# CurveTracer CT-3100/3200

## For High-Power Semiconductor Device Characterization

DATA SHEET

Emerging energy standards and increasing power consumption demand additional performance capabilities. As such, pressure has been placed on manufacturers to rapidly design, develop and characterize new power devices to develop innovative chipset designs to provide more efficiency. Characterization requires measuring performance across an entire operating region, often hundreds of amperes and thousands of volts. High-performance requirements have created the need for innovations in curve tracer technology – tools that have long been the industry-standard for power device characterization, but that no longer meet today's stringent characterization requirements.

CT-3100/3200 Curve Tracers are manufactured by Iwatsu Test Instruments Corporation exclusively for Cascade Microtech to address the obsolescence of these measurement tools, and to provide versatile wafer-level measurement for the growing power device market.
The CT-3100/3200 Curve Tracers are designed specifically for measuring different types of high-power semiconductor devices such as IGBTs, super-junction MOSFETs, diodes and thyristors. Complementary to existing SMU-based instruments, they provide fast, accurate characterization up to 3,000 V, 400 A, 4,000 W peak power and support a leakage mode with cursor resolution of 1 pA. With a built-in USB port and a LAN interface for remote control, seamless data is now possible, enhancing measurement productivity.

On-wafer characterization shortens the design cycle and provides device manufacturers with faster time-to-market. Cascade Microtech also provides seamless integration with its Tesla on-wafer power device characterization system for a fully-integrated solution that will meet both current and emerging requirements.

## FEATURES / BENEFITS

| | |
|---|---|
| High-voltage and current sourcing (3,000 V, 400 A) | Wide power range for devices characterization (up to 390 W in high-voltage mode and up to 4,000 W in high-current mode) |
| AC, rectified sine, DC, leakage mode | Serving variety of application needs |
| TRACE and WAVE viewing mode | Intuitive high-current pulse device characterization |
| 1 pA cursor resolution | Low-leakage DC measurements |
| Graphical configuration block diagram | Simple and fast device measurement set-up |
| Up to 20 measurement steps simultaneously | Efficient and fast device characterization |
| USB, LAN interface | Easy data acquisition and full remote control |
| Safety Interlock | Protect operator from electrical shock |

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## SPECIFICATIONS CT-3100/3200

**Collector Supply**

| | |
|---|---|
| Collector supply mode | High-voltage mode: AC, +/- rectified sine, +/- DC, +/- leakage |
| Max. peak power consumption selection | 120 mW, 1.2 W, 12 W, 120 W, 390 W (390 W can be selected excluding max. peak voltage at 3,000 V range) |
| High-voltage mode | Max. peak (peak pulse) current 75 mA at max. peak voltage 3,000 V (2,500 V at AC)<br>Max. peak (peak pulse) current 750 mA at max. peak voltage 300 V<br>Max. peak (peak pulse) current 7.5 A at max. peak voltage 30 V |
| Looping compensation | Hardware: Stray capacitance compensation between Collector and GND<br>Software: Yes |
| Maximum data points | 20 to 1,000 points per trace |

**Step Generator**

| | |
|---|---|
| Current mode | Amplitude range: 50 nA to 200 mA at 1-2-5 step<br>Maximum current: 10 times of STEP AMPLITUDE setting<br>Offset: +/- 10 times of STEP AMPLITUDE testing |
| Voltage mode | Amplitude range: 50 mA to 2 V at 1-2-5 step<br>Maximum current: 10 times of STEP AMPLITUDE setting<br>Offset: +/- 10 times of STEP AMPLITUDE testing |
| Step rate | Staircase waveform: 2 times of 50 Hz or 60 Hz (50 Hz or 60 Hz at AC mode) |
| Pulse steps | Pulse width variable from 50 µs to 400 µs at 10 µs resolution (measurement points can be set) |
| Number of steps | 0 to 20 steps |

**AUX Output**

| | |
|---|---|
| Range | OFF, variable from - 40 V to + 40 V at 100 mV step |

**Vertical Axis**

| | |
|---|---|
| Collector current | High-voltage mode: 1 µA/div to 2 A/div (20 steps) at 1-2-5 step |
| Emitter current at LEAKAGE mode | 1 nA/div to 2 mA/div (20 steps) at 1-2-5 step |

**Horizontal Axis**

| | |
|---|---|
| Collector voltage | High-voltage mode: 50 mA/div to 500 A/div (13 steps) at 1-2-5 step |
| Base/emitter voltage | 50 mV/div to 5 V/div (7 steps) at 1-2-5 step |

## SPECIFICATIONS FOR HIGH-CURRENT MODULE (AVAILABLE WITH CT-3200)

**Collector Supply**

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|---|---|
| Collector supply mode | Pulse |
| Max. peak power consumption selection | 400 W, 4,000 W |
| High-current mode (for pulse only) | Max. peak current 400 A at max. peak voltage 40 V |
| Pulse width / measurement points | Variable from 50 µs to 400 µs at 10 µs resolution (measurement points can be set) |

**Step Generator**

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|---|---|
| Step rate - Pulse | Variable from 80 ms to 1,000 ms (lowest frequency limited by max. peak power consumption setting) |

**Vertical Axis**

| | |
|---|---|
| Collector current | 100 mA/div to 50 A/div (9 steps) at 1-2-5 step |

**Horizontal Axis**

| | |
|---|---|
| Collector voltage | 50 mA/div to 5 V/div (7 steps) at 1-2-5 step |

## GENERAL SPECIFICATIONS

| | CT-3100/3200 |
|---|---|
| Operating conditions | 10°C to 35°C |
| Display | 8.4 inch color TFT-LCD (SVGA 800 x 600 pixels) |
| Data save/recall | Internal memory: 256 setups and four REF waveforms<br>External: USB port to transfer measurement data and display screen |
| USB port | 1 port (USB 1.1) |
| Remote control | LAN: 1 port (100 BASE-TX) |
| AC power supply/power consumption | AC 90 V – AC 264 V single phase, 45 Hz to 66 Hz, 500 VA |

## PHYSICAL DIMENSIONS

| | CT-3100 | CT-3200 |
|---|---|---|
| Dimensions | 424 mm (W) x 555 mm (D) x 221 mm (H) | 424 mm (W) x 555 mm (D) x 354 mm (H) |
| Weight | 30 kg without accessories | 45 kg without accessories |

## ORDERING INFORMATION

| Part Number | Description |
|---|---|
| 153-221 | Curve Tracer, CT-3100 |
| 153-222 | Curve Tracer, CT-3200 |
| 154-584 | CS-301 (Fixture S), CS-500 (blank test adapter), operation manual, power cable |
| 154-585 | CS-30 (Fixture M), CS-500 (blank test adapter), wire set, operation manual, power cable |
| 151-260 | Interface assembly for Tesla and Curve Tracers<br>(See Cascade Microtech's Tesla specification sheet for more details) |

## REGULATORY COMPLIANCE

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|---|---|
| Certification | UL, CE |

## WARRANTY

| | |
|---|---|
| Warranty* | 12 months |
| Service contracts | Single and multi-year programs available to suit your needs |

**See Cascade Microtech's Terms and Conditions of Sale for more details.*



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CT-DS-0212