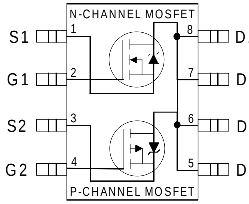
International
IOR Rectifier

PD - 91625

# IRF7379

HEXFET® Power MOSFET

- Generation V Technology
- Ultra Low On-Resistance
- Complimentary Half Bridge
- Surface Mount
- Fully Avalanche Rated



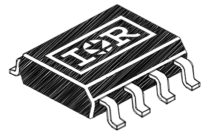

Top View

| | N-Ch | P-Ch |
|---|---|---|
| $V_{DSS}$ | 30V | -30V |
| $R_{DS(on)}$ | 0.045Ω | 0.090Ω |

## Description

Fifth Generation HEXFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The SO-8 has been modified through a customized leadframe for enhanced thermal characteristics and multiple-die capability making it ideal in a variety of power applications. With these improvements, multiple devices can be used in an application with dramatically reduced board space. The package is designed for vapor phase, infra red, or wave soldering techniques.



SO-8

## Absolute Maximum Ratings

| | Parameter | Max. | | Units |
|---|---|---|---|---|
| | | N-Channel | P-Channel | |
| $V_{SD}$ | Drain-to-Source Voltage | 30 | -30 | |
| $I_D$ @ $T_A$ = 25°C | Continuous Drain Current, $V_{GS}$ @ 10V | 5.8 | -4.3 | A |
| $I_D$ @ $T_A$ = 70°C | Continuous Drain Current, $V_{GS}$ @ 10V | 4.6 | -3.4 | |
| $I_{DM}$ | Pulsed Drain Current ① | 46 | -34 | |
| $P_D$ @$T_A$ = 25°C | Power Dissipation | 2.5 | | W |
| | Linear Derating Factor | 0.02 | | W/°C |
| $V_{GS}$ | Gate-to-Source Voltage | ± 20 | | V |
| dv/dt | Peak Diode Recovery dv/dt ② | 5.0 | -5.0 | V/ns |
| $T_J$, $T_{STG}$ | Junction and Storage Temperature Range | -55 to + 150 | | °C |

## Thermal Resistance Ratings

| | Parameter | Max. | Units |
|---|---|---|---|
| $R_{\theta JA}$ | Maximum Junction-to-Ambient④ | 50 | °C/W |

