

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

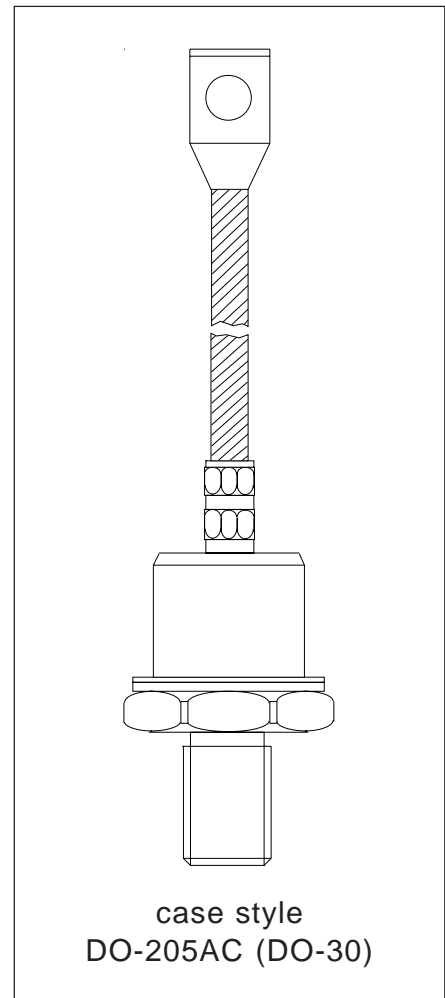
Typical Applications

- 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 ² s
@ 60Hz	58	KA ² 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
	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 ² 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 ² √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	$I_{pk} = 471A$, $T_J = 25^\circ C$, $t_p = 10ms$ sinusoidal wave

Thermal and Mechanical Specifications

Parameter	45L(R)..D	Units	Conditions
T _J Max. junction operating temperature	-40 to 200	°C	
T _{stg} Max. storage temperature range	-40 to 200		
R _{thJC} Max. thermal resistance, junction to case	0.25	K/W	DC operation
R _{thCS} 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_{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°	0.031	0.023	K/W	T _J = T _J max.
120°	0.038	0.040		
90°	0.048	0.053		
60°	0.071	0.075		
30°	0.120	0.121		

