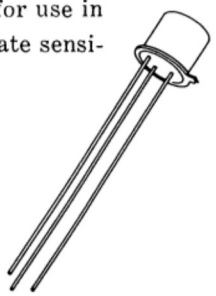
SCR

1.6A RMS Up to 400 Volts

C5 Series
2N2322-29
2N2322A-28A

The C5 Series of Silicon Controlled Rectifiers are reverse blocking thyristors for use in low power switching and control applications. They feature two ranges of gate sensitivity and high external gate-cathode shunting resistance.



- All-diffused
- Two ranges of gate sensitivity—2N2322-29—200μA max. & 2N2322A-28A—20μA max.
- Low holding current
- Broad voltage range

MAXIMUM ALLOWABLE RATINGS

TYPES† JEDEC		REPETITIVE PEAK OFF-STATE VOLTAGE, V_{DRM} $T_C = -65°C$ to $+125°C$ $R_{GK} = 1000$ OHMS (2N2322-29) $= 2000$ OHMS (2N2322A-28A)	REPETITIVE PEAK REVERSE VOLTAGE, V_{RRM} $T_C = -65°C$ to $+125°C$	NON-REPETITIVE PEAK REVERSE VOLTAGE, V_{RSM} ($\leqq$ 10 Millisec.) $T_C = -65°C$ to $+125°C$
2N2322	C5U	25V.*	25V.*	40V.*
2N2322A	—	25V.*	25V.*	40V.*
2N2323	C5F	50V.*	50V.*	75V.*
2N2323A	—	50V.*	50V.*	75V.*
2N2324	C5A	100V.*	100V.*	150V.*
2N2324A	—	100V.*	100V.*	150V.*
2N2325	C5G	150V.*	150V.*	225V.*
2N2325A	—	150V.*	150V.*	225V.*
2N2326	C5B	200V.*	200V.*	300V.*
2N2326A	—	200V.*	200V.*	300V.*
2N2327	C5H	250V.*	250V.*	350V.*
2N2327A	—	250V.*	250V.*	350V.*
2N2328	C5C	300V.*	300V.*	400V.*
2N2328A	—	300V.*	300V.*	400V.*
2N2329	C5D	400V.*	400V.*	500V.*

Peak Positive Anode Voltage, PFV ..... 500 Volts

RMS On-State Current, $I_{T(RMS)}$ ..... 1.6 Amperes (all conduction angles)

Average On-State Current, $I_{T(AV)}$ ..... Depends on conduction angle (see Charts 2, 3, 5 and 6)

Critical Rate-of-Rise of On-State Current, di/dt:
Gate Triggered Operation, Switching from Rated Voltage ..... 50 Amperes per microsecond

Peak One Cycle Surge (non-rep) On-State Current, I_{TSM} ..... 15 Amperes*

I^2t (for fusing), for times $\geqslant$ 1.5 milliseconds ..... 0.5 Ampere^{2}seconds

Peak Gate Power Dissipation, P_{GM} ..... 0.1 Watts*

Average Gate Power Dissipation, $P_{G(AV)}$ ..... 0.01 Watts*

Peak Positive Gate Current, I_{GM} ..... 0.1 Amperes*

Peak Positive Gate Voltage, V_{GM} ..... 6 Volts*

Peak Negative Gate Voltage, V_{GM} ..... 6 Volts*

Storage Temperature, T_{STG} ..... −65°C to +150°C*

Operating Temperature, T_J ..... −65°C to +125°C*

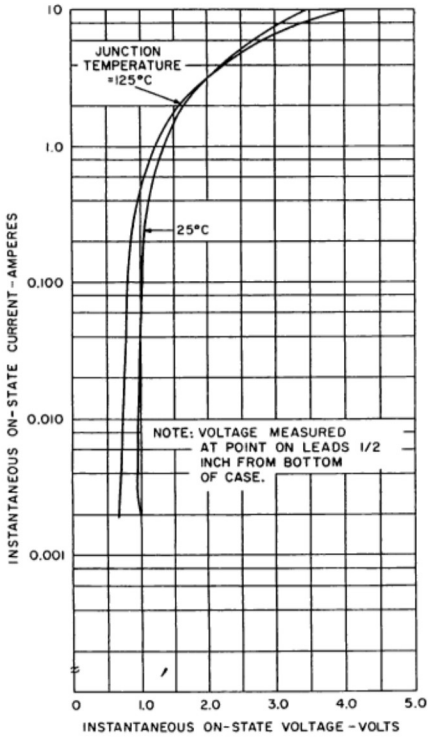
*Indicates data included on JEDEC type number registration

