

1N3488-1N3566

TYPE	MATERIAL	REPLACEMENT	PAGE NUMBER	IDENTIFICATION	RECTIFIERS					ZENER DIODES					
					V_R (volts)	V_F (volts)	I_O (Amps)	I_R (mA)	I_{surge} (Amps)	V_Z (min)	V_Z (nom) *	T_{ol} V_Z %	P_D		
					SIGNAL DIODES					REFERENCE DIODES					
					V_{PRV} (volts)	V_F @ I_F (volts)	I_R	t_{rr} (μ s)	TC %/°C	V_Z	T (min) °C	T (max) °C			
1N3488 1N3489 thru 1N3490 1N3491 1N3492 1N3493 1N3494 1N3495	S S S S S S S S S	Varactor Diode, See table on page 1-86 4-Layer Diodes, See table on page 1-96		R R R R R	50 100 200 300 400	1.7 1.7 1.7 1.7 1.7	18 18 18 18 18	1.0 1.0 1.0 1.0 1.0	300 300 300 300 300						
1N3496 1N3497 1N3498	S S S	1N829 1N827 1N825	2-45 2-45 2-45	RD RD RD						0.005 0.002 0.001	6.5 6.5 6.5	0 0 0	75 75 75		
1N3499 1N3500 1N3501 1N3502 1N3503 1N3504 1N3506 1N3507 1N3508 1N3509 1N3510 1N3511	S S S S S S S S S S S S	1N823 1N821 M2640 M2620 M2610 M2605 1N5226B 1N5227B 1N5228B 1N5229B 1N5230B 1N5231B	2-45 2-45 2-52 2-52 2-52 2-52 2-32 2-32 2-32 2-32 2-32 2-32	RD RD RD RD RD RD ZD ZD ZD ZD ZD ZD						0.0005 0.01	6.5 6.5 6.5 6.5 6.5 6.5 3.3* 3.6* 3.9* 4.3* 4.7* 5.1*	0 0 25 25 25 25 5.0 5.0 5.0 5.0 5.0 5.0	75 75 100 100 100 100 400M 400M 400M 400M 400M 400M		
1N3512 1N3513 1N3514 1N3515 1N3516 1N3517 1N3518 1N3519 1N3520 1N3521 1N3522 1N3523	S S S S S S S S S S S S	1N5232B 1N5234B 1N5235B 1N5236B 1N5237B 1N5239B 1N5240B 1N5241B 1N5242B 1N5243B 1N5245B 1N5246B	2-32 2-32 2-32 2-32 2-32 2-32 2-32 2-32 2-32 2-32 2-32 2-32	ZD ZD ZD ZD ZD ZD ZD ZD ZD ZD ZD ZD							5.6* 6.2* 6.8* 7.5* 8.2* 9.1* 10* 11* 12* 13* 15* 16*	5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0	400M 400M 400M 400M 400M 400M 400M 400M 400M 400M 400M 400M		
1N3524 1N3525 1N3526 1N3527 1N3528 1N3529 1N3530 1N3531 1N3532 1N3533 1N3534 1N3535 1N3536	S S S S S S S S S S S S S	1N5248B 1N5250B 1N5251B 1N5252B 1N5254B 1N5256B 1N5257B 1N5258B 1N5259B 1N5260B 1N5261B	2-32 2-32 2-32 2-32 2-32 2-32 2-32 2-32 2-32 2-32 2-32	ZD ZD ZD ZD ZD ZD ZD ZD ZD ZD ZD							18* 20* 22* 24* 27* 30* 33* 36* 39* 43* 47*	5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0	400M 400M 400M 400M 400M 400M 400M 400M 400M 400M 400M		
1N3537 1N3538 1N3539 1N3539A 1N3540 1N3540A 1N3541 1N3541A 1N3542 1N3542A 1N3543 1N3543A 1N3544	S S S S S S S S S S S S S	1N4741A† Backward Diode Backward Diode Backward Diode Backward Diode Backward Diode Backward Diode Backward Diode Backward Diode Backward Diode Backward Diode Backward Diode 1N4002	2-29 3-24	ZD GP GP GP GP GP GP GP GP GP GP GP R	150 100	0.549 0.65 1.5	100M 1.0M 0.6	25N 0.2	15 15		12*		1.0W		
1N3545 1N3546 1N3547 1N3548 1N3549 1N3550 1N3551 thru 1N3552 1N3553 1N3554 thru	S S S S S S S S S S S S	1N4003 1N4004 1N4004 1N4005 1N4005 Varactor Diodes, See table on page 1-86 1N821 Varactor Diodes, See table on page 1-86	3-24 3-24 3-24 3-24 3-24 2-45 	R R R R R RD 	200 300 400 500 600 100	1.5 1.5 1.5 1.5 1.5 1.7	0.6 0.6 0.6 0.6 0.6 18	0.2 0.2 0.2 0.2 0.2 300	15 15 15 15 15 100		0.0001	6.3	-55	100	
1N3557 1N3558 1N3559 1N3560 thru 1N3562 1N3563 1N3564 1N3565 1N3566	S G S G S S	Matched Pair of 1N751A's, Zener Diode Tunnel Diodes, See table on page 1-92		GP R GP HC R	24 1000 15 6.0 800	1.0 1.2 1.0 2.0 2.25	200M 0.4 40M 2.0A 1.0	20* 0.2 40 25M 0.5							

