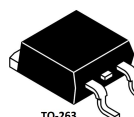
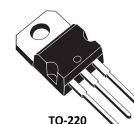
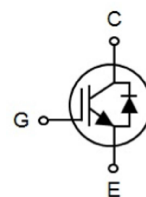


Feature

- High ruggedness for motor control
- VCE(sat) positive temperature coefficient
- Very soft, fast recovery anti-parallel diode
- Low EMI
- Maximum junction temperature 175°C



Applications

- Inverter for motor control

Maximum Ratings

| Parameter | Symbol | Rating | Unit |
|---|-------------|--------------------|-------------|
| Collector-emitter voltage | V_{CE} | 650 | V |
| DC collector current, limited by T_{vjmax} | I_C | $T_C=25^{\circ}C$ | 30 |
| | | $T_C=100^{\circ}C$ | 15 |
| Pulsed collector current, t_p limited by T_{vjmax} | I_{Cpuls} | 60 | A |
| Diode forward current, limited by T_{vjmax} | I_F | $T_C=25^{\circ}C$ | 30 |
| | | $T_C=100^{\circ}C$ | 15 |
| Gate-emitter voltage | V_{GE} | $\pm 20V$ | V |
| Diode pulsed current, t_p limited by T_{vjmax} | I_{Fpuls} | 60 | A |
| Power dissipation (TO-220/TO-263) | P_D | 182 | W |
| Power dissipation (TO-220F) | P_D | 48 | W |
| Short circuit withstand time $V_{CC} \leq 360V, V_{GE} = 15V, T_{vj} = 150^{\circ}C$ | tsc | 5 | μs |
| Operating Junction temperature range | T_{vj} | -40~175 | $^{\circ}C$ |
| Storage temperature range | T_{stg} | -55~150 | $^{\circ}C$ |

Thermal Characteristics

| Parameter | Symbol | Rating | | Unit |
|---|---------------|-----------|------------------------|---------------|
| | | SL15T65FF | SL15T65F/ SL15T65FK | |
| Thermal resistance junction-to-ambient | $R_{th(j-a)}$ | 62 | 62.5 | $^{\circ}C/W$ |
| Thermal resistance junction-to-case for IGBT | $R_{th(j-c)}$ | 3.1 | 0.77 | |
| Thermal resistance junction-to-case for Diode | $R_{th(j-a)}$ | 5.2 | 2.05 | |

Electrical Characteristics ($T_{vj} = 25^{\circ}\text{C}$ unless otherwise specified)

Static Characteristics

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit | |
|--------------------------------------|---------------|----------------------------|---------------------------|-----|-----------|------|---------------|
| Collector-emitter breakdown voltage | $V_{(BR)CES}$ | $V_{GE}=0V, I_C=2mA$ | 650 | - | - | V | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $V_{GE}=15V, I_C=15A$ | $T_j=25^{\circ}\text{C}$ | - | 1.65 | 2.00 | V |
| | | | $T_j=150^{\circ}\text{C}$ | - | 1.90 | - | V |
| Diode forward voltage | V_F | $V_{GE}=0V, I_F=15A$ | $T_j=25^{\circ}\text{C}$ | - | 1.85 | 2.30 | V |
| | | | $T_j=150^{\circ}\text{C}$ | - | 1.95 | - | V |
| Gate-emitter threshold voltage | $V_{GE(th)}$ | $I_C=0.5mA, V_{CE}=V_{GE}$ | 4.5 | 5.5 | 6.5 | V | |
| Zero gate voltage collector current | I_{CES} | $V_{CE}=650V, V_{GE}=0V$ | $T_j=25^{\circ}\text{C}$ | - | - | 20 | μA |
| | | | $T_j=150^{\circ}\text{C}$ | - | - | 4 | mA |
| Gate-emitter leakage current | I_{GES} | $V_{CE}=0V, V_{GE}=20V$ | - | - | ± 100 | nA | |

Dynamic Characteristics

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|------------------------------|-----------|------------------------------------|-----|------|-----|------|
| Input capacitance | C_{ies} | $V_{CE}=25V, V_{GE}=0V, f=1MHz$ | - | 1129 | - | pF |
| Output capacitance | C_{oes} | | - | 57 | - | |
| Reverse transfer capacitance | C_{res} | | - | 31 | - | |
| Total gate charge | Q_g | $V_{CE}=520V, I_C=15A, V_{GE}=15V$ | - | 61 | - | nC |
| Gate-emitter charge | Q_{ge} | | - | 11 | - | nC |
| Gate-collector charge | Q_{gc} | | - | 35 | - | nC |

