Bulletin I20201 rev. C 03/04

International
IOR 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^2s
	@ 60Hz	1450		A^2s
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)

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. @ $T_J = T_J$ 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) 10 to 120	40HF(R) 140, 160	Units	Conditions		
$I_{F(AV)}$	Max. average forward current @ Case temperature	40 140	40 110	A °C	180° conduction, half sine wave		
$I_{F(RMS)}$	Max. RMS forward current	62		A			
I_{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	570		A	t = 10ms	No voltage reapplied	Sinusoidal half wave, Initial $T_J = T_J$ max.
		595			t = 8.3ms		
		480			t = 10ms	100% V_{RRM} reapplied	
		500			t = 8.3ms		
I^2t	Maximum I^2t for fusing	1600		A^2s	t = 10ms	No voltage reapplied	
		1450			t = 8.3ms		
		1150			t = 10ms	100% V_{RRM} reapplied	
		1050			t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	16000		$A^2\sqrt{s}$	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		V	$T_J = T_J$ 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		mΩ	$T_J = T_J$ 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

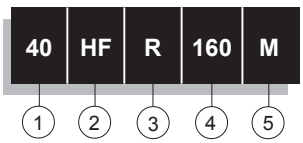
ΔR_{thJC} Conduction

(The following table shows the increment of thermal resistence 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	$T_J = T_J$ 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



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)

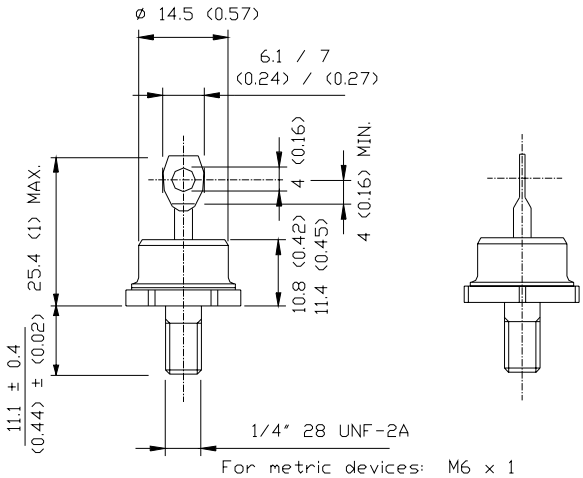
4 - Voltage code: Code x 10 = V_{RRM} (See Voltage Ratings table)

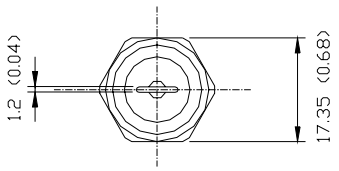
5 - None = Stud base DO-203AB (DO-5) 1/4" 28UNF-2A
M = Stud base DO-203AB (DO-5) M6 X 1

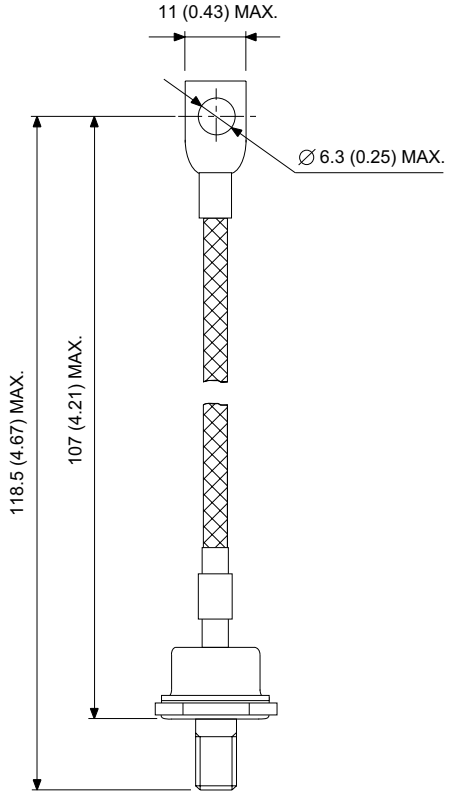
Outlines Table

40HF(R)

