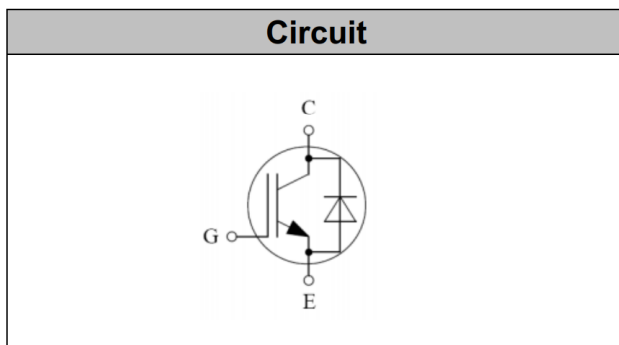


IGBT Discrete

| | | |
|-----------------------|-------------|----------|
| V_{CE} | 1200 | V |
| I_C | 75 | A |
| $V_{CE(SAT)} I_C=75A$ | 1.49 | V |



Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- Uninterruptible power supply

Features

- High breakdown voltage to 1200V for improved reliability
- Maximum junction temperature 175°C
- Positive temperature coefficient
- Including fast & soft recovery anti-parallel FWD
- High short circuit capability(10us)

Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|-------------|-----------|---------|
| Collector-Emitter Breakdown Voltage | V_{CE} | 1200 | V |
| DC Collector Current, limited by T_{jmax} $T_C=25^{\circ}C$ $T_C=100^{\circ}C$ | I_C | 150 75 | A |
| Diode Forward Current, limited by T_{jmax} $T_C=25^{\circ}C$ $T_C=100^{\circ}C$ | I_F | 150 75 | A |
| Continuous Gate-Emitter Voltage | V_{GE} | ± 20 | V |
| Transient Gate-Emitter Voltage ($t_p \leq 10\mu s, D < 0.010$) | V_{GE} | ± 30 | V |
| Turn off Safe Operating Area $V_{CE} \leq 1200V$, $T_j \leq 150^{\circ}C$ | | 300 | A |
| Pulsed Collector Current, $V_{GE}=15V$, t_p limited by T_{jmax} | I_{CM} | 300 | A |
| Diode Pulsed Current, t_p limited by T_{jmax} | I_{Fpuls} | 300 | A |
| Short Circuit Withstand Time, $V_{GE}=15V, V_{CC}=900V, V_{CEM} \leq 1200V$ | T_{sc} | 10 | μs |
| Power Dissipation, $T_j=175^{\circ}C, T_C=25^{\circ}C$ | P_{tot} | 803 | W |

| | | | |
|--|-------|------------|----|
| Operating Junction Temperature | T_j | -40...+175 | °C |
| Storage Temperature | T_s | -55...+150 | °C |
| Soldering Temperature, wave soldering 1.6mm (0.063in.) from case for 10s | | 260 | °C |

Electrical Characteristics of the IGBT ($T_j = 25^\circ\text{C}$ unless otherwise specified):

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|--------------------------------------|---------------|---|------|----------------------|--------------|------|
| Static | | | | | | |
| Collector-Emitter Breakdown Voltage | BV_{CES} | $V_{GE}=0V, I_C=250\mu A$ | 1200 | | - | V |
| Gate Threshold Voltage | $V_{GE(th)}$ | $V_{GE}=V_{CE}, I_C=1.0mA$ | 5.1 | 5.8 | 6.5 | V |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $V_{GE}=15V, I_C=35A$ $T_j=25^\circ\text{C}$ $T_j=125^\circ\text{C}$ $T_j=150^\circ\text{C}$ | | 1.45 2.00 2.10 | 2.0 | V |
| Zero Gate Voltage Collector Current | I_{CES} | $V_{CE}=1200V, V_{GE}=0V$ $T_j=25^\circ\text{C}$ $T_j=150^\circ\text{C}$ | | | 0.25 5.00 | mA |
| Gate-Emitter Leakage Current | I_{GES} | $V_{CE}=0V, V_{GE}=\pm 30V$ | | | 100 | nA |

