

Standard Recovery Diodes (Stud Version), 25 A



DO-203AA (DO-4)

FEATURES

- High surge current capability
- Stud cathode and stud anode version
- Wide current range
- Types up to 1200 V V_{RRM}
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

TYPICAL APPLICATIONS

- Battery charges
- Converters
- Power supplies
- Machine tool controls

PRODUCT SUMMARY

$I_{F(AV)}$	25 A
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MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		25	A
	T_C	120	°C
$I_{F(RMS)}$		40	A
I_{FSM}	50 Hz	356	A
	60 Hz	373	
I^2t	50 Hz	636	A ² s
	60 Hz	580	
V_{RRM}	Range	100 to 1200	V
T_J		- 65 to 175	°C

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS

TYPE NUMBER	VOLTAGE CODE	V_{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM} , MAXIMUM NON-REPETITIVE PEAK VOLTAGE V	$V_{R(BR)}$, MINIMUM AVALANCHE VOLTAGE V ⁽¹⁾	I_{RRM} MAXIMUM AT $T_J = 175\text{ °C}$ mA
25F(R)	10	100	150	-	12
	20	200	275	-	
	40	400	500	500	
	60	600	725	750	
	80	800	950	950	
	100	1000	1200	1150	
	120	1200	1400	1350	

Note

⁽¹⁾ Avalanche version only available from V_{RRM} 400 V to 1200 V



FORWARD CONDUCTION					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave		25	A
				120	°C
Maximum RMS forward current	$I_{F(RMS)}$			40	A
Maximum on-repetitive peak reverse power	$P_R^{(1)}$	10 μ s square pulse, $T_J = T_J$ maximum		10	K/W
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	$t = 10$ ms	No voltage reapplied	356	A
		$t = 8.3$ ms	No voltage reapplied	373	
		$t = 10$ ms	100 % V_{RRM} reapplied	300	
		$t = 8.3$ ms	100 % V_{RRM} reapplied	314	
Maximum I^2t for fusing	I^2t	$t = 10$ ms	No voltage reapplied	636	A^2s
		$t = 8.3$ ms	No voltage reapplied	580	
		$t = 10$ ms	100 % V_{RRM} reapplied	450	
		$t = 8.3$ ms	100 % V_{RRM} reapplied	410	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ to 10 ms, no voltage reapplied		6360	$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)1}$	$(16.7 \% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ maximum		0.80	V
High level value of threshold voltage	$V_{F(TO)2}$	$(I > \pi \times I_{F(AV)})$, $T_J = T_J$ maximum		0.90	
Low level value of forward slope resistance	r_{f1}	$(16.7 \% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ maximum		6.80	m Ω
High level value of forward slope resistance	r_{f2}	$(I > \pi \times I_{F(AV)})$, $T_J = T_J$ maximum		5.70	
Maximum forward voltage drop	V_{FM}	$I_{pk} = 78$ A, $T_J = 25$ °C, $t_p = 400$ μ s rectangular wave		1.30	V

Note

⁽²⁾ Available only for avalanche version, all other parameters the same as 25F

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction operating temperature range	T_J		- 65 to 175	°C
Maximum storage temperature range	T_{Stg}		- 65 to 200	
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	1.5	K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.5	
Allowable mounting torque		Not lubricated threads	1.5 + 0 - 10 % (13)	N · m (lbf · in)
		Lubricated threads	1.2 + 0 - 10 % (10)	N · m (lbf · in)
Approximate weight			7	g
			0.25	oz.
Case style		See dimensions - link at the end of datasheet	DO-203AA (DO-4)	

ΔR_{thJC} CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.28	0.24	$T_J = T_J$ maximum	K/W
120°	0.39	0.41		
90°	0.50	0.54		
60°	0.73	0.75		
30°	1.20	1.21		

