

Description

The IRF9335TRPBF is the new generation trenchP-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

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

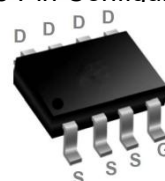
Applications

- Battery Protection
- Load Switch
- Power Management
- Notebook

V_{DSS}	-30V
I_D	-7A
$R_{DS(ON)}$	21m Ω @ $V_{GS} = -10V$
$R_{DS(ON)}$	32m Ω @ $V_{GS} = -4.5V$

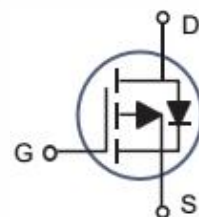
Outline

SOP-8 Pin Configuration



Equivalent

(4)Gate
(1\2\3)Source
(5\6\7\8)Drain



Packaging specifications

Part No.	Package	Marking	Basic ordering unit.(pcs)
IRF9335TRPBF	SOP-8		3000

Absolute Maximum Ratings

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous ^(Note2)	$T_C = 25^\circ C$	I_D	-7	A
	$T_C = 70^\circ C$		-5.5	A
-Pulsed ^(Note 1- Note 2)		I_{DM}	-28	A
Maximum Power Dissipation	$T_C = 25^\circ C$	P_D	1.6	W
	$T_C = 70^\circ C$		1.2	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Resistance Junction-Ambient		$R_{\theta JA}$	85	$^\circ C / W$

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	-30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V , 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	-1.5	-2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V , I _D =-6A		21	24	mΩ
		V _{GS} =-4.5V , I _D =-3A		32	39	mΩ
Forward Transconductance	g _{FS}	V _{GS} =-10V , I _D =-5A		5.5		S
DYNAMIC CHARACTERISTICS Note4						
Input Capacitance	C _{ISS}	V _{DS} =-15V ,		850		pF
Output Capacitance	C _{OSS}	V _{GS} =0 V ,		120		pF
Reverse Transfer Capacitance	C _{RSS}	f =1.0MHz		80		pF
Total Gate Charge	Q _g	V _{DS} =-15V , I _D =-5A , V _{GS} =-10V		14		nC
Gate-Source Charge	Q _{gs}	V _{DS} =-15V , I _D =-5A ,		3.2		nC
Gate-Drain Charge	Q _{gd}	V _{GS} =-10V		2.5		nC
SWITCHING CHARACTERISTICS Note4						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =-15V ,		5.5		ns
Rise Time	tr	I _D =-1A ,		14		ns
Turn-Off Delay Time	t _{D(OFF)}	V _{GS} =-10V ,		35		ns
Fall Time	tf	R _{GEN} =5Ω		16		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =-5A			-1.0	V

Notes:

- 1、Pulse Test Width < 300us,Duty Cycle< 2%
- 2、Drain current limited by maximum junction temperature.
- 3、Starting T_j=25°C ,L=0.1mH,V_{DD}=-15V,V_{GS}=-10V ,R_G=25Ω
- 4、Guaranteed by design,not subject to production testing.

Typical Performance Characteristics

Fig.1 Continuous Drain Current vs. T_C

T_C , Case Temperature ($^{\circ}\text{C}$)

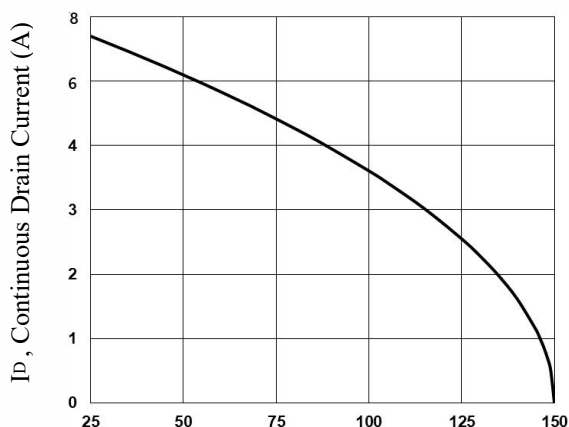


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

T_J , Junction Temperature ($^{\circ}\text{C}$)

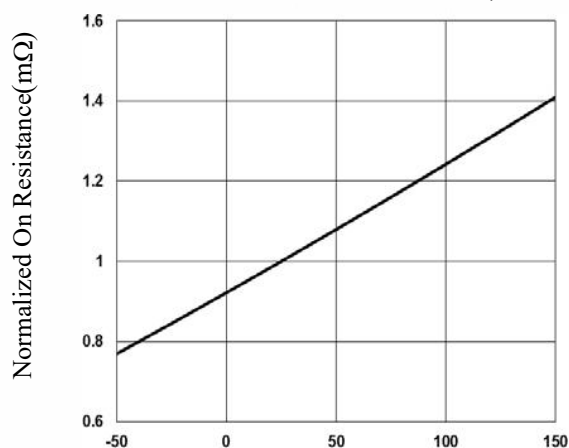


Fig.3 Normalized V_{th} vs. T_J

T_J , Junction Temperature ($^{\circ}\text{C}$)

