Description

The IRLR3410TRPBF uses advanced trench technology

and design to provide excellent $R_{DS(ON)}$ with low gat

e charge. It can be used in a wide variety of

applications.

TO252-2L

General Features

V_{DS} =100V, I_D =15A
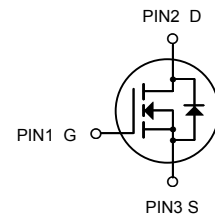
$R_{DS(ON)}$ <112mΩ @ V_{GS}=10V

Application

Power switch

DC/DC converters

PIN2 D

PIN1 G

PIN3 S

N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
IRLR3410TRPBF	TO252-2L	15N10D XXX YYYY	2500

Absolute Maximum Ratings (T_C=25℃ 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℃	Continuous Drain Current, V_{GS} @ 10V[1]	15	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	7.7	A
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	3	A
I_D@T_A=70℃	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℃	Total Power Dissipation[3]	34.7	W
P_D@T_A=25℃	Total Power Dissipation[3]	2	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	3.6	℃/W

Electrical Characteristics (T$_J$=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V , I$_D$=250uA	100	---	---	V
ΔBV$_{DSS}$/ΔT$_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I$_D$=1mA	---	0.098	---	V/℃
R$_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V$_{GS}$=10V , I$_D$=10A	---	100	112	mΩ
		V$_{GS}$=4.5V , I$_D$=8A	---	117	130	mΩ
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$ =250uA	1.0	---	2.5	V
ΔV$_{GS(th)}$	V$_{GS(th)}$ Temperature Coefficient		---	-4.57	---	mV/℃
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=80V , V$_{GS}$=0V , T$_J$=25℃	---	---	1	uA
		V$_{DS}$=80V , V$_{GS}$=0V , T$_J$=55℃	---	---	5	
I$_{GSS}$	Gate-Source Leakage Current	V$_{GS}$=±20V , V$_{DS}$=0V	---	---	±100	nA
gfs	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)	V$_{DS}$=80V , V$_{GS}$=10V , I$_D$=10A	---	26.2	---	nC
Q$_{gs}$	Gate-Source Charge		---	4.6	---	
Q$_{gd}$	Gate-Drain Charge		---	5.1	---	
T$_{d(on)}$	Turn-On Delay Time	V$_{DD}$=50V , V$_{GS}$=10V , R$_G$=3.3 I$_D$=10A	---	4.2	---	ns
T$_r$	Rise Time		---	8.2	---	
T$_{d(off)}$	Turn-Off Delay Time		---	35.6	---	
T$_f$	Fall Time		---	9.6	---	
C$_{iss}$	Input Capacitance	V$_{DS}$=15V , V$_{GS}$=0V , f=1MHz	---	1535	---	pF
C$_{oss}$	Output Capacitance		---	60	---	
C$_{rss}$	Reverse Transfer Capacitance		---	37	---	
I$_s$	Continuous Source Current[1,5]	V$_G$=V$_D$=0V , Force Current	---	---	12	A
I$_{SM}$	Pulsed Source Current[2,5]		---	---	24	A
V$_{SD}$	Diode Forward Voltage[2]	V$_{GS}$=0V , I$_s$=1A , T$_J$=25℃	---	---	1.2	V
t$_{rr}$	Reverse Recovery Time	I$_F$=10A , dI/dt=100A/μs , T$_J$=25℃	---	37	---	nS
Q$_{rr}$	Reverse Recovery Charge		---	27.3	---	nC

Note :

1.The data tested by surface mounted on a 1 inch^2 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℃ 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.
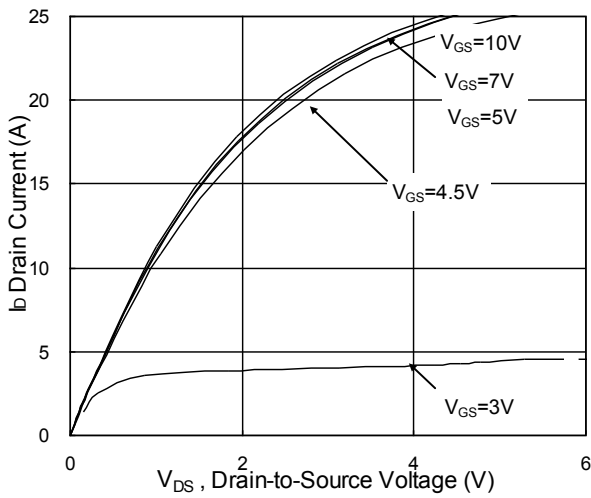
Typical Characteristics
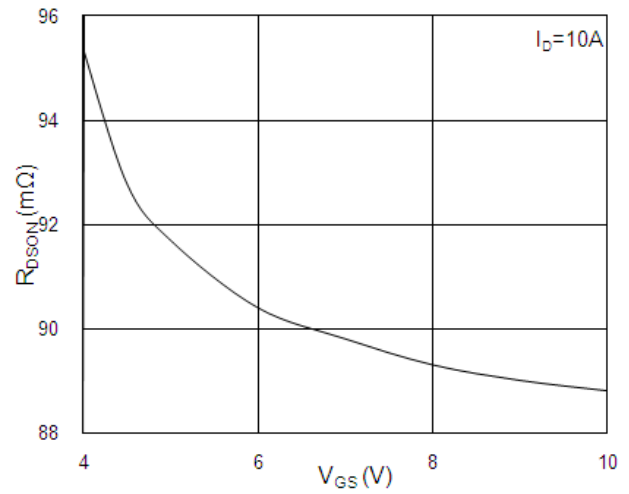

