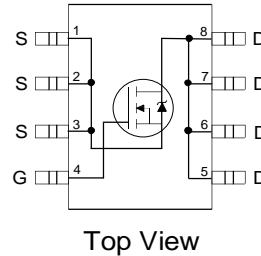


MOSFET

- Ultra Low On-Resistance
- N-Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- Dynamic dv/dt Rating
- Fast Switching



$$V_{DSS} = 30V$$

$$R_{DS(on)} = 0.030\Omega$$

Description

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. Power dissipation of greater than 0.8W is possible in a typical PCB mount application.

SOP-8

Absolute Maximum Ratings

| | Parameter | Max. | Units |
|--------------------------|---|--------------|------------|
| V_{DS} | Drain- Source Voltage | 30 | V |
| $I_D @ T_C = 25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 7.3 | A |
| $I_D @ T_C = 70^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 5.8 | |
| I_{DM} | Pulsed Drain Current ① | 58 | |
| $P_D @ T_C = 25^\circ C$ | Power Dissipation | 2.5 | W |
| $P_D @ T_C = 70^\circ C$ | Power Dissipation | 1.6 | |
| | Linear Derating Factor | 0.02 | |
| V_{GS} | Gate-to-Source Voltage | ± 20 | V |
| V_{GSM} | Gate-to-Source Voltage Single Pulse $t_p < 10\mu s$ | 30 | V |
| E_{AS} | Single Pulse Avalanche Energy ② | 70 | mJ |
| dv/dt | Peak Diode Recovery dv/dt ③ | 5.0 | V/ns |
| T_J, T_{STG} | Junction and Storage Temperature Range | -55 to + 150 | $^\circ C$ |

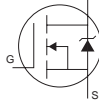
Thermal Resistance

| | Parameter | Typ. | Max. | Units |
|-----------------|-------------------------------|------|------|--------------|
| $R_{\theta JA}$ | Maximum Junction-to-Ambient ⑤ | — | 50 | $^\circ C/W$ |

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

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|--------------------------------------|--|------|-------|----------------|-------|--|
| V _{(BR)DSS} | Drain-to-Source Breakdown Voltage | 30 | — | — | V | V _{GS} = 0V, I _D = 250μA |
| ΔV _{(BR)DSS/ΔT_J} | Breakdown Voltage Temp. Coefficient | — | 0.024 | — | V/°C | Reference to 25°C, I _D = 1mA |
| R _{DS(on)} | Static Drain-to-Source On-Resistance | — | — | 0.030 0.050 | Ω | V _{GS} = 10V, I _D = 7.3A ④ V _{GS} = 4.5V, I _D = 3.7A ④ |
| V _{GS(th)} | Gate Threshold Voltage | 1.0 | — | — | V | V _{DS} = V _{GS} , I _D = 250μA |
| g _{fs} | Forward Transconductance | 5.8 | — | — | S | V _{DS} = 15V, I _D = 2.3A |
| I _{DSS} | Drain-to-Source Leakage Current | — | — | 1.0 25 | μA | V _{DS} = 24V, V _{GS} = 0V V _{DS} = 24V, V _{GS} = 0V, T _J = 125°C |
| I _{GSS} | Gate-to-Source Forward Leakage Gate-to-Source Reverse Leakage | — | — | -100 100 | nA | V _{GS} = -20V V _{GS} = 20V |
| Q _g | Total Gate Charge | — | 19 | 28 | nC | I _D = 4.6A V _{DS} = 24V V _{GS} = 10V, See Fig. 10 ④ |
| Q _{gs} | Gate-to-Source Charge | — | 2.3 | 3.5 | | |
| Q _{gd} | Gate-to-Drain ("Miller") Charge | — | 6.3 | 9.5 | | |
| t _{d(on)} | Turn-On Delay Time | — | 7.0 | — | ns | V _{DD} = 15V I _D = 4.6A R _G = 6.2Ω R _D = 3.2Ω, ④ |
| t _r | Rise Time | — | 35 | — | | |
| t _{d(off)} | Turn-Off Delay Time | — | 21 | — | | |
| t _f | Fall Time | — | 19 | — | | |
| C _{iss} | Input Capacitance | — | 550 | — | pF | V _{GS} = 0V V _{DS} = 25V f = 1.0MHz, See Fig. 9 |
| C _{oss} | Output Capacitance | — | 260 | — | | |
| C _{rss} | Reverse Transfer Capacitance | — | 100 | — | | |

