DIGITRON SEMICONDUCTORS

2N877-2N881, 2N885-2N889 SILICON CONTROLLED RECTIFIER

Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).
Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.

MAXIMUM RATINGS

Part number	Peak forward blocking voltage	Working and repetitive peak reverse voltage	Non-repetitive peak reverse voltage	Units
	V_{FXM}	V_{ROM}(wkg) and V_{ROM}(rep)	V_{ROM}(non-rep) < 5 milliseconds	
	T_J = -65° to 125°C R_{GK} = 1000 ohms maximum	T_J = -65° to 150°C	T_J = -65° to 125°C	
2N877, 2N885	30	30	45	V
2N878, 2N886	60	60	90	V
2N879, 2N887	100	100	130	V
2N880, 2N888	150	150	200	V
2N881, 2N889	200	200	275	V

Rating	Symbol	Value	Unit
Peak forward voltage	$V_{F(pk)}$	300	V
RMS on-state current	$I_{T(RMS)}$	0.5	A
Peak one cycle surge (non-repetitive) on-state current	I_{FM}	7.0	A
Peak forward gate power dissipation	P_{GM}	0.1	W
Average forward gate power dissipation	$P_{G(AV)}$	0.01	W
Peak gate voltage, forward and reverse	V_{GFM}, V_{GRM}	6.0	V
Storage temperature	T_{stg}	-65 to 150	°C
Operating temperature	T_J	-65 to 150	°C

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Units	Test Condition
Forward blocking current	I_{FX}					V_{FX} = rated V_{FXM}, R_{GK} = 1000ohms
2N877-2N881		-	0.03	10	µAdc	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}					V_{RX} = rated V_{ROM}(rep)
2N877-2N881		-	0.1	10	µAdc	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} = 2V, T_J = 25°C
Peak on-state voltage	V_{FM}	-	1.3	1.9	V	T_J = 25°C, I_{FX} = 1A, single, half sinewave pulse, 2.0ms wide max.
Holding current	I_H					T_J = 25°C, R_{GK} = 1000ohms, V_{FX} = 24V dc
2N877-2N881		0.4	1.7	5.0	mAdc	
2N885-2N889		0.4	1.1	3.0		
Critical rate of rise of applied forward voltage	dv/dt	-	40	-	V/µs	T_J = 125°C, R_{GK} = 1000ohms, V_{FXM} = rated V_{FXM}
Turn-on time (Delay time + rise time)	$t_d + t_r$	-	1.0	-	µs	T_J = 25°C, V_{FX} = rated V_{FXM}, I_{FM} = 1A, gate supply: 6V, 300ohms
Circuit commutated turn-off time (all types)	t_{off}	-	15	-	µs	T_J = 125°C, R_{GK} = 1000ohms, I_{FM} = 1A, I_R(recovery) = 1A, reapplied V_{FXM} = rated, rate of rise of reapplied forward blocking voltage = 20V/µs

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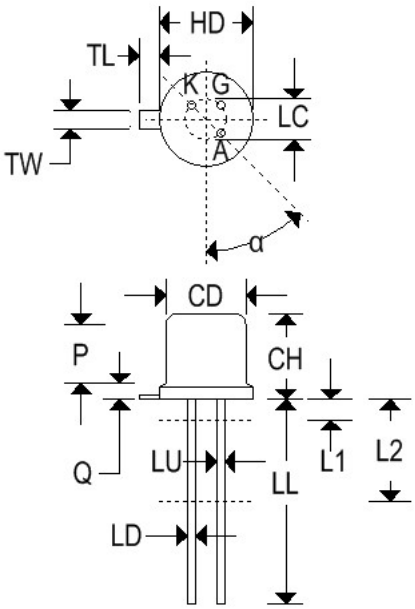
ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Units	Test Condition
Gate trigger current						V_{FX} = 6Vdc, R_{GK} = 1000ohms, R_L = 100 ohms max.
2N877-2N881	I_{GT}	-	40	200	µAdc	T_J = 25°C
2N885-2N889		-	10	20		T_J = 25°C
Gate trigger voltage						V_{FX} = 6Vdc, R_{GK} = 1000ohms, R_L = 100ohms max.
2N877-2N881	V_{GT}	0.4	0.5	0.8	Vdc	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} = 1000ohms, T_J = 125°C

