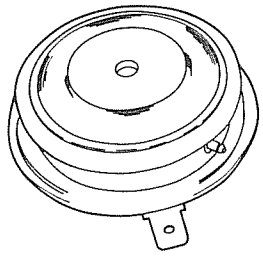
HIGH SPEED
Silicon Controlled Rectifier

C364/C365

600 Volts **275 A RMS**

AMPLIFYING GATE



The General Electric C364 and C365 Silicon Controlled Rectifiers are designed for power switching at high frequencies. These are all-diffused Press-Pak devices employing the field-proven amplifying gate.

FEATURES:

- Fully characterized for operation in inverter and chopper applications.
- High di/dt ratings.
- High dv/dt capability with selections available.
- Rugged hermetic glazed ceramic package.

MAXIMUM ALLOWABLE RATINGS

TYPES	REPETITIVE PEAK OFF-STATE VOLTAGE, V_{DRM}[1] T_J = -40°C to +125°C	REPETITIVE PEAK REVERSE VOLTAGE, V_{RRM}[1] T_J = -40°C to +125°C	NON-REPETITIVE PEAK REVERSE VOLTAGE, V_{RSM}[1] T_J = +125°C
C364/C365A	100 Volts	100 Volts	200 Volts
C364/C365B	200	200	300
C364/C365C	300	300	400
C364/C365D	400	400	500
C364/C365E	500	500	600
C364/C365M	600	600	720
C365S	700	700	840
C365N	800	800	960

[1] Half sinewave waveform, 10 ms max. pulse width.

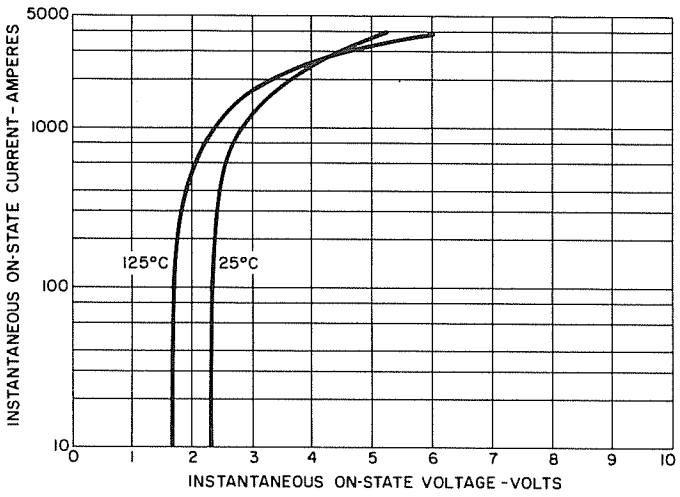
RMS On-State Current, $I_{T(RMS)}$ . . . . . 275 Amperes
Peak One Cycle Surge (Non-Repetitive) On-State Current, I_{TSM} (60 Hz) . . . . . 1800 Amperes
Peak One Cycle Surge (Non-Repetitive) On-State Current, I_{TSM} (50 Hz) . . . . . 1700 Amperes
I^2t (for fusing) for times ⩾ 1.5 milliseconds . . . . . 9,500 (RMS Ampere)^2 Seconds
I^2t (for fusing) for times ⩾ 8.3 milliseconds . . . . . 13,500 (RMS Ampere)^2 Seconds
Critical Rate-of-Rise of On-State Current, Non-Repetitive . . . . . 800 A/μs †
Critical Rate-of-Rise of On-State Current, Repetitive . . . . . 500 A/μs †
Average Gate Power Dissipation, $P_{G(AV)}$ . . . . . 2 Watts
Storage Temperature, T_{stg} . . . . . -40°C to +150°C
Operating Temperature, T_J . . . . . -40°C to +125°C
Mounting Force Required . . . . . .800 Lbs. ± 10%
3.56 KN ± 10%

†di/dt ratings established in accordance with EIA-NEMA Standard RS-397, Section 5.2.2.6 for conditions of max. rated V_{DRM}; 20 volts, 20 ohms gate trigger source with 0.5 μs short circuit trigger current rise time.

