

### STANDARD RECOVERY DIODES

### Stud Version

#### Features

- High current carrying capability
- High surge current capability
- Types up to 1200V  $V_{RRM}$
- Stud cathode and stud anode version
- Standard JEDEC types
- Diffused junction

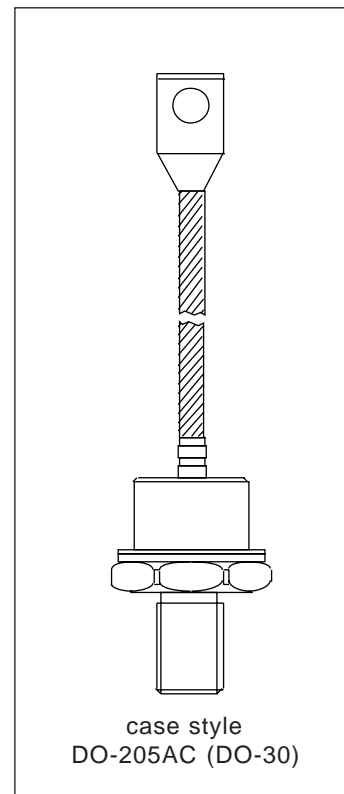
130 A

#### Typical Applications

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

#### Major Ratings and Characteristics

Parameters	130HF(R)	Units
$I_{F(AV)}$	130	A
	@ $T_C$	125 °C
$I_{F(RMS)}$	200	A
$I_{FSM}$	@ 50Hz	2000 A
	@ 60Hz	2100 A
$I^2t$	@ 50Hz	20 KA <sup>2</sup> s
	@ 60Hz	18 KA <sup>2</sup> s
$V_{RRM}$ range	400 to 1200	V
$T_J$	-40 to 180	°C



## 130HF(R) Series

Bulletin I2019 rev. A 07/94

International  
 Rectifier

### ELECTRICAL SPECIFICATIONS

#### Voltage Ratings

Type number	Voltage Code	$V_{RRM}$ , maximum repetitive peak reverse voltage V	$V_{RSM}$ , maximum non-repetitive peak rev. voltage V	$I_{RRM}$ max. @ 180°C mA
130HF(R)	40	400	500	15
	80	800	900	
	120	1200	1300	

#### Forward Conduction

Parameter	130HF(R)	Units	Conditions
$I_{F(AV)}$ Max. average forward current @ Case temperature	130	A	180° conduction, half sine wave
	125	°C	
$I_{F(RMS)}$ Max. RMS forward current	200	A	DC @ 115°C case temperature
$I_{FSM}$ Max. peak, one-cycle forward, non-repetitive surge current	2000	A	t = 10ms No voltage
	2100		t = 8.3ms reapplied
	1680		t = 10ms 100% $V_{RRM}$
	1760		t = 8.3ms reapplied
$I^2t$ Maximum $I^2t$ for fusing	20	KA <sup>2</sup> s	t = 10ms No voltage
	18		t = 8.3ms reapplied
	14		t = 10ms 100% $V_{RRM}$
	13		t = 8.3ms reapplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	200	KA <sup>2</sup> √s	t = 0.1 to 10ms, no voltage reapplied
$V_{F(TO)1}$ Low level value of threshold voltage	0.76	V	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J = T_J \text{ max.}$
$V_{F(TO)2}$ High level value of threshold voltage	0.95		$(I > \pi \times I_{F(AV)})$ , $T_J = T_J \text{ max.}$
$r_{f1}$ Low level value of forward slope resistance	1.41	mΩ	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J = T_J \text{ max.}$
$r_{f2}$ High level value of forward slope resistance	1.02		$(I > \pi \times I_{F(AV)})$ , $T_J = T_J \text{ max.}$
$V_{FM}$ Max. forward voltage drop	1.5	V	$I_{pk} = 500A$ , $T_J = 25^\circ C$

Thermal and Mechanical Specification

Parameter	130HF(R)	Units	Conditions
T <sub>J</sub> Max. operating temperature range	-40 to 180	°C	
T <sub>stg</sub> Max. storage temperature range	-55 to 180		
R <sub>thJC</sub> Max. thermal resistance, junction to case	0.3	K/W	DC operation
R <sub>thCS</sub> Max. thermal resistance, case to heatsink	0.08		Mounting surface, smooth, flat and greased
T Max. allowed mounting torque +0 -20%	11	Nm	Not lubricated threads
	10		Lubricated threads
wt Approximate weight	120	g	
Case style	DO-205AC(DO-30)		See Outline Table

