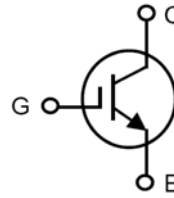


For Capacitor Discharge Applications

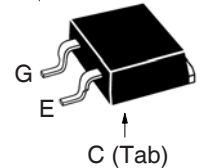


$$V_{CES} = 2500V$$

$$I_{C110} = 12A$$

$$V_{CE(sat)} \leq 3.1V$$

TO-263HV



G = Gate C = Collector
E = Emitter Tab = Collector

| Symbol | Test Conditions | Maximum Ratings | |
|----------------|--|-----------------|------------|
| V_{CES} | $T_J = 25^\circ C$ to $150^\circ C$ | 2500 | V |
| V_{GGR} | $T_J = 25^\circ C$ to $150^\circ C$, $R_{GE} = 1M\Omega$ | 2500 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ C$ | 30 | A |
| I_{C110} | $T_C = 110^\circ C$ | 12 | A |
| I_{CM} | $T_C = 25^\circ C$, $V_{GE} = 19V$, 1ms 10ms | 105 | A |
| | | 55 | A |
| SSOA | $V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 20\Omega$ | $I_{CM} = 60$ | A |
| (RBSOA) | Clamped Inductive Load | 1500 | V |
| P_C | $T_C = 25^\circ C$ | 150 | W |
| T_J | | -55 ... +150 | $^\circ C$ |
| T_{JM} | | 150 | $^\circ C$ |
| T_{stg} | | -55 ... +150 | $^\circ C$ |
| T_L | Maximum Lead Temperature for Soldering | 300 | $^\circ C$ |
| T_{SOLD} | 1.6 mm (0.062in.) from Case for 10s | 260 | $^\circ C$ |
| V_{ISOL} | 50/60Hz, 1 Minute | 4000 | V~ |
| Weight | | 2.3 | g |

Features

- International Standard Package
- High Voltage Package
- Electrically Isolated Tab
- High Peak Current Capability
- Low Saturation Voltage
- Molding Epoxies Meet UL 94 V-0 Flammability Classification

Advantages

- High Power Density
- Easy to Mount

Applications

- Capacitor Discharge
- Pulsar Circuits

| Symbol | Test Conditions ($T_J = 25^\circ C$, Unless Otherwise Specified) | Characteristic Values | | |
|---------------|---|-----------------------|------|---------------------------|
| | | Min. | Typ. | Max. |
| BV_{CES} | $I_C = 250\mu A$, $V_{GE} = 0V$ | 2500 | | V |
| $V_{GE(th)}$ | $I_C = 250\mu A$, $V_{CE} = V_{GE}$ | 3.0 | | 5.0 V |
| I_{CES} | $V_{CE} = 0.8 \cdot V_{CES}$, $V_{GE} = 0V$ $T_J = 125^\circ C$ | | | 25 μA 750 μA |
| I_{GES} | $V_{CE} = 0V$, $V_{GE} = \pm 20V$ | | | ± 100 nA |
| $V_{CE(sat)}$ | $I_C = 20A$, $V_{GE} = 15V$, Note 1 | | | 3.1 V |

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | |
|--------------|---|-----------------------|------|-------------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $I_C = 20\text{A}$, $V_{CE} = 10\text{V}$, Note 1 | 8 | 13 | S |
| $I_{C(ON)}$ | $V_{GE} = 20\text{V}$, $V_{CE} = 15\text{V}$, Note 1 | | 190 | A |
| C_{ies} | $V_{CE} = 15\text{V}$, $V_{GE} = 25\text{V}$, $f = 1\text{MHz}$ | | 1190 | pF |
| C_{oes} | | | 53 | pF |
| C_{res} | | | 18 | pF |
| Q_g | $I_C = 20\text{A}$, $V_{GE} = 15\text{V}$, $V_{CE} = 1000\text{V}$ | | 53 | nC |
| Q_{ge} | | | 8 | nC |
| Q_{gc} | | | 22 | nC |
| $t_{d(on)}$ | Resistive Switching Times $I_C = 40\text{A}$, $V_{GE} = 15\text{V}$, Note 1 $V_{CE} = 1250\text{V}$, $R_G = 10\Omega$ | | 57 | ns |
| t_r | | | 160 | ns |
| $t_{d(off)}$ | | | 136 | ns |
| t_f | | | 930 | ns |
| R_{thJC} | | | | 0.83 $^\circ\text{C/W}$ |

Note 1. Pulse test, $t < 300\mu\text{s}$, duty cycle, $d < 2\%$.

