# ANTREX Electronics

Electronic Components Sourcing Information

## Product Reference Information

| | |
|---|---|
| **Part Number:** | IRLR2705TRRPBF |
| **Manufacturer:** | Infineon Technologies |
| **Package:** | Please confirm with sales |
| **Availability:** | Please confirm with sales |

**Product Page:**

https://antrexco.com/product/details/infineon-technologies/irlr2705trrpbf.html

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**Note:**

This PDF includes an ANTREX product reference cover page.

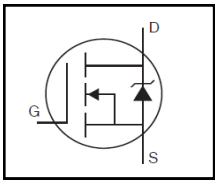
The original manufacturer datasheet follows from the next page.

# IRLR2705PbF

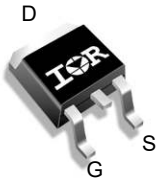
HEXFET® Power MOSFET

**Features**

- Logic-Level Gate Drive
- Ultra Low On-Resistance
- Advanced Process Technology
- Fast Switching
- Fully Avalanche Rated
- Lead-Free




| | |
|---|---|
| $V_{DSS}$ | 55V |
| $R_{DS(on)}$ | 0.040Ω |
| $I_D$ | 28A⑤ |




D- Pak
IRLR2705PbF

**Description**

Fifth Generation HEXFETs utilize advanced processing techniques to achieve the lowest possible on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET Power MOSFETs are well known for, provides the designer with an extremely efficient device for use in a wide variety of applications.

The D-PAK is designed for surface mounting using vapor phase, infrared, or wave soldering techniques. Power dissipation levels up to 1.5 watts are possible in typical surface mount applications.

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

| Base part number | Package Type | Standard Pack | | Orderable Part Number |
|---|---|---|---|---|
| | | Form | Quantity | |
| IRLR2705PbF | D-Pak | Tape and Reel | 2000 | IRLR2705TRPbF |

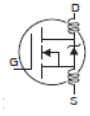
**Absolute Maximum Ratings**

| Symbol | Parameter | Max. | Units |
|---|---|---|---|
| $I_D$ @ $T_C$ = 25°C | Continuous Drain Current, $V_{GS}$ @ 10V | 28 | A |
| $I_D$ @ $T_C$ = 100°C | Continuous Drain Current, $V_{GS}$ @ 10V | 20 | |
| $I_{DM}$ | Pulsed Drain Current ① | 110 | |
| $P_D$ @$T_C$ = 25°C | Maximum Power Dissipation | 68 | W |
| | Linear Derating Factor | 0.45 | W/°C |
| $V_{GS}$ | Gate-to-Source Voltage | ± 16 | V |
| $E_{AS}$ | Single Pulse Avalanche Energy② | 110 | mJ |
| $I_{AR}$ | Avalanche Current① | 16 | A |
| $E_{AR}$ | Repetitive Avalanche Energy ① | 6.8 | mJ |
| dv/dt | Peak Diode Recovery dv/dt ③ | 5.0 | V/ns |
| $T_J$<br>$T_{STG}$ | Operating Junction and<br>Storage Temperature Range | -55 to + 175 | °C |
| | Soldering Temperature, for 10 seconds (1.6mm from case) | 300 | |

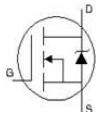
**Thermal Resistance**

| Symbol | Parameter | Typ. | Max. | Units |
|---|---|---|---|---|
| $R_{\theta JC}$ | Junction-to-Case | — | 2.2 | °C/W |
| $R_{\theta JA}$ | Junction-to-Ambient ( PCB Mount) ⑥ | — | 50 | |
| $R_{\theta JA}$ | Junction-to-Ambient | — | 110 | |

