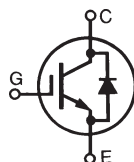


High Voltage, High Gain BIMOSFET™ Monolithic Bipolar MOS Transistor

IXBH32N300 IXBT32N300



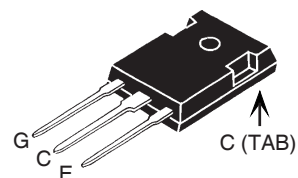
$$V_{CES} = 3000V$$

$$I_{C110} = 32A$$

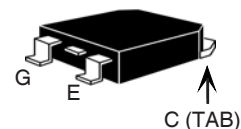
$$V_{CE(sat)} \leq 3.2V$$

| Symbol | Test Conditions | Maximum Ratings | |
|-------------------------------|--|--------------------------------------|------------|
| V_{CES} | $T_C = 25^\circ C$ to $150^\circ C$ | 3000 | V |
| V_{CGR} | $T_J = 25^\circ C$ to $150^\circ C$, $R_{GE} = 1M\Omega$ | 3000 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ C$ | 80 | A |
| I_{C110} | $T_C = 110^\circ C$ | 32 | A |
| I_{CM} | $T_C = 25^\circ C$, 1ms | 280 | A |
| SSOA (RBSOA) | $V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 10\Omega$ Clamped Inductive Load | $I_{CM} = 80$ $V_{CES} \leq 2400$ | A V |
| P_C | $T_C = 25^\circ C$ | 400 | W |
| T_J | | -55 ... +150 | $^\circ C$ |
| T_{JM} | | 150 | $^\circ C$ |
| T_{stg} | | -55 ... +150 | $^\circ C$ |
| T_L | 1.6mm (0.062 in.) from Case for 10s | 300 | $^\circ C$ |
| T_{SOLD} | Plastic Body for 10 seconds | 260 | $^\circ C$ |
| M_d | Mounting Torque (TO-247) | 1.13/10 | Nm/lb.in. |
| Weight | TO-247 | 6 | g |
| | TO-268 | 4 | g |

TO-247 (IXBH)



TO-268 (IXBT)



G = Gate C = Collector
E = Emitter TAB = Collector

Features

- High Blocking Voltage
- International Standard Packages
- Low Conduction Losses

Advantages

- Low Gate Drive Requirement
- High Power Density

Applications:

- Switched-Mode and Resonant-Mode Power Supplies
- Uninterruptible Power Supplies (UPS)
- Laser Generators
- Capacitor Discharge Circuits
- AC Switches

| Symbol | Test Conditions | Characteristic Values | | |
|---------------|---|-----------------------|------|--------------------|
| | | Min. | Typ. | Max. |
| BV_{CES} | $I_C = 250\mu A$, $V_{GE} = 0V$ | 3000 | | V |
| $V_{GE(th)}$ | $I_C = 250\mu A$, $V_{CE} = V_{GE}$ | 2.5 | | V |
| I_{CES} | $V_{CE} = 0.8 \cdot V_{CES}$, $V_{GE} = 0V$ $T_J = 125^\circ C$ | | | 50 μA 2 mA |
| I_{GES} | $V_{CE} = 0V$, $V_{GE} = \pm 20V$ | | | ± 100 nA |
| $V_{CE(sat)}$ | $I_C = 32A$, $V_{GE} = 15V$, Note 1 $T_J = 125^\circ C$ | | 2.8 | 3.2 V |
| | | | 3.5 | V |

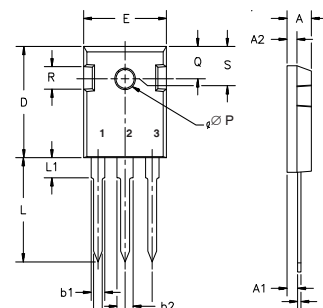
Symbol Test Conditions

($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)

