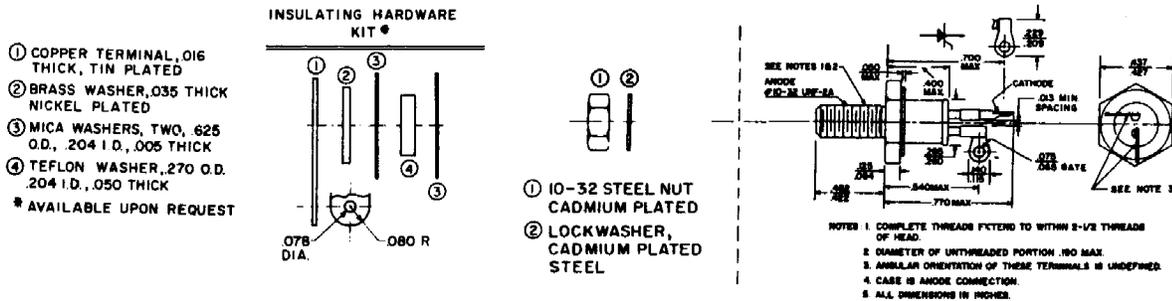


The C11 Silicon Controlled Rectifier is a three junction semiconductor device for use in low power switching and control applications requiring blocking voltages up to 600 volts and RMS load currents up to 7.4 amperes.

- Broad Voltage Range (Up to 600V)
- Long Electrical Creepage Path
- Over Three Years of Successful Field Experience
- No Gate Bias Required
- High Gate Sensitivity



Type	Minimum Forward Breakover Voltage (V <sub>BO</sub> )† T <sub>J</sub> = -65°C to +125°C	Repetitive Peak Reverse Voltage (PRV)† T <sub>J</sub> = -65°C to +125°C	Transient Peak Reverse Voltage (Non-recurrent < 5 Millisec.)† T <sub>J</sub> = -65°C to +125°C
C11U (2N1770)	25 Volts*	25 Volts*	40 Volts*
C11F (2N1771)	50 Volts*	50 Volts*	75 Volts*
C11A (2N1772)	100 Volts*	100 Volts*	150 Volts*
C11G (2N1773)	150 Volts*	150 Volts*	225 Volts*
C11B (2N1774)	200 Volts*	200 Volts*	300 Volts*
C11H (2N1775)	250 Volts*	250 Volts*	350 Volts*
C11C (2N1776)	300 Volts*	300 Volts*	400 Volts*
C11D (2N1777)	400 Volts*	400 Volts*	500 Volts*
C11E (2N1778)	500 Volts*	500 Volts*	600 Volts*
C11M (2N2619)	600 Volts*	600 Volts*	720 Volts*

†Values apply for zero or negative gate voltage only. Maximum case to ambient thermal resistance for which maximum PRV ratings apply equals 18°C/watt.

### MAXIMUM ALLOWABLE RATINGS

Repetitive Peak Forward Blocking Voltage (PFV)	(C11U thru C11D)	480	Volts
	(C11E and C11M)	720	Volts
RMS Forward Current	(All conduction angles)	7.4	Amperes
Average Forward Current (I <sub>o</sub> )	4.7 Amperes* at 60°C Case (Half Wave Rectified)		
	For other operating conditions see Chart 3.		
Peak One Cycle Non-recurrent Surge Current (i <sub>surge</sub> )		60	Amperes*
Peak Surge Current During Turn-on Time Interval			See Chart 7
I <sup>2</sup> t (for fusing)			Calculate from Chart 8
Peak Gate Power (p <sub>G</sub> )		5	Watts*
Average Gate Power (P <sub>G</sub> )		0.5	Watt*
** Peak Gate Current (i <sub>G</sub> )		2.0	Amperes*
Peak Gate Voltage (v <sub>G</sub> ) (Forward and Reverse)		10	Volts*
Operating Temperature		-65°C to +125°C*	
Storage Temperature		-65°C to +150°C*	
Stud Torque		15	inch-pounds

\*Indicates data included on JEDEC type number registration.

