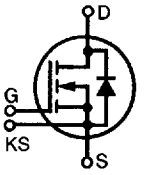
IXYS

# MegaMOS™FRED

# IXTN36N50

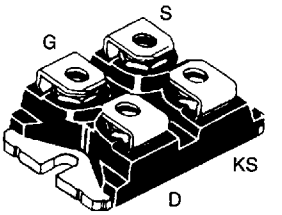
$V_{DSS}$ = 500 V
$I_{D25}$ = 36 A
$R_{DS(on)}$ = 0.12 Ω

N-Channel Enhancement Mode




| Symbol | Test Conditions | | Maximum Ratings | |
|---|---|---|---|---|
| $V_{DSS}$ | $T_J$ = 25°C to 150°C | | 500 | V |
| $V_{DGR}$ | $T_J$ = 25°C to 150°C; $R_{GS}$ = 10 kΩ | | 500 | V |
| $V_{GS}$ | Continuous | | ±20 | V |
| $V_{GSM}$ | Transient | | ±30 | V |
| $I_{D25}$ | $T_C$ = 25°C | | 36 | A |
| $I_{DM}$ | $T_C$ = 25°C, pulse width limited by $T_{JM}$ | | 133 | A |
| $P_D$ | $T_C$ = 25°C | | 400 | W |
| $T_J$ | | | -40 ... +150 | °C |
| $T_{JM}$ | | | 150 | °C |
| $T_{stg}$ | | | -40 ... +150 | °C |
| $V_{ISOL}$ | 50/60 Hz | t = 1 min | 2500 | V~ |
| | $I_{ISOL}$ ≤ 1 mA | t = 1 s | 3000 | V~ |
| $M_d$ | Mounting torque | | 1.5/13 | Nm/lb.in. |
| | Terminal connection torque (M4) | | 1.5/13 | Nm/lb.in. |
| Weight | | | 30 | g |

**miniBLOC, SOT-227 B**




G = Gate, D = Drain,
S = Source, KS = Kelvin Source

## Features

- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 3000 V~
- Low $R_{DS(on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Low drain-to-case capacitance (< 50 pF)
- Low package inductance (< 10 nH) - easy to drive and to protect

| Symbol | Test Conditions | | Characteristic Values ($T_J$ = 25°C, unless otherwise specified) min. | typ. | max. | |
|---|---|---|---|---|---|---|
| $V_{DSS}$ | $V_{GS}$ = 0 V, $I_D$ = 1 mA | | 500 | | | V |
| $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 20 mA | | 2 | | 4 | V |
| $I_{GSS}$ | $V_{GS}$ = ±20 $V_{DC}$, $V_{DS}$ = 0 | | | | ±500 | nA |
| $I_{DSS}$ | $V_{DS}$ = 0.8 • $V_{DSS}$ | $T_J$ = 25°C | | | 400 | µA |
| | $V_{GS}$ = 0 V | $T_J$ = 125°C | | | 2 | mA |
| $R_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D$ = 0.5 • $I_{D25}$ Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 % | | | | 0.12 | Ω |

## Applications

- AC motor speed control
- DC servo and robot drives
- Uninterruptible power systems (UPS)
- Switch-mode and resonant-mode power supplies
- DC choppers

## Advantages

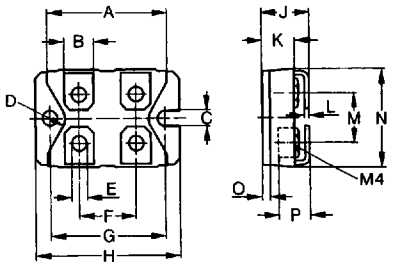
- Easy to mount with 2 screws
- Space savings
- High power density

