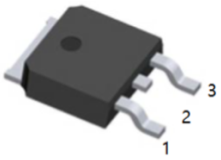
-100V P-Channel Enhancement Mode MOSFET

Description

The IRFR9120N uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gat e charge. It can be used in a wide variety of applications. It is ESD protested.



1.G 2.D 3.S

TO-252(DPAK) top view

General Features

V_{DS} =-100V,I_D =-8A

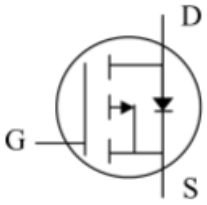
$R_{DS(ON)}$ <210m @ V_{GS}=-10V (Typ:145m)

Super high dense cell design

Advanced trench process technology

Reliable and rugged

High density celldesign for ultra low on-resistance



Application

Power switch

DC/DC converters

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	-8	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	-6	A
Pulsed Drain Current	I_{DM}	-30	A
Maximum Power Dissipation	P_D	40	W
Derating factor		0.32	W/℃
Single pulse avalanche energy (Note 5)	E_{AS}	110	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case (Note 2)	$R_{\theta Jc}$	3.13	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-100V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±10	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1		-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-16A		210	235	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-15V,I_D=-5A	12	-		S
Input Capacitance	C_{lss}	V_{DS}=-25V,V_{GS}=0V, F=1.0MHz		760		PF
Output Capacitance	C_{oss}			260		PF
Reverse Transfer Capacitance	C_{rss}			170		PF
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-50V,I_D=-10A V_{GS}=-10V,R_{GEN}=9.1		14		nS
Turn-on Rise Time	t_r			18		nS
Turn-Off Delay Time	$t_{d(off)}$			50		nS
Turn-Off Fall Time	t_f			18		nS
Total Gate Charge	Q_g	V_{DS}=-50V,I_D=-10A, V_{GS}=-10V		25		nC
Gate-Source Charge	Q_{gs}			5		nC
Gate-Drain Charge	Q_{gd}			7		nC
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-10A			-1.2	V
Diode Forward Current (Note 2)	I_S	-			-13	A
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF =-10A di/dt = 100A/μs(Note3)		35		nS
Reverse Recovery Charge	Qrr			46		nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, t ≤ 10 sec.

3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

4. Guaranteed by design, not subject to production

5. E_{AS} condition：Tj=25℃,V_{DD}=-50V,V_G=-10V,L=0.5mH,Rg=25

Typical Electrical and Thermal Characteristics (Curves)

