

TrenchHV™ Power MOSFET HiperFET™

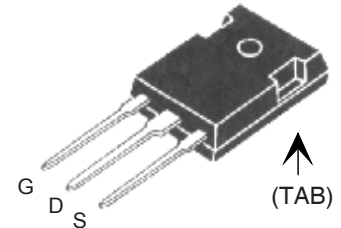
IXFH150N17T

$V_{DSS} = 175V$
 $I_{D25} = 150A$
 $R_{DS(on)} \leq 12m\Omega$

N-Channel Enhancement Mode
Avalanche Rated



TO-247



G = Gate D = Drain
 S = Source TAB = Drain

| Symbol | Test Conditions | Maximum Ratings | |
|---------------|--|-----------------|------------|
| V_{DSS} | $T_J = 25^\circ C$ to $175^\circ C$ | 175 | V |
| V_{DGR} | $T_J = 25^\circ C$ to $175^\circ C$, $R_{GS} = 1M\Omega$ | 175 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^\circ C$ | 150 | A |
| I_{LRMS} | Lead Current Limit, RMS | 75 | A |
| I_{DM} | $T_C = 25^\circ C$, pulse width limited by T_{JM} | 400 | A |
| I_A | $T_C = 25^\circ C$ | 75 | A |
| E_{AS} | $T_C = 25^\circ C$ | 1.5 | J |
| dV/dt | $I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 175^\circ C$ | 15 | V/ns |
| P_D | $T_C = 25^\circ C$ | 830 | W |
| T_J | | -55 ... +175 | $^\circ C$ |
| T_{JM} | | 175 | $^\circ C$ |
| T_{stg} | | -55 ... +175 | $^\circ C$ |
| T_L | 1.6mm (0.062in.) from case for 10s | 300 | $^\circ C$ |
| T_{sold} | Plastic body for 10 seconds | 260 | $^\circ C$ |
| M_d | Mounting torque | 1.13 / 10 | Nm/lb.in. |
| Weight | | 6 | g |

Features

- International standard package
- Avalanche rated
- 175°C Operating Temperature
- High current handling capability

Advantages

- Easy to mount
- Space savings
- High power density

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor drives
- Uninterruptible power supplies
- High speed power switching applications
- Synchronous rectification

| Symbol | Test Conditions ($T_J = 25^\circ C$ unless otherwise specified) | Characteristic Values | | |
|--------------|---|-----------------------|------|---------------|
| | | Min. | Typ. | Max. |
| BV_{DSS} | $V_{GS} = 0V$, $I_D = 250\mu A$ | 175 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 3mA$ | 2.5 | | 5.0 V |
| I_{GSS} | $V_{GS} = \pm 20V$, $V_{DS} = 0V$ | | | ± 200 nA |
| I_{DSS} | $V_{DS} = V_{DSS}$ | | | 5 μA |
| | $V_{GS} = 0V$ $T_J = 150^\circ C$ | | 250 | μA |
| $R_{DS(on)}$ | $V_{GS} = 10V$, $I_D = 0.5 \cdot I_{D25}$, Notes 1 | 10 | | 12 m Ω |

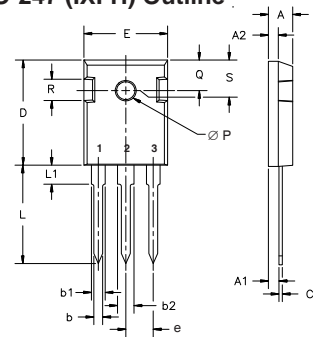
| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified) | Characteristic Values | | |
|--------------|--|-----------------------|------|--------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 10\text{V}, I_D = 60\text{A}$, Note 1 | 75 | 118 | S |
| C_{iss} | $V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$ | | 9800 | pF |
| C_{oss} | | | 1110 | pF |
| C_{rss} | | | 60 | pF |
| $t_{d(on)}$ | Resistive Switching Times $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 2\Omega$ (External) | | 22 | ns |
| t_r | | | 30 | ns |
| $t_{d(off)}$ | | | 58 | ns |
| t_f | | | 30 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 25\text{A}$ | | 155 | nC |
| Q_{gs} | | | 40 | nC |
| Q_{gd} | | | 47 | nC |
| R_{thJC} | | | 0.18 | $^\circ\text{C/W}$ |
| R_{thCH} | | 0.21 | | $^\circ\text{C/W}$ |