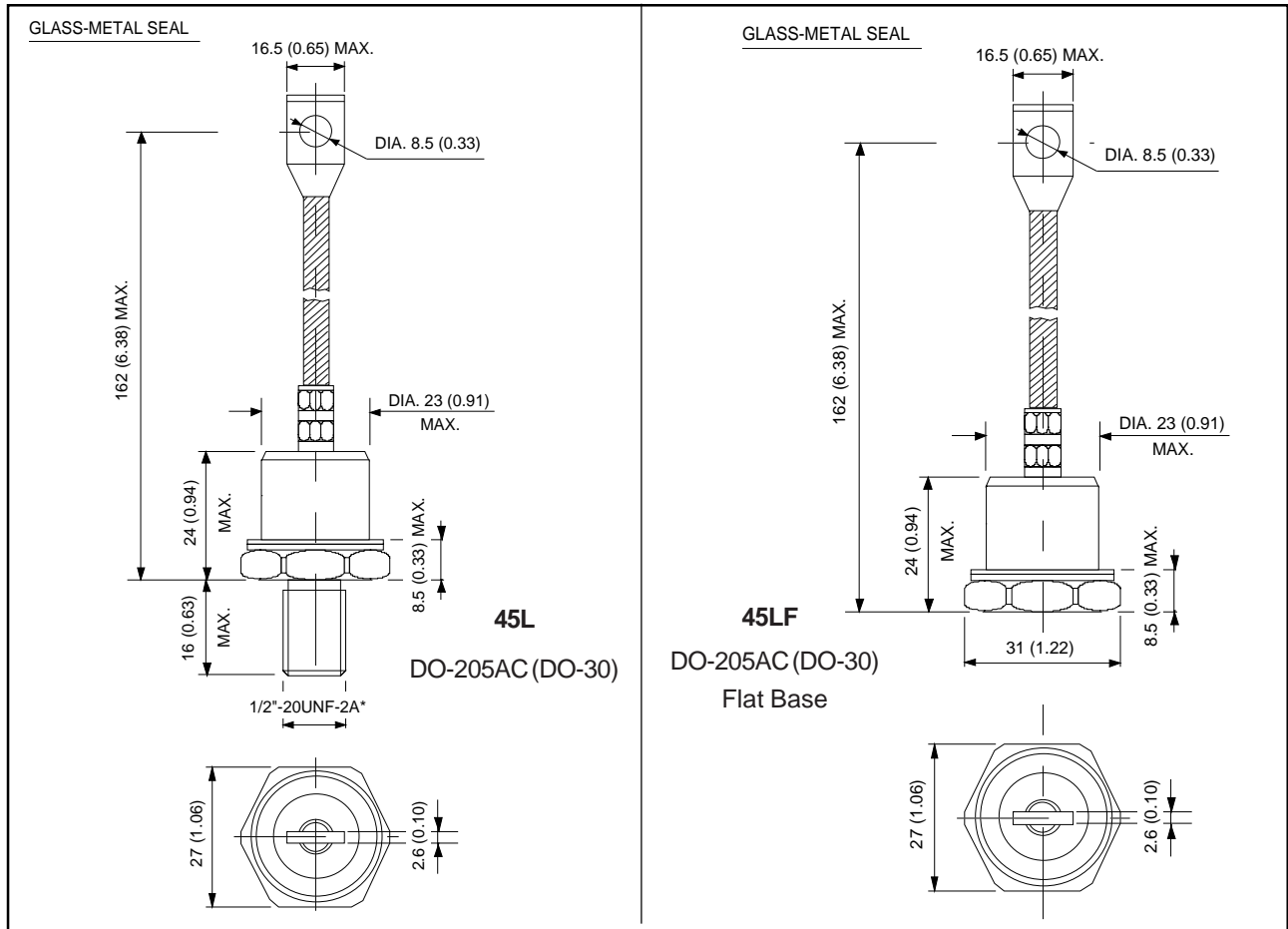
Ordering Information Table

Device Code

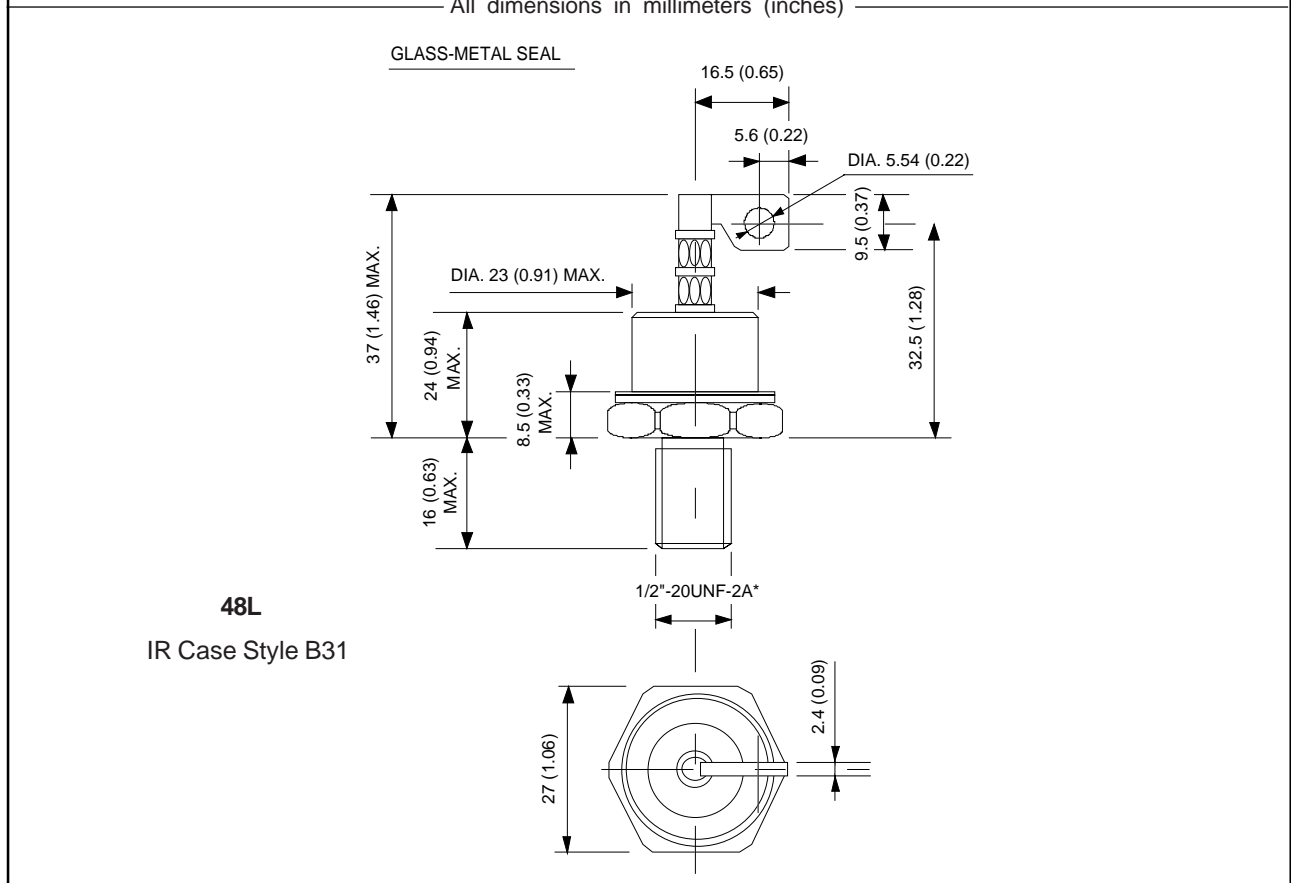
45	L	F	R	160	D
