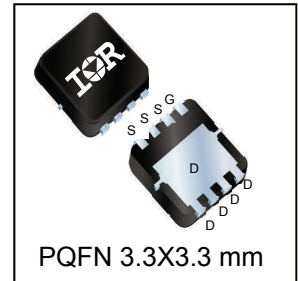
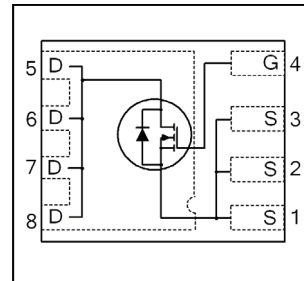


| | | |
|--|-------------|-----------|
| V_{DSS} | 30 | V |
| $V_{GS\ max}$ | ±20 | V |
| $R_{DS(on)\ max}$ (@ $V_{GS} = 10V$) | 4.7 | mΩ |
| (@ $V_{GS} = 4.5V$) | 6.7 | |
| Q_g (typical) | 20 | nC |
| I_D (@ $T_C(Bottom) = 25°C$) | 70 Ⓞ | A |

HEXFET® Power MOSFET



Applications

- Charge and Discharge Switch for Notebook PC Battery Application
- System/Load Switch
- Synchronous MOSFET for Buck Converters

Features

| |
|--|
| Low Thermal Resistance to PCB (<3.4°C/W) |
| Low Profile (<1.05 mm) |
| Industry-Standard Pinout |
| Compatible with Existing Surface Mount Techniques |
| RoHS Compliant Containing no Lead, no Bromide and no Halogen |
| MSL1, Consumer Qualification |

results in
⇒

Benefits

| |
|-----------------------------------|
| Enable better thermal dissipation |
| Increased Power Density |
| Multi-Vendor Compatibility |
| Easier Manufacturing |
| Environmentally Friendlier |
| Increased Reliability |

| Base part number | Package Type | Standard Pack | | Orderable Part Number |
|------------------|----------------------|---------------|----------|-----------------------|
| | | Form | Quantity | |
| IRFHM8326PbF | PQFN 3.3 mm x 3.3 mm | Tape and Reel | 4000 | IRFHM8326TRPbF |

Absolute Maximum Ratings

| | Parameter | Max. | Units |
|-----------------------------|--|--------------|-------|
| V_{GS} | Gate-to-Source Voltage | ± 20 | V |
| $I_D @ T_A = 25°C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 19 | A |
| $I_D @ T_A = 70°C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 15 | |
| $I_D @ T_C(Bottom) = 25°C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 70Ⓞ | |
| $I_D @ T_C(Bottom) = 100°C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 44Ⓞ | |
| $I_D @ T_C = 25°C$ | Continuous Drain Current, $V_{GS} @ 10V$ (Source Bonding Technology Limited) | 25⑦ | |
| I_{DM} | Pulsed Drain Current ① | 278 | W |
| $P_D @ T_A = 25°C$ | Power Dissipation ⑤ | 2.8 | |
| $P_D @ T_C(Bottom) = 25°C$ | Power Dissipation ⑤ | 37 | |
| | Linear Derating Factor ⑤ | 0.023 | W/°C |
| T_J T_{STG} | Operating Junction and Storage Temperature Range | -55 to + 150 | °C |

Notes ① through ⑦ are on page 9

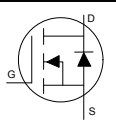
Static @ T_J = 25°C (unless otherwise specified)

| | 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 | — | 22 | — | mV/°C | Reference to 25°C, I _D = 1mA |
| R _{DS(on)} | Static Drain-to-Source On-Resistance | — | 3.8 | 4.7 | mΩ | V _{GS} = 10V, I _D = 20A ③ |
| | | — | 5.2 | 6.7 | | V _{GS} = 4.5V, I _D = 20A ③ |
| V _{GS(th)} | Gate Threshold Voltage | 1.2 | 1.7 | 2.2 | V | V _{DS} = V _{GS} , I _D = 50μA |
| ΔV _{GS(th)} | Gate Threshold Voltage Coefficient | — | -10 | — | 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 | — | — | 100 | nA | V _{GS} = 20V |
| | Gate-to-Source Reverse Leakage | — | — | -100 | | V _{GS} = -20V |
| g _{fs} | Forward Transconductance | 70 | — | — | S | V _{DS} = 10V, I _D = 20A |
| Q _g | Total Gate Charge | — | 39 | — | nC | V _{GS} = 10V, V _{DS} = 15V, I _D = 20A |
| Q _{gs1} | Pre-V _{th} Gate-to-Source Charge | — | 4.8 | — | | |
| Q _{gs2} | Post-V _{th} Gate-to-Source Charge | — | 2.6 | — | | |
| Q _{gd} | Gate-to-Drain Charge | — | 6.5 | — | | |
| Q _{godr} | Gate Charge Overdrive | — | 6.1 | — | | |
| Q _{sw} | Switch Charge (Q _{gs2} + Q _{gd}) | — | 9.1 | — | | |
| Q _{oss} | Output Charge | — | 11 | — | | |
| R _G | Gate Resistance | — | 1.9 | — | Ω | |
| t _{d(on)} | Turn-On Delay Time | — | 12 | — | ns | V _{DD} = 15V, V _{GS} = 4.5V I _D = 20A R _G = 1.8Ω |
| t _r | Rise Time | — | 35 | — | | |
| t _{d(off)} | Turn-Off Delay Time | — | 18 | — | | |
| t _f | Fall Time | — | 12 | — | | |
| C _{iss} | Input Capacitance | — | 2496 | — | pF | V _{GS} = 0V V _{DS} = 10V f = 1.0MHz |
| C _{oss} | Output Capacitance | — | 524 | — | | |
| C _{rss} | Reverse Transfer Capacitance | — | 273 | — | | |

