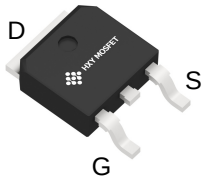
## Description

The IRLR8729TRPBF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

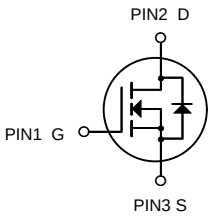



**TO-252-2L**
**(TO-252(DPAK))**

## General Features

$V_{DS}$ = 30V $I_D$ = 80A

$R_{DS(ON)}$ < 6.8mΩ @ $V_{GS}$=10V




N-Channel MOSFET

## Application

Battery protection

Load switch

Uninterruptible power supply

## Package Marking and Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|---|---|---|---|
| IRLR8729TRPBF | TO-252-2L(TO-252(DPAK)) | HXY MOSFET | 2500 |

## Absolute Maximum Ratings ($T_C$=25°C unless otherwise noted)

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 30 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$ | Drain Current – Continuous ($T_C$=25°C) | 80 | A |
| | Drain Current – Continuous ($T_C$=100°C) | 51 | A |
| $I_{DM}$ | Drain Current – Pulsed[1] | 320 | A |
| EAS | Single Pulse Avalanche Energy[2] | 88 | mJ |
| IAS | Single Pulse Avalanche Current[2] | 42 | A |
| $P_D$ | Power Dissipation ($T_C$=25°C) | 54 | W |
| | Power Dissipation – Derate above 25°C | 0.43 | W/°C |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | °C |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | °C |
| $R_{\theta JA}$ | Thermal Resistance Junction to ambient | 62 | °C/W |
| $R_{\theta JC}$ | Thermal Resistance Junction to Case | 2.3 | °C/W |

## Electrical Characteristics ($T_J$=25 °C, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| BVDSS | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=250uA | 30 | --- | --- | V |
| △BVDSS/△TJ | $BV_{DSS}$ Temperature Coefficient | Reference to 25℃ , $I_D$=1mA | --- | 0.04 | --- | V/℃ |
| IDSS | Drain-Source Leakage Current | $V_{DS}$=30V , $V_{GS}$=0V , $T_J$=25℃ | --- | --- | 1 | uA |
| | | $V_{DS}$=24V , $V_{GS}$=0V , $T_J$=125℃ | --- | --- | 10 | uA |
| IGSS | Gate-Source Leakage Current | $V_{GS}$=±20V , $V_{DS}$=0V | --- | --- | ±100 | nA |
| RDS(ON) | Static Drain-Source On-Resistance[3] | $V_{GS}$=10V , $I_D$=20A | --- | 5 | 6.8 | mΩ |
| | | $V_{GS}$=4.5V , $I_D$=10A | --- | 6.5 | 9 | mΩ |
| VGS(th) | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =250uA | 1 | 1.6 | 2.5 | V |
| △$V_{GS(th)}$ | $V_{GS(th)}$ Temperature Coefficient | | --- | -4 | --- | mV/℃ |
| gfs | Forward Transconductance | $V_{DS}$=10V , $I_D$=10A | --- | 18 | --- | S |
| $Q_g$ | Total Gate Charge[3,4] | $V_{DS}$=15V , $V_{GS}$=4.5V , $I_D$=20A | --- | 11.1 | --- | nC |
| Qgs | Gate-Source Charge[3,4] | | --- | 1.85 | --- | |
| Qgd | Gate-Drain Charge[3,4] | | --- | 6.8 | --- | |
| Td(on) | Turn-On Delay Time[3,4] | $V_{DD}$=15V , $V_{GS}$=10V , $R_G$=3.3Ω<br>$I_D$=15A | --- | 7.5 | --- | ns |
| $T_r$ | Rise Time[3,4] | | --- | 14.5 | --- | |
| Td(off) | Turn-Off Delay Time[3,4] | | --- | 35.2 | --- | |
| $T_f$ | Fall Time[3,4] | | --- | 9.6 | --- | |
| Ciss | Input Capacitance | $V_{DS}$=25V , $V_{GS}$=0V , F=1MHz | --- | 1160 | --- | pF |
| Coss | Output Capacitance | $V_{GS}$=0V, $V_{DS}$=0V, F=1MHz | --- | 200 | --- | Ω |
| Crss | Reverse Transfer Capacitance | | --- | 180 | --- | |
| $R_g$ | Gate resistance | | --- | 2.5 | --- | |
| EAS | Single Pulse Avalanche Energy | $V_{DD}$=25V, L=0.1mH, IAS=20A | 20 | --- | --- | mJ |
| IS | Continuous Source Current | $V_G$=$V_D$=0V , Force Current | --- | --- | 80 | A |
| ISM | Pulsed Source Current[3] | | --- | --- | 320 | A |
| VSD | Diode Forward Voltage[3] | $V_{GS}$=0V , $I_S$=1A , $T_J$=25℃ | --- | --- | 1 | V |
| trr | Reverse Recovery Time | VGS=0V,IS=1A , di/dt=100A/μs $T_J$=25℃ | --- | --- | --- | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | --- | --- | --- | nC |