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

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-to-Source Breakdown Voltage | 55 | — | — | V | $V_{GS}$ = 0V, $I_D$ = 250µA |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient | — | 0.065 | — | V/°C | Reference to 25°C, $I_D$ = 1mA |
| $R_{DS(on)}$ | Static Drain-to-Source On-Resistance | — | — | 0.040 | Ω | $V_{GS}$ = 10V, $I_D$ = 17A ④ |
| | | — | — | 0.051 | | $V_{GS}$ = 5.0V, $I_D$ = 17A ④ |
| | | — | — | 0.065 | | $V_{GS}$ = 4.0V, $I_D$ = 14A ④ |
| $V_{GS(th)}$ | Gate Threshold Voltage | 1.0 | — | 2.0 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 250µA |
| gfs | Forward Trans conductance | 11 | — | — | S | $V_{DS}$ = 25V, $I_D$ = 16A ⑦ |
| $I_{DSS}$ | Drain-to-Source Leakage Current | — | — | 25 | µA | $V_{DS}$ = 55V, $V_{GS}$ = 0V |
| | | — | — | 250 | | $V_{DS}$ = 44V,$V_{GS}$ = 0V,$T_J$ =150°C |
| $I_{GSS}$ | Gate-to-Source Forward Leakage | — | — | 100 | nA | $V_{GS}$ = 16V |
| | Gate-to-Source Reverse Leakage | — | | -100 | | $V_{GS}$ = -16V |
| $Q_g$ | Total Gate Charge | — | — | 25 | nC | $I_D$ = 16A |
| $Q_{gs}$ | Gate-to-Source Charge | — | — | 5.2 | | $V_{DS}$ = 44V |
| $Q_{gd}$ | Gate-to-Drain ('Miller') Charge | — | | 14 | | $V_{GS}$ = 5.0V, See Fig. 6 and 13 ④⑦ |
| $t_{d(on)}$ | Turn-On Delay Time | — | 8.9 | — | ns | $V_{DD}$ = 28V |
| $t_r$ | Rise Time | — | 100 | — | | $I_D$ = 16A |
| $t_{d(off)}$ | Turn-Off Delay Time | — | 21 | — | | $R_G$ = 6.5Ω,$V_{GS}$ = 5.0V |
| $t_f$ | Fall Time | — | 29 | — | | $R_D$ = 1.8Ω, See Fig. 10 ④⑦ |
| $L_D$ | Internal Drain Inductance | — | 4.5 | — | nH | Between lead, 6mm (0.25in.) from package and center of die contact  |
| $L_S$ | Internal Source Inductance | — | 7.5 | — | | |
| $C_{iss}$ | Input Capacitance | — | 880 | — | pF | $V_{GS}$ = 0V |
| $C_{oss}$ | Output Capacitance | — | 220 | — | | $V_{DS}$ = 25V |
| $C_{rss}$ | Reverse Transfer Capacitance | — | 94 | — | | $f$ = 1.0MHz, See Fig. 5⑦ |

**Source-Drain Ratings and Characteristics**

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current (Body Diode) | — | — | 28 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| $I_{SM}$ | Pulsed Source Current (Body Diode) ① | — | — | 110 | | |
| $V_{SD}$ | Diode Forward Voltage | — | — | 1.3 | V | $T_J$ = 25°C,$I_S$ = 17A,$V_{GS}$ = 0V ④ |
| $t_{rr}$ | Reverse Recovery Time | — | 76 | 110 | ns | $T_J$ = 25°C ,$I_F$ = 16A |
| $Q_{rr}$ | Reverse Recovery Charge | — | 190 | 290 | nC | di/dt = 100A/µs ④⑦ |
| $t_{on}$ | Forward Turn-On Time | Intrinsic turn-on time is negligible (turn-on is dominated by $L_S$+$L_D$) | | | | |

**Notes:**

① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11).

② $V_{DD}$ = 25V, starting $T_J$ = 25°C, L = 610µH, $R_G$ = 25Ω, $I_{AS}$ = 16A. (See fig. 12)

③ $I_{SD} \leq$ 16A, dv/dt ≤ 270A/µs, $V_{DD} \leq V_{(BR)DSS}$, $T_j \leq$ 175°C

④ Pulse width ≤ 300µs; duty cycle ≤ 2%.

⑤ Calculated continuous current based on maximum allowable junction temperature; Package limitation current = 20A.

⑥ When mounted on 1" square PCB (FR-4 or G-10 Material). For recommended footprint and soldering techniques refer to application note #AN-994.

⑦ Uses IRLZ34N data and test conditions.

