

# Test Solution for Semiconductor



# About Us

Products

Roadmap



Stack



Lab DP Tester



Module



ATE Tester



## About Us

After years of experience in the application and development of power devices, Firstack has conducted in-depth research on power semiconductor testing technologies, aligning with the latest requirements of WBG semiconductor industry. We provide professional and complete testing solutions for the industry. These solutions cover electrical parameter testing and screening from Wafer-level (WLBI), Die-level (KGD), Device/Module-level (ATE), to Application-level (DPT) and Dynamic-reliability testing (DHTG/RB), ensuring product performance and reliability screening for customers.



2011

Company Established



2018

Equipment Division Established



380+

Staff



130+

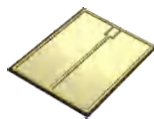
IPs



Discrete Device



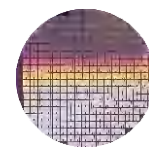
DGS+DRB Tester



Die



KGD Tester



Wafer



WLBI Tester





## One Stop Test Solution For Semiconductor



DPT Equipment



DGB&DRB Test Equipment

01

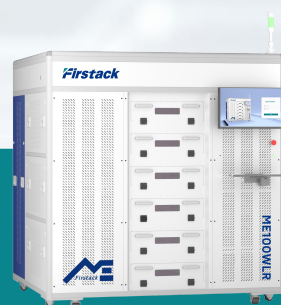
Laboratory

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Production Line



ATE



WLBI Test Equipment

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Laboratory

# ME400D

IGBT/SiC Device, Module, Stack  
DPT Equipment



## Product Description

The ME400D is an equipment for IGBT/SiC power modules, used for R&D and application dynamic characteristic test. The equipment can help manufacturers to test modules, quickly generate specifications and test reports. At the same time, the equipment can help module applications to evaluate electric drives or inverters, gate parameter self matching and incoming material inspection.

## Product Features



### General-type Intelligent Test Fixture

A single fixture can accommodate different packages by replacing adapter board, enabling wireless programming for  $V_{GS}$  and fault protection.



### Gate Parameter Self-matching

Parameters like  $V_{DC}$ ,  $I_C$ ,  $T_{vj}$ ,  $V_{GE}$ ,  $R_{GON}$ ,  $R_{GOFF}$ ,  $C_{GE}$  can be automatic adjusted, quickly fit the output characteristic curve of power modules, and identify gate parameters suitable for power stacks.



### DPowerTest Software

Supports multiple test items like S/DPT, RBSOA, short circuit, current-sharing, narrow pulse, etc. and offers high operational flexibility.



### Temperature Platform

The temperature control system is integrated, enabling safe dynamic test at  $-40\sim 200^{\circ}\text{C}$ .

## Product Specification

Model	ME400D-2k	ME400D-6k
DUT	IGBT, SiC MOSFET, Power Stack	
Test items	S/DPT, RBSOA, SCSOA, current-sharing, narrow pulse, phase calibration and parasitic inductance calculation, device comparison. ( $t_{don}$ , $t_r$ , $t_{on}$ , $t_{doff}$ , $t_f$ , $t_{off}$ , $E_{on}$ , $E_{off}$ , $di/dt$ , $dv/dt$ , $Q_g$ , $I_{rr}$ , $t_{rr}$ , $E_{rec}$ , $Q_{rr}$ , $P_{frd(max)}$ , etc.)	
Software	Report generation, wave form overlay, curve plotting, gate parameter self-matching, $V_{CEMAX}/I_{CMAX}$ safety limits, cycle/single-step control, etc.	
Pulse Width	$t_{1(on)} = 0.1\sim 600\ \mu\text{s}$ , $t_{2(off)} = 1\sim 50\ \mu\text{s}$ , $t_{3(on)} = 1\sim 50\ \mu\text{s}$ , accuracy $0.1\ \mu\text{s}$ , resolution $0.1\ \mu\text{s}$ .	
Fixture	Negative voltage $-20\sim -1\ \text{V}$ , resolution $0.1\ \text{V}$ ; positive voltage $10\sim 30\ \text{V}$ , resolution $0.1\ \text{V}$ ; total voltage: $15\sim 35\ \text{V}$ , resolution $0.1\ \text{V}$ ; Parasitic inductance $L < 10\ \text{nH}$ (for HPD); protection with online configuration; wireless programming	
Inductance	10/20/50/100/200/500 $\mu\text{H}$	
Temperature Range	$-55^{\circ}\text{C} \sim +250^{\circ}\text{C}$ , accuracy $\pm 5^{\circ}\text{C}$ , resolution $0.1^{\circ}\text{C}$ .	
Power Supply	AC 220 V, 6 kW	AC 220 V, 10 kW
Size&Weight	1450 mm (W) $\times$ 800 mm (D) $\times$ 1980 mm (H), 600 kg	

