

HiPerFET™ Power MOSFETs Q-CLASS

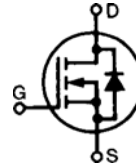
Single MOSFET Die

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

IXFK 27N80Q
IXFX 27N80Q

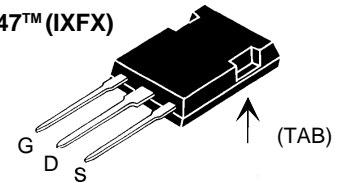
V_{DSS} = 800 V
I_{D25} = 27 A
R_{DS(on)} = 320 mΩ

t_{rr} ≤ 250 ns

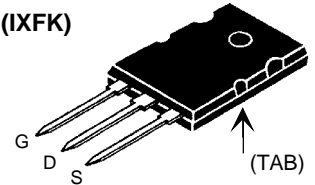


| Symbol | Test Conditions | Maximum Ratings | |
|------------------|---|-----------------|-----------------|
| V _{DSS} | T _J = 25°C to 150°C | 800 | V |
| V _{DGR} | T _J = 25°C to 150°C; R _{GS} = 1 MΩ | 800 | V |
| V _{GS} | Continuous | ±20 | V |
| V _{GSM} | Transient | ±30 | V |
| I _{D25} | T _C = 25°C | 27 | A |
| I _{DM} | T _C = 25°C, pulse width limited by T _{JM} | 108 | A |
| I _{AR} | T _C = 25°C | 27 | A |
| E _{AR} | T _C = 25°C | 60 | mJ |
| E _{AS} | T _C = 25°C | 2.5 | J |
| dv/dt | I _S ≤ I _{DM} , di/dt ≤ 100 A/μs, V _{DD} ≤ V _{DSS} T _J ≤ 150°C, R _G = 2 Ω | 5 | V/ns |
| P _D | T _C = 25°C | 500 | W |
| T _J | | -55 ... +150 | °C |
| T _{JM} | | 150 | °C |
| T _{stg} | | -55 ... +150 | °C |
| T _L | 1.6 mm (0.063 in.) from case for 10 s | 300 | °C |
| M _d | Mounting torque | TO-264 | 0.4/6 Nm/lb.in. |
| Weight | | PLUS 247 | 6 g |
| | | TO-264 | 10 g |

PLUS247™ (IXFX)



TO-264 AA (IXFK)



G = Gate
S = Source

D = Drain
TAB = Drain

Features

- IXYS advanced low Q_g process
- Low gate charge and capacitances
 - easier to drive
 - faster switching
- International standard packages
- Low R_{DS(on)}
- Rated for unclamped Inductive load switching (UIS) rated
- Molding epoxies meet UL 94 V-0 flammability classification

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control
- Temperature and lighting controls

Advantages

- PLUS 247™ package for clip or spring mounting
- Space savings
- High power density

| 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 | 800 | | V |
| V _{GS(th)} | V _{DS} = V _{GS} , I _D = 4 mA | 2.0 | | 4.5 V |
| I _{GSS} | V _{GS} = ±20 V, V _{DS} = 0 | | | ±100 nA |
| I _{DSS} | V _{DS} = V _{DSS} V _{GS} = 0 V T _J = 125°C | | | 100 μA 2 mA |
| R _{DS(on)} | V _{GS} = 10 V, I _D = 0.5 • I _{D25} Note 1 | | | 320 mΩ |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|--|---|------|------|
| | | min. | typ. | max. |
| g_{fs} | $V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ Note 1 | 20 | 27 | S |
| C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | 7600 | pF |
| C_{oss} | | | 750 | pF |
| C_{rss} | | | 120 | pF |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$ (External), | | 20 | ns |
| t_r | | | 28 | ns |
| $t_{d(off)}$ | | | 50 | ns |
| t_f | | | 13 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ | | 170 | nC |
| Q_{gs} | | | 47 | nC |
| Q_{gd} | | | 65 | nC |
| R_{thJC} | | | 0.26 | K/W |
| R_{thCK} | | 0.15 | | K/W |

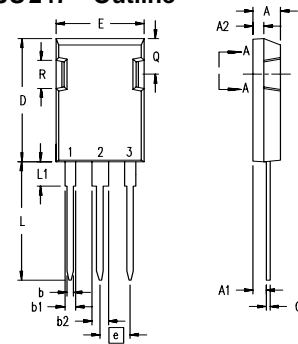
| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|----------|--|---|------|---------------|
| | | min. | typ. | max. |
| I_s | $V_{GS} = 0\text{ V}$ | | 27 | A |
| I_{SM} | Repetitive; pulse width limited by T_{JM} | | 108 | A |
| V_{SD} | $I_F = I_s, V_{GS} = 0\text{ V}$, Note 1 | | 1.5 | V |
| t_{rr} | $I_F = I_s, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$ | | 250 | ns |
| Q_{RM} | | | 1.3 | μC |
| I_{RM} | | | 8 | A |

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

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

IXYS MOSFETS and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 6,306,728B1
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

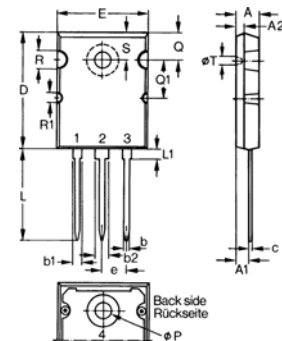
PLUS 247™ Outline



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 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 |



Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.