

## 600V, 25A STANDARD TRIAC

This device is suitable for low power AC switching application, phase control application such as fan speed and temperature modulation control, lighting control and static switching relay.

### • Features

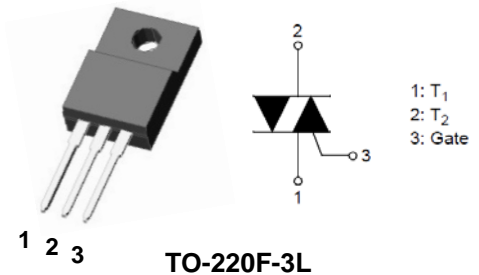
- Repetitive Peak Off-State Voltage :  $V_{DRM}=600V$
- R.M.S On-State Current :  $I_{T(RMS)}=25A$
- Gate trigger current :  $I_{GT}=35mA$  max (Mode I - II - III)
- High Commutation:  $(di/dt)_C = 13.0A/ms$  (Min)

### Applications

- Switching mode power supply, light dimmer
- TV sets, stereo, refrigerator, washing machine
- Electric blanket, solenoid driver, small motor control
- Photo copier, electric tool

### Ordering Information

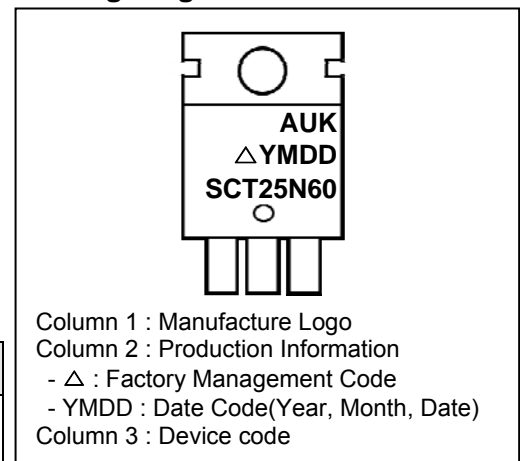
| Device     | Marking Code | Package    | Packaging       |
|------------|--------------|------------|-----------------|
| SCT25N60FD | SCT25N60     | TO-220F-3L | 50 Units / Tube |



### Product Characteristics

| Symbol       | Rating |
|--------------|--------|
| $I_{T(RMS)}$ | 25A    |
| $V_{DRM}$    | 600V   |

### Marking Diagram



### Absolute Maximum Ratings (Limiting Values)

| Characteristic  | Symbol       | Value       | Unit             |
|---|--------------|-------------|------------------|
| Repetitive Peak Off-state Voltage   | $V_{DRM}$    | 600         | V                |
| RMS on-state current (full sine wave)   | $I_{T(RMS)}$ | 25          | A                |
| Non-repetitive surge peak on-state current (full cycle, $T_j$ initial = 25°C) | $I_{TSM}$    | 260         | A                |
| $I^2t$ Value for fusing   | $I^2t$       | 340         | A <sup>2</sup> s |
| Peak gate current   | $I_{GM}$     | 4           | A                |
| Average gate peak dissipation   | $P_{G(AV)}$  | 1           | W                |
| Storage temperature range   | $T_{stg}$    | -40 to +150 | °C               |
| Operating junction temperature range  | $T_j$        | -40 to +125 | °C               |

## Thermal Characteristics

| Characteristic                                      | Symbol        | Value | Unit                        |
|---|---------------|-------|-----------------------------|
| Maximum thermal resistance junction to case (AC)    | $R_{th(j-c)}$ | 2.8   | $^{\circ}\text{C}/\text{W}$ |
| Maximum thermal resistance junction to ambient (AC) | $R_{th(j-a)}$ | 60    | $^{\circ}\text{C}/\text{W}$ |

## Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ , unless otherwise specified)

### Off Characteristics

| Characteristic                    | Symbol    | Test Condition  | Min. | Typ. | Max. | Unit          |
|-----------------------------------|-----------|-----------------|------|------|------|---------------|
| Repetitive peak Off-state current | $I_{DRM}$ | $V_D = V_{DRM}$ | -    | -    | 5    | $\mu\text{A}$ |
| Repetitive peak reverse current   | $I_{RRM}$ | $V_R = V_{RRM}$ | -    | -    | 5    | $\mu\text{A}$ |

