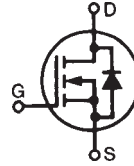


PolarHV™ HiPerFET IXFR 64N60P Power MOSFET

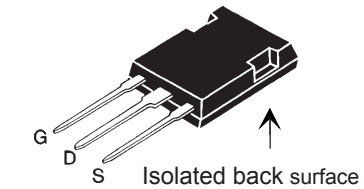
(Electrically Isolated Back Surface)

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode



| | | | |
|--------------|---|-----|----|
| V_{DSS} | = | 600 | V |
| I_{D25} | = | 36 | A |
| $R_{DS(on)}$ | ≤ | 105 | mΩ |
| t_{rr} | ≤ | 200 | ns |

ISOPLUS247 (IXFR)
E153432



G = Gate D = Drain
S = Source

| Symbol | Test Conditions | Maximum Ratings | |
|------------|---|-----------------|------|
| | | | |
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 150°C | 600 | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1\text{ M}\Omega$ | 600 | V |
| V_{GSS} | Continuous | ± 30 | V |
| V_{GSM} | Transient | ± 40 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 36 | A |
| I_{DM} | $T_C = 25^\circ\text{C}$, pulse width limited by T_{JM} | 150 | A |
| I_{AR} | $T_C = 25^\circ\text{C}$ | 64 | A |
| E_{AR} | $T_C = 25^\circ\text{C}$ | 80 | mJ |
| E_{AS} | $T_C = 25^\circ\text{C}$ | 3.5 | J |
| dv/dt | $I_S \leq I_{DM}$, $di/dt \leq 100\text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2\ \Omega$ | 20 | V/ns |
| P_D | $T_C = 25^\circ\text{C}$ | 360 | W |
| T_J | | -55 ... +150 | °C |
| T_{JM} | | 150 | °C |
| T_{stg} | | -55 ... +150 | °C |
| V_{ISOL} | 50/60 Hz, RMS, 1 minute | 2500 | V~ |
| T_L | 1.6 mm (0.062 in.) from case for 10 s | 300 | °C |
| F_C | Mounting force | 22..130/5..29 | N/lb |
| Weight | ISOPLUS247 | 5 | g |

Features

- 1 Silicon chip on Direct-Copper-Bond substrate
 - High power dissipation
 - Isolated mounting surface
 - 2500V electrical isolation
- 1 International standard packages
- 1 Unclamped Inductive Switching (UIS) rated
- 1 Low package inductance
 - easy to drive and to protect

Advantages

- 1 Easy to mount
- 1 Space savings
- 1 High power density

| Symbol | Test Conditions | Characteristic Values | | |
|--------------|--|-----------------------|------|--|
| | | Min. | Typ. | Max. |
| BV_{DSS} | $V_{GS} = 0\text{ V}$, $I_D = 3\text{ mA}$ | 600 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 8\text{ mA}$ | 3.0 | | 5.0 V |
| I_{GSS} | $V_{GS} = \pm 30\text{ V}_{DC}$, $V_{DS} = 0$ | | | ± 200 nA |
| I_{DSS} | $V_{DS} = V_{DSS}$, $V_{GS} = 0\text{ V}$ | | | 25 μA 1000 μA |
| $R_{DS(on)}$ | $V_{GS} = 10\text{ V}$, $I_D = I_T$, Note 1 | | | 105 mΩ |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|---|---|------|--------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 20\text{ V}; I_D = I_T$, Note 1 | 40 | 63 | S |
| C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | 12 | nF |
| C_{oss} | | | 1150 | pF |
| C_{rss} | | | 80 | pF |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_T$ $R_G = 1\ \Omega$ (External) | | 28 | ns |
| t_r | | | 23 | ns |
| $t_{d(off)}$ | | | 79 | ns |
| t_f | | | 24 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_T$ | | 200 | nC |
| Q_{gs} | | | 70 | nC |
| Q_{gd} | | | 68 | nC |
| R_{thJC} | | | 0.35 | $^\circ\text{C/W}$ |
| R_{thC} | | 0.15 | | $^\circ\text{C/W}$ |

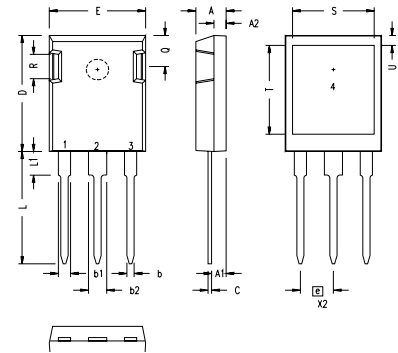
Source-Drain Diode

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|----------|--|---|------|---------------|
| | | Min. | Typ. | Max. |
| I_S | $V_{GS} = 0\text{ V}$ | | | 64 A |
| I_{SM} | Repetitive | | | 150 A |
| V_{SD} | $I_F = I_S, V_{GS} = 0\text{ V}$ | | | 1.5 V |
| t_{rr} | $I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 100\text{ V}$ | | | 200 ns |
| Q_{RM} | | | 0.6 | μC |
| I_{RM} | | | 6.0 | A |

Notes:

1. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$;
2. Test current $I_T = 32\text{ A}$.

ISOPLUS247 Outline



| SYM | INCHES | | MILLIMETERS | |
|-----|----------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .190 | .205 | 4.83 | 5.21 |
| A1 | .090 | .100 | 2.29 | 2.54 |
| A2 | .075 | .085 | 1.91 | 2.16 |
| b | .045 | .055 | 1.14 | 1.40 |
| b1 | .075 | .084 | 1.91 | 2.13 |
| b2 | .115 | .123 | 2.92 | 3.12 |
| C | .024 | .031 | 0.61 | 0.80 |
| D | .819 | .840 | 20.80 | 21.34 |
| E | .620 | .635 | 15.75 | 16.13 |
| e | .215 BSC | | 5.45 BSC | |
| L | .780 | .800 | 19.81 | 20.32 |
| L1 | .150 | .170 | 3.81 | 4.32 |
| Q | .220 | .244 | 5.59 | 6.20 |
| R | .170 | .190 | 4.32 | 4.83 |
| S | .520 | .540 | 13.21 | 13.72 |
| T | .620 | .640 | 15.75 | 16.26 |
| U | .065 | .080 | 1.65 | 2.03 |

- 1 - GATE
- 2 - DRAIN (COLLECTOR)
- 3 - SOURCE (EMITTER)
- 4 - NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by 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
 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 6,710,405B2 6,759,692
 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