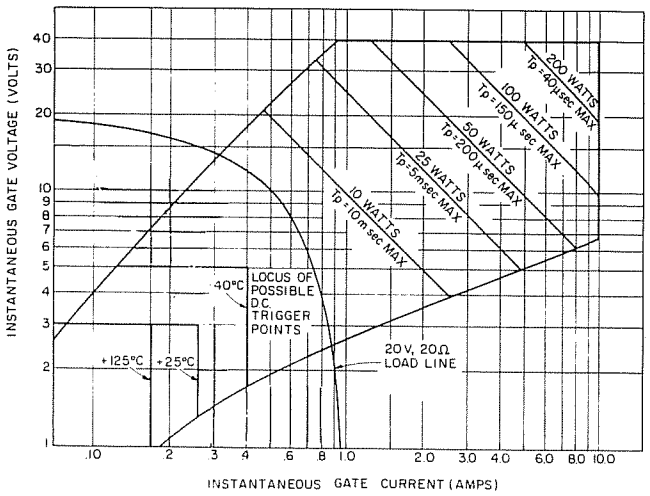
CHARACTERISTICS

TEST	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITION
Repetitive Peak Reverse and Off-State Current	I_{RRM} and I_{DRM}	–	5	12	mA	T_J = +25°C V = V_{DRM} = V_{RRM}
Repetitive Peak Reverse and Off-State Current	I_{RRM} and I_{DRM}	–	12	17	mA	T_J = 125°C V = V_{DRM} = V_{RRM}
Thermal Resistance	$R_{\theta JC}$	–	.12	.135	°C/Watt	Junction-to-Case (Double-Side Cooled)
		–	.15	.26		Junction-to-Case (Single-Side Cooled)
Critical Rate-of-Rise of Off-State Voltage (Higher values may cause device switching)	dv/dt	200	500	–	V/μsec	T_J = +125°C, Gate Open. V_{DRM} = Rated Linear or Exponential Rising Waveform. Exponential dv/dt = V_{DRM} (.632)/τ
Higher minimum dv/dt selections available – consult factory.						
Holding Current	I_H	–	40	1000	mAdc	T_C = +25°C, Anode Supply = 24 Vdc. Initial On-State Current = 2 Amps.
DC Gate Trigger Current	I_{GT}	–	70	250	mAdc	T_C = +25°C, V_D = 6 Vdc, R_L = 3 Ohms
		–	100	400		T_C = -40°C, V_D = 6 Vdc, R_L = 3 Ohms
		–	25	175		T_C = +125°C, V_D = 6 Vdc, R_L = 3 Ohms
DC Gate Trigger Voltage	V_{GT}	–	3	5	Vdc	T_C = -40°C to 0°C, V_D = 6 Vdc, R_L = 3 Ohms
		–	1.25	3.0		T_C = 0°C to +125°C, V_D = 6 Vdc, R_L = 3 Ohms
		0.15	–	–		T_C = 125°C, V_{DRM}, R_L = 1000 Ohms
Peak On-State Voltage	V_{TM}	–	1.9	2.6	Volts	T_C = +25°C, I_{TM} = 500 Amps. Peak Duty Cycle ⩽ .01%
Turn-On Delay Time	t_d	–	0.5	–	μsec	T_C = +25°C, I_T = 50 Adc, V_{DRM}, Gate Supply: 20 Volt Open Circuit, 20 Ohm, 0.1 μsec max. rise time. ††, †††
Conventional Circuit Commutated Turn-Off Time (with Reverse Voltage) Faster Maximum Turn-Off Times Available, Consult Factory	t_q C364 C365	 – –	 8 15	 10 20	μsec	(1) T_C = +125°C (2) I_{TM} = 150 Amps. (3) V_R = 50 Volts Min. (4) V_{DRM} (Reapplied) (5) Rate-of-Rise of Reapplied Off-State Voltage = 200 V/μsec (linear) (6) Commutation di/dt = 5 Amps/μsec. (7) Repetition Rate = 1 pps. (8) Gate Bias During Turn-Off Interval = 0 Volts, 100 Ohms
Conventional Circuit Commutated Turn-Off Time (with Feedback Diode)	$t_{q(diode)}$ C364 C365	 – –	 15 20	 † †	μsec	(1) T_C = +125°C (2) I_{TM} = 150 Amps. (3) V_R = 1 Volt (4) V_{DRM} (Reapplied) (5) Rate-of-Rise of Reapplied Forward Blocking Voltage = 200 V/μsec (linear) (6) Commutation di/dt = 5 Amps/μsec (7) Repetition Rate = 1 pss. (8) Gate Bias During Turn-Off Interval = 0 Volts, 100 Ohms.

