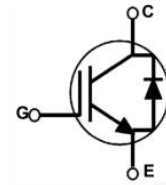
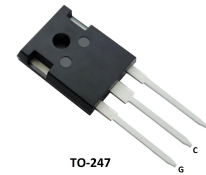


Features

- High Current Capability
- Low Saturation Voltage:
VCE(sat) = 1.55 V @ IC = 50 A
- High Input Impedance
- RoHS Compliant



Applications

- PDP TV

Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit | |
|---|------------------|-----------------------|------|---|
| Collector to Emitter Voltage | V _{CES} | 330 | V | |
| Gate to Emitter Voltage | V _{GES} | ±30 | | |
| Collector Current | I _c | T _C =25°C | 100 | A |
| | | T _C =100°C | 50 | |
| Pulsed Collector Current TC=25°C | I _{CM} | 200 | | |
| Maximum Power Dissipation TC=25°C | P _D | 302 | W | |
| Maximum Power Dissipation TC=100°C | | 138 | | |
| Operating Junction Temperature | T _J | -55 to 150 | °C | |
| Storage Temperature Range | T _{stg} | -55 to 150 | | |
| Maximum Lead Temp. for soldering Purposes, 1/8" from case for 5 seconds | T _L | 300 | | |

Thermal Characteristics

| Parameter | Symbol | Typ | Max | Unit |
|--------------------------------------|--------------------------|-----|------|------|
| Thermal Resistance, Junction to Case | R _{θJC} (IGBT) | - | 0.38 | °C/W |
| Thermal Resistance, Junction to Case | R _{θJC} (Diode) | - | 1.1 | |

Package Marking and Ordering Information

| Device Marking | Device | Package | MOQ |
|----------------|---------------|---------|-----|
| MSG50N350HLC0 | MSG50N350HLC0 | TO-247 | |

Electrical Characteristics of the IGBT $T_C = 25^\circ\text{C}$ unless otherwise noted

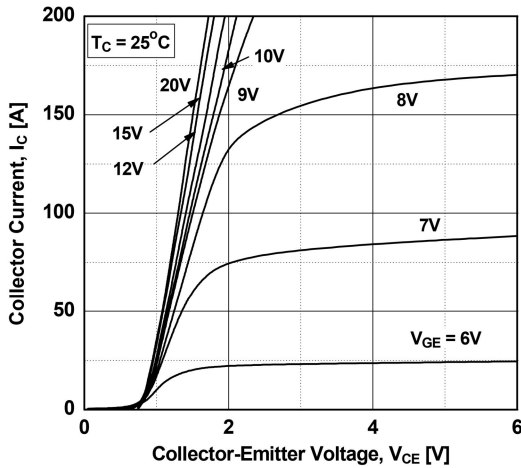
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---------------|--|-----|------|-----------|---------------|
| On/off Characteristics | | | | | | |
| G-E Threshold Voltage | $V_{GE(th)}$ | $I_C = 250\mu\text{A}, V_{CE} = V_{GE}$ | 2.5 | 4 | 5.5 | V |
| Collector to Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 50\text{A}, V_{GE} = 15\text{V}$ | - | 1.55 | - | |
| Collector to Emitter Breakdown Voltage | B_{VCE} | $V_{GE} = 0\text{V}, I_C = 250\mu\text{A}$ | 330 | - | - | |
| Collector Cut-Off Current | I_{CES} | $V_{CE} = V_{CES}, V_{GE} = 0$ | - | - | 100 | μA |
| G-E Leakage Current | I_{GES} | $V_{GE} = V_{GES}, V_{CE} = \pm 30\text{V}$ | - | - | ± 100 | nA |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{ies} | $V_{CE} = 30\text{V}, V_{GE} = 0\text{V}$ $f = 1\text{MHz}$ | - | 4600 | - | pF |
| Output Capacitance | C_{oes} | | - | 2100 | - | |
| Reverse Transfer Capacitance | C_{res} | | - | 96 | - | |
| Switching Characteristics | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{CC} = 200\text{V}, I_C = 40\text{A},$ $R_G = 5\Omega, V_{GE} = 15\text{V},$ Resistive Load, $T_C = 25^\circ\text{C}$ | - | 78 | - | nS |
| Rise Time | t_r | | - | 93 | - | |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 142 | - | |
| Turn-Off Fall Time | t_f | | - | 146 | - | |
| Total Gate Charge | Q_g | $V_{CE} = 200\text{V}, I_C = 40\text{A},$ $V_{GE} = 15\text{V}$ | - | 175 | - | nC |