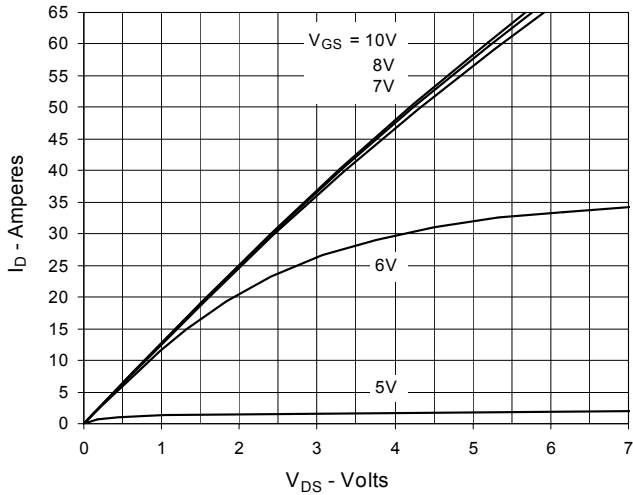
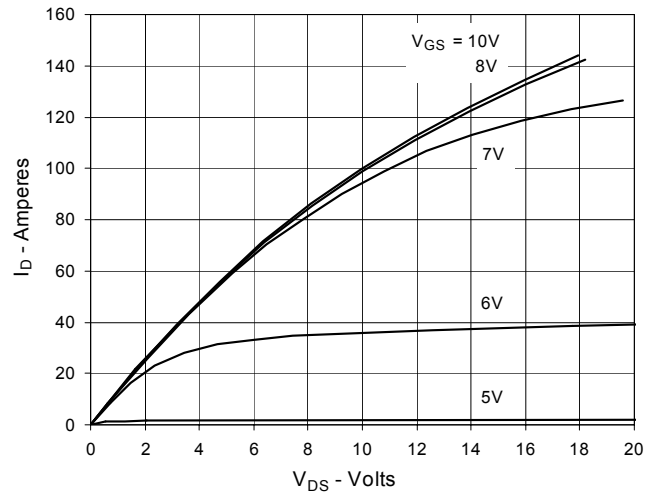
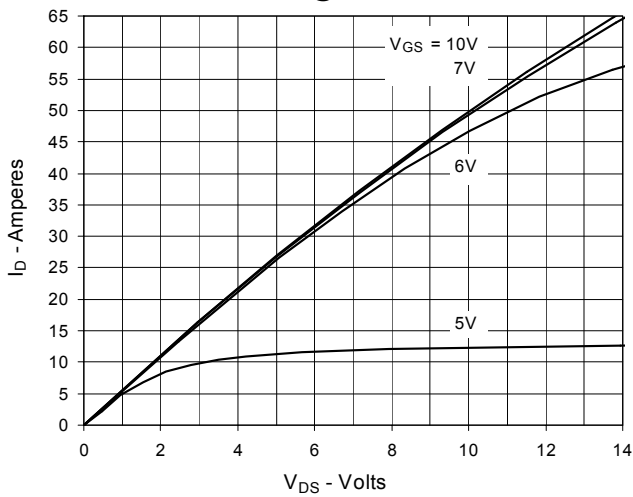
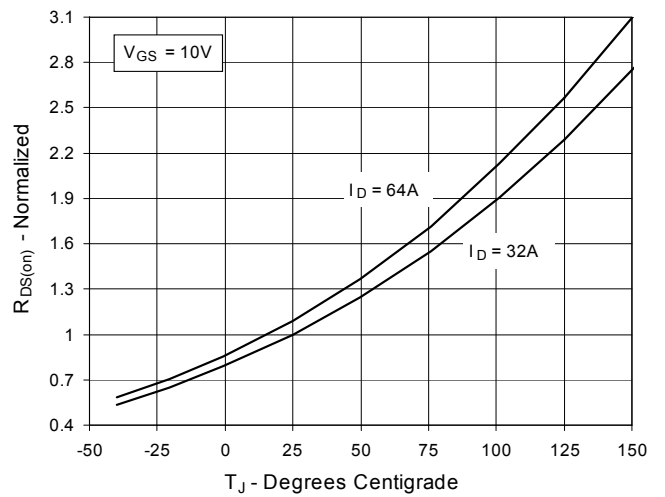
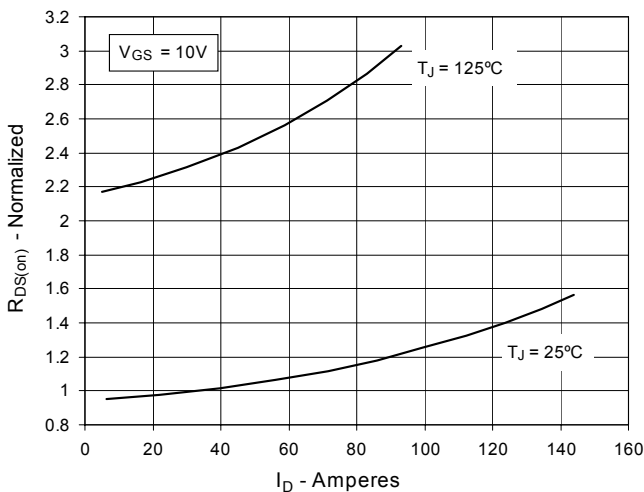
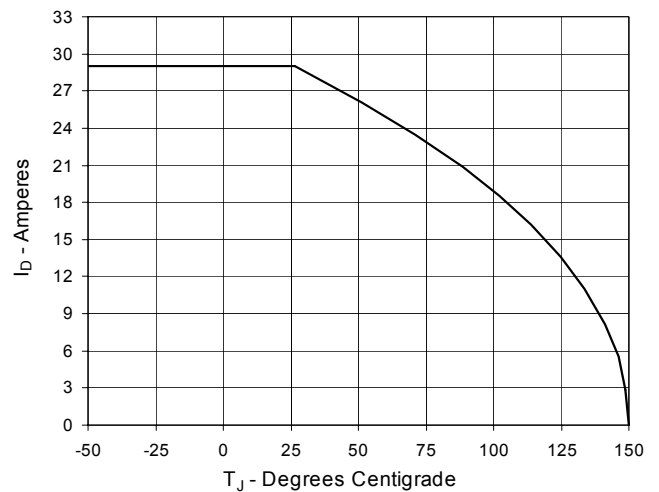
Fig. 1. Output Characteristics @ 25°C

