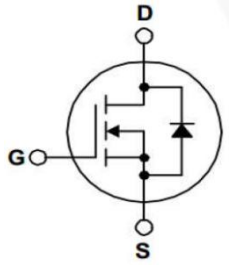
迈诺斯科技

MPG140N15P

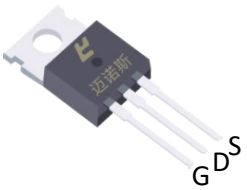
150V N-Channel Power MOSFET

Description

MPG140N15P uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications.



Schematic diagram



TO-220

KEY CHARACTERISTICS

① V_{DS}=150V,I_D= 140A $R_{DS(ON)}$ <11.8mΩ @V_{GS}=10V
② High power and current handing capability
③ Lead free product is acquired
④ 100% avalanche tested
⑤ RoHS product

APPLICATIONS

① Load switch
② Power management

ORDERING INFORMATION

Ordering Codes	Package	Product Code	Packing
MPG140N15-P	TO-220	MPG140N15P	Tube

ABSOLUTE RATINGS（at TC = 25°C, unless otherwise specified）

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	150	V
I_D	Continuous Drain Current	140	A
	Continuous Drain Current T_C = 100 °C	78	A
I_{DM}	Pulsed Drain Current(Note1)	400	A
P_D	Power Dissipation	330	W
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy(Note2)	361	mJ
T_J， T_{stg}	Operating Junction and Storage Temperature Range	175，-55 to 175	℃
T_L	Maximum Temperature for Soldering	300	℃

Thermal characteristics (No FullPAK)

Symbol	Parameter	Rating	Units
$R_{\theta JC}$	Junction-to-Case	0.45	℃/W

Electrical Characteristics（at TC = 25°C, unless otherwise specified）

OFF Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	150	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=150V, V_{GS}= 0V, T_j= 25℃	--	--	1	μA
I_{GSS}	Gate to Source Forward Leakage	V_{GS} =±20V	--	--	±100	nA

ON Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On- Resistance	V_{GS}=10V, I_D=30A(Note3)	--	10	11.8	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS} = VGS, I_D =250μA(Note2)	2	3	4	V

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
R_g	Gate resistance	f = 1.0MHz	--	1.5	--	Ω
C_{iss}	Input Capacitance	V_{GS}= 0V V_{DS} = 25V f = 1.0MHz	--	6230	--	pF
C_{oss}	Output Capacitance		--	590	--	
C_{rss}	Reverse Transfer Capacitance		--	330	--	

Switching Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D =62A V_{DD} = 98V V_{GS} = 10V R_G =2.2Ω	--	18	--	ns
t_r	Rise Time		--	72	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	40	--	
t_f	Fall Time		--	39	--	
Q_g	Total Gate Charge	I_D =62A V_{DS} =140V V_{GS} = 10V	--	152	--	nC
Q_{gs}	Gate to Source Charge		--	42	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	70	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)	T_C=25 °C	--	--	140	A
V_{SD}	Diode Forward Voltage	I_S=30A, V_{GS}=0V(Note3)	--	--	1.2	V

Note1: Pulse width limited by maximum junction temperature

Note2: Eas condition： Vg=10V,L=0.5mH, Vds=50V, Start TJ=25℃, Ias=38A Note3: Pulse width tp≤300μs, δ≤2%

