5. Device Power Supplies **- Technical Specifications**

5.1 General Purpose Device Power Supply (E7002AA)

Configuration

Maximum number of channels per system

512 channel test head	16 (4 DPS boards with 4 channels each)
1024 channel test head	32 (8 DPS boards with 4 channels each)

Maximum current

Per channel	8 A [1)]
Per board	16 A [1)]
Per system	
Test head 512 pin	64 A [1)]
Test head 1024 pin	128 A

Parallel connection	Parallel connection (ganging) possible for up to 32 channels (only across boards of the same product E7002AA). Maximum four gangs of pins allowed. Only subsequent pins can be ganged.

1. The DUT interface E6980A uses low current pogo pins for DPS pins 13-16.
   This only allows 4 A per channel in these locations. See "DUT board design guide" for details.

Supply Voltage/ Current Range Specifications

Mode	Range	Resolution	Accuracy	Comments
Voltage force	±7 V	1 mV	±5 mV ±0.1%	Imax = +8 A, -4 A
	±8 V	1 mV	±5 mV ±0.1%	Imax = ±4 A
Voltage measure	±8 V	1 mV	±5 mV ±0.1% of reading	
Current force (clamp)	8 A, -4 A	1 mA	±20 mA ±0.5% of setting	
Current measure	±8 A	1 mA	±20 mA ±0.1% of reading [2)]	
	±0.3 A	30 µA	±300 µA ±0.1% of reading [2)]	
	±10 mA	1 µA	±10 µA ±0.1% of reading [3)]	
	±100 µA	10 nA	±100 nA ±0.1% of reading [4)]	

2. Number of samples fixed to 16.
3. Maximum capacitance C_{load} at device 100 µF, number of samples fixed to 32.
4. Maximum capacitance C_{load} at device 1 µF, minimum number of samples 500.

5.1 General Purpose Device Power Supply (E7002AA) continued

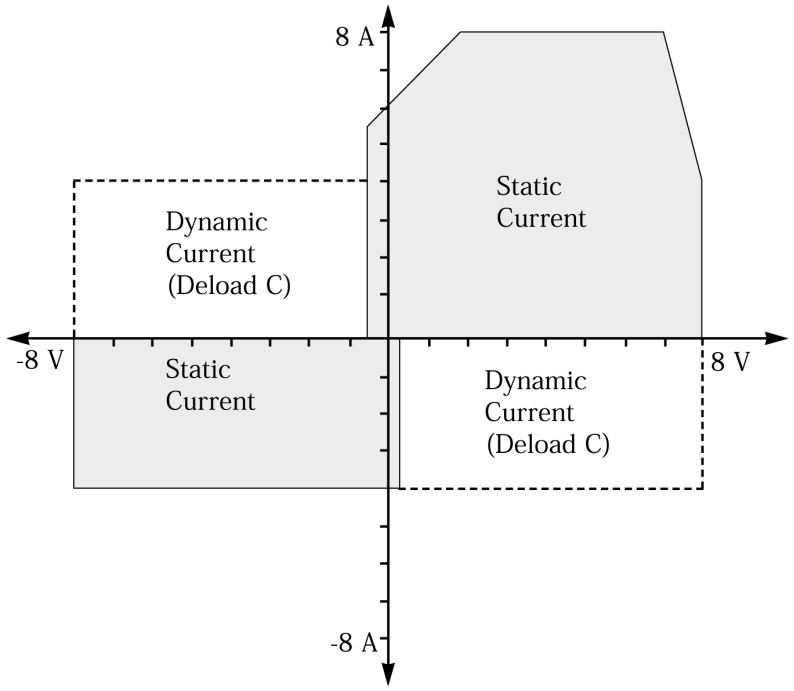

Fig. 1: General Purpose Device Power Supply: Power Diagram (E7002AA)

Product Characteristics

Current measure accuracy for parallel connection	n x ±20 µA n x ±600 µA (if ganging is not on the same board) (n = number of ganged pins).
V_{bump} function	Switchable between two values during test execution. DPS is calibrated to both values. Real-time signal provided from DUT board.
Voltage force accuracy for V_{bump}	±20 mV ±0.2% of setting
IDDQ measurement	To calculate measurement times for IDDQ measurements please refer to the user documentation.
Load capacitance on DUT board	To determine the adequate blocking capacitance on the DUT board please refer to the user documentation.

Note: If the High Voltage Device Power Supply (E7002AB) is installed, ganging of the General Purpose Device Power Supplies (E7002AA) is only possible for voltages above –4 V.

