

### FEATURES

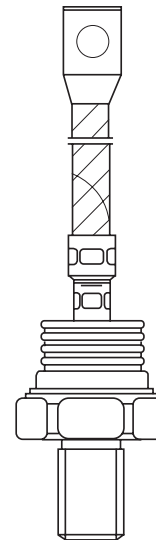
- 1). Wide current range
- 2). High voltage ratings up to 3200V
- 3). High surge current capabilities
- 4). Stud cathode and stud anode version
- 5). Standard JEDEC types

### TYPICAL APPLICATIONS

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

### MAJOR RATINGS AND CHARACTERISTICS

Parameters	40HF(R)		Unit
	04 to 20	25 to 32	
$I_{F(AV)}$	600	600	A
@ TC	92	54	°C
$I_{F(RMS)}$	940	940	A
@ 50Hz	13000	10500	A
@ 60Hz	13600	11000	A
$I^2t$	845	551	A <sup>2</sup> s
@ 50Hz	772	503	A <sup>2</sup> s
$V_{RRM}$	range 400 to 2000	range 2500 to 3200	V
$T_J$	range - 40 to 180	range - 40 to 150	°C



### 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
SD600N(R)	04	400	500	35
	08	800	900	
	12	1200	1300	
	16	1600	1700	
	20	2000	2100	
	25	2500	2600	
	28	2800	2900	
	32	3200	3300	

2). Forward Conduction

Parameters		SD600N(R)		Unit	Conditions		
		04 to 20	25 to 32				
$I_{F(AV)}$	Max. average forward current	400	600	A	180° conduction, half sine wave		
	@ Case temperature	120	54	°C			
$I_{F(AV)}$	Max. average forward current	480	375	A	180° conduction, half sine wave		
	@ Case temperature	100	100	°C			
$I_{F(RMS)}$	Max. RMS forward current	630	940	A	DC @ 110° C case temperature		
$I_{FSM}$	Max. peak, one-cycle forward, non-repetitive surge current	8250	10500	A	t = 10ms	No voltage	Sinusoidal half wave, Initial $T_J = T_J \text{ max.}$
		8640	11000		t = 8.3ms	reapplied	
		6940	8830		t = 10ms	100% $V_{RRM}$	
		7270	9250		t = 8.3ms	reapplied	
$I^2t$	Maximum $I^2t$ for fusing	340	551	KA <sup>2</sup> s	t = 10ms	No voltage	
		311	503		t = 8.3ms	reapplied	
		241	390		t = 10ms	100% $V_{RRM}$	
		220	356		t = 8.3ms	reapplied	
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	3400	5510	KA <sup>2</sup> $\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)1}$	Low level value of threshold voltage	0.78	0.84	V	(16.7% $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J \text{ max.}$		
$V_{F(TO)2}$	High level value of threshold voltage	0.87	0.88		(I > $\pi \times I_{F(AV)}$ ), $T_J = T_J \text{ max.}$		
$r_{f1}$	Low level value of forward slope resistance	0.35	0.40	m $\Omega$	(16.7% $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J \text{ max.}$		
$r_{f2}$	High level value of forward slope resistance	0.31	0.38		(I > $\pi \times I_{F(AV)}$ ), $T_J = T_J \text{ max.}$		
$V_{FM}$	Max. forward voltage drop	1.31	1.44	V	$I_{pk} = 1500A$ , $T_J = 25^\circ C$ , $t_p = 10ms$ sinusoidal wave		
$T_J$	Max. junction operating temperature range	-40 to 180	-40 to 150	°C			
$T_{stg}$	Max. storage temperature range	-55 to 200	-55 to 200				
$R_{thJC}$	Max. thermal resistance, junction to case	0.1		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 $\pm 10\%$	50		Nm	Not lubricated threads		
wt	Approximate weight	454		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°	0.012	0.008	K/W	$T_J = T_J \text{ max.}$
120°	0.014	0.014		
90°	0.017	0.019		
60°	0.025	0.026		
30°	0.042	0.042		