Electrical Characteristics of the Diode $T_C = 25^\circ\text{C}$ unless otherwise noted

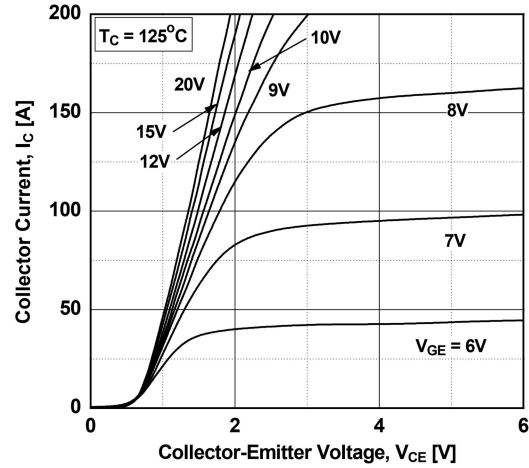
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit | |
|-------------------------------------|----------|--|---------------------------|-----|-----|------|----|
| Diode Forward Voltage | V_{FM} | $I_F = 30\text{A}$ | $T_C = 25^\circ\text{C}$ | - | 1.0 | 1.4 | V |
| | | | $T_C = 125^\circ\text{C}$ | - | 0.9 | - | |
| Diode Reverse Recovery Time | t_{rr} | $I_F = 20\text{A},$ $di_F/dt = 200\text{A}/\mu\text{s}$ | $T_C = 25^\circ\text{C}$ | - | 35 | - | ns |
| | | | $T_C = 125^\circ\text{C}$ | - | 53 | - | |
| Diode Peak Reverse Recovery Current | I_{rr} | | $T_C = 25^\circ\text{C}$ | - | 4 | - | A |
| | | | $T_C = 125^\circ\text{C}$ | - | 6 | - | |
| Diode Reverse Recovery Charge | Q_{rr} | | $T_C = 25^\circ\text{C}$ | - | 50 | - | nC |
| | | | $T_C = 125^\circ\text{C}$ | - | 120 | - | |

