

INTERNATIONAL RECTIFIER 

## 30HFU... SERIES

### SUPER FAST RECTIFIER DIODE 30 Amp 60ns

#### Major ratings and characteristics

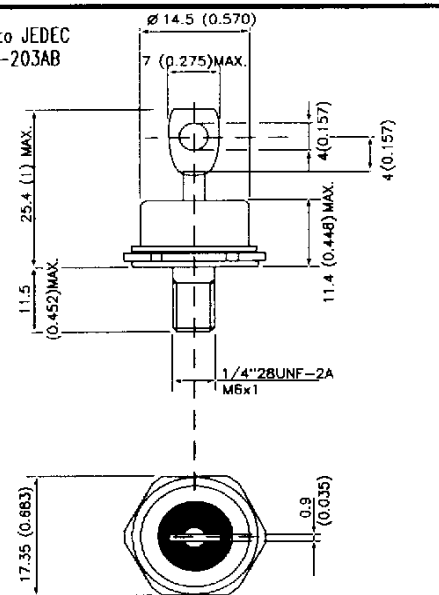
	30HFU	Units
$I_{F(AVG)}$	30	A
$T_c$	91	°C
$I_{RMS}$	47	A
$I_{FSM}$ @ 10ms	475	A
$I_{FSM}$ @ 8.3ms	500	A
$V_{RRM}$	100 to 600	V
$T_J$	-40 to 125	°C

#### Description and Features

- Very low reverse recovery time
- Reduced switching losses
- Soft recovery characteristics
- High surge current capability
- No voltage derating up to 150°C
- Stud cathode and stud anode versions
- Designed for switching applications:  
Free wheeling diode in converters and control circuits  
Rectifier in S.M.P.S.



Conforms to JEDEC  
Outline DO-203AB  
(DO-5)



All dimensions in millimetres (inches)

**ELECTRICAL SPECIFICATIONS**

**Forward Conduction**

Parameters	Value	Units	Conditions
$I_{F(AV)}$ Maximum average forward current	30	A	180° conduction, half sine cond @ Case temperature = 91°C
	33	A	180° conduction, rect cond @ Case temperature = 91°C
$I_{RMS}$ Maximum RMS current	47	A	
$I_{FSM}$ Maximum peak, one-cycle non-repetitive forward current Initial $T_j = T_j \text{ max.}$	475	A	$t = 10\text{ms}$ No voltage reapplied
	500	A	$t = 8.3\text{ms}$
	400	A	$t = 10\text{ms}$ 100% $V_{RRM}$ reapplied
	420	A	$t = 8.3\text{ms}$
PI Maximum PI for fusing Initial $T_j = T_j \text{ max.}$	1130	A <sup>2</sup> s	$t = 10\text{ms}$ No voltage reapplied
	1030	A <sup>2</sup> s	$t = 8.3\text{ms}$
	800	A <sup>2</sup> s	$t = 10\text{ms}$ 100% $V_{RRM}$ reapplied
	730	A <sup>2</sup> s	$t = 8.3\text{ms}$
$P\sqrt{t}$ Maximum $P\sqrt{t}$ for fusing	11300	A <sup>2</sup> $\sqrt{s}$	$t = 0$ to 10ms, no voltage reapplied
$V_{F(10)}$ Maximum value of threshold voltage	1.08	V	$T_j = 125^\circ\text{C}$
$r_l$ Maximum value of forward slope resistance	6.33	m $\Omega$	$T_j = 125^\circ\text{C}$
$V_{FM}$ Maximum forward voltage drop	1.45	V	$I_M = 30 \text{ Apk}$ $T_j = 25^\circ\text{C}$
	1.25	V	$I_M = 30 \text{ Apk}$ $T_j = 125^\circ\text{C}$

**Thermal and Mechanical Specifications**

$T_j$ Junction temperature range	-40 to 125	°C	
$T_{stg}$ Storage temperature range	-40 to 150	°C	
$R_{thJC}$ Maximum thermal resistance junction to case	0.60	K/W	DC operation per junction
$R_{thCS}$ Maximum thermal resistance, case to heatsink	0.25	K/W	Mounting surface, smooth and greased
T Mounting torque, base to heatsink $\pm 10\%$	2.5	Nm	A mounting compound is recommended and the torque should be rechecked after a period of about 3 hours to allow for the spread of the compound
wl Approximate weight	25	g	

