Standard Recovery Diodes, (Stud Version), 25 A

DO-4 (DO-203AA)

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

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	25 A
Package	DO-4 (DO-203AA)
Circuit configuration	Single

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^2s
	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	I_{RRM} MAXIMUM AT T_J = 175 °C mA
VS-25F(R)	10	100	150	12
	20	200	275	
	40	400	500	
	60	600	725	
	80	800	950	
	100	1000	1200	
	120	1200	1400	

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 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		356	A
		t = 8.3 ms				373	
		t = 10 ms	100 % V_{RRM} reapplied			300	
		t = 8.3 ms				314	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied			636	A^2s
		t = 8.3 ms				580	
		t = 10 ms	100 % V_{RRM} reapplied			450	
		t = 8.3 ms				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 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum				0.80	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum				0.90	
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				6.80	mΩ
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum				5.70	
Maximum forward voltage drop	V_{FM}	I_{pk} = 78 A, T_J = 25 °C, t_p = 400 µs rectangular wave				1.30	V

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 heat sink	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-4 (DO-203AA)	

∆R$_{thJC}$ CONDUCTION

CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.28	0.24		
120°	0.39	0.41		
90°	0.50	0.54	$T_J = T_J$ maximum	K/W
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
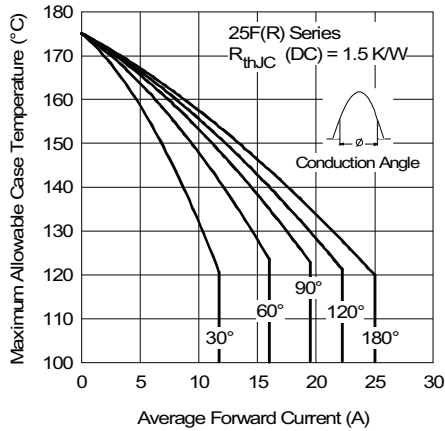
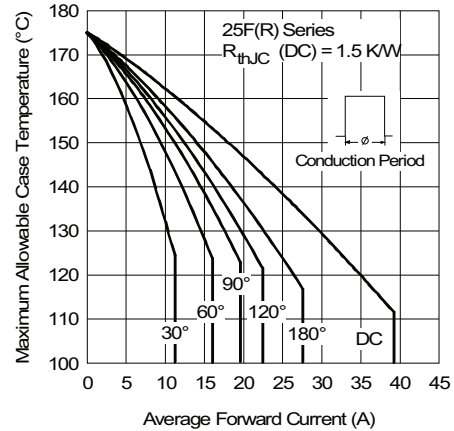Fig. 1 - Current Ratings Characteristics

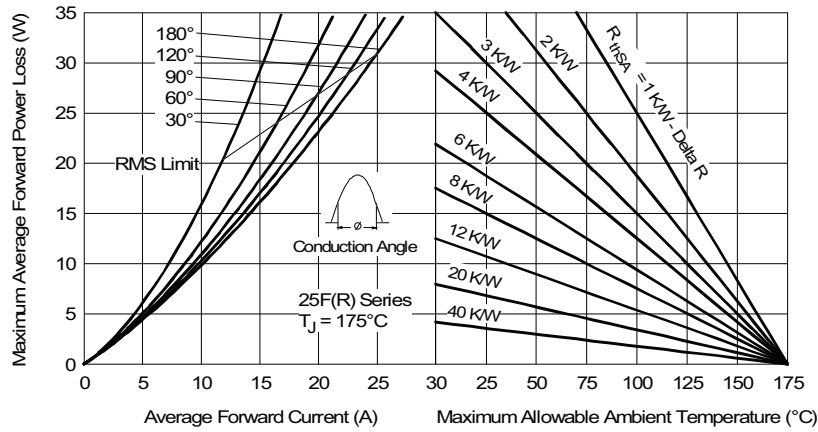Fig. 2 - Current Ratings Characteristics

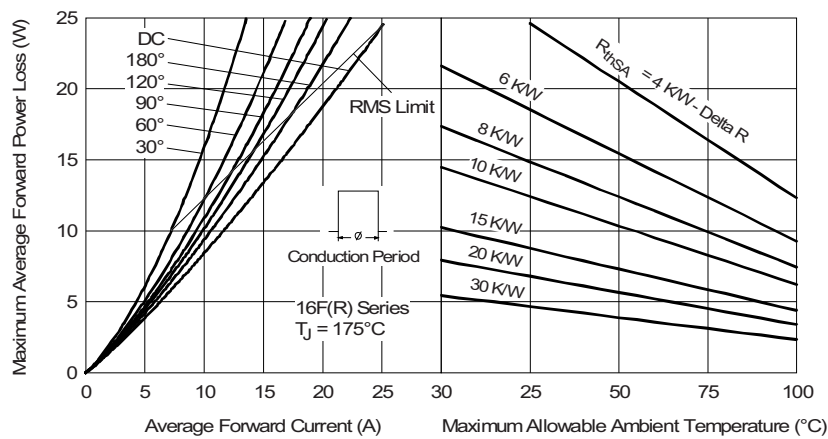Fig. 3 - Forward Power Loss Characteristics

