



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

Vishay Semiconductors

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
- Designed and qualified for industrial level


RoHS
COMPLIANT

PRODUCT SUMMARY

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

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 $T_J = 175^\circ\text{C}$ 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	



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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	mW
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

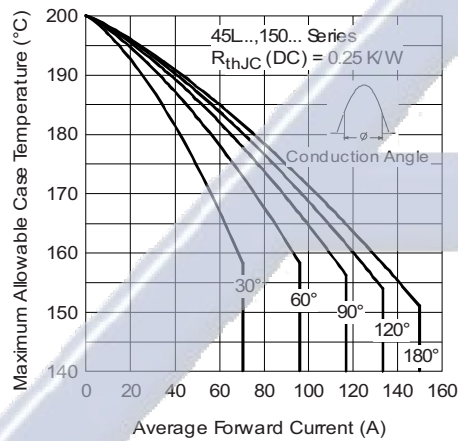


Fig. 1 - Current Ratings Characteristics

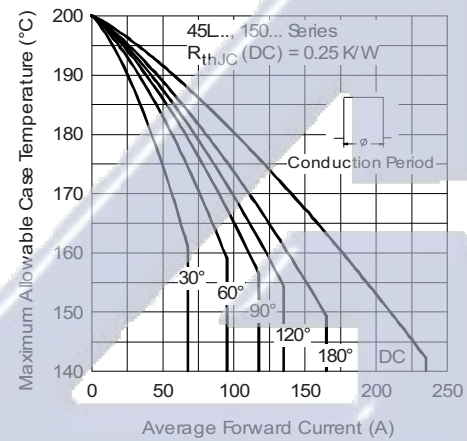


Fig. 2 - Current Ratings Characteristics

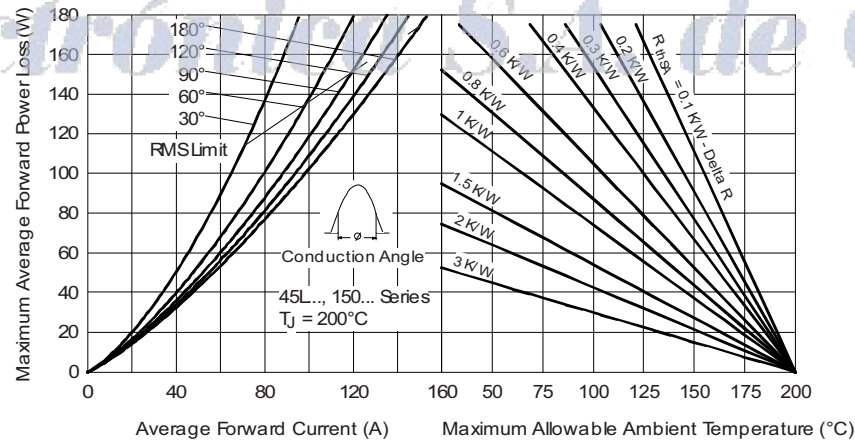


Fig. 3 - Forward Power Loss Characteristics



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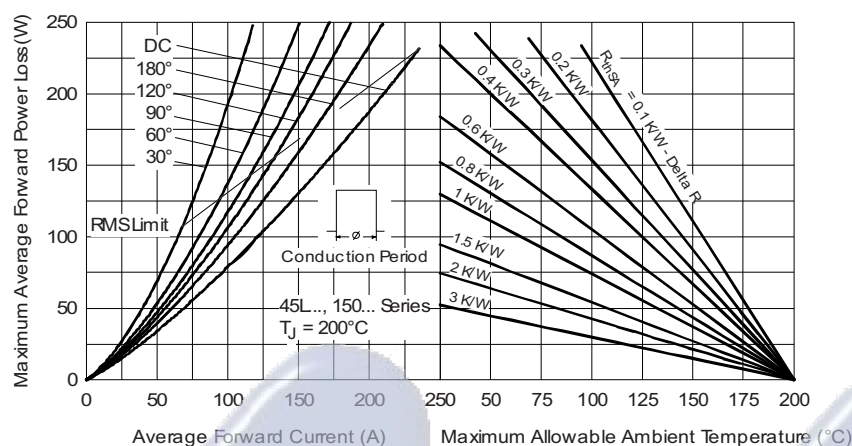


