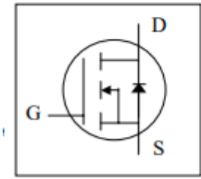


100V N-Channel Enhancement Mode MOSFET

Description

The IRLR3410TRPBF-ML uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

It is ESD protected.



General Features

$V_{DS} = 100V, I_D = 15A$

$R_{DS(ON)} < 93m\Omega @ V_{GS} = 10V$

Application

Power switch

DC/DC converters



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

| Symbol | Parameter | Rating | Units |
|---------------------------|--|------------|--------------|
| V_{DS} | Drain-Source Voltage | 100 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| $I_D @ T_C = 25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 15 | A |
| $I_D @ T_C = 100^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 7.7 | A |
| $I_D @ T_A = 25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 3 | A |
| $I_D @ T_A = 70^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 2.4 | A |
| I_{DM} | Pulsed Drain Current ² | 24 | A |
| EAS | Single Pulse Avalanche Energy ³ | 6.1 | mJ |
| I_{AS} | Avalanche Current | 11 | A |
| $P_D @ T_C = 25^\circ C$ | Total Power Dissipation ³ | 34.7 | W |
| $P_D @ T_A = 25^\circ C$ | Total Power Dissipation ³ | 2 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ C$ |
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient ¹ | 62 | $^\circ C/W$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case ¹ | 3.6 | $^\circ C/W$ |

100V N-Channel Enhancement Mode MOSFET

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 | 100 | --- | --- | V |
| ∂BV _{DSS} /∂T _J | BVDSS Temperature Coefficient | Reference to 25°C, I _D =1mA | --- | 0.098 | --- | V/°C |
| R _{DS(on)} | Static Drain-Source On-Resistance ² | V _{GS} =10V, I _D =10A | --- | 93 | 110 | mΩ |
| | | V _{GS} =4.5V, I _D =8A | --- | 97 | 120 | mΩ |
| V _{GS(th)} | Gate Threshold Voltage | | 1.0 | --- | 2.5 | V |
| | | V _{GS} =V _{DS} , I _D =250uA | | | | |
| ∂V _{GS(th)} | V _{GS(th)} Temperature Coefficient | | --- | -4.57 | --- | mV/°C |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =80V, V _{GS} =0V, T _J =25°C | --- | --- | 1 | uA |
| | | V _{DS} =80V, 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 | --- | 13 | --- | S |
| R _g | Gate Resistance | V _{DS} =0V, V _{GS} =0V, f=1MHz | --- | 2 | --- | Ω |
| Q _g | Total Gate Charge (10V) | | --- | 26.2 | --- | nC |
| Q _{gs} | Gate-Source Charge | V _{DS} =80V, V _{GS} =10V, I _D =10A | --- | 4.6 | --- | |
| Q _{gd} | Gate-Drain Charge | | --- | 5.1 | --- | |
| T _{d(on)} | Turn-On Delay Time | | --- | 4.2 | --- | ns |
| T _r | Rise Time | V _{DD} =50V, V _{GS} =10V, R _G =3.3 | --- | 8.2 | --- | |
| T _{d(off)} | Turn-Off Delay Time | I _D =10A | --- | 35.6 | --- | |
| T _f | Fall Time | | --- | 9.6 | --- | |
| C _{iss} | Input Capacitance | | --- | 1535 | --- | pF |
| C _{oss} | Output Capacitance | V _{DS} =15V, V _{GS} =0V, f=1MHz | --- | 60 | --- | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 37 | --- | |
| I _S | Continuous Source Current ^{1,5} | | --- | --- | 12 | A |
| I _{SM} | Pulsed Source Current ^{2,5} | V _G =V _D =0V, Force Current | --- | --- | 24 | 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 | | --- | 37 | --- | nS |
| Q _{rr} | Reverse Recovery Charge | I _F =10A, di/dt=100A/μs, T _J =25°C | --- | 27.3 | --- | 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 ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=11A
- 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