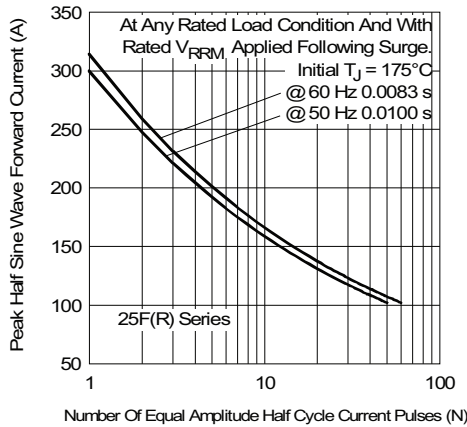Fig. 4 - Forward Power Loss Characteristics
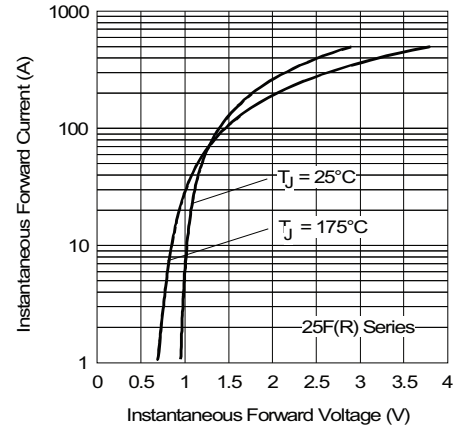
Fig. 5 - Maximum Non-Repetitive Surge Current

Fig. 7 - Forward Voltage Drop Characteristics

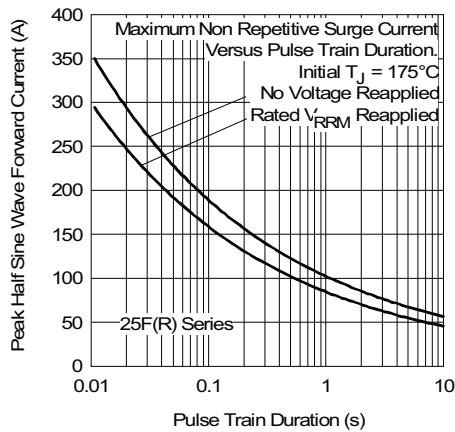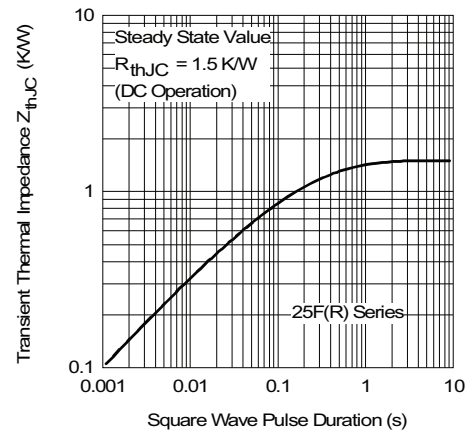Fig. 6 - Maximum Non-Repetitive Surge Current

Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code	VS-	25	F	R	120	M
	1	2	3	4	5	6

1 - Vishay Semiconductors product

2 - Current rating: code = $I_{F(AV)}$

3 - F = standard device

4 - None = stud normal polarity (cathode to stud)
    R = stud reverse polarity (anode to stud)

5 - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)

6 - None = stud base DO-4 (DO-203AA) 10-32UNF-2A

    M = stud base DO-4 (DO-203AA) M5 X 0.8

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

DO-203AA (DO-4)

DIMENSIONS in millimeters (inches)

3.30 (0.13)
4.00 (0.16)

$2 \, {}^{+\,0.3}_{0}$

$(0.08 \, {}^{+\,0.01}_{0})$

5.50 (0.22) MIN.

Ø 1.80 ± 0.20
(Ø 0.07 ± 0.01)

20.30 (0.80) MAX.

10.20 (0.40)
MAX.

3.50 (0.14)

11.50 (0.45)
10.70 (0.42)

10/32" UNF-2A
For metric devices: M5 x 0.8

11 (0.43)

0.8 ± 0.1
(0.03 ± 0.004)

R 0.40
R (0.02)

Ø 6.8 (0.27)

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