Avalanche Characteristics

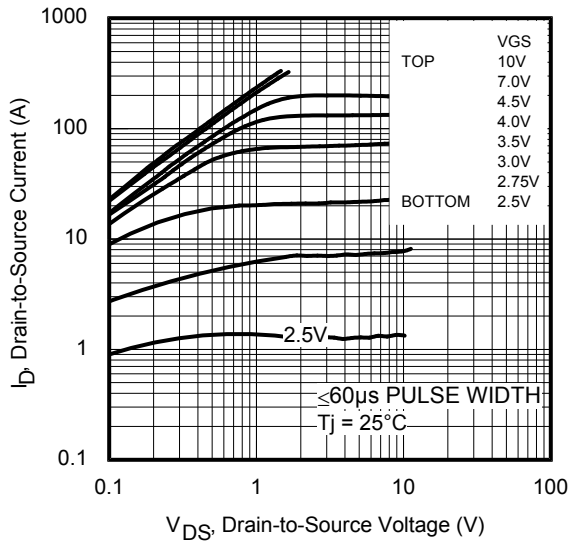
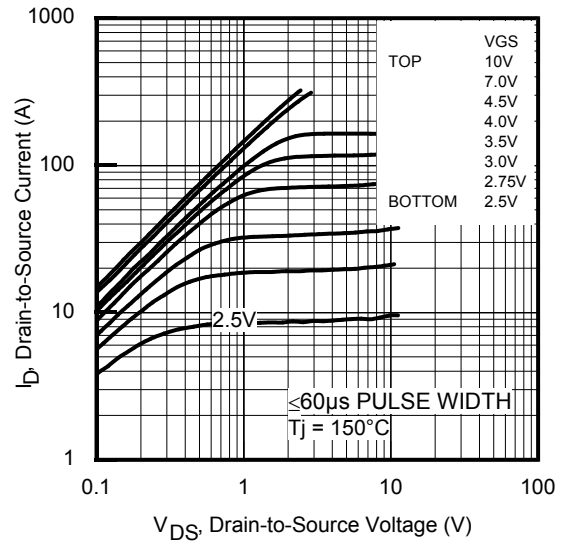
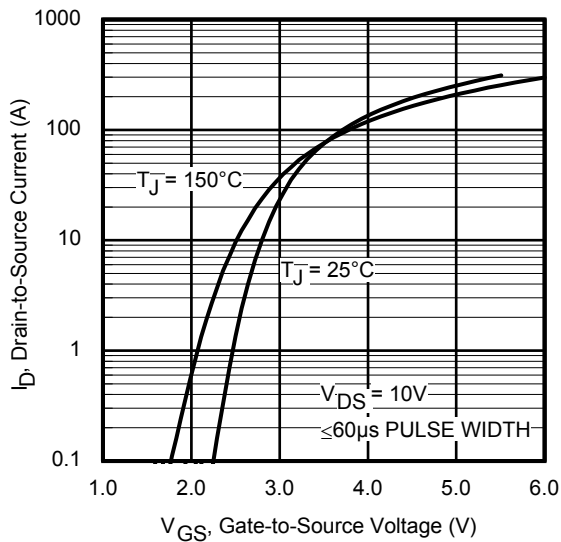
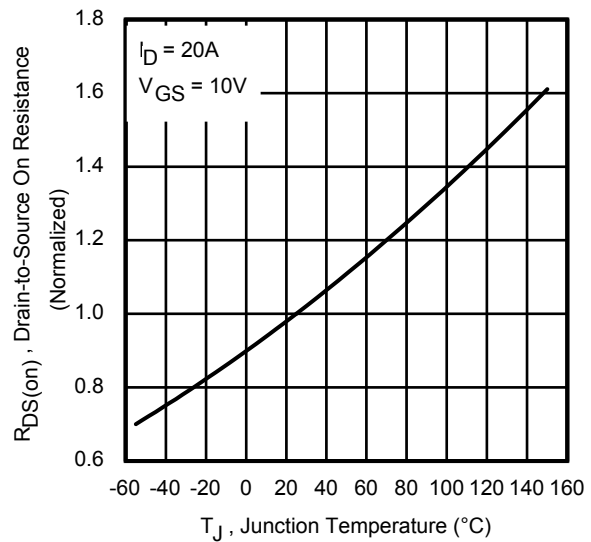
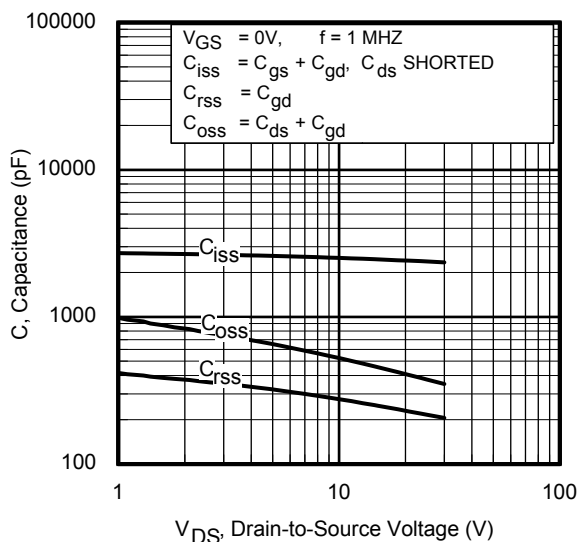
