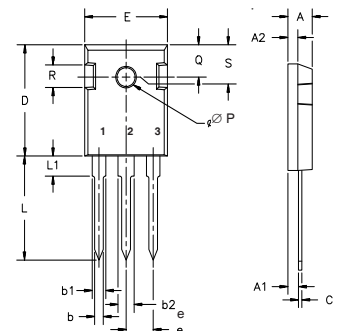


| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)             | Characteristic Values |      |                    |
|--------------|-----------------------------------------------------------------------------------------|-----------------------|------|--------------------|
|              |                                                                                         | Min.                  | Typ. | Max.               |
| $g_{fs}$     | $I_C = 50\text{A}$ , $V_{CE} = 10\text{V}$ , Note 1                                     | 33                    | 55   | S                  |
| $C_{ies}$    | $V_{CE} = 25\text{V}$ , $V_{GE} = 0\text{V}$ , $f = 1\text{MHz}$                        |                       | 4780 | pF                 |
| $C_{oes}$    |                                                                                         |                       | 330  | pF                 |
| $C_{res}$    |                                                                                         |                       | 117  | pF                 |
| $Q_g$        | $I_C = 50\text{A}$ , $V_{GE} = 15\text{V}$ , $V_{CE} = 0.5 \cdot V_{CES}$               |                       | 174  | nC                 |
| $Q_{ge}$     |                                                                                         |                       | 33   | nC                 |
| $Q_{gc}$     |                                                                                         |                       | 72   | nC                 |
| $t_{d(on)}$  | Inductive Load, $T_J = 25^\circ\text{C}$<br>$I_C = 50\text{A}$ , $V_{GE} = 15\text{V}$  |                       | 27   | ns                 |
| $t_{ri}$     |                                                                                         |                       | 37   | ns                 |
| $E_{on}$     |                                                                                         |                       | 1.03 | mJ                 |
| $t_{d(off)}$ | $V_{CE} = 480\text{V}$ , $R_G = 2\Omega$ , Note 2                                       |                       | 77   | ns                 |
| $t_{fi}$     |                                                                                         |                       | 55   | ns                 |
| $E_{off}$    |                                                                                         |                       | 0.48 | mJ                 |
| $t_{d(on)}$  | Inductive Load, $T_J = 125^\circ\text{C}$<br>$I_C = 50\text{A}$ , $V_{GE} = 15\text{V}$ |                       | 26   | ns                 |
| $t_{ri}$     |                                                                                         |                       | 36   | ns                 |
| $E_{on}$     |                                                                                         |                       | 1.48 | mJ                 |
| $t_{d(off)}$ | $V_{CE} = 480\text{V}$ , $R_G = 2\Omega$ , Note 2                                       |                       | 120  | ns                 |
| $t_{fi}$     |                                                                                         |                       | 124  | ns                 |
| $E_{off}$    |                                                                                         |                       | 0.93 | mJ                 |
| $R_{thJC}$   |                                                                                         |                       | 0.23 | $^\circ\text{C/W}$ |
| $R_{thCK}$   |                                                                                         | 0.21                  |      | $^\circ\text{C/W}$ |

## TO-247 (IXGH) Outline



Terminals: 1 - Gate 2 - Collector  
3 - Emitter Tab - Collector

| Dim.           | Millimeter |       | Inches |       |
|----------------|------------|-------|--------|-------|
|                | Min.       | Max.  | Min.   | Max.  |
| A              | 4.7        | 5.3   | .185   | .209  |
| A <sub>1</sub> | 2.2        | 2.54  | .087   | .102  |
| A <sub>2</sub> | 2.2        | 2.6   | .059   | .098  |
| b              | 1.0        | 1.4   | .040   | .055  |
| b <sub>1</sub> | 1.65       | 2.13  | .065   | .084  |
| b <sub>2</sub> | 2.87       | 3.12  | .113   | .123  |
| C              | .4         | .8    | .016   | .031  |
| D              | 20.80      | 21.46 | .819   | .845  |
| E              | 15.75      | 16.26 | .610   | .640  |
| e              | 5.20       | 5.72  | 0.205  | 0.225 |
| L              | 19.81      | 20.32 | .780   | .800  |
| L1             |            | 4.50  |        | .177  |
| ØP             | 3.55       | 3.65  | .140   | .144  |
| Q              | 5.89       | 6.40  | 0.232  | 0.252 |
| R              | 4.32       | 5.49  | .170   | .216  |
| S              | 6.15       | BSC   | .242   | BSC   |

### Notes:

1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .
2. Switching times & energy losses may increase for higher  $V_{CE}(\text{Clamp})$ ,  $T_J$  or  $R_G$ .

