

NATS®-1000

IGBT/SiC模块
绝缘/静态/动态 自动检测装置

Si-IGBT/SiC-MOSFET
Power Module ISO/DC/AC Automated Test System

For
Mass-Production



In-line外观照片→

In-line inspection system image
(Appearance varies depending on system configuration)



Trolley connection



← LOADER连接照片

Loader type inspection system image
(Appearance varies depending on system configuration)

特徴 | Features

■ 绝缘检测 (ISO)

Isolation Test (ISO)

■ 静态检测 (DC)

Static Characteristic Test (DC)

■ 动态检测(AC)

Dynamic Characteristic Test (AC)

● 高温检测 ~175℃ (~200℃)

High Temperature Test (up to 200℃)

● 高产能

最大144UPH (25秒/Unit)

High-throughput up to
144UPH(25sec/unit)

● 低LS 4.5 nH

Low stray inductance 4.5 nH

● 可扩展为自动产线

Automatic Line Expandable

● IEC60747基准测定

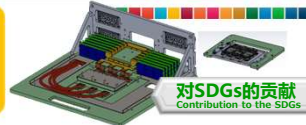
IEC60747 Compliant Measurement

● AOI/翘曲测试/镭射标记

AOI/Warpage test/Laser Marking



共用治具 | Universal Fixture



对SDGs的贡献
Contribution to the SDGs

- 实现了低LS值、对应高精度SiC产品检测
Achieves low LS value and enables highly accurate SiC device inspection
- 以共用夹具的构造实现低成本，短纳期！
Universal jig structure achieves low costs and short delivery times!

高产出 | High Throughput



High Temp.
Dynamic Test

- 最大144UPH(25秒/Unit)的高产出检测
Capable of high-throughput test up to
144UPH(25 seconds/unit)

高温检测 | High Temperature Test

- 200℃的高温检测
Capable of high temperature test up to 200℃

NATS®-1630/1730

IGBT/SiC 功率模块
动态手动测试机

Si-IGBT/SiC-MOSFET
Power Module AC Manual Test System

NEW
ARRIVAL



For R&D

手动机外观照片→

Manual inspection system image
也可构成绝缘、静态设备
Isolation/Static characteristic test system configuration available
(Appearance varies depending on system configuration)

NATS-1730



数据可追溯性 | Data Traceability



- 外部PC，云端等数据
可与管理系统做连接

Available to link with external PCs
and upper data management systems

机构的选择 | Configuration Selection



手动测试式样
Manual Test System



自动检测整线式样 NATS-1000
Auto In-Line Test System

- 可选择手动测试，Inline，上&下载式样
Selectable Manual/In-Line/Loader & Unloader
Configuration

KGD Test | known good die Test



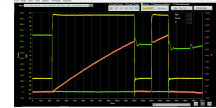
Wafer测试后的进阶筛查!!
Further screening after Wafer testing

低LS 4.5nH | Low stray inductance



- 以低LS治具/测试机实现SiC-PM检测!!
Achieve the low LS required for SiC Power module
inspection with jigs and testers! !

操作简单 | Easy Operation



波形解析软件 <Pulse EYE>
Waveform analysis software

- 无需编程，操作简单
Easy operability with no programming
required
- 一键式简易操作完成波形分析
One-touch analysis of waveforms with easy
operations

宽带隙测试技术!!

We offer measurement technologies
such as wide bandgap.