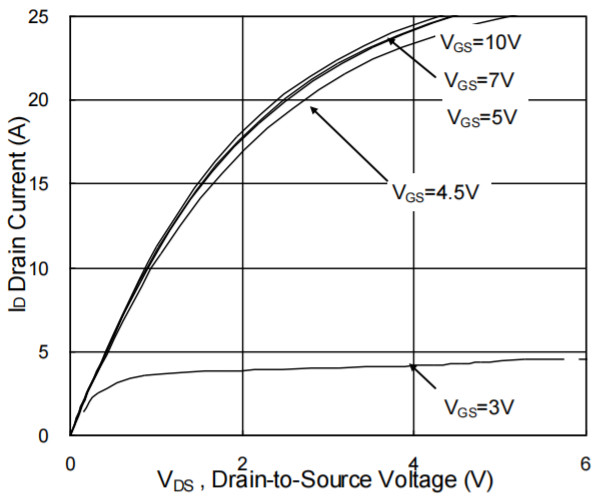


Fig.1 Typical Output Characteristics

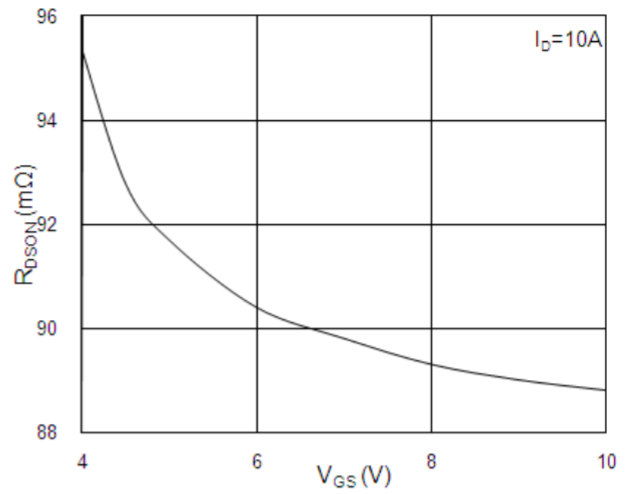


Fig.2 On-Resistance vs. Gate-Source

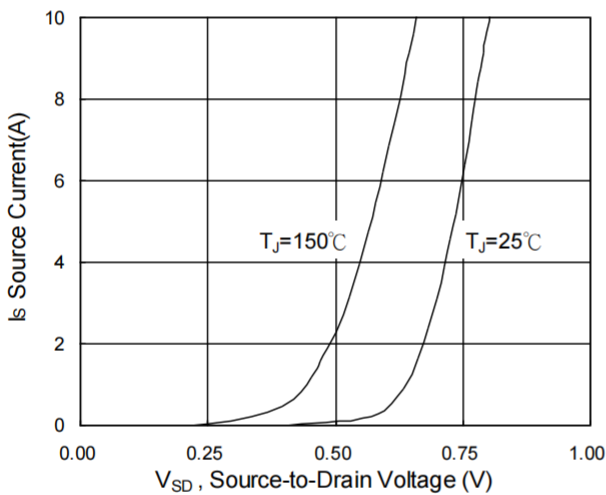


Fig.3 Forward Characteristics Of Reverse

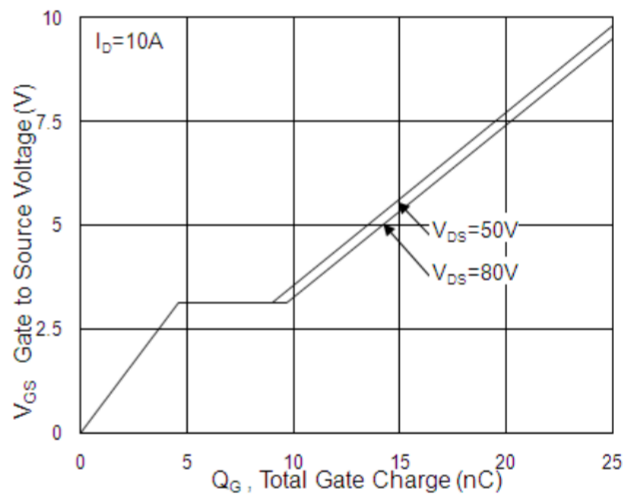


Fig.4 Gate-Charge Characteristics

