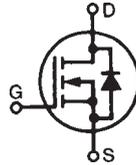


Power MOSFET

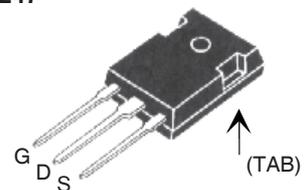
Low $R_{DS(on)}$, High Voltage,
Superjunction MOSFET

IXKH 47N60C3

$$\begin{aligned} V_{DSS} &= 600 \text{ V} \\ I_{D25} &= 47 \text{ A} \\ R_{DS(on)} &= 70 \text{ m}\Omega \end{aligned}$$



| Symbol | Test Conditions | Maximum Ratings | |
|---------------|--|-----------------|------------------|
| V_{DSS} | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$ | 600 | V |
| V_{GS} | Continuous | ± 20 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 47 | A |
| I_{D100} | $T_C = 100^\circ\text{C}$ | 30 | A |
| E_{AS} | $I_o = 10\text{A}, T_C = 25^\circ\text{C}$ | 1800 | mJ |
| P_D | $T_C = 25^\circ\text{C}$ | 415 | W |
| T_J | | -55 ... +150 | $^\circ\text{C}$ |
| T_{JM} | | 150 | $^\circ\text{C}$ |
| T_{stg} | | -55 ... +125 | $^\circ\text{C}$ |
| T_L | 1.6 mm (0.062 in.) from case for 10 s | 300 | $^\circ\text{C}$ |
| Weight | | 6 | g |
| M_D | Mounting torque | 1.13/10 | Nm/lb-in |

TO-247


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

Features

- 3RD generation Superjunction power MOSFET
 - High blocking capability
 - Low on resistance
 - Avalanche rated for unclamped inductive switching (UIS)
- Low thermal resistance due to reduced chip thickness

Applications

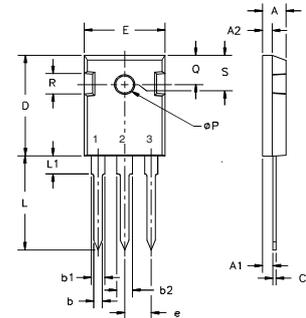
- Switched Mode Power Supplies (SMPS)
- Uninterruptible Power Supplies (UPS)
- Power Factor Correction (PFC)
- Welding
- Inductive Heating

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|---|---|-----------|--|
| | | min. | typ. | max. |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}, I_D = I_{D100}$, Note 1 $V_{GS} = 10 \text{ V}, I_D = I_{D100}$, Note 1, $T_J = 125^\circ\text{C}$ | | 60 150 | 70 m Ω m Ω |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 2 \text{ mA}$ | 2 | 3 | 4 V |
| I_{DSS} | $V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ | | | $T_J = 25^\circ\text{C}$ $T_J = 150^\circ\text{C}$ 25 μA 250 μA |
| I_{GSS} | $V_{GS} = \pm 20 V_{DC}, V_{DS} = 0$ | | | $\pm 100 \text{ nA}$ |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|---|---|------|---------|
| | | min. | typ. | max. |
| g_{FS} | $V_{DS} = 10\text{ V}, I_D = I_{D100}$ | | 40 | S |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 350\text{ V}, I_D = 40\text{ A}$ | | 252 | 320 nC |
| Q_{gs} | | | 24 | nC |
| Q_{gd} | | | 121 | nC |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 380\text{ V}$ $I_D = 47\text{ A}, R_G = 4.7\ \Omega$ | | 20 | ns |
| t_r | | | 27 | ns |
| $t_{d(off)}$ | | | 111 | ns |
| t_f | | | 10 | ns |
| R_{thJC} | | | | 0.3 K/W |
| R_{thCH} | | 0.25 | | K/W |

| Reverse Correction | | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------------|---|---|------|-------|
| Symbol | Test Conditions | min. | typ. | max. |
| V_{SD} | $I_F = I_{D100}, V_{GS} = 0\text{ V}$ Note 1 | | 1.0 | 1.2 V |

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

TO-247 Outline


Terminals: 1 - Gate 2 - Drain
3 - Source Tab - 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 |
| S | 6.15 | BSC | 242 | BSC |

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

| | | | | | | | | |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-------------|-------------|
| IXYS MOSFETs and IGBTs are covered by one or more | 4,835,592 | 4,881,106 | 5,017,508 | 5,049,961 | 5,187,117 | 5,486,715 | 6,306,728B1 | 6,259,123B1 |
| | 4,850,072 | 4,931,844 | 5,034,796 | 5,063,307 | 5,237,481 | 5,381,025 | 6,404,065B1 | 6,162,665 |