Switching Characteristics

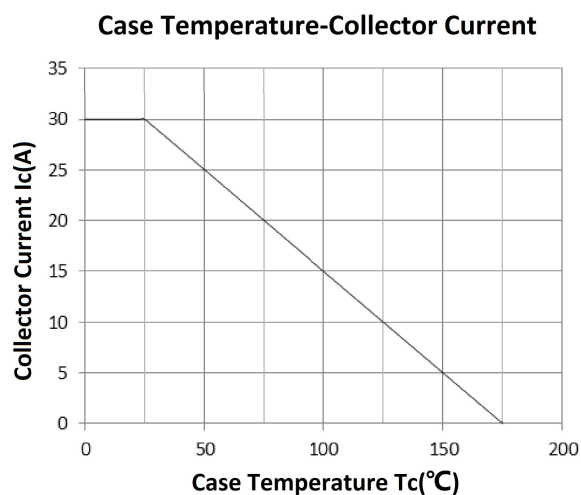
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---------------------------|------------|--|-----|-----|-----|---------------|
| Turn-on delay time | $t_d(on)$ | $V_{GE} = 15V, V_{CC} = 400V,$ $I_C = 15A, R_G = 10\Omega, T_{vj} = 25^{\circ}\text{C}$ Inductive Load | - | 19 | - | nS |
| Rise time | t_r | | - | 27 | - | |
| Turn-off delay time | $t_d(off)$ | | - | 128 | - | |
| Fall time | t_f | | - | 32 | - | μJ |
| Turn-on switching energy | E_{on} | | - | 270 | - | |
| Turn-off switching energy | E_{off} | | - | 86 | - | |
| Total switching energy | E_{ts} | | - | 356 | - | |

