

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	IRF9530N
▶ Overseas	Part Number	IRF9530N
▶ Equivalent	Part Number	IRF9530N

EV is the abbreviation of name EVVO

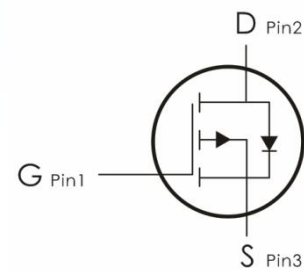
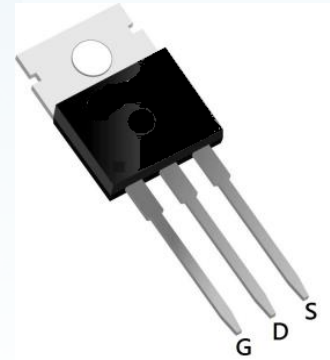
P-Channel MOSFET

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) $V_{DS}=-100V, I_D=-20A, R_{DS(ON)}<90m\ \Omega$ @ $V_{GS}=-10V$
- 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: ($T_C=25^\circ\text{C}$ 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- $T_C=25^\circ\text{C}$	-20	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	-14	A
I_{DM}	Pulsed Drain Current ¹	-85	A
P_D	Total Power Dissipation	58	W
E_{AS}	Single Pulsed Avalanche Energy	177	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

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Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.15	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	62	$^{\circ}\text{C}/\text{W}$

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	$V_{GS}=0\text{V}, I_D=-250\ \mu\text{A}$	-100	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0\text{V}, V_{DS}=-100\text{V}$	---	---	-50	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{A}$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\ \mu\text{A}$	-1.2	-1.7	-2.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=-10\text{V}, I_D=-10\text{A}$	---	78	90	m Ω
		$V_{GS}=-4.5\text{V}, I_D=-8\text{A}$	---	86	110	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-20\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$	---	3020	---	pF
C_{oss}	Output Capacitance		---	120	---	
C_{rss}	Reverse Transfer Capacitance		---	73	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=-50\text{V}, I_D=-10\text{A},$ $V_{GS}=-10\text{V}, R_G=3.3\ \Omega$	---	11	---	ns
t_r	Rise Time ^{2,3}		---	27	---	ns
$t_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	78	---	ns
t_f	Fall Time ^{2,3}		---	53	---	ns
Q_g	Total Gate Charge ^{2,3}	$V_{GS}=-10\text{V}, V_{DS}=-50\text{V},$	---	44	---	nC

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Q_{gs}	Gate-Source Charge ^{2,3}	I _D =-20A	---	9	---	nC
Q_{gd}	Gate-Drain "Miller" Charge ^{2,3}		---	5.5	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Drain Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A	---	---	-1.2	V
I_S	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	-20	A
T_{rr}	Reverse Recovery Time	I _F =-8A , di/dt=-100A/μs , T _J =25°C	---	38.7	---	nS
Q_{rr}	Reverse Recovery Charge		---	22.4	---	nC

Notes:

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=-25V, V_{GS}=-10V, L=0.88mH, I_{AS}=-18.9A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

