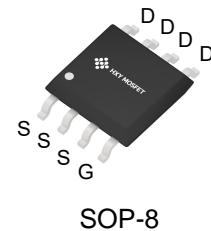




Description

The IRF8113GTRPBF 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.



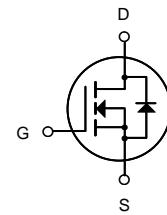
SOP-8

General Features

$V_{DS} = 30V$ $I_D = 18A$

$R_{DS(ON)} < 6.5m\Omega$ @ $V_{GS}=10V$

$R_{DS(ON)} < 12m\Omega$ @ $V_{GS}=4.5V$



N-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|---------------|-------|------------|----------|
| IRF8113GTRPBF | SOP-8 | HXY MOSFET | 3000 |

Absolute Maximum Ratings ($T_c=25^\circ C$ unless otherwise noted)

| Symbol | Parameter | Limit | Unit |
|--------------------|---|------------|------|
| V_{DS} | Drain-Source Voltage | 30 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| I_D | Drain Current-Continuous | 18 | A |
| $I_D (70^\circ C)$ | Drain Current-Continuous($T_c=70^\circ C$) | 8.2 | A |
| I_{DM} | Pulsed Drain Current | 42 | A |
| P_D | Maximum Power Dissipation | 1.5 | W |
| T_J, T_{STG} | Operating Junction and Storage Temperature Range | -55 To 150 | °C |
| R_{eJC} | Thermal Resistance,Junction-to-Case ^(Note 2) | 36 | °C/W |



