High Speed
Fast Recovery Rectifier

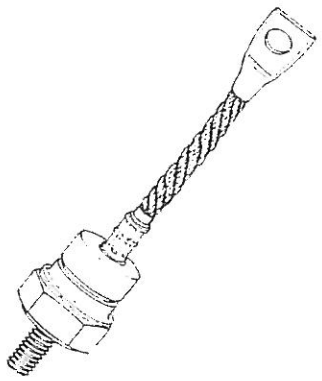
A187

A190 SEE 1N3735, PAGE 241

1500 Volts 150A Avg.

The A187 series is General Electric's highly reliable, all-diffused, Pic-Pac,[4] 150 ampere, fast recovery, silicon rectifier diode. These diodes are designed for use in high frequency applications or where a fast recovery diode is a necessity. These diodes provide a superior combination of speed, blocking voltage capability and soft recovery, which is required in such demanding applications as:

- Inverter Feedback Diode
- Free Wheeling Diode
- High Frequency Rectification
- Low EMI Power Supplies



FEATURES:

- Published Current Ratings Up To 20,000 Hz
- All-Diffused
- Thermal Fatigue Resistant Pic-Pac[4] Construction
- Cathode Strain Buffer
- Soft Recovery With Low Recovered Charge
- Rugged Hermetic Package
- Available in 3/8" or 1/2" Stud

MAXIMUM ALLOWABLE RATINGS AND SPECIFICATIONS

TYPES*	REPETITIVE PEAK [1] REVERSE VOLTAGE V_{RRM} T_J = -40°C to +125°C	NON-REPETITIVE[2] PEAK REVERSE VOLTAGE, V_{RSM} T_J = 25°C to +125°C	DC REVERSE[3] VOLTAGE, V_R T_J = -40°C to +125°C	REPETITIVE PEAK REVERSE CURRENT, I_{RRM} T_J = 125°C
A187A	100 Volts	200 Volts	100 Volts	25 mA
A187B	200	300	200	25
A187C	300	400	300	25
A187D	400	500	400	25
A187E	500	600	500	25
A187M	600	720	600	25
A187S	700	840	700	25
A187N	800	950	800	25
A187T	900	1075	900	25
A187P	1000	1200	1000	25
A187PA	1100	1300	1100	25
A187PB	1200	1400	1200	25
A187PC	1300	1500	1300	25
A187PD	1400	1600	1400	25
A187PE	1500	1700	1500	25

*Models listed are stud cathode (forward polarity) types. Specify A187R- for stud anode (reverse polarity) types. Ratings and specifications are for frequencies from 50 to 20,000 Hz, except where noted otherwise.

Peak Forward Current, I_{FM} (T_C = +65°C, Half Sine Wave Pulse Base Width = 8.3 msec., D.F. = 50%) . . . . . 380 Amperes
Peak One-Cycle Surge (Non-Repetitive), Forward Current, I_{FSM} . . . . . 2800 Amperes
Minimum I^2t Rating (See Curve 11), $t \geq 1$ msec. (Non-Repetitive) . . . . . 21,000 (RMS Ampere)^2 Seconds
Thermal Resistance, $R\theta_{JC}$ (D.C.) . . . . . 0.3°C/Watt
Storage Temperature, T_{stg} . . . . . -40°C to +150°C
Operating Junction Temperature, T_J . . . . . -40°C to +125°C
Stud Torque . . . . . 90 Lb-in (Min.), 100 Lb-in (Max.)
10.2 N-m (Min.), 11.3 N-m (Max.)