R—Rectifier, RD—Reference Diode, ZD—Zener Diode, GP—General Purpose, HC—High Conductance (≥ 20 mA @ ≤ 1 V), HS—High Speed Switch (Max $t_r < 0.3 \mu$ s), CS—High Conductance, High Speed Switch, MS—Medium Speed Switch, PA—Parametric Amplifier, SP—Special Purpose.

*Original device is a clipper, requires a pair of units for adequate replacement.

1N3491 thru 1N3495 (SILICON)
(MR322 thru MR326)
MR327, MR328, MR330, MR331

V_R — to 1000 V

$I_O = 25$ A

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 6 4 3 2.5 2 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

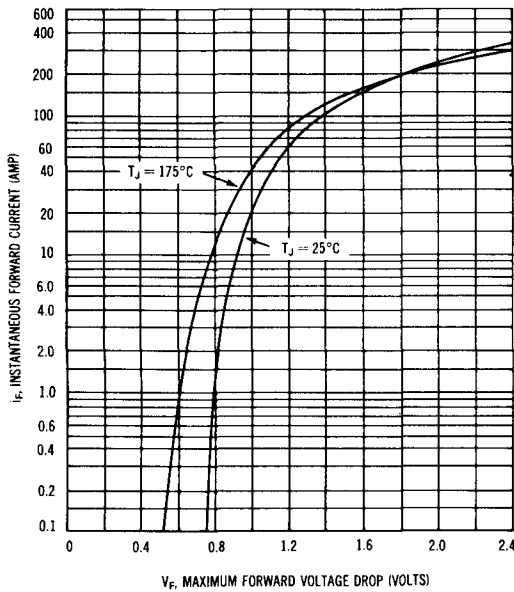
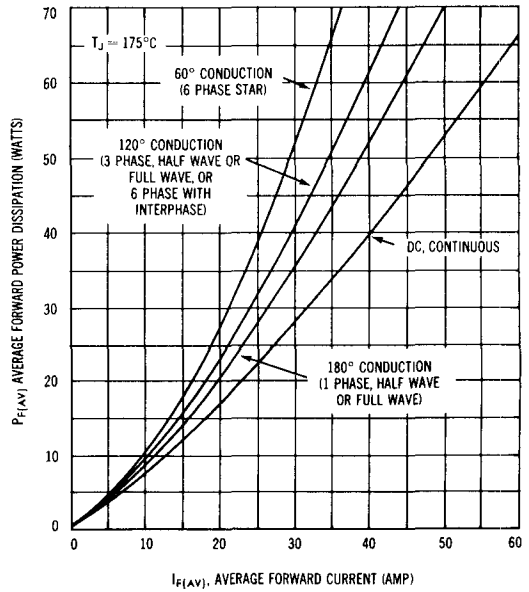


