

Dynamic Characteristic

| | | | | | | |
|--|-------------|---|---|------|---|----|
| Input capacitance | C_{iss} | $V_{CE}=25V,$ $V_{GE}=0V,$ $f=1MHz$ | - | 2500 | - | pF |
| Output capacitance | C_{oss} | | - | 130 | - | |
| Reverse transfer capacitance | C_{rss} | | - | 110 | - | |
| Gate charge | Q_{Gate} | $V_{CC}=960V, I_C=40A$ $V_{GE}=15V$ | - | 203 | - | nC |
| Internal emitter inductance measured 5mm (0.197 in.) from case | L_E | | - | 13 | - | nH |
| Short circuit collector current ¹⁾ | $I_{C(SC)}$ | $V_{GE}=15V, t_{SC} \leq 10\mu s$ $V_{CC} = 600V,$ $T_j = 25^\circ C$ | - | 210 | - | A |

Switching Characteristic, Inductive Load, at $T_j=25^\circ C$

| Parameter | Symbol | Conditions | Value | | | Unit |
|-----------|--------|------------|-------|------|------|------|
| | | | min. | typ. | max. | |

IGBT Characteristic

| | | | | | | |
|------------------------|--------------|--|---|-----|---|----|
| Turn-on delay time | $t_{d(on)}$ | $T_j=25^\circ C,$ $V_{CC}=600V, I_C=40A,$ $V_{GE}=0/15V,$ $R_G=15\Omega,$ $L_\sigma^{2)}=180nH,$ $C_\sigma^{2)}=39pF$ Energy losses include "tail" and diode reverse recovery. | - | 48 | - | ns |
| Rise time | t_r | | - | 34 | - | |
| Turn-off delay time | $t_{d(off)}$ | | - | 480 | - | |
| Fall time | t_f | | - | 70 | - | mJ |
| Turn-on energy | E_{on} | | - | 3.3 | - | |
| Turn-off energy | E_{off} | | - | 3.2 | - | |
| Total switching energy | E_{ts} | | - | 6.5 | - | |

Switching Characteristic, Inductive Load, at $T_j=150^\circ C$

| Parameter | Symbol | Conditions | Value | | | Unit |
|-----------|--------|------------|-------|------|------|------|
| | | | min. | typ. | max. | |

IGBT Characteristic

| | | | | | | |
|------------------------|--------------|--|---|------|---|----|
| Turn-on delay time | $t_{d(on)}$ | $T_j=150^\circ C$ $V_{CC}=600V, I_C=40A,$ $V_{GE}=0/15V,$ $R_G=15\Omega,$ $L_\sigma^{2)}=180nH,$ $C_\sigma^{2)}=39pF$ Energy losses include "tail" and diode reverse recovery. | - | 52 | - | ns |
| Rise time | t_r | | - | 40 | - | |
| Turn-off delay time | $t_{d(off)}$ | | - | 580 | - | |
| Fall time | t_f | | - | 120 | - | mJ |
| Turn-on energy | E_{on} | | - | 5.0 | - | |
| Turn-off energy | E_{off} | | - | 5.4 | - | |
| Total switching energy | E_{ts} | | - | 10.4 | - | |

¹⁾ Allowed number of short circuits: <1000; time between short circuits: >1s.

²⁾ Leakage inductance L_σ and Stray capacity C_σ due to dynamic test circuit in Figure E.

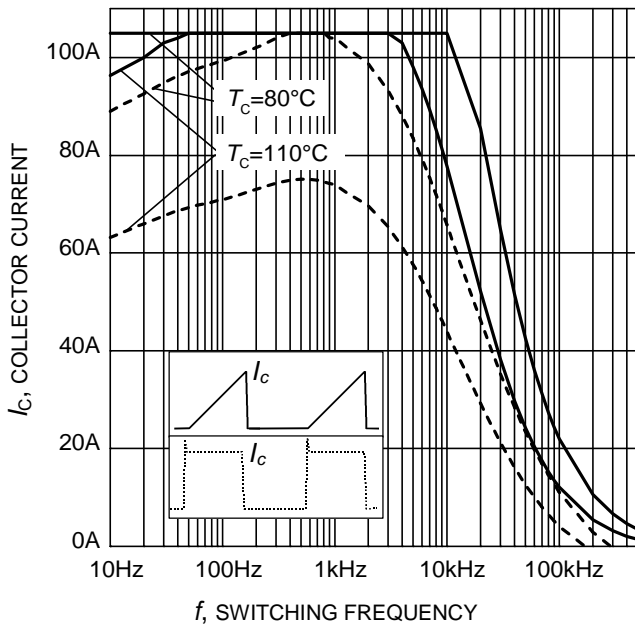


Figure 1. Collector current as a function of switching frequency
 ($T_j \leq 150^\circ\text{C}$, $D = 0.5$, $V_{CE} = 600\text{V}$,
 $V_{GE} = 0/+15\text{V}$, $R_G = 15\Omega$)

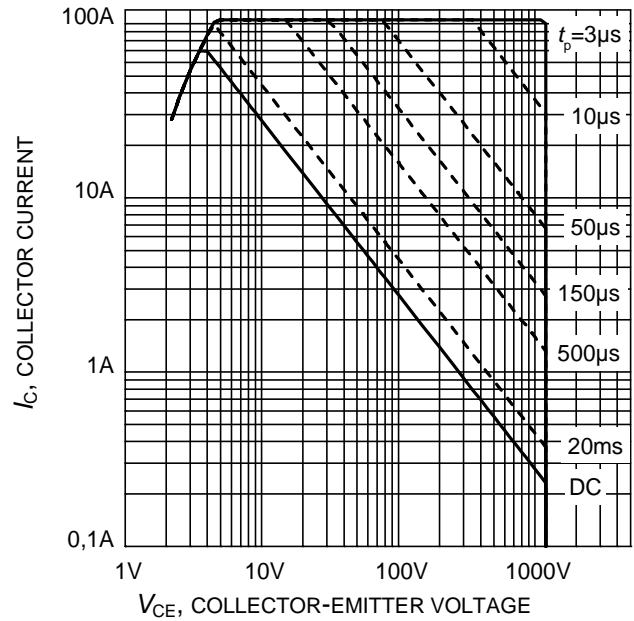


Figure 2. Safe operating area
 ($D = 0$, $T_C = 25^\circ\text{C}$,
 $T_j \leq 150^\circ\text{C}$; $V_{GE} = 15\text{V}$)

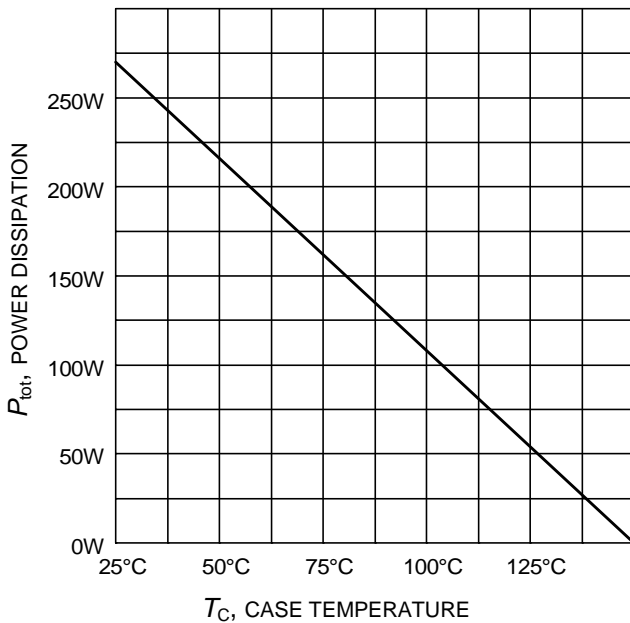


Figure 3. Power dissipation as a function of case temperature
 ($T_j \leq 150^\circ\text{C}$)

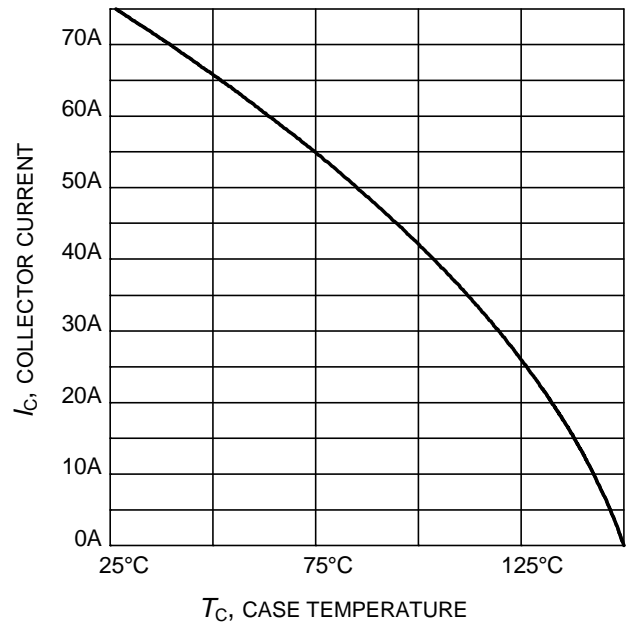


Figure 4. Collector current as a function of case temperature
 ($V_{GE} \geq 15\text{V}$, $T_j \leq 150^\circ\text{C}$)