

WESTCODE

SEMICONDUCTORS
TECHNICAL
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Stud-Base Silicon Rectifier Diodes Type PHN/PHR400

400amperes average: up to 1500 volts V_{RRM}

RATINGS Maximum values at 190°C T_j unless stated otherwise

RATING	CONDITIONS	SYMBOL	
Average forward current	Half sine wave 120°C case temperature	$I_{F(AV)}$	400A
RMS current		$I_{F(RMS)}$	630A
DC forward current		I_F	630A
Peak one-cycle surge (non repetitive)	10ms duration $\begin{cases} 60\% V_{RRM} \text{ re-applied} \\ V_R \leq 10 \text{ volts} \end{cases}$	$I_{FSM(1)}$	7500A
		$I_{FSM(2)}$	8250A
Maximum permissible surge energy	10ms duration $\begin{cases} 60\% V_{RRM} \text{ re-applied} \\ V_R \leq 10 \text{ volts} \end{cases}$	$I^2 t (1)$	281000A ² s
	3ms duration $V_R \leq 10 \text{ volts}$	$I^2 t (2)$	340000A ² s
			245000A ² s
Case operating temperature		T _C	-30, +190°C
Storage temperature		T _{stg}	-40, +200°C

CHARACTERISTICS Maximum values at 190°C T_j unless stated otherwise

CHARACTERISTIC	CONDITIONS	SYMBOL	
Peak forward voltage drop	At 1500A, I_{FM}	V_{FM}	1.62V
Forward conduction threshold voltage		V_0	0.8V
Forward conduction slope resistance		r	0.55mΩ
Peak reverse current	At V_{RRM}	I_{RRM}	15mA
Thermal resistance junction to case for a diode with a maximum forward voltage drop characteristic	DC and 180° sine wave	$R_{th(j-c)}$	0.13°C/W
	120° rectangular wave		0.14°C/W
Thermal resistance case to heatsink		$R_{th(c-hs)}$	0.04°C/W

VOLTAGE CODE →	02	04	06	08	10	12	14	15	
Repetitive voltage V_{RRM}	200	400	600	800	1000	1200	1400	1500	
Non-repetitive voltage V_{RSM}	300	500	700	900	1100	1300	1500	1600	

ORDERING INFORMATION (Please quote device code as explained below – 10 digits)

S	W	●	●	P	H	●	4	0	0
FIXED BASIC CODE	VOLTAGE CODE (see above)	FIXED OUTLINE CODE		STUD POLARITY N = cathode R = anode		FIXED TYPE CODE			

Typical code SW06PHR400 = 600V_{RRM} diode with stud anode*In the interest of product improvement, Westcode reserves the right to change specifications at any time without notice.*

The graph plots maximum forward dissipation in watts against mean forward current in amperes (whole cycle average). The x-axis ranges from 0 to 700 amperes, and the y-axis ranges from 0 to 800 watts. Four lines are shown: DC (highest dissipation), 1 phase, 3 phase, and 6 phase (steepest line, indicating highest dissipation for a given current).

Mean Forward Current (A)	DC (W)	1 phase (W)	3 phase (W)	6 phase (W)
0	0	0	0	0
100	100	80	60	40
200	200	160	120	80
300	300	240	180	120
400	400	320	240	160
500	500	400	300	200
600	600	480	360	240

A log-log plot showing the transient thermal impedance θ_{JA} in $^{\circ}\text{C}/\text{W}$ as a function of time in seconds for a 100-watt transistor. The y-axis ranges from 0.001 to 1.0 $^{\circ}\text{C}/\text{W}$, and the x-axis ranges from 0.001 to 10.0 seconds. The curve starts at approximately 0.005 $^{\circ}\text{C}/\text{W}$ at 0.001 seconds and rises to a steady-state value of 0.130 $^{\circ}\text{C}/\text{W}$ after about 1 second.

time, seconds	transient thermal impedance, $^{\circ}\text{C}/\text{W}$
0.001	0.005
0.01	0.015
0.1	0.05
1.0	0.11
10.0	0.130

The graph plots total peak half sine surge current in k. amperes against the duration of surge in milliseconds and cycles at 50Hz. The left y-axis ranges from 1 to 100 k. amperes, and the right y-axis ranges from 10^5 to 10^7 amps² secs. The x-axis has two scales: milliseconds (1 to 10) and cycles at 50Hz (0.5 to 100). Four curves are shown, representing different surge current limits and their corresponding I^2t values.

Duration (m. secs)	Duration (cycles at 50Hz)	I^2t ($V_{RRM} < 10$)	I^2t ($60\% V_{RRM}$)	I_{FSM} ($V_{RRM} < 10$)	I_{FSM} ($60\% V_{RRM}$)
1	0.5	~25	~25	~2	~2
5	2.5	~10	~10	~4	~4
10	5	~8	~8	~4	~4
100	50	~25	~25	~2	~2

max. I^2t (amps² secs)

Technical drawing of a probe assembly with dimensions in mm and inches:

- Top dimension: 21.4 (84)
- Top hole diameter: Ø 10.5 (41)
- Top hole depth: 11 (43)
- Threaded section length: 70 (2.75)
- Threaded section diameter: Ø 28.3 (1.11)
- Bottom section length: 28 (1.1)
- Bottom section diameter: 21 (83)
- Bottom section thread: 3/4" - 16 UNF - 2A
- Bottom section length: 15.7 (62)
- Bottom section diameter: 31.5 (1.24) A/F
- Total length: 200 (7.87)

Mounting Torque
2.50 – 2.77 KgM
threads not to be
lubricated

Weight: 250 grams

dimensions
in mm (inches)

Mounting Torque
2.50 — 2.77 KgM
threads not to be
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Weight: 250 grams

dimensions
in mm (inches)



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