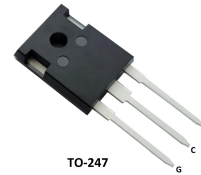


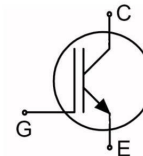
Features

- Low gate charge
- Trench FS Technology
- Fast switching speed
- Low switching losses
- No reverse fast recovery diode
- RoHS product



Applications

- Charging pile
- UPS
- Solar converters



Absolute Ratings (T_c=25°C unless otherwise specified)

| Parameter | Symbol | conditions | Value | Unit |
|----------------------------------------------------|------------------|----------------------|----------|------|
| Collector-Emitter Voltage | V _{ce} | | 650 | V |
| Collector Current-continuous | I _c | T=25°C | 150 | A |
| | | T=100°C | 75 | A |
| Collector Current-pulse (note 1) | I _{CM} | | 300 | A |
| Gate-Emitter Voltage | V _{GES} | | ±20 | V |
| Power Dissipation | P _D | T _c =25°C | 625 | W |
| Operating Temperature Range | T _J | | -40~+175 | °C |
| Storage Temperature Range | T _{STG} | | -55~+150 | °C |
| Maximum Lead Temperature for Soldering Purposes | T _L | | 260 | °C |

Electrical Characteristics

| Parameter | Symbol | Tests conditions | Min | Typ | Max | Units |
|-------------------------------------|-------------------|--------------------------------------------------------|-----|-----|-----|-------|
| Off-Characteristics | | | | | | |
| Collector-Emitter Voltage | BV _{CES} | I _c =250uA, V _{GE} =0V (note 2) | 650 | - | - | V |
| Zero Gate Voltage Collector Current | I _{CES} | V _{CE} =650V, V _{GE} =0V | - | - | 80 | uA |

| | | | | | | |
|--------------------------------------|--------------|---------------------------------------------|-----|------|------|----|
| Gate-body leakage current, forward | I_{GESF} | $V_{CE}=0V, V_{GE}=20V$ | - | - | 200 | nA |
| Gate-body leakage current, reverse | I_{GESR} | $V_{CE}=0V, V_{GE}=-20V$ | - | - | -200 | nA |
| On-Characteristics | | | | | | |
| Gate Threshold Voltage | $V_{GE(th)}$ | $V_{CE}=V_{GE}, I_C=250\mu A$ | 4.0 | - | 5.0 | V |
| Collector-Emitter saturation Voltage | V_{CESAT} | $V_{GE}=15V, I_C=50A$ $T_C=25^\circ C$ | - | 1.3 | 1.5 | V |
| Dynamic Characteristics | | | | | | |
| Input capacitance | C_{ies} | $V_{CE}=25V,$ $V_{GE}=0V,$ $f=1.0MHZ$ | - | 3650 | - | pF |
| Output capacitance | C_{oes} | | - | 320 | - | pF |
| Reverse transfer capacitance | C_{res} | | - | 63 | - | pF |

Electrical Characteristics

| Parameter | Symbol | Tests conditions | Min | Typ | Max | Units |
|----------------------------------|--------------|---------------------------------------------------------------|-----|-----|-----|-------|
| Switching Characteristics | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{CE}=400V, I_C=75A,$ $R_G=5\Omega$ $T_C=25^\circ C$ | - | 26 | - | ns |
| Turn-On rise time | t_r | | - | 120 | - | ns |
| Turn-Off delay time | $t_{d(off)}$ | | - | 95 | - | ns |
| Turn-Off Fall time | t_f | | - | 80 | - | ns |
| Turn-on energy | E_{on} | | - | 2.8 | - | mJ |
| Turn-off energy | E_{off} | | - | 1.5 | - | mJ |
| Total switching energy | E_{total} | | - | 4.3 | - | mJ |
| Turn-on delay time | $t_{d(on)}$ | $V_{CE}=400V, I_C=75A,$ $R_G=5\Omega$ $T_C=175^\circ C$ | - | 28 | - | ns |
| Turn-On rise time | t_r | | - | 131 | - | ns |
| Turn-Off delay time | $t_{d(off)}$ | | - | 120 | - | ns |
| Turn-Off Fall time | t_f | | - | 125 | - | ns |
| Turn-on energy | E_{on} | | - | 4.0 | - | mJ |
| Turn-off energy | E_{off} | | - | 1.8 | - | mJ |
| Total switching energy | E_{total} | | - | 5.8 | - | mJ |
| Total Gate Charge | Q_g | $V_{CE}=520V,$ $I_C=75A$ $V_{GE}=15V$ | - | 140 | - | nC |
| Gate to emitter Charge | Q_{ge} | | - | 28 | - | nC |
| Gate to collector Charge | Q_{gc} | | - | 80 | - | nC |

Thermal Characteristics

| Parameter | Symbol | Max | Unit |
|-----------------------|---------------|------|---------------|
| Junction to Ambient | $R_{th(j-A)}$ | 40 | $^{\circ}C/W$ |
| Junction to Case IGBT | $R_{th(j-c)}$ | 0.24 | $^{\circ}C/W$ |

Order Message

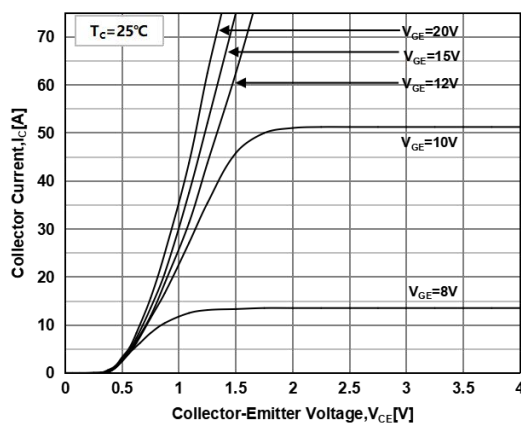
| Order codes | Marking | Package |
|--------------|--------------|---------|
| MSG75D65HFC0 | MSG75D65HFC0 | TO-247 |

Notes:

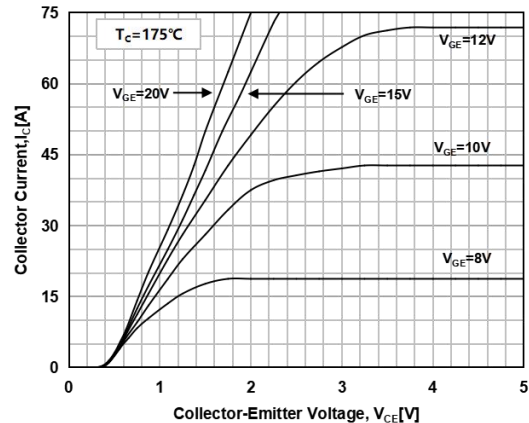
1. Pulse width limited by maximum junction temperature
2. It needs to be tested with a reverse quick recovery diode, or it will damage the IGBT

Electrical Characteristics (curves)

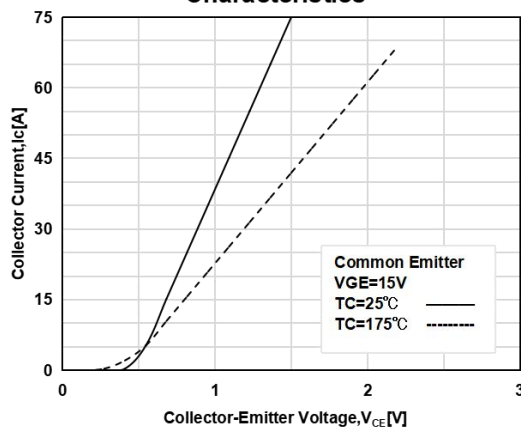
Typical Output Characteristics



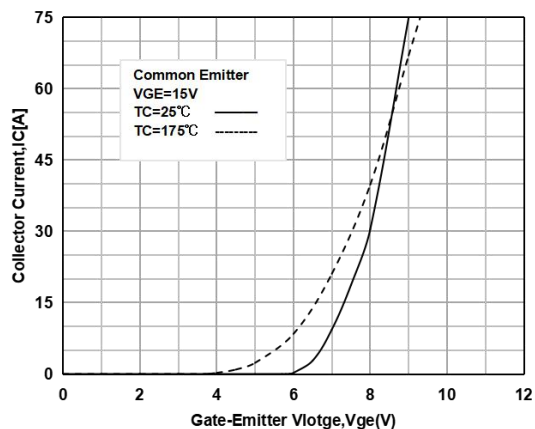
Typical Output Characteristics



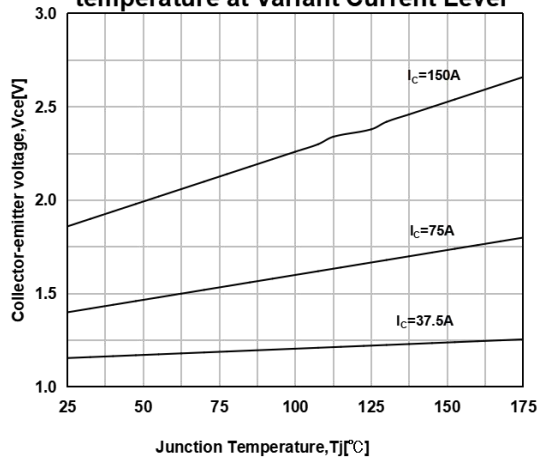
Typical Saturation Voltage Characteristics



