

# SERIES 45L(R), 150K /L /KS(R)

## STANDARD RECOVERY DIODES

Stud Version

### Features

- Alloy diode
- High current carrying capability
- High voltage ratings up to 1000V
- High surge current capabilities
- Stud cathode and stud anode version

150A

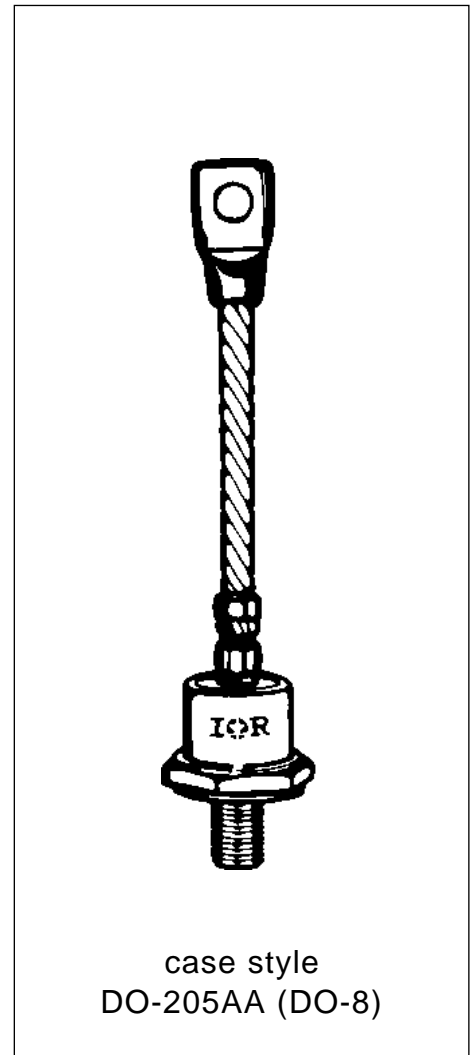
### Typical Applications

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

### Major Ratings and Characteristics

Parameters	45L /150...	Units
$I_{F(AV)}$	150	A
$@ T_C$	150	°C
$I_{F(RMS)}$	235	A
$I_{FSM}$ @ 50Hz	3570	A
@ 60Hz	3740	A
$I^2t$ @ 50Hz	64	KA <sup>2</sup> s
@ 60Hz	58	KA <sup>2</sup> s
$V_{RRM}$ range *	50 to 1000	V
$T_J$	- 40 to 200	°C

\* 45L available from 100V to 1000V



**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. @ $T_J = 175^\circ\text{C}$ mA
45L(R) * 150K(R) 150L(R) 150KS(R)	5	50	100	35
	10	100	200	35
	20	200	300	35
	30	300	400	35
	40	400	500	35
	60	600	720	35
	80	800	960	32
	100	1000	1200	24

\* 45L 50V and 300V  $V_{RRM}$  classes are not available.

\*\*Also available as JEDEC series 1N3288A through 1N3296A (DO-8 case style) and 1N3111 through 1N3092 (DO-30 case style)

**Forward Conduction**

Parameter	45L/150...	Units	Conditions
$I_{F(AV)}$ Max. average forward current @ Case temperature	150	A	180° conduction, half sine wave
	150	°C	
$I_{F(RMS)}$ Max. RMS forward current	235	A	DC @ 142°C case temperature
$I_{FSM}$ Max. peak, one-cycle forward, non-repetitive surge current	3570	A	t = 10ms No voltage
	3740		t = 8.3ms reapplied
	3000		t = 10ms 100% $V_{RRM}$
	3140		t = 8.3ms reapplied
$I^2t$ Maximum $I^2t$ for fusing	64	KA <sup>2</sup> s	t = 10ms No voltage
	58		t = 8.3ms reapplied
	45		t = 10ms 100% $V_{RRM}$
	41		t = 8.3ms reapplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	640	KA <sup>2</sup> /s	t = 0.1 to 10ms, no voltage reapplied
$V_{F(TO)1}$ Low level value of threshold voltage	0.67	V	(16.7% $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ max.
$V_{F(TO)2}$ High level value of threshold voltage	0.83		( $I > \pi \times I_{F(AV)}$ ), $T_J = T_J$ max.
$r_{f1}$ Low level value of forward slope resistance	1.42	mΩ	(16.7% $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ max.
$r_{f2}$ High level value of forward slope resistance	0.91		( $I > \pi \times I_{F(AV)}$ ), $T_J = T_J$ max.
$V_{FM}$ Max. forward voltage drop	1.33	V	$I_{pk} = 471\text{A}$ , $T_J = 25^\circ\text{C}$ , $t_p = 10\text{ms}$ sinusoidal wave

