

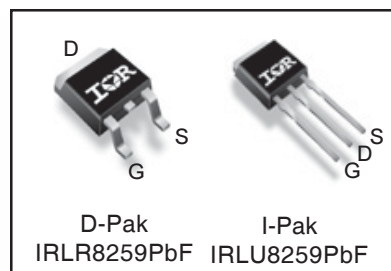
Applications

- High Frequency Synchronous Buck Converters for Computer Processor Power
- High Frequency Isolated DC-DC Converters with Synchronous Rectification for Telecom and Industrial Use

| | | |
|----------|------------------|-------|
| V_{DS} | $R_{DS(on)}$ max | Qg |
| 25V | 8.7mΩ | 6.8nC |

Benefits

- Very Low RDS(on) at 4.5V V_{GS}
- Ultra-Low Gate Impedance
- Fully Characterized Avalanche Voltage and Current
- Lead-Free
- RoHS compliant



| | | |
|----------|----------|----------|
| G | D | S |
| Gate | Drain | Source |

Absolute Maximum Ratings

| | Parameter | Max. | Units |
|-----------------------------------|--|-----------------------|-------|
| V_{DS} | Drain-to-Source Voltage | 25 | V |
| V_{GS} | Gate-to-Source Voltage | ± 20 | |
| I_D @ $T_C = 25^\circ\text{C}$ | Continuous Drain Current, V_{GS} @ 10V | 57 ^④ | A |
| I_D @ $T_C = 100^\circ\text{C}$ | Continuous Drain Current, V_{GS} @ 10V | 40 ^④ | |
| I_{DM} | Pulsed Drain Current ^① | 230 | |
| P_D @ $T_C = 25^\circ\text{C}$ | Maximum Power Dissipation ^⑤ | 48 | W |
| P_D @ $T_C = 100^\circ\text{C}$ | Maximum Power Dissipation ^⑤ | 24 | |
| | Linear Derating Factor | 0.32 | W/°C |
| T_J | Operating Junction and | -55 to + 175 | °C |
| T_{STG} | Storage Temperature Range | | |
| | Soldering Temperature, for 10 seconds | 300 (1.6mm from case) | |

Thermal Resistance

| | Parameter | Typ. | Max. | Units |
|-----------------|--|------|------|-------|
| $R_{\theta JC}$ | Junction-to-Case | — | 3.15 | °C/W |
| $R_{\theta JA}$ | Junction-to-Ambient (PCB Mount) ^⑥ | — | 50 | |
| $R_{\theta JA}$ | Junction-to-Ambient | — | 110 | |

ORDERING INFORMATION:

See detailed ordering and shipping information on the last page of this data sheet.

Notes ^① through ^⑥ are on page 11

Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

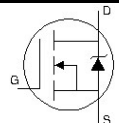
| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|--------------------------------|--|------|------|------|-------|--|
| BV_{DSS} | Drain-to-Source Breakdown Voltage | 25 | — | — | V | $V_{GS} = 0V, I_D = 250\mu A$ |
| $\Delta BV_{DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient | — | 18 | — | mV/°C | Reference to $25^\circ\text{C}, I_D = 1mA$ |
| $R_{DS(on)}$ | Static Drain-to-Source On-Resistance | — | 6.3 | 8.7 | mΩ | $V_{GS} = 10V, I_D = 21A$ ③ |
| | | — | 10.6 | 12.9 | | $V_{GS} = 4.5V, I_D = 17A$ ③ |
| $V_{GS(th)}$ | Gate Threshold Voltage | 1.35 | 1.90 | 2.35 | V | $V_{DS} = V_{GS}, I_D = 25\mu A$ |
| $\Delta V_{GS(th)}/\Delta T_J$ | Gate Threshold Voltage Coefficient | — | -7.1 | — | mV/°C | |
| I_{DSS} | Drain-to-Source Leakage Current | — | — | 1.0 | μA | $V_{DS} = 20V, V_{GS} = 0V$ |
| | | — | — | 150 | | $V_{DS} = 20V, V_{GS} = 0V, T_J = 125^\circ\text{C}$ |
| 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 | 55 | — | — | S | $V_{DS} = 13V, I_D = 17A$ |
| Q_g | Total Gate Charge | — | 6.8 | 10 | nC | $V_{DS} = 13V$ $V_{GS} = 4.5V$ $I_D = 17A$ See Fig. 16 |
| Q_{gs1} | Pre-V _{th} Gate-to-Source Charge | — | 1.5 | — | | |
| Q_{gs2} | Post-V _{th} Gate-to-Source Charge | — | 1.1 | — | | |
| Q_{gd} | Gate-to-Drain Charge | — | 2.4 | — | | |
| Q_{godr} | Gate Charge Overdrive | — | 1.8 | — | | |
| Q_{sw} | Switch Charge ($Q_{gs2} + Q_{gd}$) | — | 3.5 | — | | |
| Q_{oss} | Output Charge | — | 5.9 | — | nC | $V_{DS} = 16V, V_{GS} = 0V$ |
| R_G | Gate Resistance | — | 2.2 | 3.6 | Ω | |
| $t_{d(on)}$ | Turn-On Delay Time | — | 8.4 | — | ns | $V_{DD} = 13V, V_{GS} = 4.5V$ ③ $I_D = 17A$ $R_G = 1.8\Omega$ See Fig. 14 |
| t_r | Rise Time | — | 38 | — | | |
| $t_{d(off)}$ | Turn-Off Delay Time | — | 9.1 | — | | |
| t_f | Fall Time | — | 8.9 | — | | |
| C_{iss} | Input Capacitance | — | 900 | — | pF | $V_{GS} = 0V$ $V_{DS} = 13V$ $f = 1.0MHz$ |
| C_{oss} | Output Capacitance | — | 300 | — | | |
| C_{rss} | Reverse Transfer Capacitance | — | 110 | — | | |

