

# HiPerFET™ MOSFET

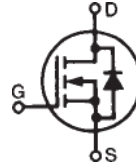
## ISOPLUS220™

Electrically Isolated Back Surface

N-Channel Enhancement Mode  
High dv/dt, Low  $t_{rr}$ , HDMOS™ Family

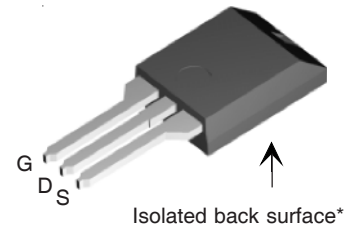
IXFC 80N08  
IXFC 80N085

$V_{DSS}$	$I_{D25}$	$R_{DS(on)}$
80 V	80 A	11 mΩ
85 V	80 A	11 mΩ



Symbol	Test Conditions	Maximum Ratings		
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	80N08	80	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1\text{ M}\Omega$	80N085	85	V
$V_{GS}$	Continuous		$\pm 20$	V
$V_{GSM}$	Transient		$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$		80	A
$I_{L(RMS)}$	Lead current limit		80	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$		75	A
$I_{AR}$	$T_C = 25^\circ\text{C}$		320	A
$E_{AR}$	$T_C = 25^\circ\text{C}$		30	mJ
$E_{AS}$			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
$P_D$	$T_C = 25^\circ\text{C}$		230	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		300	$^\circ\text{C}$
$F_C$	Mounting force		11..65/2.4..11	Nm/lb
$V_{ISOL}$	50/60 Hz, RMS $t = 1$ minute leads-to-tab		2500	V~
Weight			2	g

ISOPLUS220™



G = Gate,  
S = Source

D = Drain,

\* Patent pending

### Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Low drain to tab capacitance (<35pF)
- Low  $R_{DS(on)}$
- 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: no screws or isolation foils required
- Space savings
- High power density
- Low collector capacitance to ground (low EMI)

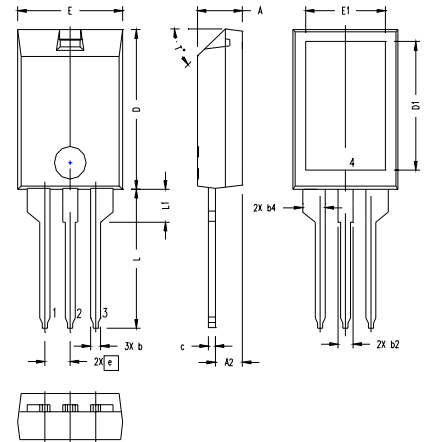
Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_{DSS}$	$V_{GS} = 0\text{ V}$ , $I_D = 250\ \mu\text{A}$	80N08 80N085	80 85	V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 4\text{ mA}$		2.0	4.0 V
$I_{GSS}$	$V_{GS} = \pm 20\text{ V}_{DC}$ , $V_{DS} = 0$			$\pm 100\text{ nA}$
$I_{DSS}$	$V_{DS} = V_{DSS}$ , $V_{GS} = 0\text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		50 $\mu\text{A}$ 1 mA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}$ , $I_D = I_T$ Notes 1, 2			11 mΩ

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = I_T$ Notes 1, 2	35	55	S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		4800	pF
$C_{oss}$		1675	pF	
$C_{rss}$		590	pF	
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS},$ $I_D = 0.5 \cdot I_{D25}, R_G = 2.5\ \Omega$ (External)		50	ns
$t_r$			75	ns
$t_{d(off)}$			95	ns
$t_f$			31	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$ Notes 2		180	nC
$Q_{gs}$			42	nC
$Q_{gd}$			75	nC
$R_{thJC}$			0.54	K/W
$R_{thCK}$		0.25		K/W

**Source-Drain Diode**

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$I_S$	$V_{GS} = 0\text{ V}$			80 A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$			320 A
$V_{SD}$	$I_F = I_S, V_{GS} = 0\text{ V},$ Note 1			1.5 V
$t_{rr}$	$I_F = 25\text{ A}$ $-di/dt = 100\text{ A}/\mu\text{s},$ $V_R = 50\text{ V}$			200 ns
$Q_{RM}$		0.5		$\mu\text{C}$
$I_{RM}$		6		A

Note: 1. Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle  $d \leq 2\%$   
 2.  $I_T = 40\text{ A}$

**ISOPLUS220LV Outline**


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.157	.197	4.00	5.00
A2	.098	.118	2.50	3.00
b	.035	.051	0.90	1.30
b2	.049	.065	1.25	1.65
b4	.093	.100	2.35	2.55
c	.028	.039	0.70	1.00
D	.591	.630	15.00	16.00
D1	.472	.512	12.00	13.00
E	.394	.433	10.00	11.00
E1	.295	.335	7.50	8.50
e	.100	BASIC	2.55	BASIC
L	.512	.571	13.00	14.50
L1	.118	.138	3.00	3.50
T*			42.5*	47.5*

**Notes:**

1. Lead 1 = Gate
2. Lead 2 = Drain
3. Lead 3 = Source
4. Back surface 4 is electrically isolated from leads 1, 2 & 3