

T-01-19

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA
1N3491
thru
1N3495
Designers Data Sheet
MEDIUM-CURRENT SILICON RECTIFIERS

... compact, highly efficient silicon rectifiers.

Designer's Data for "Worst Case" Conditions

The Designers Data Sheet permits the design of most circuits entirely from the information presented. Limit curves — representing device characteristics boundaries — are given to facilitate "worst case" design.

SILICON RECTIFIERS
25 AMPERE
50-400 VOLTS
DIFFUSED JUNCTION


3

***MAXIMUM RATINGS**

Rating	Symbol	1N3491	1N3492	1N3493	1N3494	1N3495	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V _{RRM} V _{RWM} V _R	50	100	200	300	400	Volts
RMS Reverse Voltage	V _{R(RMS)}	35	70	140	210	280	Volts
Average Rectified Forward Current (Single phase, resistive load, 60 Hz, see Figure 3) T _C = 100°C	I _O	25					Amp
Nonrepetitive Peak Surge Current (surge applied at rated load conditions, see Figure 5)	I _{FSM}	300 (for 1/2 cycle)					Amp
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-65 to +175					°C

THERMAL CHARACTERISTICS

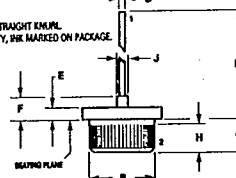
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R _{θJC}	1.2	°C/Watt

MECHANICAL CHARACTERISTICS
CASE: Welded, hermetically sealed construction.

FINISH: All external surfaces corrosion-resistant and the terminal lead is readily solderable.

POLARITY: CATHODE TO CASE (reverse polarity units are available upon request and are designated by an "R" suffix i.e. MR327R or 1N3491R).

MOUNTING POSITIONS: Any.

 NOTES:
 1. 50 TYP STRAIGHT RADIUS.
 2. POLARITY, MARK MARKED ON PACKAGE.


DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	15.484	16.256	0.610	0.640
B	12.725	13.427	0.501	0.530
C	5.08	5.38	0.200	0.210
D	1.193	1.348	0.047	0.053
E	2.032	4.428	0.080	0.175
F	—	19.77	—	0.778
G	4.572	4.703	0.180	0.185
H	—	3.558	—	0.140
I	12.70	—	0.500	—

CASE 43-02
DO-208AA
METAL

*Indicates JEDEC registered data for 1N3491-1N3495

1N3491 thru 1N3495

*ELECTRICAL CHARACTERISTICS

Characteristic and Conditions	Symbol	Max	Unit
Instantaneous Forward Voltage Drop ($I_F = 57$ Amps, $T_J = 25^\circ\text{C}$)	V_F	1.7	Volts
Full Cycle Average Reverse Current (18 Amp AV and V_R , single phase, 60 Hz, $T_C = 150^\circ\text{C}$)	$I_R(\text{AV})$	10 10 8.0 6.0 4.0	mA
DC Reverse Current (Rated V_R , $T_C = 25^\circ\text{C}$)	I_R	1.0	mA

FIGURE 1 — MAXIMUM FORWARD VOLTAGE DROP

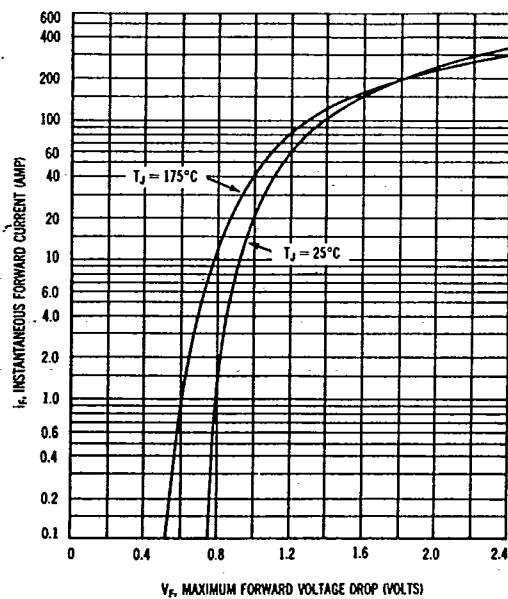
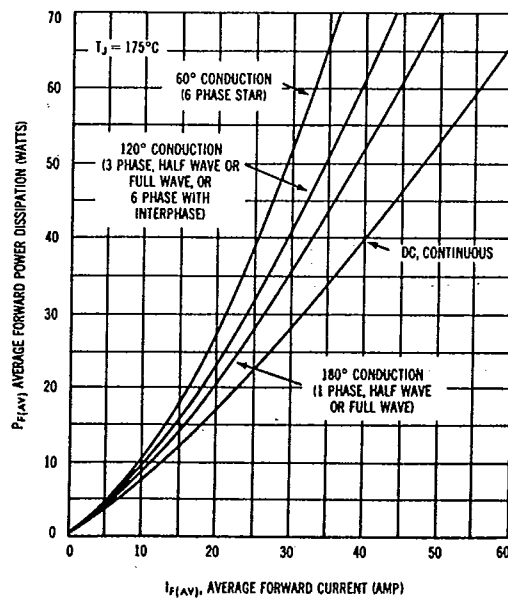