## Electrical Characteristics @ $T_J$ = 25°C (unless otherwise specified)

| | Parameter | | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-to-Source Breakdown Voltage | N-Ch | 30 | — | — | V | $V_{GS}$ = 0V, $I_D$ = 250µA |
| | | P-Ch | -30 | — | — | | $V_{GS}$ = 0V, $I_D$ = -250µA |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient | N-Ch | — | 0.032 | — | V/°C | Reference to 25°C, $I_D$ = 1mA |
| | | P-Ch | — | -0.037 | — | | Reference to 25°C, $I_D$ = -1mA |
| $R_{DS(ON)}$ | Static Drain-to-Source On-Resistance | N-Ch | — | 0.038 | 0.045 | Ω | $V_{GS}$ = 10V, $I_D$ = 5.8A ③ |
| | | | — | 0.055 | 0.075 | | $V_{GS}$ = 4.5V, $I_D$ = 4.9A ③ |
| | | P-Ch | — | 0.070 | 0.090 | | $V_{GS}$ = -10V, $I_D$ =- 4.3A ③ |
| | | | — | 0.130 | 0.180 | | $V_{GS}$ = -4.5V, $I_D$ =- 3.7A ③ |
| $V_{GS(th)}$ | Gate Threshold Voltage | N-Ch | 1.0 | — | — | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 250µA |
| | | P-Ch | -1.0 | — | — | | $V_{DS}$ = $V_{GS}$, $I_D$ = -250µA |
| $g_{fs}$ | Forward Transconductance | N-Ch | 5.2 | — | — | S | $V_{DS}$ = 15V, $I_D$ = 2.4A ③ |
| | | P-Ch | 2.5 | — | — | | $V_{DS}$ = -24V, $I_D$ = -1.8A ③ |
| $I_{DSS}$ | Drain-to-Source Leakage Current | N-Ch | — | — | 1.0 | µA | $V_{DS}$ = 24 V, $V_{GS}$ = 0V |
| | | P-Ch | — | — | -1.0 | | $V_{DS}$ = -24V, $V_{GS}$ = 0V |
| | | N-Ch | — | — | 25 | | $V_{DS}$ = 24 V, $V_{GS}$ = 0V, $T_J$ = 125°C |
| | | P-Ch | — | — | -25 | | $V_{DS}$ = -24V, $V_{GS}$ = 0V, $T_J$ = 125°C |
| $I_{GSS}$ | Gate-to-Source Forward Leakage | N-P | — | — | ±100 | | $V_{GS}$ = ± 20V |
| $Q_g$ | Total Gate Charge | N-Ch | — | — | 25 | nC | N-Channel<br>$I_D$ = 2.4A, $V_{DS}$ = 24V, $V_{GS}$ = 10V<br>③<br>P-Channel<br>$I_D$ = -1.8A, $V_{DS}$ = -24V, $V_{GS}$ = -10V |
| | | P-Ch | — | — | 25 | | |
| $Q_{gs}$ | Gate-to-Source Charge | N-Ch | — | — | 2.9 | | |
| | | P-Ch | — | — | 2.9 | | |
| $Q_{gd}$ | Gate-to-Drain ("Miller") Charge | N-Ch | — | — | 7.9 | | |
| | | P-Ch | — | — | 9.0 | | |
| $t_{d(on)}$ | Turn-On Delay Time | N-Ch | — | 6.8 | — | ns | N-Channel<br>$V_{DD}$ = 15V, $I_D$ = 2.4A, $R_G$ = 6.0Ω,<br>$R_D$ = 6.2Ω<br>③<br>P-Channel<br>$V_{DD}$ = -15V, $I_D$ = -1.8A, $R_G$ = 6.0Ω,<br>$R_D$ = 8.2Ω |
| | | P-Ch | — | 11 | — | | |
| $t_r$ | Rise Time | N-Ch | — | 21 | — | | |
| | | P-Ch | — | 17 | — | | |
| $t_{d(off)}$ | Turn-Off Delay Time | N-Ch | — | 22 | — | | |
| | | P-Ch | — | 25 | — | | |
| $t_f$ | Fall Time | N-Ch | — | 7.7 | — | | |
| | | P-Ch | — | 18 | — | | |
| $L_D$ | Internal Drain Inductace | N-P | — | 4.0 | — | nH | Between lead, 6mm (0.25in.) from<br>package and center of die contact |
| $L_S$ | Internal Source Inductance | N-P | — | 6.0 | — | | |
| $C_{iss}$ | Input Capacitance | N-Ch | — | 520 | — | pF | N-Channel<br>$V_{GS}$ = 0V, $V_{DS}$ = 25V, $f$ = 1.0MHz<br>③<br>P-Channel<br>$V_{GS}$ = 0V, $V_{DS}$ = -25V, $f$ = 1.0MHz |
| | | P-Ch | — | 440 | — | | |
| $C_{oss}$ | Output Capacitance | N-Ch | — | 180 | — | | |
| | | P-Ch | — | 200 | — | | |
| $C_{rss}$ | Reverse Transfer Capacitance | N-Ch | — | 72 | — | | |
| | | P-Ch | — | 93 | — | | |

## Source-Drain Ratings and Characteristics

| | Parameter | | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current (Body Diode) | N-Ch | — | — | 3.1 | A | |
| | | P-Ch | — | — | -3.1 | | |
| $I_{SM}$ | Pulsed Source Current (Body Diode) ① | N-Ch | — | — | 46 | | |
| | | P-Ch | — | — | -34 | | |
| $V_{SD}$ | Diode Forward Voltage | N-Ch | — | — | 1.0 | V | $T_J$ = 25°C, $I_S$ = 1.8A, $V_{GS}$ = 0V ③ |
| | | P-Ch | — | — | -1.0 | | $T_J$ = 25°C, $I_S$ = -1.8A, $V_{GS}$ = 0V ③ |
| $t_{rr}$ | Reverse Recovery Time | N-Ch | — | 47 | 71 | ns | N-Channel<br>$T_J$ = 25°C, $I_F$ = 2.4A, di/dt = 100A/µs<br>P-Channel ③<br>$T_J$ = 25°C, $I_F$ = -1.8A, di/dt = -100A/µs |
| | | P-Ch | — | 53 | 80 | | |
| $Q_{rr}$ | Reverse Recovery Charge | N-Ch | — | 56 | 84 | nC | |
| | | P-Ch | — | 66 | 99 | | |

**Notes:**

① Repetitive rating; pulse width limited by max. junction temperature. ( See fig. 10 )

② N-Channel $I_{SD} \le$ 2.4A, di/dt ≤ 73A/µs, $V_{DD} \le V_{(BR)DSS}$, $T_J \le$ 150°C
P-Channel $I_{SD} \le$ -1.8A, di/dt ≤ 90A/µs, $V_{DD} \le V_{(BR)DSS}$, $T_J \le$ 150°C

③ Pulse width ≤ 300µs; duty cycle ≤ 2%.

④ Surface mounted on FR-4 board, t ≤ 10sec.