SOLID STATE INC.
46 FARRAND STREET
BLOOMFIELD, NEW JERSEY 07003
www.solidstateinc.com

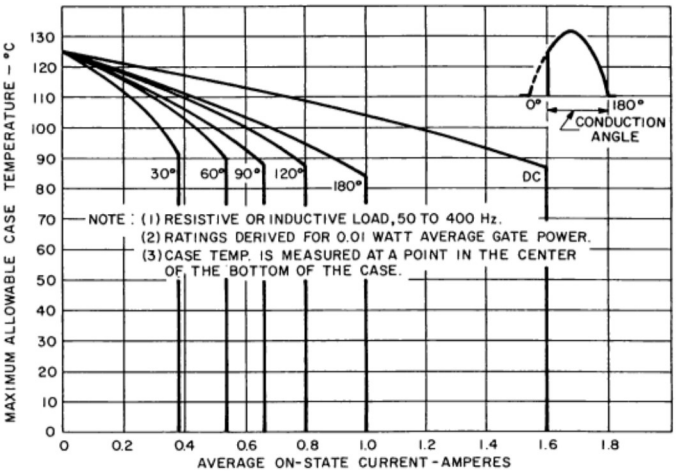
CHARACTERISTICS

TEST	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
PEAK REVERSE or OFF-STATE CURRENT	I_{RRM}				μA	$V_{RRM} = V_{DRM}$ = Rated.
	or	—	2.0	10.0		$T_C = +25°C$, R_{GK} = 1000 Ohms 2N2322-29 (C5 Series) = 2000 Ohms 2N2322A-28A
All Types	I_{DRM}	—	40	100*		$T_C = +125°C$, R_{GK} = 1000 Ohms 2N2322-29 (C5 Series) = 2000 Ohms 2N2322A-28A
GATE TRIGGER CURRENT	I_{GT}				μAdc	
2N2322-29 (C5 Series)		—	10	200		$T_C = +25°C$, V_D = 6Vdc, R_L = 100 Ohms, R_{GK} = 1000 Ohms
2N2322A-28A		—	2	20		$T_C = +25°C$, V_D = 6Vdc, R_L = 100 Ohms, R_{GK} = 2000 Ohms
2N2322-29 (C5 Series)		—	20.0	350*		$T_C = -65°C$, V_D = 6Vdc, R_L = 100 Ohms, R_{GK} = 1000 Ohms
2N2322A-28A		—	10	75*		$T_C = -65°C$, V_D = 6Vdc, R_L = 100 Ohms, R_{GK} = 2000 Ohms
GATE TRIGGER VOLTAGE	V_{GT}				Vdc	
2N2322-29 (C5 Series)		0.35	0.5	0.8		$T_C = +25°C$, V_D = 6Vdc, R_L = 100 Ohms, R_{GK} = 1000 Ohms
2N2322A-28A		0.35	0.4	0.6		$T_C = +25°C$, V_D = 6Vdc, R_L = 100 Ohms, R_{GK} = 2000 Ohms
2N2322-29 (C5 Series)		—	0.7	1.0*		$T_C = -65°C$, V_D = 6Vdc, R_L = 100 Ohms, R_{GK} = 1000 Ohms
2N2322A-28A		—	—	0.9*		$T_C = -65°C$, V_D = 6Vdc, R_L = 100 Ohms, R_{GK} = 2000 Ohms
2N2322-29 (C5 Series)		0.1*	0.25	0.5		$T_C = +125°C$, V_{DM} = Rated V_{DRM} Value, R_{GK} = 1000 Ohms, R_L = 100 Ohms
2N2322A-28A		0.1*	—	—		$T_C = +125°C$, V_{DM} = Rated V_{DRM} Value, R_{GK} = 2000 Ohms, R_L = 100 Ohms
PEAK ON-STATE VOLTAGE	V_{TM}	—	2.0	2.2	V	$T_C = +25°C$, I_{TM} = 4.0A, Single Half Sine Wave Pulse, 2.0 Millisec. Wide
All Types		—	1.9	2.0*		$T_C = +85°C$, $I_{T(AV)}$ = 1.0A, Half Sine Wave, 60 Hz, 180° Conduction Angle
HOLDING CURRENT	I_H				mAdc	R_{GK} = 1000 Ohms 2N2322-29 (C5 Series) = 2000 Ohms 2N2322A-28A
All Types		—	1.0	2.0		$T_C = +25°C$, R_L = 10K
All Types		—	1.5	3.0*		$T_C = -65°C$, R_L = 10K
2N2322-29		0.15*	0.4	—		$T_C = +125°C$, R_L = 50K
2N2322A-28A		0.10*	0.4	—		
TURN-ON TIME All Types	$t_d + t_r$	—	1.4	—	μsec	$T_C = +25°C$, I_F = 1.0A, V_{DM} = Rated V_{DRM} Value, Gate Supply: 6 Volt Open Circuit, 330 Ohm Load Line, 0.1 μsec. Rise Time, 5 μsec. Min. Pulse Width.
CIRCUIT-COMMUTATED TURN-OFF TIME All Types	t_q	—	40	—	μsec	$T_C = +125°C$, I_{TM} = 1.0A Peak. Rectangular current pulse, 50 μsec duration. Rate of rise of current <10 amperes/μsec. Commutation rate ≤5 amperes/μsec. Peak reverse voltage = rated V_{RRM} volts max. Reverse voltage at end of turn-off time interval = 15V. Repetition rate = 60 pps. Rate of rise of re-applied off-state voltage (dv/dt) = 20V/μsec. Off-state voltage = rated V_{DRM} volts. Gate bias during turn-off time interval = 0 volts, 100 ohms.