FIGURE 2 — MAXIMUM FORWARD POWER DISSIPATION



1N3491 thru 1N3495

FIGURE 3 — MAXIMUM CURRENT RATINGS

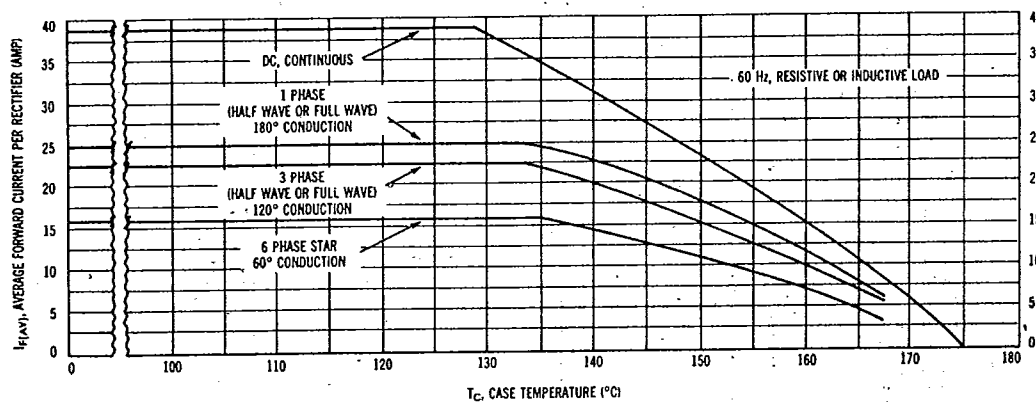


FIGURE 4 — MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE

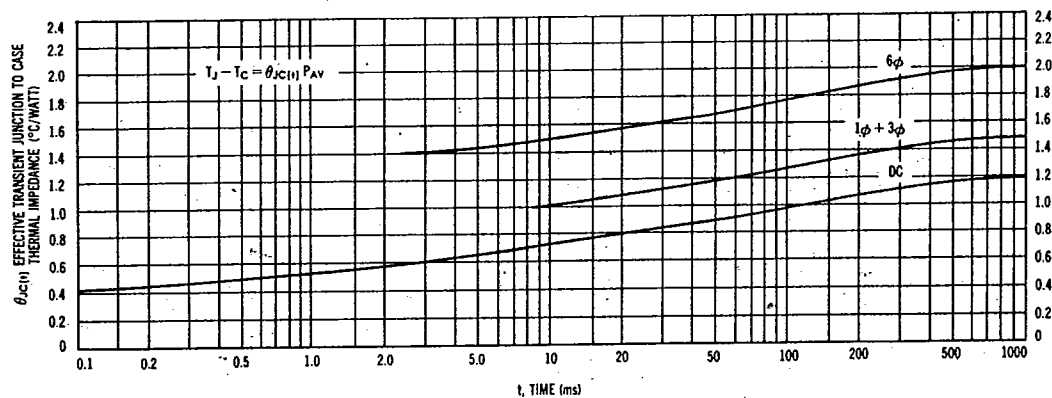
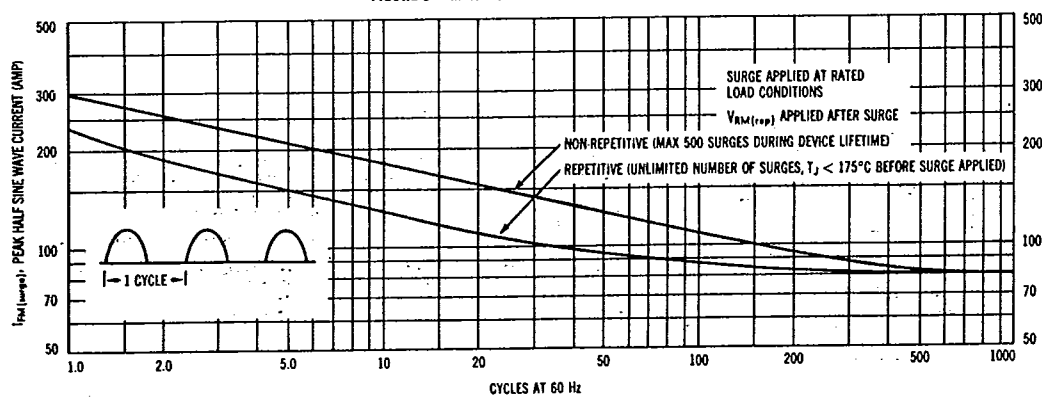