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

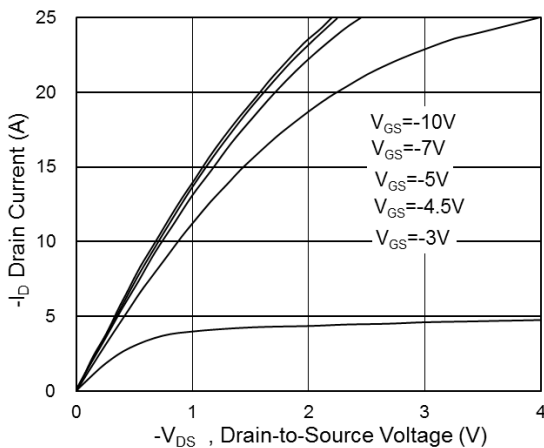


Fig.1 Typical Output Characteristics

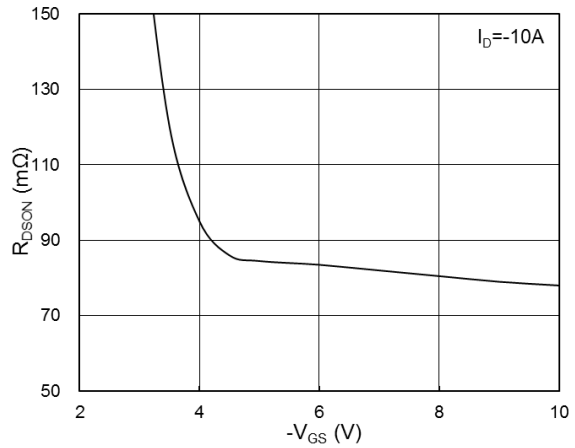


Fig.2 On-Resistance vs G-S Voltage

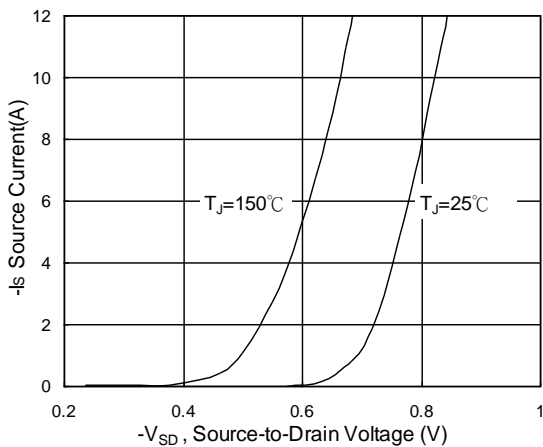


Fig.3 Typical S-D Diode Forward Voltage

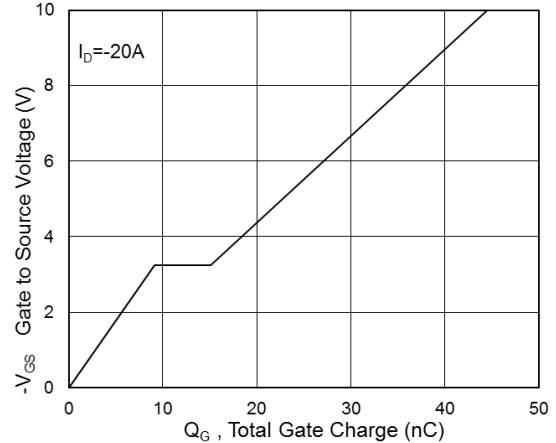


Fig.4 Gate-Charge Characteristics

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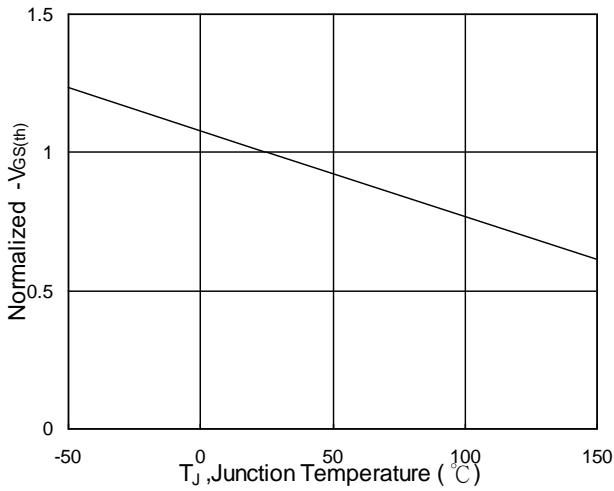


