ACTION POWER

Technical Specifications Sheet

PRL SERIES

High Dynamic Regenerative DC Load



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01 | PRODUCT OVERVIEW

The PRL Series represents the fourth generation of high-dynamic regenerative DC load technology. Developed by ActionPower, the platform addresses a long-standing engineering challenge: achieving ultra-fast transient response without compromising energy regeneration efficiency. By integrating both capabilities into a single system, PRL broadens the application scope of regenerative load testing and supports the increasingly demanding power validation requirements of AI data centers (AIDCs).

As power levels continue to rise across AIDC power architectures, test facilities face increasing pressure on grid capacity, cooling infrastructure, and energy consumption. PRL feeds recovered energy back to the grid, reducing heat generation and easing facility power and cooling requirements. Its high-current dynamic response reproduces the rapid current steps and short-duration surge conditions found in AI server workloads. Together with its scalable capacity, these capabilities make PRL suitable for power supply validation ranging from individual units to MW-level AIDC test platforms.

02 | KEY FEATURES

- **Ultra-high Slew Rate Loading**

  80V Desktop Type: 400A, maximum rise slew rate up to 60A/μs
  1000V Desktop Type: 40A, maximum rise slew rate up to 4.5A/μs
  80V Cabinet Type: 2800A, maximum slew rate up to 168A/μs
  1000V Cabinet Type: 280A, maximum slew rate up to 16.5A/μs

- **High Regeneration Efficiency:** up to 85%

- **Featuring 1.6 Times Overload Capability**

- **High Measurement Accuracy:** Voltage 0.02%+0.02% F.S. \ Current 0.05%+0.05% F.S.

- **Supports LIST Testing, OCP/OPP Testing, EDPP Testing, and Dynamic Scanning Functions**

- **Minimum Loaded Voltage**

  80V model: 1.5V @ 400A
  1000V model: 5V @ 40A

03 | PRODUCT APPEARANCE



Width × Depth × Height (mm)	435×689×219	600×1000×1370	800×1000×1955
80V ProductPower Range (kW)	18.5	37-74	74-129.5
1000V Product Power Range (kW)	25	50-100	100-175

04 | NAMING CONVENTIONS

Model Example	PRL	18 [1]	80	400	C
Explanation	Product Series	Rated Power	Maximum Voltage	Maximum Steady-state Current	Cabinet Identification

[1] Note

Refer to the specific datasheet for detailed power specifications.

05 | PRODUCT SERIES

Model Number	Rated Power (kW)	Maximum Voltage (V)	Maximum Continuous Power (kW)	Maximum Continuous Current (A)	Maximum CCD Current (A) 2ms	Minimum Rise Time (μs)	Maximum Rise Fall Slew Rate ❷ (A/μs)	Dimensions (mm) W × H × D	Weight (kg)
PRL18-80-400	18.5	80	24	400	540	≤6	≤60	435×689×219	65
PRL25-1000-40	25	1000	33	40	48	≤8	≤4.5	435×689×219	65
PRL37-80-800C	37	80	48	800	1080	≤10	≤72	600×1000×1370	340
PRL55-80-1200C	55.5	80	72	1200	1620	≤10	≤108	600×1000×1370	405
PRL74-80-1600C	74	80	96	1600	2160	≤10	≤144	600×1000×1370	470
PRL74-80-1600	74	80	96	1600	2160	≤15	≤96	800×1000×1955	555
PRL92-80-2000	92.5	80	120	2000	2700	≤15	≤120	800×1000×1955	620
PRL111-80-2400	111	80	144	2400	3240	≤15	≤144	800×1000×1955	685
PRL129-80-2800	129.5	80	168	2800	3780	≤15	≤168	800×1000×1955	750
PRL50-1000-80C	50	1000	66	80	96	≤10	≤7	600×1000×1370	340
PRL75-1000-120C	75	1000	99	120	144	≤10	≤10.5	600×1000×1370	405
PRL100-1000-160C	100	1000	132	160	192	≤10	≤14	600×1000×1370	470
PRL100-1000-160	100	1000	132	160	192	≤15	≤9.5	800×1000×1955	555
PRL125-1000-200	125	1000	164	200	240	≤15	≤12	800×1000×1955	620
PRL150-1000-240	150	1000	198	240	288	≤15	≤14	800×1000×1955	685
PRL175-1000-280	175	1000	231	280	336	≤15	≤16.5	800×1000×1955	750

❷ Note

1. The maximum current slew rate may be reduced due to the parasitic inductance of the wiring between the device under test and the load terminals. In the 80V range, the voltage drop in the load loop must not exceed 5V; in the 1000V range, the loop voltage drop must not exceed 20V.

