

Switching Power Supplies

PS5R-V Series



STANDARDS COMPLIANCE

Applicable Standards	Mark	File No. or Organization
UL508 UL1310 ¹ ANSI/ISA 12.12.01 CSA C22.2 No.107.1 CSA C22.2 No.213 CSA C22.2 No.223 ¹		UL/c-UL Listed File No. E467154, E177168
EN60950-1 EN50178 EN61204-3 EN50581	 	TÜV SÜD ² EU Low Voltage Directive EMC Directive RoHS Directive
SEMI F47	—	EPRI

Note 1: PS5R-VA/VB/VC/VD/VE only

Note 2: EN60950-1, EN50178 only

POWER SUPPLY PART NUMBERS

Output Capacity	Part Number	Input Voltage	Output Voltage	Output Current
7.5W	PS5R-VA05	100 to 240V AC (Voltage range: 85 to 264V AC / 100 to 370V DC)	5V	1.5A
	PS5R-VA12		12V	0.6A
	PS5R-VA24		24V	0.3A
10W	PS5R-VB05		5V	2.0A
15W	PS5R-VB12		12V	1.3A
	PS5R-VB24		24V	0.65A
30W	PS5R-VC12		12V	2.5A
	PS5R-VC24		24V	1.3A
60W	PS5R-VD24		24V	2.5A
90W	PS5R-VE24		24V	3.75A
120W	PS5R-VF24		24V	5.0A
240W	PS5R-VG24		24V	10.0A

Part Number Structure

PS5R - V □ □

Output Voltage

05: 5V³
12: 12V⁴
24: 24V

Output Capacity

A: 7.5W
B: 10W/15W
C: 30W
D: 60W
E: 90W
F: 120W
G: 240W

Note 3: PS5R-VA/VB only

Note 4: PS5R-VA/VB/VC only

Use only for interpreting part numbers.

Do not use for developing part numbers.

PRODUCT DESCRIPTION

DIN-rail mount switching power supplies with global approvals for both industrial and hazardous locations

KEY FEATURES

- Compact size preserves panel space
- Slim size (width):
22.5mm (10W/15W/30W)
36mm (60W/90W)
45mm (7.5W)
46mm (120W)
60mm (240W)
- Universal Voltage Input:
85-264V AC/100-370V DC
- Wide operating temperature range
- Spring-up terminals accept ring & fork terminals
- Approved for use in Class I Division 2 hazardous locations
- Can be installed in 6 directions
- 7.5W ~ 90W meet NEC Class 2 output ratings
- Overcurrent protection with auto-reset
- Meets SEMI F47 Sag Immunity (208V AC input)
- RoHS compliant
- Five-year factory warranty