$\Delta R_{thJC}$  Conduction

(The following table shows the increment of thermal resistance R<sub>thJC</sub> when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.052	0.042	K/W	T <sub>J</sub> = T <sub>J</sub> max.
120°	0.064	0.070		
90°	0.083	0.090		
60°	0.117	0.120		
30°	0.177	0.180		

Ordering Information Table

**Device Code**

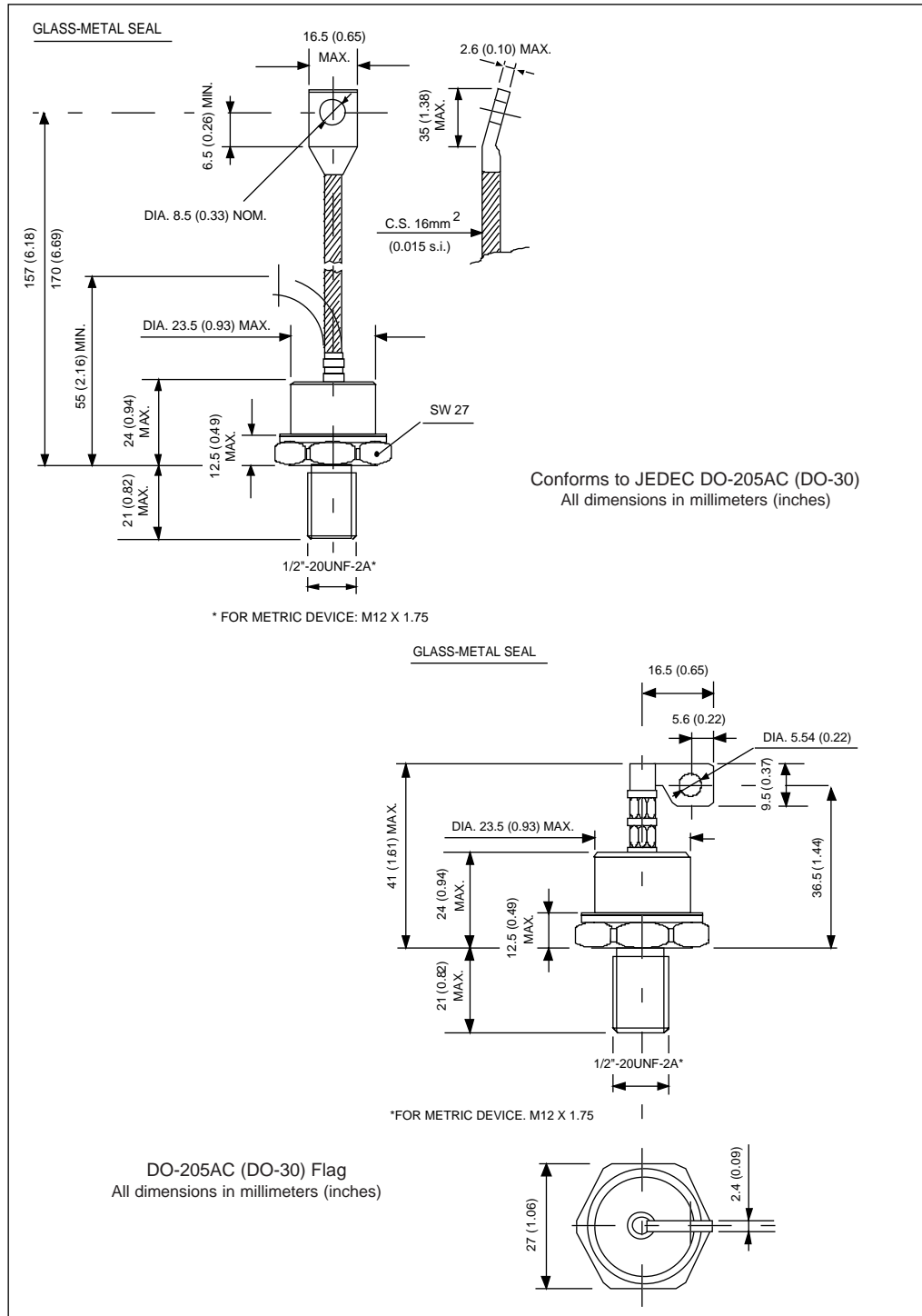
130	HF	R	120	P	B	V
①	②	③	④	⑤	⑥	⑦

- 1** - Essential Part Number
- 2** - Diode
- 3** - None = Stud Normal Polarity (Cathode to Stud)  
R = Stud Reverse Polarity (Anode to Stud)
- 4** - Voltage code: Code x 10 = V<sub>RRM</sub> (See Voltage Ratings table)
- 5** - P = Stud base DO-205AC(DO-30) 1/2" 20UNF-2A  
M = Stud base DO-205AC(DO-30) M12x1.75
- 6** - B = Flag top terminals (for Cathode/ Anode Leads)  
S = Isolated lead with silicone sleeve  
(Red = Reverse Polarity; Blue = Normal Polarity)  
None = Not isolated lead
- 7** - V = Glass-metal seal