**Recovery Characteristics**

Parameters	Typ.	Max.	Units	Conditions
$t_{rr}$ Recovery time	60	80	ns	$T_j = 25^\circ\text{C}$ $I_F = 1\text{A}$ , $diF/dt = -100 \text{ A}/\mu\text{s}$ , $V_r = -30\text{V}$
$Q_{rr}$ Recovered charge	200	250	nC	$T_j = 25^\circ\text{C}$ $I_F = 1\text{A}$ , $diF/dt = -100 \text{ A}/\mu\text{s}$ , $V_r = -30\text{V}$

The graph illustrates the current recovery process. It shows a current waveform that transitions from a positive value (IFM) to zero, and then recovers to a steady-state value (IRM (REC)). The recovery time (trr) is defined as the sum of two time intervals, ta and tb. The area under the curve during the recovery phase is labeled as QRR. The slope of the initial recovery is labeled as dIR/dt.

**Voltage ratings ( $T_j = T_j \text{ max.}$ )**

Type number	$V_{RRM}$ , maximum repetitive peak reverse voltage		$V_{RSM}$ , maximum non-repetitive peak reverse voltage		$I_{RRM}$ Max @ 100°C	$I_{RRM}$ Max @ 150°C	$I_{RRM}$ Typ. @ 25°C
	V	V	V	V	mA	mA	$\mu\text{A}$
30HFU(R)-100	100		110		2.5	10	35
30HFU(R)-200	200		220		2.5	10	35
30HFU(R)-300	300		330		2.5	10	35
30HFU(R)-400	400		440		2.5	10	35
30HFU(R)-500	500		550		2.5	15	35
30HFU(R)-600	600		660		2.5	15	35

**ΔR Conduction (per junction)**

(The following table shows the increment of thermal resistance  $R_{th\ J-C}$  when devices operate at different conduction angles than DC.)

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.09	0.08	K/W	
120°	0.12	0.14	K/W	
90°	0.16	0.18	K/W	
60°	0.23	0.24	K/W	
30°	0.35	0.36	K/W	

