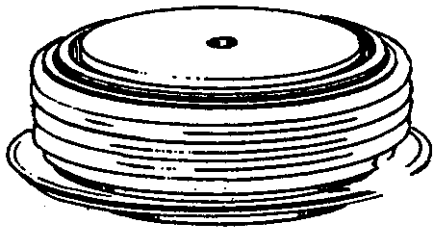
SILICON POWER

A740, A750, A780

53mm RECTIFIER DIODES
4200V - 1200V, 2400A - 1500A

Type A740, A750 and A780 rectifier diodes feature a nominal 53mm silicon junction diameter design processed with the proven multi-diffusion technology. High reverse blocking voltage is optimized for low forward voltage and reverse recovery current.

This series is designed specifically for 50/60 Hz rectifiers needed for the transportation, industrial and utility fields. They are housed in hermetically sealed disc-type packages having glazed-fluted ceramic insulator walls and a welded metal to metal seal.



RECTIFIER DIODE PRESSPAK

TABLE 1 MAIMUM ALLOWABLE RATINGS

TYPE	REPETITIVE PEAK REVERSE VOLTAGE V_{DRM}/V_{RRM} (1) T_j = -40°C to T_j max	REPETITIVE PEAK REVERSE VOLTAGE V_{DRM}/V_{RRM}(1) T_j = @200°C	V_{FM} @ (2) 1KA T_j = 160°C	I_{FSM}(3) 8.3ms/10ms	$I_{F(AV)}$(4) @ T_{case} = 100°C
A780DB	4200 volts	3600 volts	1.15V	20/18KA	1500A
DA	4100	3500			
DP	4000 T_j max	3400			
CT	3900 = 170°C	3300			
CN	3800	3200			
CS	3700	3100			
CM	3600	3000			
CE	3500	2900			
A750CB	3200 volts	2800 volts	0.96V	25/22KA	1800A
CA	3100	2700			
CP	3000 T_j max	2600			
LT	2900 = 175°C	2500			
LN	2800	2400			
LS	2700	2300			
LM	2600	2200			
LE	2500	2100			
A740L	2000 volts	1700 volts	0.86V	32/30KA	2400A
PT	1900	1600			
PN	1800 T_j max	1500			
PS	1700 = 185°C	1400			
PM	1600	1300			
PE	1500	1200			
PD	1400	1100			

NOTES:

1. Sinusoidal waveform 50/60Hz. Device under test must be assembled with recommended mounting force to a heat dissipator at less than 0.3°C/W. T_j max is normal sustained operation. T_j @200°C is for momentary, short periods.
2. Instantaneous peak values half sine (8.3ms-10ms)
3. Non-repetitive surge current rating - crest of half sinewave $T_{j_{max}}$ = 175°C ; V_R = .67V_{RRM}
4. Full cycle average current - continuous half sinewave @50/60Hz (see Mounting Instructions)

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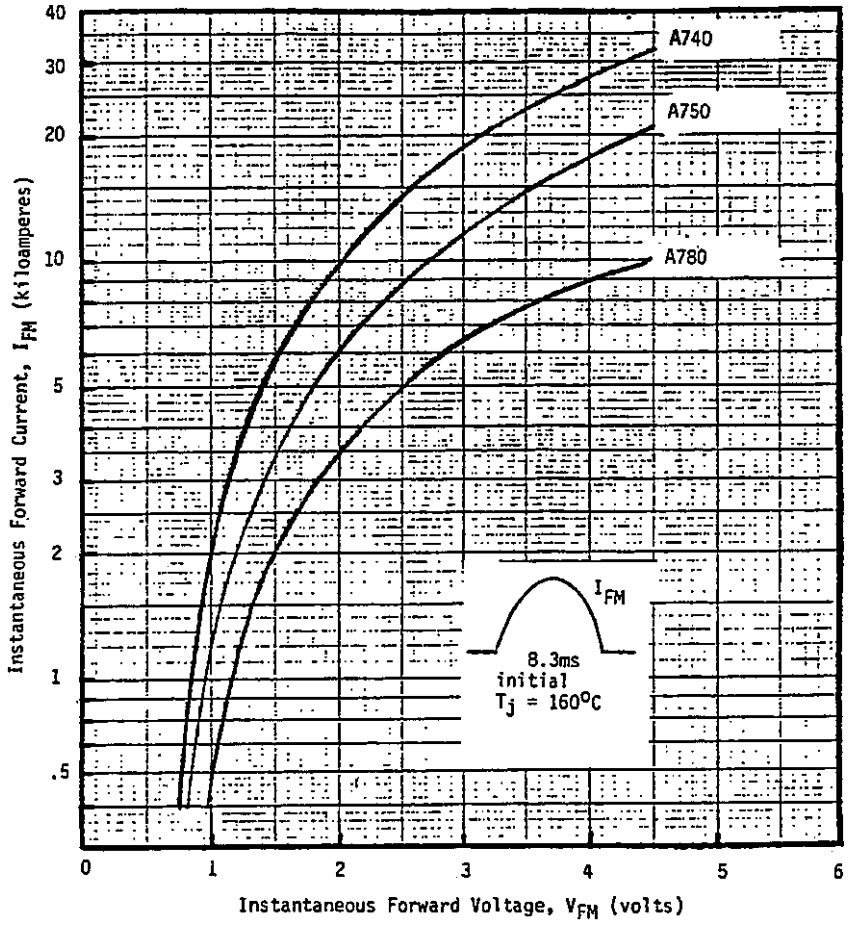


