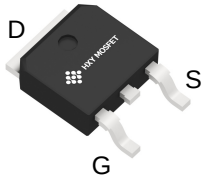
IRLR8721TRPBF-1

N-Channel Enhancement Mode MOSFET

Description

The IRLR8721TRPBF-1 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.

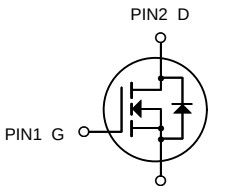


TO-252-2L

General Features

V_{DS}= 30V I_D= 80A

$R_{DS(ON)}$< 6.8mΩ@ V_{GS}=10V



N-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
IRLR8721TRPBF-1	TO-252-2L	HXY MOSFET	2500

Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25°C)	80	A
	Drain Current – Continuous (T_C=100°C)	51	A
I_{DM}	Drain Current – Pulsed	320	A
EAS	Single Pulse Avalanche Energy	88	mJ
IAS	Single Pulse Avalanche Current	42	A
P_D	Power Dissipation (T_C=25°C)	54	W
	Power Dissipation – Derate above 25°C	0.43	W/°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction to ambient	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	2.3	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
△BVDSS/△TJ	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.04	---	V/°C
IDSS	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=125°C	---	---	10	uA
IGSS	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
$RDS_{(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=20A	---	5	6.8	mΩ
		V_{GS}=4.5V , I_D=10A	---	6.5	9	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=VDS , I_D=250uA	1	1.6	2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4	---	mV/°C
gfs	Forward Transconductance	V_{DS}=10V , I_D=10A	---	18	---	S
Q_g	Total Gate Charge	V_{DS}=15V , V_{GS}=4.5V , I_D=20A	---	11.1	---	nC
Q_{gs}	Gate-Source Charge		---	1.85	---	
Q_{gd}	Gate-Drain Charge		---	6.8	---	
$Td_{(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω I_D=15A	---	7.5	---	ns
T_r	Rise Time		---	14.5	---	
$Td_{(off)}$	Turn-Off Delay Time		---	35.2	---	
T_f	Fall Time		---	9.6	---	
Ciss	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	1160	---	pF
Coss	Output Capacitance		---	200	---	
Crss	Reverse Transfer Capacitance		---	180	---	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	2.5	---	Ω
EAS	Single Pulse Avalanche Energy	V_{DD}=25V, L=0.1mH, I_{AS}=20A	20	---	---	mJ
IS	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	80	A
ISM	Pulsed Source Current		---	---	320	A
VSD	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V , I_S=1A , di/dt=100A/μs, T_J=25℃	---	---	---	ns
Q_{rr}	Reverse Recovery Charge		---	---	---	nC