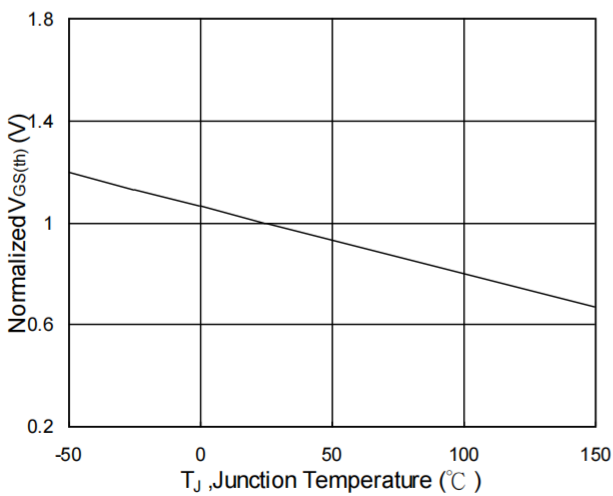


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

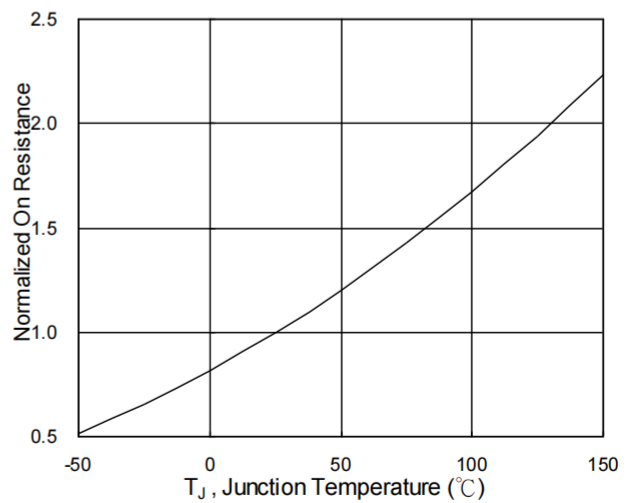


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

100V N-Channel Enhancement Mode MOSFET

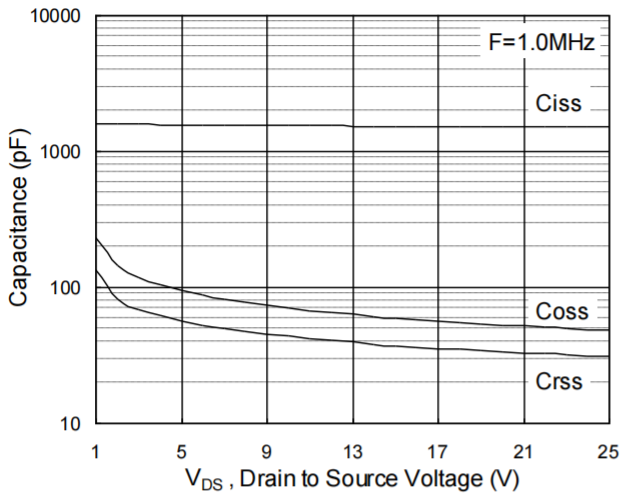


Fig.7 Capacitance

