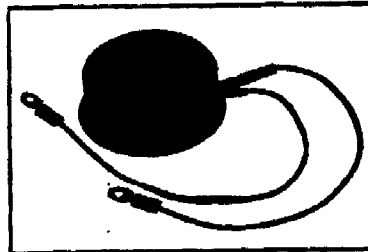
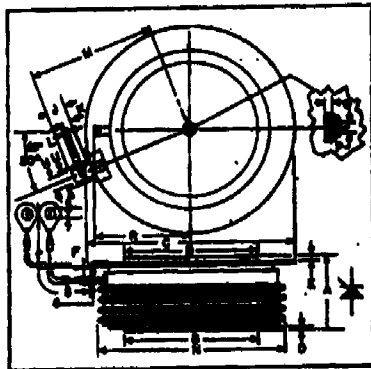


**C451**

**Phase Control SCR**  
 1400-1500 Amperes Avg  
 500-1800 Volts



**C451**  
 Phase Control SCR  
 1400-1500 Amperes/500-1800 Volts

**C451**  
 Outline Drawing

Dimensions	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	1.020	1.065	26.90	27.05
B	1.845	1.855	46.96	47.12
C	—	2.840	—	74.68
D	.030	—	.76	—
E	.060	—	1.27	—
F	.017	.023	.43	.58
G	.057	.059	1.44	1.50
H	.186	.191	4.72	4.85
J	.245	.265	6.22	6.48
K	.115	.130	2.92	3.30
L	.084	.070	1.62	1.78
M	—	1.800	—	45.72
N	—	2.650	—	67.31
P	.195	.145	3.42	3.68
Q	.070	.100	1.77	2.54
R	—	1.365	—	34.42
S	12.218	12.343	310.36	313.51
T	.137	.153	3.47	3.89

**Features:**

- Low On-State Voltage
- High di/dt
- High dv/dt
- Hermetic Packaging
- Excellent Surge and Ft Ratings

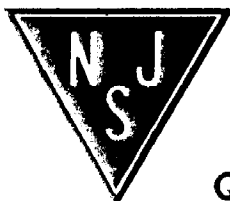
**Applications:**

- Power Supplies
- Battery Chargers
- Motor Control
- Light Dimmers
- VAR Generators

**Ordering Information**

Example: Select the complete six or seven digit part number you desire from the table - i.e. C451M1 is a 600 Volt, 1500 Ampere Phase Control SCR.

Type	Voltage		Current	
	Vmax Vmax	Code	Ir (avg)	Code
C451	500	E	1500	1
	600	M	1400	2
	700	S		
	800	N		
	900	T		
	1000	P		
	1100	PA		
	1200	PB		
	1300	PC		
	1400	PD		
	1500	PE		
	1600	PM		
	1700	PS		
	1800	PN		



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

### Absolute Maximum Ratings

	Symbol	C481-1	C481-2	Units
RMS On-State Current	$I_{T(RMS)}$	2350	2200	Ampere
Average On-State Current	$I_{T(AV)}$	1500	1400	Ampere
Peak One-Cycle Surge (Non Repetitive) On-State Current (60Hz)	$I_{TSM}$	23,000	21,000	Ampere
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	$I_{TSS}$	20,800	19,200	Ampere
Critical Rate-of-Rise of On-State Current (Non-Repetitive)	$di/dt$	400	400	Ampere/ $\mu$ s
Critical Rate-of-Rise of On-State Current (Repetitive)	$di/dt$	75	75	Ampere/ $\mu$ s
$I^2t$ (for Fusing), One Cycle at 60Hz	$I^2t$	2,200,000	1,990,000	A <sup>2</sup> sec
Peak Gate Power Dissipation	$P_{GM}$	200	200	Watts
Average Gate Power Dissipation	$P_{G(AV)}$	5	5	Watts
Storage Temperature	$T_{STG}$	-40 to 150	-40 to 150	°C
Operating Temperature	$T_J$	-40 to 125	-40 to 125	°C
Mounting Force <sup>Ⓞ</sup>		5500 to 6000	5500 to 6000	lb.
Mounting Force <sup>Ⓞ</sup>		24.5 to 26.7	24.5 to 26.7	kN

### Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C481-1	C481-2	Units
C481					
Current—Conducting State Maximums					
Peak On-State Voltage	$V_{TM}$	$T_J = 25^\circ\text{C}; I_{TM} = 3000\text{A Peak, Duty Cycle } \leq 0.01\%$	1.70	1.90	Volt
C481					
Voltage—Blocking State Maximums					
Forward Leakage, Peak	$I_{FPM}$	$T_J = 125^\circ\text{C}, V = V_{DFM}$	45		mA
Reverse Leakage, Peak	$I_{RPM}$	$T_J = 125^\circ\text{C}, V = V_{RPM}$	45		mA
Switching					
Typical Turn-Off Time	$t_f$	$T_J = 125^\circ\text{C}, I_T = 2000\text{A, Pulse Width} = 1000 \mu\text{sec}; V_n = 50\text{V}; dv/dt = 200 \text{V}/\mu\text{sec}; \text{Linear to } .8 V_{DFM}; di_n/dt = 25\text{A}/\mu\text{sec}; V_G = 0, R_L = 100\Omega$	150		$\mu$ sec
Typical Delay Time	$t_d$	$T_J = 25^\circ\text{C}, I_T = 50\text{A, Gate Supply} = 20\text{V}; R_L = 20\Omega; \text{Rise Time} = 0.1/\mu\text{sec}$	.7		$\mu$ sec
Min. Critical $dv/dt$ exponential to $V_{DFM}$	$dv/dt$	$T_J = 125^\circ\text{C}, 0.8V_{DFM}$ Applied	400		$\text{V}/\mu\text{sec}$
Thermal					
Maximum Thermal Resistance, <sup>Ⓞ</sup> double sided cooling					
Junction to Case	$R_{\theta JC}$		.025		°C/Watt
Case to Sink, Lubricated	$R_{\theta CS}$		.0075		°C/Watt
Gate—Maximum Parameters					
Gate Current to Trigger	$I_{GT}$	$T_J = 25^\circ\text{C}, V_D = 20\text{Vdc}, R_L = 3\Omega$	200		mA
Gate Voltage to Trigger	$V_{GT}$	$T_J = -40 \text{ to } 125^\circ\text{C}, V_D = 20\text{Vdc}, R_L = 3\Omega$	5		Volts
Non-Triggering Gate Voltage	$V_{GOW}$	$V_D = \text{rated } V_{DFM}, T_J = 125^\circ\text{C}, R_L = 1000\Omega$	.15		Volts
Peak Forward Gate Current	$I_{GM}$		10		Ampere
Peak Reverse Gate Voltage	$V_{GM}$		5		Volts