Characteristic Values

| | | Min. | Typ. | Max. | | |
|--------------|---|--|------|------|--------------------|----|
| g_{fS} | $I_C = 32\text{A}, V_{CE} = 10\text{V}, \text{Note 1}$ | 16 | 26 | | S | |
| C_{ies} | $V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$ | | 3140 | | pF | |
| C_{oes} | | | 124 | | pF | |
| C_{res} | | | 40 | | pF | |
| Q_g | $I_C = 32\text{A}, V_{GE} = 15\text{V}, V_{CE} = 1000\text{V}$ | | 142 | | nC | |
| Q_{ge} | | | 20 | | nC | |
| Q_{gc} | | | 57 | | nC | |
| $t_{d(on)}$ | Resistive Switching Times, $T_J = 25^\circ\text{C}$ $I_C = 32\text{A}, V_{GE} = 15\text{V}$ | | 50 | | ns | |
| t_r | | | 185 | | ns | |
| $t_{d(off)}$ | | $V_{CE} = 1250\text{V}, R_G = 2\Omega$ | | 160 | | ns |
| t_f | | | | 720 | | ns |
| $t_{d(on)}$ | Resistive Switching Times, $T_J = 125^\circ\text{C}$ $I_C = 32\text{A}, V_{GE} = 15\text{V}$ | | 58 | | ns | |
| t_r | | | 515 | | ns | |
| $t_{d(off)}$ | | $V_{CE} = 1250\text{V}, R_G = 2\Omega$ | | 165 | | ns |
| t_f | | | | 630 | | ns |
| R_{thJC} | | | | 0.31 | $^\circ\text{C/W}$ | |
| R_{thCS} | (TO-247) | | 0.21 | | $^\circ\text{C/W}$ | |

TO-247 (IXBH) Outline



Terminals: 1 - Gate
2 - Drain
3 - Source
Tab - Drain

| Dim. | Millimeter | | Inches | |
|----------------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.7 | 5.3 | .185 | .209 |
| A ₁ | 2.2 | 2.54 | .087 | .102 |
| A ₂ | 2.2 | 2.6 | .059 | .098 |
| b | 1.0 | 1.4 | .040 | .055 |
| b ₁ | 1.65 | 2.13 | .065 | .084 |
| b ₂ | 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 |
| ∅P | 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 |

Reverse Diode

Symbol Test Conditions

($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)

Characteristic Values

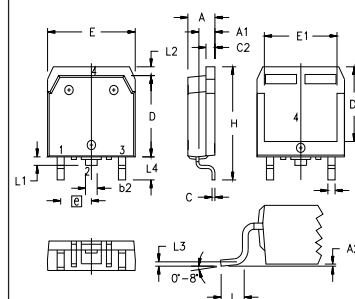
| | | Min. | Typ. | Max. | |
|----------|--|---|------|------|---------------|
| V_F | $I_F = 32\text{A}, V_{GE} = 0\text{V}$ | | | 2.1 | V |
| t_{rr} | $I_F = 16\text{A}, V_{GE} = 0\text{V}, -di_F/dt = 100\text{A}/\mu\text{s}$ | | 1.5 | | μs |
| I_{RM} | | $V_R = 100\text{V}, V_{GE} = 0\text{V}$ | | 33 | |

Note 1: Pulse Test, $t \leq 300\mu\text{s}$, Duty Cycle, $d \leq 2\%$.

PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

TO-268 (IXBT) Outline



| SYM | INCHES | | MILLIMETERS | |
|-----|----------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .193 | .201 | 4.90 | 5.10 |
| A1 | .106 | .114 | 2.70 | 2.90 |
| A2 | .001 | .010 | 0.02 | 0.25 |
| b | .045 | .057 | 1.15 | 1.45 |
| b2 | .075 | .083 | 1.90 | 2.10 |
| C | .016 | .026 | 0.40 | 0.65 |
| C2 | .057 | .063 | 1.45 | 1.60 |
| D | .543 | .551 | 13.80 | 14.00 |
| D1 | .488 | .500 | 12.40 | 12.70 |
| E | .624 | .632 | 15.85 | 16.05 |
| E1 | .524 | .535 | 13.30 | 13.60 |
| e | .215 BSC | | 5.45 BSC | |
| H | .736 | .752 | 18.70 | 19.10 |
| L | .094 | .106 | 2.40 | 2.70 |
| L1 | .047 | .055 | 1.20 | 1.40 |
| L2 | .039 | .045 | 1.00 | 1.15 |
| L3 | .010 BSC | | 0.25 BSC | |
| L4 | .150 | .161 | 3.80 | 4.10 |