TO-263HV Outline

| CREEPAGE DISTANCE | | |
|-----------------------------------|--------|----------------|
| DESCRIPTION | SYMBOL | MIN DISTANCE |
| LEAD TO LEAD AIR CLEARANCE | e2 | 0.163 [4.15mm] |
| LEAD TO LEAD Pkg SURFACE CREEPAGE | e2 | 0.165 [4.20mm] |
| LEAD TO BOTTOM DRAIN CREEPAGE | A2+D2 | 0.177 [4.50mm] |

| SYM | INCHES | | MILLIMETER | |
|------|--------|------|------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .170 | .185 | 4.30 | 4.70 |
| A1 | .000 | .008 | 0.00 | 0.20 |
| A2 | .091 | .098 | 2.30 | 2.50 |
| b | .028 | .035 | 0.70 | 0.90 |
| b2 | .046 | .054 | 1.18 | 1.38 |
| C | .018 | .024 | 0.45 | 0.60 |
| C2 | .049 | .055 | 1.25 | 1.40 |
| D | .354 | .370 | 9.00 | 9.40 |
| D1 | .311 | .327 | 7.90 | 8.30 |
| D2 | .083 | .098 | 2.10 | 2.50 |
| E | .386 | .402 | 9.80 | 10.20 |
| E1 | .307 | .323 | 7.80 | 8.20 |
| e1 | .200 | BSC | 5.08 | BSC |
| (e2) | .163 | .174 | 4.13 | 4.43 |
| H | .591 | .614 | 15.00 | 15.60 |
| L | .079 | .102 | 2.00 | 2.60 |
| L1 | .039 | .055 | 1.00 | 1.40 |
| L3 | .010 | BSC | 0.254 | BSC |
| (L4) | .071 | .087 | 1.80 | 2.20 |

NOTE:

1. These dimensions do not include mold protrusion.
2. () is reference dimension only.
3. Metal finish – Matte pure tin plating except trim area.
4. Pin call out: 1- Gate; 2 - Emitter; 3 - Collector

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

| | | | | | | | | | | |
|--|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|-------------|
| IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: | 4,835,592 | 4,931,844 | 5,049,961 | 5,237,481 | 6,162,665 | 6,404,065 B1 | 6,683,344 | 6,727,585 | 7,005,734 B2 | 7,157,338B2 |
| | 4,860,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343 | 6,710,405 B2 | 6,759,692 | 7,063,975 B2 | |
| | 4,881,106 | 5,034,796 | 5,187,117 | 5,486,715 | 6,306,728 B1 | 6,583,505 | 6,710,463 | 6,771,478 B2 | 7,071,537 | |

Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

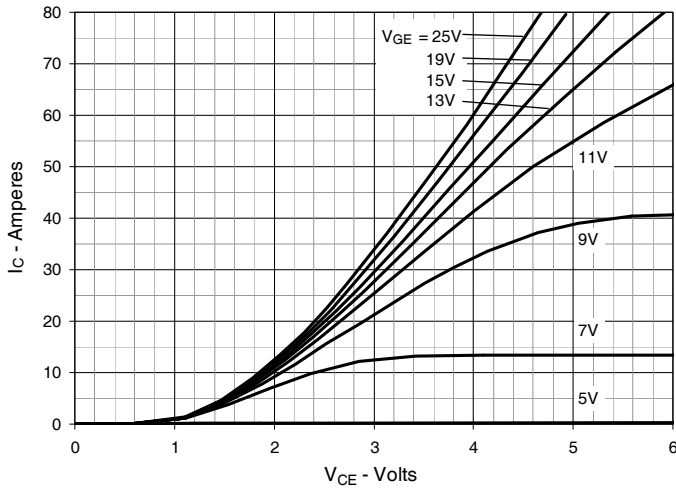


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

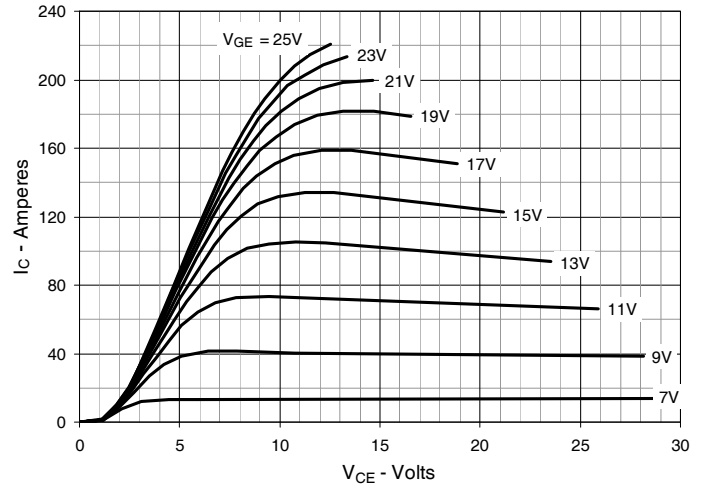


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

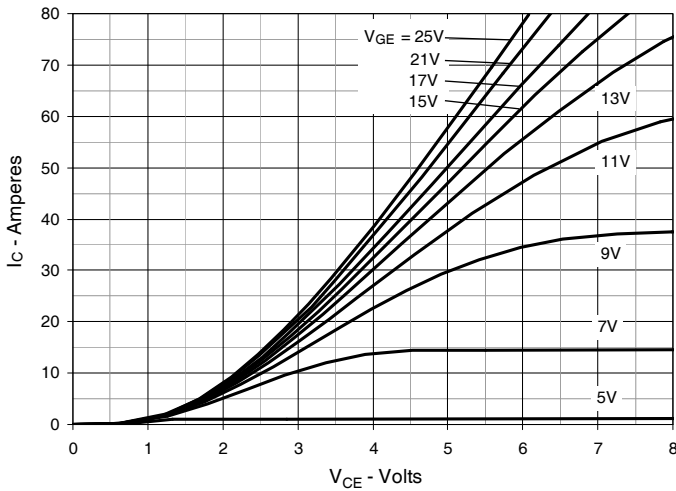


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