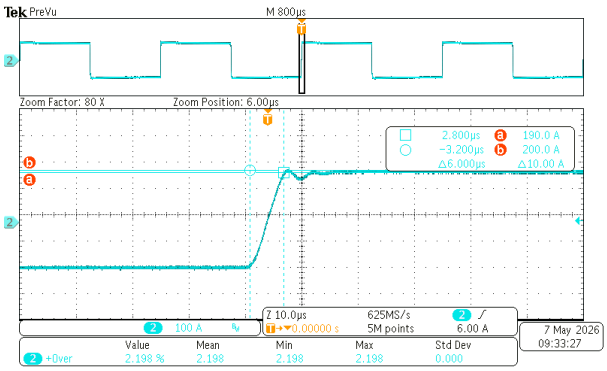
2. If low-inductance cables are required, please contact us for selection advice.

06 | PRODUCT ADVANTAGES

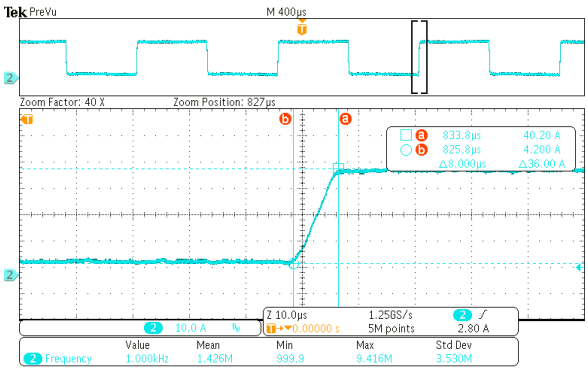
● High Dynamic Performance

Excellent dynamic current response characteristics to meet the high-dynamic testing requirements of different DUTs.