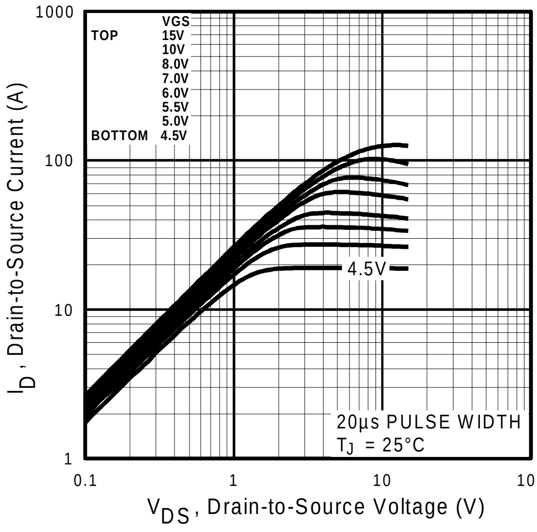



**Fig 1.** Typical Output Characteristics

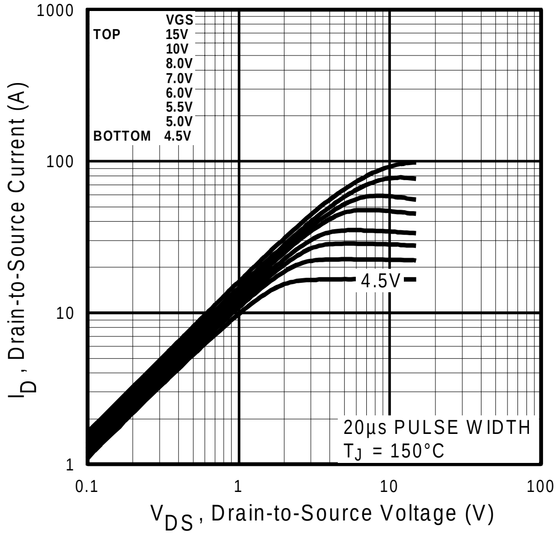



**Fig 2.** Typical Output Characteristics

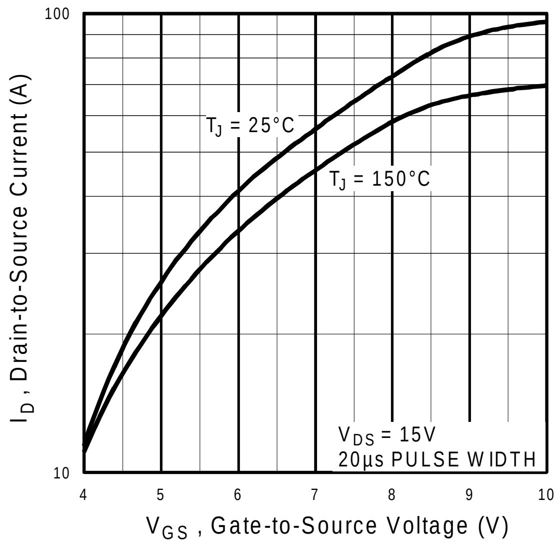



**Fig 3.** Typical Transfer Characteristics

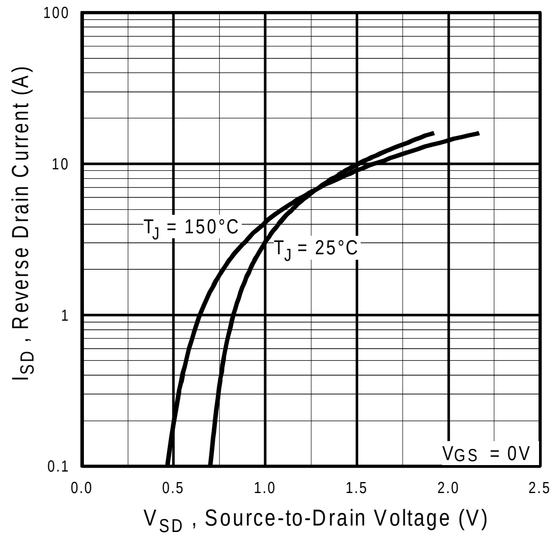



**Fig 4.** Typical Source-Drain Diode Forward Voltage

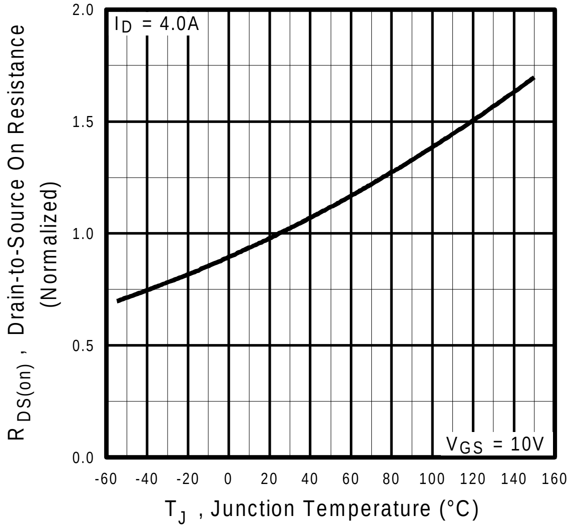



