

### 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

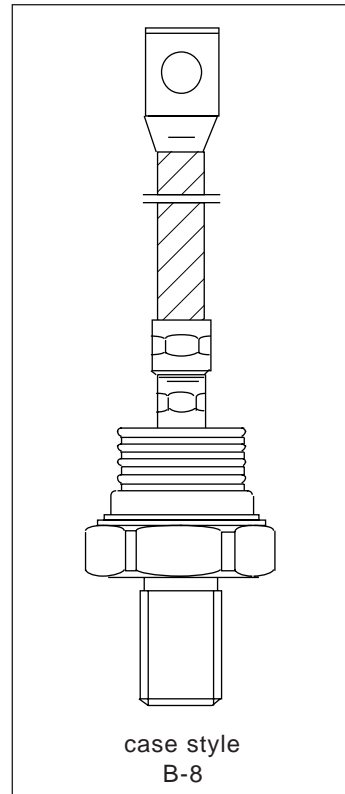
600A

#### Typical Applications

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

#### Major Ratings and Characteristics

Parameters	SD600N/R		Units
	04 to 20	25 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 <sup>2</sup> s
@ 60Hz	772	503	KA <sup>2</sup> s
$V_{RRM}$ range	400 to 2000	2500 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	
	25	2500	2600	
	28	2800	2900	
	32	3200	3300	

## Forward Conduction

Parameter	SD600N/R		Units	Conditions		
	04 to 20	25 to 32				
$I_{F(AV)}$ Max. average forward current @ Case temperature	600	600	A	180° conduction, half sine wave		
	92	54	°C			
$I_{F(AV)}$ Max. average forward current @ Case temperature	570	375	A	180° conduction, half sine wave		
	100	100	°C			
$I_{F(RMS)}$ Max. RMS forward current	940	940	A	DC @ $T_C = 75^\circ\text{C}$ (04 to 20), $T_C = 36^\circ\text{C}$ (25 to 32)		
$I_{FSM}$ Max. peak, one-cycle forward, non-repetitive surge current	13000	10500	A	t = 10ms	No voltage reappplied	Sinusoidal half wave, Initial $T_J = T_J$ max.
	13600	11000		t = 8.3ms	reappplied	
	10900	8830		t = 10ms	100% $V_{RRM}$ reappplied	
	11450	9250		t = 8.3ms	reappplied	
$I^2t$ Maximum $I^2t$ for fusing	845	551	KA <sup>2</sup> s	t = 10ms	No voltage reappplied	Initial $T_J = T_J$ max.
	772	503		t = 8.3ms	reappplied	
	598	390		t = 10ms	100% $V_{RRM}$ reappplied	
	546	356		t = 8.3ms	reappplied	
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	8450	5510	KA <sup>2</sup> √s	t = 0.1 to 10ms, no voltage reappplied		
$V_{F(TO)1}$ Low level value of threshold voltage	0.78	0.84	V	(16.7% x $\pi$ x $I_{F(AV)}$ ) < I < $\pi$ x $I_{F(AV)}$ , $T_J = T_J$ max.		
$V_{F(TO)2}$ High level value of threshold voltage	0.87	0.88		(I > $\pi$ 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 $\pi$ x $I_{F(AV)}$ ) < I < $\pi$ x $I_{F(AV)}$ , $T_J = T_J$ max.		
$r_{f2}$ High level value of forward slope resistance	0.31	0.38		(I > $\pi$ x $I_{F(AV)}$ ), $T_J = T_J$ max.		
$V_{FM}$ Max. forward voltage drop	1.31	1.44	V	$I_{pk} = 1500\text{A}$ , $T_J = T_J$ max, $t_p = 10\text{ms}$ sinusoidal wave		

**Thermal and Mechanical Specifications**

Parameter	SD600N/R		Units	Conditions
	04 to 20	25 to 32		
T <sub>J</sub> Max. junction operating temperature range	-40 to 180	-40 to 150	°C	
T <sub>stg</sub> Max. storage temperature range	-55 to 200	-55 to 200		
R <sub>thJC</sub> Max. thermal resistance, junction to case	0.1		K/W	DC operation
R <sub>thCS</sub> 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<sub>thJC</sub> Conduction**

(The following table shows the increment of thermal resistance R<sub>thJC</sub> 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 <sub>J</sub> = T <sub>J</sub> 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**

<b>SD</b>	<b>60</b>	<b>0</b>	<b>N</b>	<b>32</b>	<b>P</b>	<b>S</b>	<b>C</b>
①	②	③	④	⑤	⑥	⑦	⑧

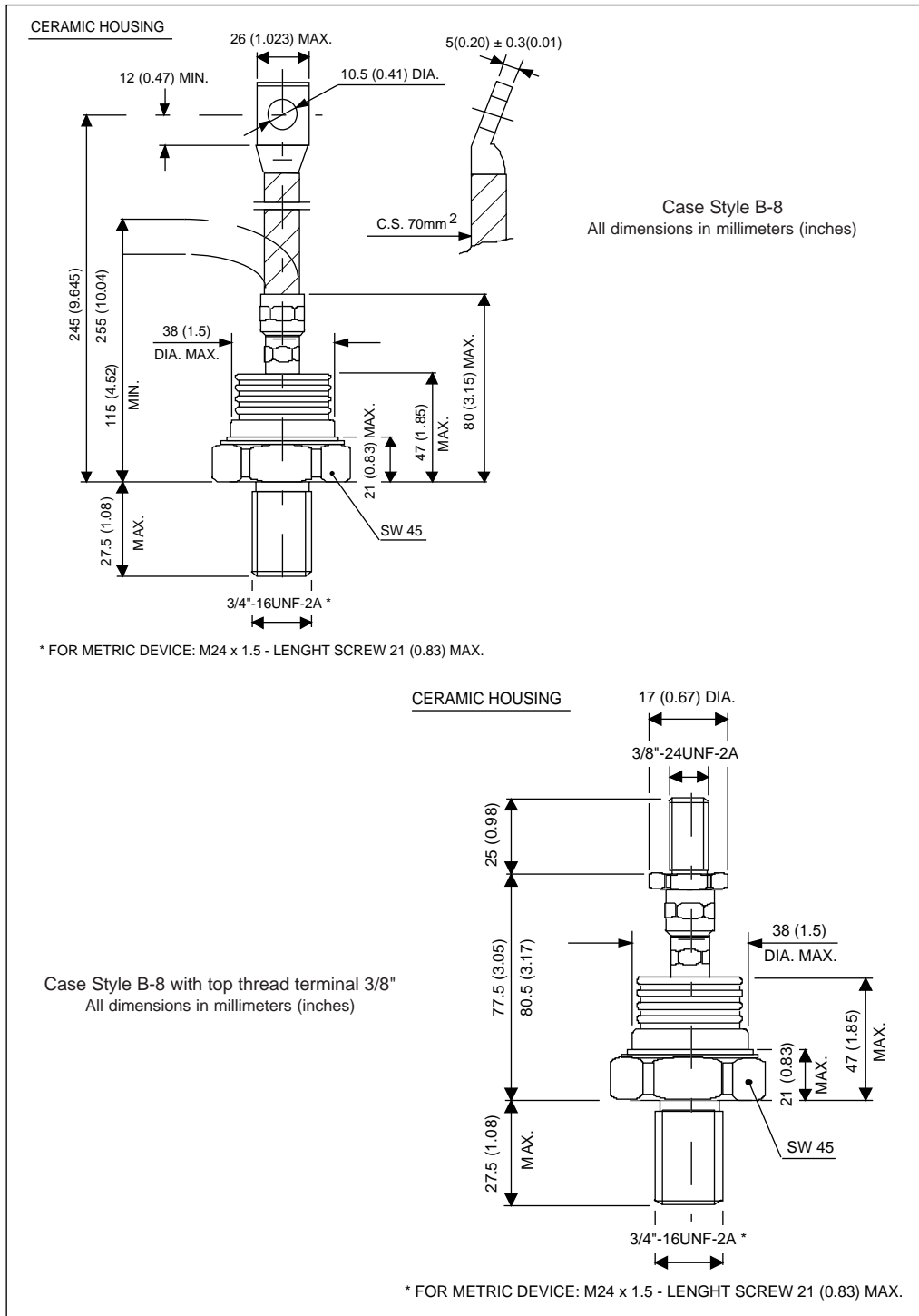
- 1** - Diode
- 2** - Essential part number
- 3** - 0 = Standard recovery
- 4** - N = Stud Normal Polarity (Cathode to Stud)  
R = Stud Reverse Polarity (Anode to Stud)
- 5** - Voltage code: Code x 100 = V<sub>RRM</sub> (See Voltage Ratings table)
- 6** - P = Stud base B-8 3/4" 16UNF-2A  
M = Stud base B-8 M24 X 1.5
- 7** - S = Isolated lead with silicone sleeve  
(Red = Reverse Polarity; Blue = Normal Polarity)  
T = Threaded Top Terminal 3/8" 24UNF-2A  
None = Non isolated lead
- 8** - C = Ceramic Housing

