

# Standard Recovery Diodes, (Stud Version), 400 A



FEAT	UR	ES
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- Wide current range
- High surge current capabilities





- Standard JEDEC® types
- · Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **TYPICAL APPLICATIONS**

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

PRIMARY CHARACTERISTICS				
I <sub>F(AV)</sub>	400 A			
Package	DO-9 (DO-205AB)			
Circuit configuration	Single			

MAJOR RATINGS AND CHARACTERISTICS				
PARAMETER	TEST CONDITIONS	VALUES	UNITS	
1		400	А	
I <sub>F(AV)</sub>	T <sub>C</sub>	120	°C	
I <sub>F(RMS)</sub>		630	А	
	50 Hz	8250	A	
IFSM	60 Hz	8640	^	
l <sup>2</sup> t	50 Hz	340	kA <sup>2</sup> s	
	60 Hz	311	KA-S	
V <sub>RRM</sub>	Range	800 to 1600	V	
TJ		-40 to +200	°C	

#### **ELECTRICAL SPECIFICATIONS**

VOLTAGE RATINGS						
TYPE NUMBER VOLTAGE CODE VRRM, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V		V <sub>RSM</sub> , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$I_{RRM}$ MAXIMUM AT $T_J = T_J$ MAXIMUM mA			
	80	800	900			
VS-400U(R)	120	1200	1300	15		
	160	1600	1700			



FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum average forward current	le	180° conduction, half sine wave		400	А	
at case temperature	I <sub>F(AV)</sub>	100 Conduct	ion, nan sine wa	VC	120	°C
Maximum RMS forward current	I <sub>F(RMS)</sub>	DC at 110 °C	case temperatu	re	630	Α
		t = 10 ms	No voltage	Sinusoidal half wave, initial $T_J = T_J$ maximum	8250	A kA <sup>2</sup> s
Maximum peak, one cycle forward,		t = 8.3 ms	reapplied		8640	
non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	100 % V <sub>BBM</sub>		6940	
		t = 8.3 ms	reapplied		7270	
		t = 10 ms	No voltage reapplied		340	
Maximum I <sup>2</sup> t for fusing	l <sup>2</sup> t	t = 8.3 ms			311	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		241	
		t = 8.3 ms			220	
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 to 10 ms, no voltage reapplied		3400	kA²√s	
Low level value of threshold voltage	V <sub>F(TO)1</sub>	(16.7 % x $\pi$ x $I_{F(AV)}$ < I < $\pi$ x $I_{F(AV)}$ ), $T_J = T_J$ maximum		0.77	V	
High level value of threshold voltage	V <sub>F(TO)2</sub>	$(I > \pi \times I_{F(AV)}), T_J = T_J \text{ maximum}$		0.85	V	
Low level value of forward slope resistance	r <sub>f1</sub>	(16.7 % x $\pi$ x I <sub>F(AV)</sub> < I < $\pi$ x I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum		0.49	C	
High level value of forward slope resistance	r <sub>f2</sub>	$(I > \pi \times I_{F(AV)}), T_J = T_J \text{ maximum}$ 0.49		mΩ		
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 1500 \text{ A}, T_J = T_J \text{ maximum}, t_p = 10 \text{ ms sinusoidal wave}$		1.62	V	

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction operating and storage temperature range	T <sub>J</sub> , T <sub>Stg</sub>		-40 to 200	°C
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation	0.15	K/W
Maximum thermal resistance, case to heatsink	R <sub>thCS</sub>	Mounting surface, smooth, flat and greased	0.04	FV/VV
Maximum allowed mounting torque ± 10 %		Not lubricated threads 27 N·I		N⋅m
Approximate weight			250	g
Case style		See dimensions - link at the end of datasheet DO-9 (DO-205AB)		

△R <sub>thJC</sub> CONDUCTION						
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS		
180°	0.020	0.013				
120°	0.023	0.023				
90°	0.029	0.031	$T_J = T_J$ maximum	K/W		
60°	0.042	0.044				
30°	0.073	0.074				

#### Note

The table above shows the increment of thermal resistance R<sub>thJC</sub> when devices operate at different conduction angles than DC