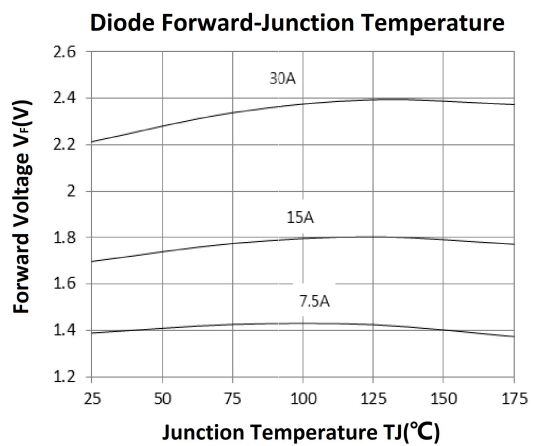
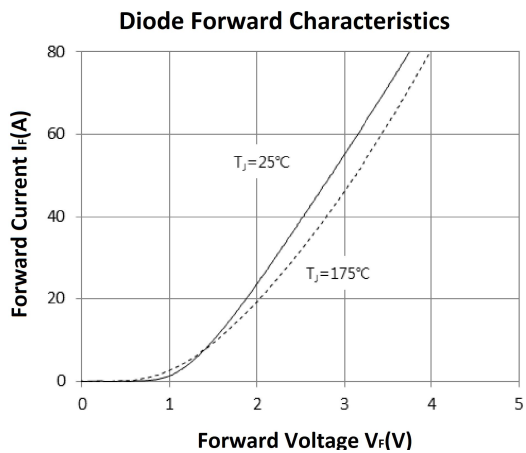
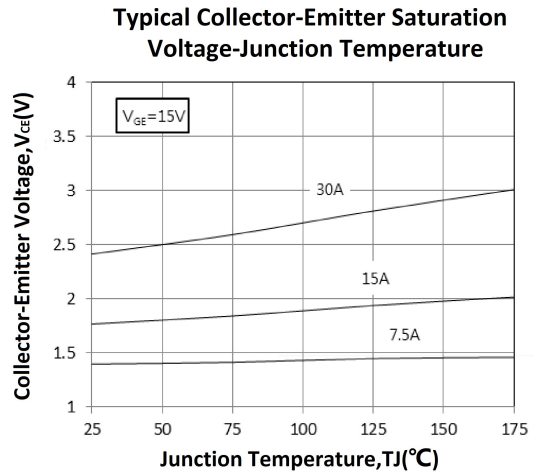
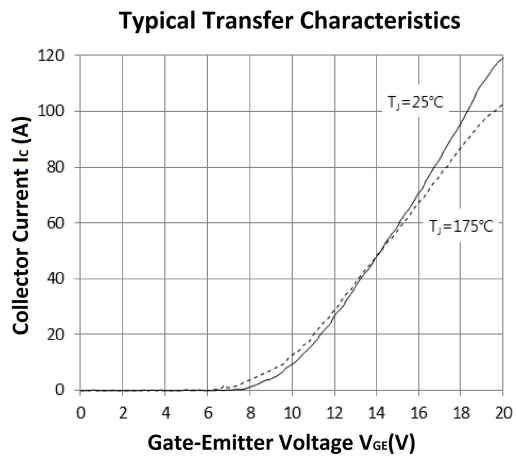
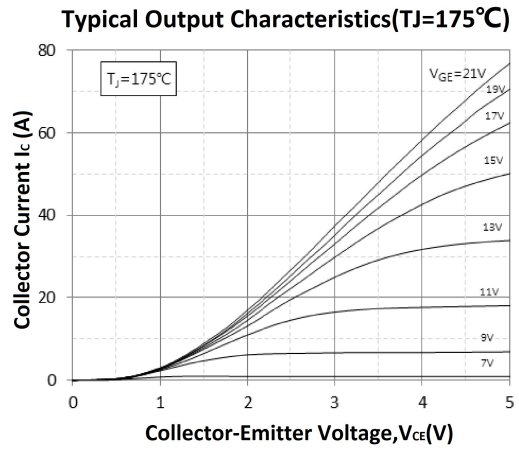
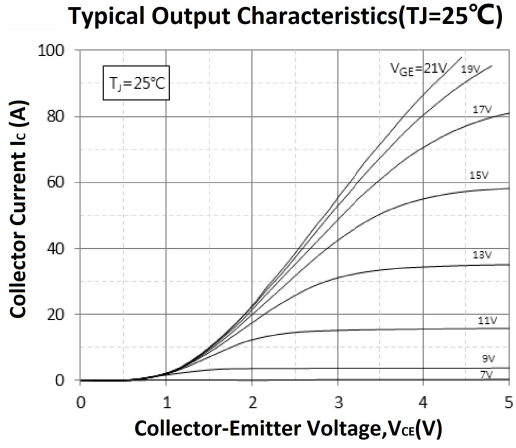
| | | | | | | |
|---------------------------|----------------|---|---|-----|---|----|
| Turn-on delay time | td(on) | $V_{GE} = 15V, V_{CC} = 400V,$ $I_C = 15A, R_G = 10\Omega, T_{vj} = 175^\circ C$ Inductive Load | - | 17 | - | nS |
| Rise time | t _r | | - | 29 | - | |
| Turn-off delay time | td(off) | | - | 150 | - | |
| Fall time | t _f | | - | 130 | - | |
| Turn-on switching energy | Eon | | - | 342 | - | μJ |
| Turn-off switching energy | Eoff | | - | 288 | - | |
| Total switching energy | Ets | | - | 630 | - | |
| Reverse recovery time | trr | $T_j = 25^\circ C \quad I_F = 15A$ $di_F/dt = 200A/\mu s$ | - | 150 | - | nS |
| Reverse recovery charge | Qrr | | - | 390 | - | nC |
| Reverse recovery current | Irrm | | - | 5.2 | - | A |
| Reverse recovery time | trr | $T_j = 175^\circ C \quad I_F = 15A$ $di_F/dt = 200A/\mu s$ | - | 207 | - | nS |
| Reverse recovery charge | Qrr | | - | 631 | - | nC |
| Reverse recovery current | Irrm | | - | 6.1 | - | A |