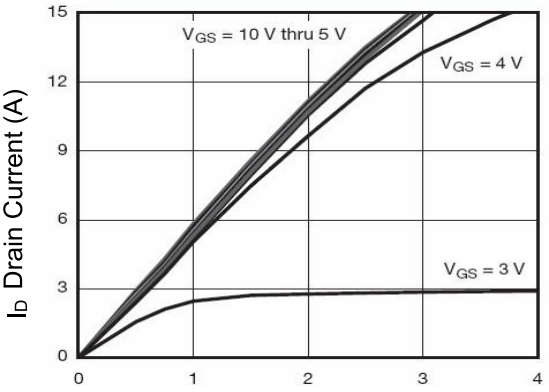


Figure 1 Output Characteristics

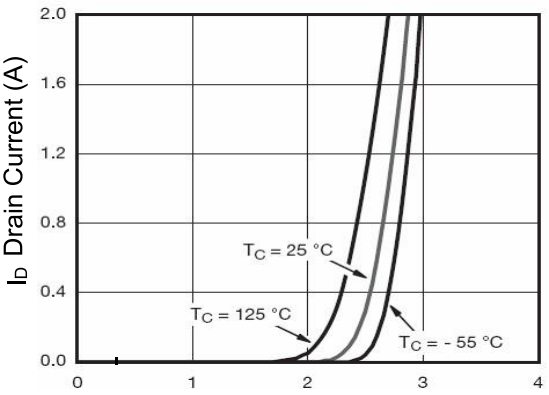


Figure 2 Transfer Characteristics

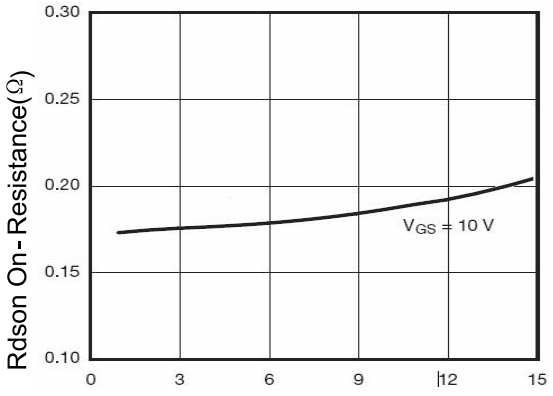


Figure 3 Rdson- Drain Current

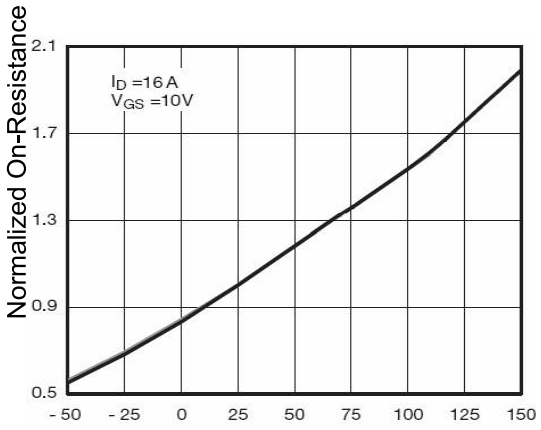


Figure 4 Rdson-JunctionTemperature

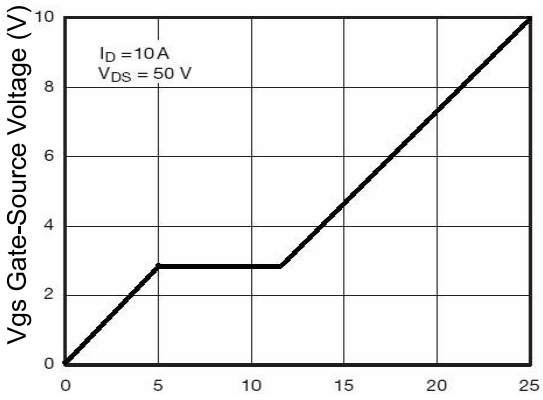


Figure 5 Gate Charge

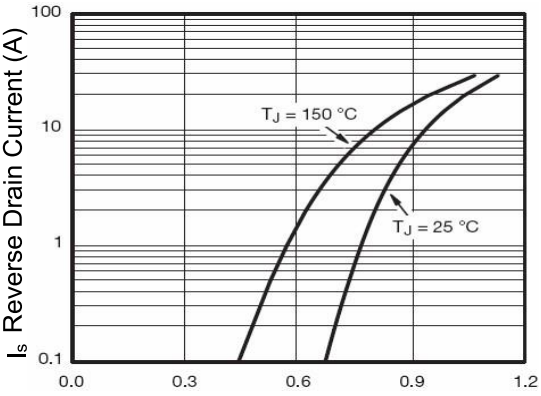


Figure 6 Source- Drain Diode Forward

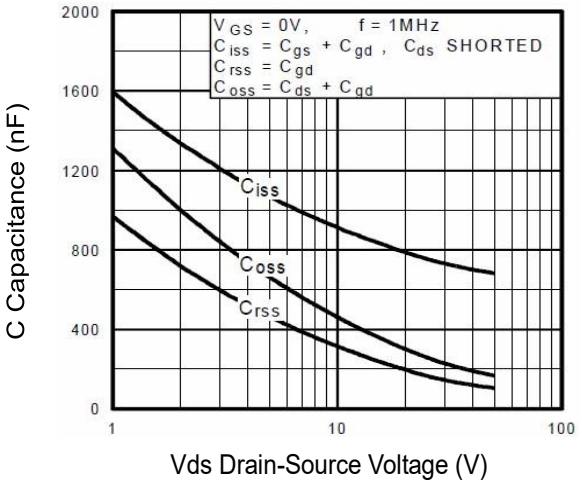