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 |
|                                                                                  | 4,850,072 | 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    |             |

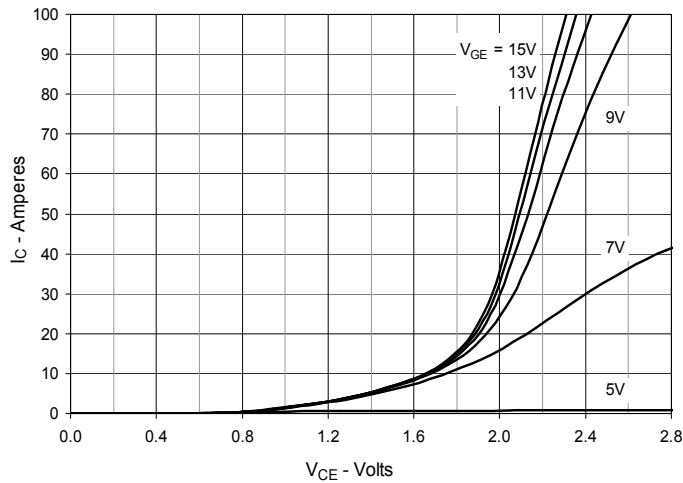
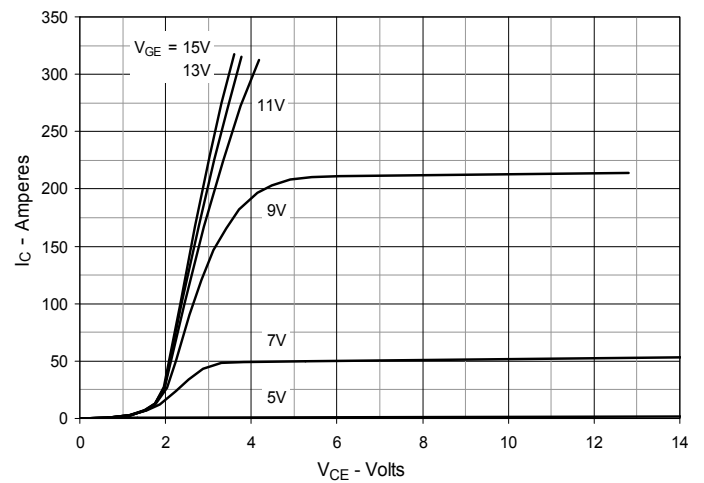
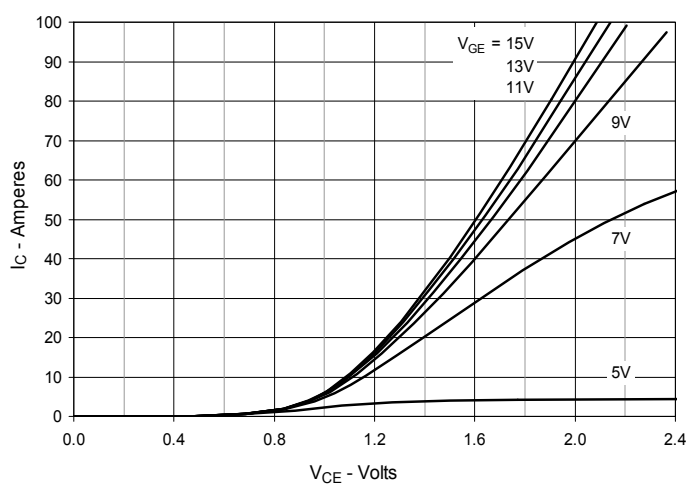
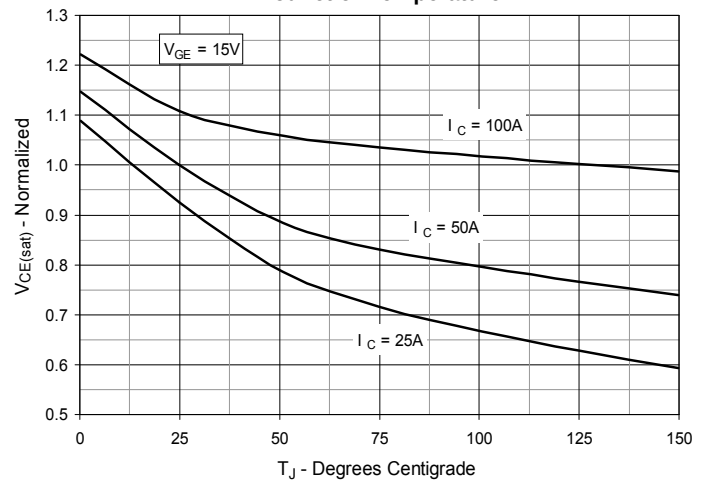
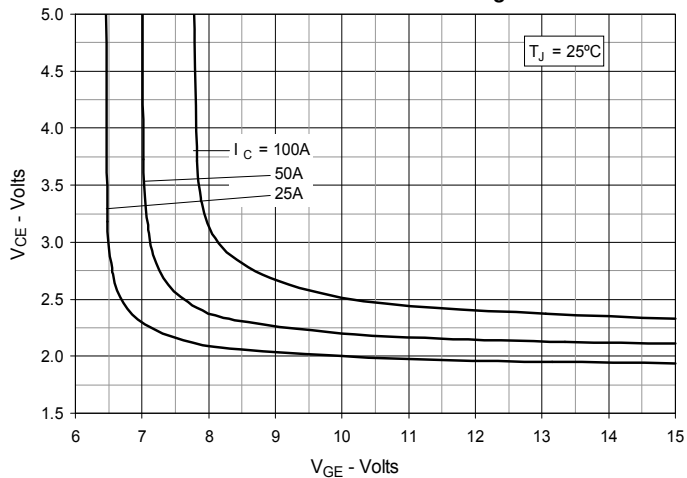
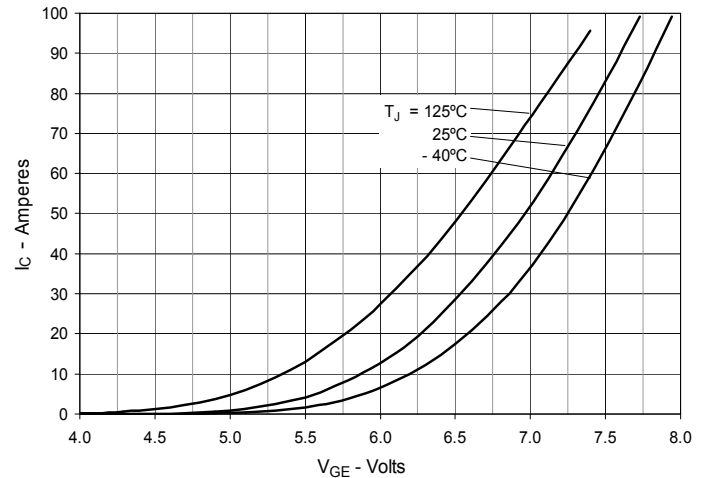
**Fig. 1. Output Characteristics @  $T_J = 25^\circ\text{C}$** 