Typical Characteristics

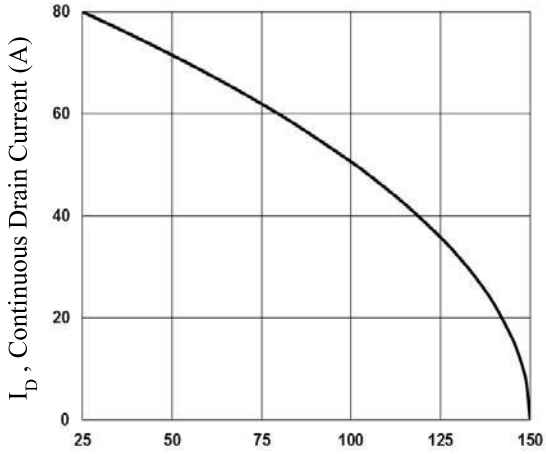


Fig.1 Continuous Drain Current vs. Tc

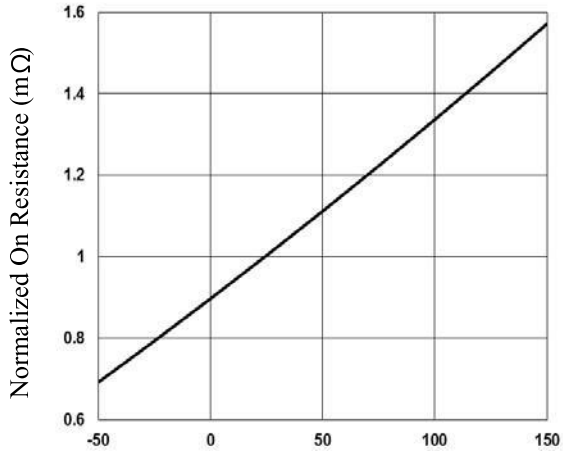


Fig.2 Normalized RDSON vs. Tj

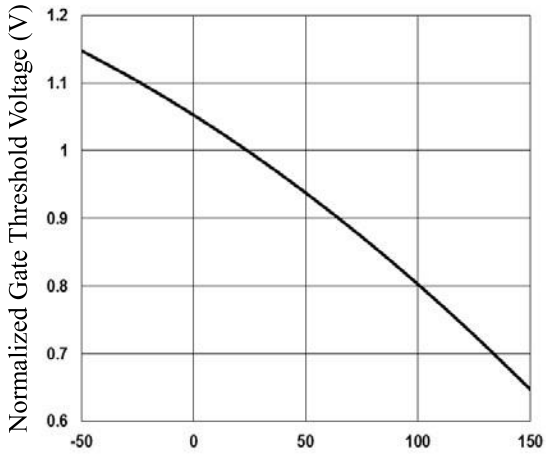


Fig. 3 Normalized Vth vs. Tj

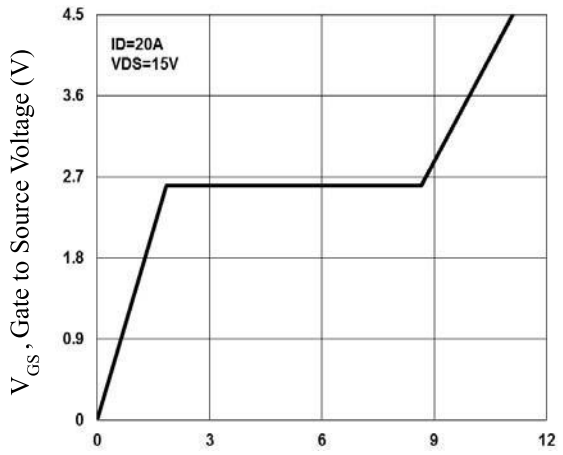


Fig. 4 Gate Charge Waveform

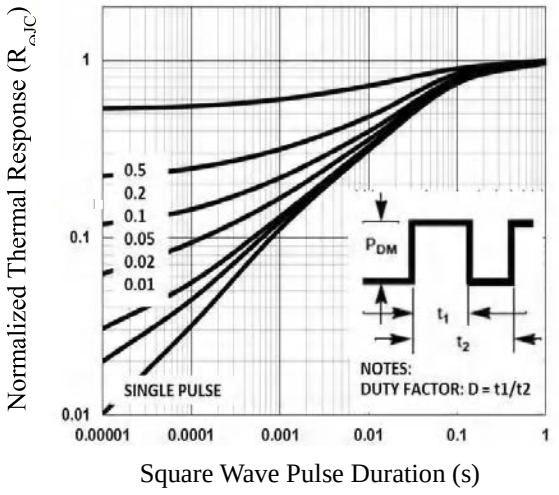


Fig.5 Normalized Transient Impedance