†Consult factory for specified maximum Turn-Off Time.
††Delay time may increase significantly as the gate drive approaches the I_{GT} of the Device Under Test.
†††Current risetime as measured with a current probe, or voltage risetime across a non-inductive resistor.

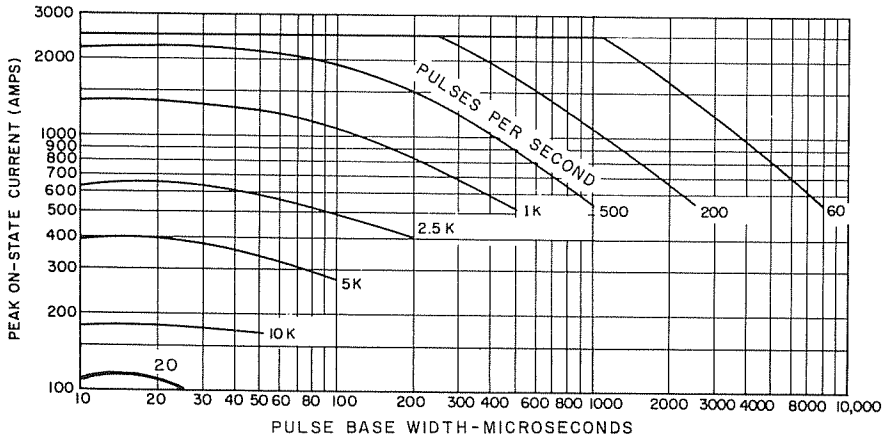


1. MAXIMUM ON-STATE CHARACTERISTICS

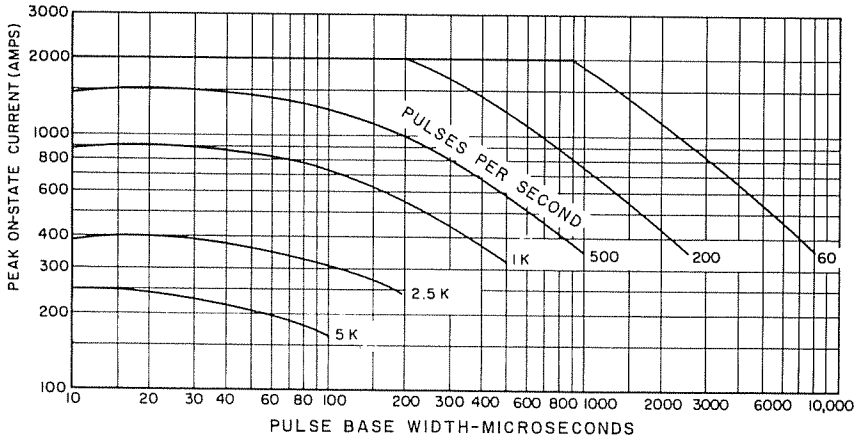


2. GATE TRIGGER CHARACTERISTICS AND POWER RATINGS

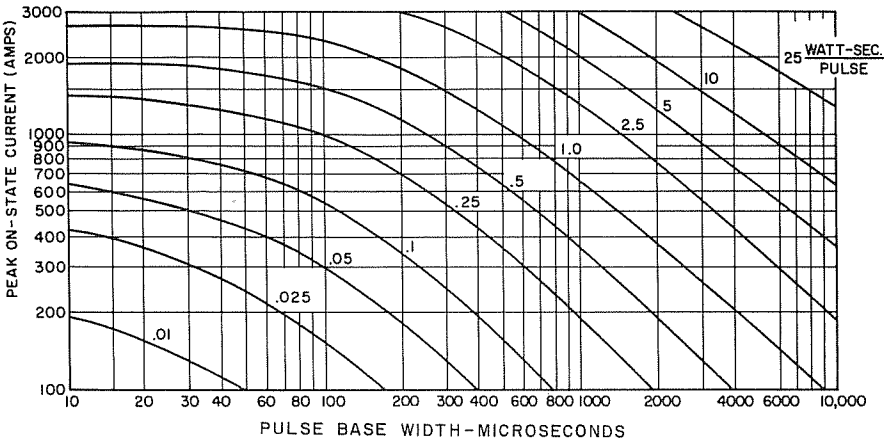
SINE WAVE CURRENT RATING DATA



3. MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VS. PULSE WIDTH (T_C = 65°C)



4. MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VS. PULSE WIDTH (T_C = 90°C)