**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

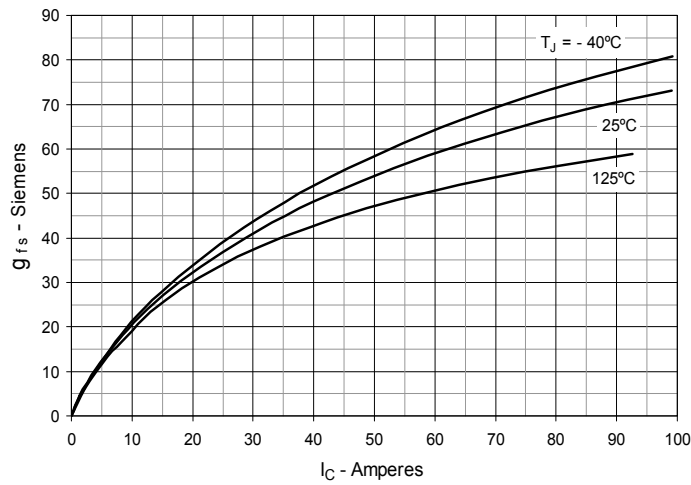


Fig. 8. Gate Charge

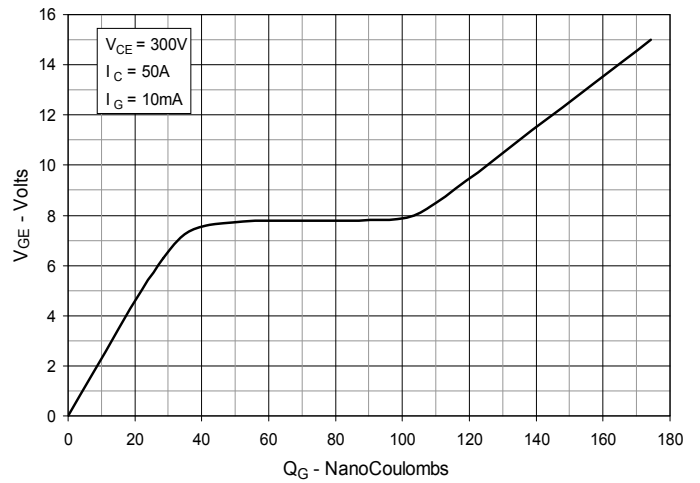


Fig. 9. Capacitance

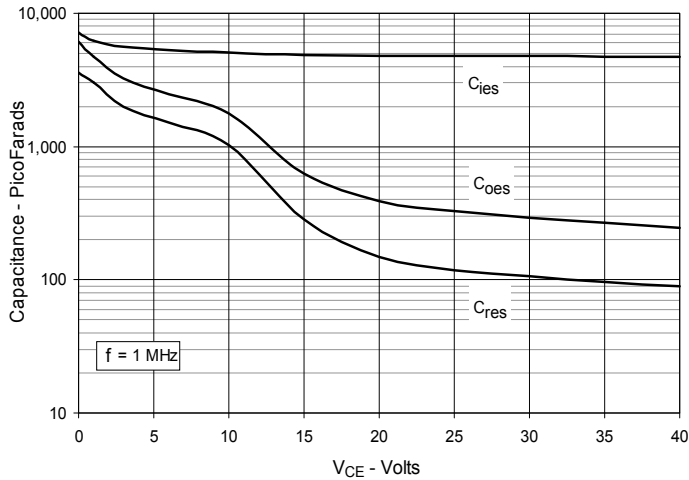