**Fig 5.** Normalized On-Resistance Vs. Temperature

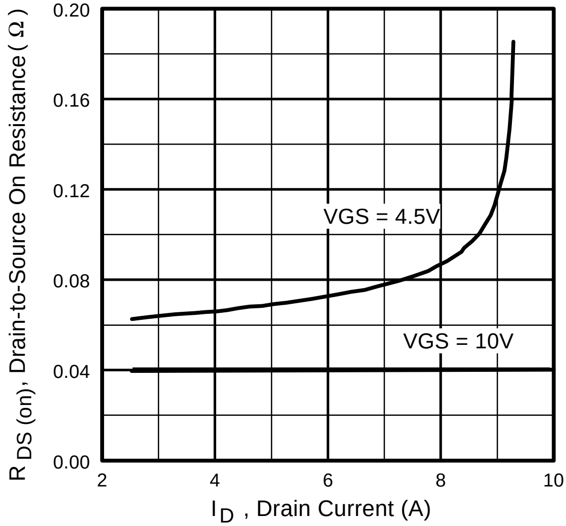



**Fig 6.** Typical On-Resistance Vs. Drain Current

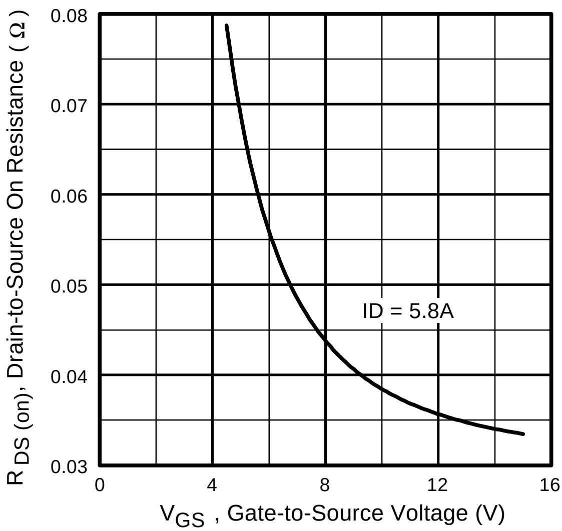



**Fig 7.** Typical On-Resistance Vs. Gate Voltage

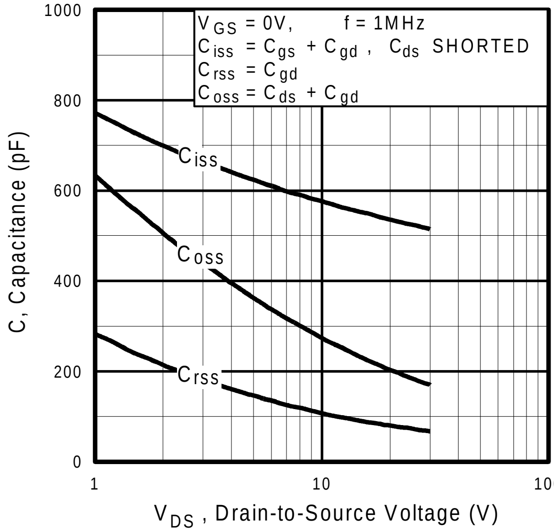



**Fig 8.** Typical Capacitance Vs. Drain-to-Source Voltage

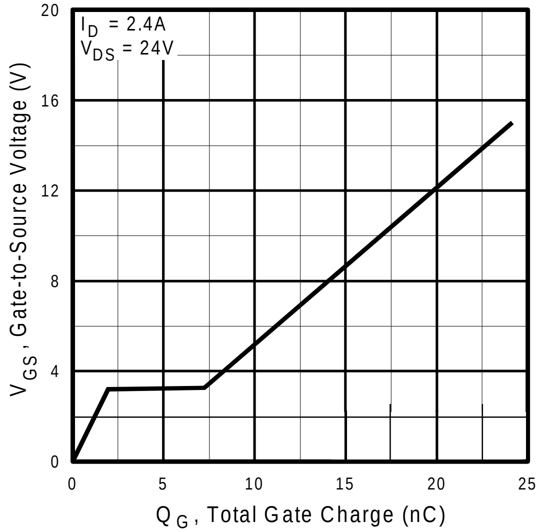



