Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 80 A

80PF(R)... 80PF(R)...W

DO-203AB (DO-5) DO-203AB (DO-5)

RoHS COMPLIANT

FEATURES

- High surge current capability
- Designed for a wide range of applications
- Stud cathode and stud anode version
- Wire version available
- Low thermal resistance
- UL approval pending
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for multiple level

TYPICAL APPLICATIONS

- Battery chargers
- Converters
- Power supplies
- Machine tool controls
- Welding

PRODUCT SUMMARY	
$I_{F(AV)}$	80 A

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		80	A
	T_C	140	°C
$I_{F(RMS)}$		126	A
I_{FSM}	50 Hz	1500	A
	60 Hz	1570	
I^2t	50 Hz	11 250	A^2s
	60 Hz	10 230	
V_{RRM}	Range	400 to 1200	V
T_J		- 55 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 = 150 °C mA
80PF(R)...(W)	40	400	500	9
	80	800	960	
	120	1200	1440	

FORWARD CONDUCTION						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**			**VALUES**	**UNITS**
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave			80	A
					140	°C
Maximum RMS forward current	$I_{F(RMS)}$				126	A
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial T_J = 150 °C	1500	A
		t = 8.3 ms			1570	
		t = 10 ms	100 % V_{RRM} reapplied		1260	
		t = 8.3 ms			1320	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		11 250	A^2s
		t = 8.3 ms			10 230	
		t = 10 ms	100 % V_{RRM} reapplied		7950	
		t = 8.3 ms			7200	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			112 500	$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)}$	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), T_J = T_J maximum			0.73	V
Low level value of forward slope resistance	r_f	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), T_J = T_J maximum			3.0	mΩ
Maximum forward voltage drop	V_{FM}	I_{pk} = 220 A, T_J = 25 °C, t_p = 400 µs rectangular wave			1.40	V

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**VALUES**	**UNITS**
Maximum junction operating and storage temperature range	T_J, T_{Stg}		- 55 to 180	°C
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.30	K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.25	
Maximum allowable mounting torque (+ 0 %, - 10 %)		Not lubricated thread, tighting on nut (1)	3.4 (30)	N · m (lbf · in)
		Lubricated thread, tighting on nut (1)	2.3 (20)	
		Not lubricated thread, tighting on hexagon (2)	4.2 (37)	
		Lubricated thread, tighting on hexagon (2)	3.2 (28)	
Approximate weight			15.8	g
			0.56	oz.
Case style		See dimensions - link at the end of datasheet	DO-203AB (DO-5)	

Notes

(1) Recommended for pass-through holes

(2) Torque must be appliable only to hexagon and not to plastic structure, recommended for holed heatsink

ΔR_{thJC} CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.14	0.10	$T_J = T_J$ maximum	K/W
120°	0.16	0.17		
90°	0.21	0.22		
60°	0.30	0.31		
30°	0.50	0.50		