Case Style DO-203AB (DO-5)
All dimensions in millimeters (inches)







41HF(R)

Case Style DO-203AB (DO-5)
All dimensions in millimeters (inches)

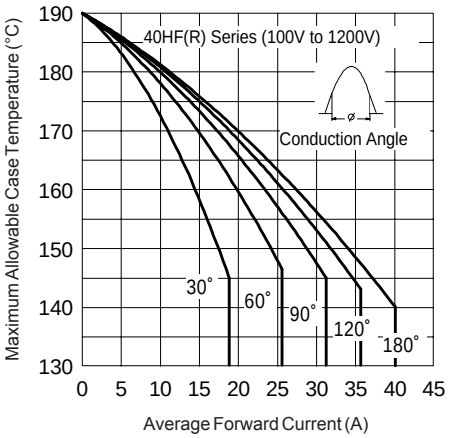


Fig. 1 - Current Ratings Characteristics

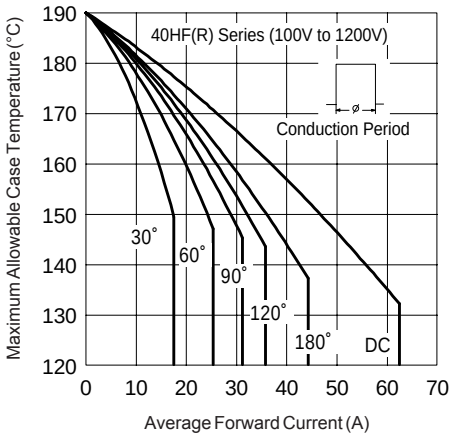


Fig. 2 - Current Ratings Characteristics

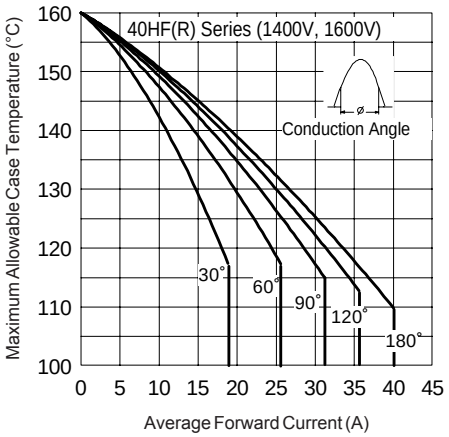


Fig. 3 - Current Ratings Characteristics

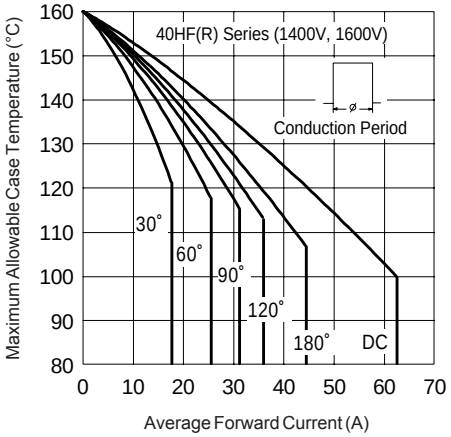


Fig. 4 - Current Ratings Characteristics

