

Description

The IRFL4310TRPBF is the new generation trench N-channel

MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications

Features

- High - speed switching
- Excellent gate charge x $R_{DS(ON)}$ product (FOM)
- for extremely low $R_{DS(ON)}$
- Lead-Free, Halogen-Free; RoHS Compliant

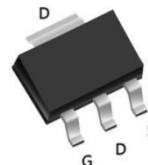
Applications

- Networking
- Load Switch
- Industrial DC/DC Conversion Circuits
- Battery Protection

V_{DS}	100V
I_D	4A
$R_{DS(ON) Typ}$	208m Ω @ $V_{GS}=10V$

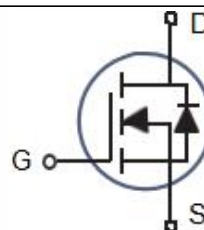
Outline

SOT-223 Pin Configuration



Equivalent

- (1) Gate
(2) Source
(3) Drain



Packaging specifications

Part No.	Package	Marking	Basic ordering unit.(pcs)
IRFL4310TRPBF	SOT-223		2500

Absolute Maximum Ratings

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous ^(Note2)	$T_C=25^\circ C$	I_D	4	A
	$T_C=70^\circ C$		3.2	A
-Pulsed ^(Note 1- Note 2)		I_{DM}	16	A
Maximum Power Dissipation	$T_C=25^\circ C$	P_D	8.3	W
	$T_C=70^\circ C$		5.2	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Resistance Junction-Ambient		$R_{\theta JA}$	65	$^\circ C / W$
Thermal Resistance Junction-Case		$R_{\theta JC}$	15	$^\circ C / W$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V , I _D =250uA	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V , V _{GS} =0V			1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V , V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250uA	1.0	1.5	2.2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V , I _D =3A		208	255	mΩ
		V _{GS} =4.5V , I _D =2A		255	290	mΩ
Forward Transconductance	g _{FS}	V _{DS} =10V , I _D =1A		4.6		S
DYNAMIC CHARACTERISTICS Note4						
Input Capacitance	C _{ISS}	V _{DS} =50V , V _{GS} =0 V , f =1.0MHz		380		pF
Output Capacitance	C _{OSS}			17		pF
Reverse Transfer Capacitance	C _{RSS}			15		pF
Gate resistance	R _g	V _{GS} =0V,V _{DS} =0V, f=1MHz		14.5		Ω
Total Gate Charge	Q _g	V _{DS} =50V , I _D =1A , V _{GS} =10V		5.8		nC
Gate-Source Charge	Q _{gs}			1.4		nC
Gate-Drain Charge	Q _{gd}			1.8		nC
SWITCHING CHARACTERISTICS Note4						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =30V , I _D =1A , V _{GS} =10V , R _{GEN} =6 Ω		14		ns
Rise Time	t _r			53		ns
Turn-Off Delay Time	t _{D(OFF)}			19		ns
Fall Time	t _f			11.8		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =3A		0.7	1.0	V

Notes:

- 1、Pulse Test Width < 300us,Duty Cycle< 2%
- 2、Drain current limited by maximum junction temperature.
- 3、Guaranteed by design,not subject to production testing.

