

### STANDARD RECOVERY DIODES

### Stud Version

#### Features

- Diffused diode
- High current carrying capability
- High voltage ratings up to 1600V
- High surge current capabilities
- Stud cathode and stud anode version
- RoHS Compliant

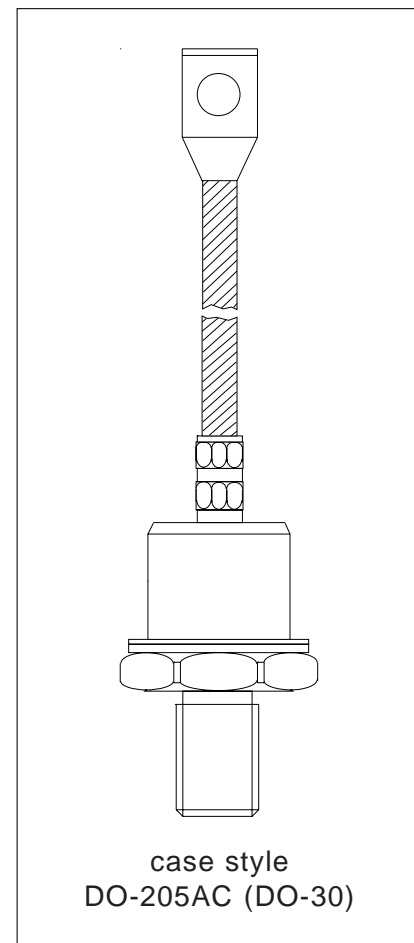
#### Typical Applications

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

#### Major Ratings and Characteristics

Parameters	45L(R)..D	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	1200 to 1600	V
$T_J$	- 40 to 200	°C

150A



**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
45L(R)..D	120	1200	1440	40
	160	1600	1920	

Forward Conduction

Parameter	45L(R)..D	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 reappplied
	3740		t = 8.3ms
	3000		t = 10ms 100% $V_{RRM}$ reappplied
	3140		t = 8.3ms
$I^2t$ Maximum $I^2t$ for fusing	64	KA <sup>2</sup> s	t = 10ms No voltage reappplied
	58		t = 8.3ms
	45		t = 10ms 100% $V_{RRM}$ reappplied
	41		t = 8.3ms
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	640	KA <sup>2</sup> √s	t = 0.1 to 10ms, no voltage reappplied
$V_{F(TO)1}$ 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	$I_{pk} = 471A$ , $T_J = 25^\circ C$ , $t_p = 10ms$ sinusoidal wave

**Thermal and Mechanical Specifications**

Parameter	45L(R)..D	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 Max. allowed mounting torque +0 -20%		17 Nm	Not lubricated threads
	14.5		Lubricated threads
wt Approximate weight	130	g	
Case style	DO-205AC (DO-30)		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°	0.031	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		