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

IXYS MOSFETs and IGBTs are covered 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
by one or more of the following U.S. patents: 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 @ 25°C

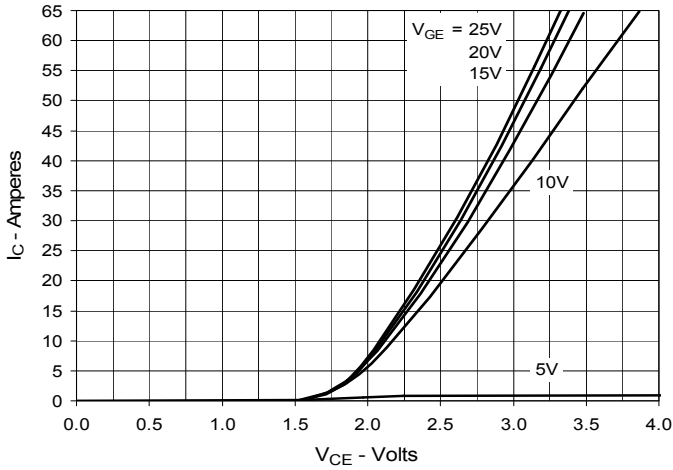


Fig. 2. Extended Output Characteristics @ 25°C

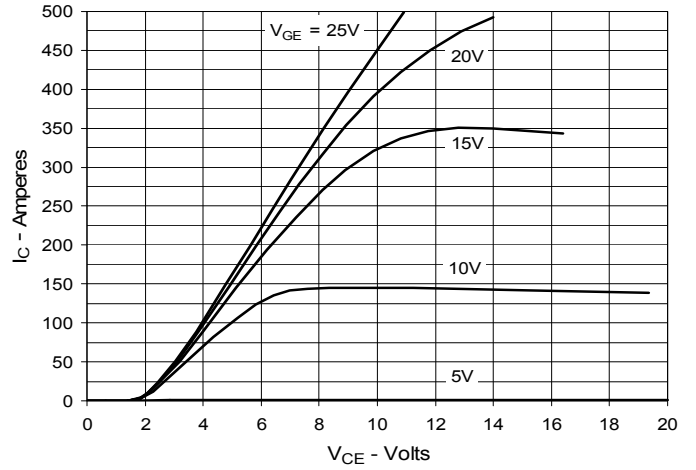


