

HiPerFET™ Power MOSFETs

ISOPLUS247™

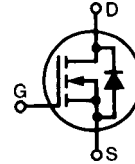
(Electrically Isolated Back Surface)

IXFR 50N50
IXFR 55N50

V_{DSS}	I_{D25}	$R_{DS(on)}$
500 V	43 A	100 mΩ
500 V	48 A	90 mΩ

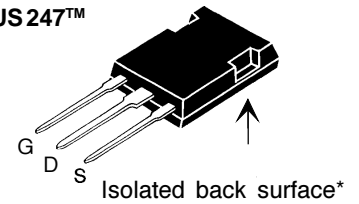
$t_{rr} \leq 250$ ns

Single Die MOSFET



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	500	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1\text{ M}\Omega$	500	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	50N50: 43 55N50: 48	A
I_{DM}	$T_C = 25^\circ\text{C}$, Pulse width limited by T_{JM}	50N50: 200 55N50: 220	A
I_{AR}	$T_C = 25^\circ\text{C}$	50N50: 50 55N50: 55	A
E_{AR}	$T_C = 25^\circ\text{C}$	60	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	3	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	$T_C = 25^\circ\text{C}$	400	W
T_J		-40 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-40 ... +150	$^\circ\text{C}$
T_L	1.6 mm (0.063 in.) from case for 10 s	300	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, RMS $t = 1$ min	2500	V~
Weight		5	g

ISOPLUS247™



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)
- 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

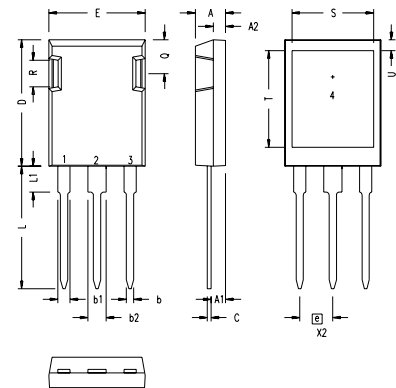
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0\text{ V}$, $I_D = 1\text{ mA}$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 8\text{ mA}$	2.5		4.5 V
I_{GSS}	$V_{GS} = \pm 20\text{ V}$, $V_{DS} = 0$			$\pm 200\text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0\text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		25 μA 2 mA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = I_T$ Note 1	50N50 55N50		100 mΩ 90 mΩ

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)	min.		typ.		max.	
g_{fs}	$V_{DS} = 10\text{ V}; I_D = I_T$	Note 1		45				S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$			9400				pF
C_{oss}				1280				pF
C_{rss}				460				pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_T$ $R_G = 1\ \Omega$ (External),			45				ns
t_r				60				ns
$t_{d(off)}$				120				ns
t_f				45				ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_T$			330				nC
Q_{gs}				55				nC
Q_{gd}				155				nC
R_{thJC}						0.30		K/W
R_{thCK}				0.15				K/W

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)	min.		typ.		max.	
I_S	$V_{GS} = 0\text{ V}$	55N50 50N50		55 50				A A
I_{SM}	Repetitive; pulse width limited by T_{JM}	55N50 50N50		220 200				A A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V}$			1.5				V
t_{rr}	$I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$			250				ns
Q_{RM}				1.0				μC
I_{RM}				10				A

Note: 1. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$
 2. I_T test current: 50N50 $I_T = 25\text{ A}$
 55N50 $I_T = 27.5\text{ A}$

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.

See IXFK55N50 data sheet for characteristic curves.