**Fig 9.** Typical Gate Charge Vs. Gate-to-Source Voltage

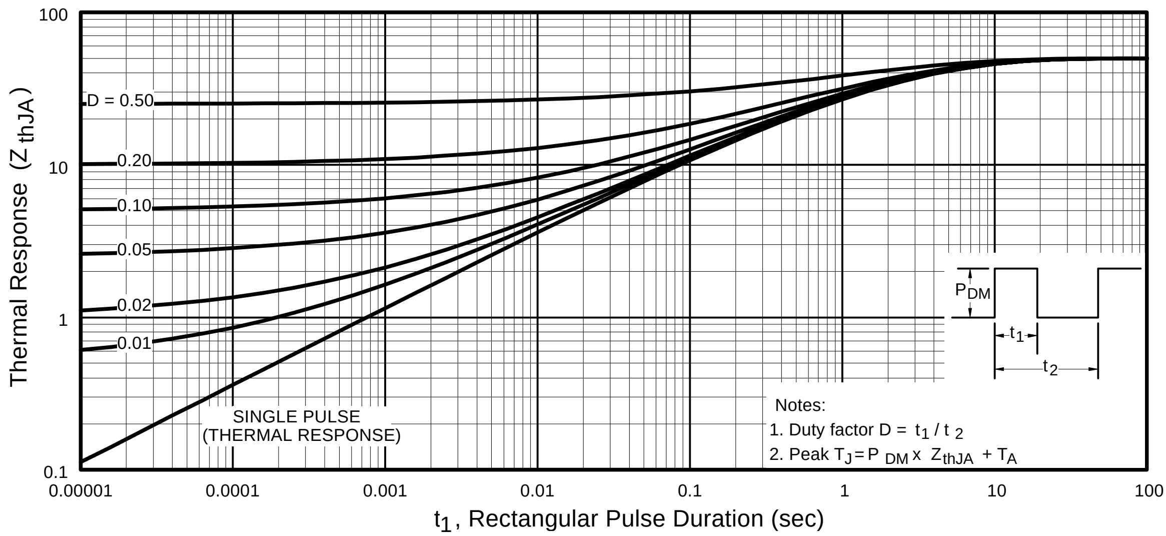



**Fig 10.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

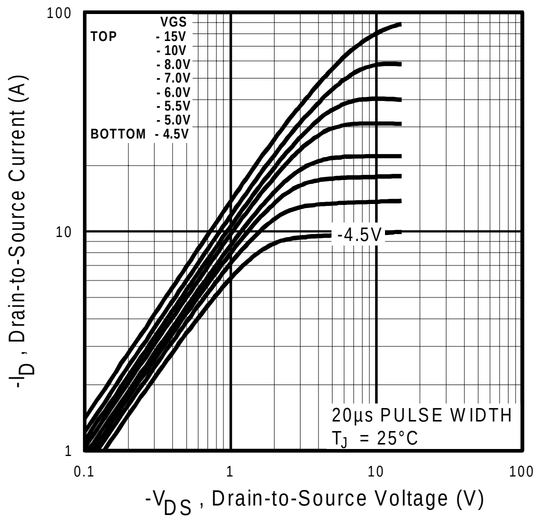



**Fig 11.** Typical Output Characteristics

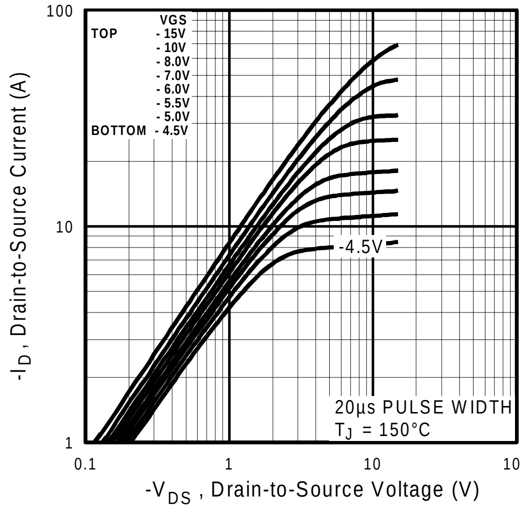



**Fig 12.** Typical Output Characteristics

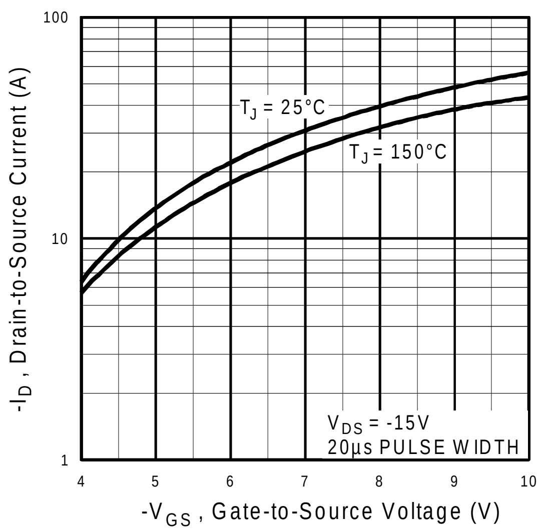