Avalanche Characteristics

| | Parameter | Typ. | Max. | Units |
|----------|---------------------------------|------|------|-------|
| E_{AS} | Single Pulse Avalanche Energy ② | — | 67 | mJ |
| I_{AR} | Avalanche Current ① | — | 17 | A |
| E_{AR} | Repetitive Avalanche Energy ① | — | 4.8 | mJ |

Diode Characteristics

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|----------|---|--|------|------|-------|---|
| I_S | Continuous Source Current (Body Diode) | — | — | 56 ④ | A | MOSFET symbol showing the integral reverse p-n junction diode. |
| I_{SM} | Pulsed Source Current (Body Diode) ① | — | — | 230 | | |
| V_{SD} | Diode Forward Voltage | — | — | 1.0 | V | $T_J = 25^\circ\text{C}, I_S = 17A, V_{GS} = 0V$ ③ |
| t_{rr} | Reverse Recovery Time | — | 17 | 26 | ns | $T_J = 25^\circ\text{C}, I_F = 17A, V_{DD} = 13V$ |
| Q_{rr} | Reverse Recovery Charge | — | 15 | 23 | nC | $di/dt = 200A/\mu s$ ③ |
| t_{on} | Forward Turn-On Time | Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD) | | | | |



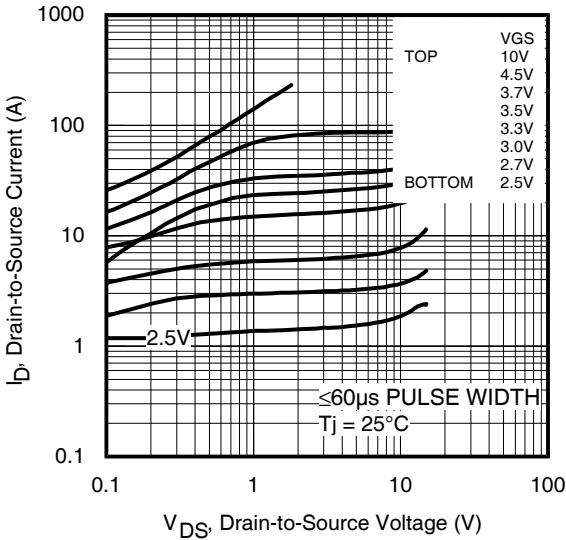


Fig 1. Typical Output Characteristics

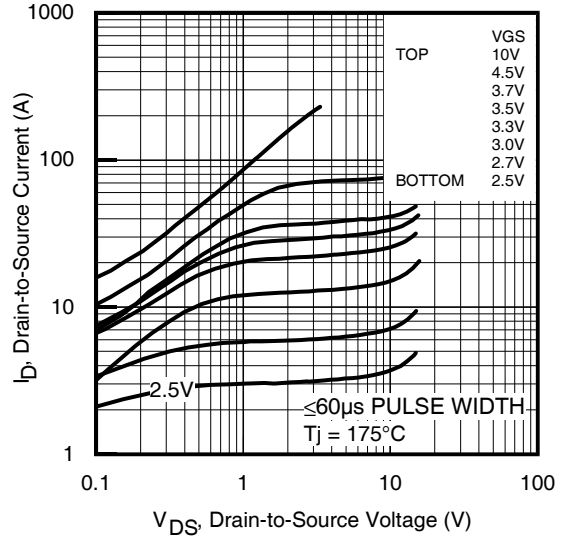


Fig 2. Typical Output Characteristics

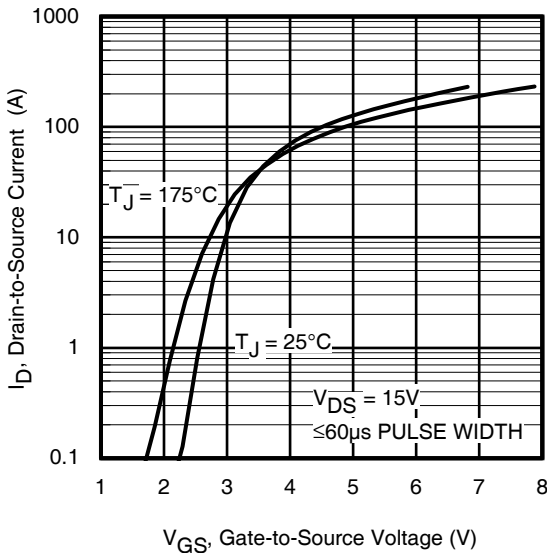


Fig 3. Typical Transfer Characteristics

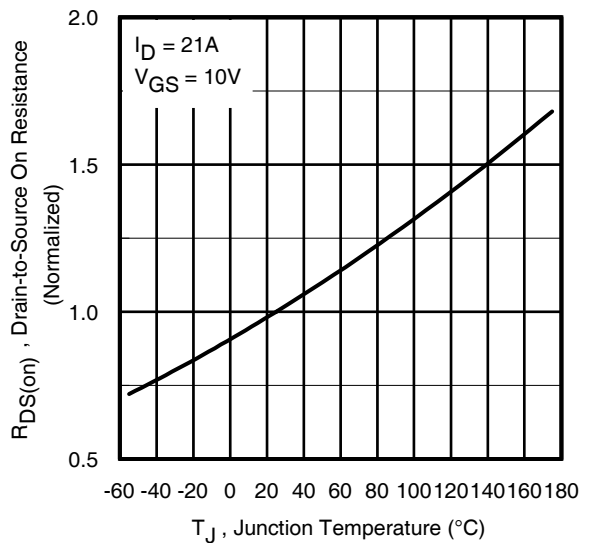


Fig 4. Normalized On-Resistance vs. Temperature

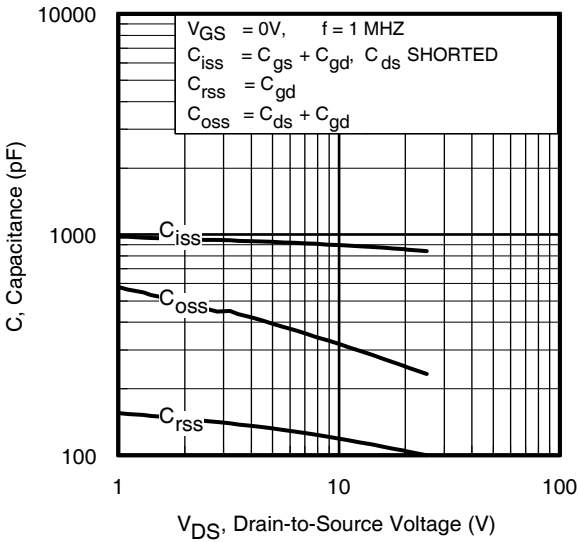


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

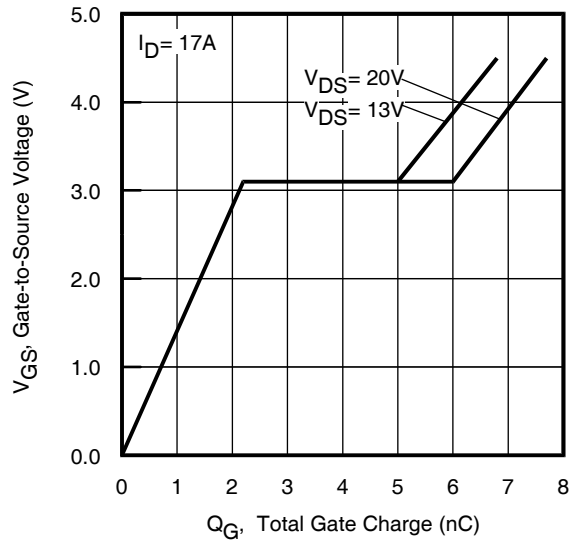


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