5. ENERGY PER PULSE FOR SINUSOIDAL PULSES

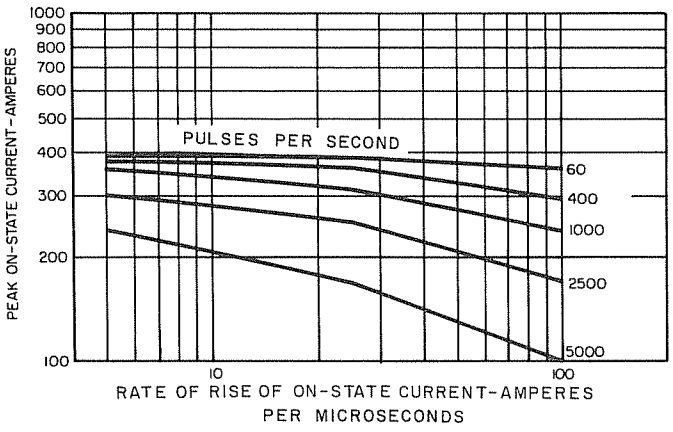
NOTES:

(Pertaining to Sine and Rectangular Wave Current Ratings)

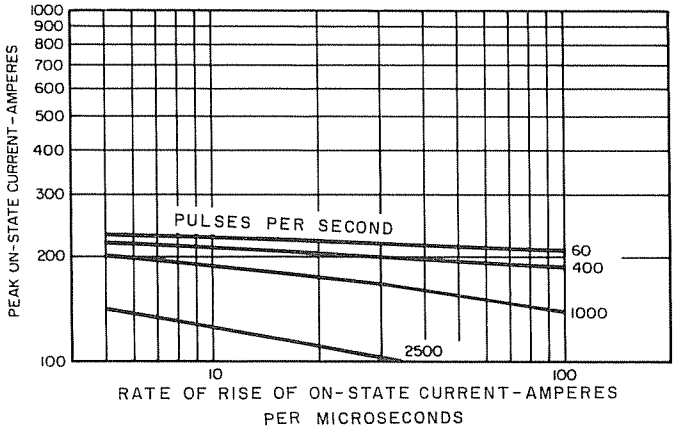
1. Switching voltage = 400 volts.
2. Reverse voltage applied = $V_R \leqslant 600$ volts.
3. Required gate drive:
   20 volts, 65 ohms, 1 μsec risetime for less than 100 amps/μsec.
   20 volts, 20 ohms, .5 μsec risetime for greater than 100 amps/μsec.
4. RC Snubber ckt. = 0.25 μf, 5 Ω.
5. Double-Side Cooled.
6. Maximum energy dissipated during reverse recovery to be 15% of total W-S/P shown in W-S/P chart or 0.03 W-S/P, whichever is least.
7. Values of W-S/P are for T_j = 125°C.

