International
IOR Rectifier

SD600N/R SERIES

STANDARD RECOVERY DIODES

Stud Version

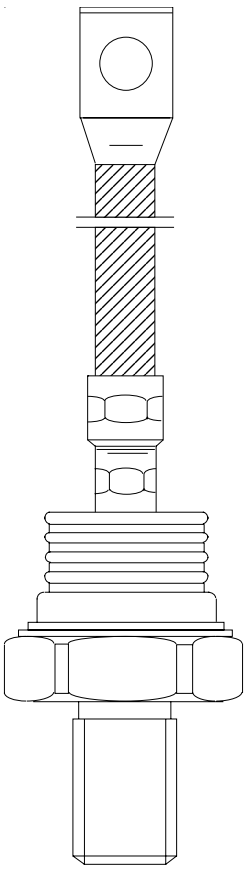
Features

- Wide current range
- High voltage ratings up to 3200V
- High surge current capabilities
- Stud cathode and stud anode version
- Standard JEDEC types
- RoHS Compliant

600A

Typical Applications

- Converters
- Power supplies
- Machine tool controls
- High power drives
- Medium traction applications



case style
B-8

Major Ratings and Characteristics

Parameters		SD600N/R		Units
		04 to 20	22 to 32	
$I_{F(AV)}$		600	600	A
	@ T_C	92	54	°C
$I_{F(RMS)}$		940	940	A
I_{FSM}	@ 50Hz	13000	10500	A
	@ 60Hz	13600	11000	A
I^2t	@ 50Hz	845	551	KA^2s
	@ 60Hz	772	503	KA^2s
V_{RRM} range		400 to 2000	2200 to 3200	V
T_J		- 40 to 180	- 40 to 150	°C

ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code	V_{RRM} , maximum repetitive peak reverse voltage V	V_{RSM} , maximum non-repetitive peak rev. voltage V	I_{RRM} max. @ $T_J = T_J$ max. mA
SD600N/R	04	400	500	35
	08	800	900	
	12	1200	1300	
	16	1600	1700	
	20	2000	2100	
	22	2200	2300	
	28	2800	2900	
	32	3200	3300	

Forward Conduction

Parameter		SD600N/R 04 to 20	SD600N/R 22 to 32	Units	Conditions		
$I_{F(AV)}$	Max. average forward current	600	600	A	180° conduction, half sine wave		
	@ Case temperature	92	54	°C			
$I_{F(AV)}$	Max. average forward current	570	375	A	180° conduction, half sine wave		
	@ Case temperature	100	100	°C			
$I_{F(RMS)}$	Max. RMS forward current	940	940	A	DC @ T_C = 75°C (04 to 20), T_C = 36°C (25 to 32)		
I_{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	13000	10500	A	t = 10ms	No voltage reapplied	Sinusoidal half wave, Initial $T_J = T_J$ max.
		13600	11000		t = 8.3ms		
		10900	8830		t = 10ms	100% V_{RRM} reapplied	
		11450	9250		t = 8.3ms		
I^2t	Maximum I^2t for fusing	845	551	KA^2s	t = 10ms	No voltage reapplied	
		772	503		t = 8.3ms		
		598	390		t = 10ms	100% V_{RRM} reapplied	
		546	356		t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	8450	5510	$KA^2\sqrt{s}$	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% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ max.		
$V_{F(TO)2}$	High level value of threshold voltage	0.87	0.88		(I > π x $I_{F(AV)}$), $T_J = T_J$ max.		
r_{f1}	Low level value of forward slope resistance	0.35	0.40	mΩ	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ max.		
r_{f2}	High level value of forward slope resistance	0.31	0.38		(I > π x $I_{F(AV)}$), $T_J = T_J$ max.		
V_{FM}	Max. forward voltage drop	1.31	1.44	V	I_{pk}= 1500A, $T_J = T_J$ max, t_p = 10ms sinusoidal wave		

Thermal and Mechanical Specifications

	Parameter	SD600N/R		Units	Conditions
		04 to 20	22 to 32		
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 ±10%	50		Nm	Not lubricated threads
wt	Approximate weight	454		g	
	Case style	B-8			See Outline Table

