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
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

TYPICAL APPLICATIONS

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

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

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^2s
	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	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^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		64	kA^2s
		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	$kA^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.67	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.83	
Low level value of forward slope resistance	r_{f1}	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum			1.42	mW
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), $T_J = T_J$ 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	

ΔR_{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

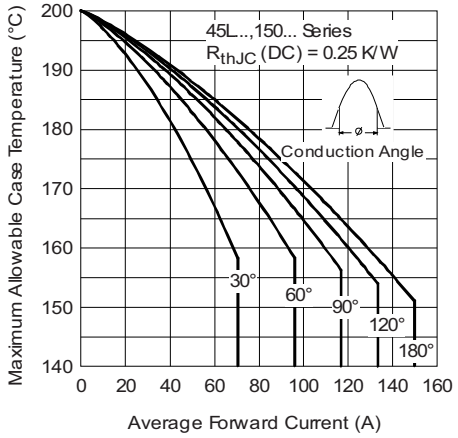


Fig. 1 - Current Ratings Characteristics

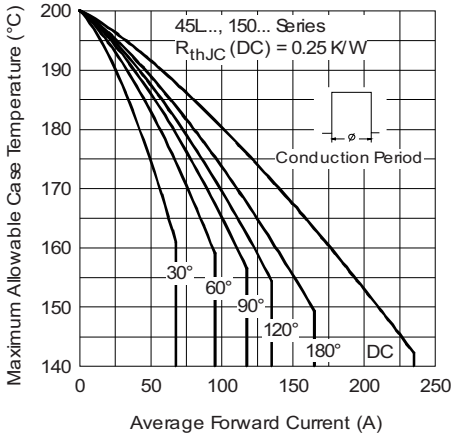