Note

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

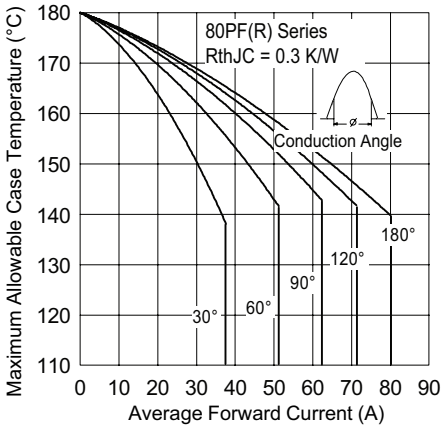

Fig. 1 - Current Ratings Characteristics

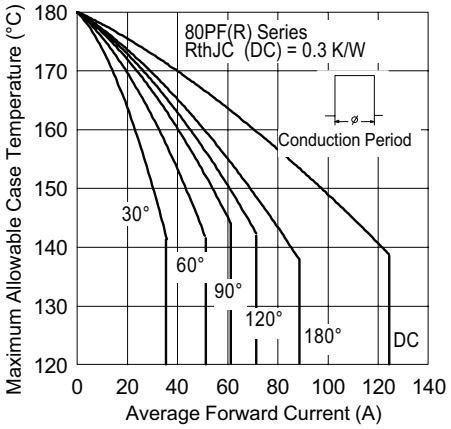

Fig. 2 - Current Ratings Characteristics

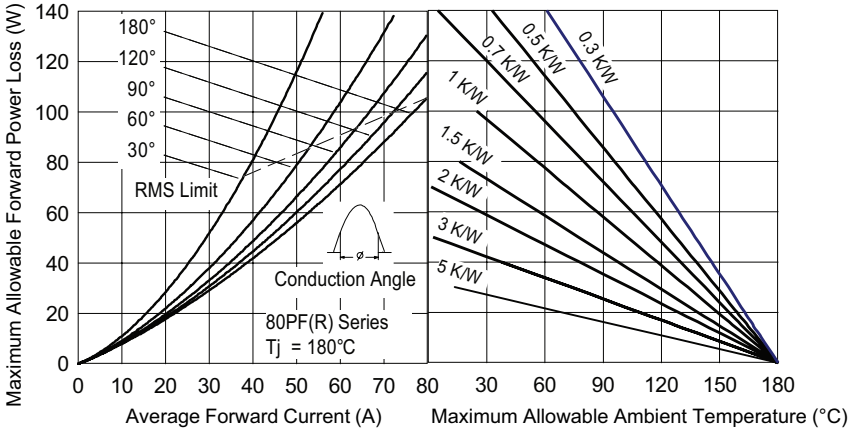

Fig. 3 - Forward Power Loss Characteristics

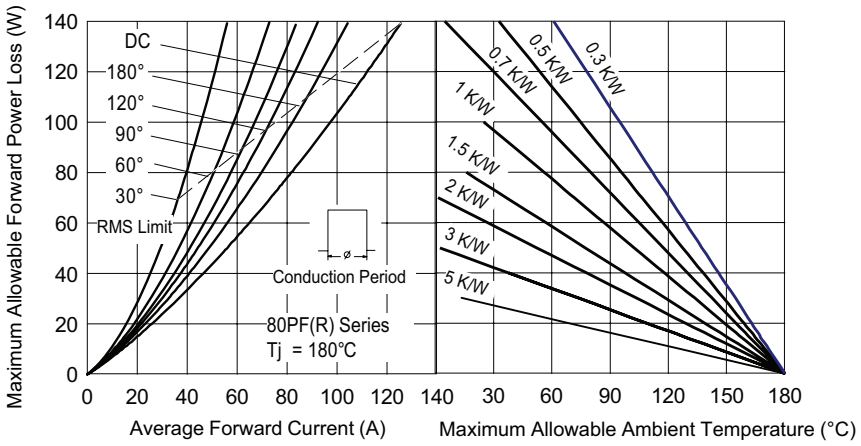

Fig. 4 - Forward Power Loss Characteristics

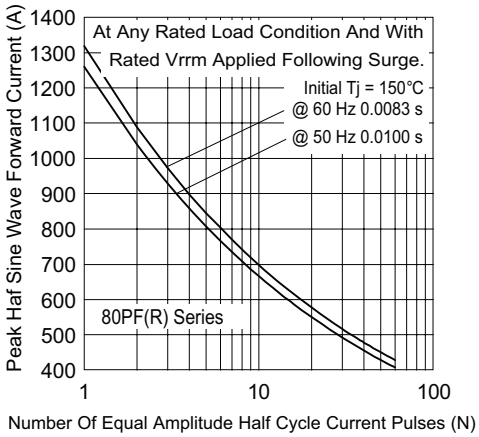

Fig. 5 - Maximum Non-Repetitive Surge Current

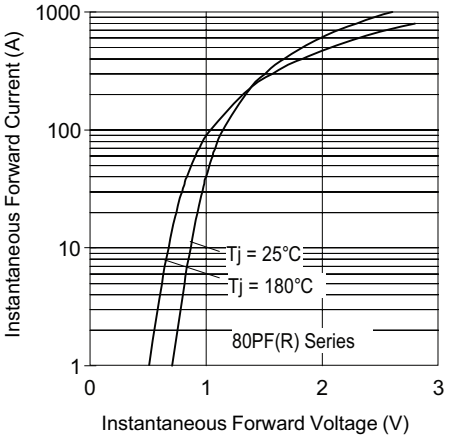

Fig. 7 - Forward Voltage Drop Characteristics

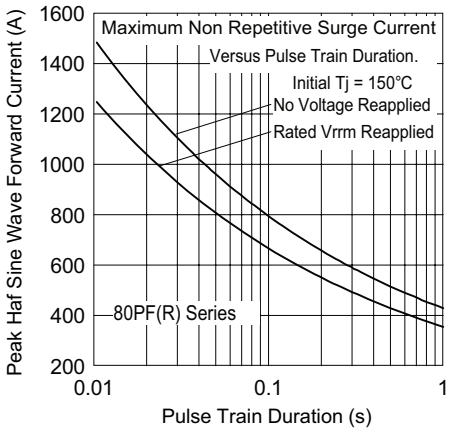

Fig. 6 - Maximum Non-Repetitive Surge Current

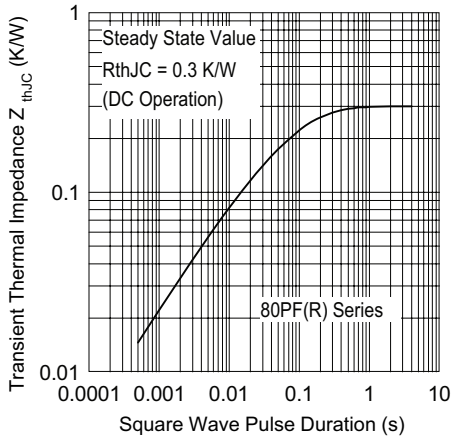

Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code

80	PF	R	120	W
1	2	3	4	5

1 -
- 80 = Standard device
- 82 = Isolated lead on standard terminal
  with silicone sleeve available for 1200 V only
  (red = Reverse polarity)
  (blue = Normal polarity)

2 - PF = Plastic package

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 = Standard terminal
  (see dimensions for 80PF(R)... - link at the end of datasheet)
- W = Wire terminal
  (see dimensions for 80PF(R)...W - link at the end of datasheet)

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95345

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