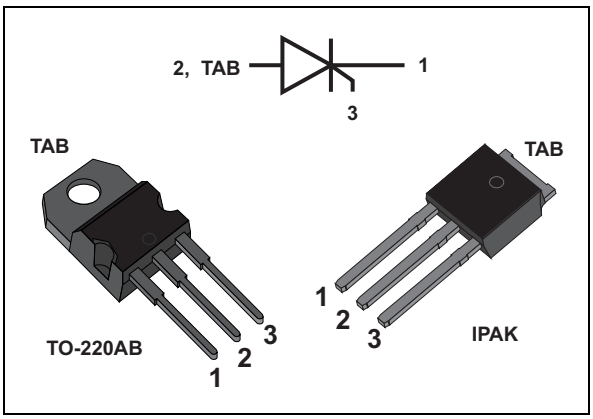
TN22

Fluorescent tube lamp starter SCR

Datasheet - production data



Features

- High clamping voltage structure (1200 to 1500 V)
- Low gate triggering current for direct drive from line (< 1.5 mA)
- High holding current (> 175 mA), ensuring high striking energy

Description

The TN22 has been specifically developed for use in fluorescent tube lamp electronic starter circuits.

Used in conjunction with a sensitive SCR, it provides high energy striking characteristics with low triggering power.

Thanks to the optimized characteristics of the TN22, starters offer high reliability levels and extended life time of the fluorescent tube lamps.

1 Characteristics

Table 1. Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{DRM}	Repetitive peak off-state voltage	T_j = 110 °C	400	V
$I_{T(RMS)}$	On-state RMS current full sine wave (180° conduction angle)	T_c = 95 °C	2	A
$I_{T(AV)}$	Mean on-state current Full sinewave (180° conduction angle)	T_c = 95 °C	1.8	A
I_{TSM}	Non repetitive surge peak on-state current (T_j initial = 25 °C)	t_p = 8.3 ms	22	A
		t_p = 10 ms	20	
I^2t	I^2t Value for fusing	t_p = 10 ms	2	A^2s
dI/dt	Critical rate of rise of on-state current I_G = 5 mA dI_G/dt = 70 mA/µs		50	A/µs
$P_{G(AV)}$	Average gate power dissipation		300	mW
P_{GM}	Peak gate power dissipation	t_p = 20 µs	2	W
I_{GM}	Peak gate current	t_p = 20 µs	1	A
V_{RGM}	Maximum peak reverse gate voltage		6	V
T_{stg} T_j	Storage and operating junction temperature range		-40 to +150 -40 to +110	°C
T_L	Maximum lead temperature for soldering during 10 s at 4.5 mm from case		260	°C

Table 2. Electrical characteristics (T_j = 25 °C unless otherwise stated)

Symbol	Test conditions		Value	Unit
I_{GT}	V_D=12 V (DC), R_L= 33 Ω	Max.	1.5	mA
V_{GT}	V_D=12 V (DC), R_L= 33 Ω, R_{GK} = 1 KΩ	Max.	3	V
I_H	V_{GK} = 0 V	Min.	175	mA
dV/dt	Linear slope up to V_D = 67% V_{DRM}, V_{GK} = 0 V, T_j = 110 °C	Min.	500	V/µs
V_{BR}	I_D = 5 mA, V_{GK} = 0 V	Min.	1200	V
		Max.	1500	

Table 3. Static electrical characteristics (T_j = 25 °C unless otherwise stated)

Symbol	Test conditions		Value	Unit
V_{TM}	I_{TM} = 2 A t_p = 380 µs	Max.	3.1	V
I_{DRM}	V_{DRM} rated	Max.	0.1	mA

Table 4. Thermal resistance

Symbol	Parameter		Value	Unit
$R_{th(j-a)}$	Junction to ambient	IPAK	100	°C/W
		TO-220AB	60	
$R_{th(j-c)}$	Junction to case		3	°C/W

Figure 1. Maximum average power dissipation versus average on-state current (rectified sine wave)

