



# WESTCODE

# SEMICONDUCTORS


TECHNICAL  
PUBLICATION

D P400

ISSUE 2

May, 1989

## Stud-Base Silicon Rectifier Diodes Type PHN/PHR400

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

RATINGS Maximum values at 190°C T<sub>j</sub> 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 $\left\{ \begin{array}{l} 60\% V_{RRM} \text{ re-applied} \\ V_R \leq 10 \text{ volts} \end{array} \right.$	$I_{FSM(1)}$	7500A
		$I_{FSM(2)}$	8250A
Maximum permissible surge energy	10ms duration $\left\{ \begin{array}{l} 60\% V_{RRM} \text{ re-applied} \\ V_R \leq 10 \text{ volts} \end{array} \right.$	$I^2 t (1)$	281000A <sup>2</sup> s
	3ms duration $V_R \leq 10 \text{ volts}$	$I^2 t (2)$	340000A <sup>2</sup> s 245000A <sup>2</sup> s
Case operating temperature		T <sub>C</sub>	-30, +190°C
Storage temperature		T <sub>stg</sub>	-40, +200°C

CHARACTERISTICS Maximum values at 190°C T<sub>j</sub> 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 volt-drop characteristic	DC and 180° sine wave 120° rectangular wave	$R_{th(j-c)}$	0.13°C/W 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<sub>RRM</sub> diode with stud anode*In the interest of product improvement, Westcode reserves the right to change specifications at any time without notice.*

D P400

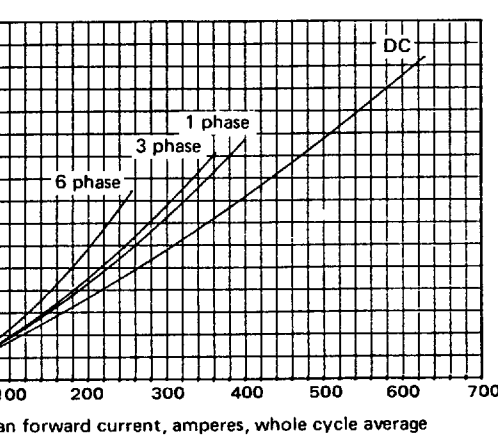
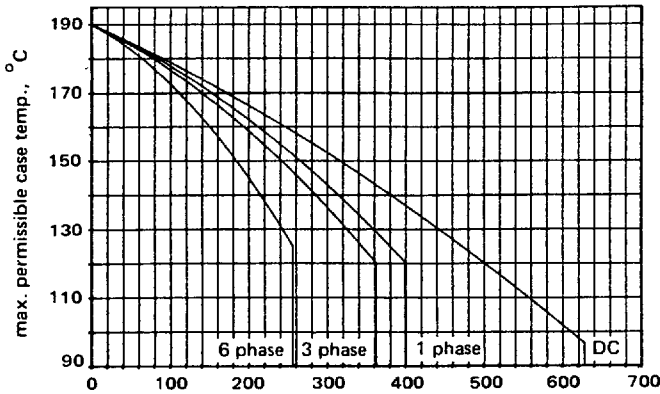


Figure 1 Dissipation and stud temperature v. mean forward current

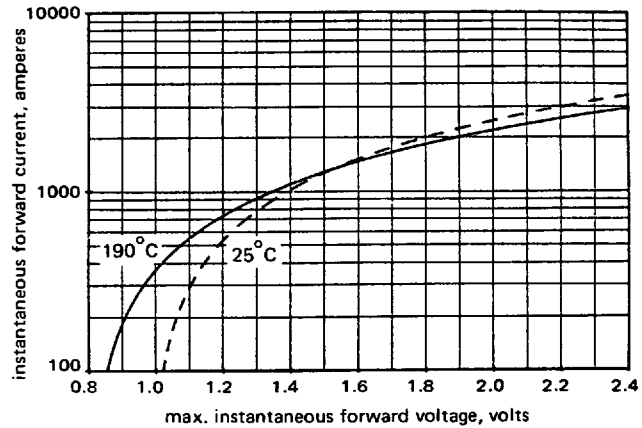


Figure 3 Forward voltage characteristic

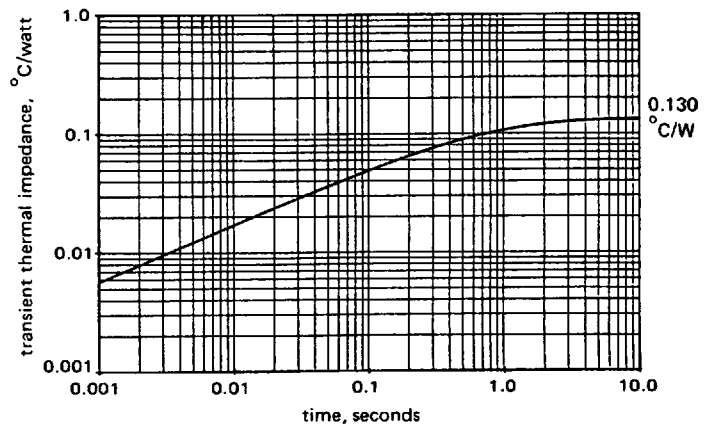


Figure 4 Transient thermal impedance, junction to case

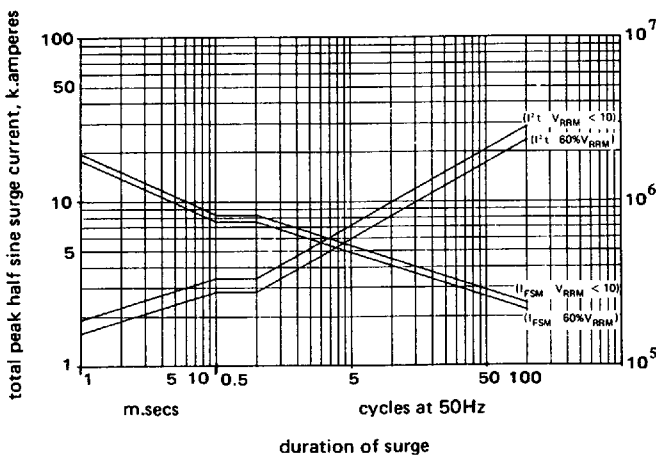
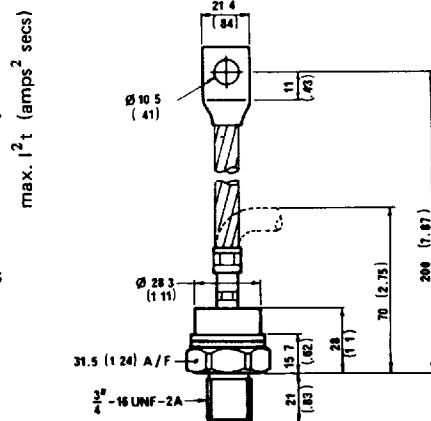


Figure 2 Max. non repetitive surge current at initial junction temperature 190°C



Mounting Torque  
2.50 – 2.77 KgM  
threads not to be  
lubricated  
Weight: 250 grams  
dimensions  
in mm (inches)



WESTCODE SEMICONDUCTORS LIMITED

P.O. Box 57, Chippenham,  
Wiltshire, England SN15 1JL  
Telephone: (0249) 444524  
Telex: 44751 Telefax: (0249) 659448