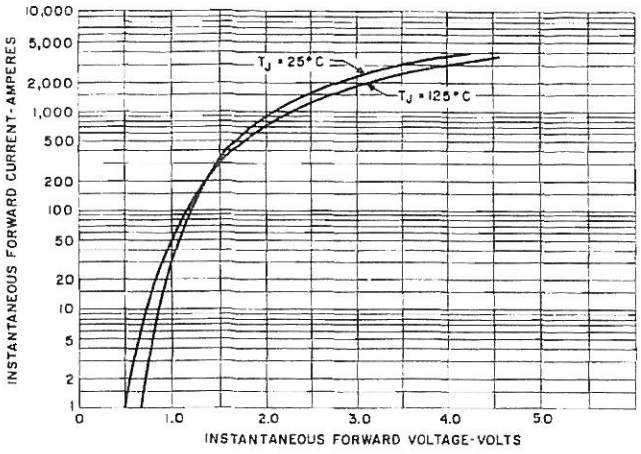
NOTES:

[1] Assumes a heatsink thermal resistance of less than 2.0°C/watt.

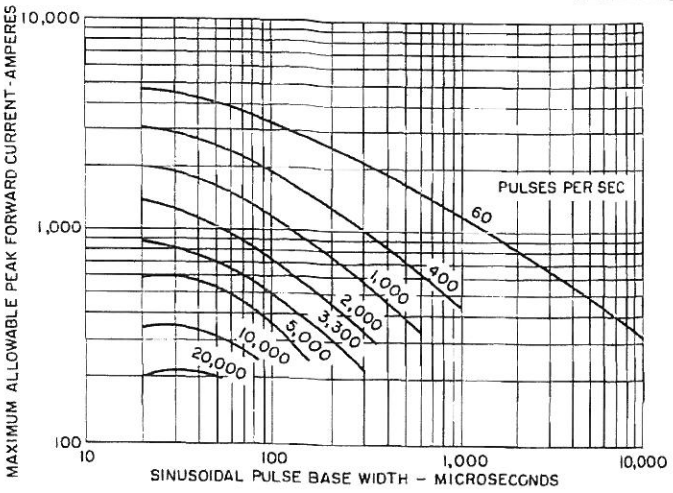
[2] Non-repetitive voltage and current ratings, as contrasted to repetitive ratings, apply for occasional or unpredictable overloads. For example, the forward surge current ratings are non-repetitive ratings that are used in fault coordination work.

[3] Assumes a heatsink thermal resistance of less than 1.0°C/watt.

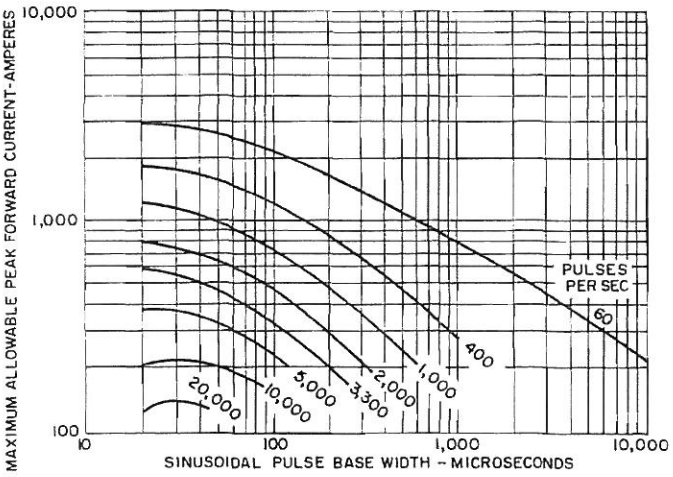
[4] "Pic-Pac" is an acronym for Pressure Internal Contact Package.



