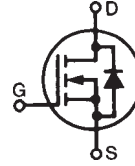


PolarHV™ HiPerFET Power MOSFET

IXFK 64N60P
IXFX 64N60P

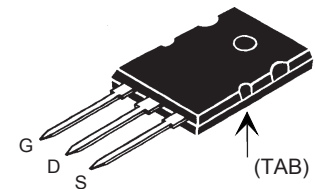
$V_{DSS} = 600 \text{ V}$
 $I_{D25} = 64 \text{ A}$
 $R_{DS(on)} \leq 96 \text{ m}\Omega$
 $t_{rr} \leq 200 \text{ ns}$

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

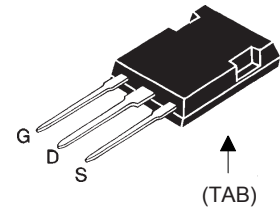


| Symbol | Test Conditions | Maximum Ratings | |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 150°C | 600 | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$ | 600 | V |
| V_{GSS} | Continuous | ± 30 | V |
| V_{GSM} | Transient | ± 40 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 64 | 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 | $T_C = 25^\circ\text{C}$ | 1040 | 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 (0.062 in.) from case for 10 s | 300 | $^\circ\text{C}$ |
| T_{SOLD} | Plastic body for 10 s | 260 | $^\circ\text{C}$ |
| F_C | Mounting force (PLUS247) | 20..120/4.5..25 | N/lb |
| M_d | Mounting torque (TO-264) | 1.13/10 | Nm/lb.in. |
| Weight | TO-264 | 10 | g |
| | PLUS247 | 6 | g |

TO-264 (IXFK)



PLUS247 (IXFX)



G = Gate D = Drain
S = Source Tab = Drain

Features

- † International standard packages
- † Fast recovery diode
- † Unclamped Inductive Switching (UIS) rated
- † Low package inductance
- easy to drive and to protect

Advantages

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

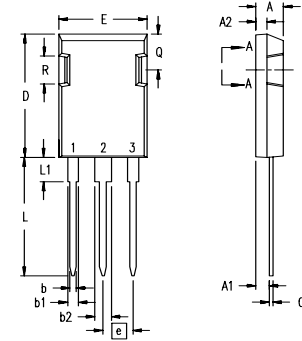
| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified) | Characteristic Values | | |
|--------------|-----------------------------------------------------------------------------|-----------------------|------|----------------------|
| | | Min. | Typ. | Max. |
| BV_{DSS} | $V_{GS} = 0 \text{ V}$, $I_D = 3 \text{ mA}$ | 600 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 8 \text{ mA}$ | 3.0 | | 5.0 V |
| I_{GSS} | $V_{GS} = \pm 30 \text{ V}_{DC}$, $V_{DS} = 0$ | | | $\pm 200 \text{ nA}$ |
| I_{DSS} | $V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$ | | | 25 μA |
| | | | | 1000 μA |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$, $I_D = 0.5 I_{D25}$, Note 1 | | | 96 $\text{m}\Omega$ |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|--------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 20\text{ V}; I_D = 0.5 I_{D25}$, 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 |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$ $R_G = 1\ \Omega$ (External) | | 28 | ns |
| t_r | | | 23 | ns |
| $t_{d(off)}$ | | | 79 | ns |
| t_f | | | 24 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$ | | 200 | nC |
| Q_{gs} | | | 70 | nC |
| Q_{gd} | | | 68 | nC |
| R_{thJC} | | | 0.12 | $^\circ\text{C/W}$ |
| R_{thCS} | | 0.15 | | $^\circ\text{C/W}$ |

| 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} | $I_F = I_S, V_{GS} = 0\text{ V}$, Note 1 | | | 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 |

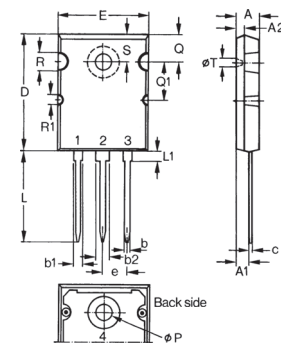
Notes:

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

PLUS 247™ Outline


Terminals: 1 - Gate
 2 - Drain (Collector)
 3 - Source (Emitter)
 4 - Drain (Collector)

| Dim. | Millimeter | | Inches | |
|----------------|------------|-------|----------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.83 | 5.21 | .190 | .205 |
| A ₁ | 2.29 | 2.54 | .090 | .100 |
| A ₂ | 1.91 | 2.16 | .075 | .085 |
| b | 1.14 | 1.40 | .045 | .055 |
| b ₁ | 1.91 | 2.13 | .075 | .084 |
| b ₂ | 2.92 | 3.12 | .115 | .123 |
| C | 0.61 | 0.80 | .024 | .031 |
| D | 20.80 | 21.34 | .819 | .840 |
| E | 15.75 | 16.13 | .620 | .635 |
| e | 5.45 BSC | | .215 BSC | |
| L | 19.81 | 20.32 | .780 | .800 |
| L1 | 3.81 | 4.32 | .150 | .170 |
| Q | 5.59 | 6.20 | .220 | 0.244 |
| R | 4.32 | 4.83 | .170 | .190 |

