

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}
- Compliant to RoHS directive 2002/95/EC
- 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 ² _t	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	

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 ² t for fusing	I ² t	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 √t for fusing	I ² √t	t = 0.1 ms 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		
Maximum allowable mounting torque (+ 0 %, - 10 %)		Not lubricated thread, tightening on nut ⁽¹⁾	3.4 (30)		N · m (lbf · in)
		Lubricated thread, tightening on nut ⁽¹⁾	2.3 (20)		
		Not lubricated thread, tightening on hexagon ⁽²⁾	4.2 (37)		
		Lubricated thread, tightening on hexagon ⁽²⁾	3.2 (28)		
Approximate weight			17		g
			0.6		oz.
Case style		See dimensions - link at the end of datasheet	DO-203AB (DO-5)		

Notes

⁽¹⁾ Recommended for pass-through holes

⁽²⁾ Recommended for holed threaded heatsinks



ΔR_{thJC} CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.14	0.10	$T_J = T_J \text{ maximum}$	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

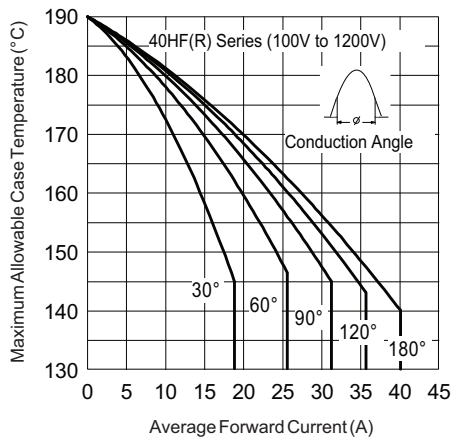


Fig. 1 - Current Ratings Characteristics

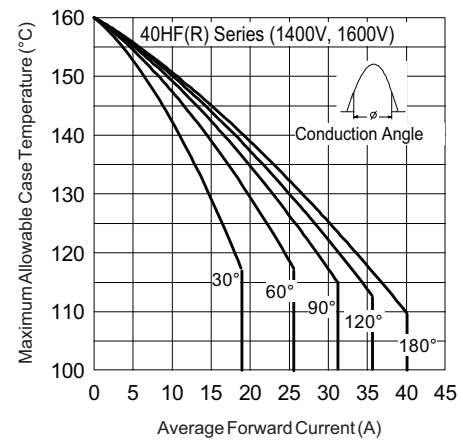


Fig. 3 - Current Ratings Characteristics

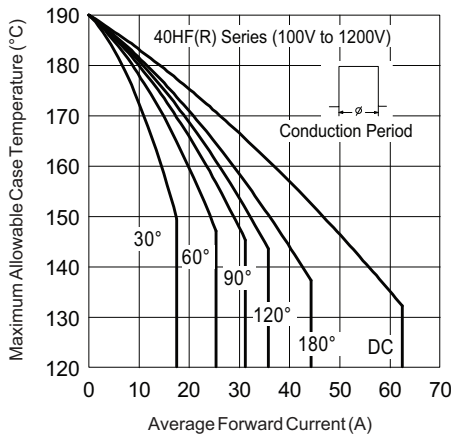


Fig. 2 - Current Ratings Characteristics

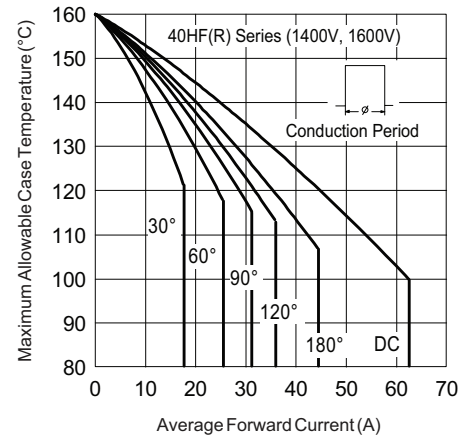


Fig. 4 - Current Ratings Characteristics