NOTE: Available for rotating applications (Contact factory)

**SD600N/R Series**

Bulletin I2070 rev. B 08/94

**Outlines Table**



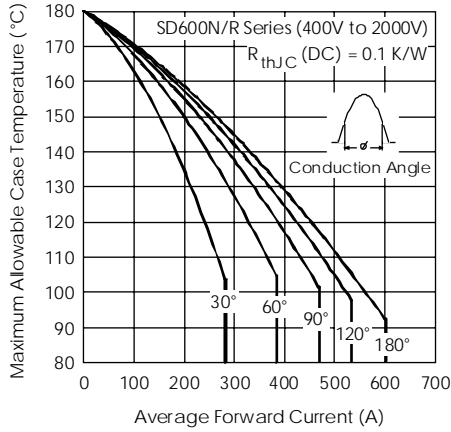


Fig. 1 - Current Ratings Characteristics

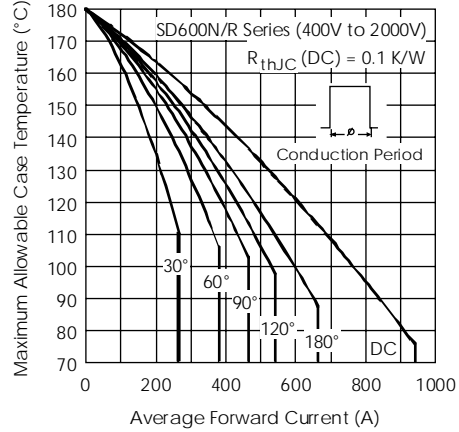


Fig. 2 - Current Ratings Characteristics

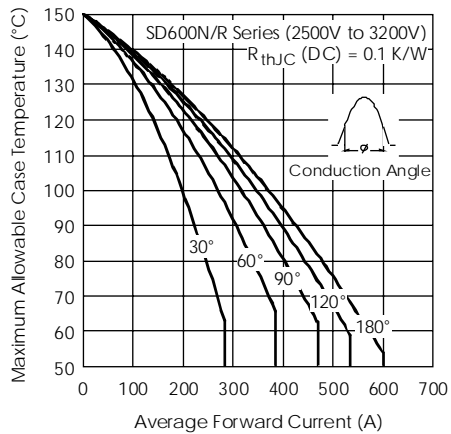


Fig. 3 - Current Ratings Characteristics

