

Standard Recovery Diodes, (Stud Version), 40 A



DO-203AB (DO-5)

FEATURES

- High surge current capability
- Stud cathode and stud anode version
- Leaded version available
- Types up to 1600 V V_{RRM}
- RoHS compliant
- Designed and qualified for multiple level


RoHS
COMPLIANT

TYPICAL APPLICATIONS

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

PRODUCT SUMMARY

$I_{F(AV)}$	40 A
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MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	40HF(R)		UNITS
		10 TO 120	140/160	
$I_{F(AV)}$		40	40	A
	T_C	140	110	°C
$I_{F(RMS)}$		62		A
I_{FSM}	50 Hz	570		A
	60 Hz	595		
I^2t	50 Hz	1600		A ² s
	60 Hz	1450		
V_{RRM}	Range	100 to 1200	1400/1600	V
T_J		- 65 to 190	- 65 to 160	°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
40HF(R)	10	100	200	9
	20	200	300	
	40	400	500	
	60	600	700	
	80	800	900	
	100	1000	1100	
	120	1200	1300	
	140	1400	1500	4.5
160	1600	1700		

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FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS		40HF(R)		UNITS
				10 TO 120	140/160	
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave		40	40	A
				140	110	°C
Maximum RMS forward current	$I_{F(RMS)}$			62		A
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms	No voltage reappplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	570	A
		t = 8.3 ms			595	
		t = 10 ms	100 % V_{RRM} reappplied		480	
		t = 8.3 ms			500	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reappplied		1600	A ² s
		t = 8.3 ms			1450	
		t = 10 ms	100 % V_{RRM} reappplied		1150	
		t = 8.3 ms			1050	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reappplied		16 000	A ² √s	
Value of threshold voltage (up to 1200 V)	$V_{F(TO)}$	$T_J = T_J$ maximum		0.65	V	
Value of threshold voltage (for 1400 V/1600 V)	$V_{F(TO)}$			0.76		
Value of forward slope resistance (up to 1200 V)	r_f	$T_J = T_J$ maximum		4.29	mΩ	
Value of forward slope resistance (for 1400 V/1600 V)	r_f			3.8		
Maximum forward voltage drop	V_{FM}	$I_{pk} = 125$ A, $T_J = 25$ °C, $t_p = 400$ μs rectangular wave		1.30	1.50	V

THERMAL AND MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		40HF(R)		UNITS
				10 TO 120	140/160	
Maximum junction operating and storage temperature range	T_J, T_{Stg}			- 65 to 190	- 65 to 160	°C
Maximum thermal resistance, junction to case	R_{thJC}	DC operation		0.95		K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased		0.25		
Allowable mounting torque		Not lubricated threads		3.4 + 0 - 10 % (30)		N · m (lbf · in)
		Lubricated threads		2.3 + 0 - 10 % (20)		
Approximate weight				17		g
				0.6		oz.
Case style		See dimensions - link at the end of datasheet		DO-203AB (DO-5)		



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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