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---------------------------------|-----------|---|------|------|------|------|
| Dynamic | | | | | | |
| Input Capacitance | C_{ies} | $V_{CE}=30V, V_{GE}=0V,$ $f=1MHz$ | - | 9.57 | - | nF |
| Reverse Transfer Capacitance | C_{res} | | - | 0.05 | - | |
| Gate Charge | Q_G | $V_{CC}=960V, I_C=75A,$ $V_{GE}=15V$ | - | 0.57 | - | uC |
| Short Circuit Collector Current | I_{SC} | $V_{GE}=15V, t_{sc}\leq 10\mu s,$ $V_{CC}=900V, T_j\leq 150^\circ\text{C}$ | - | 280 | - | A |

Electrical Characteristics of the Diode ($T_j = 25^\circ\text{C}$ unless otherwise specified):

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|-----------------------|--------|--|------|----------------------|------|------|
| Static | | | | | | |
| Diode Forward Voltage | V_F | $I_F = 35\text{A}$ $T_j = 25^\circ\text{C}$, $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$ | | 1.44 1.28 1.15 | | V |

Switching Characteristic, Inductive Load ($T_j = 25^\circ\text{C}$ unless otherwise specified):

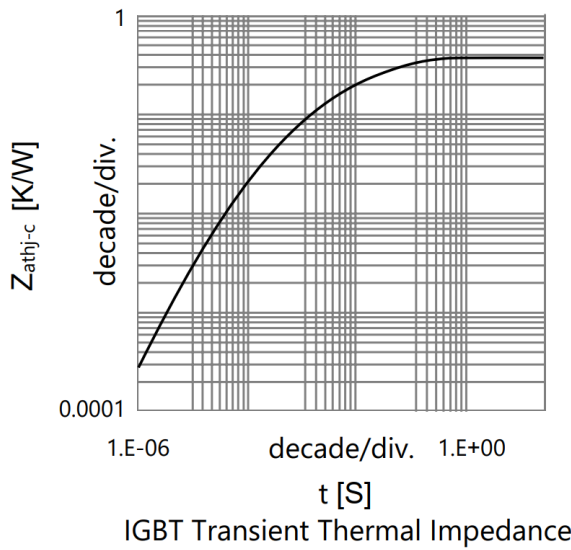
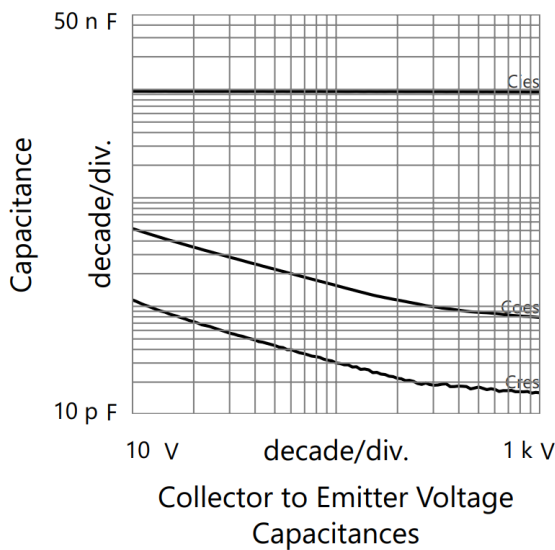
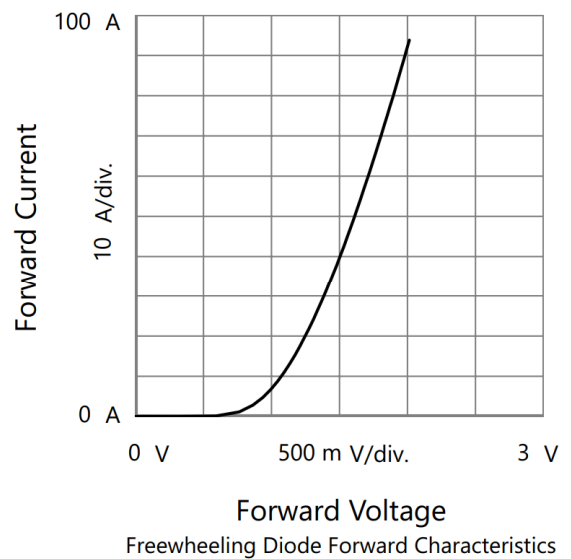
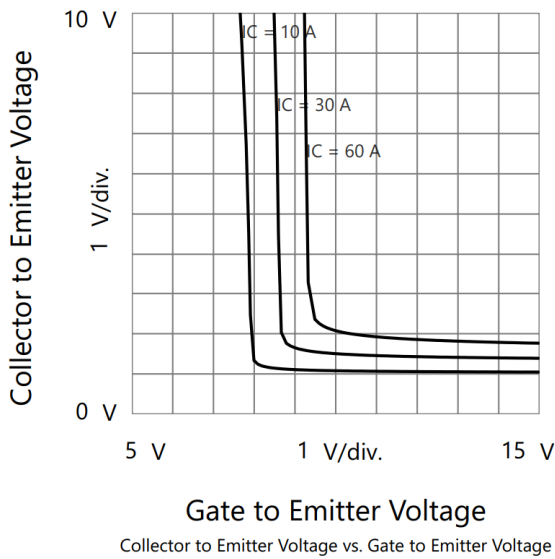
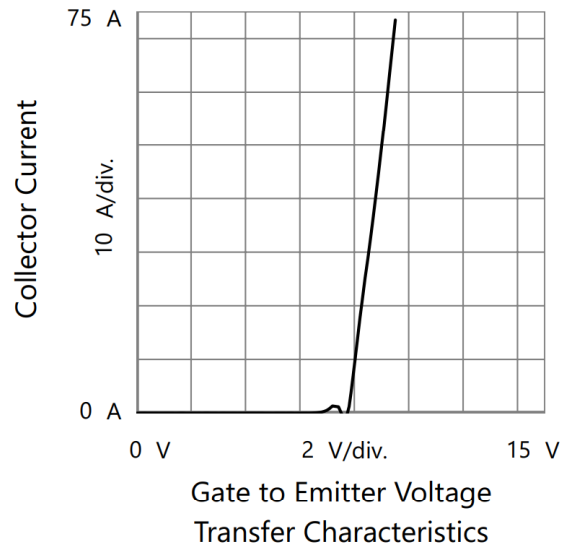
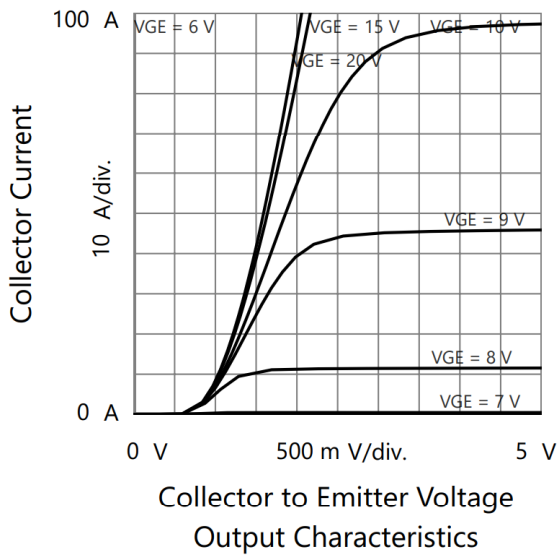
| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---------------------|---------------------|---|------|------|------|------|
| Turn-on Delay Time | $t_{d(\text{on})}$ | $V_{CC} = 600\text{V}$, $I_C = 75\text{A}$, $V_{GE} = -15\text{V} \sim 15\text{V}$, $R_g = 12\Omega$ | - | 25 | - | ns |
| Rise Time | t_r | | - | 26 | - | ns |
| Turn-on Energy | E_{on} | | - | 5.8 | - | mJ |
| Turn-off Delay Time | $t_{d(\text{off})}$ | | - | 165 | - | ns |
| Fall Time | t_f | | - | 30 | - | ns |
| Turn-off Energy | E_{off} | | - | 2.7 | - | mJ |