## Typical Characteristics

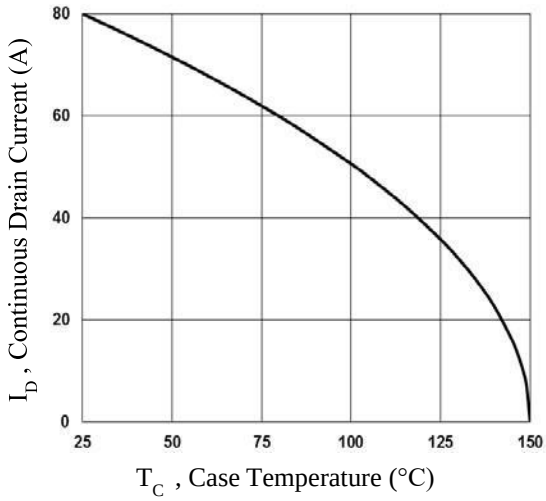



**Fig.1 Continuous Drain Current vs. Tc**

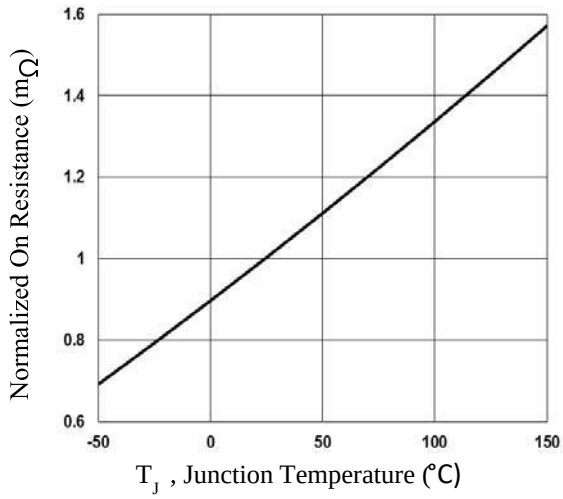



**Fig.2 Normalized RDSON vs. Tj**

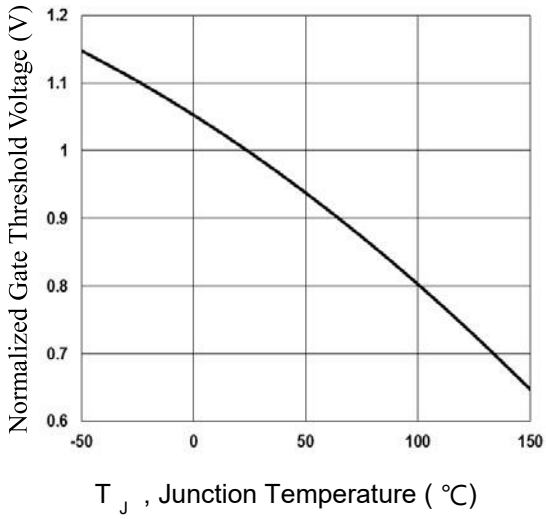



**Fig. 3 Normalized Vth vs. Tj**

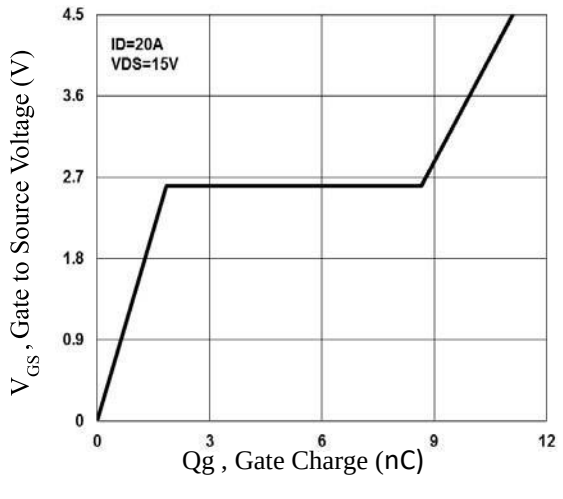



**Fig. 4 Gate Charge Waveform**

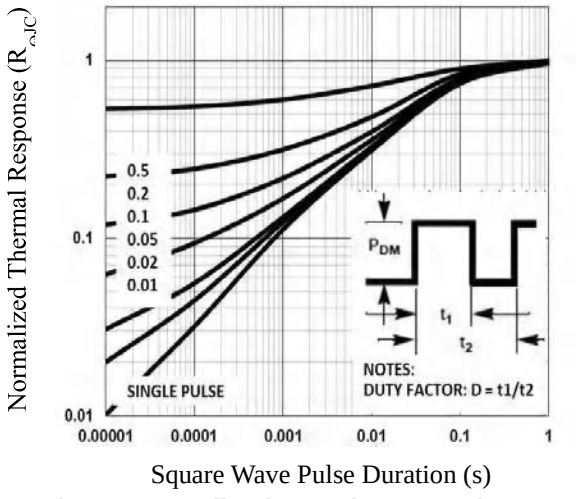



**Fig.5 Normalized Transient Impedance**

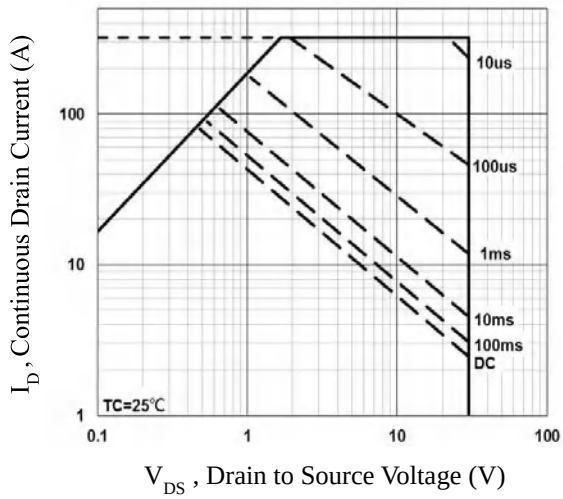



