

Product Specification

XBLW IRFR5305TRPBF

P-Channel Enhancement Mode MOSFET

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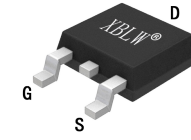


Description

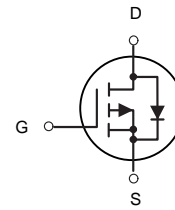
The IRFR5305TRPBF uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

- VDS = -60V, ID = -20A
- RDS(ON) < 72mΩ @ VGS = -10V
- RDS(ON) < 100mΩ @ VGS = -4.5V



TO-252-2L



P-Channel MOSFET

Application

- PWM applications
- Load switch
- Power management

Package Marking and Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
XBLW IRFR5305TRPBF	TO-252-2L	IRFR5305	Tape	2500Pcs/Reel

ABSOLUTE MAXIMUM RATINGS(TA=25°C unless otherwise noted)

Symbol	Parameter	Limit	Unit
VDS	Drain-Source Voltage	-60	V
VGS	Gate-Source Voltage	±20	V
Id(25°C)	Drain Current-Continuous@ Current-Pulsed (Note 1)	-20	A
Id(70°C)		-15	A
IDM		-48	A
P _D	Maximum Power Dissipation	40	W
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 To 175	°C
R _{θJA}	Thermal Resistance, Junction-to-Ambient (Note 2)	20	°C/W

ELECTRICAL CHARACTERISTICS TA=25°C unless otherwise noted

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-48V, V_{GS}=0V$			-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.8	-2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-10A$		64	72	m Ω
		$V_{GS}=-4.5V, I_D=-10A$		90	100	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-20A$	5			S
Input Capacitance	C_{iss}	$V_{DS}=-30V, V_{GS}=0V,$ $F=1.0MHz$		2460		PF
Output Capacitance	C_{oss}			220		PF
Reverse Transfer Capacitance	C_{rss}			155		PF
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=-30V, V_{GS}=-10V,$ $R_{GEN}=3\Omega$ $I_D=1A$		14		nS
Turn-on Rise Time	t_r			20		nS
Turn-Off Delay Time	$t_{d(off)}$			40		nS
Turn-Off Fall Time	t_f			19		nS
Total Gate Charge	Q_g	$V_{DS}=-30V, I_D=-20A, V_{GS}=-10V$		48		nC
Gate-Source Charge	Q_{gs}			11		nC
Gate-Drain Charge	Q_{gd}			10		nC
Body Diode Reverse Recovery Time	T_{rr}	$I_F=-20A, dI/dt=100A/\mu s$		40		nS
Body Diode Reverse Recovery Charge	Q_{rr}			56		nC
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=-1A$		-0.72	-1	V

NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on 1in² FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production testing.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

