# TEST SYSTEMS

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#### Setting the Test Standard for Tomorrow

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#### **Solutions from Wafers to Package Parts**





Die/Module



Package Parts







BIB



WaferPak



#### Aehr Product Portfolio of Test & Burn-in Systems





FOX- **P** WaferPak Contactor & DiePak Carrier

Engineering & NPI Dual Wafer Test & Burn-In System



FOXCP FOXIP

Single Wafer Test & Burn-In System



FOXXP

Multi Wafer & Singulated Die Test & Burn-In System



ABTS Burn-in Board



ABTS-L 72 Slot Test & Burn-In System



ABTS-P 36 Slot High Power Test & Burn-In System



64 Slot High Power & Voltage Test & Burn-In System



# **MAX5 Burn-in Test System**

Serving the High Voltage Power Devices, Automotive, and IoT markets with:

- 48 slots (each is its own pattern zone)
- Up to 9 power supplies per BIB
- High Voltage Options
- 128 bi-directional test channels
- Advanced DUT Monitoring
- DUT Current Measurements
- Individual Thermal Control
- Simple and Complex Test Plans
- GUI Programming interface
- Optional MAX3-compatible config





# **High Voltage Done Safely and Effortlessly**

- Up to 1,000V, 1,600V, and 1,900V options
- Designed for safety
  - Operator safety protections
  - Safety interlocks and emergency off
  - Clearances and creepages to prevent arcing
  - Isolated HV power sources and returns
    - Over voltage, over current protection
    - Short circuit protection
    - Output arcing protection
  - Software monitoring for OV, OC, OT
- Compliance with safety standards
  - IEC 62368-1 (aka UL-62368-1)
  - SEMI S22, IEEE 510-1983
- HV BIBs are supplied by Aehr Test Systems



# **Fine Tune Your Burn-in Strategy**

with real-time Voltage and Current measurements PER DUT

# Measure voltage or current PER DUT

- Voltage measurement: 1mV to 2,000V
- Current measurement: 1uA to 100A
- Optimize stress voltage & BI time
- Automatically datalog measurements
- Identify failures when they happen
- Programmable shutdown on fail







# **Know How Your Devices are Performing Under Stress**

- Real-time monitoring & testing during burn-in
  - Expected data compare
  - Sign of life detection
  - Voltage measurement
  - Current measurement
  - Temperature measurement
- Fault trigger and logging
- Shutdown trigger and logging





#### **MAX5 Chamber**



- Up to 64 Slots (48 slots for HV option)
- 1.8" (45.7mm) or 2.4" (61mm) slot pitch
- Airflow: up to 6,000 cfm
- Burn-in Temperature up to 150°C
- Power Dissipation: Up to 36kW @ 150°C
- Safety features:
  - Electronic safety interlocks
  - High voltage shielding and barriers
  - EPO switches
- Optional compatibility with MAX3 BIBs



# **MAX5 DUT Power Supplies per Slot**

- Standard up to six PS Modules per slot:
  Available interchangeable PS modules:
  0.7 to 7.5V / 25A (200W max)
  1 to 20V / 15A (200W max)
  1 to 60V / 1A (60W max)
  Per PS or per DUT current monitoring
  - All PS are fully programmable
- Optional High Voltage Add-on per slot
  - Up to 1000V, 1600V, 1900V (200mA max)
  - Plus two floating +/- 32V (5A) PS
- Optional High Current Add-on per slot (future)
  - Additional six 4V @ 50A modules
  - Can be ganged in pairs for three 4V @ 100A







# **MAX5 Test Electronics per Slot**

- Each BIB is its own test zone
- Up to 128 bi-directional channels
  - Vector pattern/compare data channels
  - Analog measurement channels
- Pin driver electronics
  - Programmable VIH to 8V
  - Two programmable VIH levels
  - Two programmable Vth levels
  - High speed pin drivers
  - 64 timing sets, assign per pin
- Voltage & current measure
  - Per DUT measurement
  - Shutdown on over limit

- Software
  - GUI operating software, test plan programming and pattern development
- Pattern generator module
  - 128 channels, 32M vectors deep
  - NRZ, RZ, RO, Tristate
  - Up to 20MHz data rate (50ns)
  - Repeat and loop commands





# **MAX5** Communications, ITC, and Analog Options

- Individual DUT Temp Control (future)
  - T<sub>CASE</sub> or calculated T<sub>JUNCTION</sub> temp control
  - On-DUT thermal diode readout
  - Shutdown on temperature limits
  - On-socket heater, sensor & heatsink
  - Up to 150°C
- Communications
  - I2C engine for DUT comms
    - Bit-rate programmable
    - Up to 20Mbps
  - Fast program download

- Analog frequency generator (future)
  - Programmable sine & triangular wave up to 20MHz
  - Programmable amplitude & freq
  - Up to 8 distinct signals
- HF Clocks







#### **MAX5** Facilities Requirements (preliminary)





# **Applications Development (BIB and Programming)**



- Application Development:
  - 1. Specs review (electrical & mech.)
  - 2. Schematic and circuit design
  - 3. PCB layout and schematic capture
  - 4. SI simulation if needed
  - 5. Fabrication, assembly & BIB test
  - 6. Applications programming
  - 7. Product bring-up
- MAX5 BIB Dimensions:
  - 11.45"W x 24"L x 0.125"
  - Up to 24 layers
  - Up to 128 channels
  - HV up to 1,900V



#### **Installed Base and Support**

#### Aehr Test Systems Installed Base

- Over 2500 systems worldwide over 40 years
- Installations in Asia, Europe, and North America
- Customers include Tier 1 IDMs and OSATs

#### Worldwide Support

- USA: 7 service & apps engineers
- Philippines: 16 service engineers
- Taiwan: 5 service engineers
- China: 3 services engineers
- Korea: 1 service engineer
- Japan: 1 service engineer
- Contact: www.aehr.com





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