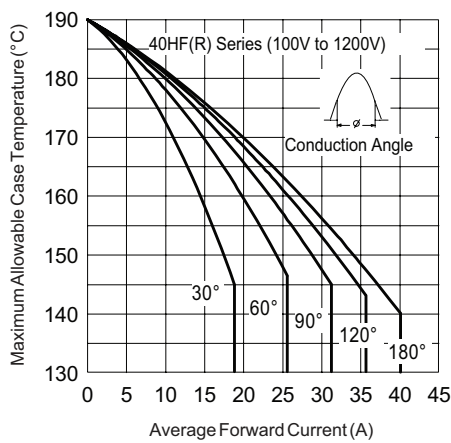


Fig. 1 - Current Ratings Characteristics

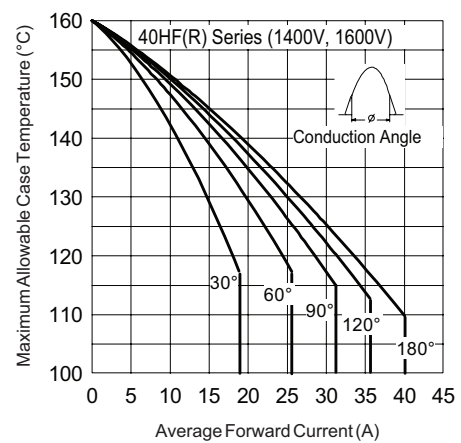


Fig. 3 - Current Ratings Characteristics

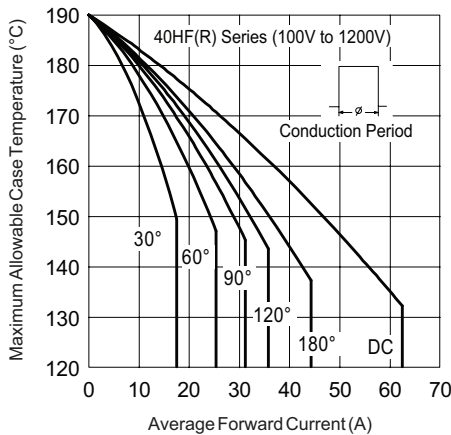


Fig. 2 - Current Ratings Characteristics

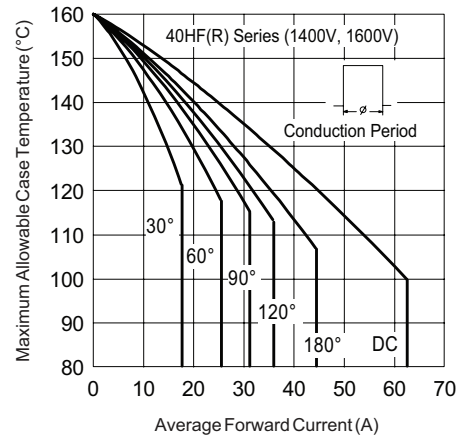


Fig. 4 - Current Ratings Characteristics

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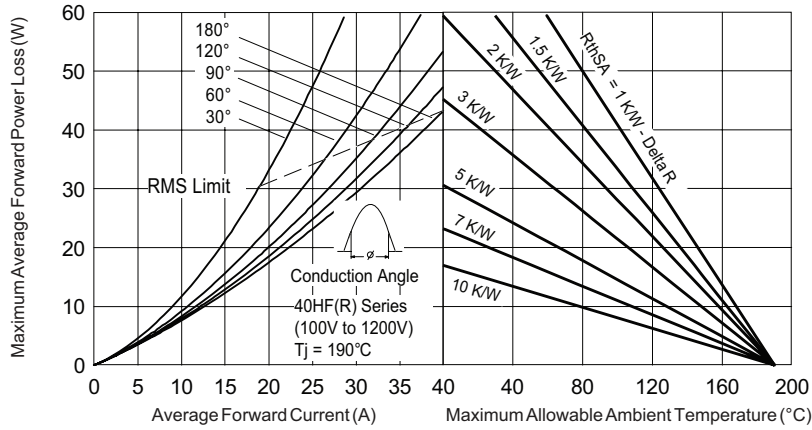