Source-Drain Diode

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified) | Characteristic Values | | |
|----------|--|-----------------------|------|-------|
| | | Min. | Typ. | Max. |
| I_S | $V_{GS} = 0\text{V}$ | | | 150 A |
| I_{SM} | Repetitive, Pulse width limited by T_{JM} | | | 400 A |
| V_{SD} | $I_F = 50\text{A}, V_{GS} = 0\text{V}$, Note 1 | | | 1.2 V |
| t_{rr} | $I_F = 75\text{A}, V_{GS} = 0\text{V}$ $-di/dt = 200\text{A}/\mu\text{s}$ $V_R = 85\text{V}$ | | 96 | ns |
| I_{RM} | | | 0.65 | A |
| Q_{RM} | | | 13.5 | nC |

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

TO-247 (IXFH) Outline



Terminals: 1 - Gate 2 - 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 |
| ØP | 3.55 | 3.65 | .140 | .144 |
| Q | 5.89 | 6.40 | 0.232 | 0.252 |
| R | 4.32 | 5.49 | .170 | .216 |

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 @ 25°C

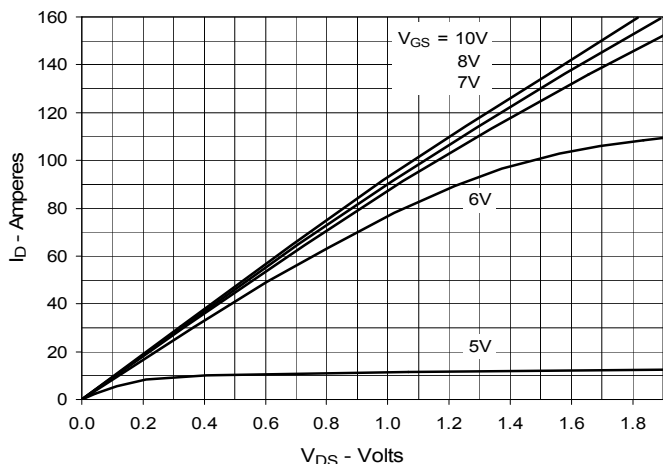


Fig. 2. Extended Output Characteristics @ 25°C

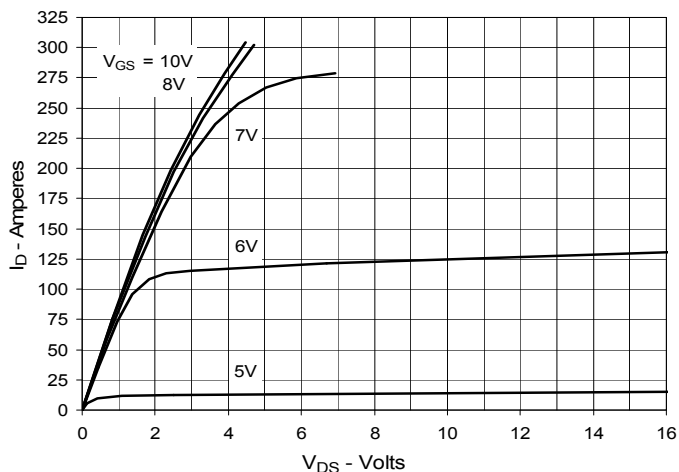


Fig. 3. Output Characteristics @ 150°C

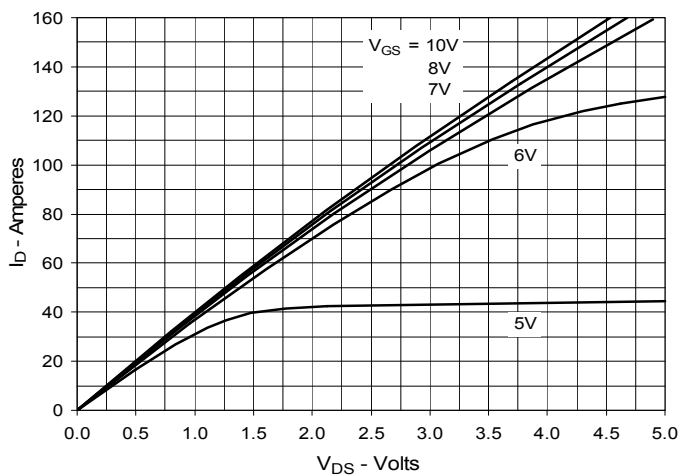


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 75A$ Value vs. Junction Temperature

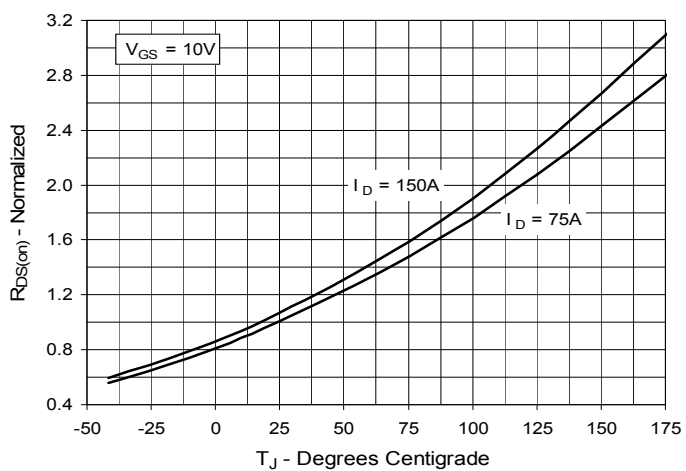


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 75A$ Value vs. Drain Current