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## Outline Table



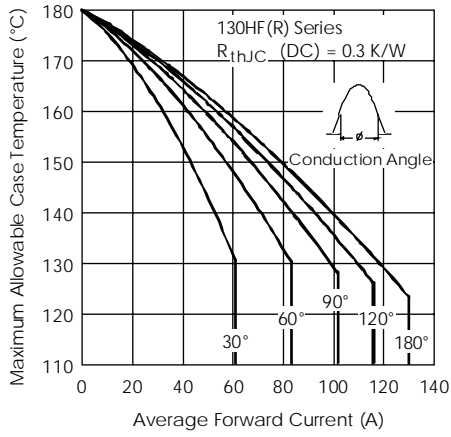


Fig. 1 - Current Ratings Characteristics

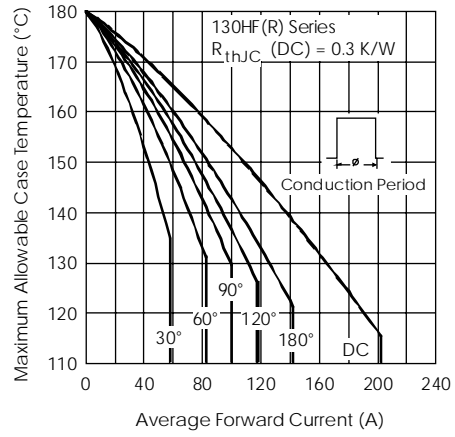


Fig. 2 - Current Ratings Characteristics

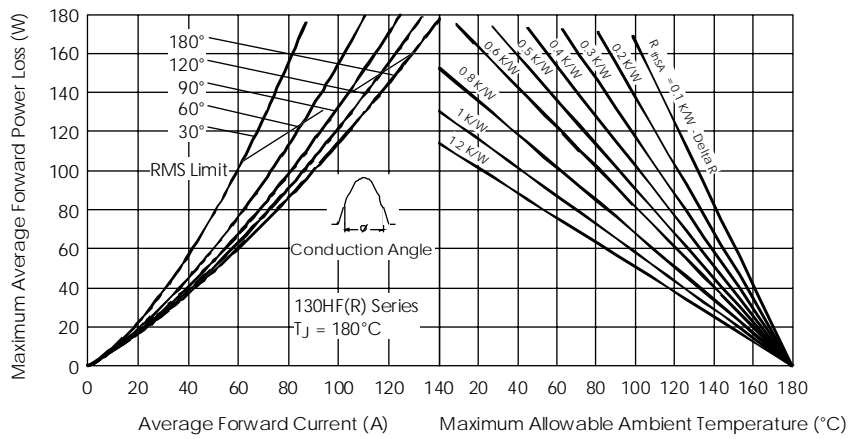


Fig. 3 - Forward Power Loss Characteristics

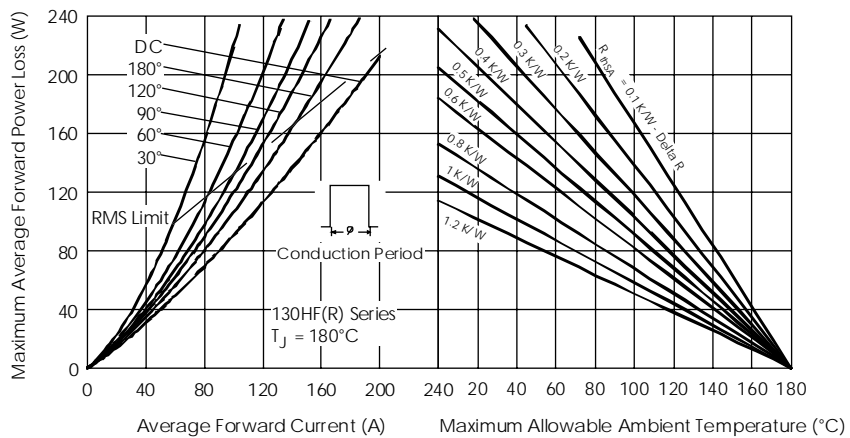


Fig. 4 - Forward Power Loss Characteristics