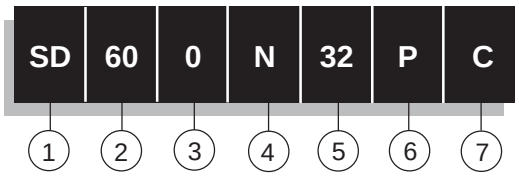
ΔR_{thJC} Conduction

(The following table shows the increment of thermal resistence 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	$T_J = T_J$ max.
120°	0.014	0.014		
90°	0.017	0.019		
60°	0.025	0.026		
30°	0.042	0.042		

Ordering Information Table

Device Code



1 - Diode

2 - Essential part number

3 - 0 = Standard recovery

4 - N = Stud Normal Polarity (Cathode to Stud)
R = Stud Reverse Polarity (Anode to Stud)

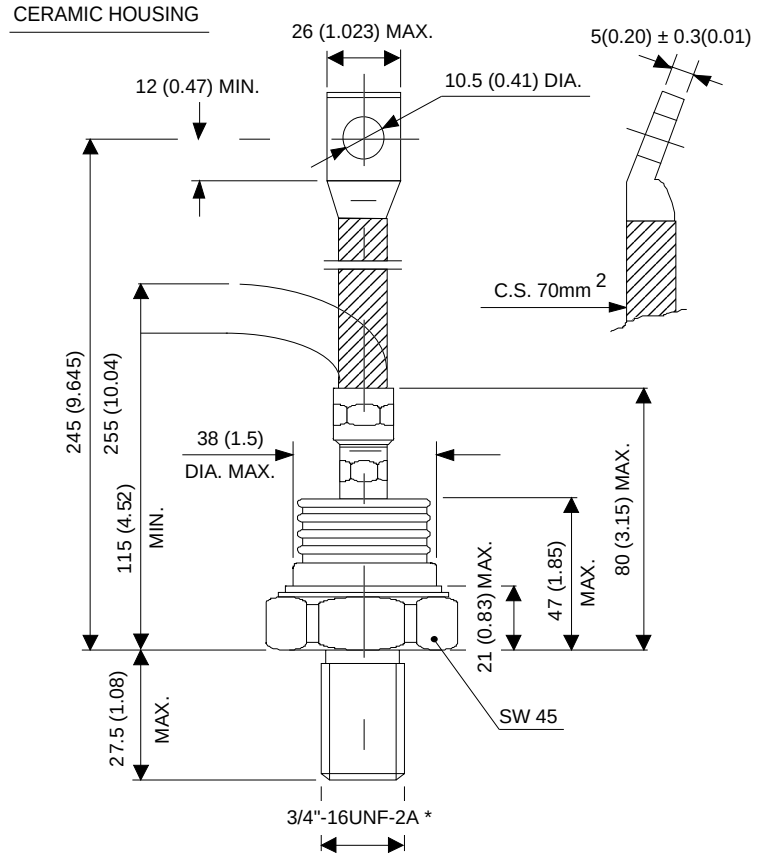
5 - Voltage code: Code x 100 = V_{RRM} (See Voltage Ratings table)

6 - P = Stud base B-8 3/4" 16UNF-2A

7 - C = ceramic cap

NOTE: For Metric Device M24 x 1.5 Contact Factory

Outlines Table



Case Style B-8
All dimensions in millimeters (inches)

