

2303, 2303-PJ High-Speed Precision Power Supply

DC VOLTAGE OUTPUT (2 Years, 23°C ± 5°C)

OUTPUT VOLTAGE: 0 to +15VDC.
OUTPUT ACCURACY: ±(0.05% + 10mV).
PROGRAMMING RESOLUTION: 5mV.
READBACK ACCURACY¹: ±(0.05% + 3mV).
READBACK RESOLUTION: 1mV.
OUTPUT VOLTAGE SETTling TIME: 5ms to within stated accuracy.
LOAD REGULATION: 0.01% + 2mV.
LINE REGULATION: 0.5mV.
STABILITY²: 0.01% + 0.5mV.
TRANSIENT RESPONSE TO 1000% LOAD CHANGE:
Transient Recovery Time^{3,4}: <40µs to within 100mV of previous level.
<80µs to within 20mV of previous level.
Transient Voltage Drop: <100mV, typical.³
<200mV, typical.⁴
RIPPLE AND NOISE (20Hz to 20MHz): 3mV rms/8mV p-p, typical.
REMOTE SENSE: Automatic 1V max. drop in each lead. Add 2mV to the voltage load regulation specification for each 1V change in the negative output lead due to load current change.

DC CURRENT (2 Years, 23°C ± 5°C)

OUTPUT CURRENT: 0–9V: 5A max. >9V–15V: 3A max. (not intended to be operated in parallel).
SOURCE COMPLIANCE ACCURACY: ±(0.16% + 5mA)⁵.
PROGRAMMED SOURCE COMPLIANCE RESOLUTION: 1.25mA.
READBACK ACCURACY¹
2303: 5A range: ±(0.2% + 400µA). 5mA range: ±(0.2% + 1µA).
2303-PJ: 5A range: ±(0.2% + 400µA). 500mA range: ±(0.2% + 40µA).
READBACK RESOLUTION
2303: 5A range: 100µA. 5mA range: 0.1µA.
2303-PJ: 5A range: 100µA. 500mA range: 10µA.
CURRENT SINK CAPACITY: 0–5V: 2A max. 5V–15V: Derate 0.1A per volt above 5V.
LOAD REGULATION: 0.01% + 1mA.
LINE REGULATION: 0.5mA.
STABILITY⁴: 0.01% + 50µA.

DIGITAL VOLTMETER INPUT (2 Years, 23°C ± 5°C)

INPUT VOLTAGE RANGE: 0 to +20VDC.
INPUT IMPEDANCE: 10¹⁰Ω typical.
MAXIMUM VOLTAGE (either input terminal) WITH RESPECT TO OUTPUT LOW: –3V, +22V.
READING ACCURACY¹: ±(0.05% + 3mV).
READING RESOLUTION: 1mV.

DC GENERAL

MEASUREMENT TIME CHOICES: 0.01 to 10 PLC⁷, in 0.01PLC steps.
AVERAGE READINGS: 1 to 10.
READING TIME^{1,8,9}: 31ms, typical.

PULSE CURRENT MEASUREMENT OPERATION

TRIGGER LEVEL:
2303: 5mA to 5A, in 5mA steps.
2303-PJ: 5A Range: 0mA to 5A, in 5mA steps.
500mA Range: 0mA to 500mA, in 0.5mA steps.
TRIGGER DELAY: 0 to 100ms, in 10µs steps.
INTERNAL TRIGGER DELAY: 25µs.
HIGH/LOW/AVERAGE MODE:
Measurement Aperture Settings: 33.3µs to 833ms, in 33.3µs steps.
Average Readings: 1 to 100.
BURST MODE:
Measurement Aperture: 33.3µs.
Conversion Rate: 3600/second, typical.
Number of Samples: 1 to 5000.
Transfer Samples Across IEEE Bus in Binary Mode: 4800 bytes/second, typical.
LONG INTEGRATION MODE: Measurement Time⁶: 850ms (840ms) to 60 seconds in 16.7ms (20ms) steps.

GENERAL

ISOLATION (low-earth): 22VDC max.
PROGRAMMING: IEEE-488.2 (SCPI).
USER-DEFINABLE POWER-UP STATES: 5.
REAR PANEL CONNECTOR: 8-position quick disconnect terminal block for output (4), sense (2), and DVM (2).
TEMPERATURE COEFFICIENT (outside 23°C ± 5°C): Derate accuracy specification by (0.1 × specification)/°C.
OPERATING TEMPERATURE:
0° to 35°C (Full power).
0° to 50°C (Derate to 70%).
STORAGE TEMPERATURE: –20° to 70°C.
HUMIDITY: <80% @ 35°C non-condensing.
POWER CONSUMPTION: 150VA max.
REMOTE DISPLAY/KEYPAD OPTION: Disables standard front panel.
DIMENSIONS: 89mm high × 213mm wide × 360mm deep (3½ in × 8½ in × 14⅞ in).
NET WEIGHT: 3.2kg (7.1 lbs).
SHIPPING WEIGHT: 5.4kg (12 lbs).
INPUT POWER: 100–120VAC/220–240VAC, 50 or 60Hz (auto detected at power-up).
WARRANTY: One year parts and labor on materials and workmanship.
EMC: Conforms with European Union Directive 89/336/EEC EN 55011, EN 50082-1, EN 61000-3-2 and 61000-3-3, FCC part 15 class B.
SAFETY: Conforms with European Union Directive 73/23/EEC EN 61010-1, UL 3111-1.
AC LINE LEAKAGE CURRENT: 450µA @ 110VAC, typ.; 600µA @ 220VAC, typ.
RELAY CONTROL JACK: 1-channel, sink 150mA max., 15V max. 5V output, 100mA max., also available on jack. Accepts 0.173 in Bantam-type plug (CS-1003-1).
ACCESSORIES SUPPLIED: User manual, service manual, output connector mating terminal (part no. CS-846).
ACCESSORIES AVAILABLE:
Model 2304-DISP: Remote Display/Keypad (4.6 in × 2.7 in × 1.5 in). Includes 2.7m (9 ft) cable and rack mount kit.
Optional Version Model 2303B: 2303 with blank front panel (only AC power indicator LED).

¹ PLC = 1.00.
² Following 15 minute warm-up, the change in output over 8 hours under ambient temperature, constant load, and line operating conditions.
³ Remote sense, at output terminals, 1000% load change; typical.
⁴ Remote sense, with 4.5m (15 ft) of 16 gauge wire and 1Ω resistance in each source lead to simulate typical test environment, up to 1.5A load change.
⁵ Minimum current in constant current mode is 6mA.
⁶ 60Hz (50Hz).
⁷ PLC = Power Line Cycle. 1PLC = 16.7ms for 60Hz operation, 20ms for 50Hz operation.
⁸ Display off.
⁹ Speed includes measurement and binary data transfer out of GPIB.