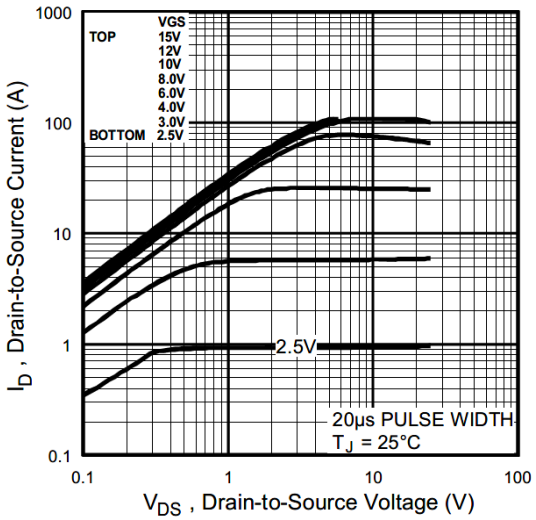



**Fig. 1** Typical Output Characteristics

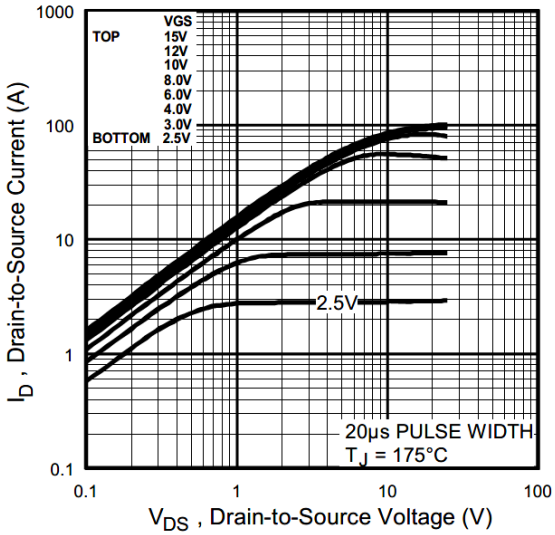



**Fig. 2** Typical Output Characteristics

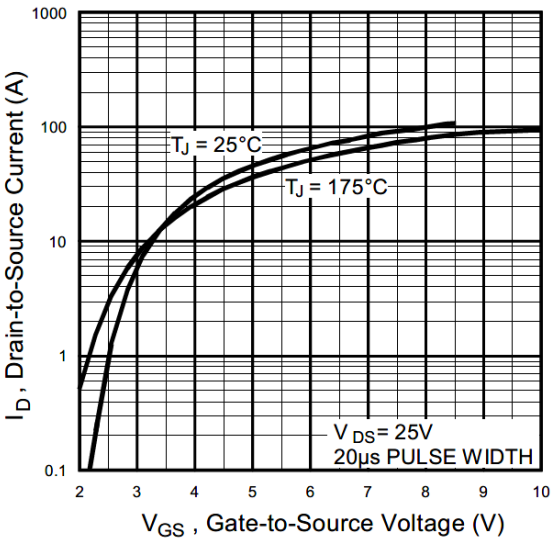



**Fig. 3** Typical Transfer Characteristics

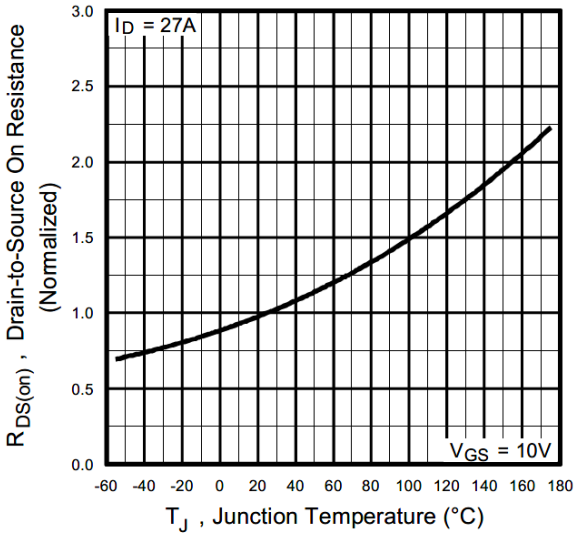



**Fig. 4** Normalized On-Resistance vs. Temperature

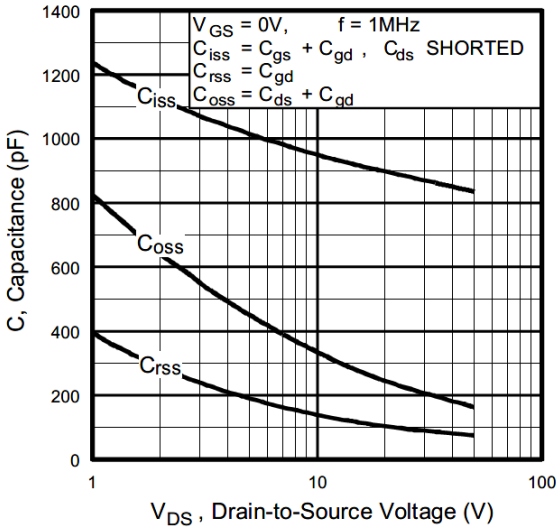