①	②	③	④	⑤	⑥

- 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_{RRM} (See Voltage Ratings table)
- 6** - D = Diffused diode

Outline Table



All dimensions in millimeters (inches)



Outline Table

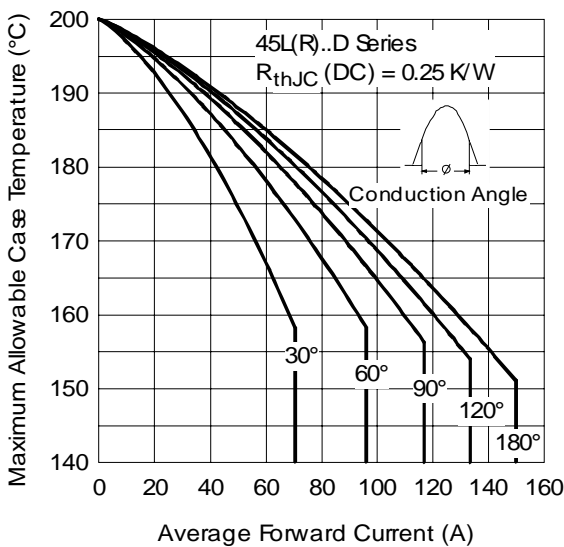
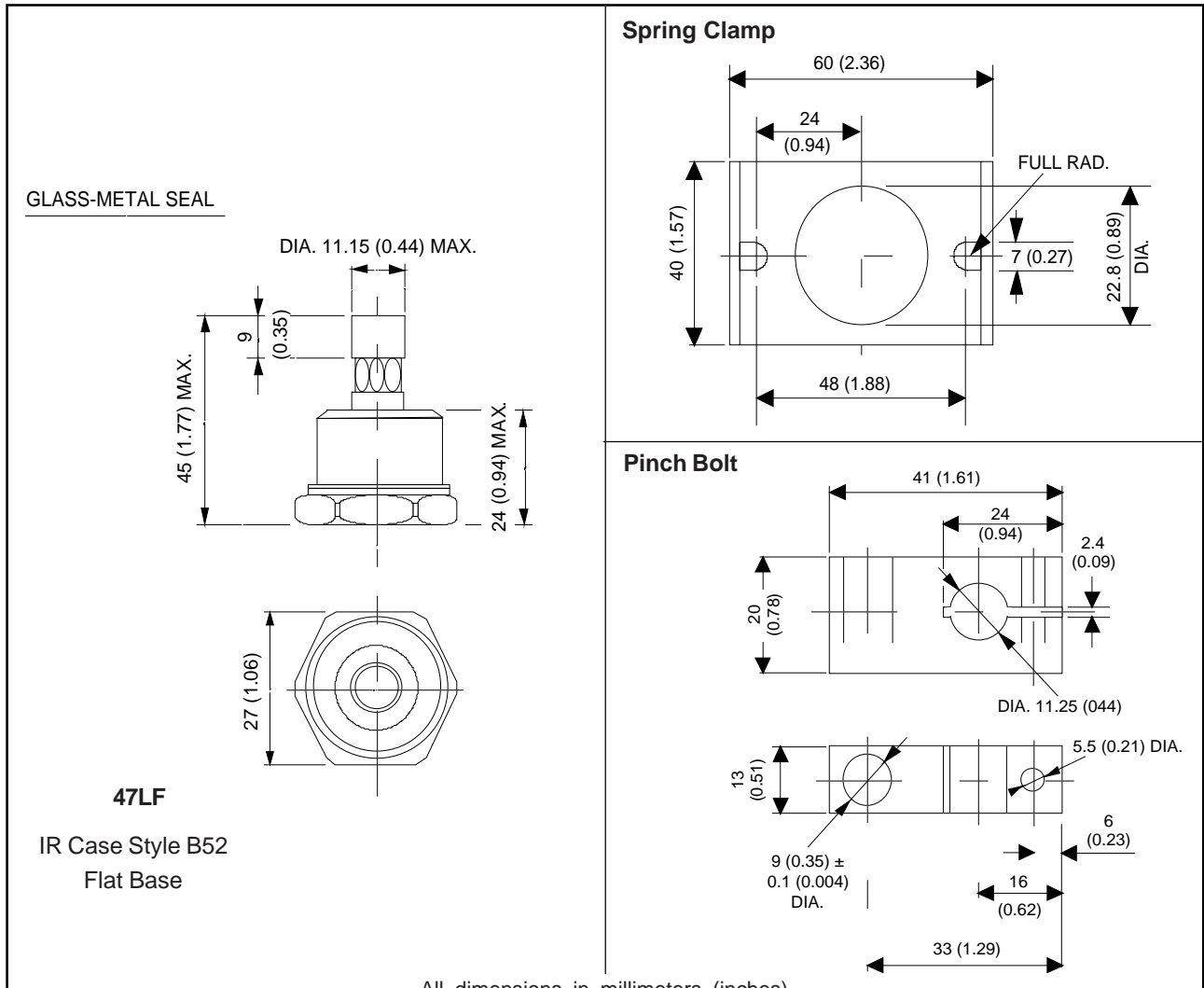