Fig.1 - Maximum Forward Energy Loss Per Pulse Characteristics

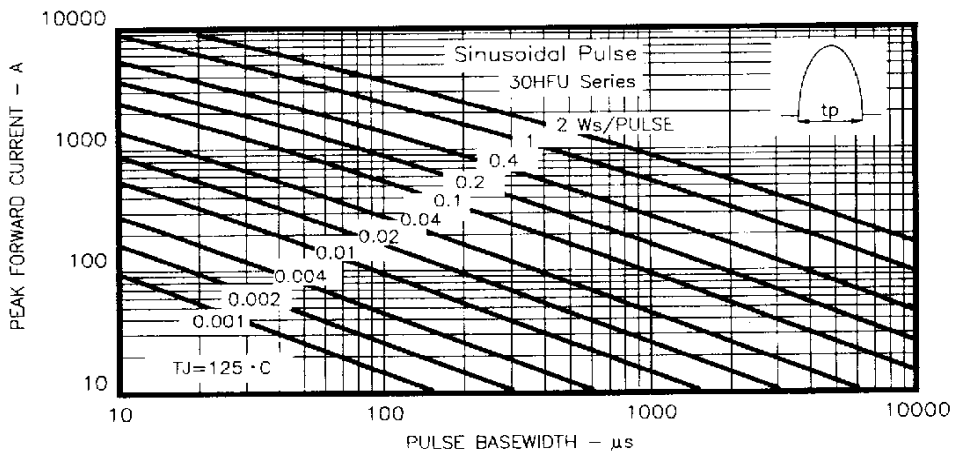
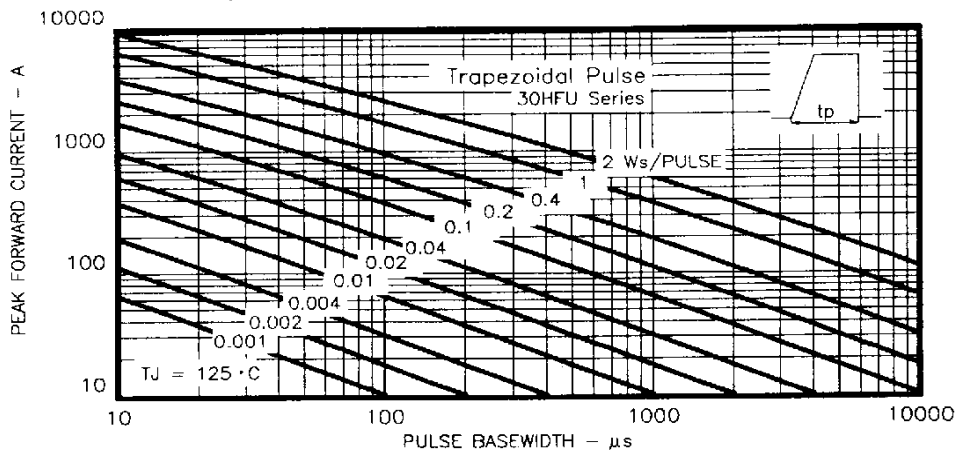
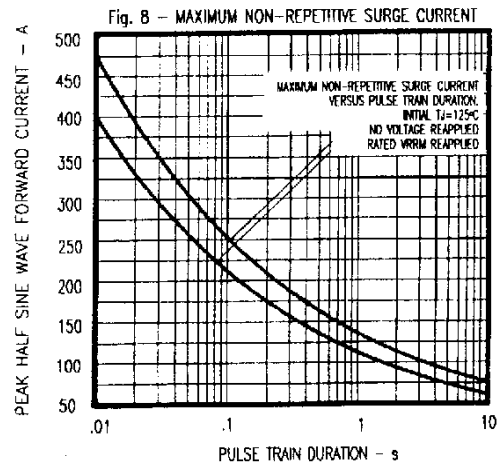
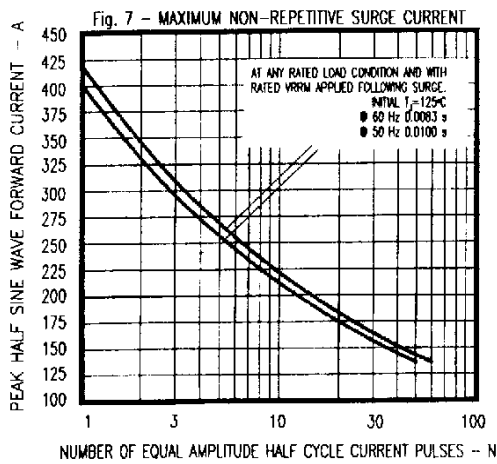
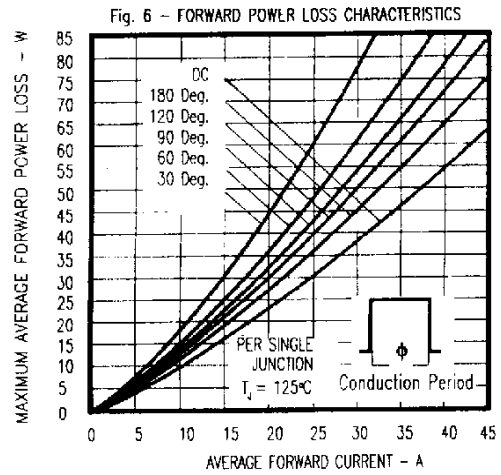
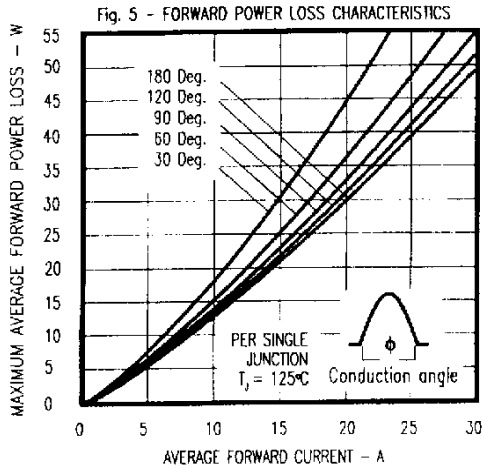
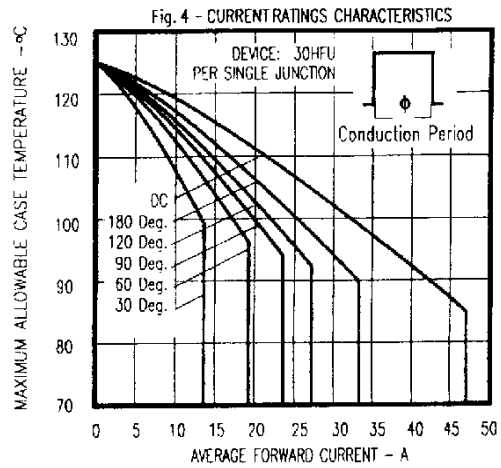
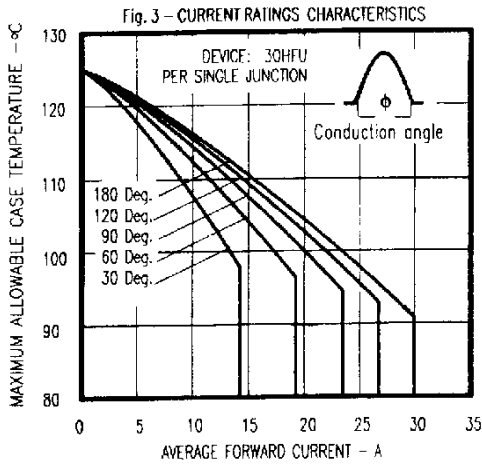
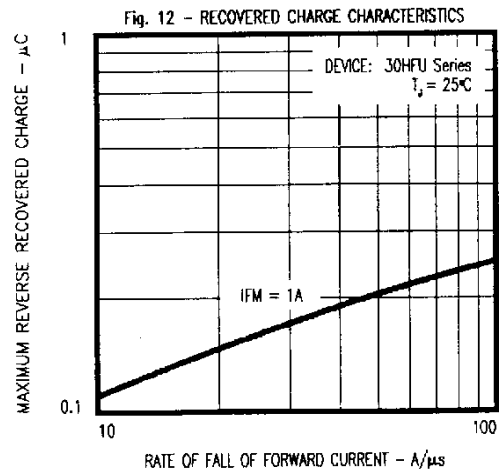