Fig. 10. Reverse-Bias Safe Operating Area

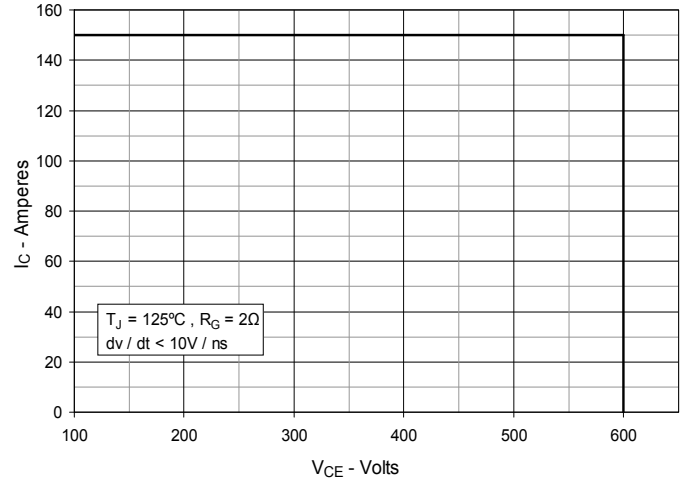
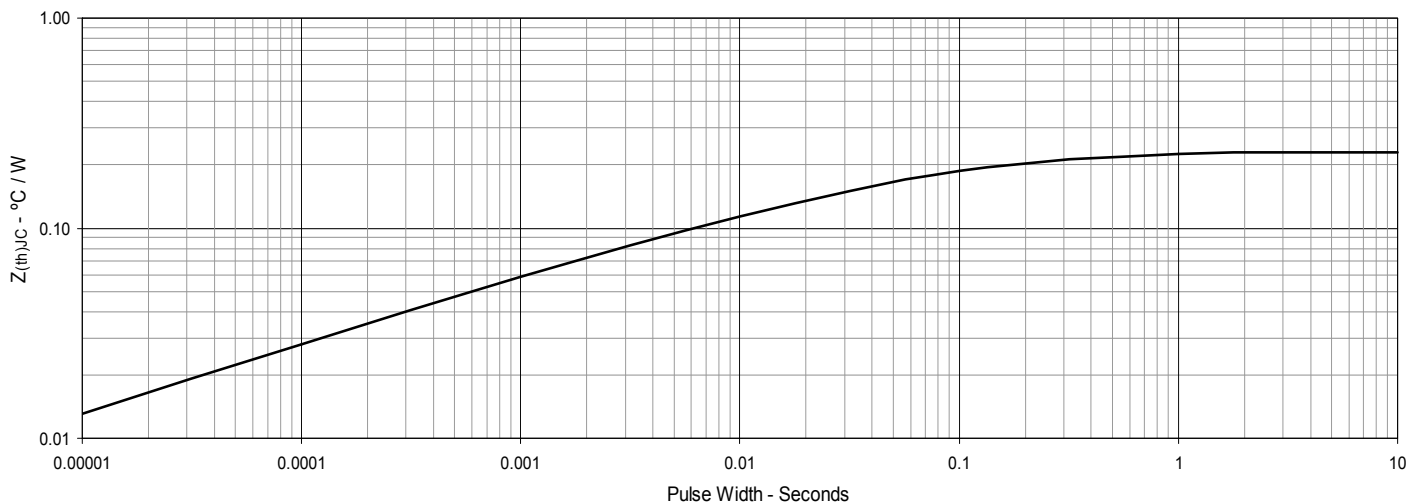
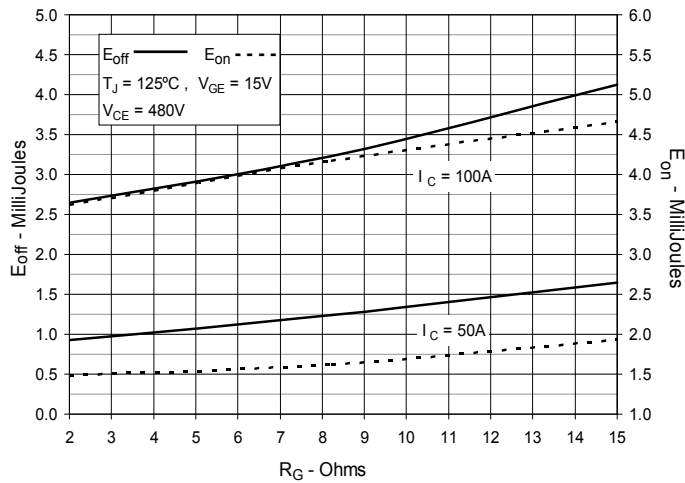


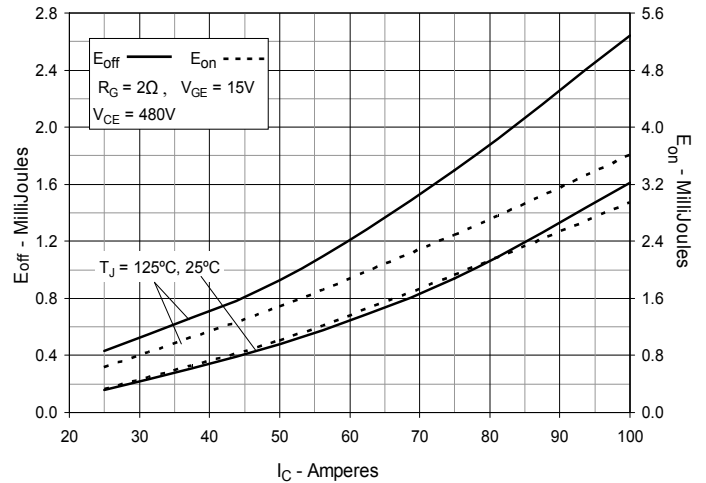
Fig. 11. Maximum Transient Thermal Impedance