TO-264 Outline


| Dim. | Millimeter | | Inches | |
|----------------|------------|-------|----------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.82 | 5.13 | .190 | .202 |
| A ₁ | 2.54 | 2.89 | .100 | .114 |
| A ₂ | 2.00 | 2.10 | .079 | .083 |
| b | 1.12 | 1.42 | .044 | .056 |
| b ₁ | 2.39 | 2.69 | .094 | .106 |
| b ₂ | 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 |

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 | 6,710,405 B2 | 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

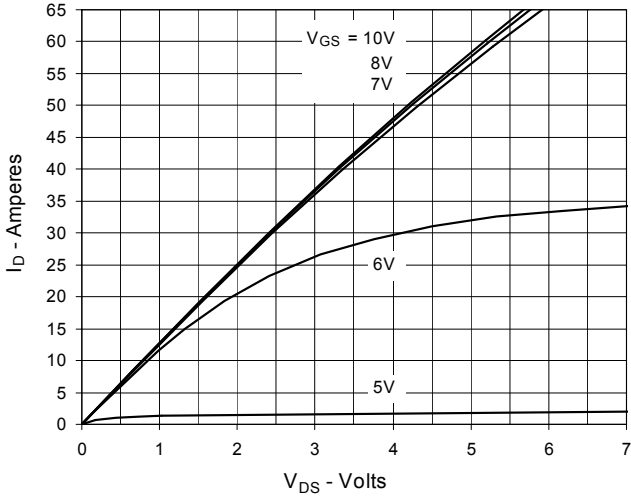


Fig. 2. Extended Output Characteristics
@ 25°C

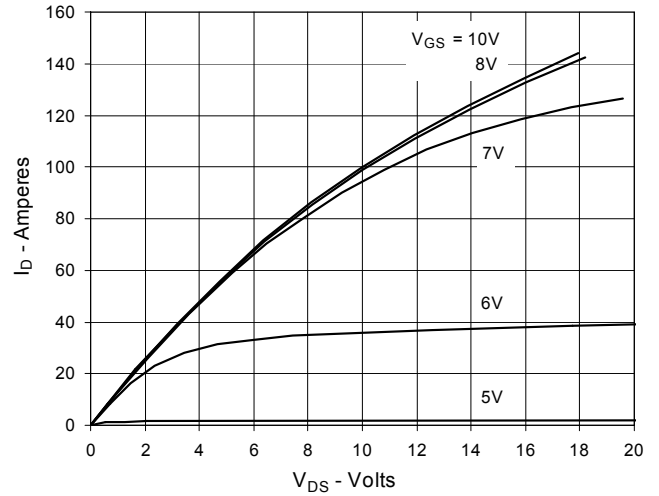


Fig. 3. Output Characteristics
@ 125°C

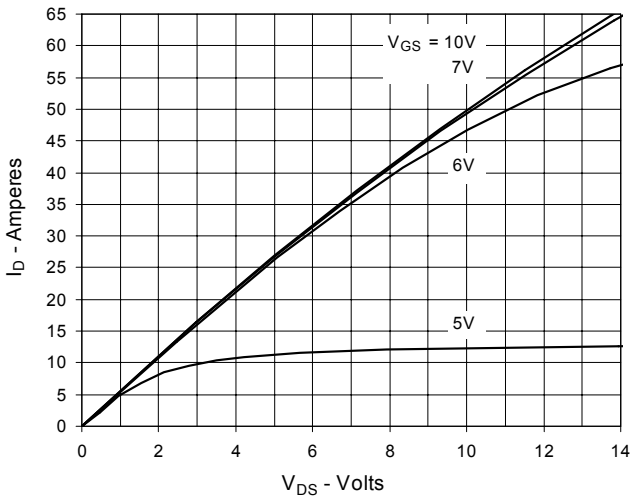


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 32\text{A}$ vs. Junction Temperature

