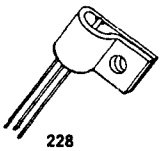
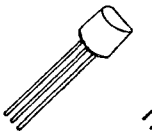
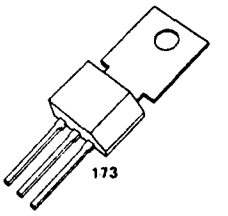


PHASE CONTROL SCR's
.5 TO 5 AMPERES





GE TYPE		C3	C103	C203	C5	C6	C7	–	C106	C107	C108
JEDEC		2N877-81[1]	–	2N5060-64	2N2322-29	–	2N2344-48	2N1595-99,A	–	–	–
ELECTRICAL SPECIFICATIONS											
VOLTAGE RANGE		30-200	30-200	30-400	25-400	25-400	25-200	50-400	15-600	15-600	15-600
FORWARD CONDUCTION											
$I_{T(RMS)}$	Max. RMS on-state current (A)	0.5	0.8	0.8	1.6	1.6	1.6	1.6	4.0	4.0	5.0
$I_{T(AV)}$	Max. average on-state current @ 180° conduction (A) @ T_C	0.32 @ 85°C	0.50 @ 25°C	0.50 @ 25°C	1.0 @ 85°C	1.0 @ 85°C	1.0 @ 55°C	1.0 @ 110°C	2.5 @ 30°C	2.5 @ 20°C	3.75 @ 30°C
I_{TSM}	Max. peak one cycle, non-repetitive surge current (A)	7	8	8	15	10	15	15	20	15	30
I^2t	Max. I^2t for fusing for > 1.5 msec (A^2 sec)	–	–	–	0.5	0.5	–	0.5	0.5	0.5	1
V_{TM}	Max. peak on-state voltage @ 25°C, 180° conduction, rated $I_{T(AV)}$ (V)	1.6	1.5	1.5	2.2	1.4	2	2	2.2	2.5	1.35
$R_{\theta JC}$	Max. internal thermal resistance, dc junction-to-case (°C/W)	80	125	75	10	10	–	–	10	10	10
I_H	Max. holding current @ 25°C (mA)	5	5	5	2	5	1	–	3	6	3
t_q	Typical turn-off time (μsec) @ max. T_J	15	15	15	40	40	20	40	40	40	40
	Maximum turn-off time (μsec @ 110°C)	–	–	–	–	–	–	–	100	100	100
$t_d + t_r$	Typical turn-on time (μsec @ 110°C)	1	1.4	1.4	1.4	1.4	1.4	1.2	1	1	1
di/dt	Max. rate-of-rise of turned-on current (A/μsec)	–	–	–	50	–	–	–	50	50	50
T_J	Junction operating temperature range (°C)	–65 to 125	–65 to 125	–65 to 125	–65 to 125	–40 to 125	–65 to 100	–65 to 150	–40 to 110	–40 to 110	–40 to 110
BLOCKING											
dv/dt	Typical critical rate-of-rise of off-state voltage, exponential to rated V_{DRM} @ max. rated T_J (V/μsec)	40	20	20	20	20	20	20	8	8	8
FIRING											
I_{GT}	Max. required gate current to trigger (μA) @ –65°C	300	500	500	350	–	75	–	–	–	–
	@ –40°C	–	–	–	–	–	–	–	500	–	500
	@ 25°C	200	200	200	200	1000	20	10,000	200	500	200
V_{GT}	Max. required gate voltage to trigger (V) @ –65°C	–	1	1	1	1	1	–	–	–	–
	@ –40°C	–	–	–	–	1	–	–	1	–	1
	@ 25°C	0.8	0.8	0.8	0.8	0.8	0.8	3	0.8	0.8	0.8
V_{GT}	Min. required gate voltage to trigger (V) @ 110°C	–	–	–	–	–	–	–	0.2	0.2	0.2
	@ 125°C	0.05	0.1	0.1	0.1	0.1	–	–	–	–	–
VOLTAGE TYPES											
Repetitive Peak Forward and Reverse Voltages											
15		–	–	–	–	–	–	–	C106Q1	C107Q1	C108Q1
25		–	–	–	2N2322 C5U	C6U	2N2344	–	–	–	–
30		2N877	C103Y	2N5060 C203Y	–	–	–	–	C106Y1	C107Y1	C108Y1
50		–	–	–	2N2323* C5F	C6F	2N2345	2N1595, A	C106F1	C107F1	C108F1
60		2N878	C103YY	2N5061 C203YY	–	–	–	–	–	–	–
100		2N879	C103A	2N5062 C203A	2N2324* C5A	C6A	2N2346	2N1596, A	C106A1	C107A1	C108A1
150		2N880	–	2N5063	2N2325 C5G	C6G	2N2347	–	–	–	–
200		2N881	C103B	2N5064 C203B	2N2326* C5B	C6B	2N2348	2N1597, A	C106B1	C107B1	C108B1
250		–	–	–	2N2327 C5H	–	–	–	–	–	–
300		–	–	C203C	2N2328* C5C	C6C	–	2N1598, A	C106C1	C107C1	C108C1
400		–	–	C203D	2N2329* C5D	C6D	–	2N1599, A	C106D1	C107D1	C108D1
500		–	–	–	–	–	–	–	C106E1	C107E1	C108E1
600		–	–	–	–	–	–	–	C106M1	C107M1	C108M1
PACKAGE OUTLINE NO.		112	195.1, 228	263	101	101	101	101	173	173	173

*JAN & JANTX types available.

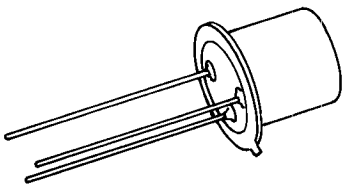
1. 2N885-89 available 20 mA max. I_{GT}.
2. 2N2322A-28A available 20 mA max. I_{GT}.

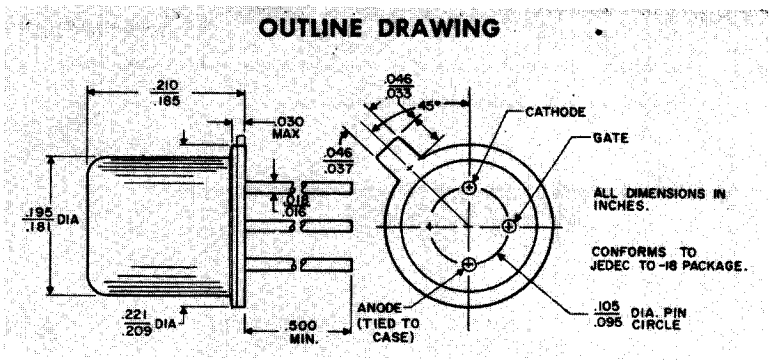
SCR

2N877-81
2N885-89

FEATURES:

- All-diffused for Proved Reliability
- Miniature Package TO-18
- Two Ranges of Gate Sensitivity:
  2N877-881 — 200 ua max.
  2N885-889 — 20ua max.
- Low Holding Current:
  2N877-881 — 5 ma. max.
  2N885-889 — 3 ma. mas.
- Voltage Ratings up to 200 volts
- Designed for Military Applications





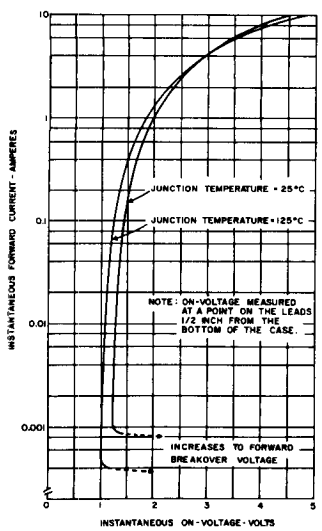
MAXIMUM ALLOWABLE RATINGS

TYPES	PEAK FORWARD BLOCKING VOLTAGE, V_{FXM}, $T_J = -65°C$ to $+125°C$. R_{GK} = 1000 OHMS MAXIMUM.	WORKING AND REPETITIVE PEAK REVERSE VOLTAGE, V_{ROM} (wkg) and V_{ROM} (rep). $T_J = -65°C$ to $+150°C$	NON-REPETITIVE PEAK REVERSE VOLTAGE, V_{ROM} (non-rep) < 5 Milliseconds. $T_J = -65°C$ to $+125°C$
2N877, 2N885	30 volts	30 volts	45 volts
2N878, 2N886	60 volts	60 volts	90 volts
2N879, 2N887	100 volts	100 volts	130 volts
2N880, 2N888	150 volts	150 volts	200 volts
2N881, 2N889	200 volts	200 volts	275 volts