Thermal and Mechanical Specifications

Parameter	45L/150...	Units	Conditions		
T <sub>J</sub> Max. junction operating temperature	-40 to 200	°C			
T <sub>stg</sub> Max. storage temperature range	-40 to 200				
R <sub>thJC</sub> Max. thermal resistance, junction to case	0.25	K/W	DC operation		
R <sub>thCS</sub> Max. thermal resistance, case to heatsink	0.10		Mounting surface, smooth, flat and greased		
T Mounting torque	45L	Min.	14.1 (125)	Nm (lbf-in)	Not lubricated threads
		Max.	17.0 (150)		
	150L	Min.	12.2 (108)	Nm (lbf-in)	Lubricated threads
		Max.	15.0 (132)		
	150K	Min.	11.3 (100)	Nm (lbf-in)	Not lubricated threads
		Max.	14.1 (125)		
	150KS	Min.	9.5 (85)	Nm (lbf-in)	Lubricated threads
		Max.	12.5 (110)		
wt Approximate weight	100 (3.5)	g (oz)			
Case style	150K-A	DO205AA (DO-8)		See Outline Table	
	150KS	B-42			
	150L-A/45L	DO-205AC (DO-30)			

$\Delta R_{thJC}$  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°	0.031	0.023	K/W	T <sub>J</sub> = T <sub>J</sub> max.
120°	0.038	0.040		
90°	0.048	0.053		
60°	0.071	0.075		
30°	0.120	0.121		

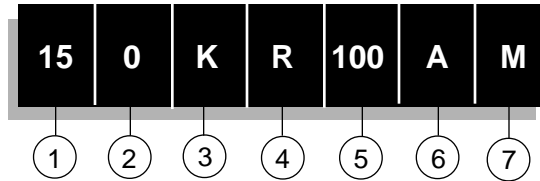
Ordering Information Table

**Device Code**

45	L	F	R	100
①	②	③	④	⑤

- 1** - 45 = Standard version  
47 = Version with Pinch Bolt (only flat base; available on request)
- 2** - L = Essential Part Number
- 3** - F = Flat Base  
None = Normal Stud 1/2" - 20UNF -2A
- 4** - R = Stud Reverse Polarity (Anode to Stud)  
None = Stud Normal Polarity (Cathode to Stud)
- 5** - Voltage code: Code x 10 = V<sub>RRM</sub> (See Voltage Ratings table)  
NOTE: For longer lead Contact Factory

