

International
IR Rectifier

40HF(R) SERIES

STANDARD RECOVERY DIODES

Stud Version

Features

- High surge current capability
- Stud cathode and stud anode version
- Leaded version available
- Types up to 1600V V_{RRM}

40 A

Typical Applications

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

Major Ratings and Characteristics

Parameters	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} @ 50Hz	570		A
@ 60Hz	595		A
I^2t @ 50Hz	1600		A ² s
@ 60Hz	1450		A ² s
V_{RRM} range	100 to 1200	1400, 1600	V
T_J range	- 65 to 190	- 65 to 160	°C



case style
DO-203AB (DO-5)

40HF(R) Series

Bulletin I20201 rev. C 03/04

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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} max. @ $T_J = T_J \text{ max.}$ 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		40HF(R)		Units	Conditions					
		10 to 120	140, 160							
I _{F(AV)}	Max. average forward current @ Case temperature	40	40	A	180° conduction, half sine wave					
I _{F(RMS)}	Max. RMS forward current	140	110	°C						
I _{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	62		A	Sinusoidal half wave, Initial T _J = T _J max.					
		570								
		595								
		480								
I ² t	Maximum I ² t for fusing	500								
		1600		A ² s				t = 10ms	No voltage	
		1450						t = 8.3ms	reapplied	
		1150						t = 10ms	100% V _{RRM}	
1050		t = 8.3ms	reapplied							
I ² √t	Maximum I ² √t for fusing	16000		A ² /s				t = 0.1 to 10ms, no voltage reapplied		
V _{F(TO)}	Value of threshold voltage (up to 1200V)	0.65		V				T _J = T _J max.		
V _{F(TO)}	Value of threshold voltage (for 1400V, 1600V)	0.76						T _J = T _J max.		
r _f	Value of forward slope resistance (up to 1200V)	4.29		mΩ				T _J = T _J max.		
r _f	Value of forward slope resistance (for 1400V, 1600V)	3.8						T _J = T _J max.		
V _{FM}	Max. forward voltage drop	1.30	1.50	V	I _{pk} = 125A, T _J = 25°C, t _p = 400μs rectangular wave					

Thermal and Mechanical Specifications

Parameter		40HF(R)		Units	Conditions
		10 to 120	140 to 160		
T _J	Max. junction operating temperature range	-65 to 190	-65 to 160	°C	
T _{stg}	Max. storage temperature range	-65 to 190	-65 to 160		
R _{thJC}	Max. thermal resistance, junction to case	0.95		K/W	DC operation
R _{thCS}	Max. thermal resistance, case to heatsink	0.25			Mounting surface, smooth, flat and greased
T	Max. allowed mounting torque ±10%	2.3 - 3.4		Nm	Not lubricated threads
		20 - 30		lbf•in	
wt	Approximate weight	17 (0.6)		g (oz)	unleaded device
Case style		DO-203AB (DO5)			See Outline Table

ΔR_{thJC} Conduction

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

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.14	0.10	K/W	$T_J = T_{J \text{ max.}}$
120°	0.16	0.17		
90°	0.21	0.22		
60°	0.30	0.31		
30°	0.50	0.50		

