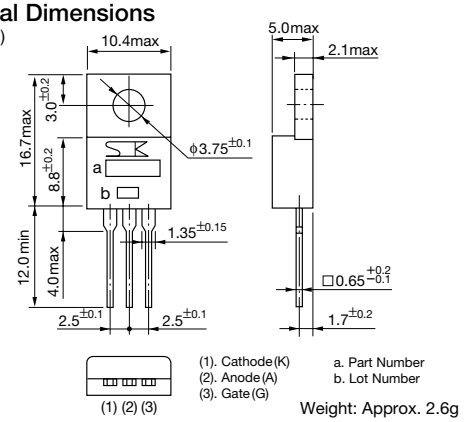
# TO-220 3A Thyristor

# TF321M / TF341M / TF361M

## ■Features

- ●Repetitive peak off-state voltage: $V_{DRM}$=200, 400, 600V
- ●Average on-state current: $I_{T(AV)}$=3A
- ●Gate trigger current: $I_{GT}$=10mA max

**External Dimensions**
(Unit: mm)




Weight: Approx. 2.6g

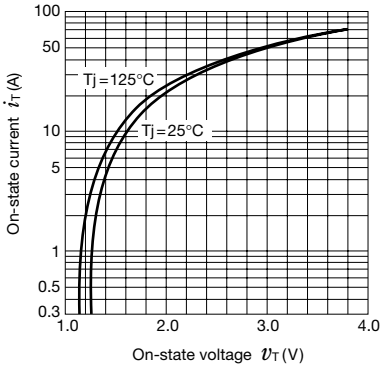
## ■Absolute Maximum Ratings

| Parameter | Symbol | Ratings | | | Unit | Conditions |
|---|---|---|---|---|---|---|
| | | TF321M | TF341M | TF361M | | |
| Repetitive peak off-state voltage | $V_{DRM}$ | 200 | 400 | 600 | V | Tj=−40 to +125°C, $R_{GK}$=1kΩ |
| Repetitive peak reverse voltage | $V_{RRM}$ | 200 | 400 | 600 | V | |
| Non-repetitive peak off-state voltage | $V_{DSM}$ | 300 | 500 | 700 | V | |
| Non-repetitive peak reverse voltage | $V_{RSM}$ | 300 | 500 | 700 | V | |
| Average on-state current | $I_{T(AV)}$ | 3.0 | | | A | 50Hz Half-cycle sinewave, Continuous current, Tc=102°C |
| RMS on-state current | $I_{T(RMS)}$ | 4.7 | | | A | |
| Surge on-state current | $I_{TSM}$ | 60 | | | A | 50Hz Half-cycle sinewave, Single shot, Non-repetitive, Tj=125°C |
| Peak forward gate current | $I_{FGM}$ | 2.0 | | | A | f≧50Hz, duty≦10% |
| Peak forward gate voltage | $V_{FGM}$ | 10 | | | V | |
| Peak reverse gate voltage | $V_{RGM}$ | 5.0 | | | V | f≧50Hz |
| Peak gate power loss | $P_{GM}$ | 5.0 | | | W | f≧50Hz, duty≦10% |
| Average gate power loss | $P_{G(AV)}$ | 0.5 | | | W | |
| Junction temperature | Tj | −40 to +125 | | | °C | |
| Storage temperature | Tstg | −40 to +125 | | | °C | |

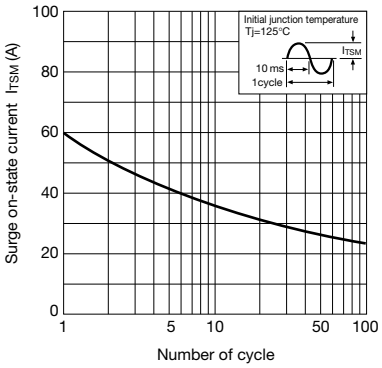
## ■Electrical Characteristics

| Parameter | Symbol | Ratings | | | Unit | Conditions |
|---|---|---|---|---|---|---|
| | | min | typ | max | | |
| Off-state current | $I_{DRM}$ | | | 2.0 | mA | Tj=125°C, $V_D$=$V_{DRM}$($V_{RRM}$), $R_{GK}$=1kΩ |
| Reverse current | $I_{RRM}$ | | | 2.0 | mA | |
| On-state voltage | $V_{TM}$ | | | 1.4 | V | $T_C$=25°C, $I_{TM}$=5A |
| Gate trigger voltage | $V_{GT}$ | | | 1.5 | V | $V_D$=6V, $R_L$=10Ω, $T_C$=25°C |
| Gate trigger current | $I_{GT}$ | | 2.0 | 10 | mA | |
| Gate non-trigger voltage | $V_{GD}$ | 0.1 | | | V | $V_D$=1/2×$V_{DRM}$, Tj=125°C, $R_{GK}$=1kΩ |
| Holding current | $I_H$ | | 4.0 | | mA | $R_{GK}$=1kΩ, Tj=25°C |
| Critical rate-of-rise of off-state voltage | dv/dt | | 50 | | V/μS | $V_D$=1/2×$V_{DRM}$, Tj=125°C, $R_{GK}$=1kΩ, $C_{GK}$=0.033μF |
| Turn-off time | tq | | 30 | | μS | Tc=25°C |
| Thermal resistance | Rth | | | 3.0 | °C/W | Junction to case |