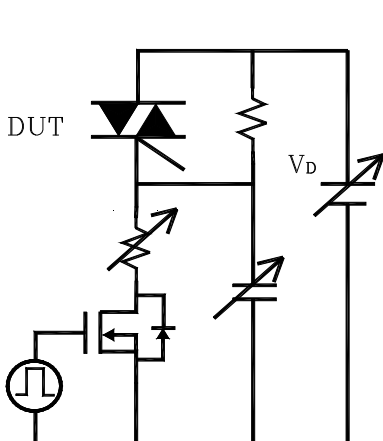
### On Characteristics

| Characteristic           | Symbol                  | Test Condition                             | Min. | Typ. | Max. | Unit |
|--------------------------|-------------------------|--|------|------|------|------|
| Peak On-state voltage    | $V_{TM}$                | $I_T = 17\text{A}$                         | -    | -    | 1.55 | V    |
| Holding current          | $I_H$                   | $V_D = 12\text{V}, I_T = 0.2\text{A}$      | -    | -    | 50   | mA   |
| Gate trigger current     | $I_{GT} (I - II - III)$ | $V_D = 12\text{V}, R_L = 30\Omega$         | -    | -    | 35   | mA   |
|                          | $I_{GT} (IV)$           | -  | -    | -    | -    | mA   |
| Gate trigger voltage     | $V_{GT} (I - II - III)$ | $V_D = 12\text{V}, R_L = 30\Omega$         | -    | -    | 1.3  | V    |
| Gate Non-trigger voltage | $V_{GD}$                | $V_D = V_{DRM}, T_J = 125^{\circ}\text{C}$ | 0.2  | -    | -    | V    |

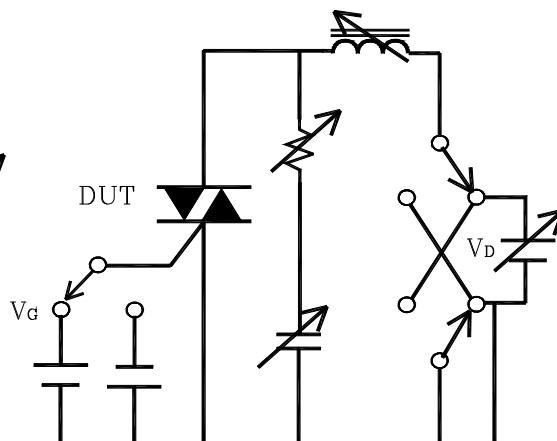
### Dynamic Characteristics

| Characteristic                             | Symbol      | Test Condition  | Min. | Typ. | Max. | Unit                   |
|--|-------------|---|------|------|------|------------------------|
| Critical rate of rise of Off-state Voltage | $(dV/dt)_s$ | $V_D = 2/3 V_{DRM}, T_J = 125^{\circ}\text{C}$  | 2500 | -    | -    | $\text{V}/\mu\text{s}$ |
| Rate of Change of Commutation Current      | $(dI/dt)_c$ | $(dV/dt)_c = 10\text{V}/\mu\text{s} \downarrow, T_J = 125^{\circ}\text{C}$                  | 13.0 | -    | -    | A/ms                   |
| Critical rate of rise of on-state current  | $dI/dt$     | $f = 120\text{Hz}, I_G = 2 \times I_{GT}, t_r \leq 100\text{ns}, T_J = 125^{\circ}\text{C}$ | -    | -    | 50   | $\text{A}/\mu\text{s}$ |

