

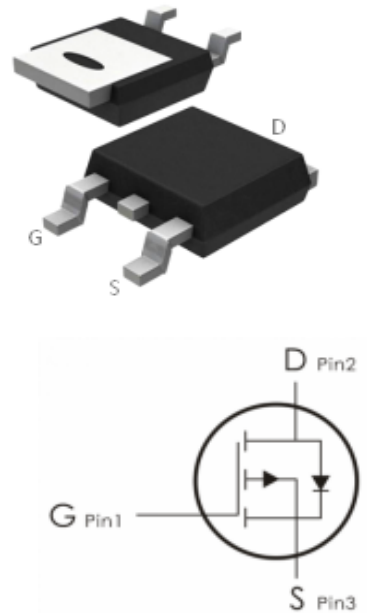
Description:

This P-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=-100V, I_D=-12A, R_{DS(on)}<200m\Omega @V_{GS}=-10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $TC=25^\circ C$	-12	A
	Continuous Drain Current- $TC=100^\circ C$	-6.5	
I_{DM}	Drain Current – Pulsed ¹	-40	
P_D	Power Dissipation- $TC=25^\circ C$	54	W
	Power Dissipation – Derate above $25^\circ C$	0.43	W/ $^\circ C$
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	2.3	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	62	

Package Marking and Ordering Information:

Part NO.	Marking	Package
IRFR5410-DO	FR5410	TO-252

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	-100	---	---	V
	BV _{DSS} Temperature Coefficient	Reference to 25 °C ID=-1mA	---	---	---	v/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} 0V, V _{DS} =-100V T _J =25 °C	---	---	-1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =-250 μ A	-1	---	-3	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =-10V, I _D =-5A	---	170	200	m Ω
		V _{GS} =-4.5V, I _D =-2A	---	190	230	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-25V, V _{GS} =0V, f=1MHz	---	1419	2500	pF
C _{oss}	Output Capacitance		---	89	170	
C _{rss}	Reverse Transfer Capacitance		---	45	90	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =-50V, I _D =-5A, R _{GEN} =25 Ω .V _{GS} =-10V	---	18	36	ns
t _r	Rise Time		---	8	16	ns
t _{d(off)}	Turn-Off Delay Time		---	100	200	ns
t _f	Fall Time		---	30	60	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-80V,	---	20	40	nC

Q_{gs}	Gate-Source Charge	I ₀ =-5A	---	3.5	7	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	4.6	9	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V,I _S =-1A, T _J =25 °C	---	---	-1.2	V
I_S	Diode Forward Current		---	---	-12	A
T_{rr}	Reverse Recovery Time ²	V _{GS} =0V,I _S =-5A , dI/dt=100A/μs T =25 °C	---	26.6	---	NS
Q_{rr}	Reverse Recovery Charge ²		---	24.2	---	NC

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

Typical Characteristics: (T_C=25°C unless otherwise noted)