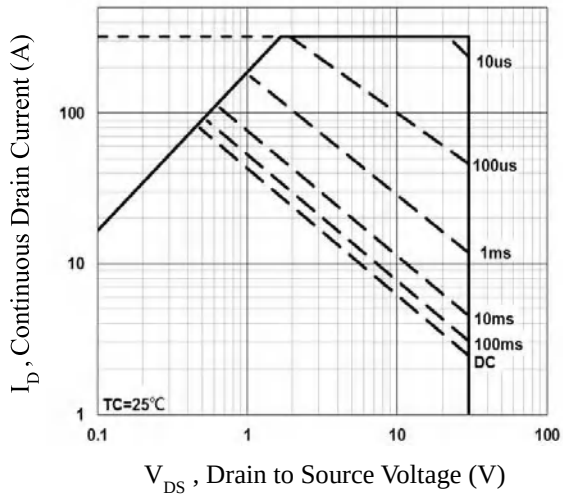


Fig.6 Maximum Safe Operation Area

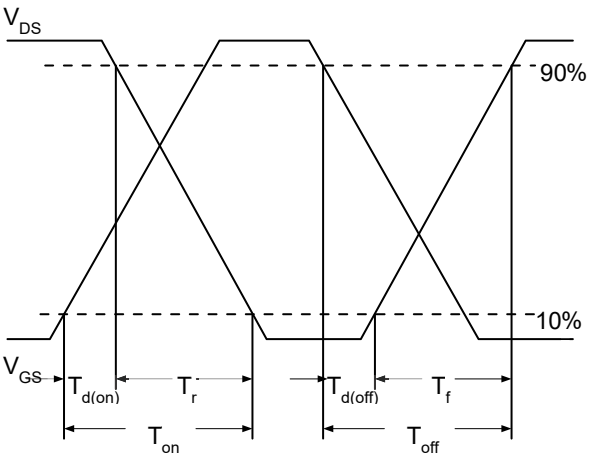


Fig. 7 Switching Time Waveform

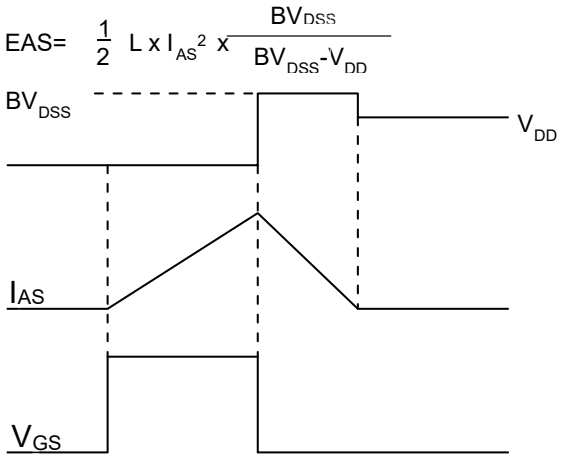
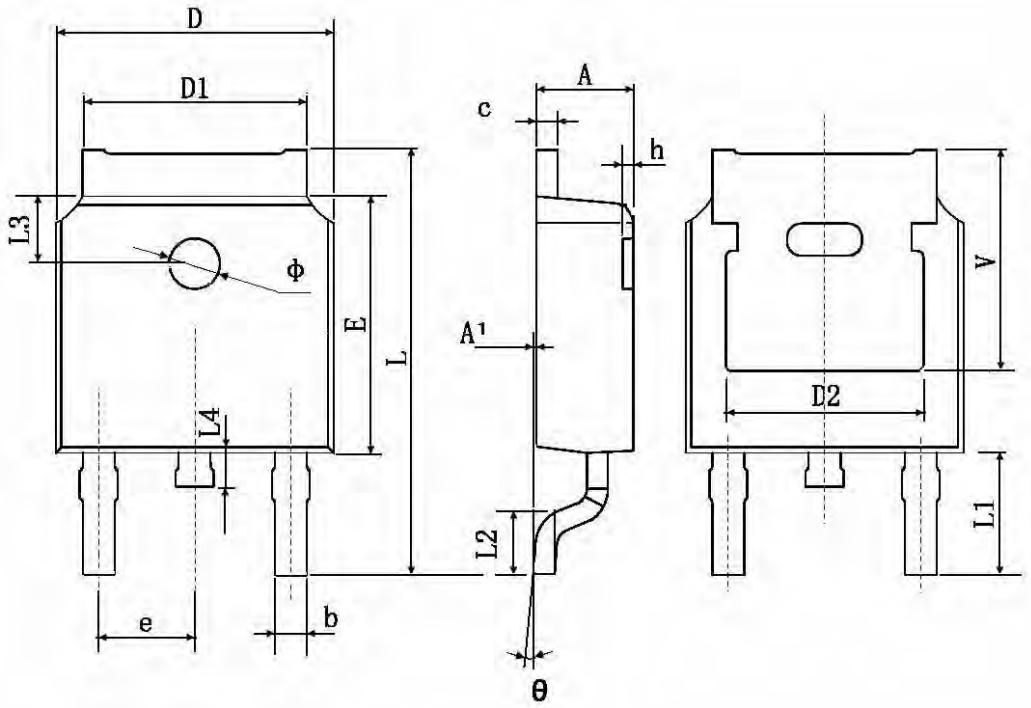


Fig. 8 EAS Waveform

TO-252-2L 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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