



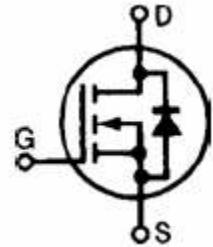
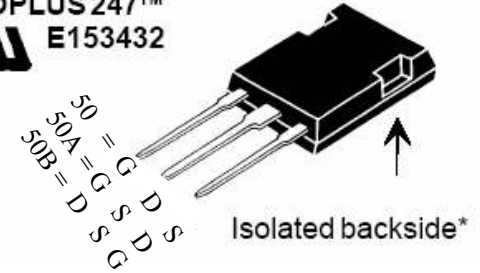
# IXZR18N50 & IXZR18N50A/B Z-MOS RF Power MOSFET

N-Channel Enhancement Mode Switch Mode RF MOSFET  
Low Capacitance Z-MOS™ MOSFET Process  
Optimized for RF Operation  
Ideal for Class C, D, & E Applications

$V_{DSS} = 500\text{ V}$   
 $I_{D25} = 19\text{ A}$   
 $R_{DS(on)} \leq 0.37\ \Omega$   
 $P_{DC} = 350\text{ W}$

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	500	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1\text{ M}\Omega$	500	V
$V_{GS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_c = 25^\circ\text{C}$	19	A
$I_{DM}$	$T_c = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	95	A
$I_{AR}$	$T_c = 25^\circ\text{C}$	19	A
$E_{AR}$	$T_c = 25^\circ\text{C}$	TBD	mJ
$dv/dt$	$I_S \leq I_{DM}$ , $di/dt \leq 100\text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$ , $R_G = 0.2\ \Omega$	5	V/ns
	$I_S = 0$	>200	V/ns
$P_{DC}$		350	W
$P_{DHS}$	$T_c = 25^\circ\text{C}$ , Derate $4.4\text{ W}/^\circ\text{C}$ above $25^\circ\text{C}$	TBD	W
$P_{DAMB}$	$T_c = 25^\circ\text{C}$	3.0	W
$R_{thJC}$		TBD	C/W
$R_{thJHS}$		TBD	C/W

ISOPLUS 247™  
E153432



Symbol	Test Conditions	Characteristic Values		
		min.	typ.	max.
$(T_J = 25^\circ\text{C}$ unless otherwise specified)				
$V_{DSS}$	$V_{GS} = 0\text{ V}$ , $I_D = 4\text{ ma}$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 250\ \mu\text{A}$		4.6	V
$I_{GSS}$	$V_{GS} = \pm 20\text{ V}_{DC}$ , $V_{DS} = 0$			$\pm 100\text{ nA}$
$I_{DSS}$	$V_{DS} = 0.8V_{DSS}$ $V_{GS} = 0$ $= 125\text{C}$	$T_J = 25\text{C}$ $T_J$	50	$\mu\text{A}$
			1	mA
$R_{DS(on)}$	$V_{GS} = 20\text{ V}$ , $I_D = 0.5I_{D25}$ Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$		0.37	$\Omega$
$g_{fs}$	$V_{DS} = 50\text{ V}$ , $I_D = 0.5I_{D25}$ , pulse test		6.7	S
$T_J$		-55		$^\circ\text{C}$
$T_{JM}$			175	$^\circ\text{C}$
$T_{stg}$		-55		$^\circ\text{C}$
$T_L$	1.6mm(0.063 in) from case for 10 s		300	$^\circ\text{C}$
<b>Weight</b>			3.5	g

### Features

- Isolated Substrate
  - high isolation voltage (>2500V)
  - excellent thermal transfer
  - Increased temperature and power cycling capability
- IXYS advanced Z-MOS process
- Low gate charge and capacitances
  - easier to drive
  - faster switching
- Low  $R_{DS(on)}$
- Very low insertion inductance (<2nH)
- No beryllium oxide (BeO) or other hazardous materials

### Advantages

- Optimized for RF and high speed
- Easy to mount—no insulators needed
- High power density



**IXZR18N50 & IXZR18N50A/B**  
**Z-MOS RF Power MOSFET**

Symbol	Test Conditions	Characteristic Values		
		(T <sub>J</sub> = 25°C unless otherwise specified)		
		min.	typ.	max.
R <sub>G</sub>				1 Ω
C <sub>iss</sub>			2020	pF
C <sub>oss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 0.8 V <sub>DSS(max)</sub> , f = 1 MHz		172	pF
C <sub>rss</sub>			21	pF
C <sub>stray</sub>	Back Metal to any Pin		33	pF
T <sub>d(on)</sub>			4	ns
T <sub>on</sub>	V <sub>GS</sub> = 15 V, V <sub>DS</sub> = 0.8 V <sub>DSS</sub> I <sub>D</sub> = 0.5 I <sub>DM</sub>		4	ns
T <sub>d(off)</sub>	R <sub>G</sub> = 1 Ω (External)		4	ns
T <sub>off</sub>			5	ns
Q <sub>g(on)</sub>			42	nC
Q <sub>gs</sub>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> I <sub>D</sub> = 0.5 I <sub>D25</sub> I <sub>G</sub> = 3mA		14	nC
Q <sub>gd</sub>			21	nC