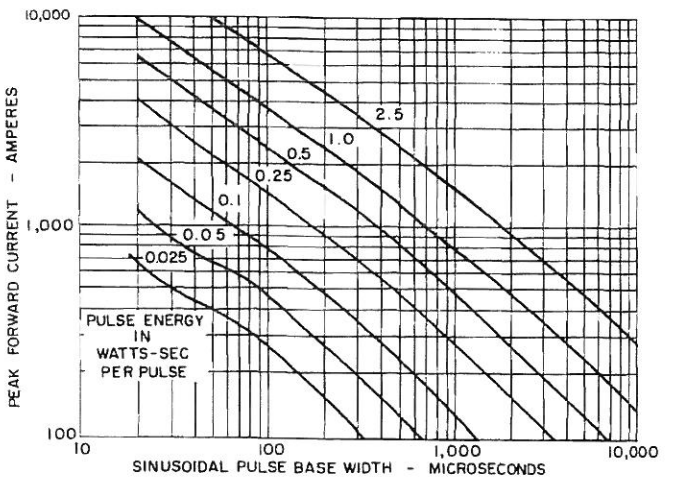
1. MAXIMUM FORWARD CHARACTERISTICS



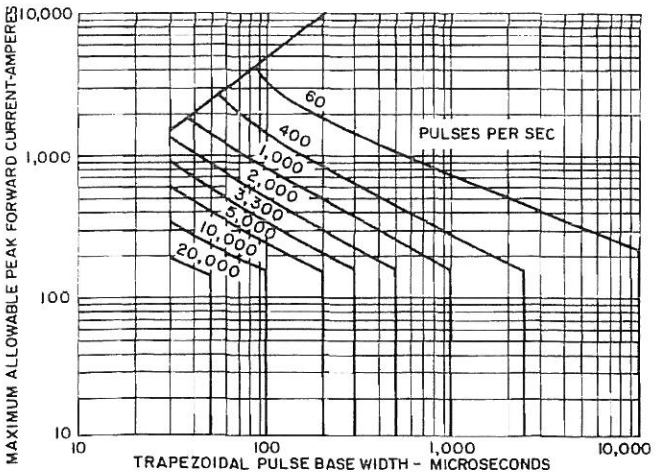
2. MAXIMUM ALLOWABLE PEAK FORWARD CURRENT SINUSOIDAL WAVEFORM (T_C = 65°C)



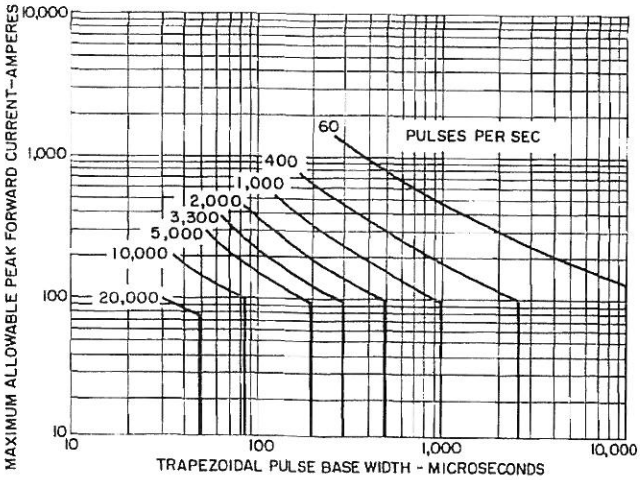
3. MAXIMUM ALLOWABLE PEAK FORWARD CURRENT SINUSOIDAL WAVEFORM (T_C= 90°C)



