

2N5754-2N5757

2.5A SILICON THYRISTORS

FEATURES:

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

MAXIMUM RATINGS

Rating	Symbol	2N5754	2N5755	2N5756	2N5757	Unit
Peak repetitive off-state voltage ⁽¹⁾ (Gate open, T _J = -65 to 100°C)	V _{DRM}	100	200	400	600	Volts
RMS on-state current (conduction angle = 360°)	I _{T(RMS)}	2.5				Amps
Peak non-repetitive surge current (1 cycle of applied principal voltage, T _C = 70°C, 60Hz)	I _{TSM}	25				Amps
Rate of change of on-state current V _{DM} = V _{DRM} , I _{GT} = 50mA, t _r = 0.1μs	di/dt	100				A/μs
Fusing current (T _J = -65 to +100°C, t = 1.25 to 10ms)	I ² t	3				A ² s
Peak gate trigger current (t ≤ 1μs)	I _{GT}	1				A
Gate power dissipation Peak (for 10μs max.) Average, T _C = 70°C	P _{GM} P _{G(AV)}	10 0.15				Watts
Operating junction temperature range	T _J	-65 to 100				°C
Storage temperature range	T _{stg}	-65 to +150				°C
Lead temperature during soldering 1/32" (0.8mm) from seating plane for 10 s max.	T _L	225				°C

Note 1: Ratings apply for open gate conditions. Thyristor devices shall not be tested with a constant current source for blocking capability such that the voltage applied exceeds the rated blocking voltage.

* Soldering temperatures shall not exceed 200°C for 10 seconds.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Characteristic	Symbol	Min	Typ.	Max	Unit																					
Peak off-state current (Gate open, Rated V _{DRM} @ T _J = 100°C)	I _{DRM}	-	0.2	0.75	mA																					
Maximum on-state voltage (I _T = 10A peak, T _C = 25°C) (I _T = 3.5A peak, T _C = 25°C)	V _{TM}	-	2.2	2.6	Volts																					
DC Holding current (V _D = 12V, gate open, initiating current = 150mA, T _C = 25°C) (V _D = 12V, gate open, initiating current = 150mA, T _C = -65°C)	I _H	-	6	35	mA																					
Critical rate of rise of commutation voltage (V _D = Rated V _{DRM} , I _{T(RMS)} = 2.5A, commutating di/dt = 0.95A/ms, gate unenergized, T _C = 70°C)	dv/dt	0.5	-	-	V/μs																					
Critical rate of rise of off-state voltage (V _D = Rated V _{DRM} , exponential voltage rise, T _C = 100°C, gate open)	dv/dt	10	100	-	V/μs																					
Peak gate trigger current (V _D = 12V, R _L = 30Ω, and T _C = 25°C)	Mode	V_{MTR2}	V_G	<table border="1"> <tr> <td>I_{GT}</td> <td>-</td> <td>5</td> <td>25</td> <td rowspan="5">mA</td> </tr> <tr> <td></td> <td>-</td> <td>5</td> <td>25</td> </tr> <tr> <td></td> <td>-</td> <td>10</td> <td>40</td> </tr> <tr> <td></td> <td>-</td> <td>10</td> <td>40</td> </tr> <tr> <td></td> <td>-</td> <td>10</td> <td>40</td> </tr> </table>		I _{GT}	-	5	25	mA		-	5	25		-	10	40		-	10	40		-	10	40
	I _{GT}	-	5			25	mA																			
		-	5			25																				
		-	10			40																				
		-	10			40																				
	-	10	40																							
I+	Positive	Positive																								
III-	Negative	Negative																								
I-	Positive	Negative																								
III+	Negative	Positive																								