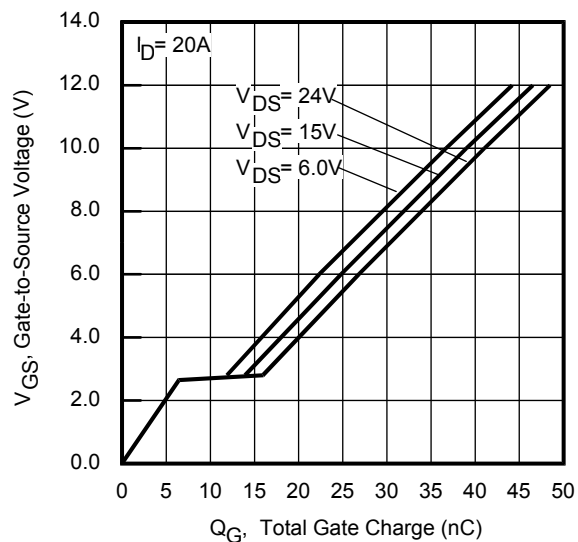
| | Parameter | Typ. | Max. |
|-----------------|---------------------------------|------|------|
| E _{AS} | Single Pulse Avalanche Energy ② | — | 58 |
| I _{AR} | Avalanche Current ① | — | 20 |

