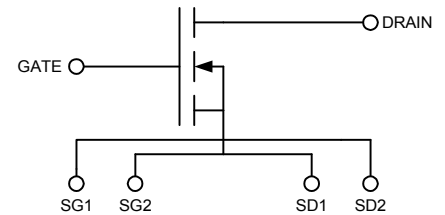
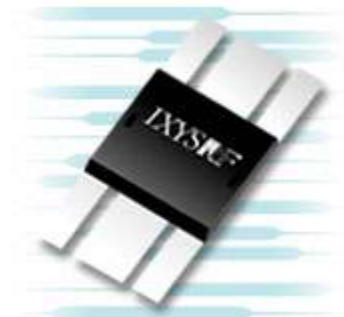


N-Channel Enhancement Mode Switch Mode RF MOSFET  
 Low Capacitance Z-MOS™ MOSFET Process  
 Optimized for RF Operation  
 Ideal for Class C, D, & E Applications

$V_{DSS} = 500 \text{ V}$   
 $I_{D25} = 19 \text{ A}$   
 $R_{DS(on)} \leq 0.34 \Omega$   
 $P_{DC} = 880 \text{ W}$

| 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   |
| $dv/dt$     | $I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ ,<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 0.2 \Omega$ | 5               | V/ns |
|             | $I_S = 0$   | >200            | V/ns |
| $P_{DC}$    |   | 880             | W    |
| $P_{DHS}$   | $T_c = 25^\circ\text{C}$  | 440             | W    |
| $P_{DAMB}$  | $T_{amb} = 25^\circ\text{C}$  | 3.0             | W    |
| $R_{thJC}$  |   | 0.17            | C/W  |
| $R_{thJHS}$ |   | 0.34            | C/W  |

| Symbol        | Test Conditions   | Characteristic Values                                 |      |                       |
|---------------|---|---|------|-----------------------|
|               |   | $(T_J = 25^\circ\text{C}$ unless otherwise specified) |      |                       |
|               |   | min.  | typ. | max.                  |
| $V_{DSS}$     | $V_{GS} = 0 \text{ V}$ , $I_D = 4 \text{ ma}$   | 500   |      |                       |
| $V_{GS(th)}$  | $V_{DS} = V_{GS}$ , $I_D = 250 \mu\text{A}$   | 3.5   | 4.9  | 6.5                   |
| $I_{GSS}$     | $V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$   |   |      | $\pm 100$             |
| $I_{DSS}$     | $V_{DS} = 0.8 V_{DSS}$<br>$V_{GS} = 0$  | $T_J = 25^\circ\text{C}$                              |      | 50 $\mu\text{A}$      |
|               |   | $T_J = 125^\circ\text{C}$                             |      | 1 mA                  |
| $R_{DS(on)}$  | $V_{GS} = 20 \text{ V}$ , $I_D = 0.5 I_{D25}$<br>Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $d \leq 2\%$ |   | .32  | .34 $\Omega$          |
| $g_{fs}$      | $V_{DS} = 50 \text{ V}$ , $I_D = 0.5 I_{D25}$ , pulse test  | 5.0   | 5.4  | 6.0 S                 |
| $T_J$         |   | -55   |      | +175 $^\circ\text{C}$ |
| $T_{JM}$      |   |   | 175  | $^\circ\text{C}$      |
| $T_{stg}$     |   | -55   |      | +175 $^\circ\text{C}$ |
| $T_L$         | 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



**IXZ318N50**  
**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>    |  |  | 1950 | pF   |
| C <sub>oss</sub>    | V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 0.8 V <sub>DSS(max)</sub> ,<br>f = 1 MHz                      |  | 175  | pF   |
| C <sub>rss</sub>    |  |  | 17   | 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><br>I <sub>D</sub> = 0.5 I <sub>DM</sub> |  | 4    | ns   |
| T <sub>d(off)</sub> | R <sub>G</sub> = 1 Ω (External)  |  | 5    | ns   |
| T <sub>off</sub>    |  |  | 6    | ns   |

| Symbol          | Test Conditions  | Characteristic Values                              |      |       |
|-----------------|--|--|------|-------|
|                 |  | (T <sub>J</sub> = 25°C unless otherwise specified) |      |       |
|                 |  | 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 ≤ 300 μs, 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.

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.