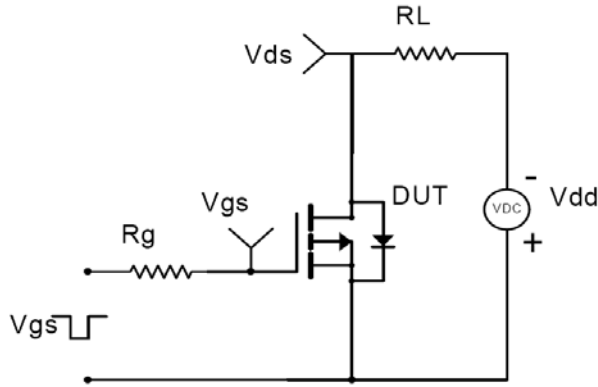


Figure 1: Switching Test Circuit

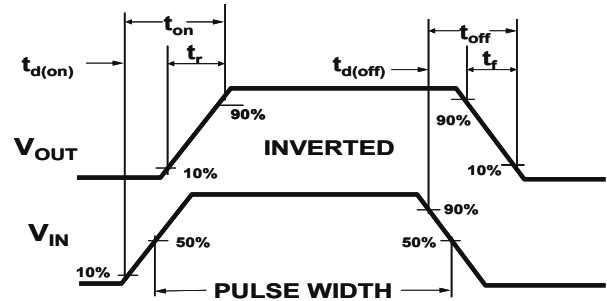


Figure 2: Switching Waveforms

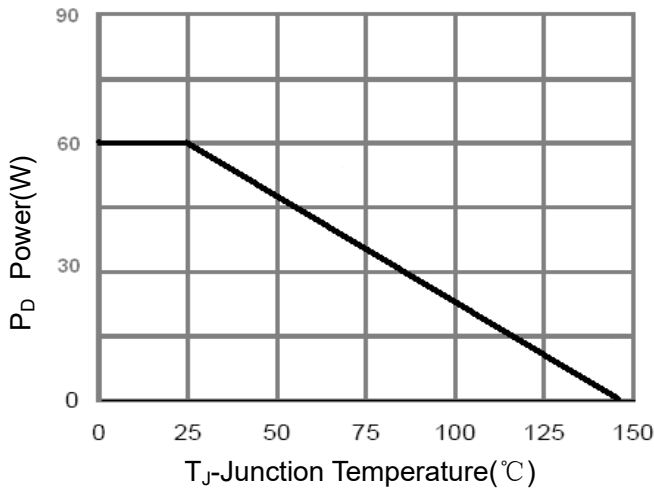


Figure 3 Power Dissipation

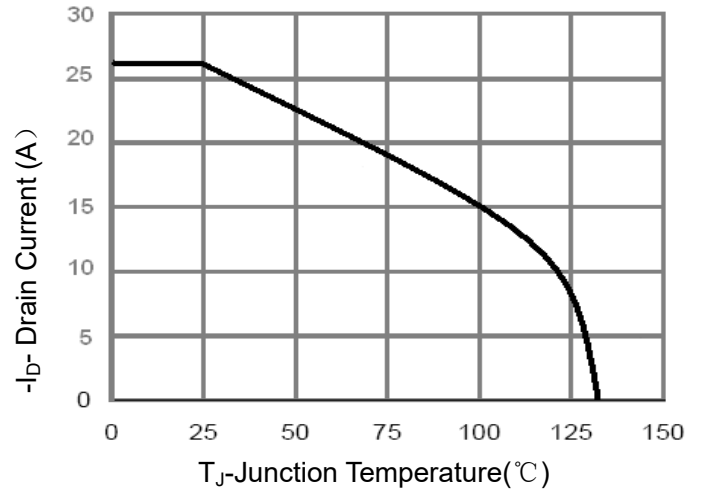


Figure 4 Drain Current

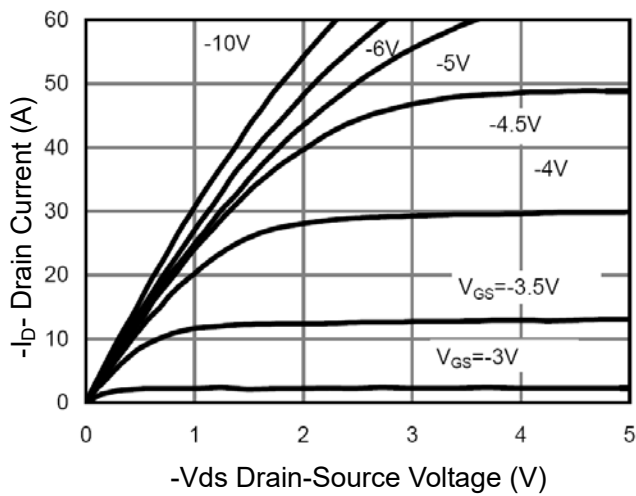


Figure 5 Output CHARACTERISTICS

