



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

Vishay High Power Products

Standard Recovery Diodes (Stud Version), 150 A



DO-205AA (DO-8)

FEATURES

- Alloy diode
- High current carrying capability
- High surge current capabilities
- Stud cathode and stud anode version
- RoHS compliant
- Designed and qualified for industrial level



RoHS
COMPLIANT

PRODUCT SUMMARY

$I_{F(AV)}$	150 A
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TYPICAL APPLICATIONS

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

MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		150	A
	T_C	150	°C
$I_{F(RMS)}$		235	A
I_{FSM}	50 Hz	3570	A
	60 Hz	3740	
I^2t	50 Hz	64	kA ² s
	60 Hz	58	
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 REVERSE VOLTAGE V	I_{RRM} MAXIMUM AT $T_J = 175\text{ °C}$ mA
45L(R) 150K(R) 150KS(R)	10	100	200	35
	20	200	300	
	30	300	400	
	40	400	500	
	60	600	720	



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FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum average forward current at case temperature	I _{F(AV)}	180° conduction, half sine wave			150	A
					150	°C
Maximum RMS forward current	I _{F(RMS)}	DC at 142 °C case temperature			235	A
Maximum peak, one cycle forward, non-repetitive surge current	I _{FSM}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial T _J = T _J maximum	3570	
		t = 8.3 ms			3740	
		t = 10 ms	100 % V _{RRM} reapplied		3000	
		t = 8.3 ms			3140	
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied		64	kA ² s
		t = 8.3 ms		58		
		t = 10 ms	100 % V _{RRM} reapplied	45		
		t = 8.3 ms		41		
Maximum I ² √t for fusing	I ² √t	t = 0.1 to 10 ms, no voltage reapplied			640	kA ² √s
Low level value of threshold voltage	V _{F(TO)1}	(16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J maximum			0.67	V
High level value of threshold voltage	V _{F(TO)2}	(I > π × I _{F(AV)}), T _J = T _J maximum			0.83	
Low level value of forward slope resistance	r _{f1}	(16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J maximum			1.42	mΩ
High level value of forward slope resistance	r _{f2}	(I > π × I _{F(AV)}), T _J = T _J maximum			0.91	
Maximum forward voltage drop	V _{FM}	I _{pk} = 471 A, T _J = 25 °C, t _p = 10 ms sinusoidal wave			1.33	V

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction operating and storage temperature range		T _J , T _{Stg}		- 40 to 200	°C
Maximum thermal resistance, junction to case		R _{thJC}	DC operation	0.25	K/W
Maximum thermal resistance, case to heatsink		R _{thCS}	Mounting surface, smooth, flat and greased	0.10	
Mounting torque 45L	minimum		Not lubricated threads	14.1 (125)	N · m (lbf · in)
	maximum			17.0 (150)	
	minimum	Lubricated threads	12.2 (108)		
	maximum		15.0 (132)		
Mounting torque 150K 150KS	minimum		Not lubricated threads	11.3 (100)	N · m (lbf · in)
	maximum			14.1 (125)	
	minimum	Lubricated threads	9.5 (85)		
	maximum		12.5 (110)		
Approximate weight				100	g
				3.5	oz.
Case style	45L		See dimensions - link at the end of datasheet	DO-205AC (DO-30)	
	150K-A			DO-205AA (DO-8)	
	150KS			B-42	



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ΔR_{thJC} CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.031	0.023	$T_J = T_J \text{ maximum}$	K/W
120°	0.038	0.040		
90°	0.048	0.053		
60°	0.071	0.075		
30°	0.120	0.121		

