DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

MR2400F-MR2406F

24A FAST RECOVERY RECTIFIERS

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS.

Rating	Symbol	MR					Unit
		2400F	2401F	2402F	2404F	2406F	
Peak repetitive reverse voltage **Working peak reverse voltage** **DC blocking voltage**	V_{RRM} V_{RWM} V_R	50	100	200	400	600	V
Non-repetitive peak reverse voltage	V_{RSM}	75	150	250	450	650	V
RMS reverse voltage	$V_{R(RMS)}$	35	70	140	280	420	V
Average rectified forward current (single phase, resistive load, T_C = 125°C)	I_O	24					A
Non repetitive peak surge current (@ rated load)	I_{FSM}	300					A
Operating junction temperature range	T_J	-65 to +150					°C
Storage junction temperature range	T_{stg}	-65 to +175					°C
Thermal resistance, junction to case	$R_{\Theta JC}$	0.8					°C/W
Thermal resistance, junction to air, (PC board mount, perpendicular to surface)	$R_{\Theta JA}$	55					°C/W

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Min	Typ	Max	Unit
Instantaneous forward voltage (I_F = 75A, T_J = 150°C)	V_F	-	1.15	1.29	V
Forward voltage (I_F = 24A, T_C = 25°C)	V_F	-	1.00	1.15	V
Reverse current (Rated dc voltage, T_C = 25°C) (Rated dc voltage, T_C = 100°C) (Rated dc voltage, T_C = 150°C)	I_R	- - -	10 0.5 7.0	25 1.0 10	µA mA mA
Reverse recovery time – soft recovery (I_F = 1.0A to V_R = 30Vdc) (I_{FM} = 36A, di/dt = 25A/µs)	t_{rr}	- -	150 200	200 300	ns
Reverse recovery current (I_F = 1.0A to V_R = 30Vdc)	$I_{RM(REC)}$	-	-	4.0	A

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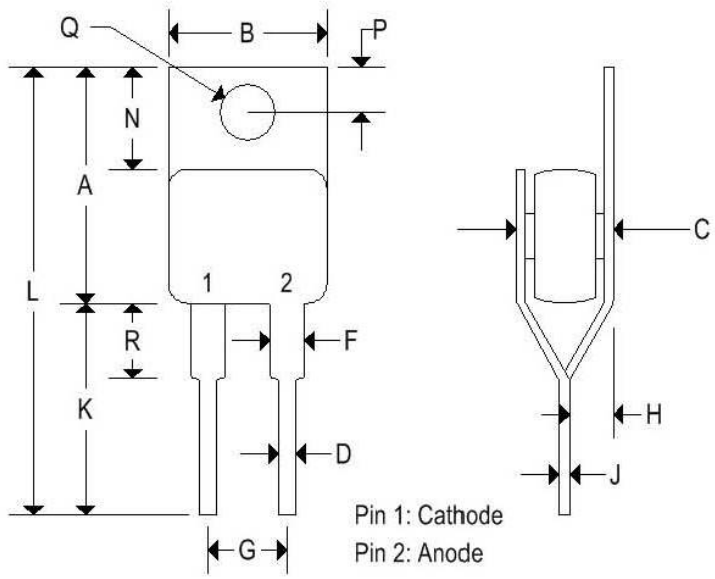
MECHANICAL CHARACTERISTICS

Case	Digi AA
Marking	Body painted, alpha-numeric
Pin out	See below



	Digi AA			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.560	0.625	14.220	15.88
B	0.380	0.420	9.650	10.670
C	0.284	0.310	7.210	7.870
D	0.025	0.045	0.640	1.140
F	0.060	0.090	1.520	2.290
G	0.170	0.210	4.320	5.330
H	0.080	0.115	2.030	2.920
J	0.023	0.029	0.580	0.740
K	-	0.562	-	14.270
L	-	1.187	-	30.150
N	0.230	0.270	5.840	6.860
P	0.100	0.120	2.5400	3.050
Q	0.139	0.147	3.530	3.730
R	-	0.200	-	5.080