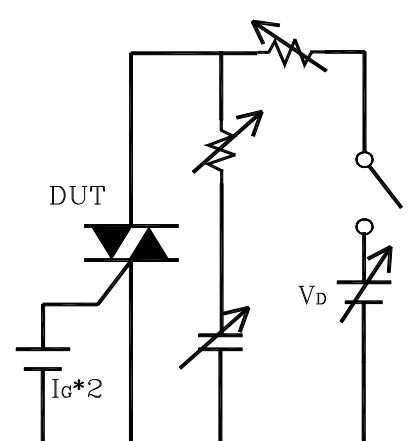
Simple circuit for  $(dV/dt)_s$



Simple circuit for  $(dI/dt)_c$  vs  $(dV/dt)_c$

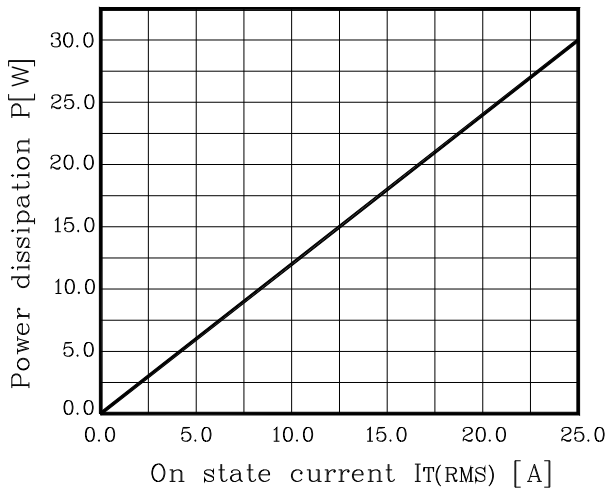


Simple circuit for  $dI/dt$

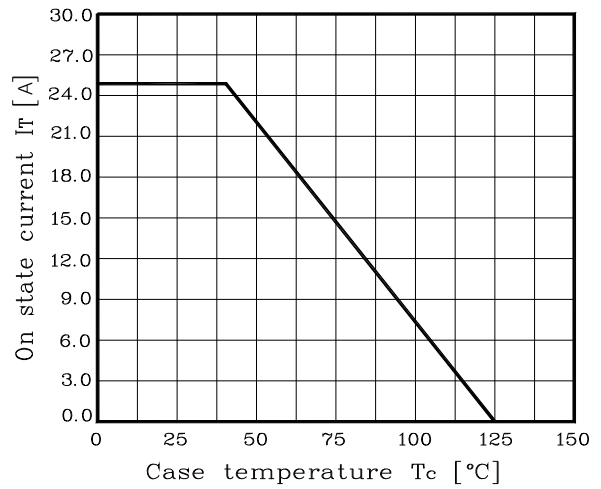


## Electrical Characteristic Curves

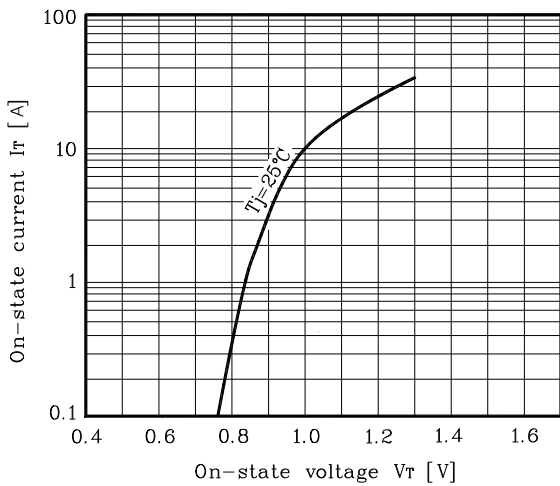
**Fig. 1**  $P - I_{T(RMS)}$



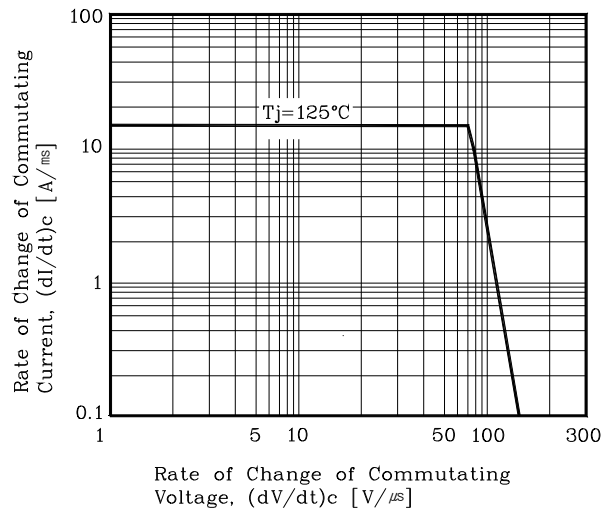
**Fig. 2**  $I_{T(RMS)} - T_C$



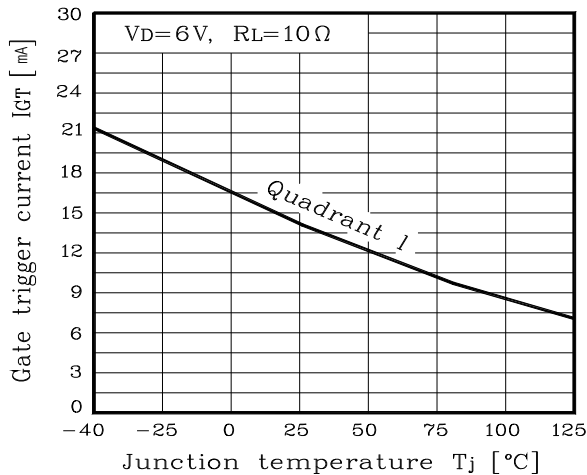
**Fig. 3**  $I_T - V_T$



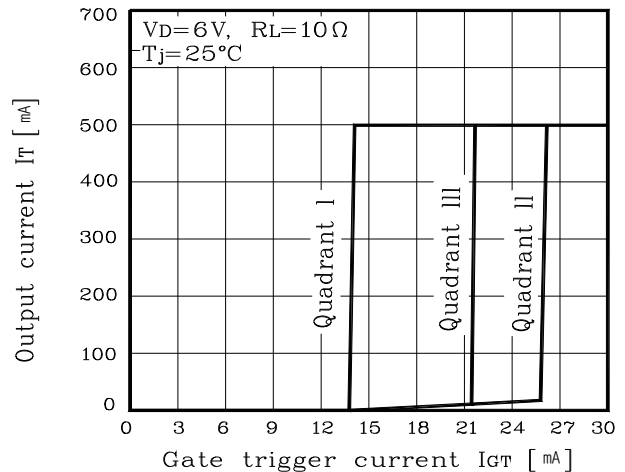
**Fig. 4**  $(di/dt)_c - (dV/dt)_c$



**Fig. 5**  $I_{GT} - T_j$



**Fig. 6**  $I_T - I_{GT}$



Electrical Characteristic Curves