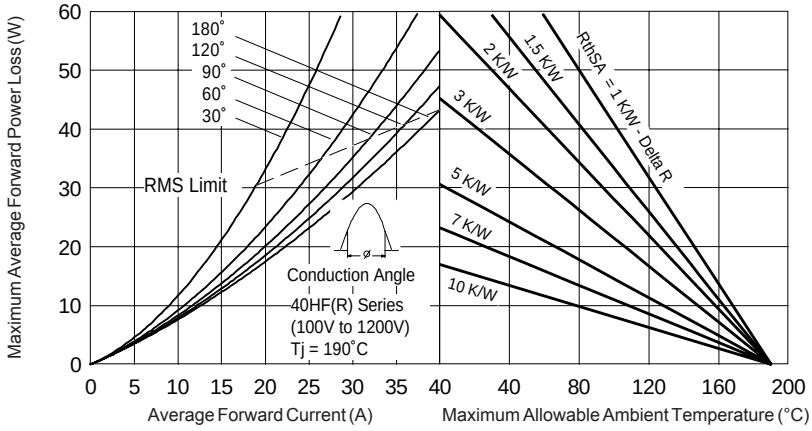


Fig. 5 - Forward Power Loss Characteristics

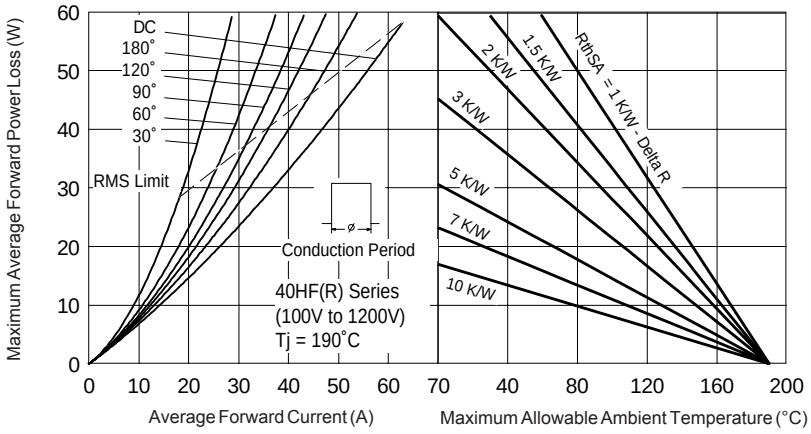


Fig. 6 - Forward Power Loss Characteristics

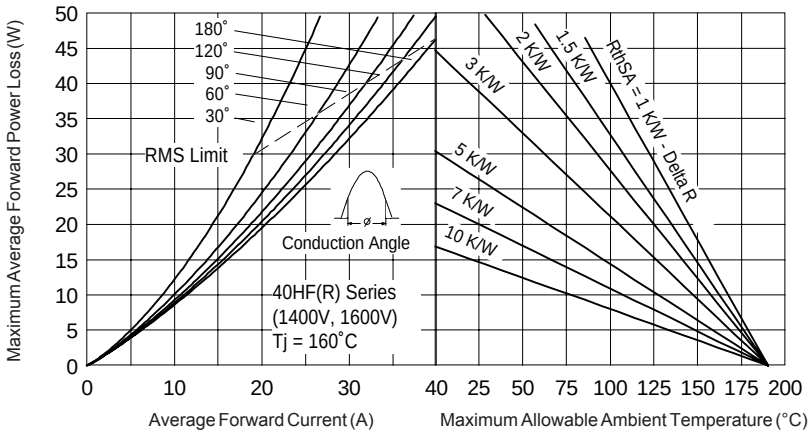


Fig. 7 - Forward Power Loss Characteristics

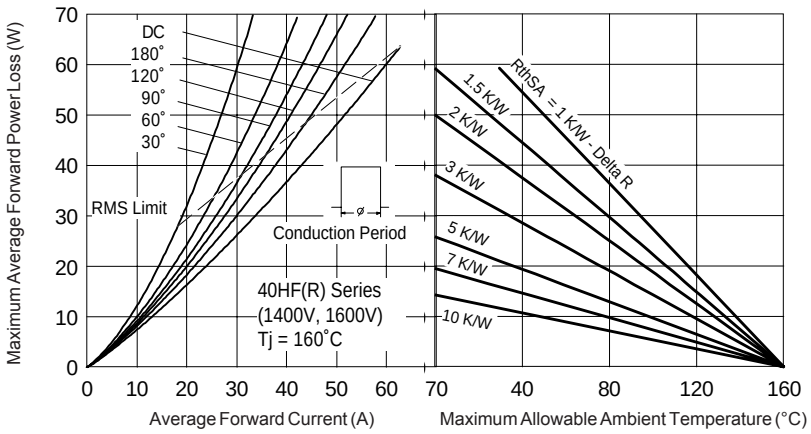


Fig. 8 - Forward Power Loss Characteristics

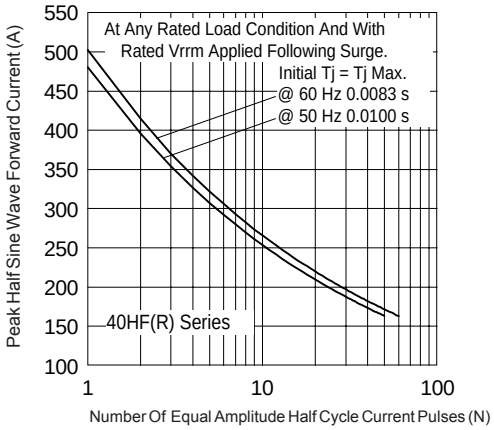


Fig. 9 - Maximum Non-Repetitive Surge Current

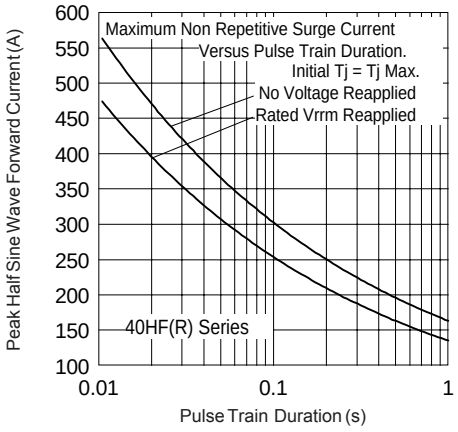