Characteristics Curves

Figure 1 Output Characteristics

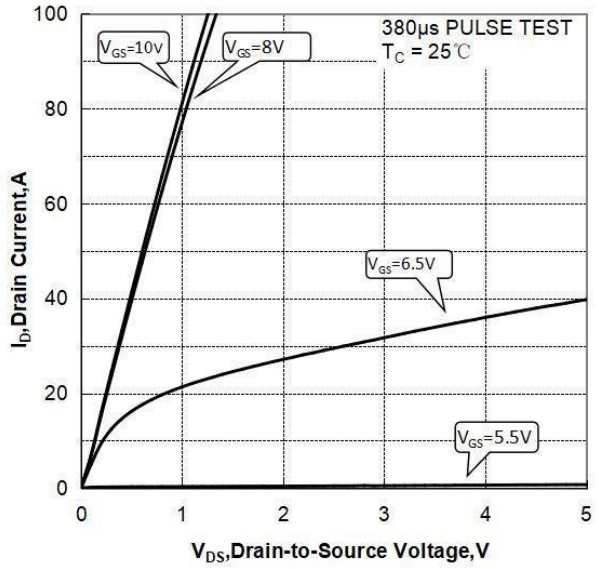


Figure 2 Transfer Characteristics

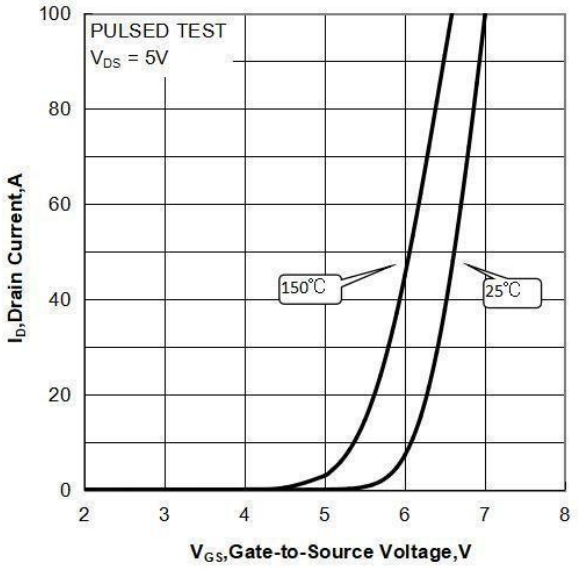


Figure 3 On-Resistance vs. I_D

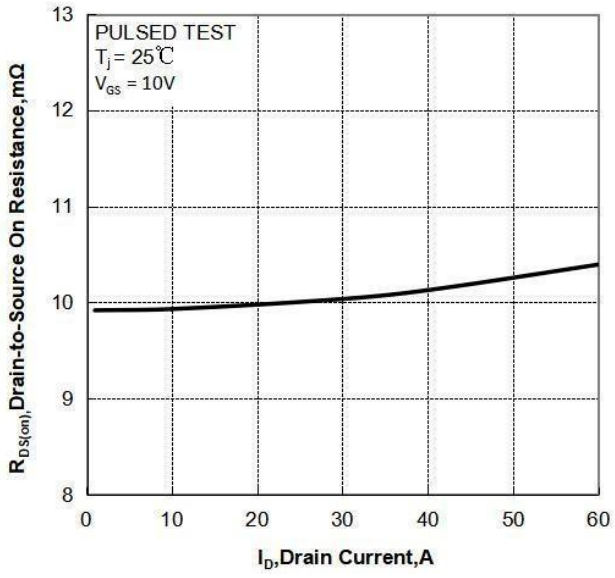


Figure 4 On-Resistance vs. Junction Temperature

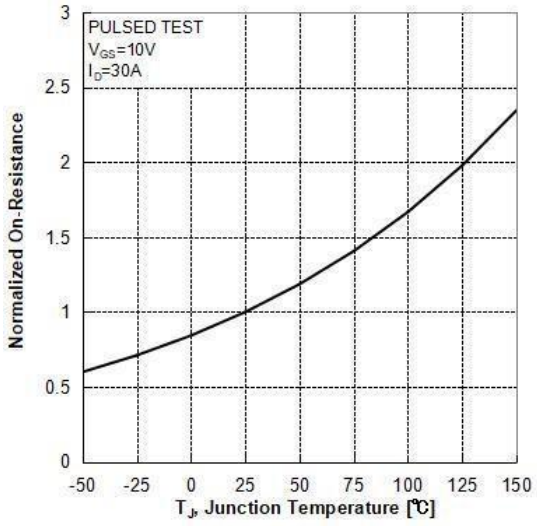


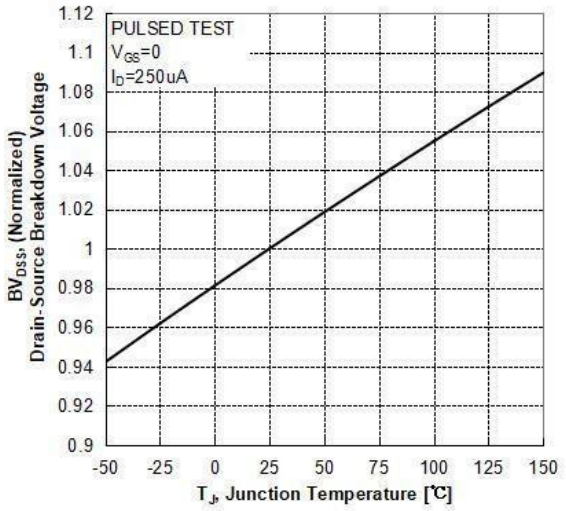
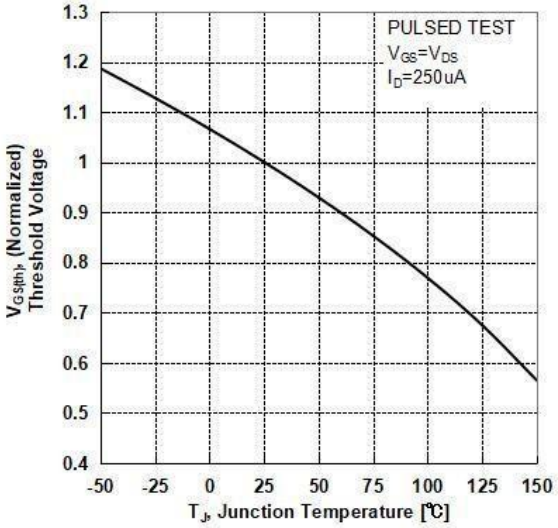
Figure 5 BV vs Junction Temperature	Figure 6 Vth vs Junction Temperature
	