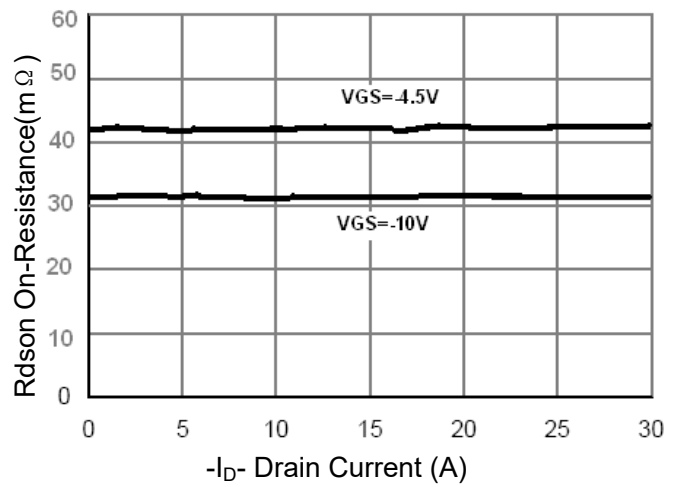


Figure 6 Drain-Source On-Resistance

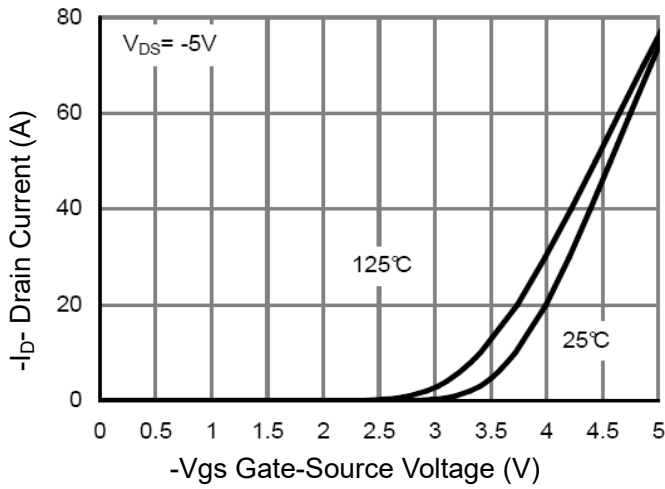


Figure 7 Transfer Characteristics

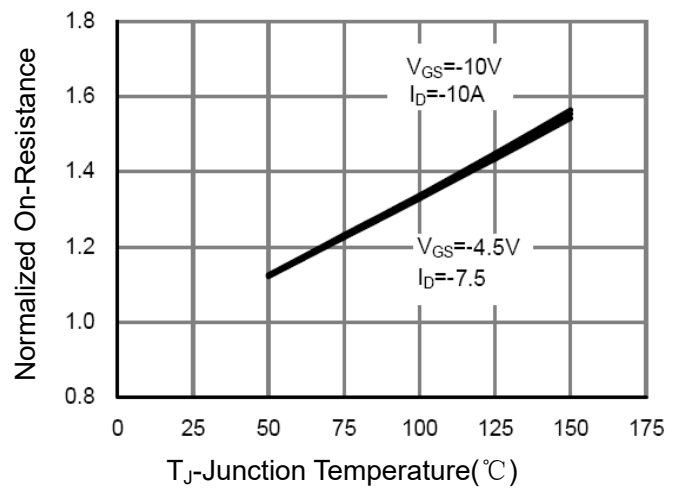


Figure 8 Drain-Source On-Resistance

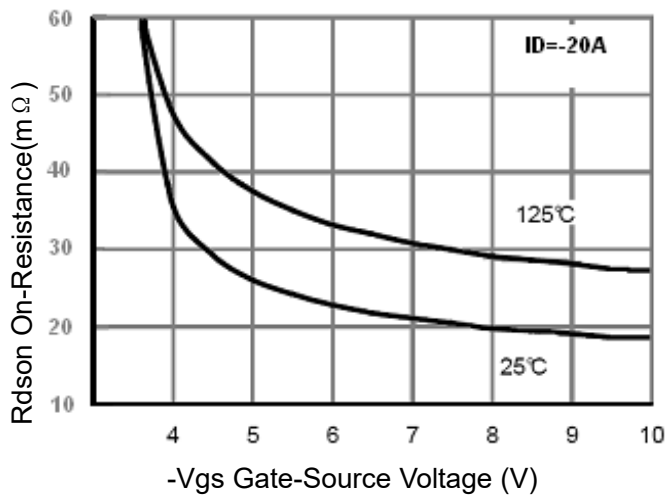


Figure 9 Rdson vs Vgs

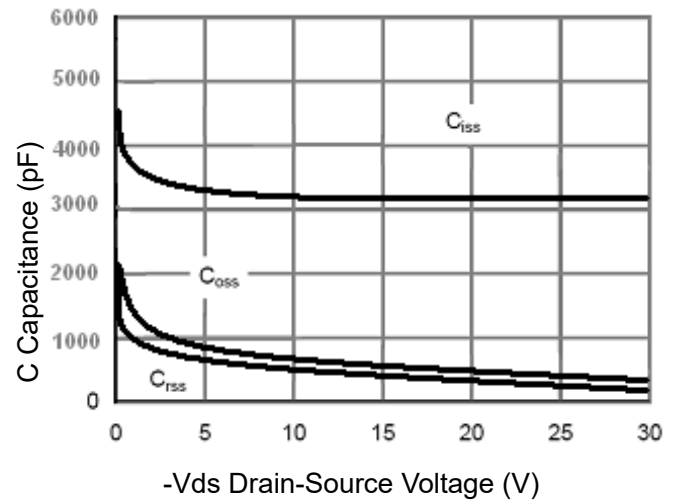


