

Description

The IRFL4105TRPBF is the new generation trench N-ch 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

- Low Gate Charge
- Fast Switching Speed
- for extremely low $R_{DS(ON)}$
- Lead-Free, Halogen-Free; RoHS Compliant

Applications

- Power-management functions
- Industrial DC/DC Conversion Circuits
- Back lighting

Packaging specifications

Part No.	Package	Marking	Basic ordering unit.(pcs)
IRFL4105TRPBF	SOT-223		2500

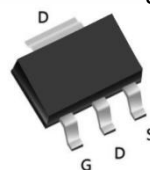
Absolute Maximum Ratings

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous ^(Note2)	$T_C=25^\circ\text{C}$	I_D	10	A
	$T_C=70^\circ\text{C}$		8	A
-Pulsed ^(Note 1· Note 2)		I_{DM}	40	A
Maximum Power Dissipation	$T_C=25^\circ\text{C}$	P_D	2.6	W
	$T_C=70^\circ\text{C}$		1.7	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Thermal Resistance Junction-Ambient		$R_{\theta JA}$	48	$^\circ\text{C/W}$
Thermal Resistance Junction-Case		$R_{\theta JC}$	8	$^\circ\text{C/W}$

V_{DSS}	60V
I_D	10A
$R_{DS(ON) Typ}$	$38\text{m}\Omega @ V_{GS}=10\text{V}$
$R_{DS(ON) Typ}$	$48\text{m}\Omega @ V_{GS}=10\text{V}$

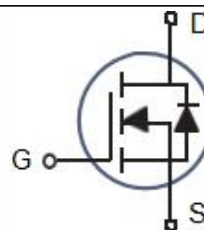
Outline

SOT-223 Pin Configuration



Equivalent

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



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	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V , 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 =5A		38	48	mΩ
		V _{GS} =4.5V , I _D =4A		48	60	mΩ
Forward Transconductance	g _{FS}	V _{DS} =10V , I _D =1A		9.6		S
DYNAMIC CHARACTERISTICS Note4						
Input Capacitance	C _{ISS}	V _{DS} =30V , V _{GS} =0 V , f =1.0MHz		730		pF
Output Capacitance	C _{OSS}			45		pF
Reverse Transfer Capacitance	C _{RSS}			37		pF
Gate resistance	R _g	V _{GS} =0V,V _{DS} =0V, f=1MHz		2.1		Ω
Total Gate Charge	Q _g	V _{DS} =30V , I _D =1A , V _{GS} =10V		17.5		nC
Gate-Source Charge	Q _{gs}			2.2		nC
Gate-Drain Charge	Q _{gd}			3.8		nC
SWITCHING CHARACTERISTICS Note4						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =30V , I _D =1A , V _{GS} =10V , R _{GEN} =6 Ω		6.5		ns
Rise Time	t _r			7.3		ns
Turn-Off Delay Time	t _{D(OFF)}			38		ns
Fall Time	t _f			12.8		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =3A			1.2	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