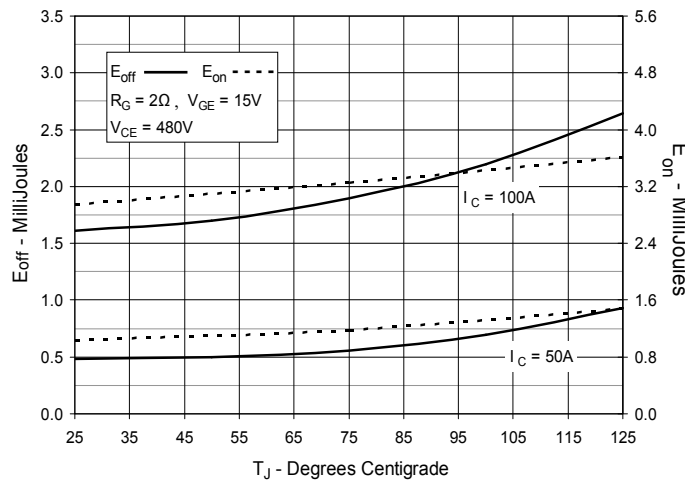
**Fig. 12. Inductive Switching  
Energy Loss vs. Gate Resistance**



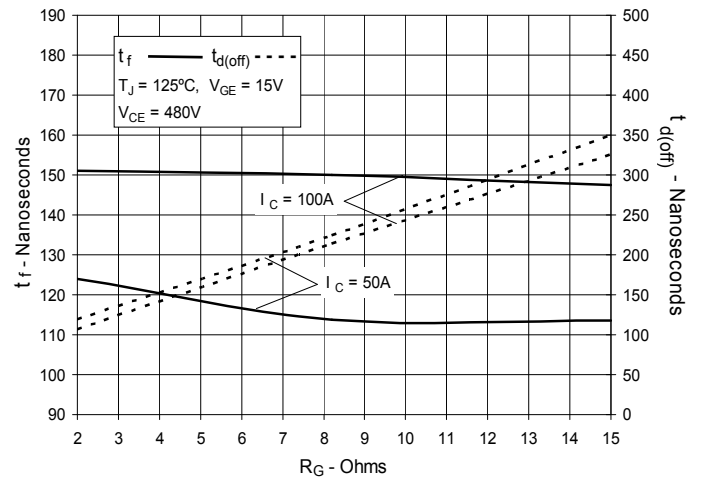
**Fig. 13. Inductive Switching  
Energy Loss vs. Collector Current**



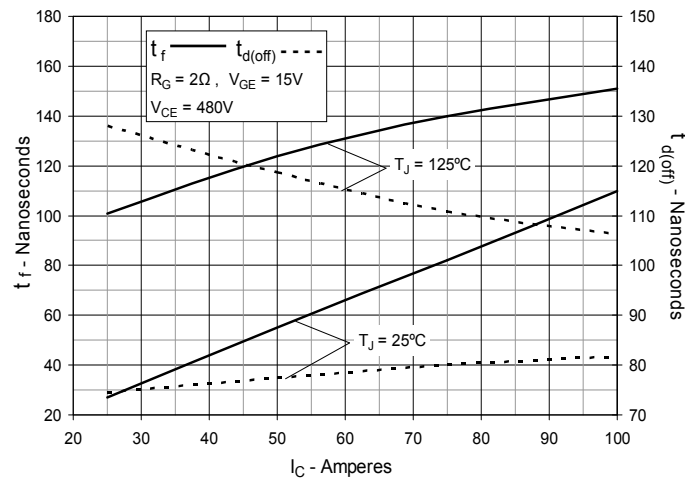
**Fig. 14. Inductive Switching  
Energy Loss vs. Junction Temperature**



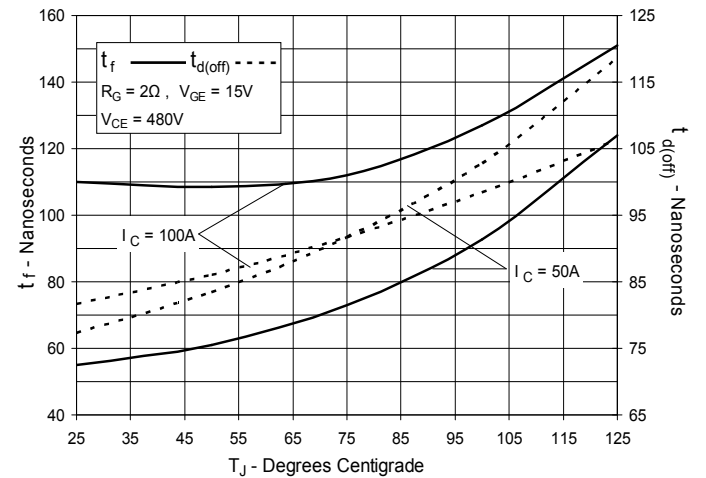
**Fig. 15. Inductive Turn-off  
Switching Times vs. Gate Resistance**



