

## Standard Recovery Diodes, (Stud Version), 320 A



DO-9 (DO-205AB)

### FEATURES

- Diffused diode
- Wide current range
- High voltage ratings up to 1200 V
- High surge current capabilities
- Stud cathode and stud anode version
- Hermetic metal case
- 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

- Welders
- Power supplies
- Machine tool controls
- High power drives
- Medium traction applications
- Battery charges
- Freewheeling diodes

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	320 A
Package	DO-9 (DO-205AB)
Circuit configuration	Single

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		320	A
	$T_C$	100	°C
$I_{F(RMS)}$		500	A
$I_{FSM}$	50 Hz	4500	A
	60 Hz	4700	
$I^2t$	50 Hz	101	kA <sup>2</sup> s
	60 Hz	92	
$V_{RRM}$	Range	600 to 1200	V
$T_J$		-40 to +180	°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 $T_J = T_J$ MAXIMUM mA
VS-240U(R)..	60	600	700	15
	80	800	900	
	100	1000	1100	
	120	1200	1300	

**FORWARD CONDUCTION**

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave		320	A
Maximum RMS forward current	$I_{F(RMS)}$	DC at 80 °C case temperature		500	°C
Maximum peak, one cycle forward, non-repetitive surge current	$I_{FSM}$	t = 10 ms	No voltage reapplied	4500	A
		t = 8.3 ms	No voltage reapplied	4700	
		t = 10 ms	100 % $V_{RRM}$ reapplied	3800	
		t = 8.3 ms	100 % $V_{RRM}$ reapplied	4000	
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reapplied	101	kA <sup>2</sup> s
		t = 8.3 ms	No voltage reapplied	92	
		t = 10 ms	100 % $V_{RRM}$ reapplied	72	
		t = 8.3 ms	100 % $V_{RRM}$ reapplied	66	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied		1010	kA <sup>2</sup> √s
Slope resistance	$r_f$	$T_J = T_J$ maximum		0.6	mΩ
Threshold voltage	$V_{F(T0)}$			0.83	V
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 750$ A, $T_J = 25$ °C, $t_p = 10$ ms sinusoidal wave		1.33	

**THERMAL AND MECHANICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction operating and storage temperature range	$T_J, T_{Stg}$		-40 to 180	°C
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation	0.18	K/W
Maximum thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth, flat and greased	0.08	
Maximum allowable mounting torque +0 -20 %		Not lubricated threads	37 (330)	N · m (lbf · in)
		Lubricated threads	28 (250)	
Approximate weight			250	g
Case style		See dimensions - link at the end of datasheet	DO-9 (DO-205AB)	

 **$\Delta R_{thJC}$  CONDUCTION**

CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.019	0.015	$T_J = T_J$ maximum	K/W
120°	0.023	0.025		
90°	0.030	0.034		
60°	0.045	0.047		
30°	0.076	0.076		