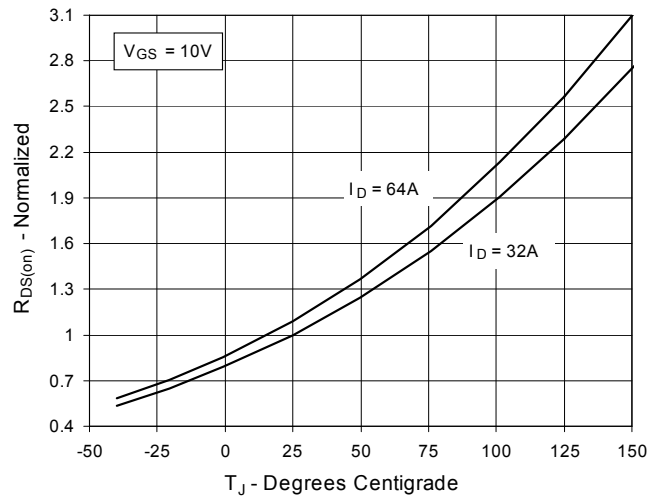


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 32\text{A}$ vs. Drain Current

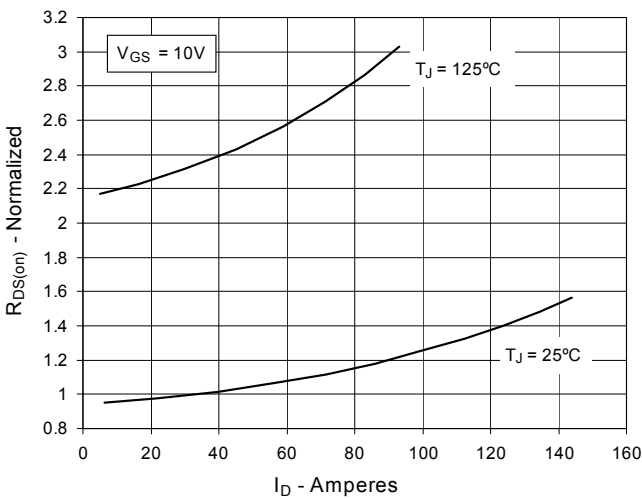


Fig. 6. Maximum Drain Current vs. Case Temperature

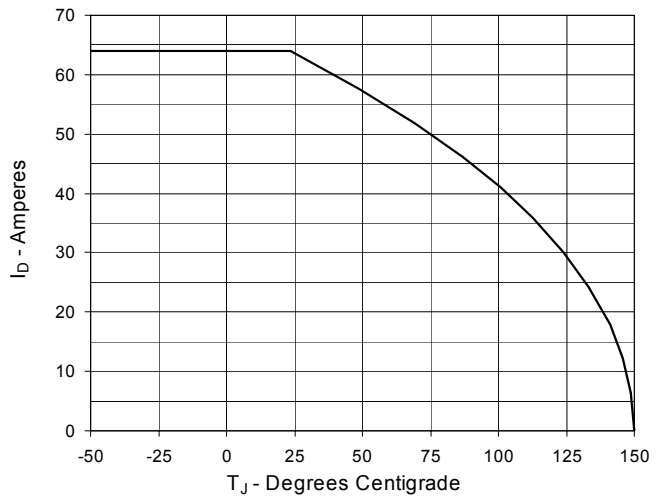


Fig. 7. Input Admittance

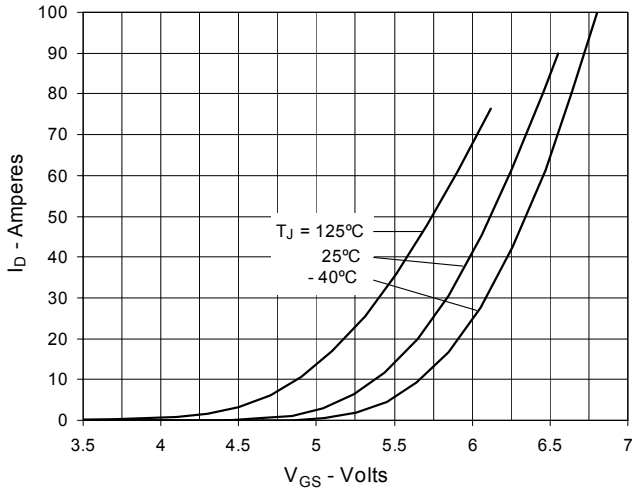


Fig. 8. Transconductance