RECTANGULAR WAVE CURRENT RATING DATA

DUTY CYCLE — 50%

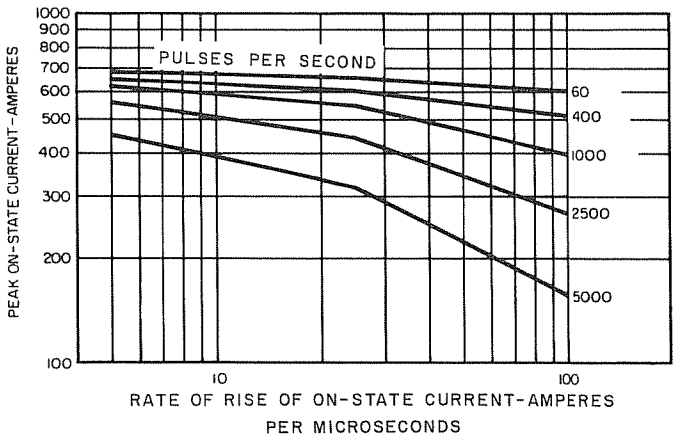


6. MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VS. di/dt (T_C = 65°C)

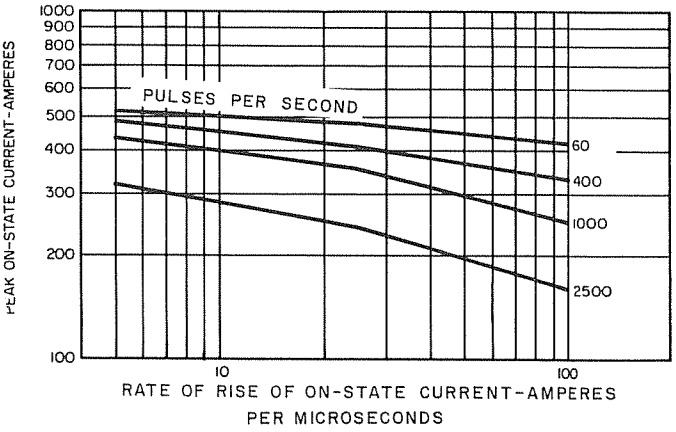


7. MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VS. di/dt (T_C = 90°C)

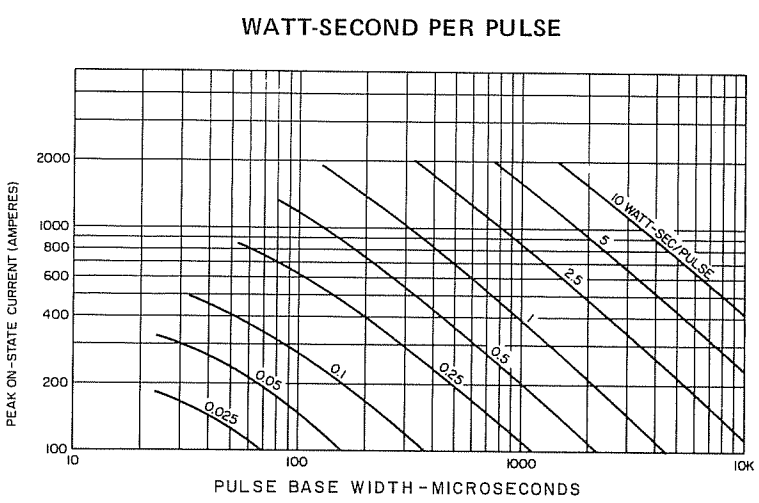
DUTY CYCLE — 25%



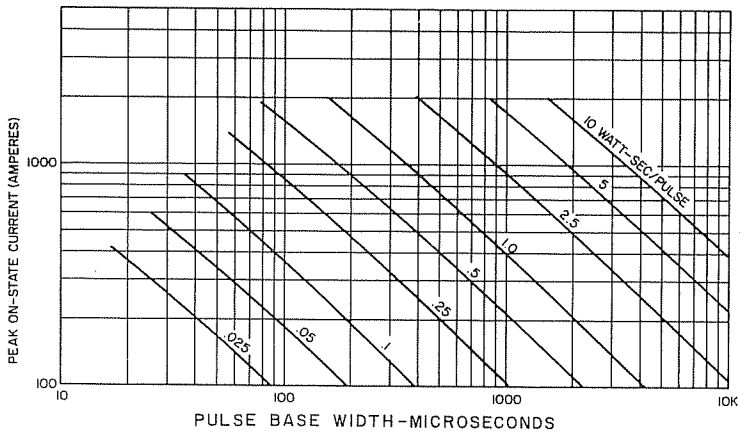
8. MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VS. di/dt (T_C = 65°C)