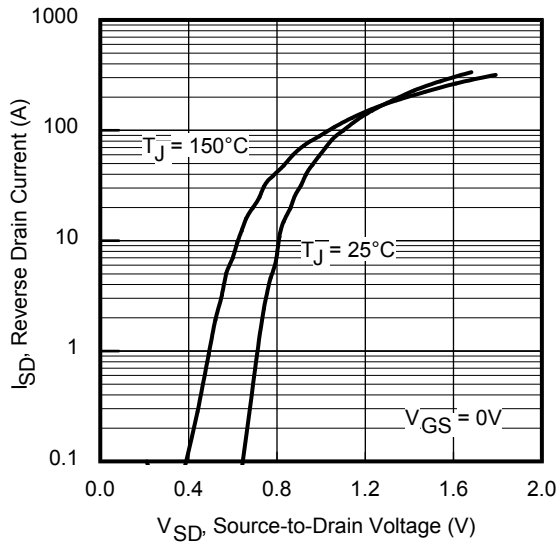
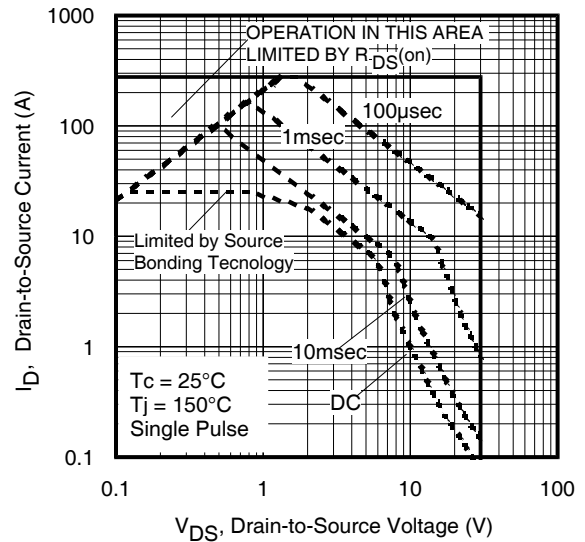
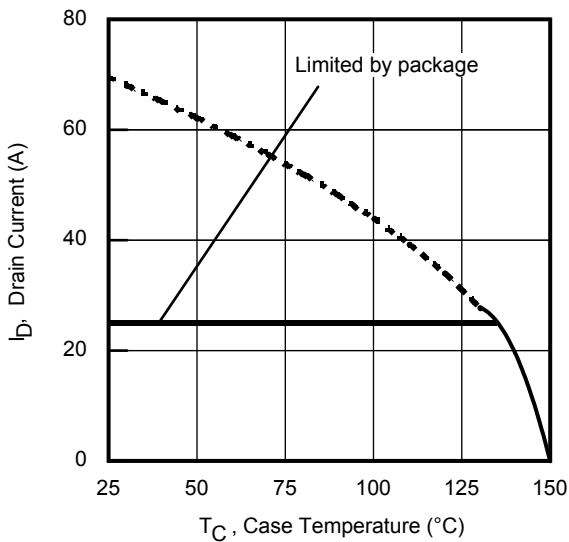
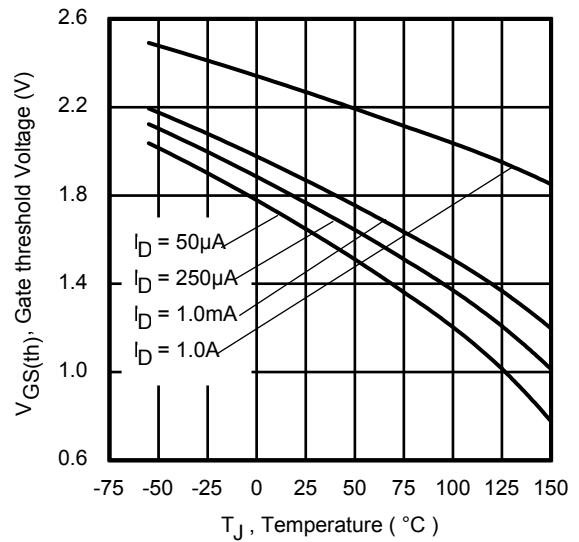
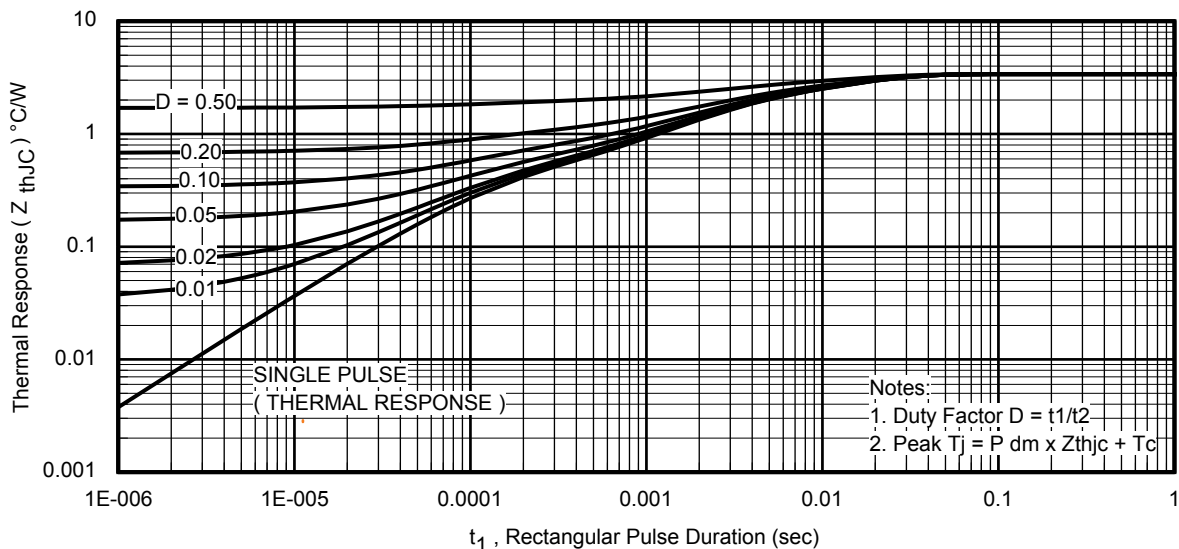
Diode Characteristics

