Bulletin I2037 11/94

International
IOR Rectifier

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

STANDARD RECOVERY DIODES **Stud Version**

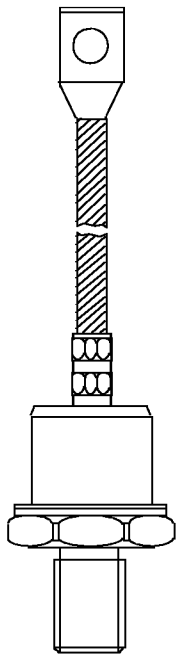
150A

Features

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

TypicalApplications

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



case style
DO-205AA (DO-8)

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^2s
	@ 60Hz	58	KA^2s
V_{RRM} range *		50 to 1000	V
T_J		- 40 to 200	°C

* 45L avaialble 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°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	150	A	180° conduction, half sine wave		
	@ Case temperature	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 reapplied	Sinusoidal half wave, Initial $T_J = T_J$ max.
		3740		t = 8.3ms		
		3000		t = 10ms	100% V_{RRM} reapplied	
		3140		t = 8.3ms		
I^2t	Maximum I^2t for fusing	64	KA^2s	t = 10ms	No voltage reapplied	
		58		t = 8.3ms		
		45		t = 10ms	100% V_{RRM} reapplied	
		41		t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	640	$KA^2\sqrt{s}$	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		$(I > \times \pi \times I_{F(AV)})$, $T_J = T_J$ 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		$(I > \times \pi \times I_{F(AV)})$, $T_J = T_J$ max.		
V_{FM}	Max. forward voltage drop	1.33	V	I_{pk}= 471A, T_J = 25°C, t_p = 10ms sinusoidal wave		

Thermal and Mechanical Specifications

	Parameter		45L/150...	Units	Conditions
T_J	Max. junction operating temperature range		-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	Mounting torque	Min.	14.1 (125)	Nm (lbf-in)	Not lubricated threads
	45L	Max.	17.0 (150)		
	150L	Min.	12.2 (108)		Lubricated threads
		Max.	15.0 (132)		
	150K	Min.	11.3 (100)	Nm (lbf-in)	Not lubricated threads
	150KS	Max.	14.1 (125)		
		Min.	9.5 (85)		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)		

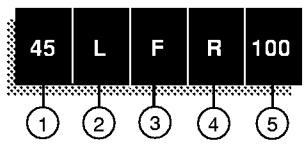
ΔR_{thJC} Conduction

(The following table shows the increment of thermal resistence 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



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_{RRM} (See Voltage Ratings table)

NOTE: For longer lead Contact Factory

Ordering Information Table

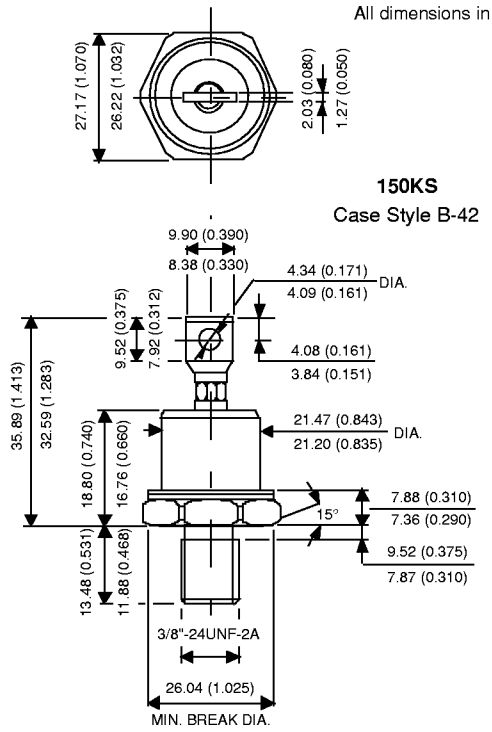
Device Code

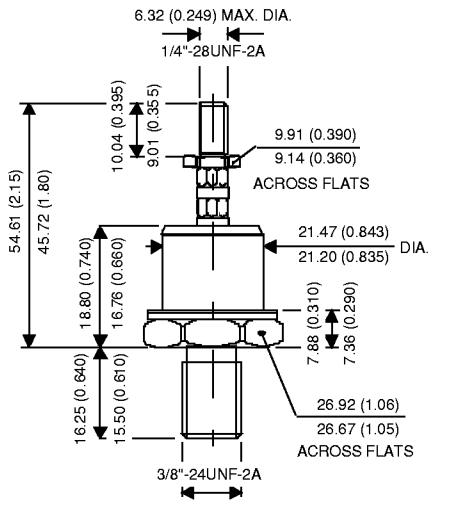
15	0	K	R	100	A	M
①	②	③	④	⑤	⑥	⑦

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

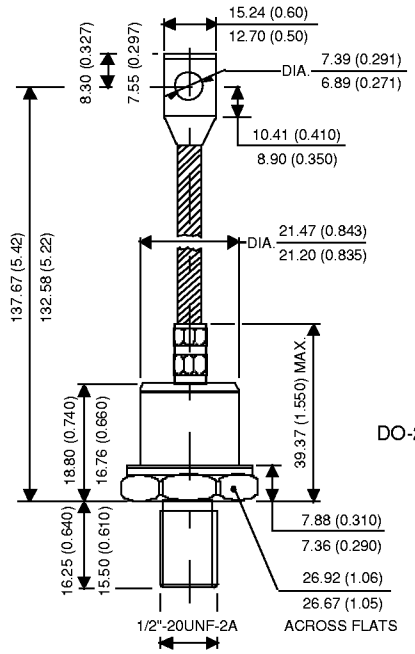
NOTE: For longer lead Contact Factory

All dimensions in millimeters (inches)



