

High Power Silicon Controlled Rectifier

600A AVG., UP TO 2600 VOLTS

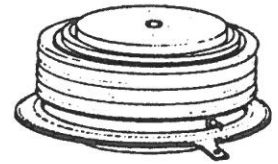
C602



The C602 Series of high power SCR's feature the proven, multi-diffused construction in a new, larger, pressure-mounted package for phase control.

FEATURES:

- 2600 Volt Blocking Voltage Capability
- Glazed Ceramic Hermetic Package with 1" Creepage Path
- Reliability of Pressure Contacts plus Reversibility of the Package
- Available in Factory Assembled Heat Exchangers or Ready-to-Mount
- Complementary Rectifiers
- Higher dv/dt Ratings



IMPORTANT: Mounting instructions on the last page of the C501 specification must be followed.

MAXIMUM ALLOWABLE RATINGS

TYPE	V _{DRM} /V _{RRM} ¹ REPETITIVE T _J = -40°C to +125°C	V _{DRM} /V _{RRM} ¹ REPETITIVE T _J = 0°C to +125°C	TRANSIENT PEAK REVERSE VOLTAGE (NON-RECURRENT < 5 MILLISECONDS) V _{RSM} T _J = -40°C to +125°C
C602PS	1700 Volts	1800 Volts	1800 Volts
C602PN	1800	1900	1900
C602PT	1900	2000	2000
C602L	2000	2100	2100
C602LA	2100	2200	2200
C602LB	2200	2300	2300
C602LC	2300	2400	2400
C602LD	2400	2500	2500
C602LE	2500	2600	2600
C602LM	2600	2700	2700

Consult factory for higher voltage grades.

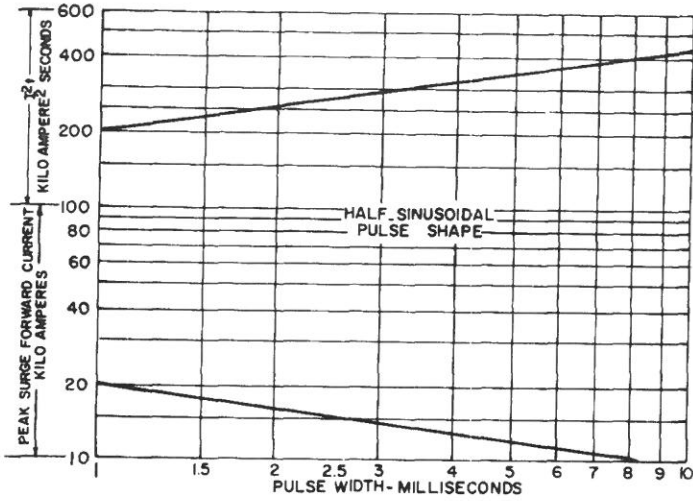
Average Forward Current, On-State	Depends on Conduction Angle
Peak One-Cycle Surge On-State Current, I _{TSM}	10,000 Amperes
Maximum Rate-of-Rise of Anode Current Turn-On Interval (Switching Rates ≤ 400 Hz)	Switch From < 600V, 75A/μsec
(See Curve 9 for Recommended Load Line).	Switch From < 1000V, 50A/μsec
	Switch From < 1500V, 35A/μsec
I ² t (for fusing) (at 8.3 milliseconds)	415,000 Ampere ² Seconds
Peak Gate Power Dissipation, P _{GM}	40 Watts
Average Gate Power Dissipation, P _{G(AV)}	5 Watts
Peak Reverse Gate Voltage, V _{GRM}	5 Volts
Storage and Operating Temperatures, T _{STG} and T _J	Refer Above
Mounting Force Required	4000 Lbs. ± 10% 17.8 KN ± 10%

NOTES:

