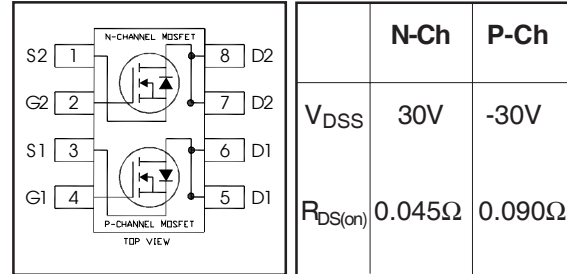


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HEXFET[®] Power MOSFET

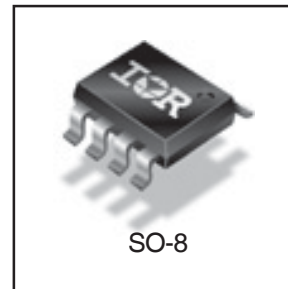
- Advanced Process Technology
- Ultra Low On-Resistance
- Dual N and P Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- 150°C Operating Temperature
- Lead-Free



Description

These HEXFET[®] Power MOSFET's in a Dual SO-8 package utilize the latest processing techniques to achieve extremely low on-resistance per silicon area. Additional features of these HEXFET Power MOSFET's are a 150°C junction operating temperature, fast switching speed and improved repetitive avalanche rating. These benefits combine to make this design an extremely efficient and reliable device for use in a wide variety of applications.

The efficient SO-8 package provides enhanced thermal characteristics and dual MOSFET die capability making it ideal in a variety of power applications. This dual, surface mount SO-8 can dramatically reduce board space and is also available in Tape & Reel.



Absolute Maximum Ratings

| | Parameter | Max. | | Units |
|--------------------------------|---|--------------|-----------|-------|
| | | N-Channel | P-Channel | |
| V_{SD} | Drain-to-Source Voltage | 30 | -30 | |
| $I_D @ T_A = 25^\circ\text{C}$ | Continuous Drain Current, $V_{GS} @ 10\text{V}$ | 5.8 | -4.3 | A |
| $I_D @ T_A = 70^\circ\text{C}$ | Continuous Drain Current, $V_{GS} @ 10\text{V}$ | 4.6 | -3.4 | |
| I_{DM} | Pulsed Drain Current ① | 46 | -34 | |
| $P_D @ T_A = 25^\circ\text{C}$ | 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-Ambient ^③ | 50 | °C/W |

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IRF7379QPbF

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IR Rectifier

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

| Parameter | Description | | 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 |
| ΔV _{(BR)DSS} /ΔT _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} = 24V, V _{GS} = 0V |
| | | P-Ch | — | — | -1.0 | | V _{DS} = -24V, V _{GS} = 0V |
| | | N-Ch | — | — | 25 | | V _{DS} = 24V, 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 | μA | V _{GS} = ±20V |
| Q _g | Total Gate Charge | N-Ch | — | — | 25 | nC | N-Channel I _D = 2.4A, V _{DS} = 24V, V _{GS} = 10V ③ |
| | | P-Ch | — | — | 25 | | |
| Q _{gs} | Gate-to-Source Charge | N-Ch | — | — | 2.9 | nC | ③ |
| | | P-Ch | — | — | 2.9 | | |
| Q _{gd} | Gate-to-Drain ("Miller") Charge | N-Ch | — | — | 7.9 | nC | P-Channel I _D = -1.8A, V _{DS} = -24V, V _{GS} = -10V |
| | | P-Ch | — | — | 9.0 | | |
| t _{d(on)} | Turn-On Delay Time | N-Ch | — | 6.8 | — | ns | N-Channel V _{DD} = 15V, I _D = 2.4A, R _G = 6.0Ω, R _D = 6.2Ω ③ |
| | | P-Ch | — | 11 | — | | |
| t _r | Rise Time | N-Ch | — | 21 | — | ns | ③ |
| | | P-Ch | — | 17 | — | | |
| t _{d(off)} | Turn-Off Delay Time | N-Ch | — | 22 | — | ns | P-Channel V _{DD} = -15V, I _D = -1.8A, R _G = 6.0Ω, R _D = 8.2Ω ③ |
| | | P-Ch | — | 25 | — | | |
| t _f | Fall Time | N-Ch | — | 7.7 | — | ns | ③ |
| | | P-Ch | — | 18 | — | | |
| L _D | Internal Drain Inductance | N-P | — | 4.0 | — | nH | Between lead, 6mm (0.25in.) from 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 V _{GS} = 0V, V _{DS} = 25V, f = 1.0MHz ③ |
| | | P-Ch | — | 440 | — | | |
| C _{oss} | Output Capacitance | N-Ch | — | 180 | — | pF | ③ |
| | | P-Ch | — | 200 | — | | |
| C _{rss} | Reverse Transfer Capacitance | N-Ch | — | 72 | — | pF | P-Channel V _{GS} = 0V, V _{DS} = -25V, f = 1.0MHz |
| | | P-Ch | — | 93 | — | | |