Note

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

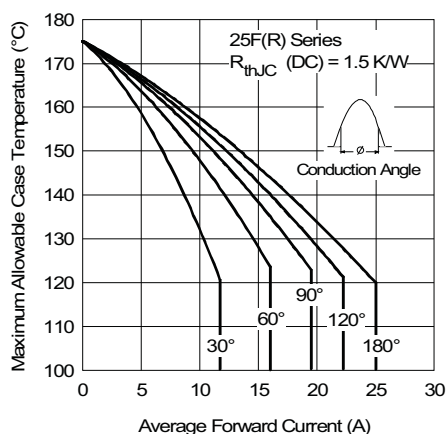


Fig. 1 - Current Ratings Characteristics

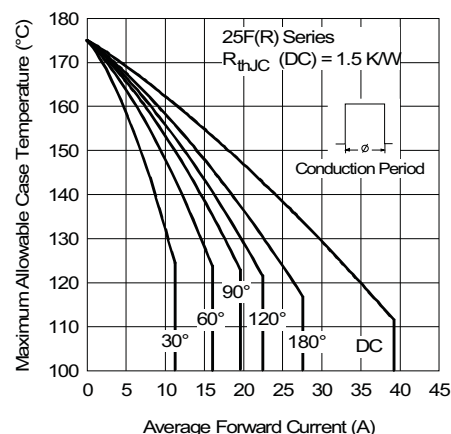


Fig. 2 - Current Ratings Characteristics

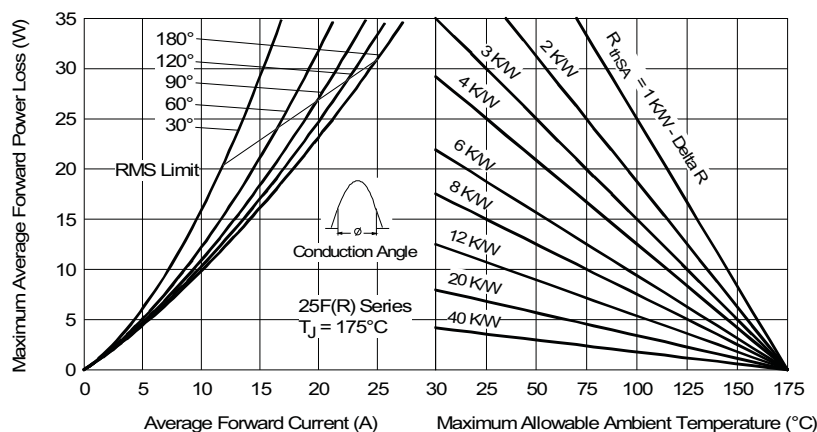


Fig. 3 - Forward Power Loss Characteristics

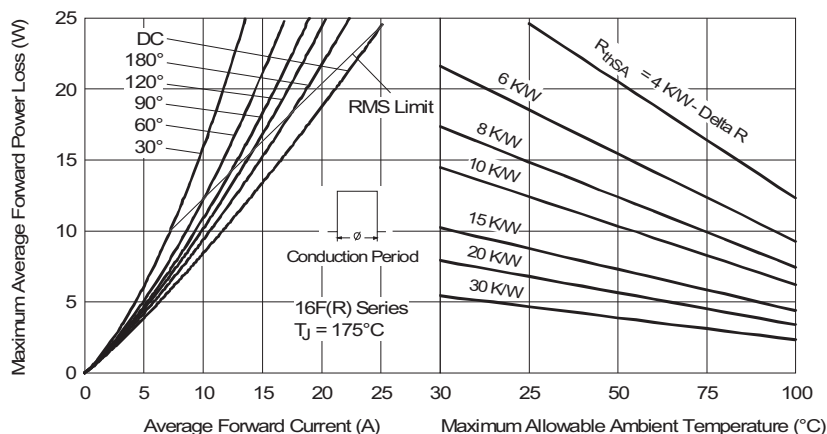


Fig. 4 - Forward Power Loss Characteristics

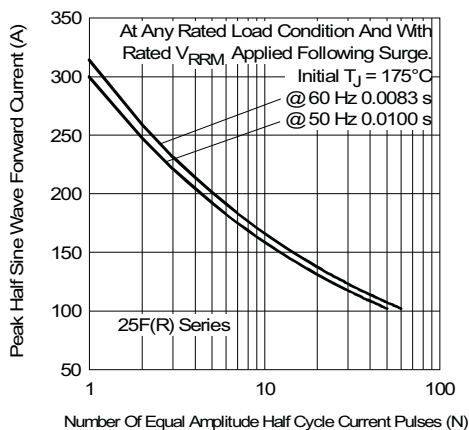


Fig. 5 - Maximum Non-Repetitive Surge Current

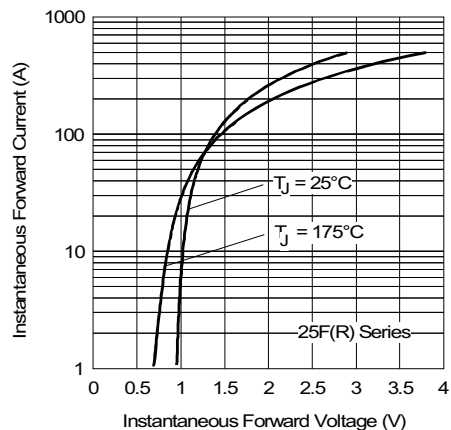


Fig. 7 - Forward Voltage Drop Characteristics

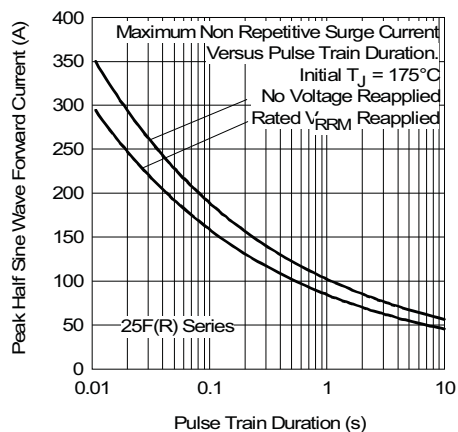
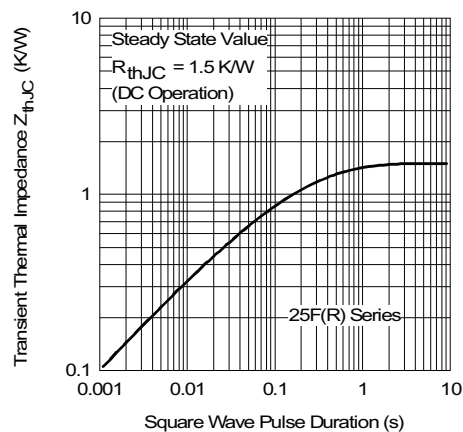


Fig. 6 - Maximum Non-Repetitive Surge Current


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE

Device code	25	F	R	120	M
	1	2	3	4	5

- 1** - Current rating: Code = $I_{F(AV)}$
- 2** - F = Standard device
- 3** - None = Stud normal polarity (cathode to stud)
R = Stud reverse polarity (anode to stud)
- 4** - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)
- 5** - None = Stud base DO-203AA (DO-4) 10-32UNF-2A
M = Stud base DO-203AA (DO-4) M5 X 0.8
(not available for avalanche diodes)

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95311

DIMENSIONS in millimeters (inches)





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