5.2 High Voltage Device Power Supply (E7002AB)

Configuration

Maximum number of channels per system

512 channel test head	16 (4 DPS boards with 4 channels each)
1024 channel test head	32 (8 DPS boards with 4 channels each)

Maximum current

per channel	1 A
per board	4 A

Parallel connection: Parallel connection (ganging) possible for up to 32 channels (only across boards of the same product E7002AB). Maximum four gangs of channels allowed. Only subsequent channels can be ganged.

Supply Voltage/ Current Range Specifications

Mode	Range	Resolution	Accuracy	Comments
Voltage force	0.5 V to 22 V	2 mV	±10 mV ±0.1%	Imax = +1 A
Voltage measure	0.5 V to 22 V	2 mV	±10 mV ±0.1%	
Current force (clamp)	1 A	1 mA	±20 mA ±0.5% of setting	
Current measure	±1 A	1 mA	±20 mA ±0.1% of reading [1)]	
	±0.3 A	30 µA	±300 µA ±0.1% of reading [1)]	
	±10 mA	1 µA	±10 µA ±0.1% of reading [2)]	
	±100 µA	10 nA	±100 nA ±0.1% of reading [3)]	

1. Number of samples fixed to 16.
2. Maximum capacitance C_{load} at device 100 µF, number of samples fixed to 32.
3. Maximum capacitance C_{load} at device 1 µF, minimum number of samples 500.

5.2 High Voltage Device Power Supply (E7002AB) continued

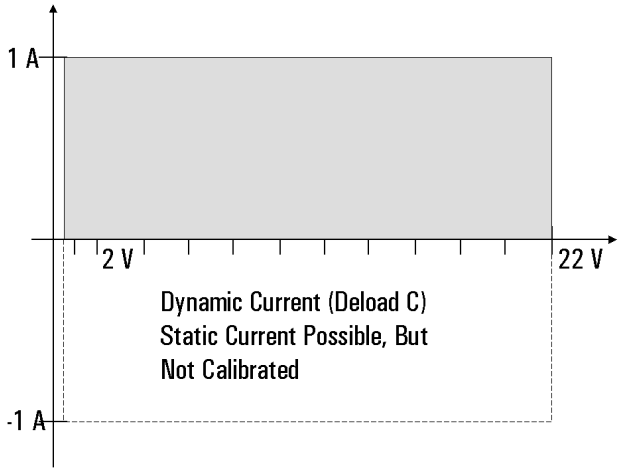

Fig. 1: High Voltage Device Power Supply: Power Diagram (E7002AB)

Product Characteristics

Current measure accuracy for parallel connection	n x ±20 µA n x ±600 µA (if ganging is not on the same board) (n = number of ganged pins).
V_{bump} function	Switchable between two values during test execution. DPS is calibrated to both values. Real-time signal provided from DUT board
Voltage force accuracy for V_{bump}	±20 mV ±0.2% of setting
IDDQ measurement	To calculate measurement times for IDDQ measurements please refer to the user documentation.
Load capacitance on DUT board	To determine the adequate blocking capacitance on the DUT board please refer to the user documentation.

Note: If the High Voltage Device Power Supply (E7002AB) is installed, ganging of the General Purpose Device Power Supplies (E7002AA) is only possible for voltages above –4 V.

Note: If the High Voltage Device Power Supply (E7002AB) is installed, ganging of the High Current Device Power Supplies (E7002C) is not possible.

5.3 High Current Device Power Supply (E7002C)

Configuration

Maximum number of supplies per system

512 channel test head	4 DPS boards with 1 channel each
1024 channel test head	8 DPS boards with 1 channel each

Maximum current per supply	100 A
Low current measurement with PMU	High current DPS can be switched to tristate to measure the small currents by a paralleled High Precision PMU.
Parallel connection	Parallel connection (ganging) possible for 2 supplies (only across supplies of the same product E7002C). Ganging is done in master/slave mode. Maximum ganging current is 200 A. Constant current mode not available in parallel connection.

Supply Voltage/ Current Range Specifications

Mode	Range	Resolution	Accuracy	Comments
Voltage force	0.3 V to 2.5 V	1 mV	±5 mV	Imax = +100 A
	2.5 V to 4 V	1 mV	±5 mV	Imax = +50 A
Voltage measure	0 V to 4 V	1 mV	±5 mV	
Current force (clamp)	+1 A to 100 A	100 mA	I ≤ 10 A: ±200 mA ±0.5% [1)] I > 10 A: ±200 mA ±2% [1)]	
Current measure	±100 A	10 mA	±100 mA ±0.4% [1) 2)]	