Fig. 1 - Current Ratings Characteristics

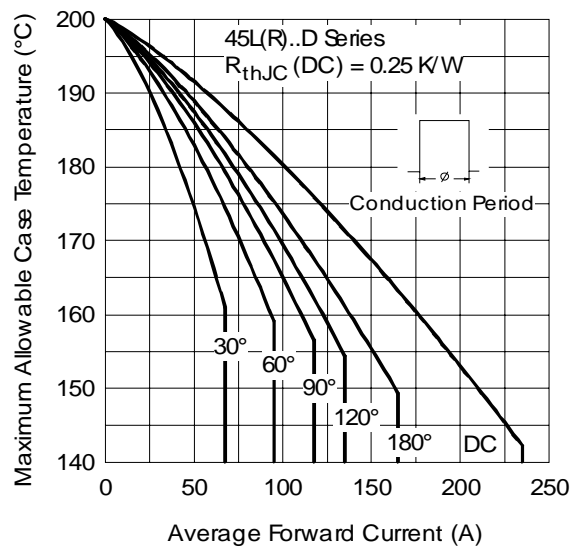


Fig. 2 - Current Ratings Characteristics

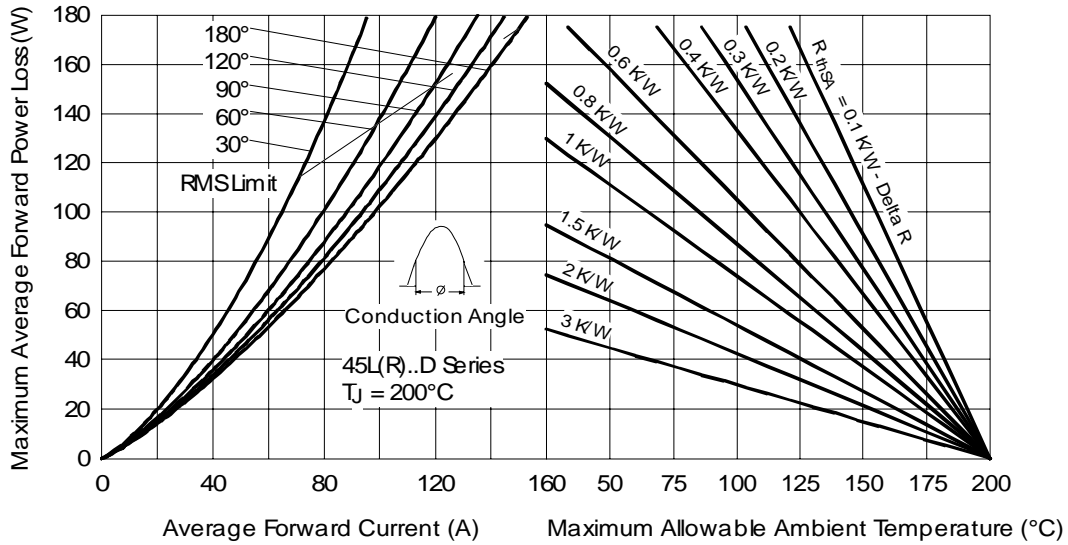


Fig. 3 - Forward Power Loss Characteristics

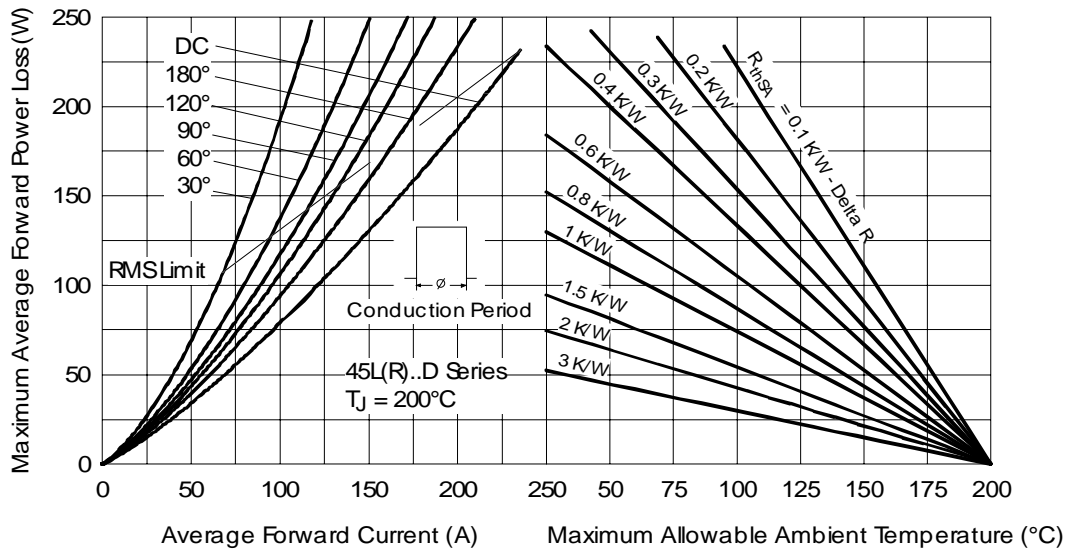


Fig. 4 - Forward Power Loss Characteristics

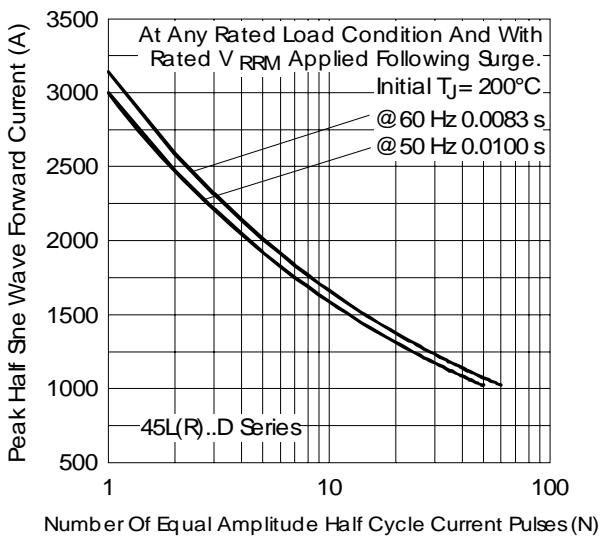


Fig. 5 - Maximum Non-Repetitive Surge Current

