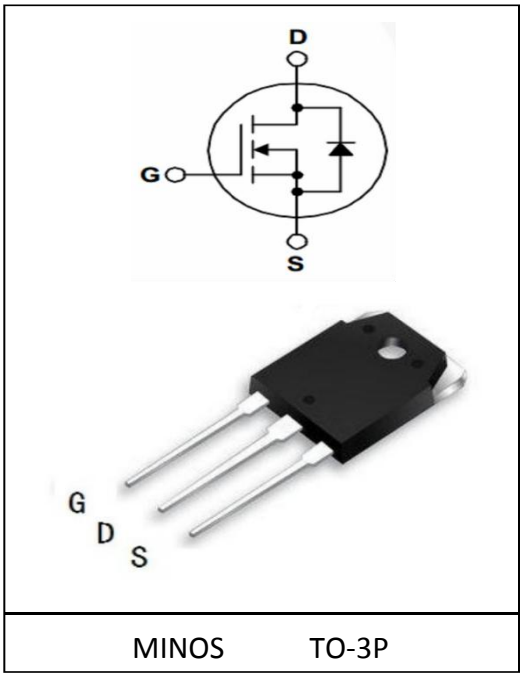
迈诺斯科技

MD9N90

Silicon N-Channel Power MOSFET

Description

The MD9N90 uses advanced technology and design to provide excellent $R_{DS(ON)}$. It can be used in a wide variety of applications.



MINOS TO-3P

General Features

① V_{DS}=900V, R_{dson}<1.15mΩ @V_{GS}=10V, I_D=9A (Typ:0.97Ω)
② Low ON Resistance
③ Low Reverse transfer capacitances
④ 100% Single Pulse avalanche energy Test

Application

① Power switching application
② Adapter and charger

Package Marking And Ordering Information：

Ordering Codes	Package	Product Code	Packing
MD9N90	TO-3P	MD9N90	Tube

Electrical Characteristics @ Ta=25℃ (unless otherwise specified)

Limited Parameters:

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-to-Source Breakdown Voltage	900	V
I_D	Drain Current (continuous) at Tc=25℃	9	A
I_{DM}	Drain Current (Pulsed)	36	A
V_{GS}	Gate to Source Voltage	±30	V
P_{tot}	Total Dissipation at Tc=25℃	350	W
T_j	Max. Operating Junction Temperature	175	℃
Eas	Single Pulse Avalanche Energy	960	mJ

Electrical Parameters:

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{DS}	Drain-source Voltage	V_{GS}=0V, I_D=250μA	900			V
$R_{DS(on)}$	Static Drain-to-Source on-Resistance	V_{GS}=10V, I_D=4.5A		0.97	1.15	Ω
$V_{GS(th)}$	Gated Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	3.0	3.95	5.0	V
I_{DSS}	Drain to Source leakeage Current	V_{DS}=900V, V_{GS} = 0V			1.0	μA
$I_{GSS(F)}$	Gated to Source Forward Leakage	V_{GS} = +30V			100	nA
$I_{GSS(R)}$	Gated to Source Reverse Leakage	V_{GS} = -30V			-100	nA
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, f=1.0MHZ		2530		pF
C_{oss}	Output Capacitance			215		pF
C_{rss}	Reverse Transfer Capacitance			23		pF

Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=450V,I_D=9A, R_G=25 Ω		60		nS
t_r	Turn-on Rise Time			130		nS
$t_{d(off)}$	Turn-off Delay Time			130		nS
t_f	Turn-off Fall Time			85		nS
Q_g	Total Gate Charge	V_{DS}=720V I_D=9A V_{GS}=10V		60		nC
Q_{gs}	Gate-Source Charge			13		nC
Q_{gd}	Gate-Drain Charge			25		nC

Source-Drain Diode Characteristics

Symbol	Paramet	Test Conditions	Min	Typ	Max	Unit
I_{SD}	S-D Current(Body Diode)				9	A
I_{SDM}	Pulsed S-D Current(Body Diode)				36	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_{DS}=9A			1.5	V
t_{rr}	Reverse Recovery Time	T_J=25℃,I_S=9A di/dt=100A/us			1000	nS
Q_{rr}	Reverse Recovery Charge				17.0	μC
	*Pulse Test: Pulse Width <= 300μs, Duty Cycle< =2%					

