

### FEATURES

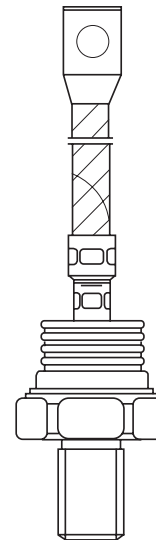
- 1). Wide current range
- 2). High voltage ratings up to 2400V
- 3). High surge current capabilities
- 4). Stud cathode and stud anode version
- 5). Standard JEDEC types

### TYPICAL APPLICATIONS

- 1). Converters
- 2). Power supplies
- 3). Machine tool controls
- 4). High power drives
- 5). Medium traction applications

### MAJOR RATINGS AND CHARACTERISTICS

Parameters		SD400N(R)	UNIT
$I_{F(AV)}$		400	A
	@ TC	120	°C
$I_{F(RMS)}$		630	A
	@ 50Hz	8250	A
$I_{FSM}$	@ 60Hz	8640	A
	@ 50Hz	340	A <sup>2</sup> s
$I^2t$	@ 60Hz	311	A <sup>2</sup> s
	range	400 to 2400	V
$V_{RRM}$	range	40 to 190	°C
$T_J$	range		



### ELECTRICAL SPECIFICATIONS

#### 1). Voltage Ratings

Type number	Voltage Code	$V_{RRM}$ , maximum repetitive peak reverse voltage	$V_{RSM}$ , maximum non-repetitive peak reverse voltage	$I_{RRM}$ max. @ $T_J = T_J$ max.
		V	V	mA
SD400N(R)	04	400	500	15
	08	800	900	
	12	1200	1300	
	16	1600	1700	
	20	2000	2100	
	24	2400	2500	

2). Forward Conduction

Parameters		SD400N(R)	Unit	Conditions		
$I_{F(AV)}$	Max. average forward current @ Case temperature	400	A	180° conduction, half sine wave		
		120	°C			
$I_{F(AV)}$	Max. average forward current @ Case temperature	480	A	180° conduction, half sine wave		
		100	°C			
$I_{F(RMS)}$	Max. RMS forward current	630	A	DC @ 110° C case temperature		
$I_{FSM}$	Max. peak, one-cycle forward, non-repetitive surge current	8250	A	t = 10ms	No voltage	Sinusoidal half wave, Initial $T_J = T_J$ max.
		8640		t = 8.3ms	reapplied	
		6940		t = 10ms	100% $V_{RRM}$	
		7270		t = 8.3ms	reapplied	
$I^2t$	Maximum $I^2t$ for fusing	340	KA <sup>2</sup> s	t = 10ms	No voltage	
		311		t = 8.3ms	reapplied	
		241		t = 10ms	100% $V_{RRM}$	
		220		t = 8.3ms	reapplied	
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	3400	KA <sup>2</sup> √s	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)1}$	Low level value of threshold voltage	0.80	V	(16.7% × π × $I_{F(AV)}$ < I < π × $I_{F(AV)}$ ), $T_J = T_J$ max.		
$V_{F(TO)2}$	High level value of threshold voltage	0.85		(I > π × $I_{F(AV)}$ ), $T_J = T_J$ max.		
$r_{f1}$	Low level value of forward slope resistance	0.55	mΩ	(16.7% × π × $I_{F(AV)}$ < I < π × $I_{F(AV)}$ ), $T_J = T_J$ max.		
$r_{f2}$	High level value of forward slope resistance	0.51		(I > π × $I_{F(AV)}$ ), $T_J = T_J$ max.		
$V_{FM}$	Max. forward voltage drop	1.62	V	$I_{pk} = 1500A$ , $T_J = 25^\circ C$ , $t_p = 10ms$ sinusoidal wave		
$T_J$	Max. junction operating temperature range	-40 to 190	°C			
$T_{stg}$	Max. storage temperature range	-55 to 200				
$R_{thJC}$	Max. thermal resistance, junction to case	0.11	K/W	DC operation		
$R_{thCS}$	Max. thermal resistance, case to heatsink	0.04		Mounting surface, smooth, flat and greased		
T	Max. allowed mounting torque ± 10%	27	Nm	Not lubricated threads		
wt	Approximate weight	250	g	unleaded device		
	Case style	B-8		See Outline Table		

$\Delta R_{thJC}$  Conduction

(The following table shows the increment of thermal resistance  $R_{thJC}$  when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.020	0.013	K/W	$T_J = T_J$ max.
120°	0.023	0.023		
90°	0.029	0.031		
60°	0.042	0.044		
30°	0.073	0.074		