Laboratory

# ME100DHTXB

SiC Device, Module  
DGB&DRB Test Equipment



## Product Description

The ME100DHTXB is designed for dynamic bias reliability tests of SiC devices and modules. The equipment can help SiC products manufacturers perform DHTGB, DHTRB reliability tests. This equipment also assists third-party testing laboratories in conducting reliability certification tests according to AQG 324, AEC-Q101, JEDEC JEP184 and other standards.



## Product Features



### Fast Turn-On&Turn-Off Technology

Perfect match between high  $dV/dt$  and low overshoot:

DGB:  $dV_{GS}/dt > 1 \text{ V/ns}$ , no overshoot;

DRB:  $dV_{DS}/dt > 50 \text{ V/ns}$ , overshoot  $< 15\%$ .



### $dV/dt$ Thread-Controlled Adjustment Technology

"One-click" software operation for programmable adjustment of driving capability.

Enables online adjustment of  $dV/dt$  for devices with different packaging types.



### Accurate Parameter Measurement Technology

Each workstation is equipped with customized test circuits.

Real-time, accurate monitoring of parameters such as  $V_{GS(th)}$ ,  $I_{GSS}$ ,  $I_{DSS}$ , and others.



### Customized Test Combinations

The system features a cabinet, slot, and fixture free combination mode.

Each cabinet can be configured with DGB or DRB test functions.

## Product Specification

Model	ME100DHTXB
DUT	SiC discrete devices and modules in TO247-3/4, HPD, DCM and other packaging types.
Test Items	DHTGB, DHTRB, HTGB, HTRB. ( $V_{GS(th)}$ , $I_{GSS}$ , $I_{DSS}$ , etc.)
Software	Supports multi-stage pre-stress and multi-stage leakage current test condition settings; real-time display of result; over current, over voltage and over temperature protection; independent safety inter locking for slots.
Capacity	Each cabinet: 5 DGB slots or 4 DRB slots. Each slot: TO247 20 positions, HPD 6 positions, DCM 12 positions.
DGB Test Range	$V_{GS}$ : -40~40 V, FS: 0~100 kHz, $dV_{GS}/dt > 1 \text{ V/ns}$ , no overshoot. $I_{GSS}$ : 0.1 nA~100 mA, $V_{GS(th)}$ : 0~10 V, Duty Cycle: 0~100%
DRB Test Range	$V_{DS}$ : 0~2000 V, FS: 0~100 kHz, $dV_{DS}/dt > 50 \text{ V/ns}$ , overshoot $< 15\%$ . $I_{DSS}$ : 1 nA~100 mA, $V_{GS(th)}$ : 0~10 V, Duty Cycle: 0~100%.
Temperature Range	RT~200°C, uniformity $\leq 3^\circ\text{C}$ .
Power Supply	Three phase, AC 380 V/61 A, 40 kW
Size&Weight	Main cabinet: 600 mm (W) × 1000 mm (D) × 2430 mm (H), 500 kg Auxiliary Cabine: 600 mm (W) × 1000 mm (D) × 2100 mm (H), 500 kg

Production line

# ME100D-AM

IGBT&SiC Device, Module  
Production Line Dynamic ATE



## Product Description

The ME100D-AM is a dynamic parameter testing system designed for the mass production of IGBT/SiC devices. It assists power device manufacturers in performing static parameter testing during production, providing not only automated testing solutions but also a turntable for manual loading and unloading. It supports both automated and manual testing, offering customers more options.

02

## Product Features



### 6 Channels SiC Drivers

Self-developed ASIC drivers with dead-timeout put, cross talk suppression, and Miller clamping functions. The resistor switching and  $Q_g/Q_{gs}/Q_{gd}$  testing are supported.



### Rapid Short-circuit Protection for High Current

Programmable short-circuit protection with a maximum protection current of 15,000 A and response time of  $<1.5 \mu s$ .



### Low Parasitic Inductance

Parasitic inductance (device and fixture not included)  $< 15 \text{ nH}$ .



### Flexible Configuration

Supports testing of both two-level and three-level topology modules.  
Supports contact resistance,  $V_{in}$ , single/doublepulse, multi-pulse, and complementary pulse testing.

