

# S6A13

## Condenser Discharge Control Applications

- FWD included between cathode and anode
- Critical rate of rise of ON-state current:  $di/dt = 750 \text{ A}/\mu\text{s}$
- Repetitive peak surge ON-state current:  $I_{TRM} = 500 \text{ A}$  ( $t_w = 2 \mu\text{s}$ )
- Repetitive peak OFF-state voltage:  $V_{DRM} = 800 \text{ V}$
- Gate trigger current:  $I_{GT} = 30 \text{ mA (max)}$

## Absolute Maximum Ratings

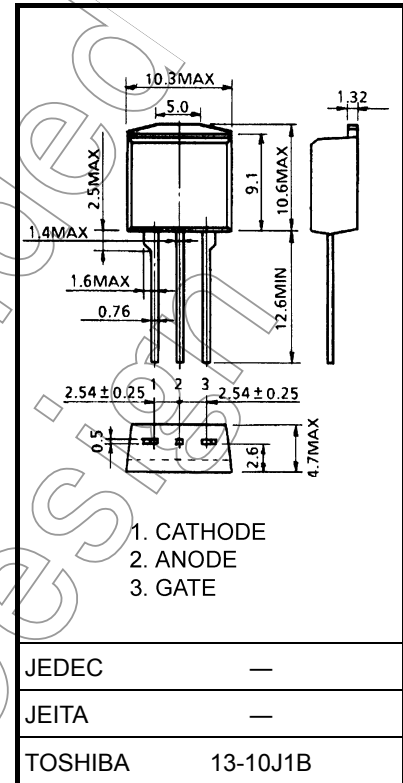
Characteristics	Symbol	Rating	Unit
Repetitive peak OFF-state voltage	$V_{DRM}$	800	V
Repetitive peak surge ON-state current (Note 1)	$I_{TRM}$	500	A
Repetitive peak surge forward current (Note 1)	$I_{FRM}$	500	A
Critical rate of rise of ON-state current (Note 1)	$di/dt$	750	$\text{A}/\mu\text{s}$
Peak gate power dissipation	$P_{GM}$	5	W
Average gate power dissipation	$P_G \text{ (AV)}$	0.5	W
Peak forward gate voltage	$V_{FGM}$	10	V
Peak reverse gate voltage	$V_{RGM}$	-5	V
Peak forward gate current	$I_{GM}$	2	A
Junction temperature	$T_j$	-40~125	$^{\circ}\text{C}$
Storage temperature range	$T_{stg}$	-40~150	$^{\circ}\text{C}$

Note 1:  $V_D \leq 0.8 \times \text{rated}$ ,  $T_c = 85^{\circ}\text{C}$ ,  $i_{gp} \geq 60 \text{ mA}$ ,  $t_{gw} \geq 10 \mu\text{s}$ ,  $t_{gr} \leq 150 \text{ ns}$

Note 2: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

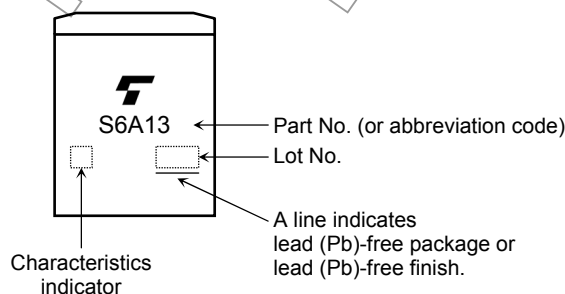
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

Unit: mm



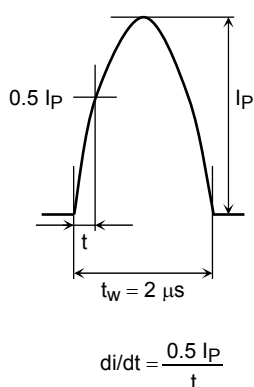
Weight: 1.5 g (typ.)

## Marking

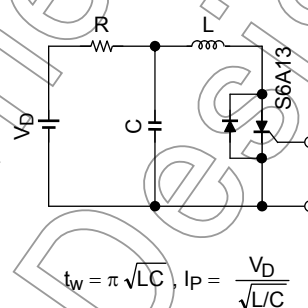


## Electrical Characteristics (Ta = 25°C)

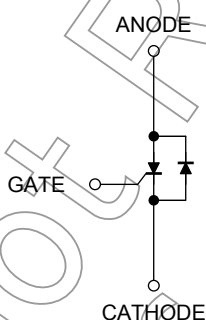
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Repetitive peak OFF-state current	$I_{DRM}$	$V_{DRM} = \text{Rated}$	—	—	10	$\mu\text{A}$
Peak ON-state voltage (thyristor)	$V_{TM}$	$I_{TM} = 25 \text{ A}$	—	—	1.5	V
Peak forward voltage (diode)	$V_{FM}$	$I_{FM} = 25 \text{ A}$	—	—	2.0	V
Gate trigger voltage	$V_{GT}$	$V_D = 6 \text{ V}, R_L = 10 \Omega$	—	—	1.0	V
Gate trigger current	$I_{GT}$		—	—	30	mA
Gate non-trigger voltage	$V_{GD}$	$V_D = \text{Rated}, T_c = 125^\circ\text{C}$	0.2	—	—	V
Critical rate of rise of OFF-state voltage	$dv/dt$	$V_{DRM} = \text{Rated}, T_c = 125^\circ\text{C}$ Exponential Rise	—	50	—	V/ $\mu\text{s}$
Holding current	$I_H$	$V_D = 6 \text{ V}, I_{TM} = 1 \text{ A}$	—	—	35	mA
Thermal resistance (junction to ambient)	$R_{th(j-a)}$	DC	—	—	70	$^\circ\text{C/W}$

