 512 Channels (Upgradable to 2048 Channels)
- Device Examples:
  1. DRAM (SDRAM, DDR, DDR2, DDR3, DDR4)
  2. Flash (NOR, NAND, SPI, I<sup>2</sup>C, PROM, EPROM)
  3. SRAM
  4. FPGAs
  5. Microprocessors
  6. Microcontrollers
  7. 5962 Microcircuits
  8. Logic
  9. Analog (Multiplexers, Op Amps, Voltage Regulators, ADC/DAC, ect)

## 6. Environmental Testing

- Burn-in testing per MIL-STD-883 Test Method 1015 (Static and Dynamic)
- Temperature Cycling per MIL-STD-883 Test Method 1010

## 7. Memory Blank Checking and Programming



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## Equipment Capabilities:

Source-Measure Units	Range	Measurement Accuracy
Keithley 2657A	$\pm 3\text{kV}$ at $\pm 20\text{mA}$ $\pm 1.5\text{kV}$ at $\pm 120\text{mA}$	Current $\sim 1\text{pA}$ Voltage $\sim 50\text{mV}$
Keithley 2651A	$\pm 40\text{V}$ at $\pm 50\text{A}$	Current $\sim 500\text{pA}$ Voltage $\sim 300\mu\text{V}$
Keithley 4200-SMU	$\pm 210\text{V}$ at $\pm 100\text{mA}$	Current $\sim 30\text{pA}$ Voltage $\sim 15\text{mV}$
Agilent B2902A	$\pm 210\text{V}$ at $\pm 100\text{mA}$ $\pm 21\text{V}$ at $\pm 1.515\text{A}$ $\pm 6\text{V}$ at $\pm 10.5\text{A}$	Current $\sim 50\text{pA}$ Voltage $\sim 225\mu\text{V}$
National Instruments PXIe-4143	$\pm 24\text{V}$ at $\pm 150\text{mA}$	Current $\sim 400\text{pA}$ Voltage $\sim 1.2\text{mV}$
National Instruments PXIe-4144	$\pm 6\text{V}$ at $\pm 500\text{mA}$	Current $\sim 6\text{nA}$ Voltage $\sim 10\text{mV}$
National Instruments PXIe-4145	$\pm 6\text{V}$ at $\pm 500\text{mA}$	Current $\sim 1.2\text{nA}$ Voltage $\sim 600\mu\text{V}$
National Instruments PXIe-4139	$\pm 60\text{V}$ at $\pm 10\text{A}$	Current $\sim 100\text{pA}$ Voltage $\sim 50\mu\text{V}$
National Instruments PXIe-4130	$\pm 20$ at $\pm 2\text{A}$ $+6\text{V}$ at $+1\text{A}$	Current $\sim 100\text{nA}$ Voltage $\sim 1.5\text{mV}$

Power Supplies	Range
National Instruments PXIe-4112	$+60\text{V}$ at $+1\text{A}$
National Instruments PXIe-4113	$+10\text{V}$ at $+6\text{A}$
National Instruments PXIe-4110	$+6\text{V}$ at $+1\text{A}$ , $+20\text{V}$ at $1\text{A}$ , $-20\text{V}$ at $-1\text{A}$
Sorensen XHR 33-33	$+33\text{V}$ at $+33\text{A}$

Oscilloscopes	Specifications
Lecroy WavePro 7300A	4 Channels, 3GHz Bandwidth Active and Passive Probes

RF	Specifications
Agilent N5321A	4 Port Parameter Network Analyzer 300KHz to 13GHz
National Instruments PXIe-5644R	1 Port Vector Signal Transceiver System 65MHz to 6GHz

Function Generators	Specifications
National Instruments PXI-5402	14-Bit 20MHz Function Generator Sine, Square, Triangle, and Ramp $\pm 5\text{V}$



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Multimeters	Specifications
National Instruments PXI-4071	7.5 Digit Multimeter
National Instruments PXI-4072	6.5 Digit Multimeter
HP/Agilent 34401A	6.5 Digit Multimeter

Passive Testing	Specifications
Keysight E4990A	Impedance Analyzer: 20Hz to 120MHz
Keysight E4981A	Capacitance Meter: 120Hz to 1MHz
QuadTech 7600	LCR Meter: 10Hz to 2.2MHz

Small Scale Digital Testing	Specifications
National Instruments PXIe-6555/6556	24-Digital Channels at 200MHz PPMU: -2V to 7V at $\pm 35\text{mA}$ Current $\sim 200\text{nA}$ , Voltage $\sim 11\text{mV}$ SMT has a total of 8 units (192 Total Channels)

Large Scale Digital Testing	Specifications
Advantest V93000 SOC System A Chassis	512-Digital Channels (Upgradable to 1024) Data Rates up to 1.6Gbs (800MHz CLK) MSDPS Power Supply: $\pm 8\text{V}$ at $\pm 8\text{A}$ PPMU: -3V to 8V at $\pm 65\text{mA}$ Current $\sim 1\text{nA}$ , Voltage $\sim 1\text{mV}$
Advantest V93000 SOC System C Chassis	512-Digital Channels (Upgradable to 2048) Data Rates up to 1.6Gbs (800MHz CLK) DPS64 Power Supply: -2.5V to +7V at $\pm 8\text{A}$ PPMU: -3V to 8V at $\pm 65\text{mA}$ Current $\sim 1\text{nA}$ , Voltage $\sim 1\text{mV}$

Temperature Forcing Units	Specifications
Temptronic Corp ATS-810-M-4	-80°C to +225°C at $\pm 1^\circ\text{C}$ Transition Rates: -55°C to +125°C in 10 seconds
MPI Thermal TA5000A	

Hi-Pot Testing	Specifications
Vitrek V74	5KV AC/DC, 30A Ground Testing

Temperature Chambers	Specifications
Thermo Scientific Heratherm OMH100-S	25°C to 330°C at $\pm 1.3^\circ\text{C}$
TPS Tenney T2C	-75°C to 200°C at $\pm 1^\circ\text{C}$

Discrete Semiconductor	Specifications
Avtech AVR-EB4-B	Diode Reverse Recovery Tester ( $t_{RR}$ ) +2A, -4A, 4.5ns transition time