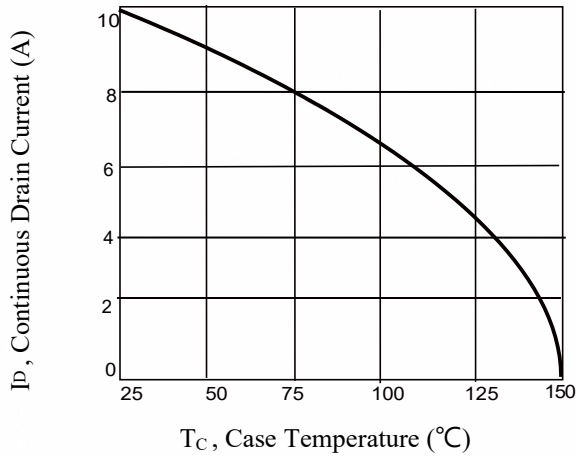


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

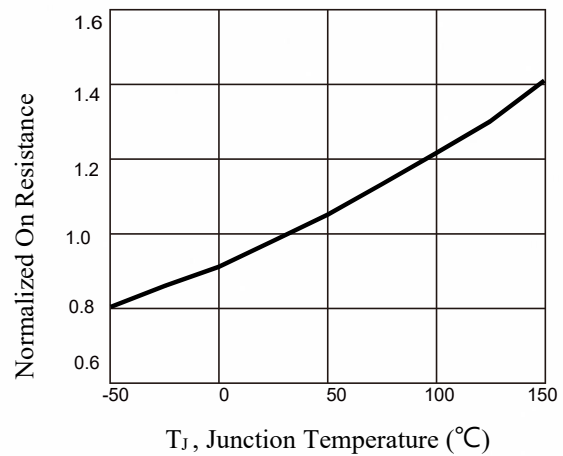


Fig.3 Normalized V_{th} vs. T_J

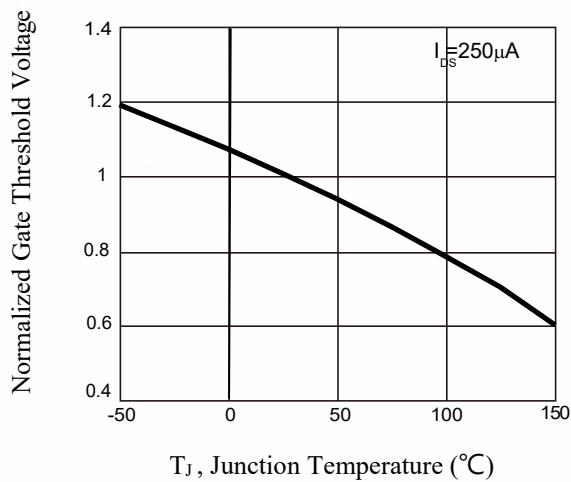


Fig.4 Gate Charge Waveform

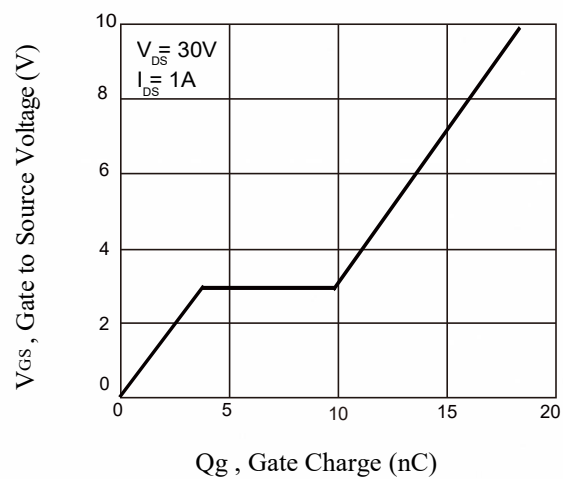


Fig.5 Typical Output Characteristics

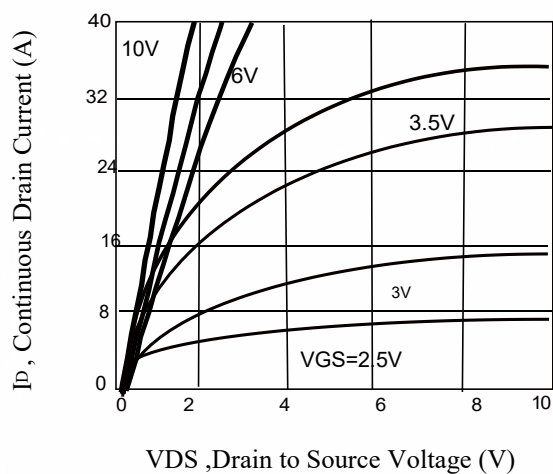