Fig. 10 - Maximum Non-Repetitive Surge Current

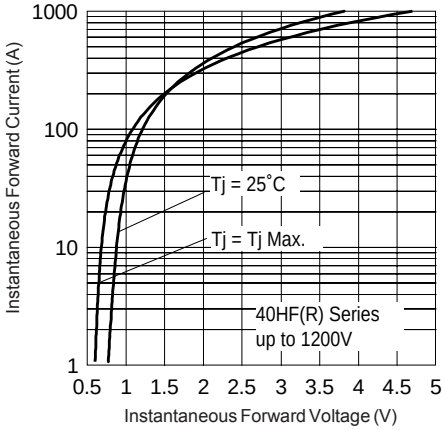


Fig. 11 - Forward Voltage Drop Characteristics
(up to 1200V)

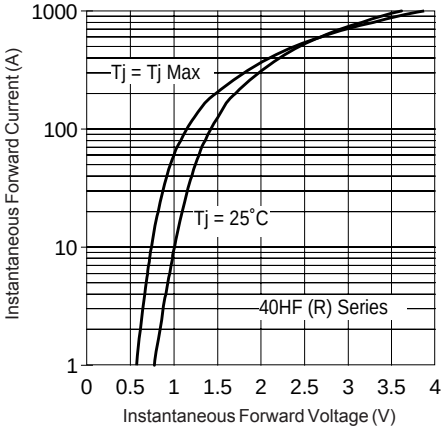


Fig. 12 - Forward Voltage Drop Characteristics
(for 1400V, 1600V)

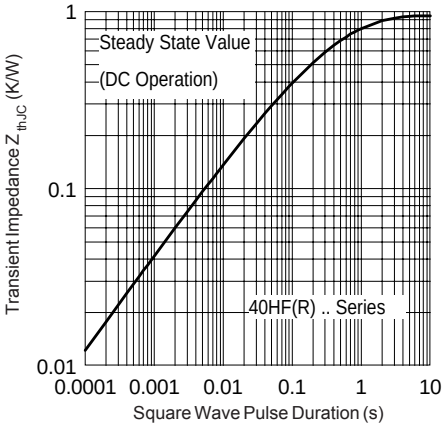


Fig. 13 - Thermal Impedance Z_{thJC} Characteristics

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.

International
IOR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 03/04