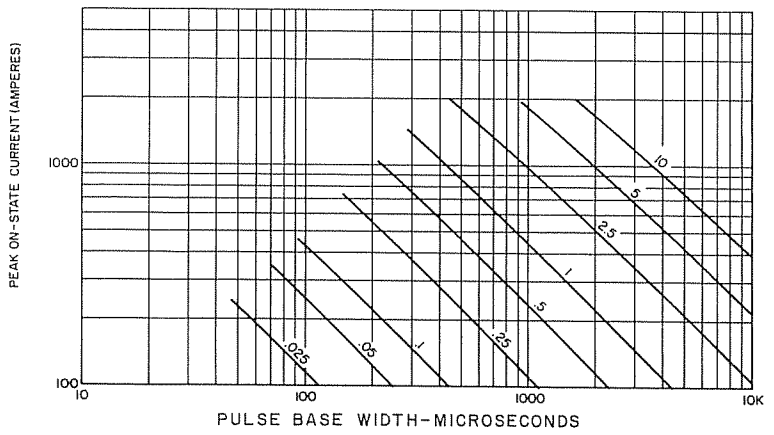
9. MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VS. di/dt (T_C = 90°C)



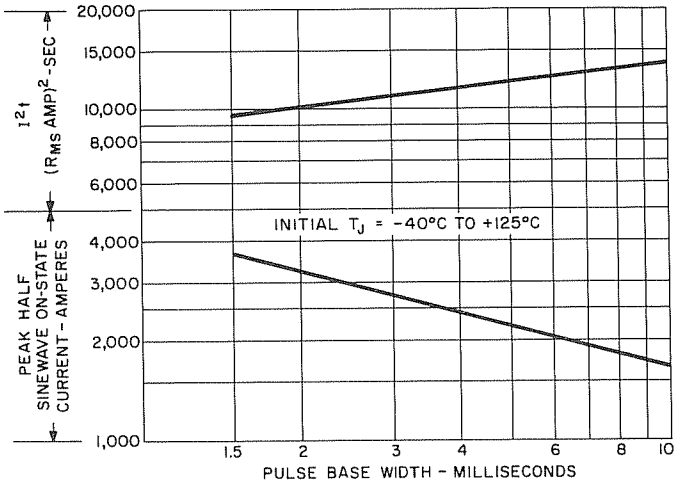
10. ENERGY PER PULSE VS. PEAK CURRENT AND PULSE WIDTH (di/dt = 100 A/μsec)



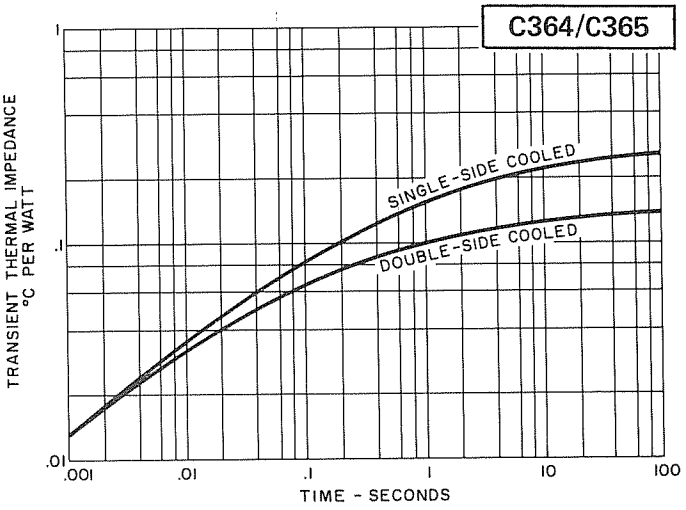
11. ENERGY PER PULSE VS. PEAK CURRENT AND PULSE WIDTH (di/dt = 25 A/μsec)