Typical Performance Characteristics

Fig.1 Continuous Drain Current vs. TC

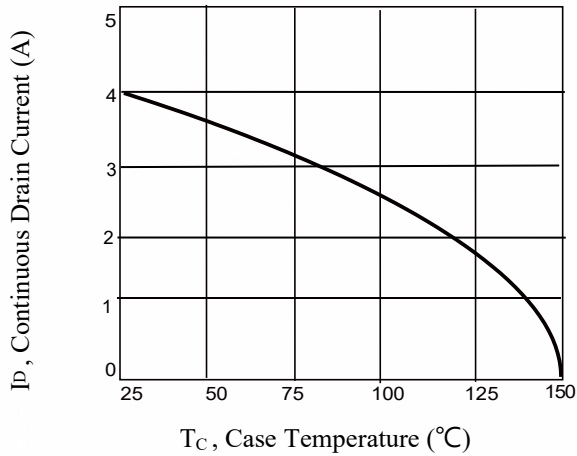


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

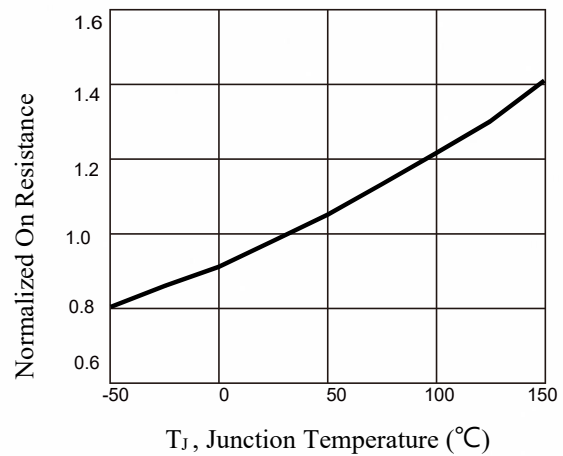


Fig.3 Normalized V_{th} vs. T_J

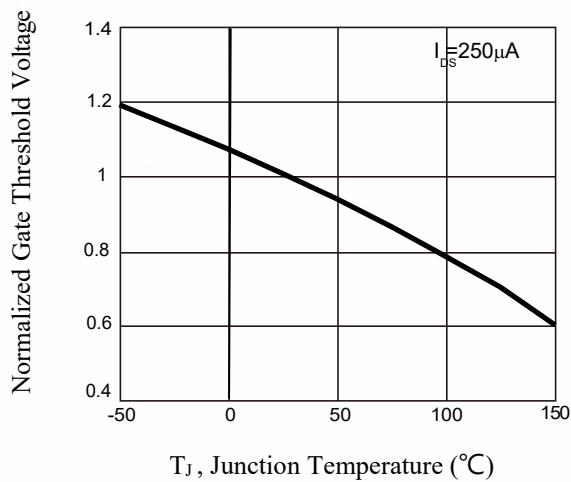


Fig.4 Gate Charge Waveform

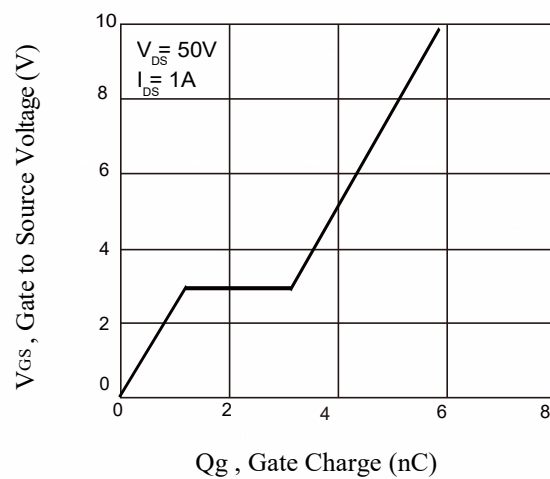


Fig.5 Typical Output Characteristics

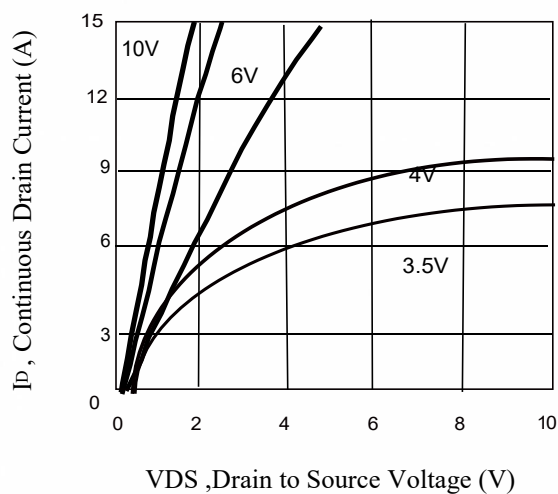


Fig.6 Turn-On Resistance vs. I_D

