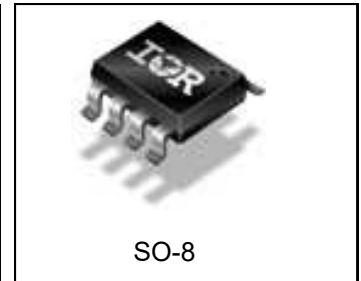
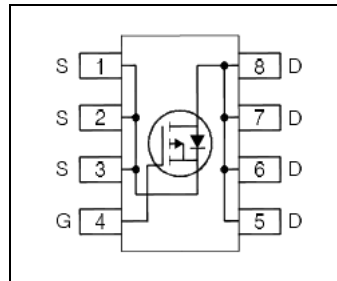


| | | |
|---|-------------|-----------|
| V_{DS} | -30 | V |
| $V_{GS\ max}$ | ±25 | mΩ |
| $R_{DS(on)\ max}$ (@ $V_{GS} = -10V$) | 11.9 | |
| I_D (@ $T_A = 25^\circ C$) | -12 | A |


Applications

- Adaptor Input Switch for Notebook PC

Features

| |
|--|
| 25V $V_{GS\ max}$ |
| Industry-Standard SO8 Package |
| RoHS Compliant Containing no Lead, no Bromide and no Halogen |

Resulting Benefits

| |
|-------------------------------|
| Direct Drive at High V_{GS} |
| Multi-Vendor Compatibility |
| Environmentally Friendlier |

| Base part number | Package Type | Standard Pack | | Note |
|------------------|--------------|---------------|----------|------|
| | | Form | Quantity | |
| IRF9388EPbF | SO-8 | Tube/Bulk | 95 | |
| | | Tape and Reel | 4000 | |

Absolute Maximum Ratings

| | Parameter | Max. | Units |
|--------------------------|---|--------------|-------|
| V_{DS} | Drain-to-Source Voltage | -30 | V |
| V_{GS} | Gate-to-Source Voltage | ± 25 | |
| $I_D @ T_A = 25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V$ | -12 | A |
| $I_D @ T_A = 70^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V$ | -9.6 | |
| I_{DM} | Pulsed Drain Current ① | -96 | |
| $P_D @ T_A = 25^\circ C$ | Power Dissipation ④ | 2.5 | W |
| $P_D @ T_A = 70^\circ C$ | Power Dissipation ④ | 1.6 | |
| | Linear Derating Factor | 0.02 | W/°C |
| T_J T_{STG} | Operating Junction and Storage Temperature Range | -55 to + 150 | °C |

Notes ① through ⑥ are on page 2

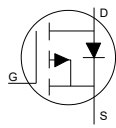
Static @ T_J = 25°C (unless otherwise specified)

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|-------------------------------------|--------------------------------------|------|-------|------|-------|---|
| BV _{DSS} | Drain-to-Source Breakdown Voltage | -30 | — | — | V | V _{GS} = 0V, I _D = -250μA |
| ΔBV _{DSS} /ΔT _J | Breakdown Voltage Temp. Coefficient | — | 0.021 | — | V/°C | Reference to 25°C, I _D = -1mA |
| R _{DS(on)} | Static Drain-to-Source On-Resistance | — | 8.5 | — | mΩ | V _{GS} = -20V, I _D = -12A ^③ |
| | | — | 10 | 11.9 | | V _{GS} = -10V, I _D = -12A ^③ |
| V _{GS(th)} | Gate Threshold Voltage | -1.3 | -1.8 | -2.4 | V | V _{DS} = V _{GS} , I _D = -25μA |
| ΔV _{GS(th)} | Gate Threshold Voltage Coefficient | — | -5.8 | — | mV/°C | |
| I _{DSS} | Drain-to-Source Leakage Current | — | — | -1.0 | μA | V _{DS} = -24V, V _{GS} = 0V |
| | | — | — | -150 | | V _{DS} = -24V, V _{GS} = 0V, T _J = 125°C |
| I _{GSS} | Gate-to-Source Forward Leakage | — | — | 10 | μA | V _{GS} = 25V |
| | Gate-to-Source Reverse Leakage | — | — | -10 | | V _{GS} = -25V |
| g _{fs} | Forward Transconductance | 20 | — | — | S | V _{DS} = -10V, I _D = -9.6A |
| Q _g | Total Gate Charge ^⑥ | — | 18 | — | | V _{DD} = -15V, V _{GS} = -4.5V, I _D = -9.6A |
| Q _g | Total Gate Charge ^⑥ | — | 35 | 52 | | V _{GS} = -10V, |
| Q _{gs} | Gate to Source Charge ^⑥ | — | 5.3 | — | | V _{DD} = -15V |
| Q _{gd} | Gate to Drain Charge ^⑥ | — | 8.5 | — | | I _D = -9.6A |
| R _G | Gate Resistance ^⑥ | — | 15 | — | Ω | |
| t _{d(on)} | Turn-On Delay Time | — | 19 | — | ns | V _{DD} = -15V, V _{GS} = -4.5V ^③ |
| t _r | Rise Time | — | 57 | — | | I _D = -1.0A |
| t _{d(off)} | Turn-Off Delay Time | — | 80 | — | | R _G = 6.8Ω |
| t _f | Fall Time | — | 66 | — | | See Figs.20a & 20b |
| C _{iss} | Input Capacitance | — | 1680 | — | pF | V _{GS} = 0V |
| C _{oss} | Output Capacitance | — | 350 | — | | V _{DS} = -25V |
| C _{riss} | Reverse Transfer Capacitance | — | 220 | — | | f = 1.0MHz |

Avalanche Characteristics

| | Parameter | Typ. | Max. | Units |
|-----------------|--|------|------|-------|
| E _{AS} | Single Pulse Avalanche Energy ^② | — | 120 | mJ |
| I _{AR} | Avalanche Current ^① | — | -9.6 | A |

Diode Characteristics

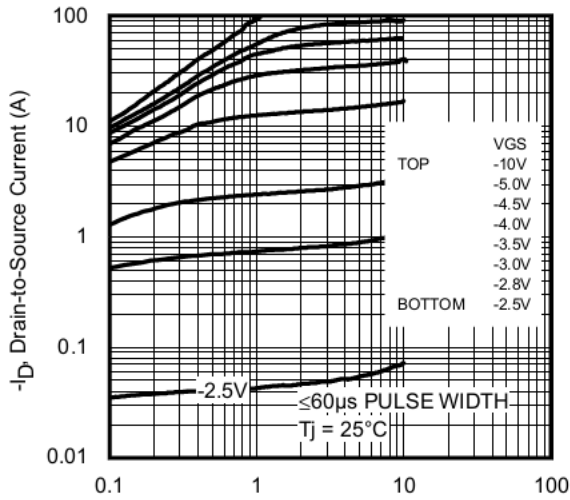
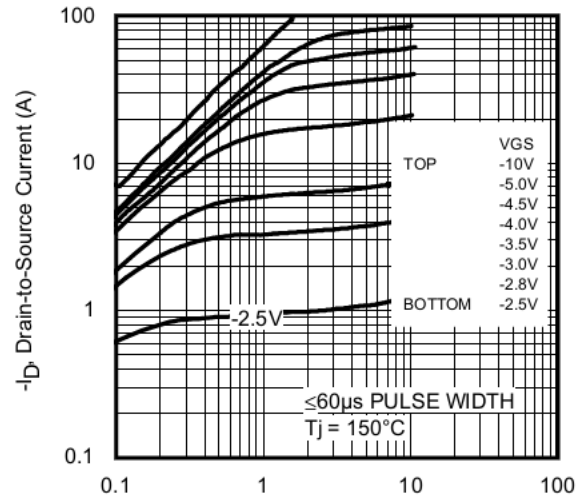
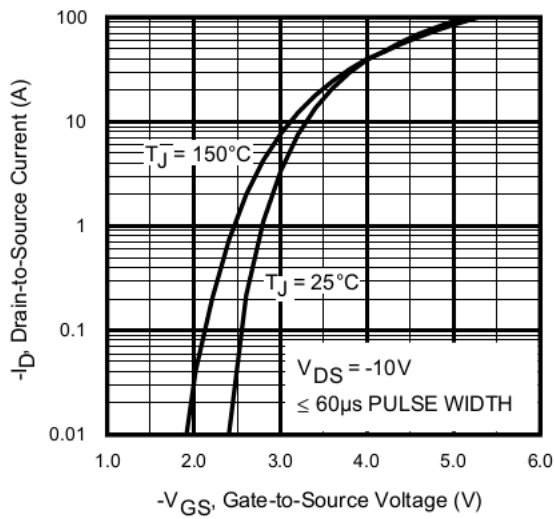
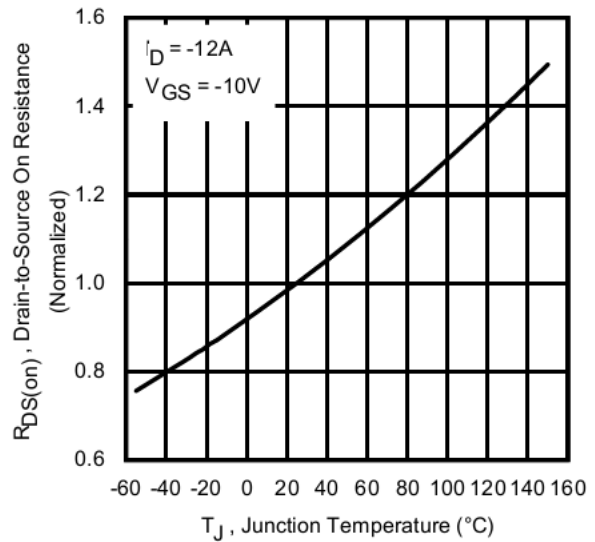
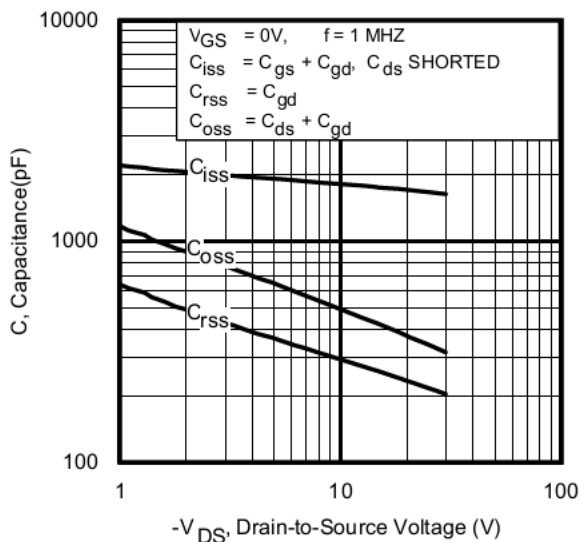
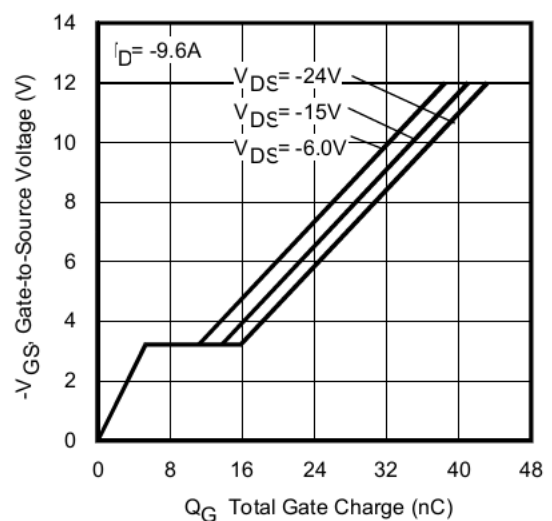
| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|-----------------|---|------|------|------|-------|--|
| I _S | Continuous Source Current (Body Diode) | — | — | -2.5 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| I _{SM} | Pulsed Source Current (Body Diode) ^① | — | — | -96 | | |
| V _{SD} | Diode Forward Voltage | — | — | -1.2 | V | T _J = 25°C, I _S = -2.5A, V _{GS} = 0V ^③ |
| t _{rr} | Reverse Recovery Time | — | 51 | 76 | ns | T _J = 25°C, I _F = -2.5A, V _{DD} = -24V |
| Q _{rr} | Reverse Recovery Charge | — | 35 | 53 | nC | di/dt = 100A/μs ^③ |

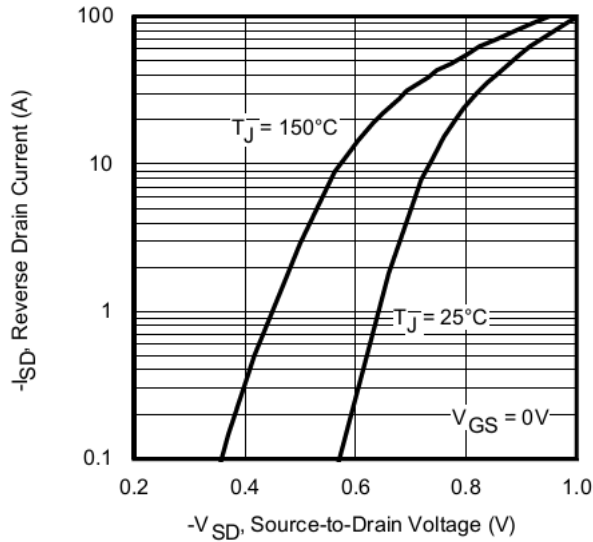
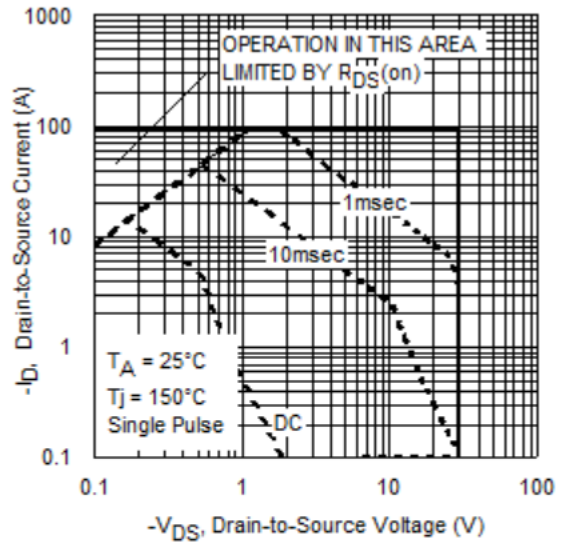
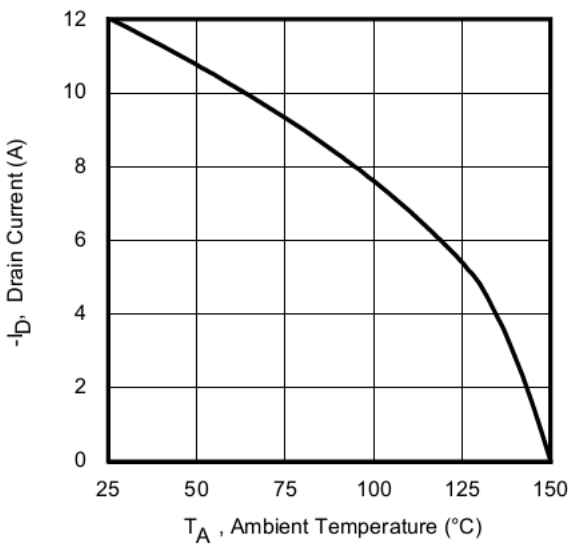