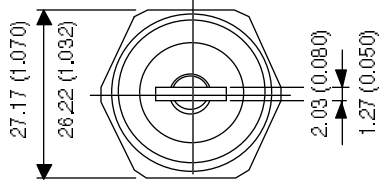
Device Code



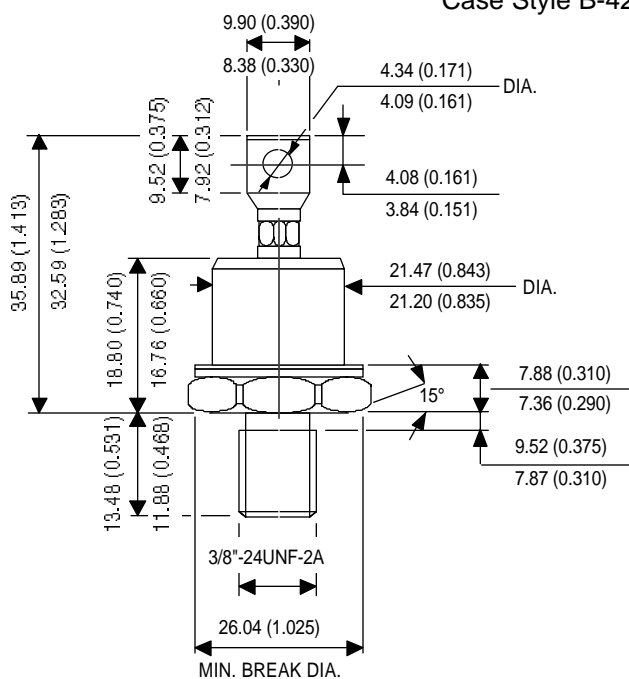
- 1** - Average Forward Current: Code x 10 =  $I_{FAV}$
- 2** - 0 = Standard Case  
2 = Stud Topped Case (152K-A only)
- 3** - Case Style  
K = DO205AA (DO-8)  
KS = B-42  
L = DO205AC (DO-30)
- 4** - R = Stud Reverse Polarity (Anode to Stud)  
None = Stud Normal Polarity (Cathode to Stud)
- 5** - Voltage code: Code x 10 =  $V_{RRM}$  (See Voltage Ratings table)
- 6** - A = Essential Part Number for 150K and 150L (Omitted for 150KS)
- 7** - None = Standard Base  
M = Metric Base M12 x 1.5

NOTE: For longer lead Contact Factory

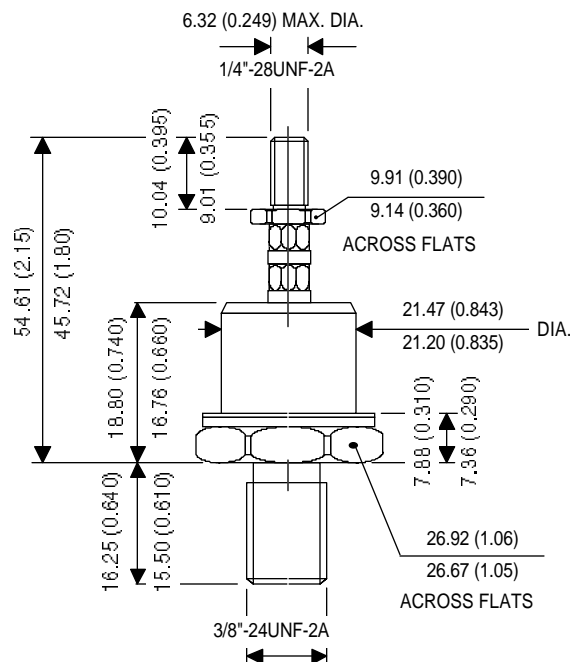
All dimensions in millimeters (inches)