1. Number of samples fixed to 128.
2. Negative currents are not calibrated.

5.3 High Current Device Power Supply (E7002C) continued

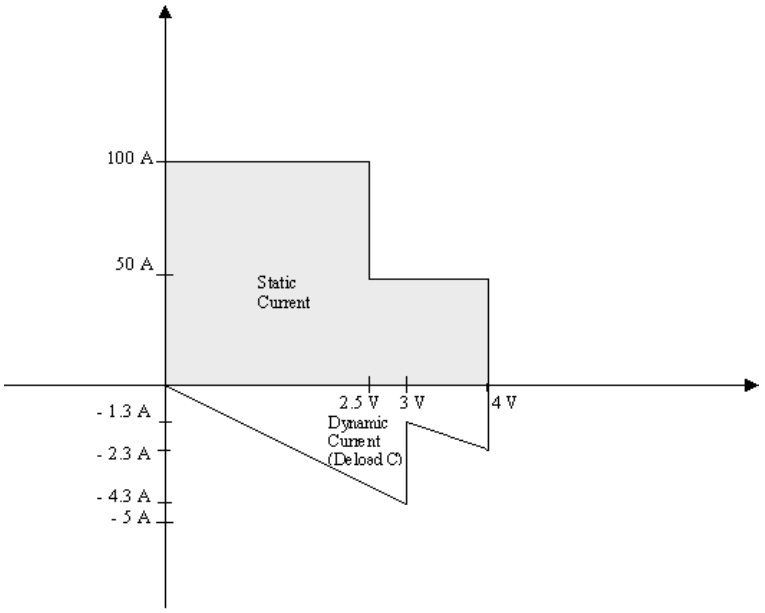

Fig. 1: High Current Device Power Supply: Power Diagram (E7002C)

Product Characteristics

Settling time (at 2 V, settling into ±20 mV of programmed value)

Loadstep	Blocking Caps	5 mF	10 mF	20 mF
0 A to 100 A		12 µs	37 µs	65 µs
100 A to 0 A		135 µs	160 µs	180 µs
40 A to 80 A		12 µs	18 µs	29 µs
80 A to 40 A		15 µs	15 µs	20 µs

Droop (at 2 V)

Loadstep	Blocking Caps	5 mF	10 mF	20 mF
0 A to 100 A		210 mV	125 mV	85 mV
100 A to 0 A		300 mV	150 mV	108 mV
40 A to 80 A		100 mV	56 mV	32 mV
80 A to 40 A		110 mV	56 mV	32 mV

Note: If the High Voltage Device Power Supply (E7002AB) is installed, ganging of the High Current Device Power Supplies (E7002C) is not possible.

5.4 Ultra Low Noise Device Power Supply (E9701A)

Configuration (Characteristic)

Maximum number of pins per system (2 pins per DPS board)

448 pin test head	8 (4 DPS boards with 2 channels each)
1024 pin test head	16 (8 DPS boards with 2 channels each)

Supply Voltage/ Current Range Specifications

Mode	Range	Resolution	Accuracy	Comments
Voltage force	8 V	16 bit	2 mV +0.1%	Imax = 8 V/4 A,-8 V/-2 A [1)]
Voltage measure	8 V	16 bit	2 mV +0.1%	
Current force	4 A	14 bit	20 mA +0.5%	
Current measure	4 A	16 bit	10 mA + 0.1%	
	200 mA	16 bit	300 µA +0.1%	
	10 mA	16 bit	10 µA +0.1%	
	1 mA	16 bit	1 µA +0.1%	
	100 µA	16 bit	100 nA + 0.1%	

1. The output VI range is as shown in figure 1

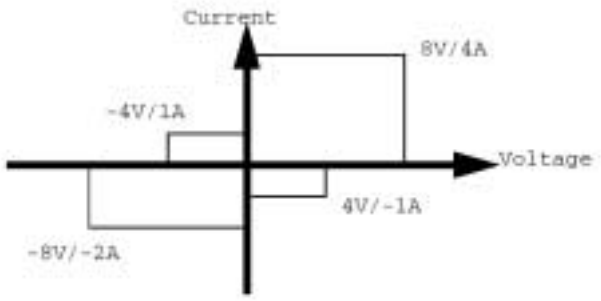

Fig. 1: Output VI Range

5.4 Ultra Low Noise Device Power Supply (E9701A) continued

Product Characteristics

Output Spurious	<-80 dBm (up to 1 MHz)
Iddq measurement Speed	3 kHz (at 1 nF load capacitance)
Iddq additional I-meas error	1% of reading + 1% of range
Modulation	Sinewave (1 Vpp@20 Hz, 0.2 Vpp@20 kHz), starts by external or SW trigger
Vbump	2 voltage levels, 50 µs interval, triggered by external trigger
Max Load capacitance	1 mF

[Parallel mode]

Max VI range	8 V/8 A,-8 V/-4 A (ganging mode)
Additional V-set/measure error	50 mV
Additional I-limit error	0.5% + 30 mA
Additional I-measure error	1% of range (@ 4 A-1 mA range)
	10 µA (@ 100 µA range)