Fig. 1. Output Characteristics @ 25 Deg. C

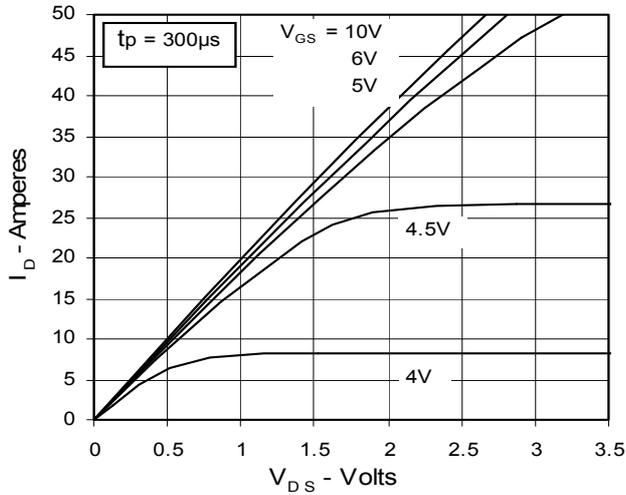


Fig. 2. Extended Output Characteristics @ 25 deg. C

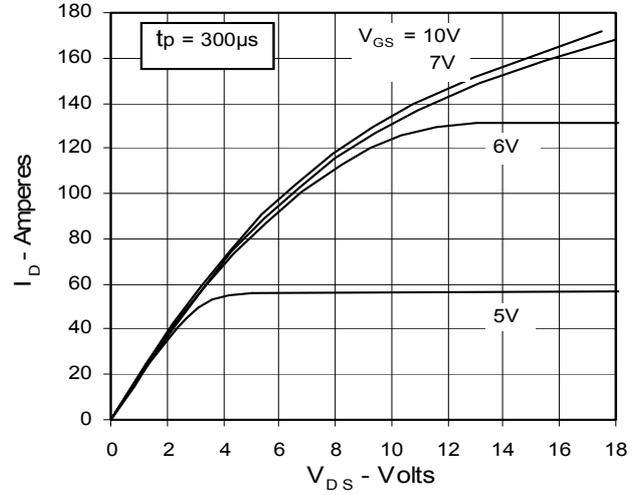


Fig. 3. Output Characteristics @ 125 Deg. C

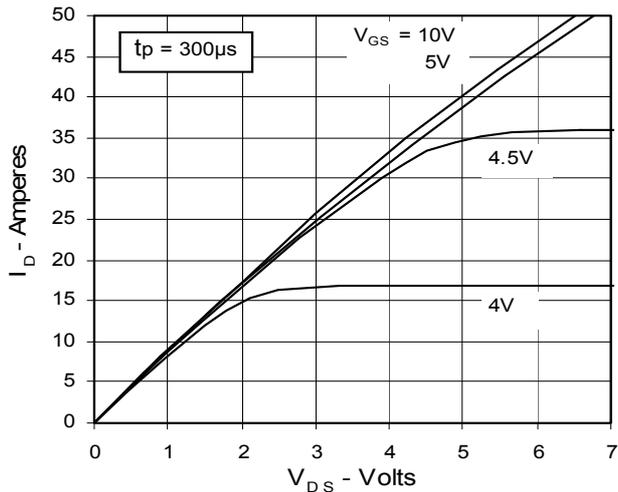


Fig. 4. $R_{DS(on)}$ Normalized to I_{D100} Value vs. Junction Temperature

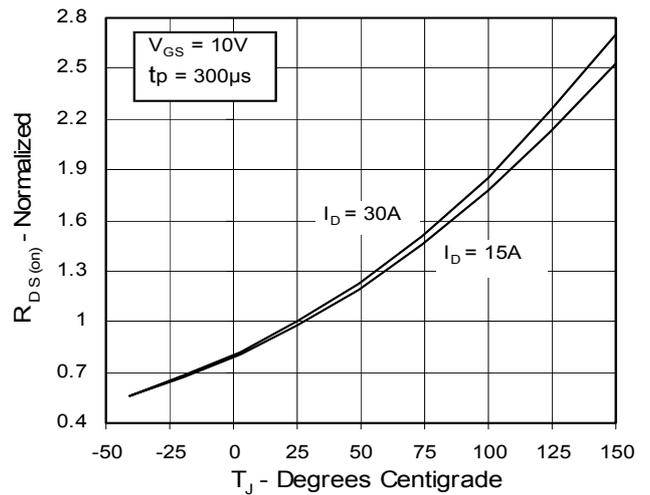


Fig. 5. $R_{DS(on)}$ Normalized to I_{D100} Value vs. I_D