Source-Drain Diode		Characteristic Values		
		(T <sub>J</sub> = 25°C unless otherwise specified)		
Symbol	Test Conditions	min.	typ.	max.
I <sub>S</sub>	V <sub>GS</sub> = 0 V			19 A
I <sub>SM</sub>	Repetitive; pulse width limited by T <sub>JM</sub>			114 A
V <sub>SD</sub>	I <sub>F</sub> = I <sub>S</sub> , V <sub>GS</sub> = 0 V, Pulse test, t ≤ 300μs, duty cycle ≤ 2%			1.5 V
T <sub>rr</sub>			200	ns

CAUTION: Operation at or above the Maximum Ratings values may impact device reliability or cause permanent damage to the device.

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

IXYS RF MOSFETS are covered by one or more of the following U.S. patents:

4,835,592	4,860,072	4,881,106	4,891,686	4,931,844	5,017,508
5,034,796	5,049,961	5,063,307	5,187,117	5,237,481	5,486,715
5,381,025	5,640,045	6,404,065	6,583,505	6,710,463	6,727,585
6,731,002					

Fig. 1 Gate Charge vs. Gate-to-Source Voltage  
 $V_{DS} = 250V, I_D = 9.5A, I_G = 3mA$

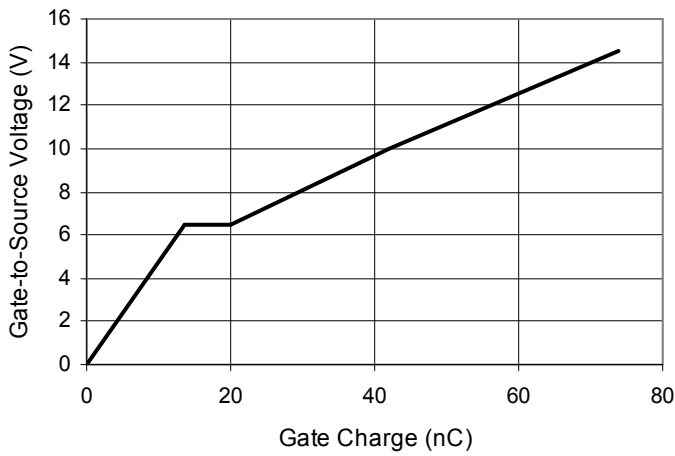


Fig. 2 Typical Output Characteristics

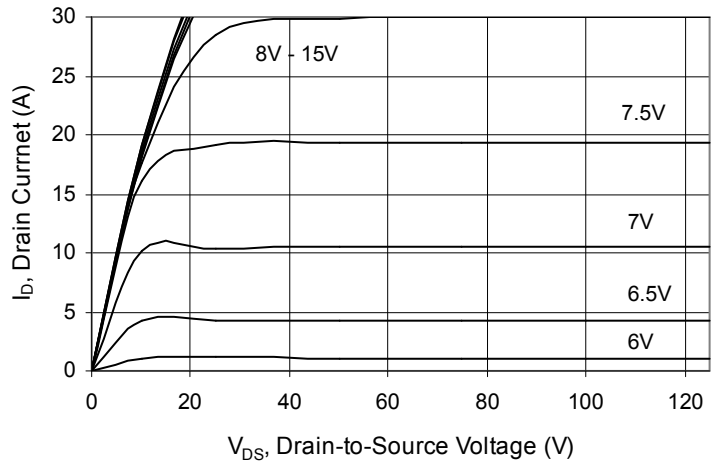


Fig. 3 Typical Transfer Characteristics  
 $V_{DS} = 50V$

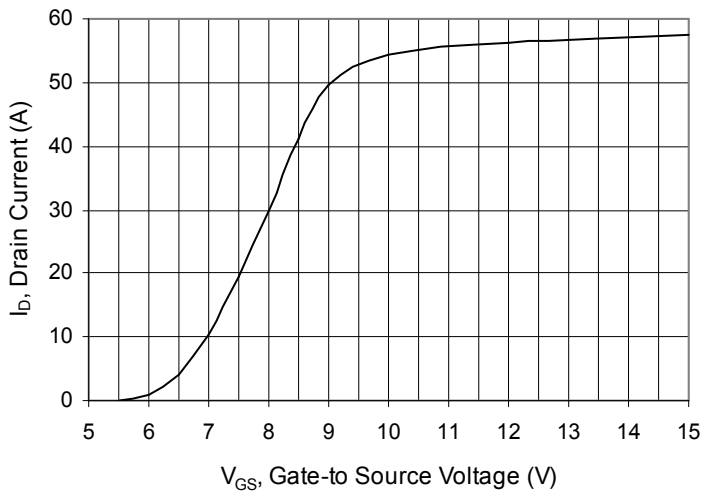


Fig. 4 Extended Typical Output Characteristics

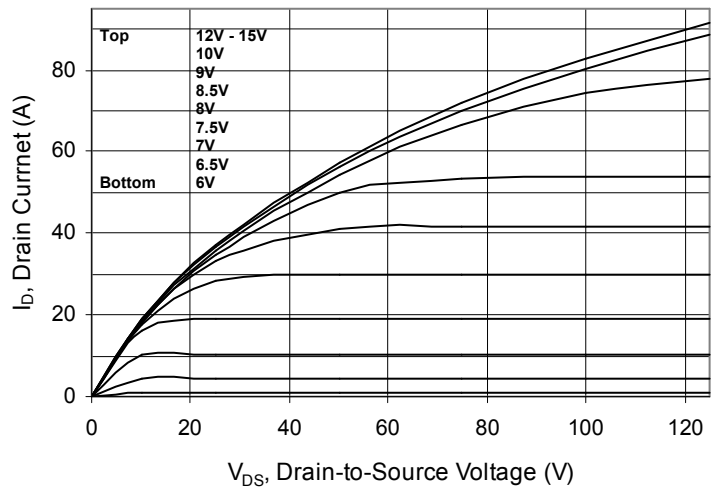


Fig. 5  $V_{DS}$  vs. Capacitance

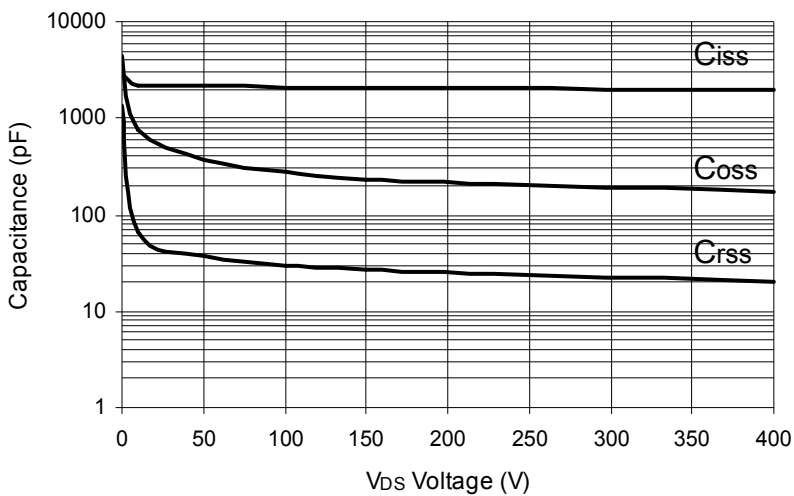
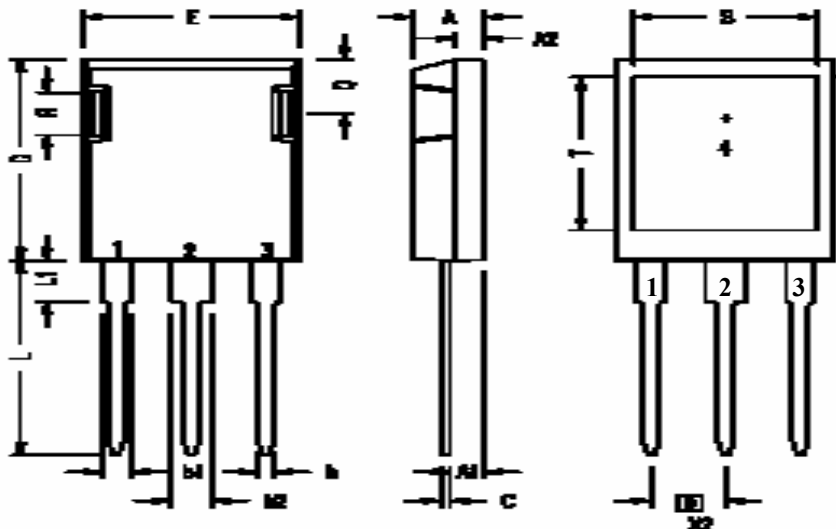


Fig. 6 Package Drawing

**ISOPLUS 247 OUTLINE**



50: 1=G, 2=D, 3=S  
 50A: 1=G, 2=S, 3=D  
 50B: 1=D, 2=S, 3=G



1 Gate, 2 Drain (Collector)  
 3 Source (Emitter)  
 4 no connection

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A <sub>1</sub>	2.29	2.54	.090	.100
A <sub>2</sub>	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b <sub>1</sub>	1.91	2.13	.075	.084
b <sub>2</sub>	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

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