Electrical Characteristics of the DIODE ($T_j = 25^\circ\text{C}$ unless otherwise specified):

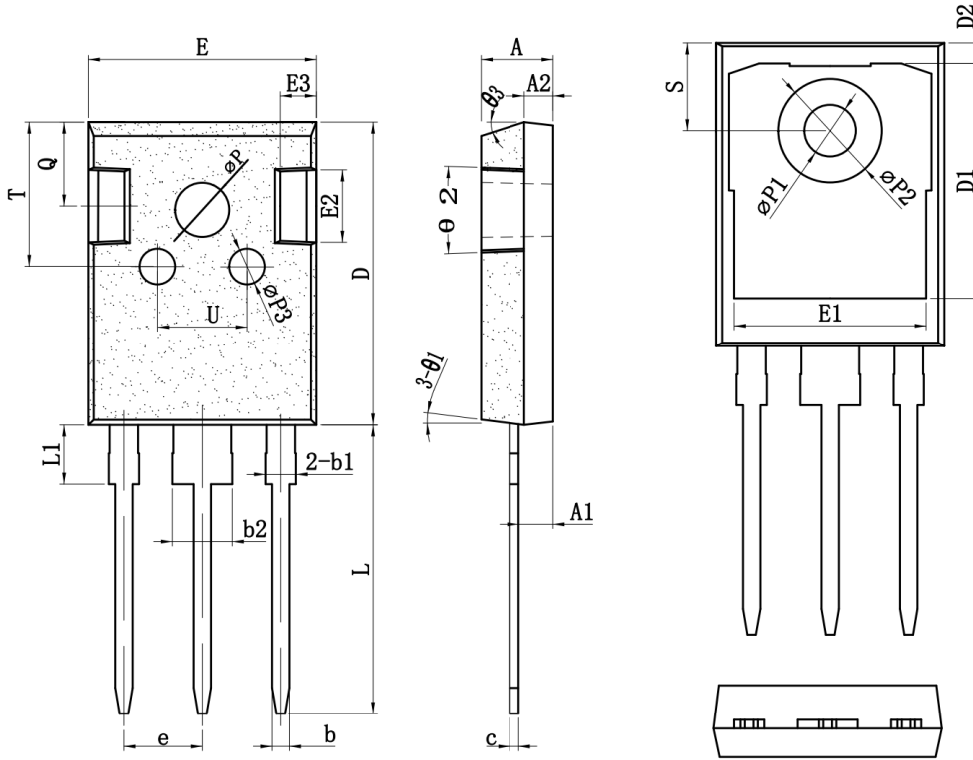
| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|--------------------------|------------------|---|------|------|------|---------------|
| Diode Forward Voltage | V_{FM} | $I_F = 75\text{A}$ | - | 2.10 | - | V |
| Reverse Recovery Current | I_{rr} | $I_F = 75\text{A}$, $V_R = 600\text{V}$, $di/dt = -1800\text{A}/\mu\text{s}$, | - | 25 | - | A |
| Reverse Recovery Charge | Q_{rr} | | - | 4.30 | - | μC |
| Reverse Recovery Energy | E_{rec} | | - | 1.10 | | mJ |

Thermal Resistance

| Parameter | Symbol | Max. Value | Unit |
|---|---------------|------------|------|
| IGBT Thermal Resistance, Junction - Case | $R_{th(j-c)}$ | 0.18 | K/W |
| Diode Thermal Resistance, Junction - Case | $R_{th(j-c)}$ | 0.45 | K/W |
| Thermal Resistance, Junction - Ambient | $R_{th(j-a)}$ | 40 | K/W |



TO-247_3L PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

| SYMBOL | MIN | TYP | MAX | SYMBOL | MIN | TYP | MAX |
|--------|-------|-------|-------|------------|-------|-------|-------|
| A | 4.60 | 5.00 | 5.40 | e | 2.10 | 5.44 | 5.70 |
| A1 | 2.10 | 2.41 | 2.70 | L | 19.00 | 19.98 | 21.00 |
| A2 | 1.70 | 2.00 | 2.30 | L1 | - | - | 4.50 |
| b | 1.00 | 1.20 | 1.40 | ΦP | 3.30 | 3.70 | 4.00 |
| b1 | 1.80 | 2.10 | 2.40 | $\Phi P1$ | 3.25 | 3.55 | 3.85 |
| b2 | 2.80 | 3.10 | 3.40 | $\Phi P2$ | 6.80 | 7.18 | 7.60 |
| C | 0.45 | 0.60 | 0.75 | $\Phi P3$ | 2.30 | 2.50 | 3.30 |
| D | 19.00 | 21.00 | 23.00 | Q | 5.50 | 5.80 | 6.30 |
| D1 | 16.00 | 16.55 | 17.00 | S | 5.60 | 6.15 | 6.30 |
| D2 | 0.95 | 1.20 | 1.45 | T | 9.50 | 10.00 | 10.50 |
| E | 15.70 | 15.80 | 16.50 | U | 6.00 | - | 8.00 |
| E1 | 12.80 | 13.25 | 13.70 | $\theta 1$ | 5° | 7° | 9° |
| E2 | 4.20 | 5.00 | 5.30 | $\theta 2$ | 1° | 3° | 5° |
| E3 | 2.20 | 2.50 | 2.80 | $\theta 3$ | 13° | 15° | 17° |

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