Fig. 2 - Current Ratings Characteristics

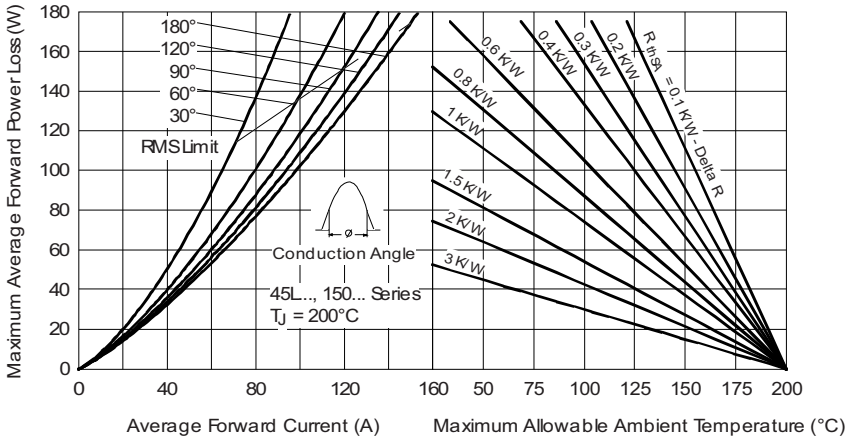


Fig. 3 - Forward Power Loss Characteristics

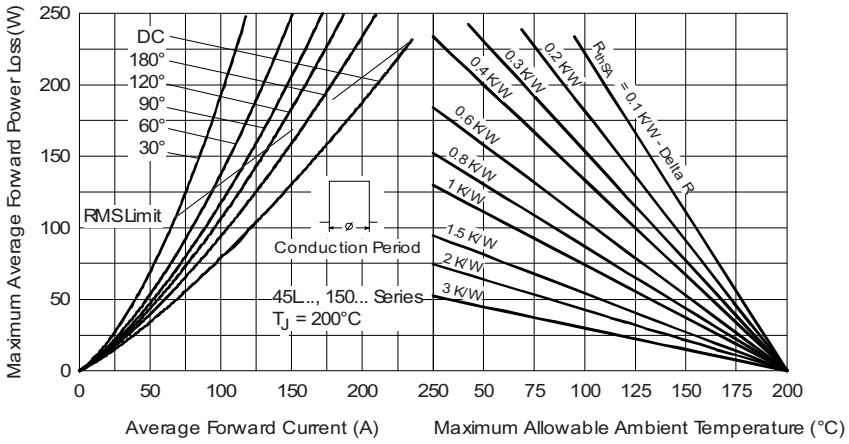


Fig. 4 - Forward Power Loss Characteristics

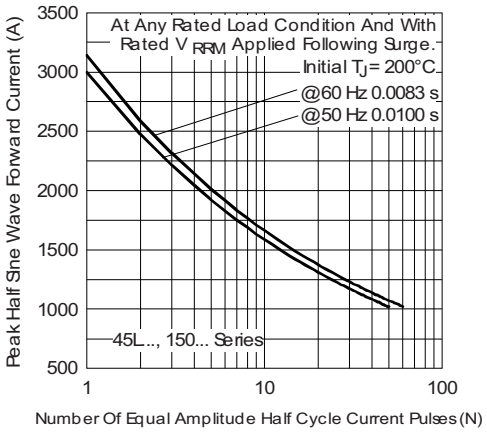


Fig. 5 - Maximum Non-Repetitive Surge Current

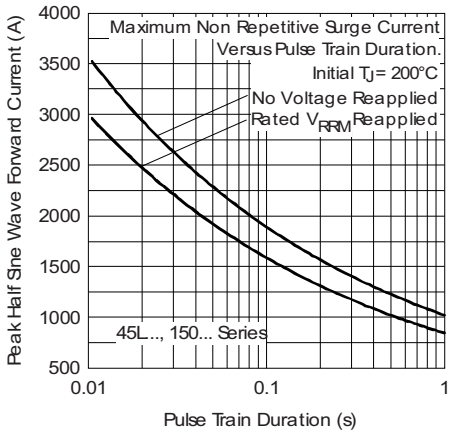


Fig. 6 - Maximum Non-Repetitive Surge Current

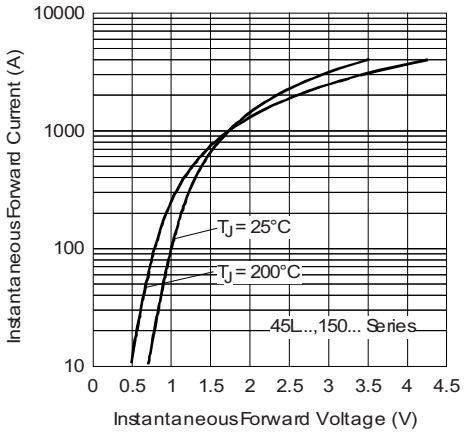


Fig. 7 - Forward Voltage Drop Characteristics

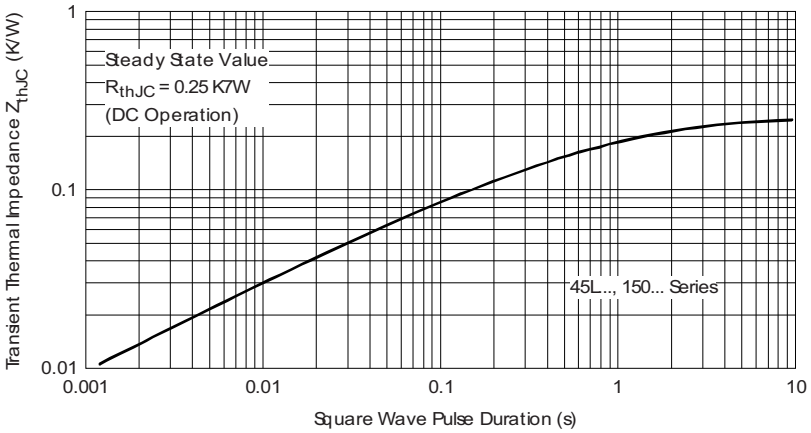


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION 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

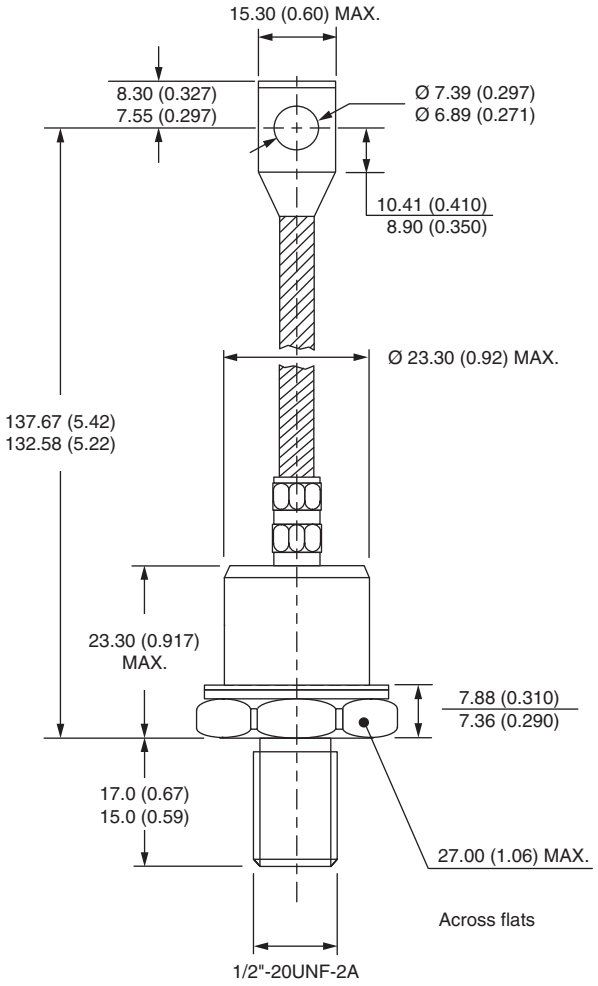
- 1 - Vishay Semiconductors product
- 2 - 15 = Essential part number
- 3 - 0 = Standard device
- 4 - Case style:
  K = DO-205AA (DO-8)
  KS = B-42
- 5 - R = Stud reverse polarity (anode to stud)
  None = Stud normal polarity (cathode to stud)
- 6 - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)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