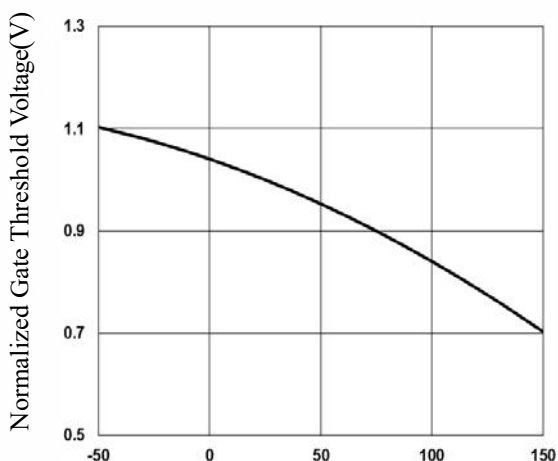


Fig.4 Gate Charge Waveform

Q_g , Gate Charge (nC)

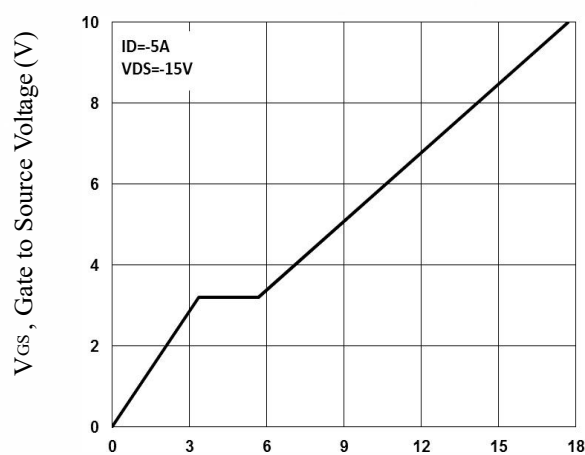


Fig.5 Normalized Transient Impedance

Square Wave Pulse Duration (s)

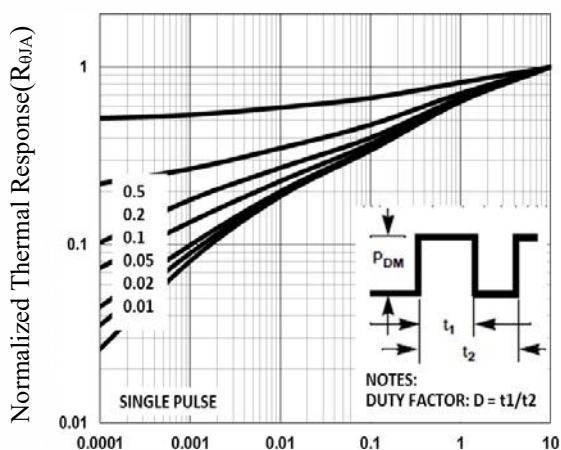


Fig.6 Maximum Safe Operation Area

$-V_{DS}$, Drain to Source Voltage (V)

