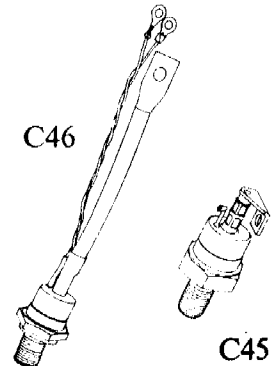


SCR

C45.6

- Broad Voltage Range—Up to 800 V
- Thermal Fatigue Resistant
- Immunity to Forward Voltage Destruction⁽¹⁾ (On units rated above 500 volts)
- Standard TO-49 Outline
- Backed by 7 Years of Design and Field Experience

⁽¹⁾These devices may be turned on in the forward direction by exceeding the breakover voltage with either a rapidly, or slowly rising wave form. This has been confirmed in the laboratory by using a 3 kv. open circuit voltage, a 4-amp. short circuit, 0.1 μsec. risetime supply, and a 60 cycle half-wave sine voltage waveform.



MAXIMUM ALLOWABLE RATINGS

TYPE	PEAK FORWARD BLOCKING VOLTAGE, V_{FBM} *	REPETITIVE PEAK REVERSE VOLTAGE, V_{RRM} (rep)	TRANSIENT PEAK REVERSE VOLTAGE (Non-repetitive < 6 Millisec.) V_{AR} (non-rep)	PEAK FORWARD VOLTAGE (PFV)
	$T_C = -40^\circ\text{C to } +125^\circ\text{C}$	$T_C = -40^\circ\text{C to } +125^\circ\text{C}$	$T_C = -40^\circ\text{C to } +125^\circ\text{C}$	
C45, C46U	25 Volts	25 Volts	35 Volts	500 Volts
C45, C46F	50 Volts	50 Volts	75 Volts	500 Volts
C45, C46A	100 Volts	100 Volts	150 Volts	500 Volts
C45, C46G	150 Volts	150 Volts	225 Volts	500 Volts
C45, C46B	200 Volts	200 Volts	300 Volts	500 Volts
C45, C46H	250 Volts	250 Volts	350 Volts	500 Volts
C45, C46C	300 Volts	300 Volts	400 Volts	500 Volts
C45, C46D	400 Volts	400 Volts	500 Volts	500 Volts
C45, C46E	500 Volts	500 Volts	650 Volts	No Limitation
C45, C46M	600 Volts	600 Volts	720 Volts	No Limitation
C45, C46S	700 Volts	700 Volts	840 Volts	No Limitation
C45, C46N	800 Volts	800 Volts	960 Volts	No Limitation

*Ratings apply for zero or negative gate voltage. Maximum heatsink thermal resistance for which maximum PRV ratings apply equal 3.5°C/watt.

RMS Forward Current, On-State	55 amperes (all conduction angles)
Average Forward Current, On-State	Depends on conduction angle (see Charts 3 and 6)
Peak One-cycle Surge Forward Current, I_{FM} (surge)	700 amperes
Maximum Rate of Rise of Anode Current During Turn-On Interval	(see Chart 15)
I^2t (for fusing) $T_J = -40^\circ\text{C to } +125^\circ\text{C}$	2000 ampere ² seconds (for times ≥ 1.0 milliseconds)
Peak Gate Power Dissipation, P_{GM}	5 watts
Average Gate Power Dissipation, $P_{G(AV)}$	0.5 watts
Peak Forward Gate Voltage, V_{GFM}	20 volts
Peak Reverse Gate Voltage, V_{GRM}	5 volts
Storage Temperature, T_{stg}	-40°C to +150°C
Storage and Operating Temperature, T_J	-40°C to +125°C
Stud Torque	125 Lbs.-in. (min.), 150 Lbs.-in. (max.) 150 Kg.-cm. (min.), 175 Kg.-cm. (max.)

CHARACTERISTICS

TEST	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Gate Trigger Current	I_{GT}	.....	30 50 20	75 125 40	mAdc mAdc mAdc	$T_C = +25^\circ\text{C}$, $V_{FX} = 6\text{ Vdc}$, $R_L = 12\text{ ohms}$, $t_p \cong 20\ \mu\text{sec}$. $T_C = -40^\circ\text{C}$, $V_{FX} = 6\text{ Vdc}$, $R_L = 12\text{ ohms}$, $t_p \cong 20\ \mu\text{sec}$. $T_C = +120^\circ\text{C}$, $V_{FX} = 6\text{ Vdc}$, $R_L = 12\text{ ohms}$, $t_p \cong 20\ \mu\text{sec}$.
Gate Trigger Voltage	V_{GT}	..... .25	1.5	3.0	Vdc Vdc	$T_C = -40^\circ\text{C}$ to $+120^\circ\text{C}$. $V_{FX} = 6\text{ Vdc}$, $R_L = 12\text{ ohms}$, $t_p \cong 20\ \mu\text{sec}$. $T_C = +120^\circ\text{C}$, $V_{FX} = \text{Rated}$, $R_L = 1000\text{ ohms}$, $t_p \cong 20\ \mu\text{sec}$.
Peak On-Voltage	V_{FM}	.....	2.0	3.0	V	$T_C = +25^\circ\text{C}$, $I_{FM} = 500\text{A Peak}$, Duty cycle $\cong .01\%$
Holding Current	I_{HO}	.....	18	100	mAdc	$T_C = +25^\circ\text{C}$, Anode supply = 24 Vdc, Initial forward current = 2A.
Turn-On Time (Delay Time + Rise Time)	$t_a + t_r$	.....	5	.....	μsec	$T_C = +25^\circ\text{C}$, $I_F = 50\text{ Adc}$, $V_{FXM} = \text{rated}$ Gate supply: 10 volt open circuit, 20 ohm, 0.1 μsec . max. rise time
Circuit Commutated Turn-Off Time	t_{off}	.....	50	.....	μsec	$T_C = +120^\circ\text{C}$, $I_{FM} = 50\text{A}$, $V_{FX} = 50\text{ volts min.}$, $V_{FXM} (\text{reapplied}) = \text{Rated } V_{FOM}$, Rate of rise of reapplied forward blocking voltage = $20\text{V}/\mu\text{sec}$ linear. Gate bias: 0 volts, 100 ohms during turn-off interval, Duty cycle $\cong .01\%$
Effective Thermal Resistance	θ_{J-C}	.....	.3	.4	$^\circ\text{C}/\text{watt}$	
Critical Exponential Rate of Rise of For- ward Blocking Voltage (Higher values may cause device switching)	dv/dt	.....	30 30 30 30 30 30 30 20 20 20 20 15 15	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	V/ μsec	$V_{FOM} = \text{Rated}$, $T_C = +120^\circ\text{C}$, Gate open.

