

1N3491 thru 1N3495 (SILICON)
(MR322 thru MR328)
MR330, MR331

CASE 43
(DO-21)



Medium-current silicon rectifiers – compact, highly efficient silicon rectifiers for medium-current applications.

MAXIMUM RATINGS

Rating	Symbol	1N3491 MR322	1N3492 MR323	1N3493 MR324	1N3494 MR325	1N3495 MR326	MR327	MR328	MR330	MR331	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RM(rep)}$ $V_{RM(wkg)}$ V_R	50	100	200	300	400	500	600	800	1000	Volts
Non-Repetitive Peak Reverse Voltage (halfwave, single phase, 60 cycle peak)	$V_{RM(non-rep)}$	100	200	300	400	500	600	720	1000	1200	Volts
RMS Reverse Voltage	V_R	35	70	140	210	280	350	420	560	700	Volts
Average Rectified Forward Current (single phase, resistive load, 60 Hz, see Figure 3) $T_C = 130^{\circ}C$	I_O	25									Amp
Non-Repetitive Peak Surge Current (surge applied at rated load conditions, see Figure 5)	$I_{FM(surge)}$	300 (for 1/2 cycle)									Amp
I^2t Rating (non-repetitive, for t greater than 1 ms and less than 8.3 ms)	I^2t	375									$A_{(rms)}^2 sec$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +175									$^{\circ}C$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	1.2	$^{\circ}C/Watt$

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.

1N3491 thru 1N3495 (continued)

ELECTRICAL CHARACTERISTICS

Characteristic and Conditions	Symbol	Max	Unit
Full Cycle Average Forward Voltage Drop (rated I_O and V_F , single phase, 60 Hz, $T_C = 150^{\circ}\text{C}$)	$V_{F(AV)}$	0.6	Volts
Instantaneous Forward Voltage Drop ($i_F = 100$ Amps, $T_J = 25^{\circ}\text{C}$)	V_F	1.5	Volts
Full Cycle Average Reverse Current (rated I_O and V_R , single phase, 60 Hz, $T_C = 150^{\circ}\text{C}$) 1N3491/MR322 1N3492/MR323 1N3493/MR324 1N3494/MR325 1N3495/MR326 MR327 MR328 MR330 MR331	$I_{R(AV)}$	10 10 8.0 6.0 4.0 3.0 2.5 2.0 1.5	mA
DC Reverse Current (Rated V_R , $T_C = 25^{\circ}\text{C}$)	I_R	1.0	mA

FIGURE 1 — MAXIMUM FORWARD VOLTAGE DROP

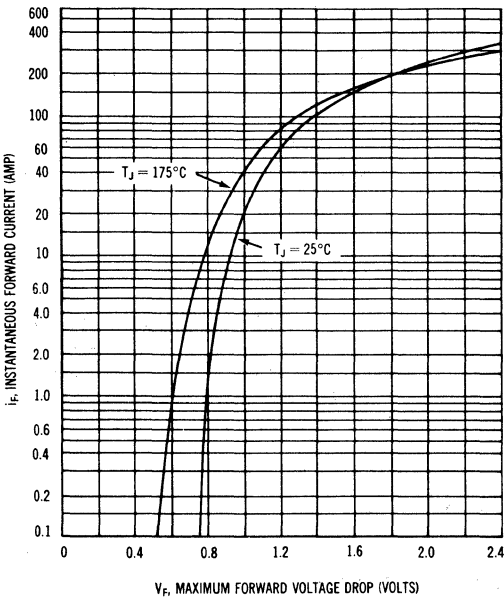
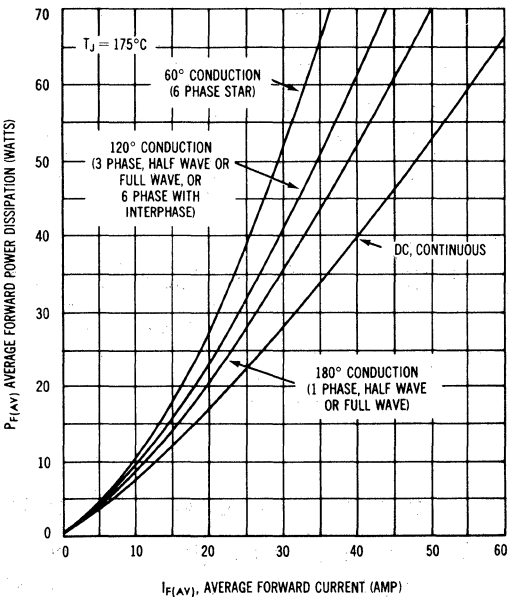