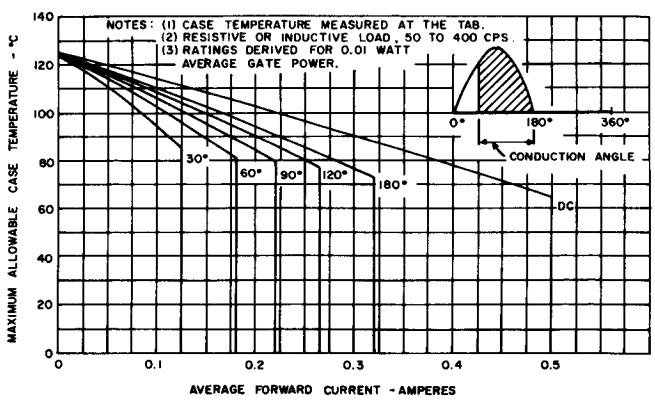
Peak Forward Voltage, PFV ——— 300 Volts
RMS Forward Current, On-state ——— 0.5 Ampere
Average Forward Current, On-state ——— Depends on conduction angle (see charts 2, 3, 11 & 12)
Peak One Cycle Surge Forward Current (Non-repetitive), I_{FM} (surge) ——— 7 Amperes
Peak Forward Gate Power Dissipation, P_{GM} ——— 0.1 Watt
Average Forward Gate Power Dissipation, $P_{G(AV)}$ ——— 0.01 Watt
Peak Gate Voltage, Forward and Reverse, V_{GFM} and V_{GRM} ——— 6 Volts
Storage Temperature, T_{stg} ——— −65°C to +150°C
Operating Temperature ——— −65°C to +150°C

CHARACTERISTICS

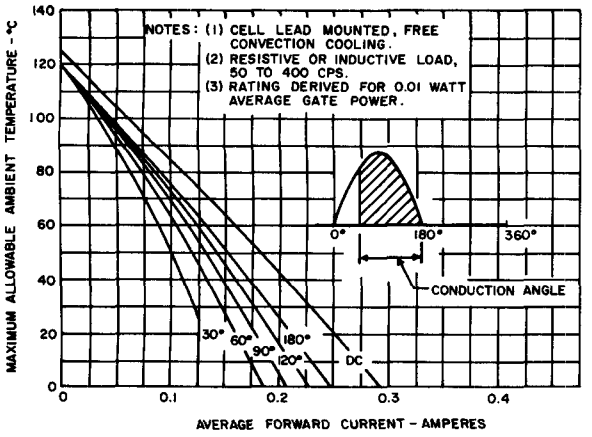
TEST	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
FORWARD BLOCKING CURRENT	I_{FX}				μAdc	V_{FX} = Rated V_{FXM}, R_{GK} = 1000 ohms
2N877-2N881		—	0.03	10		T_J = +25°C
		—	10	100		T_J = +125°C
2N885-2N889		—	0.03	1		T_J = +25°C
		—	10	20		T_J = +125°C
REVERSE BLOCKING CURRENT	I_{RX}				μAdc	V_{RX} = Rated V_{ROM} (rep)
2N877-2N881		—	0.1	10		T_J = +25°C
		—	10	100		T_J = +125°C
2N885-2N889		—	0.1	1		T_J = +25°C
		—	10	20		T_J = +125°C
REVERSE GATE CURRENT	I_{GRM}	—	1	10	μAdc	V_{GRM} = 2 Volts, T_J = +25°C.
PEAK ON-VOLTAGE	V_{FM}	—	1.3	1.9	volts	T_J = +25°C, I_{FM} = 1 Ampere, single half sine wave pulse, 2.0 milliseconds wide max.
HOLDING CURRENT	I_{HX}				mAdc	T_J = +25°C, R_{GK} = 1000 ohms, V_{FX} = 24 Volts dc.
2N877-2N881		0.4	1.7	5.0		
2N885-2N889		0.4	1.1	3.0		
RATE OF RISE OF APPLIED FORWARD VOLTAGE	dv/dt	—	40	—	volts/μsec	T_J = +125°C, R_{GK} = 1000 ohms, V_{FXM} = Rated V_{FXM}
TURN-ON TIME (Delay Time + Rise Time)	t_d+t_r	—	1.0	—	μsec	T_J = +25°C, V_{FX} = Rated V_{FXM}, I_{FM} = 1 Ampere, Gate Supply: 6 Volts, 300 ohms
CIRCUIT COMMUTATED TURN-OFF TIME	t_{off}				μsec	T_J = +125°C, R_{GK} = 1000 ohms, I_{FM} = 1 Ampere, I_R (recovery) = 1 Ampere
All Types		—	15	—		Reapplied V_{FXM} = Rated, Rate of Rise of Reapplied Forward Blocking Voltage = 20 V/μsec
GATE TRIGGER CURRENT	I_{GT}				μAdc	V_{FX} = 6 Vdc, R_{GK} = 1000 ohms, R_L = 100 ohms maximum.
2N877-2N881		—	40	200		T_J = +25°C
2N885-2N889		—	10	20		T_J = +25°C
GATE TRIGGER VOLTAGE	V_{GT}				Vdc	V_{FX} = 6 Vdc, R_{GK} = 1000 ohms, R_L = 100 ohms maximum.
2N877-2N881		0.4	0.5	0.8		T_J = +25°C
2N885-2N889		0.44	0.5	0.6		T_J = +25°C
All Types		0.05	—	—		V_{FX} = Rated V_{FXM}, R_{GK} = 1000 ohms, T_J = +125°C