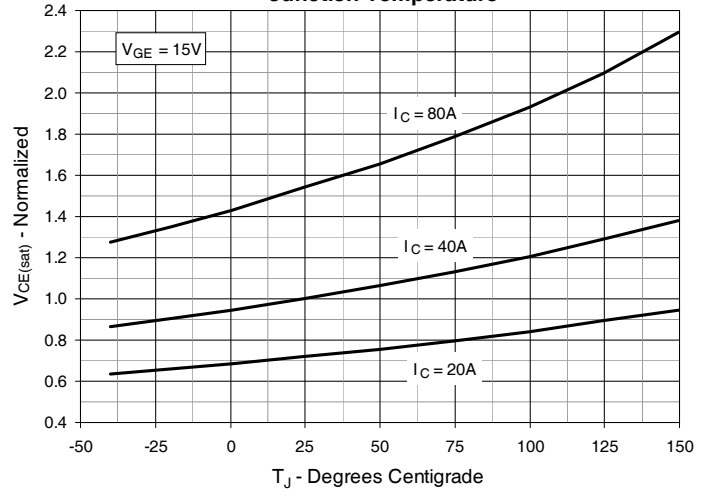


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

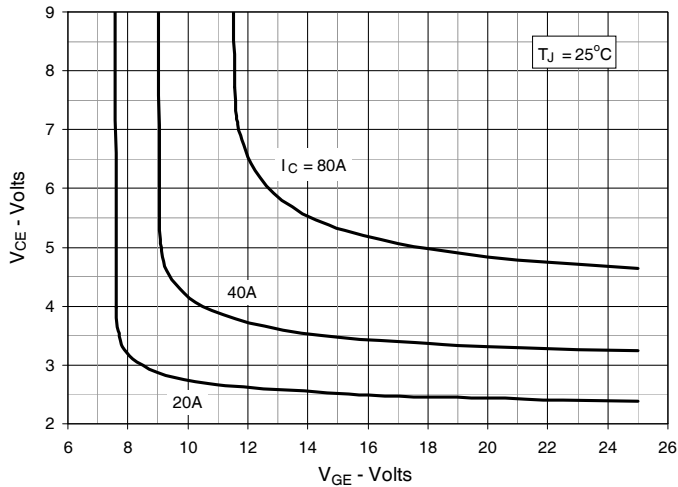


Fig. 6. Input Admittance

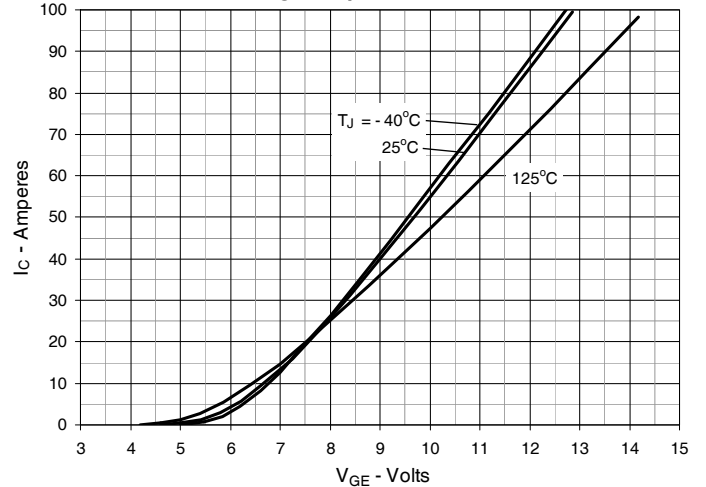


Fig. 7. Transconductance

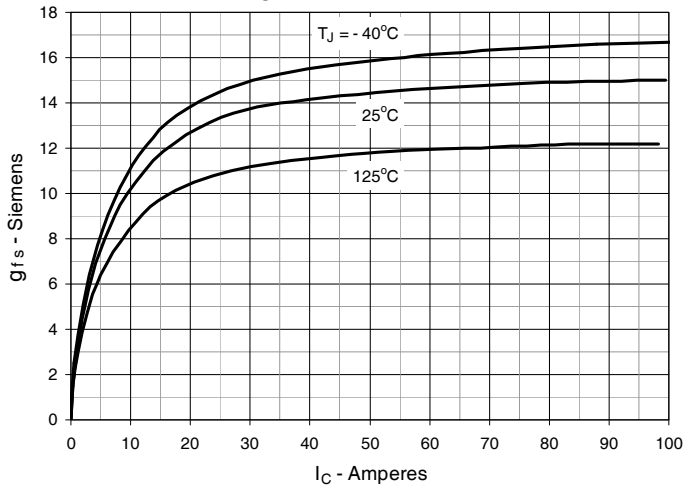


Fig. 8. Gate Charge