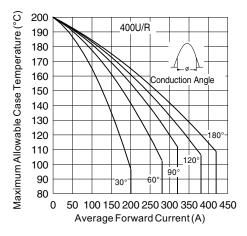


Fig. 1 - Current Ratings Characteristics

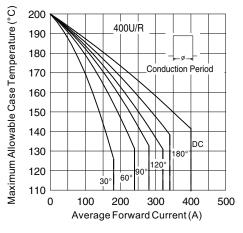


Fig. 2 - Current Ratings Characteristics

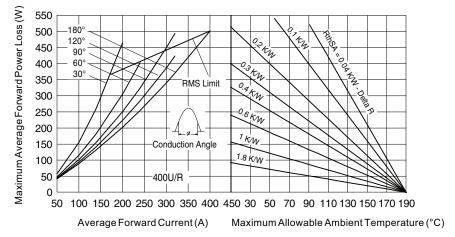


Fig. 3 - Forward Power Loss Characteristics

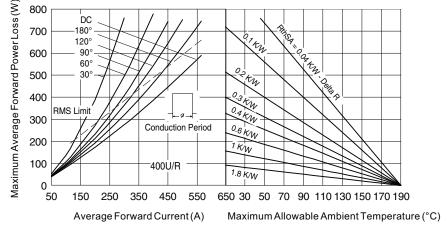


Fig. 4 - Forward Power Loss Characteristics

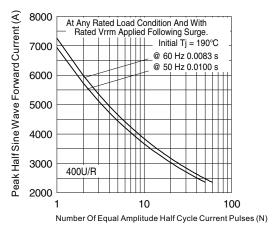


Fig. 5 - Maximum Non-Repetitive Surge Current

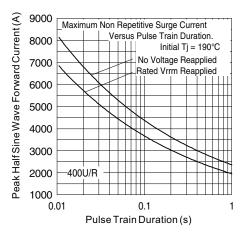


Fig. 6 - Maximum Non-Repetitive Surge Current

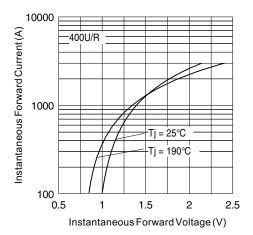


Fig. 7 - Forward Voltage Drop Characteristics

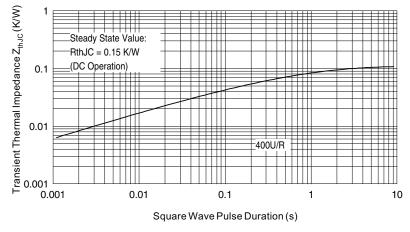
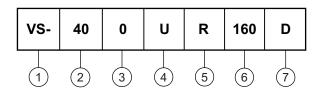


Fig. 8 - Thermal Impedance Z<sub>thJC</sub> Characteristic



#### **ORDERING INFORMATION TABLE**

**Device code** 



1 - Vishay Semiconductors product

2 - 40 = essential part number

0 = standard recovery device

U = stud normal polarity (cathode to stud)

None = stud normal polarity (cathode to stud)

• R = stud reverse polarity (anode to stud)

- Voltage code x 10 = V<sub>RRM</sub> (see Voltage Ratings table)

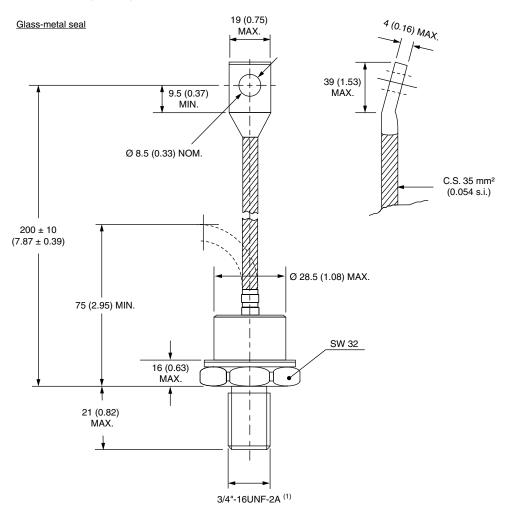
7 - Diffused diode

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

Document Number: 95339 Revision: 24-Jul-08



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