FIGURE 2 — MAXIMUM FORWARD POWER DISSIPATION



1N3491 thru 1N3495 (continued)

FIGURE 3 — MAXIMUM CURRENT RATINGS

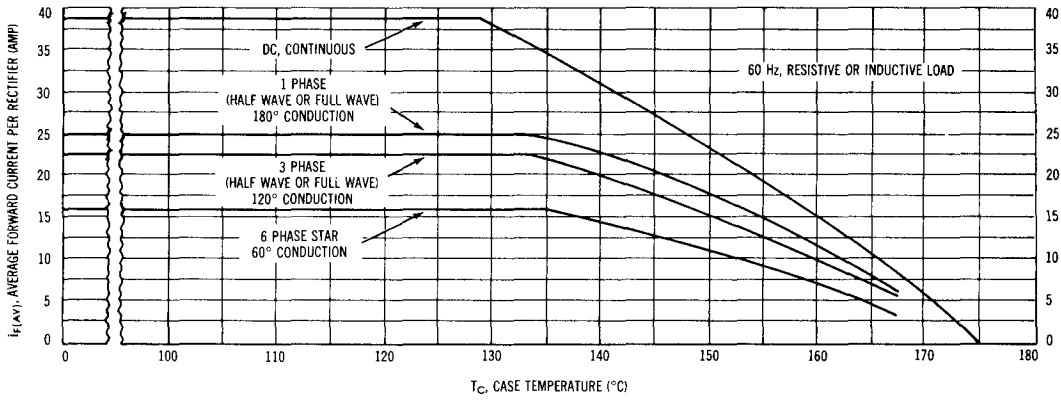


FIGURE 4 — MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE

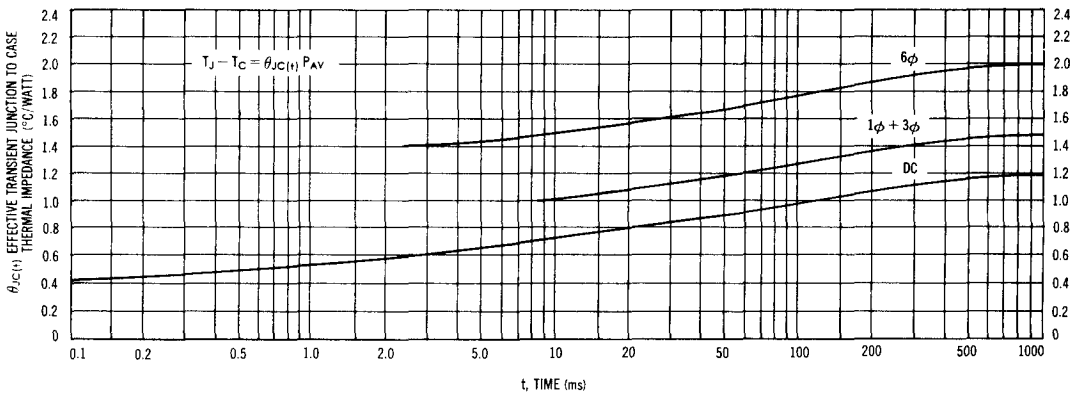
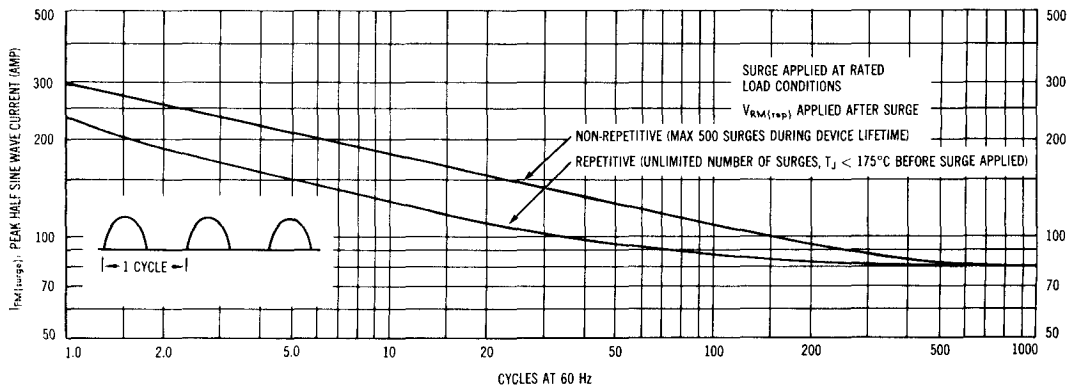