Typical Performance Characteristics

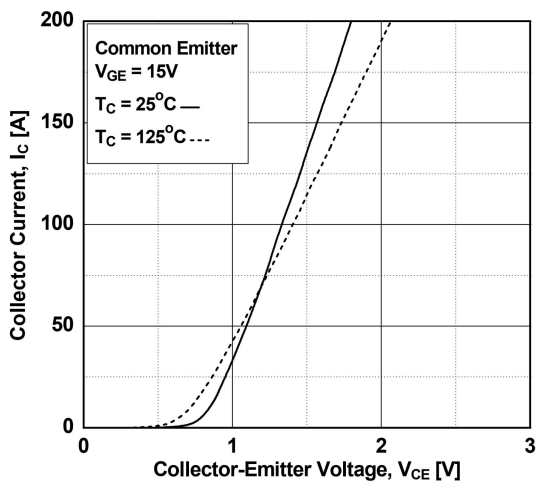
Typical Output Characteristics



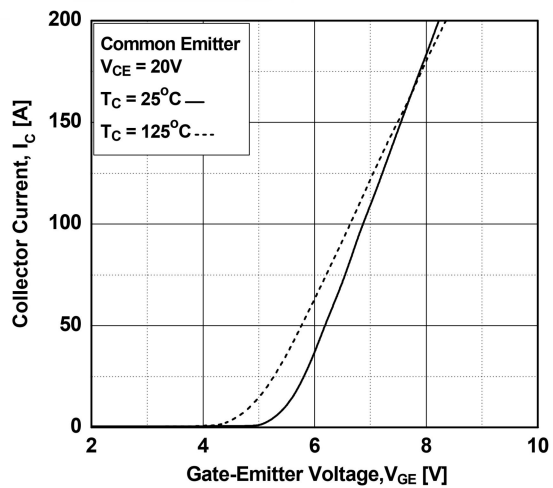
Typical Output Characteristics



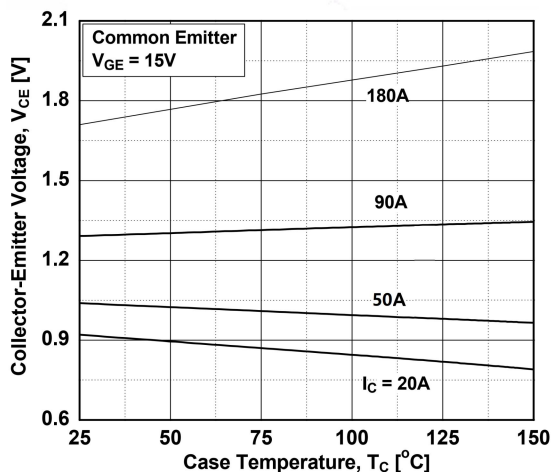
Typical Saturation Voltage Characteristics



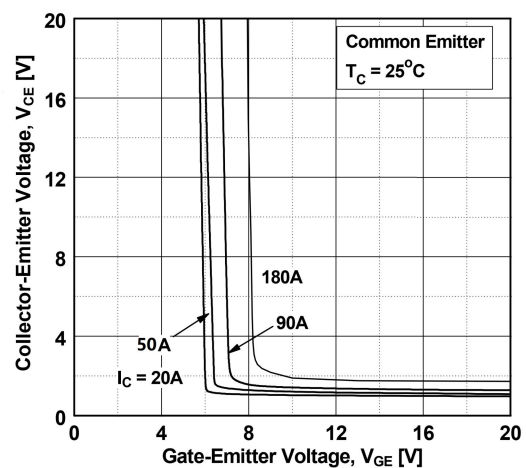
Transfer Characteristics



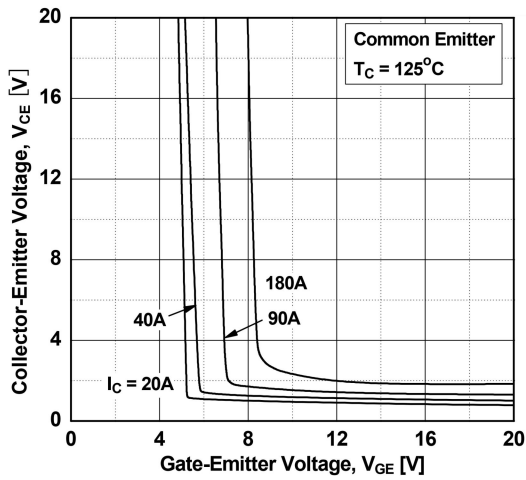
Saturation Voltage vs. Case Temperature at Variant Current Level