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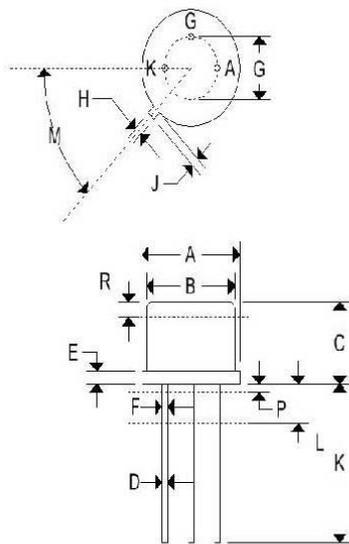
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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Characteristic				Symbol	Min	Typ.	Max	Unit
Peak gate trigger current (V _D = 12V, R _L = 30Ω, and T _C = -65°C)	Mode	V _{MGT}	V _G	I _{GT}	-	30	60	mA
	I+	Positive	Positive					
	III-	Negative	Negative					
	I-	Positive	Negative					
	III+	Negative	Positive					
Gate trigger voltage (V _D = 12V, R _L = 30Ω, and T _C = 25°C) (V _D = 12V, R _L = 30Ω, and T _C = -65°C) (V _D = V _{DRM} , T _L = 125Ω, T _C = 100°C)				V _{GT}	-	0.9	2.2	V
Thermal resistance, junction to ambient				R _{θJA}	-	-	150	°C/W

MECHANICAL CHARACTERISTICS

Case	TO-39
Marking	Alpha-numeric
Polarity	See below



	TO-39			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.335	0.370	8.510	9.390
B	0.305	0.335	7.750	8.500
C	0.240	0.280	6.100	6.600
D	0.016	0.021	0.410	0.530
E	0.009	0.041	0.230	1.040
F	0.016	0.019	0.410	0.480
G	0.200 BSC		5.080 BSC	
H	0.028	0.034	0.720	0.860
J	0.029	0.045	0.740	1.140
K	0.500	0.750	12.700	19.050
L	0.250	-	6.350	-
M	45°C BSC		45°C BSC	
P	-	0.050	-	1.270
R	0.100	-	2.540	-

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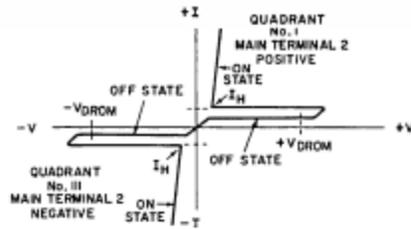


Fig. 1 - Principal voltage-current characteristic.

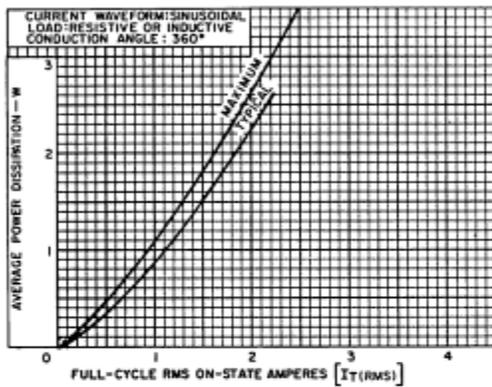


Fig. 2 - Power dissipation vs. on-state current.

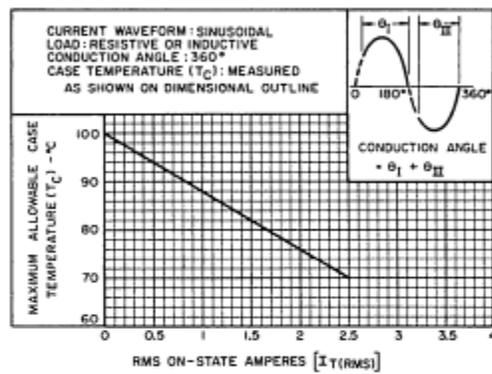


Fig. 3 - Maximum allowable case temperature vs. on-state current.