Single-Module Waveform

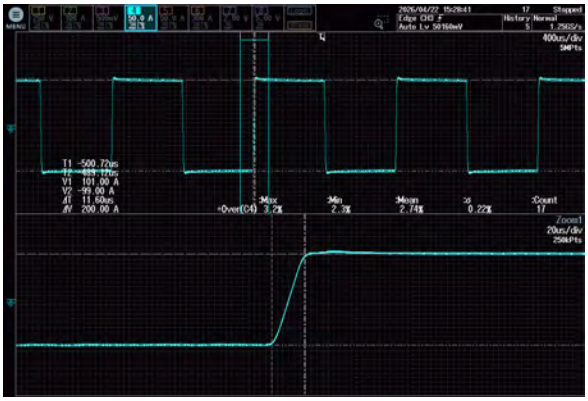


80V △360A current slew rate 60A/µs, overshoot <3%

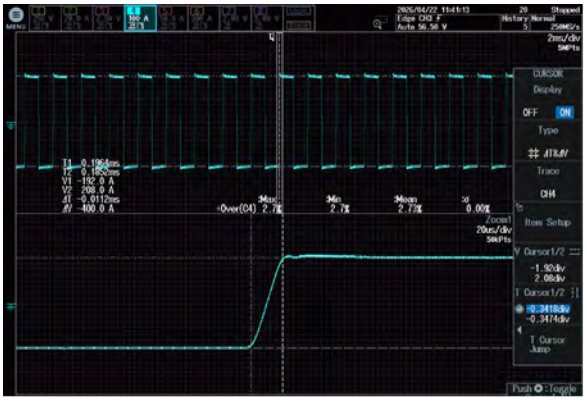


1000V △36A rise time ≤8µs, overshoot <0.5%

80V 2000A Product Test Waveform



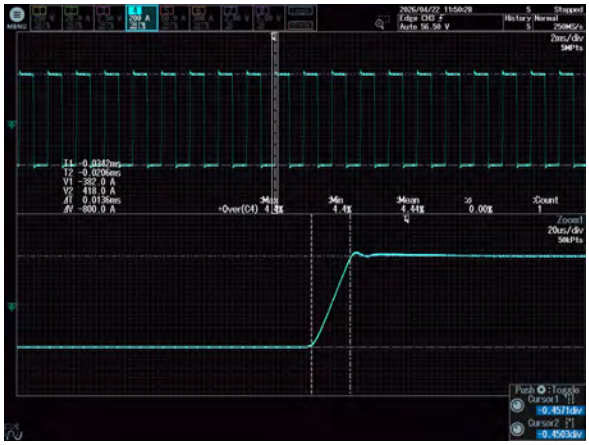
△200A current slew rate 17.2A/µs



△400A current slew rate 35.7A/µs



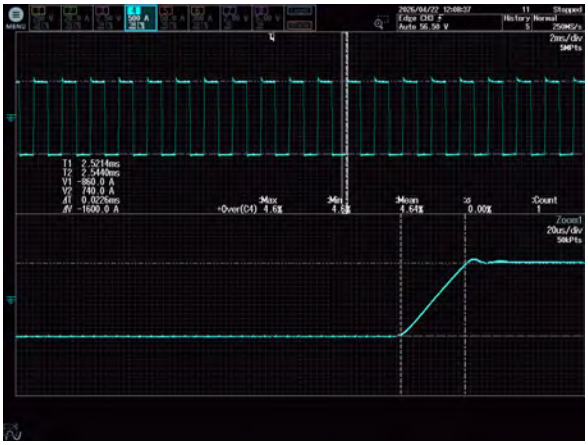
△600A current slew rate 55.5A/µs



△800A current slew rate 58.8A/µs

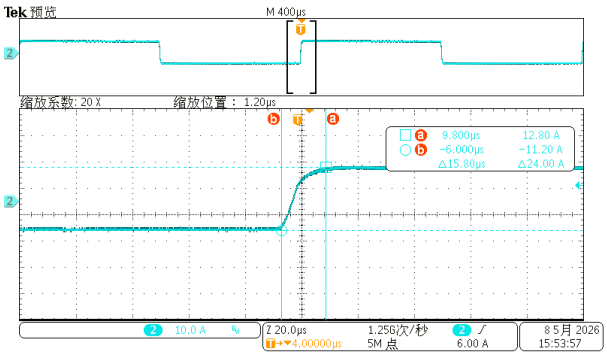


△1200A current slew rate 68.1A/μs

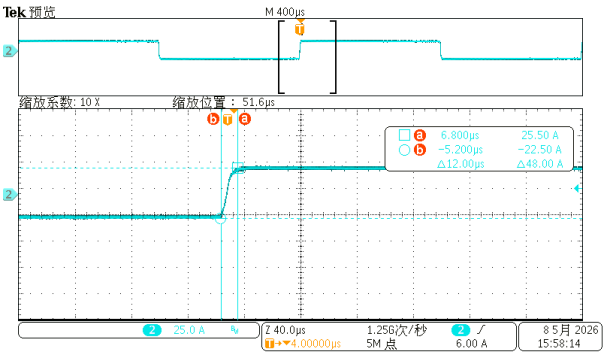


△1600A current slew rate 70.8A/μs

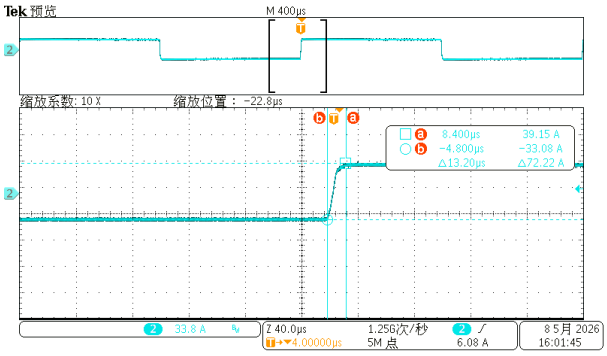
1000V 240A Product Test Waveform



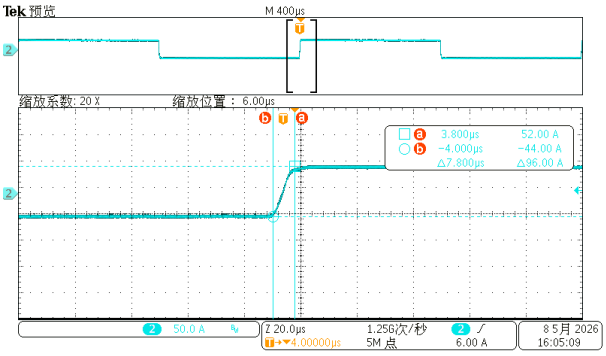
△24A current slew rate 1.5A/μs