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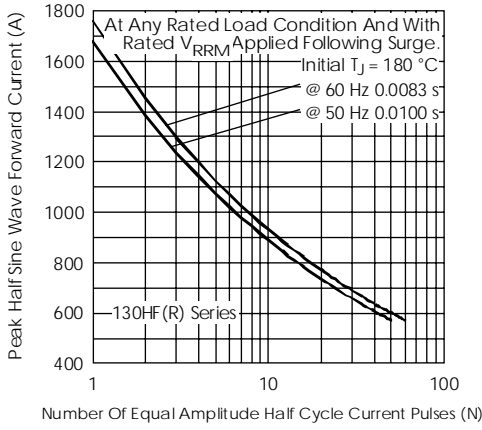


Fig. 5 - Maximum Non-Repetitive Surge Current

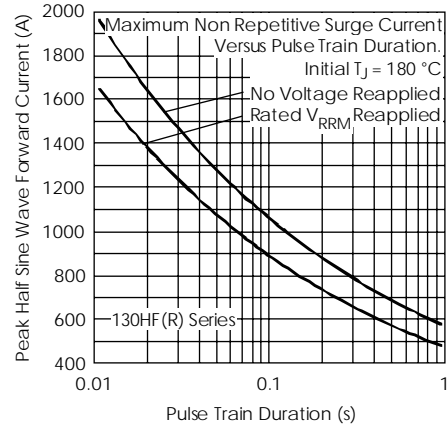


Fig. 6 - Maximum Non-Repetitive Surge Current

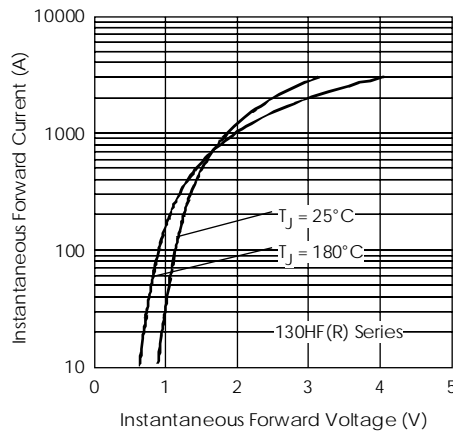


Fig. 7 - Forward Voltage Drop Characteristics

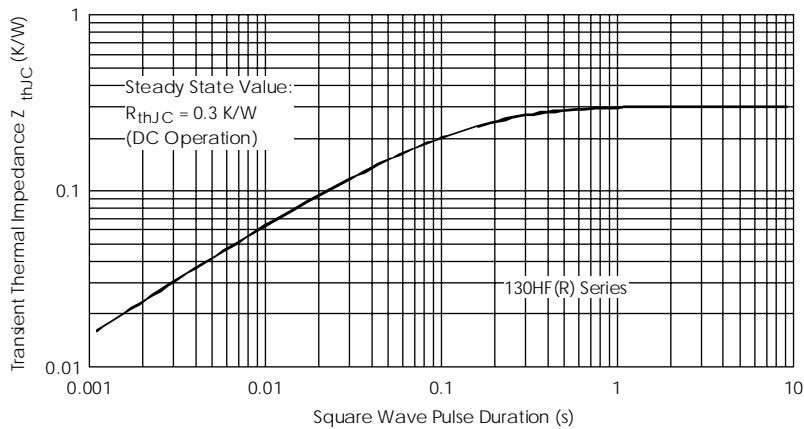


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics