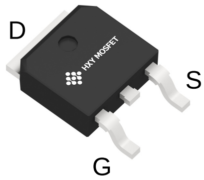
Description

The IRLR8113TRPBF uses advanced trench technology to provide excellent $R_{DS(ON)}$, 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 (TO-252(DPAK))

General Features

V_{DS} = 30V I_D = 80A

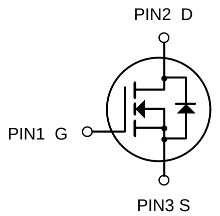
$R_{DS(ON)}$ < 6.8mΩ @ V_{GS}=10V

Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
IRLR8113TRPBF	TO-252-2L(TO-252(DPAK))	HXY MOSFET	2500

Absolute Maximum Ratings (T_C=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[1]	320	A
EAS	Single Pulse Avalanche Energy[2]	88	mJ
IAS	Single Pulse Avalanche Current[2]	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˚C , 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[3]	V_{GS}=10V , I_D=20A	---	5	6.8	mΩ
		V_{GS}=4.5V , I_D=10A	---	6.5	9	mΩ
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , 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[3,4]	V_{DS}=15V , V_{GS}=4.5V , I_D=20A	---	11.1	---	nC
Qgs	Gate-Source Charge[3,4]		---	1.85	---	
Qgd	Gate-Drain Charge[3,4]		---	6.8	---	
Td(on)	Turn-On Delay Time[3,4]	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω I_D=15A	---	7.5	---	ns
T_r	Rise Time[3,4]		---	14.5	---	
Td(off)	Turn-Off Delay Time[3,4]		---	35.2	---	
T_f	Fall Time[3,4]		---	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, IAS=20A	20	---	---	mJ
IS	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	80	A
ISM	Pulsed Source Current[3]		---	---	320	A
VSD	Diode Forward Voltage[3]	V_{GS}=0V , I_S=1A , T_J=25˚C	---	---	1	V
trr	Reverse Recovery Time	VGS=0V,IS=1A , di/dt=100A/μs T_J=25˚C	---	---	---	ns
Q_{rr}	Reverse Recovery Charge		---	---	---	nC

Typical Characteristics

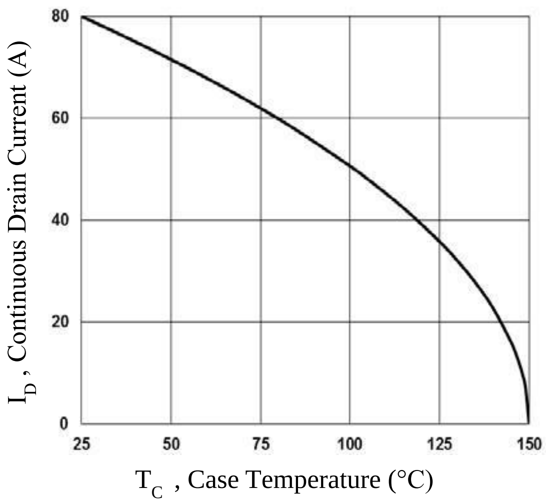


Fig.1 Continuous Drain Current vs. Tc

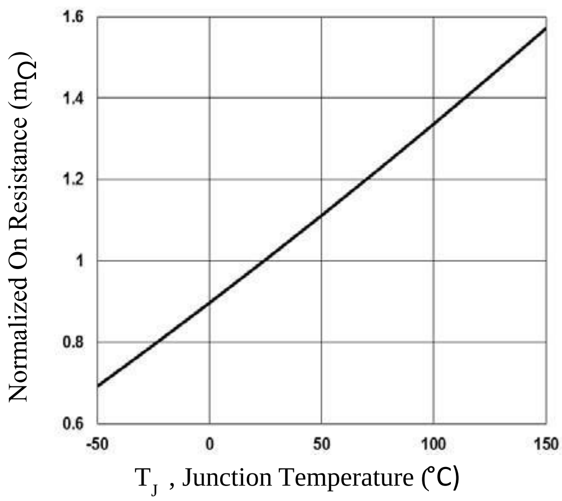
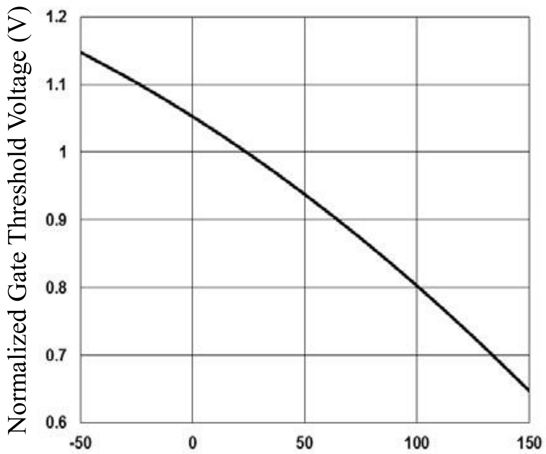


Fig.2 Normalized RDSON vs. Tj



T_J , Junction Temperature (℃)

Fig. 3 Normalized Vth vs. Tj

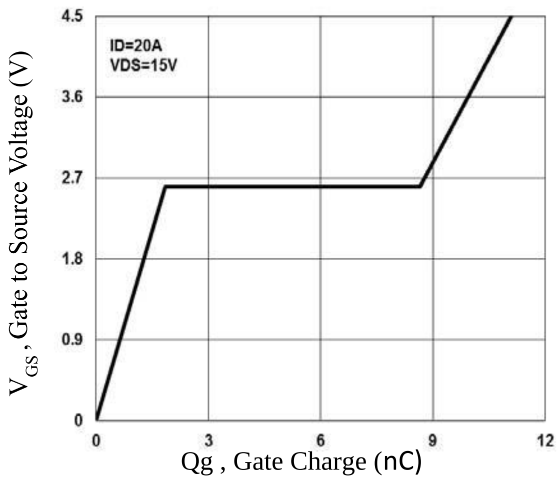


Fig. 4 Gate Charge Waveform

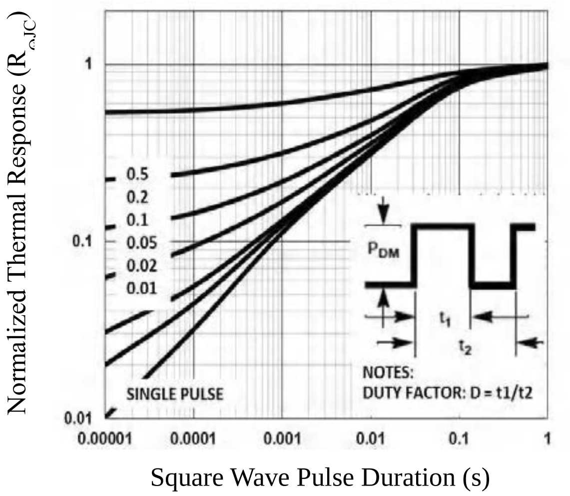


Fig.5 Normalized Transient Impedance

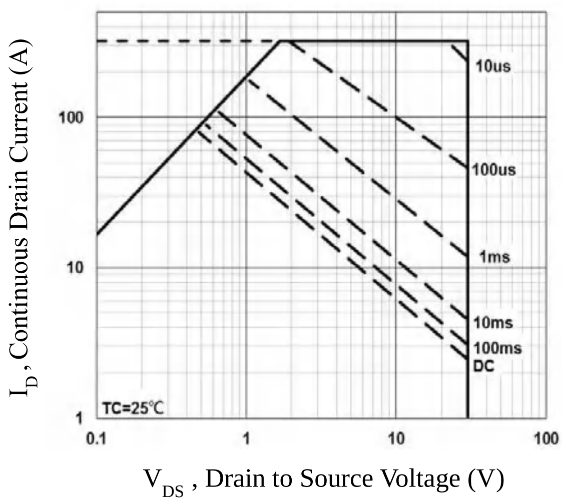


Fig.6 Maximum Safe Operation Area

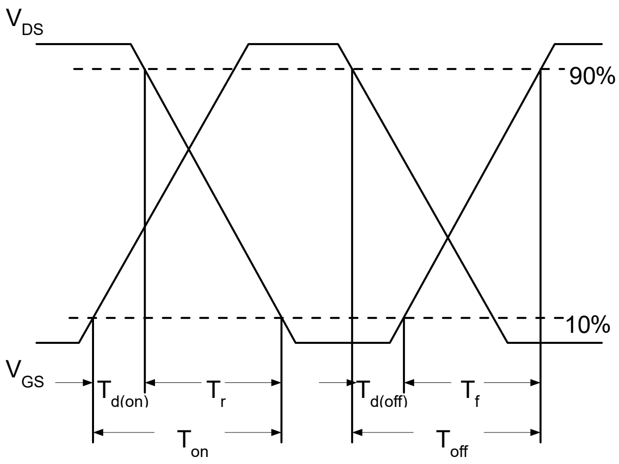


Fig. 7 Switching Time Waveform

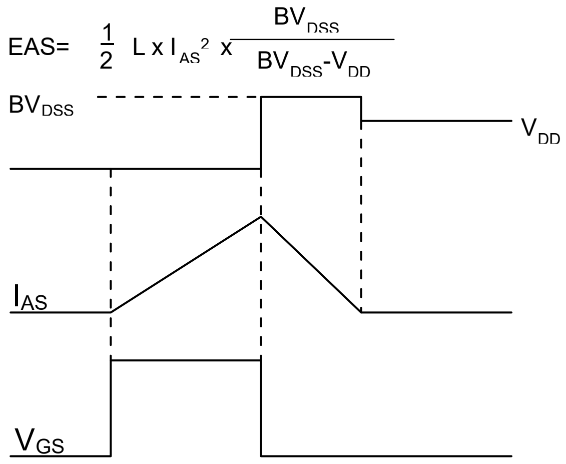
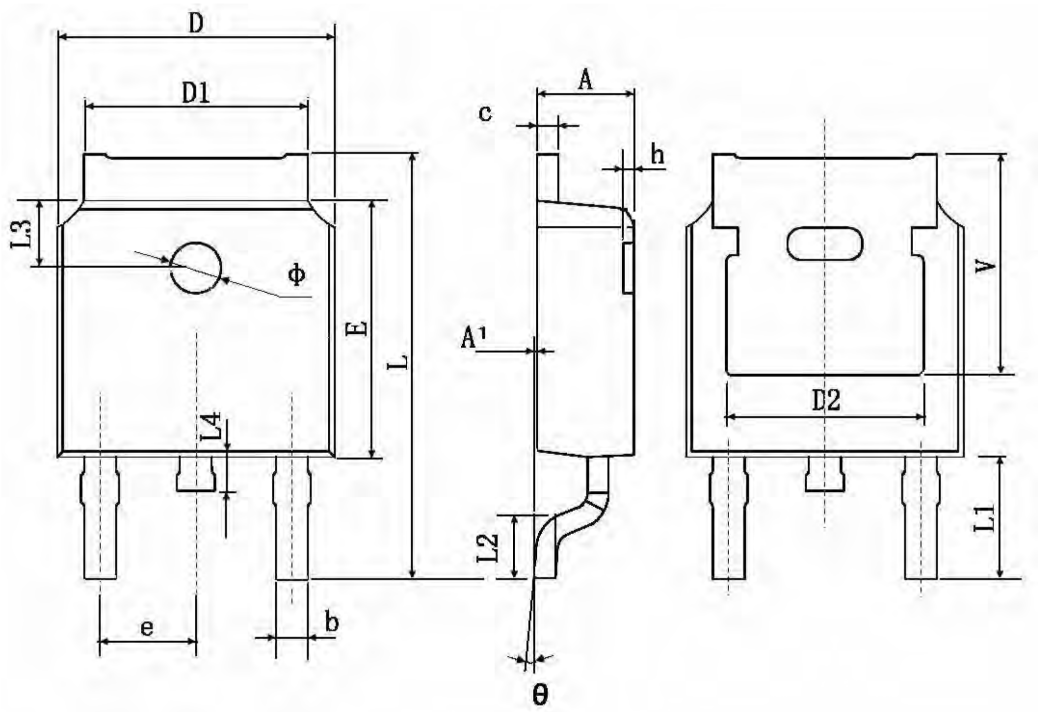


Fig. 8 EAS Waveform

TO252-2L(TO-252(DPAK)) 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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