For detailed device mounting and installation instructions, see the “Device Installation & Mounting Instructions” technical note on the IXYSRF web site at;

[http://www.ixysrf.com/pdf/switch\\_mode/appnotes/7de\\_series\\_mosfet\\_installation\\_instructions.pdf](http://www.ixysrf.com/pdf/switch_mode/appnotes/7de_series_mosfet_installation_instructions.pdf)

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 |           |           |           |           |

Fig. 1

**Typical Transfer Characteristics**  
 $V_{DS} = 50V, P.W. = 20\mu S$

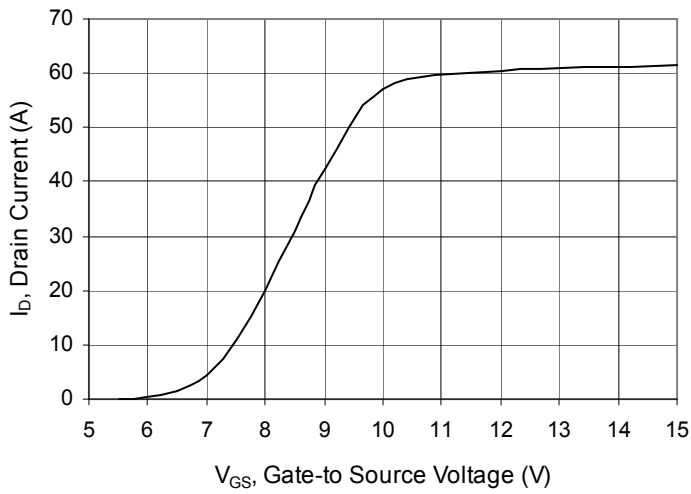


Fig. 2

**Typical Output Characteristics**

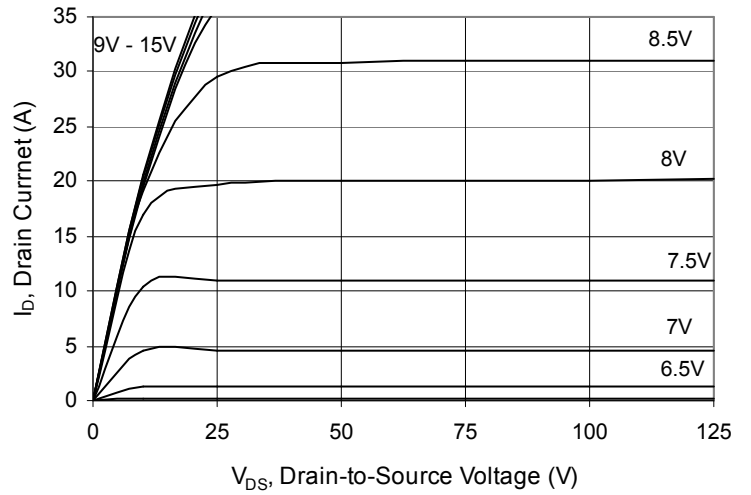


Fig. 3

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

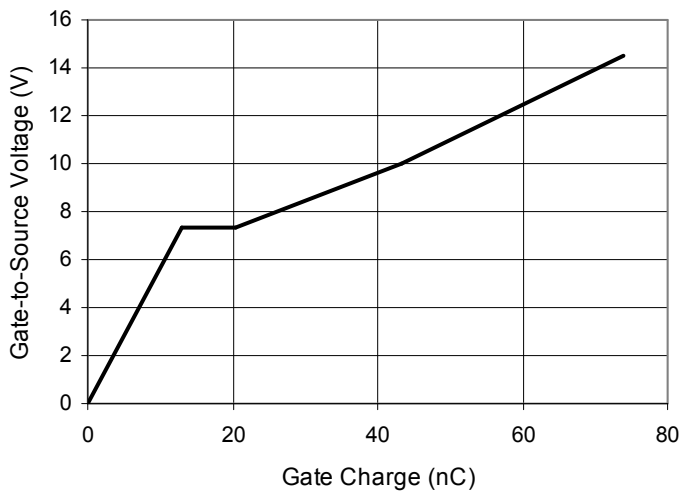


Fig. 4

**Extended Typical Output Characteristics**

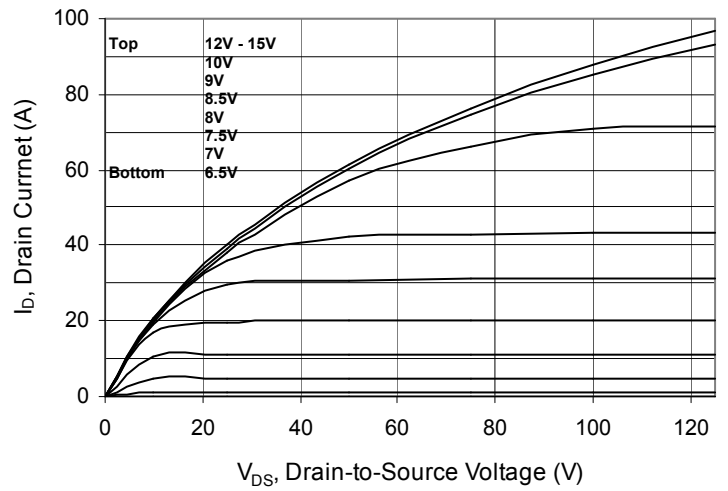


Fig. 5

$V_{DS}$  vs. Capacitance

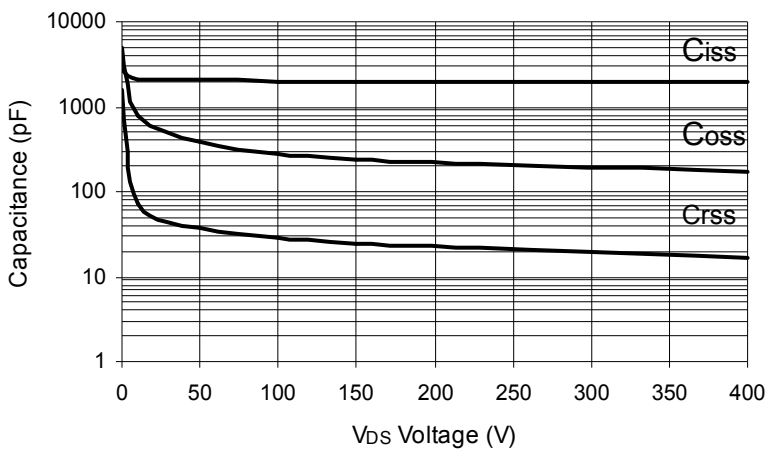
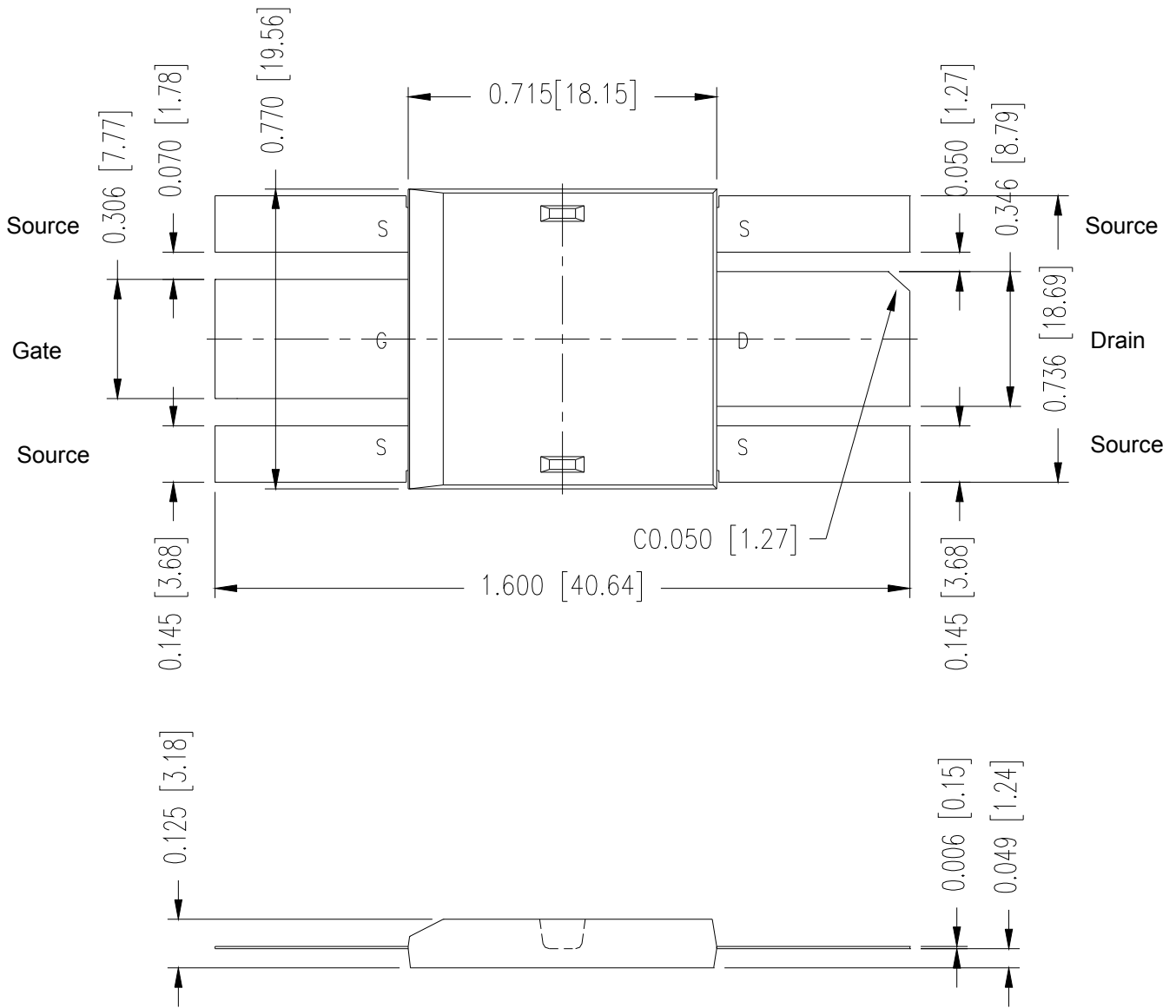


Fig. 6 Package Drawing



Doc #dsIXZ318N50 REV 07/09  
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