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C358 Series High Speed Silicon Controlled Rectifier 1200 volts

The C358 Silicon Controlled Rectifier is designed for power switching at high frequencies. This is all-diffused Press-Pak device employing the field-proven amplifying gate.

Features:

*Fully Characterized for operation in inverted and chopper applications.

*Rugged hermetic glazed ceramic package.

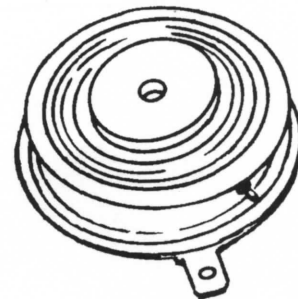
*Hi di/dt ratings.

*High dv/dt capability with selections available.

MAXIMUM ALLOWABLE RATINGS

TYPES	REPETITIVE PEAK OFF-STATE VOLTAGE, V_{DRM}^1 $T_J = -40^\circ\text{C to } +125^\circ\text{C}$	REPETITIVE PEAK REVERSE VOLTAGE, V_{RRM}^1 $T_J = -40^\circ\text{C to } +125^\circ\text{C}$	NON-REPETITIVE PEAK REVERSE VOLTAGE, V_{RSM}^1 $T_J = +125^\circ\text{C}$
C358E	500 Volts	500 Volts	600 Volts
C358M	600	600	720
C358S	700	700	840
C358N	800	800	960
C358T	900	900	1080
C358P	1000	1000	1200
C358PA	1100	1100	1300
C358PB	1200	1200	1400

¹ Half sinewave waveform 10 ms max. pulse width.



Quality Semi-Conductors

RMS On-State Current, $I_{T(RMS)}$	225 Amperes
Peak One Cycle Surge (Non-Repetitive) On-State Current, I_{TSM} (60 Hz)	1600 Amperes
Peak One Cycle Surge (Non-Repetitive) On-State Current, I_{TSM} (50 Hz)	1500 Amperes
I^2t (for fusing) for times ≥ 1.5 milliseconds	5,200 (RMS Ampere) ² Seconds
I^2t (for fusing) for times ≥ 8.3 milliseconds	10,500 (RMS Ampere) ² Seconds
Critical Rate-of-Rise of On-State Current, Non-Repetitive	800 A/ μ s †
Critical Rate-of-Rise of On-State Current, Repetitive	500 A/ μ s †
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
Mounting Force	800 Lbs. \pm 10%
	3.56 KN \pm 10%

†di/dt ratings established in accordance with EIA-NEMA Standard RS-397, Section 5.2.2.6 for conditions of max. rated V_{DRM} ; 20 volts, 20 ohms gate trigger source with 0.5 μ s short circuit trigger current rise time.

CHARACTERISTICS

TEST	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Repetitive Peak Reverse and Off-State Current	I_{RRM} and I_{DRM}				mA	$T_J = +25^\circ\text{C}$, $V_{DRM} = V_{RRM} =$
C358E		—	3	10		500 Volts
C358M		—	3	10		600
C358S		—	3	10		700
C358N		—	3	10		800
C358T		—	3	9		900
C358P		—	3	7		1000
C358PA		—	3	7		1100
C358PB		—	3	7		1200
Repetitive Peak Reverse and Off-State Current	I_{RRM} and I_{DRM}				mA	$T_J = 125^\circ\text{C}$, $V_{DRM} = V_{RRM} =$
C358E		—	12	15		500 Volts
C358M		—	12	15		600
C358S		—	12	15		700
C358N		—	12	15		800
C358T		—	12	15		900
C358P		—	12	15		1000
C358PA		—	12	17		1100
C358PB		—	12	18		1200
Thermal Resistance	$R_{\theta JC}$	—	.12	.135	°C/Watt	Junction-to-Case — Double-Side Cooled
		—	.15	.26		Junction-to-Case — Single-Side Cooled
Critical Rate-of-Rise of Off-State Voltage (Higher values may cause device switching)	dv/dt	200	500	—	V/ μ sec	$T_J = +125^\circ\text{C}$, Gate Open. $V_{DRM} =$ Rated Linear or Exponential Rising Waveform. Exponential dv/dt = $\frac{V_{DRM}}{\tau}$ (.632)
Higher minimum dv/dt selections available — consult factory.						
Holding Current	I_H	—	100	500	mAdc	$T_C = +25^\circ\text{C}$, Anode Supply = 24 Vdc. Initial On-State Current = 2 Amps.
DC Gate Trigger Current	I_{GT}	—	50	150	mAdc	$T_C = +25^\circ\text{C}$, $V_D = 6$ Vdc, $R_L = 3$ Ohms
		—	75	300		$T_C = -40^\circ\text{C}$, $V_D = 6$ Vdc, $R_L = 3$ Ohms
		—	15	125		$T_C = +125^\circ\text{C}$, $V_D = 6$ Vdc, $R_L = 3$ Ohms
DC Gate Trigger Voltage	V_{GT}	—	3	5	Vdc	$T_C = -40^\circ\text{C}$ to 0°C , $V_D = 6$ Vdc, $R_L = 3$ Ohms
		—	1.25	3.0		$T_C = 0^\circ\text{C}$ to $+125^\circ\text{C}$, $V_D = 6$ Vdc, $R_L = 3$ Ohms
		0.15	—	—		$T_C = 125^\circ\text{C}$, V_{DRM} , $R_L = 1000$ Ohms
Peak On-State Voltage	V_{TM}	—	2.8	3.5	Volts	$T_C = +25^\circ\text{C}$, $I_{TM} = 500$ Amps. Peak. Duty Cycle $\leq .01\%$.

CHARACTERISTICS (continued)

TEST	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITION
Turn-On Delay Time	t_d	—	0.5	—	μsec	$T_C = +25^\circ\text{C}$, $I_T = 50 \text{ Adc}$, V_{DRM} , Gate Supply: 20 volt open circuit, 20 ohm, 0.1 μsec max. rise time. ††, †††
Conventional Circuit Commutated Turn-Off Time (with Reverse Voltage) Faster Maximum Turn-Off Times Available, Consult Factory	t_q	—	25	40	μsec	(1) $T_C = +125^\circ\text{C}$ (2) $I_{\text{TM}} = 150 \text{ Amps}$. (3) $V_R = 50 \text{ Volts Min.}$ (4) V_{DRM} (Reapplied) (5) Rate-of-Rise of Reapplied Off-State Voltage = 200 $\text{V}/\mu\text{sec}$ (Linear) (6) Commutation $di/dt = 5 \text{ Amps}/\mu\text{sec}$. (7) Repetition Rate = 1 pps. (8) Gate bias during turn-off interval = 0 volts, 100 ohms
Conventional Circuit Commutated Turn-Off Time (with Feedback Diode)	t_q (diode)	—	40	†	μsec	(1) $T_C = +125^\circ\text{C}$ (2) $I_{\text{TM}} = 150 \text{ Amps}$. (3) $V_R = 1 \text{ Volt}$ (4) V_{DRM} (Reapplied) (5) Rate-of-Rise of Reapplied Off-State Voltage = 200 $\text{V}/\mu\text{sec}$ (Linear). (6) Commutation $di/dt = 5 \text{ Amps}/\mu\text{sec}$. (7) Repetition Rate = 1 pps. (8) Gate bias during turn-off interval = 0 volts, 100 ohms