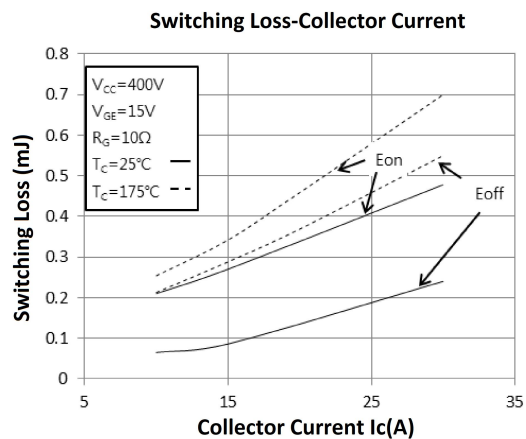
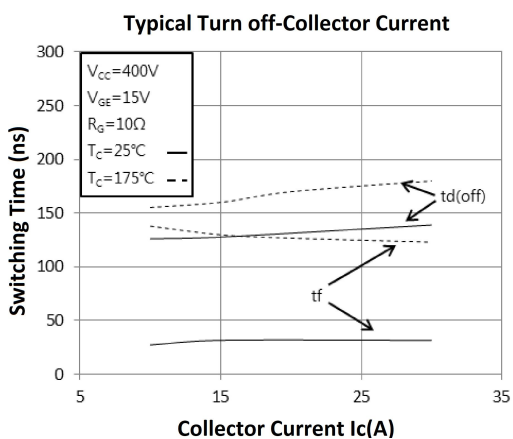
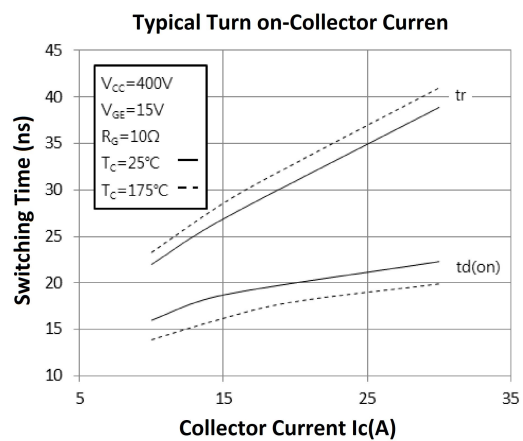
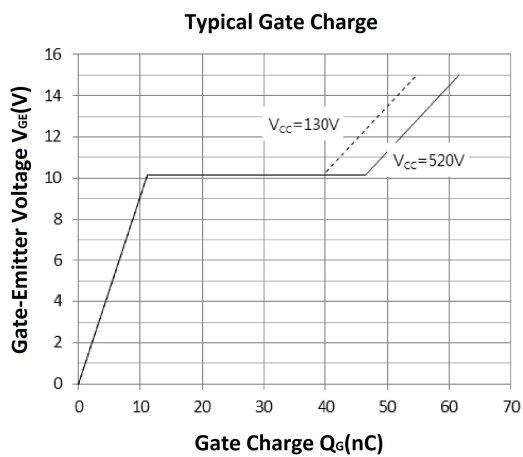
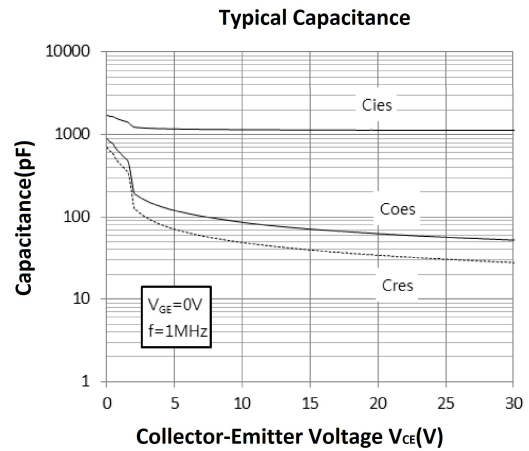
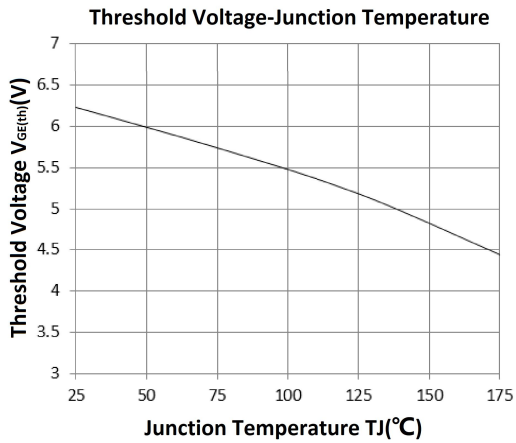
Order Message

| Order codes | Package | Packaging |
|-------------|---------|-----------|
| SL15T65FF | TO-220F | Tube |
| SL15T65F | TO-220 | Tube |
| SL15T65FK | TO-263 | Tube |

