

HiPerFET™ Power MOSFETs

IXFK / IXFN 44 N50
IXFK / IXFN 48 N50

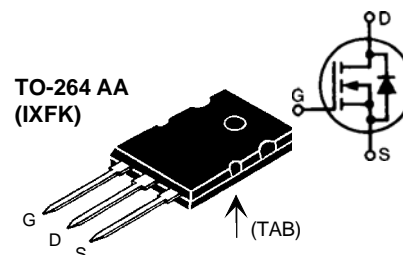
| V_{DSS} | I_{D25} | $R_{DS(on)}$ |
|--------------|-------------|---------------------------------|
| 500 V | 44 A | 0.12 Ω |
| 500 V | 48 A | 0.10 Ω |

$t_{rr} \leq 250$ ns

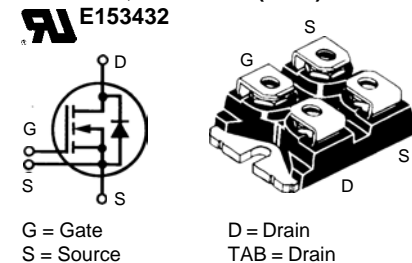
N-Channel Enhancement Mode
Avalanche Rated, High dv/dt, Low t_{rr}

| Symbol | Test Conditions | Maximum Ratings | | |
|------------|--|-----------------|----------|------------------|
| | | IXFK | IXFN | |
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 150°C | 500 | 500 | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1$ M Ω | 500 | 500 | V |
| V_{GS} | Continuous | ± 20 | ± 20 | V |
| V_{GSM} | Transient | ± 30 | ± 30 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 44N50 | 44 | A |
| | | 48N50 | 48 | A |
| I_{DM} | $T_C = 25^\circ\text{C}$, pulse width limited by T_{JM} | 44N50 | 176 | A |
| | | 48N50 | 192 | A |
| I_{AR} | $T_C = 25^\circ\text{C}$ | 24 | 24 | A |
| E_{AR} | $T_C = 25^\circ\text{C}$ | 30 | 30 | mJ |
| dv/dt | $I_S \leq I_{DM}$, $di/dt \leq 100$ A/ μs , $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2$ Ω | 5 | 5 | V/ns |
| P_D | $T_C = 25^\circ\text{C}$ | 500 | 520 | W |
| T_J | | -55 ... +150 | | $^\circ\text{C}$ |
| T_{JM} | | | 150 | $^\circ\text{C}$ |
| T_{stg} | | -55 ... +150 | | $^\circ\text{C}$ |
| T_L | 1.6 mm (0.063 in) from case for 10 s | 300 | - | $^\circ\text{C}$ |
| | | | | |
| V_{ISOL} | 50/60 Hz, RMS $t = 1$ min $I_{ISOL} \leq 1$ mA $t = 1$ s | - | 2500 | V~ |
| | | - | 3000 | V~ |
| M_d | Mounting torque Terminal connection torque | 0.9/6 | 1.5/13 | Nm/lb.in. |
| | | - | 1.5/13 | Nm/lb.in. |
| Weight | | 10 | 30 | g |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|--|---|------|-------------------|
| | | min. | typ. | max. |
| V_{DSS} | $V_{GS} = 0$ V, $I_D = 1$ mA | 500 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 8$ mA | 2 | | V |
| I_{GSS} | $V_{GS} = \pm 20$ V _{DC} , $V_{DS} = 0$ | | | ± 200 nA |
| I_{DSS} | $V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0$ V | $T_J = 25^\circ\text{C}$ | | 400 μA |
| | | $T_J = 125^\circ\text{C}$ | | 2 mA |
| $R_{DS(on)}$ | $V_{GS} = 10$ V, $I_D = 0.5 \cdot I_{D25}$ | 44N50 | | 0.12 Ω |
| | | 48N50 | | 0.10 Ω |
| | Pulse test, $t \leq 300$ μs , duty cycle $d \leq 2$ % | | | |



miniBLOC, SOT-227 B (IXFN)



Either Source terminal at miniBLOC can be used as Main or Kelvin Source

Features

- International standard packages
- Molding epoxies meet UL 94 V-0 flammability classification
- SOT-227B miniBLOC with aluminium nitride isolation
- Low $R_{DS(on)}$ HDMOS™ process
- Unclamped Inductive Switching (UIS) rated
- Fast intrinsic rectifier

Applications

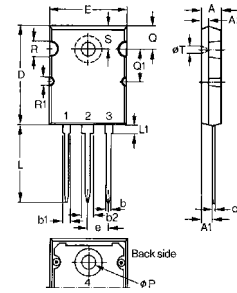
- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls

Advantages

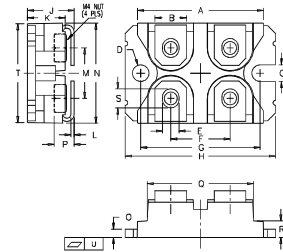
- Easy to mount
- Space savings
- High power density

| Symbol | Test Conditions | Characteristic Values | | |
|---|--|---|------|----------|
| | | (T _J = 25°C, unless otherwise specified) | | |
| | | min. | typ. | max. |
| g_{fs} | V _{DS} = 10 V; I _D = 0.5 • I _{D25} , pulse test | 22 | 42 | S |
| C_{iss} C_{oss} C_{rss} | V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz | | 8400 | pF |
| | | | 900 | pF |
| | | | 280 | pF |
| t_{d(on)} t_r t_{d(off)} t_f | V _{GS} = 10 V, V _{DS} = 0.5 • V _{DSS} , I _D = 0.5 • I _{D25} R _G = 1 Ω (External), | | 30 | ns |
| | | | 60 | ns |
| | | | 100 | ns |
| | | | 30 | ns |
| Q_{g(on)} Q_{gs} Q_{gd} | V _{GS} = 10 V, V _{DS} = 0.5 • V _{DSS} , I _D = 0.5 • I _{D25} | | 270 | nC |
| | | | 60 | nC |
| | | | 135 | nC |
| R_{thJC} R_{thCK} | TO-264 AA | | 0.15 | 0.25 K/W |
| R_{thJC} R_{thCK} | miniBLOC, SOT-227 B | | 0.05 | 0.24 K/W |

| Symbol | Test Conditions | Characteristic Values | | |
|---|--|---|------|--------|
| | | (T _J = 25°C, unless otherwise specified) | | |
| | | min. | typ. | max. |
| I_S | V _{GS} = 0 V | | | 48 A |
| I_{SM} | Repetitive; pulse width limited by T _{JM} | | | 192 A |
| V_{SD} | I _F = 100 A, V _{GS} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 % | | | 1.5 V |
| t_{rr} Q_{RM} I_{RM} | I _F = I _S , -di/dt = 100 A/μs, V _R = 100 V | | TBD | 250 ns |
| | | | 20 | μC |
| | | | | |

TO-264 AA Outline


| Dim. | Millimeter | | Inches | |
|------|-------------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.82 | 5.13 | .190 | .202 |
| A1 | 2.54 | 2.89 | .100 | .114 |
| A2 | 2.00 | 2.10 | .079 | .083 |
| b | 1.12 | 1.42 | .044 | .056 |
| b1 | 2.39 | 2.69 | .094 | .106 |
| b2 | 2.90 | 3.09 | .114 | .122 |
| c | 0.53 | 0.83 | .021 | .033 |
| D | 25.91 | 26.16 | 1.020 | 1.030 |
| E | 19.81 | 19.96 | .780 | .786 |
| e | 5.46 BSC .215 BSC | | | |
| J | 0.00 | 0.25 | .000 | .010 |
| K | 0.00 | 0.25 | .000 | .010 |
| L | 20.32 | 20.83 | .800 | .820 |
| L1 | 2.29 | 2.59 | .090 | .102 |
| P | 3.17 | 3.66 | .125 | .144 |
| Q | 6.07 | 6.27 | .239 | .247 |
| Q1 | 8.38 | 8.69 | .330 | .342 |
| R | 3.81 | 4.32 | .150 | .170 |
| R1 | 1.78 | 2.29 | .070 | .090 |
| S | 6.04 | 6.30 | .238 | .248 |
| T | 1.57 | 1.83 | .062 | .072 |

miniBLOC, SOT-227 B


M4 screws (4x) supplied

| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 31.50 | 31.88 | 1.240 | 1.255 |
| B | 7.80 | 8.20 | 0.307 | 0.323 |
| C | 4.09 | 4.29 | 0.161 | 0.169 |
| D | 4.09 | 4.29 | 0.161 | 0.169 |
| E | 4.09 | 4.29 | 0.161 | 0.169 |
| F | 14.91 | 15.11 | 0.587 | 0.595 |
| G | 30.12 | 30.30 | 1.186 | 1.193 |
| H | 38.00 | 38.23 | 1.496 | 1.505 |
| J | 11.68 | 12.22 | 0.460 | 0.481 |
| K | 8.92 | 9.60 | 0.351 | 0.378 |
| L | 0.76 | 0.84 | 0.030 | 0.033 |
| M | 12.60 | 12.85 | 0.496 | 0.506 |
| N | 25.15 | 25.42 | 0.990 | 1.001 |
| O | 1.98 | 2.13 | 0.078 | 0.084 |
| P | 4.95 | 5.97 | 0.195 | 0.235 |
| Q | 26.54 | 26.90 | 1.045 | 1.059 |
| R | 3.94 | 4.42 | 0.155 | 0.174 |
| S | 4.72 | 4.85 | 0.186 | 0.191 |
| T | 24.59 | 25.07 | 0.968 | 0.987 |
| U | -0.05 | 0.1 | -0.002 | 0.004 |