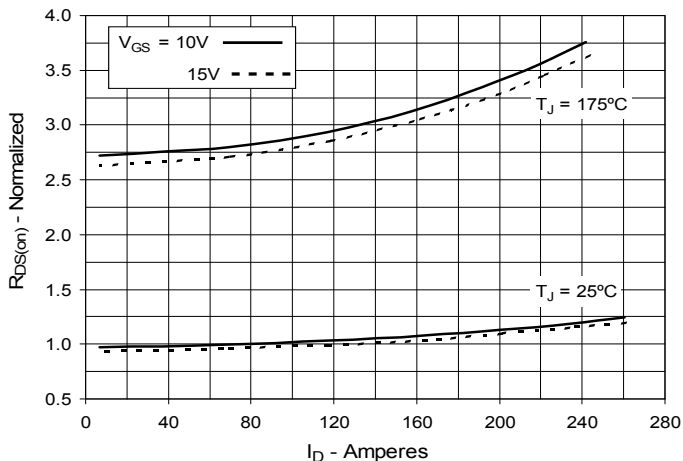


Fig. 6. Drain Current vs. Case Temperature

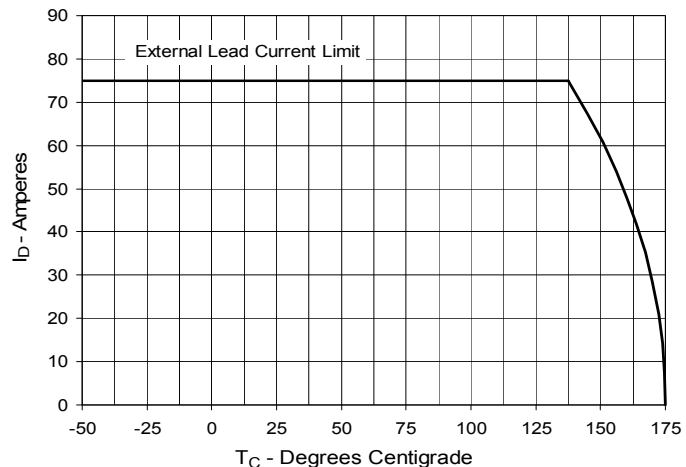


Fig. 7. Input Admittance

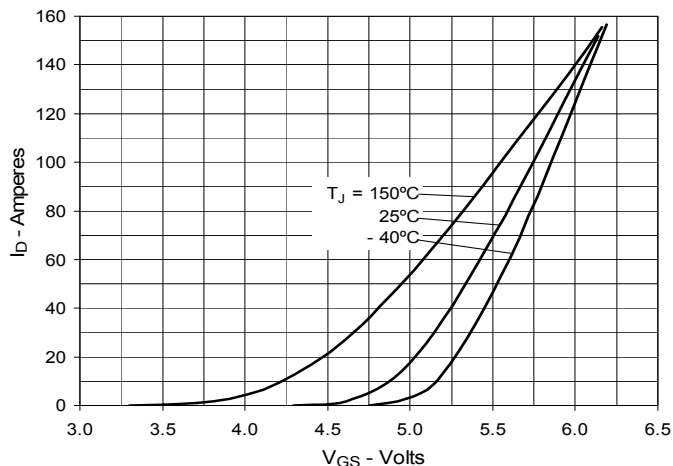


Fig. 8. Transconductance