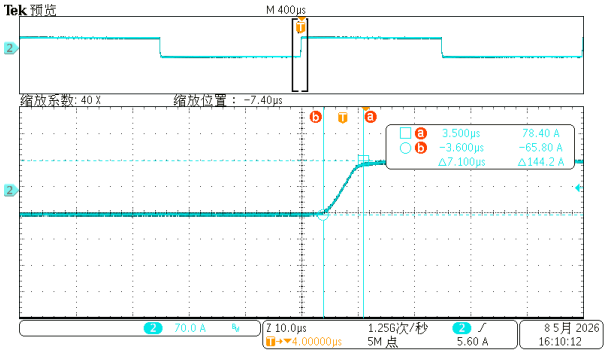
△48A current slew rate 4A/μs



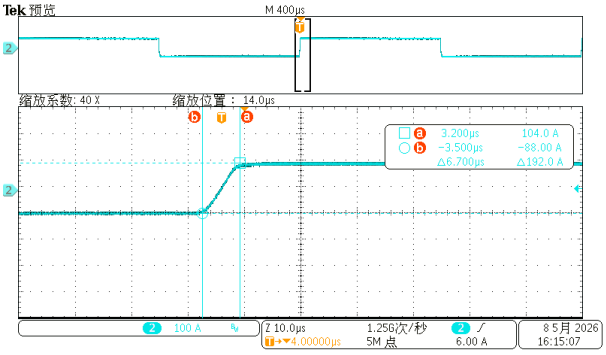
△72A current slew rate 5.4A/μs



△96A current slew rate 12.3A/μs



△144A Current Slew Rate: 20.2A/μs



△192A Current Slew Rate: 28.6A/μs

High Regeneration Efficiency

Peak Regeneration Efficiency reaches 85%, significantly reducing test heat loss and lowering thermal management and energy costs.

DUT: 12kW 50V PSU



100% Steady-State Load, Regeneration Efficiency 87%



10%-100% Dynamic Test, Regeneration Efficiency 70%

DUT: 72kW 50V PSU



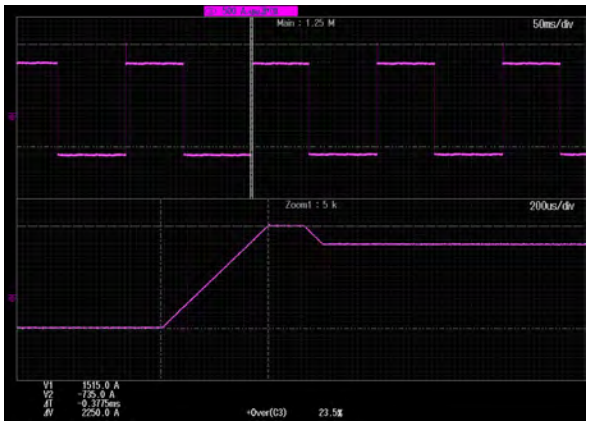
100% Steady-State Load, Regeneration Efficiency 84.8%



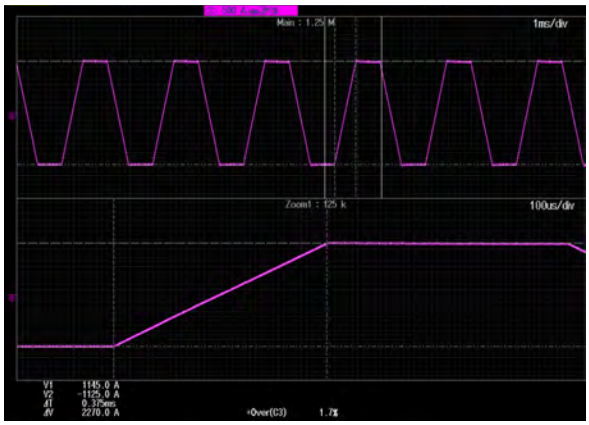
10%-120% Dynamic Test, Regeneration Efficiency 67%