Fig. 3. Output Characteristics @ 125°C

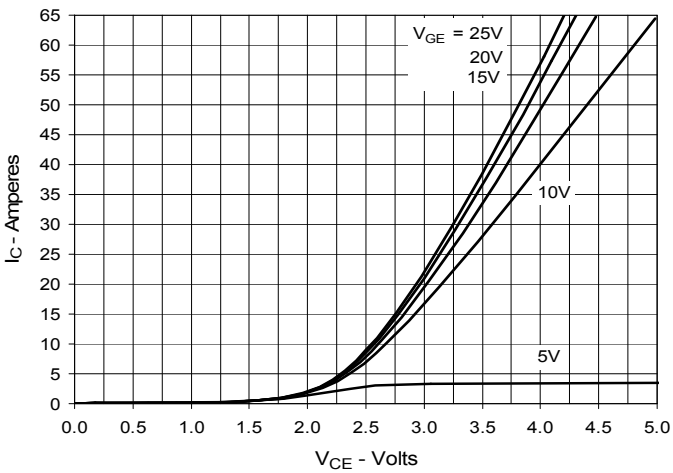


Fig. 4. Dependence of VCE(sat) on Junction Temperature

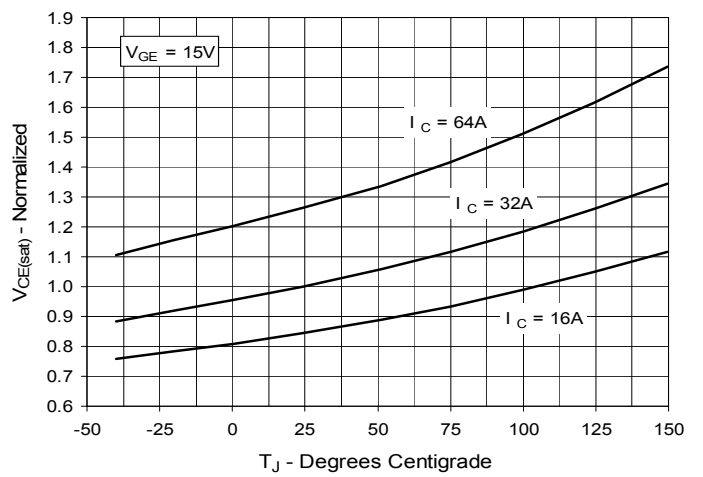


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

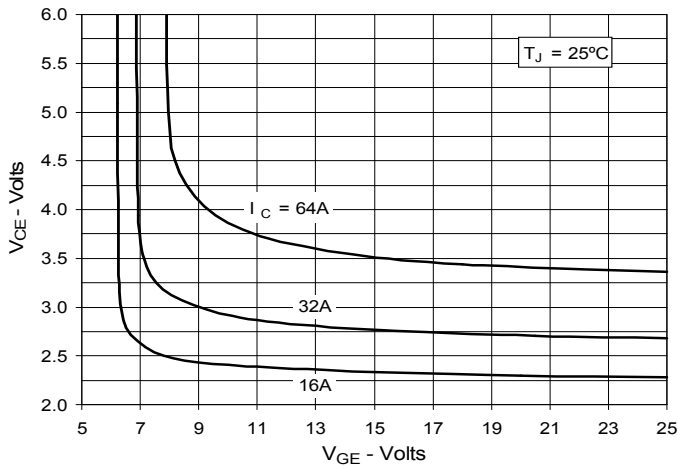


Fig. 6. Input Admittance

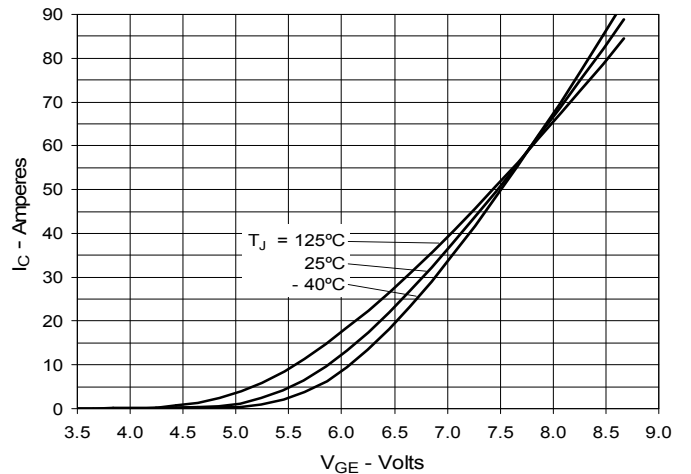