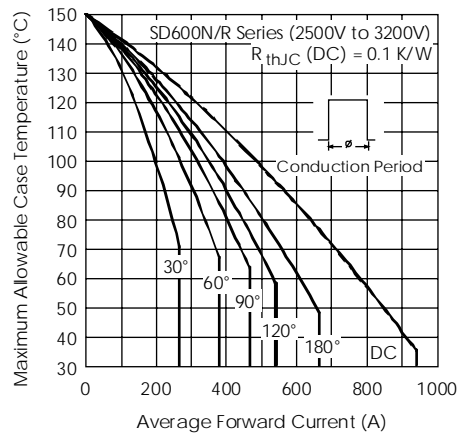


Fig. 4 - Current Ratings Characteristics

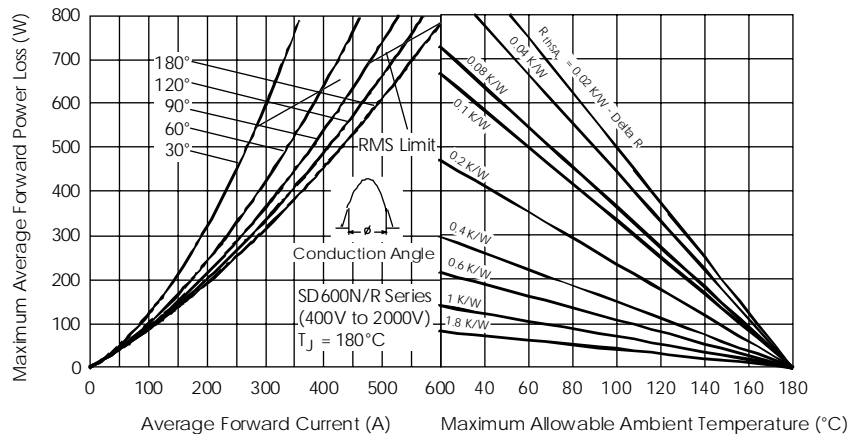


Fig. 5 - Forward Power Loss Characteristics

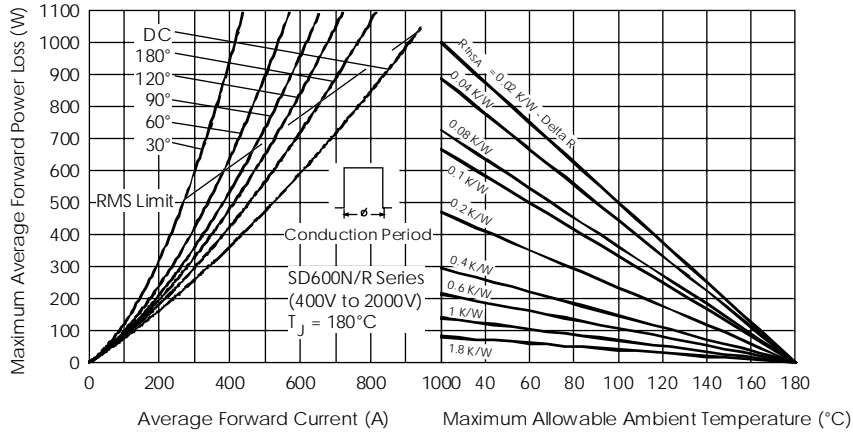


Fig. 6 - Forward Power Loss Characteristics

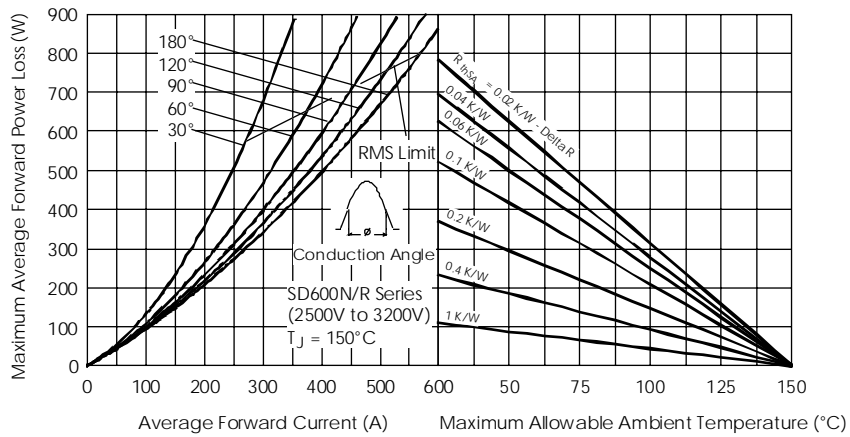


Fig. 7 - Forward Power Loss Characteristics