Note

- The table above shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

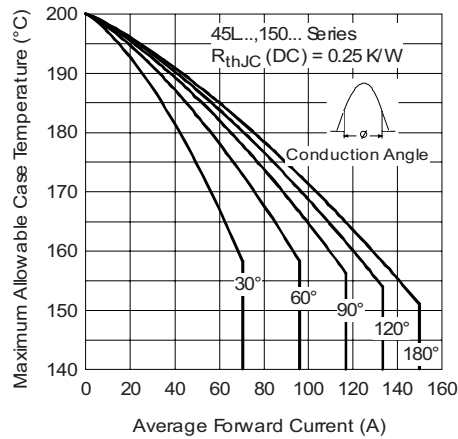


Fig. 1 - Current Ratings Characteristics

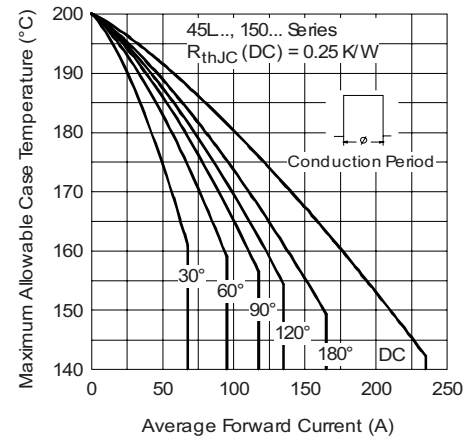


Fig. 2 - Current Ratings Characteristics

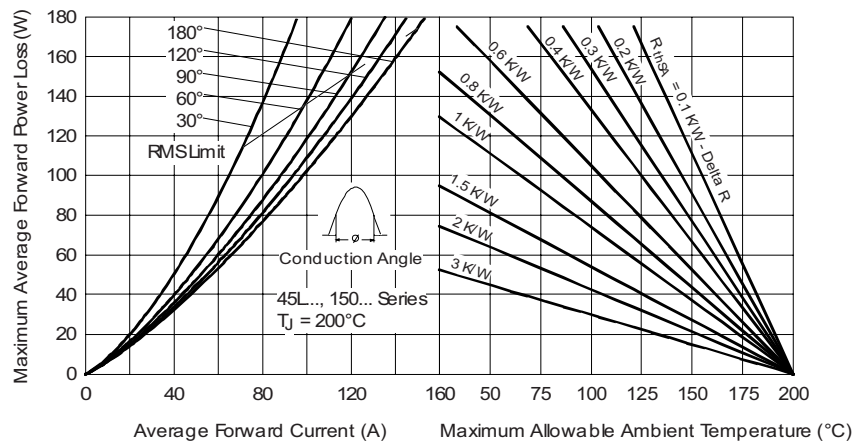


Fig. 3 - Forward Power Loss Characteristics

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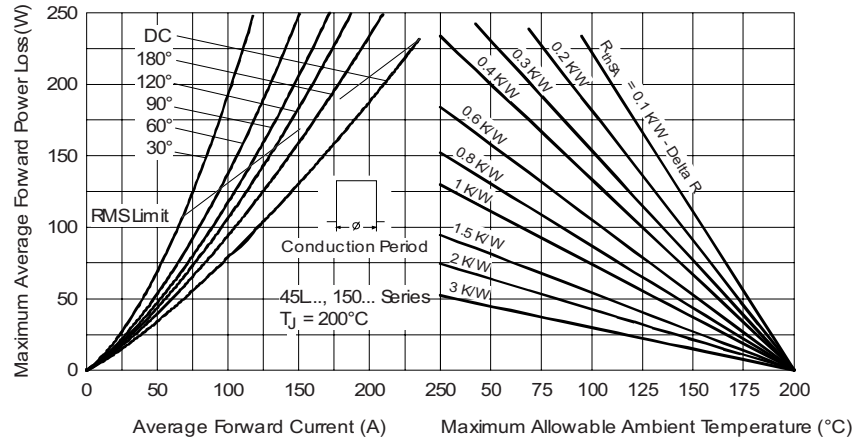