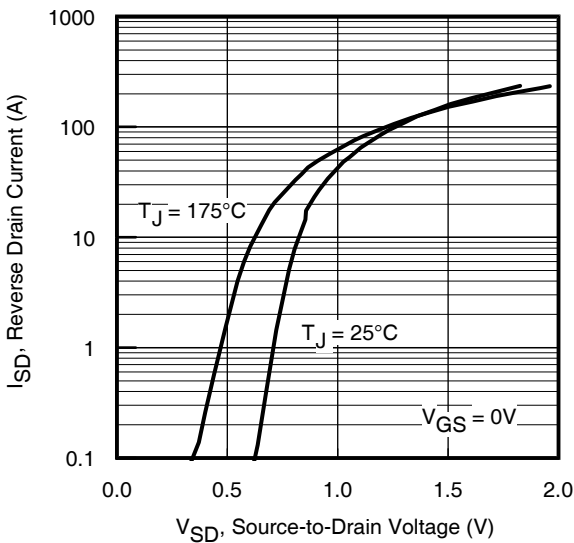


Fig 7. Typical Source-Drain Diode Forward Voltage

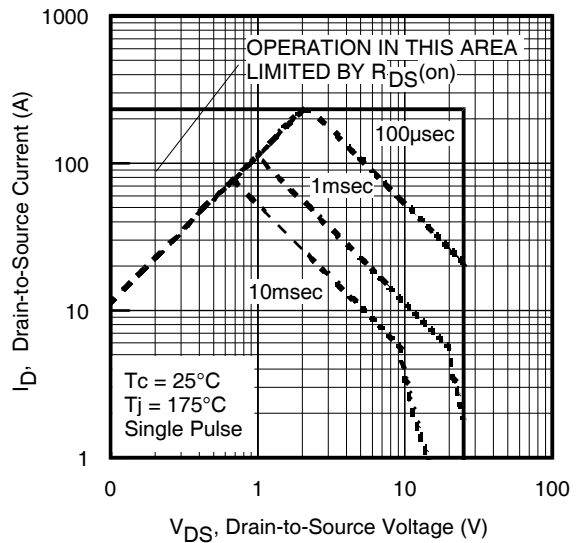


Fig 8. Maximum Safe Operating Area

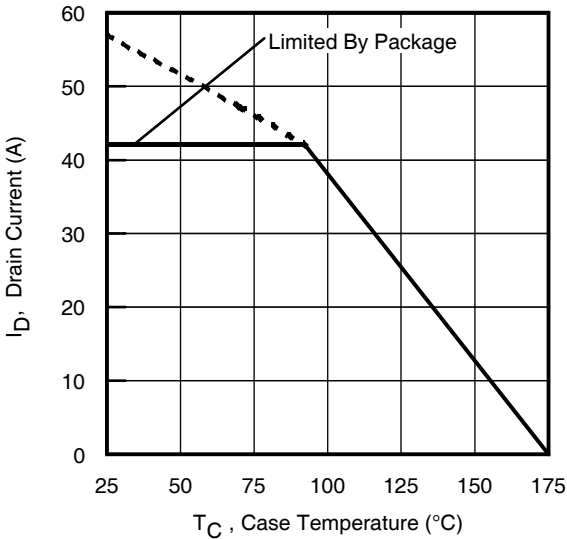


Fig 9. Maximum Drain Current vs. Case Temperature

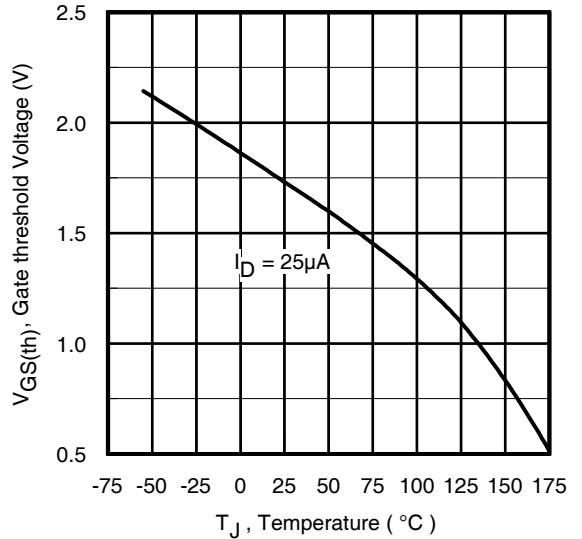


Fig 10. Threshold Voltage vs. Temperature

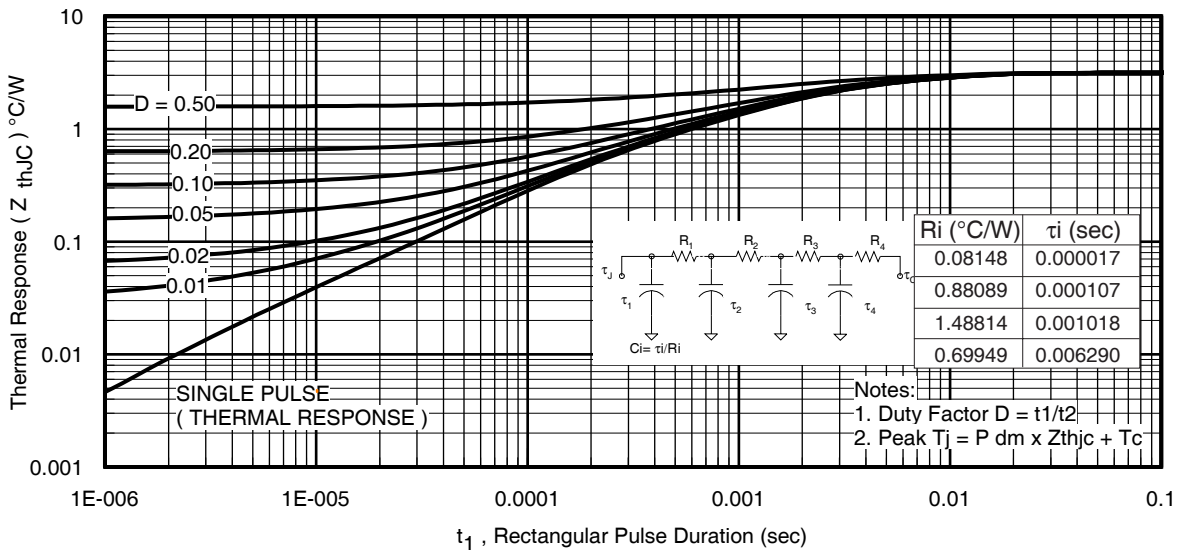


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

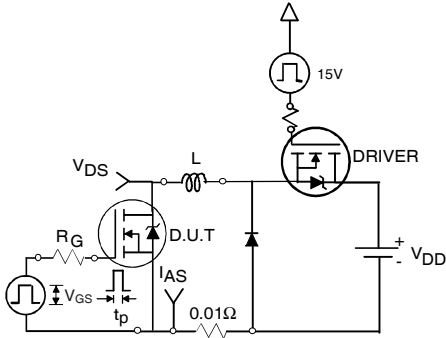


Fig 12a. Unclamped Inductive Test Circuit

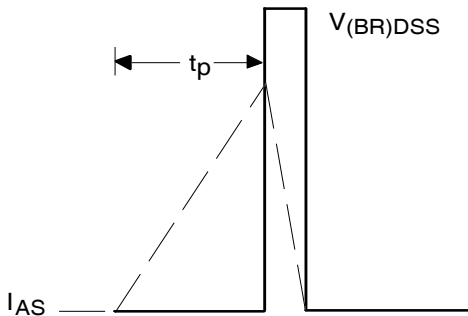


Fig 12b. Unclamped Inductive Waveforms

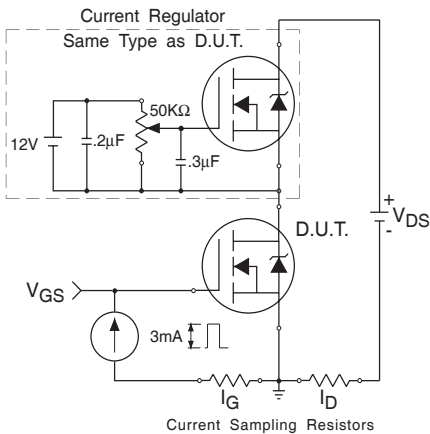


Fig 13. Gate Charge Test Circuit

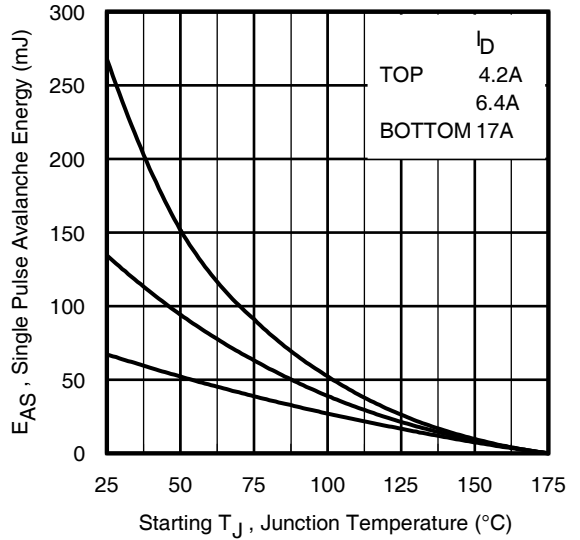