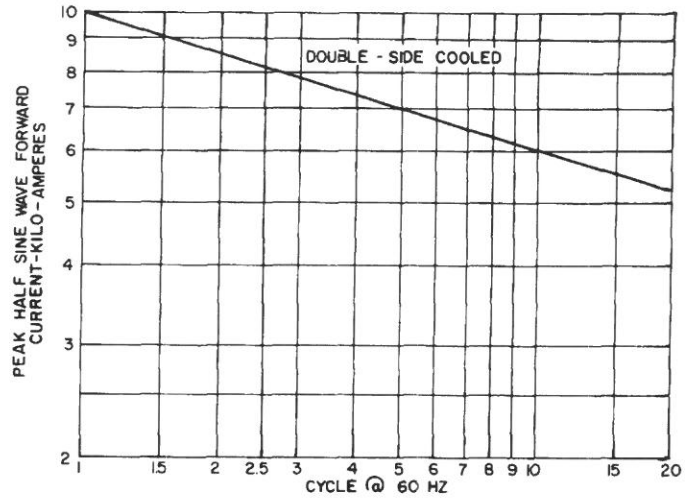
¹ Ratings apply for zero gate voltage. Assumes heat dissipator thermal resistance less than 0.5°C/W.

CHARACTERISTICS

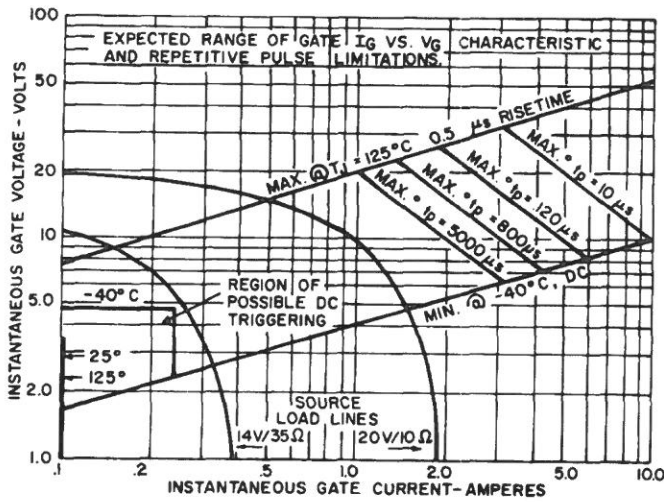
TEST	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Peak Reverse and Forward Blocking Current	I_{DRM} and I_{RRM}	—	10	15	mA	$T_J = +25^\circ\text{C}$, $V = V_{DRM} = V_{RRM}$
Peak Reverse and On-State Blocking Current	I_{DRM} and I_{RRM}	—	15	35	mA	$T_J = +125^\circ\text{C}$, $V = V_{DRM} = V_{RRM}$
Effective Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	—	—	.036	$^\circ\text{C/Watt}$	Junction-to-Case, Double-Side Cooled (DC)
Critical Exponential Rate-of-Rise of Forward Blocking Voltage (Higher values may cause device switching)	dv/dt	500	—	—	V/ μsec	$T_J = +125^\circ\text{C}$, $V_{DRM} = .67$ Rated, Gate Open.
Holding Current	I_H	—	100	250	mAdc	$T_C = +25^\circ\text{C}$, Anode Supply = 20 Vdc. Initial Forward Current = 500 Amps.
Latching Current	I_L	—	—	1	Adc	$T_C = +25^\circ\text{C}$, Anode Voltage = 24 Vdc. Load Resistance 12 Ohms Max.
Delay Time	t_d	—	1.8	—	μsec	Switching From 900 Volts, 20V/10 Ω , .5 μsec Rise Time
Gate Pulse Width Necessary to Trigger		—	—	10	μsec	See Figure 9.
Gate Trigger Current	I_{GT}	—	80	150	mAdc	$T_C = 25^\circ\text{C}$, $V_D = 10$ Vdc, $R_L = 3$ Ohms
		5.0	15	75		$T_C = +125^\circ\text{C}$, $V_D = .5$ x Rated, $R_L = 1000$ Ohms
Gate Trigger Voltage	V_{GT}	—	2.6	4.5	Vdc	$T_C = 0^\circ\text{C}$ to $+125^\circ\text{C}$, $V_D = 10$ Vdc, $R_L = 3$ Ohms
		.2	—	—		$T_C = 125^\circ\text{C}$, $V_D = .5$ x Rated, $R_L = 1000$ Ohms
Peak On-State Voltage	V_{TM}	—	—	1.90	Volts	$T_C = +125^\circ\text{C}$, $I_T = 1000$ Amps. Peak, Duty Cycle $\leq 0.01\%$
Circuit Commutated Turn-Off Time	t_q	—	125	250	μsec	(1) $T_C = +125^\circ\text{C}$ (2) $I_T = 450$ Amps. (3) $V_R = 75$ Volts Min. (4) 50% V_{DRM} Reapplied (5) Rate-of-rise of Reapplied Forward Blocking Voltage = .25V/ μsec . Linear (6) Gate Bias = Open During Turn-Off Interval (7) Duty Cycle $\leq 0.01\%$
Suppressible Surge Current	$I_{TM(SUP)}$	—	7500	—	Amps	(1) $T_C = 115^\circ\text{C}$ (2) $V_R = .67 V_{RRM}$ (3) .67 V_{DRM} , Applied 8.3 msec. After Completion of Surge (4) Figure 13.