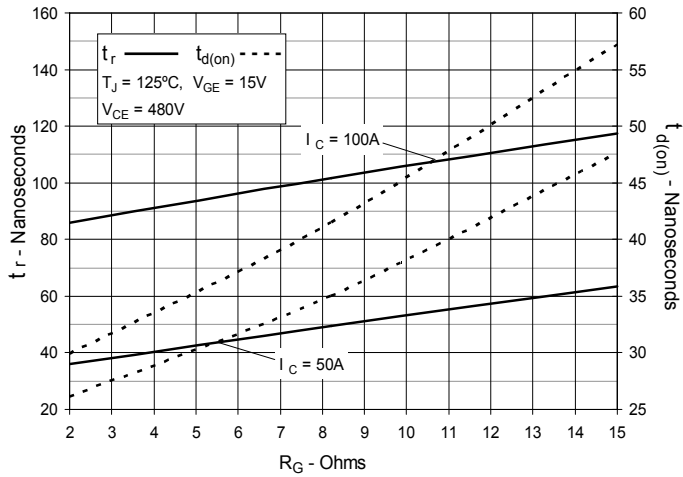
**Fig. 16. Inductive Turn-off  
Switching Times vs. Collector Current**



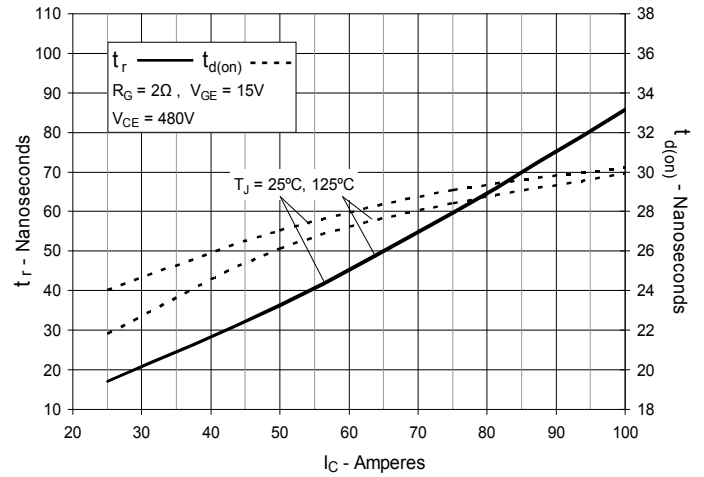
**Fig. 17. Inductive Turn-off  
Switching Times vs. Junction Temperature**



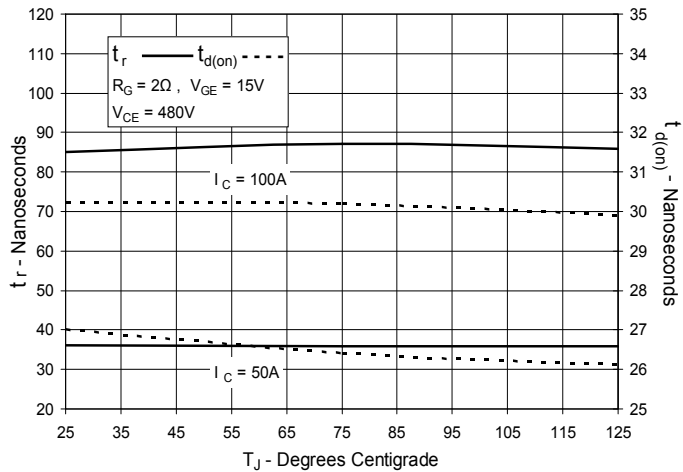
**Fig. 18. Inductive Turn-on  
Switching Times vs. Gate Resistance**



**Fig. 19. Inductive Turn-on  
Switching Times vs. Collector Current**



**Fig. 20. Inductive Turn-on  
Switching Times vs. Junction Temperature**





---

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](http://www.littelfuse.com/disclaimer-electronics).