

International  
**IRF** Rectifier

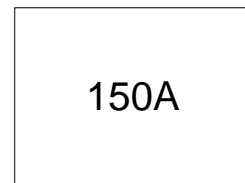
**SERIES**  
**45L(R), 150K/ KS(R)**

**STANDARD RECOVERY DIODES**

**Stud Version**

**Features**

- Alloy diode
- High current carrying capability
- High surge current capabilities
- Stud cathode and stud anode version

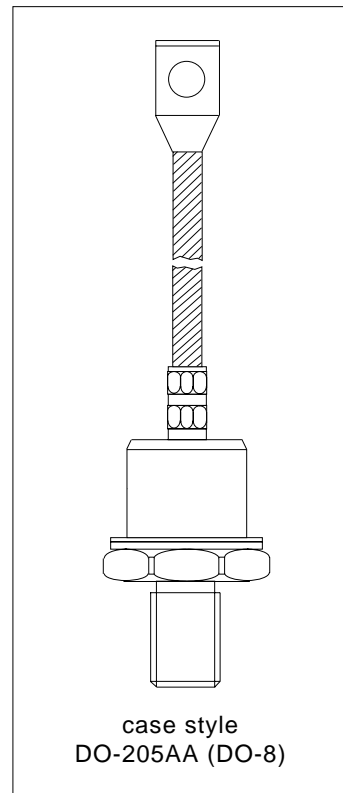


**Typical Applications**

- Battery charges
- Welders
- Machine tool controls
- High power drives
- Medium traction applications
- Freewheeling diodes

**Major Ratings and Characteristics**

Parameters	45L /150K	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	100 to 600	V
$T_J$	- 40 to 200	°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. @ $T_J = 175^\circ\text{C}$ mA
45L(R) 150K(R) 150KS(R)	10	100	200	35
	20	200	300	
	30	300	400	
	40	400	500	
	60	600	720	

Forward Conduction

Parameter	45L /150K	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	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J = T_J \text{ max.}$
$V_{F(TO)2}$ High level value of threshold voltage	0.83		$(I > \pi \times I_{F(AV)})$ , $T_J = T_J \text{ max.}$
$r_{f1}$ Low level value of forward slope resistance	1.42	mΩ	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J = T_J \text{ max.}$
$r_{f2}$ High level value of forward slope resistance	0.91		$(I > \pi \times I_{F(AV)})$ , $T_J = T_J \text{ max.}$
$V_{FM}$ 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/150K	Units	Conditions	
T <sub>J</sub> Max. junction operating temperature range	-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  150K 150KS	Min.	14.1 (125)	Nm (lbf-in)	Not lubricated threads
	Max.	17.0 (150)		
	Min.	12.2 (108)	Nm (lbf-in)	Lubricated threads
	Max.	15.0 (132)		
	Min.	11.3 (100)	Nm (lbf-in)	Not lubricated threads
	Max.	14.1 (125)		
	Min.	9.5 (85)	Nm (lbf-in)	Lubricated threads
	Max.	12.5 (110)		
wt Approximate weight	100 (3.5)	g (oz)		
Case style	45L	DO-205AC (DO-30)	See Outline Table	
	150K-A	DO-205AA (DO-8)		
	150KS	B-42		

**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	R	60
①	②	③	④

- 1** - 45 = Standard version
- 2** - L = Essential Part Number
- 3** - R = Stud Reverse Polarity (Anode to Stud)  
None = Stud Normal Polarity (Cathode to Stud)
- 4** - Voltage code: Code x 10 = V<sub>RRM</sub> (See Voltage Ratings table)