4. SINUSOIDAL PULSE ENERGY (T_J = 125°C)

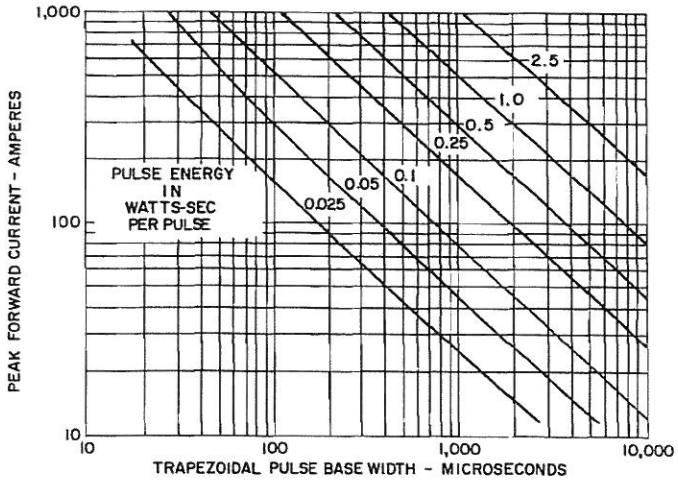


5. MAXIMUM ALLOWABLE PEAK FORWARD CURRENT TRAPEZOIDAL WAVEFORM (T_C = 65°C)

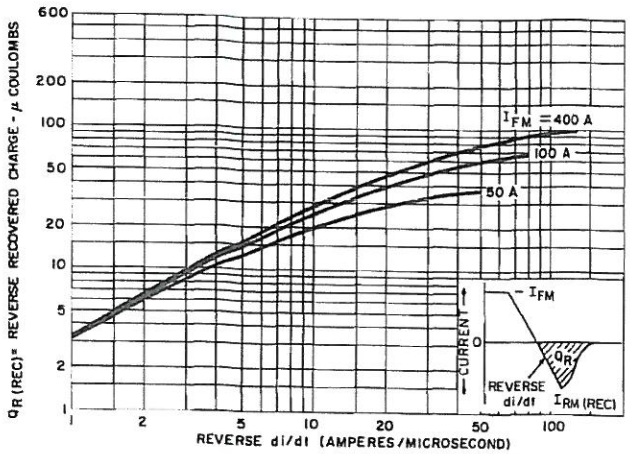


6. MAXIMUM ALLOWABLE PEAK FORWARD CURRENT TRAPEZOIDAL WAVEFORM (T_C = 90°C)

A187

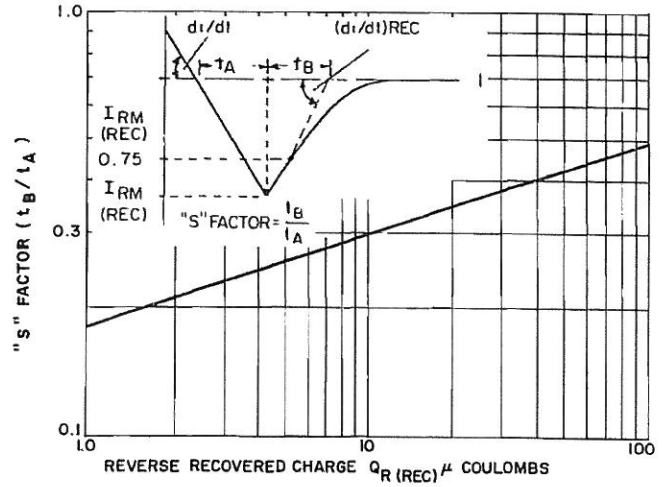


7. TRAPEZOIDAL PULSE ENERGY, DI/DT (RISING & FALLING) = 100 A/μS (T_J = 125°C)

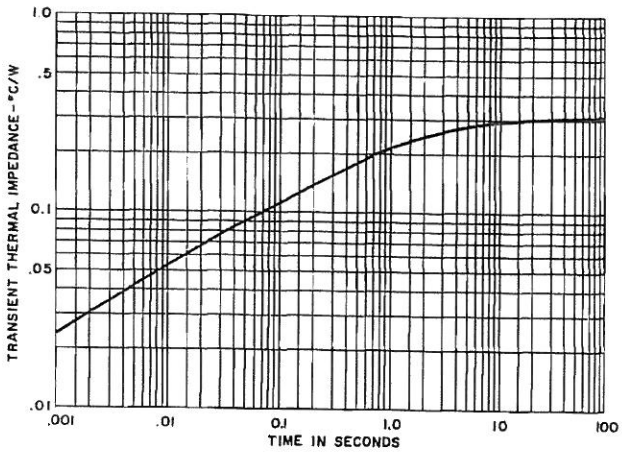


8. RECOVERED CHARGE (T_J = 125°C) (Maximum Recovered Charge Group 12)

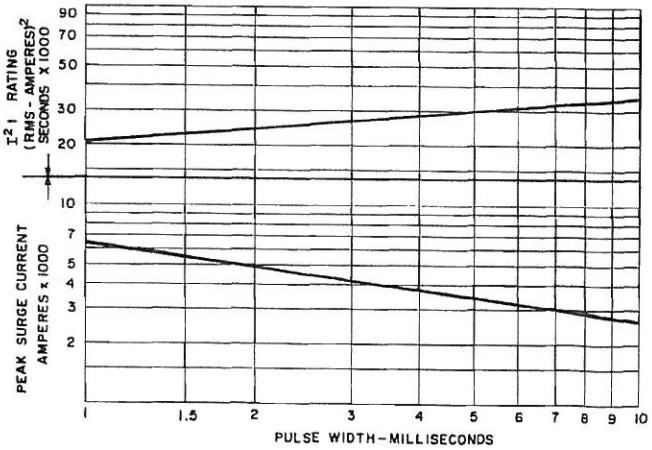
If maximum recovered charge group 12 is required, request A187___ X9, e.g. A187BX9, A187RBX9, etc.



9. TYPICAL "S" FACTOR VERSUS REVERSE RECOVERED CHARGE (T_J = 125°C)

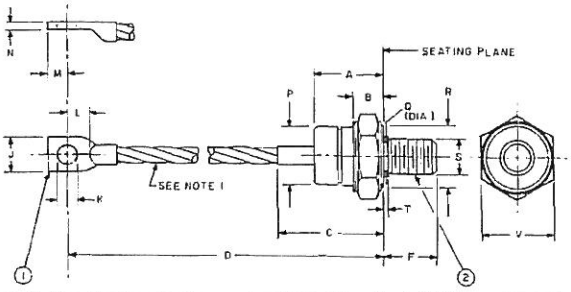


10. TRANSIENT THERMAL IMPEDANCE – JUNCTION-TO-CASE



11. SUB-CYCLE SURGE FORWARD CURRENT AND I^2t RATINGS VERSUS PULSE TIME FOLLOWING RATED LOAD CONDITIONS

OUTLINE DRAWING



MODEL	TERMINAL 1	TERMINAL 2	S THREAD SIZE	F THREAD LENGTH	Q RELIEF DIAMETER