Fig.5 Normalized $V_{GS(th)}$ vs T_J

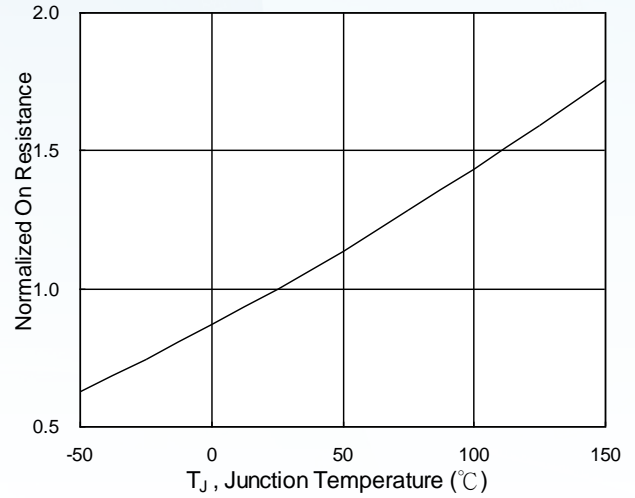


Fig.6 Normalized $R_{DS(on)}$ vs T_J

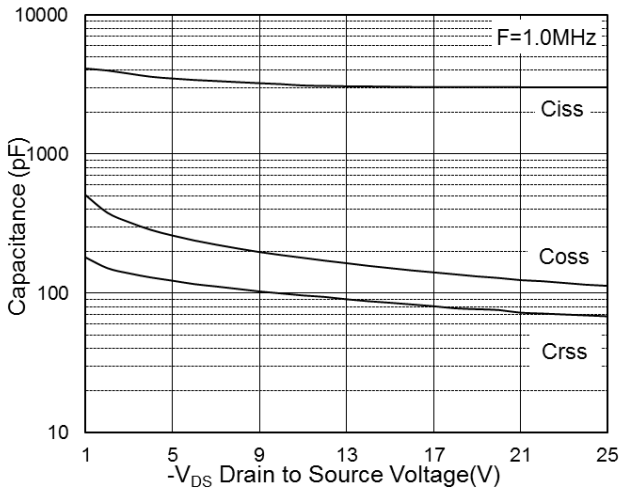


Fig.7 Capacitance

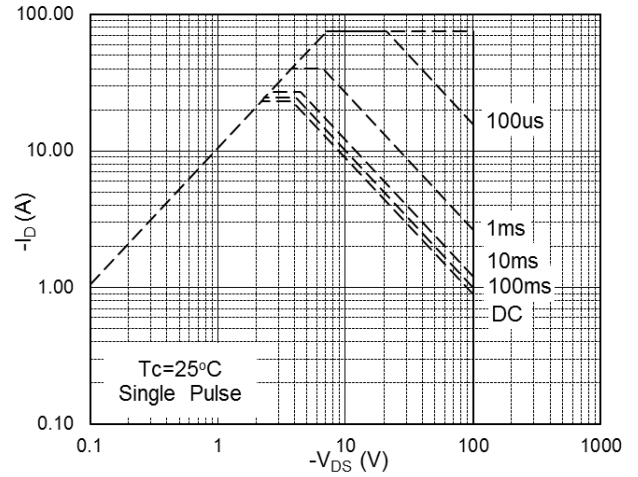


Fig.8 Safe Operating Area

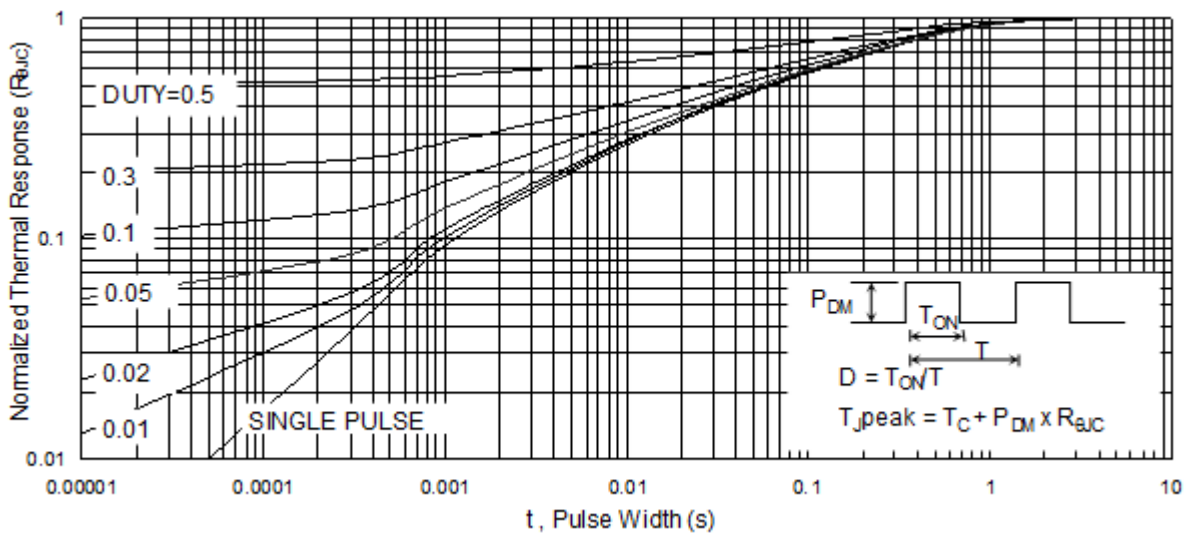


Fig.9 Normalized Maximum Transient Thermal Impedance

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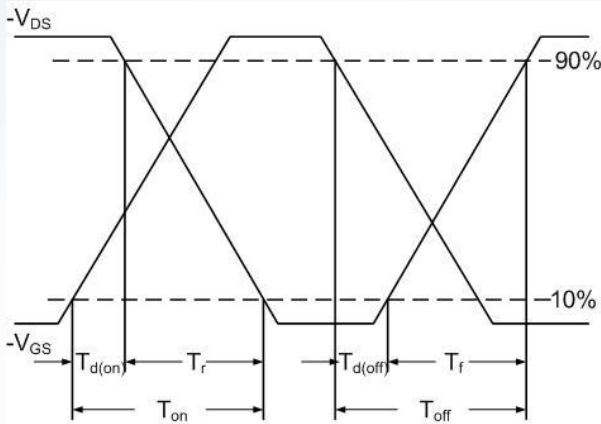