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

Bulletin I2037 rev. B 03/03

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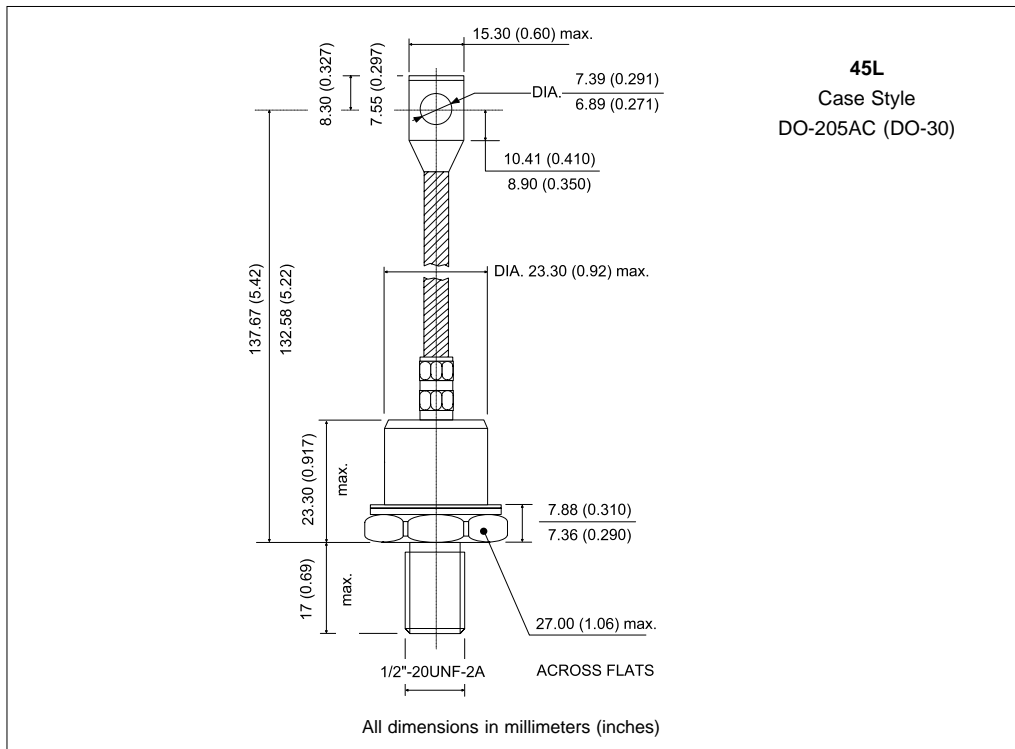
### Ordering Information Table