**Fig 5.** Typical Capacitance vs. Drain-to-Source Voltage

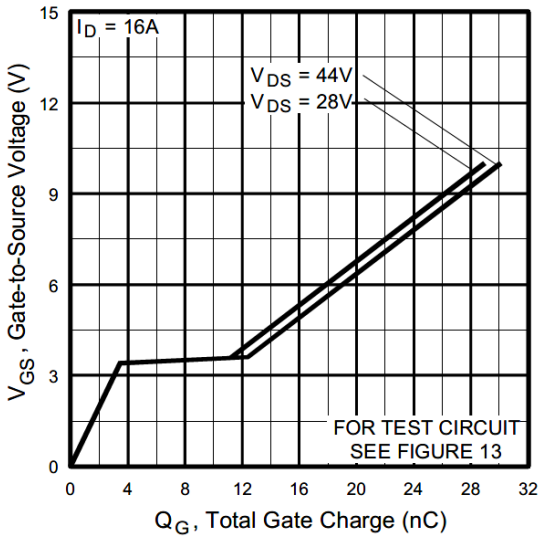



**Fig 6.** Typical Gate Charge vs. Gate-to-Source Voltage

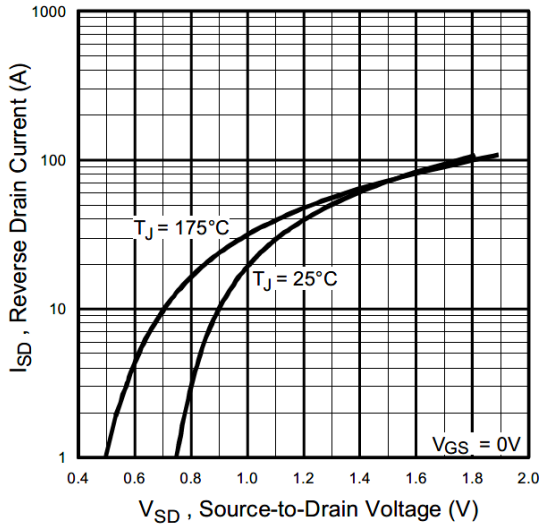



**Fig. 7** Typical Source-to-Drain Diode Forward Voltage

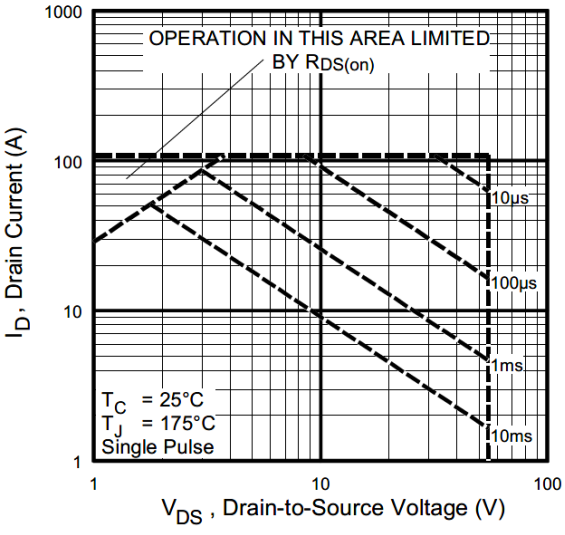



**Fig 8.** Maximum Safe Operating Area

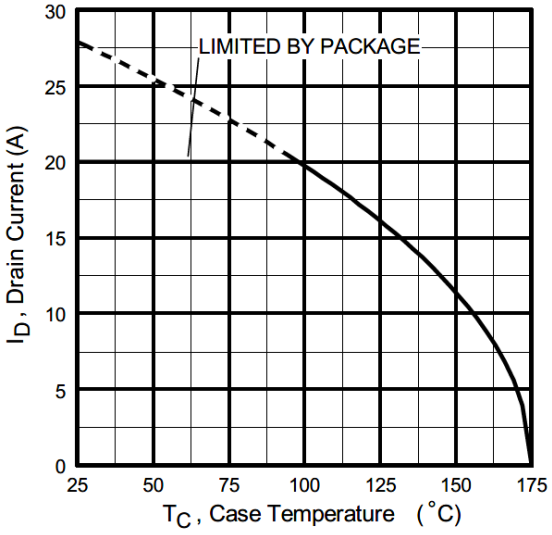