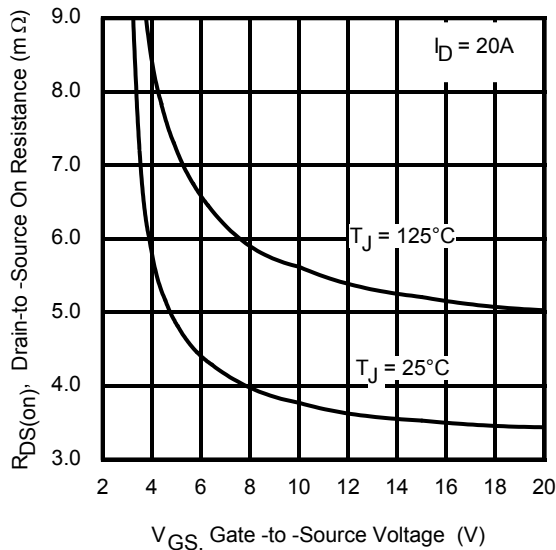
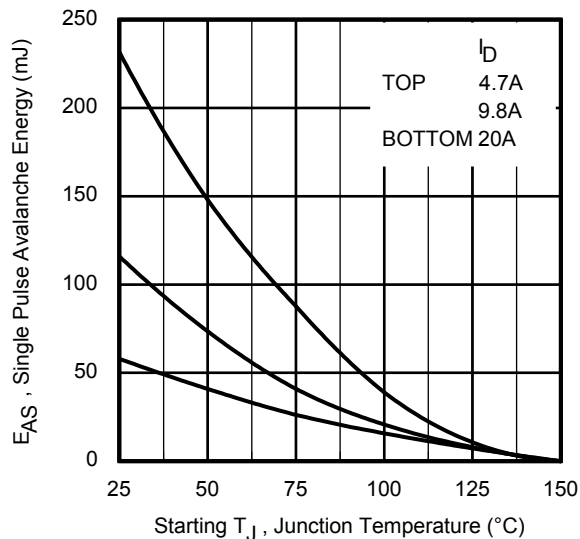
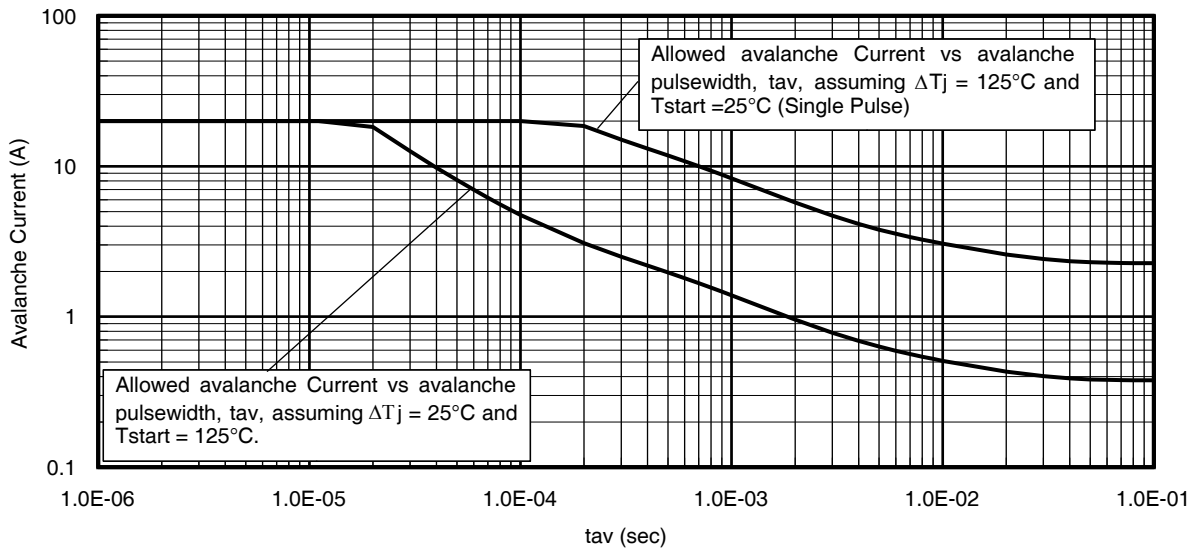
| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|-----------------|--|------|------|------|-------|--|
| I _S | Continuous Source Current (Body Diode) | — | — | 25⑦ | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| I _{SM} | Pulsed Source Current (Body Diode) ① | — | — | 278 | | |
| V _{SD} | Diode Forward Voltage | — | — | 1.0 | V | T _J = 25°C, I _S = 20A, V _{GS} = 0V ③ |
| t _{rr} | Reverse Recovery Time | — | 15 | 23 | ns | T _J = 25°C, I _F = 20A, V _{DD} = 15V |
| Q _{rr} | Reverse Recovery Charge | — | 14 | 21 | nC | di/dt = 300A/μs ③ |