Fig 12c. Maximum Avalanche Energy vs. Drain Current

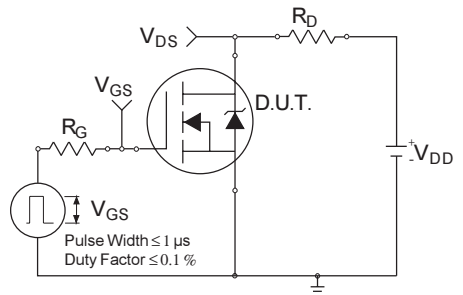


Fig 14a. Switching Time Test Circuit

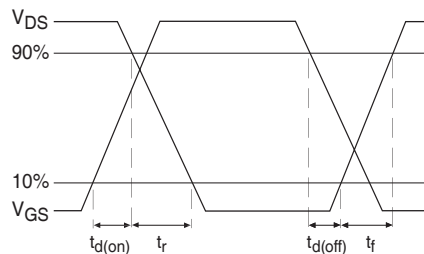


Fig 14b. Switching Time Waveforms

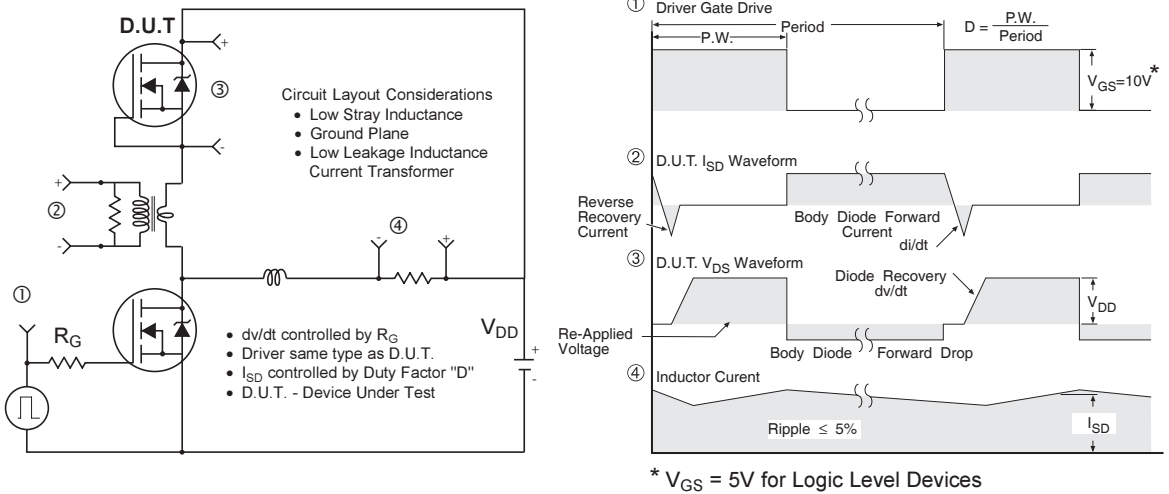


Fig 15. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET[®] Power MOSFETs

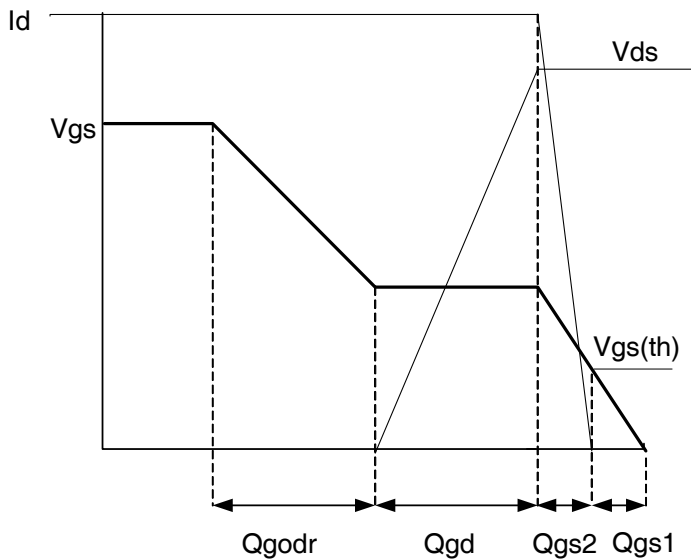
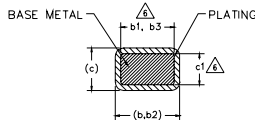
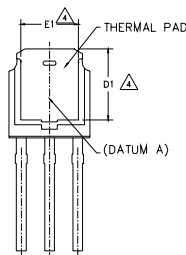
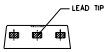
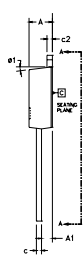
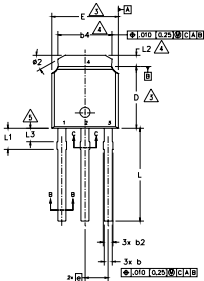


Fig 16. Gate Charge Waveform

I-Pak (TO-251AA) Package Outline

Dimensions are shown in millimeters (inches)



SECTION B-B & C-C

NOTES:

- 1.- DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