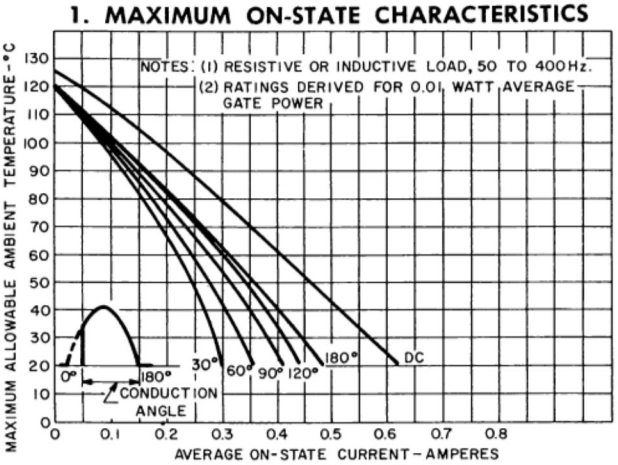
*Indicates data included on JEDEC type number registration



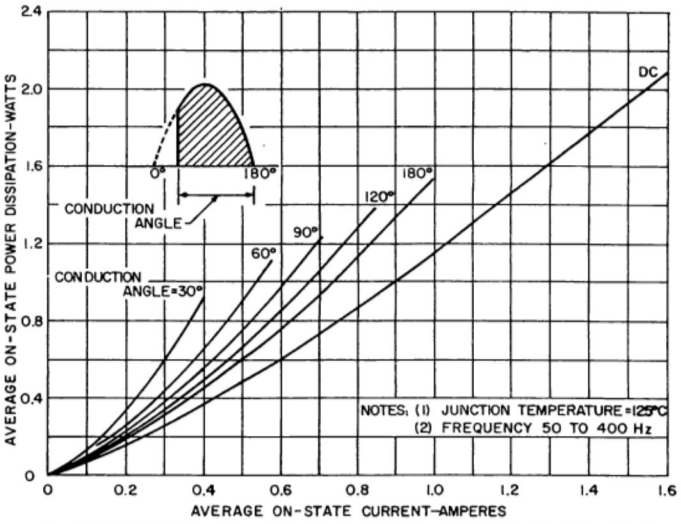
1. MAXIMUM ON-STATE CHARACTERISTICS



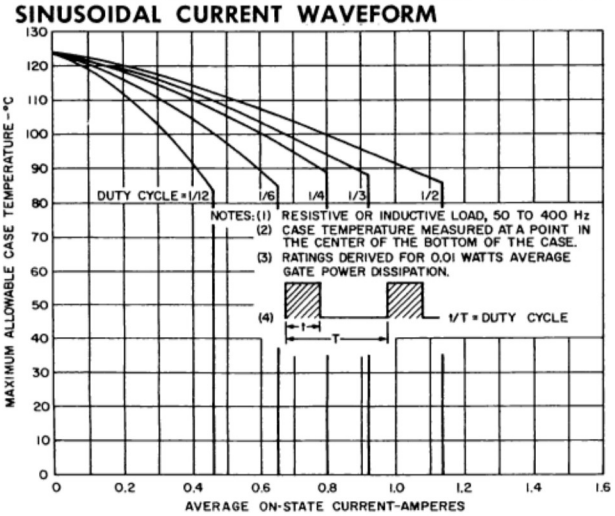
2. MAXIMUM ALLOWABLE CASE TEMPERATURE FOR SINUSOIDAL CURRENT WAVEFORM



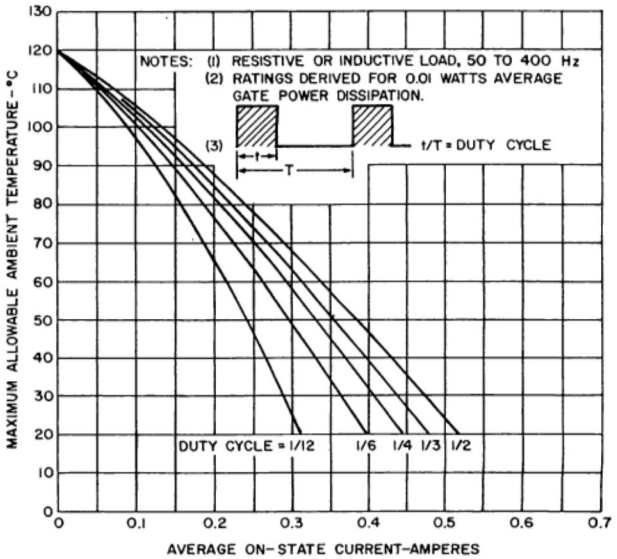
3. MAXIMUM ALLOWABLE AMBIENT TEMPERATURE FOR SINUSOIDAL CURRENT WAVEFORM