Fig. 7  $V_{GT} - T_j$

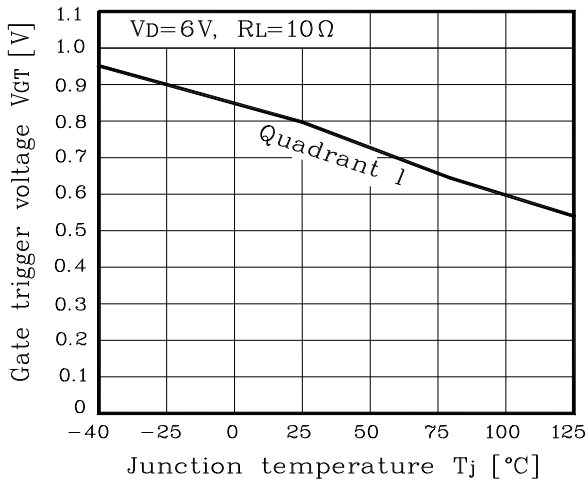


Fig. 8  $I_T - V_{GT}$

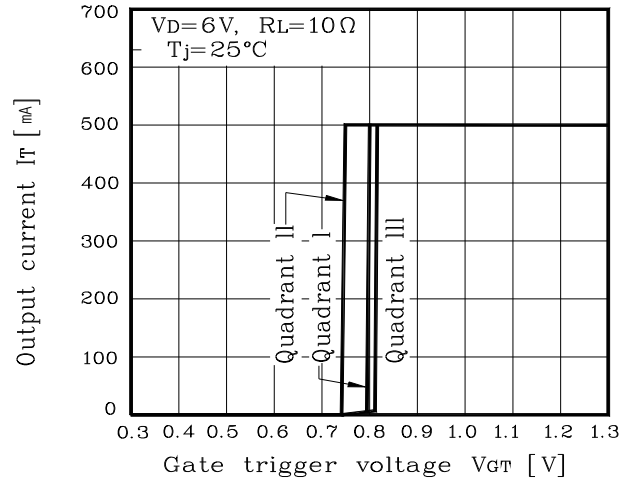
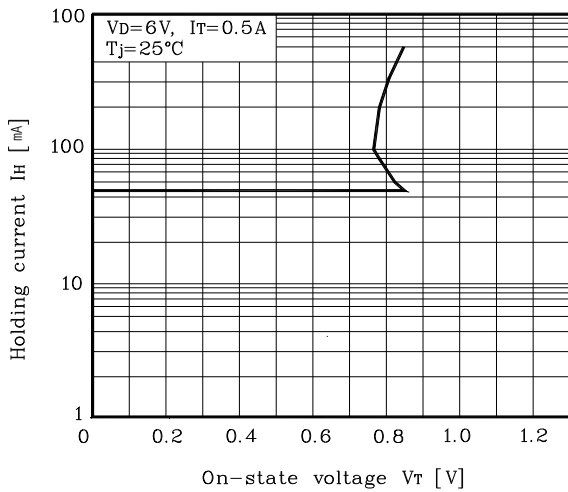
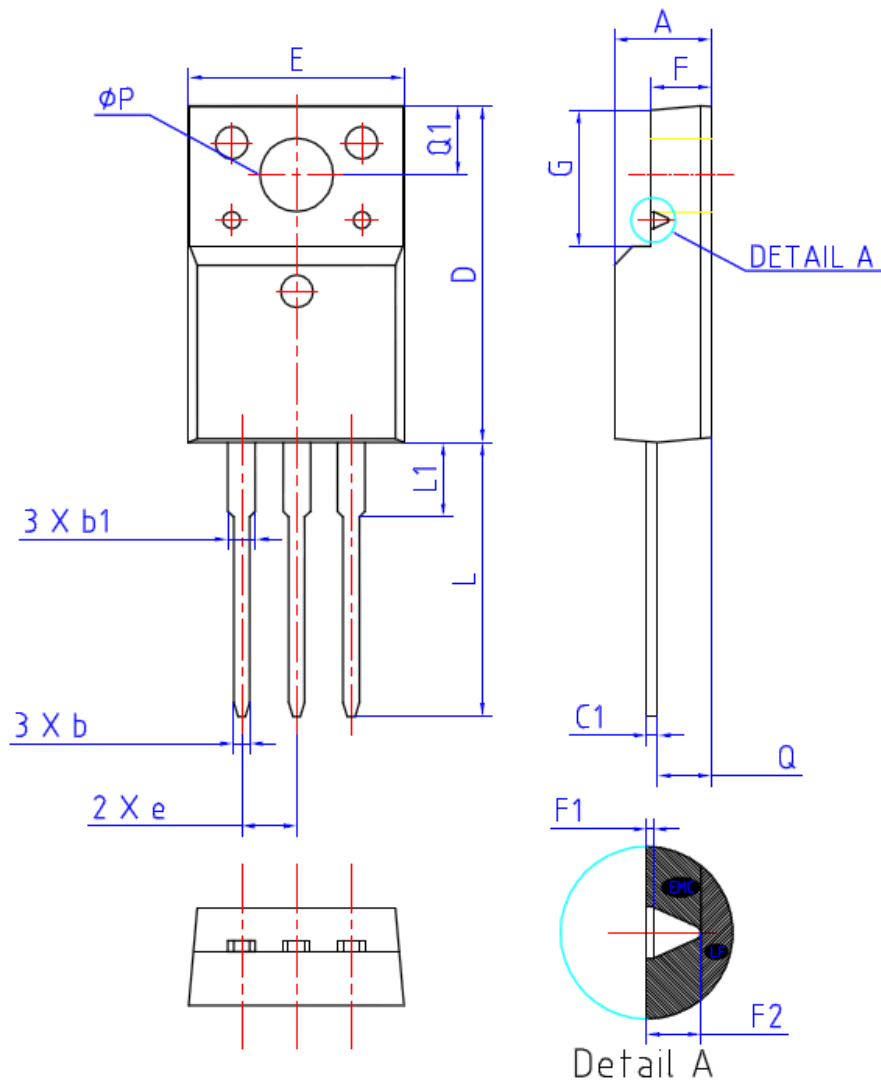


Fig. 9  $I_H - V_T$



## Package Outline Dimensions



| SYMBOL   | MILLIMETERS |         |         | NOTE |
|----------|-------------|---------|---------|------|
|          | MINIMUM     | NOMINAL | MAXIMUM |      |
| A        | 4.50        | 4.70    | 4.90    |      |
| b        | 0.70        | 0.80    | 0.90    |      |
| b1       | 1.33        | 1.40    | 1.47    |      |
| C1       | 0.45        | 0.50    | 0.60    |      |
| D        | 15.67       | 15.87   | 16.07   |      |
| E        | 9.96        | 10.16   | 10.36   |      |
| e        | 2.54BSC     |         |         |      |
| F        | 2.34        | 2.54    | 2.74    |      |
| F1       | (0.10 REF)  |         |         |      |
| F2       | (0.84 REF)  |         |         |      |
| G        | 6.48        | 6.68    | 6.88    |      |
| L        | 12.78       | 12.98   | 13.18   |      |
| L1       | 3.03        | 3.23    | 3.43    |      |
| Q        | 2.56        | 2.76    | 2.96    |      |
| Q1       | 3.10        | 3.30    | 3.50    |      |
| $\phi P$ | 3.08        | 3.18    | 3.28    |      |

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