

# HiPerFET™ Power MOSFETs

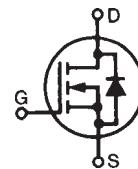
## ISOPLUS264™

(Electrically Isolated Backside)

Single Die MOSFET

IXFL 60N60

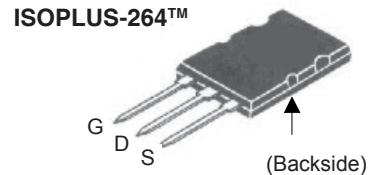
$V_{DSS}$  = 600 V  
 $I_{D25}$  = 60 A  
 $R_{DS(on)}$  = 80 mΩ



Preliminary Data Sheet

Symbol	Test Conditions	Maximum Ratings		
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	600	V	
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$	600	V	
$V_{GS}$	Continuous	$\pm 20$	V	
$V_{GSM}$	Transient	$\pm 30$	V	
$I_{D25}$	$T_c = 25^\circ\text{C}$ , Chip capability	60	A	
$I_{DM}$	$T_c = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	240	A	
$I_{AR}$	$T_c = 25^\circ\text{C}$	60	A	
$E_{AR}$	$T_c = 25^\circ\text{C}$	64	mJ	
$E_{AS}$	$T_c = 25^\circ\text{C}$	4	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	
$P_D$	$T_c = 25^\circ\text{C}$	700	W	
$F_c$	Mouting Force	30...150/7...33	N/lb	
$T_J$		-55 ... +150	°C	
$T_{JM}$		150	°C	
$T_{stg}$		-55 ... +150	°C	
$V_{ISOL}$	50/60 Hz, RMS $t = 1 \text{ min}$ $I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$	2500 3000	V~ V~	
$M_d$	Mounting torque Terminal connection torque	1.5/13 Nm/lb.in. 1.5/13 Nm/lb.in.		
Weight		8	g	

Symbol	Test Conditions	Characteristic Values		
		( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	min.	typ.
$V_{DSS}$	$V_{GS} = 0 \text{ V}$ , $I_D = 3 \text{ mA}$	600		V
$V_{GH(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8 \text{ mA}$	2.0		4.0 V
$I_{GSS}$	$V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$			$\pm 200 \text{ nA}$
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		100 $\mu\text{A}$ 2 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$ , $I_D = I_T$ Notes 1, 2			80 mΩ



G = Gate      D = Drain  
 S = Source

## 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

Symbol	Test Conditions	Characteristic Values		
		( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	min.	typ.
$g_{fs}$	$V_{DS} = 15 \text{ V}; I_D = 0.5 \cdot I_{D25}$ , pulse test	40	60	S
$C_{iss}$	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	10000	pF	
$C_{oss}$		1600	pF	
$C_{rss}$		360	pF	
$t_{d(on)}$	$V_{GS} = 10 \text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1 \Omega$ (External),	43	ns	
$t_r$		52	ns	
$t_{d(off)}$		110	ns	
$t_f$		26	ns	
$Q_{g(on)}$	$V_{GS} = 10 \text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$	380	nC	
$Q_{gs}$		78	nC	
$Q_{gd}$		190	nC	
$R_{thJC}$			0.18	K/W
$R_{thCK}$			0.05	K/W

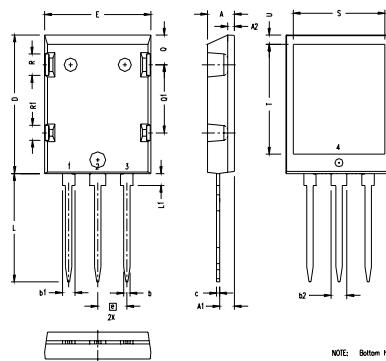
## Source-Drain Diode

Characteristic Values  
( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

Symbol	Test Conditions	Characteristic Values		
		min.	typ.	max.
$I_s$	$V_{GS} = 0 \text{ V}$		60	A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$		240	A
$V_{SD}$	$I_F = I_s, V_{GS} = 0 \text{ V}$ , Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $d \leq 2\%$		1.3	V
$t_{rr}$	$I_F = 25 \text{ A}, -di/dt = 100 \text{ A}/\mu\text{s}, V_R = 100 \text{ V}$	1.5	250	ns
$Q_{RM}$		10	$\mu\text{C}$	
$I_{RM}$			A	

Notes: 1. Pulse test,  $t \leq 300 \mu\text{s}$ ,  
duty cycle  $d \leq 2\%$   
2. Test current  $I_T = 30 \text{ A}$

## ISOPLUS 264 OUTLINE



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.102	.118	2.59	3.00
A2	.046	.055	1.17	1.40
b	.045	.055	1.14	1.40
b1	.087	.102	2.21	2.59
b2	.111	.126	2.82	3.20
c	.020	.029	0.51	0.74
D	1.020	1.040	25.91	26.42
E	.770	.799	19.56	20.29
e	.215	BSC	5.46	BSC
L	.780	.820	19.81	20.83
L1	.080	.102	2.03	2.59
Q	.210	.235	5.33	5.97
Q1	.490	.513	12.45	13.03
R	.150	.180	3.81	4.57
R1	.100	.130	2.54	3.30
S	.668	.690	16.97	17.53
T	.801	.821	20.34	20.85
U	.065	.080	1.65	2.03

NOTE: Bottom heatsink meets 2500Vrms isolation to the other pins.