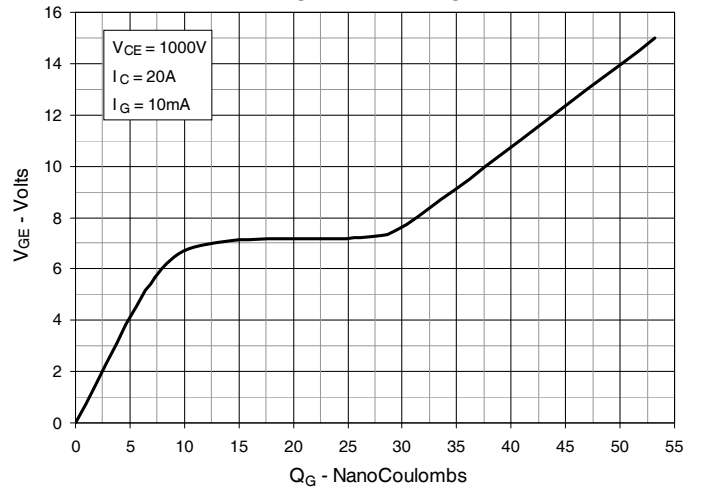


Fig. 9. Reverse-Bias Safe Operating Area

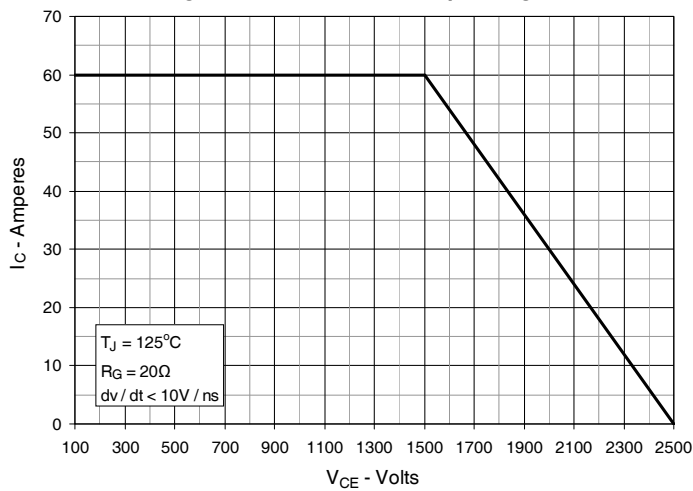


Fig. 10. Capacitance

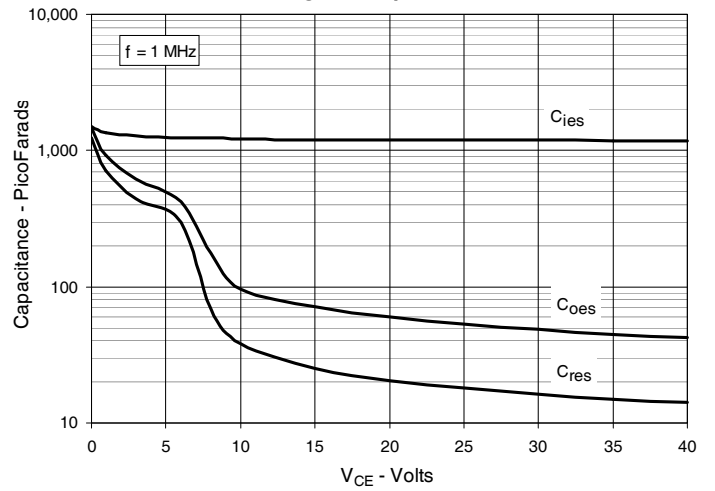


Fig. 11. Maximum Transient Thermal Impedance

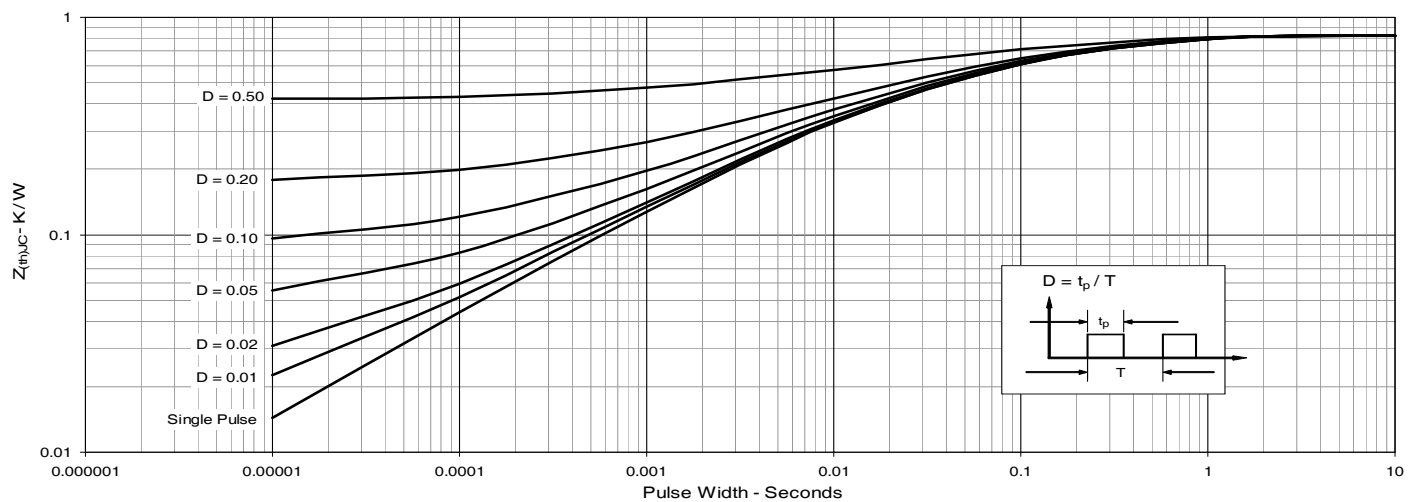


Fig. 12. Resistive Turn-on Rise Time vs. Junction Temperature

