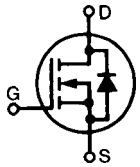
HiPerFET™ Power MOSFETs ISOPLUS247™

(Electrically Isolated Back Surface)

IXFR 120N20

V_{DSS} = 200 V
I_{D25} = 105 A
$R_{DS(on)}$ = 17 mΩ
$t_{rr} \leq$ 250 ns

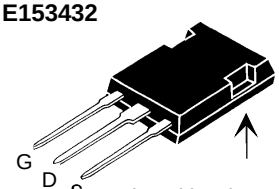
Single MOSFET Die



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 (MOSFET chip capability)	105	A
$I_{D(RMS)}$	External lead (current limit)	76	A
I_{DM}	T_C = 25°C, Note 1	480	A
I_{AR}	T_C = 25°C	120	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	400	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

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(<25pF)
- Low $R_{DS(on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- 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
- Low noise to ground

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.
V_{DSS}	V_{GS} = 0 V, I_D = 3mA		200		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}	$V_{DS} = V_{DSS}$	T_J = 25°C			100 μA
	V_{GS} = 0 V	T_J = 125°C			2 mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 60A Note 2				17 mΩ

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

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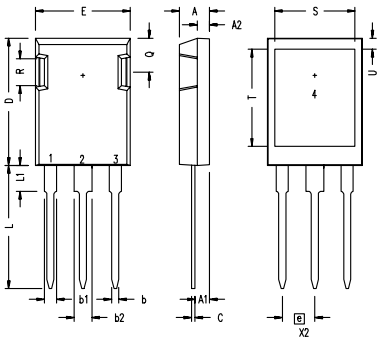
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)		Characteristic Values min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; I_D = 60A	Note 1	40	70		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz			9100		pF
C_{oss}				2200		pF
C_{rss}				1000		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 60A R_G = 1 Ω (External),			40		ns
t_r				65		ns
$t_{d(off)}$				110		ns
t_f				35		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 60A			360		nC
Q_{gs}				50		nC
Q_{gd}				170		nC
R_{thJC}					0.30	K/W
R_{thCK}				0.15		K/W

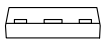
Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values min.	typ.	max.	
I_S	V_{GS} = 0 V			120	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			480	A
V_{SD}	I_F = 100A, V_{GS} = 0 V, Note 1			1.5	V
t_{rr}	I_F = 50A,-di/dt = 100 A/µs, V_R = 100 V			250	ns
Q_{RM}			1.1		µC
I_{RM}			13		A

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

ISOPLUS 247 (IXFR) OUTLINE





1 Gate, 2 Drain (Collector)
3 Source (Emitter)
4 no connection

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

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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
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

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