

HiPerFET™ Power MOSFETs Q-CLASS

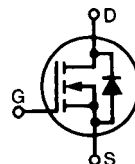
Single MOSFET Die

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

IXFK 27N80Q
IXFR 27N80Q
IXFX 27N80Q

$V_{DSS} = 800 \text{ V}$
 $I_{D25} = 27 \text{ A}$
 $R_{DS(on)} = 300 \text{ m}\Omega$

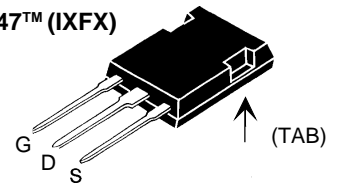
$t_{rr} \leq 250 \text{ ns}$



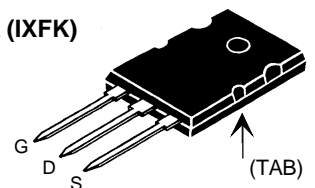
Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	800	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$	800	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	27	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	108	A
I_{AR}	$T_C = 25^\circ\text{C}$	27	A
E_{AR}	$T_C = 25^\circ\text{C}$	60	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	2.5	J
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$, $R_G = 2 \Omega$	5	V/ns
P_D	$T_C = 25^\circ\text{C}$	500	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	$^\circ\text{C}$
M_d	Mounting torque	TO-264 0.4/6	Nm/lb.in.
Weight		PLUS 247/ISOPLUS 247 TO-264	6 g 10 g

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	800		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4 \text{ mA}$	2.0		4.5 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$			100 μA 2 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 0.5 \cdot I_{D25}$ Note 1			300 m Ω

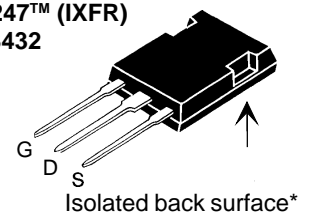
PLUS 247™ (IXFX)



TO-264 AA (IXFK)



ISOPLUS 247™ (IXFR)
E153432



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

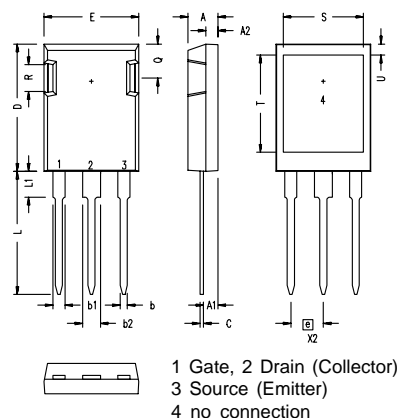
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ Note 1	20	27	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		7600	pF
C_{oss}			750	pF
C_{rss}			120	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$ (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

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$			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

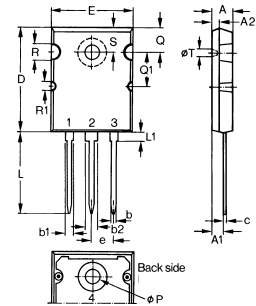
Note: 1. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$

ISOPLUS 247 (IXFR) OUTLINE



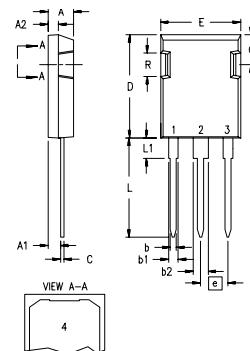
Dim.	Millimeter Min. Max.	Inches Min. Max.
A	4.83 5.21	.190 .205
A ₁	2.29 2.54	.090 .100
A ₂	1.91 2.16	.075 .085
b	1.14 1.40	.045 .055
b ₁	1.91 2.13	.075 .084
b ₂	2.92 3.12	.115 .123
C	0.61 0.80	.024 .031
D	20.80 21.34	.819 .840
E	15.75 16.13	.620 .635
e	5.45 BSC	.215 BSC
L	19.81 20.32	.780 .800
L1	3.81 4.32	.150 .170
Q	5.59 6.20	.220 .244
R	4.32 4.83	.170 .190
S	13.21 13.72	.520 .540
T	15.75 16.26	.620 .640
U	1.65 3.03	.065 .080

TO-264 AA (IXFK) Outline



Dim.	Millimeter Min. Max.	Inches 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

PLUS247™ (IXFX) Outline



Dim.	Millimeter Min. Max.	Inches 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 .244
R	4.32 4.83	.170 .190