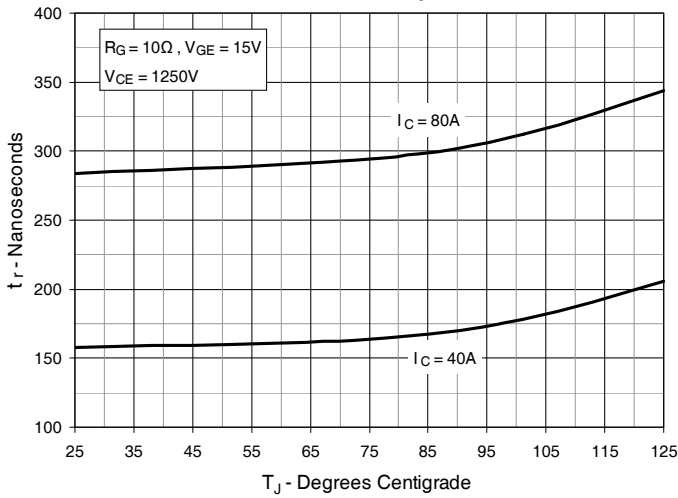


Fig. 13. Resistive Turn-on Rise Time vs. Collector Current

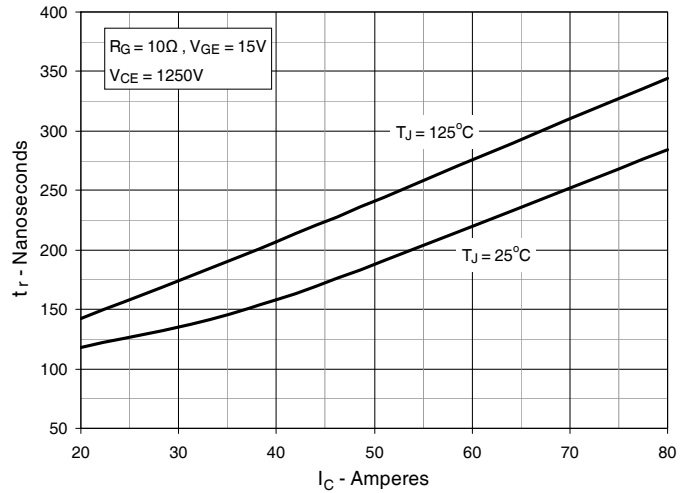


Fig. 14. Resistive Turn-on Switching Times vs. Gate Resistance

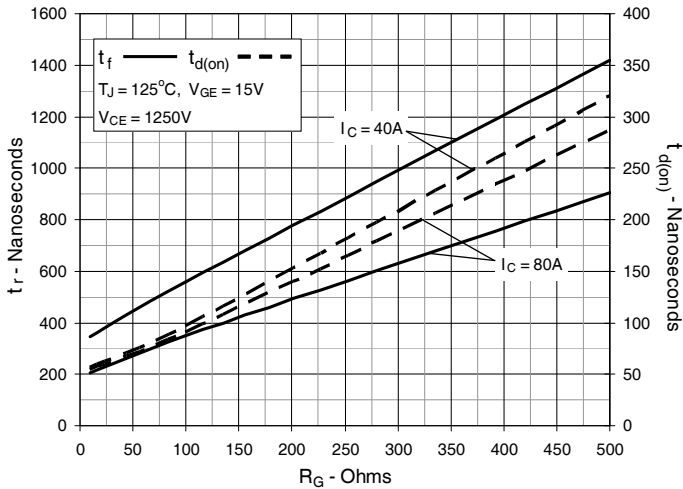


Fig. 15. Resistive Turn-off Switching Times vs. Junction Temperature