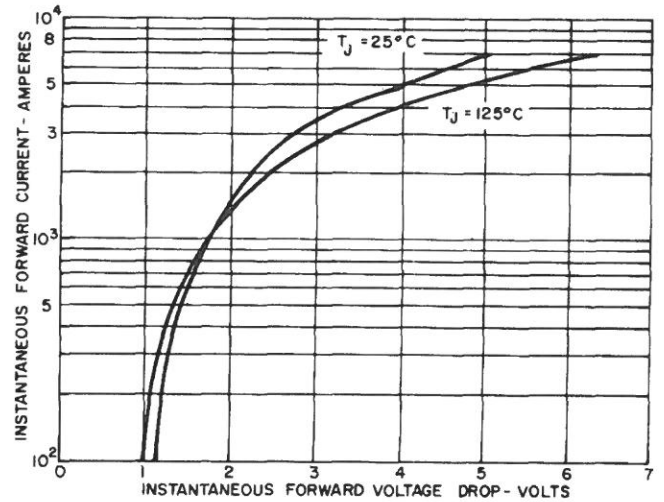
7. SUB CYCLE SURGE AND I^2t RATING FOLLOWING RATED LOAD CONDITIONS



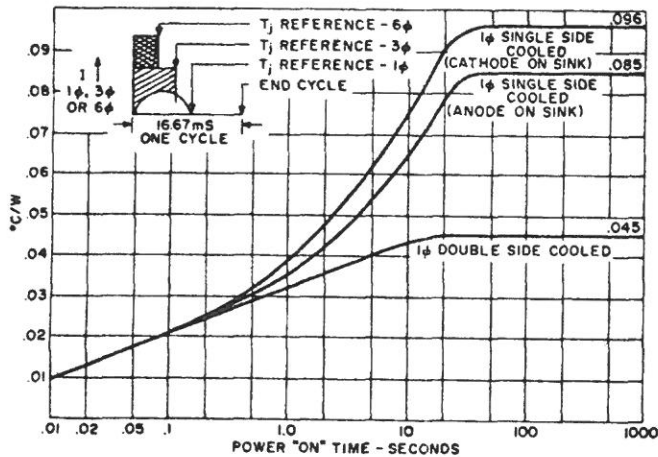
8. MAXIMUM ALLOWABLE SURGE CURRENT FOLLOWING RATED LOAD CONDITIONS



9. GATE TRIGGERING CHARACTERISTICS



10. FORWARD CONDUCTION CHARACTERISTIC, ON-STATE



11. TRANSIENT THERMAL IMPEDANCE - JUNCTION-TO-CASE

NOTES:

- For 3 ϕ thermal resistance add .0037°C/W along entire curve length.
- For 6 ϕ thermal resistance add .001°C/W along entire curve length.
- For DC thermal resistance subtract .005°C/W along entire curve length.