**Fig 9.** Maximum Drain Current vs. Case Temperature

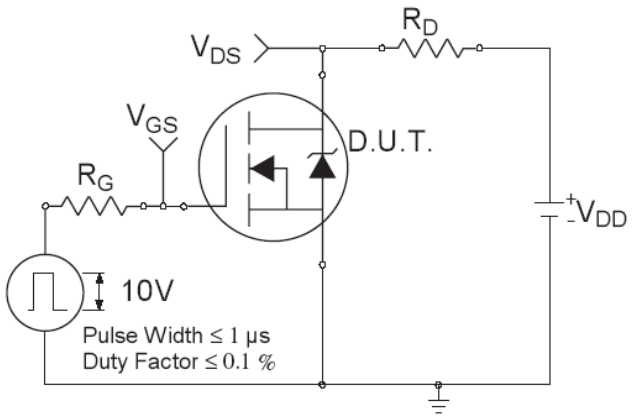



**Fig 10a.** Switching Time Test Circuit

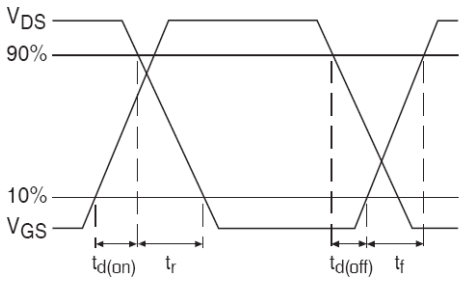



**Fig 10b.** Switching Time Waveforms

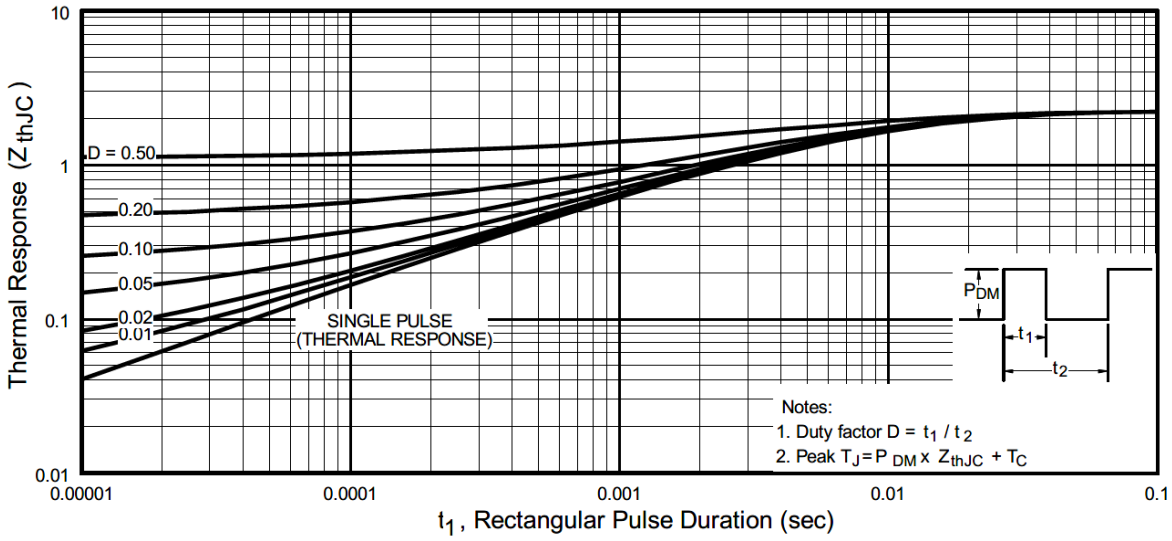



**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Case

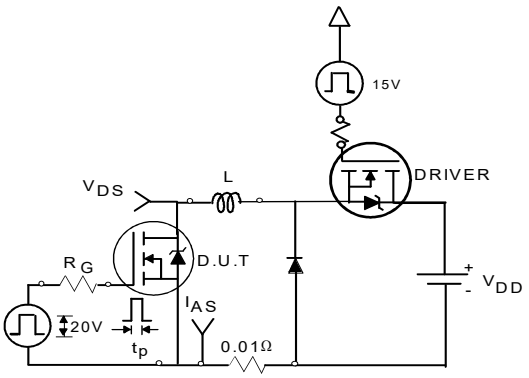



**Fig 12a.** Unclamped Inductive Test Circuit

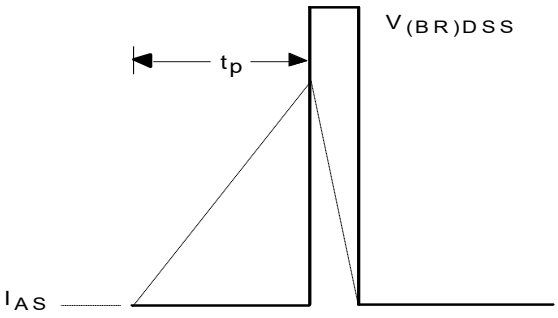



