

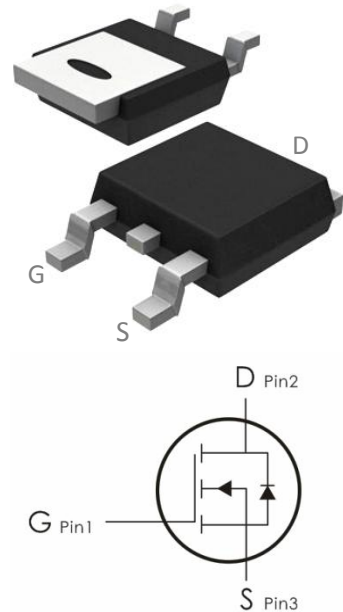
Description:

This N-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) $V_{DS}=30V, I_D=60A, R_{DS(on)} < 8.5m\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 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	30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current $T_c=25^\circ C$	60	A
	Continuous Drain Current $T_c=100^\circ C$	33	
E_{AS}	Single Pulse Avalanche Energy ^{note2}	36	mJ
I_{DM}	Pulsed Drain Current ^{note1}	200	A
P_D	Power Dissipation $T_c=25^\circ C$	33	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.8	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
IRFR3707Z-DO	FR3707Z	TO-252

Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourtce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =30V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ± 20V, V _{DS} =0V	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	1.5	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ^{note3}	V _{GS} =10V, I _D =25A	---	6.2	8.5	m Ω
		V _{GS} =4.5V, I _D =15A	---	10	14	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	1120	---	pF
C _{oss}	Output Capacitance		---	170	---	
C _{rss}	Reverse Transfer Capacitance		---	145	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{GS} =10V ,V _{DS} =15V, I _D =25A, R _{GEN} =3Ω	---	15	---	ns
t _r	Rise Time		---	19	---	ns
t _{d(off)}	Turn-Off Delay Time		---	35	---	ns
t _f	Fall Time		---	21	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =25A	---	21	---	nC
Q _{gs}	Gate-Source Charge		---	2.35	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	5.9	---	nC
Drain-Source Diode Characteristics						
I _S	Maximum Continuous Drain to Source Diode Forward Current		---	---	50	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		---	---	200	A
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =30A	---	---	1.2	V

trr	Body Diode Reverse Recovery Time	$I_F=30A, dI/dt=100A/\mu s$	---	25	---	ns
Qrr	Body Diode Reverse Recovery Charge		---	26	----	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: $T_J=25^\circ C$, $V_{DD}=15V$, $V_G=10V$, $R_G=25\Omega$, $L=0.5mH$, $I_{AS}=12A$

3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Characteristics: ($T_A=25^\circ C$ unless otherwise noted)

Figure1: Output Characteristics

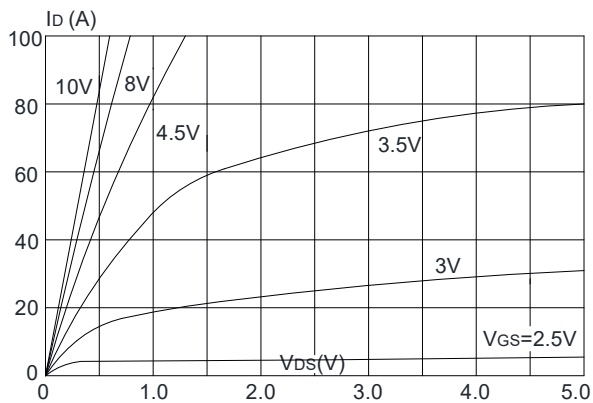


Figure 2: Typical Transfer Characteristics

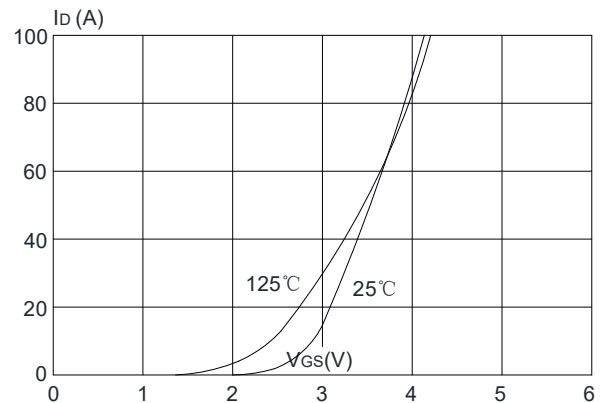


Figure 3: On-resistance vs. Drain Current

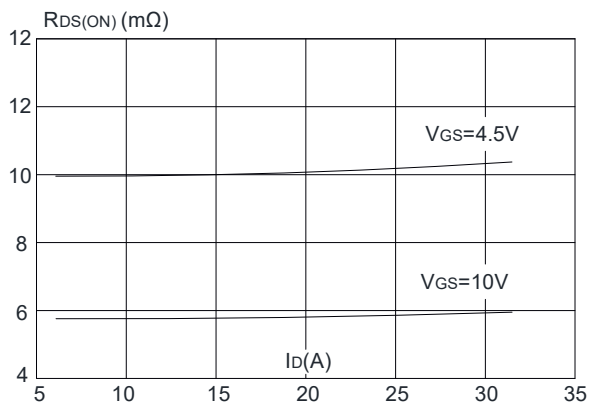


Figure 4: Body Diode Characteristics

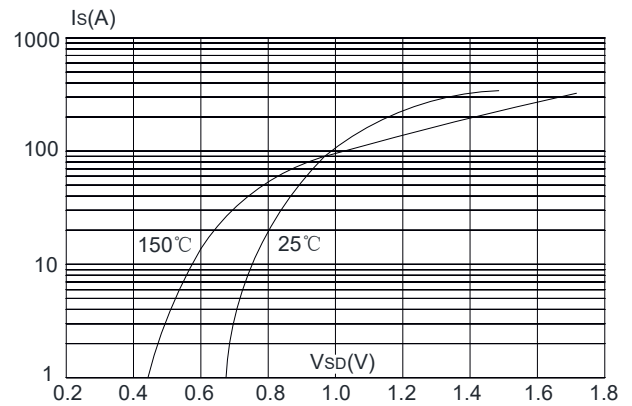


Figure 5: Gate Charge Characteristics

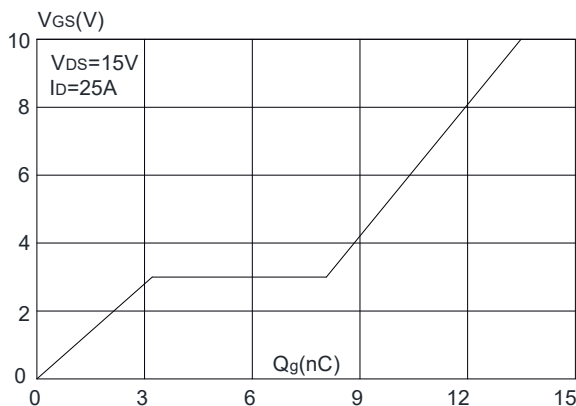


Figure 6: Capacitance Characteristics

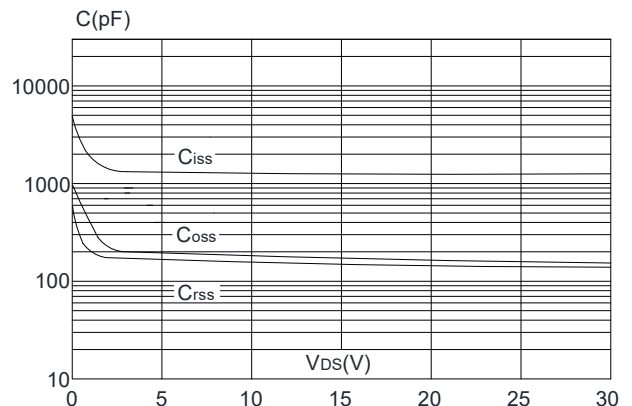


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

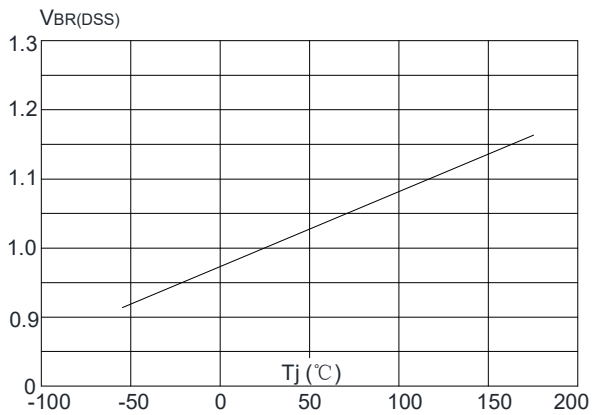


Figure 8: Normalized on Resistance vs. Junction Temperature

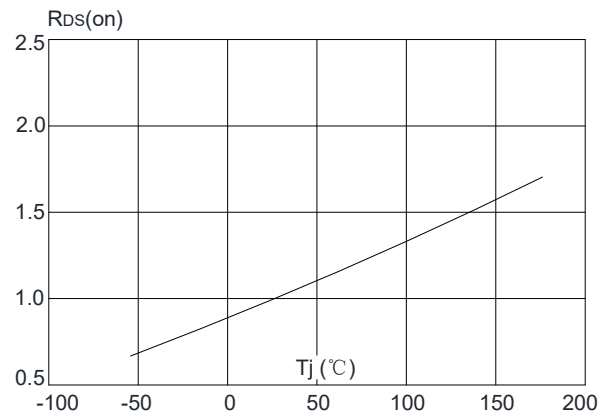
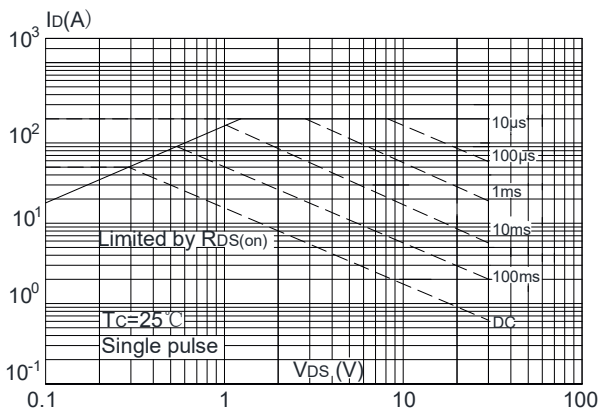


Figure 9: Maximum Safe Operating Area



Maximum Effective
Transient Thermal Impedance, Junction-to-Case

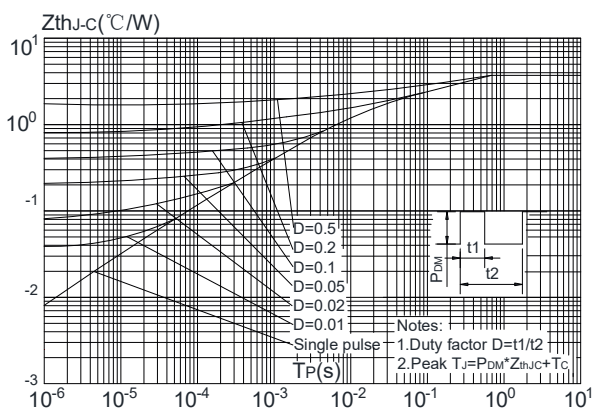


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