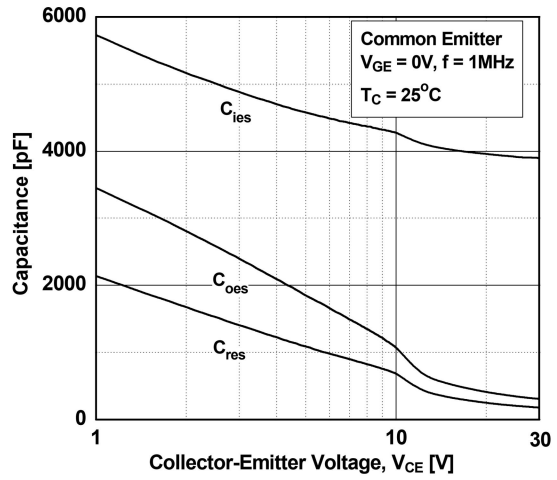
Saturation Voltage vs. V_{GE}



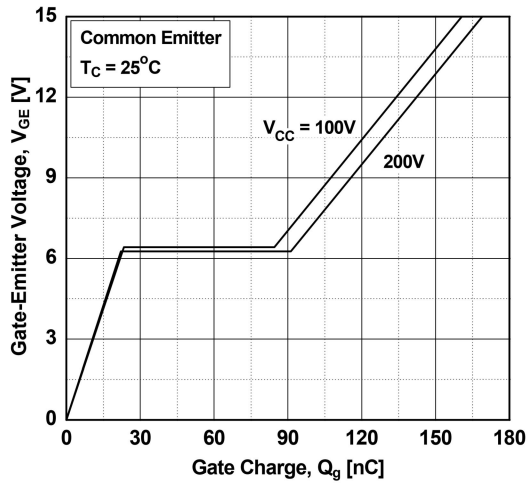
Saturation Voltage vs. V_{GE}



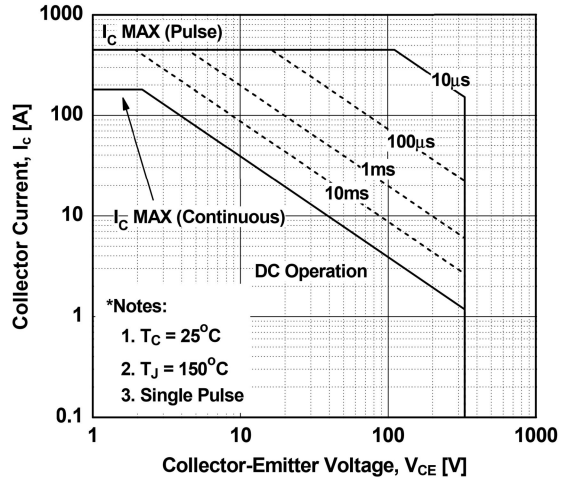
Capacitance Characteristics



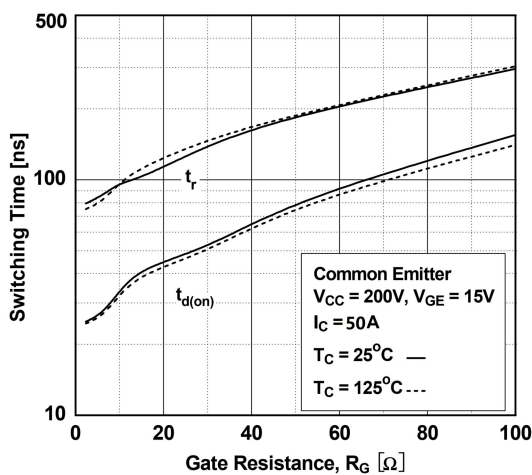
Gate charge Characteristics



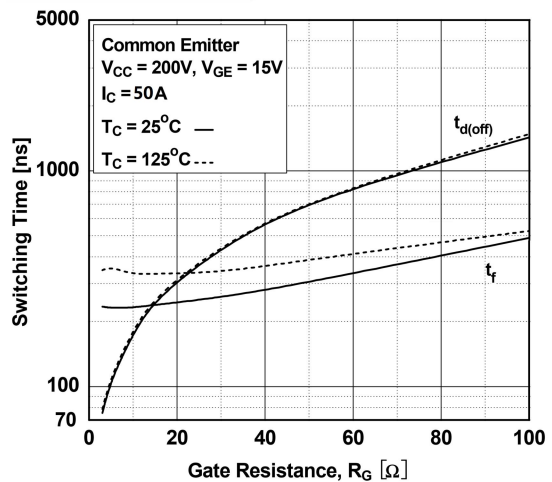
SOA Characteristics



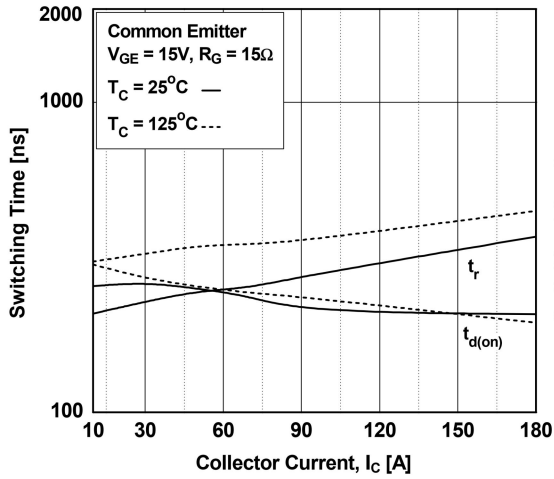
Turn-on Characteristics vs. Gate Resistance



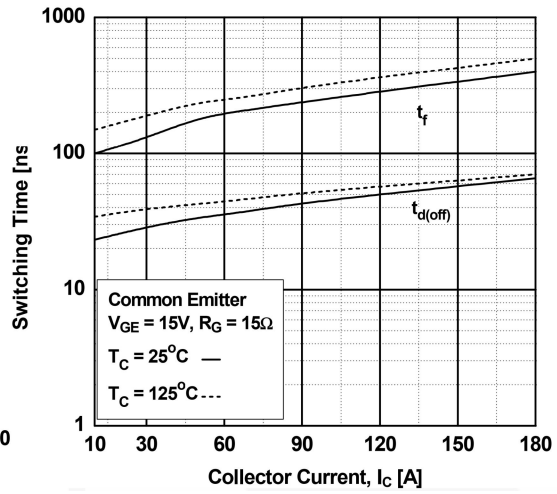
Turn-off Characteristics vs. Gate Resistance