Fig. 1 Family of Maximum Forward Characteristics

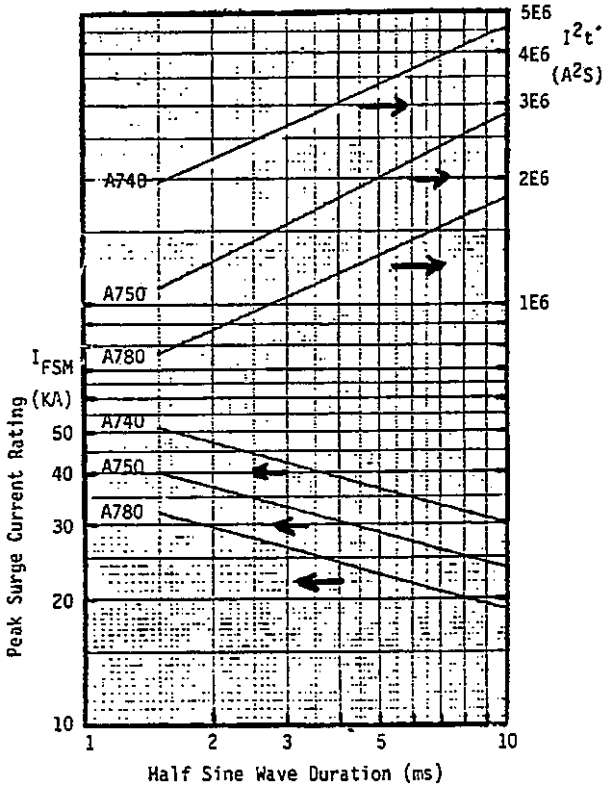


Fig. 2 Non-repetitive I_{FSM} and I^2t Capability for Fuse Coordination

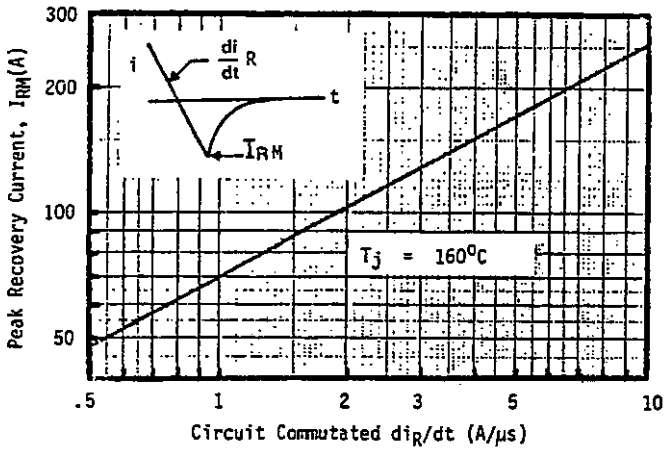


Fig. 3 Maximum Peak Recovery Current

$I_{F(AV)}$ A	FULL CYCLE AVERAGE POWER DISSIPATION - FORWARD CURRENT					
	A740		A750		A780	
	120° cond sq wave	180° cond half sine	120° cond sq wave	180° cond half sine	120° cond sq wave	180° cond half sine
	watts	watts	watts	watts	watts	watts
200	150	143	169	162	203	195
300	243	232	280	265	335	318
400	345	328	404	381	485	457
500	456	432	542	507	655	611
600	574	542	693	645	844	781
700	699	658	856	793	1054	968
800	833	781	1030	951	1284	1171
900	974	910	1217	1118	1534	1390
1000	1122	1045	1415	1296	1806	1627
1200	1440	1334	1844	1679	2414	2153
1400	1788	1647	2317	2099	3108	2749
1600	2164	1984	2833	2555	3892	3416
1800	2570	2345	3391	3046		
2000	3005	2730				
2200	3468	3138				
2400	3961	3571				

