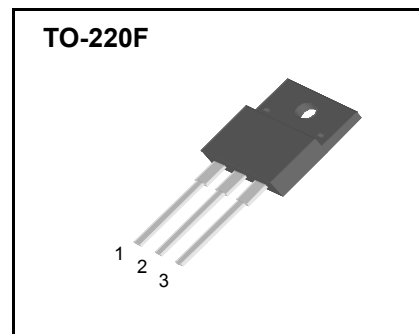
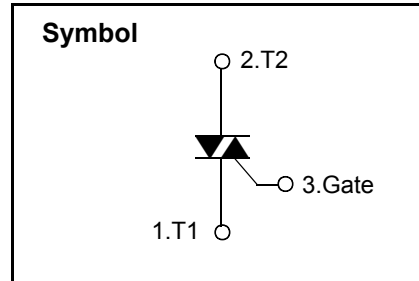


Features

- ◆ Repetitive Peak Off-State Voltage : 600V
- ◆ R.M.S On-State Current ($I_{T(RMS)} = 25\text{ A}$)
- ◆ High Commutation dv/dt
- ◆ Isolation Voltage ($V_{ISO} = 1500\text{V AC}$)

General Description

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



Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$ unless otherwise specified)

| Symbol | Parameter | Condition | Ratings | Units |
|--------------|-----------------------------------|--|------------|----------------------|
| V_{DRM} | Repetitive Peak Off-State Voltage | Sine wave, 50 to 60Hz | 600 | V |
| $I_{T(RMS)}$ | R.M.S On-State Current | $T_j = 125^\circ\text{C}$ | 25 | A |
| I_{TSM} | Surge On-State Current | One Cycle, 50Hz/60Hz, Peak, Non-Repetitive | 250/260 | A |
| I^2t | I^2t | $t=10\text{ms}$ | 312 | A^2s |
| P_{GM} | Peak Gate Power Dissipation | $T_j = 125^\circ\text{C}$ | 5.0 | W |
| $P_{G(AV)}$ | Average Gate Power Dissipation | $T_j = 125^\circ\text{C}$ | 1.0 | W |
| I_{GM} | Peak Gate Current | $T_j = 125^\circ\text{C}$ | 2.0 | A |
| V_{GM} | Peak Gate Voltage | $T_j = 125^\circ\text{C}$ | 10 | V |
| T_J | Operating Junction Temperature | A.C. 1 minute | - 40 ~ 125 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature | | - 40 ~ 150 | $^\circ\text{C}$ |



Electrical Characteristics

| Symbol | Items | | Conditions | Ratings | | | Unit |
|-------------|---|----------------------|--|---------|------|------|------------------|
| | | | | Min. | Typ. | Max. | |
| I_{DRM} | Repetitive Peak Off-State Current | | $V_D = V_{DRM}$, Single Phase, Half Wave $T_J = 125\text{ }^\circ\text{C}$ | ---- | ---- | 3.0 | mA |
| V_{TM} | Peak On-State Voltage | | $I_{TM} = 35\text{A}$, Inst. $t_p=380\mu\text{s}$ | — | — | 1.55 | V |
| I_{GT1}^+ | I | Gate Trigger Current | $V_D = 12\text{ V}$, $R_L=33\ \Omega$ | — | — | 50 | mA |
| I_{GT1}^- | II | | | — | — | 50 | |
| I_{GT3}^- | III | | | — | — | 50 | |
| V_{GT1}^+ | I | Gate Trigger Voltage | $V_D = 12\text{ V}$, $R_L=33\ \Omega$ | — | — | 1.5 | V |
| V_{GT1}^- | II | | | — | — | 1.5 | |
| V_{GT3} | III | | | — | — | 1.5 | |
| V_{GD} | Non-Trigger Gate Voltage | | $T_J = 125\text{ }^\circ\text{C}$, $V_D=V_{DRM}$, $R_L=3.3\text{k}\Omega$ | 0.2 | ---- | ---- | V |
| dv/dt | Critical Rate of Rise Off-State Voltage | | $T_J = 125\text{ }^\circ\text{C}$, $V_D=2/3\ V_{DRM}$ | 40 | ---- | ---- | V/ μs |
| I_H | Holding Current | | $I_T=0.5\text{A}$ | --- | -- | 80 | mA |