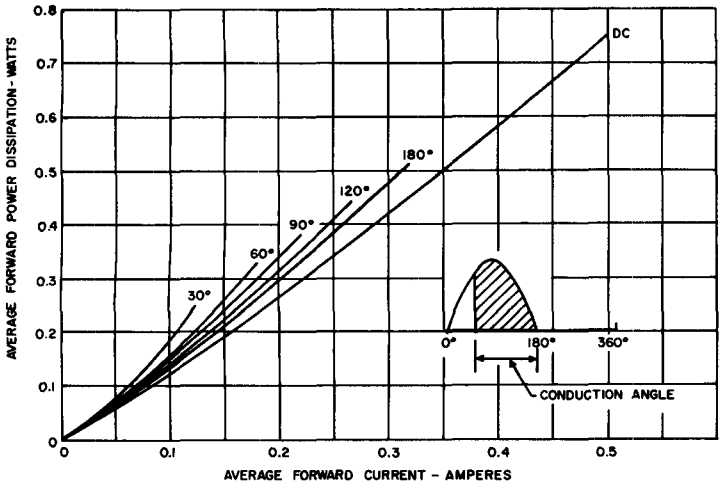
1. MAXIMUM FORWARD CHARACTERISTICS, ON-STATE



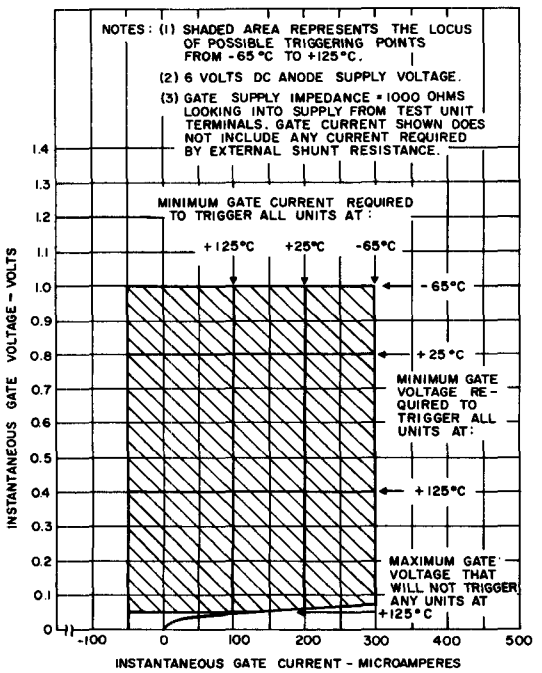
2. MAXIMUM ALLOWABLE CASE TEMPERATURE (125°C JUNCTION TEMP.)