Device Code					
1	2	3	4	5	6
15	0	K	R	60	A

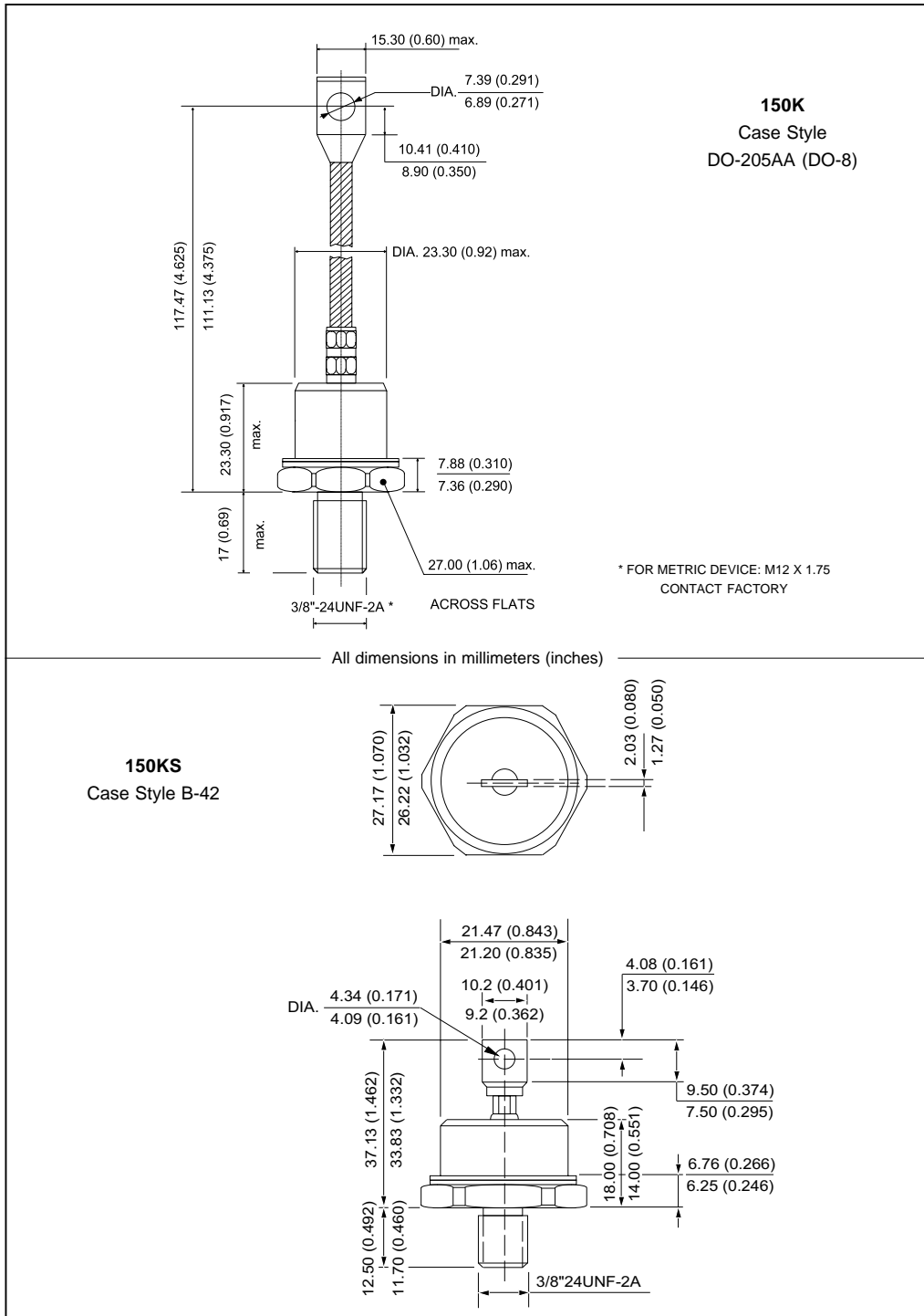
  

<p><b>1</b> - 15 = Essential Part Number</p> <p><b>2</b> - 0 = Standard Device</p> <p><b>3</b> - Case Style K = DO205AA (DO-8) KS = B-42</p> <p><b>4</b> - R = Stud Reverse Polarity (Anode to Stud) None = Stud Normal Polarity (Cathode to Stud)</p> <p><b>5</b> - Voltage code: Code x 10 = <math>V_{RRM}</math> (See Voltage Ratings table)</p> <p><b>6</b> - A = Essential Part Number for 150K (Omitted for 150KS)</p>	<p>NOTE: For Metric Device M12 x 1.75 Contact Factory</p>
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### Outline Table



Outline Table



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

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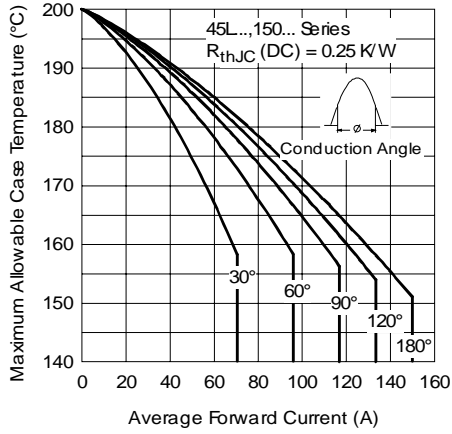