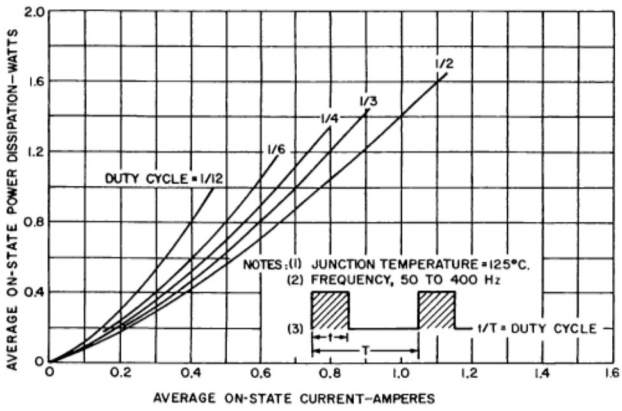
4. MAXIMUM ON-STATE POWER DISSIPATION FOR SINUSOIDAL CURRENT WAVEFORM



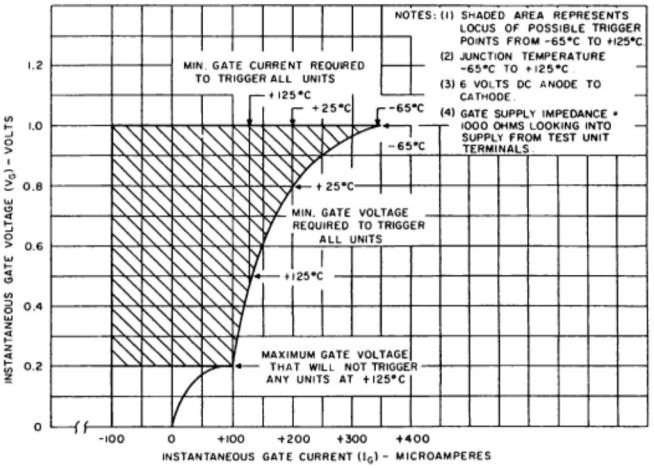
5. MAXIMUM ALLOWABLE CASE TEMPERATURE FOR RECTANGULAR CURRENT WAVEFORM



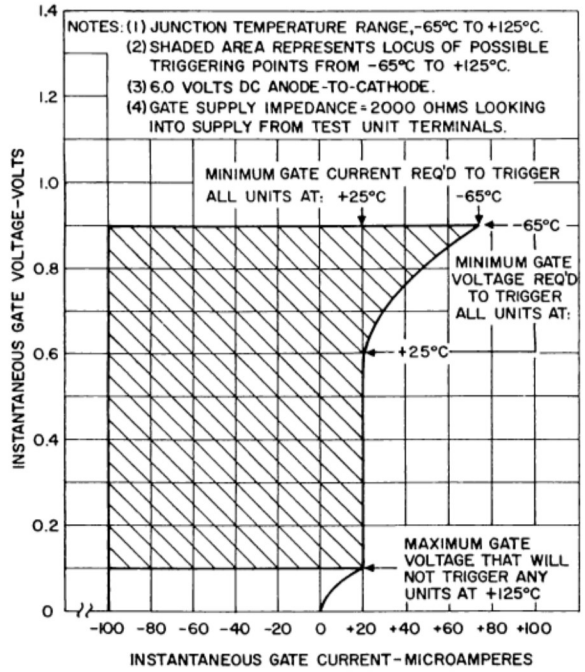
6. MAXIMUM ALLOWABLE AMBIENT TEMPERATURE FOR RECTANGULAR CURRENT WAVEFORM



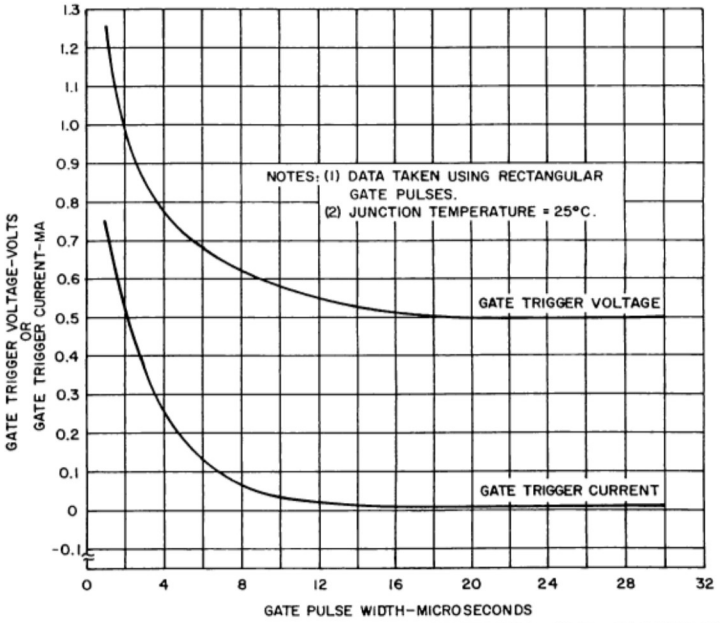