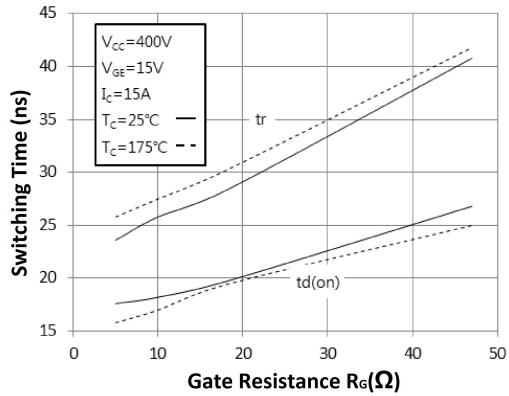
Electrical Characteristics



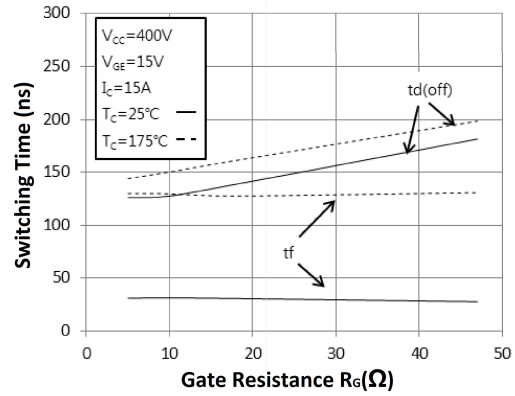




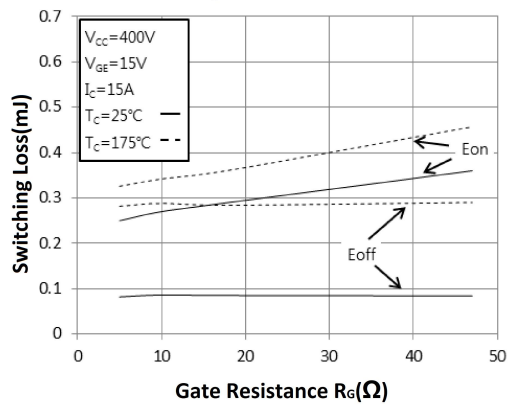
Turn on Characteristics-Gate Resistance



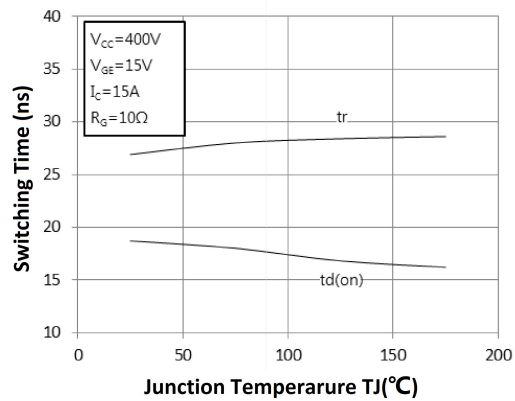
Turn off Characteristics-Gate Resistance