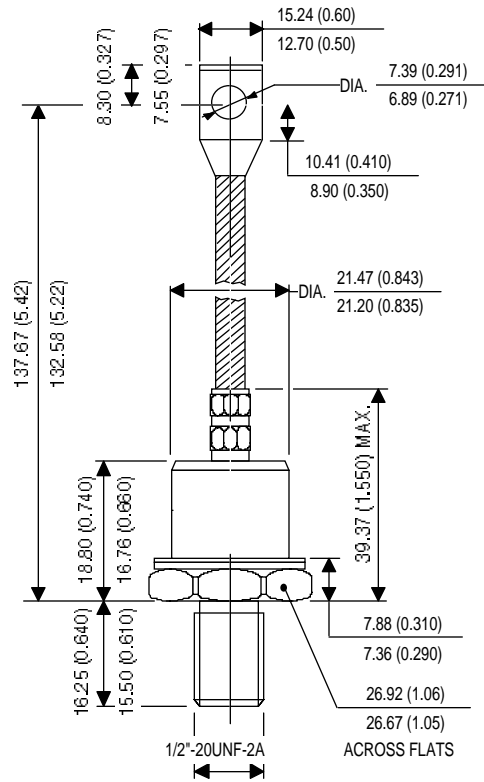
**150KS**  
Case Style B-42



**152K-A**  
IR Case Style B-28

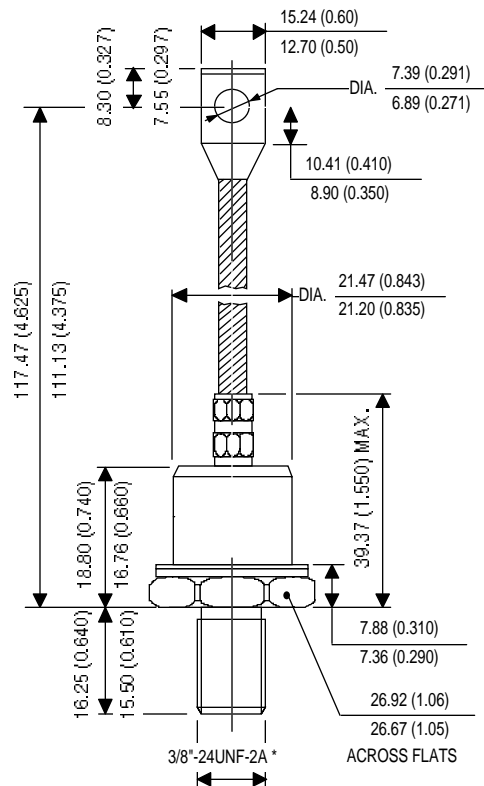


Outline Table



**45L**  
Case Style