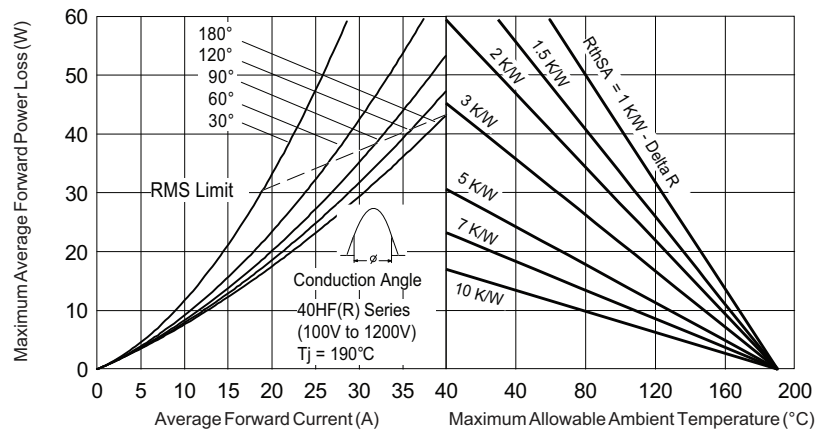


Fig. 5 - Forward Power Loss Characteristics

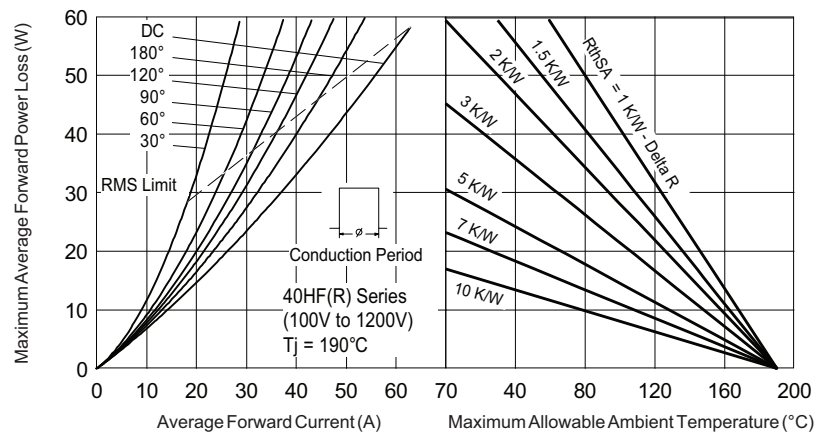


Fig. 6 - Forward Power Loss Characteristics

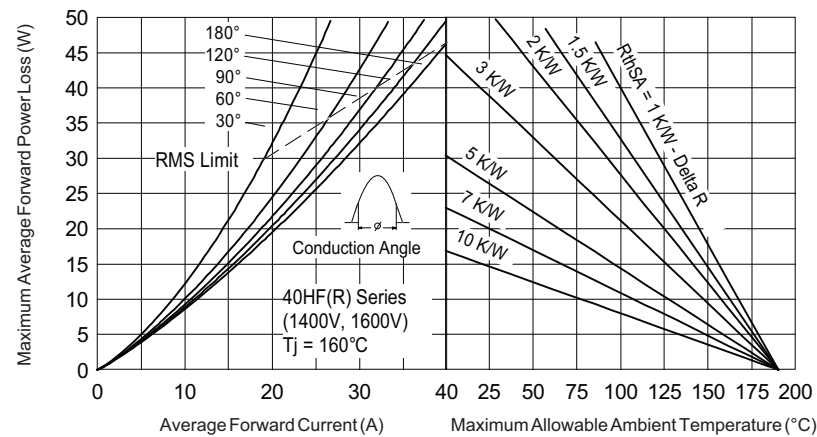


Fig. 7 - Forward Power Loss Characteristics

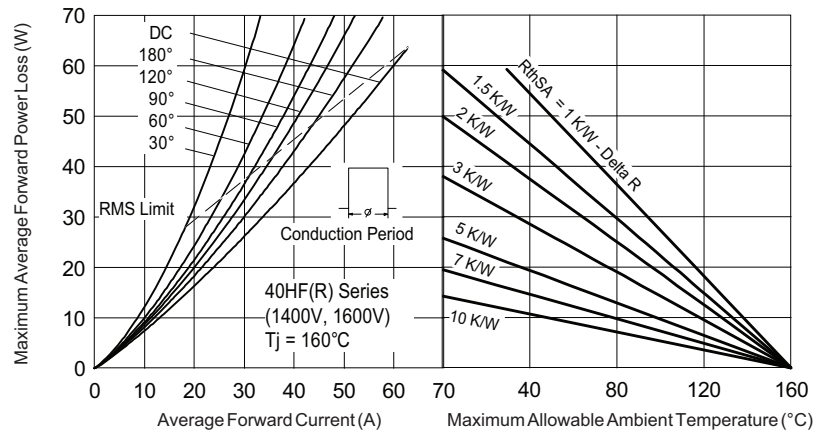


Fig. 8 - Forward Power Loss Characteristics

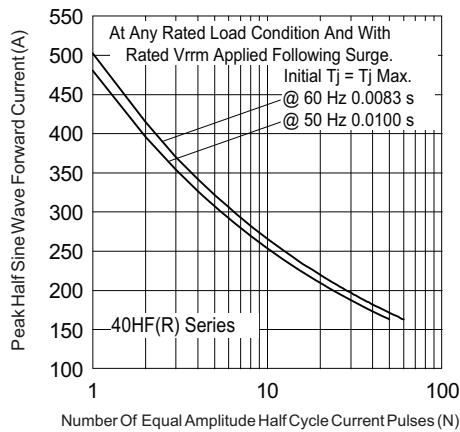


Fig. 9 - Maximum Non-Repetitive Surge Current

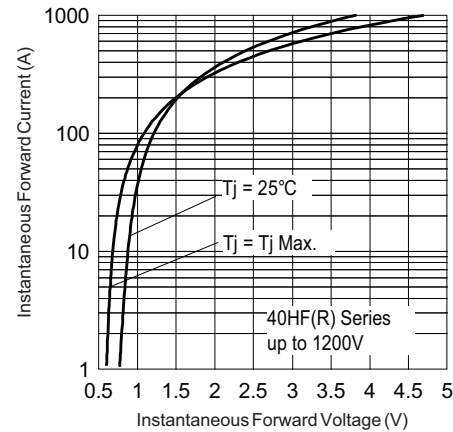


Fig. 11 - Forward Voltage Drop Characteristics
(Up To 1200 V)

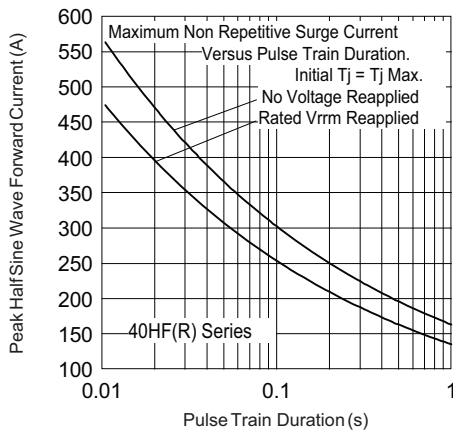


Fig. 10 - Maximum Non-Repetitive Surge Current

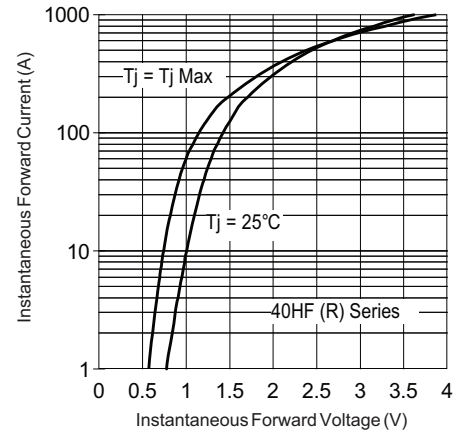


Fig. 12 - Forward Voltage Drop Characteristics
(For 1400 V/1600 V)

