

INTERNATIONAL RECTIFIER **IR**

500V-A, 500VF-A, 502V-A, 502VF-A SERIES

500 Amp Power Silicon Rectifier Diodes

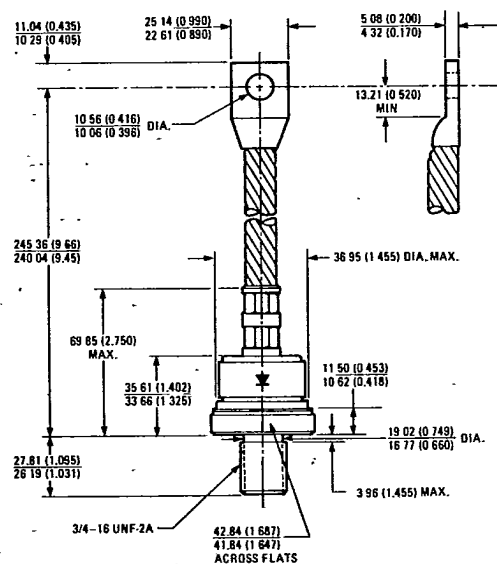
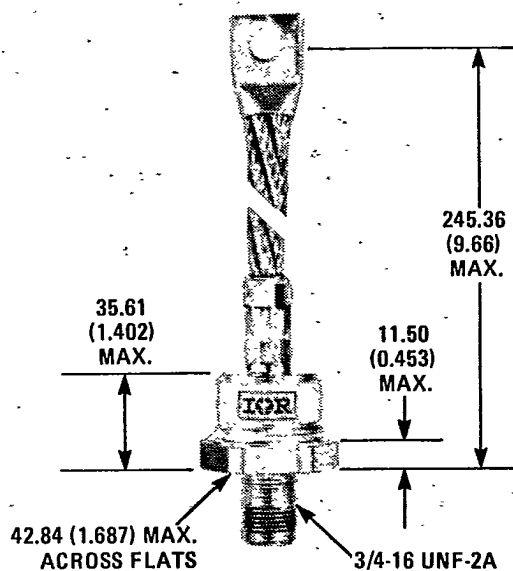
Major Ratings and Characteristics

	500V-A 500VF-A 502V-A 502VF-A	500VR-A 500VFR-A 502VR-A 502VFR-A	Units
$I_F(AV)$	500	500	A
@ Max. T_C	137	137	$^{\circ}C$
I_{FSM} @ 50 Hz	9,550	9,550	A
@ 60 Hz	10,000	10,000	
I^2_t @ 50 Hz	455,000	455,000	A^2s
@ 60 Hz	415,000	415,000	
$I^2\sqrt{t}$	6,450,000	6,450,000	$A^2\sqrt{s}$
V_{RRM} Range	50 - 600	50 - 600	V

Description/Features

- 3 case styles
- 50V to 600V
- Used in mining and transit power supplies, and electromechanical process supplies
- Can be supplied to meet stringent military, aerospace and other high-reliability requirements

CASE STYLE AND DIMENSIONS



IR Case Style B-8
(500-A & 500VR-A)

Dimensions in Millimeters and (Inches)
See Page 236 for additional case styles.

500V-A, 500VF-A, 502V-A,

INTERNATIONAL RECTIFIER



502VF-A Series

VOLTAGE RATINGS

Part Number ① ②		V _{RRM} — Max. Repetitive Peak Reverse Voltage (V)	V _{RSM} — Max. Non-Repetitive Peak Reverse Voltage (V)	V _R — Max. Direct Reverse Voltage (V)
		T _J = -40°C to 200°C	T _J = 25°C to 200°C	T _J = -40°C to 200°C
500V5A	502V5A	50	100	50
500V10A	502V10A	100	200	100
500V20A	502V20A	200	300	200
500V30A	502V30A	300	400	300
500V40A	502V40A	400	525	400
500V50A	502V50A	500	650	500
500V60A	502V60A	600	800	600

ELECTRICAL SPECIFICATIONS

		500V-A 500VR-A 502V-A 502VR-A	Units	Conditions ③
I _{F(AV)}	Max. average forward current	500	A	180° sinusoidal conduction max. T _C = 137°C.
I _{FSM}	Max. peak one-cycle non-repetitive surge current	9,550	A	Half cycle 50 Hz sine wave or 6 ms rectangular pulse
		10,000		Half cycle 60 Hz sine wave or 5 ms rectangular pulse
		11,500		Half cycle 50 Hz sine wave or 6 ms rectangular pulse
		12,000		Half cycle 60 Hz sine wave or 5 ms rectangular pulse
I ² t	Max. I ² t for fusing	455,000	A ² s	t = 10 ms With rated V _{RRM} applied following surge, initial T _J = 200°C.
		415,000		t = 8.3 ms
	Max. I ² t for individual device fusing	645,000		t = 10 ms With V _{RRM} = 0 following surge, initial T _J = 200°C.
		590,000		t = 8.3 ms
I ² √t	Max. I ² √t for individual device fusing ④	6,450,000	A ² √s	t = 0.1 to 10 ms, V _{RRM} = 0 following surge.
V _{FM}	Max. peak forward voltage	1.06	V	I _{F(AV)} = 500A (1570A peak) T _C = 137°C.
I _{R(AV)}	Max. average reverse current	30	mA	Max. rated I _{F(AV)} , V _{RRM} and T _C

① Basic part number indicates cathode to case. For anode to case, add "R" to part number, i.e., 500VR10A.