All dimensions in millimeters (inches)



**150K**  
Case Style

\* FOR METRIC DEVICE M12 X 1.5

Outline Table

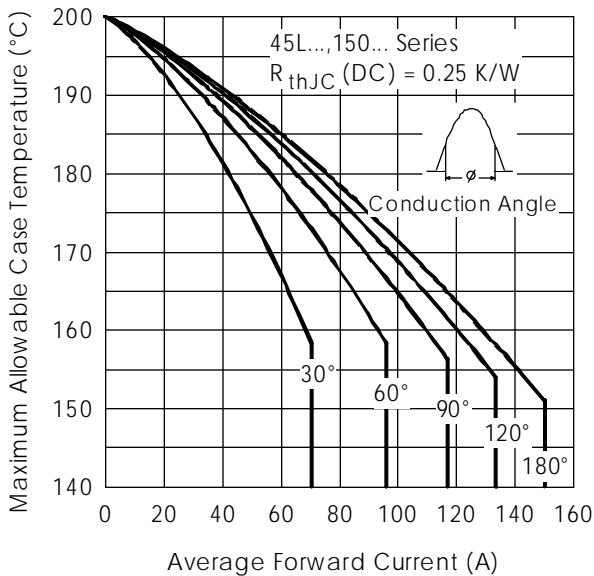
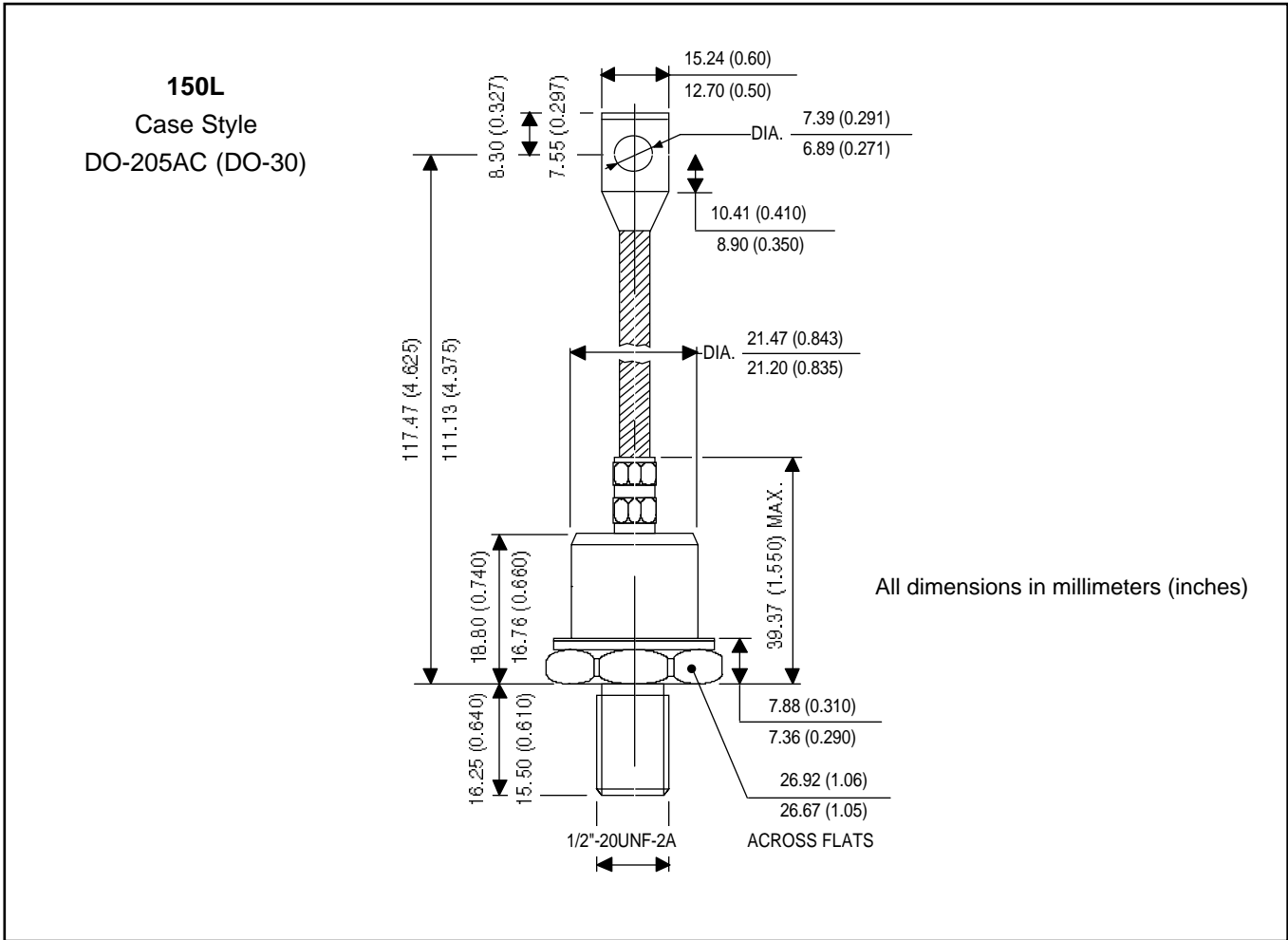