Fig. 7. Transconductance

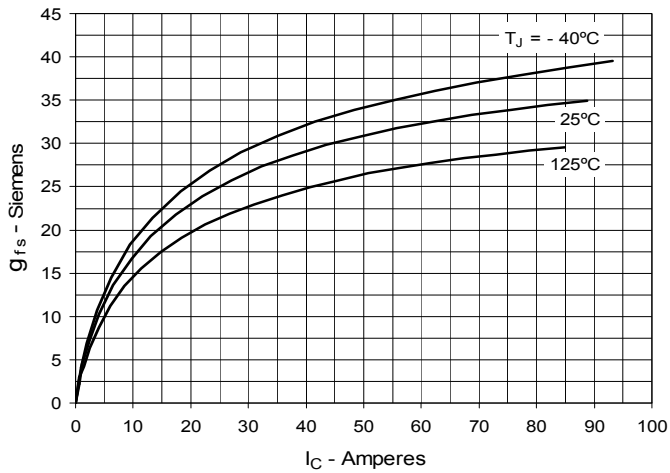


Fig. 8. Forward Voltage Drop of Intrinsic Diode

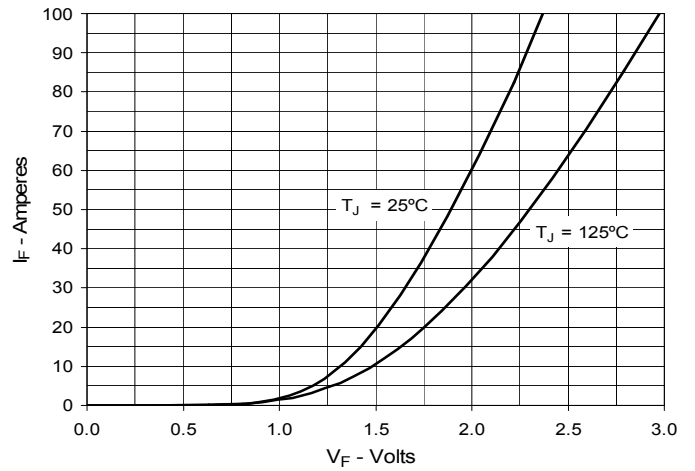


Fig. 9. Gate Charge

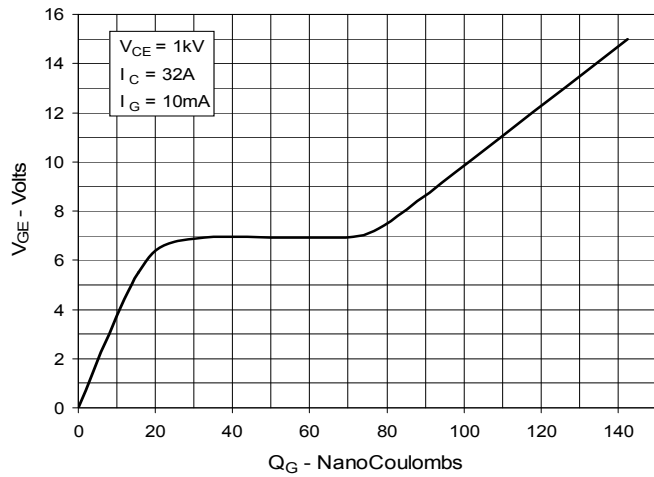


Fig. 10. Capacitance

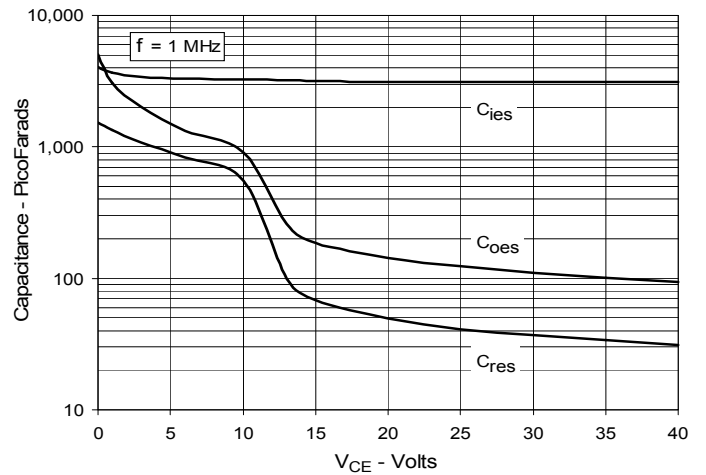


Fig. 11. Reverse-Bias Safe Operating Area

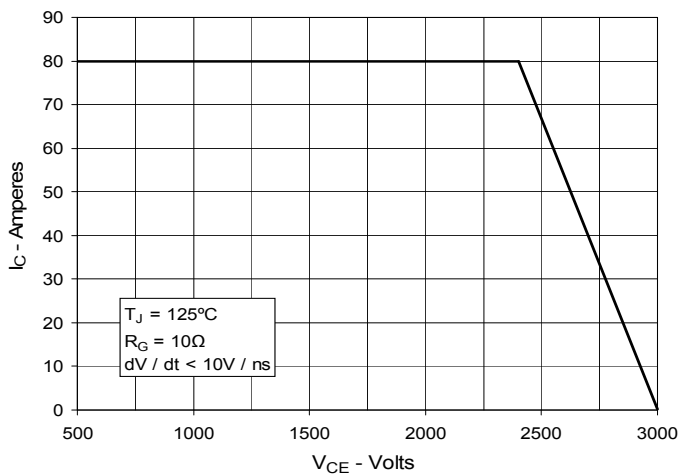