Figure 7 Capacitance vs Vds

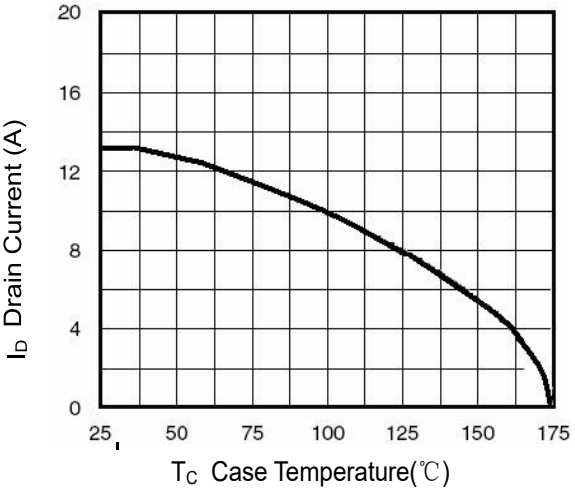


Figure 9 Drain Current vs Case Temperature

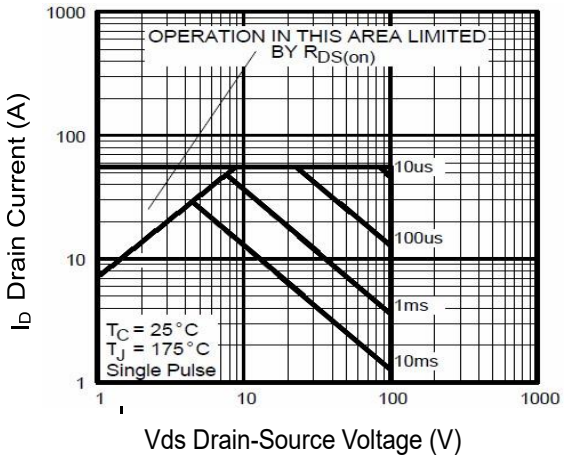


Figure 8 Safe Operation Area

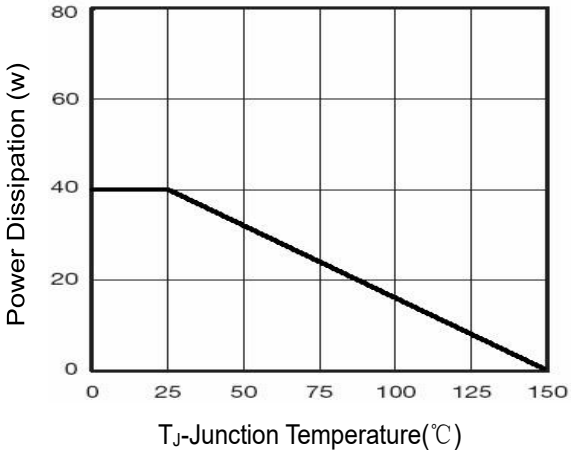


Figure 10 Power De-rating

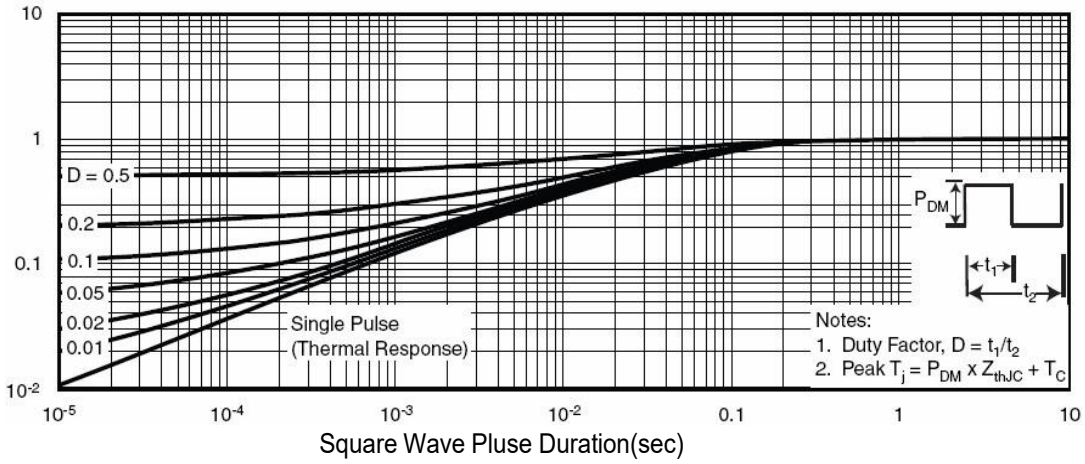
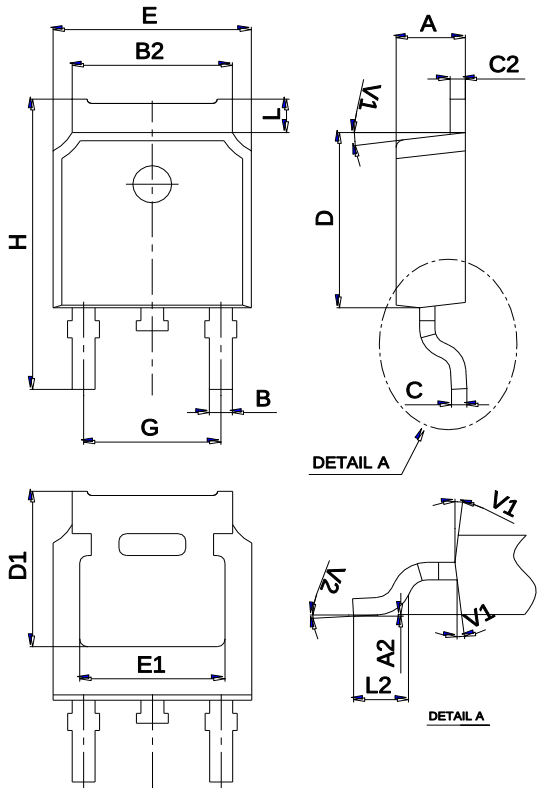


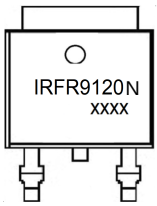
Figure 11 Normalized Maximum Transient Thermal

Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
IRFR9120N	TO-252	2500	Tape and reel