

# MX300C Series Semiconductor Thermal Characteristics Test System

- . Power cycling test
- . Thermal resistance test/Transient thermal resistance test ( $R_{th}/Z_{th}$ )
- . The K Curve test



## Summary

MX300C Series is an automated thermal characteristics test system for power devices, composed of sampling units, temperature control units, power supply units, and control units. It is mainly applied in the power cycling and thermal characteristics tests of IGBT, simulating and measuring the performance of power devices during their service life.

# Functions

- Power cycling test
- Thermal resistance test/Transient thermal resistance test (Rth/Zth)
- The K Curve test
- Junction-to-case thermal resistance (RJC)
- Gate leakage current test (IGES)

# Advantages

- High precision test and control over constant temperature plate. Fast removal of IH.
- “Real-time” diagnosis of structure and functions: Fast access to fault progress, cycle-index, and cause. Automatic shutdown.
- Support remote control during operation: Mobile/PC
- Complete protection mechanism: Overtemperature/smoke/coolant leakage detection
- Compatibility: IGBT/DIODE/MOSFET/BJT/SCR tests.
- Adopt UPS power supply allowing the auxiliary control system to indicate safety status of the equipment under power off condition

Models		MX300C-1500
Precision	Constant temp. plate 1	Temp. control precision: $\pm 0.5^{\circ}\text{C}$ Temp. control range: $15\sim 80^{\circ}\text{C}$
	Constant temp. plate 2	Stability: $\pm 0.01^{\circ}\text{C}$ Temp. control range: $-35\sim 200^{\circ}\text{C}$
	Voltage drop measurement	$\pm 50\mu\text{V}$
	Tj measurement	$\pm 2^{\circ}\text{C}$
	Temp. measurement of cold plate & case	$\pm 2^{\circ}\text{C}$
	Gate current detection	$0.2\text{nA}\sim 100\mu\text{A}$ ; Resolution: $25\text{pA}$
Capacity	Rth/Zth/K Curve	1 sample per single test
	Power cycling (Unit: Second/Minute)	12 samples per single test
The K Curve Test	Test current	Range: $0\sim 3\text{A}$ ; Precision: $\leq 0.1\%+5\text{mA}$ ; Resolution: $0.1\text{mA}$
	Constant temp. system	Temp. range: $-35\sim 200^{\circ}\text{C}$ ; Stability: $\pm 0.01^{\circ}\text{C}$ (Depend on the equipment.)
Rth/Zth Test	Tj test	Sampling rate: $1\text{MHz}$ ; Precision: $2^{\circ}\text{C}$ ; Resolution: $0.1^{\circ}\text{C}$
	Tc test	Sampling rate: $1\text{MHz}$ ; Precision: $2^{\circ}\text{C}$ ; Resolution: $0.1^{\circ}\text{C}$
	Fast turnoff	Sample Im can be removed within $1\mu\text{s}$ .
	Zthjc/Zthja tests	Available
	Display of integral/differential structure function curve	Available

Power Cycling Test (Unit: Second)	Power supply	Output capacity>1800A; Current precision: $\pm 0.1\%$ set+0.4%FS
	Tj test	Sampling rate: 10KHz; Precision: 2°C; Resolution: 0.1°C
	Tc test	Sampling rate: 10KHz; Precision: 2°C; Resolution: 0.1°C
	Typical conditions	0.5s<tcycle<10s; Tjmax=150°C; $\Delta Tjmax=60K$ ; 130,000 cycles
	Ageing mode	Constant current; Constant Tjmax/ $\Delta Tjmax$ ; Constant power P
	Data recording	IH; ton; toff; Tjmax; $\Delta Tj$ ; Tjmin; Tcoolant; Coolant flow F; Cold plate temp. THS
Power Cycling Test (Unit: Minute)	Power supply	Output capacity>1800A/10V Current precision: $\pm 0.1\%$ set+0.4%FS
	Tj test	Sampling rate: 10KHz; Precision: 2°C; Resolution: 0.1°C
	Tc test	Sampling rate: 10KHz; Precision: 2°C; Resolution: 0.1°C
	Typical conditions	2min<tcycle<6min; TCmin=25°C; $\Delta Tjmax=80K$ ; 2,000~5,000 cycles
	Ageing mode	Constant current; Constant Tjmax/ $\Delta Tjmax$ ; Constant power P
	Data recording	I <sub>H</sub> ; ton; toff; Tjmax; $\Delta Tj$ ; Tjmin; Tcoolant; Coolant flow F; Cold plate temp. THS