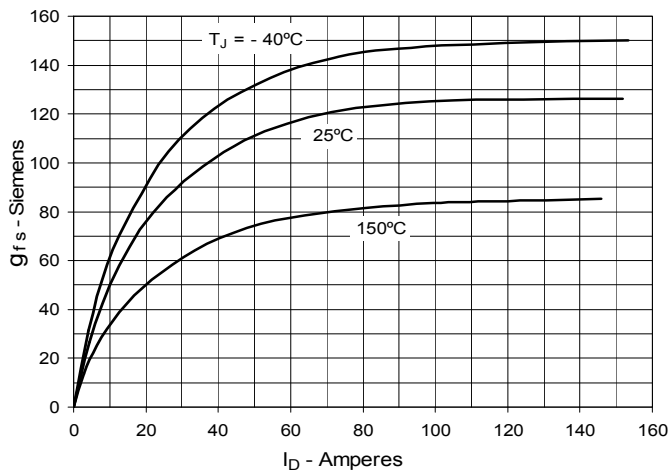


Fig. 9. Forward Voltage Drop of Intrinsic Diode

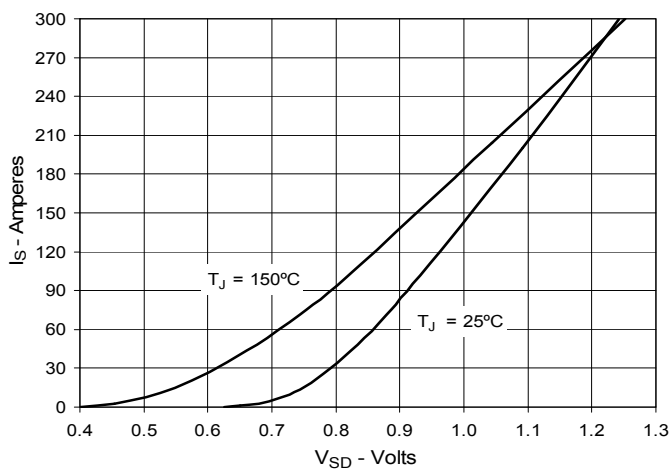


Fig. 10. Gate Charge

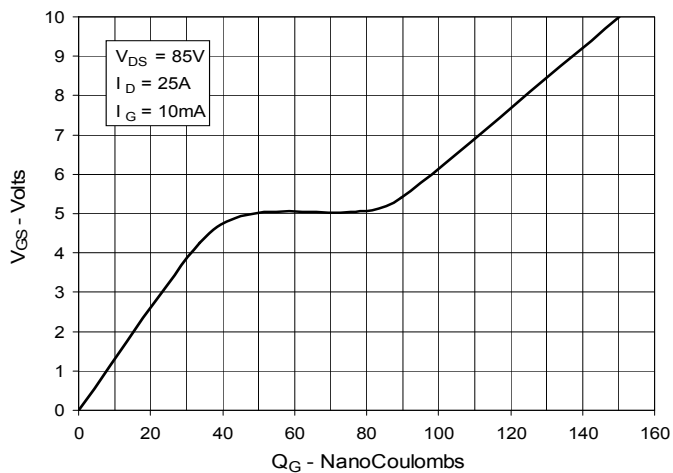


Fig. 11. Capacitance