FIGURE 2 — MAXIMUM FORWARD POWER DISSIPATION



1N3491 thru 1N3495 (continued)

FIGURE 3 — MAXIMUM CURRENT RATINGS

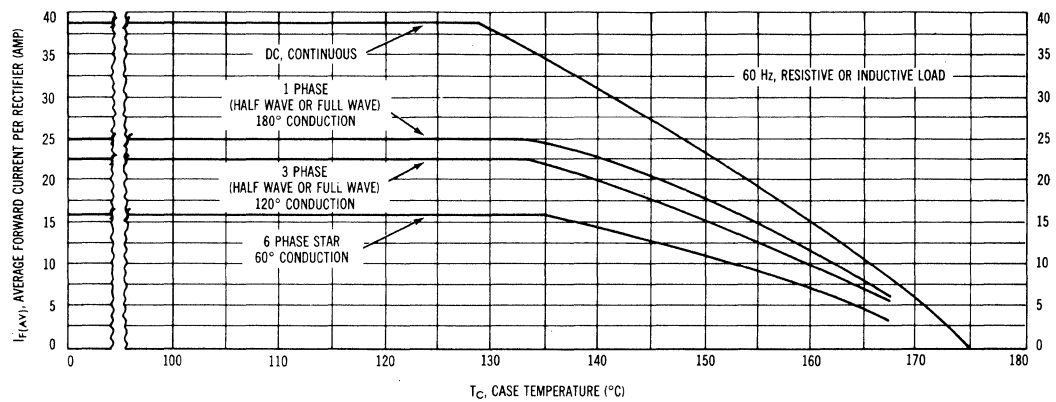


FIGURE 4 — MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE

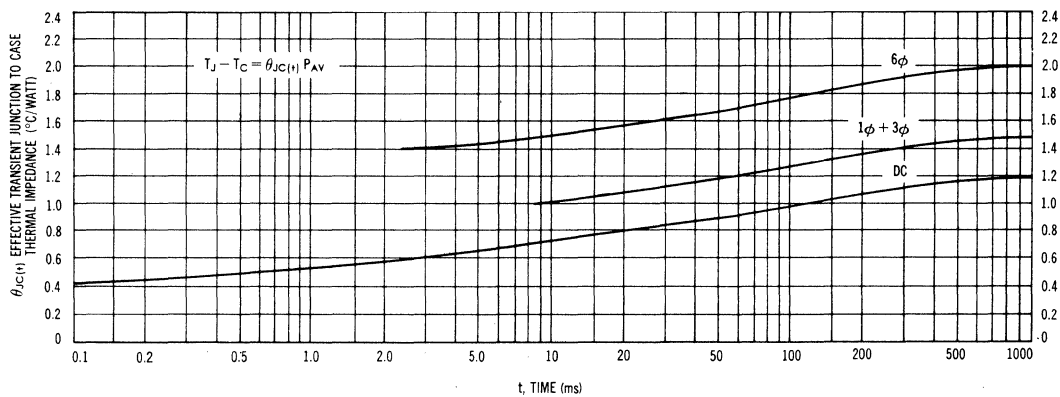
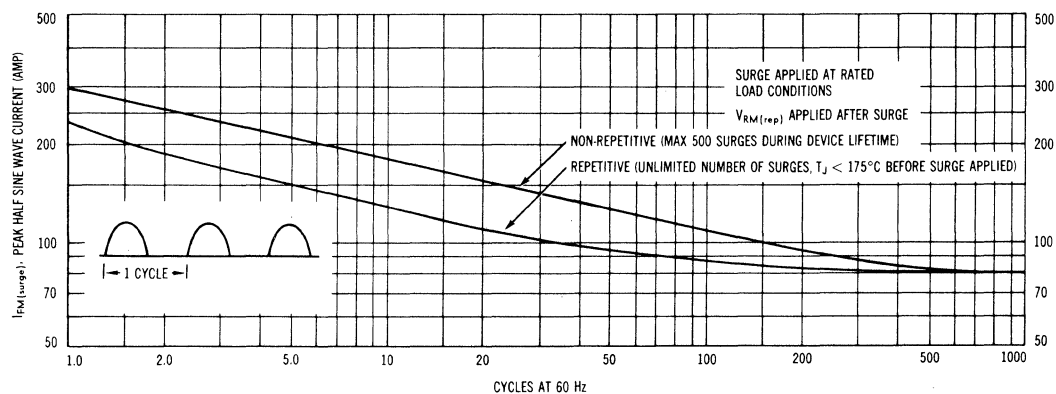