**Fig.6 Maximum Safe Operation Area**

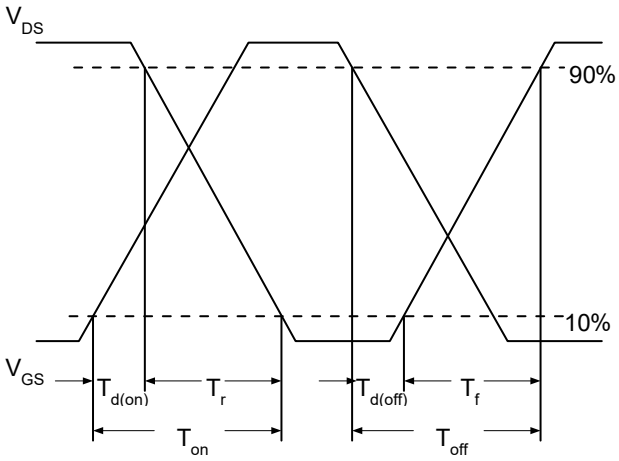



**Fig. 7 Switching Time Waveform**

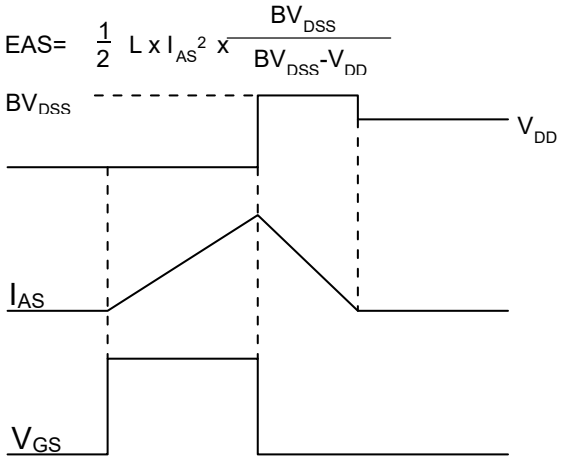
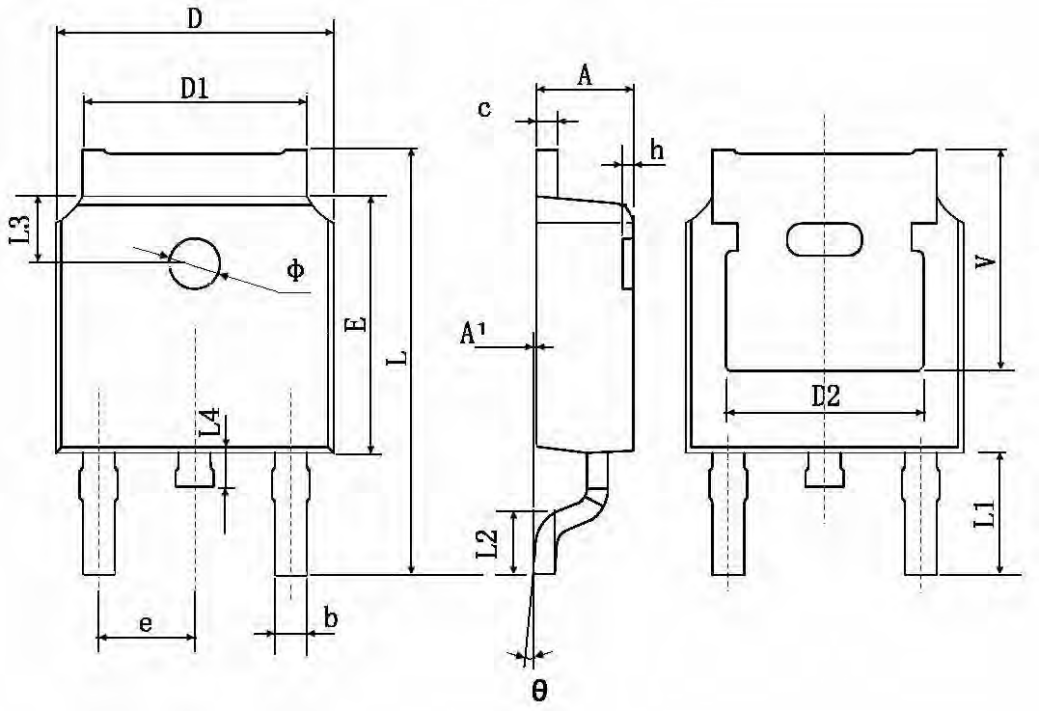



**Fig. 8 EAS Waveform**

## TO252-2L(TO-252(DPAK)) Package Information




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.127 | 0.000 | 0.005 |
| b | 0.660 | 0.860 | 0.026 | 0.034 |
| c | 0.460 | 0.580 | 0.018 | 0.023 |
| D | 6.500 | 6.700 | 0.256 | 0.264 |
| D1 | 5.100 | 5.460 | 0.201 | 0.215 |
| D2 | 0.483 TYP. | | 0.190 TYP. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.800 | 10.400 | 0.386 | 0.409 |
| L1 | 2.900 TYP. | | 0.114 TYP. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 TYP. | | 0.063 TYP. | |
| L4 | 0.600 | 1.000 | 0.024 | 0.039 |
| Φ | 1.100 | 1.300 | 0.043 | 0.051 |
| θ | 0° | 8° | 0° | 8° |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| V | 5.350 TYP. | | 0.211 TYP. | |

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