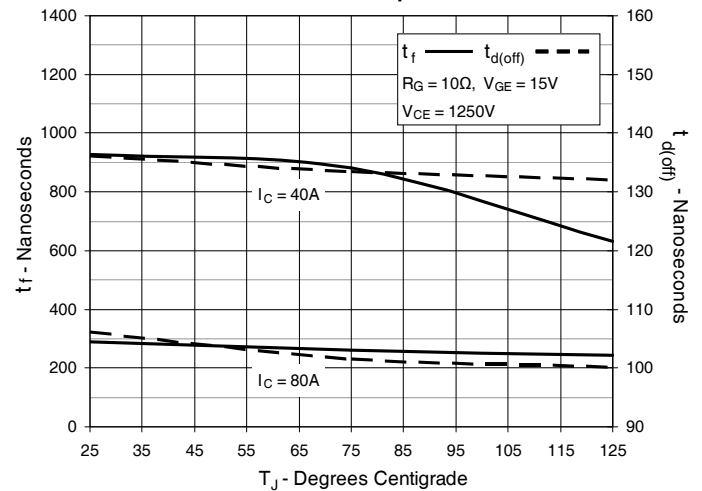


Fig. 16. Resistive Turn-off Switching Times vs. Collector Current

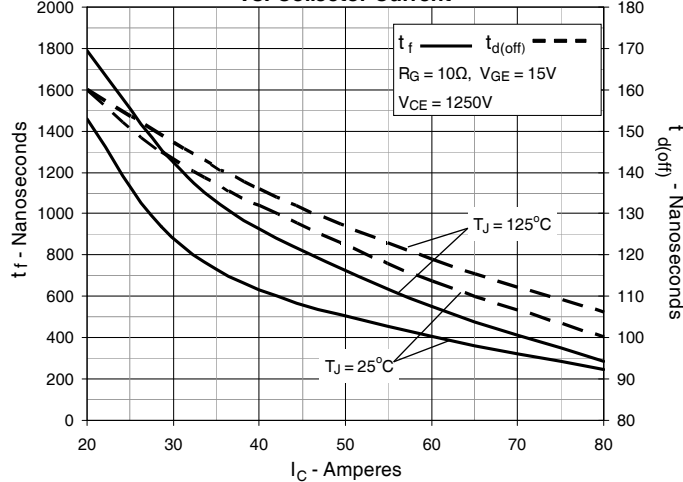
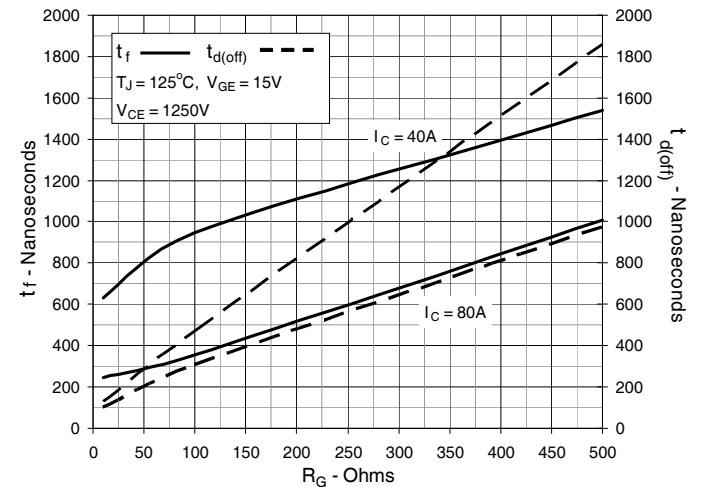


Fig. 17. Resistive Turn-off Switching Times vs. Gate Resistance





Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.