* FOR METRIC DEVICE: M24 X 1.5 - LENGHT 21 (0.83) MAX.
CONTACT FACTORY

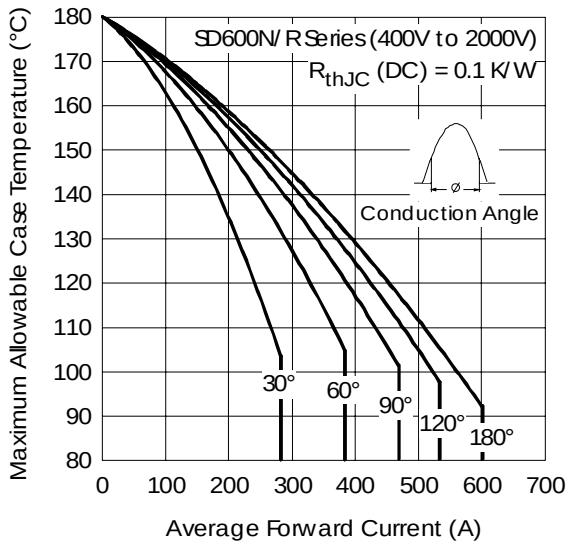


Fig. 1 - Current Ratings Characteristics

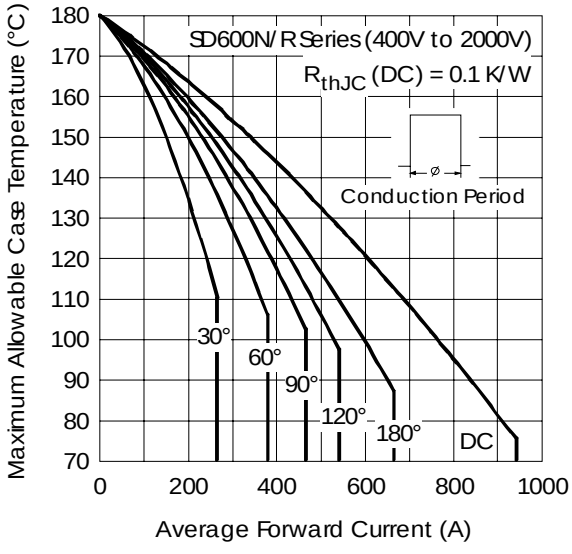


Fig. 2 - Current Ratings Characteristics

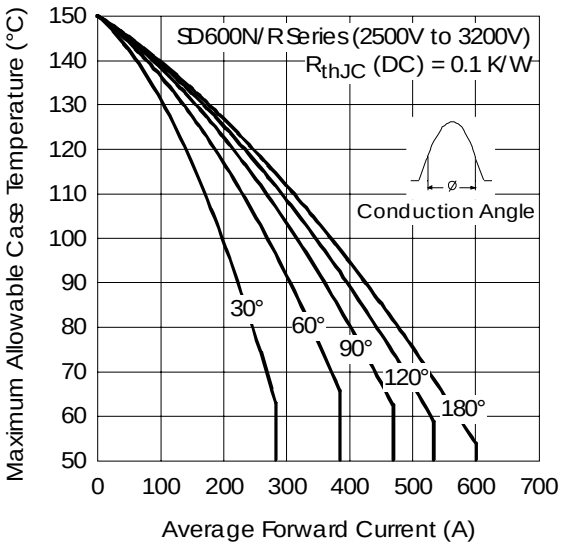