Fig. 5 - Forward Power Loss Characteristics

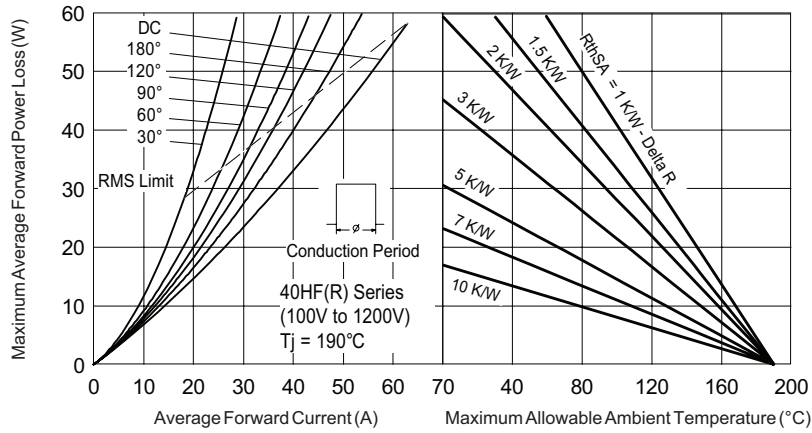


Fig. 6 - Forward Power Loss Characteristics

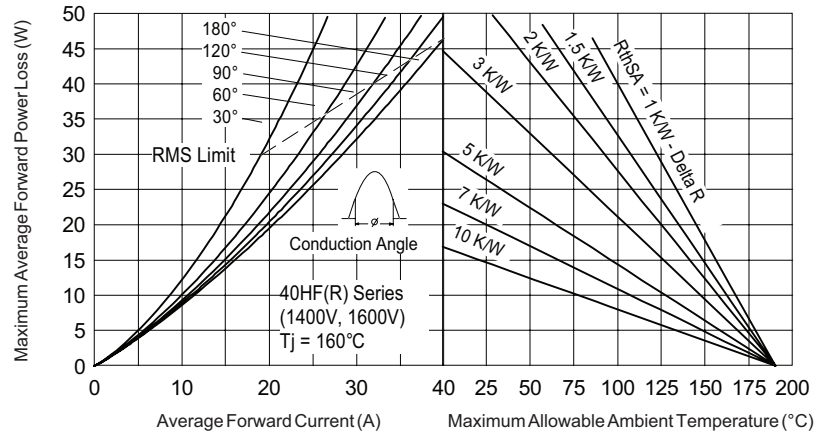


Fig. 7 - Forward Power Loss Characteristics

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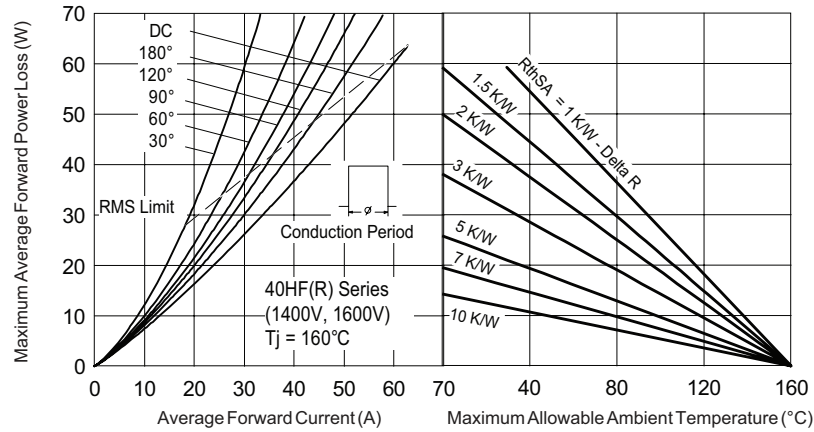


Fig. 8 - Forward Power Loss Characteristics

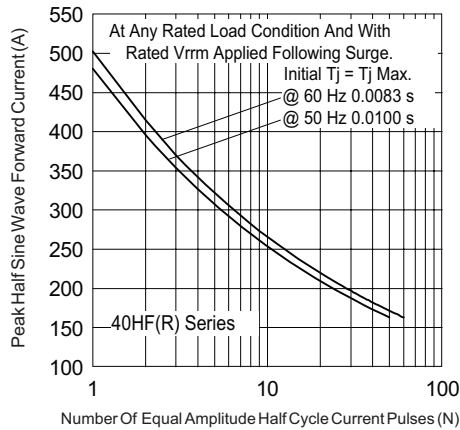


Fig. 9 - Maximum Non-Repetitive Surge Current

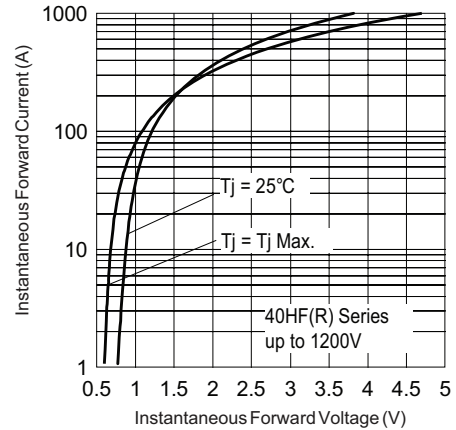


Fig. 11 - Forward Voltage Drop Characteristics (Up To 1200 V)

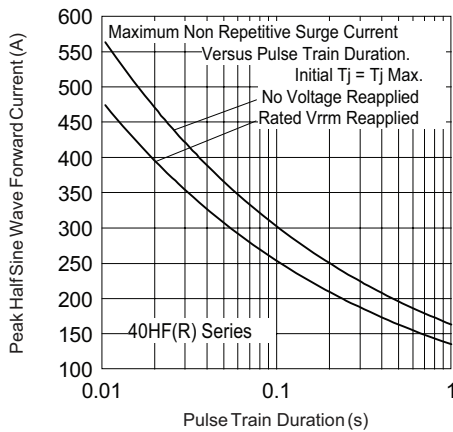


Fig. 10 - Maximum Non-Repetitive Surge Current

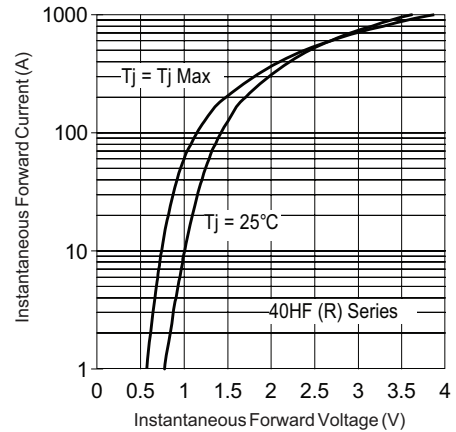


Fig. 12 - Forward Voltage Drop Characteristics (For 1400 V/1600 V)

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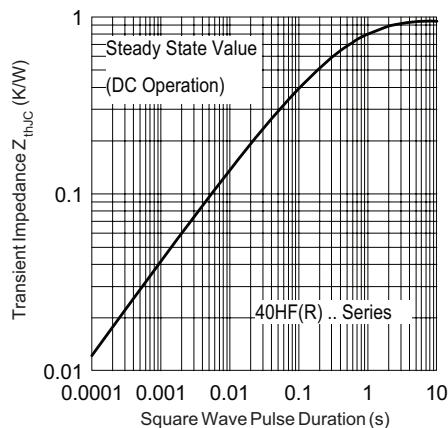


Fig. 13 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code	40	HF	R	160	M
	①	②	③	④	⑤

- 1** -
 - 40 = Standard device
 - 41 = Not isolated lead
 - 42 = Isolated lead with silicone sleeve
(red = Reverse polarity)
(blue = Normal polarity)
- 2** - HF = Standard diode
- 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-203AB (DO-5) 1/4" 28UNF-2A
 - M = Stud base DO-203AB (DO-5) M6 x 1

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95344



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