Fig. 12. Maximum Transient Thermal Impedance

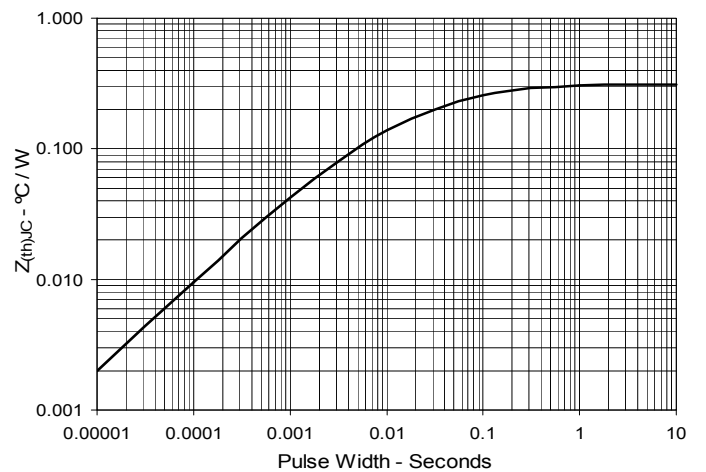


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

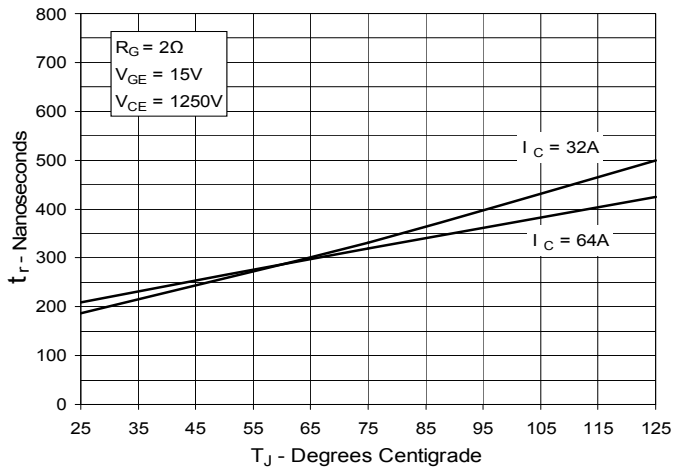


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

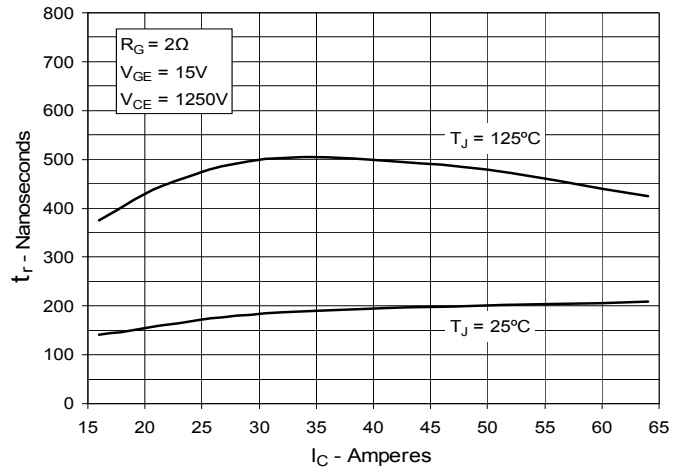


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

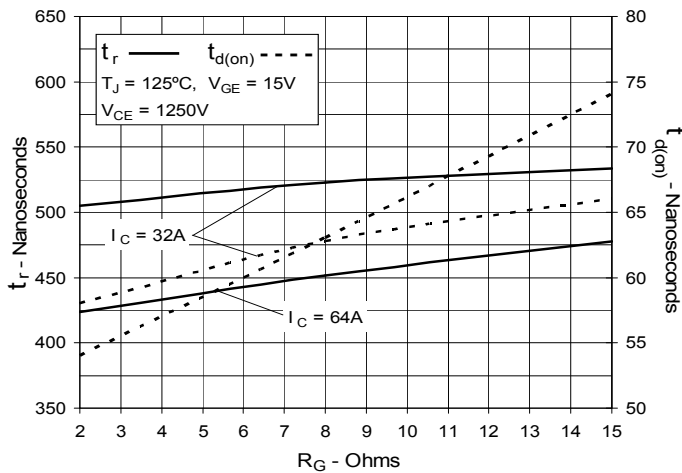


