IXYS

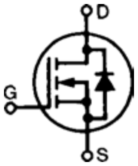
HiPerFET™ Power MOSFETs ISOPLUS247™ Q-Class

(Electrically Isolated Back Surface)

IXFR 58N20Q

V_{DSS} = 200 V
I_{D25} = 50 A
$R_{DS(on)}$ = 40 mΩ
t_{rr} ≤ 200 ns

N-Channel Enhancement Mode
Avalanche Rated, High dV/dt
Low Gate Charge and Capacitances



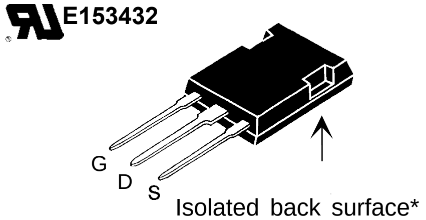
Preliminary Data Sheet

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	200	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	200	V
V_{GS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	50	A
I_{DM}	T_C = 25°C, Note 1	232	A
I_{AR}	T_C = 25°C	58	A
E_{AR}	T_C = 25°C	30	mJ
E_{AS}	T_C = 25°C	1.0	J
dv/dt	$I_S \le I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \le V_{DSS}$ $T_J \le$ 150°C, R_G = 2 Ω	5	V/ns
P_D	T_C = 25°C	300	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	250	°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 = 250 µA		200		V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 4mA		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			25 µA 1 mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 29A Note 2				40 mΩ

ISOPLUS 247™

E153432



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(<50pF)
- IXYS advanced low Q_g process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Fast intrinsic diode

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

Characteristic Values (T_J = 25°C, unless otherwise specified)

Symbol	Test Conditions	min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; I_D = 29A Note 2	24	34		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		3600		pF
C_{oss}			870		pF
C_{rss}			280		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 29A R_G = 1.5 Ω (External),		20		ns
t_r			40		ns
$t_{d(off)}$			40		ns
t_f			13		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 29A		98	140	nC
Q_{gs}			25	35	nC
Q_{gd}			45	70	nC
R_{thJC}				0.5	K/W
R_{thCK}	(TO-247)		0.15		K/W

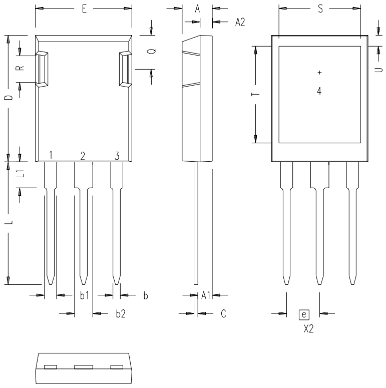
Source-Drain Diode

Characteristic Values (T_J = 25°C, unless otherwise specified)

Symbol	Test Conditions	min.	typ.	max.	
I_S	V_{GS} = 0 V			58	A
I_{SM}	Repetitive, Note 1			232	A
V_{SD}	$I_F = I_s$, V_{GS} = 0 V, Note 2			1.5	V
t_{rr}	$I_F = I_s$, -di/dt = 100 A/µs, V_R = 100 V			200	ns
Q_{RM}			0.7		µC
I_{RM}			7		A

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

ISOPLUS 247 OUTLINE



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	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.