Fig. 2. Extended Output Characteristics @ 25°C

Fig. 3. Output Characteristics @ 125°C

Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 32\text{A}$ vs. Junction Temperature

Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 32\text{A}$ vs. Drain Current

Fig. 6. Maximum Drain Current vs. Case Temperature


Fig. 7. Input Admittance

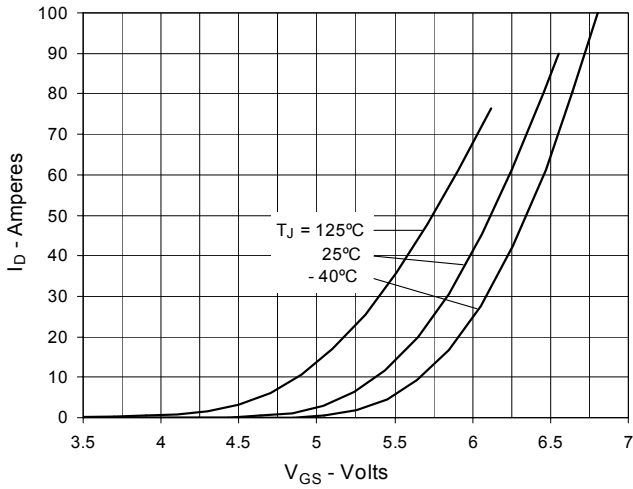


Fig. 8. Transconductance