**Fig 13.** Typical Transfer Characteristics

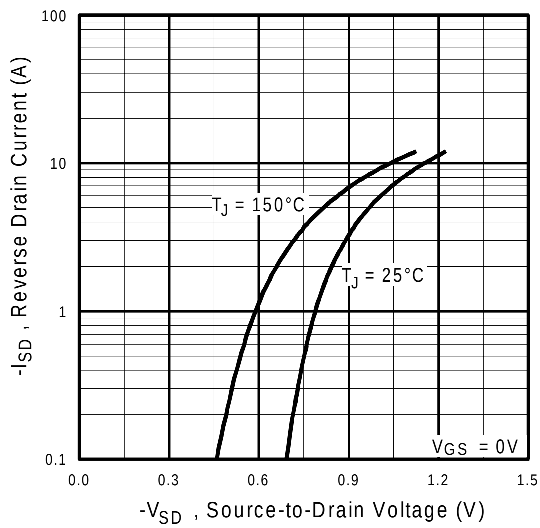



**Fig 14.** Typical Source-Drain Diode Forward Voltage

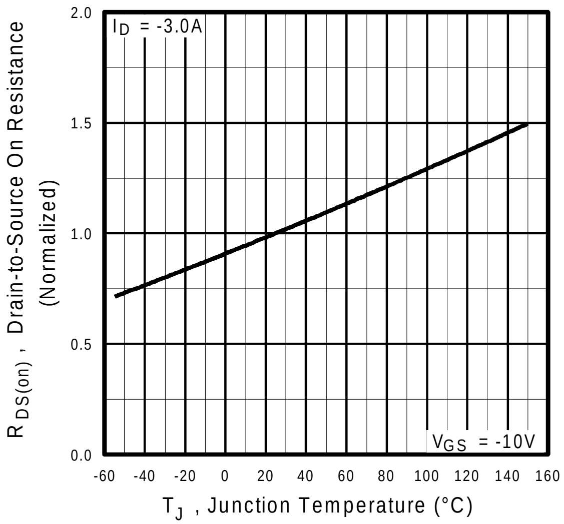



**Fig 15.** Normalized On-Resistance Vs. Temperature

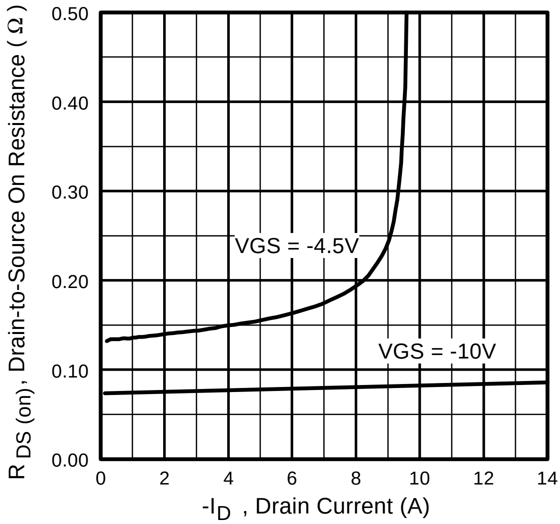



**Fig 16.** Typical On-Resistance Vs. Drain Current

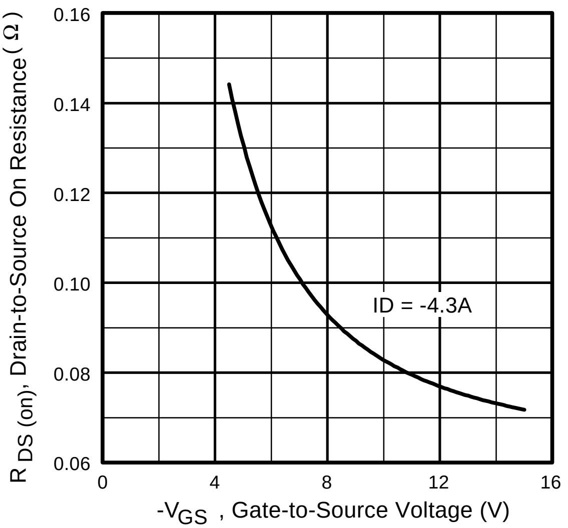