7. MAXIMUM ON-STATE POWER DISSIPATION FOR RECTANGULAR CURRENT WAVEFORM



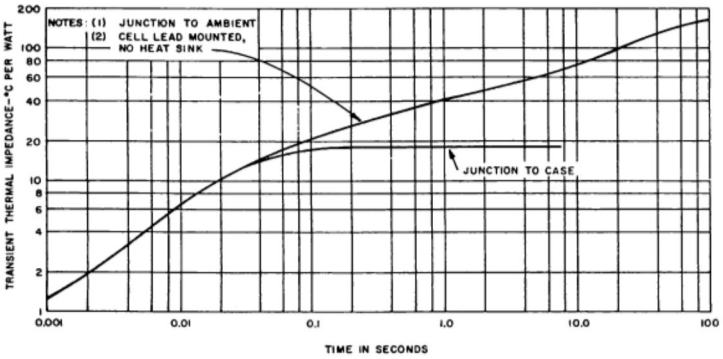
8. GATE TRIGGERING CHARACTERISTICS FOR 2N2322-29 (C5 SERIES) ONLY



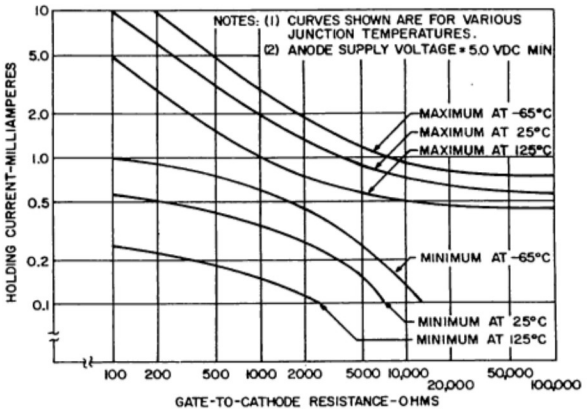
9. GATE TRIGGERING CHARACTERISTICS FOR 2N2322A-28A ONLY



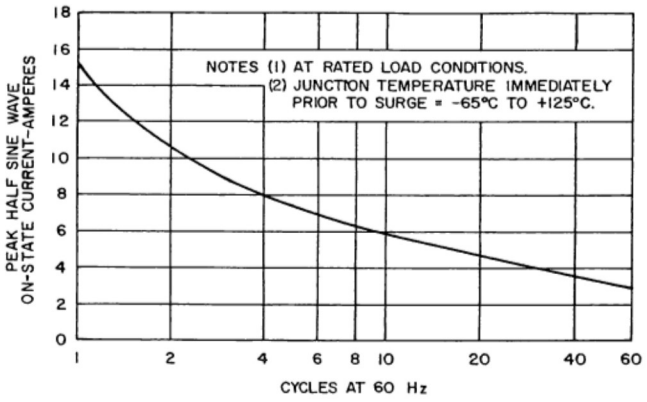
10. TYPICAL GATE TRIGGER CURRENT AND VOLTAGE VARIATION WITH GATE PULSE WIDTH