FIGURE 5 — MAXIMUM ALLOWABLE SURGE CURRENT



1N3491 thru 1N3495 (continued)

TYPICAL DYNAMIC CHARACTERISTICS

FIGURE 6 — RECTIFICATION EFFICIENCY

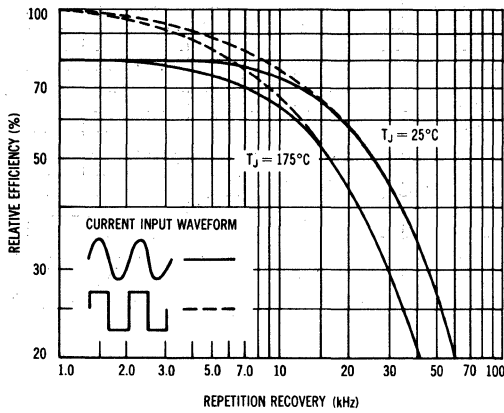


FIGURE 7 — REVERSE RECOVERY TIME

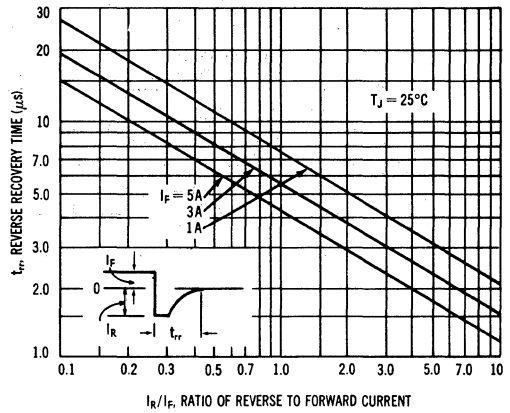


FIGURE 8 — JUNCTION CAPACITANCE

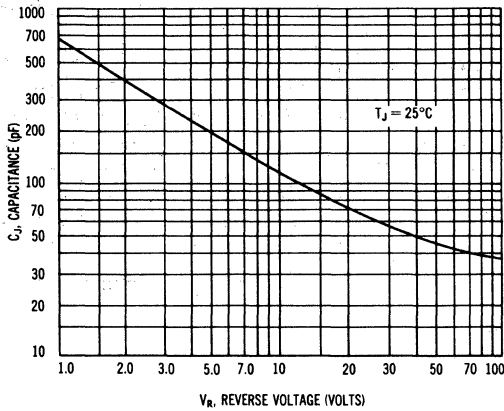
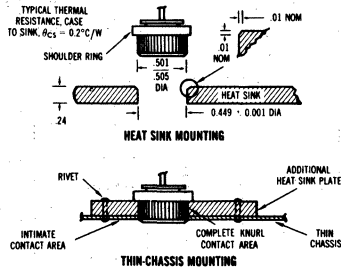
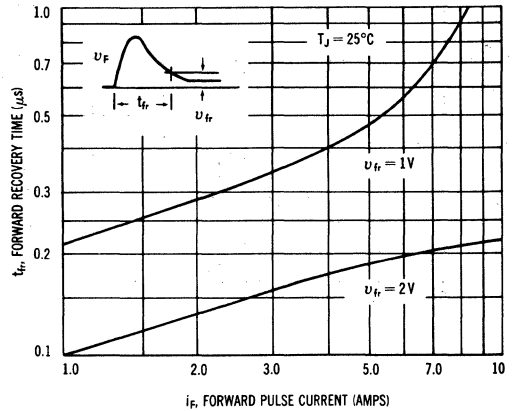


FIGURE 9 — FORWARD RECOVERY TIME



MOUNTING PROCEDURES

MR322-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.