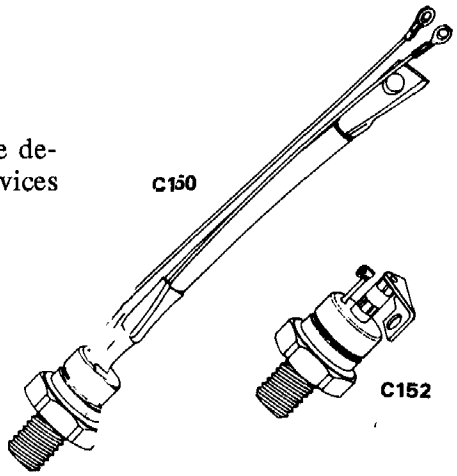
New Jersey Semi-Conductor Products, Inc.

High Power Silicon Controlled Rectifier

1300 VOLTS 110 ARMS

C150,2

C150 and C152 Silicon Controlled Rectifiers are designed for phase control applications. These are all-diffused, Pic-Pac devices employing the field-proven amplifying gate.



FEATURES:

- High di/dt Rating
- High dv/dt Capability with Selections Available
- Excellent Surge and I^2t Ratings Providing Easy Fusing
- Rugged Hermetic Package with Long Creepage Path

MAXIMUM ALLOWABLE RATINGS

TYPE	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
C150, C152E	500 Volts	500 Volts	600 Volts
C150, C152M	600	600	720
C150, C152S	700	700	850
C150, C152N	800	800	950
C150, C152T	900	900	1075
C150, C152P	1000	1000	1200
C150, C152PA	1100	1100	1325
C150, C152PB	1200	1200	1450
C150, C152PC	1300	1300	1550

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

RMS On-State Current, $I_{T(RMS)}$ . . . . . 100 Amperes (All Conduction Angles)
Average On-State Current, $I_{T(AV)}$ . . . . . Depends on Conduction Angle (See Charts 1 and 4)
Peak One-Cycle Surge (Non-Repetitive) On-State Current, I_{TSM} (60 Hz) . . . . . 1500 Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current, I_{TSM} (50 Hz) . . . . . 1400 Amperes
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
I^2t (for fusing), for times ⩾ 1.5 milliseconds . . . . . 7000 (RMS Ampere)^2 Seconds
Peak Gate Power Dissipation, P_{GM} . . . . . 10 Watts
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
Stud Torque . . . . . 125 Lbs.-In. (Min.) – 150 Lbs.-In. (Max.)
14 N-m (Min.) – 17 N-m (Max.)

*di/dt ratings established in accordance with EIA-NEMA Standard RS-397, ion 5.2.2.6 for conditions of V_{DRM} stated above; 20 volts, 20 ohms gate trigger source with 0.5 μsec short circuit trigger current rise

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CHARACTERISTICS

TEST	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Repetitive Peak Reverse and Off-State Current	I_{DRM} and I_{RRM}				mA	T_J = +25°C V_{DRM} = V_{RRM} =
C150, C152E		–	3	10		500 Volts Peak
C150, C152M		–	3	10		600
C150, C152S		–	3	10		700
C150, C152N		–	3	10		800
C150, C152T		–	3	10		900
C150, C152P		–	3	10		1000
C150, C152PA		–	3	10		1100
C150, C152PB		–	3	6		1200
C150, C152PC		–	3	5		1300
Repetitive Peak Reverse and Off-State Current	I_{DRM} and I_{RRM}				mA	T_J = +125°C V_{DRM} = V_{RRM}
C150, C152E		–	15	20		500 Volts Peak
C150, C152M		–	15	20		600
C150, C152S		–	15	20		700
C150, C152N		–	15	20		800
C150, C152T		–	15	20		900
C150, C152P		–	15	20		1000
C150, C152PA		–	15	20		1100
C150, C152PB		–	10	13		1200
C150, C152PC		–	8	11		1300
Thermal Resistance	$R\theta_{JC}$	–	.2	.3	°C/Watt	Junction-to-Case
Critical Rate-of-Rise of Off-State Voltage (Higher values may cause device switching)	dv/dt	200	500	–	V/μsec	T_J = +125°C, Rated V_{DRM}, Using Linear Exponential Rising Waveform. Gate Open Circuited. Exponential dv/dt = $\frac{V_{DRM}}{\tau}$ (.632)
Higher minimum dv/dt selections available – consult factory.						
Holding Current	I_H	–	20	500	mAdc	T_C = +25°C, Anode Supply = 24 Vdc. Initial Forward Current = 2 Amps.
Turn-On Delay Time	t_d	–	1	–	μsec	T_C = +25°C, I_T = 50 Adc, V_{DRM} = Rated. Gate Supply: 10 Volt Open Circuit, 20 Ohm, 0.1 μsec max. rise time
Gate Pulse Width Necessary to Trigger		–	8	10	μsec	T_C = +25°C. Gate Supply: 20 Volt Open Circuit, 40 Ohm, 0.5 μsec rise time. I_T = 1.0 Amps. for High di/dt Capability. See Chart 9.
DC Gate Trigger Current	I_{GT}	–	50	150	mAdc	T_C = +25°C, V_D = 6 Vdc, R_L = 3 Ohms
		–	75	200		T_C = -40°C, V_D = 6 Vdc, R_L = 3 Ohms
		–	15	125		T_C = +125°C, V_D = 6 Vdc, R_L = 3 Ohms
DC Gate Trigger Voltage	V_{GT}	–	1.25	3.0	Vdc	T_C = -40°C to +120°C, V_D = 6 Vdc, R_L = 3 Ohms
		0.15	–	–		T_C = +125°C, V_D = Rated, R_L = 1000 Ohms
Peak On-State Voltage	V_{TM}	–	2.0	2.6	Volts	T_C = +25°C, I_{TM} = 500 Amps. Peak. Duty Cycle ≤ 0.01%
Circuit Commutated Turn-Off Time**	t_q	–	100	†	μsec	(1) T_J = +125°C (2) I_{TM} = 50 Amps (3) V_R = 50 Volts Min. (4) V_{DRM} (Reapplied) = Rated (5) Rate-of-Rise of Reapplied Off-State Voltage = 20V/μsec Linear

† Consult factory if guaranteed turn-off time is required.

** Typical turn-off time increases 30%, if I_{TM} is increased to 500 amps

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