MECHANICAL CHARACTERISTICS

Case	TO-18
Marking	Alpha-numeric
Pin out	See below



	TO-18			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.209	0.230	5.310	5.840
B	0.178	0.195	4.520	4.950
C	0.170	0.210	4.320	5.330
D	0.016	0.021	0.406	0.533
E	-	0.030	-	0.762
F	0.016	0.019	0.406	0.483
G	0.100 BSC		2.540 BSC	
H	0.036	0.046	0.914	1.170
J	0.028	0.048	0.711	1.220
K	0.500	-	12.700	-
L	0.250	-	6.350	-
M	45°C BSC		45° BSC	
N	0.050 BSC		1.270 BSC	
P	-	0.050	-	1.270

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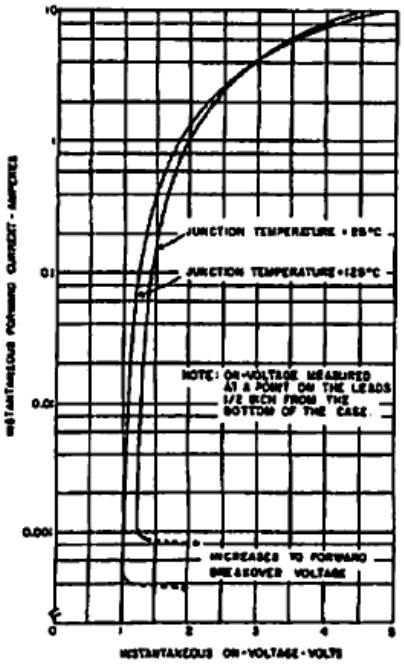
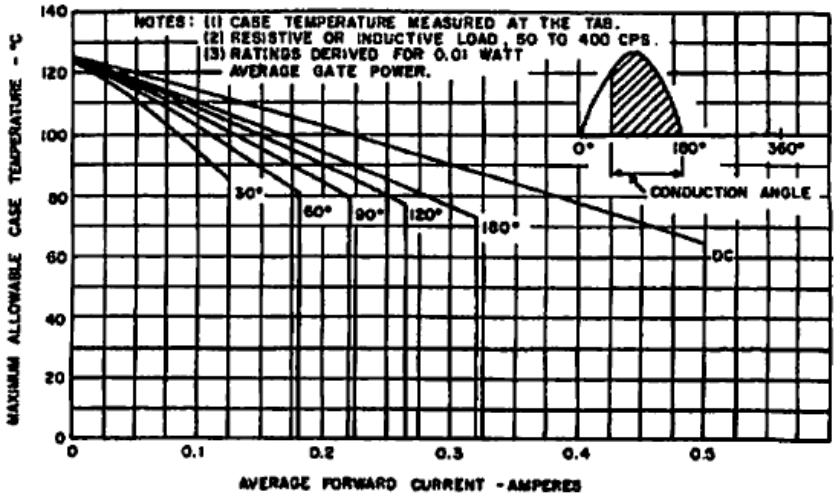


1. MAXIMUM FORWARD CHARACTERISTICS, ON-STATE



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

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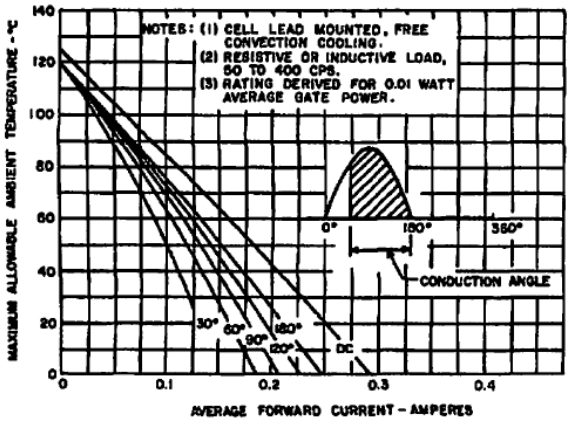
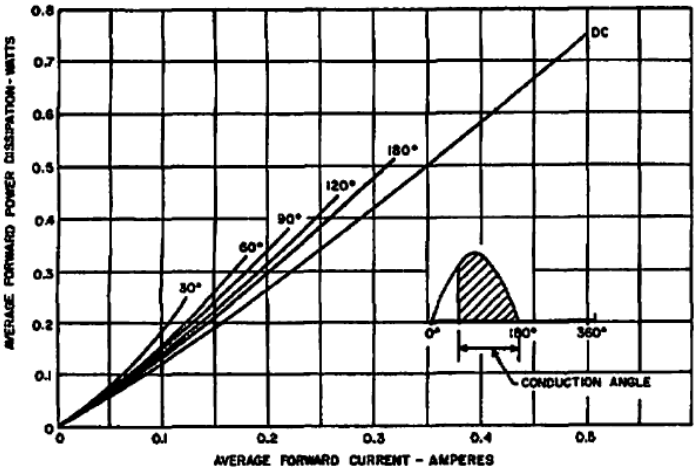
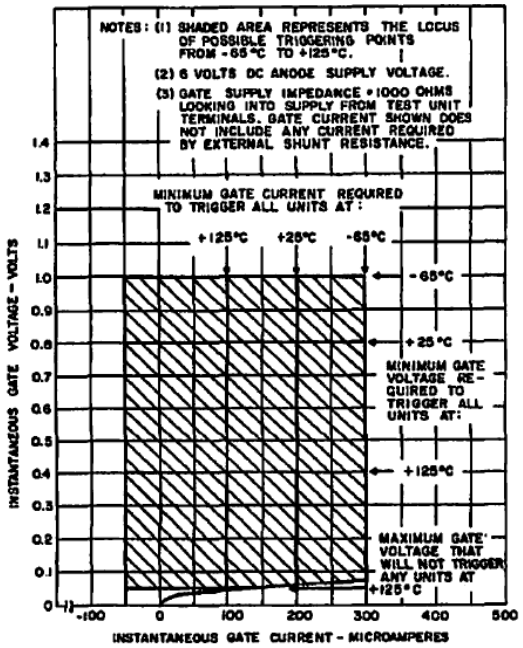