A187 FORWARD POLARITY	ANODE	CATHODE	3/8 – 24 UNF – 2A	.640 / .610 IN. / 16.26 / 15.49 MM	.373 / .344 IN. / 9.47 / 8.74 MM
A187R REVERSE POLARITY	CATHODE	ANODE			

TABLE OF DIMENSIONS
Conversion Table

SYM.	DECIMAL INCHES MIN.	DECIMAL INCHES MAX.	METRIC MM MIN.	METRIC MM MAX.	NOTES
A	1.020	1.140	25.90	28.96	
B	.390	.500	9.90	12.70	
C	1.670	1.750	39.87	44.45	
D	4.750	5.150	120.65	130.81	
J	.520	.625	13.20	15.88	
K	270	.291	6.85	7.39	
L	320	–	8.12	–	
M	.280	.320	7.11	8.13	
N	070	.110	1.77	2.79	
P	.840	.910	21.33	23.11	
R	.920	–	23.36	–	3
T	–	060	–	1.52	4
V	1.052	1.063	26.72	27.00	

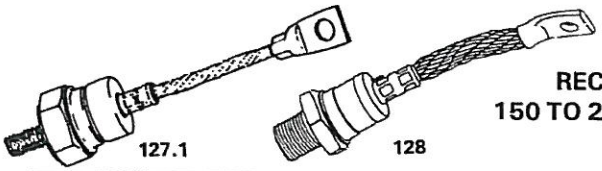
NOTES:
1. Flexible Copper Lead, 9/32 Inch Nominal Diameter.
2. One Nut and One Lockwasher Supplied With Each Unit. Material of Hardware is Steel-Cad Plated.
3. "R" Dimension is Diameter of Effective Seating Area.
4. "T" Dimension is Area of Unthreaded Portion. Complete Threads are Within 2.5 Threads of Seating Plane.
5. Angular Orientation of Terminals is Undefined.
6. Approximate Weight: 105 Grams.

