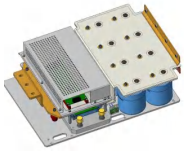
Test Solution for Semiconductor

Firstack

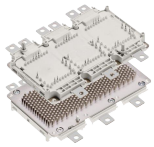
About Us

Products

Roadmap



Stack



Module

Lab DP Tester

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

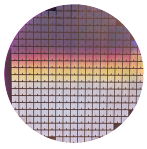
130+
IPs

Discrete Device

DGS+DRB Tester

Die

KGD Tester



Wafer

WLBI Tester

Product Series

One Stop Test Solution For Semiconductor

01 Laboratory

DPT Equipment

DGS&DRB Test Equipment

02 Production Line

ATE

WLBI Test Equipment

CONTENTS

From Laboratory

To Production Line

Laboratory

ME400D

IGBT/SiC Device, Module,Stack
DPT Equipment

01 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

02

General-type Intelligent Test Fixture

A single fixture can accommdoate 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 integrited, enabling safe dynamic test at -40~200℃.

03 Product Specification

Model	ME400D-2k	ME400D-6k
DUT	IGBT，SiC MOSFET，Power Stack	
Test Range	V_{DC}=20-2000V，I_C=8000A，I_{SC}=12000A；V_{DC}=20-6000V，I_C=8000A，I_{SC}=12000A	
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	$t_{1(on)}$ = 0.1~600 μs, $t_{2(off)}$ = 1~50 μs, $t_{3(on)}$ = 1~50 μs, accuracy 0.1 μs, resolution 0.1 μs.	
Fixture	Negative volatge -20~-1 V, resolution 0.1 V; positive voltage 10~30 V, resolution 0.1 V; total voltage: 15~35 V, resolution 0.1 V; Parasitic inductance L＜10 nH (for HPD); protection with online configuration; wireless programming	
Inductance	10/20/50/100/200/500 μH	
Temperature Range	-55℃ ~ +250℃, accuracy ±5℃, resolution 0.1℃.	
Power Supply	AC 220 V, 6 kW	AC 220 V, 10 kW
Size&Weight	1450 mm (W) × 800 mm (D) × 1980 mm (H), 600 kg	

ME100DHTXB

SiC Device, Module
DGS&DRB Test Equipment

01 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

02

Fast Turn-On&Turn-Off Technology

Perfect match between high dV/dt and low overshoot:
DGB: dV_{GS}/dt > 1 V/ns, no overshoot;
DRB: dV_{DS}/dt > 50 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.

03 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.
DGS Test Range	V_{GS}: -40~40 V, FS: 0~100 kHz, dV_{GS}/dt > 1 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 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 ≤ 3°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

ME100D-AM

IGBT&SiC Device, Module
Production Line Dynamic ATE

01 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.

Product Features

02

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 μs.

Low Parasitic Inductance

Parasitic inductance (device and fixture not included)< 15 nH.

Flexible Configuration

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

03 Product Specification

Project	ME100D-AM
DUT	IGBT, SiC MOSFET
Test Items	Double-pulse testing (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 ⩽ 3°C.
UPH	150 (based on real data from production line using six-pack module)
Size&Weight	Main Cabinet: 1300 mm (W) × 900 mm (D) × 1868mm (H) Turntable: 850 mm (W) × 900 mm (D) × 1200 mm (H) Total weight: 600 kg

ME100S-AM

IGBT&SiC Device, Module Production Line Static ATE

01 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

02

ATE Architecture

Integrated with AccoTEST resource boards and Firstack test units, ensuring stability, efficiency, and high accuracy.

High-accuracy Pulsed High Current Source

± 3000A /30V / 1ms pulse current output capability, with current value measurement function.
Supports GFS testing, V_{GE} range: 0 ~ 20 V.

High-voltage Leakage Current Testing Capability

Single channel: 1800 V, 20 mA for single channel.
Two channels in series/parallel: up to 3600 V, 20 mA/1800 V, 40 mA.

Flexible Configuration

Supports contact resistance testing, short-circuit, open-circuit, and missing-pindetection.
Optional ZMU module supports R_g, C_{iss}, C_{oss}, C_{rss} testing.

03 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 V/3600 V, current: 1000 A/2000 A/3000 A
Temperature Range	RT~200°C, uniformity ≤ 3°C
UPH	300 (based on real data from production line using six-pack module)
Size&Weight	Main Cabinet: 1300 mm (W) × 900 mm (D)× 1868mm (H) Turntable: 850 mm (W) × 900 mm (D) × 1200 mm (H) Totalweight: 600 kg

ME100DS-PIM

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

01 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 avaliable. The UIS, R_gC_g, insulation and other test items are configurable based on requirements.

Product Features

02

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 dynaminc 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 μs.
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.

03 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℃, uniformity ≤ 3℃	
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) × 700 mm (D) × 1580 mm (H) Auxiliary Cabinet: 860 mm (W) × 860 mm (D) × 880 mm (H) Total weight: 730~970 kg	

ME100WLR

SiC Wafer-Level Burn-In Test Equipment

01 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

02

High Efficiency, Precision, and Safety

The $V_{GS(th)}$ test time for a single die is ≤0.6 s, heating rate ≥ 9°C/min, temperature uniformity ≤ 2°C
Maximum resolution of 0.01 nA; voltage test repeatability ≤ 0.5%; current test repeatability ≤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.

03 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 ~ ±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 μA (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) × 1700 mm (D) × 2310mm (H), 2600 kg Wafer loading and unloading machine: 1500 mm (W) × 1600mm (D) × 1900 mm (H), 1600 kg

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

Firstack Intelligent Manufacturing Plant	Expected production start	Construction area	Location
	June 2025	~ 45,000m²	Hangzhou, China

Test easy Life happy

Make Test Easy

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