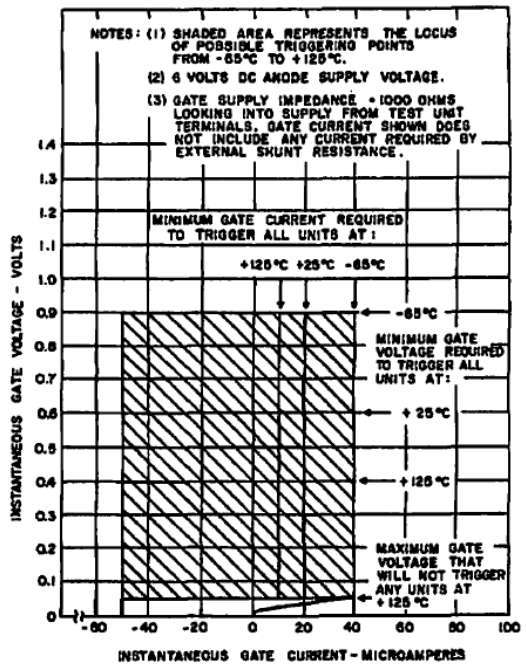
3. MAXIMUM ALLOWABLE AMBIENT TEMPERATURE (125°C JUNCTION TEMP.)



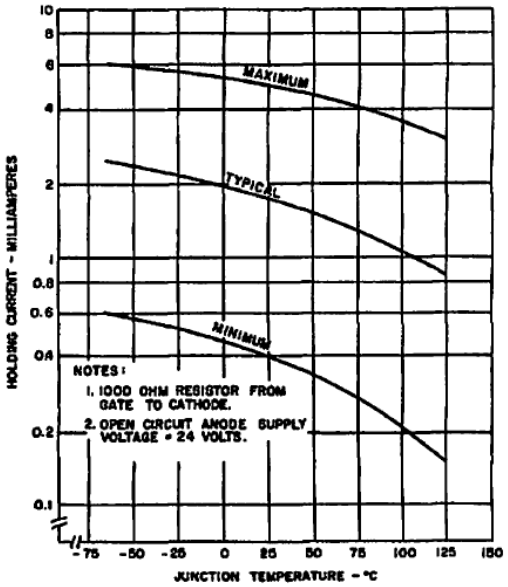
4. FORWARD POWER DISSIPATION



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



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



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

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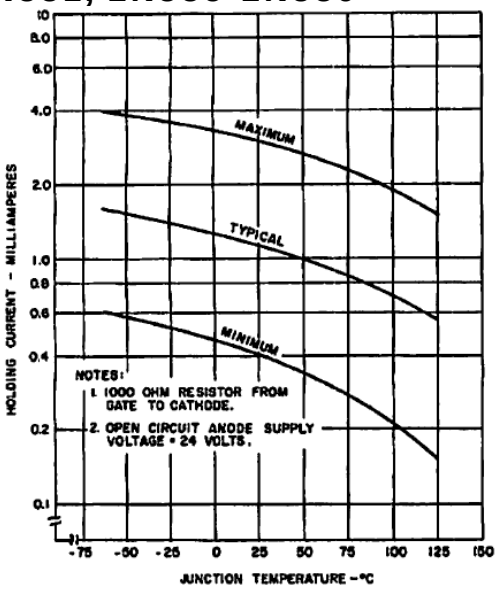