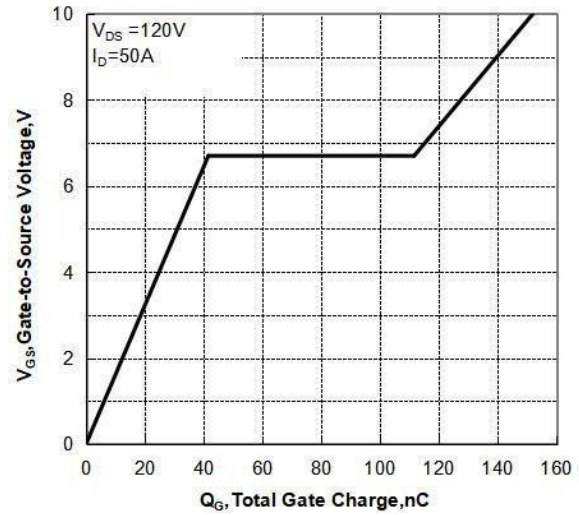
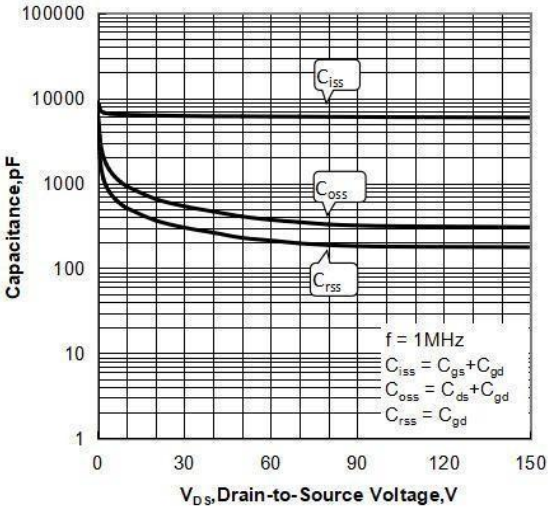
Figure 7 Gate-Charge Characteristics	Figure 8 Capacitance Characteristics
	