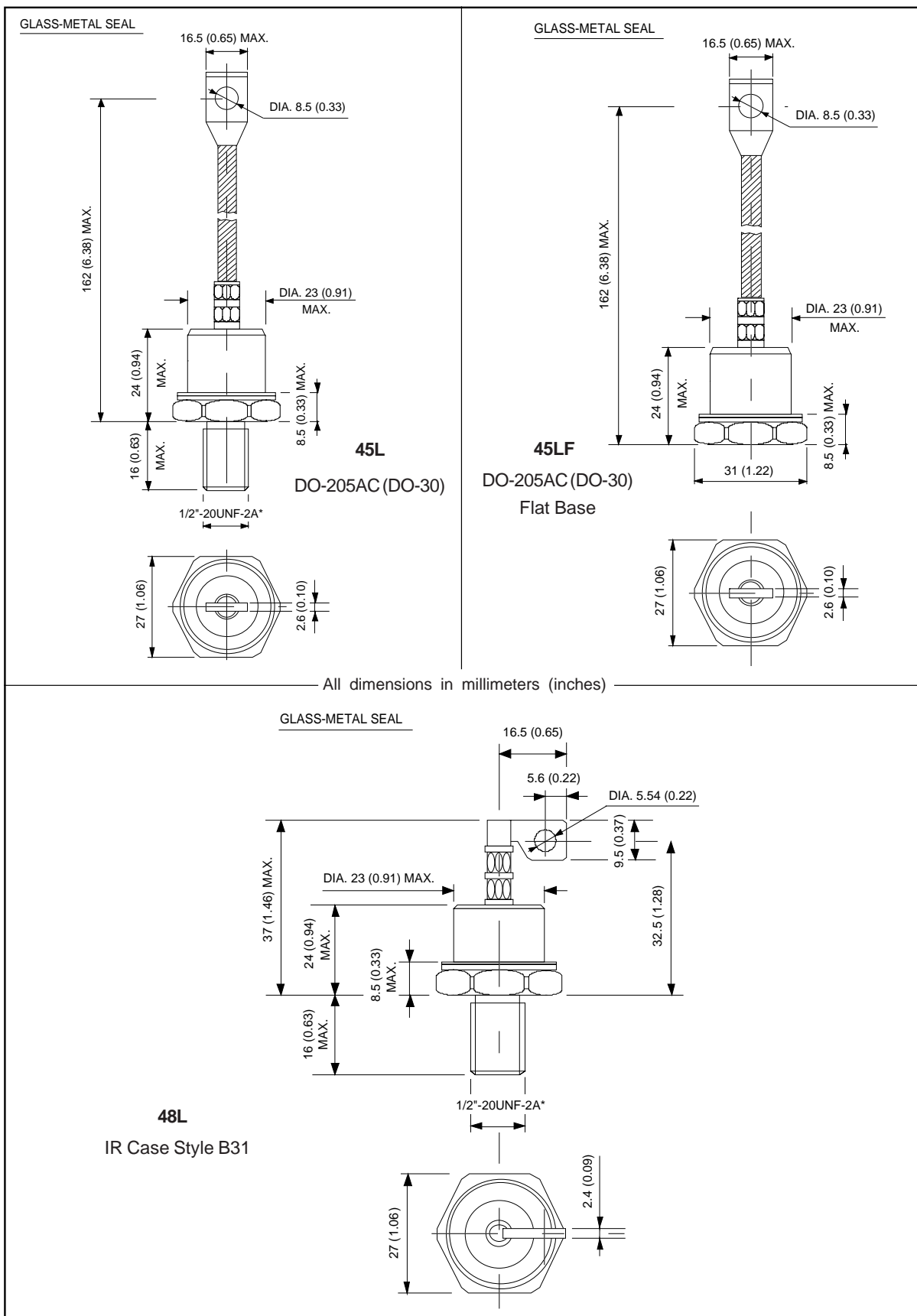
**Ordering Information Table**

**Device Code**

45	L	F	R	160	D
①	②	③	④	⑤	⑥

- 1** - 45 = Standard version  
       47 = Version with Pinch Bolt (only flat base)  
       48 = Flag Top Terminal
- 2** - L = Essential Part Number
- 3** - F = Flat Base  
       None = Normal Stud Base 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)
- 6** - D = Diffused diode