SPECIFICATIONS

Model		5V DC output	PS5R-VA05		PS5R-VB05		-	-	-	-	-	
		12V DC output	PS5R-VA12		PS5R-VB12		PS5R-VC12	-	-	-	-	
		24V DC output	PS5R-VA24		PS5R-VB24		PS5R-VC24	PS5R-VD24	PS5R-VE24	PS5R-VF24	PS5R-VG24	
Output Capacity			7.5W		15W (5V Model is 10W)		30W	60W	90W	120W	240W	
Input	Rated Input Voltage (Single-phase two-wire) ¹		100 to 240V AC (Voltage range: 85 to 264V AC/100 to 370V DC) (Load ≤ 80% at 100-105V DC)									
	Frequency		50/60 Hz									
	Input Current (Typ.)	100V AC	5V: 0.20A 12V, 24V: 0.18A	5V: 0.25A 12V, 24V: 0.35A	0.7A	1.3A	1.1A	1.4A	2.7A			
		230V AC	5V: 0.12A 12V, 24V: 0.10A	5V: 0.14A 12V, 24V: 0.19A	0.3A	0.8A	0.6A	0.7A	1.2A			
	Inrush Current (Typ.) (Ta=25°C, cold start)	100V AC	15A		18A				14A			
		230V AC	36A		45A				41A	30A		
	Leakage Current	120V AC	0.5mA max.									
		230V AC	1.0mA max.									
	Efficiency (Typ.) (at rated output) ²	100V AC	5V: 74%, 12V: 79%, 24V: 80%	5V: 77%, 12V: 82%, 24V: 84%	12V: 83%, 24V: 85%	86%	88% 89%	89%				
		230V AC	5V: 73%, 12V: 77%, 24V: 76%	5V: 73%, 12V: 80%, 24V: 81%	12V: 85%, 24V: 87%	86%		90%				
Power Factor (Typ.)	100V AC	—		—	—	0.99			0.96			
	230V AC	—		—	—	0.86	0.92					
Output	Rated Voltage/Current		5V/1/5A, 12V/0.6A, 24V/0.3A		5V/2.0A ³ , 12V/1.3A, 24V/0.65A		12V/2.5A, 24V/1.3A	24V/2.5A	24V/3.75A	24V/5A	24V/10A	
	Adjustable Voltage Range		±10%									
	Output Holding Time (Typ.) (at rated output)	100V AC	5V: 45ms, 12V: 45ms, 24V: 47ms		5V: 53ms, 12V: 34ms, 24V: 36ms		12V: 13ms, 24V: 15ms	13ms	20ms	30ms		
		230V AC	5V: 289ms 12V: 294ms 24V: 282ms		5V: 330ms 12V: 215ms 24V: 230ms		12V: 110ms 24V: 110ms	105ms	30ms	33ms	40ms	
	Start Time (at rated input and output)		450ms max.		500ms max.		600ms max.	800ms max.		700ms max.	800ms max.	
	Rise Time (at rated input and output)		220ms max		5V, 12V: 200ms max. 24V: 250ms max.		200ms max.					
	Regulation	Input Fluctuation		0.4% max.								
		Load Fluctuation		5V: 2.5% max. 12V, 24V: 1.0% max.				1.0% max.				
		Temperature Change		0.04%/°C max. (-10 to +65°C)		0.05%/°C max. (-10 to +65°C)		12V: 0.05%/°C max. (-10 to +50°C) 24V: 0.05%/°C max. (-10 to +55°C)	0.05%/°C max. (-10 to +55°C)	0.05%/°C max. (-10 to +50°C)	0.05%/°C max. (-25 to +55°C)	0.05%/°C max. (-25 to +50°C)
		Ripple (including noise)	5V: 8% p-p max. (-25 to -10°C) 12V: 6% p-p max. (-25 to -10°C) 24V: 4% p-p max. (-25 to -10°C)		5V: 8% p-p max. (-25 to -10°C) 12V: 6% p-p max. (-25 to -10°C) 24V: 4% p-p max. (-25 to -10°C)		12V: 6% p-p max. (-25 to -10°C) 24V: 4% p-p max. (-25 to -10°C)	4% p-p max. (-25 to -10°C)				
			5V: 5% p-p max. (-10 to +0°C) 12V: 2.5% p-p max. (-10 to +0°C) 24V: 1.5% p-p max. (-10 to +0°C)		5V: 5% p-p max. (-10 to +0°C) 12V: 2.5% p-p max. (-10 to +0°C) 24V: 1.5% p-p max. (-10 to +0°C)		12V: 2.5% p-p max. (-10 to +0°C) 24V: 1.5% p-p max. (-10 to +0°C)	1.5% p-p max. (-10 to +0°C)				
			5V: 2.5% p-p max. (0 to +65°C) 12V: 1.5% p-p max. (0 to +65°C) 24V: 1% p-p max. (0 to +65°C)		5V: 2.5% p-p max. (0 to +65°C) 12V: 1.5% p-p max. (0 to +65°C) 24V: 1% p-p max. (0 to +65°C)		12V: 1.5% p-p max. (0 to +50°C) 24V: 1% p-p max. (0 to +55°C)	1% p-p max. (0 to +55°C)	1% p-p max. (0 to +50°C)	1% p-p max. (0 to +55°C)	1% p-p max. (0 to +50°C)	
	Overcurrent Protection			105% min. (auto reset)						101% min. (auto reset)	105% min. (auto reset)	
	Operation Indicator			LED (green)								
Dielectric Strength	Between input and output terminals		3,000V AC, 1 minute									
	Between input and ground terminals		2,000V AC, 1 minute									
	Between output and ground terminals		500V AC, 1 minute									
Insulation Resistance			Between input and output terminals: 100MΩ min. (500V DC megger) Between input and ground terminals: 100MΩ min. (500V DC megger)									
Operating Temperature ⁴ (No freezing)			-25 to +75°C			-25 to +70°C			-25 to +65°C			
Operating Humidity			20 to 90% RH (no condensation)									
Storage Temperature (No freezing)			-25 to +75°C									
Storage Humidity			20 to 90% RH (no condensation)									
Vibration Resistance			10 to 55Hz, amplitude 0.375mm, 2 hours each in 3 axes (when used with BNL6 end clips)				10 to 55Hz, amplitude 0.33mm, 2 hours each in 3 axes (when used with BNL6 end clips) 10 to 55Hz, amplitude 0.375mm, 2 hours each in 3 axes (when used with BNL8 end clips)		10 to 55Hz, amplitude 0.21mm, 2 hours each in 3 axes (when used with BNL6 end clips) 10 to 55Hz, amplitude 0.375mm, 2 hours each in 3 axes (when used with BNL8 end clips)		10 to 55Hz, amplitude 0.375mm, 2 hours each in 3 axes (when used with part no. BNL6 mounting clips)	
Shock Resistance			300 m/s ² (30G), 3 times each in 6 directions									
Expected Life ⁵			8 years minimum (at the rated input, 50% load, operating temperature +40°C, standard mounting direction)									
EMC	EMI	EN61204-3 (Class B)										
	EMS	EN61204-3 (industrial)										
Safety Standards			UL508 (Listing), UL1310 Class 2, ANSI/ISA-12.12.01 CSA C22.2 No. 107.1, 213, 223 EN60950-1, EN50178						UL508 (Listing) ANSI/ISA-12.12.01 107.1, 213 EN60950-1, EN50178		CSA C22.2 No.	
Other Standard			SEMI F47 (at 208V AC input only)									
Degree of Protection			IP20 (EN60529)									
Dimensions (mm)			75H × 45W × 70D		90H × 22.5W × 95D		95H × 36W × 108D		115H × 46W × 121D		125H × 60W × 125D	
Weight (approx.)			130g		140g		150g	260g	310g	470g	960g	
Terminal Screw			M3.5									