OUTLINE DRAWINGS

C46 OUTLINE (Conforms to JEDEC TO-94 Outline)

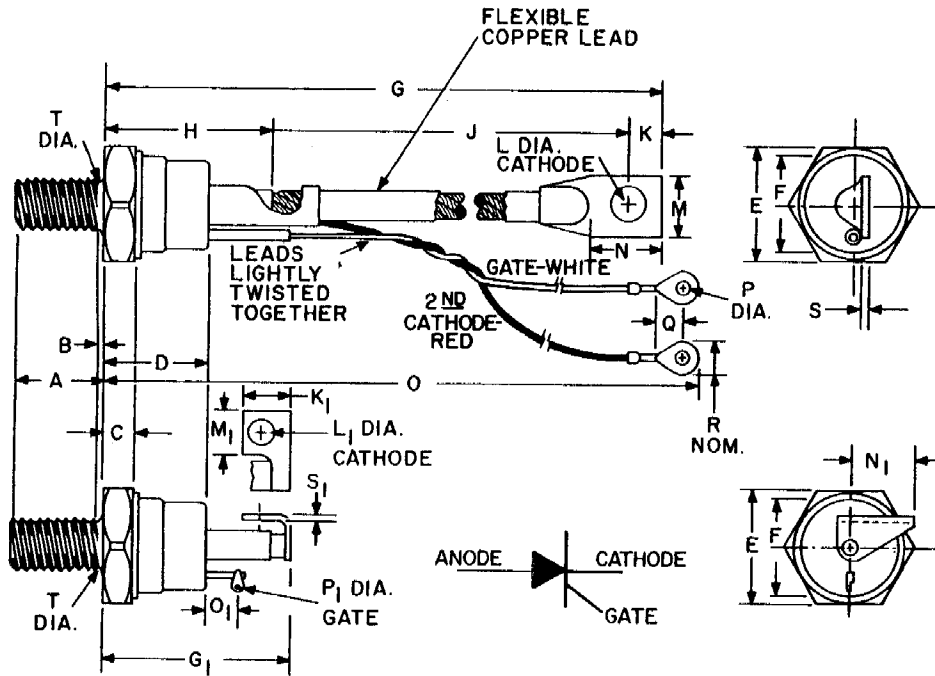


TABLE OF DIMENSIONS

Conversion Table

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.797	.827	20.243	21.000
B	—	.080	—	2.032
C	.278	.350	7.060	8.990
D	.874	1.030	22.099	26.160
E	1.049	1.062	26.644	26.978
F	.840	.910	21.335	23.118
G	6.204	6.512	157.619	165.448
G ₁	—	1.750	—	44.400
H	1.484	1.640	37.653	41.656
J	4.437	5.623	112.698	142.836
K	.275	.325	6.985	8.288
K ₁	.445	.485	11.302	12.319
L	.251	.281	6.375	7.137
L ₁	.198	.212	5.029	5.388
M	.500	.600	12.700	15.240
M ₁	.385	.415	9.778	10.541
N	.632	.725	16.052	18.396
N ₁	.590	.640	14.985	16.256
O	7.000	7.342	177.799	186.482
O ₁	.312 Ref.	—	7.925 Ref.	—
P	.140	.150	3.555	3.811
P ₁	.060	.075	1.524	1.908
Q	.250 Nom.	—	6.350 Nom.	—
R	.290 Nom.	—	7.366 Nom.	—
S	.065	.095	1.631	2.413
S ₁	.058	.070	1.473	1.778
T	.463	.498	11.760	12.649

C45 OUTLINE

NOTES

1. Complete stud threads (1/2-20 UNF 2A) to within 2 1/2 threads of head.
2. Flexible lead covered with silicon rubber insulation (Class H), 600 volt ASTM standard wall.
3. Orientation of cathode and gate terminals not defined.
4. One, 1/2-20 steel, cadmium plated nut and one cadmium plated spring washer supplied with each unit.
5. Approximate weights:

Unit	With Hardware		Without Hardware	
	Ounces	Grams	Ounces	Grams
C46	4.25	120	3.50	99
C45	3.50	99	2.75	78