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

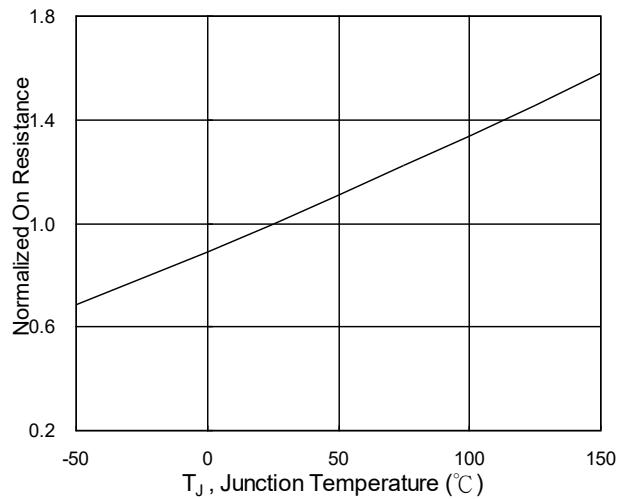
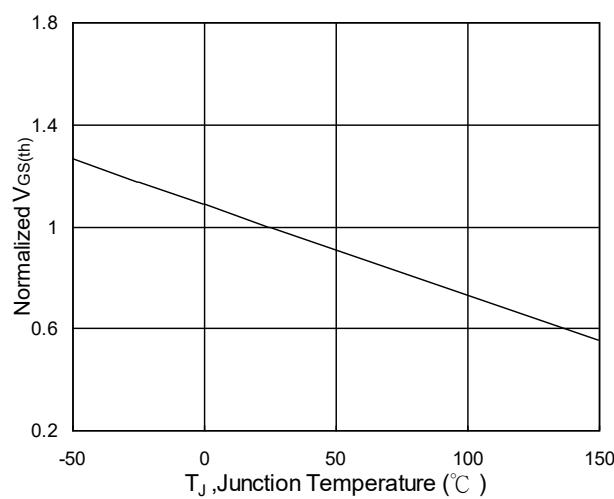
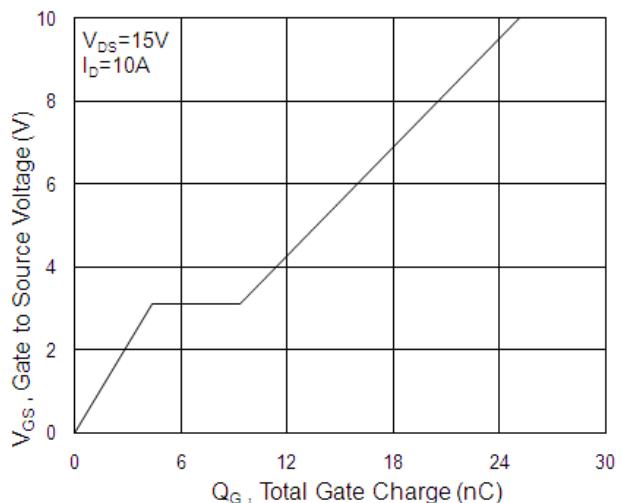
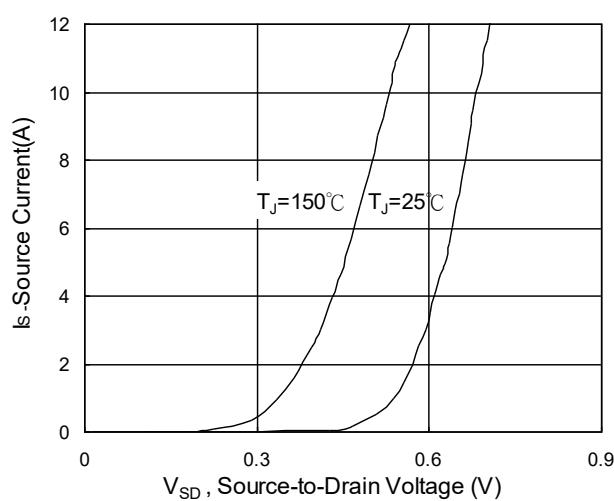
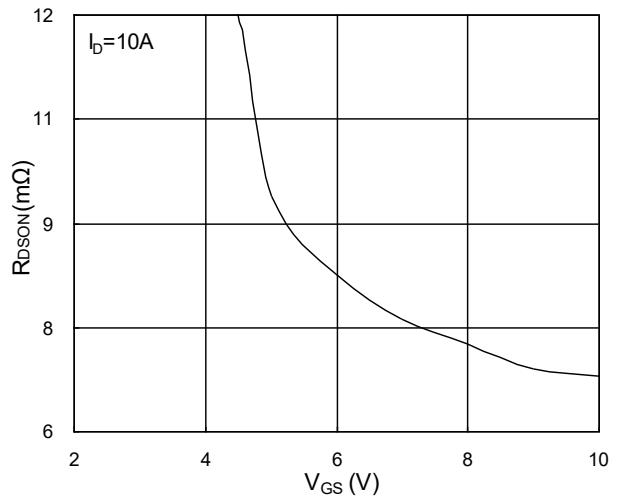
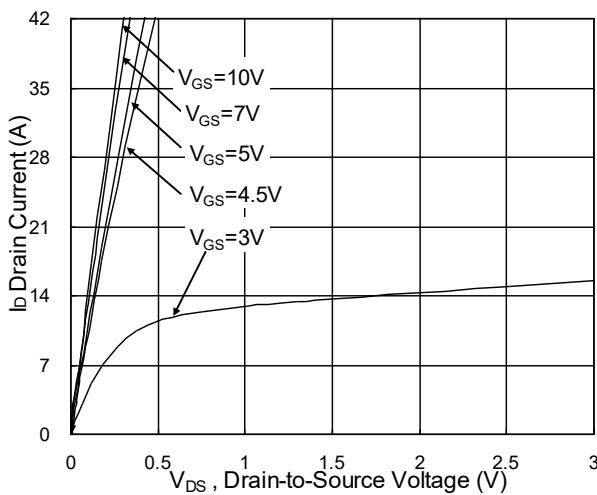
| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------|--|--|------|-------|-------|-------|
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250uA | 30 | --- | --- | V |
| △BV _{DSS} /△T _J | BVDSS Temperature Coefficient | Reference to 25°C, I _D =1mA | --- | 0.027 | --- | V/°C |
| R _{Ds(ON)} | Static Drain-Source On-Resistance ² | V _{GS} =10V, I _D =10A | --- | 5.5 | 6.5 | mΩ |
| | | V _{GS} =4.5V, I _D =8A | --- | 9 | 12 | |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =250uA | 1.2 | 1.5 | 2.5 | V |
| △V _{GS(th)} | V _{GS(th)} Temperature Coefficient | | --- | -5.8 | --- | mV/°C |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =24V, V _{GS} =0V, T _J =25°C | --- | --- | 1 | uA |
| | | V _{DS} =24V, V _{GS} =0V, T _J =55°C | --- | --- | 5 | |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±20V, V _{DS} =0V | --- | --- | ±100 | nA |
| g _{fs} | Forward Transconductance | V _{DS} =5V, I _D =10A | --- | 5.8 | --- | S |