FIGURE 5 — MAXIMUM ALLOWABLE SURGE CURRENT



1N3491 thru 1N3495 (continued)

TYPICAL DYNAMIC CHARACTERISTICS

FIGURE 6 — RECTIFICATION EFFICIENCY

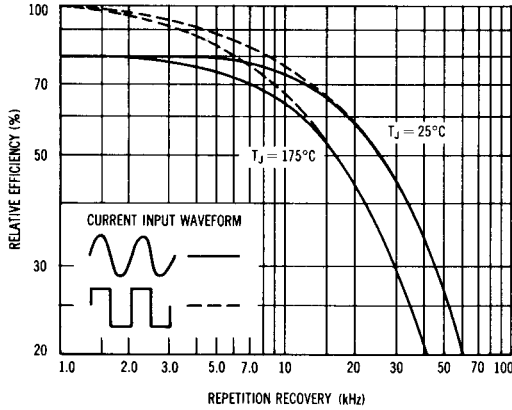


FIGURE 7 — REVERSE RECOVERY TIME

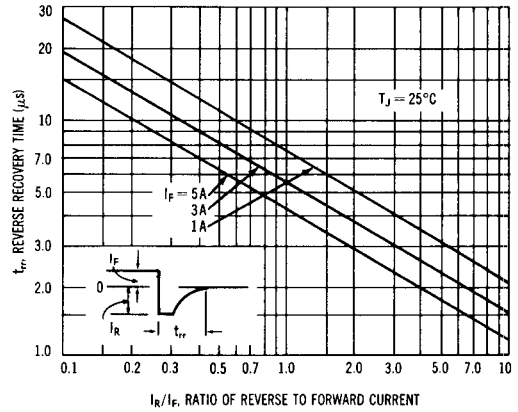


FIGURE 8 — JUNCTION CAPACITANCE

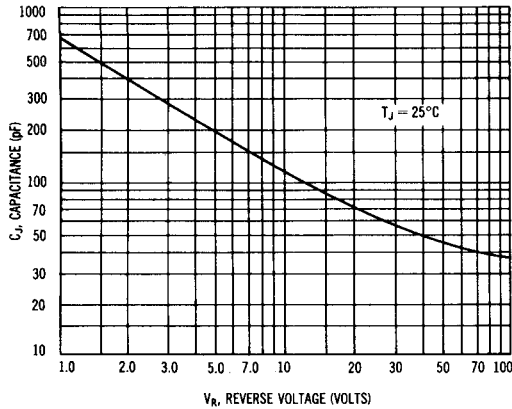
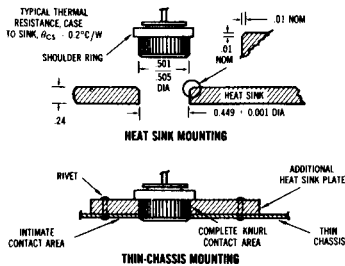
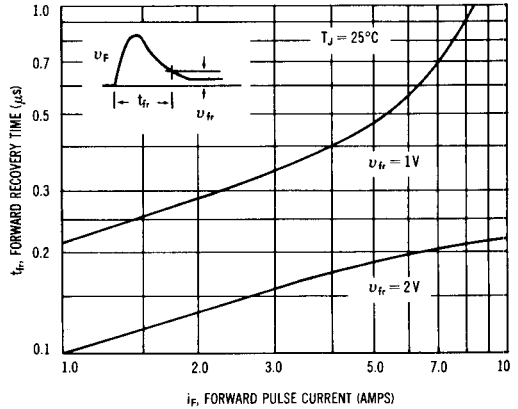


FIGURE 9 — FORWARD RECOVERY TIME



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.

NOTE:

Refer to brochure PR-104 for additional suggested mounting methods, examples and information.