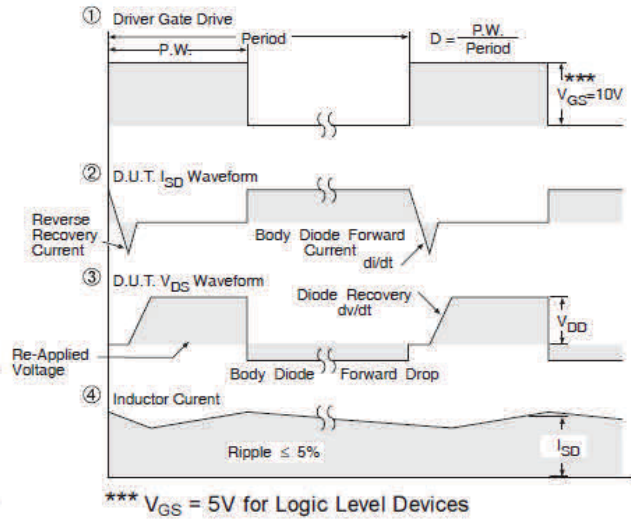
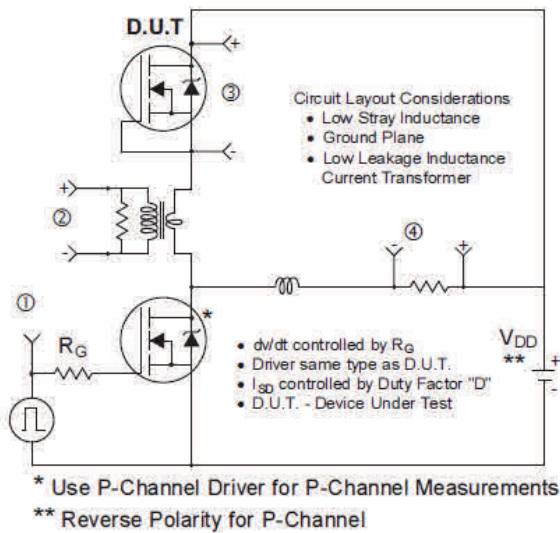
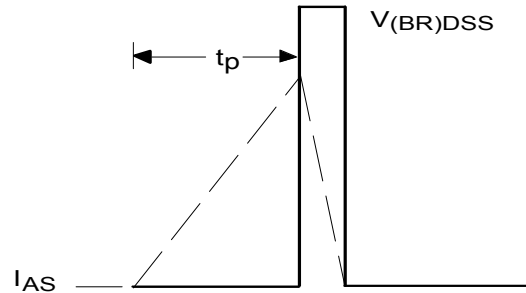
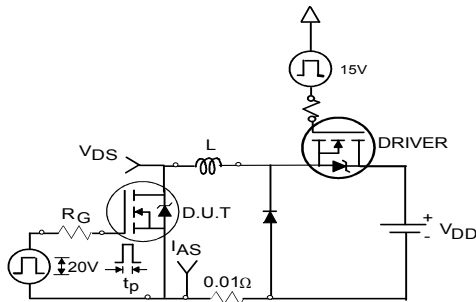
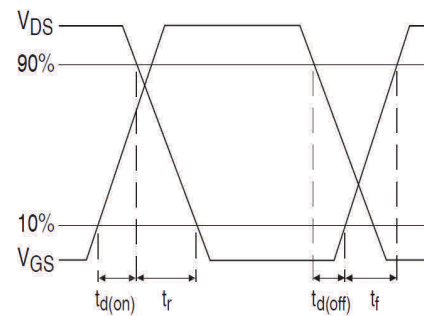
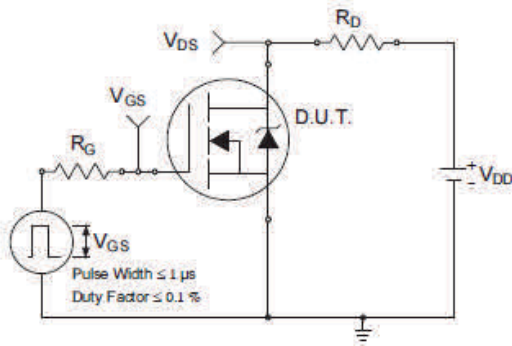
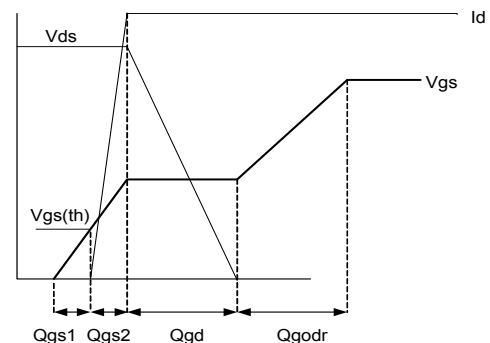
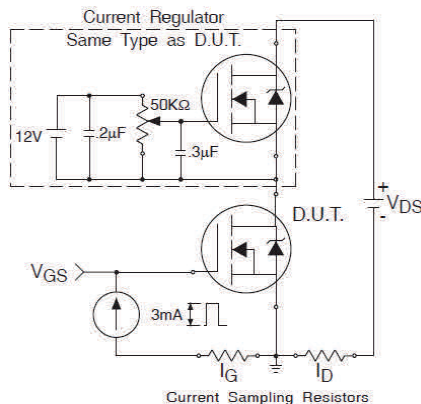
Thermal Resistance