Fig. 3 - Current Ratings Characteristics

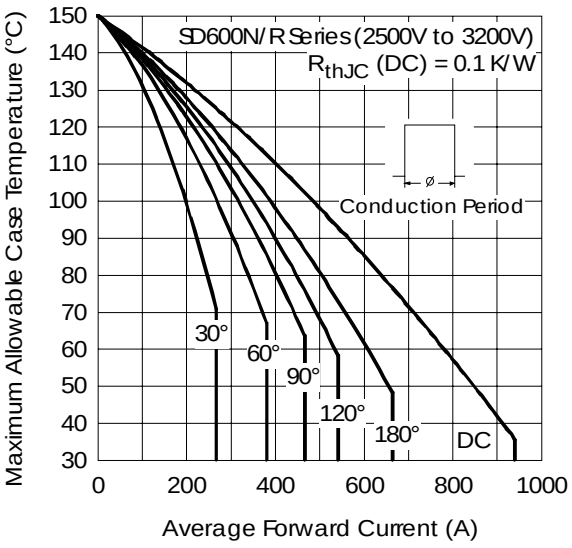


Fig. 4 - Current Ratings Characteristics

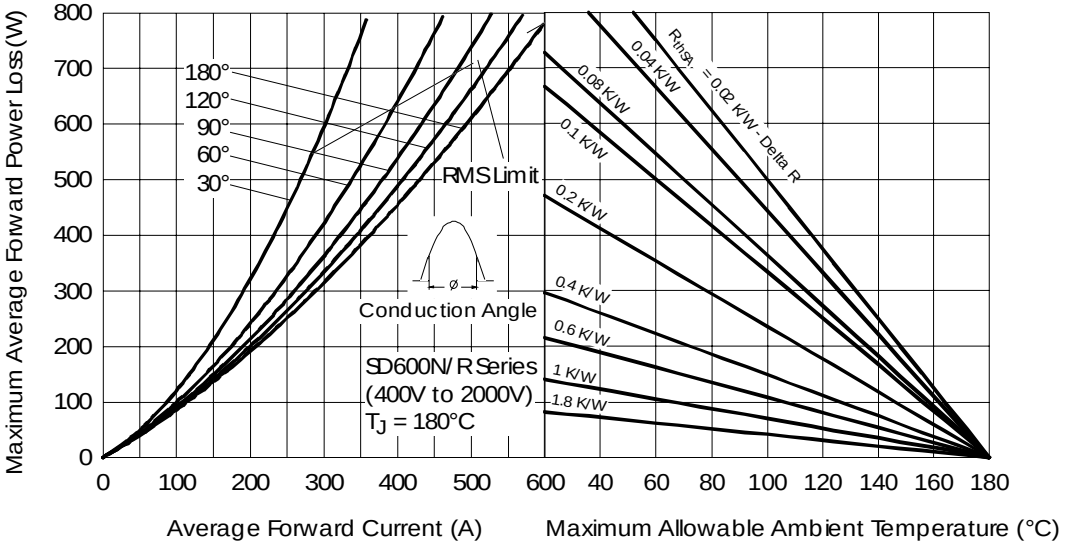


Fig. 5 - Forward Power Loss Characteristics

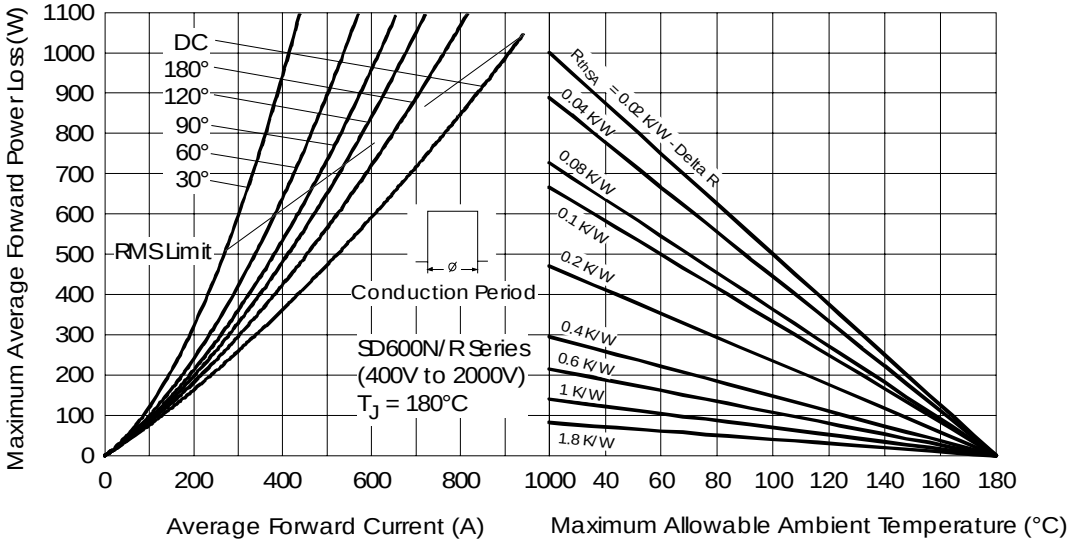


Fig. 6 - Forward Power Loss Characteristics