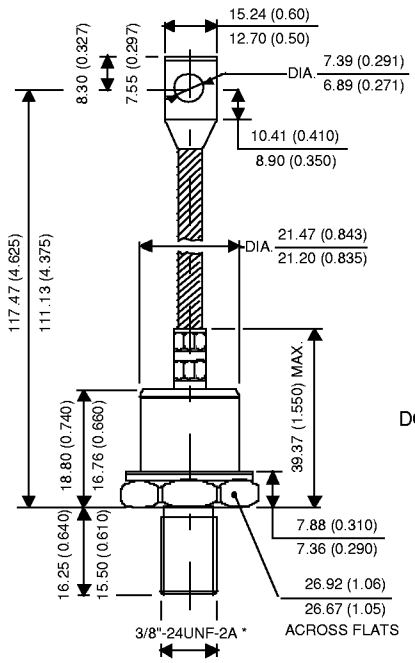


Outline Table



45L
Case Style
DO-205AC (DO-30)

All dimensions in millimeters (inches)

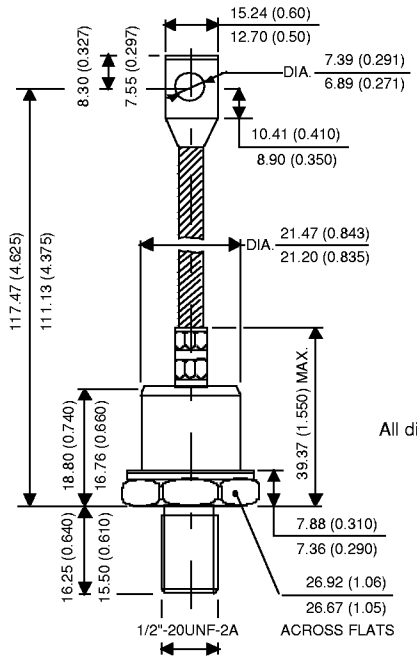


150K
Case Style
DO-205AA (DO-8)

* FOR METRIC DEVICE M12 X 1.5

Outline Table

150L
Case Style
DO-205AC (DO-30)



All dimensions in millimeters (inches)