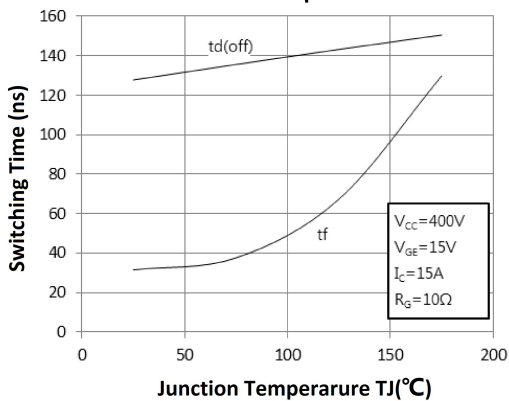
Switching Loss-Gate Resistance



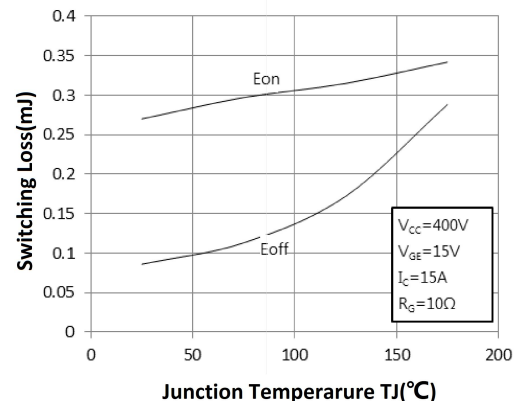
Turn on Characteristics-Junction Temperature