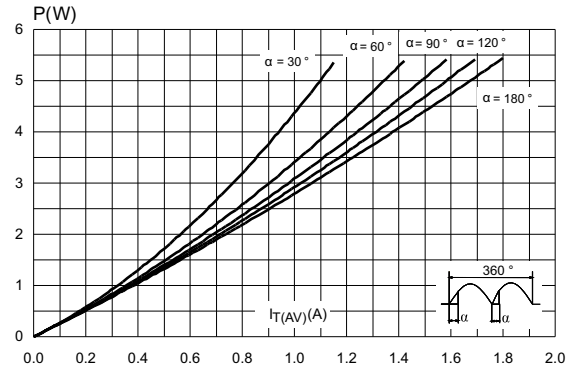


Figure 2. Average and DC on-state current versus case temperature (rectified sine wave)

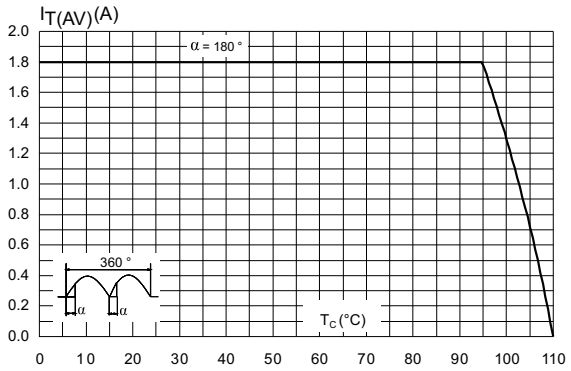


Figure 3. Average on-state current versus ambient temperature, free air convection (rectified sine wave)

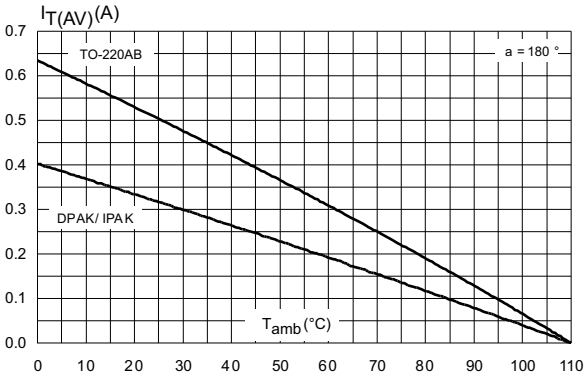


Figure 4. Variation of thermal impedance junction to ambient versus pulse duration

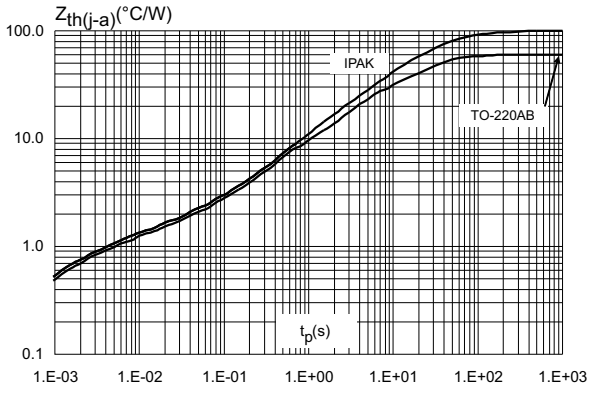


Figure 5. Relative variation of gate trigger and holding current versus junction temperature