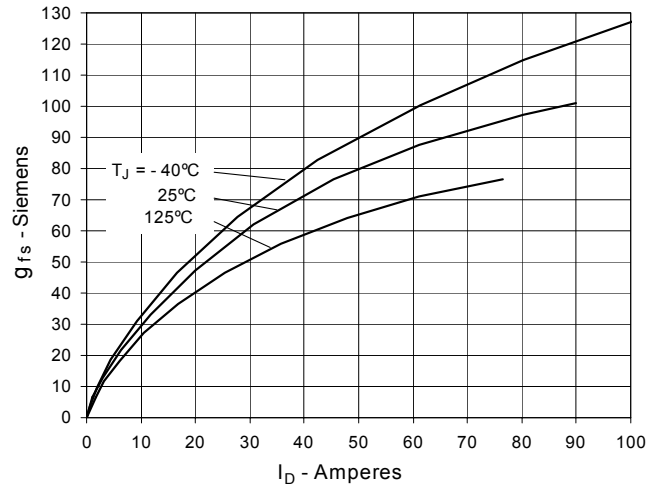


Fig. 9. Forward Voltage Drop of Intrinsic Diode

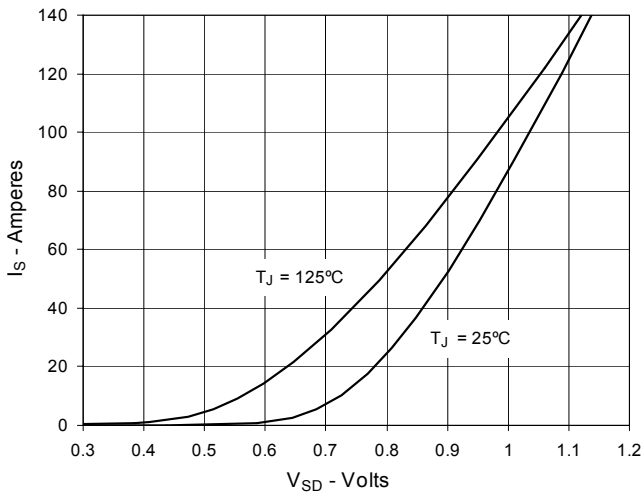


Fig. 10. Gate Charge

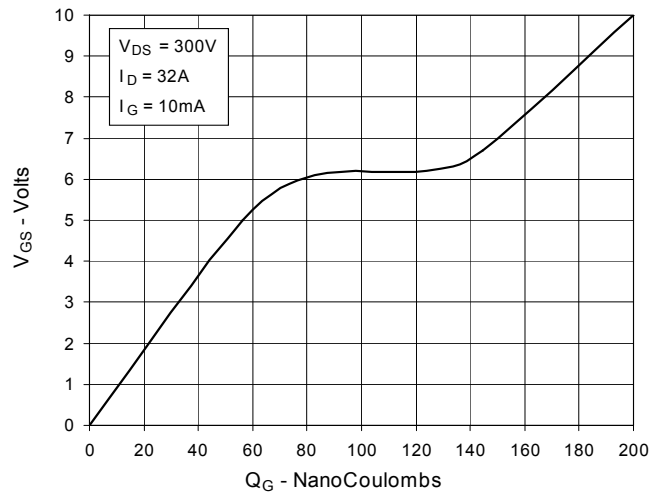


Fig. 11. Capacitance

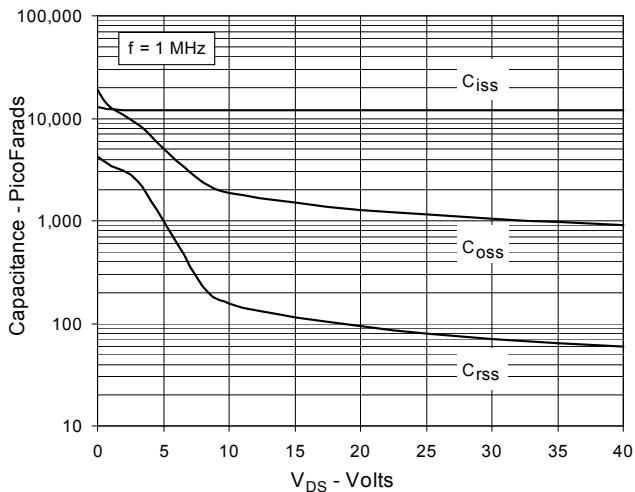


Fig. 12. Forward-Bias Safe Operating Area

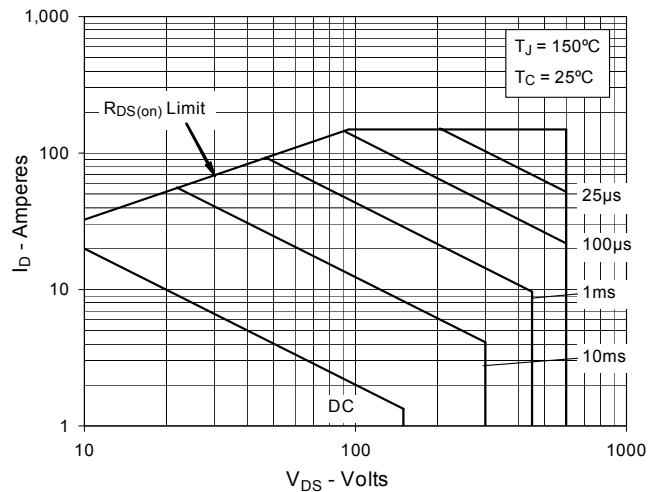


Fig. 13. Maximum Transient Thermal Resistance