Fig.10 Switching Time Waveform

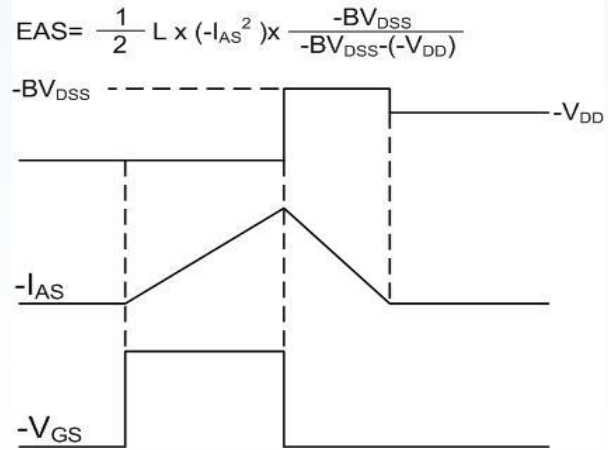
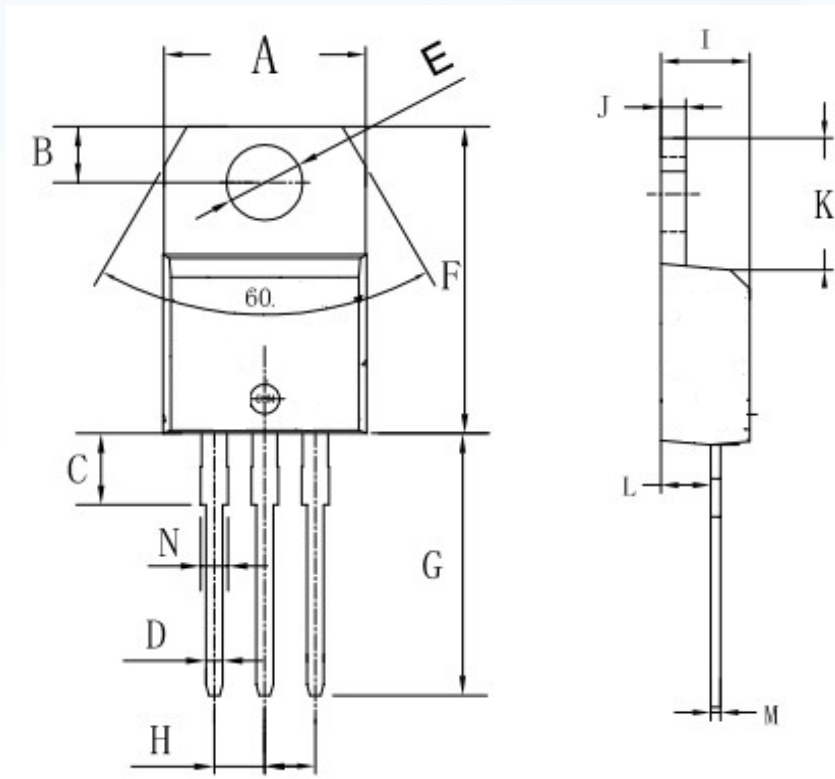


Fig.11 Unclamped Inductive Waveform

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Package Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	9.8	10.4	0.385	0.409
B	2.65	3.1	0.104	0.122
C	2.8	4.2	0.110	0.165
D	0.7	0.92	0.027	0.036
E	3.75	3.95	0.147	0.155
F	14.8	16.1	0.582	0.633
G	13.05	13.6	0.513	0.535
H	2.4	2.7	0.094	0.106
I	4.38	4.61	0.172	0.181
J	1.15	1.36	0.045	0.053
K	5.85	6.82	0.230	0.268
L	2.35	2.75	0.092	0.108
M	0.35	0.65	0.013	0.025
N	1.18	1.42	0.046	0.055

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