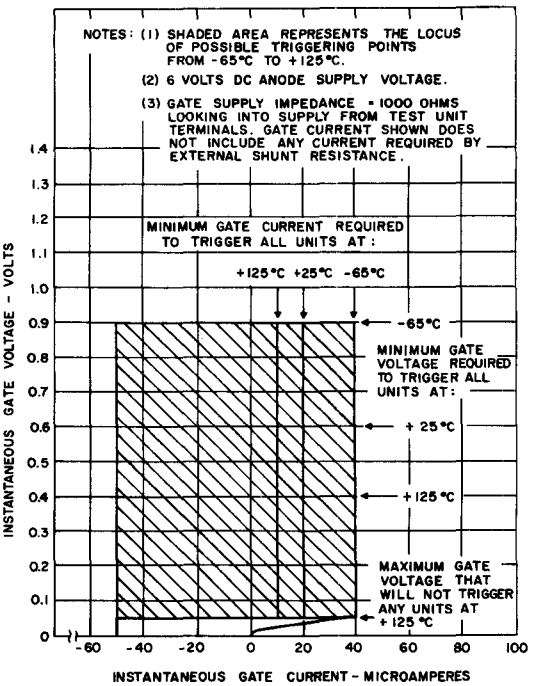
3. MAXIMUM ALLOWABLE AMBIENT TEMPERATURE (125°C JUNCTION TEMP.)



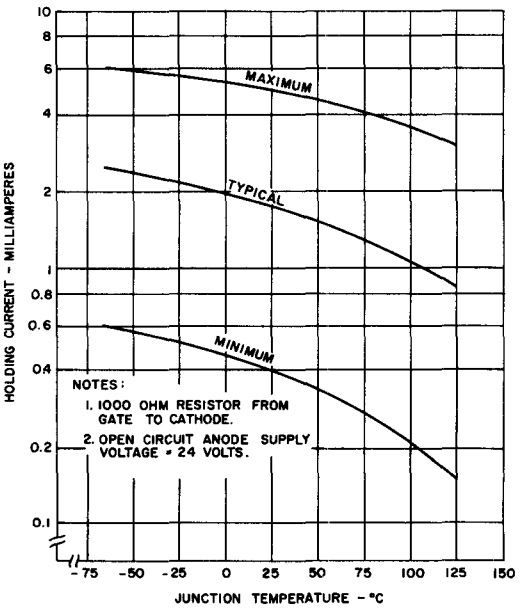
4. FORWARD POWER DISSIPATION



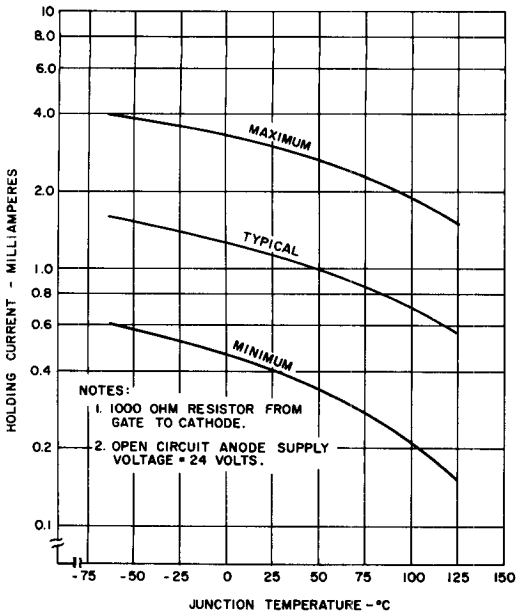
5. GATE TRIGGERING CHARACTERISTICS (2N877-2N881)



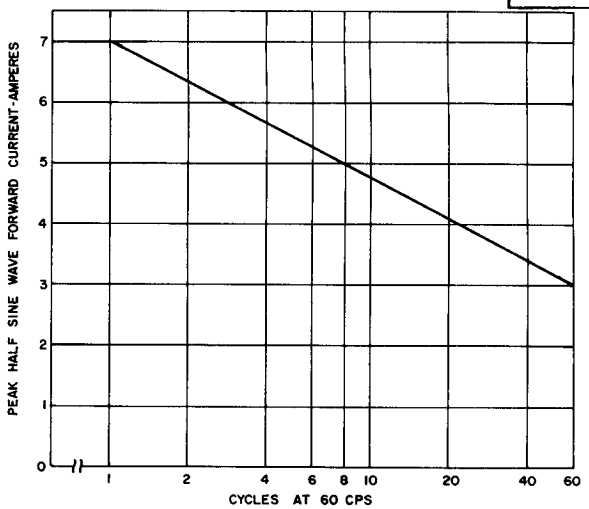
6. GATE TRIGGERING CHARACTERISTICS (2N885-2N889)