Source-Drain Ratings and Characteristics

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|-----------------|---|------|------|------|-------|--|
| I _S | Continuous Source Current (Body Diode) | — | — | 2.5 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| I _{SM} | Pulsed Source Current (Body Diode) ① | — | — | 58 | | |
| V _{SD} | Diode Forward Voltage | — | — | 1.2 | V | T _J = 25°C, I _S = 4.6A, V _{GS} = 0V ③ |
| t _{rr} | Reverse Recovery Time | — | 48 | 73 | ns | T _J = 25°C, I _F = 4.6A |
| Q _{rr} | Reverse Recovery Charge | — | 73 | 110 | nC | di/dt = 100A/μs ③ |

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)
- ② V_{DD} = 15V, starting T_J = 25°C, L = 6.6mH
R_G = 25Ω, I_{AS} = 4.6A. (See Figure 8)
- ③ I_{SD} ≤ 4.6A, di/dt ≤ 120A/μs, V_{DD} ≤ V_{(BR)DSS},
T_J ≤ 150°C
- ④ Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ⑤ When mounted on 1 inch square copper board, t < 10 sec

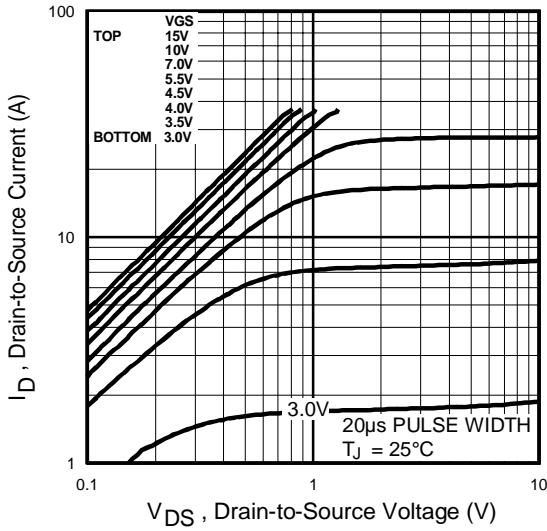


Fig 1. Typical Output Characteristics

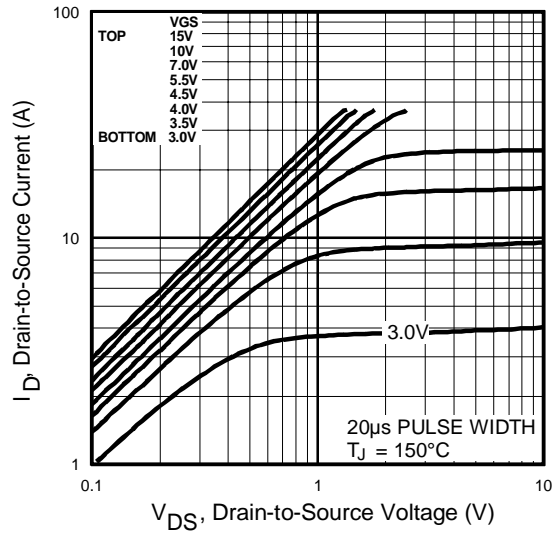


Fig 2. Typical Output Characteristics

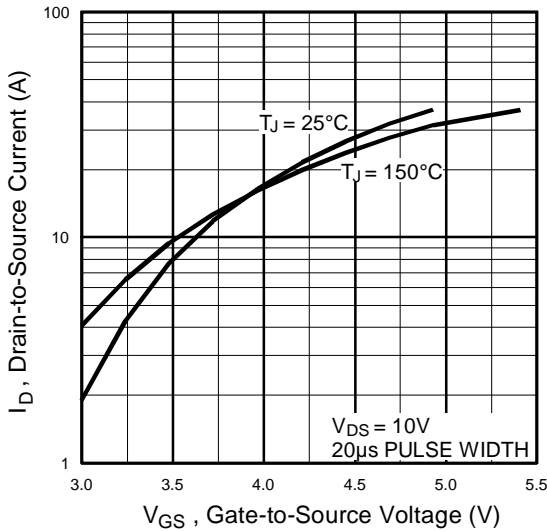


Fig 3. Typical Transfer Characteristics

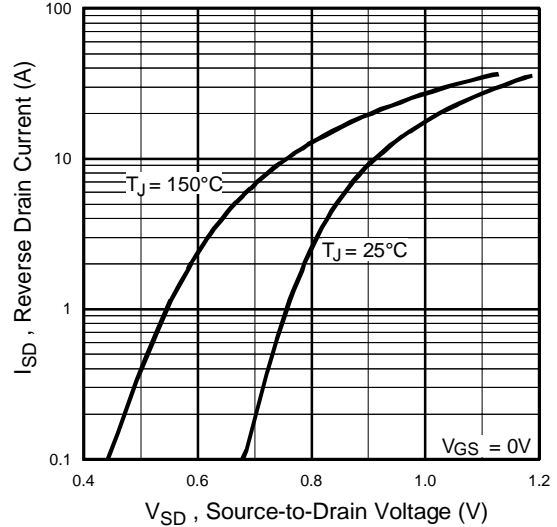


Fig 4. Typical Source-Drain Diode Forward Voltage

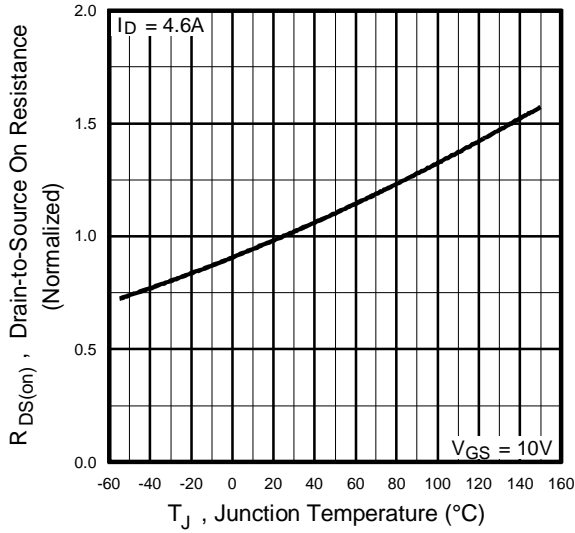


Fig 5. Normalized On-Resistance Vs. Temperature

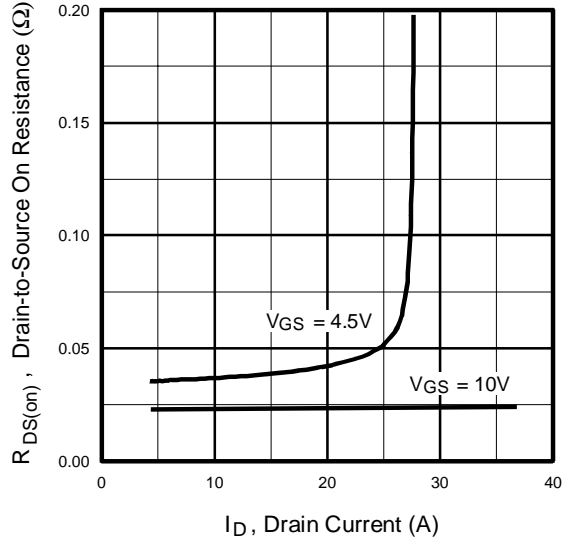


Fig 6. On-Resistance Vs. Drain Current

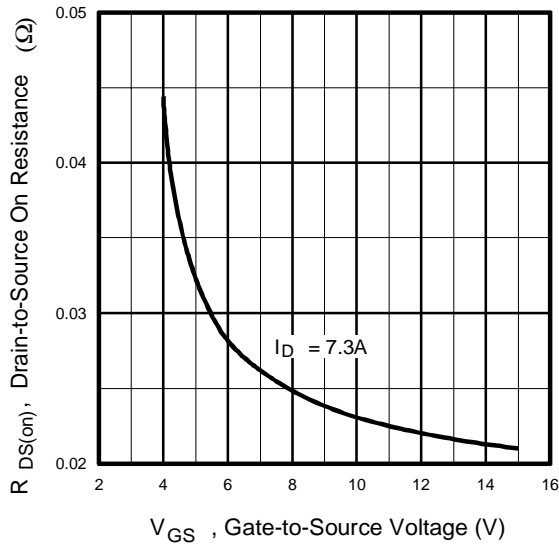


Fig 7. On-Resistance Vs. Gate Voltage

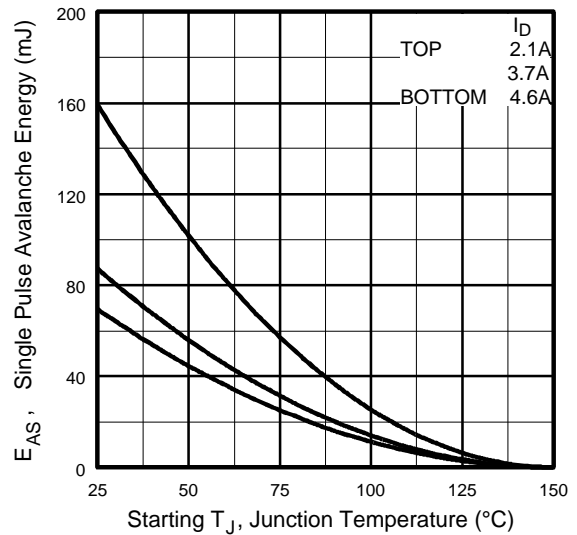


Fig 8. Maximum Avalanche Energy Vs. Drain Current

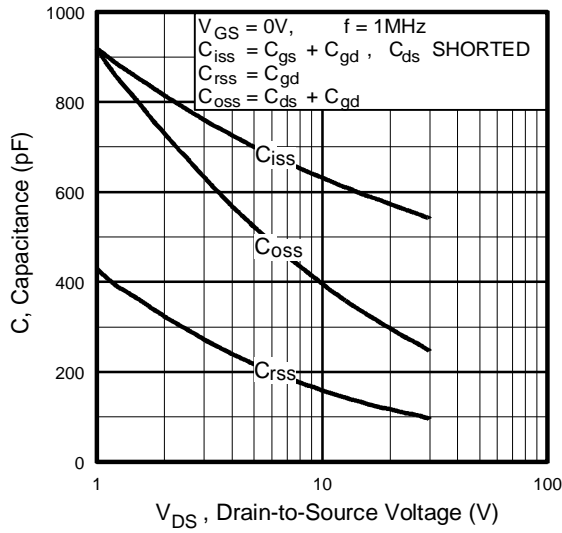


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

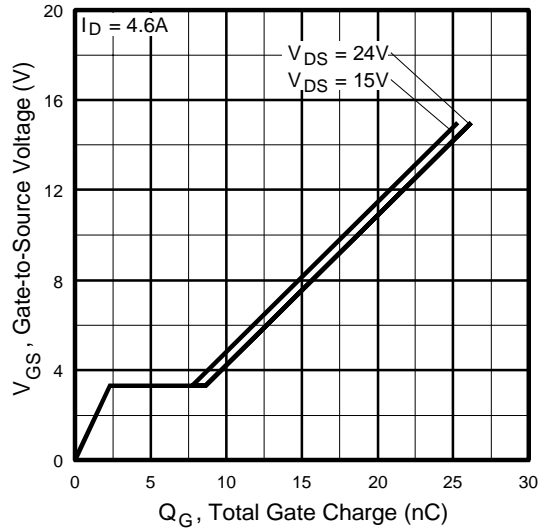


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

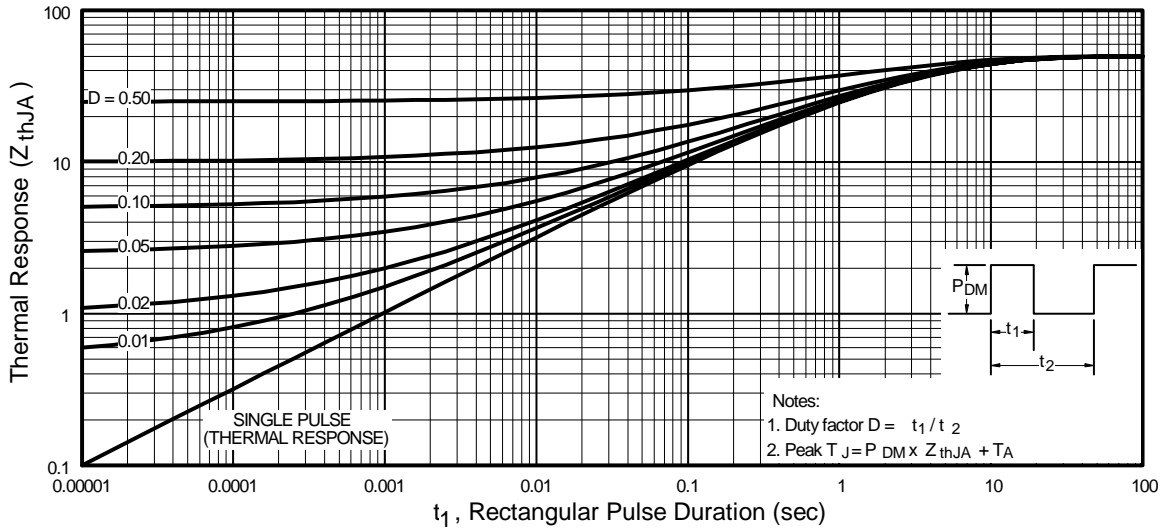
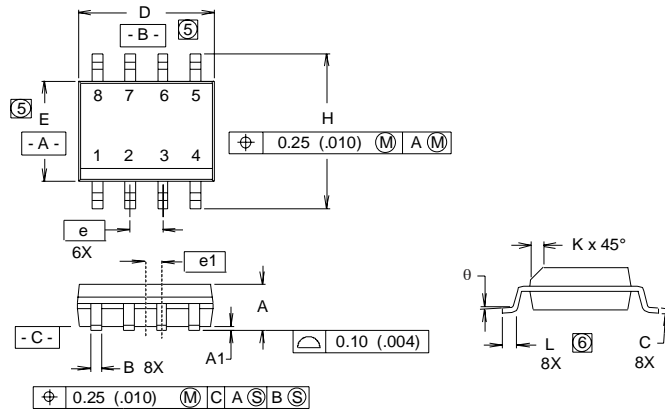