**Fig 12b.** Unclamped Inductive Waveforms

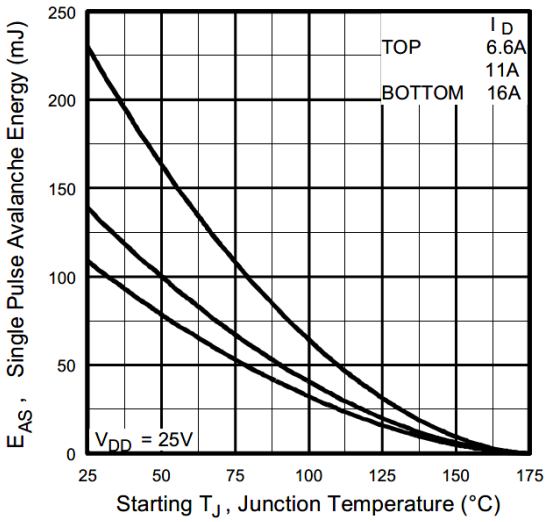



**Fig 12c.** Maximum Avalanche Energy vs. Drain Current

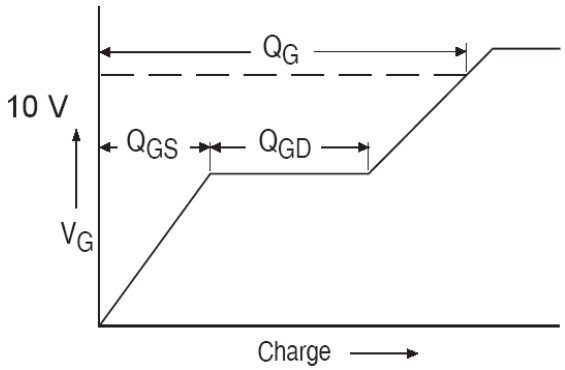



**Fig 13a.** Gate Charge Waveform

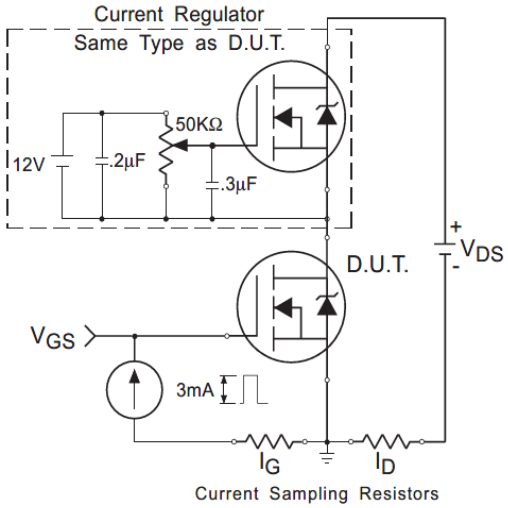



**Fig 13b.** Gate Charge Test Circuit

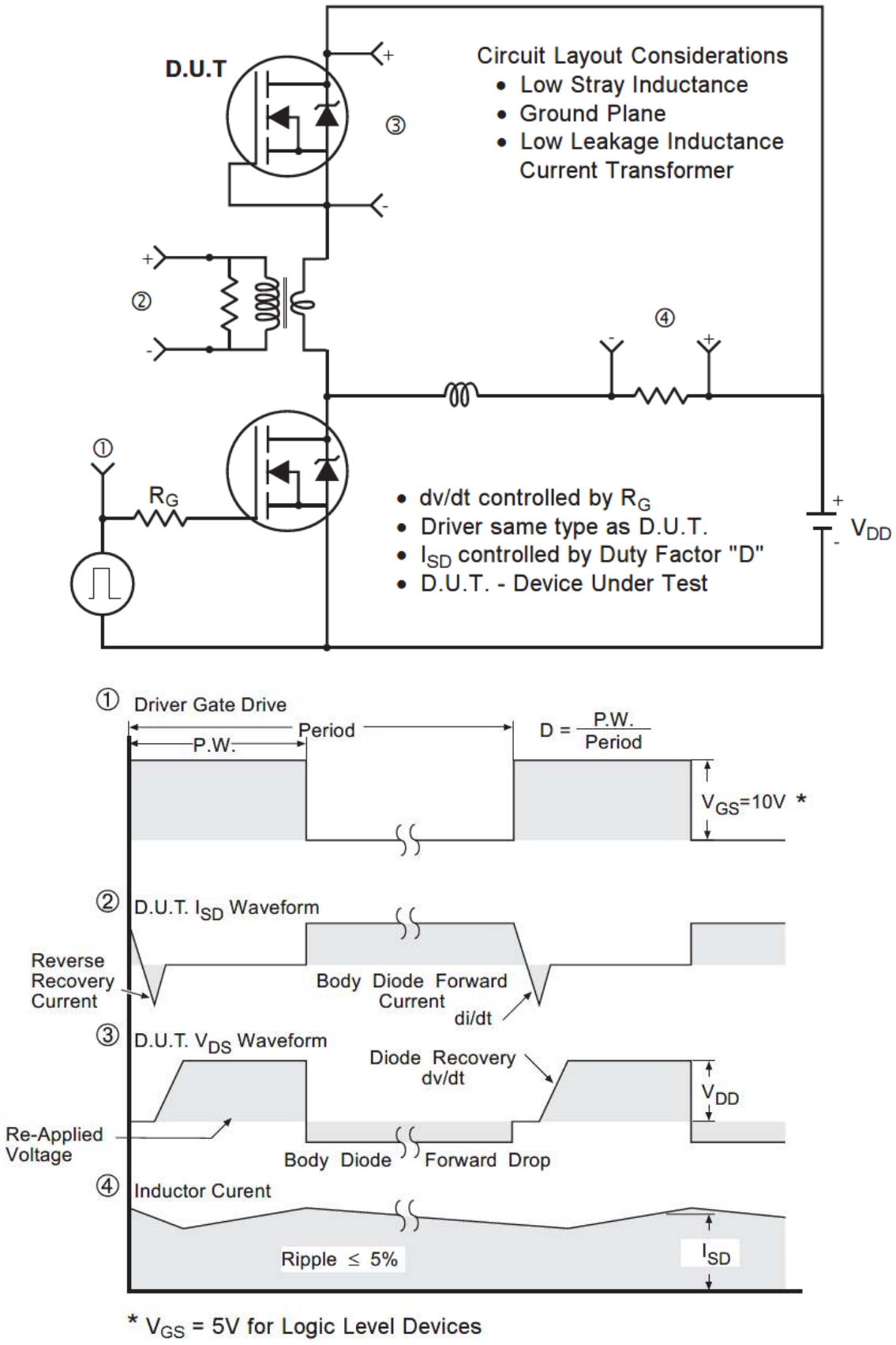
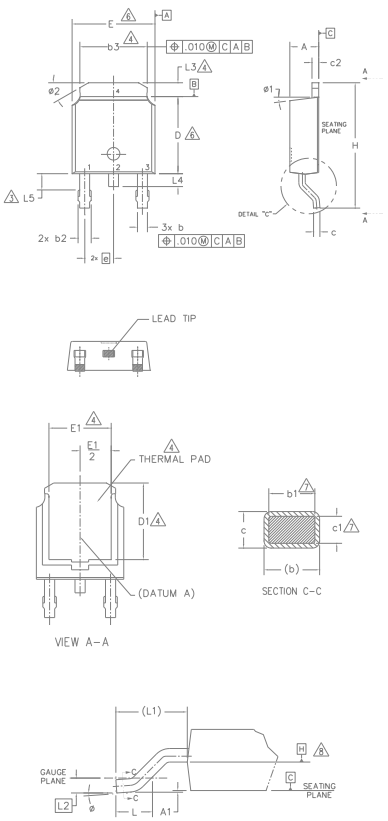