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Fig 1. Gate Characteristics

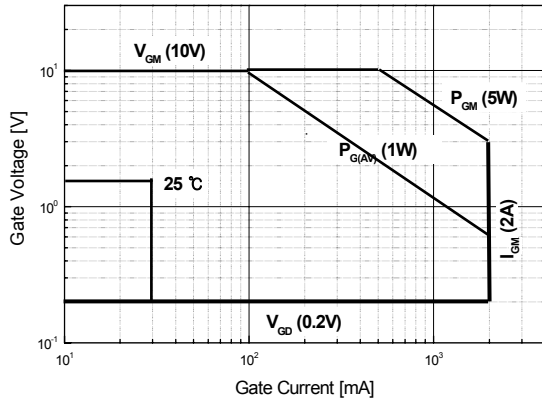


Fig 2. On-State Voltage

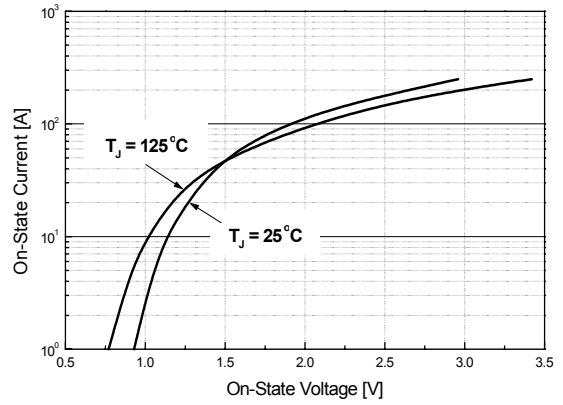


Fig 3. On State Current vs. Maximum Power Dissipation

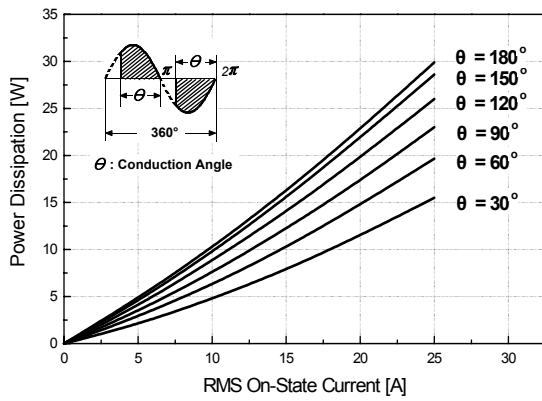


Fig 4. On State Current vs. Allowable Case Temperature

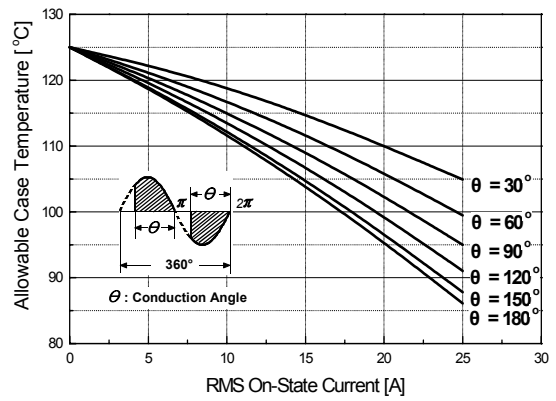


Fig 5. Surge On-State Current Rating (Non-Repetitive)

