

# 34993-DI



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## VS-45L(R), VS-150K(R), VS-150KS(R) Series

Vishay Semiconductors

### Standard Recovery Diodes, (Stud Version), 150 A



DO-8 (DO-205AA)

#### FEATURES

- Alloy diode
- High current carrying capability
- High surge current capabilities
- Stud cathode and stud anode version
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS  
COMPLIANT

#### TYPICAL APPLICATIONS

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

#### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	150 A
Package	DO-8 (DO-205AA)
Circuit configuration	Single

#### 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 <sup>2</sup> 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 $T_J = 175$ °C mA
VS-45L(R) VS-150K(R) VS-150KS(R)	10	100	200	35
	20	200	300	
	30	300	400	
	40	400	500	
	60	600	720	



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	
Maximum peak, one cycle forward, non-repetitive surge current	$I_{FSM}$	t = 10 ms	No voltage reapplied	3570	A
		t = 8.3 ms		3740	
		t = 10 ms	100 % $V_{RRM}$ reapplied	3000	
		t = 8.3 ms		3140	
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reapplied	64	kA <sup>2</sup> s
		t = 8.3 ms		58	
		t = 10 ms	100 % $V_{RRM}$ reapplied	45	
		t = 8.3 ms		41	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied		640	kA <sup>2</sup> √s
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		0.67	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > $\pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		0.83	
Low level value of forward slope resistance	$r_{f1}$	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		1.42	mW
High level value of forward slope resistance	$r_{f2}$	(I > $\pi \times I_{F(AV)}$ ), $T_J = T_J$ 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-30 (DO-205AC)	
	150K-A			DO-8 (DO-205AA)	
	150KS			B-42	

$\Delta R_{thJC}$ CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.031	0.023	$T_J = T_J$ 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

