IXYS

HiPerFET™ Power MOSFETs ISOPLUS247™

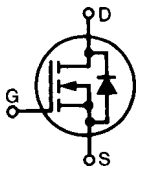
(Electrically Isolated Backside)

IXFR 180N06

V_{DSS} = 60 V
I_{D25} = 180 A
$R_{DS(on)}$ = 5 mΩ
$t_{rr} \leq$ 200ns

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

Preliminary data sheet



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	60	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	60	V
V_{GS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C (MOSFET chip capability)	180	A
$I_{D(RMS)}$	External lead (current limit)	76	A
I_{DM}	T_C = 25°C, Note 1	720	A
I_{AR}	T_C = 25°C	180	A
E_{AR}	T_C = 25°C	60	mJ
E_{AS}	T_C = 25°C	3	J
dv/dt	$I_S \leq I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \leq V_{DSS}$ $T_J \leq$ 150°C, R_G = 2 Ω	5	V/ns
P_D	T_C = 25°C	560	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
V_{ISOL}	50/60 Hz, RMS t = 1 min	2500	V~
Weight		5	g

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.
V_{DSS}	V_{GS} = 0 V, I_D = 3mA		60		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8mA		2.0		4.0 V
I_{GSS}	V_{GS} = ±20 V, V_{DS} = 0				±100 nA
I_{DSS}	$V_{DS} = V_{DSS}$ V_{GS} = 0 V	T_J = 25°C T_J = 125°C			100 µA 2 mA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = I_T$ Notes 2, 3				5 mΩ

ISOPLUS 247™
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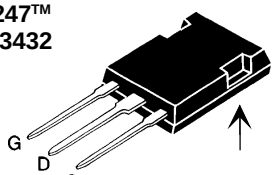


Isolated backside*

G = Gate D = Drain
S = Source

* Patent pending

Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Low drain to tab capacitance(<30pF)
- Low $R_{DS\ (on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Rated for Unclamped Inductive Load Switching (UIS)
- Fast intrinsic Rectifier

Applications

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

Advantages

- Easy assembly
- Space savings
- High power density

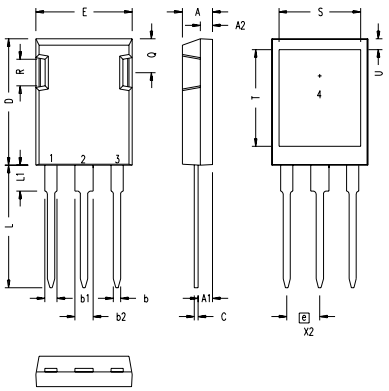
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; I_D = 60A Note 2	55	90		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		7650		pF
C_{oss}			4600		pF
C_{rss}			2700		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = I_T; R_G = 1 Ω (External), Notes 2, 3		63		ns
t_r			100		ns
$t_{d(off)}$			130		ns
t_f			55		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = I_T; Notes 2, 3		420		nC
Q_{gs}			65		nC
Q_{gd}			220		nC
R_{thJC}				0.30	K/W
R_{thCK}			0.15		K/W

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} = 0 V			180	A
I_{SM}	Repetitive; Note 1			720	A
V_{SD}	I_F = I_T, V_{GS} = 0 V, Notes 2, 3			1.3	V
t_{rr}	I_F = 50A,-di/dt = 100 A/µs, V_R = 100 V			200	ns
Q_{RM}			0.5		µC
I_{RM}			4		A

Note: 1. Pulse width limited by T_{JM}
2. Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %
3. I_T = 90A

ISOPLUS 247 OUTLINE



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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.