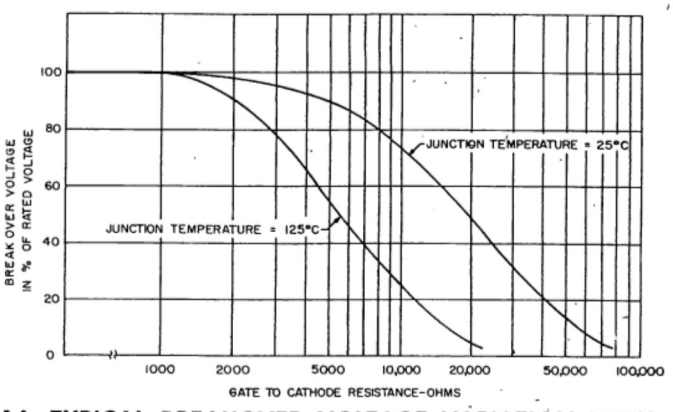
11. MAXIMUM TRANSIENT THERMAL IMPEDANCE



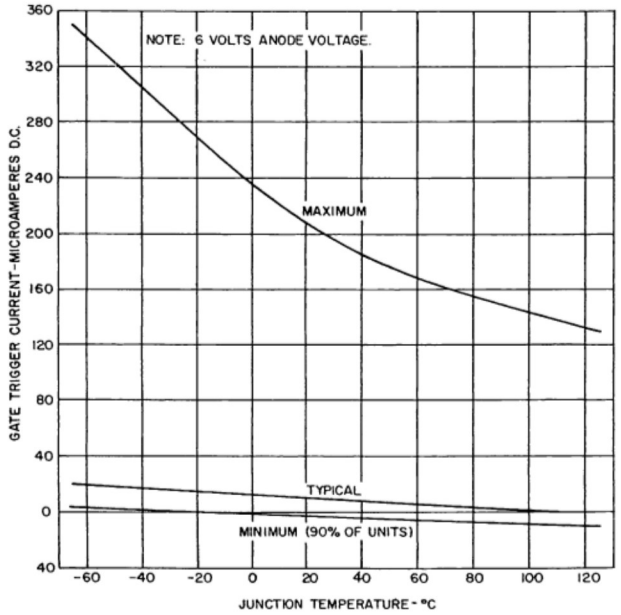
12. MAXIMUM AND MINIMUM HOLDING CURRENT VARIATION WITH EXTERNAL GATE-TO-CATHODE RESISTANCE FOR 2N2322-29 (C5 SERIES) ONLY



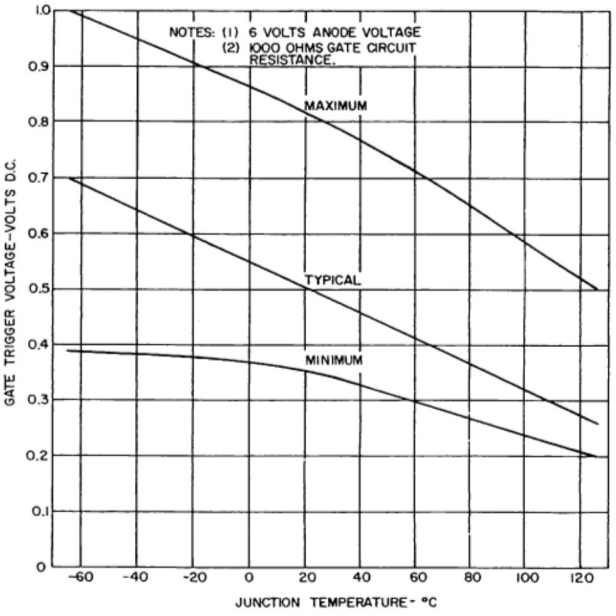
13. MAXIMUM ALLOWABLE SURGE (NON-REPETITIVE) ON-STATE CURRENT