**PERFORMANCE CURVES FIGURE**

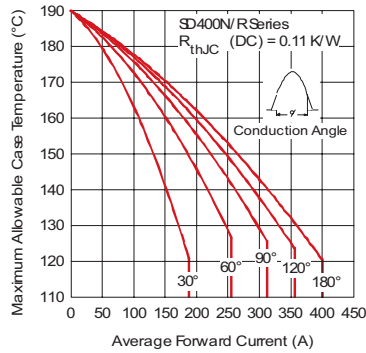


Fig. 1 - Current Ratings Characteristics

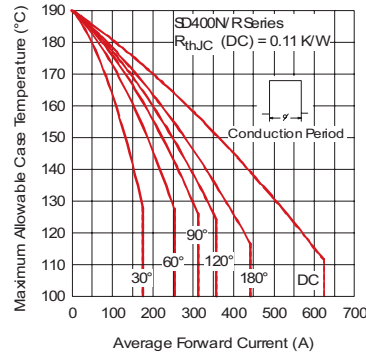


Fig. 2 - Current Ratings Characteristics

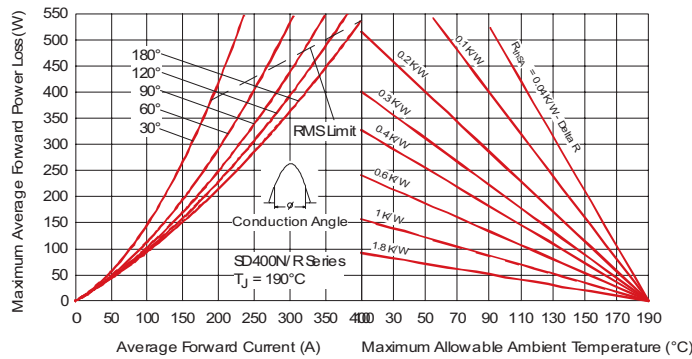


Fig. 3 - Forward Power Loss Characteristics

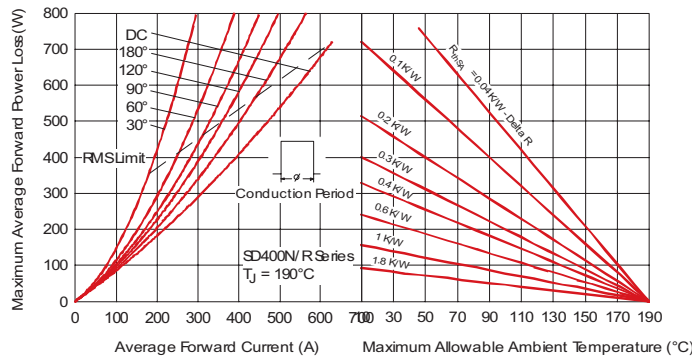


Fig. 4 - Forward Power Loss Characteristics

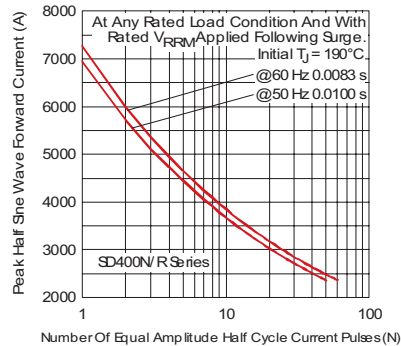


Fig. 5 - Maximum Non-Repetitive Surge Current

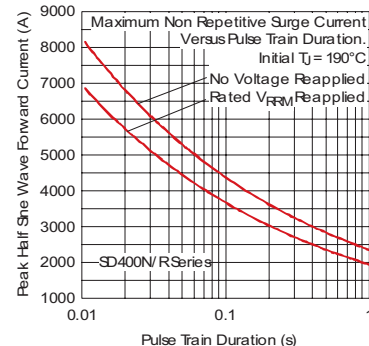


Fig. 6 - Maximum Non-Repetitive Surge Current

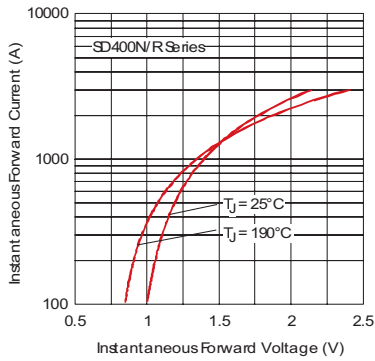


Fig. 7 - Forward Voltage Drop Characteristics

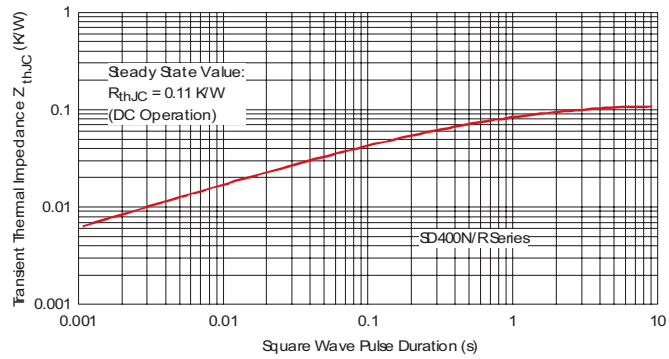
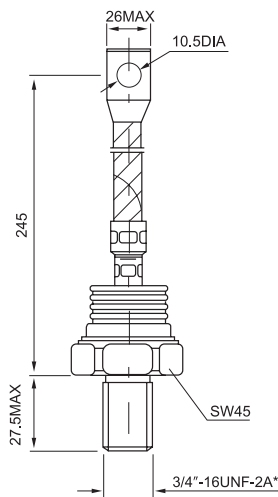


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristic

## OUTLINE



\*FOR METRIC DEVICE: M20 × 1.5/M24 × 1.5

**Case Style B-8**

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