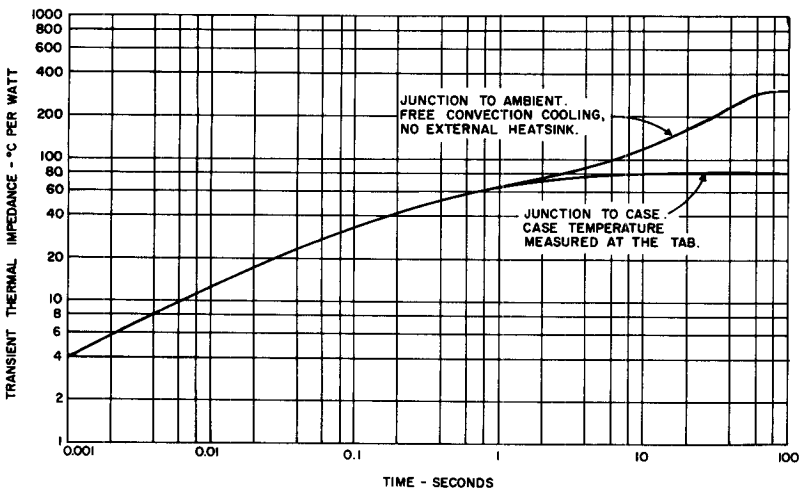
7. HOLDING CURRENT AS A FUNCTION OF JUNCTION TEMPERATURE (2N877-2N881)



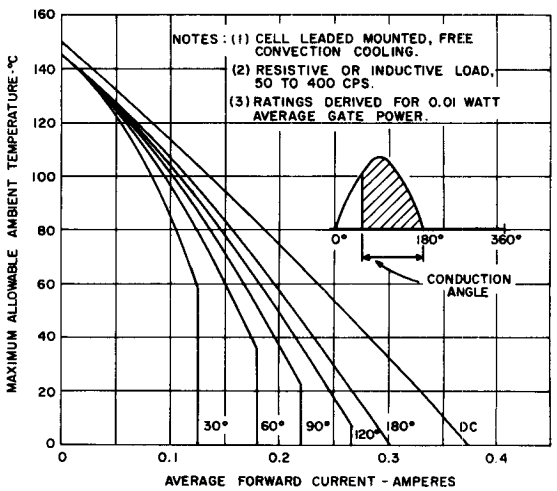
8. HOLDING CURRENT AS A FUNCTION OF JUNCTION TEMPERATURE (2N885-2N889)



9. MAXIMUM ALLOWABLE NON-RECURRENT SURGE CURRENT AT RATED LOAD CONDITIONS

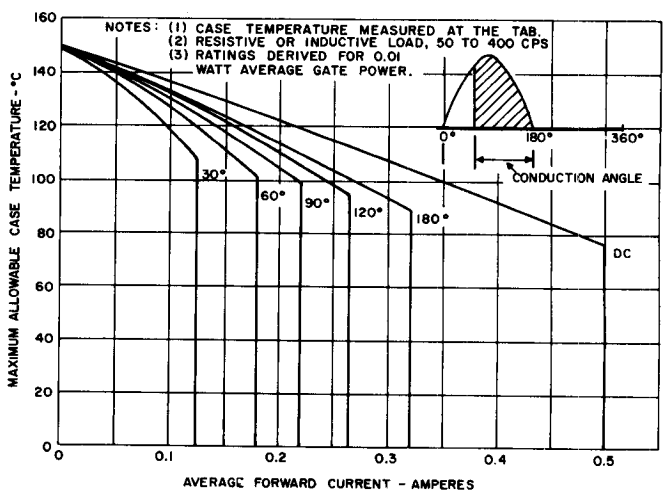


10. MAXIMUM TRANSIENT THERMAL IMPEDANCE



11. MAXIMUM ALLOWABLE AMBIENT TEMPERATURE (150°C JUNCTION TEMP.)

Charts 11 and 12 apply to latching applications where SCR need not block forward voltage after being turned on, since the V_{FXM} rating does not apply above 125°C junction temperature. SCR will again block rated forward voltage after junction temperature drops below 125°C.



12. MAXIMUM ALLOWABLE CASE TEMPERATURE (150°C JUNCTION TEMP.)