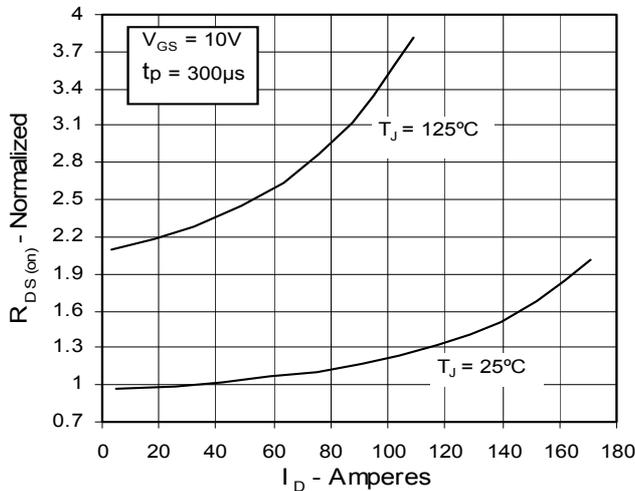


Fig. 6. Drain Current vs. Case Temperature

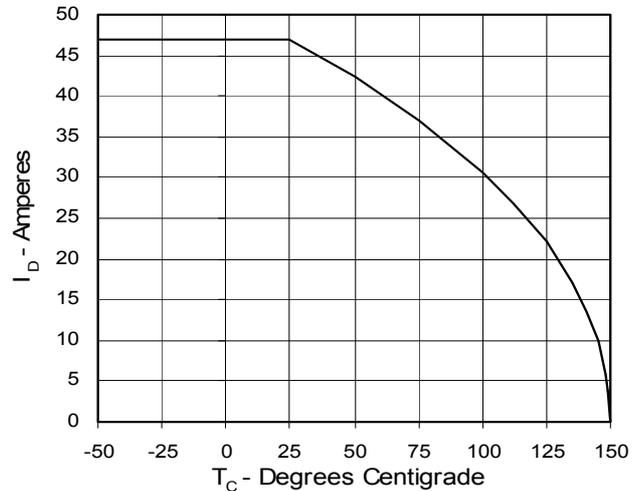


Fig. 7. Input Admittance

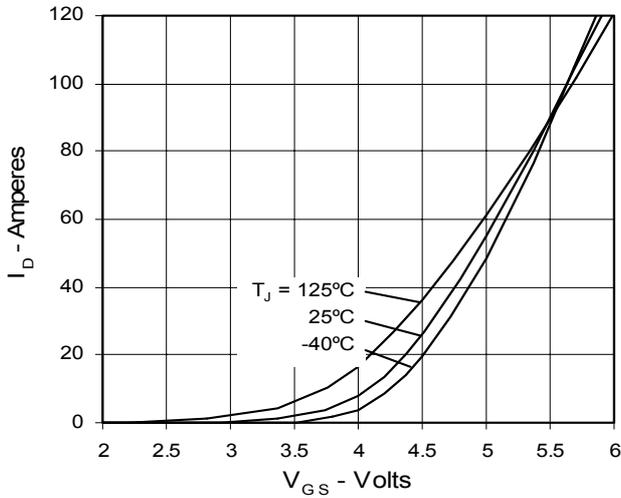


Fig. 8. Transconductance

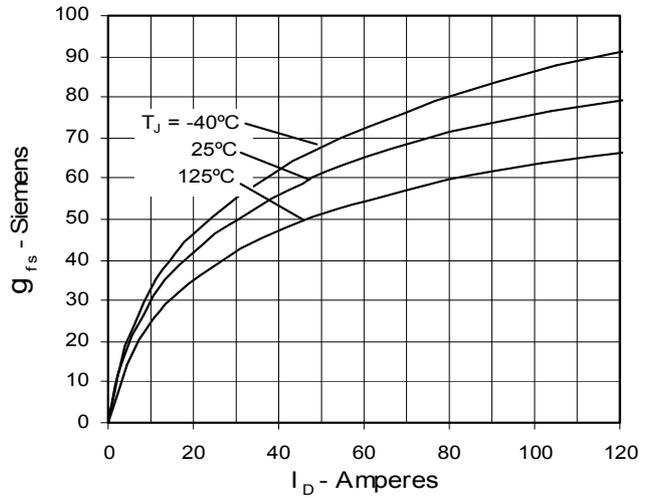


Fig. 9. Source Current vs. Source-To-Drain Voltage

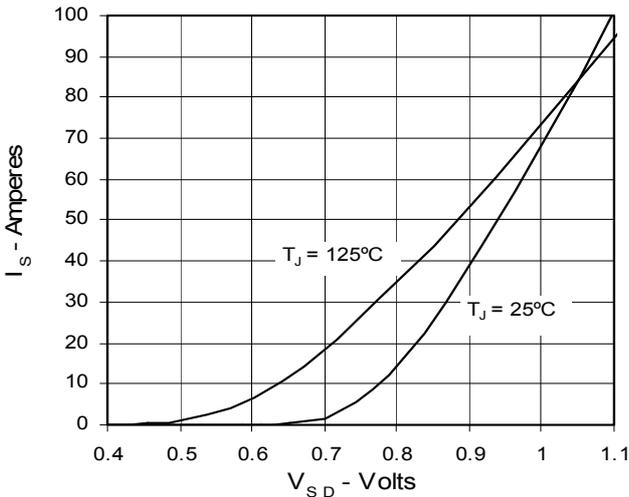


Fig. 10. Gate Charge