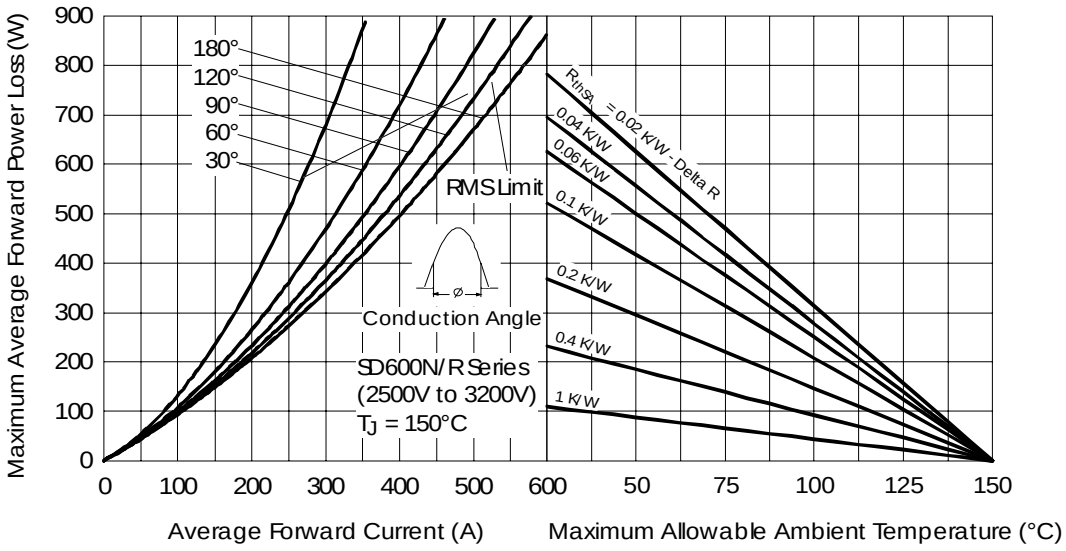


Fig. 7 - Forward Power Loss Characteristics

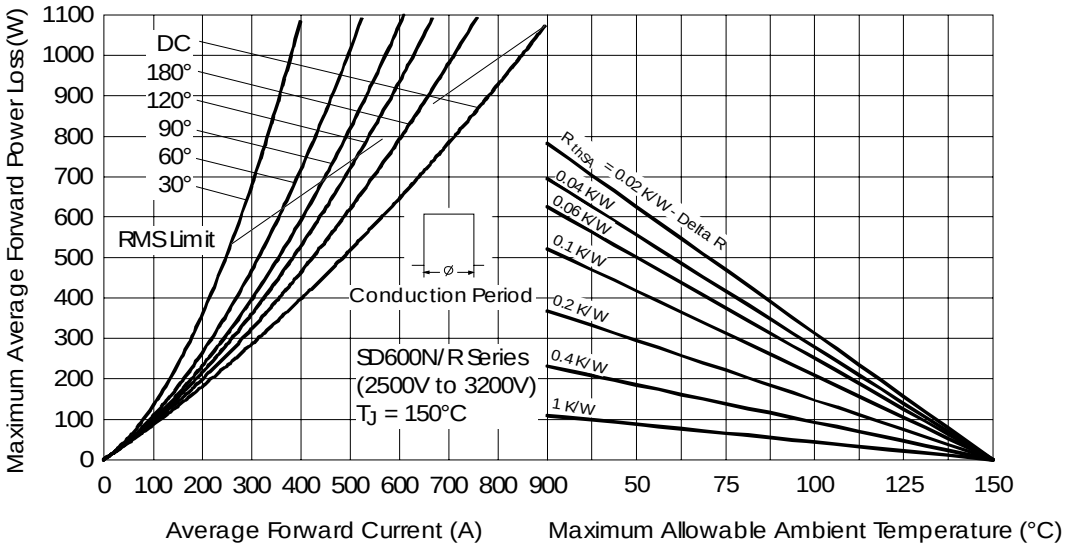


Fig. 8 - Forward Power Loss Characteristics

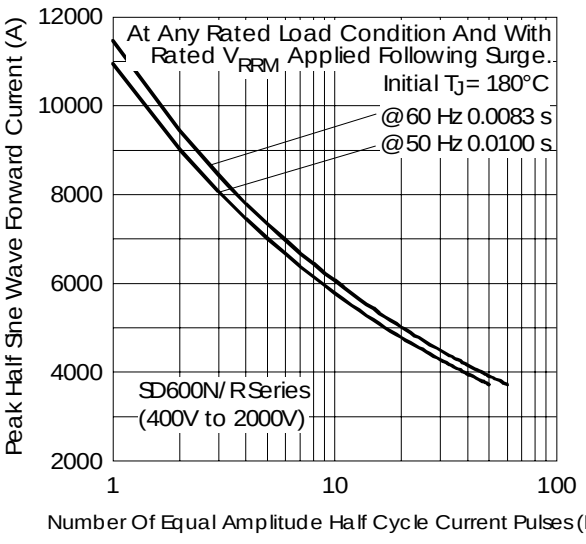


Fig. 9 - Maximum Non-Repetitive Surge Current

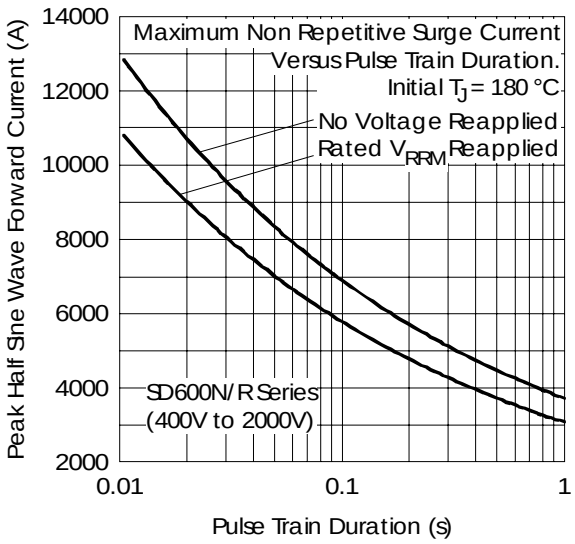