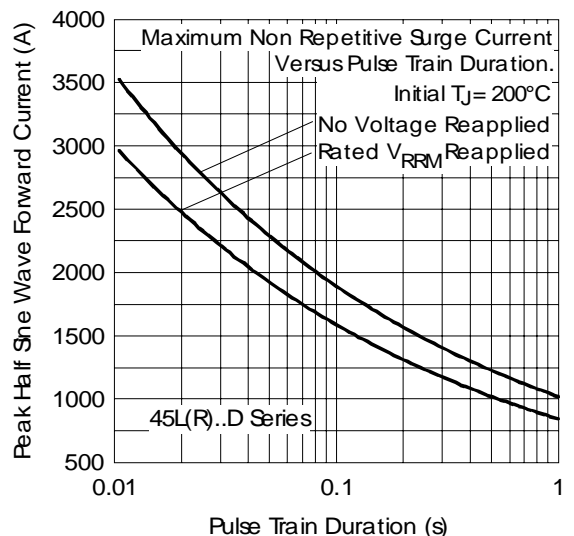


Fig. 6 - Maximum Non-Repetitive Surge Current

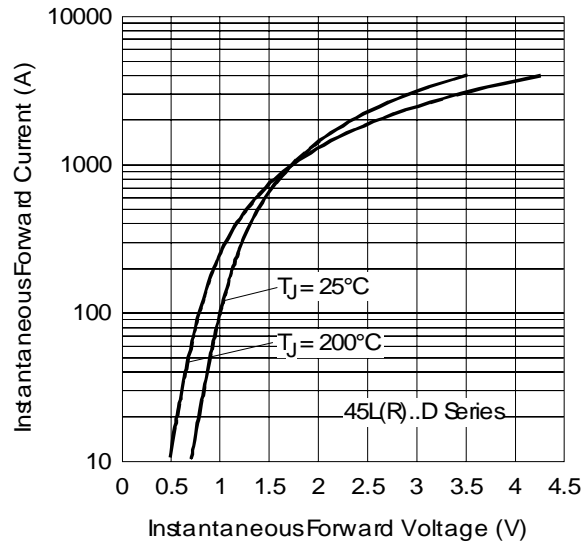


Fig. 7 - Forward Voltage Drop Characteristics

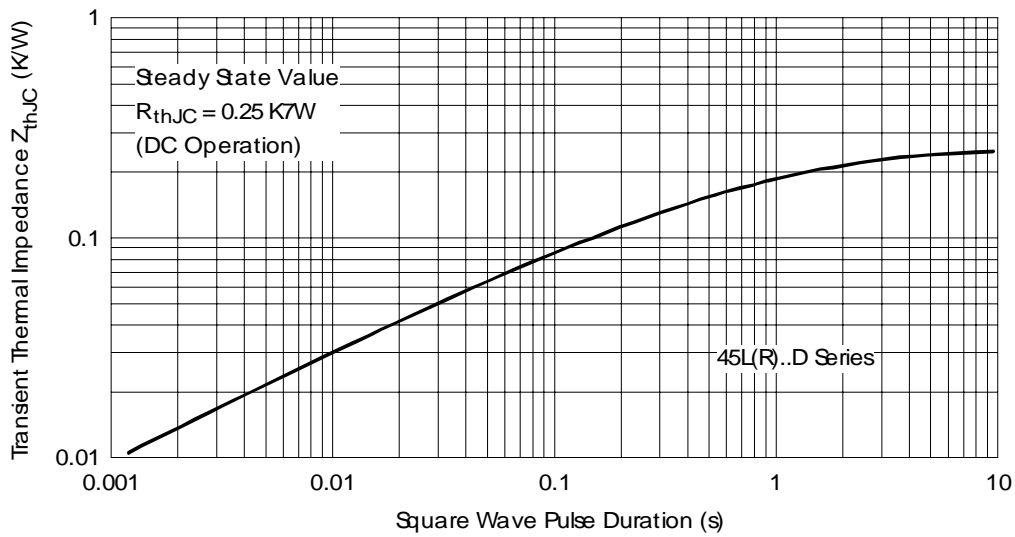


Fig. 8 - Thermal Impedance Z_{thJC} Characteristic

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

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