**Fig 14.** Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET® Power MOSFETs

## D-Pak (TO-252AA) Package Outline (Dimensions are shown in millimeters (inches))




NOTES:
1.– DIMENSIONING AND TOLERANCING PER ASME Y14.5M–1994
2.– DIMENSION ARE SHOWN IN INCHES [MILLIMETERS].
3.– LEAD DIMENSION UNCONTROLLED IN L5.
4.– DIMENSION D1, E1, L3 & b3 ESTABLISH A MINIMUM MOUNTING SURFACE FOR THERMAL PAD.
5.– SECTION C–C DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN .005 AND 0.10 [0.13 AND 0.25] FROM THE LEAD TIP.
6.– DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .006 [0.15] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
7.– DIMENSION b1 & c1 APPLIED TO BASE METAL ONLY.
8.– DATUM A & B TO BE DETERMINED AT DATUM PLANE H.
9.– OUTLINE CONFORMS TO JEDEC OUTLINE TO–252AA.

| SYMBOL | DIMENSIONS | | | | NOTES |
|---|---|---|---|---|---|
| | MILLIMETERS | | INCHES | | |
| | MIN. | MAX. | MIN. | MAX. | |
| A | 2.18 | 2.39 | .086 | .094 | |
| A1 | – | 0.13 | – | .005 | |
| b | 0.64 | 0.89 | .025 | .035 | |
| b1 | 0.64 | 0.79 | .025 | .031 | 7 |
| b2 | 0.76 | 1.14 | .030 | .045 | |
| b3 | 4.95 | 5.46 | .195 | .215 | 4 |
| c | 0.46 | 0.61 | .018 | .024 | |
| c1 | 0.41 | 0.56 | .016 | .022 | 7 |
| c2 | 0.46 | 0.89 | .018 | .035 | |
| D | 5.97 | 6.22 | .235 | .245 | 6 |
| D1 | 5.21 | – | .205 | – | 4 |
| E | 6.35 | 6.73 | .250 | .265 | 6 |
| E1 | 4.32 | – | .170 | – | 4 |
| e | 2.29 BSC | | .090 BSC | | |
| H | 9.40 | 10.41 | .370 | .410 | |
| L | 1.40 | 1.78 | .055 | .070 | |
| L1 | 2.74 BSC | | .108 REF. | | |
| L2 | 0.51 BSC | | .020 BSC | | |
| L3 | 0.89 | 1.27 | .035 | .050 | 4 |
| L4 | – | 1.02 | – | .040 | |
| L5 | 1.14 | 1.52 | .045 | .060 | 3 |
| ø | 0° | 10° | 0° | 10° | |
| ø1 | 0° | 15° | 0° | 15° | |
| ø2 | 25° | 35° | 25° | 35° | |