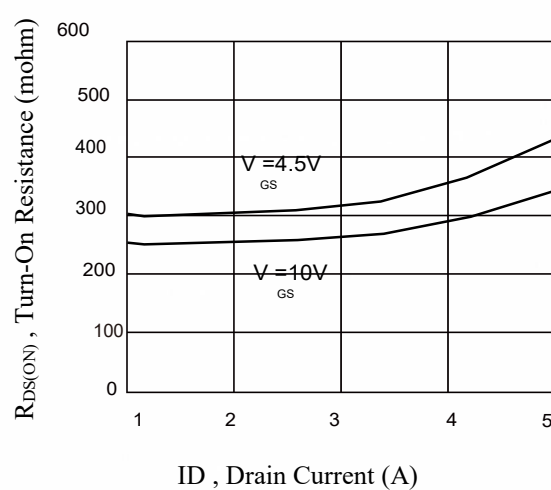


Fig.7 Capacitance

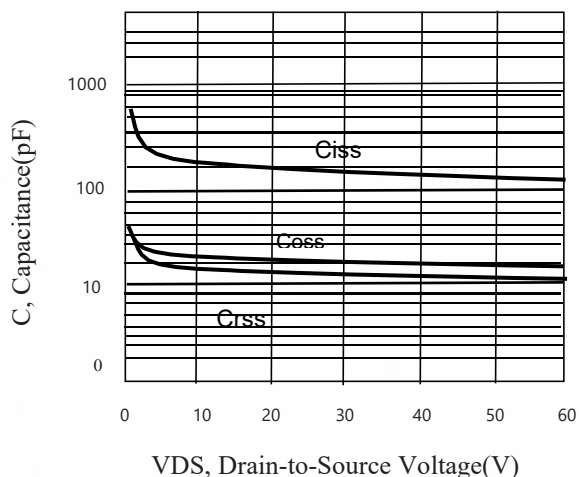


Fig.8 Typical Source-Drain Diode Forward Voltage

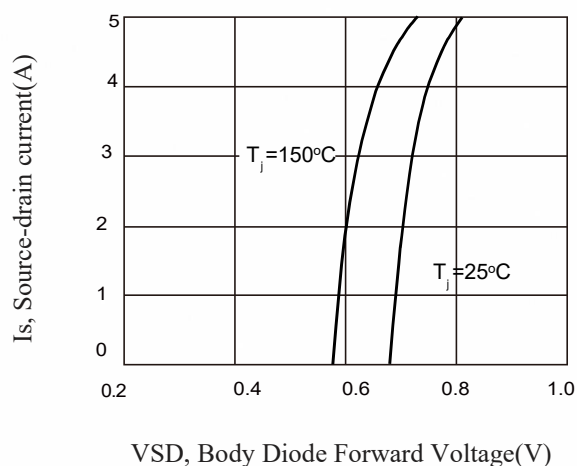


Fig.9 Normalized Transient Impedance

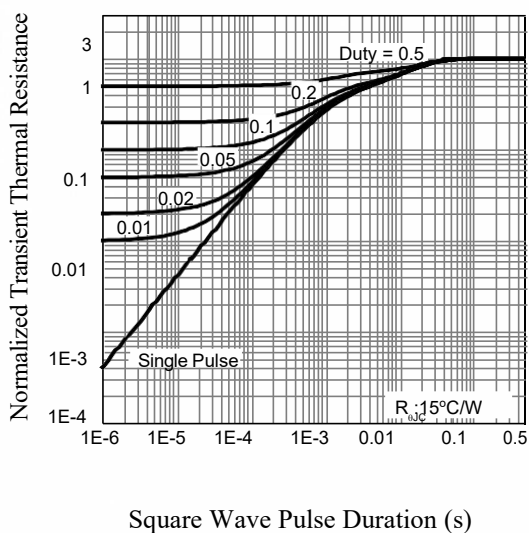


Fig.10 Maximum Safe Operation Area

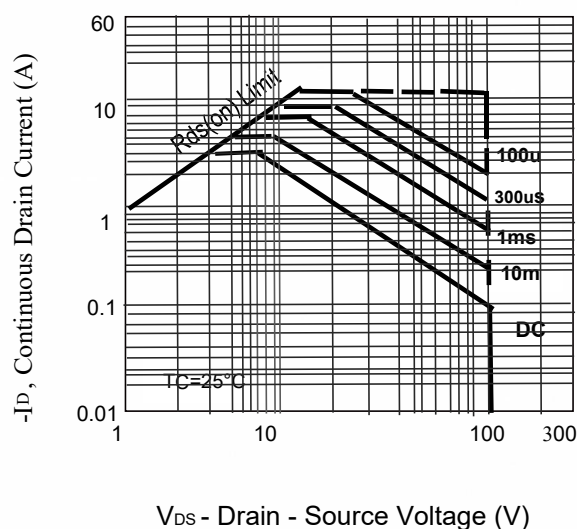


Figure11a. Switching Test Circuit

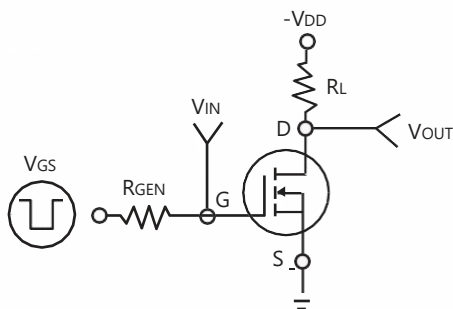
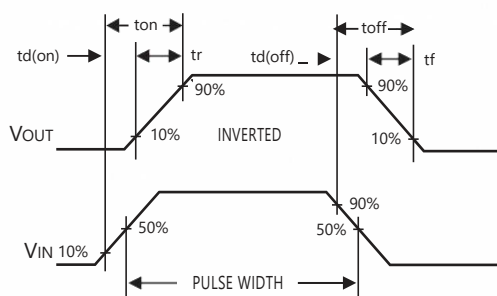