**PERFORMANCE CURVES FIGURE**

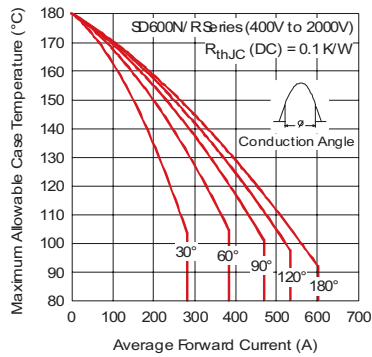


Fig. 1 - Current Ratings Characteristics

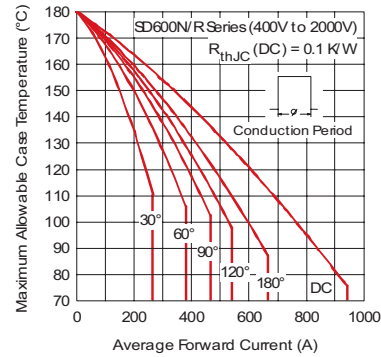


Fig. 2 - Current Ratings Characteristics

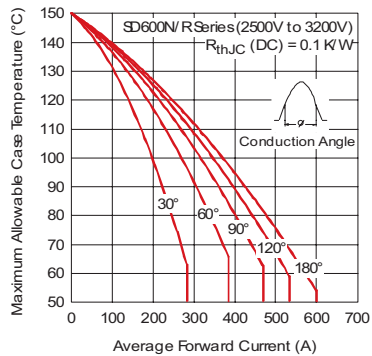


Fig. 3 - Current Ratings Characteristics

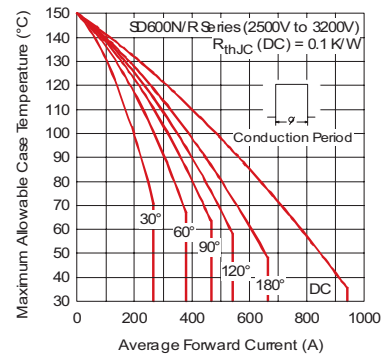


Fig. 4 - Current Ratings Characteristics

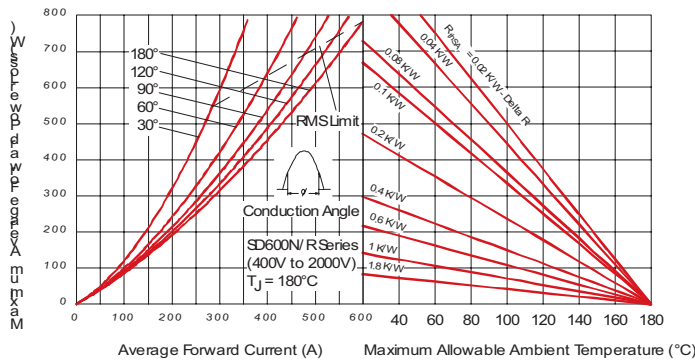


Fig. 5 - Forward Power Loss Characteristics

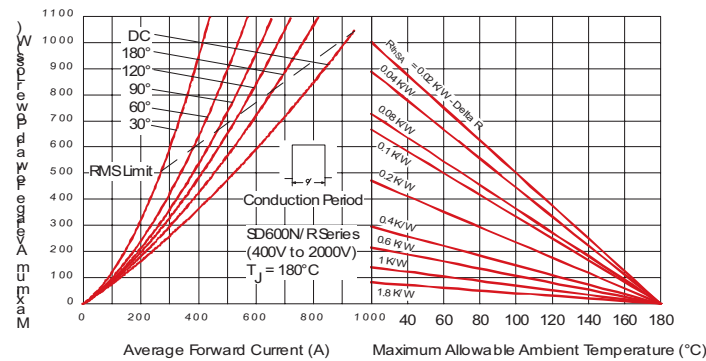


Fig. 6 - Forward Power Loss Characteristics

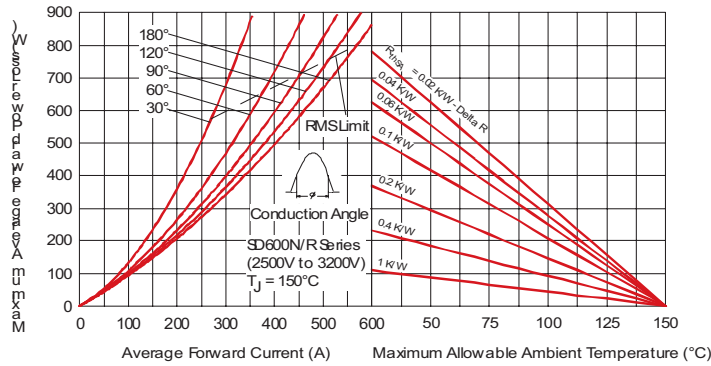


Fig. 7 - Forward Power Loss Characteristics

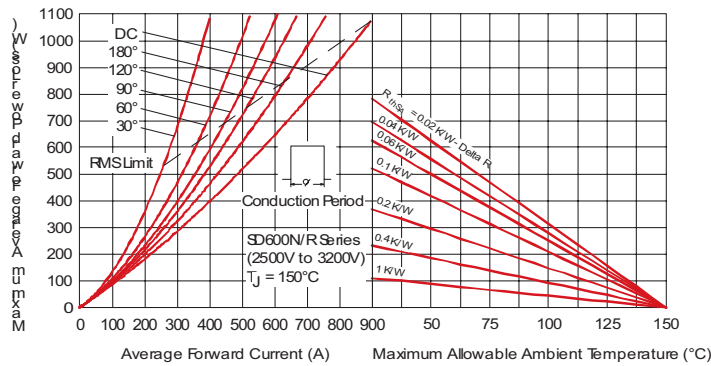


Fig. 8 - Forward Power Loss Characteristics

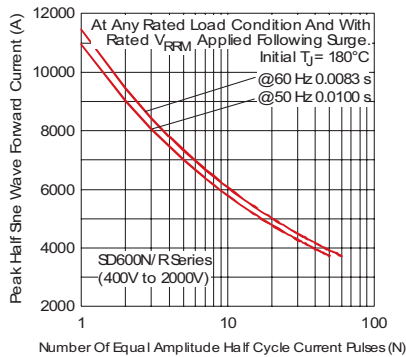