Note: For metric device M12 x 1.75 contact factory

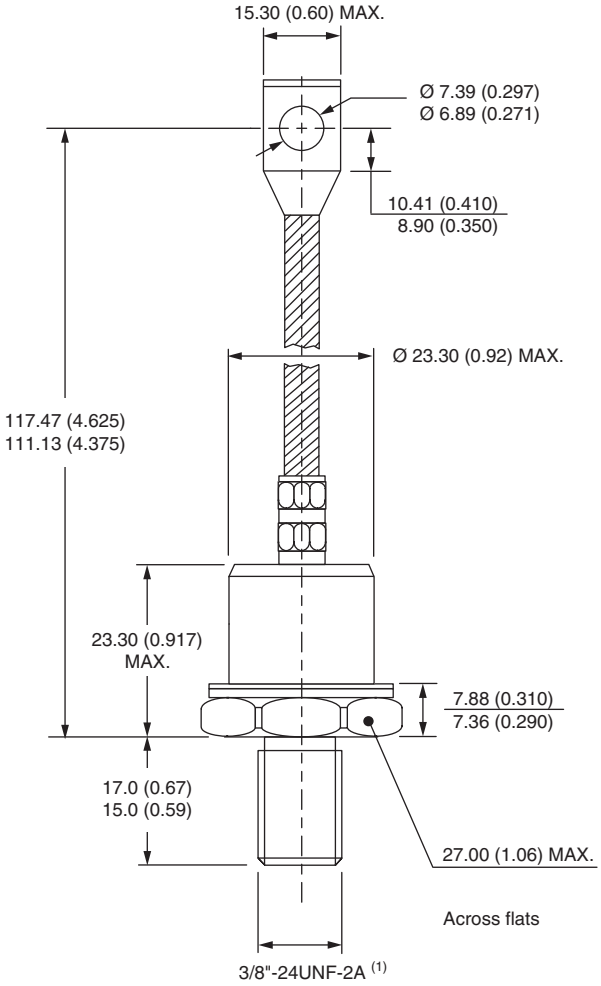
LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95314

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)



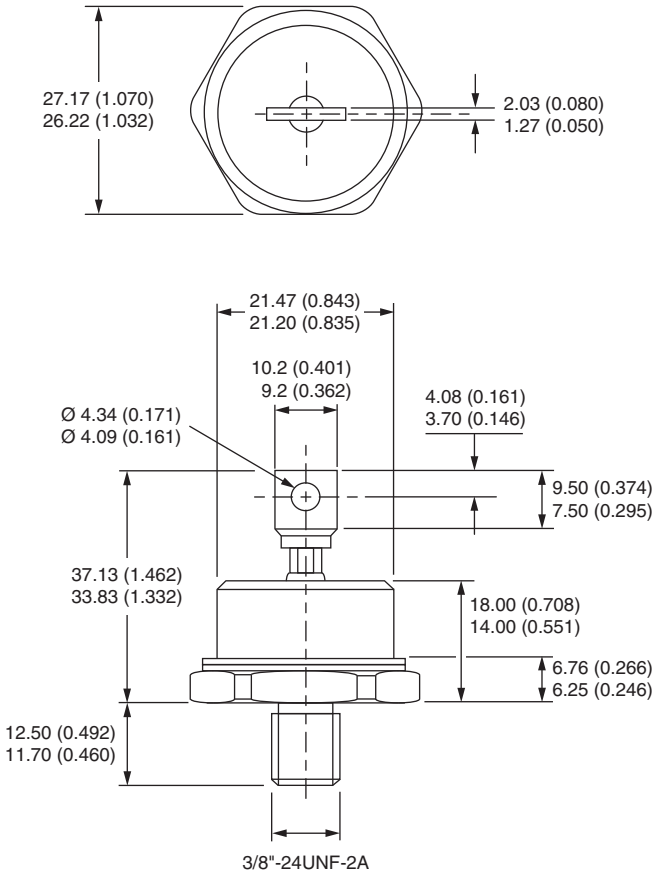
DIMENSIONS FOR 150K(R) SERIES - DO-205AA (DO-8) in millimeters (inches)



Note

(1) For metric device M12 x 1.75 contact factory

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



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