| Symbol | Test Conditions (T$_J$ = 25°C, unless otherwise specified) | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $g_{fs}$ | $V_{DS}$ = 10 V; $I_D$ = 0.5 • $I_{D25}$, pulsed | 30 | 38 | | S |
| $C_{iss}$ | $V_{GS}$ = 0 V, $V_{DS}$ = 25 V, f = 1 MHz | | 8.5 | | nF |
| $C_{oss}$ | | | 0.9 | | nF |
| $C_{rss}$ | | | 0.3 | | nF |
| $t_{d(on)}$ | $V_{GS}$ = 10 V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 0.5 $I_{D25}$<br>$R_G$ = 1 Ω, (External) | | | 100 | ns |
| $t_r$ | | | | 110 | ns |
| $t_{d(off)}$ | | | | 220 | ns |
| $t_f$ | | | | 105 | ns |
| $Q_{g(on)}$ | $V_{GS}$ = 10 V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 0.5 $I_{D25}$ | | 270 | 350 | nC |
| $Q_{gs}$ | | | 60 | 90 | nC |
| $Q_{gd}$ | | | 125 | 200 | nC |
| $R_{thJC}$ | | | | 0.31 | K/W |
| $R_{thCK}$ | | | 0.05 | | K/W |

**Source-Drain Diode**

| Symbol | Test Conditions (T$_J$ = 25°C, unless otherwise specified) | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $I_S$ | $V_{GS}$ = 0 | | | 36 | A |
| $I_{SM}$ | Repetitive; pulse width limited by $T_{JM}$ | | | 144 | A |
| $V_{SD}$ | $I_F$ = $I_S$, $V_{GS}$ = 0 V,<br>Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 % | | | 1.5 | V |
| $t_{rr}$ | $I_F$ = $I_S$, -di/dt = 100 A/µs, $V_R$ = 100 V | | 600 | | ns |

**miniBLOC, SOT 227-B**




M4 screws (4x) supplied

| Dim. | Millimeter Min. | Max. | Inches Min. | Max. |
|---|---|---|---|---|
| A | 31.5 | 31.7 | 1.241 | 1.249 |
| B | 7.8 | 8.2 | 0.307 | 0.323 |
| C | 4 0 | - | 0.158 | - |
| D | 4 1 | 4.3 | 0.162 | 0.169 |
| E | 4 1 | 4 3 | 0 162 | 0.169 |
| F | 14 9 | 15 1 | 0 587 | 0.595 |
| G | 30 1 | 30 3 | 1 186 | 1 193 |
| H | 38.0 | 38 2 | 1 497 | 1.505 |
| J | 11 8 | 12 2 | 0 465 | 0.481 |
| K | 8 9 | 9.1 | 0.351 | 0.359 |
| L | 0.75 | 0.85 | 0.030 | 0.033 |
| M | 12.6 | 12.8 | 0.496 | 0.504 |
| N | 25.2 | 25.4 | 0.993 | 1.001 |
| O | 1.95 | 2.05 | 0.077 | 0.081 |
| P | - | 5.0 | - | 0.197 |