- 2.- DIMENSION ARE SHOWN IN INCHES [MILLIMETERS].
- 3.- DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005 [0.13] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
- 4.- THERMAL PAD CONTOUR OPTION WITHIN DIMENSION b4, L2, E1 & D1.
- 5.- LEAD DIMENSION UNCONTROLLED IN L3.
- 6.- DIMENSION b1, b3 & c1 APPLY TO BASE METAL ONLY.
- 7.- OUTLINE CONFORMS TO JEDEC OUTLINE TO-251AA (Date 06/02).
- 8.- CONTROLLING DIMENSION : INCHES.

| SYMBOL | DIMENSIONS | | | | NOTES |
|--------|-------------|------|--------|------|------------------|
| | MILLIMETERS | | INCHES | | |
| | MIN. | MAX. | MIN. | MAX. | |
| A | 2.18 | 2.39 | .086 | .094 | 6 |
| A1 | 0.89 | 1.14 | .035 | .045 | |
| b | 0.64 | 0.89 | .025 | .035 | |
| b1 | 0.65 | 0.79 | .025 | .031 | |
| b2 | 0.76 | 1.14 | .030 | .045 | |
| b3 | 0.76 | 1.04 | .030 | .041 | |
| b4 | 4.95 | 5.46 | .195 | .215 | 4 |
| c | 0.46 | 0.61 | .018 | .024 | 6 |
| c1 | 0.41 | 0.56 | .016 | .022 | |
| c2 | 0.46 | 0.89 | .018 | .035 | 3 |
| D | 5.97 | 6.22 | .235 | .245 | |
| D1 | 5.21 | - | .205 | - | 4 |
| E | 6.35 | 6.73 | .250 | .265 | 3 |
| E1 | 4.32 | - | .170 | - | 4 |
| e | 2.29 | BSC | .090 | BSC | LEAD ASSIGNMENTS |
| L | 8.89 | 9.65 | .350 | .380 | |
| L1 | 1.91 | 2.29 | .045 | .090 | |
| L2 | 0.89 | 1.27 | .035 | .050 | |
| L3 | 1.14 | 1.52 | .045 | .060 | |
| ø1 | 0" | 15" | 0" | 15" | HEXFEET |
| ø2 | 25" | 35" | 25" | 35" | |

LEAD ASSIGNMENTS

HEXFEET

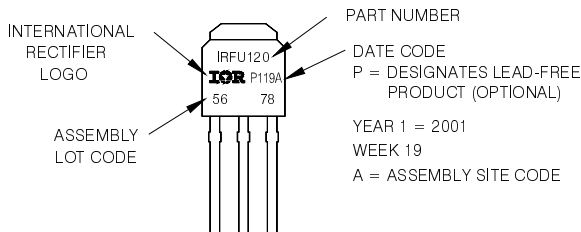
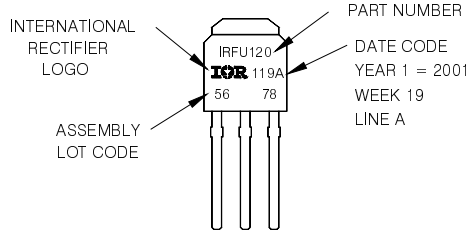
- 1.- GATE
- 2.- DRAIN
- 3.- SOURCE
- 4.- DRAIN