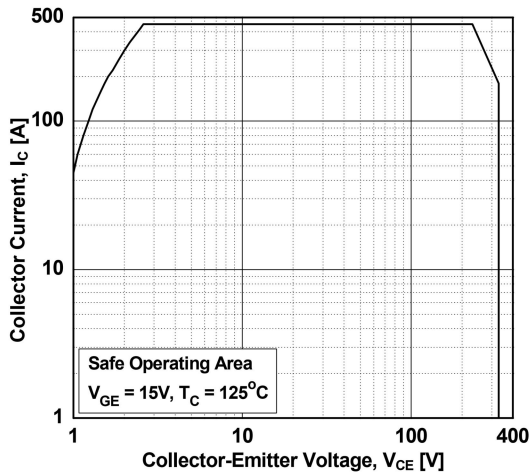
Turn-on Characteristics vs. Collector Current



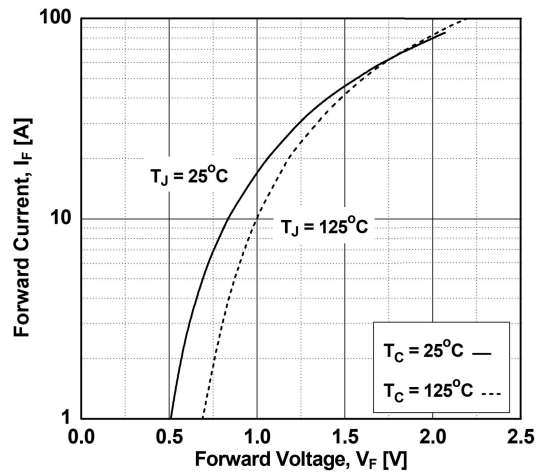
Turn-off Characteristics v Collector Current