MOUNTING INSTRUCTIONS

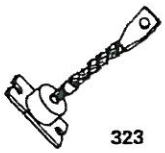
Following these installation instructions will result in a rectifier diode-to-heatsink contact thermal resistance of 0.10 C/watt or less.

1. Be sure mounting surface is clean and flat within .001 inch/inch.
2. Mounting hole diameter should not exceed the outside diameter of the rectifier diode stud by more than 1/16 inch, and should be deburred.
3. Use Dow Corning's DC3, 4, 340 or 640 or GE G3221 or equivalent, on mounting surfaces that come in contact with the heatsink.
4. Use only hardware furnished with each rectifier diode.
5. Tighten with a torque wrench, from nut side, to 100 lb-in max.

5.2 Condensed Electrical and Thermal Characteristics and Ratings



RECTIFIERS
150 TO 225 AMPERES



JEDEC TYPE			1N3260-74	—	—	—	—
GE TYPE			—	A180	A187	A215	A399

SPECIFICATIONS

$I_{FM(AV)}$	Max. average forward (1 phase operation)		160	150	150	150	225
	T_C = (°C)		125	143	65	108	80
V_{RM} (Rep)	Max. repetitive peak reverse voltage (V)		100-1200	100-1500	100-1500	800	600-1500
I_{FM} (Surge)	Max. peak one cycle, non-recurrent surge current (1 phase operation) @ max. rated load conditions (A)	50 Hz.	—	3200	2600	2800	3350
		60 Hz.	2000	3400	2800	3000	3500
I^2t	Max. non-repetitive for 1.5 msec (A^2sec)		6000	26000	23000	24000	22000
T_J	Operation junction temperature range (°C)		−55 to 190	−40 to 200	−40 to 125	−40 to 175	−40 to 125
$R_{\theta JC}$	Max. thermal resistance, junction-to-case (°C/W)		.3	.3	.3	.35	.095
V_{FM}	Max. peak forward voltage drop @ rated $I_{F(AV)}$ (1 phase operation)		1.3	1.3	1.7	1.3	2.7
	@ T_C = (°C)		125	143	25	108	65
$Q_{R(REC)}$	Reverse recovered charge @ rated T_J (μc)		—	—	50	—	15
t_{rr}	Reverse recovery time @ rated T_J (μs)		—	—	2.3	—	1.5
V_F	Max. forward [1] voltage drop for the current range:	I_{MIN}(A)	10	10	10	100	200
		I_{MAX}(A)	2000	6000	6000	25000	5000
		A	.3905	.53	.363	−1.4	.038
		B	.0137	.079	.151	0.727	.234
		C	.0008	8.85E-4	7.04E-4	.0022	5.95E-4
		D	.0343	−8.1E-3	4.12E-3	−1.31	.025
$R_{\theta JC}$	Transient thermal[2] resistance for time:	T_{MIN}(S)	.001	.001	.001	.001	.001
		T_{MAX}(S)	.01	.01	.01	.01	.01
		F	.21	.21	.21	.261	.072
		G	.34	.34	.34	.49	.24
Package Outline No.			128	127.1	127.1	323	109.1
Maximum Stud Torque (In-Lbs/N-M)			—	100/11.3	100/11.3	—	800/3.56
Max Mounting Force (Lbs./Kn)			—	—	—	—	—
Expanded Electrical Characterization, see page:			N.A.	N.A.	N.A.	151	162

[1]Voltage Drop Model: $V_F = A + B \cdot L_N(I) + C \cdot I + D\sqrt{I}$
[2]Transient Thermal Resistance Model: $R_{\theta JC} = F$