**Fig 17.** Typical On-Resistance Vs. Gate Voltage

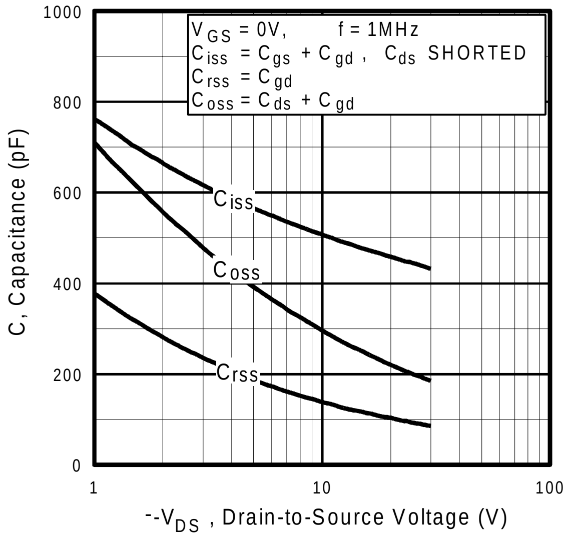



**Fig 18.** Typical Capacitance Vs. Drain-to-Source Voltage

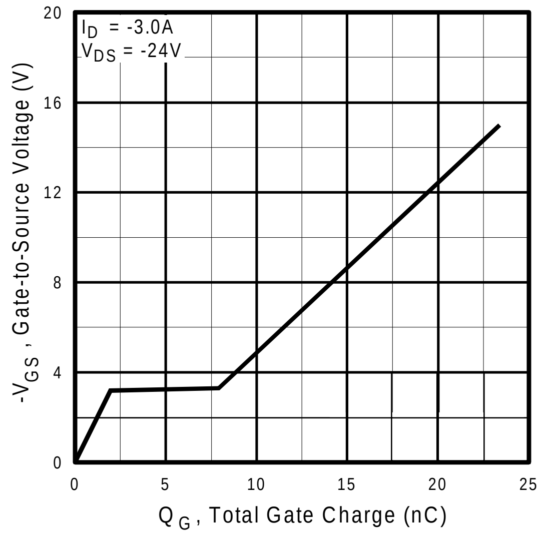



**Fig 19.** Typical Gate Charge Vs. Gate-to-Source Voltage

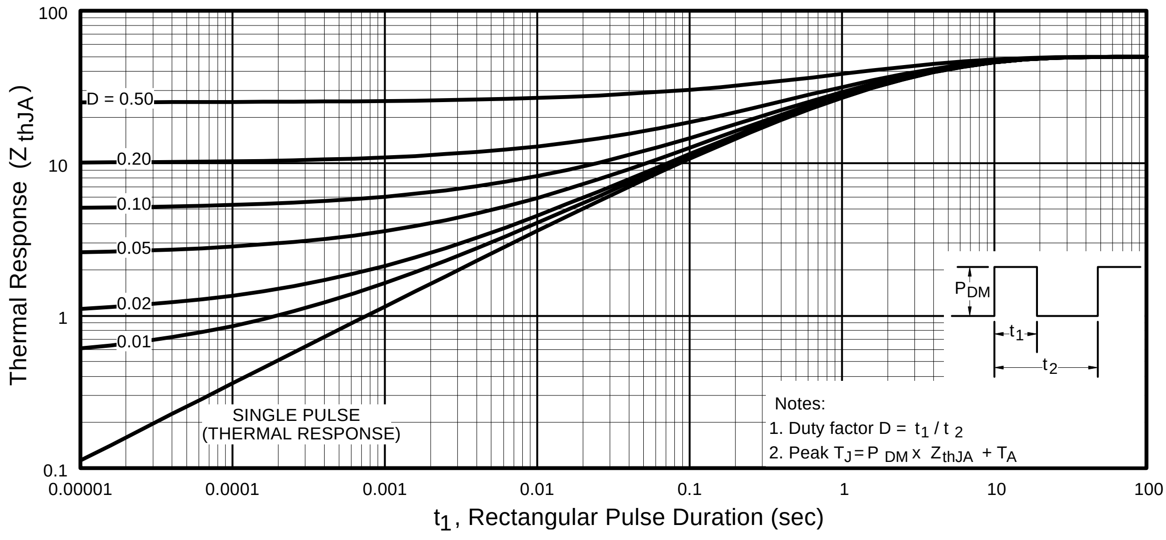
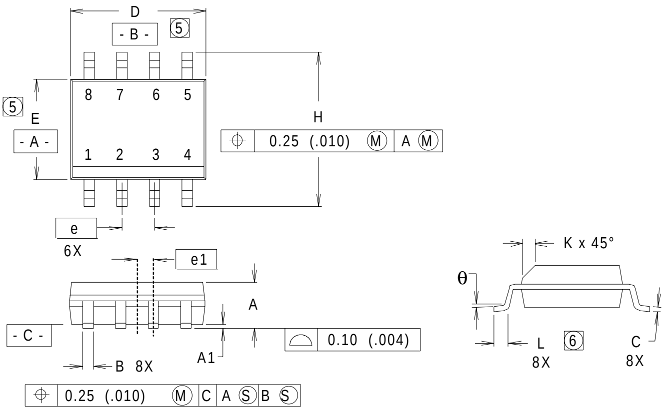