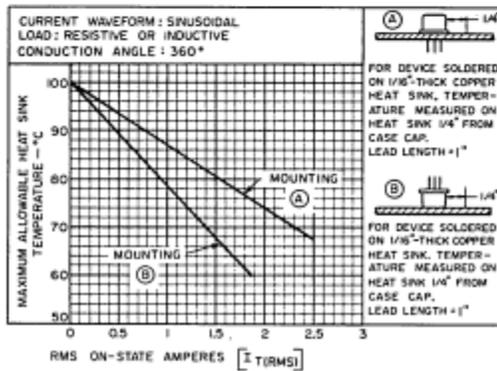


Fig. 4 - Maximum allowable heat-sink temperature vs. on-state current.

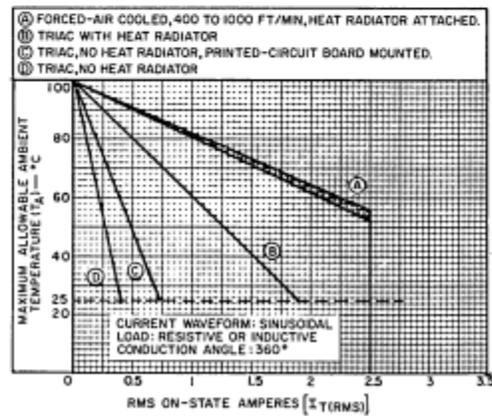


Fig. 5 - Maximum allowable ambient temperature vs. on-state current.

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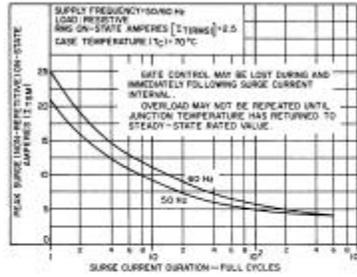


Fig. 6 - Peak surge on-state current vs. surge current duration.

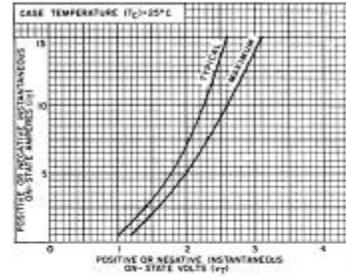


Fig. 7 - On-state current vs. on-state voltage.

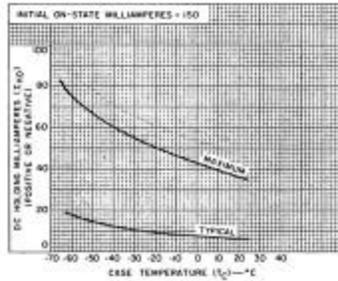


Fig. 8 - DC holding current (positive or negative) vs. case temperature.

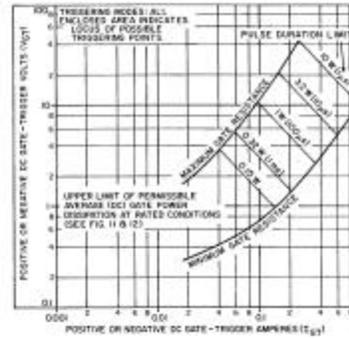
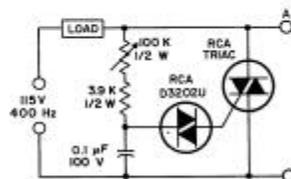


Fig. 9 - Gate trigger characteristics and limiting conditions for determination of permissible gate trigger pulses.



NOTE: For incandescent lamp loads which produce burnout current surges with I^2t values greater than 2.8 ampere² seconds, connect a 10-ohm resistor of appropriate power rating in series with the load. This rating can be determined as follows:
Power Rating of 10-ohm Resistor = $10(I_{rms} \text{ load current})^2$



SNUBBER NETWORK FOR INDUCTIVE LOADS. CONNECT POINTS A¹ AND B¹ TO TERMINALS A AND B RESPECTIVELY.

AC INPUT VOLTAGE	120 V	240 V
	60 Hz	60 Hz
SNUBBER NETWORK FOR 2.5 A (RMS) INDUCTIVE LOAD	C_S	0.068 μ F 200 V
	R_S	0.075 μ F 400 V
		2.2 k Ω 1/2 W
		2.5 k Ω 1/2 W