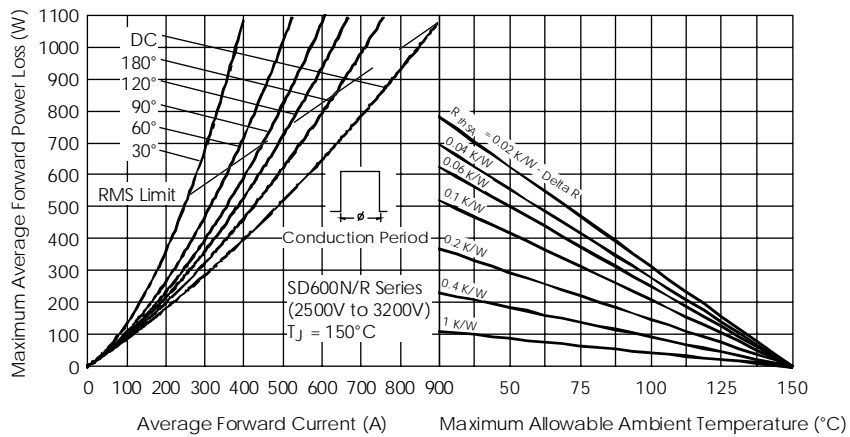


Fig. 8 - Forward Power Loss Characteristics

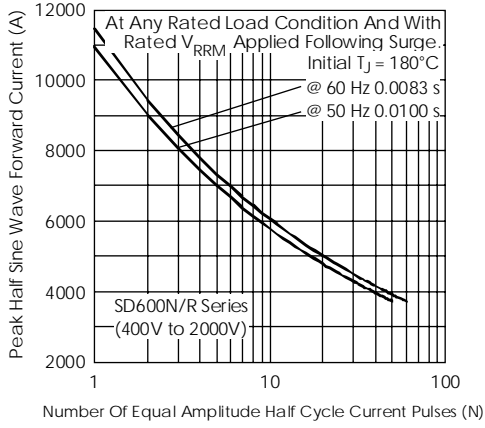


Fig. 9 - Maximum Non-Repetitive Surge Current

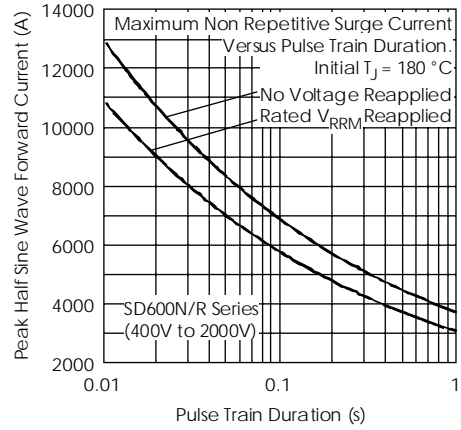


Fig. 10 - Maximum Non-Repetitive Surge Current

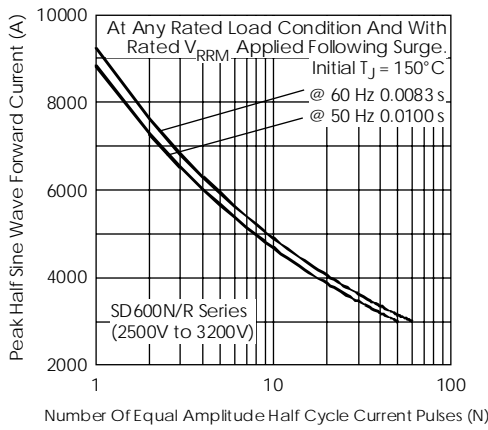


Fig. 11 - Maximum Non-Repetitive Surge Current

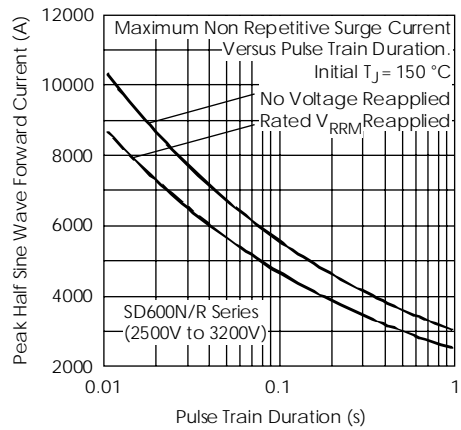


Fig. 12 - Maximum Non-Repetitive Surge Current

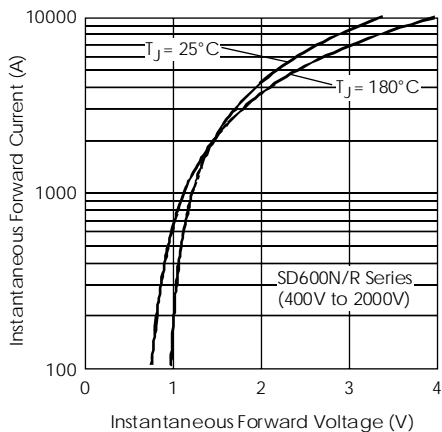


Fig. 13 - Forward Voltage Drop Characteristics

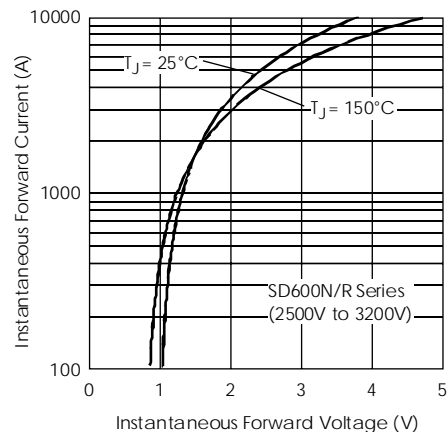


Fig. 14 - Forward Voltage Drop Characteristics

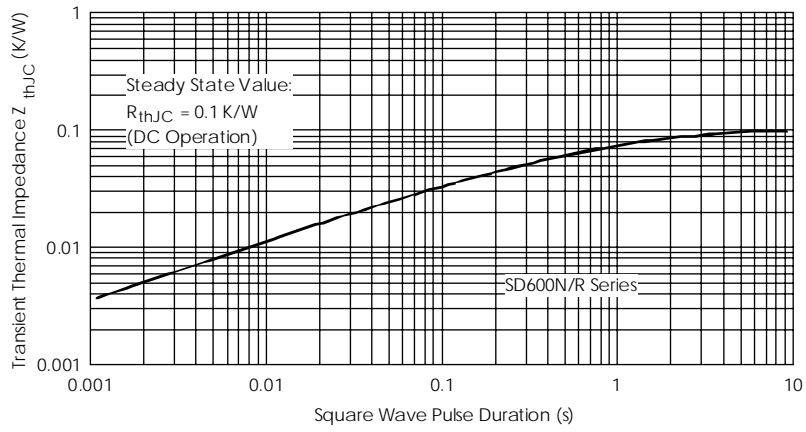


Fig. 15 - Thermal Impedance  $Z_{thJC}$  Characteristics