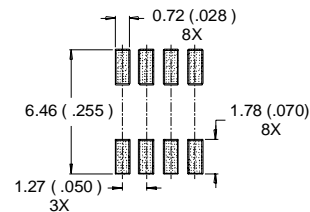
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

SO-8 Package Details



| 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

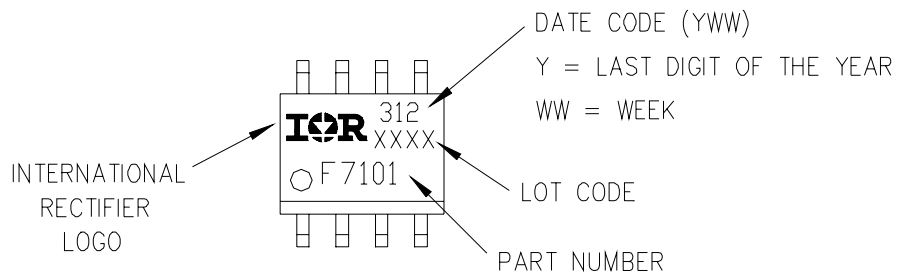


NOTES:

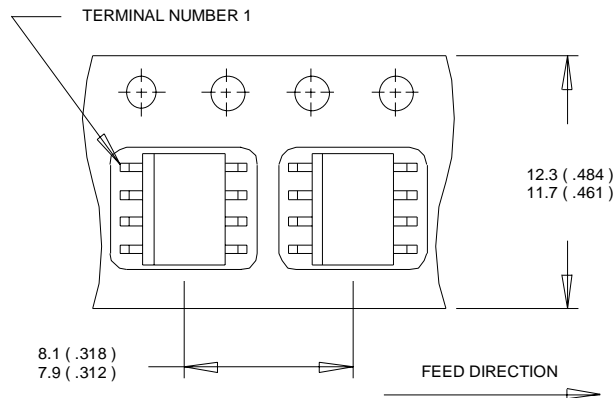
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION : INCH.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
- ⑤ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS
MOLD PROTRUSIONS NOT TO EXCEED 0.25 (.006).
- ⑥ DIMENSIONS IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE..

SO-8 Part Marking

EXAMPLE: THIS IS AN IRF7101

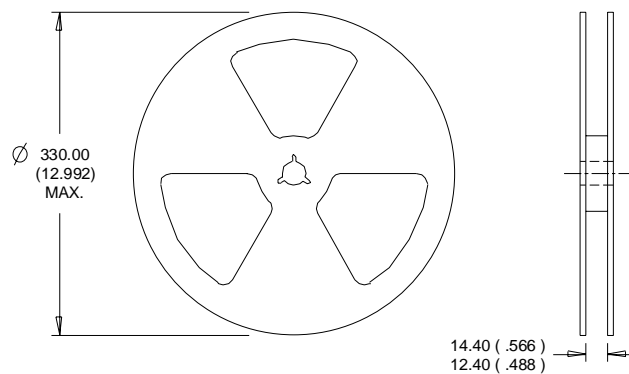


SO-8 Tape and Reel



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.