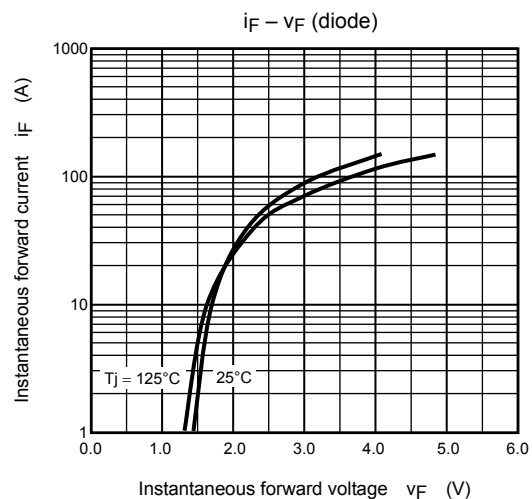
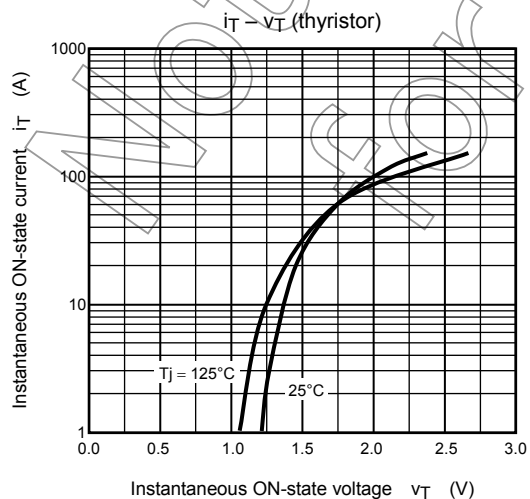
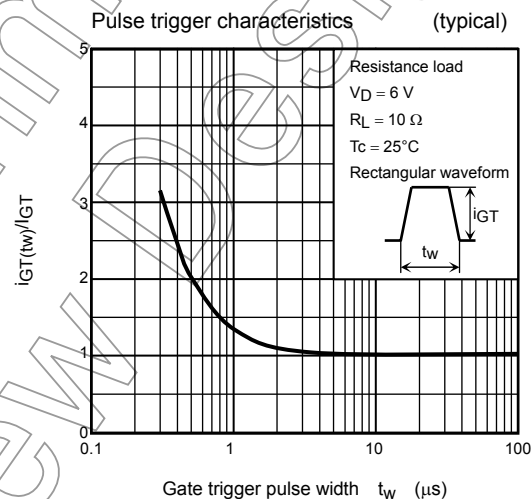
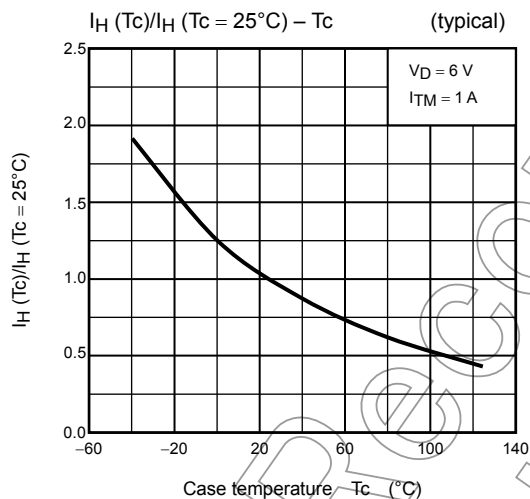
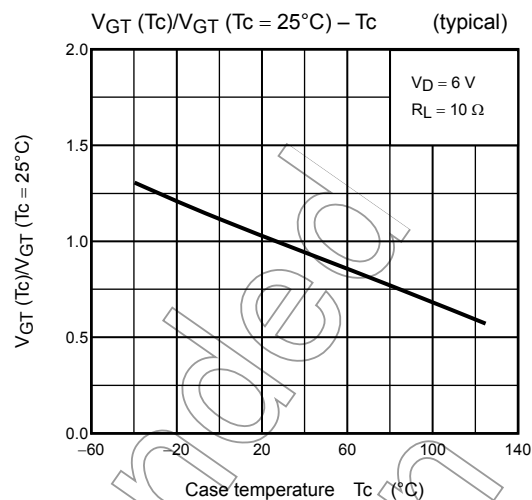
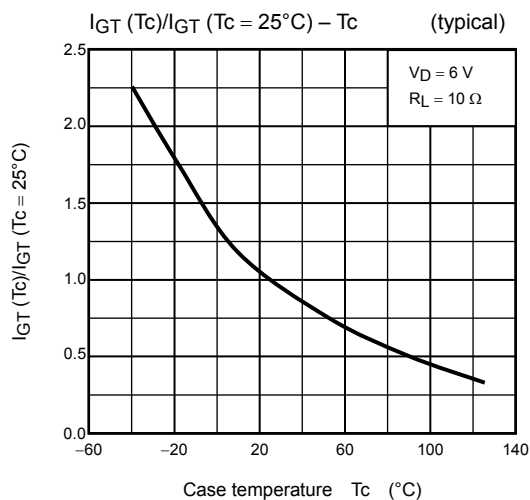


Test Circuit Examples



## Equivalent Circuit





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