| R _g | Gate Resistance | V _{DS} =0V, V _{GS} =0V, f=1MHz | --- | 2.2 | 3.8 | Ω |
| Q _g | Total Gate Charge (4.5V) | V _{DS} =15V, V _{GS} =4.5V, I _D =10A | --- | 12.6 | 17.6 | nC |
| Q _{gs} | Gate-Source Charge | | --- | 4.2 | 5.9 | |
| Q _{gd} | Gate-Drain Charge | | --- | 5.1 | 7.1 | |
| T _{d(on)} | Turn-On Delay Time | V _{DD} =15V, V _{GS} =10V, R _G =3.3Ω | --- | 6.2 | 12.4 | ns |
| T _r | Rise Time | | --- | 59 | 106 | |
| T _{d(off)} | Turn-Off Delay Time | | --- | 27.6 | 55 | |
| T _f | Fall Time | | --- | 8.4 | 16.8 | |
| C _{iss} | Input Capacitance | V _{DS} =15V, V _{GS} =0V, f=1MHz | --- | 1317 | 1845 | pF |
| C _{oss} | Output Capacitance | | --- | 163 | 228.2 | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 131 | 183.4 | |
| I _S | Continuous Source Current ^{1,5} | V _G =V _D =0V, Force Current | --- | --- | 18 | A |
| I _{SM} | Pulsed Source Current ^{2,5} | | --- | --- | 42 | A |
| V _{SD} | Diode Forward Voltage ² | V _{GS} =0V, I _S =1A, T _J =25°C | --- | --- | 1.2 | V |
| t _{rr} | Reverse Recovery Time | I _F =10A, dI/dt=100A/μs, T _J =25°C | --- | 12.5 | --- | nS |
| Q _{rr} | Reverse Recovery Charge | | --- | 5 | --- | nC |