Fig. 4 - Forward Power Loss Characteristics

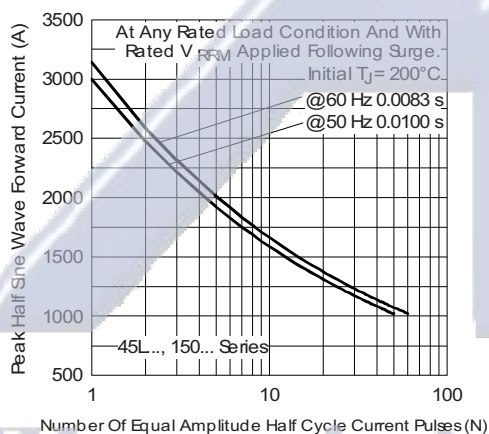


Fig. 5 - Maximum Non-Repetitive Surge Current

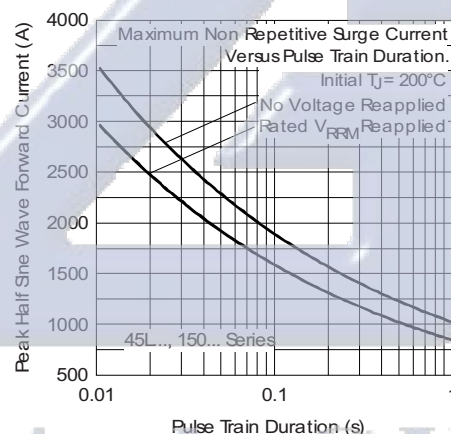


Fig. 6 - Maximum Non-Repetitive Surge Current

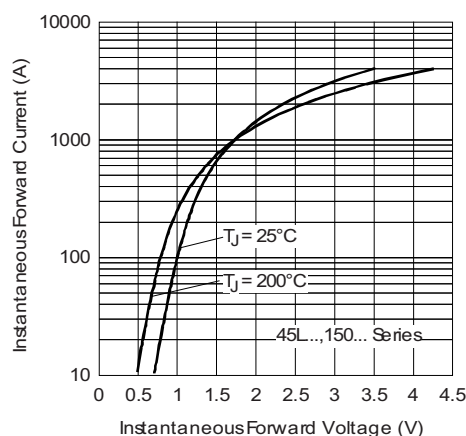


Fig. 7 - Forward Voltage Drop Characteristics



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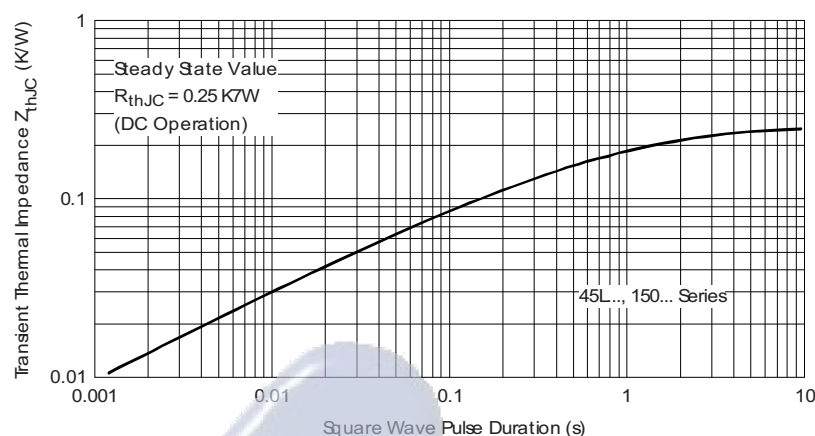