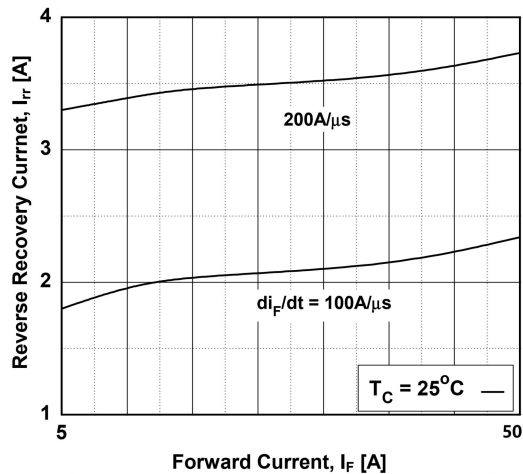
Turn off Switching SOA Characteristics



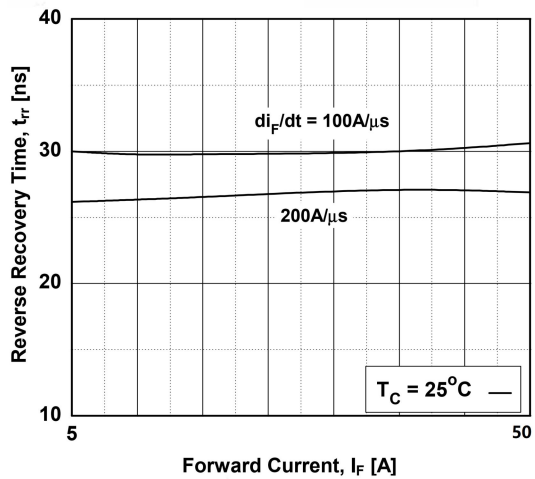
Forward Characteristics



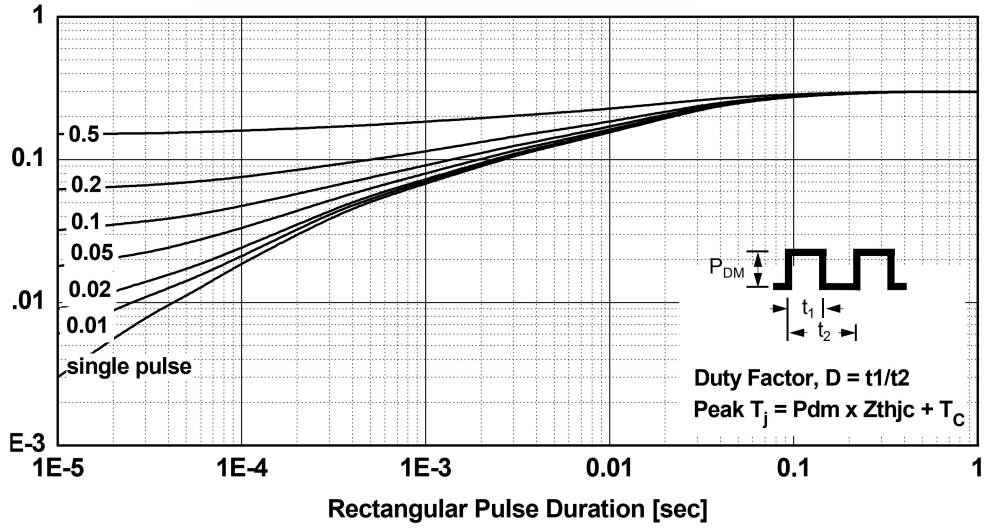
Reverse Recovery Current



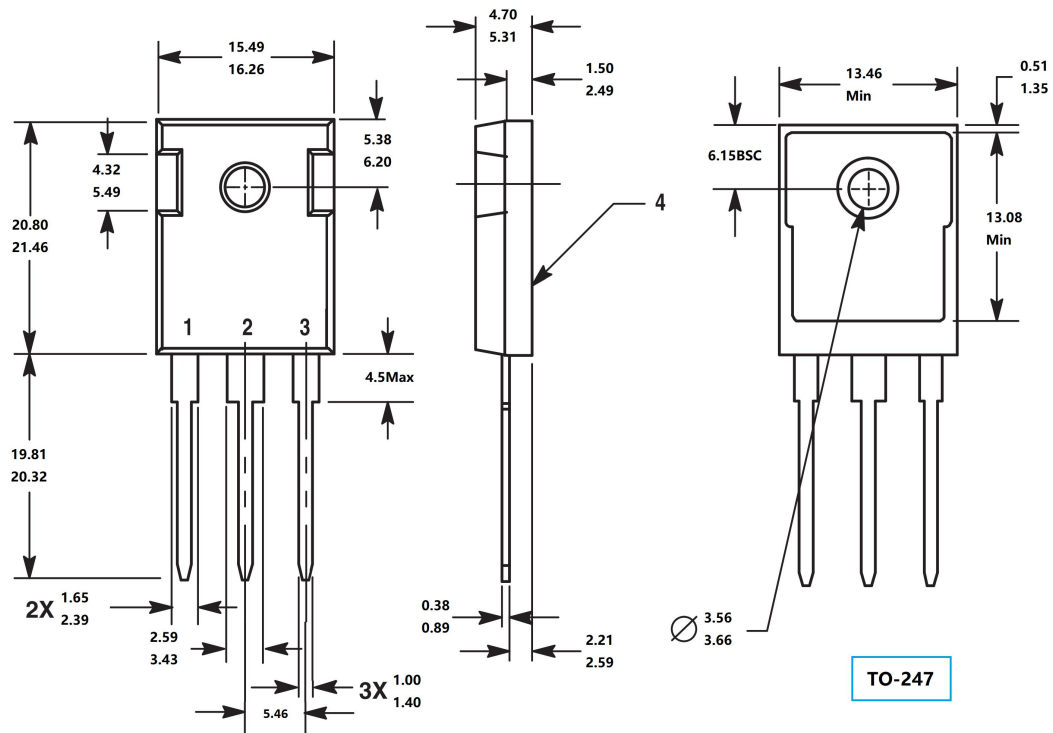
Reverse Recovery Time



Transient Thermal Impedance of IGBT



Package outline dimension



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[MS13N20HGD0](#) [MS140N30HGB3](#) [MS140N30HGC0](#) [MS15N100HGC0](#) [MS15N100HGT1](#) [MS15N120HGC0](#) [MS170N15IDC0](#)
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