

Standard Recovery Diodes, (Stud Version), 400 A



DO-9 (DO-205AB)

FEATURES

- Wide current range
- High surge current capabilities
- Stud cathode and stud anode version
- Standard JEDEC® types
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

TYPICAL APPLICATIONS

- Converters
- Power supplies
- Machine tool controls
- High power drives

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	400 A
Package	DO-9 (DO-205AB)
Circuit configuration	Single

MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		400	A
	T_C	120	°C
$I_{F(RMS)}$		630	A
I_{FSM}	50 Hz	8250	A
	60 Hz	8640	
I^2t	50 Hz	340	kA ² s
	60 Hz	311	
V_{RRM}	Range	800 to 1600	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 $T_J = T_J$ MAXIMUM mA
VS-400U(R)	80	800	900	15
	120	1200	1300	
	160	1600	1700	



FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS	
Maximum average forward current at case temperature	I _{F(AV)}	180° conduction, half sine wave			400	A	
					120	°C	
Maximum RMS forward current	I _{F(RMS)}	DC at 110 °C case temperature			630	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	8250	A	
		t = 8.3 ms			8640		
		t = 10 ms	100 % V _{RRM} reapplied		6940		
		t = 8.3 ms			7270		
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied			340	kA ² s
		t = 8.3 ms				311	
		t = 10 ms	100 % V _{RRM} reapplied			241	
		t = 8.3 ms				220	
Maximum I ² √t for fusing	I ² √t	t = 0.1 to 10 ms, no voltage reapplied			3400	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			0.77	V	
High level value of threshold voltage	V _{F(TO)2}	(I > π × I _{F(AV)}), T _J = T _J maximum			0.85		
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			0.49	mΩ	
High level value of forward slope resistance	r _{f2}	(I > π × I _{F(AV)}), T _J = T _J maximum			0.49		
Maximum forward voltage drop	V _{FM}	I _{pk} = 1500 A, T _J = T _J maximum, t _o = 10 ms sinusoidal wave			1.62	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	0.15	K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.04	
Maximum allowed mounting torque ± 10 %		Not lubricated threads	27	N · m
Approximate weight			250	g
Case style		See dimensions - link at the end of datasheet	DO-9 (DO-205AB)	

ΔR_{thJC} CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.020	0.013	$T_J = T_J$ maximum	K/W
120°	0.023	0.023		
90°	0.029	0.031		
60°	0.042	0.044		
30°	0.073	0.074		