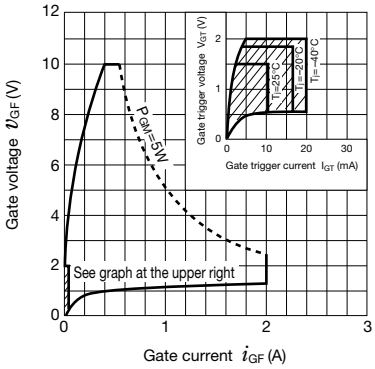
### $v_T - i_T$ Characteristics (max)



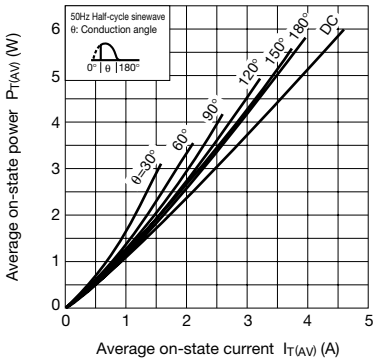

### $I_{TSM}$ Ratings



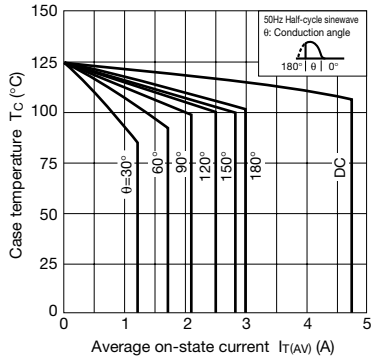

### Gate Characteristics



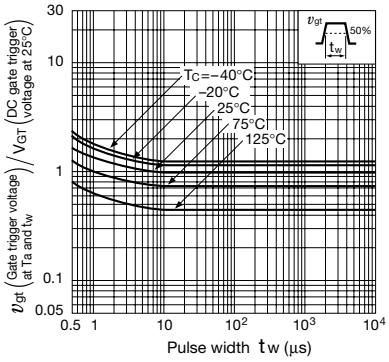

### $I_{T(AV)} - P_{T(AV)}$ Characteristics



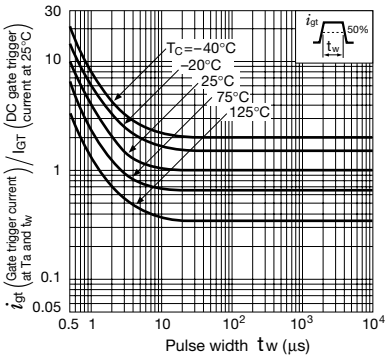

### $I_{T(AV)} - T_C$ Ratings



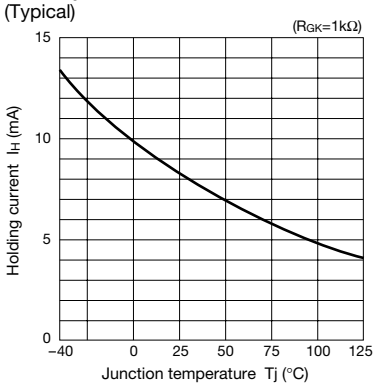

### Pulse trigger temperature Characteristics $v_{gt}$ (Typical)



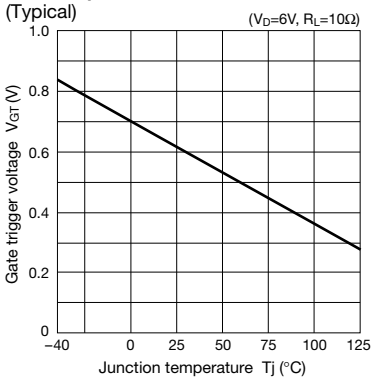

### Pulse trigger temperature Characteristics $i_{gt}$ (Typical)



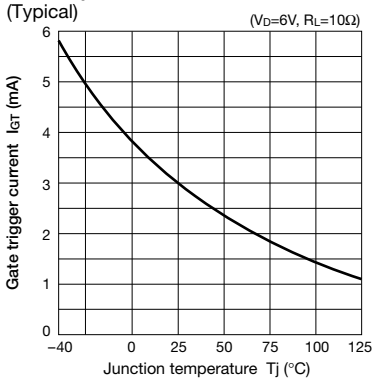

### $I_H$ temperature Characteristics (Typical)




### $V_{GT}$ temperature Characteristics (Typical)




### $I_{GT}$ temperature Characteristics (Typical)




### Transient thermal resistance Characteristics (Junction to case)