TH510 Series

Semiconductor C-V Characteristic Analyzer

An integrated C-V characteristic analyzer for diodes, triodes, MOSFETs and IGBTs — combining an LCR bridge, VGS/VDS sources, channel switching and host software in one instrument. One-click testing of the four key parasitic parameters, with no re-wiring between devices, suits production-line sorting and automated test cells as well as R&D bench work with optional curve scanning.

Dimensions: 430(W) × 177(H) × 405(D) mm · Weight: approx. 16 kg



- **Integrated design**: LCR bridge + VGS source + VDS source + channel switching + host software in one instrument
- Gate voltage VGS: **0 – ±40 V**; drain voltage VDS up to **±3000 V** depending on model
- Three test modes: single-device (spot), module/multi-die (list scan), and curve scan (optional)
- Four parasitic parameters — Ciss, Coss, Crss, Rg (or Cies, Coes, Cres, Rg) — one-click, same-screen display
- 10.1" capacitive-touch display; standard 2 channels, expandable to 6
- CV curve scan and Ciss–Rg curve scan for R&D characterization (optional)
- Fast capacitor-charging technology for high-speed production testing
- Contact-check (Cont) and open/short continuity test (OP_SH) flag bad connections and damaged devices before they skew results
- Crss Plus function corrects negative Crss readings at high frequency; DS breakdown protection guards the instrument from discharge current
- 10-level bin sorting with programmable HANDLER interface; Interlock safety lock on TH513

Three models, one platform

TH511

Standard-voltage bench & production testing

Frequency	1 kHz – 2 MHz
VDS range	0 – ±200 V
Channels	2 (exp. to 6)
Interlock lock	—

TH512

Extended voltage for 3rd-gen power devices

Frequency	1 kHz – 2 MHz
VDS range	0 – ±1500 V
Channels	2 (exp. to 6)
Interlock lock	—

TH513

High-voltage testing with safety interlock

Frequency	1 kHz – 2 MHz
VDS range	0 – ±3000 V
Channels	1
Interlock lock	Yes

All three models share the same 1 kHz – 2 MHz test frequency range, 10.1" touch UI and Ciss/Coss/Crss/Rg parameter set, differing mainly in drain voltage and channel count. TH513 adds an Interlock safety-door interface to protect operators at its ±3000 V range. SCPI and MODBUS protocols are standard across all models.

Applications

Semiconductor power devices

Parasitic capacitance test and C-V characteristic analysis of diodes, triodes, MOSFETs, IGBTs, thyristors, ICs and optoelectronic chips.

Semiconductor & LC materials

Wafer-dicing C-V characterization and elastic-constant analysis of liquid-crystal materials.

Capacitive components

C-V characteristic testing of capacitors and capacitive sensors, using the built-in Cs-V diode-junction-capacitance function.

Technical specifications

Parameter	TH511	TH512	TH513
Channels	2 (expandable to 4/6)	2 (expandable to 4/6)	1
Display	10.1" capacitive touchscreen, 16:9, 1280×RGB×800		
Test parameters	Ciss, Coss, Crss, Rg — four parameters selectable arbitrarily, same-screen display		
Test frequency	1 kHz – 2 MHz, 0.01% accuracy; resolution 10 mHz–10 Hz (finer at lower frequency bands)		
Test level	5 mVrms – 1 Vrms, accuracy ± (10% × setting value + 2 mV), 1 mVrms resolution		
VGS	0 – ±40 V, accuracy 1% × setting voltage + 8 mV, resolution 1 mV (≤±10 V) / 10 mV (>±10 V)		
VDS range	0 – ±200 V	0 – ±1500 V	0 – ±3000 V
VDS accuracy	1% × setting voltage + 100 mV		
Output impedance	100 Ω, ±2% @ 1 kHz		
Calibration & math	Open / Short / Load / fixture correction · Δ absolute and Δ% percent deviation from nominal		
Averaging & speed	1–32× averaging · AD time: Fast+ 2.5 ms(>5 kHz) · Fast 11 ms · Medium 90 ms · Slow 220 ms		
Best accuracy[1]	0.5% (condition-dependent — see user manual)		
Measurement range	Ciss/Coss/Crss: 0.00001 pF – 9.99999 F · Rg: 0.001 mΩ – 99.9999 MΩ · Δ%: ± (0.000–999.9%)		
List scan	50 points; averaging and bin sorting configurable per point; scans test frequency, Vg, Vd, channel		
Curve scan[2]	Up to 1001 points; log/linear axes; multi-curve display; manual single-sweep trigger		
Bin sorting	10 bins + PASS/FAIL, bin counting, front-panel PASS/FAIL indicator		
Storage	Internal ~100 MB non-volatile memory · External USB for setup files, screenshots, logs · front-panel keys lockable		
Warm-up & power	60 min warm-up · 100–120 VAC / 198–242 VAC (selectable), 47–63 Hz, ≥130 VA		
Dimensions (W×H×D)	430 × 177 × 405 mm		
Weight	approx. 16 kg		

[1] Best/highest accuracy is achieved under specific test conditions; consult the user manual for the full accuracy chart. [2] Curve scan is an optional function.

Interfaces

RS232C	USB Host	USB Device	LAN	Handler	SCPI / MODBUS	GPIB	RS485
standard	standard	standard	standard	standard	standard	optional	optional[1]

[1] RS485 requires an RS232-to-RS485 converter. Handler output is fully configurable (pin assignment, I/O direction, signal, handshake) for automation integration.

Standard accessories

Item	Description
–	EU power cable (Schuko, CEE 7/7)
TH26063B	Test fixture (TH511 / TH512 only)
TH26063C	Test fixture (TH511 / TH512 only)
TH26063D	Connection cable (TH511 / TH512 only)
TH26063G	Test extension cable (TH511 / TH512 only)
TH26071C	USB-to-RS232 communication cable
TH513-1	Test fixture (TH513 only)

Optional accessories

Item	Description
–	200 V channel expansion board
–	1500 V channel expansion board
–	Curve-scan software option

More fixtures and expansion options available on request — ask your Techmize contact or authorized distributor.

Techmize Electronic GmbH
Office 125–126, Regus
Carl-Zeiss-Ring 15a, 85737 Ismaning, Germany
An international subsidiary of Changzhou Tonghui Electronic Co., Ltd. (China)

Contact
Mobile: +49 171 4981898
Email: dx.han@tonghui.com.cn
Web: en.tonghui.com.cn

Registration
Managing Director: Haohua Zhao
Register Court: Amtsgericht München
HRB 312530
VAT ID DE463170824

Website LinkedIn YouTube

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