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLES

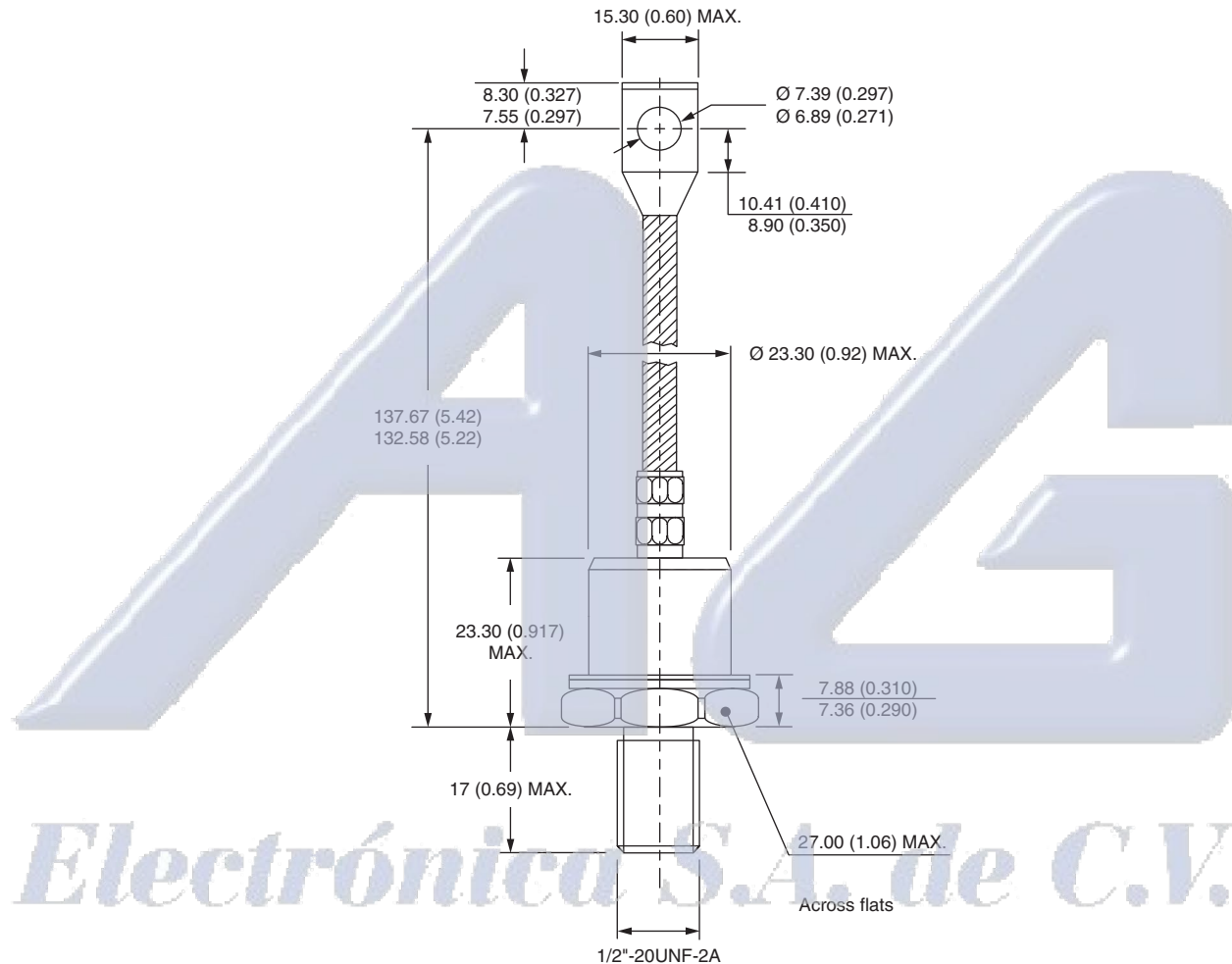
Device code	VS-	45	L	R	60
	①	②	③	④	⑤
①	- Vishay Semiconductors product				
②	- 45 = Standard version				
③	- L = Essential part number				
④	- R = Stud reverse polarity (anode to stud) None = Stud normal polarity (cathode to stud)				
⑤	- Voltage code x 10 = V_{RRM} (see Voltage Ratings table)				

Device code	VS-	15	0	K	R	60	A
	①	②	③	④	⑤	⑥	⑦
①	- Vishay Semiconductors product						
②	- 15 = Essential part number						
③	- 0 = Standard device						
④	- Case style: K = DO-205AA (DO-8) 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