I-Pak (TO-251AA) Part Marking Information

EXAMPLE: THIS IS AN IRFU120
WITH ASSEMBLY
LOT CODE 5678
ASSEMBLED ON WW 19, 2001
IN THE ASSEMBLY LINE 'A'

Note: 'P' in assembly line position
indicates Lead-Free

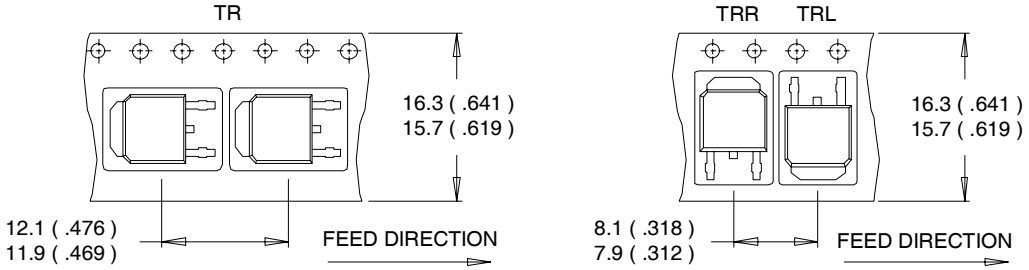
OR



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

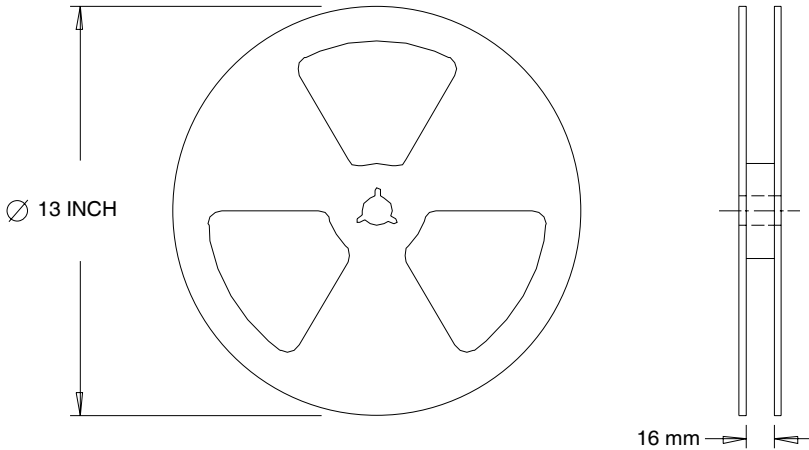
D-Pak (TO-252AA) Tape & Reel Information

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. OUTLINE CONFORMS TO EIA-481.

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

| Orderable part number | Package Type | Standard Pack | | Note |
|-----------------------|--------------|---------------|----------|------|
| | | Form | Quantity | |
| IRLR8259PBF | D-PAK | Tube/Bulk | 75 | |
| IRLR8259TRPBF | D-PAK | Tape and Reel | 2000 | |
| IRLU8259PBF | I-PAK | Tube/Bulk | 75 | |

| Qualification information† | | |
|----------------------------|--|-------------------------------------|
| Qualification level | Industrial†† (per JEDEC JESD47F††† guidelines) | |
| | Comments: This family of products has passed JEDEC's Industrial qualification. IR's Consumer qualification level is granted by extension of the higher Industrial level. | |
| Moisture Sensitivity Level | D-PAK | MSL 1 (per JEDEC J-ST D-020D†††) |
| | I-PAK | Not applicable |
| 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 $T_J = 25^\circ\text{C}$, $L = 0.48\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 17\text{A}$.
- ③ Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ Calculated continuous current based on maximum allowable junction temperature.
 Package limitation current is 42A.
- ⑤ When mounted on 1" square PCB (FR-4 or G-10 Material). For recommended footprint and soldering techniques refer to application note #AN-994.

Data and specifications subject to change without notice.

International
IR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
 TAC Fax: (310) 252-790

Visit us at www.irf.com for sales contact information.12/08

IMPORTANT NOTICE

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffheitsgarantie").

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Infineon Technologies in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office (www.infineon.com).

WARNINGS

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.

单击下面可查看定价，库存，交付和生命周期等信息

[>>Infineon\(英飞凌\)](#)