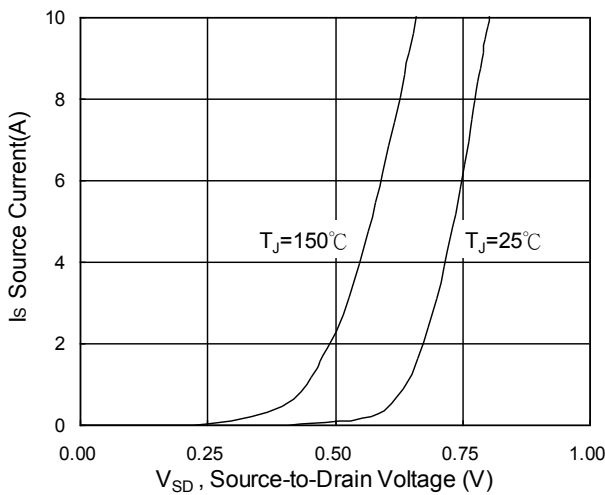**Fig.1 Typical Output Characteristics**

Fig.2 On-Resistance vs. Gate-Source

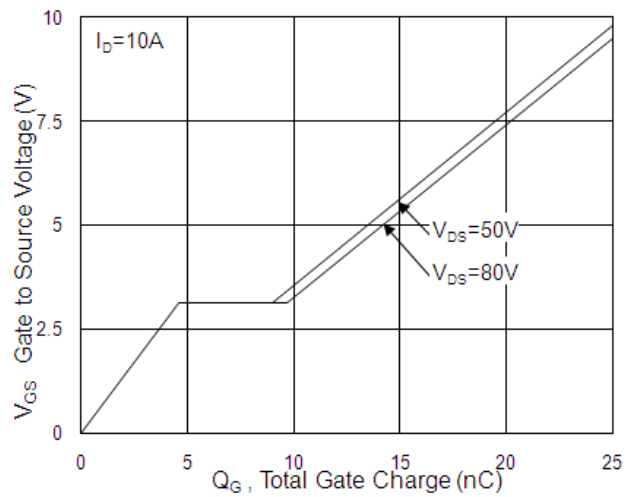**Fig.3 Forward Characteristics Of Reverse**

Fig.4 Gate-Charge Characteristics
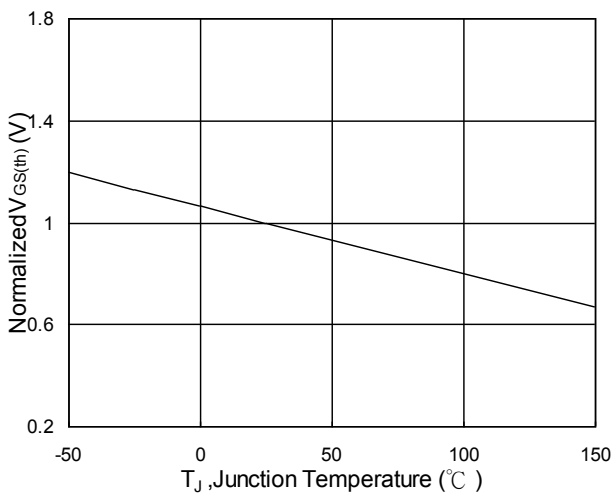
Fig.5 Normalized $V_{GS(th)}$ vs. T_J
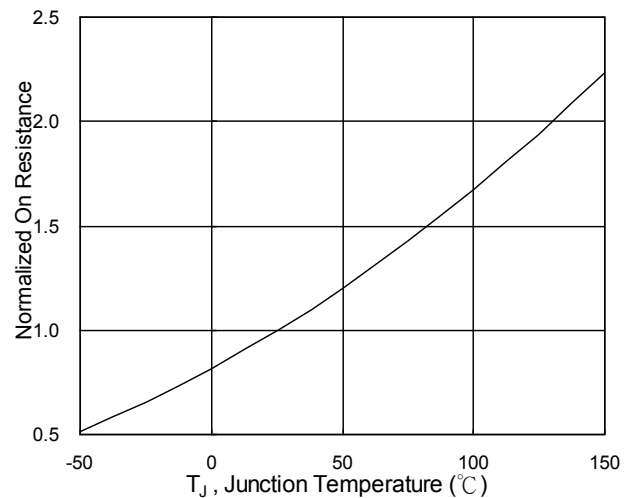
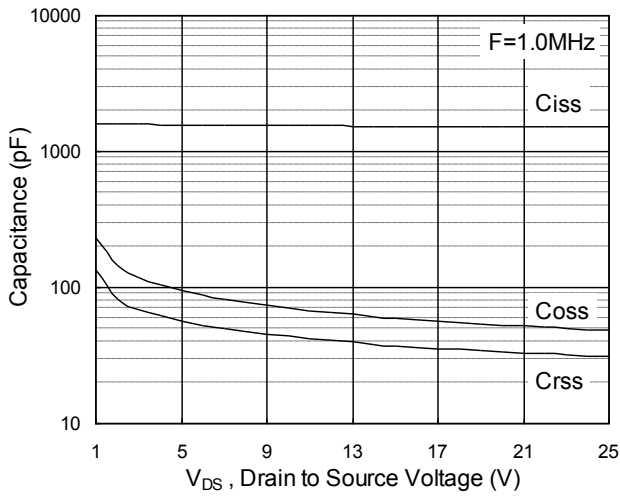**Fig.6 Normalized R_{DSON} vs. T_J**