Fig. 10 - Maximum Non-Repetitive Surge Current

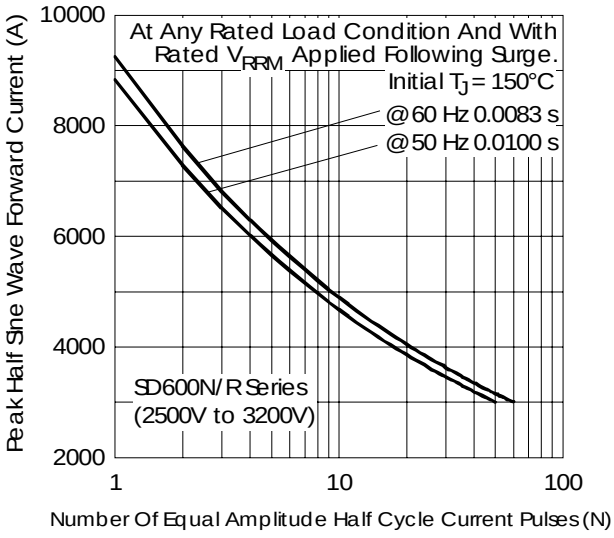


Fig. 11 - Maximum Non-Repetitive Surge Current

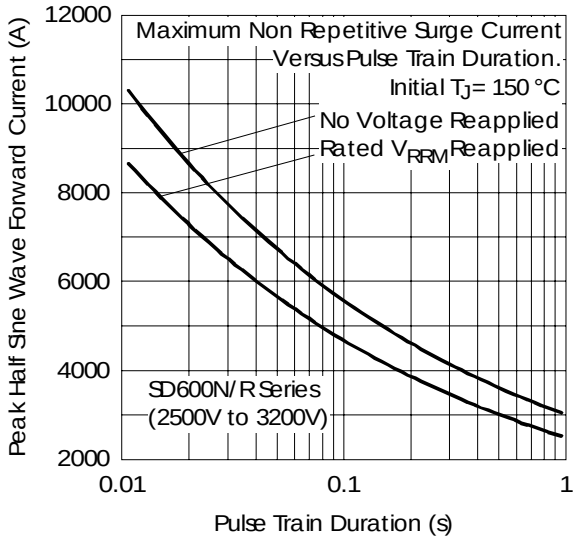


Fig. 12 - Maximum Non-Repetitive Surge Current

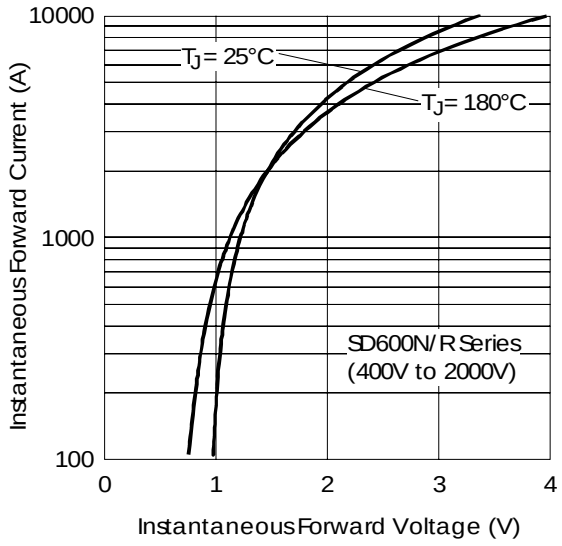