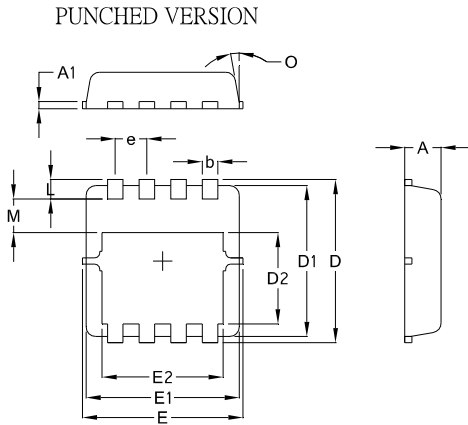
| | Parameter | Typ. | Max. | Units |
|---------------------------|-----------------------|------|------|-------|
| R _{θJC} (Bottom) | Junction-to-Case ④ | — | 3.4 | °C/W |
| R _{θJC} (Top) | Junction-to-Case ④ | — | 41 | |
| R _{θJA} | Junction-to-Ambient ⑤ | — | 44 | |
| R _{θJA} (<10s) | Junction-to-Ambient ⑤ | — | 31 | |


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. Case Temperature

Fig 10. Drain-to-Source Breakdown Voltage

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


Fig 12. On-Resistance vs. Gate Voltage

Fig 13. Maximum Avalanche Energy vs. Drain Current

Fig 14. Typical Avalanche Current vs. Pulsewidth

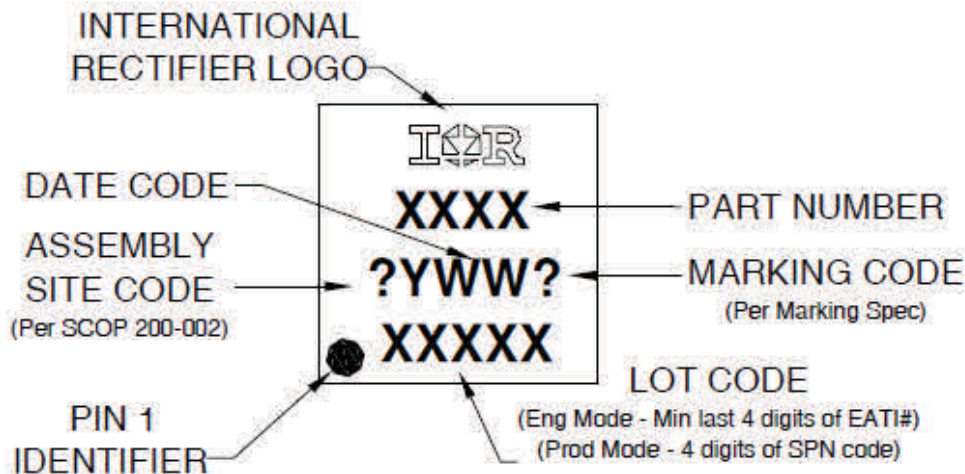

Fig 15. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET® Power MOSFETs

Fig 16a. Unclamped Inductive Test Circuit
Fig 16b. Unclamped Inductive Waveforms

Fig 17a. Switching Time Test Circuit
Fig 17b. Switching Time Waveforms

Fig 18a. Gate Charge Test Circuit
Fig 18b. Gate Charge Waveform

PQFN 3.3mm x 3.3mm Outline Package Details


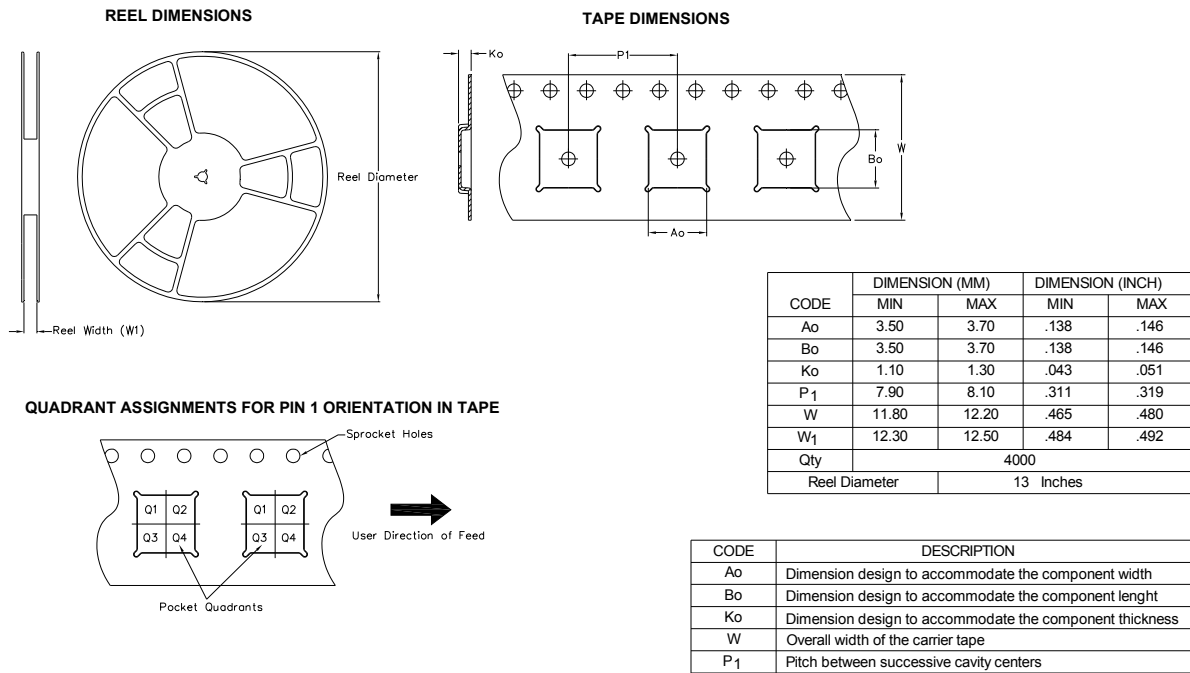
| SYMBOL | COMMON | | | |
|--------|----------|-------|------------|--------|
| | MM | | INCH | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.70 | 1.05 | 0.0276 | 0.0413 |
| A1 | 0.12 | 0.39 | 0.0047 | 0.0154 |
| b | 0.25 | 0.39 | 0.0098 | 0.0154 |
| D | 3.20 | 3.45 | 0.1260 | 0.1358 |
| D1 | 3.00 | 3.20 | 0.1181 | 0.1417 |
| D2 | 1.69 | 2.20 | 0.0665 | 0.0866 |
| E | 3.20 | 3.40 | 0.1260 | 0.1339 |
| E1 | 3.00 | 3.20 | 0.1181 | 0.1417 |
| E2 | 2.15 | 2.59 | 0.0846 | 0.1020 |
| e | 0.65 BSC | | 0.0256 BSC | |
| L | 0.15 | 0.55 | 0.0059 | 0.0217 |
| M | 0.59 | — | 0.0232 | — |