**Note**

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

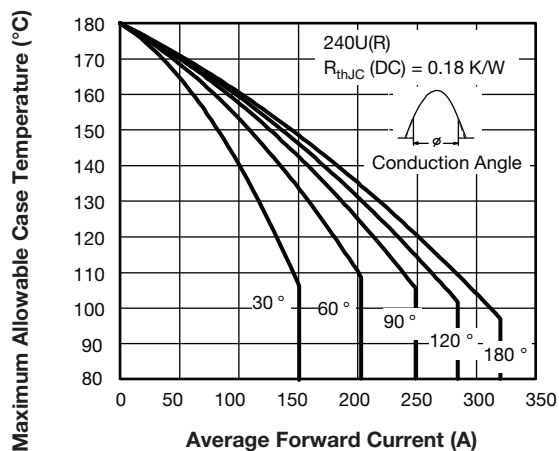


Fig. 1 - Current Ratings Characteristics

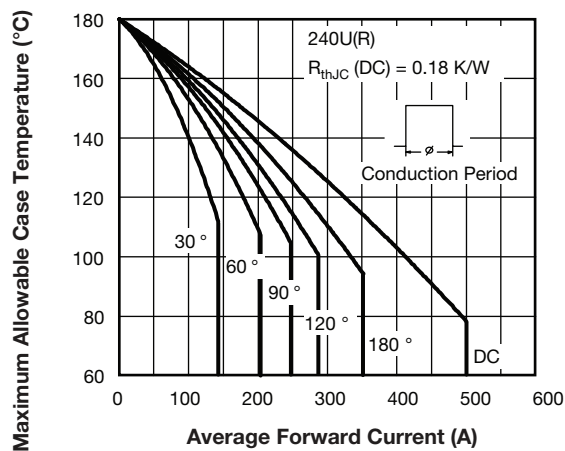


Fig. 2 - Current Ratings Characteristics

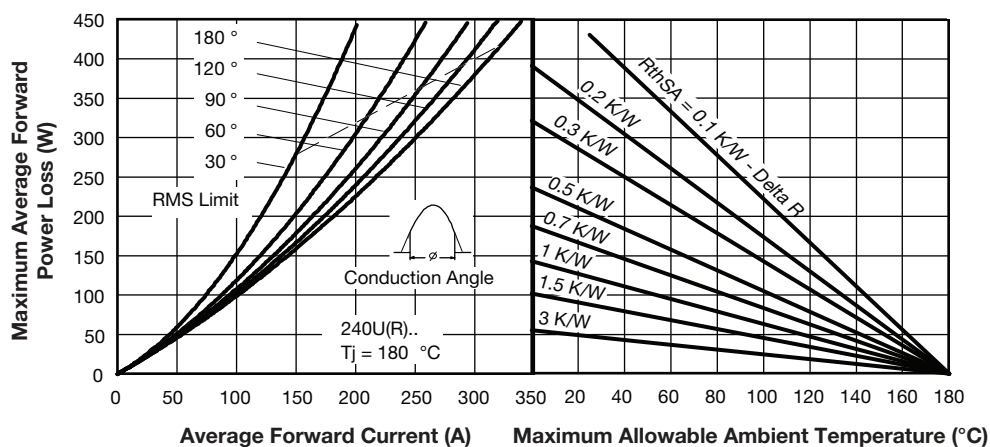


Fig. 3 - Forward Power Loss Characteristics

