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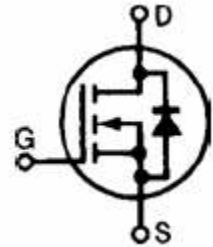
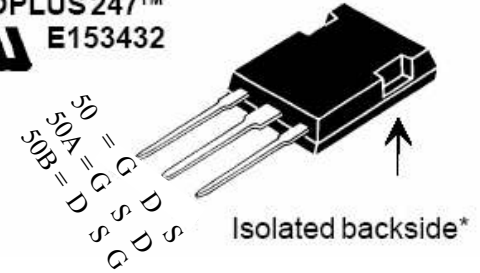
IXZR18N50 & IXZR18N50A/B Z-MOS RF Power MOSFET

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°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} | $T_c = 25^\circ\text{C}$ | 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°C | TBD | W |
| P_{DAMB} | $T_c = 25^\circ\text{C}$ | 3.0 | W |
| R_{thJC} | | TBD | C/W |
| R_{thJHS} | | TBD | C/W |

ISOPLUS247™
E153432



| Symbol | Test Conditions | Characteristic Values | | |
|--|--|-----------------------------|------|---------------------|
| | | min. | typ. | max. |
| (T _J = 25°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 | μA |
| | | | 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 | Ω |
| 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 | $^\circ\text{C}$ |
| Weight | | | 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 _J = 25°C unless otherwise specified) | | |
| | | min. | typ. | max. |
| R _G | | | | 1 Ω |
| C _{iss} | | | 2020 | pF |
| C _{oss} | V _{GS} = 0 V, V _{DS} = 0.8 V _{DSS(max)} , f = 1 MHz | | 172 | pF |
| C _{rss} | | | 21 | pF |
| C _{stray} | Back Metal to any Pin | | 33 | pF |
| T _{d(on)} | | | 4 | ns |
| T _{on} | V _{GS} = 15 V, V _{DS} = 0.8 V _{DSS} I _D = 0.5 I _{DM} | | 4 | ns |
| T _{d(off)} | R _G = 1 Ω (External) | | 4 | ns |
| T _{off} | | | 5 | ns |
| Q _{g(on)} | | | 42 | nC |
| Q _{gs} | V _{GS} = 10 V, V _{DS} = 0.5 V _{DSS} I _D = 0.5 I _{D25} I _G = 3mA | | 14 | nC |
| Q _{gd} | | | 21 | nC |

| Source-Drain Diode | | Characteristic Values | | |
|--------------------|---|--|------|-------|
| | | (T _J = 25°C unless otherwise specified) | | |
| Symbol | Test Conditions | min. | typ. | max. |
| I _S | V _{GS} = 0 V | | | 19 A |
| I _{SM} | Repetitive; pulse width limited by T _{JM} | | | 114 A |
| V _{SD} | I _F = I _S , V _{GS} = 0 V, Pulse test, t ≤ 300μs, duty cycle ≤ 2% | | | 1.5 V |
| T _{rr} | | | 200 | ns |

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

Information in this document is believed to be accurate and reliable. IXYSRF reserves the right to make changes to information published in this document at any time and without notice.

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
 $V_{DS} = 250V, I_D = 9.5A, I_G = 3mA$