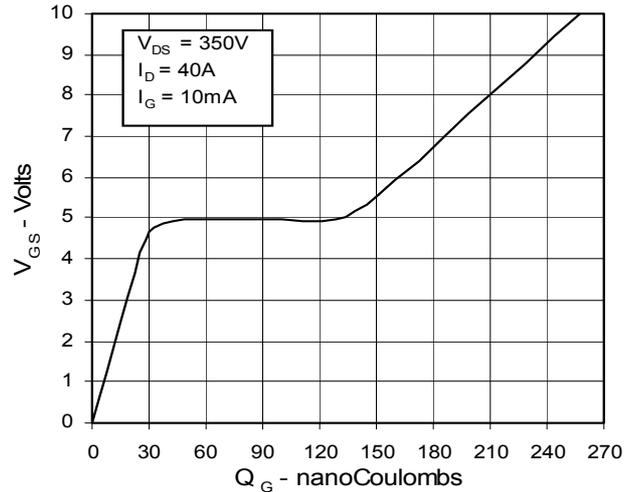


Fig. 11. Capacitance

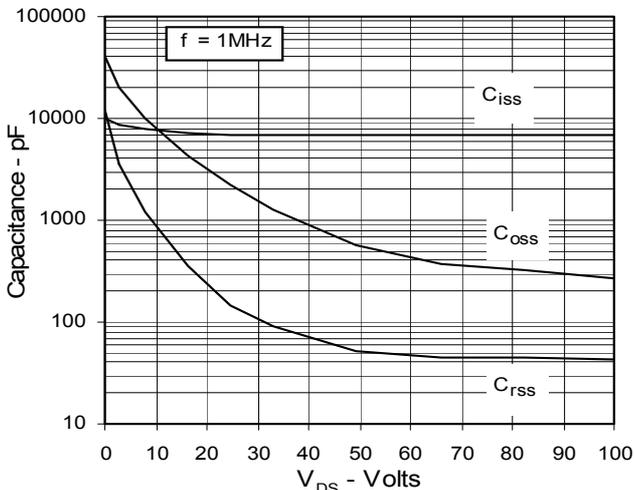
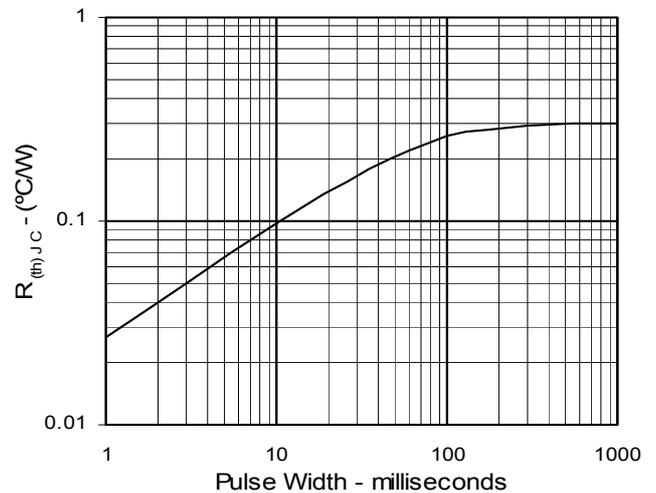


Fig. 12. Maximum Transient Thermal Resistance



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| | | | | | | | | |
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| | 4,850,072 | 4,931,844 | 5,034,796 | 5,063,307 | 5,237,481 | 5,381,025 | 6,404,065B1 | 6,162,665 |