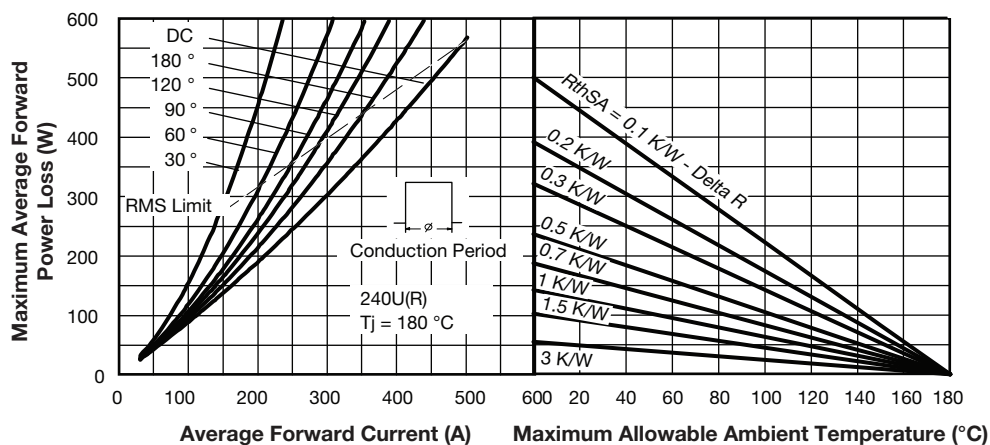


Fig. 4 - Forward Power Loss Characteristics

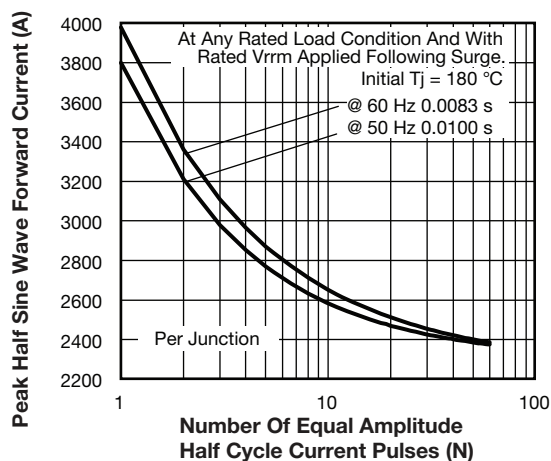


Fig. 5 - Maximum Non-Repetitive Surge Current

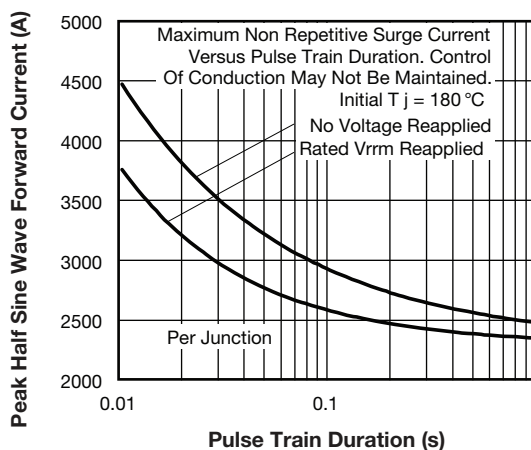


Fig. 6 - Maximum Non-Repetitive Surge Current

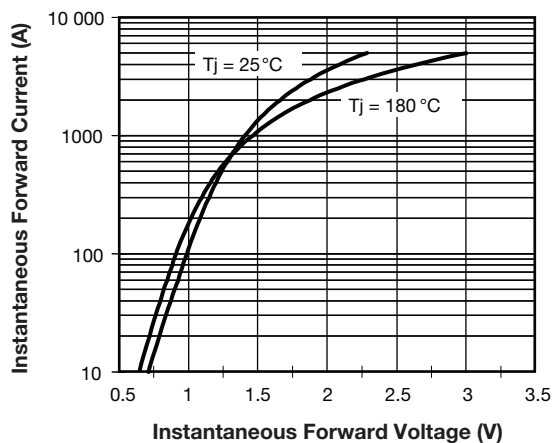
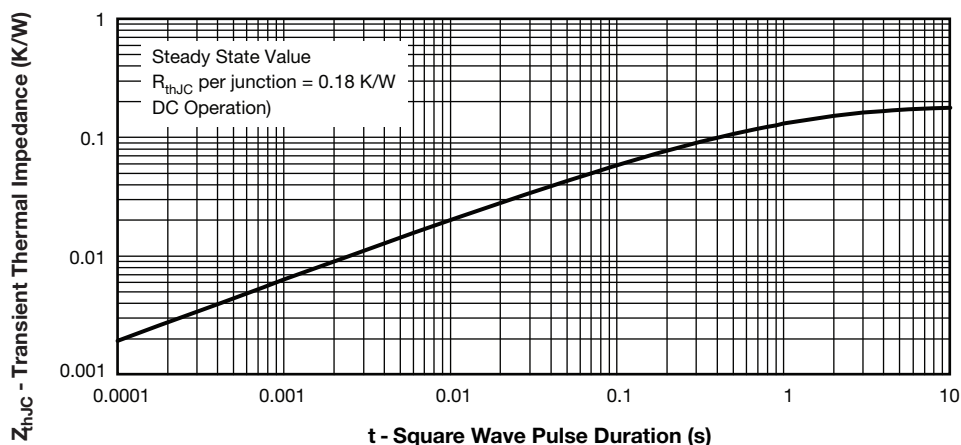