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FIGURE 1 — MAXIMUM FORWARD VOLTAGE

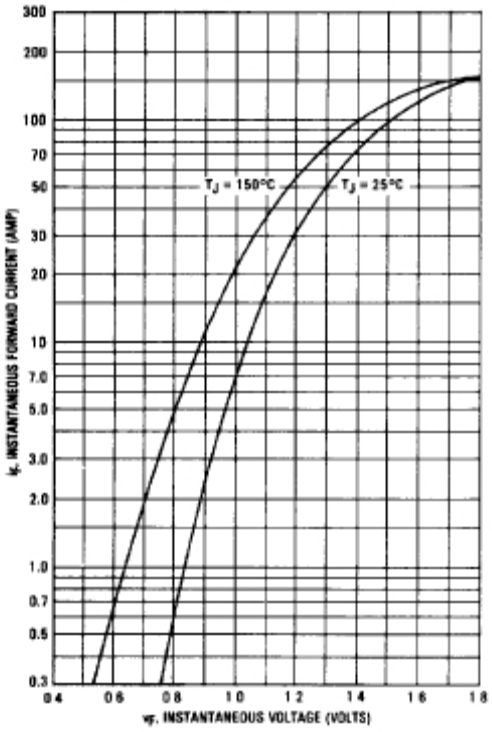
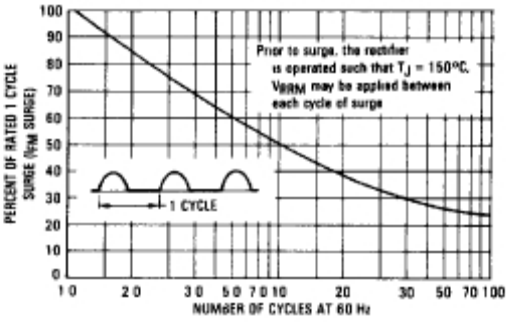


FIGURE 2 — MAXIMUM SURGE CAPABILITY



NOTE 1

DUTY CYCLE, D = t_p/t1
PEAK POWER, P_{pk}, is peak of an equivalent square power pulse

To determine maximum junction temperature of the diode in a given situation, the following procedure is recommended

The temperature of the case should be measureed using a thermocouple placed on the case at the temperature reference point. The thermal mass connected to the case is normally large enough so that it will not significantly respond to heat surges generated in the diode as a result of pulsed operation once steady-state conditions are achieved. Using the measured value of T_C, the junction temperature may be determined by.

$$T_J = T_C + \Delta T_{JC}$$

where ΔT_{JC} is the increase in junction temperature above the case temperature. It may be determined by

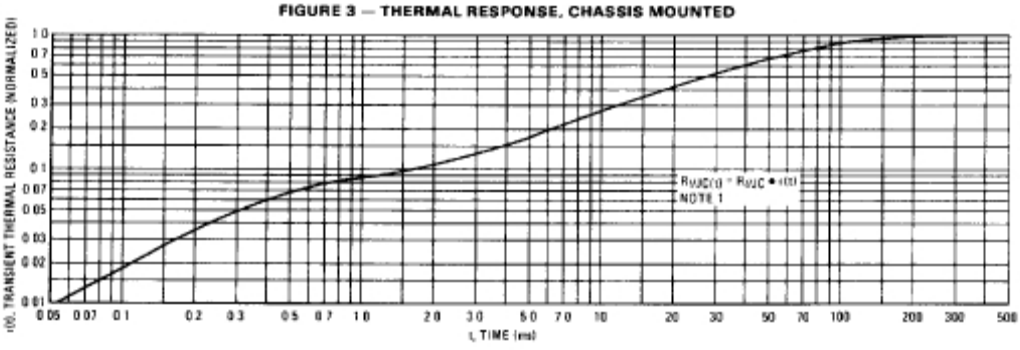
$$\Delta T_{JC} = P_{pk} \bullet R_{\theta JC} [D + (1 - D) \bullet r(t1 + t_p) + r(t_p) - r(t1)]$$

where

r(t) = normalized value of transient thermal resistance at time, t, from Figure 3, i.e.