LEAD ASSIGNMENTS

HEXFET
1.– GATE
2.– DRAIN
3.– SOURCE
4.– DRAIN

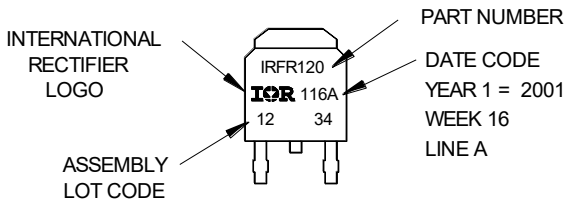
IGBT & CoPAK
1.– GATE
2.– COLLECTOR
3.– EMITTER
4.– COLLECTOR

## D-Pak (TO-252AA) Part Marking Information

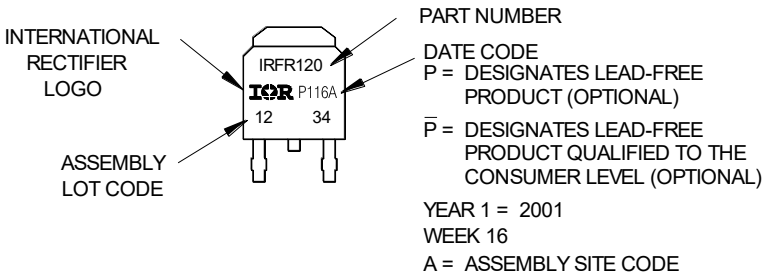
EXAMPLE: THIS IS AN IRFR120
WITH ASSEMBLY
LOT CODE 1234
ASSEMBLED ON WW 16, 2001
IN THE ASSEMBLY LINE "A"

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

"P̄" in assembly line position indicates "Lead-Free" qualification to the consumer-level

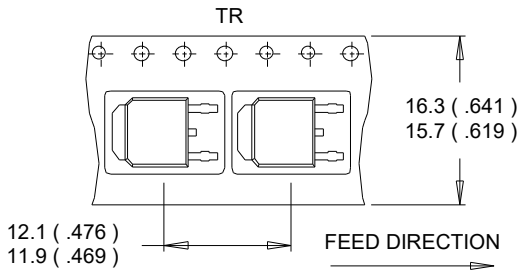



OR

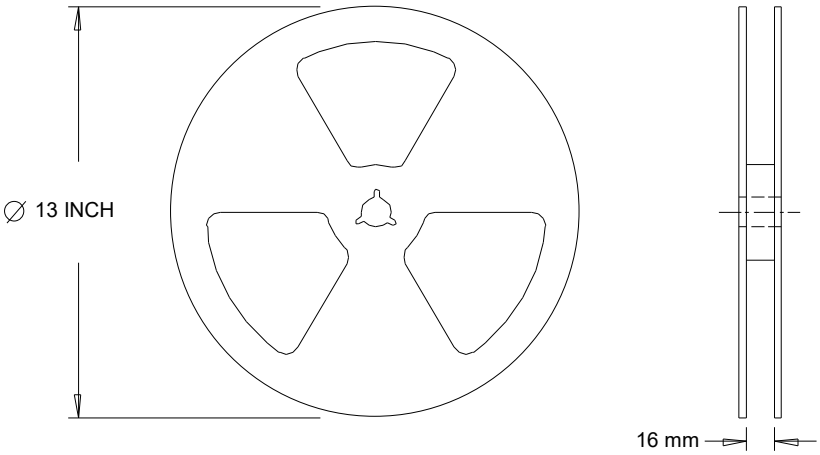



Notes:
1. For the most current drawing please refer to Infineon website at http://www.infineon.com/package/

**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 Infineon's web site www.infineon.com

**Revision History**

| Date | Rev. | Comments |
|---|---|---|
| 01/09/2025 | 2.1 | • Changed datasheet with corporate template.<br>• Removed I-Pack “(IRLU2705PbF )-All pages<br>• Updated typo Rdson unit from “W” to “Ω”-page 2<br>• Updated disclaimer on last page. |

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**81726 München, Germany**



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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.

**Information**

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.

The Infineon Technologies component described in this Data Sheet may be used in life support devices or systems and or automotive, aviation and aerospace applications or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life support, automotive, aviation and aerospace device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.