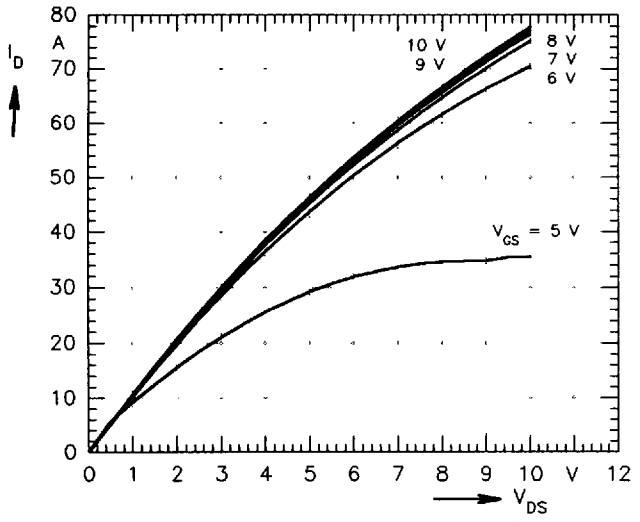



Fig. 1 Typ output characteristics, $I_D = f(V_{DS})$

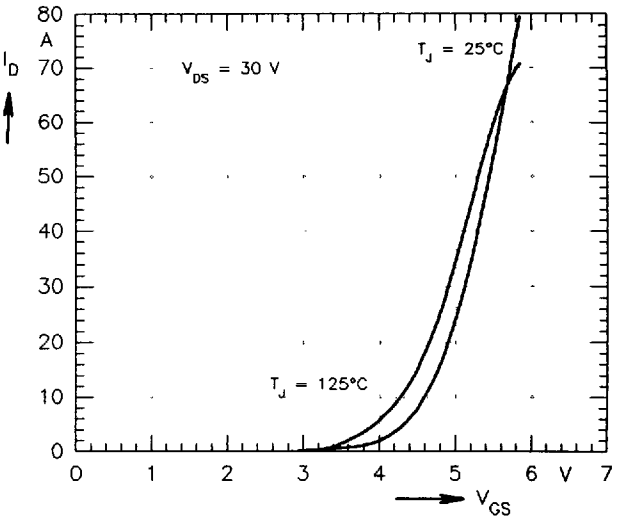



Fig. 2 Typ. transfer characteristics, $I_D = f(V_{GS})$

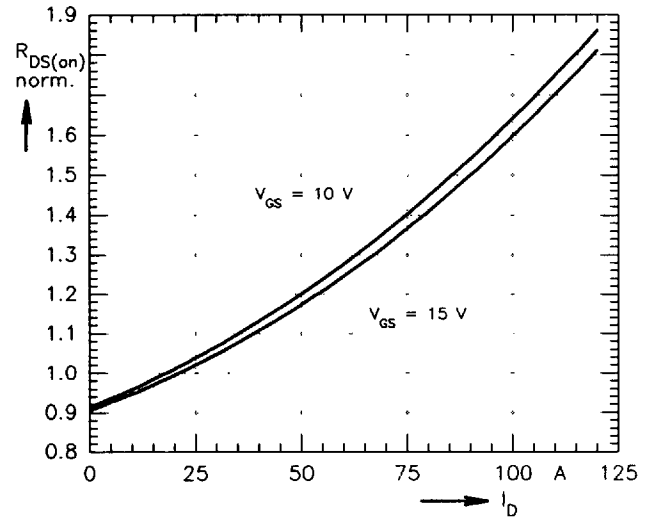



Fig. 3 Typ. normalized $R_{DS(on)} = f(I_D)$

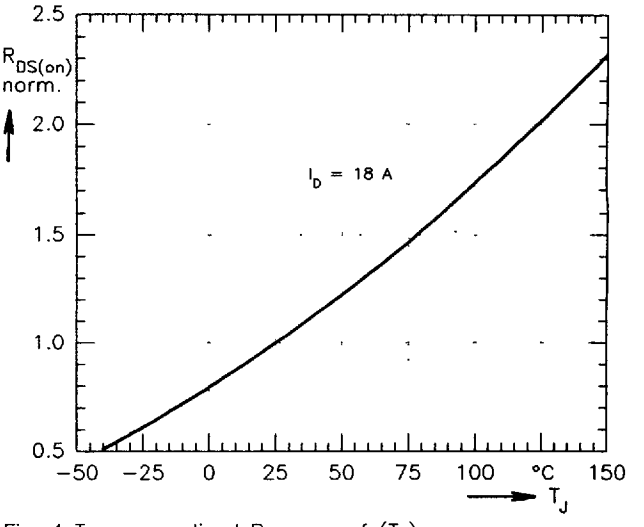



Fig. 4 Typ. normalized $R_{DS(on)} = f(T_J)$