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## Product Specification

Project	ME100D-AM
DUT	IGBT, SiC MOSFET
Test Items	Double-pulsetesting (including turn-on characteristics, turn-off characteristics, and reverse recovery testing), five-pulse, ten-pulse, and other customization multi-pulse tests, as well as short -circuit testing.
Output Range	Voltage: 1500 V/2000 V, Current: 4000 A
Temperature Range	RT~200°C, uniformity $\leq 3^\circ\text{C}$ .
UPH	150 (based on real data from production line using six-pack module)
Size&Weight	Main Cabinet: 1300 mm (W) $\times$ 900 mm (D) $\times$ 1868mm (H) Turntable: 850 mm (W) $\times$ 900 mm (D) $\times$ 1200 mm (H) Total weight: 600 kg

Production line

# ME100S-AM

IGBT&SiC Device, Module  
Production Line Static ATE



## Product Description

The ME100S-AM is a static parameter testing system designed for the mass production of IGBT/SiC devices. It assists power device manufacturers in performing static parameter testing during production, providing not only automated testing solutions but also a turntable for manual loading and unloading. It supports both automated and manual testing, offering customers more options.

## Product Features



### ATE Architecture

Integrated with AccoTEST resource board and Firststack test units, ensuring stability, efficiency, and high accuracy.



### High-accuracy Pulsed High Current Source

$\pm 3000\text{A} / 30\text{V} / 1\text{ms}$  pulse current output capability, with current value measurement function.

Supports GFS testing,  $V_{GE}$  range:  $0 \sim 20\text{V}$ .



### High-voltage Leakage Current Testing Capability

Single channel:  $1800\text{V}$ ,  $20\text{mA}$  for single channel.

Two channels in series/parallel: up to  $3600\text{V}$ ,  $20\text{mA}/1800\text{V}$ ,  $40\text{mA}$ .



### Flexible Configuration

Supports contact resistance testing, short-circuit, open-circuit, and missing-pin detection.

Optional ZMU module supports  $R_g$ ,  $C_{ISS}$ ,  $C_{OSS}$ ,  $C_{RSS}$  testing.

## Product Specification

Project	ME100S-AM
DUT	IGBT, SiC MOSFET
Test Items	$I_{GSS}/I_{DSS}$ , $R_{DS(on)}/V_{GS(th)}$ , $G_{FS}$ , $R_{NTC}$ /Kelvin, etc.
Output Range	Voltage: $1800\text{V}/3600\text{V}$ , current: $1000\text{A}/2000\text{A}/3000\text{A}$
Temperature Range	$RT \sim 200^\circ\text{C}$ , uniformity $\leq 3^\circ\text{C}$
UPH	300 (based on real data from production line using six-pack module)
Size&Weight	Main Cabinet: $1300\text{mm (W)} \times 900\text{mm (D)} \times 1868\text{mm (H)}$ Turntable: $850\text{mm (W)} \times 900\text{mm (D)} \times 1200\text{mm (H)}$ Total weight: $600\text{kg}$

Production line

# ME100DS-PIM

IGBT/SiC Module/DBC  
Production line D&S ATE



## Product Description

The ME100DS-PIM offers a comprehensive and professional automatic test solution for manufacturers. It is designed for the mass production of IGBT, SiC modules, DBC and supports both dynamic and static testing. Two-station parallel testing is available. The UIS,  $R_gC_g$ , insulation and other test items are configurable based on requirements.

## Product Features



### Supports Both Dynamic and Static Testing for IGBT, SiC MOSFET and DBC

The equipment provides maximum output of "1200 V, 4000 A, 12000 A (SC)" for dynamic testing and "2000 V, 2000 A" for static testing.



### Integrated Dynamic&Static Testing, Two-station in Parallel, High UPH

Supports two-station testing in parallel, enabling a high UPH of 400 (based on six-pack module).



### Proprietary Short-circuit Protection for Extended Measurement Range

Built-in proprietary short-circuit protection with protection current of 12,000 A and response time of 1.5  $\mu$ s. Optimized loop design minimizes parasitic inductance to as low as 15 nH.



### Compatible with Various Handlers and Probe Stations, Offering Customized One-stop ATE Solutions

One platform covers testing of Modules, DBCs, Dies, and Wafers, offering users more testing options. Supports "HardDocking" to enhance the automation level of mass production testing on the production line.