**Outline Dimensions**

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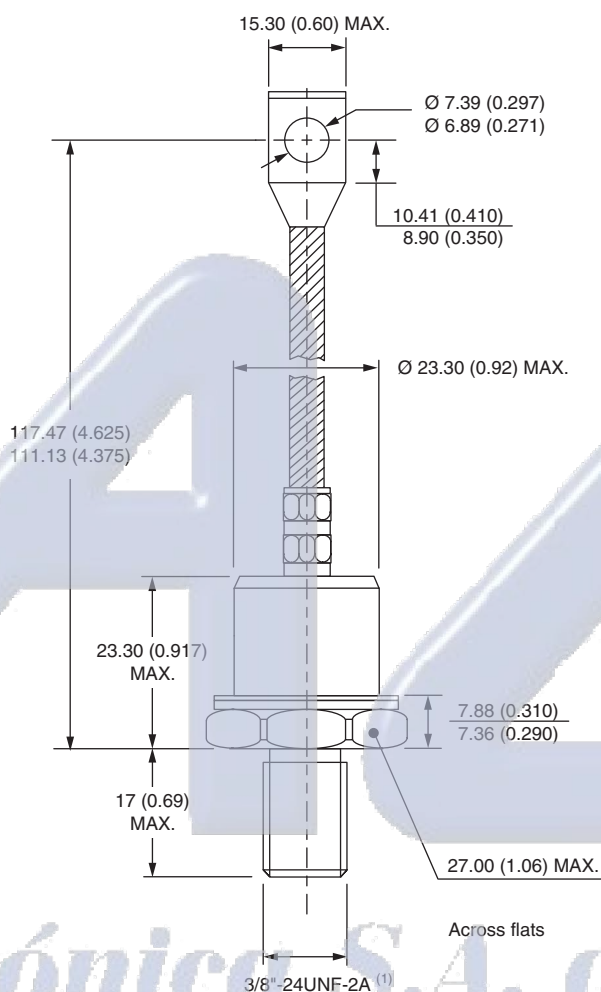
**DO-205AC (DO-30), DO-205AA (DO-8)
and B-42 for 45L(R), 150K(R) and 150KS(R) Series****DIMENSIONS FOR 45L(R) SERIES - DO-205AC (DO-30) in millimeters (inches)**

Outline Dimensions

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



Note

⁽¹⁾ For metric device M12 x 1.75 contact factory

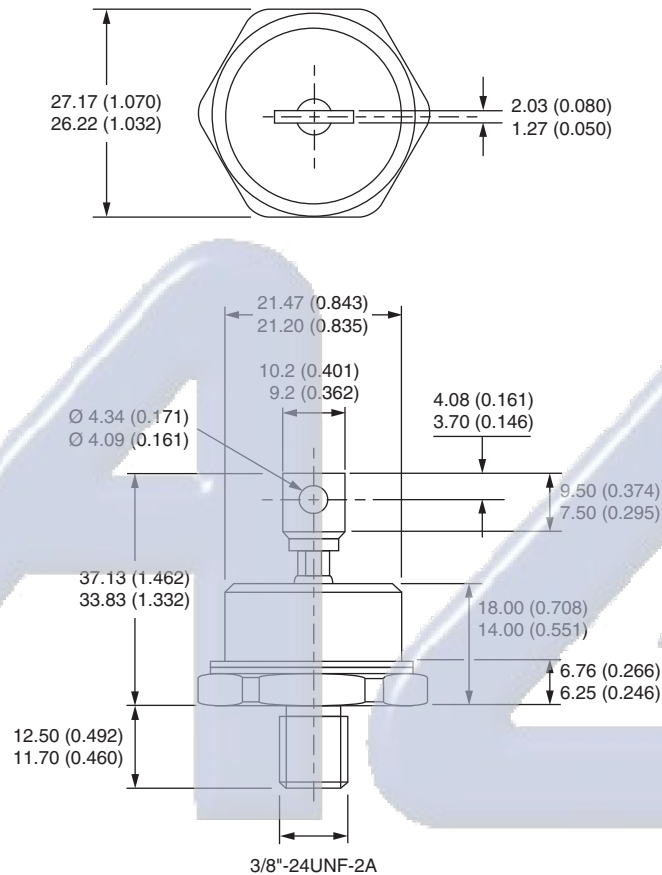


Outline Dimensions

DO-205AC (DO-30), DO-205AA (DO-8)
and B-42 for 45L(R), 150K(R) and 150KS(R) Series

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



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