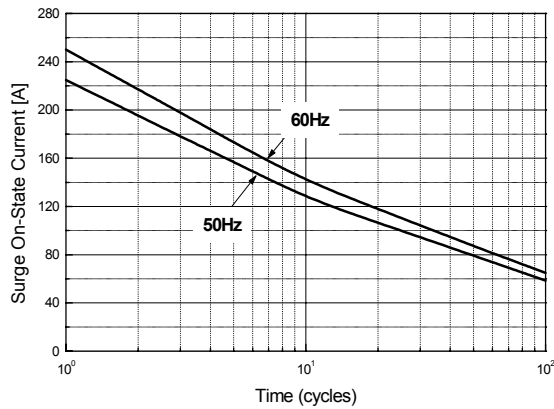
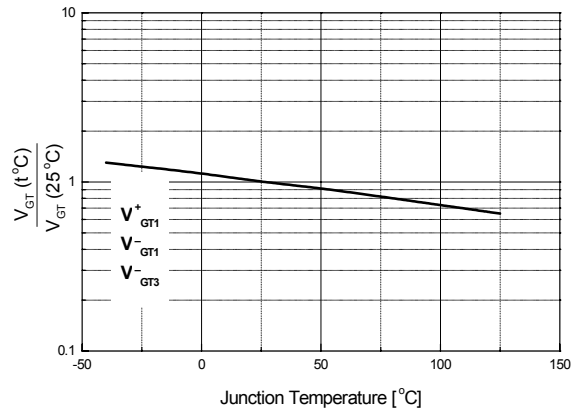


Fig 6. Gate Trigger Voltage vs. Junction Temperature



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Fig 7. Gate Trigger Current vs. Junction Temperature

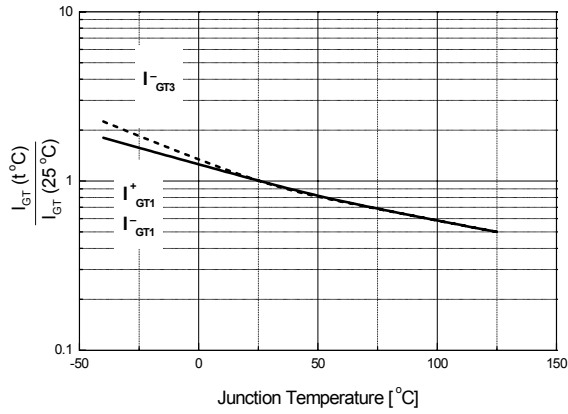


Fig 8. Transient Thermal Impedance

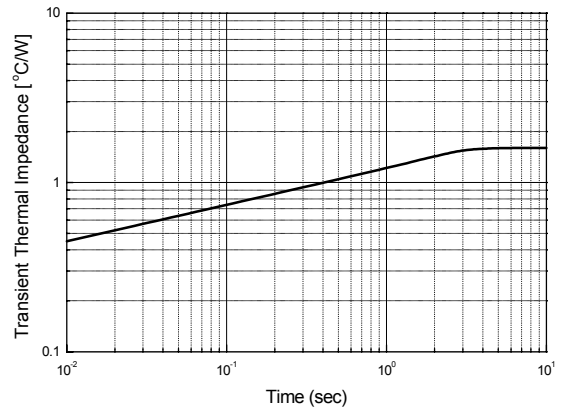
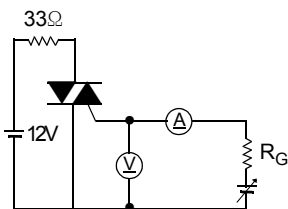
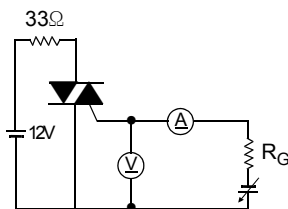


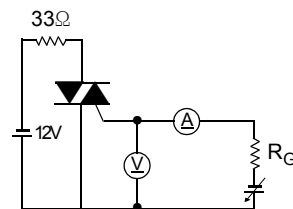
Fig 9. Gate Trigger Characteristics Test Circuit