## Product Specification

Project	ME100DS-PIM	
DUT	IGBT&SiC Device, Module, DBC	
Test Items	DC: $I_{GES}/I_{EGS}, V_{CESat}/V_{DS(on)}/V_{FBV}/I_{CES}, V_{th}, G_{FS}, RNTC/Kelvin$ , etc.	AC: Double-pulse testing (including turn-on/turn-off characteristics, reverse recovery testing), five-pulse, ten-pulse, and other customization multi-pulse tests, as well as short -circuit testing.
Software	Supports flexible editing of test sequences and binning criteria. Parameters like pulse width, delay time, clamping voltage and current can be precisely configured	
Output range	DC: 2000V/2000A	AC: 1200V/4000A, 12000A (SC)
Temperature Range	RT~200°C, uniformity $\leq 3^{\circ}\text{C}$	
Parasitic Inductance	< 15 nH (without fixture and device)	
UPH	DC: UPH 300 (for SiC Half-bridge Module)	AC: UPH 300 (for SiC Half-bridge Module)
Size&Weight	Main Cabinet: 1200 mm (W) $\times$ 700 mm (D) $\times$ 1580 mm (H) Auxiliary Cabinet: 860 mm (W) $\times$ 860 mm (D) $\times$ 880 mm (H) Total weight: 730~970 kg	

Production Line

# ME100WLR

SiC Wafer-Level Burn-In  
Test Equipment



## Product Description

The ME100WLR offers a fully automated 6-inch SiC Wafer-Level Burn-In test solution. The equipment supports HTGB (High-Temperature Gate Bias), HTRB (High-Temperature Reverse Bias) tests and enables precise measurement of  $V_{GS(th)}$ ,  $I_{GSS}$ ,  $I_{DSS}$ . Widely used for automotive-grade SiC wafer-level reliability testing, it helps manufacturers efficiently screen out potential defective dies, reducing the early life failure rate of products.



## Product Features



### High Efficiency, Precision, and Safety

The  $V_{GS(th)}$  test time for a single die is  $\leq 0.6$  s, heating rate  $\geq 9^{\circ}\text{C}/\text{min}$ , temperature uniformity  $\leq 2^{\circ}\text{C}$   
 Maximum resolution of 0.01 nA; voltage test repeatability  $\leq 0.5\%$ ; current test repeatability  $\leq 0.5$  nA.  
 Nitrogen protection, over-current protection, real-time environmental monitoring.



### Intelligent Testing and Data Analysis

The system is centrally controlled by intelligent software, with independent, flexible testing for each slot, while monitoring data and marking failure dies in real-time.



### Innovative Fixture Design

The number of fixture channels, probing accuracy, and probe contact depth can be customized, which ensures high test accuracy while reducing the impact on products and costs.

## Product Specification

Project	ME100WLR
DUT	6 inch SiC wafer
Test Items	$V_{GS(th)}$ , HTGB, HTRB
Capacity	6 independent slots (wafers), maximum 720 dies per wafer
Temperature Range	RT~200°C
Voltage Range and Accuracy	HTGB: 0 ~ $\pm 75$ V, 0.02%+10 mV HTRB: 0 ~ 2000 V, 0.5%+10 V
Measurement Accuracy	$V_{GS(th)}$ : 2 V (0.02%+0.3 mV) ~ 20 V (0.02%+1 mV) $I_{GSS}$ : 100nA (1%+0.5 nA) ~ 100 $\mu\text{A}$ (0.1%+10 nA) $I_{DSS}$ : 100nA (1%+0.5 nA) ~ 1 mA (0.1%+60 nA) Maximum resolution: 100 nV, 0.01 nA
Power Supply	Host: three phase five line, AC 380 V/60 A, 40 kW Wafer loading and unloading machine: single phase, AC 220 V/40 A, 8 kW
Gas	CDA (Compressed Dry Air), Nitrogen
UPH	Loading + Unloading (for single wafer) < 10 min
Size&Weight	Host: 1900 mm (W) $\times$ 1700 mm (D) $\times$ 2310mm (H), 2600 kg Wafer loading and unloading machine: 1500 mm (W) $\times$ 1600mm (D) $\times$ 1900 mm (H), 1600 kg

Note: The above are standard parameters, and some can be customized.



**Test easy Life happy**



# Make Test Easy

## Hangzhou Firststack Technology Co.,Ltd



Building/4, Xizi Wisdom Park, No.1279 Tongxie Road, 310000 Hangzhou, China



+86 180 5881 9817



[sales.eqp@firststack.com](mailto:sales.eqp@firststack.com)



[www.firststack-test.com](http://www.firststack-test.com)