Note

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

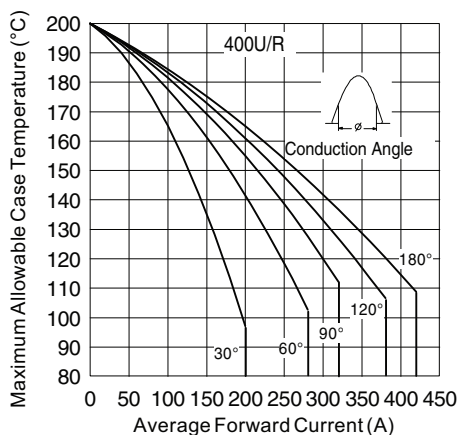


Fig. 1 - Current Ratings Characteristics

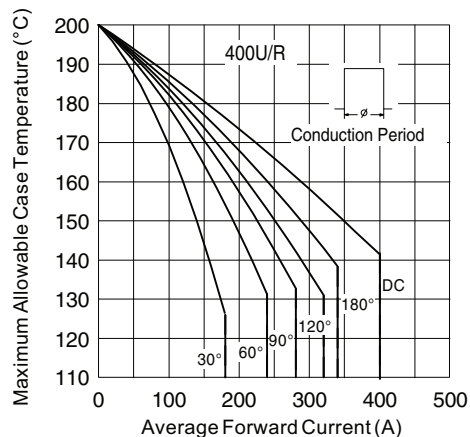


Fig. 2 - Current Ratings Characteristics

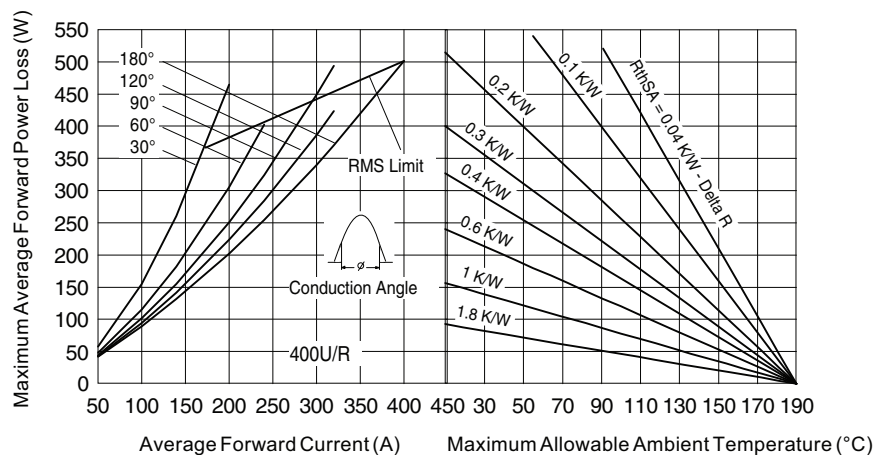


Fig. 3 - Forward Power Loss Characteristics

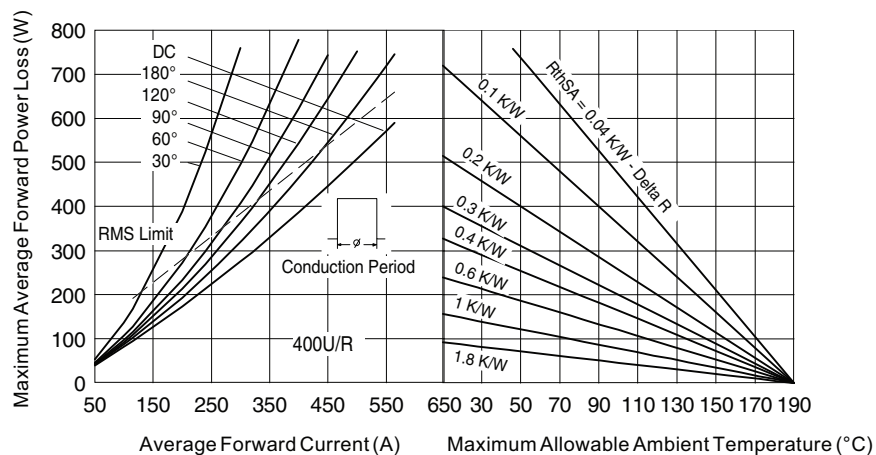


Fig. 4 - Forward Power Loss Characteristics

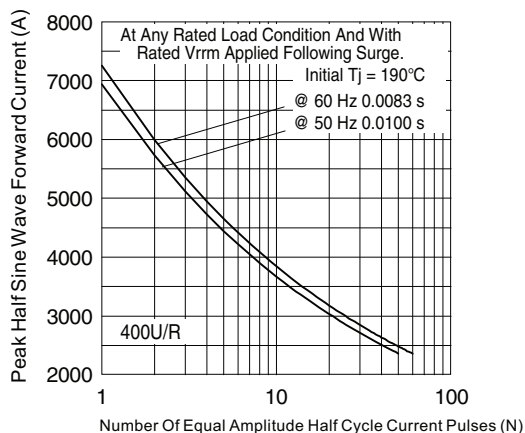


Fig. 5 - Maximum Non-Repetitive Surge Current

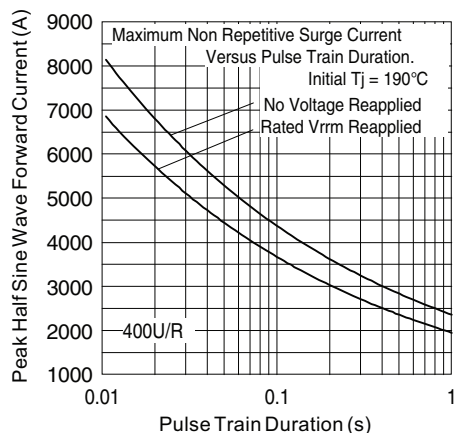


Fig. 6 - Maximum Non-Repetitive Surge Current

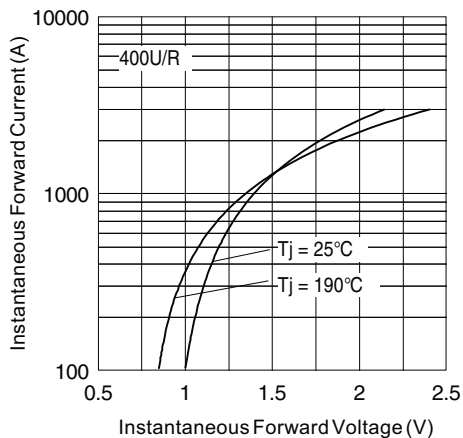
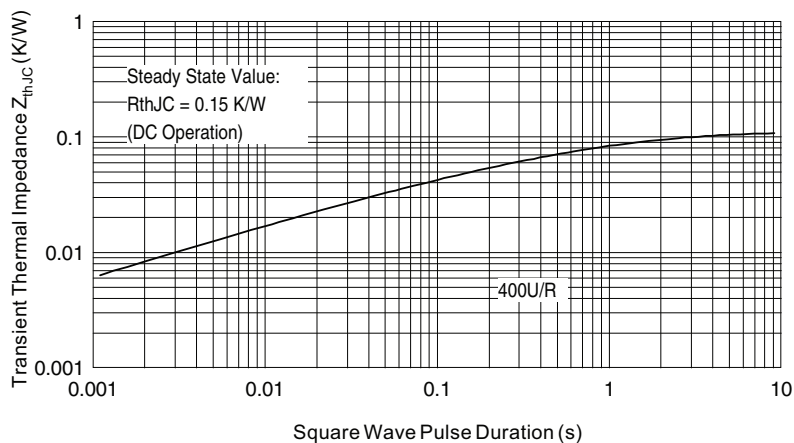