Symbol	Parameter	Typ	Units
$R_{\theta JC}$	Junction-to-Case	0.42	℃/W

Typical Performance Characteristics

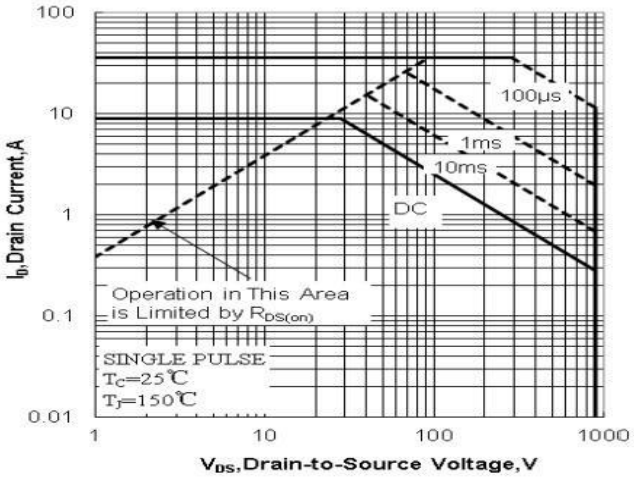


Figure 1 Maximum Forward Bias Safe Operating Area

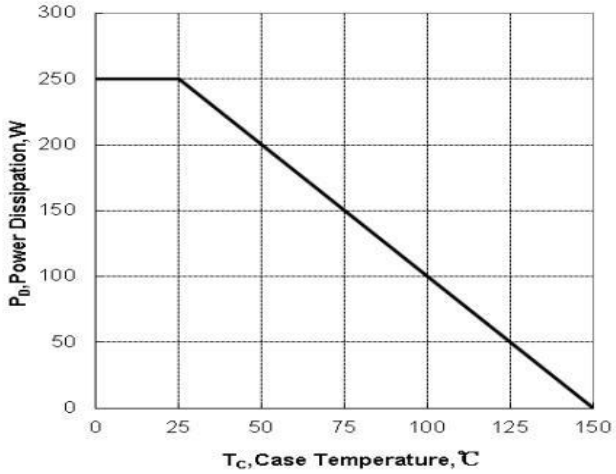


Figure 2 Maximum Power dissipation vs Case Temperatu

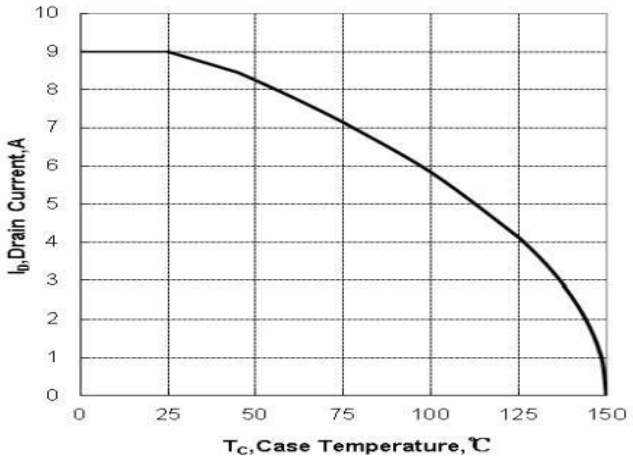


Figure 3 Maximum Continuous Drain Current vs Case Temperature

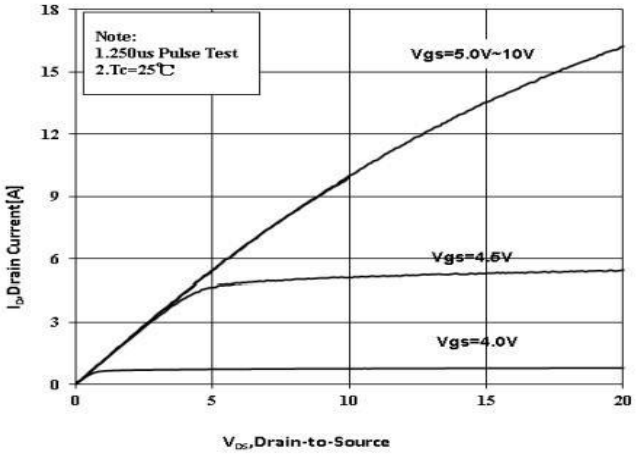


Figure 4 Typical Output Characteristics

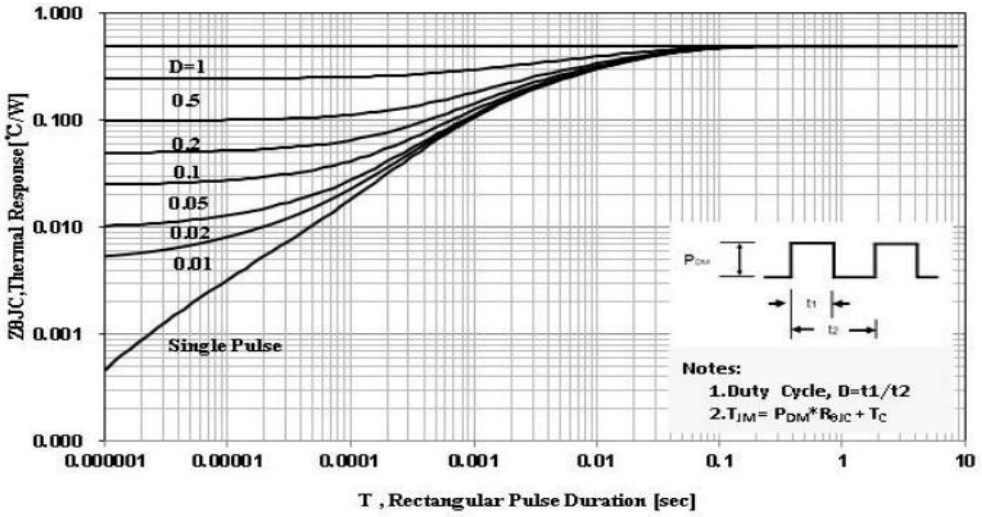


Figure 5 Maximum Effective Thermal Impedance , Junction to Case