Fig.7 Capacitance
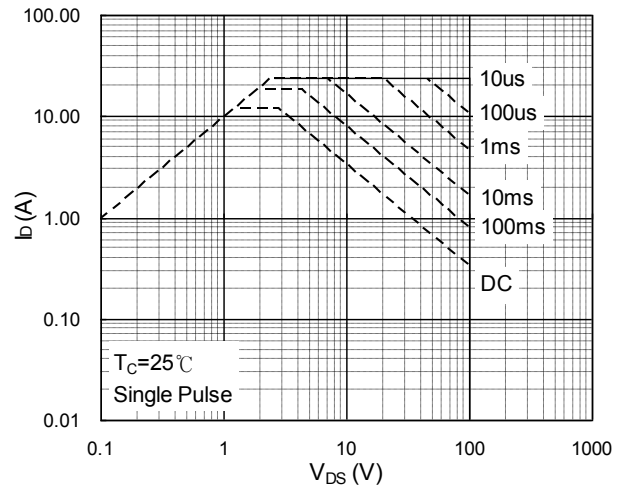
Fig.8 Safe Operating Area
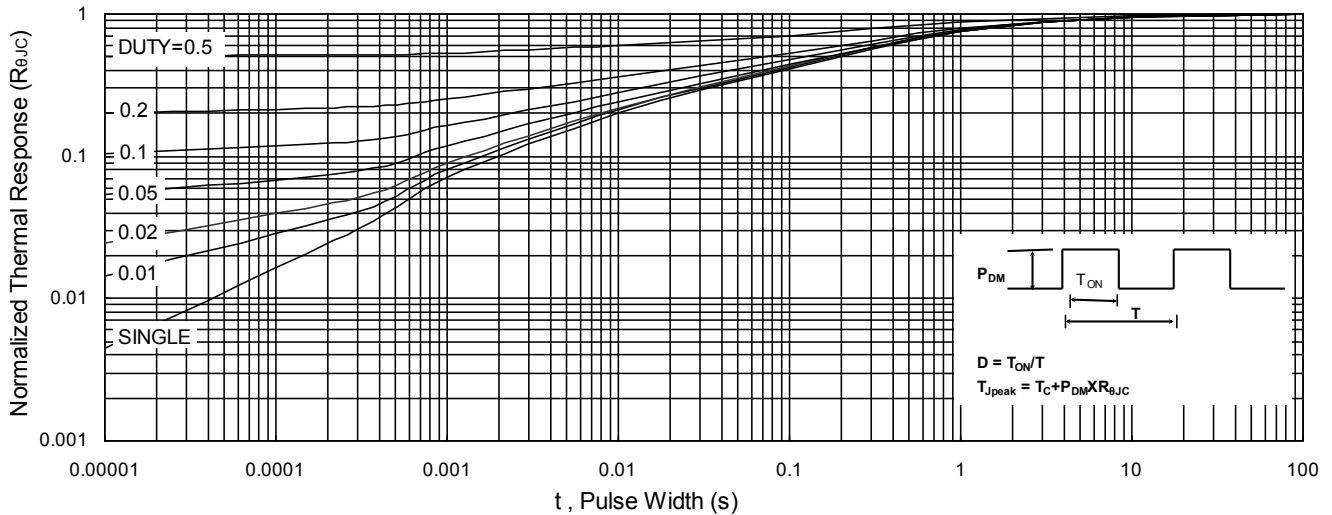
Fig.9 Normalized Maximum Transient Thermal Impedance