Outline Table



Outline Table

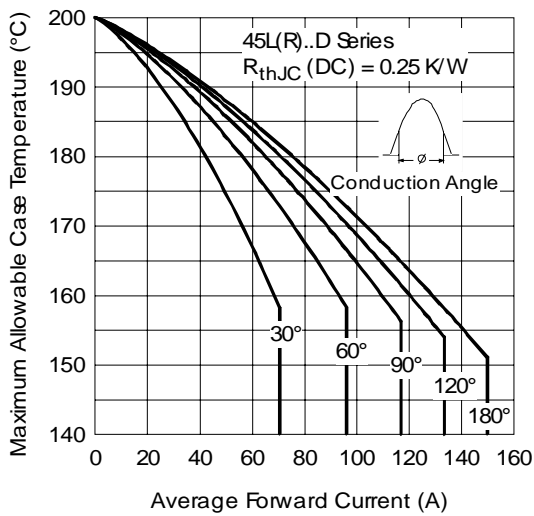
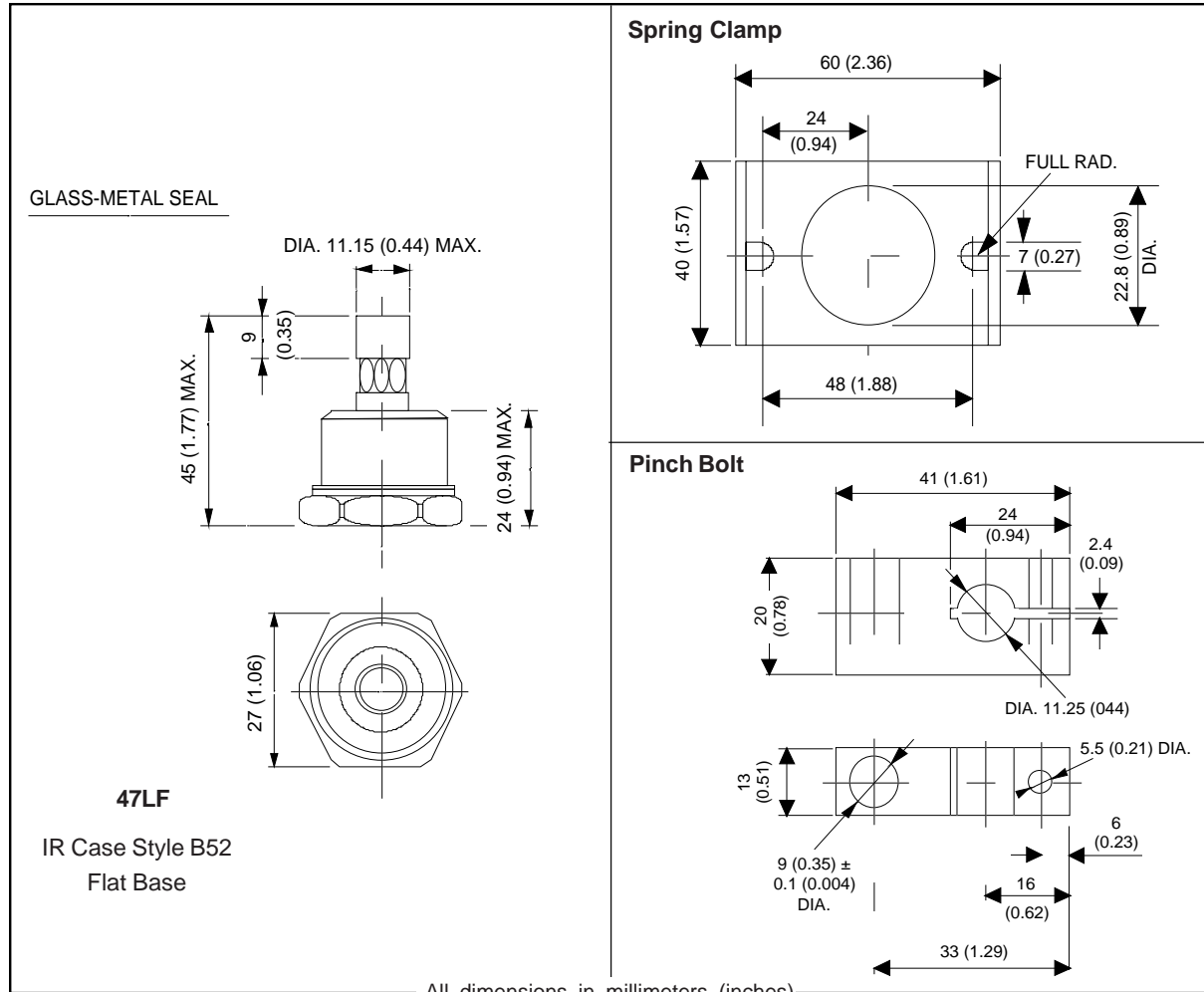