| O | 9Deg | 12Deg | 9Deg | 12Deg |

For more information on board mounting, including footprint and stencil recommendation, please refer to application note AN-1136: <http://www.irf.com/technical-info/appnotes/an-1136.pdf>

For more information on package inspection techniques, please refer to application note AN-1154: <http://www.irf.com/technical-info/appnotes/an-1154.pdf>

PQFN 3.3mm x 3.3mm Outline Part Marking


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

PQFN 3.3mm x 3.3mm Outline Tape and Reel


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 | PQFN 3.3mm x 3.3mm | 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>

†† Higher qualification ratings may be available should the user have such requirements. Please contact your International Rectifier sales representative for further information: <http://www.irf.com/whoto-call/salesrep/>

††† Applicable version of JEDEC standard at the time of product release.

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 0.29\text{mH}$, $R_G = 50\Omega$, $I_{AS} = 20\text{A}$.
- ③ Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ R_θ is measured at T_J of approximately 90°C .
- ⑤ When mounted on 1 inch square 2 oz copper pad on 1.5x1.5 in. board of FR-4 material.
- ⑥ Calculated continuous current based on maximum allowable junction temperature.
- ⑦ Current is limited to 25A by source bonding technology.

Revision History

| Date | Comments |
|---------|--|
| 6/6/14 | <ul style="list-style-type: none"> • Updated schematic on page 1 • Updated package outline and part marking on page 7 • Updated tape and reel on page 8 |
| 6/30/14 | <ul style="list-style-type: none"> • Remove "SAWN" package outline on page 7. |