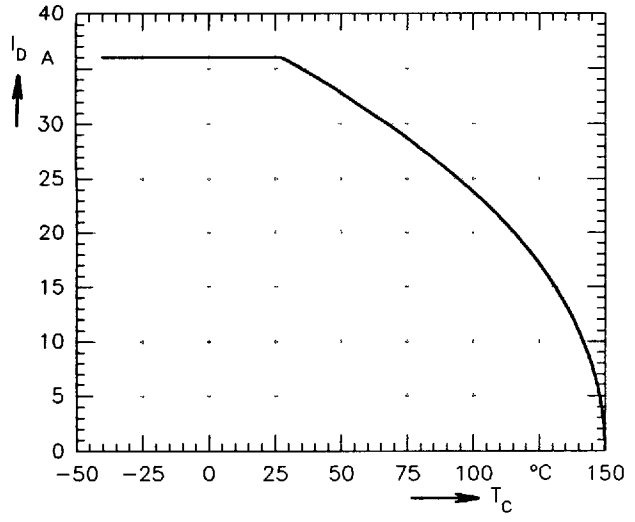



Fig. 5 Continuous drain current $I_D = f(T_C)$

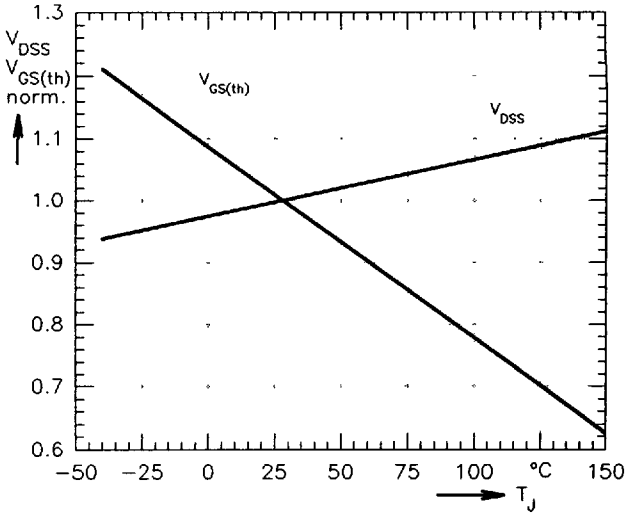



Fig. 6 Typ. normalized $V_{DSS} = f(T_J)$, $V_{GS(th)} = f(T_J)$

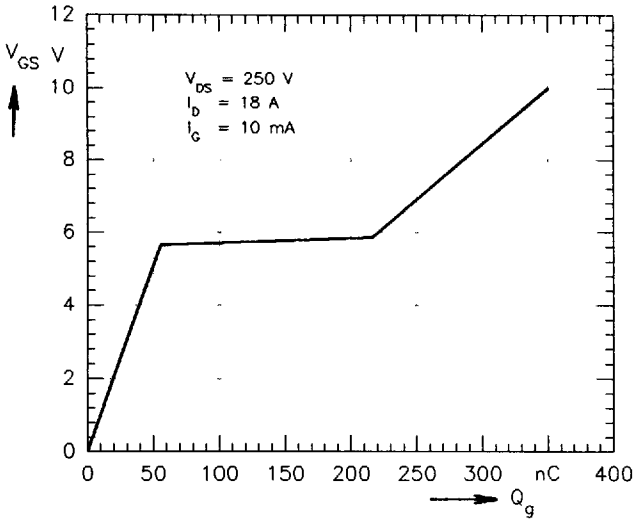



Fig. 7 Typ. turn-on gate charge characteristics, $V_{GS}$ = f (Qg)

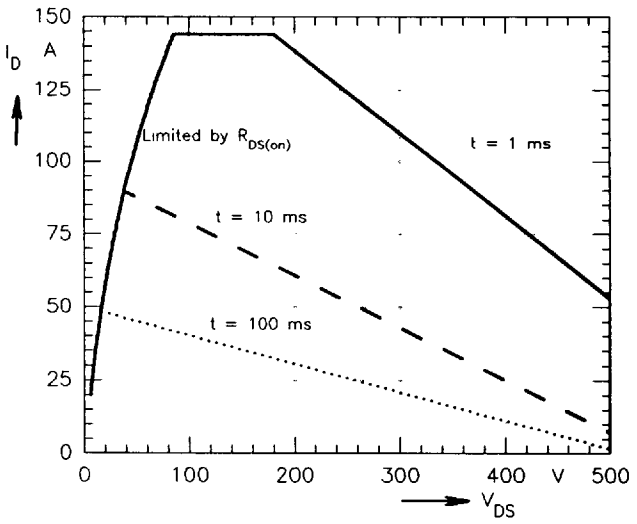



Fig. 8 Forward Bias Safe Operating Area $I_D$ = f ($V_{DS}$)