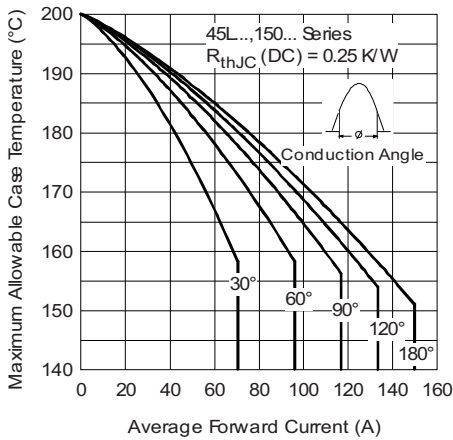


Fig. 1 - Current Ratings Characteristics

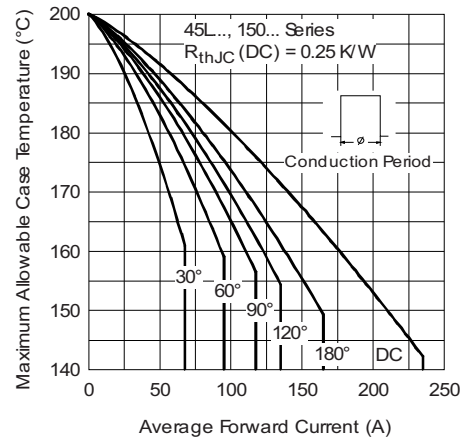


Fig. 2 - Current Ratings Characteristics

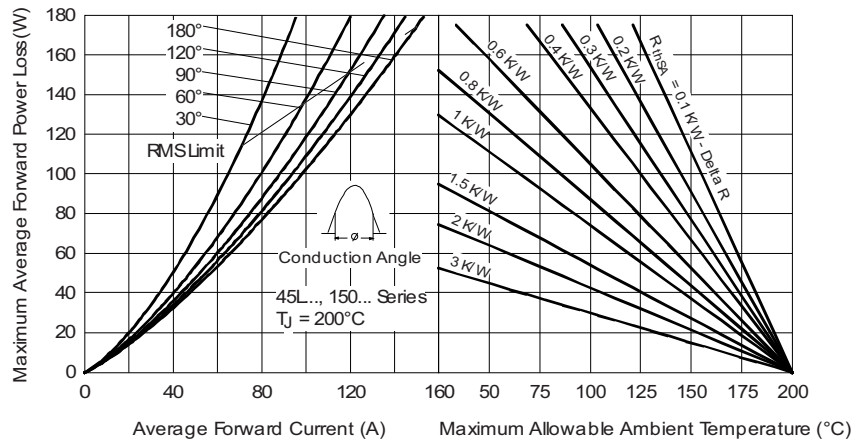


Fig. 3 - Forward Power Loss Characteristics

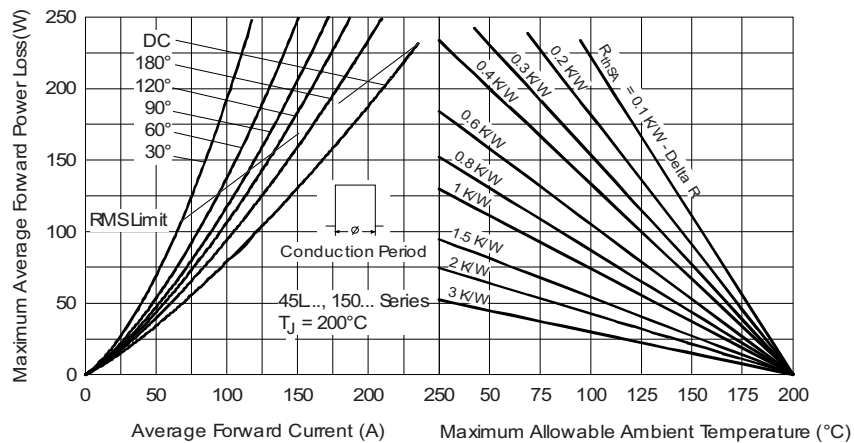


Fig. 4 - Forward Power Loss Characteristics

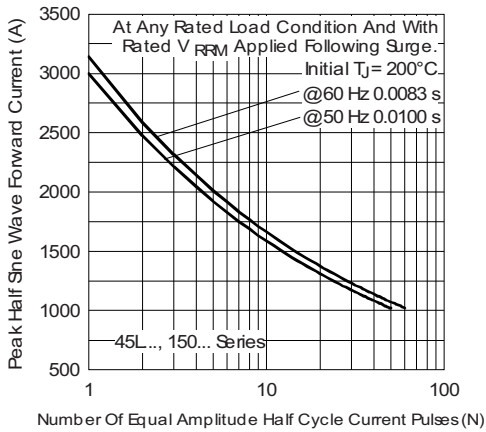


Fig. 5 - Maximum Non-Repetitive Surge Current

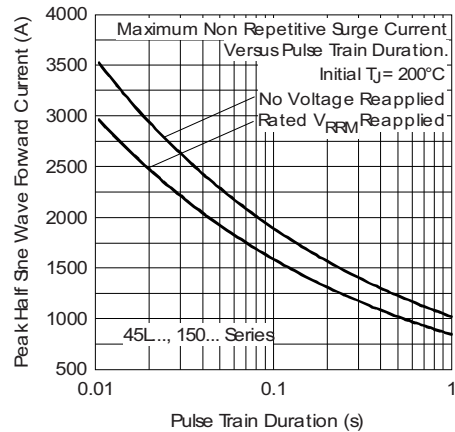


Fig. 6 - Maximum Non-Repetitive Surge Current

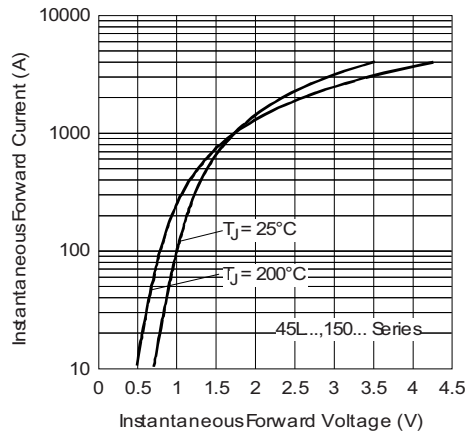


Fig. 7 - Forward Voltage Drop Characteristics

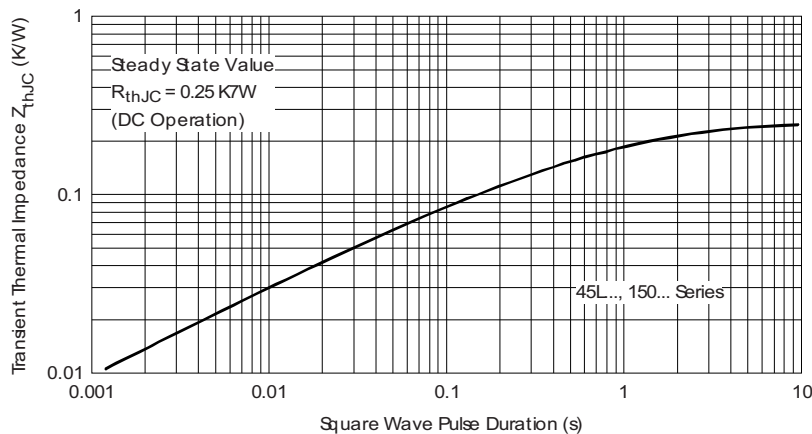
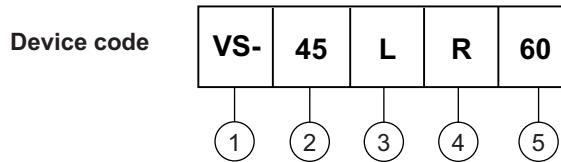


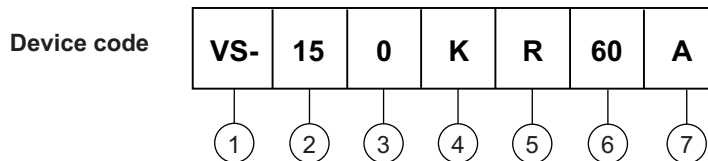
Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - 45 = standard version
- 3** - L = essential part number
- 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)



- 1** - Vishay Semiconductors product
- 2** - 15 = essential part number
- 3** - 0 = standard device
- 4** - Case style:  
K = DO-8 (DO-205AA)  
KS = B-42
- 5** - R = stud reverse polarity (anode to stud)  
None = stud normal polarity (cathode to stud)
- 6** - Voltage code x 10 =  $V_{RRM}$  (see Voltage Ratings table)
- 7** - A = essential part number for 150K (omitted for 150KS)