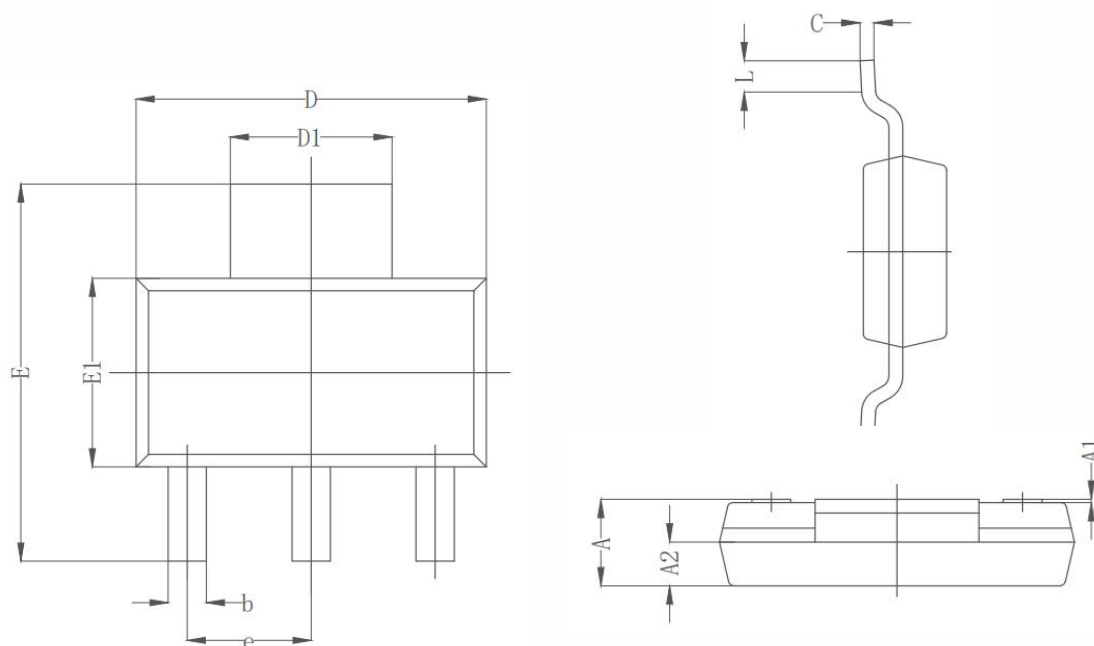


Figure11b. Switching Waveforms



SOT-223 Package Information



COMMON DIMENSION(MM)

PKG		SOT-223	
SYMBOL	MIN	TYP	MAX
A	1.520	1.580	1.720
A1	0.010	0.060	0.150
A2	0.770	0.800	0.830
b	0.660	0.710	0.800
c	0.250	0.280	0.350
D	6.500	6.600	6.750
D1	2.900	3.000	3.100
E	6.700	7.000	7.300
E1	3.300	3.500	3.700
L		0.750 REF	
e	2.275	2.300	2.325
Q	0°	4°	10°

NOTICE

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