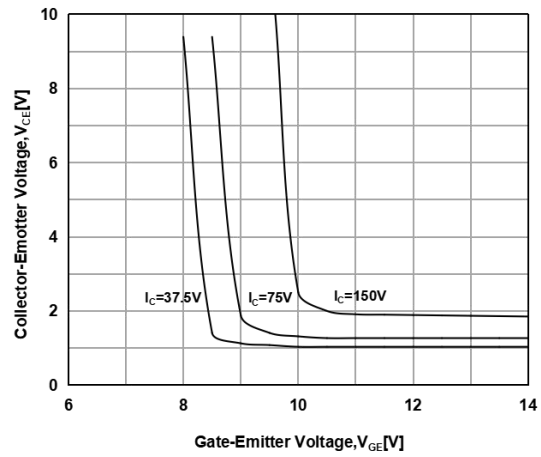
Transfer Characteristics



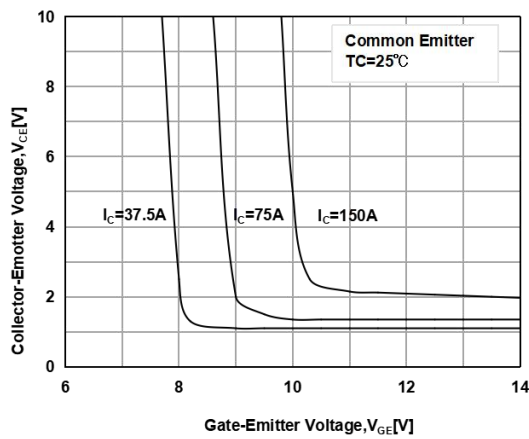
Saturation Voltage vs. Junction temperature at Variant Current Level