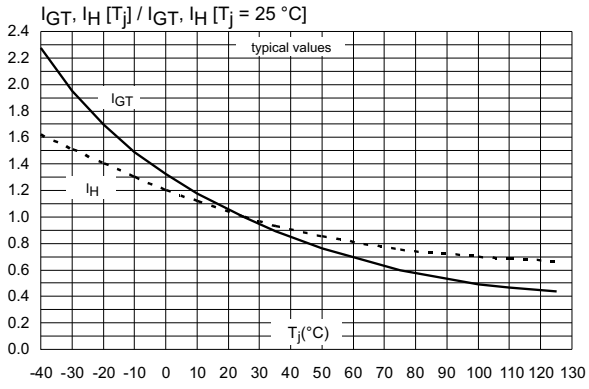


Figure 6. Surge peak on-state current versus number of cycles

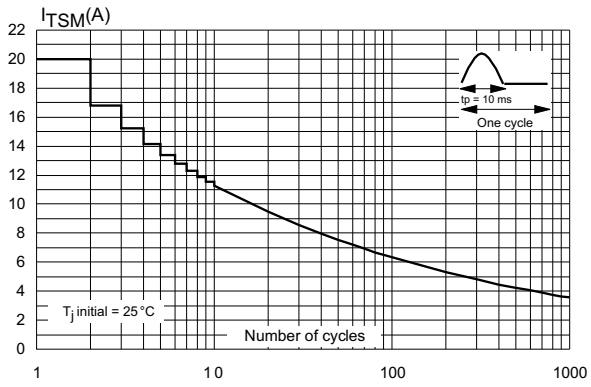


Figure 7. Non-repetitive surge peak on-state current for sinusoidal pulse

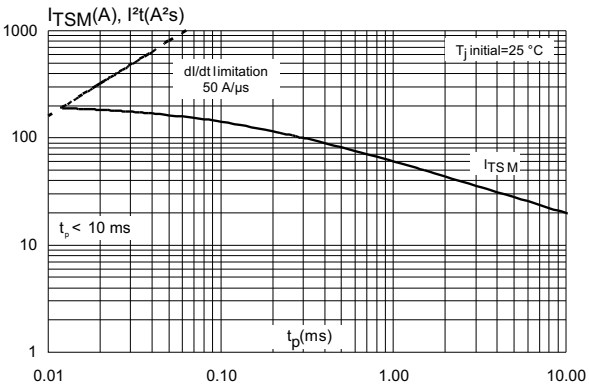


Figure 8. On-state characteristics (maximum values)

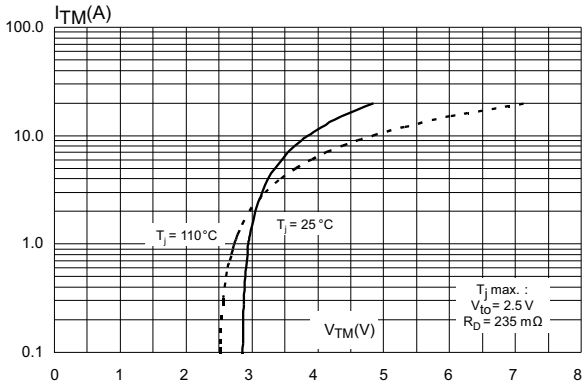


Figure 9. Maximum allowable RMS current versus time conduction and initial case temperature

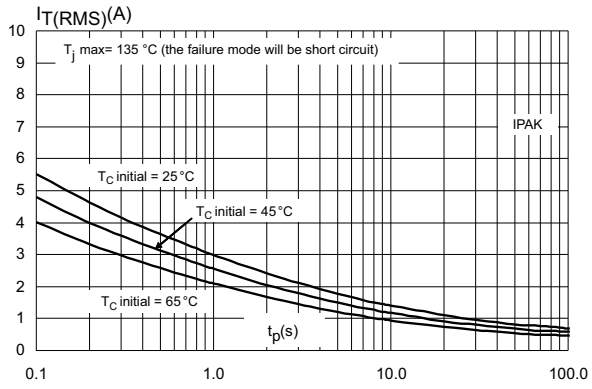


Figure 10. Maximum allowable RMS current versus time conduction and initial case temperature

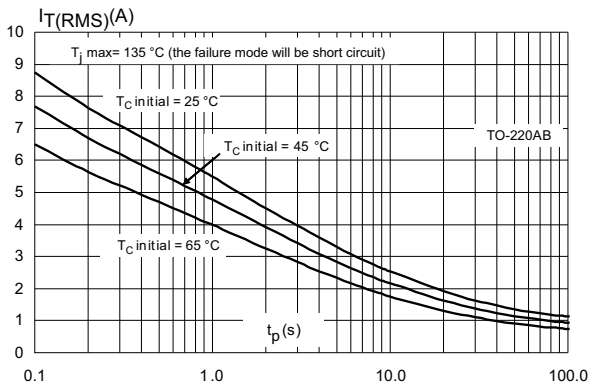


Figure 11. Holding current versus gate-cathode resistance (typical values)