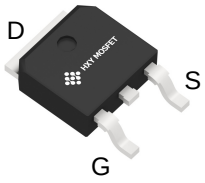
Description

The IRFR5410TRR 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
(DPAK)

General Features

V_{DS} = -100V I_D = -15A

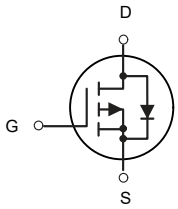
$R_{DS(ON)}$ < 170mΩ @ V_{GS}=-10V

Application

Brushless motor

Load switch

Uninterruptible power supply



P-Channel MOSFET

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
IRFR5410TRR	TO-252-2L(DPAK)	HXY MOSFET	2500

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -10V	-15	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ -10V	-10.5	A
I_{DM}	Pulsed Drain Current	-60	A
EAS	Single Pulse Avalanche Energy	46	mJ
P_D@T_C=25℃	Total Power Dissipation	34	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	3.7	℃/W

Electrical Characteristics (TJ =25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	-100	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=-100V	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	-1.1	-1.6	-2.2	V
$R_{DS(ON)}$	Drain-Source On Resistance[3]	V_{GS}=-10V,I_D=-5A	---	140	170	mΩ
		V_{GS}=-4.5V,I_D=-4A	---	150	190	mΩ
C_{iss}	Input Capacitance	V_{DS}=-25V, V_{GS}=0V, f=1MHz	---	2448	---	pF
C_{oss}	Output Capacitance		---	69	--	
C_{rss}	Reverse Transfer Capacitance		---	54	---	
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=-50V, I_D=-6.5A, R_{ENG}=10Ω,V_{GS}=-10V	---	23	---	ns
t_r	Rise Time		---	31.5	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	60.9	---	ns
t_f	Fall Time		---	54	---	ns
Q_g	Total Gate Charge	V_{GS}=-10V, V_{DS}=-50V, I_D=-10A	---	47	---	nC
Q_{gs}	Gate-Source Charge		---	4.5	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	5.7	---	nC
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_{SD}=-5A	---	---	-1.2	V
I_S	Continuous Drain Curren	V_D=V_G=0V	---	---	-15	A
I_{SM}	Pulsed Drain Current		---	---	-60	A

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : TJ=25℃,VDD=-50V,VG=10V,L=0.5mH
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