Fig.6 Turn-On Resistance vs. I_D

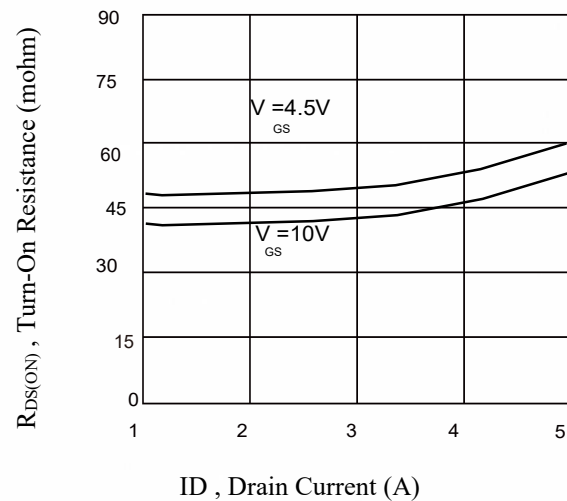


Fig.7 Capacitance

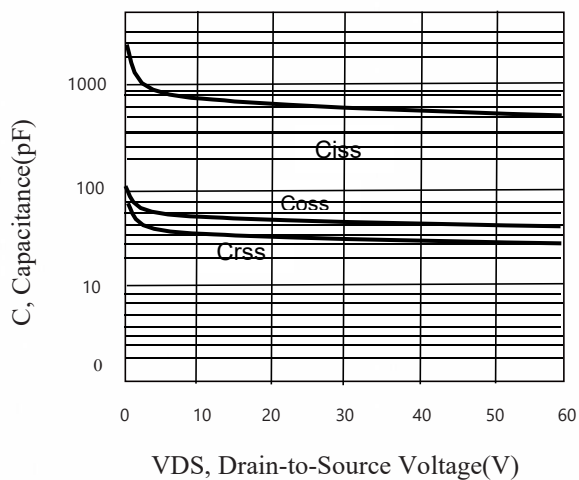


Fig.8 Typical Source-Drain Diode Forward Voltage

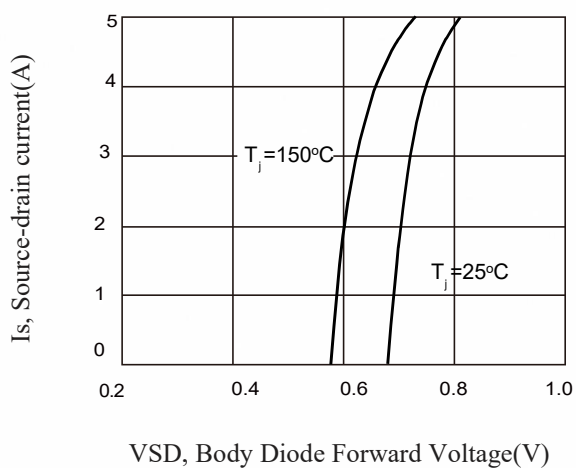


Fig.9 Normalized Transient Impedance

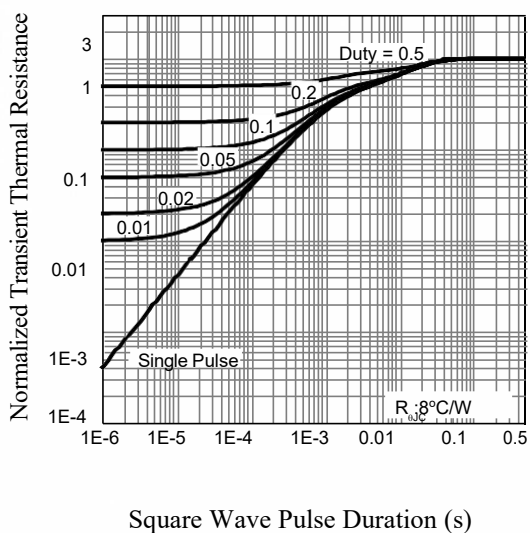


Fig.10 Maximum Safe Operation Area