**Fig 20.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

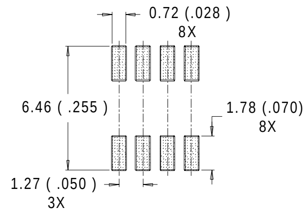
# Package Outline

**SO8 Outline**




| DIM | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | .0532 | .0688 | 1.35 | 1.75 |
| A1 | .0040 | .0098 | 0.10 | 0.25 |
| B | .014 | .018 | 0.36 | 0.46 |
| C | .0075 | .0098 | 0.19 | 0.25 |
| D | .189 | .196 | 4.80 | 4.98 |
| E | .150 | .157 | 3.81 | 3.99 |
| e | .050 BASIC | | 1.27 BASIC | |
| e1 | .025 BASIC | | 0.635 BASIC | |
| H | .2284 | .2440 | 5.80 | 6.20 |
| K | .011 | .019 | 0.28 | 0.48 |
| L | 0.16 | .050 | 0.41 | 1.27 |
| θ | 0° | 8° | 0° | 8° |

RECOMMENDED FOOTPRINT




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION : INCH.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.

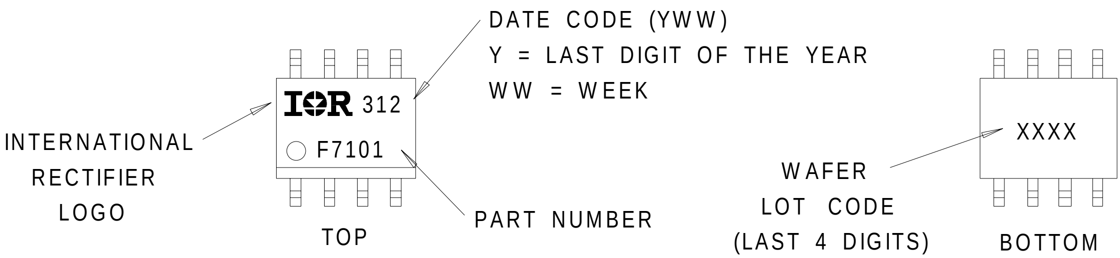
5 DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS
MOLD PROTRUSIONS NOT TO EXCEED 0.25 (.006).

6 DIMENSIONS IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE..

# Part Marking Information

**SO8**

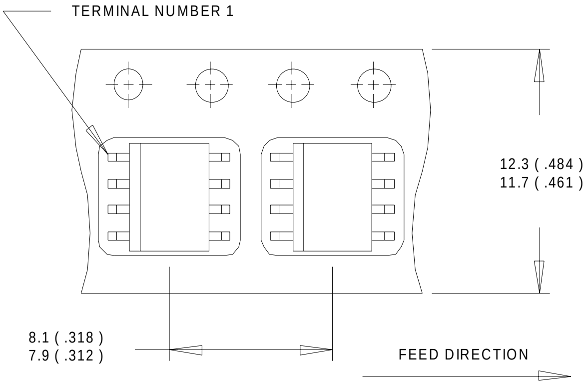
EXAMPLE : THIS IS AN IRF7101



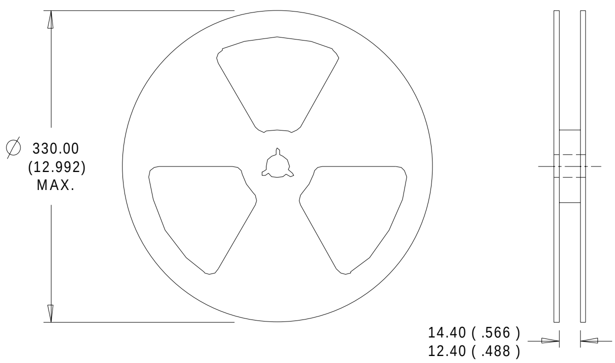
# Tape & Reel Information

**SO8**

Dimensions are shown in millimeters (inches)




NOTES:
1. CONTROLLING DIMENSION : MILLIMETER.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS(INCHES).
3. OUTLINE CONFORMS TO EIA-481 & EIA-541.




NOTES :
1. CONTROLLING DIMENSION : MILLIMETER.
2. OUTLINE CONFORMS TO EIA-481 & EIA-541.

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