P-Channel Typical Characteristics

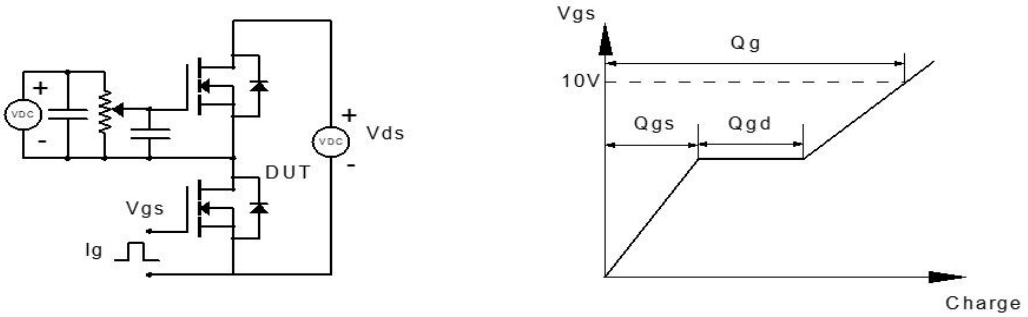


Figure 1: Gate Charge Test Circuit & Waveform

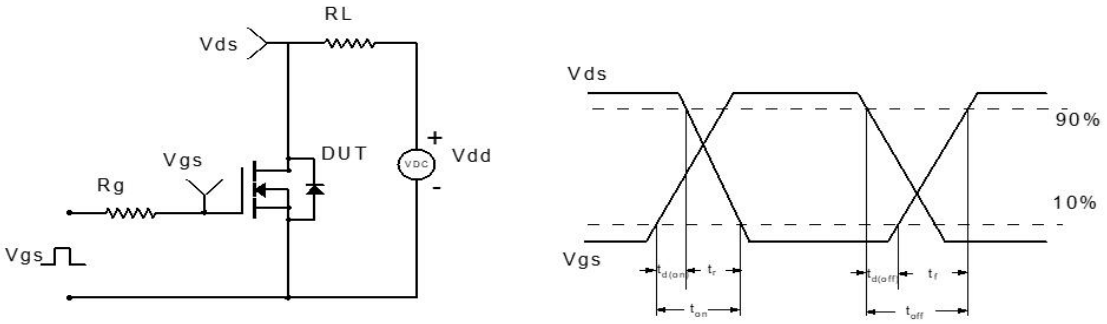


Figure 2: Resistive Switching Test Circuit & Waveform

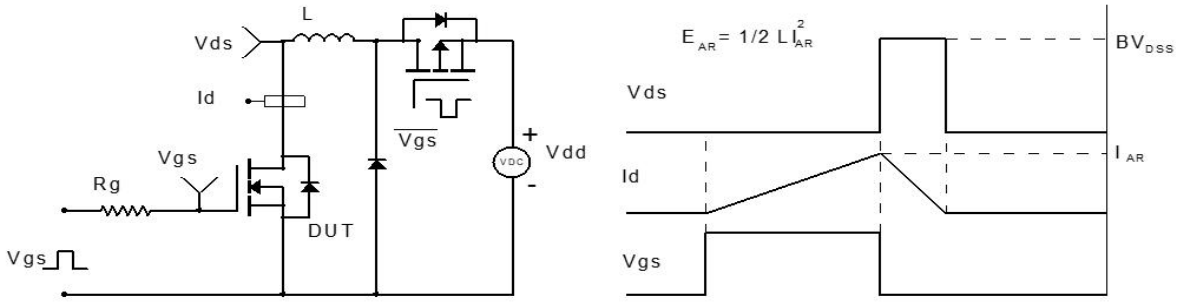


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

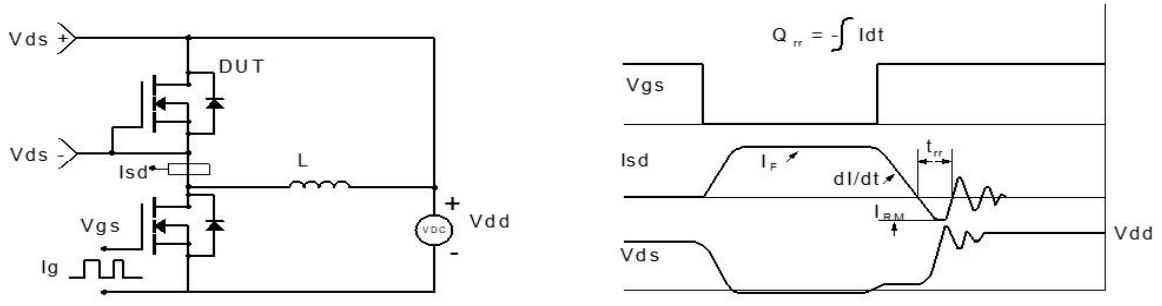
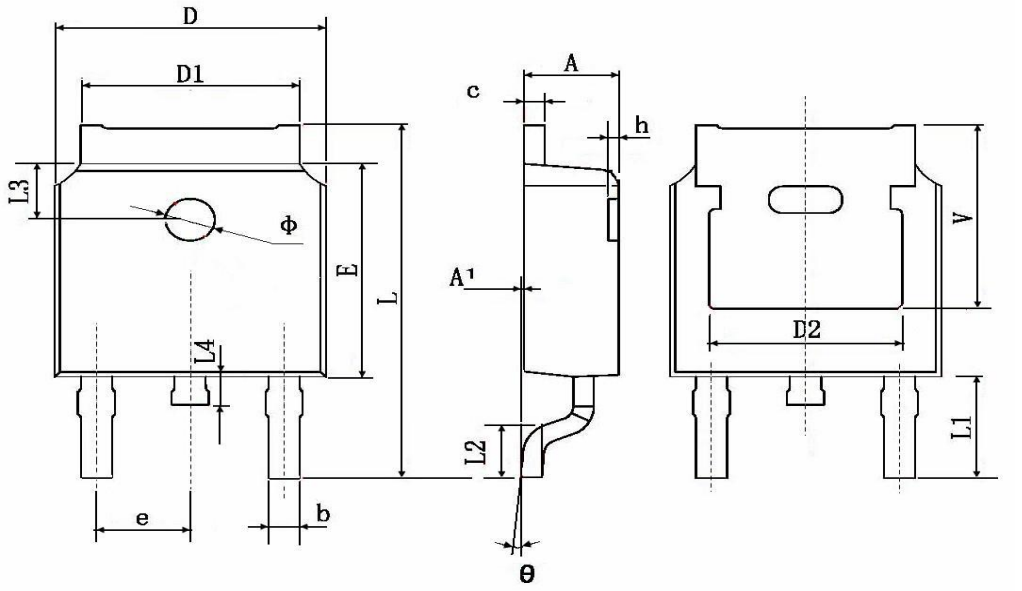


Figure 4: Diode Recovery Test Circuit & Waveform

TO 252-2L(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	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
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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