FIGURE 5 — MAXIMUM ALLOWABLE SURGE CURRENT



1N3491 thru 1N3495

TYPICAL DYNAMIC CHARACTERISTICS

FIGURE 6 — RECTIFICATION EFFICIENCY

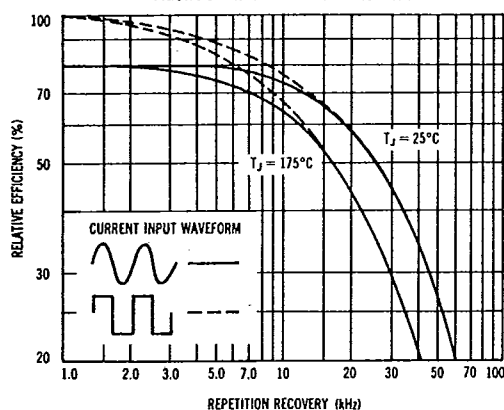


FIGURE 7 — REVERSE RECOVERY TIME

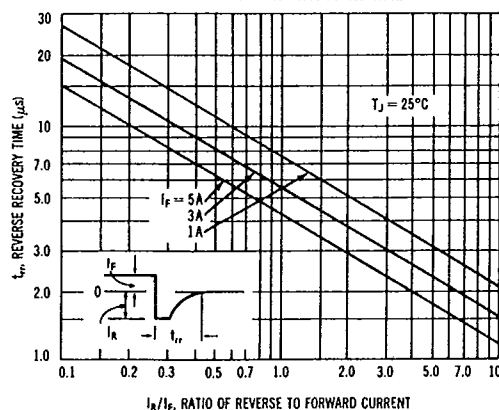


FIGURE 8 — JUNCTION CAPACITANCE

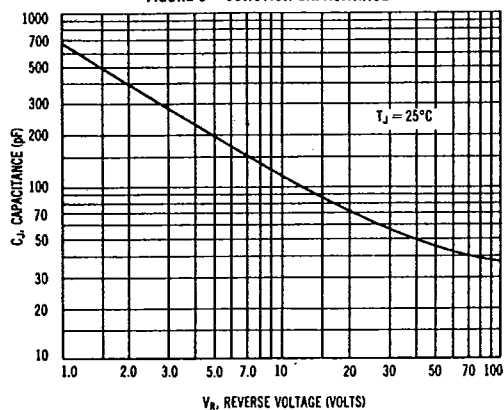
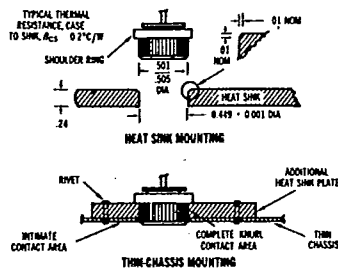
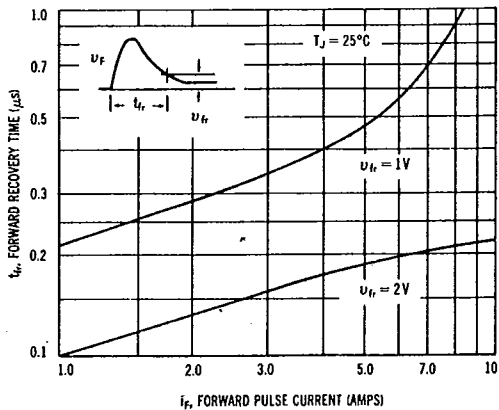


FIGURE 9 — FORWARD RECOVERY TIME



MOUNTING PROCEDURES

MR327-MR331 and 1N3491-1N3495 rectifiers are designed to be press-fitted in a heat sink in order to attain full device ratings. Recommended procedures for this type of mounting are as follows:

1. Drill a hole in the heat sink $0.499 \pm .001$ inch in diameter.
2. Break the hole edge as shown to prevent shearing off the knurled edge of the rectifier when it is pressed into the hole.
3. The depth and width of the break should be 0.010 inch maximum to retain maximum heat sink surface contact.
4. To prevent damage to the rectifier during press-in, the pressing force should be applied only on the shoulder ring of the rectifier case as shown in the figure.
5. The pressing force should be applied evenly about the shoulder ring to avoid tilting or canting of the rectifier case in the hole during the press-in operation. Also, the use of a light industrial lubricant will be of considerable aid.