Ordering Information Table

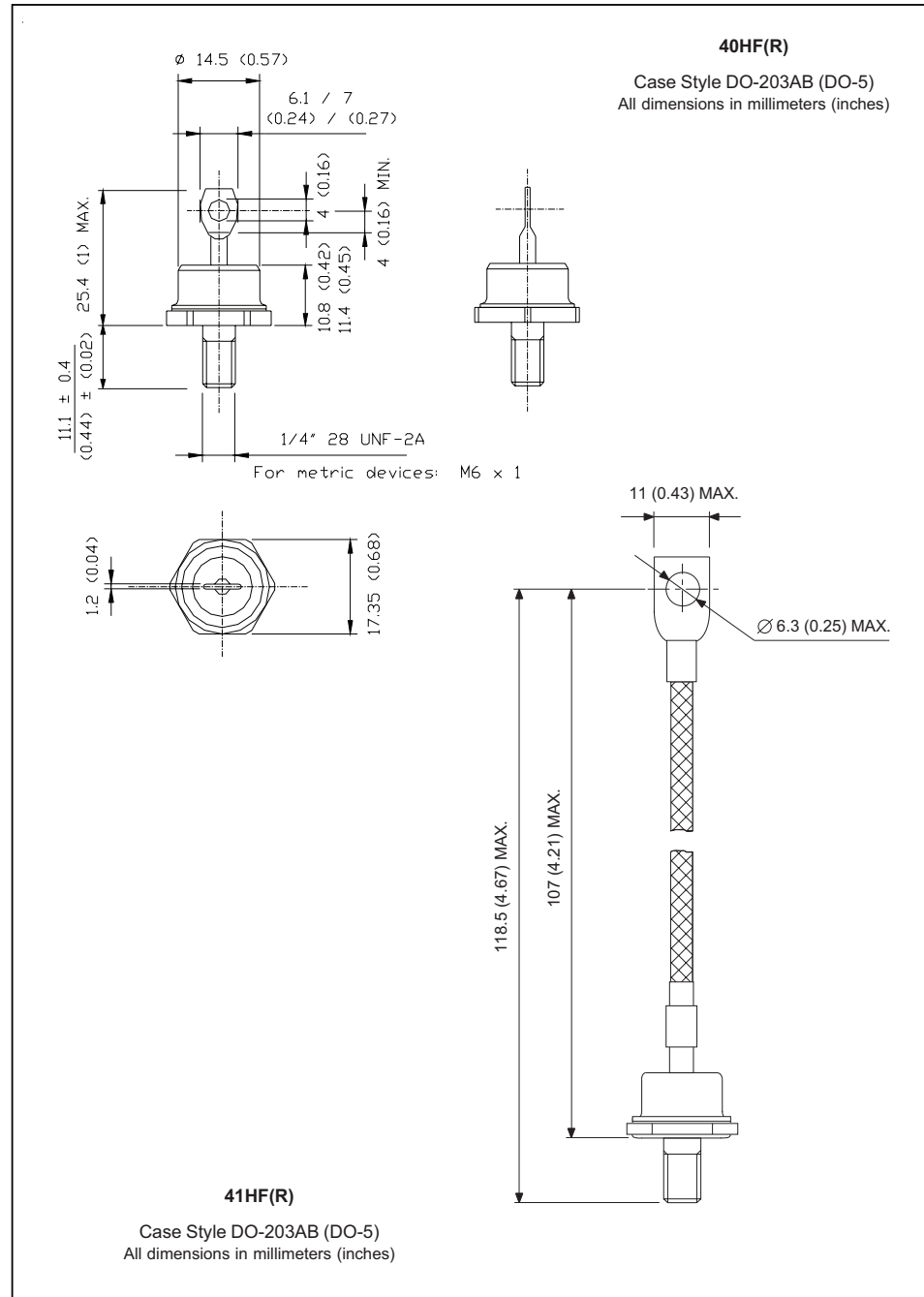
Device Code				
	40	HF	R	160 M
	①	②	③	④ ⑤
1	- 40 = Standard device 41 = Not isolated lead 42 = Isolated lead with silicone sleeve (Red = Reverse polarity) (Blue = Normal polarity)			
2	- Standard diode			
3	- None = Stud Normal Polarity (Cathode to Stud) R = Stud Reverse Polarity (Anode to Stud)			
4	- Voltage code: 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			