Fig. 1 - Current Ratings Characteristics

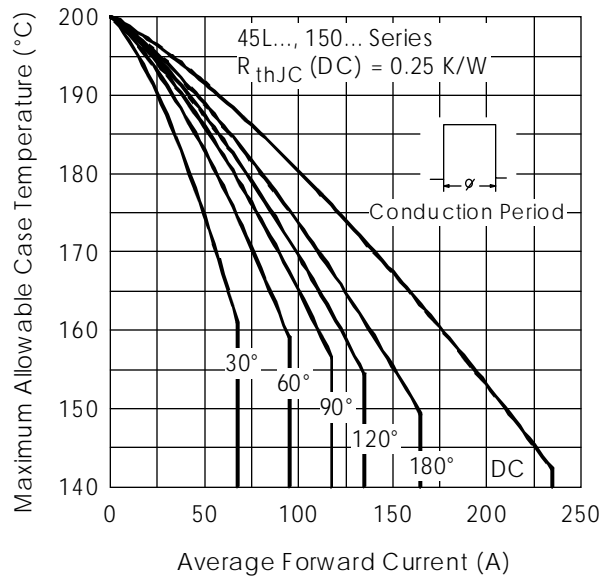


Fig. 2 - Current Ratings Characteristics

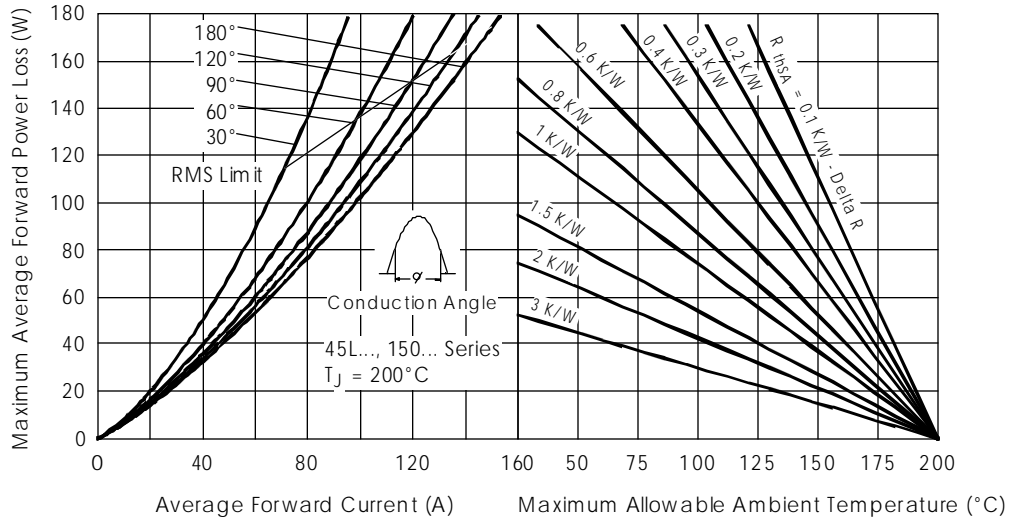


Fig. 3 - Forward Power Loss Characteristics

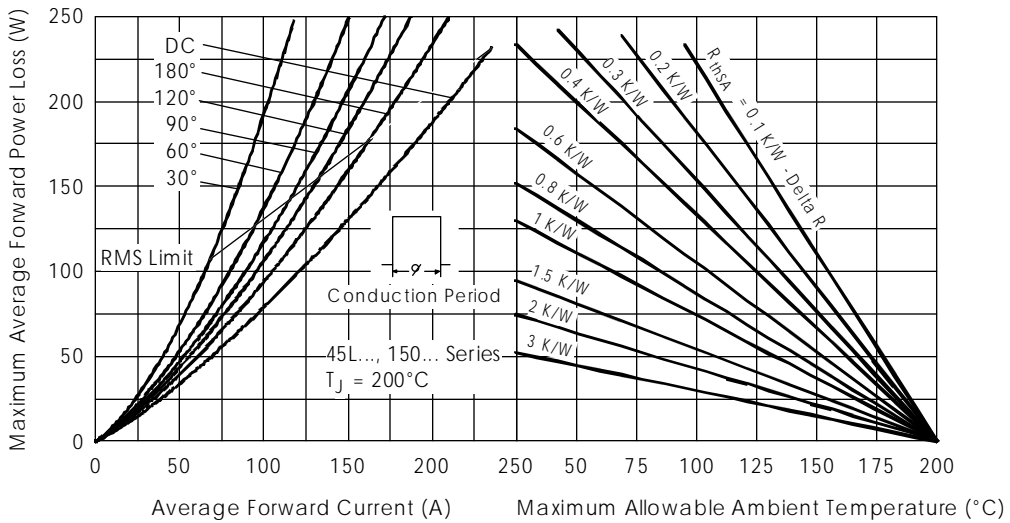


Fig. 4 - Forward Power Loss Characteristics

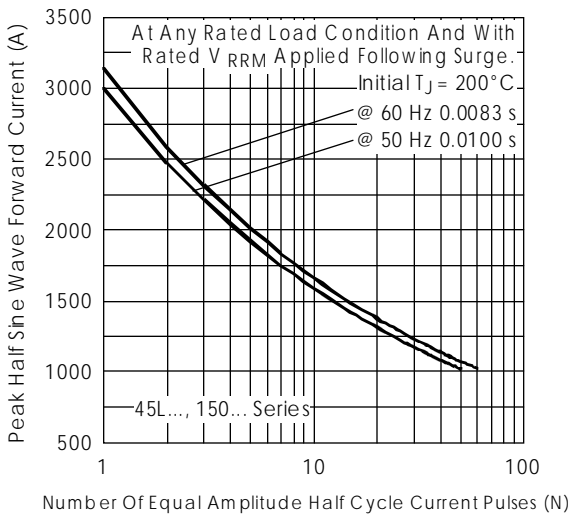