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

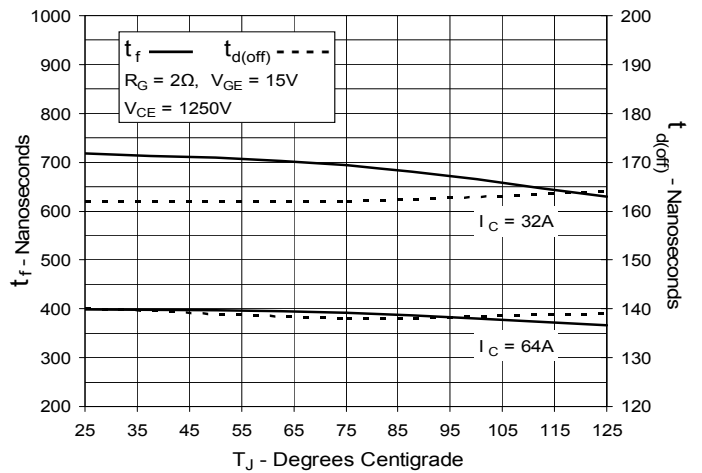


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

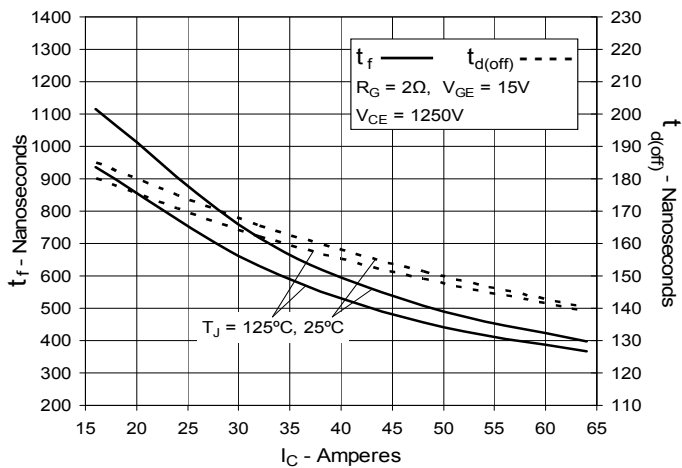
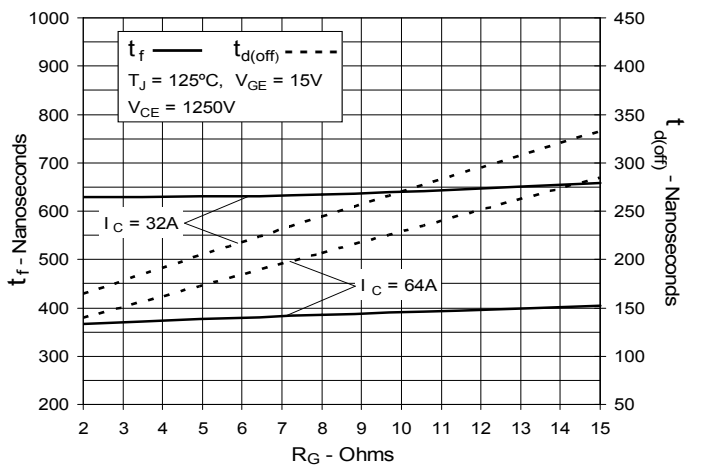


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance





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