Fig. 7 - Forward Voltage Drop Characteristics


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



ORDERING INFORMATION TABLE

Device code	VS-	24	0	U	R	60	D
	1	2	3	4	5	6	7
1	- Vishay Semiconductors product						
2	- 24 = essential part number						
3	- 0 = standard device						
4	- U = stud normal polarity (cathode to stud)						
5	- • None = stud normal polarity (cathode to stud) • R = stud reverse polarity (anode to stud)						
6	- Voltage code x 10 = $V_{RRM}$ (see Voltage Ratings table)						
7	- Diffused diode						

Note

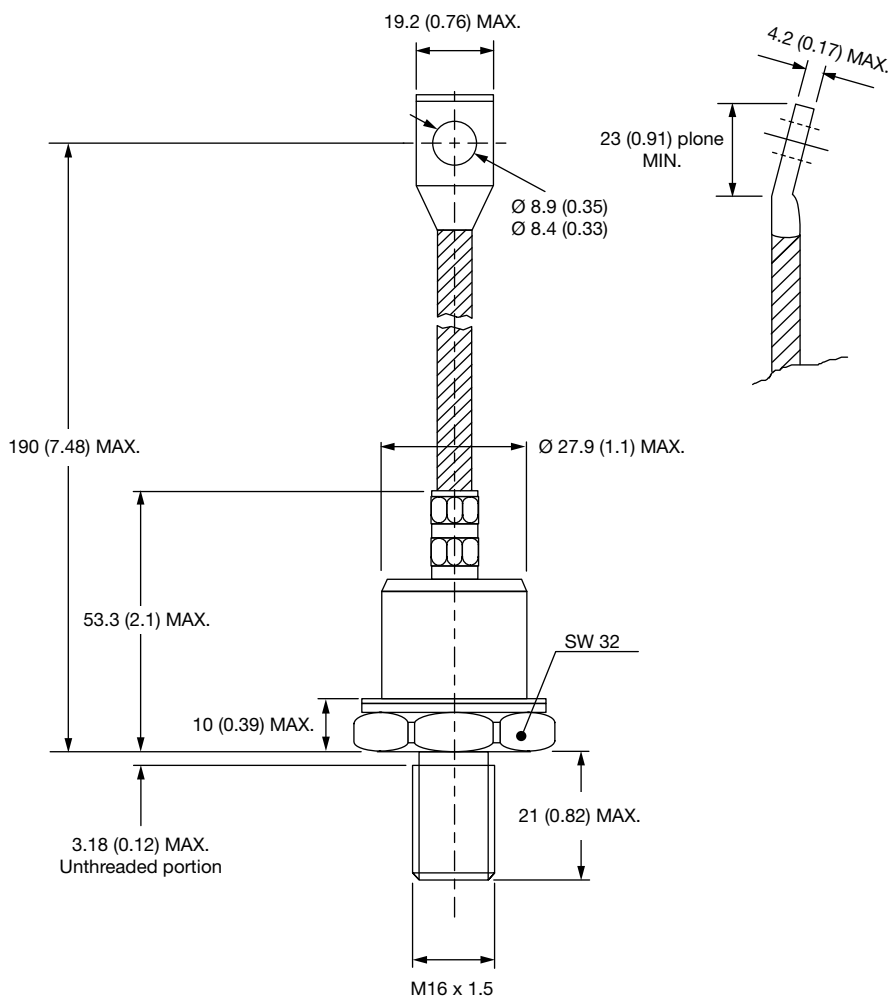
- For metric device M16 x 1.5 contact factory

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95317">www.vishay.com/doc?95317</a>



## DO-205AB (DO-9) for 240U(R)

**DIMENSIONS** in millimeters (inches)





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