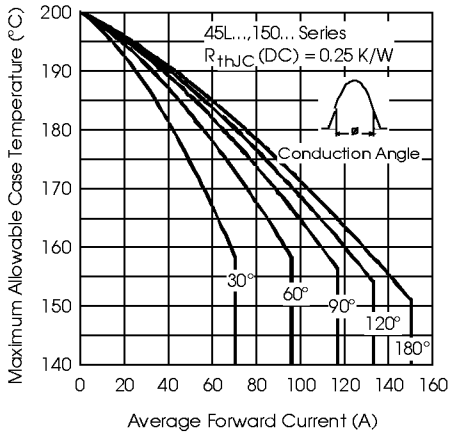


Fig. 1 - Current Ratings Characteristics

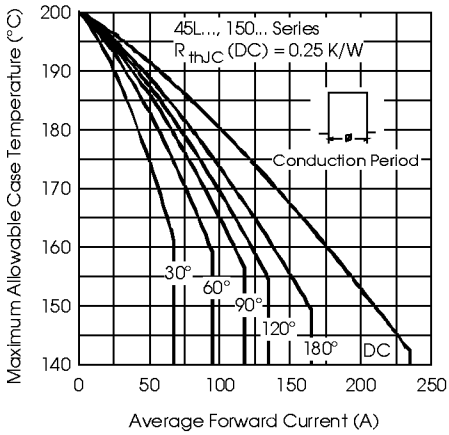


Fig. 2 - Current Ratings Characteristics

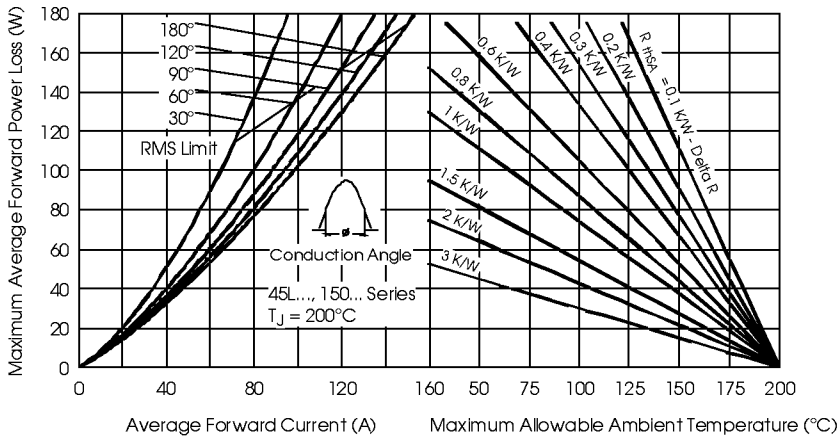


Fig. 3 - Forward Power Loss Characteristics

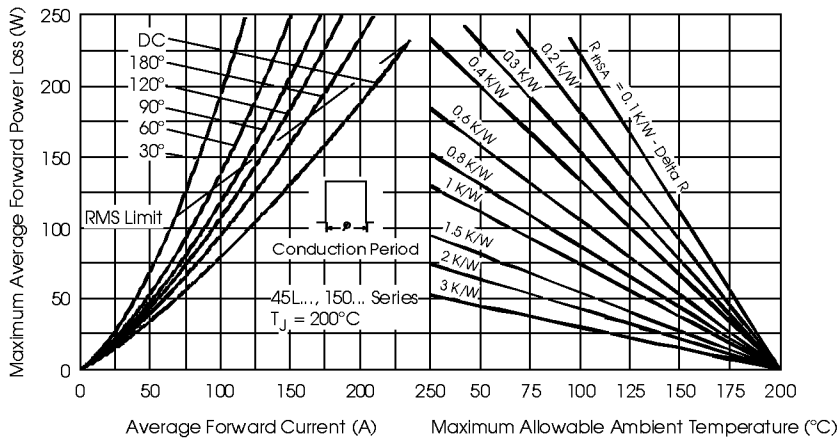


Fig. 4 - Forward Power Loss Characteristics

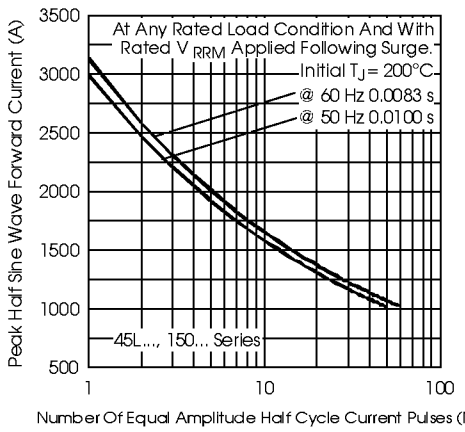


Fig. 5 - Maximum Non-Repetitive Surge Current

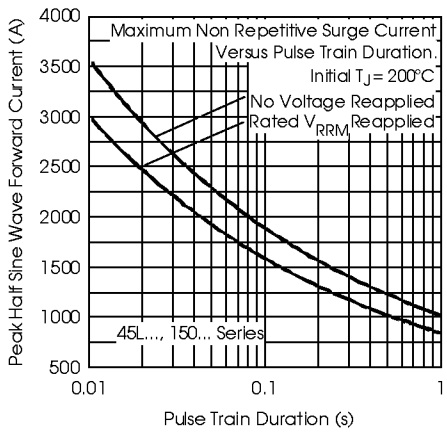


Fig. 6 - Maximum Non-Repetitive Surge Current

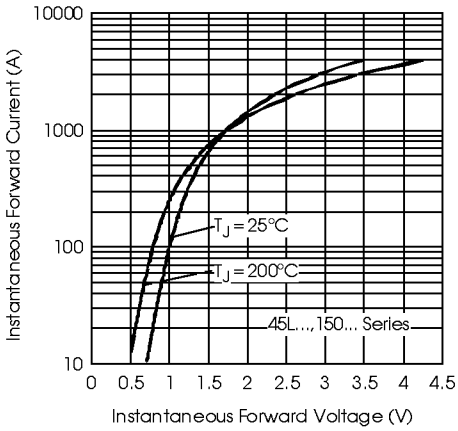


Fig. 7 - Forward Voltage Drop Characteristics

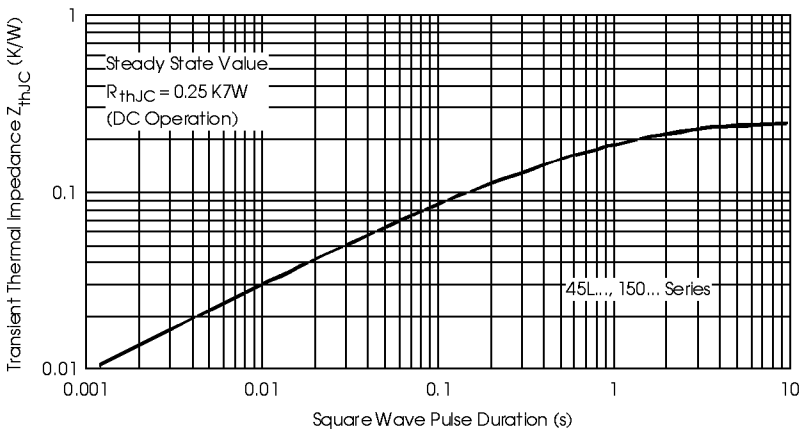


Fig. 8 - Thermal Impedance Z_{thJC} Characteristic