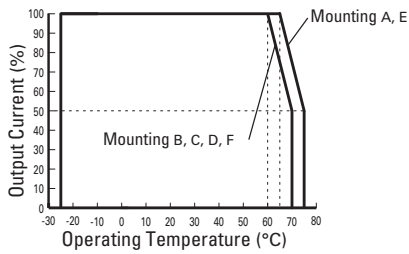
*At normal temperature and humidity unless otherwise specified. Notes: 1: DC input voltage is not subject to safety standards. When using on DC input, connect a fuse to the input terminal for DC input protection. 2: Under stable state. 3: PS5R-VB05 (5V DC/2.0A) is 10W (Up to 3.0A at Ta = 0 to 40°C. Not subject to safety standards above 2.0A.) 4: See the output derating curves on page 3. 5: Calculation of the expected life is based on the actual life of the aluminum electrolytic capacitor. The expected life depends on operating conditions.

CHARACTERISTICS

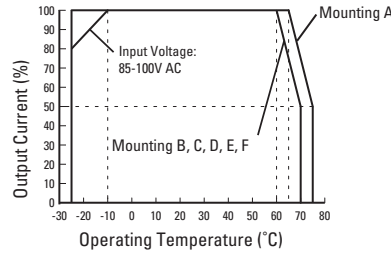
Operating Temperature vs. Output Current (Derating Curves)

Conditions: Natural air cooling (Operating temperature is the temperature around the switching power supply.)