Fig. 9 - Maximum Non-Repetitive Surge Current

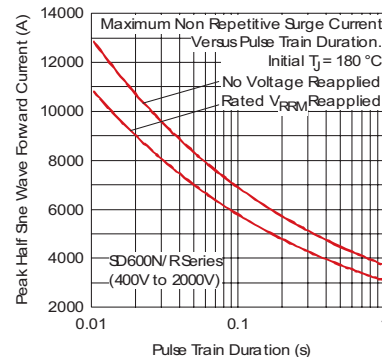


Fig. 10 - Maximum Non-Repetitive Surge Current

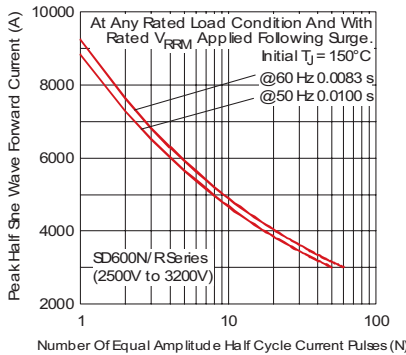


Fig. 11 - Maximum Non-Repetitive Surge Current

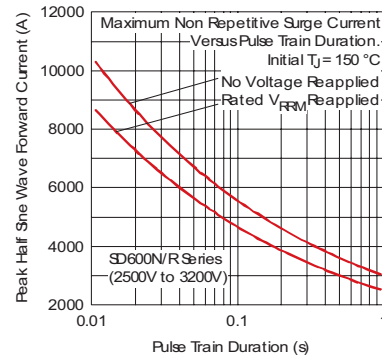


Fig. 12 - Maximum Non-Repetitive Surge Current

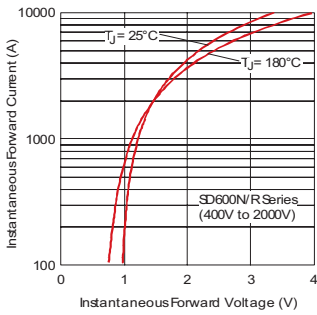


Fig. 13 - Forward Voltage Drop Characteristics

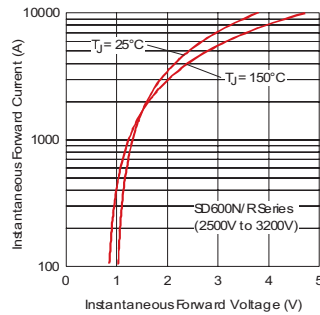


Fig. 14 - Forward Voltage Drop Characteristics

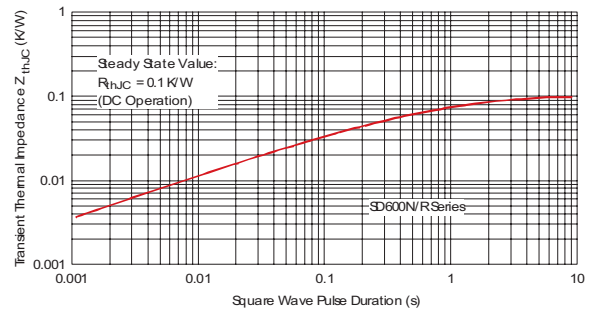
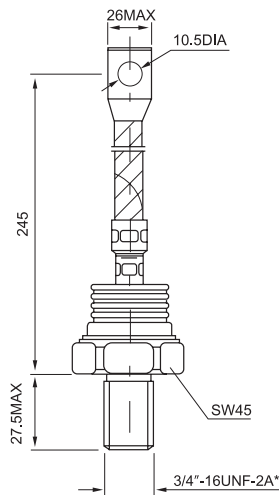


Fig. 15 - Thermal Impedance  $Z_{thJC}$  Characteristics

## OUTLINE



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

**Case Style B-8**

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