TABLE II Full Cycle Average Power Dissipation as Function of Average Current

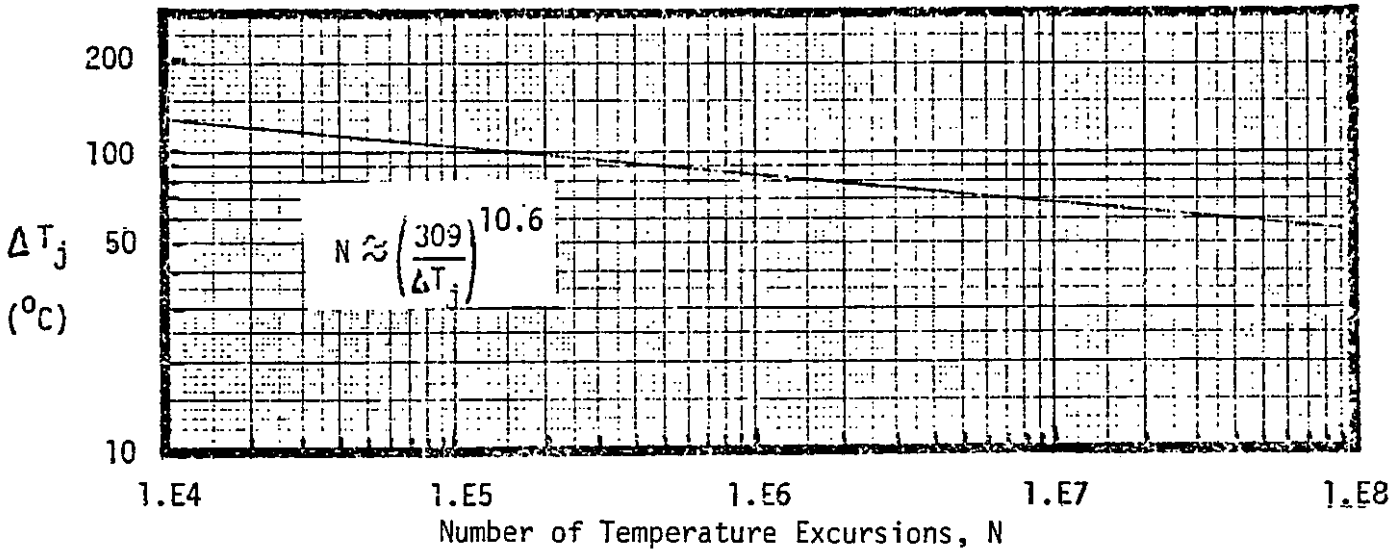


Fig. 4 Number of Junction Temperature Excursions Than Can Induce Thermal Fatigue Failure

T_j (°C)	A740	A750	A780
	ma	ma	ma
-40 to +25	10	10	10
170	-	-	80
175	-	50	-
185	50	-	-
200	100	100	300

TABLE III Maximum Instantaneous Leakage Current versus Junction Temperature
I_{RRM} @V_{RRM} for T_j

ASSEMBLY OF PRESSPAKS TO HEAT DISSIPATORS

1. INSPECTION OF MATING SURFACES

Check each mating surface for nicks, scratches, flames and surface finish. The Presspak surface has a total indicator reading TIR .0005-inch and surface finish prior to factory electrical test in pressure fixtures. The dissipator surface should be equally as good. The TIR of a fully tested Presspak may run higher but not exceed .001-inch net including some minor nicks and scratches also associated with test fixtures. (Recommended mounting force is based upon these requirements.)

2. SURFACE DEOXIDATION AND CLEANING

Although plated surfaces are recommended for aluminum and copper heat dissipators, bare surfaces may be used if careful attention to cleaning and treating is assured. Plated surfaces and Presspaks should be lightly sanded with 600 grit paper, then oil or compound applied as recommended. Unplated surfaces should be vigorously abraided with a fine wire brush or 3M "Scotchbrite" coated with Alcoa #2 compound. The Alcoa #2 should be removed and the recommended compound applied.

3. FINAL SURFACE TREATMENT (a)(b)

Apply silicon oil or thin layer of grease or compound as indicated below. Rotate the Presspak to properly distribute the applied agent.