12. ENERGY PER PULSE VS. PEAK CURRENT AND PULSE WIDTH (di/dt = 5 A/μsec)

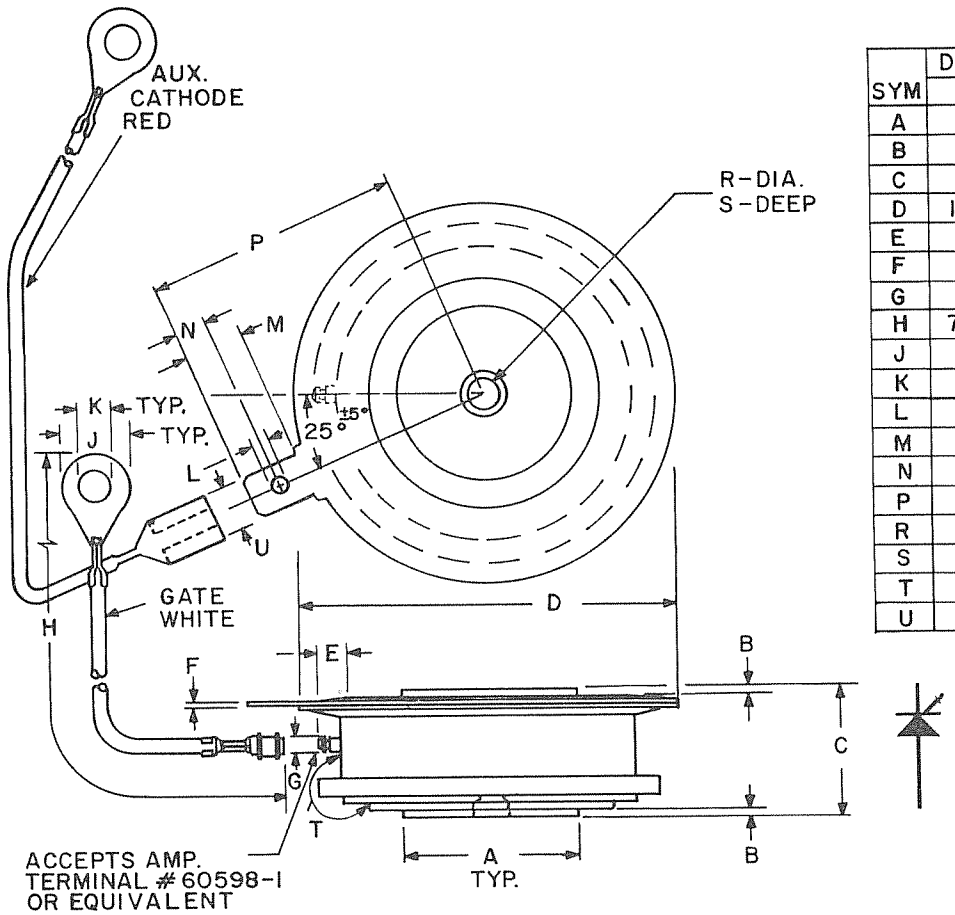


13. SUB-CYCLE SURGE (NON-REPETITIVE) ON-STATE CURRENT AND I^2t RATING



14. TRANSIENT THERMAL IMPEDANCE – JUNCTION-TO-CASE

OUTLINE DRAWING



H – STRAIGHT LEAD LENGTH, TYP. 2 LEADS

T – SURFACE CREEPAGE

TABLE OF DIMENSIONS

Conversion Table

	DECIMAL INCHES		METRIC MM	
SYM	MIN	MAX.	MIN.	MAX.
A	.744	.752	18.897	19.101
B	.030	.060	.762	1.524
C	.515	.565	13.081	14.351
D	1.600	1.656	40.64	42.06
E	.110	—	2.794	—
F	.031	.017	.330	.432
G	.057	.059	1.447	1.449
H	7.980	8.115	202.70	206.11
J	—	.300	—	7.620
K	.137	.153	3.479	3.886
L	.065	.070	1.651	1.778
M	.245	.260	6.223	6.604
N	.120	.140	3.048	3.556
P	1.090	1.125	27.69	28.55
R	.135	.145	3.429	3.683
S	.067	.083	1.701	2.108
T	.340	—	8.636	—
U	.186	.189	4.724	4.801