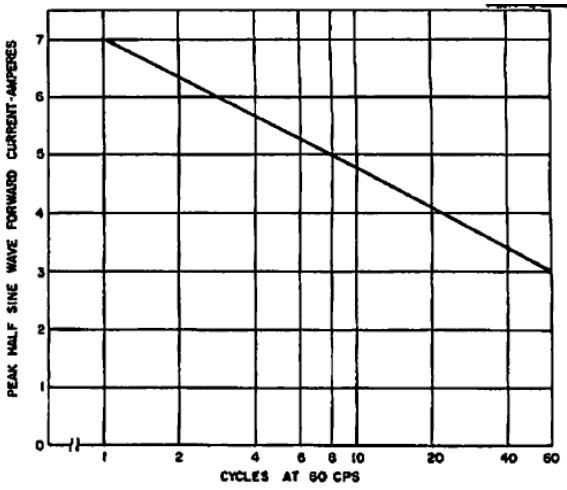
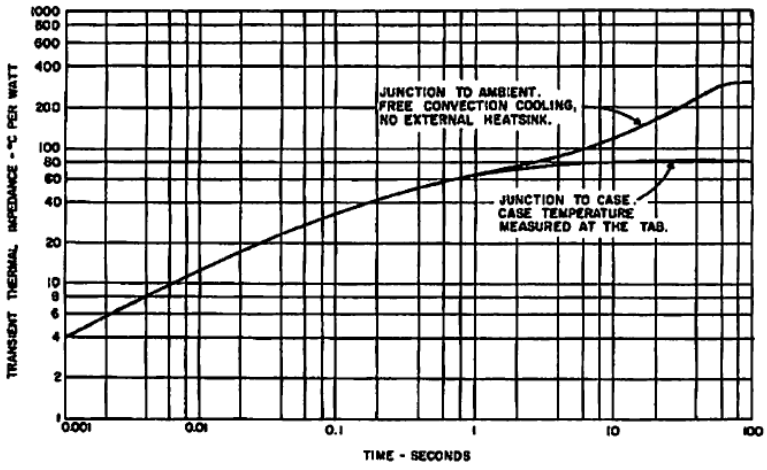


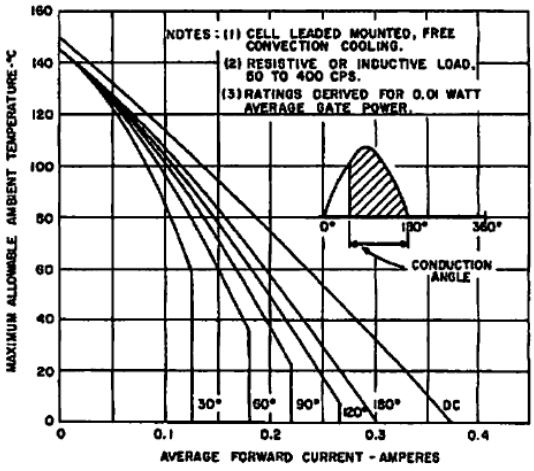
8. HOLDING CURRENT AS A FUNCTION OF JUNCTION TEMPERATURE (2N885-2N889)



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

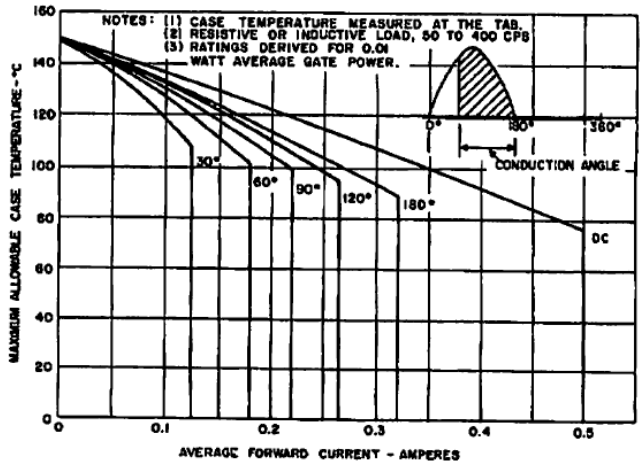


10. MAXIMUM TRANSIENT THERMAL IMPEDANCE



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.)

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