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Outlines Table



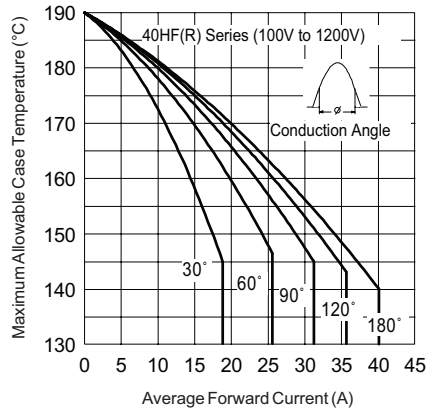


Fig. 1 - Current Ratings Characteristics

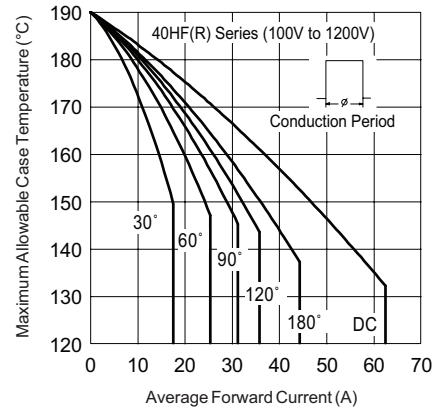


Fig. 2 - Current Ratings Characteristics

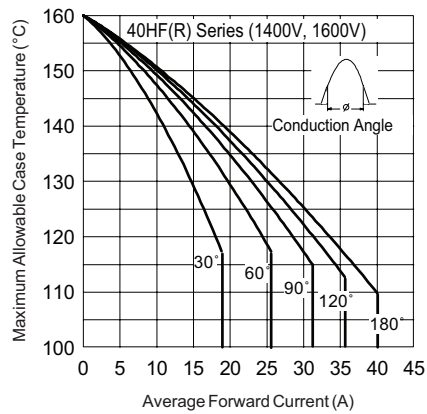


Fig. 3 - Current Ratings Characteristics

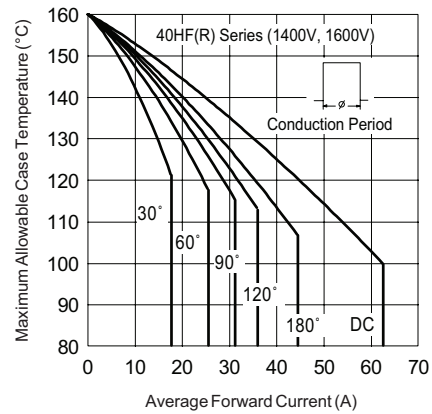


Fig. 4 - Current Ratings Characteristics

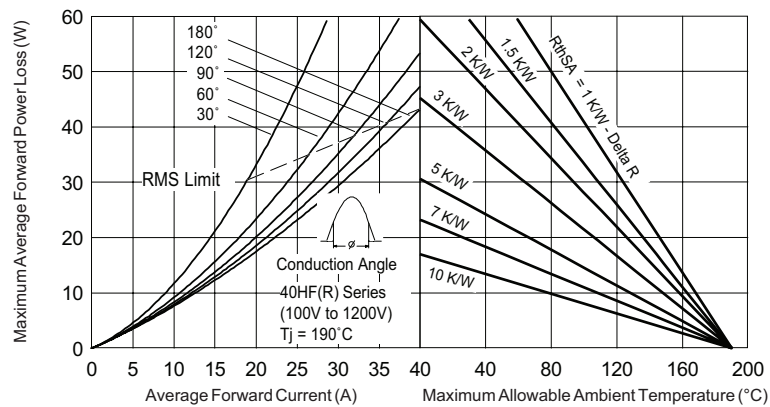


Fig. 5 - Forward Power Loss Characteristics

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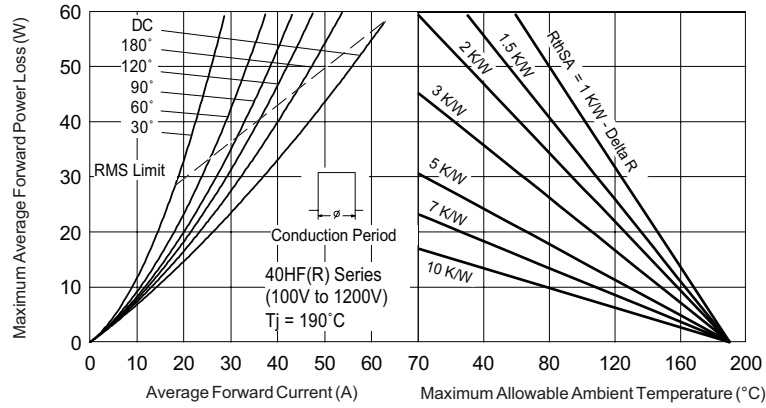