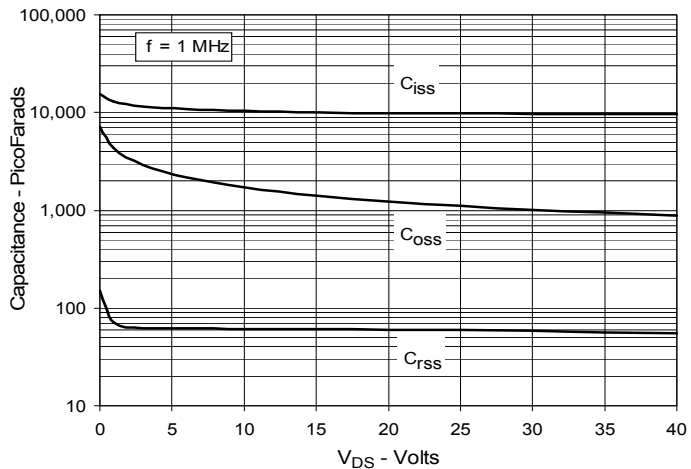


Fig. 12. Maximum Transient Thermal Impedance

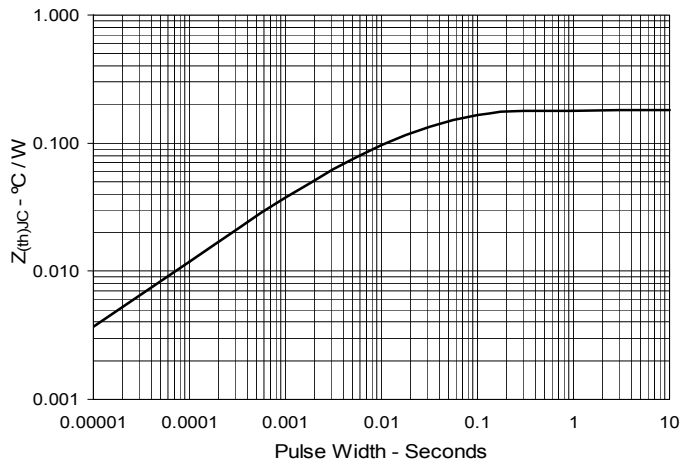
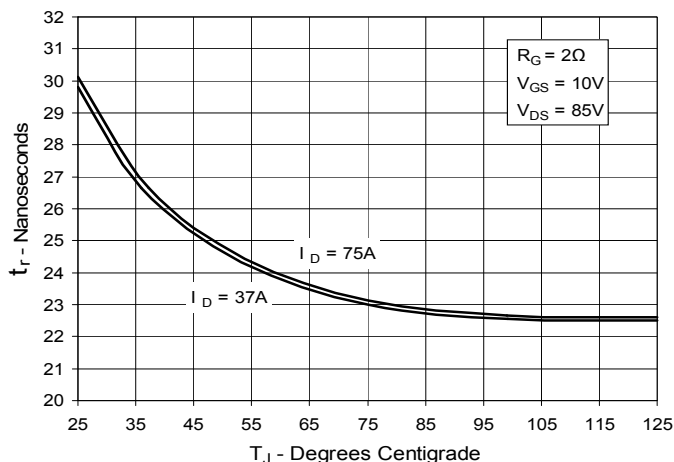
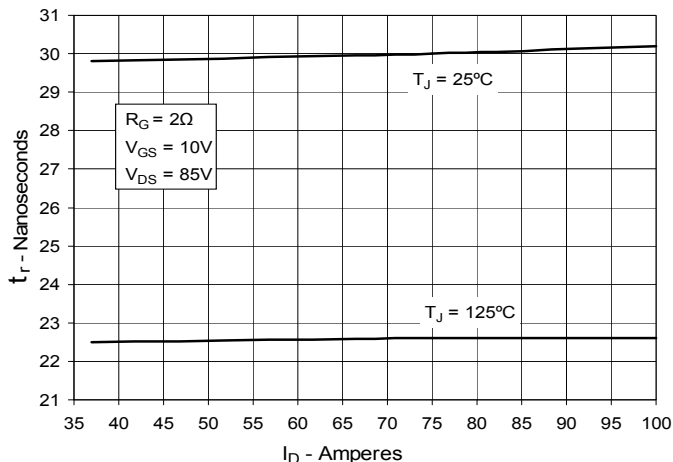