EDPP Testing

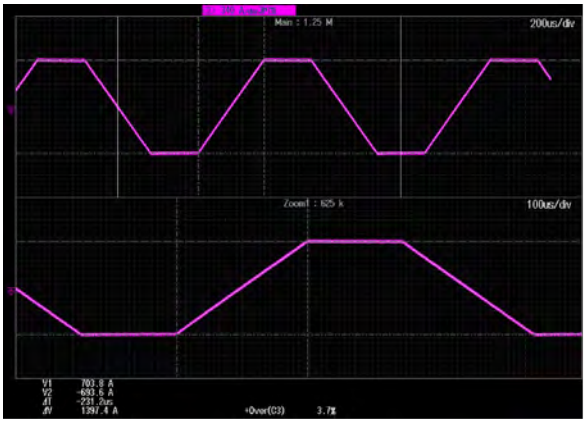
Load testing compliant with the EDPP standard waveform requirements of the AIDC Industry.



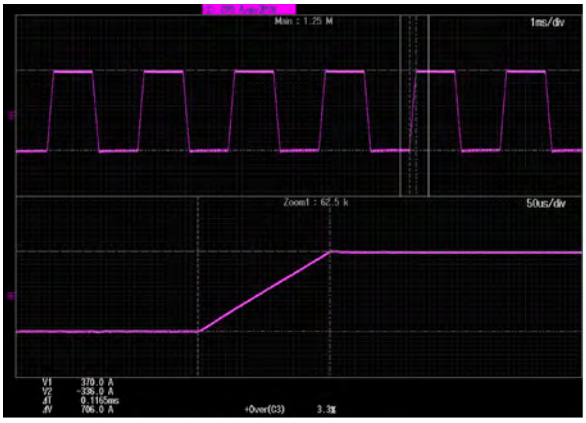
180% load for 0.5 ms - 150% load for 50 ms - 10% load for 60 ms - 180% load



180% load for 0.4 ms - 8% load for 0.4 ms



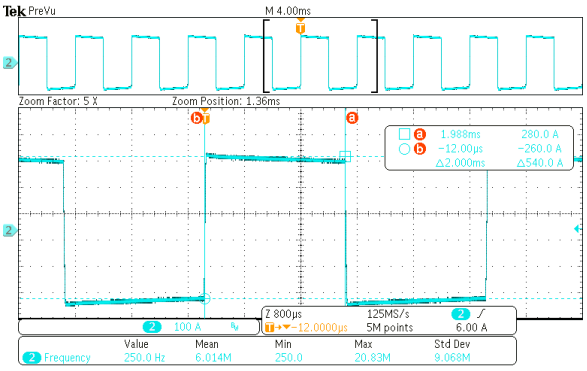
135% load for 0.4 ms - 30% load for 0.4 ms



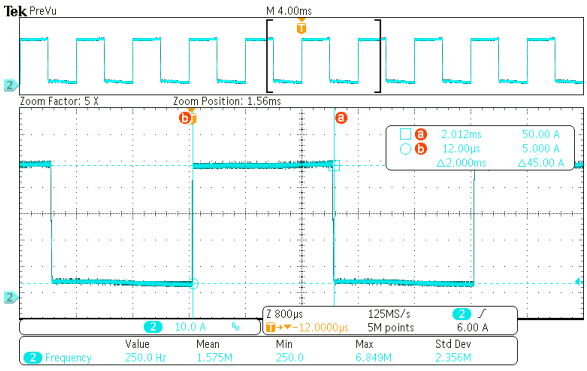
68% load for 0.4 ms - 15% load for 0.4 ms

● Short-term Overload Capability

Can withstand short-term overloads of up to 1.6x rated power, making it ideal for testing the instantaneous overload capability of power supplies, such as server PSU startup inrush, or for verifying protection circuit response speed.