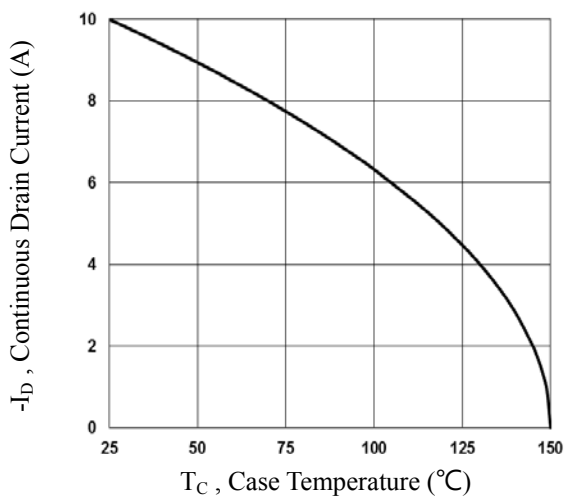


Fig.1 Continuous Drain Current vs. T_C

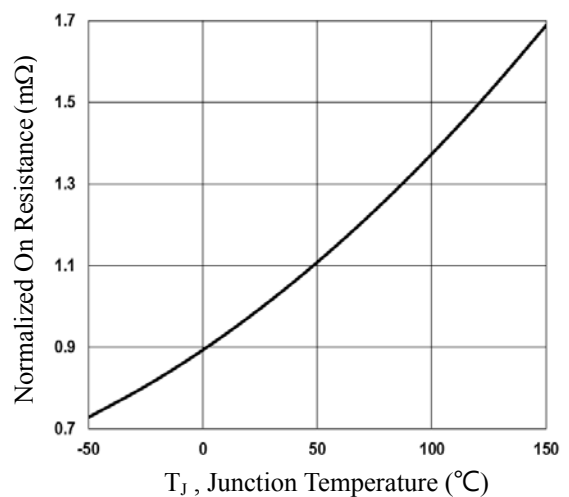


Fig.2 Normalized RDSON vs. T_J

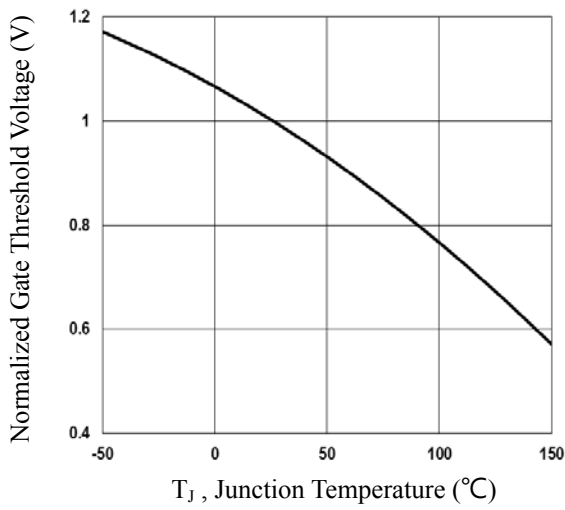


Fig.3 Normalized V_{th} vs. T_J

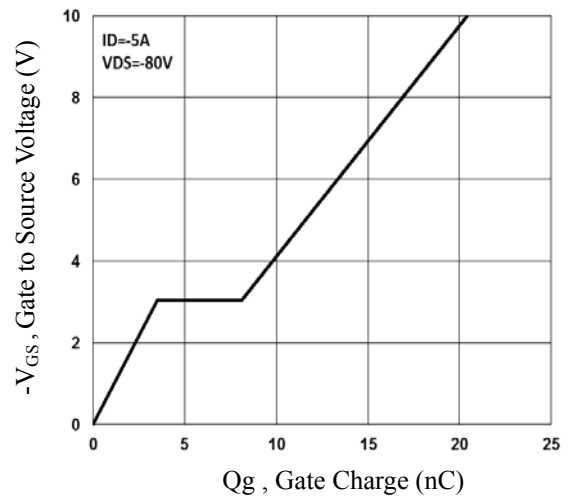


Fig.4 Gate Charge Waveform

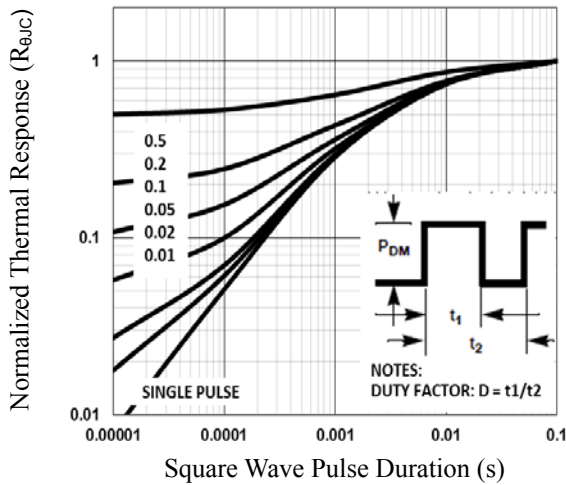


Fig.5 Normalized Transient Impedance

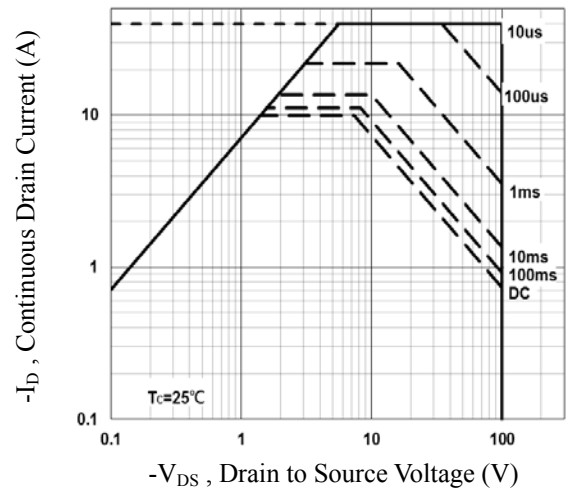


Fig.6 Maximum Safe Operation Area