Fig. 6 - Forward Power Loss Characteristics

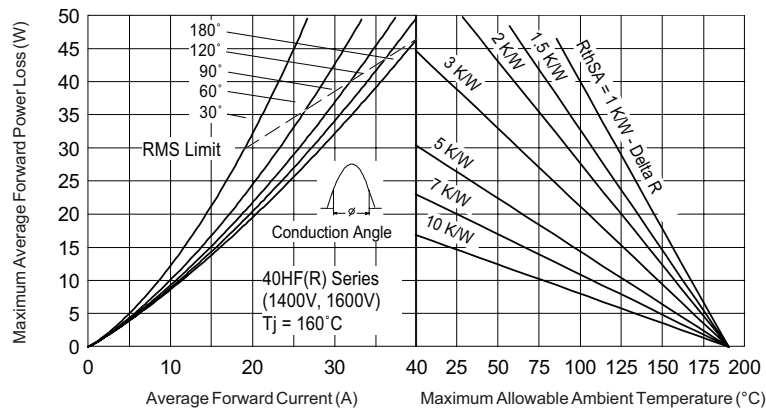


Fig. 7 - Forward Power Loss Characteristics

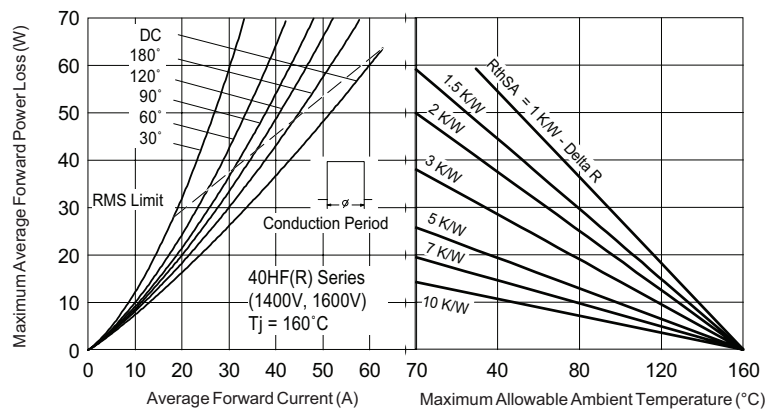


Fig. 8 - Forward Power Loss Characteristics

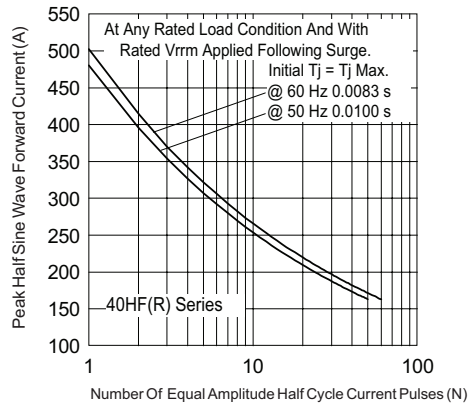


Fig. 9 - Maximum Non-Repetitive Surge Current

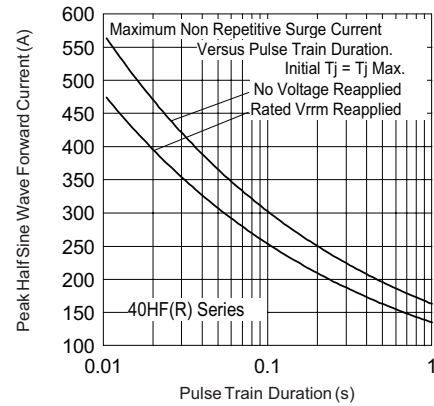


Fig. 10 - Maximum Non-Repetitive Surge Current

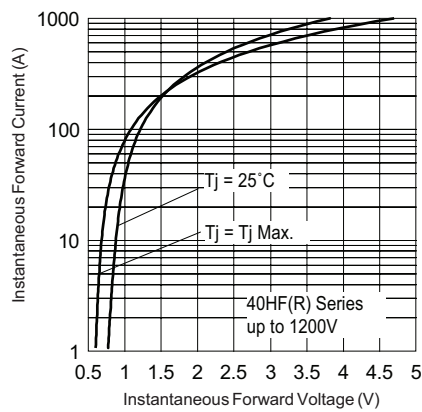


Fig. 11 - Forward Voltage Drop Characteristics (up to 1200V)

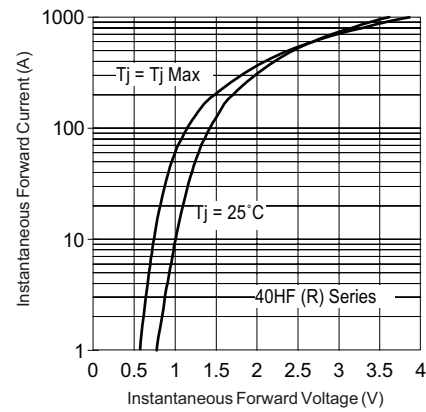


Fig. 12 - Forward Voltage Drop Characteristics (for 1400V, 1600V)

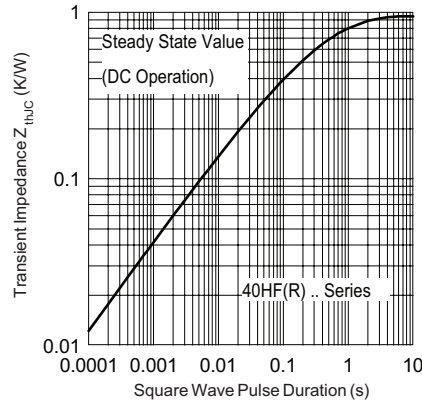


Fig. 13 - Thermal Impedance Z_{thJC} Characteristics

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Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

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