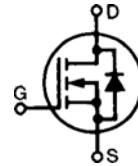


HiPerFET™ Power MOSFETs IXFR 58N20Q

ISOPLUS247™ Q-Class

(Electrically Isolated Back Surface)

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



$$V_{DSS} = 200 \text{ V}$$

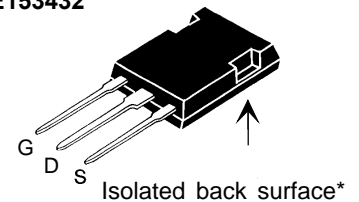
$$I_{D25} = 50 \text{ A}$$

$$R_{DS(on)} = 40 \text{ m}\Omega$$

$$t_{rr} \leq 200 \text{ ns}$$

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	200	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$	200	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	50	A
I_{DM}	$T_C = 25^\circ\text{C}$, Note 1	232	A
I_{AR}	$T_C = 25^\circ\text{C}$	58	A
E_{AR}	$T_C = 25^\circ\text{C}$	30	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	1.0	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	$T_C = 25^\circ\text{C}$	300	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 (0.062 in.) from case for 10 s	250	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, RMS $t = 1 \text{ min}$	2500	V~
Weight		5	g

ISOPLUS247™
 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

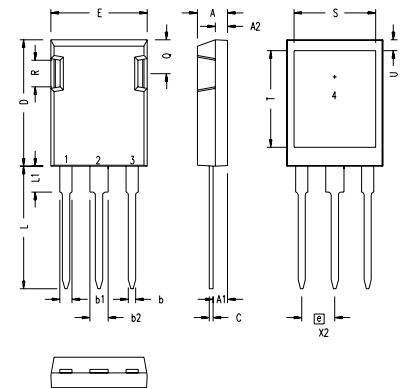
- Easy assembly
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	200		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4 \text{ mA}$	2.0		4.0 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0 \text{ V}$		$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	25 μA 1 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 29 \text{ A}$ Note 2			40 m Ω

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values			
			min.	typ.	max.	
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 29\text{ A}$	Note 2	24	34	S	
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$			3600	pF	
C_{oss}				870	pF	
C_{rss}				280	pF	
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 29\text{ A}$ $R_G = 1.5\ \Omega$ (External),			20	ns	
t_r				40	ns	
$t_{d(off)}$				40	ns	
t_f				13	ns	
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 29\text{ A}$			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	

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values						
			min.	typ.	max.				
I_S	$V_{GS} = 0\text{ V}$			58	A				
I_{SM}	Repetitive, Note 1			232	A				
V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V}$, Note 2			1.5	V				
t_{rr}	$I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$			0.7	200	ns			
Q_{RM}							7		A
I_{RM}									

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.

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

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

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 6,306,728B1
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025