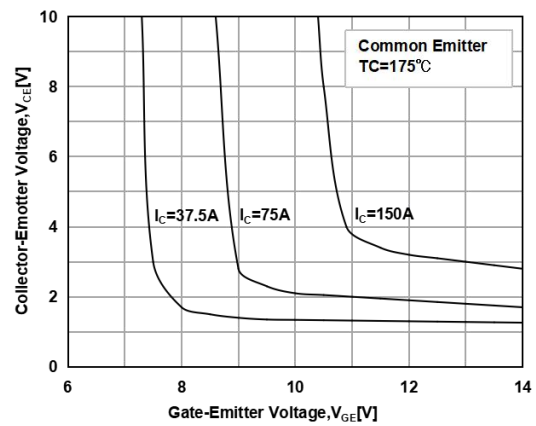
Saturation Voltage vs. V_{GE}



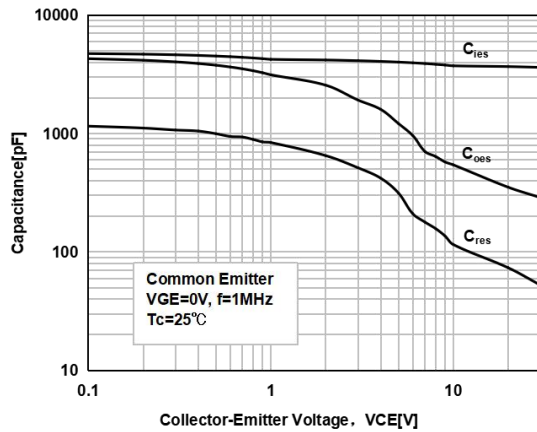
Saturation Voltage vs. V_{GE}



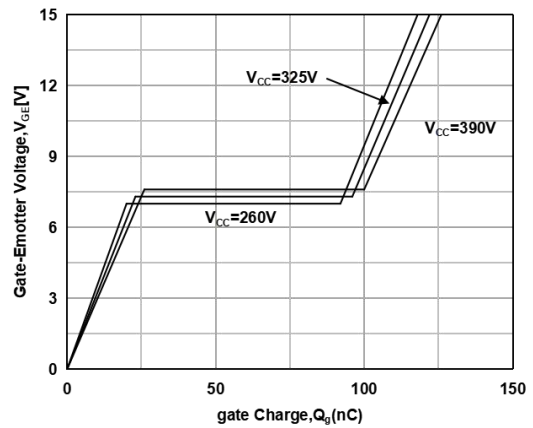
Saturation Voltage vs. V_{GE}



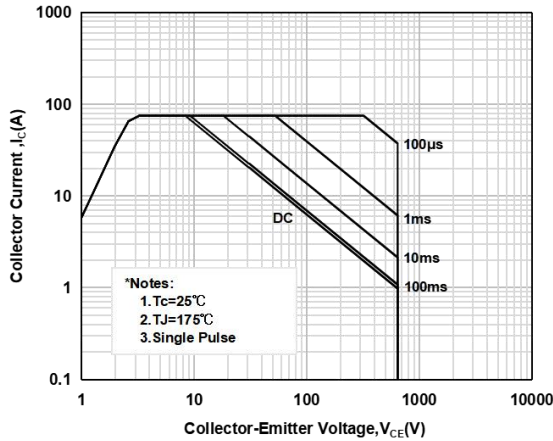
Capacitance Characteristics



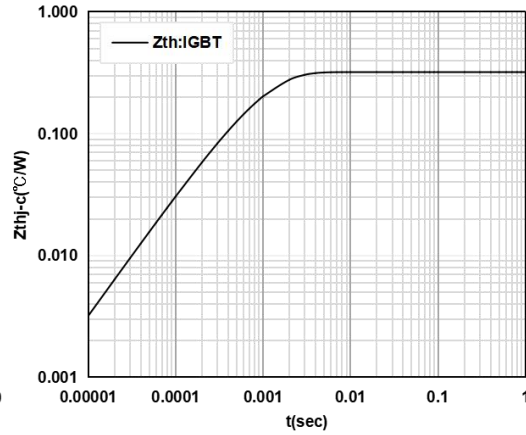
Gate Charge Characteristics



Forward Bias Safe Operating Area

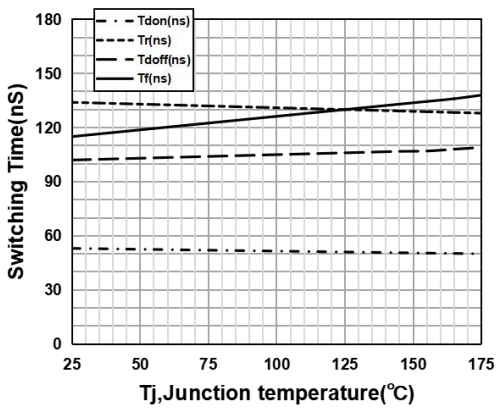


Transient Thermal Impedance



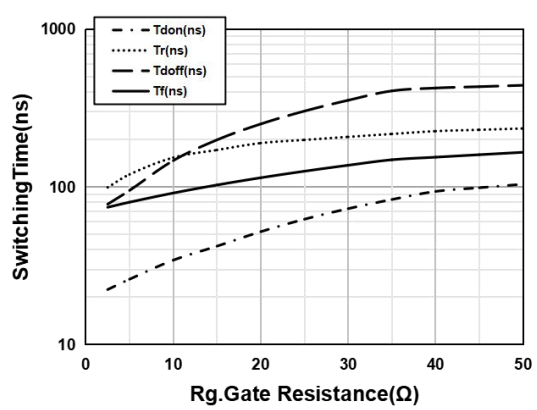
Switching Time vs. Tj

$V_{ge}=15\text{V}, V_{ce}=400\text{V}, I_c=75\text{A}, R_g=5\Omega$



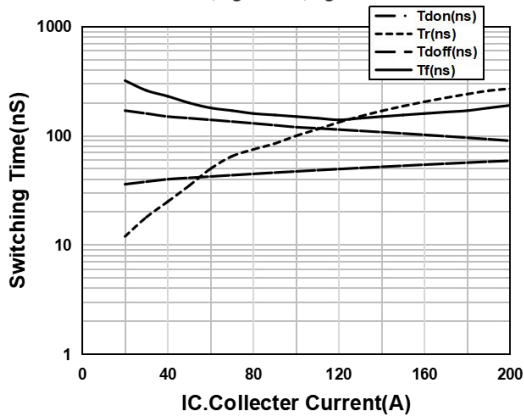
Switching Time Vs. Rg(175°C)

