DC Electronic Loads

Ultra-Compact, Modular Loads Model 4100/4110

- ❑ **300 W, 60 A modules**
- ❑ **Up to 6 loads in a 5 1/4-inch high chassis**
- ❑ **Parallelable “virtual” loads**
- ❑ **Below 1 volt operation**

The Model 4100 and 4110 electronic loads are designed for use within the S300 Power Subsystem. These highly versatile loads may be used in any combination together with DC sources within the same 6-slot chassis. The use of such wide-capability modular loads yields more flexibility, less rack space, and lower cost than an assortment of loads each having limited voltage and current range.

BROAD OPERATING ENVELOPE

To cover the full spectrum of supply-under-test output voltages, the Model 4100 load operates at full current from 2.1 to 450 V. To meet newer low voltage requirements, the Model 4110 load operates down to 0.7 V and at reduced current down to 0.1 V. In the constant-current mode, both loads have three ranges in order to assure the necessary low-end resolution for both set and measurement values.

PARALLELED “VIRTUAL” LOADS

To address higher power requirements, the same type (4100 or 4100s) can be paralleled in software to respond as if they were a single larger load. All load functions, including slew rate and short-circuit, are then internally synchronized so that the supply-under-test sees a single “virtual” load without the dynamic discontinuities associated with paralleling older designs. Should the next application require a different load grouping, reconfiguration is quickly achieved through reprogramming, thus extending the system’s flexibility with a minimum of load modules.

OPERATION BELOW 1 VOLT

With the clear trend toward lower IC voltages, today’s loads must anticipate tomorrow’s test requirements. Both the 4100 and the 4110 will operate below 1 V at reduced current levels, with the latter being optimized for operation at these very low voltages.

MODEL 4100/4110 SPECIFICATIONS

PROGRAMMABLE FEATURES

Current: 0 to 60A

Voltage:

4100	4110
2.1* to 450 VDC	0.7* to 80 VDC

* Full current operation. See graph below for current derating at lower voltages.

Power: 300 W

Modes: Constant current, constant voltage, constant resistance, constant power, transient generator, short-circuit and external analog modulation

Control: GPIB (IEEE 488.2) or RS485

PROTECTION CIRCUITS

Over-power: Maximum power is limited through monitoring of heatsink temperature. Programmable to lower limits.

Over-current: All modes limited to current set in constant current mode

Over-voltage: Output protected for transients over 450 V

Reverse-voltage: Reverse polarity diodes on outputs to short UUT

Over-temperature: Monitor of heatsink temperature

ADDITIONAL FEATURES

Mode Switching: Glitch-free transition when changing between current, voltage, power, and resistance modes

Isolation: ± 500 VDC between input and chassis ground

Remote Sense: 2 VDC max drop between sense and load input

OVPS Relay: DPST, 5A, isolated control

Self-test: Complete built-in hardware self-test of all major functions including each output transistor

Calibration: Closed cover, all adjustments done in software and stored in an on-board EEPROM

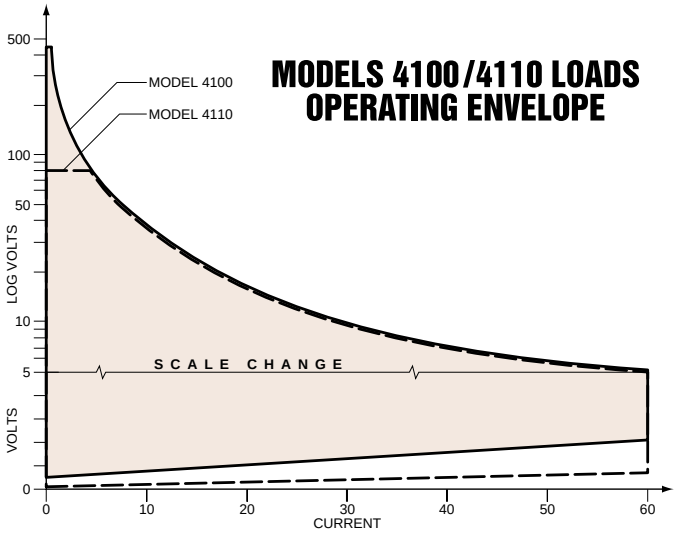
SUPPLEMENTAL CHARACTERISTICS

Size (HWD): Single-slot (six available) of S300 mainframe chassis (5¼ x 19 x 22-inch)

Weight: Module: 6.6 lbs, Chassis: 21 lb

Operating Temperature: 0 to 50° C
All specifications apply for 27° C ± 5° C

Power (loads only): 115 VAC ± 10%, 208 to 264 VAC, 47 to 63 Hz



MODAL OPERATION	4100	4110
Constant Current		
Ranges:	0 to 60 A, 6 A, and 660 mA	0 to 60A, 6A, and 660 mA
Accuracy:	60 mA, 30 mA, 660 µA + 2 µA/V	60 mA, 30 mA, 660 µA + 2 µA/V
Resolution:	0.025% FS	0.025% FS
Constant Voltage		
Ranges:	0.5 to 120 V, to 450 V	0.2 to 8V, 0.75 to 80 V
Accuracy:	0.1% FS	0.1% FS
Resolution:	0.025% FS	0.025% FS
Constant Resistance		
Ranges:	0.035 to 10 kΩ	0.12 to 10 kΩ
Accuracy:	0.5% Set	0.5% Set
Resolution:	0.15% Set	0.15% Set
Constant Power		
Ranges:	0 to 400 W, 40 W	0 to 400 W, 40 W
Accuracy:	1% Set	1% Set
Resolution:	0.1% FS	0.1% FS
Transient Generator		
Pulse		
Current Settings:	3	3
Total Period:	40 µsec to 1 sec (25 kHz to 1 Hz)	40 µsec to 1 sec (25 kHz to 1 Hz)
Delay Between Settings:	20 µsec to 1 sec	20 µsec to 1 sec
Resolution:	10 µsec	10 µsec
Accuracy:	1% + 5 µsec	1% + 5 µsec
Modes:	Single burst, continuous	Single burst, continuous
Rise/Fall Time		
Range:	10 µsec to 1 sec (10% to 90%)	10 µsec to 1 sec (10% to 90%)
Resolution:	2 µsec	2 µsec
Accuracy:	1% of setting + 3 µsec	1% of setting + 3 µsec
External Modulation		
Bandwidth:	DC to 25 kHz	DC to 25 kHz
Programming Voltage:	0 to 5V	0 to 5V
Accuracy:	5% FS	5% FS
Short-circuit		
Resistance:	0.035 Ω @ 60 A	0.012 Ω @ 60 A

READBACK INSTRUMENTATION	4100	4110
DC Current		
Ranges:	0 to 60 A, 6 A, 660 mA	0 to 60 A, 6 A, 660 mA
Accuracy:	15 mA, 5m A, 0.3 mA, + 2 µA/V	15 mA, 5 mA, 0.3 mA, + 2µA/V
Resolution:	250, 25, 2.5 µA	250, 25, 2.5 µA
DC Voltage		
Ranges:	0 to 120, 450 V	0 to 8, 80 V
Accuracy:	0.025% FS	0.025% FS
Resolution:	500, 1.8 µV	33, 330 µV
Power		
Ranges:	0 to 500, 50 W	0 to 500, 50 W
Accuracy:	1%	1%
Resolution:	± 30 mW	± 30 mW

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