Fig. 13 - Forward Voltage Drop Characteristics

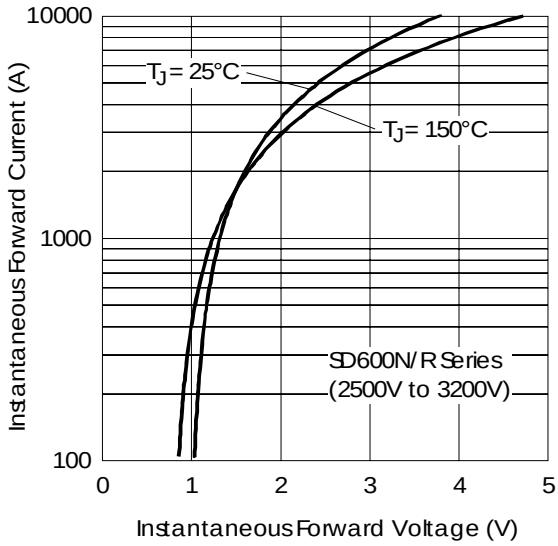


Fig. 14 - Forward Voltage Drop Characteristics

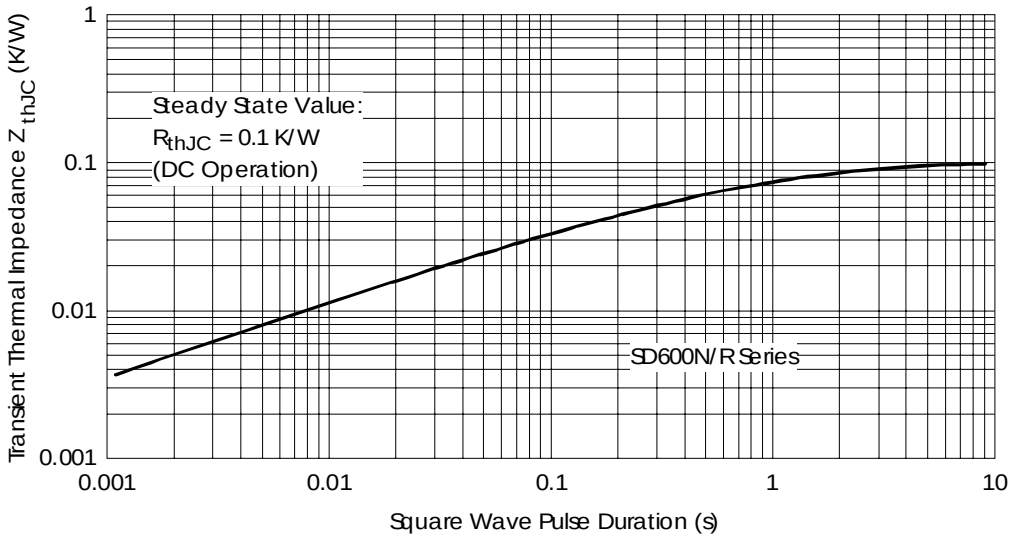


Fig. 15 - Thermal Impedance Z_{thJC} Characteristics

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 10/06