**Note**

- For metric device M12 x 1.75 contact factory

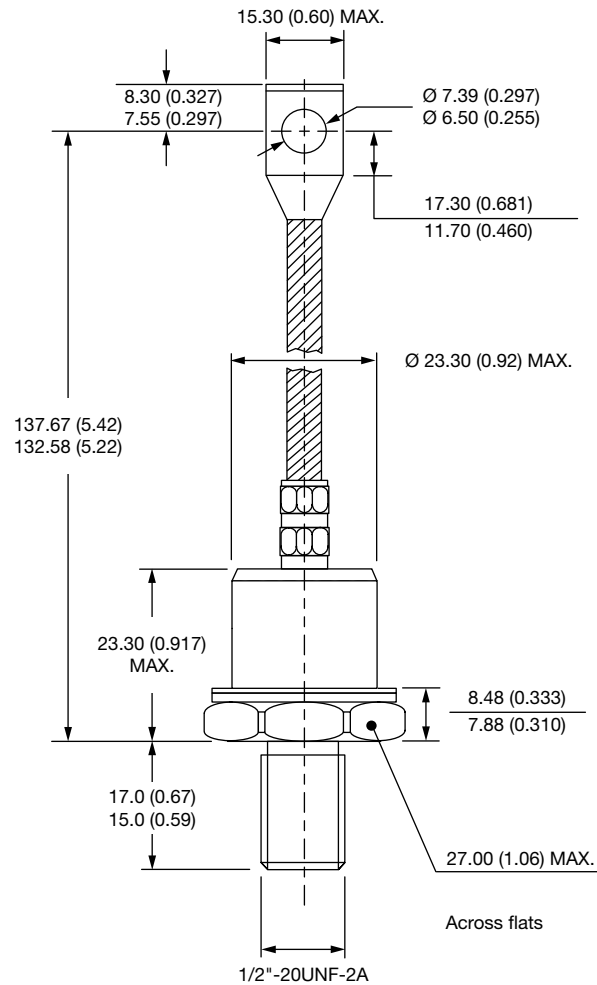
### LINKS TO RELATED DOCUMENTS

Dimensions	<a href="http://www.vishay.com/doc?95314">www.vishay.com/doc?95314</a>
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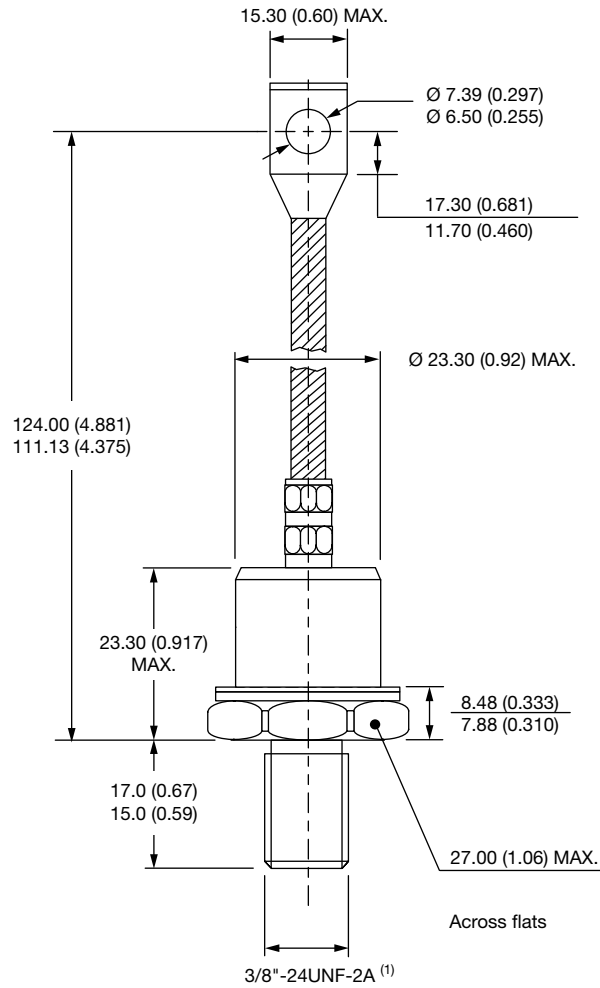
## DO-205AC (DO-30), DO-205AA (DO-8) and B-42 for 45L(R), 150K(R) and 150KS(R) Series

**DIMENSIONS FOR 45L(R) SERIES - DO-205AC (DO-30)** in millimeters (inches)





### DIMENSIONS FOR 150K(R) SERIES - DO-205AA (DO-8) in millimeters (inches)

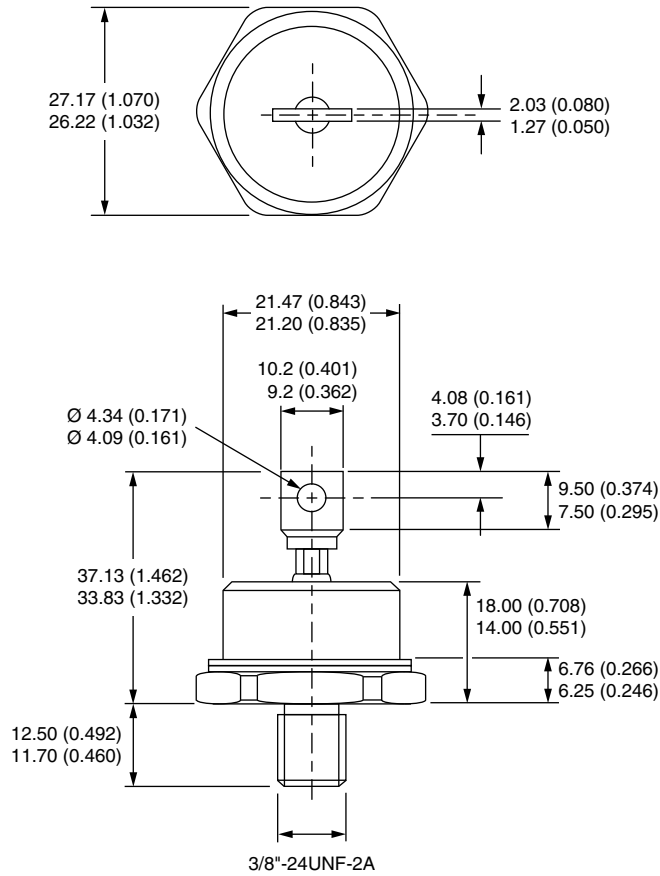


#### Note

<sup>(1)</sup> For metric device M12 x 1.75 contact factory



### DIMENSIONS FOR 150KS(R) SERIES - B-42 in millimeters (inches)







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