- bare copper - use G322L or LS2037
- bare aluminum - use Alcoa #2 or G322L
- tin-plated copper or aluminum - use SF1154 preferably, or G623 or G322L
- nickel-plated aluminum - use SF1154 or G623
- silver-plating is not recommended.

4. MOUNTING

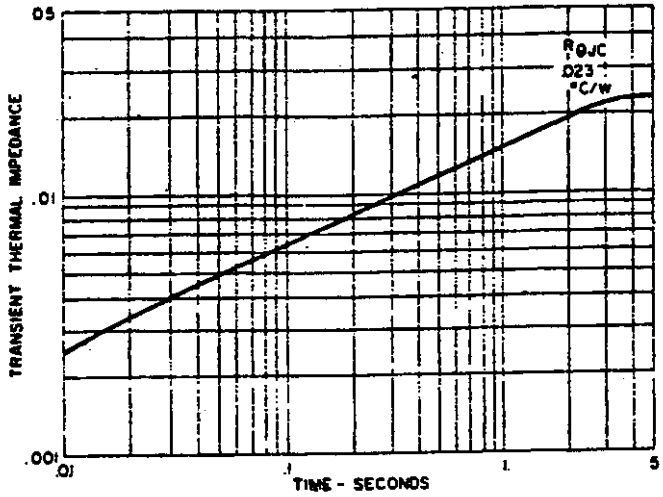
Assemble with specified mounting force applied through a self-leveling swivel connection. The force has to be evenly distributed over the full area. Center holes on top and bottom of the Presspak are for locating.

5000 - 6000 lbs.
22.4 - 26.7 kN

NOTES:

a) Silicone oil SF1154, 200 centistoke, clear silicone grease G623, and yellow compound G322L are products of the General Electric Company; compound Alcoa #2 is a product of Aluminum Company of America; and LS2037 black compound is a product of Arco Company 7301 Bessemer Avenue, Cleveland, Ohio.

b) Limit maximum joint temperature to 95°C, except for those prepared with SF1154 or G322L, which are limited to 150°C.

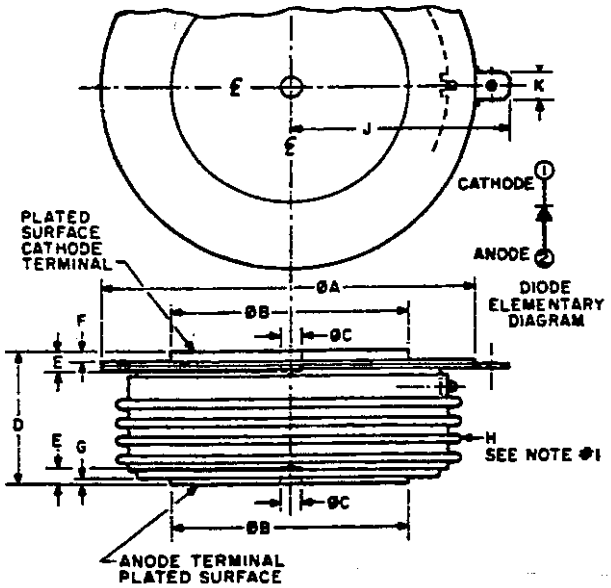


NOTES:

1. Add .006°C/W to account for both case to dissipator interfaces when properly mounted: e.g., $R\theta_{JS}$ = .029° C/W. See Mounting Instructions.
2. DC Thermal Impedance is based on average full cycle junction temperature. Instantaneous junction temperature may be calculated using the following modifications:
   - end of conducting portion of cycle
     - 120° sq. wave add .0025°C/W along entire curve
     - 180° sq. wave add .0018°C/W along entire curve
     - 180° sine wave add .0010°C/W along entire curve
   - end of full cycle
     - any wave, subtract .001°C/W along entire curve.

7. TRANSIENT THERMAL RESISTANCE– JUNCTION-TO-CASE

Outline Drawing



SYM.	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
ϕA	–	2.960	–	75.18	
ϕB	1.800	1.900	45.78	49.26	
ϕC	0.136	0.146	3.45	3.71	
D	1.000	1.070	25.10	27.18	
E	.070	.100	1.78	2.54	
F	.030	–	0.76	–	
G	.003	.067	0.13	1.70	
H	–	–	–	–	1
J	1.630	1.710	42.67	43.43	
K	.186	.189	4.72	4.80	

NOTE:

1. Glazed ceramic insulator with 1.00-inch (25.40mm) surface creepage, minimum.