$V_{ge}=15\text{V}, V_{ce}=400\text{V}, I_c=75\text{A}$



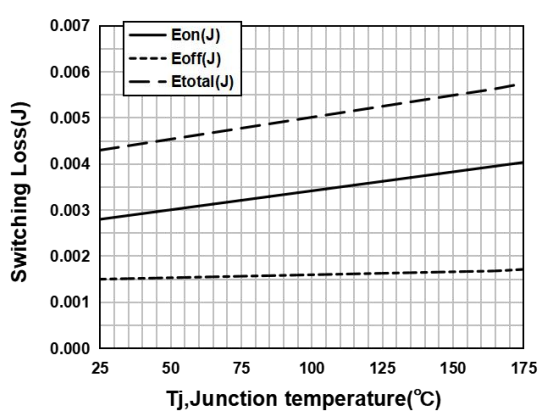
Switching Time vs. Ic(175°C)

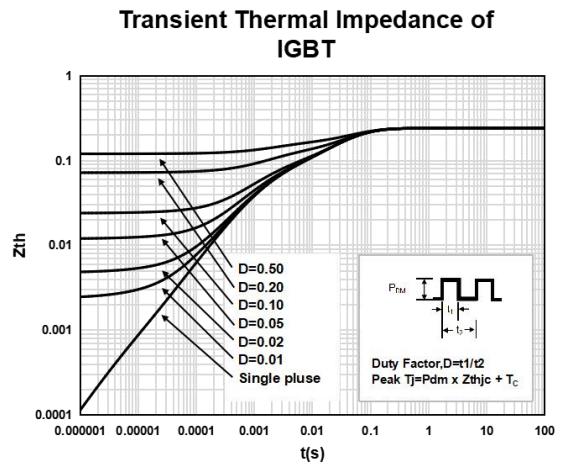
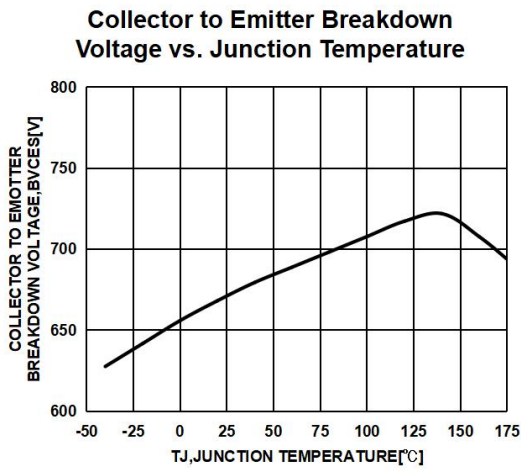
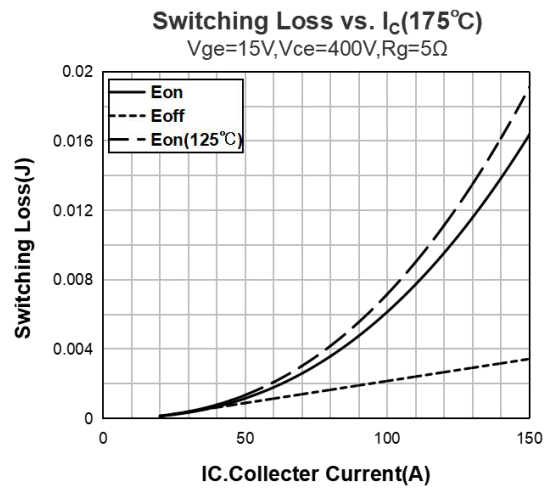
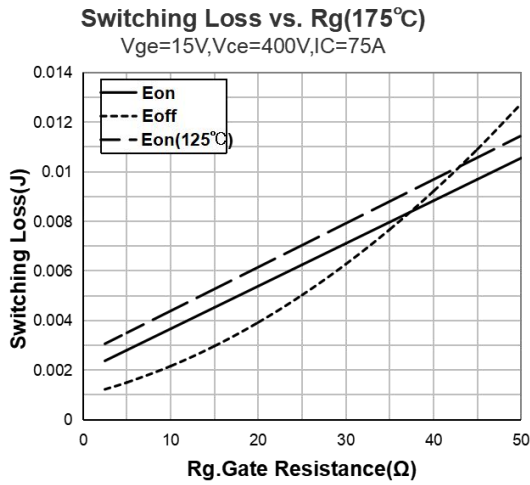
$V_{ce}=400\text{V}, V_{ge}=15\text{V}, R_g=5\Omega$



Switching Loss vs. Tj

$V_{ge}=15\text{V}, V_{ce}=400\text{V}, I_c=75\text{A}, R_g=5\Omega$





Package Mechanical DATA