\*\*NOT TO EXCEED GATE POWER RATINGS



# CHARACTERISTICS

**C11 SERIES**

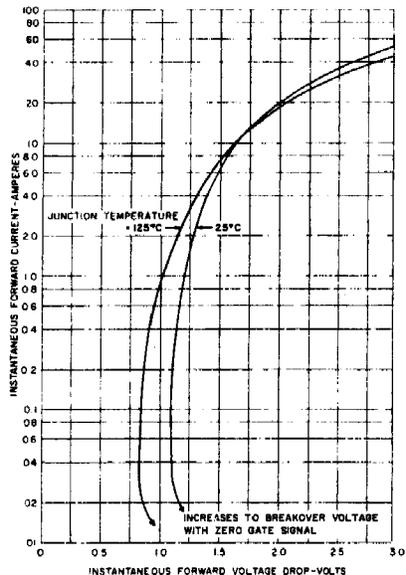
**2N1770-78**

**2N2619**

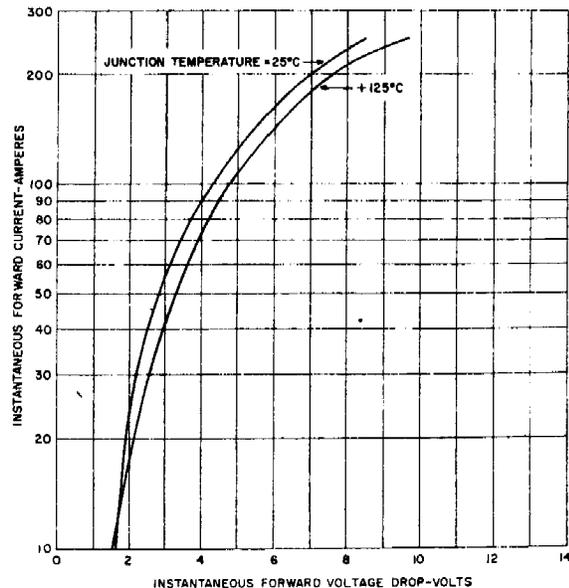
Test	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Peak Reverse and Forward Blocking Current†	$i_R$ and $i_S$					$T_J = 125^\circ\text{C}$ , Gate Open $v_{AC} = v_{CA} = 25$ Volts Peak
C11U (2N1770)		—	4.5	9.0	ma	50
C11F (2N1771)		—	4.5	9.0	ma	100
C11A (2N1772)		—	4.5	9.0	ma	150
C11G (2N1773)		—	4.0	8.0	ma	200
C11B (2N1774)		—	3.0	6.0	ma	250
C11H (2N1775)		—	2.5	5.0	ma	300
C11C (2N1776)		—	1.5	4.0	ma	400
C11D (2N1777)		—	1.0	2.0	ma	500
C11E (2N1778)		—	1.0	2.0	ma	600
C11M (2N2619)		—	1.0	2.0	ma	
Full Cycle Avg. Reverse and Forward Blocking Current†	$I_{R(AV)}$ and $I_{S(AV)}$					$T_J = 60^\circ\text{C}$ , $I_a = 4.7\text{A}$ , half sine wave $180^\circ$ Conduction Angle $v_{AC} = v_{CA} = 25$ Volts Peak
C11U (2N1770)		—	2.3	4.5*	mA dc	50
C11F (2N1771)		—	2.3	4.5*	mA dc	100
C11A (2N1772)		—	2.3	4.5*	mA dc	150
C11G (2N1773)		—	2.0	4.0*	mA dc	200
C11B (2N1774)		—	1.5	3.0*	mA dc	250
C11H (2N1775)		—	1.3	2.5*	mA dc	300
C11C (2N1776)		—	0.8	2.0*	mA dc	400
C11D (2N1777)		—	0.5	1.0*	mA dc	500
C11E (2N1778)		—	0.5	1.0*	mA dc	600
C11M (2N2619)		—	0.5	1.0*	mA dc	
Gate Current to Fire	$I_{GF}$		10	15	mA dc	$V_{AC} = 12\text{Vdc}$ , $T_J = 25^\circ\text{C}$ , $R_{th} = 250$ ohms
			20	30*	mA dc	$V_{AC} = 12\text{Vdc}$ , $T_J = -65^\circ\text{C}$ , $R_{th} = 250$ ohms
			4	8	mA dc	$V_{AC} = 12\text{Vdc}$ , $T_J = 125^\circ\text{C}$ , $R_{th} = 250$ ohms
Gate Voltage to Fire	$V_{GF}$		1.3	2.0*	V dc	$V_{AC} = 12\text{Vdc}$ , $T_J = -65^\circ$ to $+125^\circ\text{C}$ , $R_{th} = 250$ ohms
		0.3*	0.7	—	V dc	$v_{AC} = \text{Rated}$ , $T_J = 125^\circ\text{C}$ , $R_{th} = 250$ ohms
Peak Forward Voltage Drop	$v_F$		1.6	1.85	v	$T_J = 25^\circ\text{C}$ , $i_F = 15\text{a}$ (single sinusoidal pulse, 4 ms wide)
Holding Current	$I_H$		8.0	—	mA dc	Anode Supply = 6 Vdc, $T_J = 25^\circ\text{C}$
Turn-on Time	$t_{on} + t_r$		1.0	—	$\mu\text{sec}$	$T_J = 25^\circ\text{C}$ , $i_F = 10\text{a}$ , $v_{AC} = \text{Rated}$ Gate Supply: 7 volt open circuit, 20 ohm, 0.1 $\mu\text{sec}$ max. rise time.
Turn-off Time	$t_{off}$		15	—	$\mu\text{sec}$	$T_J = 125^\circ\text{C}$ , $i_F = 5\text{a}$ , $i_R = 5\text{a}$ $v_{AC}$ (Reapplied) = Rated. Rate of Rise of Reapplied Forward Blocking Voltage = 20 volts per microsecond maximum.
Thermal Resistance	$\theta_{JC}$		1.5	3.1	$^\circ\text{C}/\text{Watt}$	Junction to Case.

†Values apply for zero or negative gate voltage. Maximum case to ambient thermal resistance for which maximum PRV ratings apply =  $18^\circ\text{C}$  per watt.

\*Indicates data included on JEDEC type number registration.



**1. MAXIMUM FORWARD CHARACTERISTICS CONDUCTING STATE**



**2. MAXIMUM FORWARD CHARACTERISTICS HIGH CURRENT LEVEL - CONDUCTING STATE**