Fig. 1 Output Characteristics

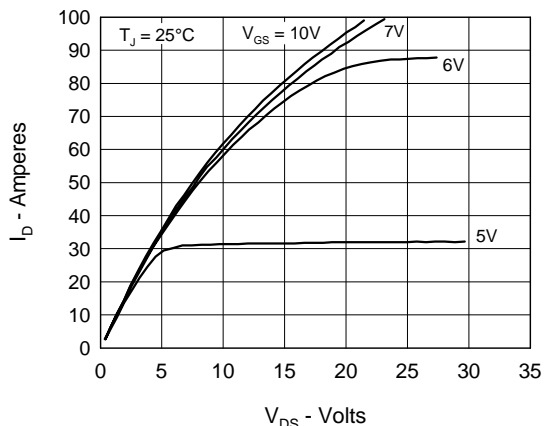


Fig. 3 $R_{DS(on)}$ vs. Drain Current

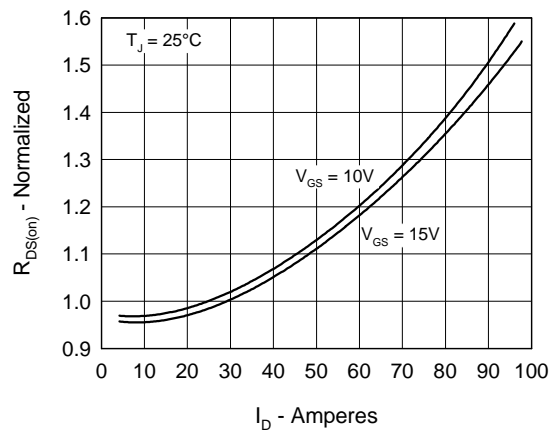


Fig. 5 Drain Current vs. Case Temperature

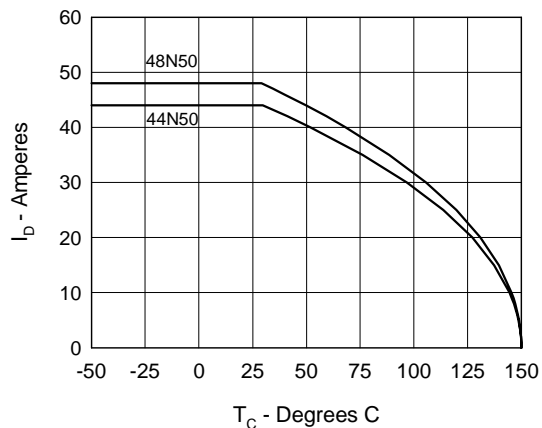


Fig. 2 Input Admittance

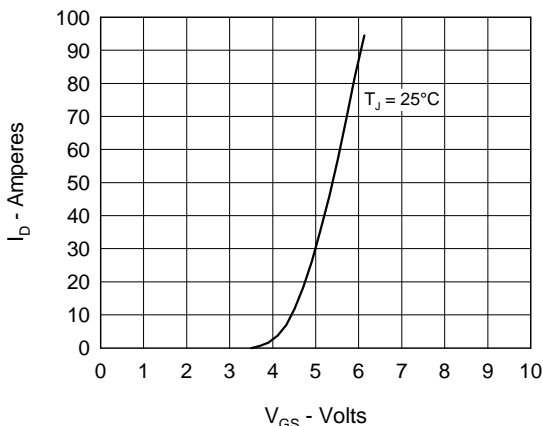


Fig. 4 Temperature Dependence of Drain to Source Resistance

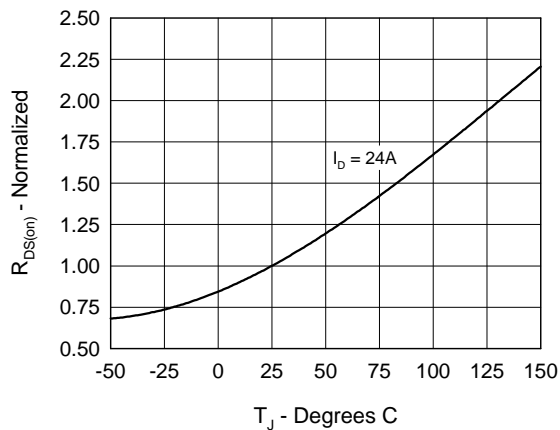


Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage



Fig.7 Gate Charge Characteristic Curve

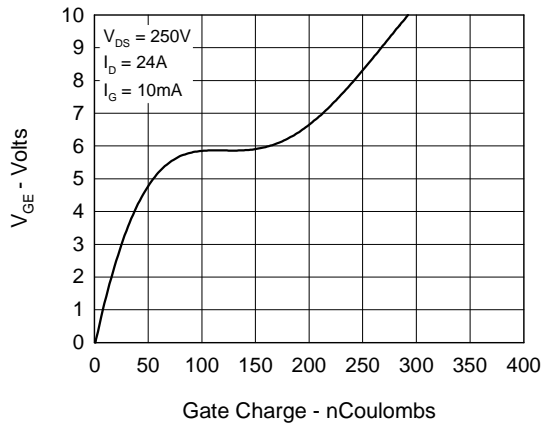


Fig.8 Capacitance Curves

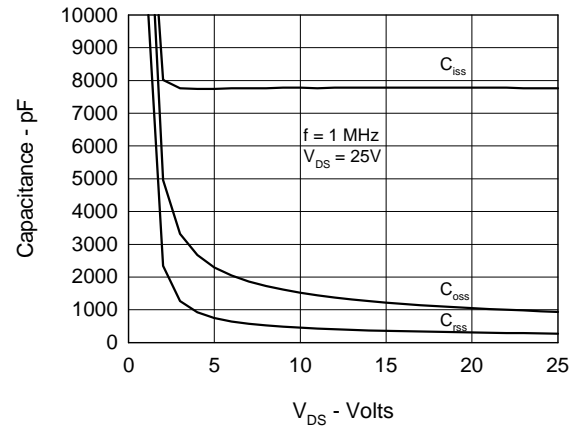


Fig.9 Source Current vs. Source to Drain Voltage

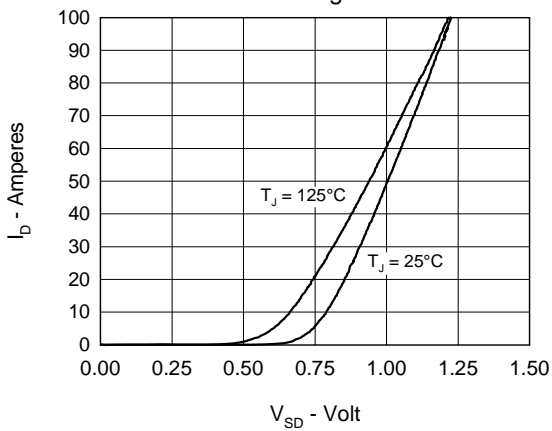
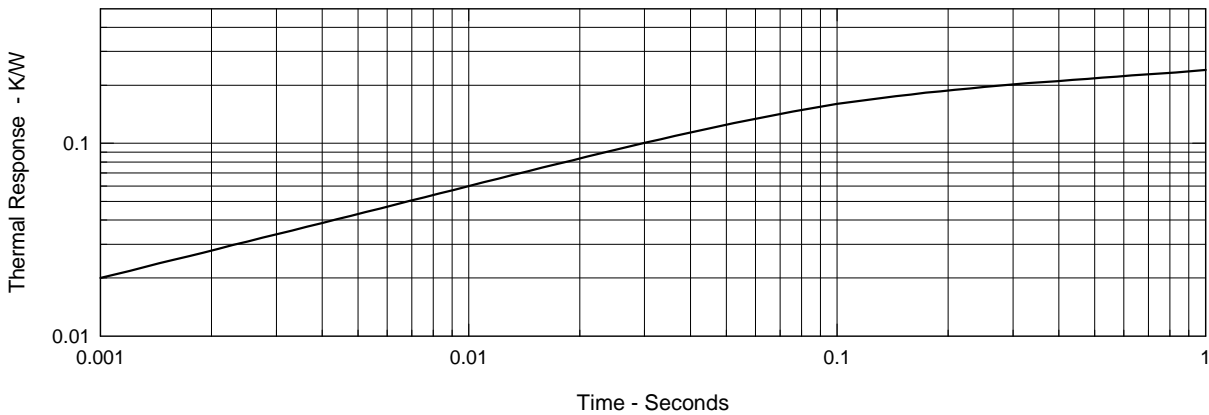


Fig.10 Transient Thermal Impedance





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