Figure 10 Capacitance vs Vds

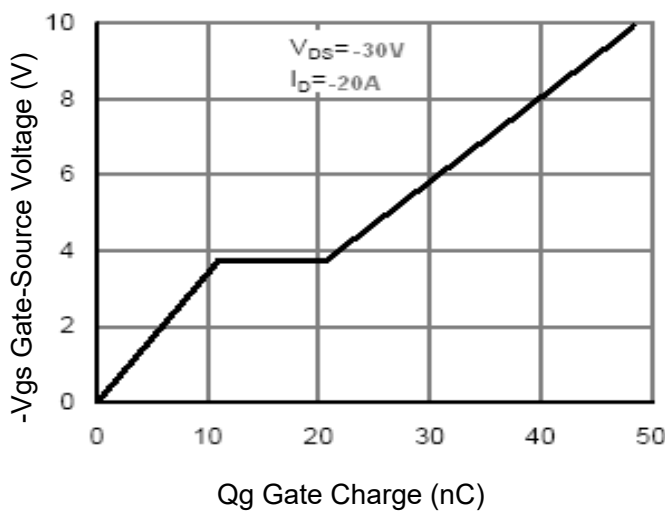


Figure 11 Gate Charge

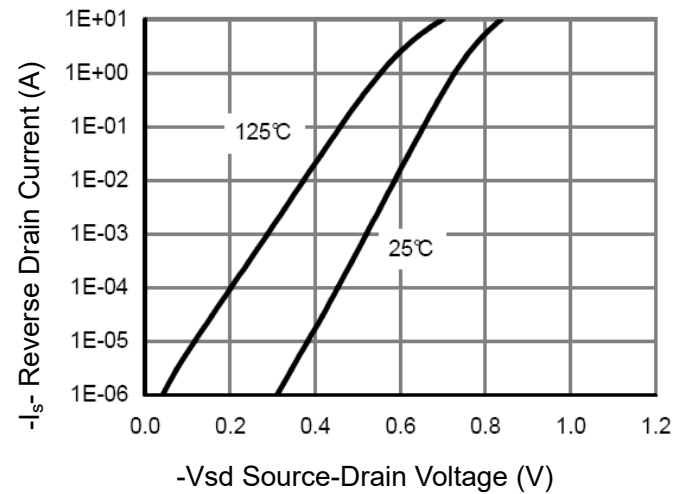


Figure 12 Source- Drain Diode Forward

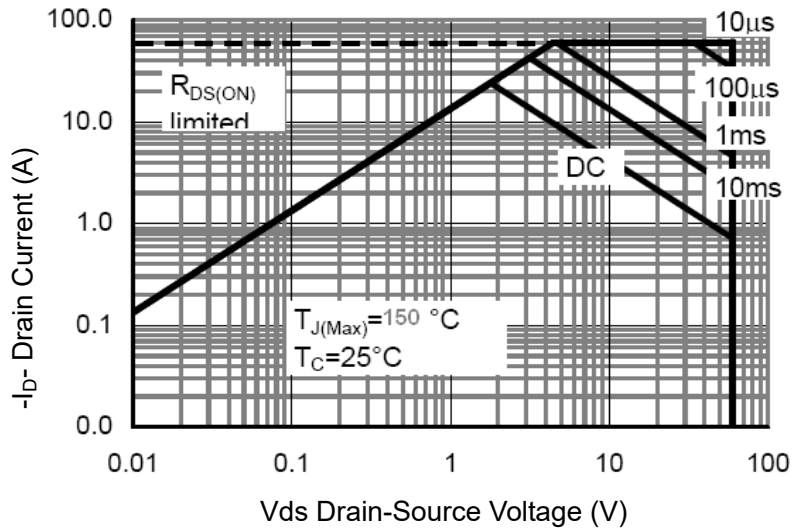


Figure 13 Safe Operation Area

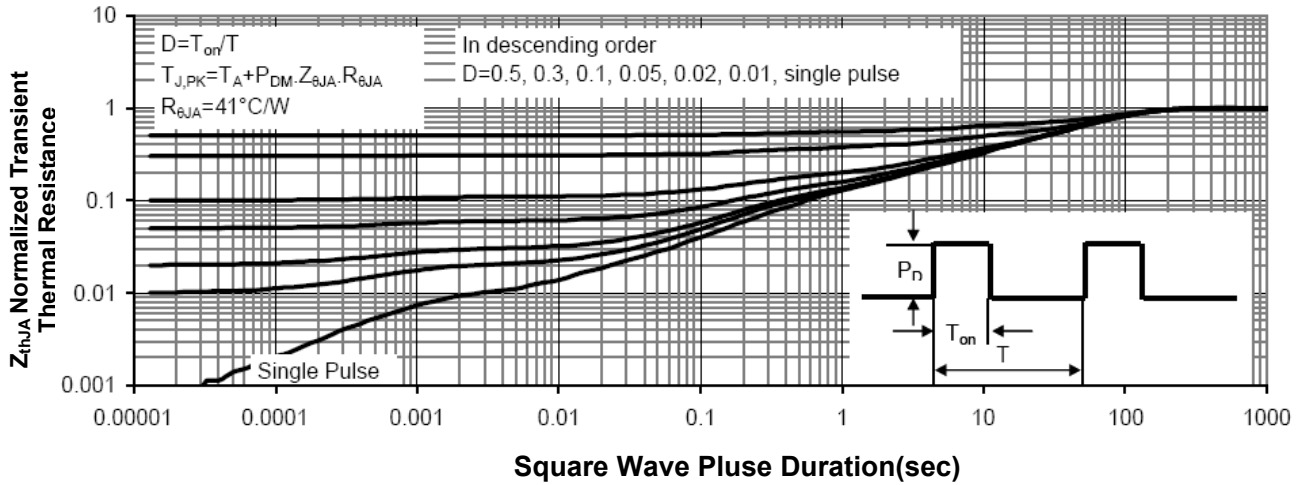
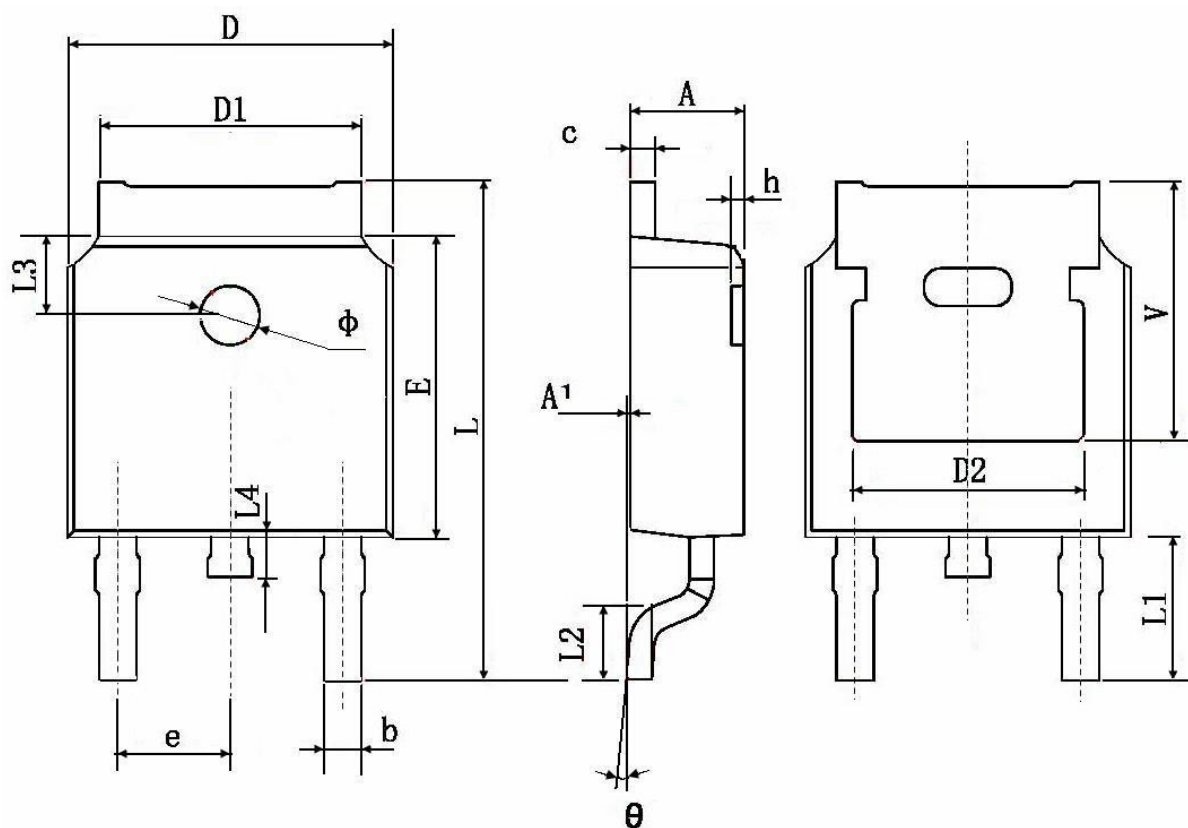


Figure 14 Normalized Maximum Transient Thermal Impedance

Package Information

TO252-2L



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	4.830 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
phi	1.100	1.300	0.043	0.051
theta	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
v	5.350 TYP.		0.211 TYP.	

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