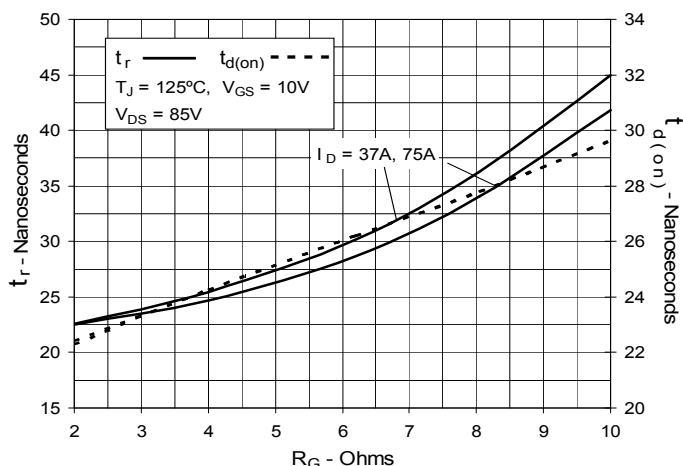
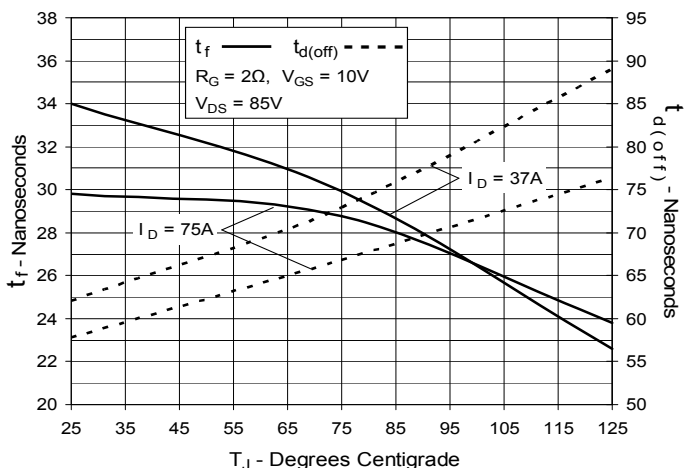
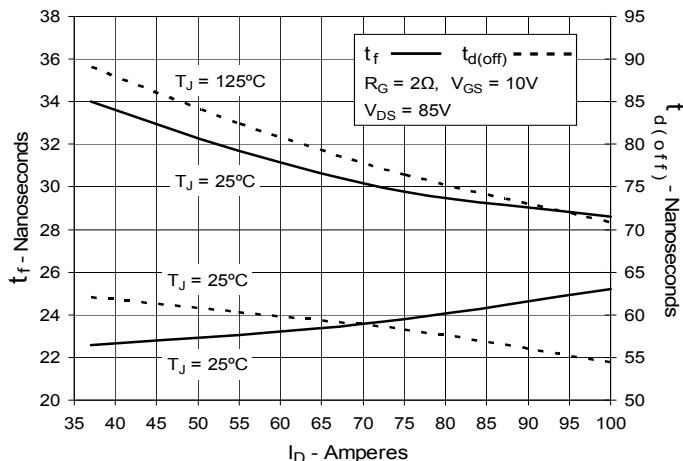


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

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