测试项目例 | Inspection Items

※ Si-IGBT 的表述
Si-IGBT notation

■ 接触检查

Contact check

■ 绝缘检测<ISO>

Isolation
inspection

- 热敏电阻绝缘
Thermistor isolation
- 绝缘电压
Isolation voltage
- 绝缘阻抗
Isolation resistance

■ 静特性检查<DC>

Static characteristic inspection

- Ices (集电极-发射极间漏电流)
(collector-emitter leakage current)
- Iges (栅极-发射极间漏电流)
(gate-to-emitter leakage current)
- Rt (热敏电阻值)
(Thermistor resistance value)
- Vth (栅极-热敏电阻间的电压)
(gate emitter threshold voltage)
- Vce(sat) (集电极-发射极间饱和电压)
(collector-emitter saturation voltage)
- Vf (集电极-发射极间二极管正向电压)
(collector-emitter diode forward voltage)
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- Ciss / Coss / Crss (Option)

■ 动特性检查<AC>

Dynamic Characteristics inspection

- RBSOA / RRSOA / SCSOA
(各种安全动作区域测量)
(Various operating area inspections)
- SWt (开关特性测量)
(switching characteristic measurement)
- Tr (开通上升时间) (turn-on rise time)
- Tf (关断下降时间) (turn-off fall time)
- TdOn (开启延迟时间) (turn-on delay time)
- TdOff (关闭延迟时间) (turn-off delay time)
- Qrr (反向恢复电荷) (Reverse recovery charge)
- Trr (恢复耐量) (Recovery Tolerance)
- Irr (反向恢复电流) (Reverse recovery current)
- Eon (开关开通损耗) (turn-on switching loss)
- Eoff (开关关断损耗) (turn-off switching loss)
- Err (反向恢复损失) (Reverse recovery loss)

测量系统规格示例 | Measurement System Specifications

■ 绝缘检测设定范围 ISO-Test Setting Range

- AC耐压测试 输出电压 AC Withstanding Voltage Test Output Voltage : AC50Vrms~5000Vrms 最大定格出力 : 500VA
- DC耐压检查 输出电压 DC Withstanding Voltage Test Output Voltage : DC50V~6000V Rated Output
- 绝缘检测 输出电压 Isolation test output voltage : DC50V~1200V 阻抗测试 : 0.1MΩ~50GΩ
- ch数 Number of channel : 1ch Resistance measurement

■ 静特性测试设定范围

DC-Test Setting Range

- 测量 & 设定电压 Measurement & Setting Voltage
: ±1300V (±3000V for SiC)
- 测量 & 设定电流 Measuring & set current
: ±1200A (±2000A for SiC)
- ch数 Number of channels : 1ch

■ 动特性测试范围 AC-Test Setting Range

- ch数 Number of channels : 8ch
- 周波数带宽 Frequency band : 1GHz
- 取样频率 Sample Rate : 3.125G Samples/sec
- 峰值电流测试 Peak current measurement
: ±6000A (±12000A for SiC)
- 差分电压测量 Differential voltage measurement : ±1500V
- 栅极驱动 Gate drive
 - 电压设定 Voltage setting : +25V ~ -15V
 - 脉冲带宽 Pulse width : 1μs~999.9μs

自动机-选配项 | Automatic Equipment Option

■ AOI检查 Visual inspection

- 瑕疵的检测 / 变色的检测 / 针脚弯曲等
Scratches/discoloration/bent pins, etc.
- 翘曲检查等, 需要定制咨询
Customization consultation required, such as warpage inspection

■ 镭射标记机构 Laser Marking System

- 侧面打印
Marking on the side
- 自动对焦功能, 二维码打印
Autofocus function, 2D Code printing

自动机-规格示例(不包括AOI和激光打印功能) | Automatic Equipment Specifications

- 供给电源 Power supply : AC220V±10%
- 电源容量 Power capacity : 95kW
- 精度保证温度 Accuracy guaranteed temperature : +20℃~+30℃ (湿度小于50%) (less than 50% humidity)
- 装置整体尺寸 Diimension : 9680x3430x1850mm(WDH)(根据设备具体构成尺寸会有变化)
(Dimensions vary depending on equipment configuration)
- 装置整体重量 Weight : Approx 4700kg(根据设备具体构成重量将有变化) (Weight varies depending on device configuration)

ニデックアドバンステクノロジー株式会社

NIDEC ADVANCE TECHNOLOGY CORPORATION

尼得科精密检测科技株式会社

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