② For flat base (IR case style B-63 or B-64A) add "F" to part number, e.g., 500VRF60.

③ For flat base parts, conditions are the same as for corresponding stud part.

④ I²t for time t_x = I²√t • √t_x.

THERMAL-MECHANICAL SPECIFICATIONS

		500V-A 500VF-A 502V-A 502VF-A	Units	Conditions
T_J	Max. operating junction temperature range	-40 to 200	$^{\circ}\text{C}$	
T_{stg}	Max. storage temperature range	-40 to 200	$^{\circ}\text{C}$	
R_{thJC}	Max. internal thermal resistance, junction-to-case	0.10	deg. C/W	DC operation.
R_{thCS}	Thermal resistance, case-to-sink	0.04	deg. C/W	Mounting surface flat, smooth, and greased.
T	Mounting torque (S)	48 (425) Min.-54 (475) Max.	N•m (lbf-in.)	Non-lubricated threads
wt	Approximate weight	454 (16)	g (oz.)	
	Case Style	B-8		500V-A
		B-63		500VF-A
		B-37		502V-A
		B-64A		502VF-A

(S) 502V, only: mounting torque at threaded top terminal 8.5 (75) min.-11.3 (100) max. N•m (lbf-in.). Torque must be applied with wrench holding the terminal in a fixed position to avoid damage.