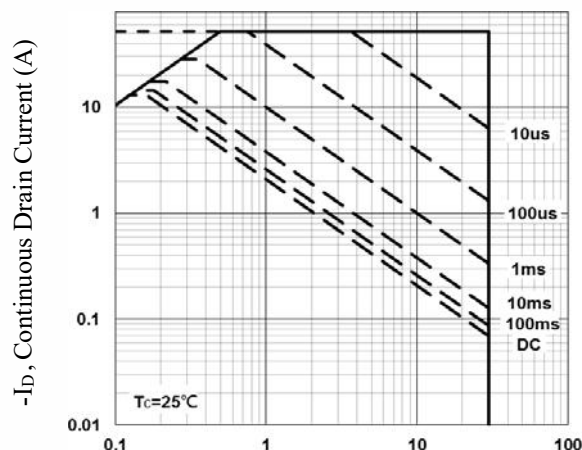


Figure 7a. Switching Test Circuit

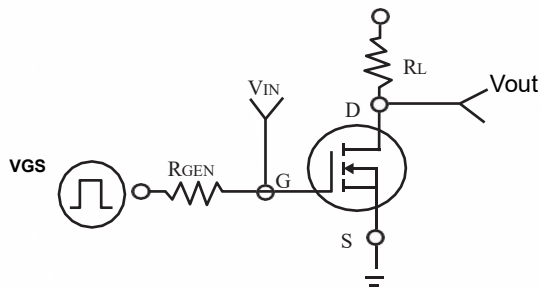


Figure 7b. Switching Waveforms

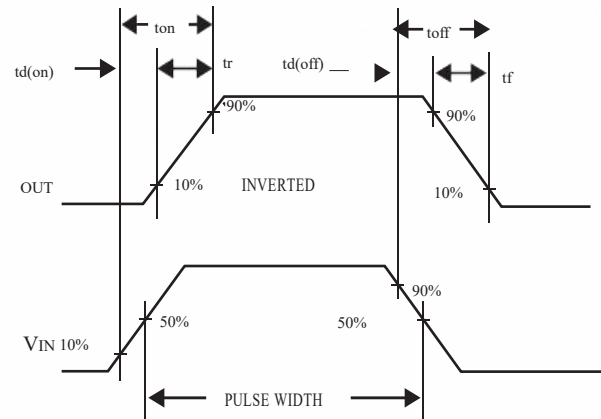


Figure 8a. Unclamped Inductive Test Circuit

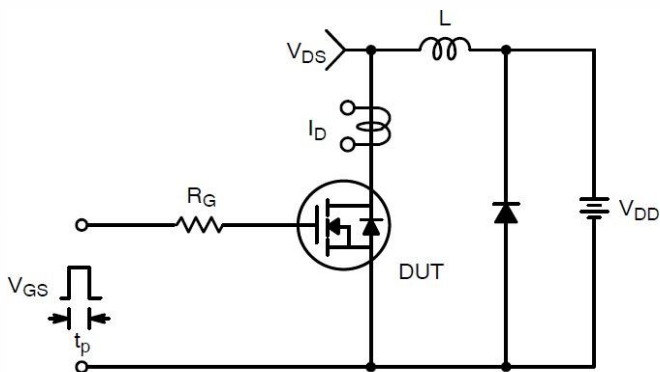
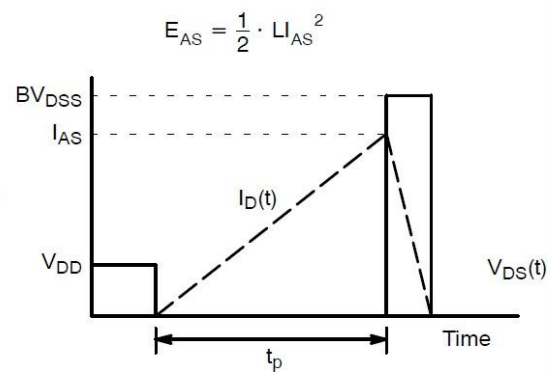


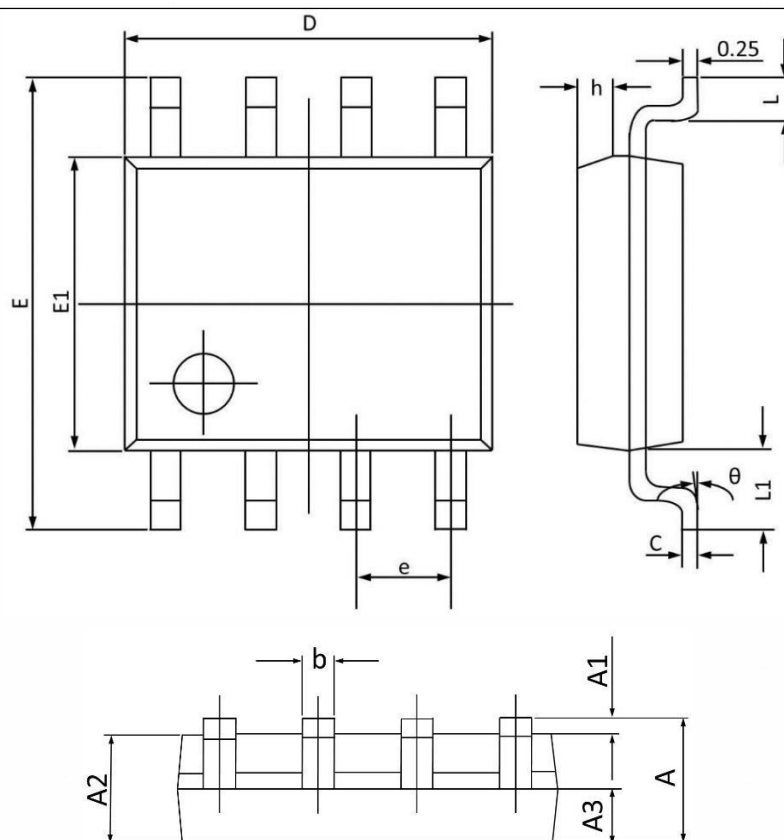
Figure 8b. Unclamped Inductive Waveforms



NOTICE

NKGL reserves the to make modifications,enhancements,improvements,corrections or other changes without further notice to any product herein.NKGL does not assume any liability arsing out of the application or use of any product described herein.

SOP- 8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.800	0.053	0.069
A1	0.050	0.250	0.002	0.010
A2	1.250	1.650	0.049	0.065
A3	0.500	0.700	0.020	0.028
b	0.300	0.510	0.012	0.020
c	0.150	0.260	0.006	0.010
D	4.700	5.100	0.185	0.201
E	5.800	6.200	0.228	0.244
E1	3.700	4.100	0.146	0.161
e	1.270(BSC)		0.050(BSC)	
h	0.250	0.500	0.010	0.020
L	0.400	1.000	0.016	0.039
L1	1.050(BSC)		0.041(BSC)	
θ	0°	8°	0°	8°