Fig. 1 - Current Ratings Characteristics

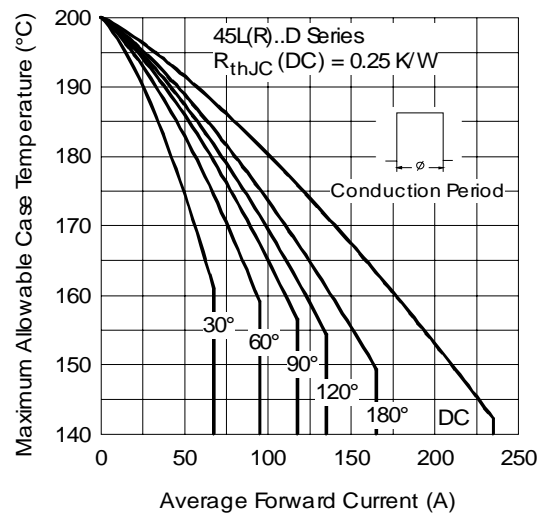


Fig. 2 - Current Ratings Characteristics

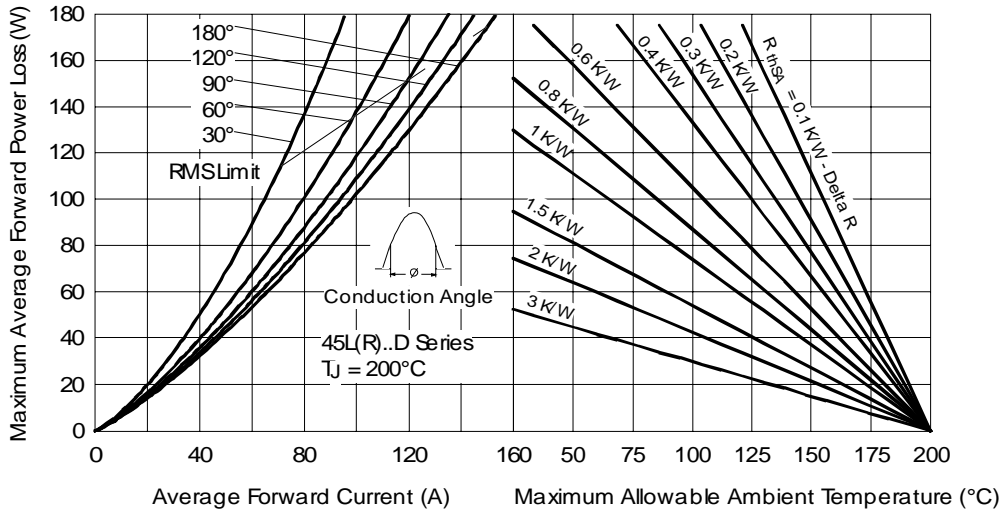


Fig. 3 - Forward Power Loss Characteristics

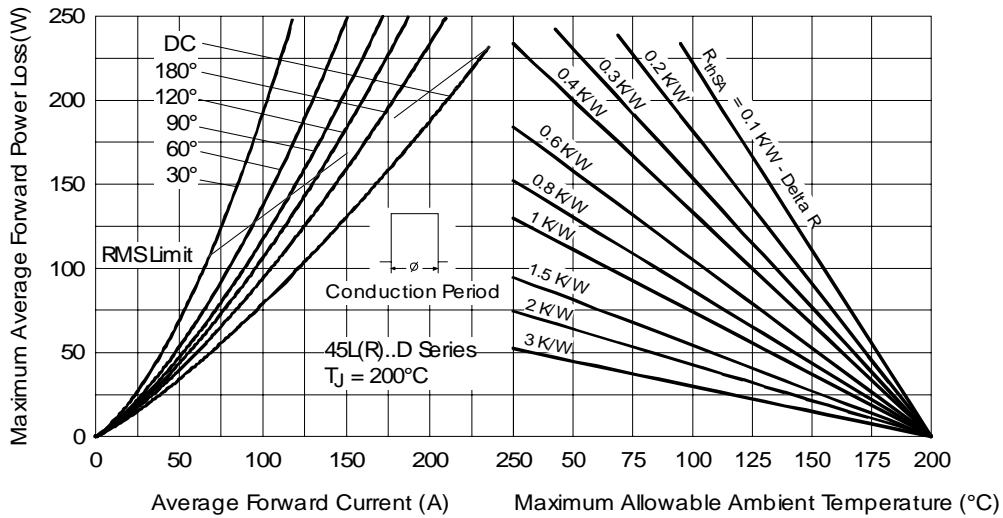


Fig. 4 - Forward Power Loss Characteristics

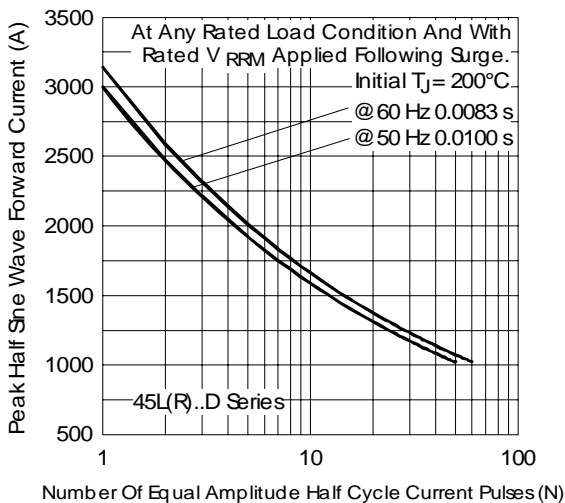


Fig. 5 - Maximum Non-Repetitive Surge Current

