



QuietCHUCK DC Hot Chuck System Model 490

GENERAL DESCRIPTION

The **MDC QuietCHUCK DC Hot Chuck System**, Model 490, provides unique capabilities for advanced MOS device measurements. Proportionally controlled direct current heating provides the most electrically quiet environment for high sensitivity capacitance and current measurements.

The QuietCHUCK is the ideal companion to computerized C-V plotters to perform MOS mobile ion measurements using either the Capacitance-Voltage Bias-Temperature Shift (CVBT) technique or the Triangular Voltage Sweep (TVS) technique. The QuietCHUCK also facilitates a wide variety of other device measurements at elevated temperatures such as accelerated minority carrier lifetime, charge-pumping, or current-voltage.

The operational parameters of the QuietCHUCK DC Controller can be downloaded via standard RS-232C protocol, and the temperature of the hot chuck may be monitored via the RS-232C connection. The QuietCHUCK also features overtemperature protection to prevent damage to a hot chuck due to hardware failures.

QuietCHUCK Systems are available in a variety of standard and custom configurations with a choice of chuck sizes, probe configurations, and light-tight enclosures.

KEY FEATURES

- DC heater power supply for noise-free measurements.
- Microprocessor based PID temperature controller for precise temperature setting.
- Enables mobile ion measurements using CVBT or TVS.
- Overtemperature protection to eliminate thermal runaway.
- Remote-controlled to allow computer control of all functions.
- Computer controlled lamp for inversion stabilization.
- Integrated water cooling with particulate filter.
- Wide choice of chuck sizes, dark boxes, and probe configurations.



SPECIFICATIONS

Facility Requirements

Power: 95 to 125 VAC at 15-20A, 50 to 60 Hz., 208 to 240 VAC at 10A, 50 Hz.
Coolant: Tap water at 1 to 2 gallons/min (4 to 8 liters/minute) at 15 PSI (1.1 Kg/cm²).
Maximum pressure of 20 PSI (1.4 Kg/cm²). NO DEIONIZED WATER.
Vacuum: 20-25" (500-600 mm) Hg.
Dimensions: Controller: Width 12.5" (31 cm); Depth 18" (46 cm); Height 7.25" (18.5 cm)
Enclosure (Std): Width 15" (38 cm); Depth 9" (23 cm); Height 8" (20 cm)

Thermocouple, Range, and Accuracy

Thermocouple Type: J
Temperature Display Accuracy: $\pm 1^{\circ}\text{C}$ (15 $^{\circ}\text{C}$ to 400 $^{\circ}\text{C}$).
Temperature Control Accuracy: $\pm 1^{\circ}\text{C}$ in PID range, $\pm 3^{\circ}\text{C}$ outside.

RS-232C Communication

Baud Rates: 2400, 1200, 600 and 300.
Format: Asynchronous, 7-bits character, odd parity, one stop bit.

DC Heater Supply

Range: 0 to 100 Volts.
AC Ripple: < 100 mV at temperature.

MODELS AVAILABLE

The basic Model 490 QuietCHUCK System includes a hot chuck mounted in a sturdy aluminum light-tight enclosure with computer-controlled light, a probe stand for up to 3 probes, a DC powered controller, one Model 725 Probe, operation manual, and all cables. Various chuck sizes are available to hold wafers from 100 mm (4") to 200 mm (8"). Both gold and nickel chuck platings are offered.

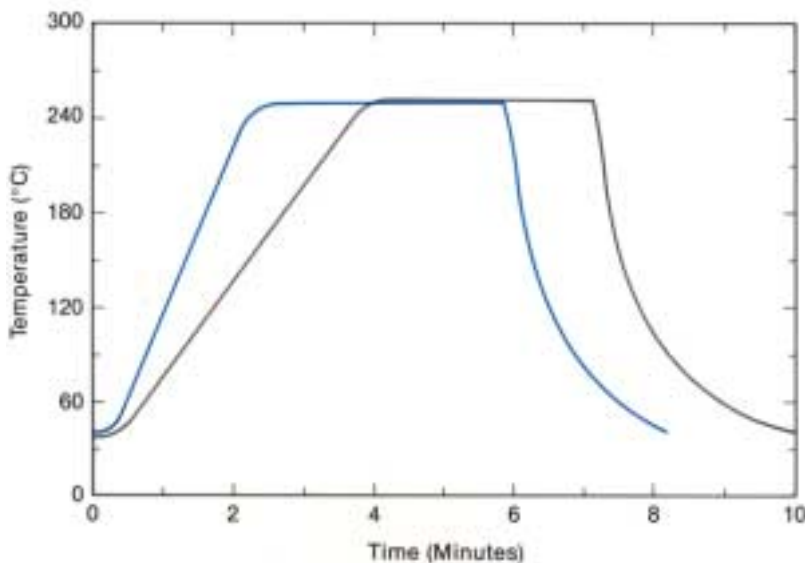
To accommodate a greater number of probes or a probe multiplexer, larger enclosures are available. The largest enclosure holds the hot chuck with multi-probe stand along with a microscope.

Custom QuietCHUCK configurations are available.

INSTRUMENTATION

CSM/Win Systems from MDC are the ideal instruments to make the most of your QuietCHUCK measurements. CSM/Win Systems contain extensive software to perform a variety of tests on semiconductors and MOS devices. QuietCHUCK software to speed mobile ion measurements is included.

MDC CSM/Win Systems are available with a wide variety of voltage ranges and capacitance and conductance measurement capabilities. Systems performing single frequency, multiple frequency, and quasistatic measurements are available. MDC also offers the most complete selection of integrated multiple hot chuck systems and mercury probes for your other measurement requirements.



Typical temperature versus time plot for QuietCHUCK bias-temperature cycle for 4" (100 mm) and 6" (150 mm) hot chucks.

Cycle parameters:

Soak Temperature 250 $^{\circ}\text{C}$;
Initial/Final Temperature - 40 $^{\circ}\text{C}$;
Soak Time 3 minutes.



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