Test Procedure I



Test Procedure II

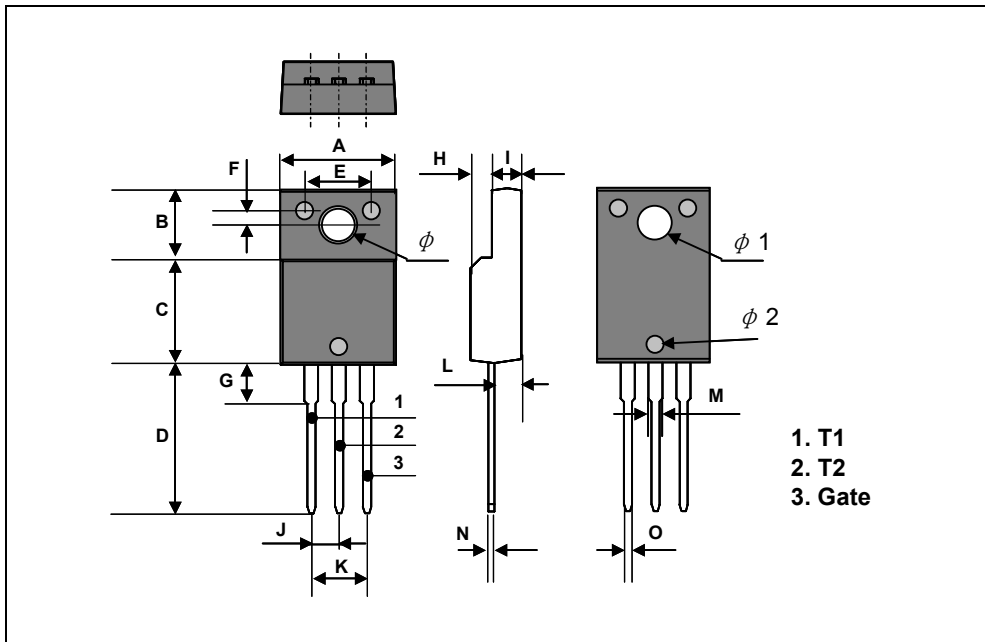


Test Procedure III

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TO-220F Package Dimension

| Dim. | mm | | | Inch | | |
|----------|-------|------|-------|-------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 10.4 | | 10.6 | 0.409 | | 0.417 |
| B | 6.18 | | 6.44 | 0.243 | | 0.254 |
| C | 9.55 | | 9.81 | 0.376 | | 0.386 |
| D | 13.47 | | 13.73 | 0.530 | | 0.540 |
| E | 6.05 | | 6.15 | 0.238 | | 0.242 |
| F | 1.26 | | 1.36 | 0.050 | | 0.054 |
| G | 3.17 | | 3.43 | 0.125 | | 0.135 |
| H | 1.87 | | 2.13 | 0.074 | | 0.084 |
| I | 2.57 | | 2.83 | 0.101 | | 0.111 |
| J | | 2.54 | | | 0.100 | |
| K | | 5.08 | | | 0.200 | |
| L | 2.51 | | 2.62 | 0.099 | | 0.103 |
| M | 1.23 | | 1.36 | 0.048 | | 0.054 |
| N | 0.45 | | 0.63 | 0.018 | | 0.025 |
| O | 0.6 | | 1.0 | 0.023 | | 0.039 |
| ϕ | | 3.7 | | | 0.146 | |
| $\phi 1$ | | 3.2 | | | 0.126 | |
| $\phi 2$ | | 1.5 | | | 0.059 | |



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TO-220F Package Dimension, Forming

| Dim. | mm | | | Inch | | |
|----------|------|------|------|--------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 10.4 | | 10.6 | 0.409 | | 0.417 |
| B | 6.18 | | 6.44 | 0.243 | | 0.254 |
| C | 9.55 | | 9.81 | 0.376 | | 0.386 |
| D | 8.4 | | 8.66 | 0.331 | | 0.341 |
| E | 6.05 | | 6.15 | 0.238 | | 0.242 |
| F | 1.26 | | 1.36 | 0.050 | | 0.054 |
| G | 3.17 | | 3.43 | 0.125 | | 0.135 |
| H | 1.87 | | 2.13 | 0.074 | | 0.084 |
| I | 2.57 | | 2.83 | 0.101 | | 0.111 |
| J | | 2.54 | | | 0.100 | |
| K | | 5.08 | | | 0.200 | |
| L | 2.51 | | 2.62 | 0.099 | | 0.103 |
| M | 1.23 | | 1.36 | 0.048 | | 0.054 |
| N | 0.45 | | 0.63 | 0.018 | | 0.025 |
| O | 0.65 | | 0.78 | 0.0025 | | 0.031 |
| P | | 5.0 | | | 0.197 | |
| ϕ | | 3.7 | | | 0.146 | |
| $\phi 1$ | | 3.2 | | | 0.126 | |
| $\phi 2$ | | 1.5 | | | 0.059 | |