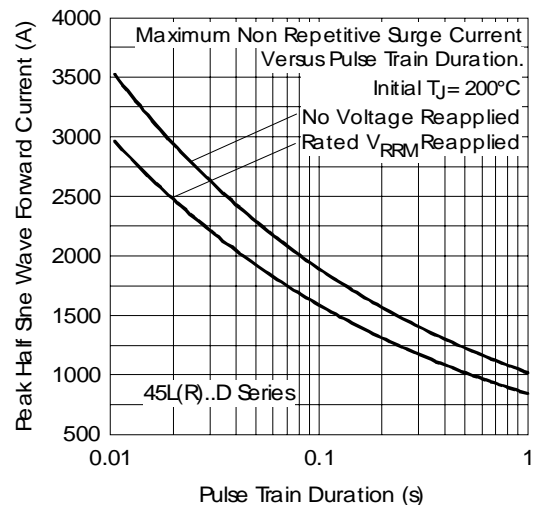


Fig. 6 - Maximum Non-Repetitive Surge Current

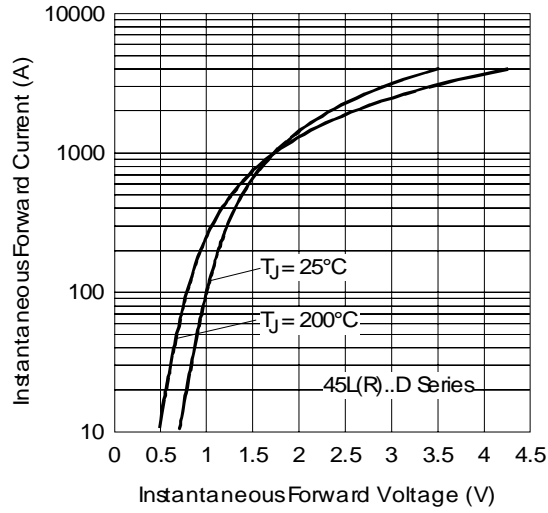


Fig. 7 - Forward Voltage Drop Characteristics

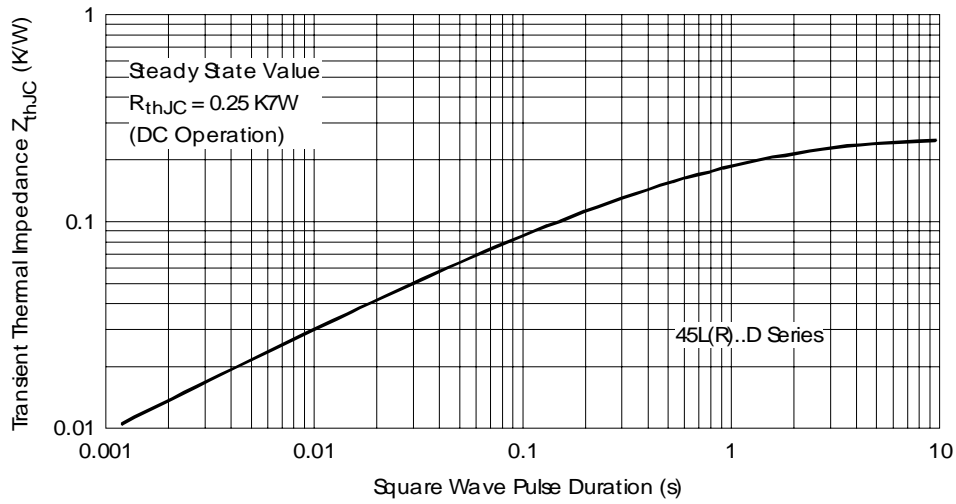


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristic

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

International  
**IOR** Rectifier

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