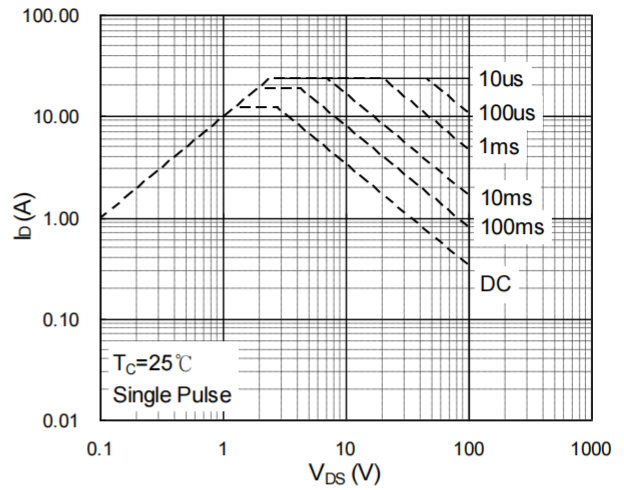


Fig.8 Safe Operating Area

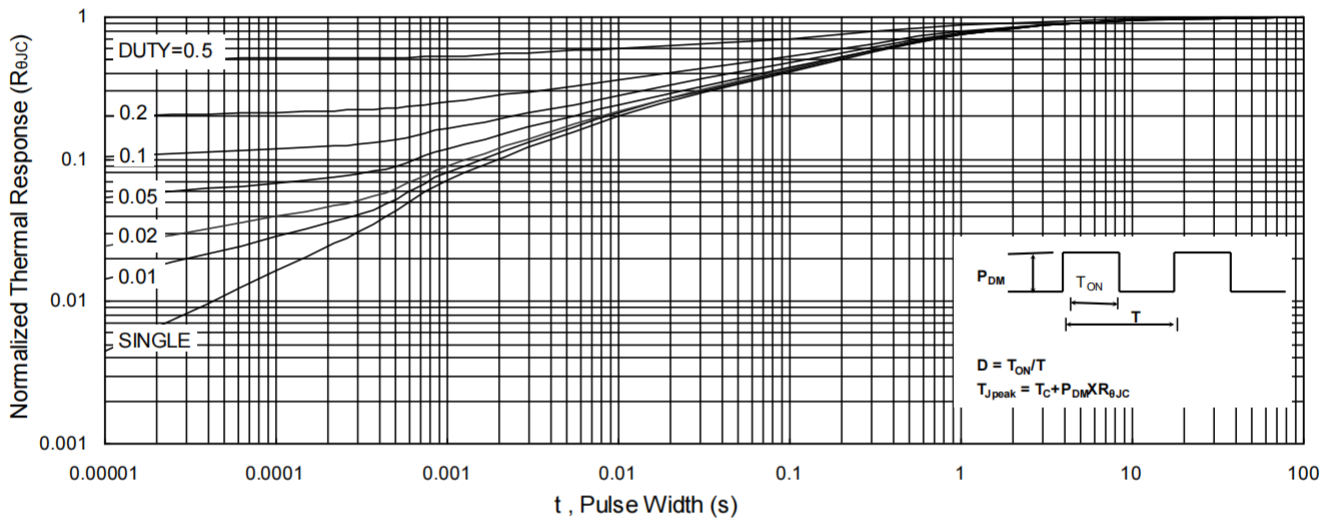


Fig.9 Normalized Maximum Transient Thermal Impedance

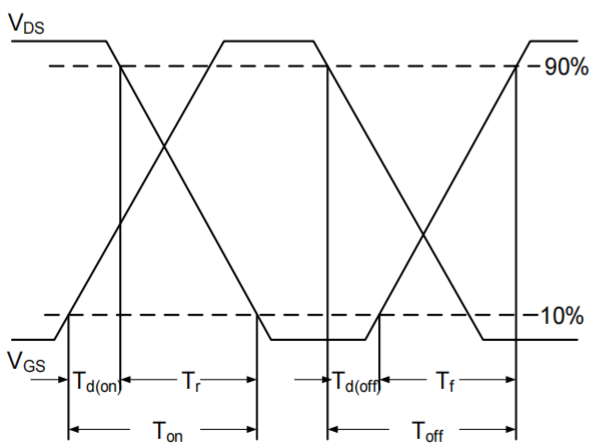


Fig.10 Switching Time Waveform

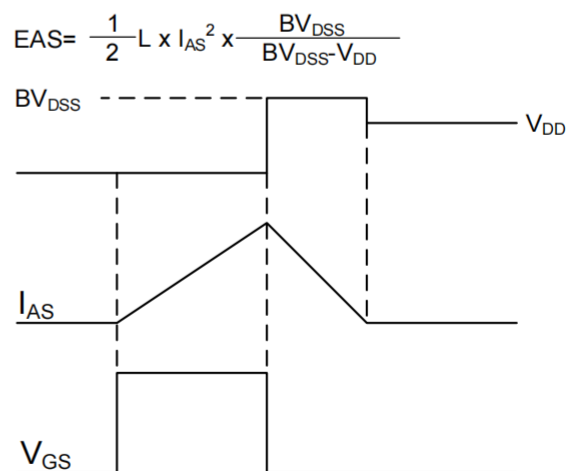
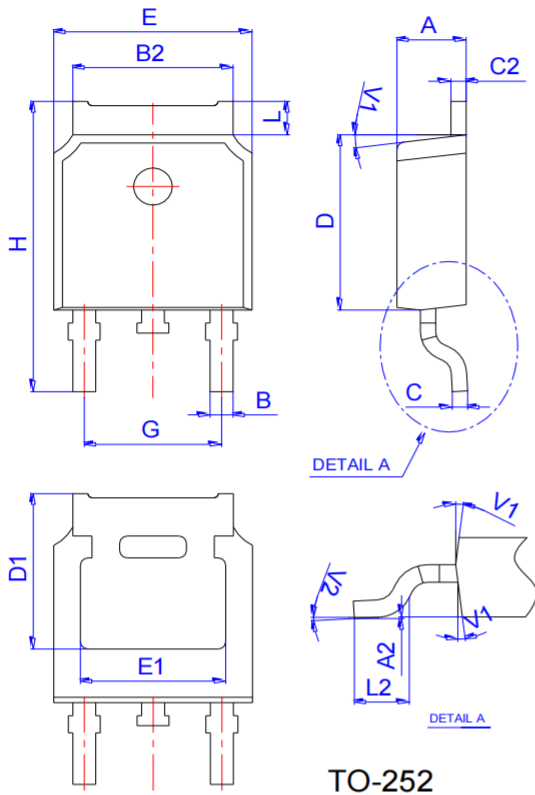