Fig. 4 - Forward Power Loss Characteristics

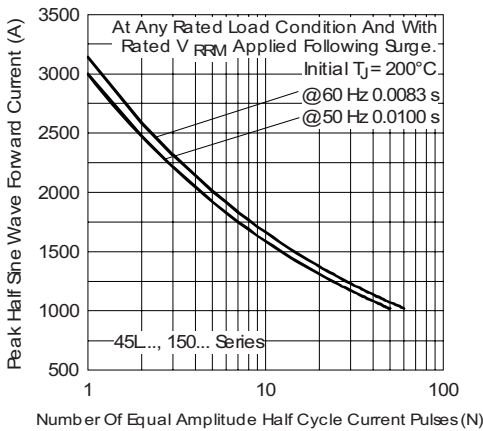


Fig. 5 - Maximum Non-Repetitive Surge Current

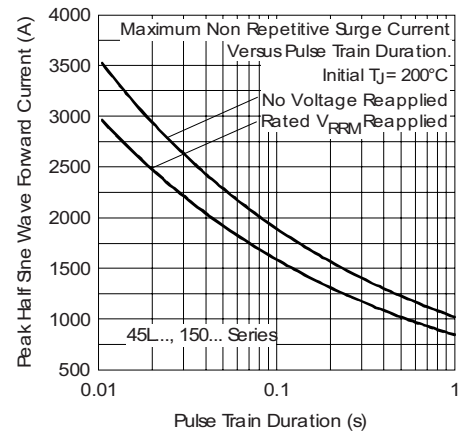


Fig. 6 - Maximum Non-Repetitive Surge Current

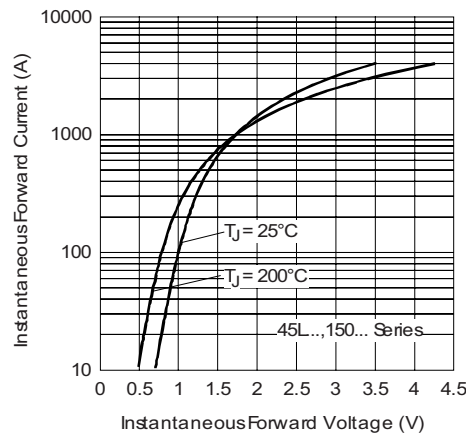


Fig. 7 - Forward Voltage Drop Characteristics



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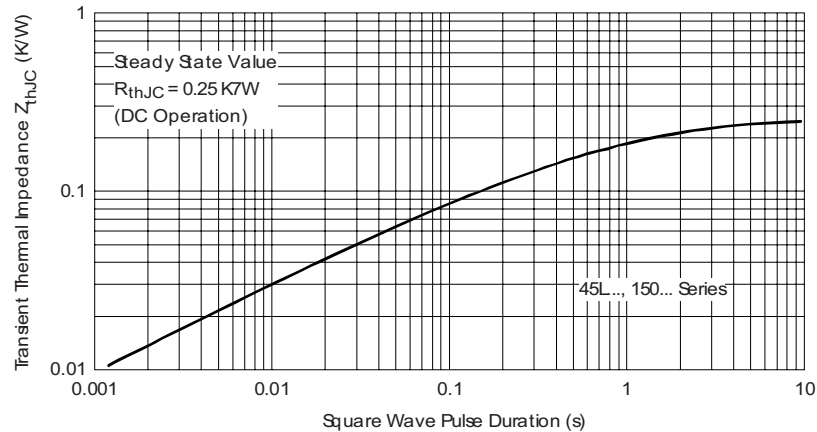


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLES

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 x 10 = V_{RRM} (see Voltage Ratings table)			

Device code	15	0	K	R	60	A
	1	2	3	4	5	6
1	- 15 = Essential part number					
2	- 0 = Standard device					
3	- Case style: K = DO-205AA (DO-8) KS = B-42					
4	- R = Stud reverse polarity (anode to stud) None = Stud normal polarity (cathode to stud)					
5	- Voltage code x 10 = V_{RRM} (see Voltage Ratings table)					
6	- A = Essential part number for 150K (omitted for 150KS)					

Note: For metric device M12 x 1.75 contact factory

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95314



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