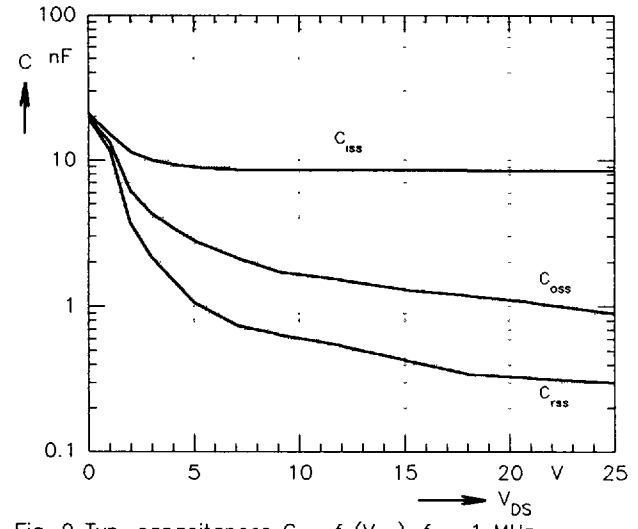



Fig. 9 Typ. capacitances C = f ($V_{DS}$), f = 1 MHz

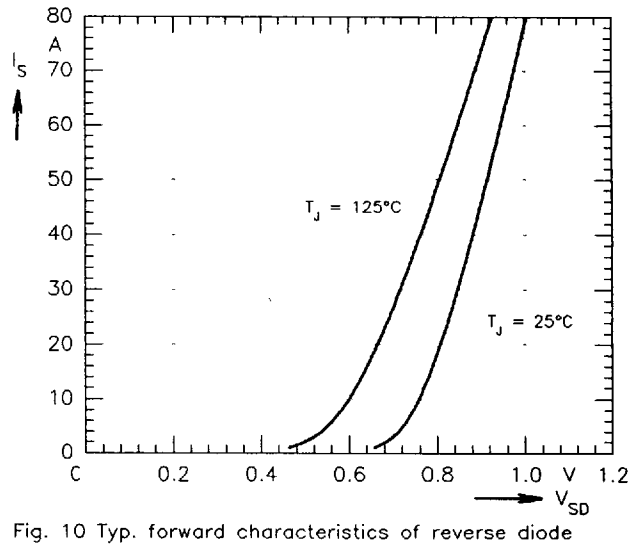



Fig. 10 Typ. forward characteristics of reverse diode $I_S$ = f ($V_{SD}$)

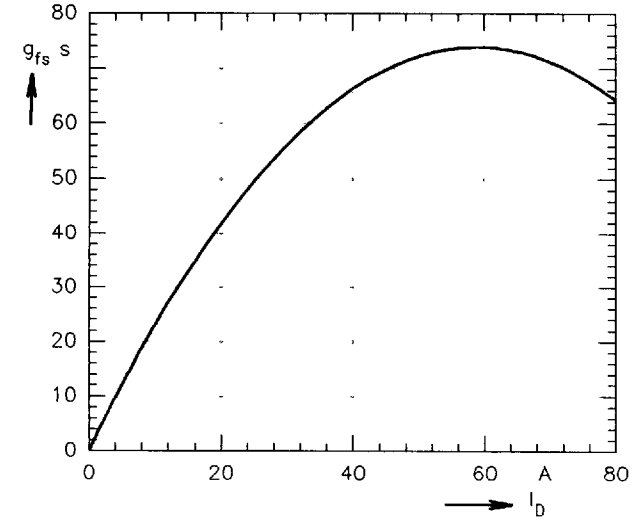



Fig. 11 Typ. transconductance, $g_{fs}$ = f ($I_D$)

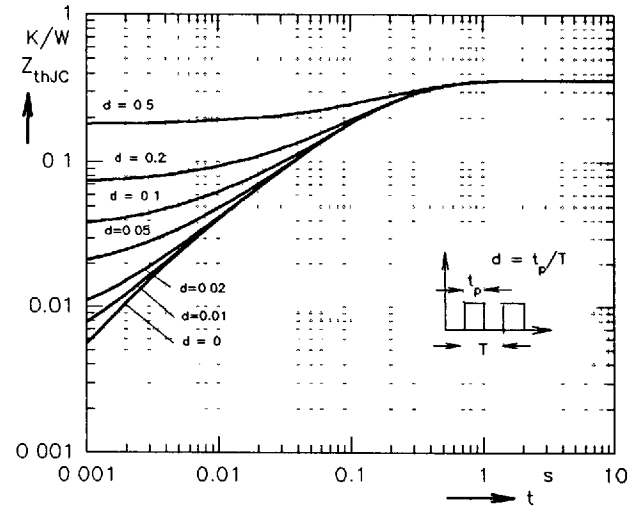



Fig. 12 Transient thermal resistance, $Z_{thJC}$ = f (t)