IXYS

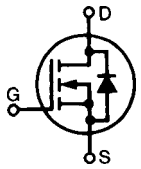
HiPerFET™ Power MOSFETs ISOPLUS247™, Q-Class (Electrically Isolated Back Surface)

IXFR 80N20Q

V_{DSS} = 200 V
I_{D25} = 71 A
$R_{DS(on)}$ = 28 mΩ
$t_{rr} \leq$ 200 ns

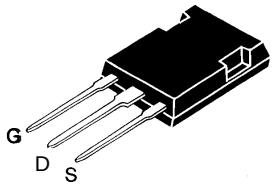
N-Channel Enhancement Mode
Avalanche Rated
Low Q_g, High dv/dt

Preliminary data



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	71	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	320	A
I_{AR}	T_C = 25°C	80	A
E_{AR}	T_C = 25°C	45	mJ
E_{AS}		1.5	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	310	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	1.13/10	Nm/lb.in.
Weight		5	g

ISOPLUS 247™
E153432



G = Gate D = Drain
S = Source TAB = Drain

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_{DSS}	V_{GS} = 0 V, I_D = 250 uA	200			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 4 mA	2.0		4.0	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0 V; T_J = 25°C			25	μA
	T_J = 125°C			1	mA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = I_T$ Note 1			28	mΩ

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
- 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

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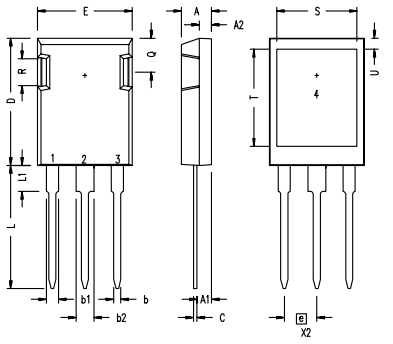
Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; I_D = I_T	Note 1	35	45		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz			4600		pF
C_{oss}				1100		pF
C_{rss}				500		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = I_T; R_G = 2 Ω (External),			26		ns
t_r				50		ns
$t_{d(off)}$				75		ns
t_f				20		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = I_T			180		nC
Q_{gs}				39		nC
Q_{gd}				100		nC
R_{thJC}					0.40	K/W
R_{thCK}				0.15		K/W

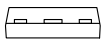
Source-Drain Diode

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} = 0 V			80	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			320	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Note 1			1.5	V
t_{rr}	I_F = I_S, -di/dt = 100 A/μs, V_R = 100 V			200	ns
Q_{RM}			1.2		μC
I_{RM}			10		A

Note: 1. Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %; I_T = 80A

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