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width \leq 300us , duty cycle \leq 2%
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=25V, V_{GS}=10V,L=0.1mH,I_{AS}=35A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.



Typical Characteristics



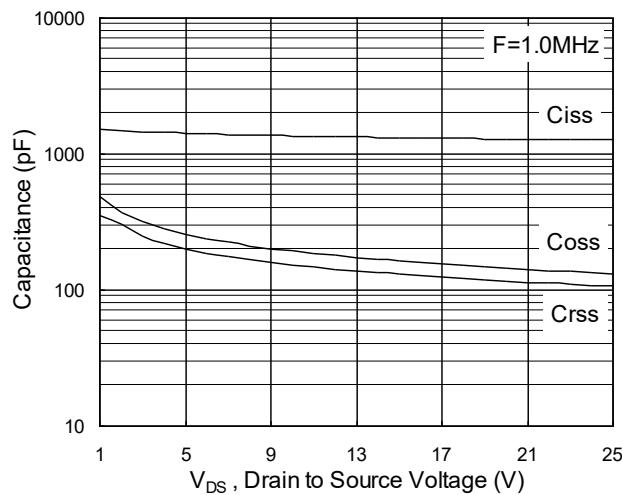


Fig.7 Capacitance

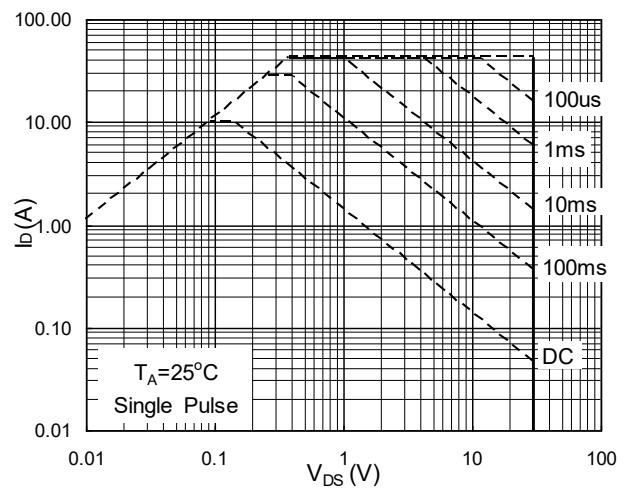


Fig.8 Safe Operating Area

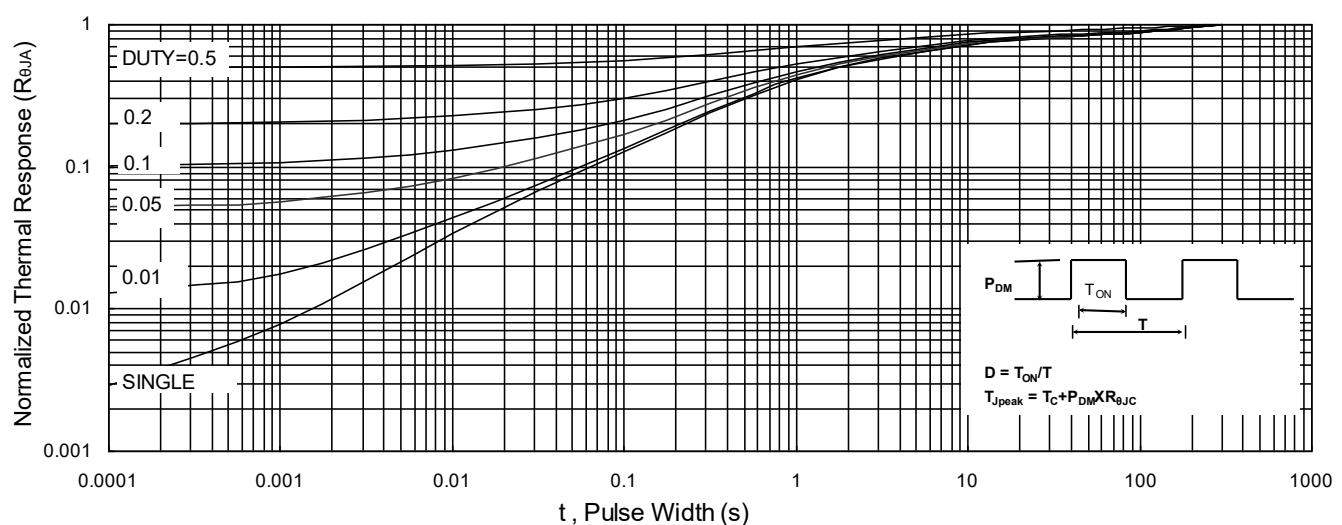


Fig.9 Normalized Maximum Transient Thermal Impedance

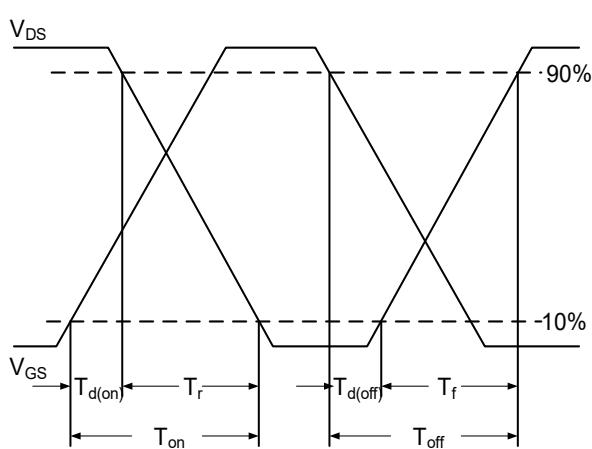


Fig.10 Switching Time Waveform

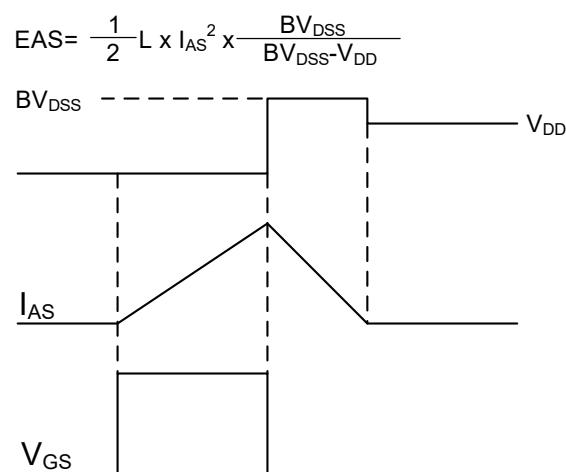
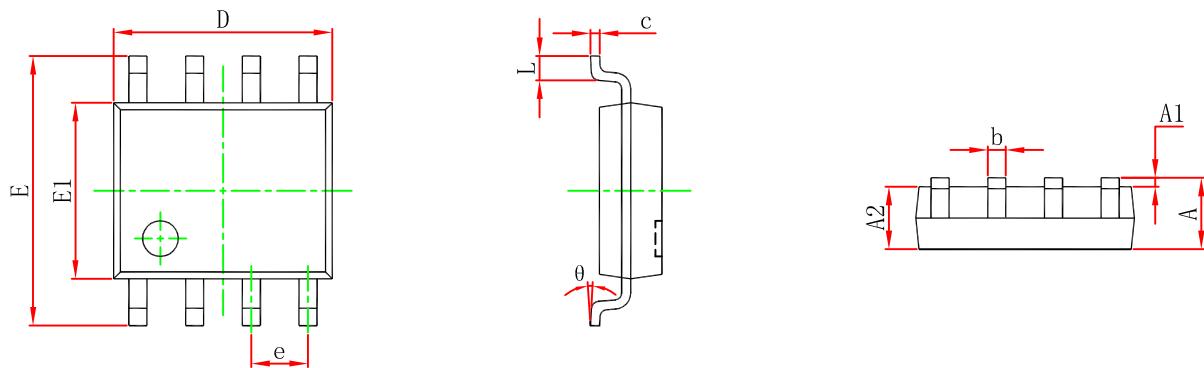