$r(t1 + t_p)$ = normalized value of transient thermal resistance at time $t1 + t_p$

FIGURE 3 — THERMAL RESPONSE, CHASSIS MOUNTED



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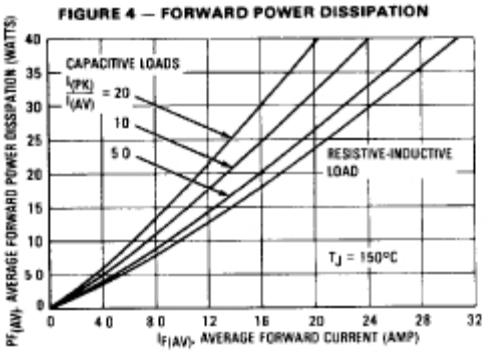
24A FAST RECOVERY RECTIFIERS

CHASSIS MOUNT RATING DATA

Sine Wave Input

FIGURE 4 — FORWARD POWER DISSIPATION



Square Wave Input

FIGURE 5 — FORWARD POWER DISSIPATION

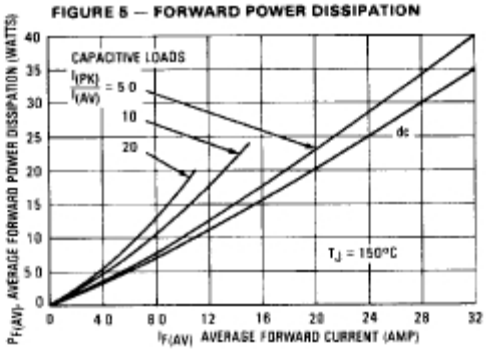


FIGURE 6 — CURRENT DERATING

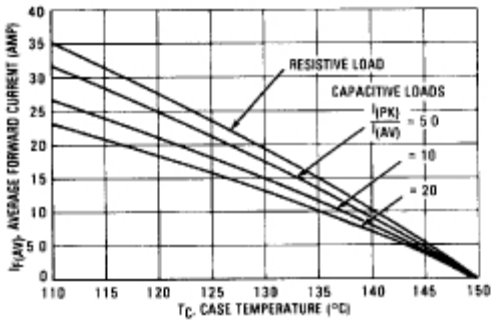
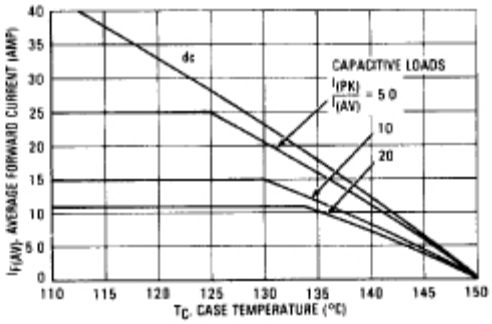


FIGURE 7 — CURRENT DERATING



PRINTED CIRCUIT BOARD RATING DATA

FIGURE 8 — FORWARD POWER DISSIPATION

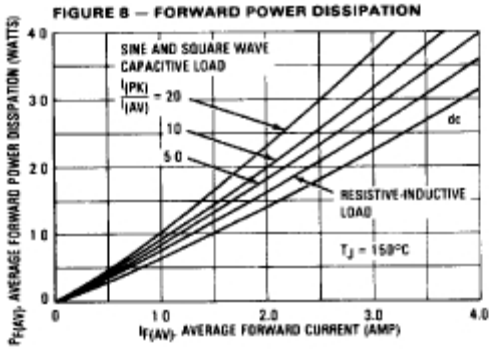


FIGURE 9 — CURRENT DERATING