Source-Drain Ratings and Characteristics

| Parameter | Description | | 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 | A | |
| | | 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 T _J = 25°C, I _F = 2.4A, di/dt = 100A/μs |
| P-Ch | — | 53 | 80 | | | | |
| Q _{rr} | Reverse Recovery Charge | N-Ch | — | 56 | 84 | nC | ③ |
| | | P-Ch | — | 66 | 99 | | |

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 10)
- ② N-Channel I_{SD} ≤ 2.4A, di/dt ≤ 73A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 150°C
P-Channel I_{SD} ≤ -1.8A, di/dt ≤ 90A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 150°C
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ④ Surface mounted on FR-4 board, t ≤ 10sec.

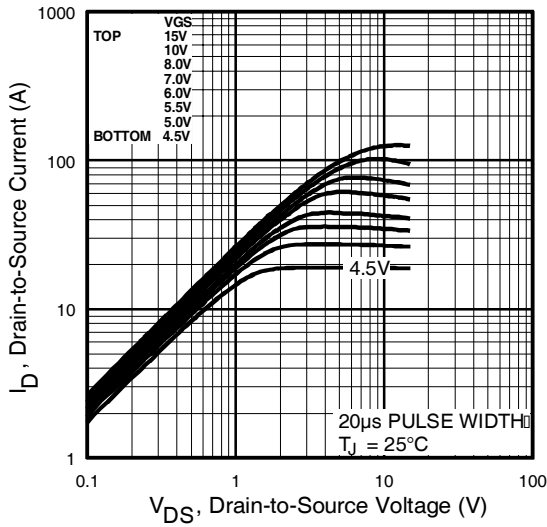


Fig 1. Typical Output Characteristics

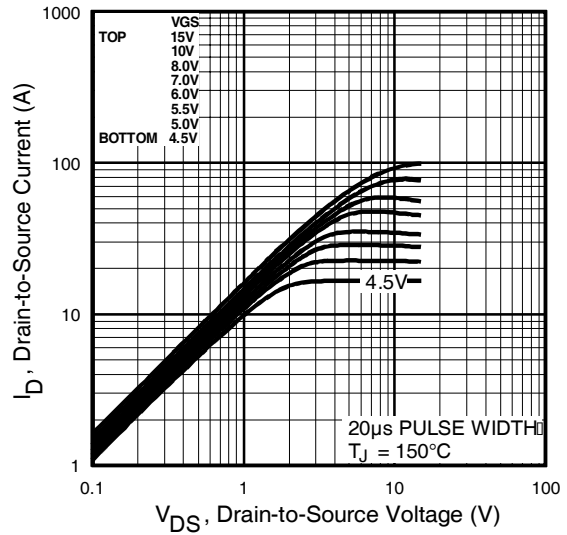


Fig 2. Typical Output Characteristics

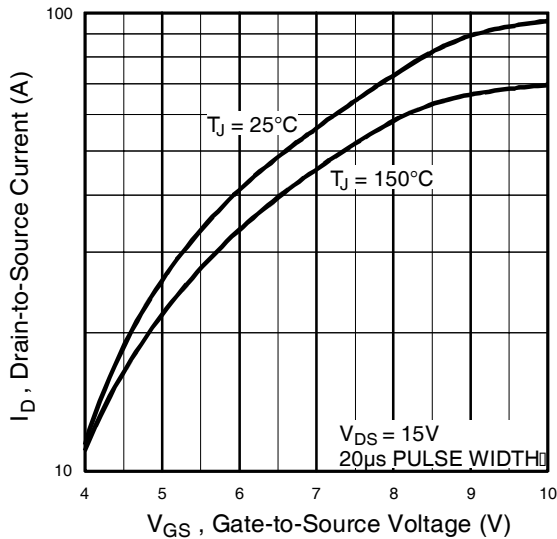


Fig 3. Typical Transfer Characteristics

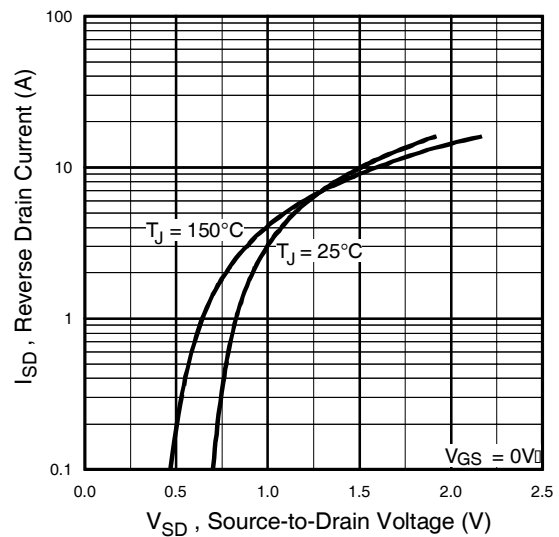


Fig 4. Typical Source-Drain Diode Forward Voltage

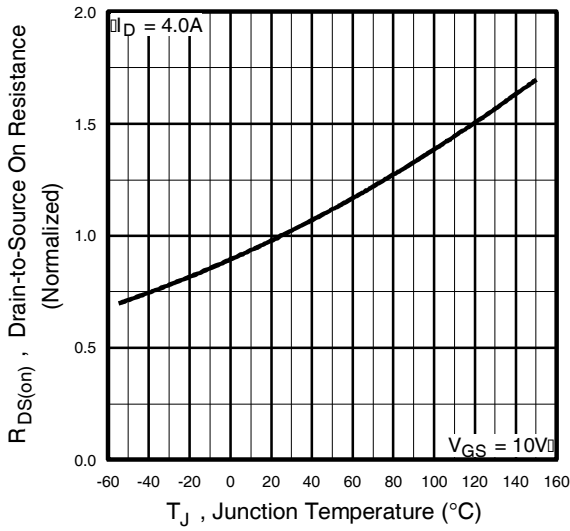


Fig 5. Normalized On-Resistance Vs. Temperature

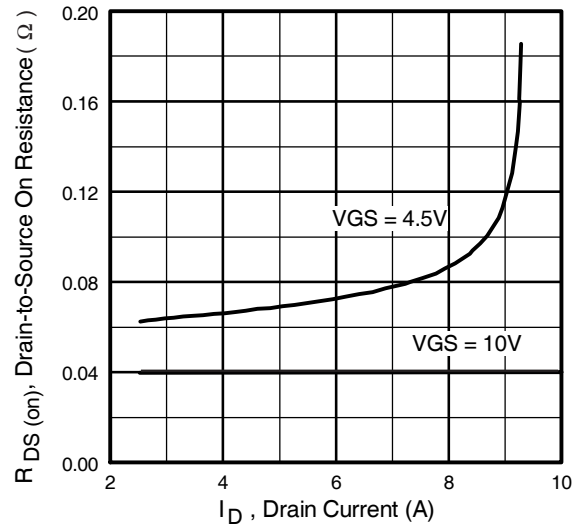


Fig 6. Typical On-Resistance Vs. Drain Current

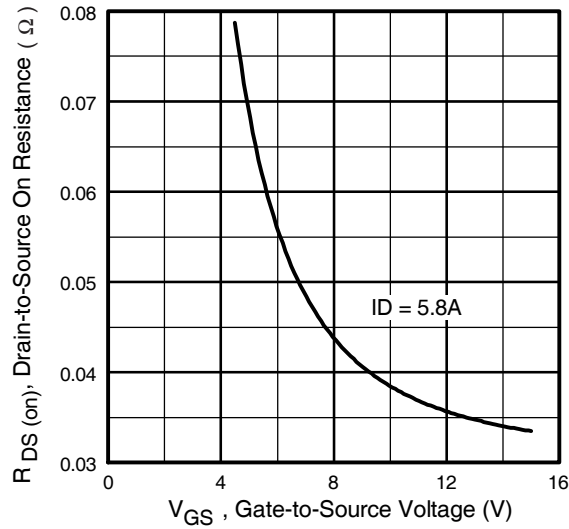


Fig 7. Typical On-Resistance Vs. Gate Voltage

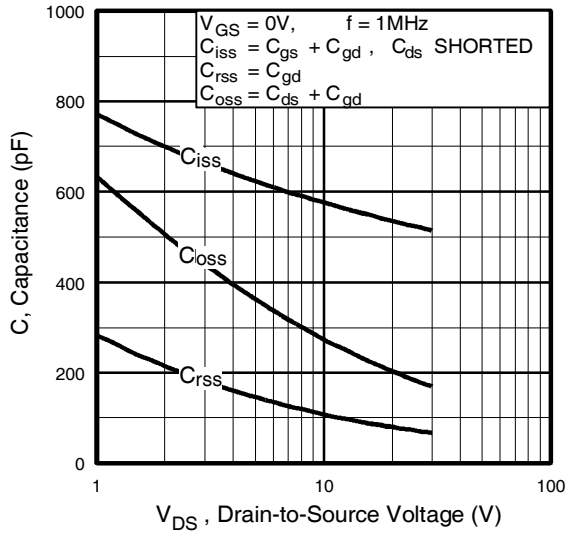


Fig 8. Typical Capacitance Vs. Drain-to-Source Voltage

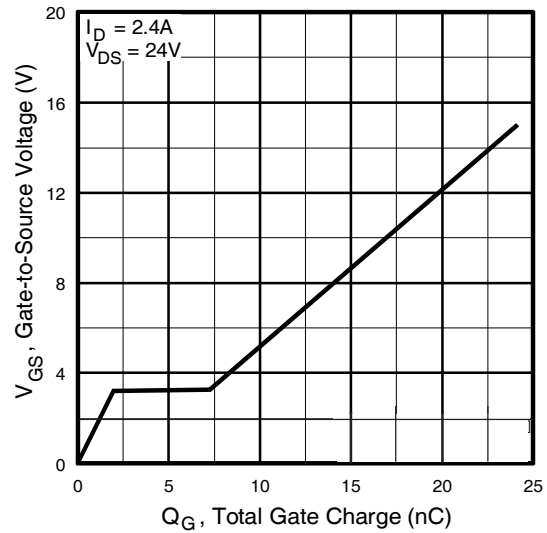


Fig 9. Typical Gate Charge Vs. Gate-to-Source Voltage

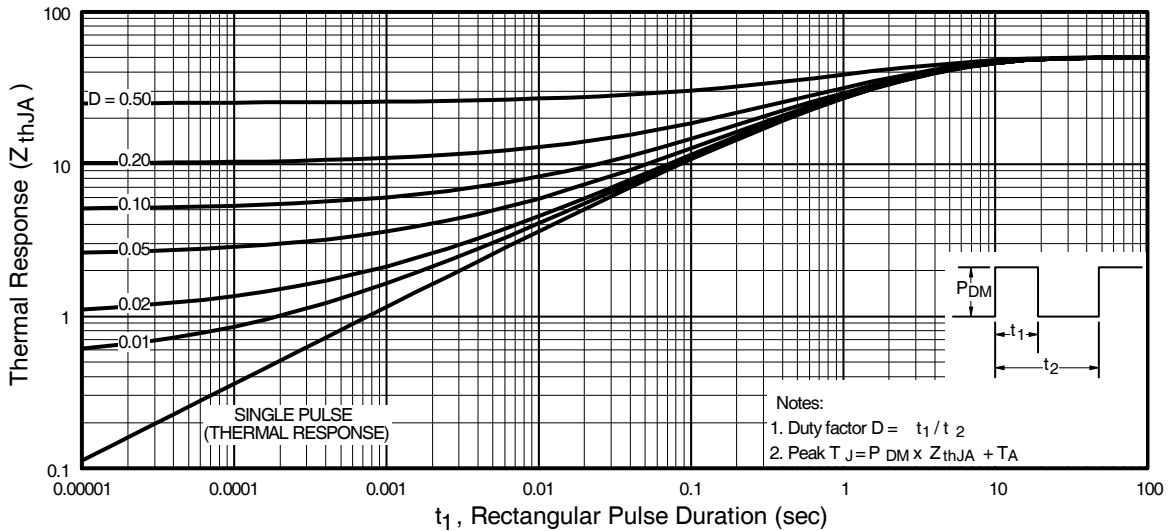


Fig 10. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

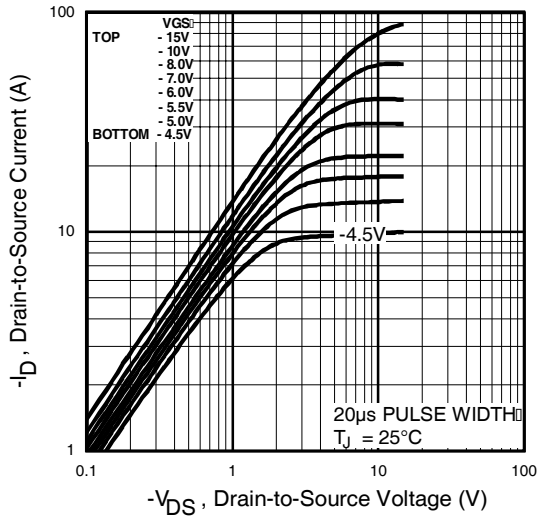


Fig 11. Typical Output Characteristics

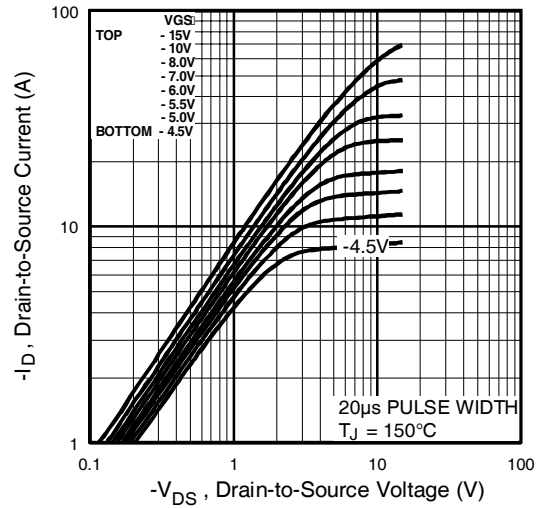


Fig 12. Typical Output Characteristics

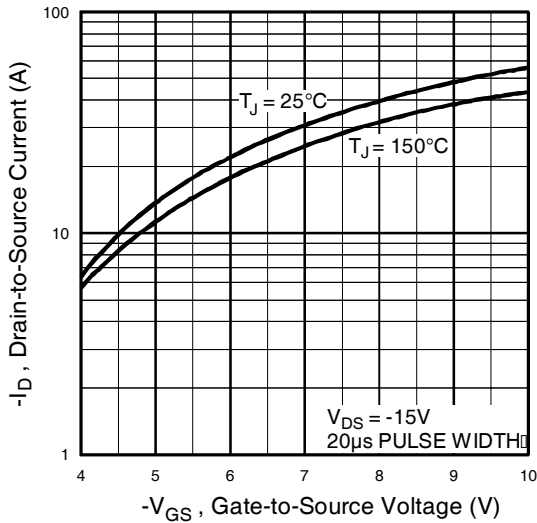


Fig 13. Typical Transfer Characteristics

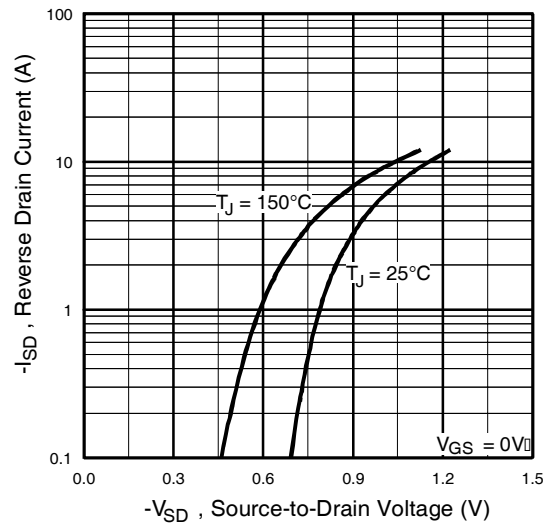


Fig 14. Typical Source-Drain Diode Forward Voltage

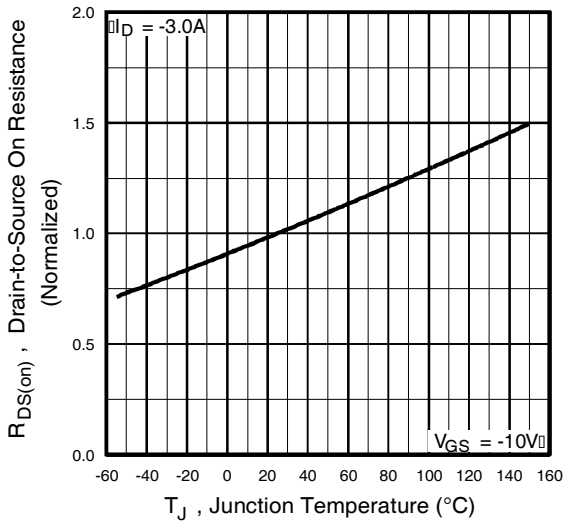


Fig 15. Normalized On-Resistance Vs. Temperature

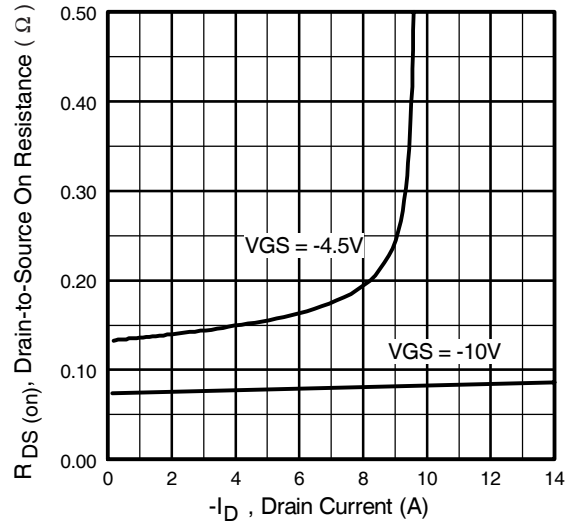


Fig 16. Typical On-Resistance Vs. Drain Current

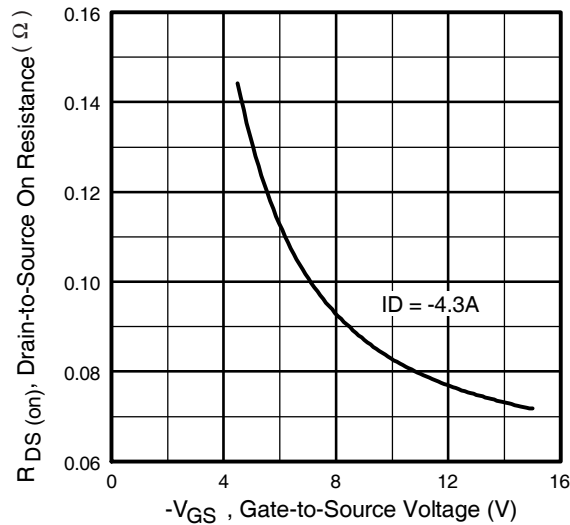


Fig 17. Typical On-Resistance Vs. Gate Voltage

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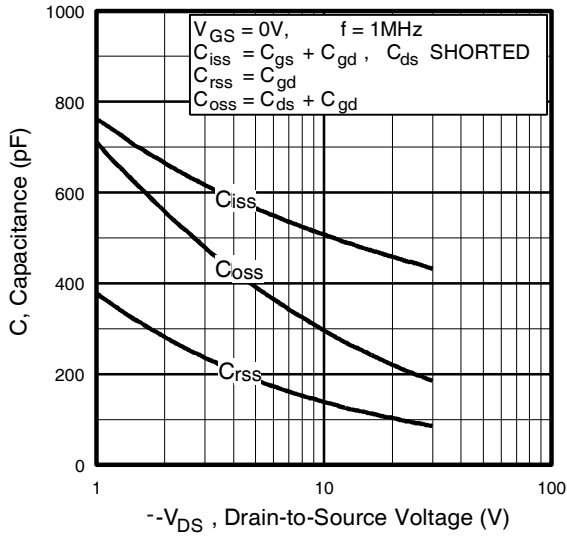