Fig. 1 - Current Ratings Characteristics

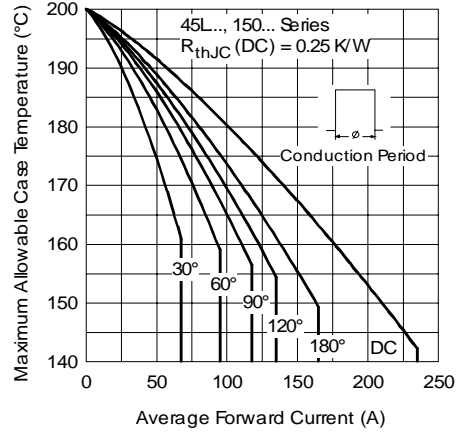


Fig. 2 - Current Ratings Characteristics

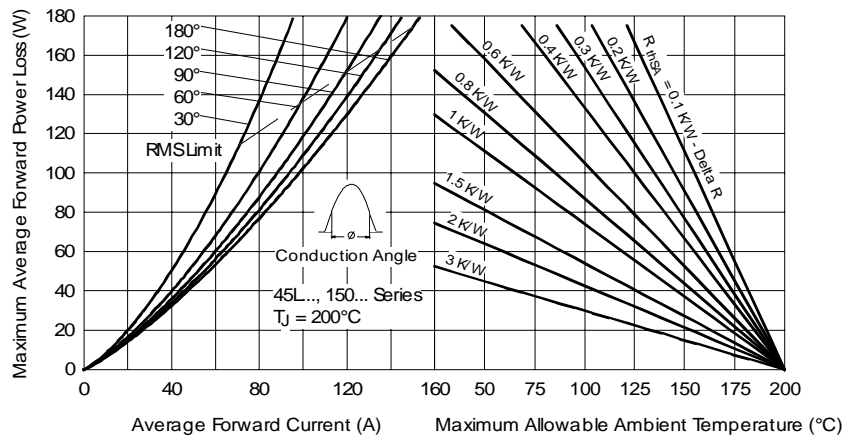


Fig. 3 - Forward Power Loss Characteristics

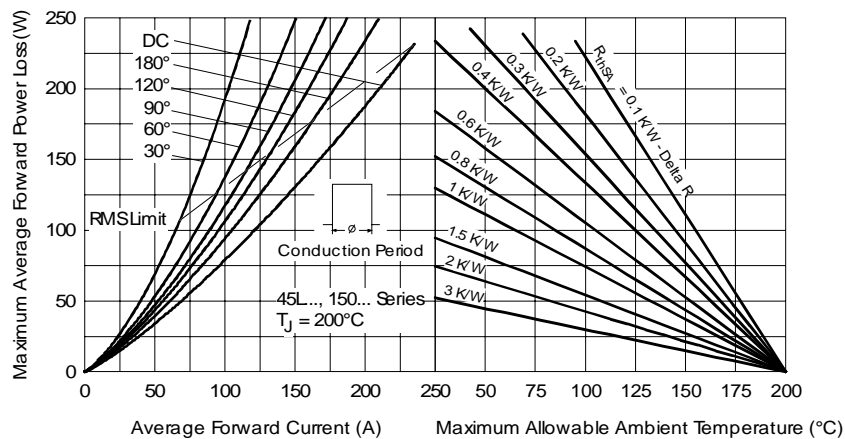


Fig. 4 - Forward Power Loss Characteristics

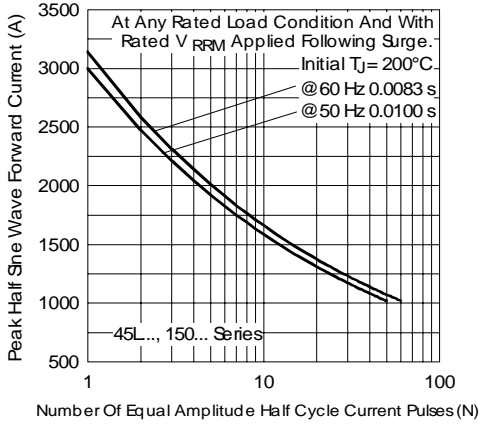


Fig. 5 - Maximum Non-Repetitive Surge Current

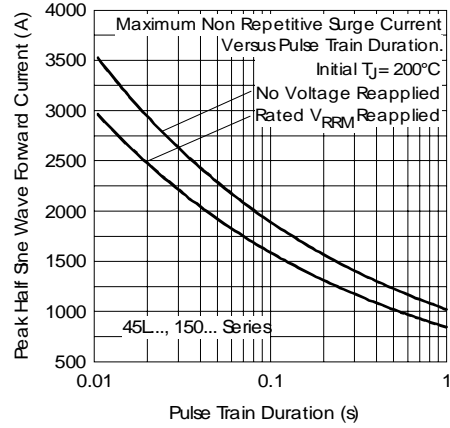


Fig. 6 - Maximum Non-Repetitive Surge Current

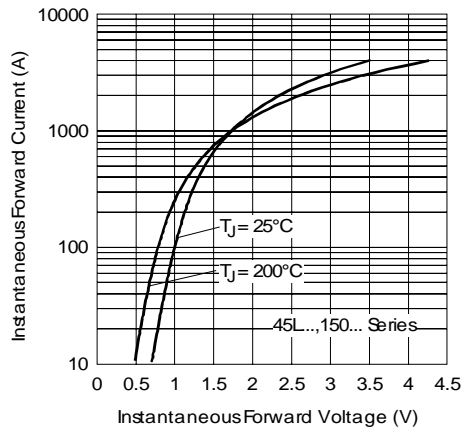


Fig. 7 - Forward Voltage Drop Characteristics

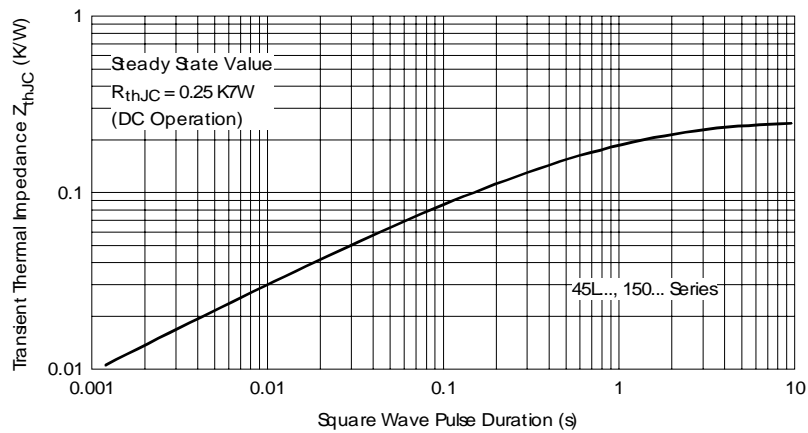


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristic

## **45L(R), 150K/ KS(R) Series**

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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.

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