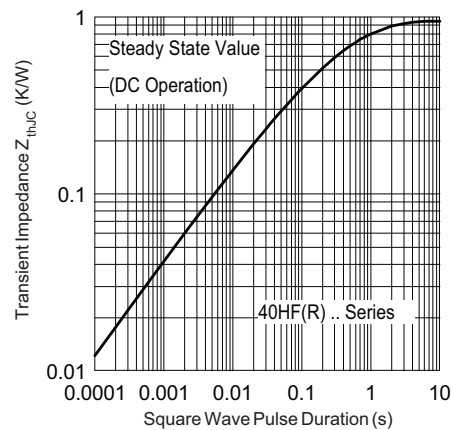


Fig. 13 - Thermal Impedance Z_{thJC} Characteristics

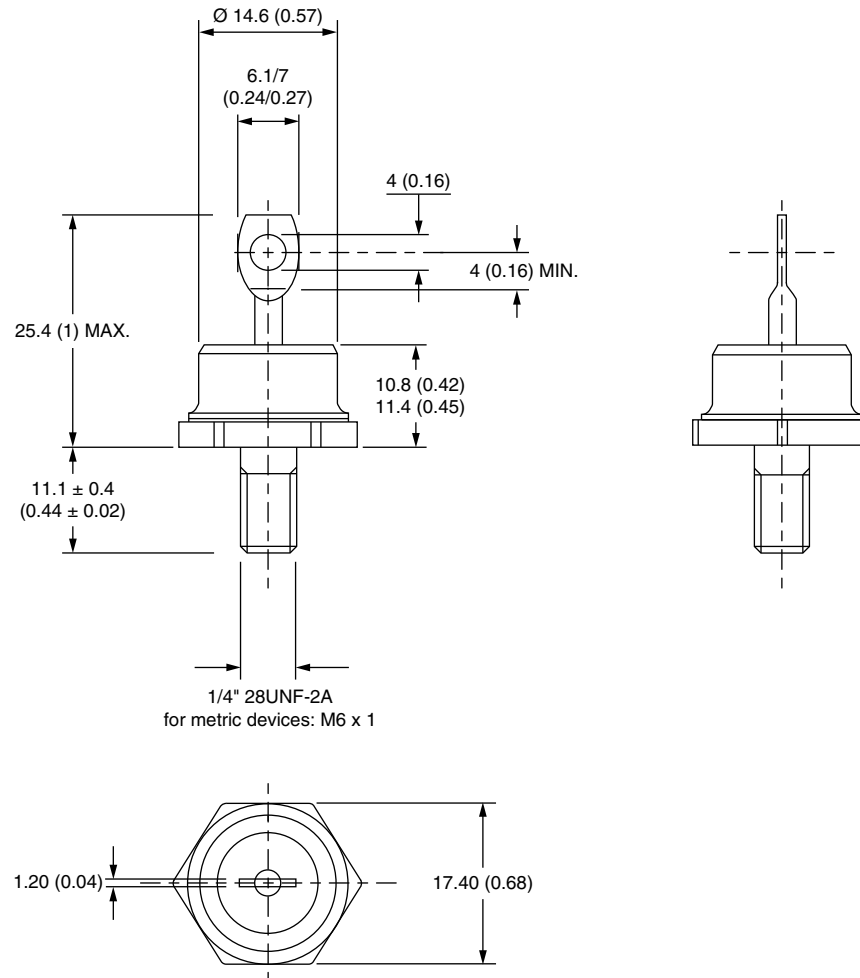
ORDERING INFORMATION TABLE

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	www.vishay.com/doc?95344

DO-203AB (DO-5) for 40HF(R) and 41HF(R) Series

DIMENSIONS FOR 40HF(R) SERIES in millimeters (inches)



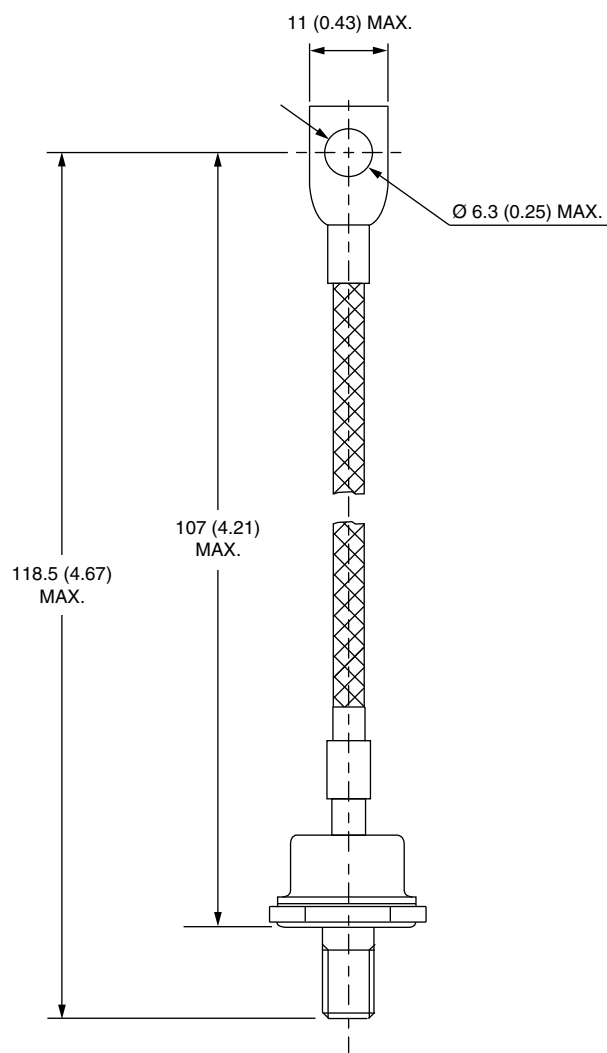
Outline Dimensions

Vishay Semiconductors

DO-203AB (DO-5) for 40HF(R)
and 41HF(R) Series



DIMENSIONS FOR 41HF(R) SERIES in millimeters (inches)





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Тел: +7 (812) 336 43 04 (многоканальный)

Email: org@lifeelectronics.ru

www.lifeelectronics.ru