Fig. 7 - Forward Voltage Drop Characteristics


Fig. 8 - Thermal Impedance Z_{thJC} Characteristic



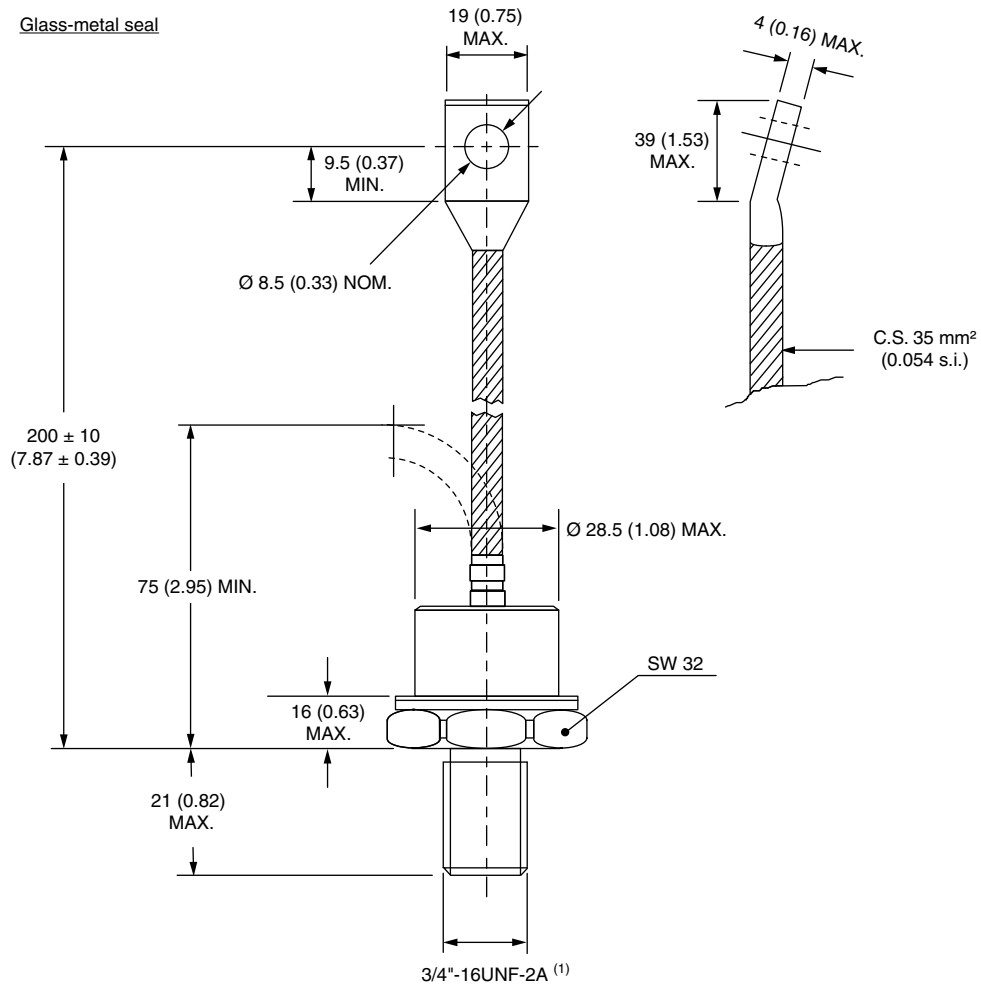
ORDERING INFORMATION TABLE

Device code	VS-	40	0	U	R	160	D
	1	2	3	4	5	6	7
1	- Vishay Semiconductors product						
2	- 40 = essential part number						
3	- 0 = standard recovery 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						

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95339

DO-205AB (DO-9) for 400U(R) Series

DIMENSIONS in millimeters (inches)



Note

- For metric device: M16 x 1.5 contact factory



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