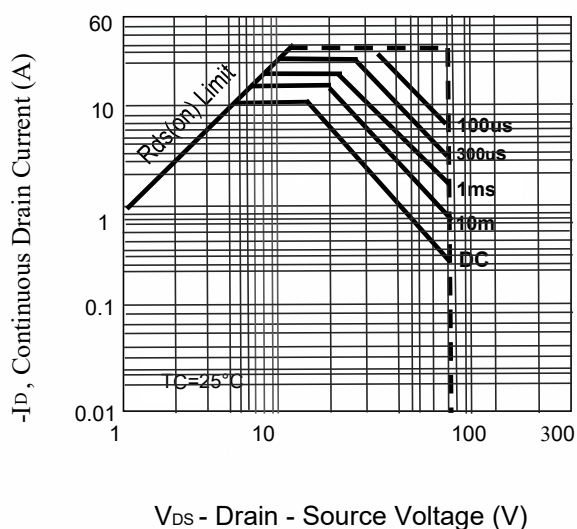


Figure11a. Switching Test Circuit

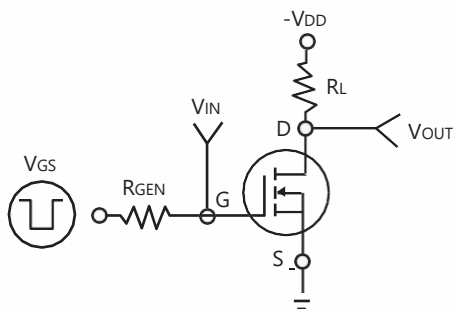
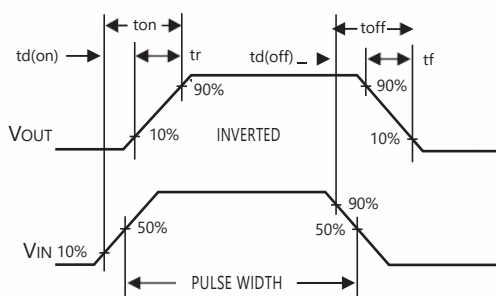
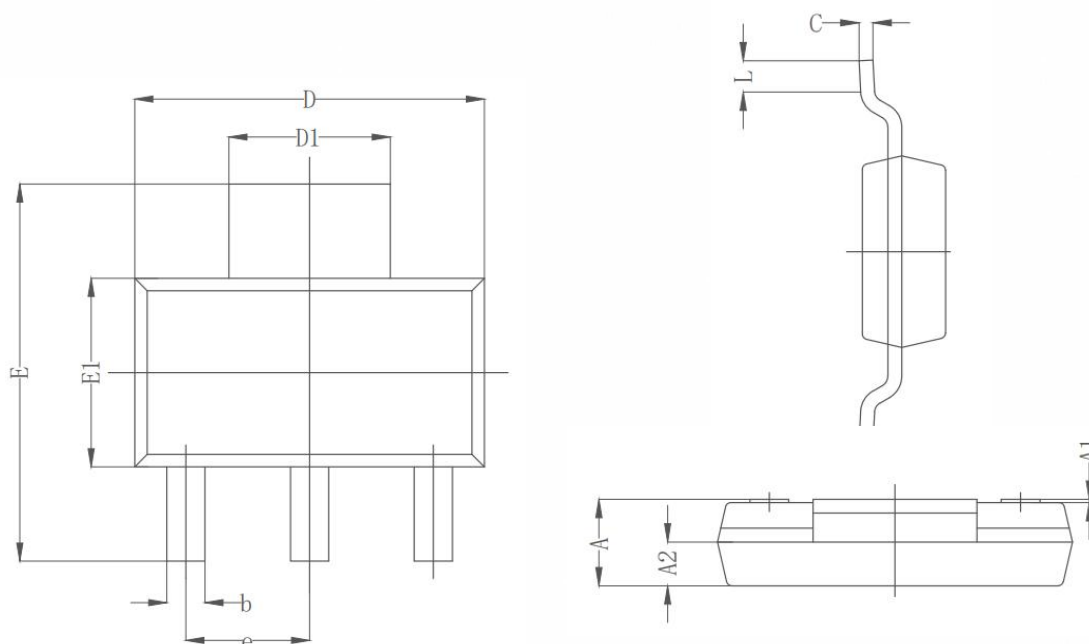


Figure11b. Switching Waveforms



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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