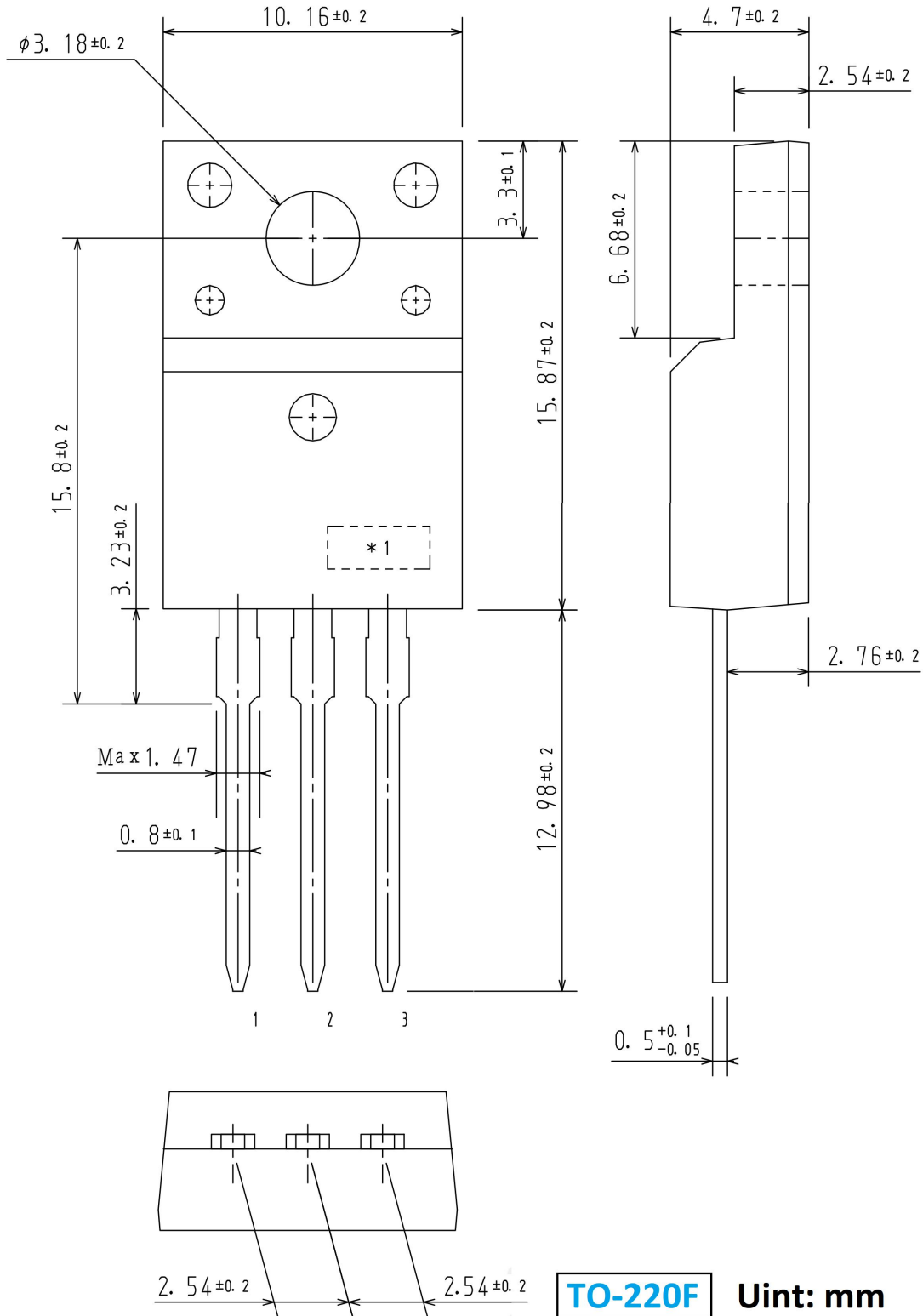


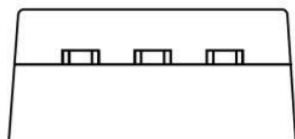
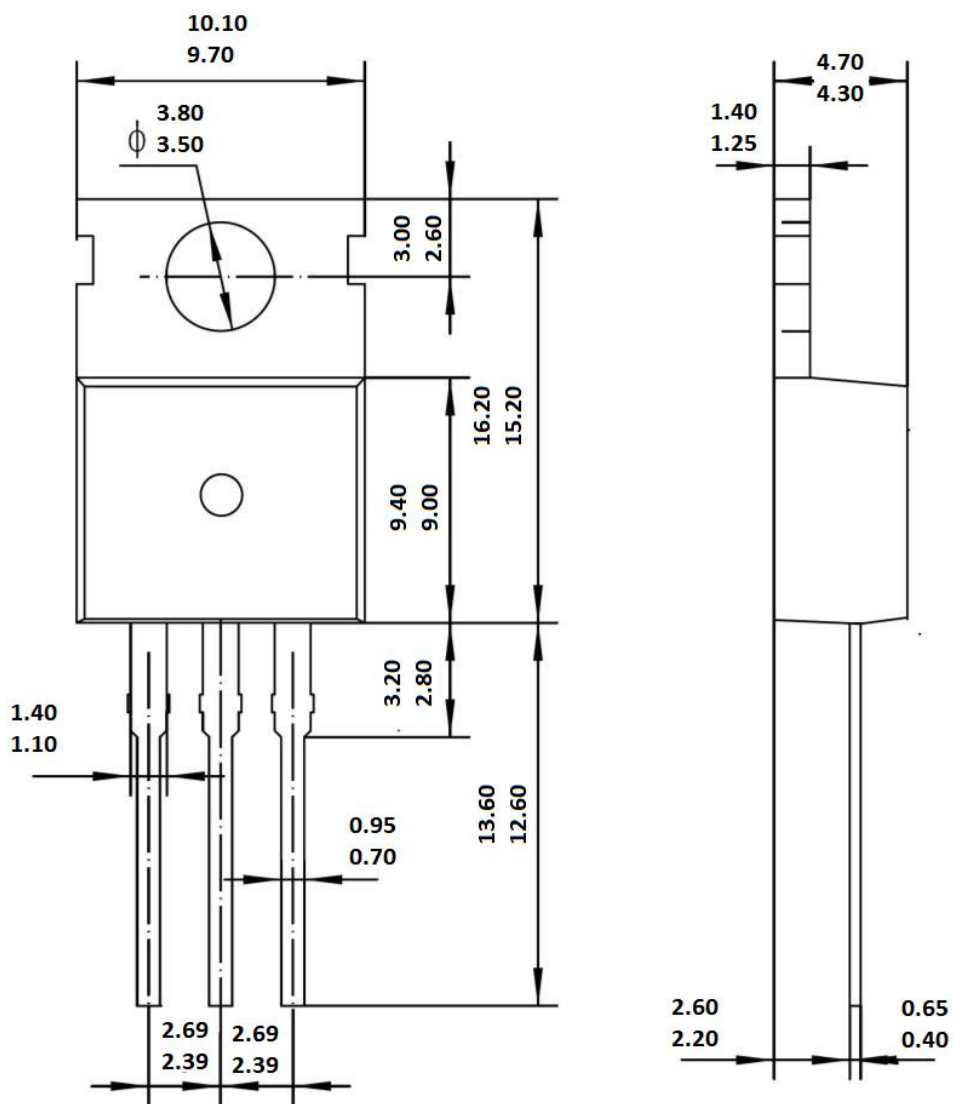
Turn off Characteristics -Junction Temperature



Switching Loss-Junction Temperature







TO-220

Unit: mm