14. TYPICAL BREAKOVER VOLTAGE VARIATION WITH EXTERNAL GATE-TO-CATHODE RESISTANCE 2N2322-29 (C5 SERIES) ONLY



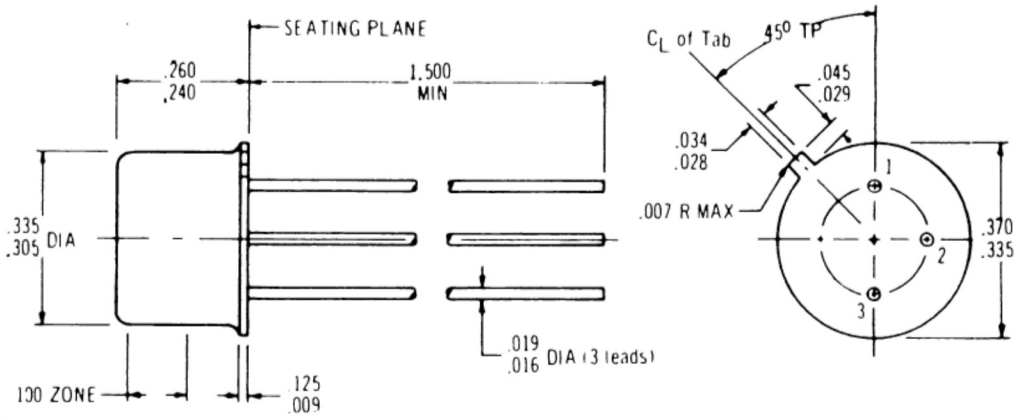
15. VARIATION OF GATE TRIGGER CURRENT WITH TEMPERATURE FOR 2N2322-29 (C5 SERIES) ONLY



16. VARIATION OF GATE TRIGGER VOLTAGE WITH TEMPERATURE FOR 2N2322-29 (C5 SERIES) ONLY

PACKAGING DATA

JEDEC TO-5 OUTLINE



PIN CONNECTIONS

1. Cathode
2. Gate
3. Anode (connected to case)