Figure 9 Body Diode Forward Voltage

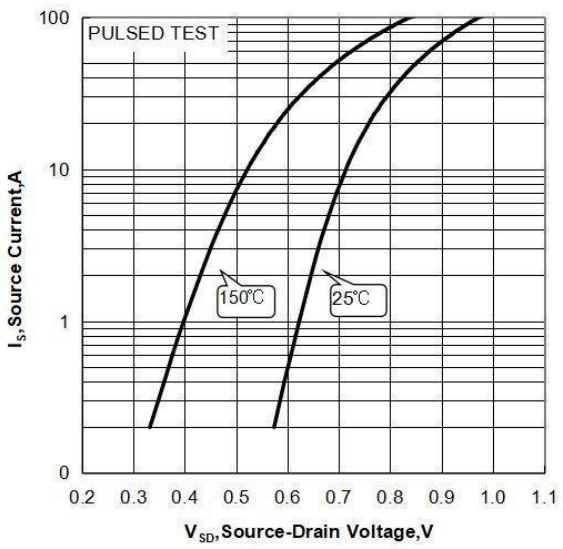


Figure 10 Maximum Safe Operating Area

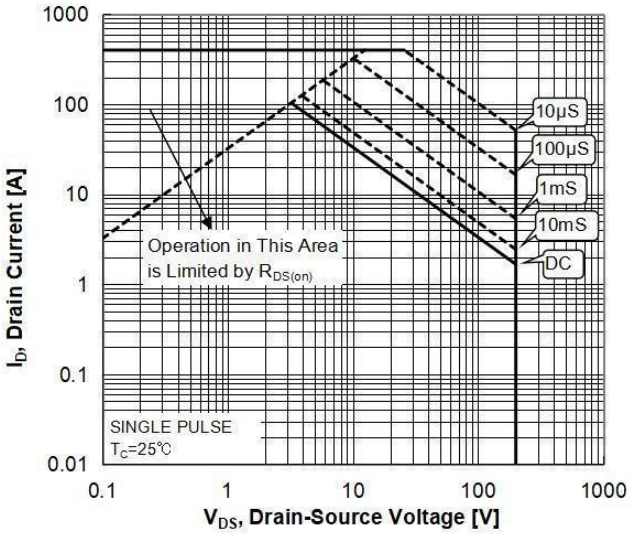
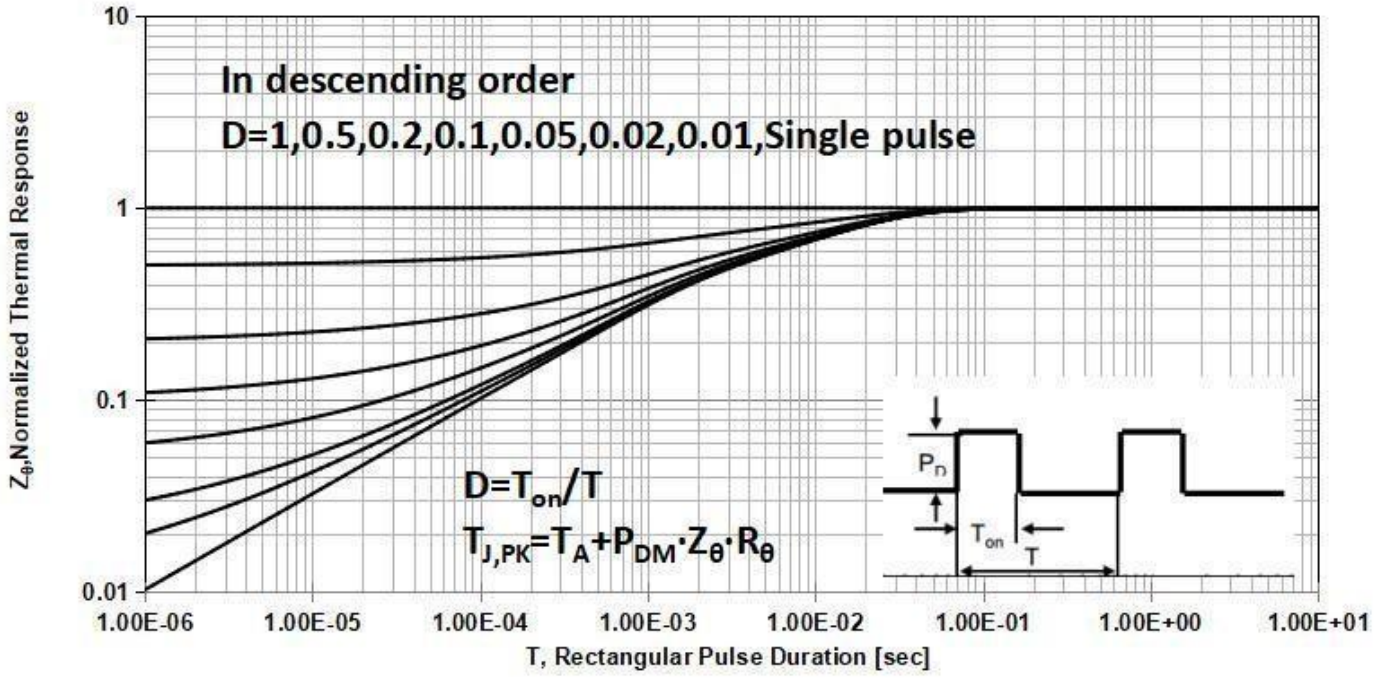
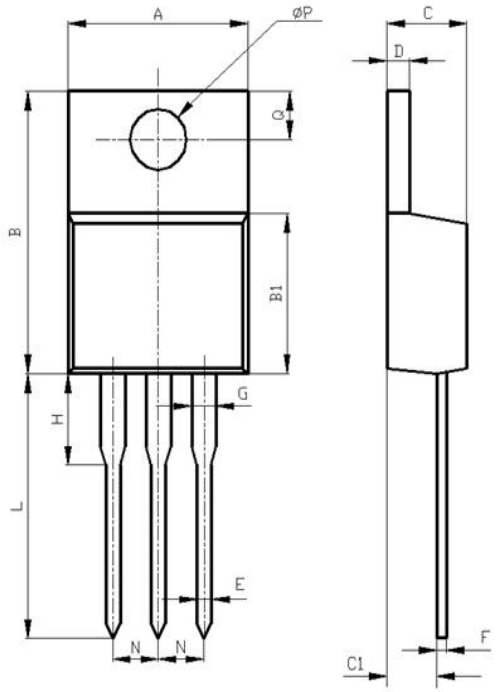


Figure 11 Transient Thermal Impedance



Package Description



Items	Values(mm)	
	MIN	MAX
A	9.60	10.6
B	15.0	16.0
B1	8.90	9.50
C	4.30	4.80
C1	2.30	3.10
D	1.20	1.40
E	0.70	0.90
F	0.30	0.60
G	1.17	1.37
H	2.70	3.80
L	12.6	14.8
N	2.34	2.74
Q	2.40	3.00
ΦP	3.50	3.90

TO-220 Package

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 without prior notice.

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