18.5 kW waveform for 1.6x overload capability



25 kW waveform for 1.6x overload capability

07 PRODUCT FEATURES

Ultra-High Measurement Accuracy

Voltage accuracy of 0.02% + 0.02% F.S. and current accuracy of 0.05% + 0.05% F.S. deliver industry-leading measurement performance, making the product ideal for high-precision applications such as precision power supply calibration and power testing for high-compute equipment, while ensuring accurate, reliable, and fully traceable test data.

High-speed dynamic mode and dynamic scan mode

Supports 30 kHz high-speed load switching to simulate rapidly changing load conditions. Dynamic scan mode automatically sweeps load parameters, accelerating verification of equipment stability under all operating conditions.

High-speed voltage and current sampling

With a real-time sampling rate of up to 500 kHz, it accurately captures nanosecond-level transient waveforms, such as power switching noise and pulse charge/discharge characteristics, providing high-resolution data for dynamic performance analysis and fault diagnosis.

Supports master/slave parallel control between modules

Using master/slave mode, it intelligently coordinates multiple units operating in parallel to enable dynamic power distribution and load balancing, supports redundant backup, and ensures a highly reliable high-power test system, such as for data center power cluster testing.

08 APPLICATION SCENARIOS

AIDC	PSU, HVDC, Panama power supply, SST, BBU, CBU, Solid-state circuit breakers, etc.
Power electronic equipment	Switching mode power supplies, electronic components


AIDC


Power Electronic Equipment

09 | TECHNICAL SPECIFICATIONS

AC Parameters	
AC Voltage (Vac)	340 ~ 480
AC Frequency (Hz)	47 ~ 63
Maximum Regeneration Efficiency	85%
Wiring Method	3/PE (three-phase four-wire)
Connection Type	Three-position output connector
Operating Mode	
Constant Current Mode - CC	
Resolution (mA)	1
Accuracy	±(0.05%+0.05% F.S.)
Constant Resistance Mode - CR	
Range (Ω)	0.02 ~ 2000
Resolution (Ω)	0.001
Accuracy	±(Vin/Rset*(0.2%)+0.2% I F.S.)
Constant Power Mode - CP	
Resolution (W)	0.01
Voltage Slew Rate Range (full load)	±(0.2%+0.2% F.S.)
Dynamic Mode - CCD	
Peak Power	1.6 × 2 ms 1.4 × 50 ms (Average power must be less than or equal to maximum continuous power)
T1&T2	0.02 ms ~ 100 s
Resolution (μs)	1
Accuracy	1μs + 100ppm
Slew Rate Resolution (mA/μs)	1
Current Accuracy	±0.2%F.S.
Range Readback Function	
Voltage Readback Value	
Resolution (mV)	0.1

Accuracy	±(0.02%+0.02% F.S.)
Current Readback Value	
Resolution (mA)	0.1
Accuracy	±(0.05%+0.05% F.S.)
Power Readback Value	
Resolution (W)	0.01
Accuracy	±(0.2%+0.2% F.S.)
Other Functions	
Dynamic load test, sequence programming, dynamic scan, OCP, OPP testing	
Protection Parameters	
Overpower Protection	0–165% F.S. (±0.4% F.S.)
Overcurrent Protection	0–165% F.S. (±0.1% F.S.)
Overvoltage Protection	0–105% F.S. (±0.04% F.S.)
Overtemperature Protection	Ambient temperature: 40°C, heat sink temperature: 100°C
External Interfaces	
Front-panel USB interface	Software Upgrade
Communication Interface	LAN
Communication Protocol	SCPI
Environmental Parameters	
Operating Temperature	0 ~ +35°C
Storage Temperature	-20 ~ +60°C
Operating Humidity	5-90% RH (non-condensing)
Operating Altitude	≤2000m
Cooling Method	Intelligent forced-air cooling, with front intake and rear exhaust

Note

Reverse polarity connection will only trigger an alarm on the screen/host computer. It does not provide protection. A reverse connection with excessive voltage may directly damage the equipment. Please ensure correct polarity when connecting the device.

Empowering Future with Action

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