Fig 18. Typical Capacitance Vs. Drain-to-Source Voltage

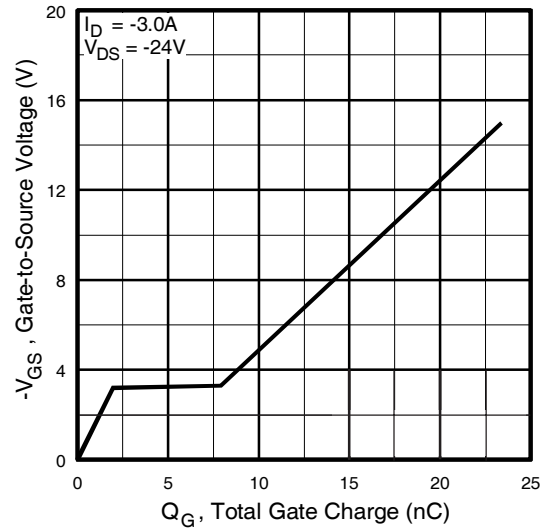


Fig 19. Typical Gate Charge Vs. Gate-to-Source Voltage

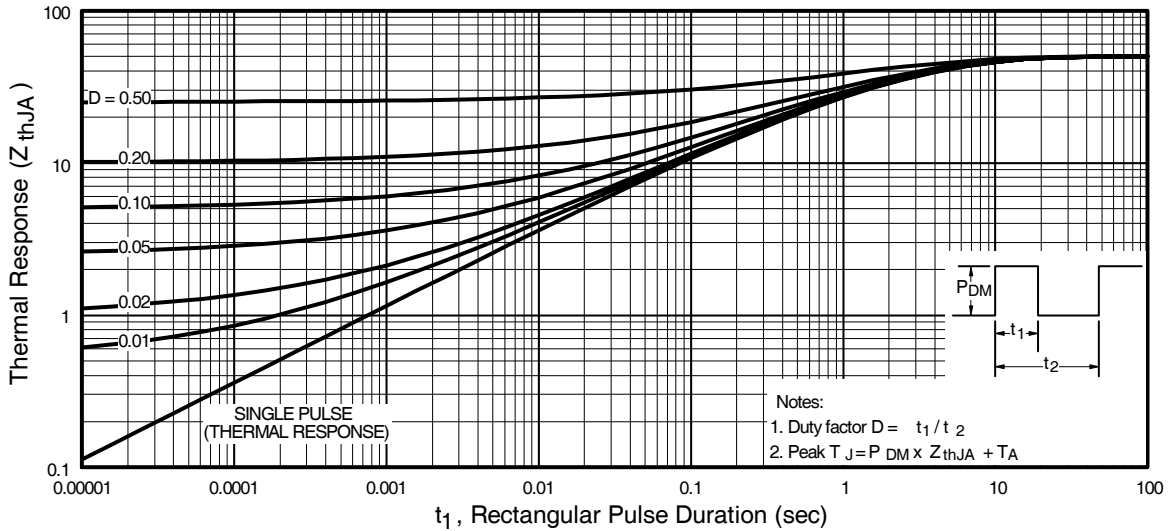
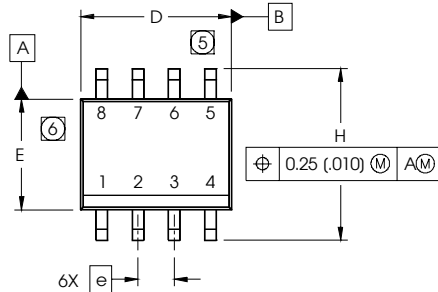


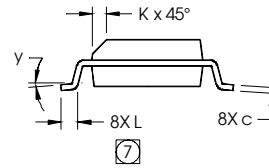
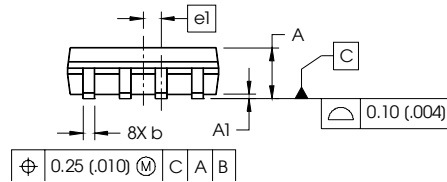
Fig 20. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

SO-8 Package Outline

Dimensions are shown in millimeters (inches)



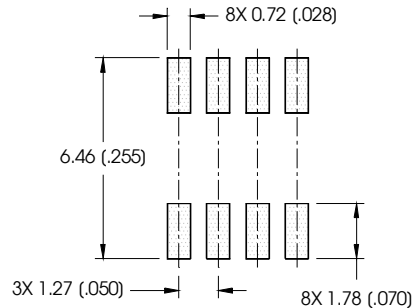
| DIM | INCHES | | MILLIMETERS | |
|-----|------------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | .0532 | .0688 | 1.35 | 1.75 |
| A1 | .0040 | .0098 | 0.10 | 0.25 |
| b | .013 | .020 | 0.33 | 0.51 |
| c | .0075 | .0098 | 0.19 | 0.25 |
| D | .189 | .1968 | 4.80 | 5.00 |
| E | .1497 | .1574 | 3.80 | 4.00 |
| e | .050 BASIC | | 1.27 BASIC | |
| e1 | .025 BASIC | | 0.635 BASIC | |
| H | .2284 | .2440 | 5.80 | 6.20 |
| K | .0099 | .0196 | 0.25 | 0.50 |
| L | .016 | .050 | 0.40 | 1.27 |
| y | 0° | 8° | 0° | 8° |



NOTES:

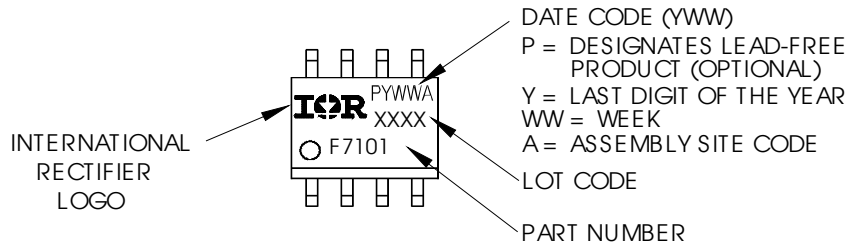
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
- ⑤ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
- ⑥ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 (.010).
- ⑦ DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

FOOTPRINT



SO-8 Part Marking

EXAMPLE: THIS IS AN IRF7101 (MOSFET)



Notes:

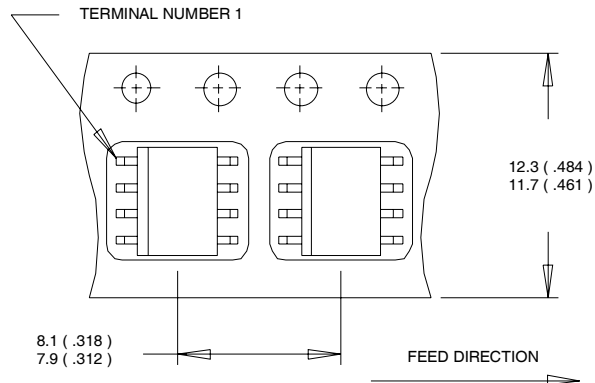
1. For an Automotive Qualified version of this part please see <http://www.irf.com/product-info/automotive/>
2. For the most current drawing please refer to IR website at <http://www.irf.com/package/>

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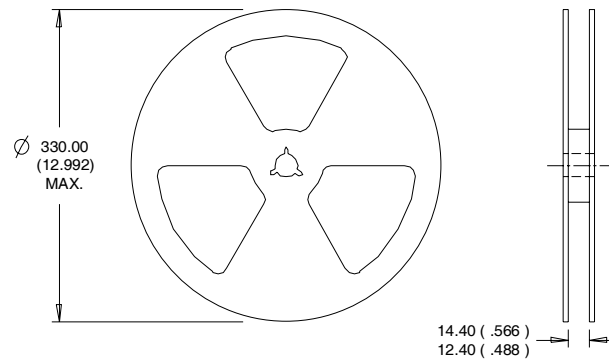
SO-8 Tape and Reel

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.

Data and specifications subject to change without notice.
This product has been designed and qualified for the Industrial market.
Qualification Standards can be found on IR's Web site.

International
IR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7903

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