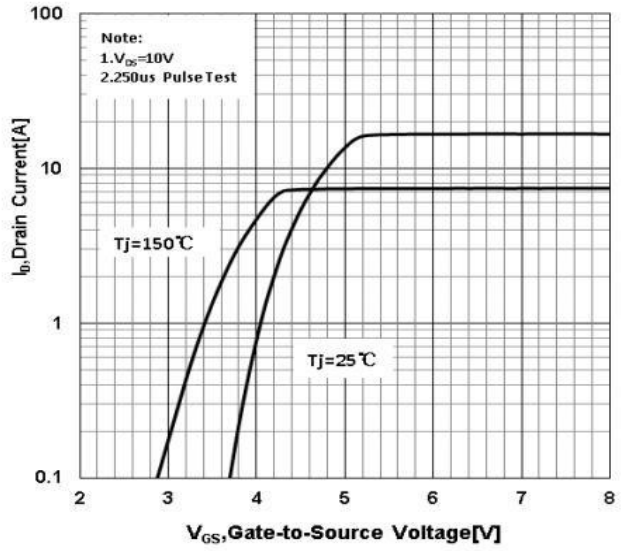


Figure 6 Typical Transfer Characteristics

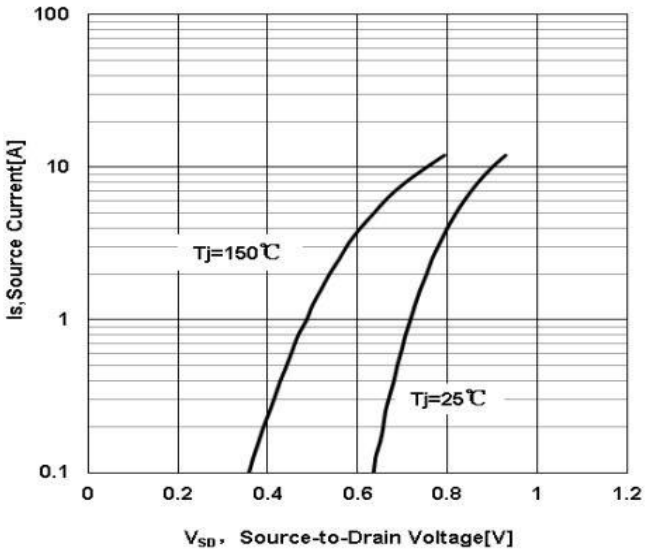


Figure 7 Typical Body Diode Transfer Characteristics

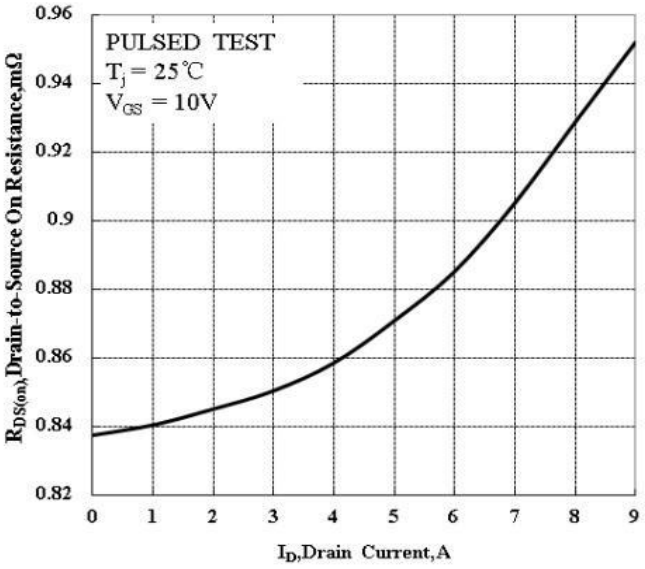


Figure 8 Typical Drain to Source ON Resistance vs Drain Current

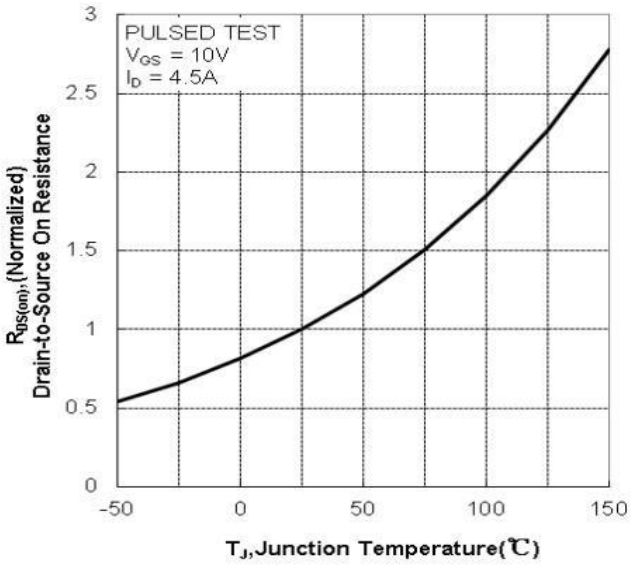


Figure 9 Typical Drian to Source on Resistance vs Junction Temperature

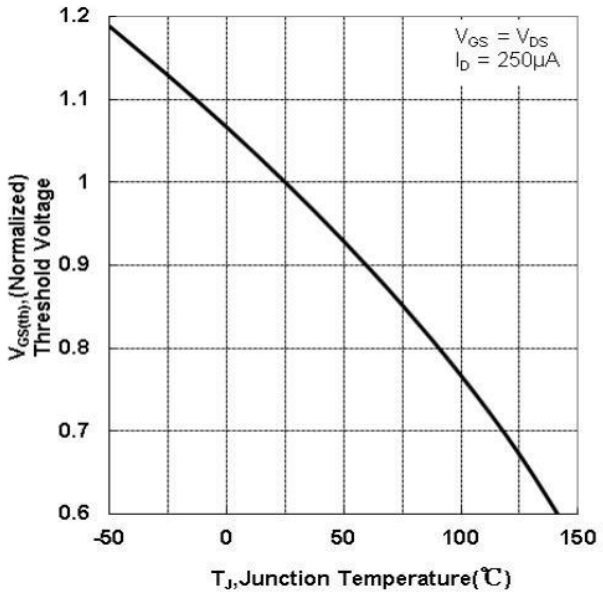


Figure 10 Typical Theshold Voltage vs Junction Temperature

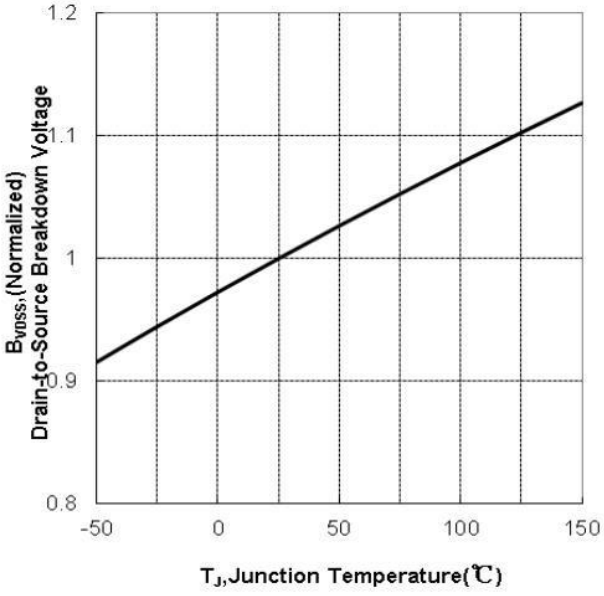