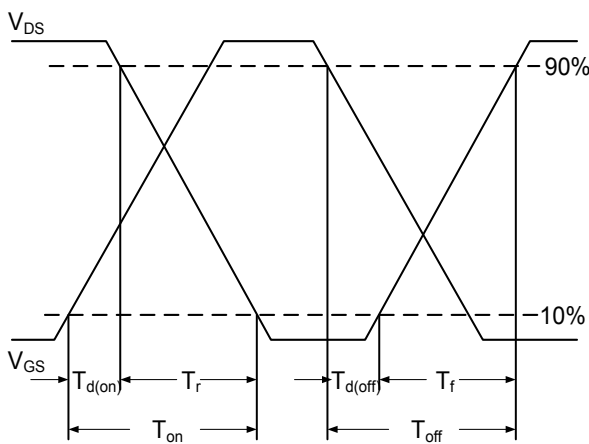$$EAS= \frac{1}{2}L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$
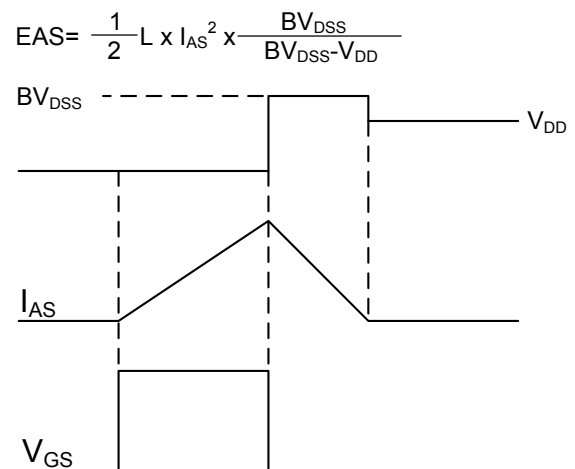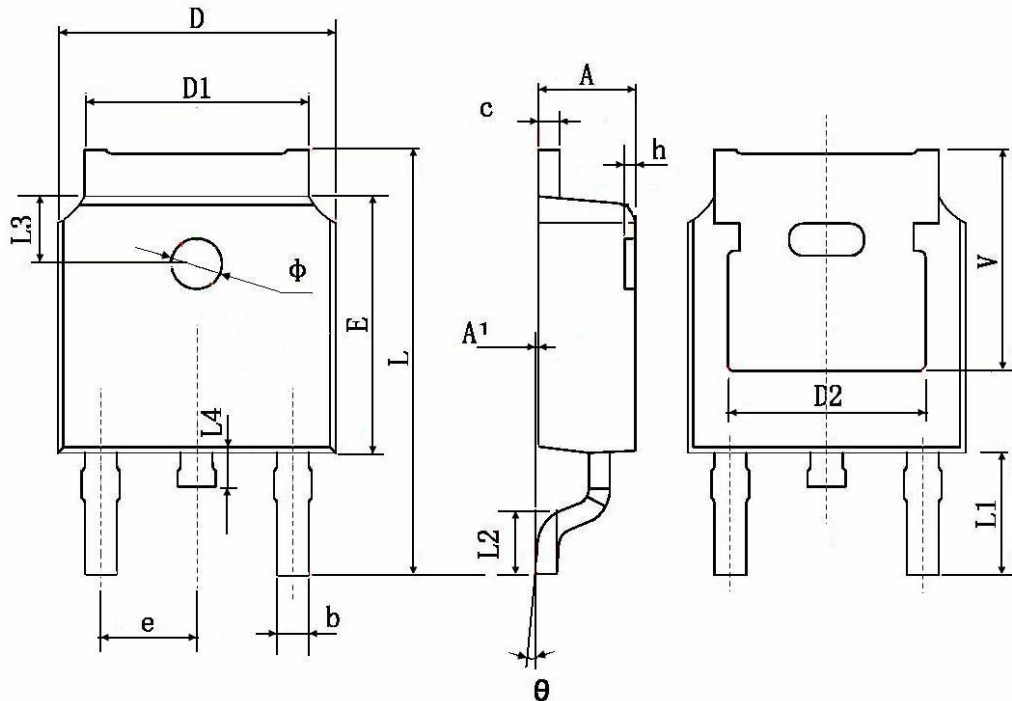
Fig.10 Switching Time Waveform

Fig.11 Unclamped Inductive Switching Waveform

TO252-2L 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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