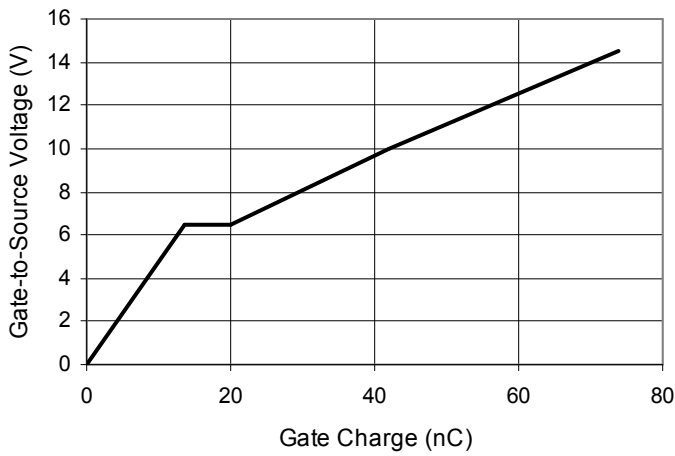


Fig. 2
Typical Output Characteristics

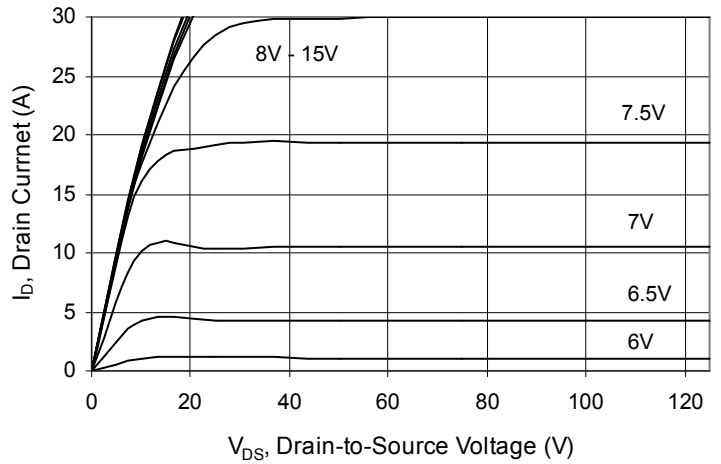


Fig. 3
Typical Transfer Characteristics
 $V_{DS} = 50V$

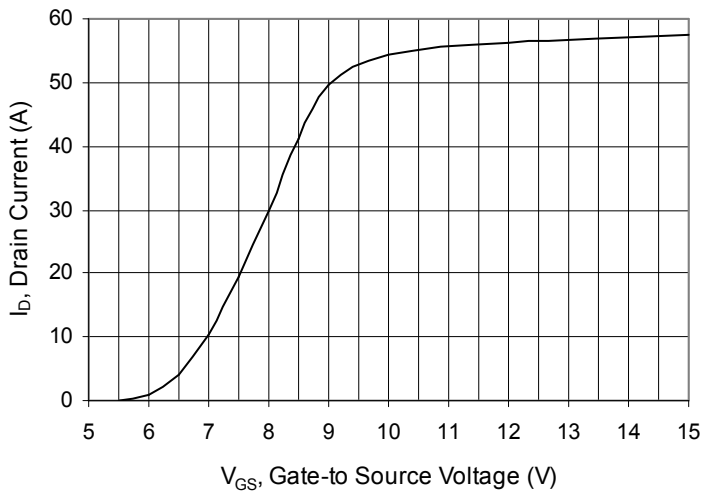


Fig. 4
Extended Typical Output Characteristics

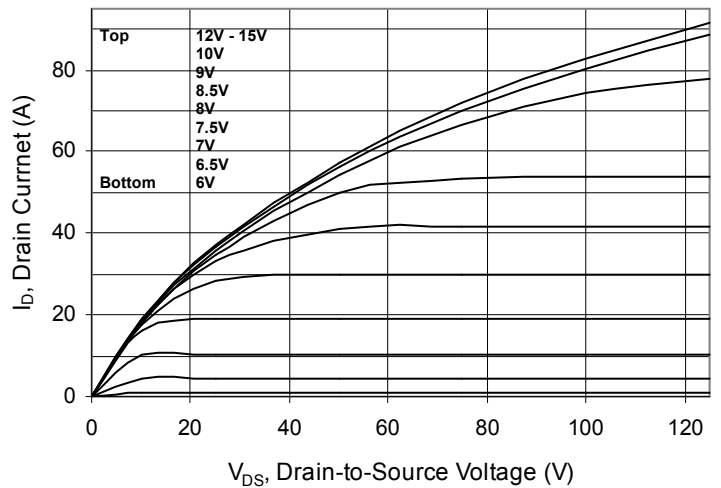


Fig. 5
 V_{DS} vs. Capacitance

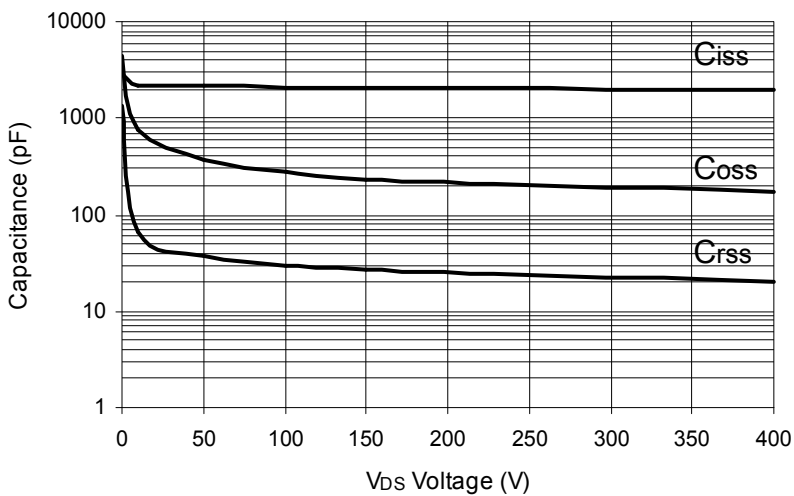
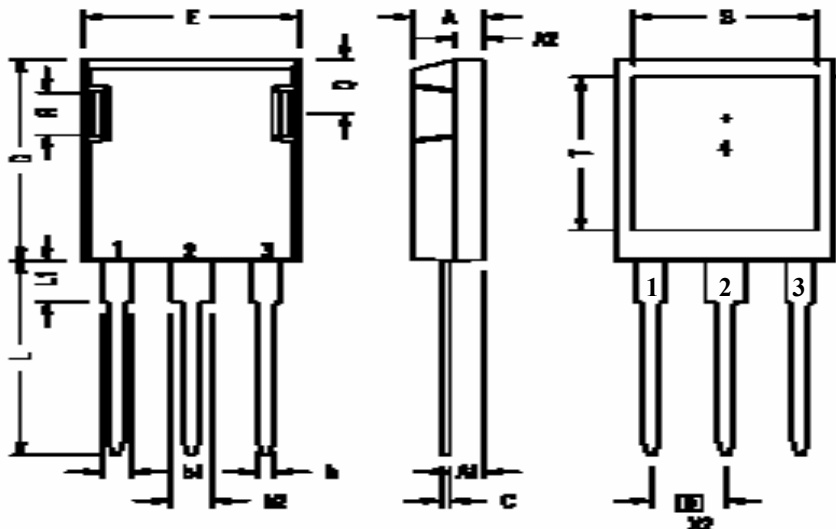


Fig. 6 Package Drawing

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 ₁ | 2.29 | 2.54 | .090 | .100 |
| A ₂ | 1.91 | 2.16 | .075 | .085 |
| b | 1.14 | 1.40 | .045 | .055 |
| b ₁ | 1.91 | 2.13 | .075 | .084 |
| b ₂ | 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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