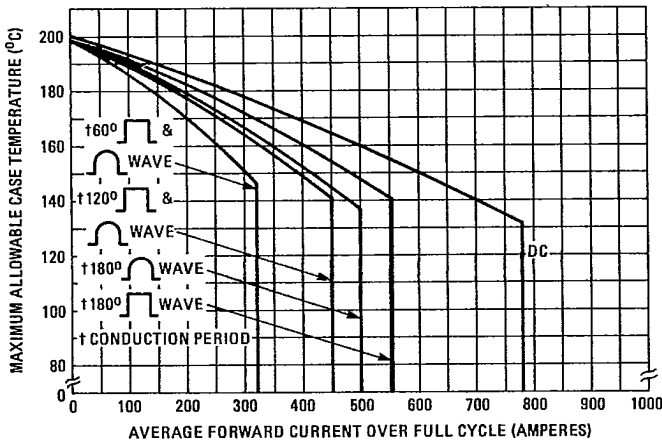


Fig. 1 - Average Forward Current Vs. Maximum Allowable Case Temperature

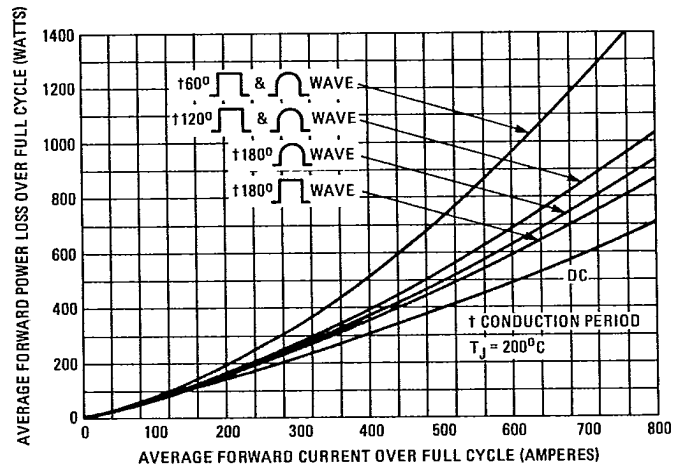


Fig. 2 - Maximum Low-Level Forward Power Loss Vs. Average Forward Current

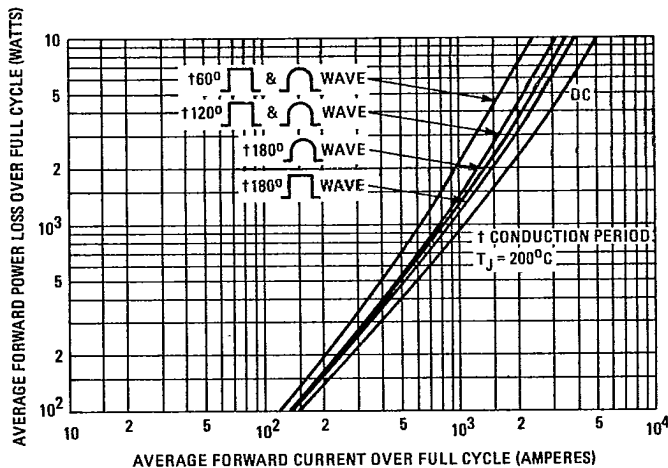


Fig. 3 - Maximum High-Level Forward Power Loss Vs. Average Forward Current

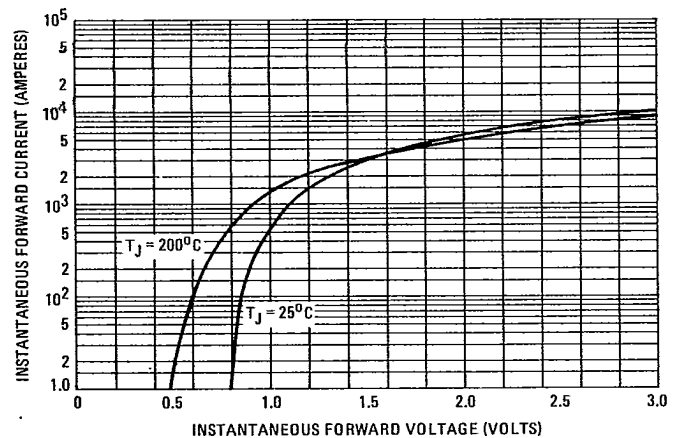


Fig. 4 - Maximum Instantaneous Forward Current Vs. Maximum Instantaneous Forward Voltage

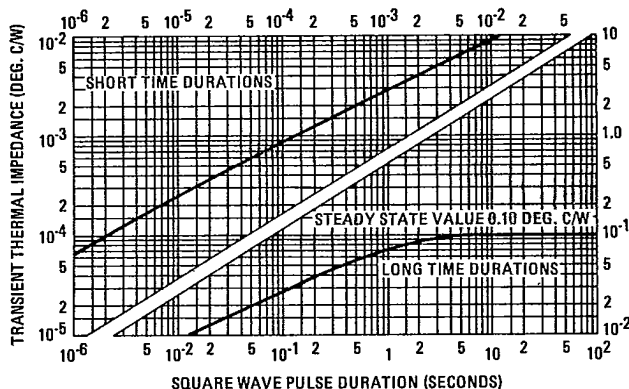


Fig. 5 - Maximum Transient Thermal Impedance, Junction-to-Case, Vs. Square Wave Pulse Duration,

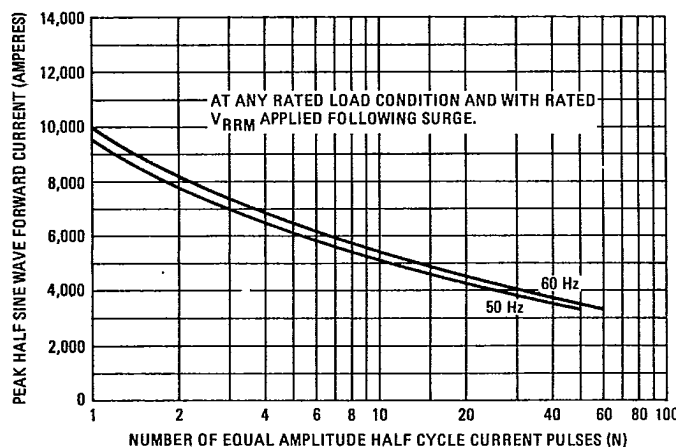
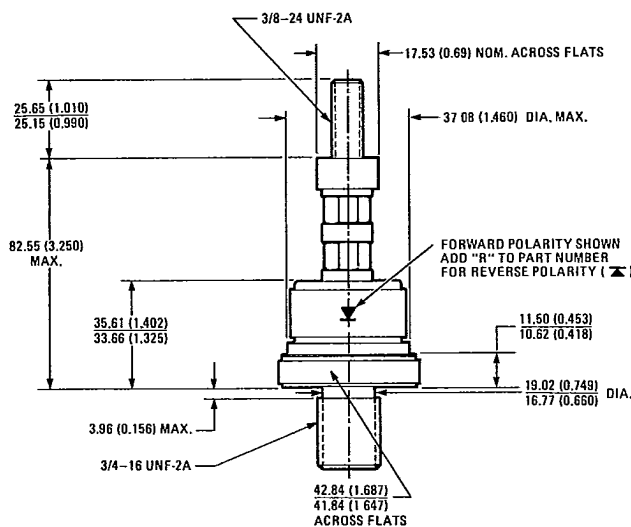


Fig. 6 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses,

Threaded Top Terminal Type

**502V and 502VR
Case Style B-64**



Flat Base Type

**500VF-A and 500VFR-A
Supplied with adapter ring
and mounting clamp.
Case Style B-63**

**Threaded top terminal type with flat base
Outline same as case style B-8A except for
threaded top terminal which is the same as
in case style B-64**

**502VF-A and 502VFR-A
Case Style B-64A**