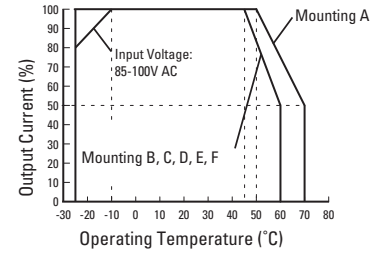
PS5R-VA05, -VA12, -VA24



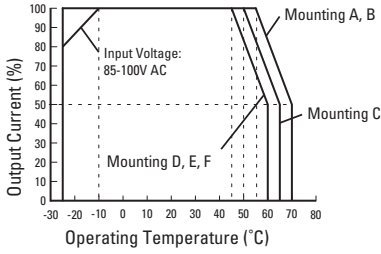
PS5R-VB05, -VB12, -VB24



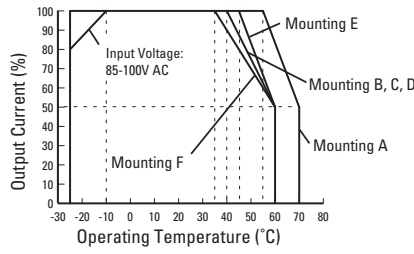
PS5R-VC12



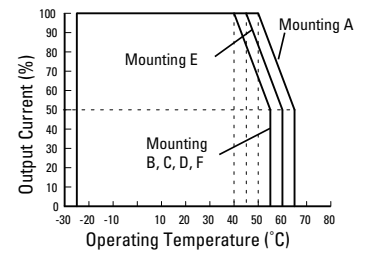
PS5R-VC24



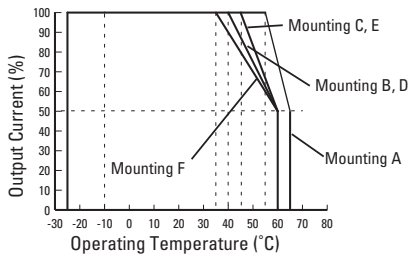
PS5R-VD24



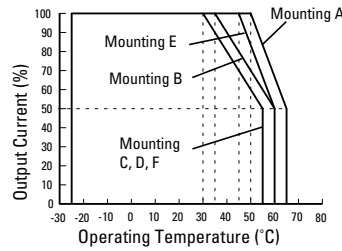
PS5R-VE24



PS5R-VF24



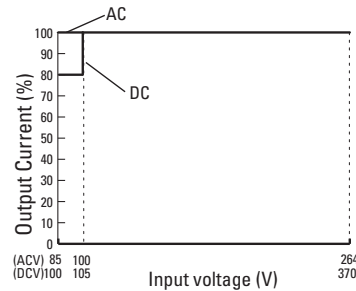
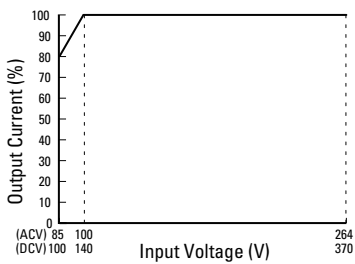
PS5R-VG24



Input Voltage vs. Output Current (Derating Curves) (Ta=25°C)

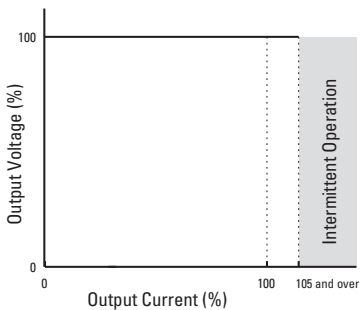
PS5R-VA05, VA12, VA24, -VB05, -VB12, -VB24, -VC12, -VC24, -VD24, -VE24, -VF24

PS5R-VG24

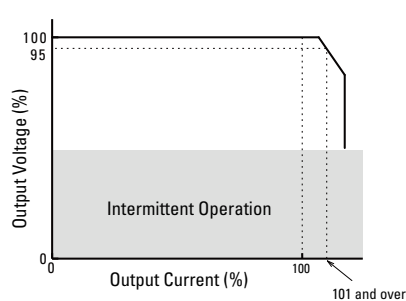


Overcurrent Protection Characteristics

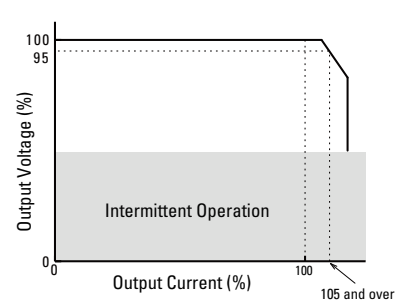
PS5R-VA/VB/VC/VD/VF



PS5R-VE24



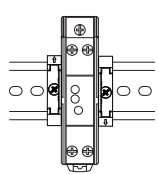
PS5R-VG24



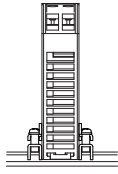
Operating Temperature Approved by Safety Standards