Figure 11 Typical Breakdown Voltage vs Junction Temperature

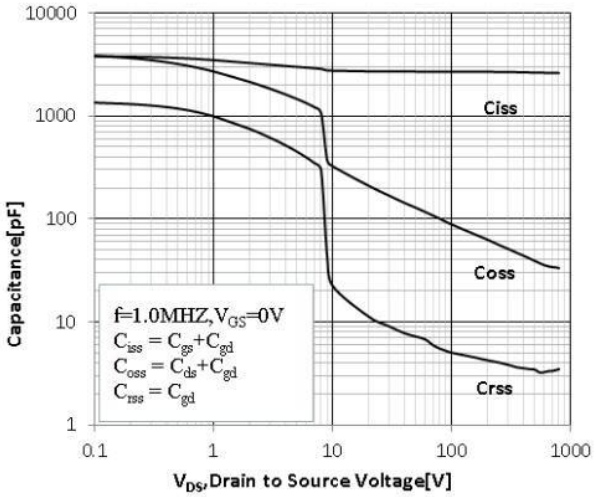


Figure 12 Typical Capacitance vs Drain to Source Voltage

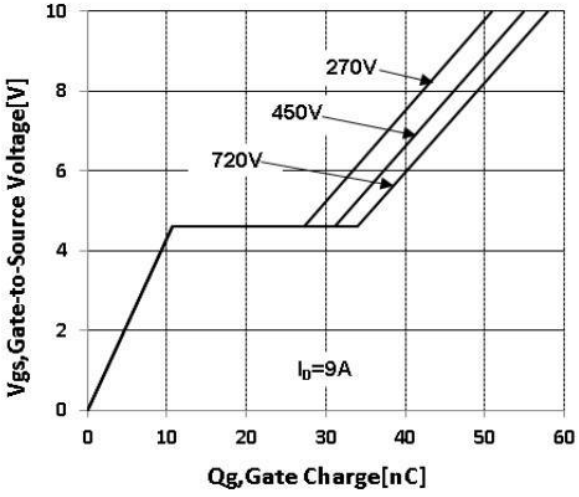
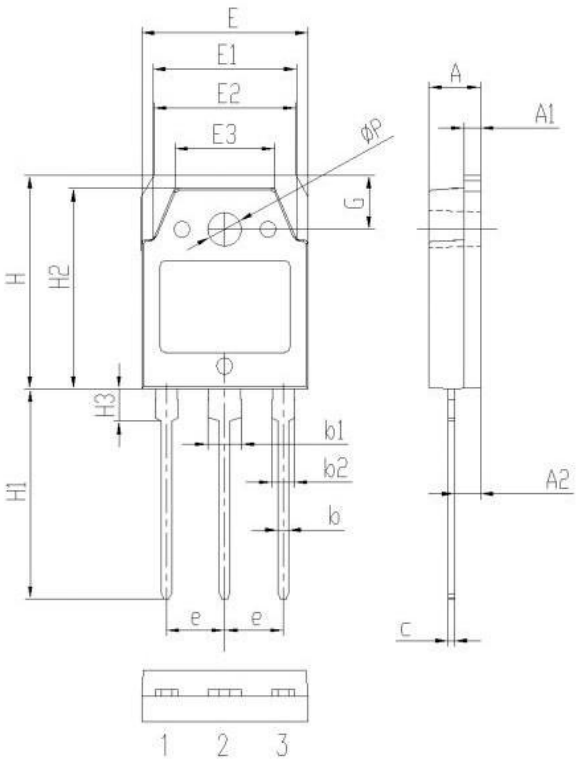


Figure 13 Typical Gate Charge vs Gate to Source Voltage

Package Information

TO-3P PACKAGE



Symbol	Dimensions(millimeters)	
	Min.	Max.
A	4.60	5.00
A1	1.30	1.70
A2	2.20	2.60
b	0.80	1.20
b1	2.90	3.30
b2	1.90	2.30
c	0.40	0.80
e	5.25	5.65
E	15.3	15.7
E1	13.2	13.6
E2	13.1	13.5
E3	9.10	9.50
H	19.7	20.1
H1	19.1	20.1
H2	18.3	18.7
H3	2.80	3.20
G	4.80	5.20
ΦP	3.00	3.40

NOTE:

1. Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. Please do not exceed the absolute maximum ratings of the device when circuit designing.
2. When installing the heat sink, please pay attention to the torsional moment and the smoothness of the heat sink.
3. MOSFETs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.
4. Shenzhen Minos reserves the right to make changes in this specification sheet and is subject to change withoutprior notice.

CONTACT:

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