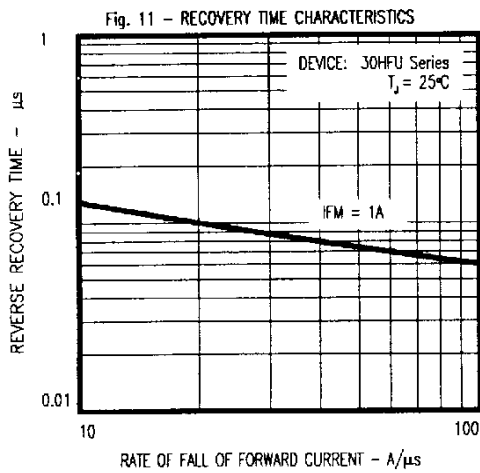
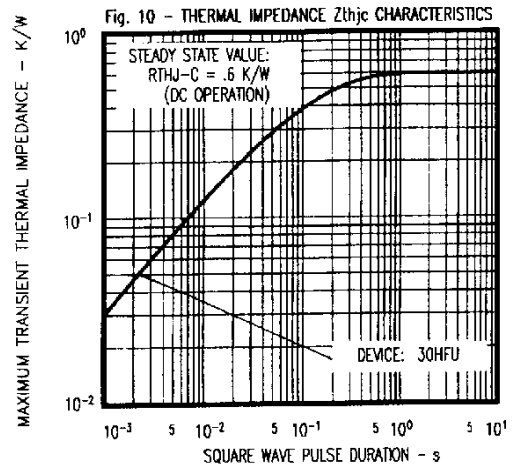
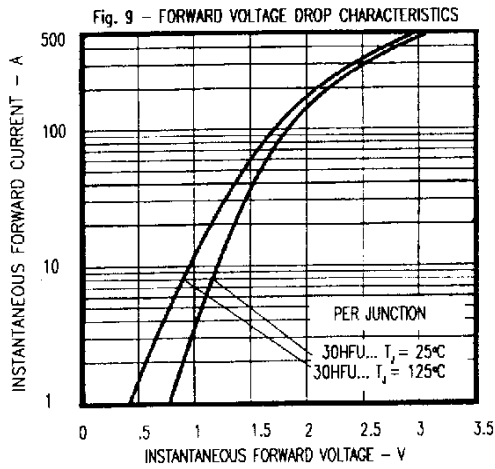


Fig.2 - Maximum Forward Energy Loss Per Pulse Characteristics







# INTERNATIONAL RECTIFIER



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In the interest of product improvement INTERNATIONAL RECTIFIER reserves the right to change specifications at any time without notice 9/88