Fig. 5 - Maximum Non-Repetitive Surge Current

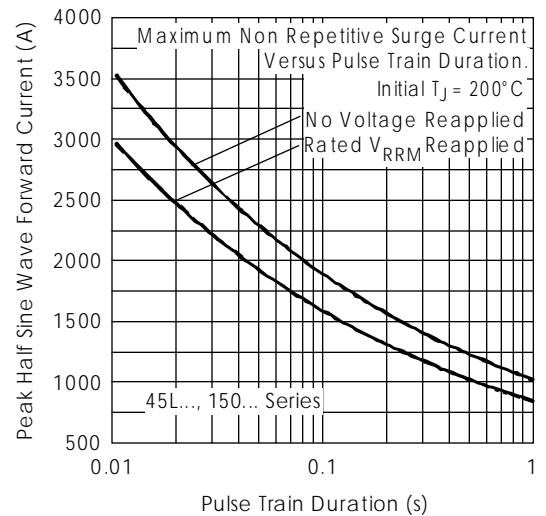


Fig. 6 - Maximum Non-Repetitive Surge Current

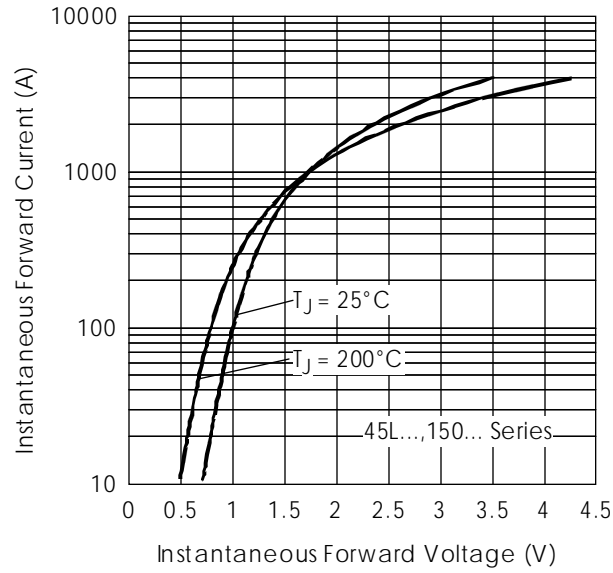


Fig. 7 - Forward Voltage Drop Characteristics

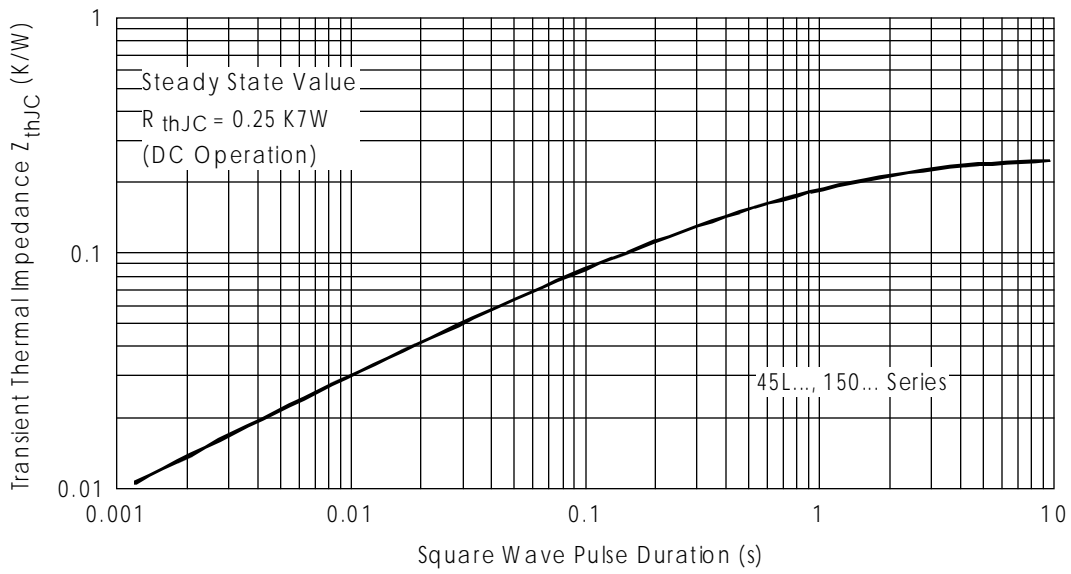


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristic