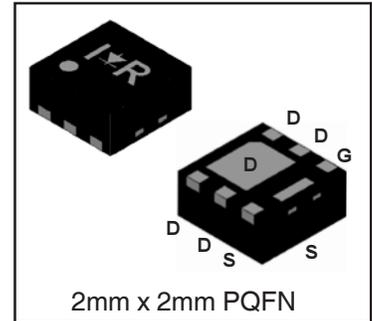
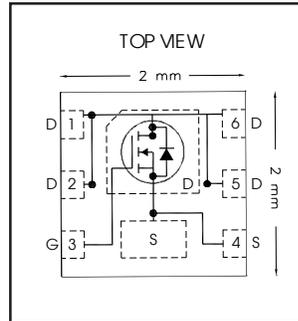


HEXFET® Power MOSFET

| | | |
|--|--------------|-----------|
| V_{DS} | 25 | V |
| $V_{GS\ max}$ | ±20 | V |
| $R_{DS(on)\ max}$ (@ $V_{GS} = 10V$) | 13.0 | mΩ |
| Q_g (typical) (@ $V_{GS} = 4.5V$) | 4.3 | nC |
| I_D (@ $T_{c(Bottom)} = 25°C$) | 8.5 ② | A |



Applications

- System/Load Switch

Features and Benefits

Features

| |
|--|
| Low $R_{DS(on)}$ ($\leq 13.0m\Omega$) |
| Low Thermal Resistance to PCB ($\leq 13°C/W$) |
| Low Profile ($\leq 1.0\ mm$) |
| Compatible with Existing Surface Mount Techniques |
| RoHS Compliant Containing no Lead, no Bromide and no Halogen |
| MSL1, Industrial Qualification |

Resulting Benefits

| |
|-----------------------------------|
| Lower Conduction Losses |
| Enable better thermal dissipation |
| Increased Power Density |
| Easier Manufacturing |
| Environmentally Friendlier |
| Increased Reliability |

results in

| Orderable part number | Package Type | Standard Pack | | Note |
|-----------------------|----------------|---------------|----------|------------------|
| | | Form | Quantity | |
| IRFHS8242TRPbF | PQFN 2mm x 2mm | Tape and Reel | 4000 | |
| IRFHS8242TR2PbF | PQFN 2mm x 2mm | Tape and Reel | 400 | EOL notice # 259 |

Absolute Maximum Ratings

| | Parameter | Max. | Units |
|------------------------------|--|--------------|-------|
| V_{DS} | Drain-to-Source Voltage | 25 | V |
| V_{GS} | Gate-to-Source Voltage | ±20 | |
| $I_D @ T_A = 25°C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 9.9② | A |
| $I_D @ T_A = 70°C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 8.0 | |
| $I_D @ T_{C(Bottom)} = 25°C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 21② | |
| $I_D @ T_{C(Bottom)} = 70°C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 17② | |
| $I_D @ T_{C(Bottom)} = 25°C$ | Continuous Drain Current, $V_{GS} @ 10V$ (Package Limited) | 8.5② | |
| I_{DM} | Pulsed Drain Current ① | 84 | |
| $P_D @ T_A = 25°C$ | Power Dissipation ④ | 2.1 | W |
| $P_D @ T_A = 70°C$ | Power Dissipation ④ | 1.3 | |
| | Linear Derating Factor ④ | 0.02 | W/°C |
| T_J | Operating Junction and | -55 to + 150 | °C |
| T_{STG} | Storage Temperature Range | | |

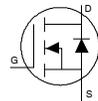
Notes ① through ⑥ are on page 2

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

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|-------------------------------------|--------------------------------------|------|------|------|-------|---|
| BV _{DSS} | Drain-to-Source Breakdown Voltage | 25 | — | — | V | V _{GS} = 0V, I _D = 250μA |
| ΔBV _{DSS} /ΔT _J | Breakdown Voltage Temp. Coefficient | — | 18 | — | mV/°C | Reference to 25°C, I _D = 1mA |
| R _{DS(on)} | Static Drain-to-Source On-Resistance | — | 10.0 | 13.0 | mΩ | V _{GS} = 10V, I _D = 8.5A ③② |
| | | — | 17.0 | 21.0 | | V _{GS} = 4.5V, I _D = 6.8A ③ |
| V _{GS(th)} | Gate Threshold Voltage | 1.35 | 1.8 | 2.35 | V | V _{DS} = V _{GS} , I _D = 25μA |
| ΔV _{GS(th)} | Gate Threshold Voltage Coefficient | — | -6.8 | — | mV/°C | |
| I _{DSS} | Drain-to-Source Leakage Current | — | — | 1.0 | μA | V _{DS} = 20V, V _{GS} = 0V |
| | | — | — | 150 | | V _{DS} = 20V, V _{GS} = 0V, T _J = 125°C |
| I _{GSS} | Gate-to-Source Forward Leakage | — | — | 100 | nA | V _{GS} = 20V |
| | Gate-to-Source Reverse Leakage | — | — | -100 | | V _{GS} = -20V |
| g _{fs} | Forward Transconductance | 19 | — | — | S | V _{DS} = 10V, I _D = 8.5A② |
| Q _g | Total Gate Charge ⑥ | — | 4.3 | — | nC | V _{GS} = 4.5V, V _{DS} = 13V, I _D = 8.5A② |
| Q _g | Total Gate Charge ⑥ | — | 10.4 | — | nC | V _{DS} = 13V |
| Q _{gs} | Gate-to-Source Charge ⑥ | — | 1.8 | — | | V _{GS} = 10V |
| Q _{gd} | Gate-to-Drain Charge ⑥ | — | 1.6 | — | | I _D = 8.5A② (See Fig. 6 & 16) |
| R _G | Gate Resistance | — | 1.9 | — | Ω | |
| t _{d(on)} | Turn-On Delay Time | — | 6.5 | — | ns | V _{DD} = 13V, V _{GS} = 4.5V③ |
| t _r | Rise Time | — | 19 | — | | I _D = 8.5A② |
| t _{d(off)} | Turn-Off Delay Time | — | 5.4 | — | | R _G = 1.8Ω |
| t _f | Fall Time | — | 5.3 | — | | See Fig.17 |
| C _{iss} | Input Capacitance | — | 653 | — | pF | V _{GS} = 0V |
| C _{oss} | Output Capacitance | — | 171 | — | | V _{DS} = 10V |
| C _{rss} | Reverse Transfer Capacitance | — | 78 | — | | f = 1.0MHz |

Diode Characteristics

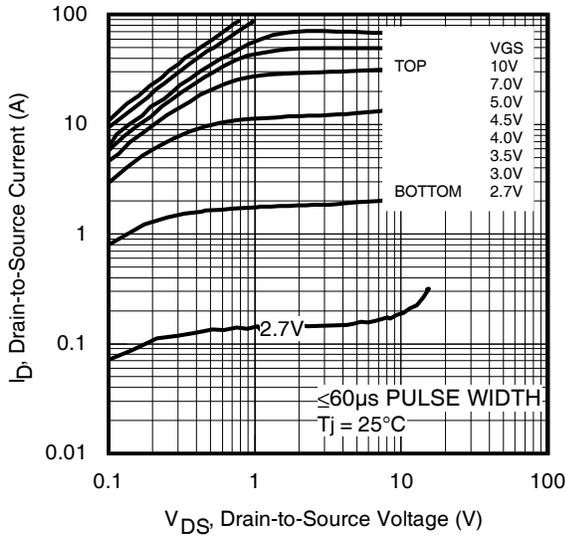
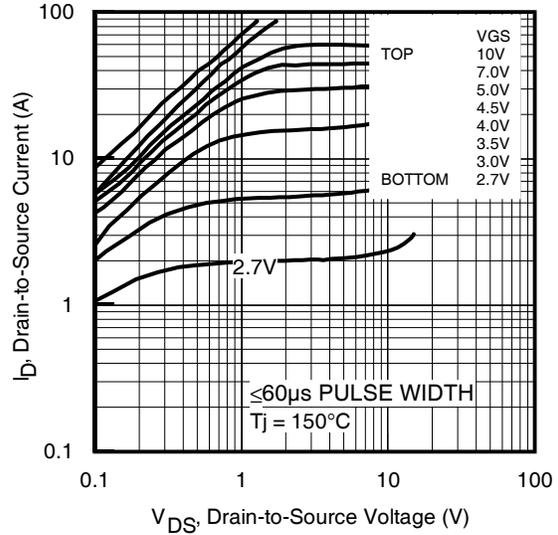
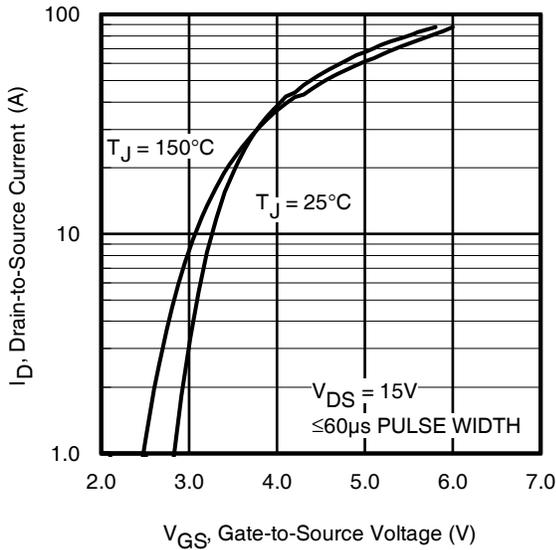
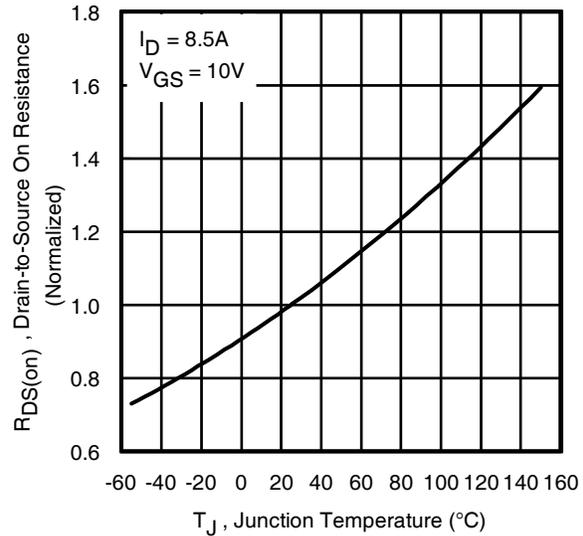
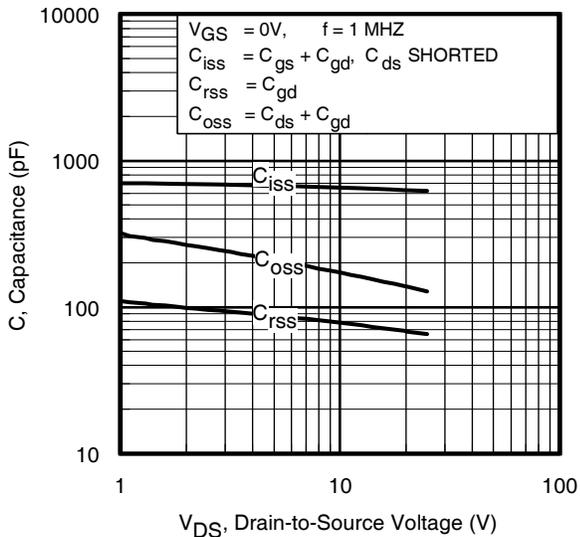
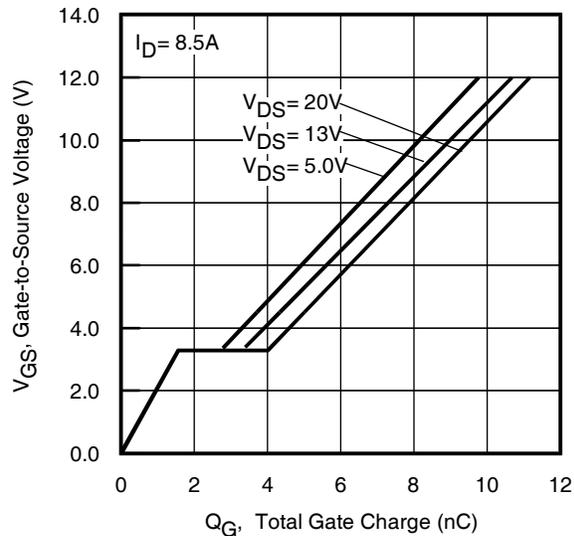
| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|-----------------|---|---|------|------|-------|---|
| I _S | Continuous Source Current (Body Diode) | — | — | 8.5② | A | MOSFET symbol showing the integral reverse p-n junction diode. |
| I _{SM} | Pulsed Source Current (Body Diode) ① | — | — | 84 | | |
| V _{SD} | Diode Forward Voltage | — | — | 1.0 | V | T _J = 25°C, I _S = 8.5A②, V _{GS} = 0V ③ |
| t _{rr} | Reverse Recovery Time | — | 11 | 17 | ns | T _J = 25°C, I _F = 8.5A②, V _{DD} = 13V |
| Q _{rr} | Reverse Recovery Charge | — | 11 | 17 | nC | di/dt = 280 A/μs ③ |
| t _{on} | Forward Turn-On Time | Time is dominated by parasitic Inductance | | | | |

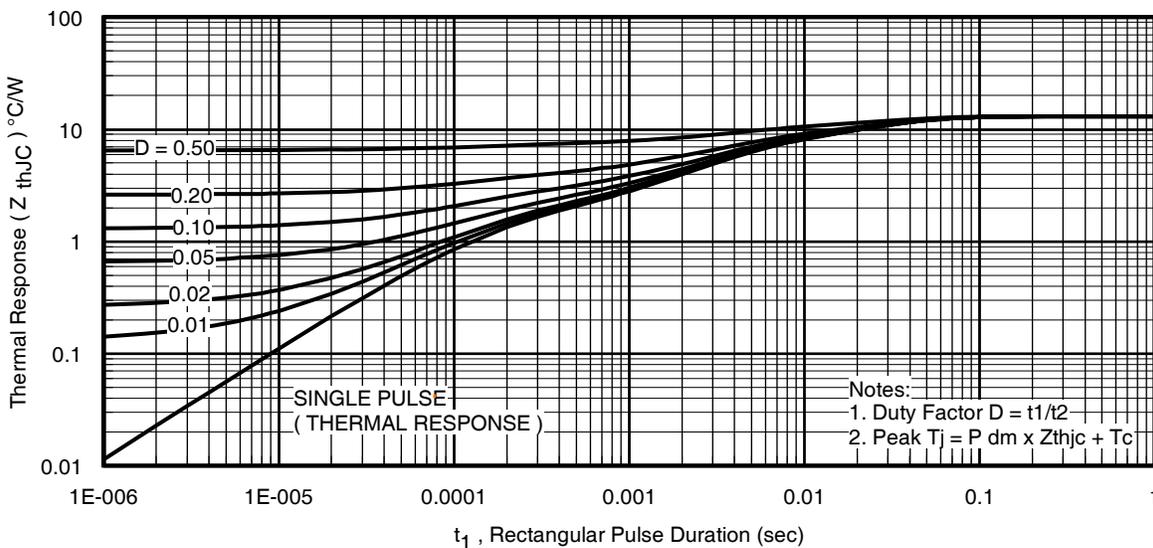
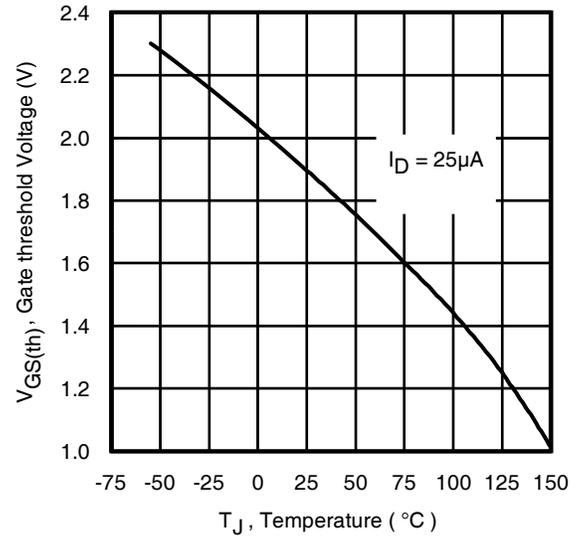
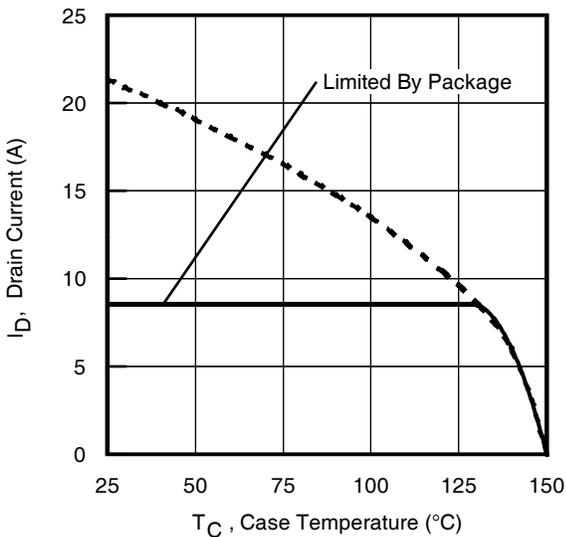
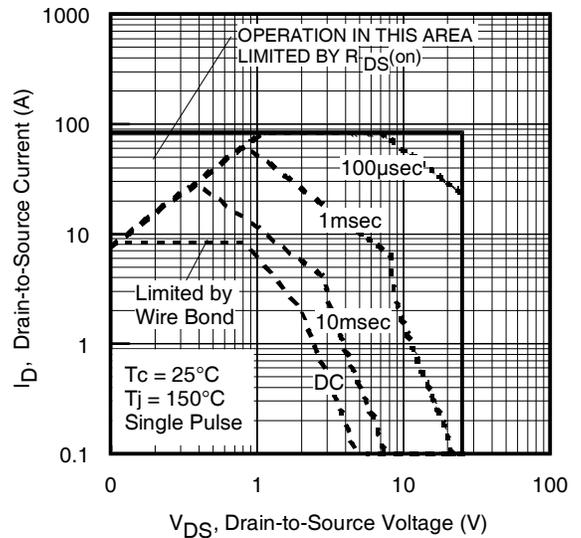
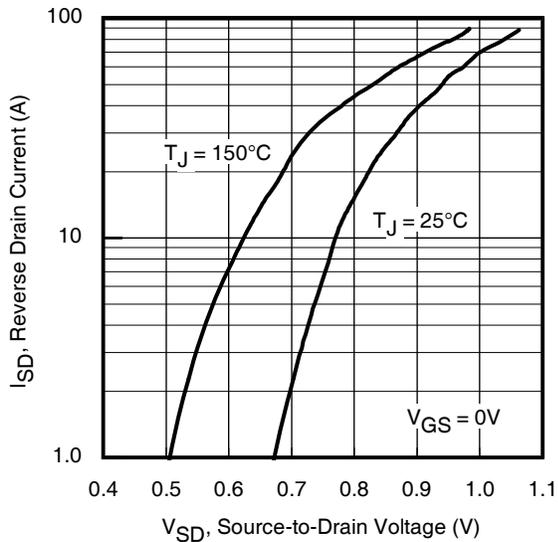

Thermal Resistance

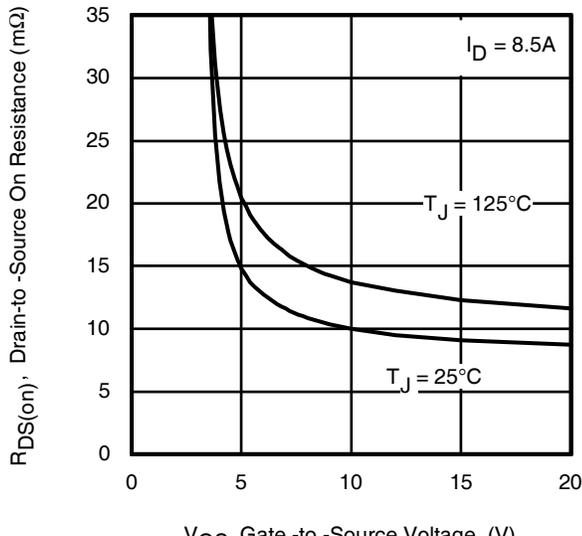
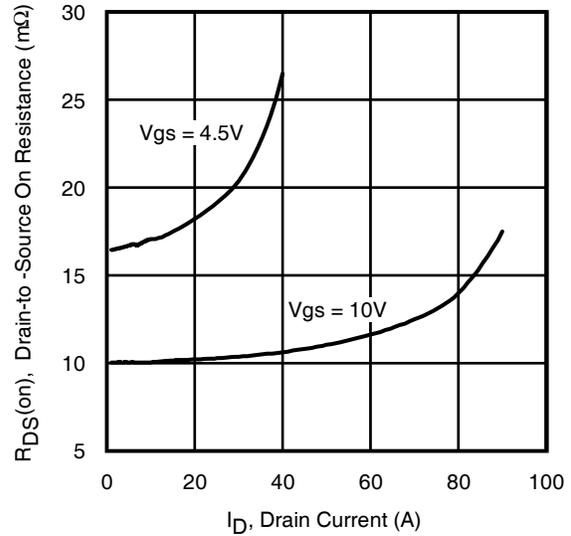
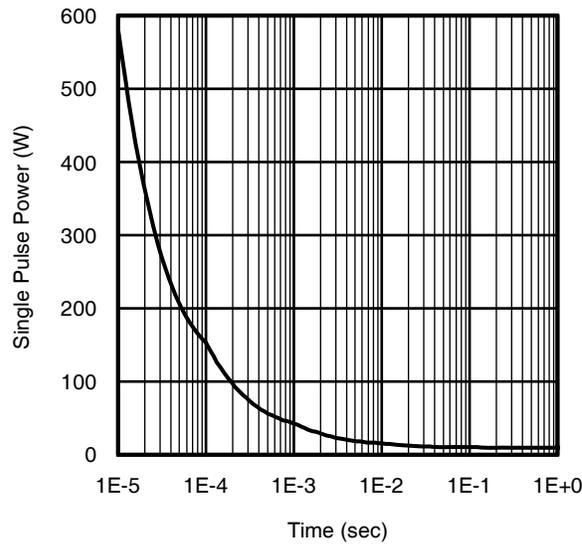
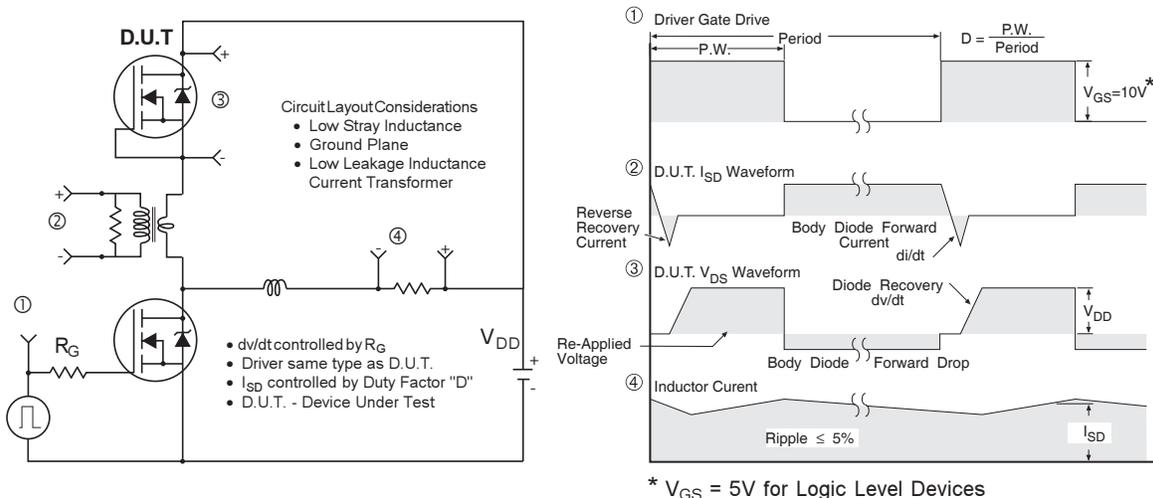
| | Parameter | Typ. | Max. | Units |
|---------------------------|------------------------------|------|------|-------|
| R _{θJC} (Bottom) | Junction-to-Case ⑤ | — | 13 | °C/W |
| R _{θJC} (Top) | Junction-to-Case ⑤ | — | 90 | |
| R _{θJA} | Junction-to-Ambient ④ | — | 60 | |
| R _{θJA} | Junction-to-Ambient (<10s) ④ | — | 42 | |

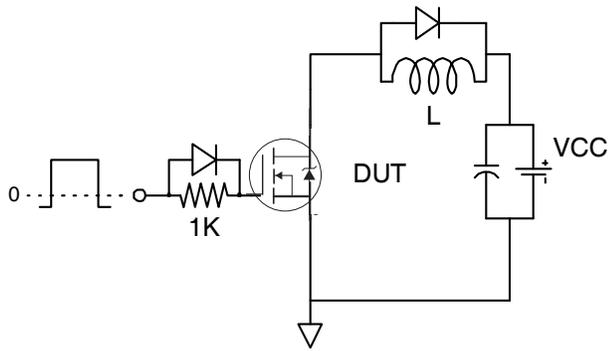
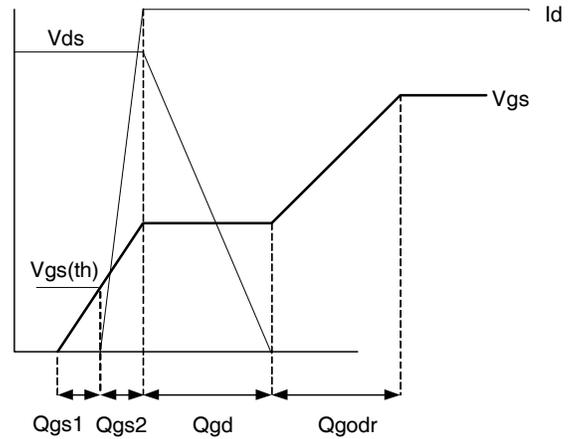
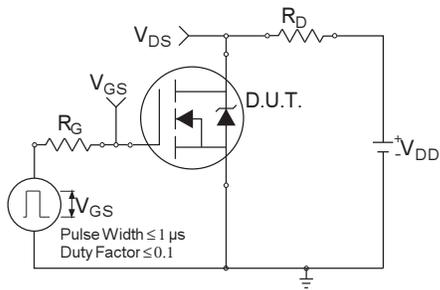
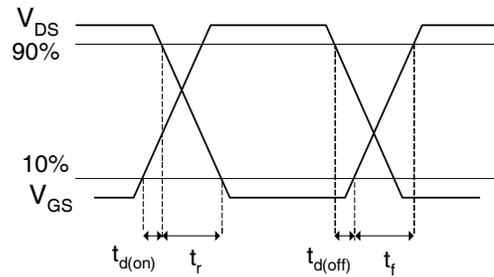
Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Current limited by package.
- 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.

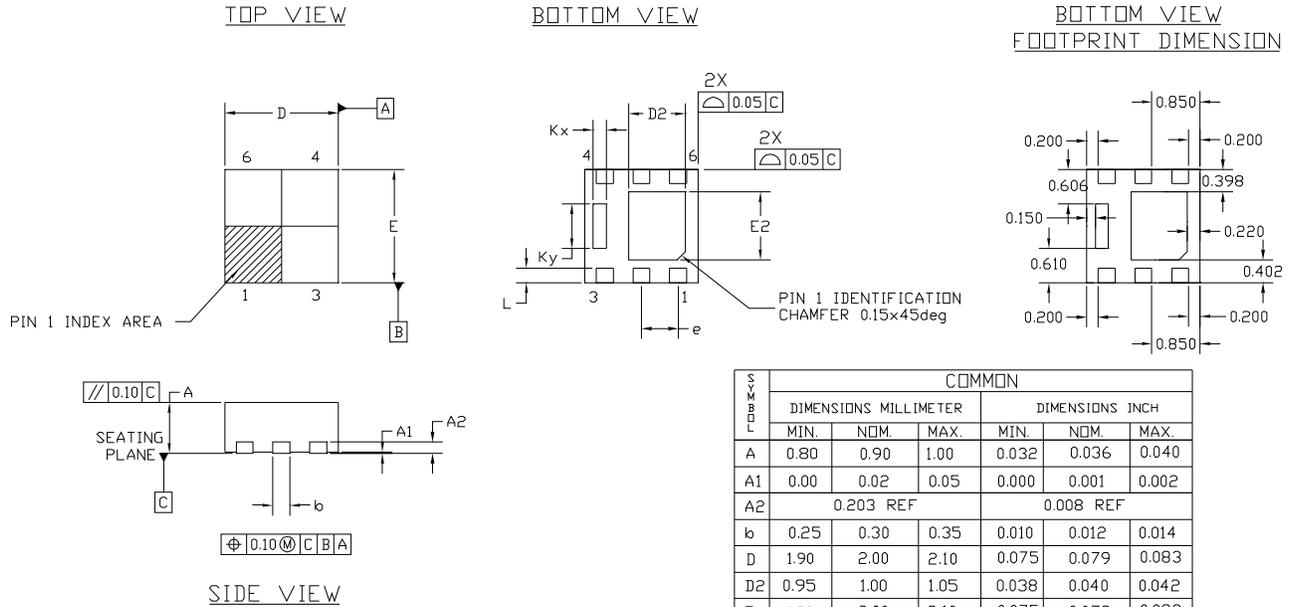

Fig 1. Typical Output Characteristics

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 12. On-Resistance vs. Gate Voltage

Fig 13. Typical On-Resistance vs. Drain Current

Fig 14. Typical Power vs. Time

Fig 15. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET[®] Power MOSFETs


Fig 16a. Gate Charge Test Circuit

Fig 16b. Gate Charge Waveform

Fig 17a. Switching Time Test Circuit

Fig 17b. Switching Time Waveforms

PQFN 2x2 Outline Package Details

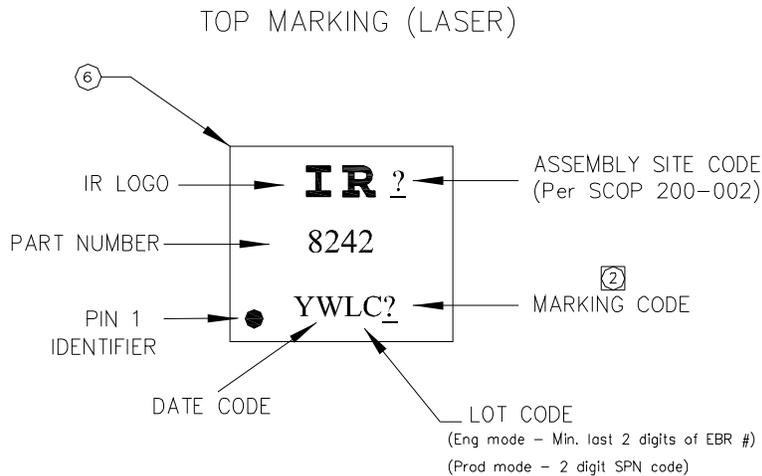


NOTES :

1. DIMENSION AND TOLERANCING CONFORM TO ASME Y14.5M-1994.
2. CONTROLLING DIMENSIONS : MILLIMETER
3. DIMENSION b APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 mm. FROM TERMINAL TIP.

For footprint and stencil design recommendations, please refer to application note AN-1154 at <http://www.irf.com/technical-info/appnotes/an-1154.pdf>

PQFN 2x2 Outline Part Marking



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

PQFN 2x2 Outline Tape and Reel

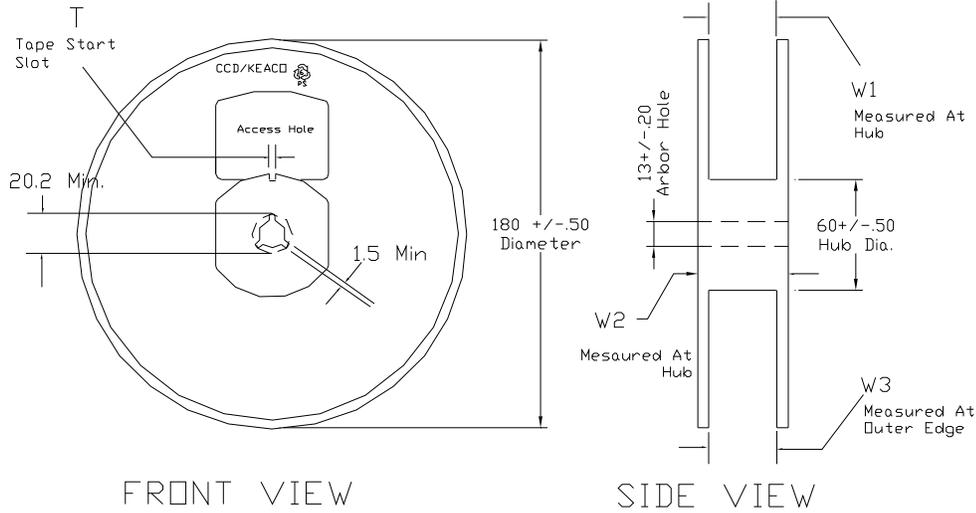
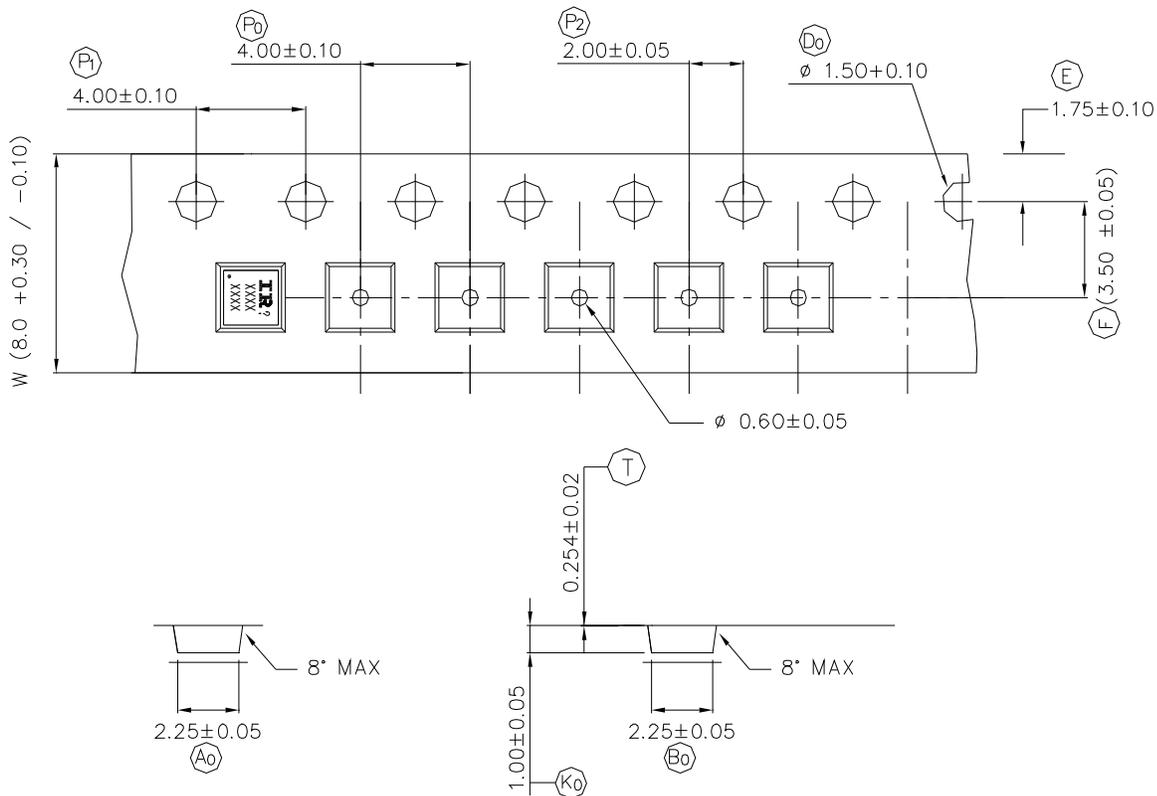


TABLE 1: REEL DETAILS

| TAPE WIDTH | T | W1 | W2 | W3 | PART NO |
|------------|----------|--------------------------------------|----------|----------------------|---------|
| 8 MM | 3 ± 0.50 | 8.4 ^{+1.5} _{-0.0} | 14.4 Max | 7.90 Min 10.9 Max | 91586-1 |
| 12 MM | 5 ± 0.50 | 12.4 ^{+2.0} _{-0.0} | 18.4 Max | 11.9 Min 15.4 Max | 91586-2 |

Note: Surface resistivity is $\geq 1 \times 10^5$ but $< 1 \times 10^{12}$ ohm/sq.



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

Qualification information[†]

| | | |
|----------------------------|---|---|
| Qualification level | Industrial [†] (per JEDEC JESD47F ^{††} guidelines) | |
| Moisture Sensitivity Level | PQFN 2mm x 2mm | 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 | Comments |
|------------|---|
| 12/17/2013 | <ul style="list-style-type: none"> • Updated ordering information to reflect the End-Of-life (EOL) of the mini-reel option (EOL notice #259) • Updated Qual level from "Consumer" to "Industrial" on page 1, 9 • Updated data sheet with new IR corporate template |