Part Number	UL508, CSA C22.2 No.107.1, ANSI/ISA12.12.01, EN60950-1, EN50178					
	Mounting A	Mounting B	Mounting C	Mounting D	Mounting E	Mounting F
PS5R-A05, -VB12, -VB24	65	60	60	60	65	60
PS5R-VB05, -VB12, -VB24	65	60	60	60	60	60
PS5R-VC12	50	45	45	45	45	45
PS5R-VC24	55	55	50	45	45	45
PS5R-VD24	55	40	40	40	45	35
PS5R-VE24	50	40	40	40	45	40
PS5R-VF24	55	40	45	40	45	35
PS5R-VG24	50	35	30	30	45	30

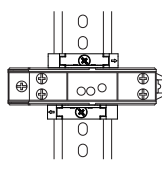
MOUNTING STYLE



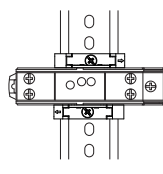
Mounting A
(Vertical, standard)



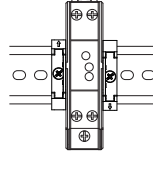
Mounting B
(Upright)



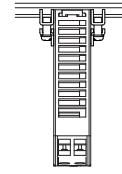
Mounting C
(Right side up)



Mounting D
(Left side up)



Mounting E
(Upside down)

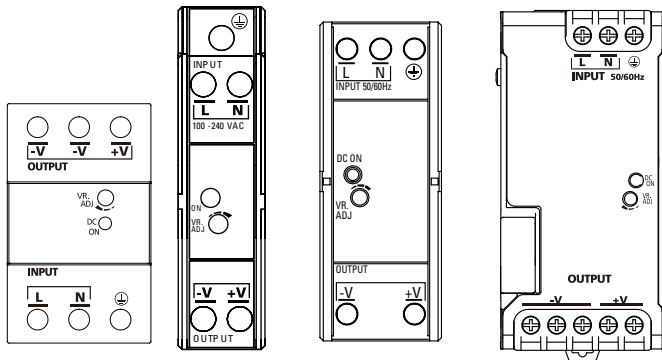


Mounting F
(Downward)



FRONT PANEL

PS5R-VA PS5R-VB/VC PS5R-VD/VE/VF PS5R-VG



Marking	Name	Description
L, N	AC Input Terminal	Voltage range: 85 to 264V AC/100 to 370V DC
	Ground Terminal	Be sure to connect this terminal to a proper ground.
+V, -V	DC Output Terminals	+V: Positive output terminal -V: Negative output terminal
VR.ADJ	Output Voltage Adjustment	Allows adjustment within $\pm 10\%$. ($V_E = \pm 5\%$) Turning clockwise increases the output voltage. Turning counterclockwise decreases the output voltage.
DC ON	Operation Indicator (green)	Illuminates when the output voltage is on.

ACCESSORIES

Panel Mounting Bracket²

Applicable Switching Power Supply	Part Number	Remarks
PS5R-VB	PS9Z-5R1B	—
PS5R-VC	PS9Z-5R2B	For side mounting
PS5R-VD	PS9Z-5R1C	—
PS5R-VE	PS9Z-5R1E	—
PS5R-VF	PS9Z-5R1F	—
PS5R-VG	PS9Z-6R1F	—
	PS9Z-6R2F	For side mounting

Note 2: Used when installing on a panel directly.

DIN Rail (35mm-wide)

Length	Part Number	Material
1000mm	BNDN1000	Aluminum

End Clip

Part Number
BNL6
BNL8