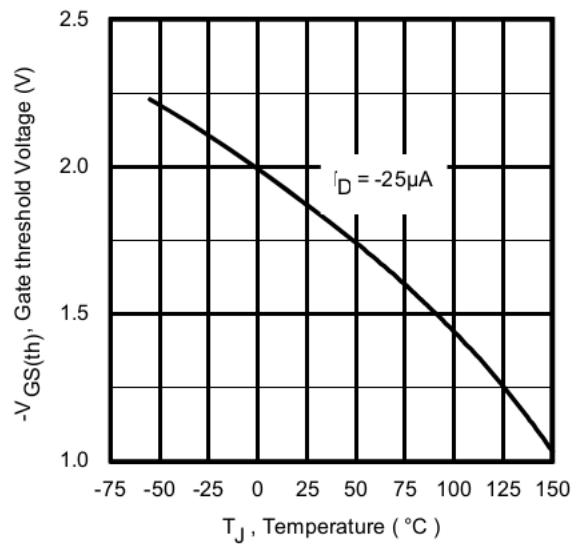
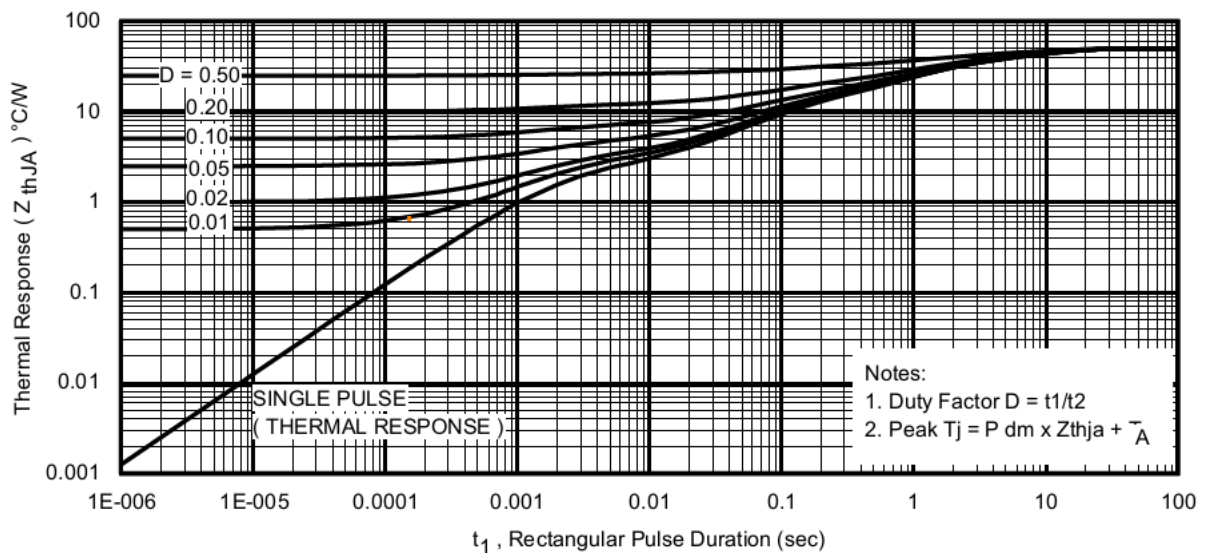
Thermal Resistance

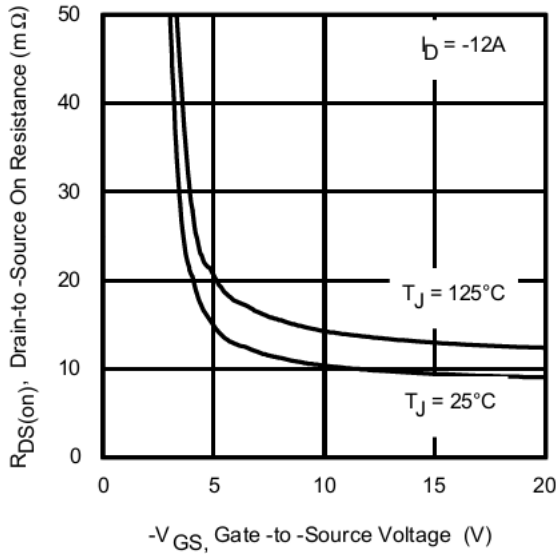
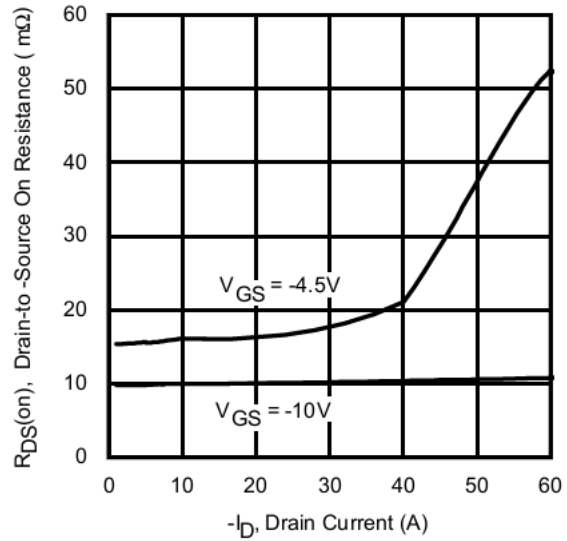
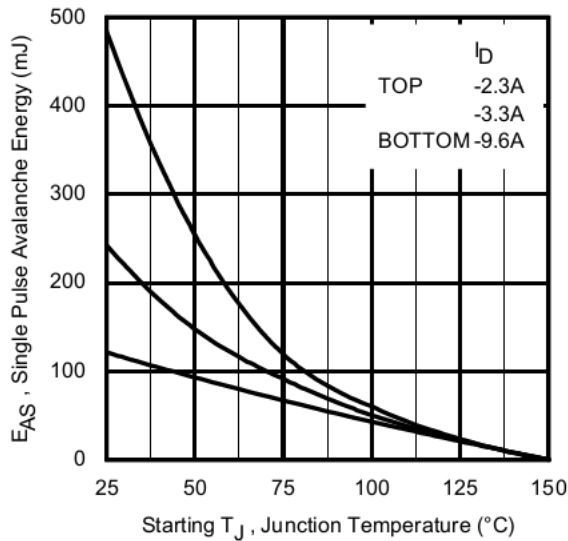
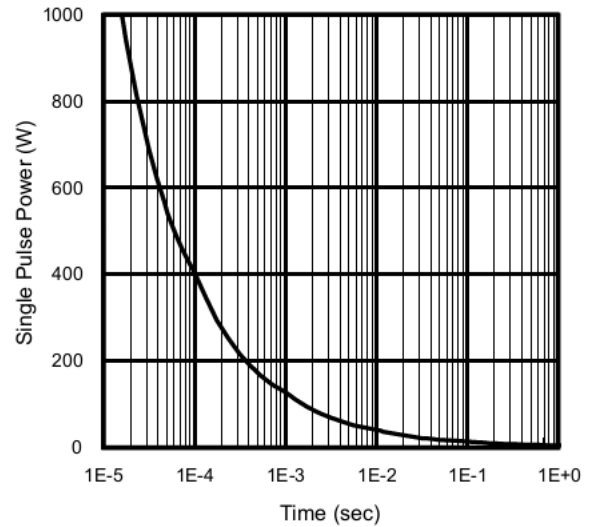
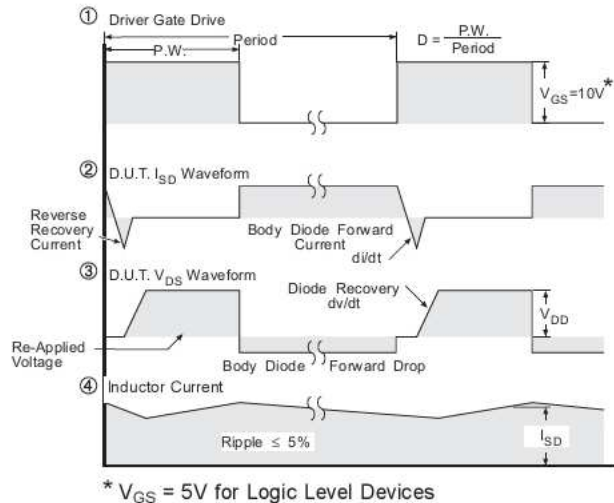
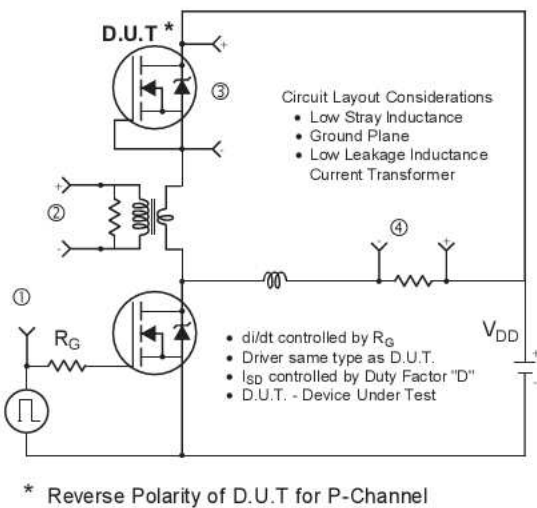
| | Parameter | Typ. | Max. | Units |
|------------------|-------------------------------------|------|------|-------|
| R _{θJL} | Junction-to-Drain Lead ^⑤ | — | 20 | °C/W |
| R _{θJA} | Junction-to-Ambient ^④ | — | 50 | |

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting T_J = 25°C, L = 2.6mH, R_G = 50Ω, I_{AS} = -9.6A.
- ③ Pulse width ≤ 400μs; duty cycle ≤ 2%.
- ④ When mounted on 1 inch square copper board.
- ⑤ R_θ is measured at T_J of approximately 90°C.
- ⑥ For DESIGN AID ONLY, not subject to production testing.


Fig 1. Typical Output Characteristics

Fig 2. Typical Output Characteristics

Fig 3. Typical Transfer Characteristics

Fig 4. Normalized On-Resistance vs. Temperature

Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage


Fig 7. Typical Source-Drain Diode Forward Voltage

Fig 8. Maximum Safe Operating Area

Fig 9. Maximum Drain Current vs. Ambient Temperature

Fig 10. Threshold Voltage Vs. Temperature

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


Fig 12. Maximum Avalanche Energy vs. Drain Current

Fig 13. Typical Power vs. Time

Fig 14. On-Resistance vs. Gate Voltage

Fig 15. Typical On-Resistance vs. Drain Current

Fig 17. Diode Reverse Recovery Test Circuit for P-Channel HEXFET[®] Power MOSFETs

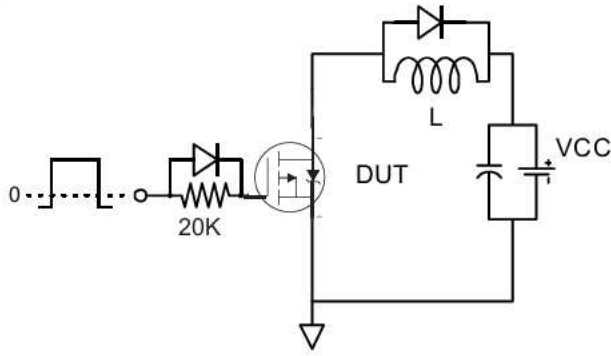


Fig 18a. Gate Charge Test Circuit

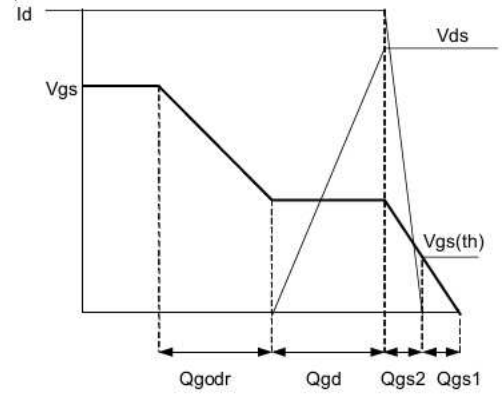


Fig 18b. Gate Charge Waveform

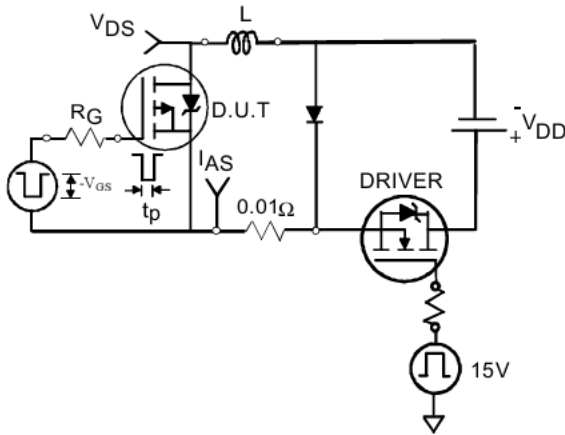


Fig 19a. Unclamped Inductive Test Circuit

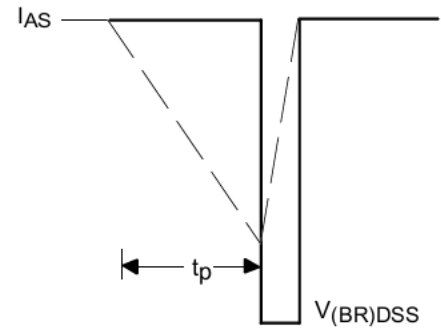


Fig 19b. Unclamped Inductive Waveforms

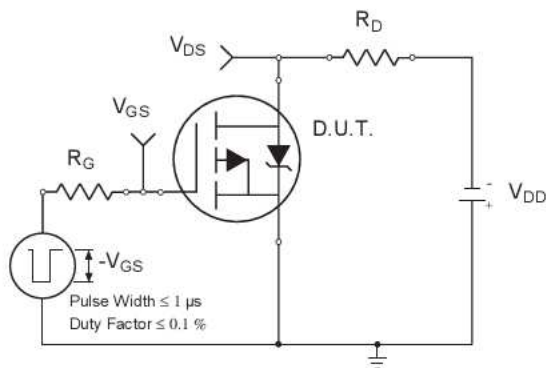


Fig 20a. Switching Time Test Circuit

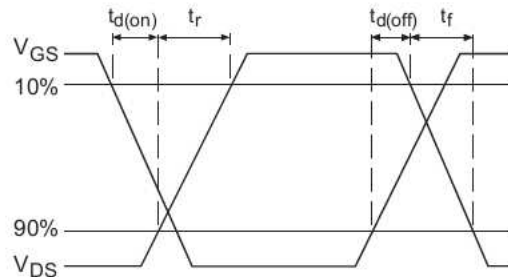
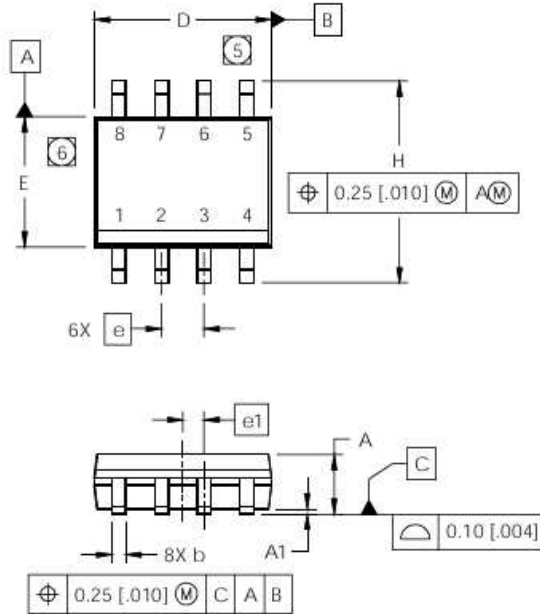


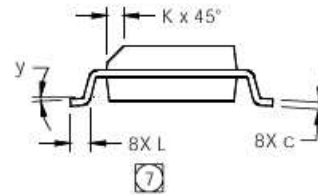
Fig 20b. Switching Time Waveforms

SO-8 Package Outline (Mosfet & Fetky)

Dimensions are shown in millimeters (inches)



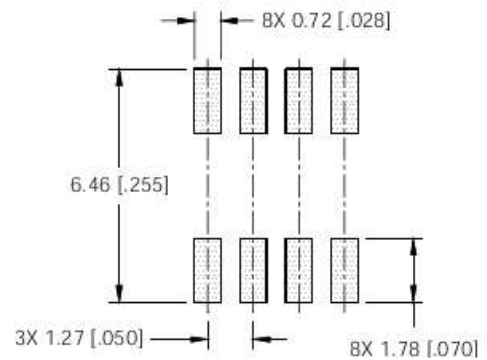
| DIM | INCHES | | MILLIMETERS | |
|-----|------------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | .0532 | .0688 | 1.35 | 1.75 |
| A1 | .0040 | .0098 | 0.10 | 0.25 |
| b | .013 | .020 | 0.33 | 0.51 |
| c | .0075 | .0098 | 0.19 | 0.25 |
| D | .189 | .1968 | 4.80 | 5.00 |
| E | .1497 | .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:

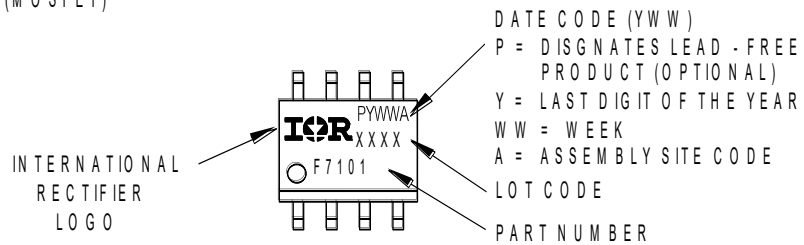
1. DIMENSIONING & TOLERANCING PER AS ME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
- ⑤ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [0.006].
- ⑥ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [0.010].
- ⑦ DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

FOOTPRINT



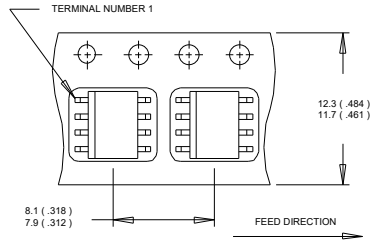
SO-8 Part Marking

EXAMPLE: THIS IS AN IRF7101 (MOSFET)

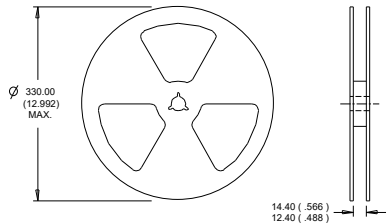


Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

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.

Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

Qualification Information†

| | | |
|-----------------------------------|--|----------------------------------|
| Qualification Level | Consumer (per JEDEC JESD47F guidelines) | |
| Moisture Sensitivity Level | SO-8 | MSL1 (per JEDEC J-STD-020D††) |
| RoHS Compliant | Yes | |

† Qualification standards can be found at International Rectifier’s web site: <http://www.irf.com/product-info/reliability/>
 †† Applicable version of JEDEC standard at the time of product release.

Revision History

| Date | Rev. | Comments |
|------------|------|--|
| 10/01/2021 | 2.1 | <ul style="list-style-type: none"> Updated I_{DM} in SOA curve Updated datasheet based on IFX template |

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