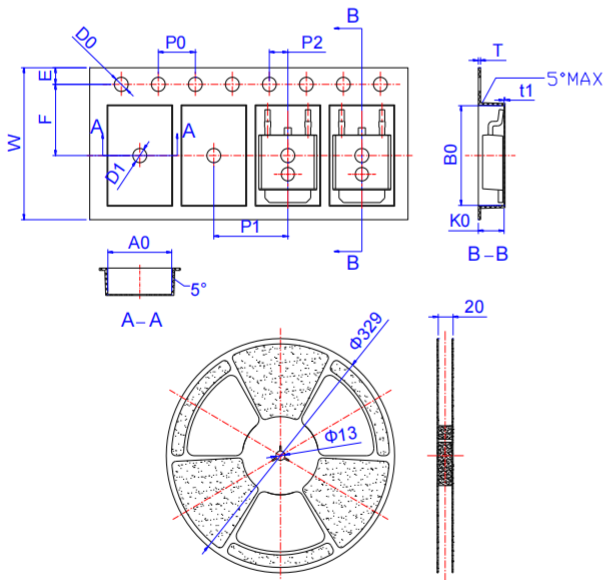
Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data



| Ref. | Dimensions | | | | | |
|------|-------------|------|-------|----------|------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.10 | | 2.50 | 0.083 | | 0.098 |
| A2 | 0 | | 0.10 | 0 | | 0.004 |
| B | 0.66 | | 0.86 | 0.026 | | 0.034 |
| B2 | 5.18 | | 5.48 | 0.202 | | 0.216 |
| C | 0.40 | | 0.60 | 0.016 | | 0.024 |
| C2 | 0.44 | | 0.58 | 0.017 | | 0.023 |
| D | 5.90 | | 6.30 | 0.232 | | 0.248 |
| D1 | 5.30REF | | | 0.209REF | | |
| E | 6.40 | | 6.80 | 0.252 | | 0.268 |
| E1 | 4.63 | | | 0.182 | | |
| G | 4.47 | | 4.67 | 0.176 | | 0.184 |
| H | 9.50 | | 10.70 | 0.374 | | 0.421 |
| L | 1.09 | | 1.21 | 0.043 | | 0.048 |
| L2 | 1.35 | | 1.65 | 0.053 | | 0.065 |
| V1 | | 7° | | | 7° | |
| V2 | | 0° | 6° | 0° | | 6° |

Reel Specification-TO-252



| Ref. | Dimensions | | | | | |
|------|-------------|-------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| W | 15.90 | 16.00 | 16.10 | 0.626 | 0.630 | 0.634 |
| E | 1.65 | 1.75 | 1.85 | 0.065 | 0.069 | 0.073 |
| F | 7.40 | 7.50 | 7.60 | 0.291 | 0.295 | 0.299 |
| D0 | 1.40 | 1.50 | 1.60 | 0.055 | 0.059 | 0.063 |
| D1 | 1.40 | 1.50 | 1.60 | 0.055 | 0.059 | 0.063 |
| P0 | 3.90 | 4.00 | 4.10 | 0.154 | 0.157 | 0.161 |
| P1 | 7.90 | 8.00 | 8.10 | 0.311 | 0.315 | 0.319 |
| P2 | 1.90 | 2.00 | 2.10 | 0.075 | 0.079 | 0.083 |
| A0 | 6.85 | 6.90 | 7.00 | 0.270 | 0.271 | 0.276 |
| B0 | 10.45 | 10.50 | 10.60 | 0.411 | 0.413 | 0.417 |
| K0 | 2.68 | 2.78 | 2.88 | 0.105 | 0.109 | 0.113 |
| T | 0.24 | | 0.27 | 0.009 | | 0.011 |
| t1 | 0.10 | | | 0.004 | | |
| 10P0 | 39.80 | 40.00 | 40.20 | 1.567 | 1.575 | 1.583 |

Disclaimer

The information presented in this document is for reference only. MOSLEADER reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), MOSLEADER or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.