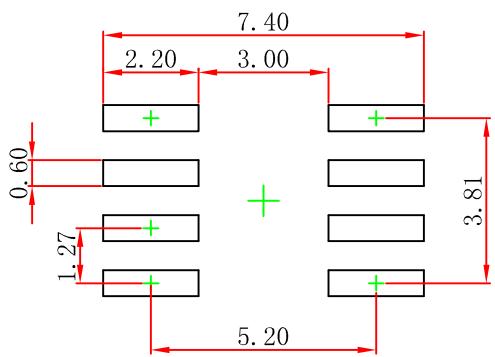
Fig.11 Unclamped Inductive Switching Waveform



SOP-8 Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.350 | 1.750 | 0.053 | 0.069 |
| A1 | 0.100 | 0.250 | 0.004 | 0.010 |
| A2 | 1.350 | 1.550 | 0.053 | 0.061 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| c | 0.170 | 0.250 | 0.007 | 0.010 |
| D | 4.800 | 5.000 | 0.189 | 0.197 |
| e | 1.270 (BSC) | | 0.050 (BSC) | |
| E | 5.800 | 6.200 | 0.228 | 0.244 |
| E1 | 3.800 | 4.000 | 0.150 | 0.157 |
| L | 0.400 | 1.270 | 0.016 | 0.050 |
| θ | 0° | 8° | 0° | 8° |



Note:
1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.



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