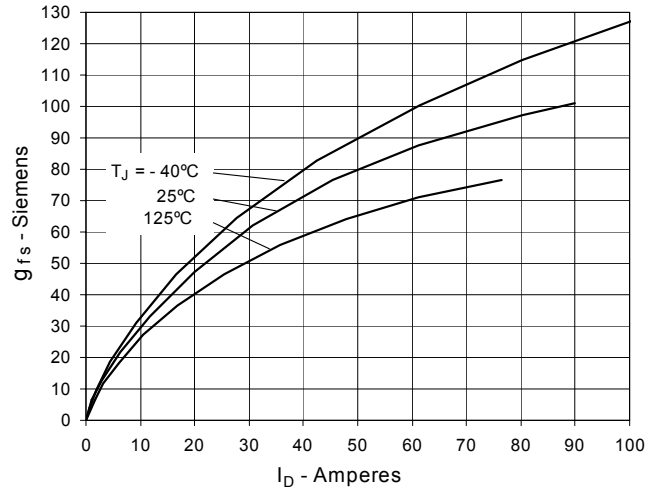


Fig. 9. Forward Voltage Drop of Intrinsic Diode

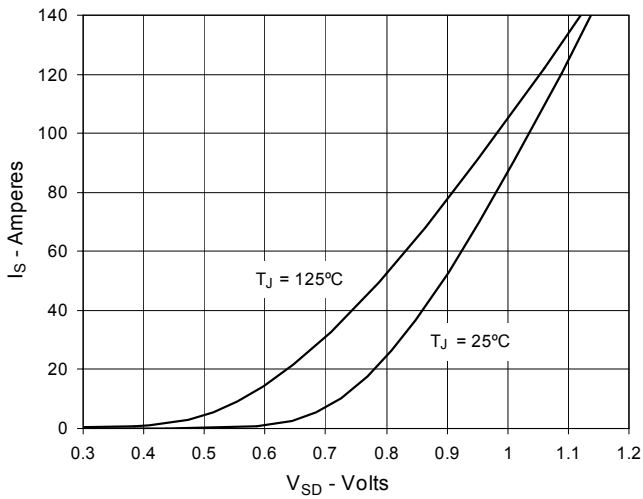


Fig. 10. Gate Charge

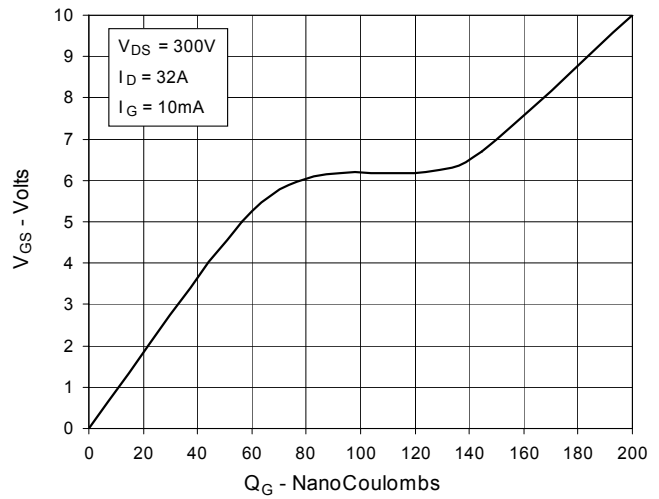


Fig. 11. Capacitance

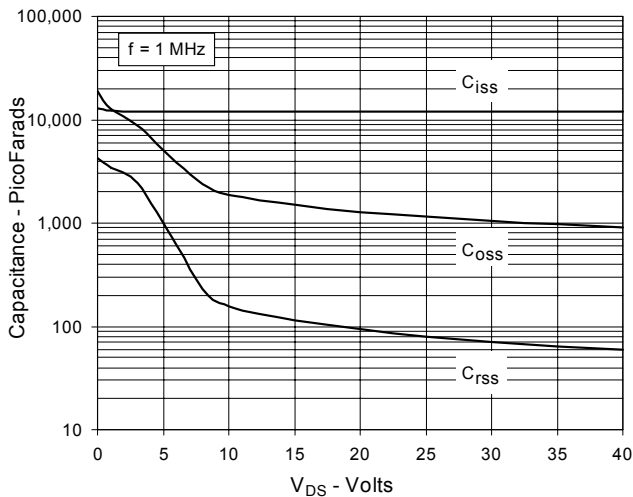


Fig. 12. Forward-Bias Safe Operating Area

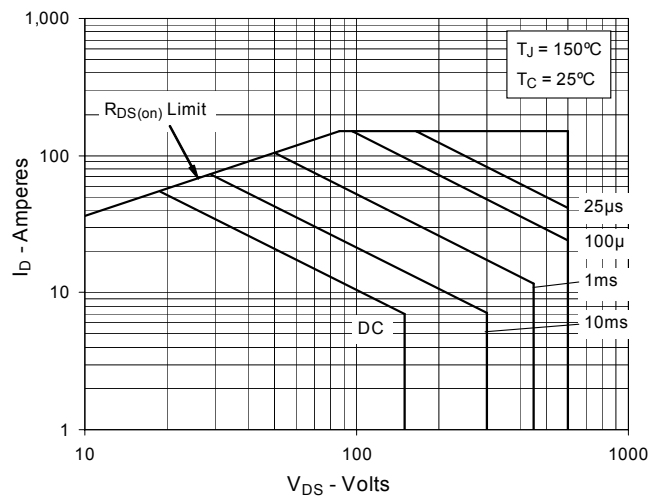


Fig. 13. Maximum Transient Thermal Resistance

