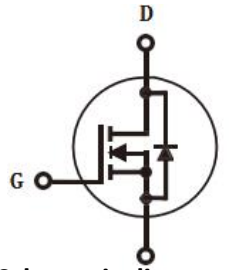
迈诺斯科技

MPF13N50

Silicon N-Channel Power MOSFET

Description

The MPF13N50 uses advanced technology and design to provide excellent $R_{DS(ON)}$. It can be used in a wide variety of applications.



Schematic diagram

TO-220F

General Features

①V_{DS}=500V,I_D=13A

②Low ON Resistance

③Low Reverse transfer capacitances

④100% Single Pulse avalanche energy Test

Application

①Power switching application

②Adapter and charger

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

Package Marking And Ordering Information

Ordering Codes	Package	Product Code	Packing
MPF13N50	TO-220F	MPF13N50	Tube

Absolute Maximum Ratings:

Symbol	Parameter	Value	Units
V_{DSS}	Drain-to-Source Breakdown Voltage	500	V
I_D	Drain Current (continuous) at Tc=25℃	13	A
I_{DM}	Drain Current (pulsed)	52	A
V_{GS}	Gate to Source Voltage	+/-30	V
P_{tot}	Total Dissipation at Tc=25℃	60	W
T_j	Max. Operating Junction Temperature	175	℃
E_{AS}	Single Pulse Avalanche Energy	1000	mJ

Electrical Parameters:

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{DS}	Drain-source Voltage	V_{GS}=0V, I_D=250μA	500			V
$R_{DS(on)}$	Static Drain-to-Source on-Resistance	V_{GS}=10V, I_D=6.5A		0.50	0.55	Ω
$V_{GS(th)}$	Gated Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	2.0	3.0	4.0	V
I_{DSS}	Drain to Source leakage Current	V_{DS}=500V, V_{GS} = 0V			1.0	μA
$I_{GSS(F)}$	Gated to Source Foward 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		2315		pF
C_{oss}	Output Capacitance			190		pF
C_{rss}	Reverse Transfer Capacitance			11		pF

Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=250V,I_D=13A, R_G=10Ω		28		nS
t_r	Turn-on Rise Time			21		nS
$t_{d(off)}$	Turn-off Delay Time			62		nS
t_f	Turn-off Fall Time			32		nS
Q_g	Total Gate Charge	V_{DS}=400V I_D=13A V_{GS}=10V		40		nC
Q_{gs}	Gate-Source Charge			9.2		nC
Q_{gd}	Gate-Drain Charge			14		nC

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
I_{SD}	S-D Current(Body Diode)				13	A
I_{SDM}	Pulsed S-D Current(Body Diode)				52	A
V_{SD}	Diode Forward Voltage	V_{GS} =0V, I_{DS}=13A			1.5	V
t_{rr}	Reverse Recovery Time	T_J=25℃,I_F=13A di/dt=100A/us			555	nS
Q_{rr}	Reverse Recovery Charge				4550	μC
	*Pulse Test: Pulse Width <= 300μs, Duty Cycle< =2%					

Symbol	Parameter	Typ	Units
$R_{\theta JC}$	Junction-to-case	2.0	℃/W

Typical Characteristics TJ = 25ºC, unless otherwise noted

Figure 1. Output Characteristics (TJ = 25ºC)

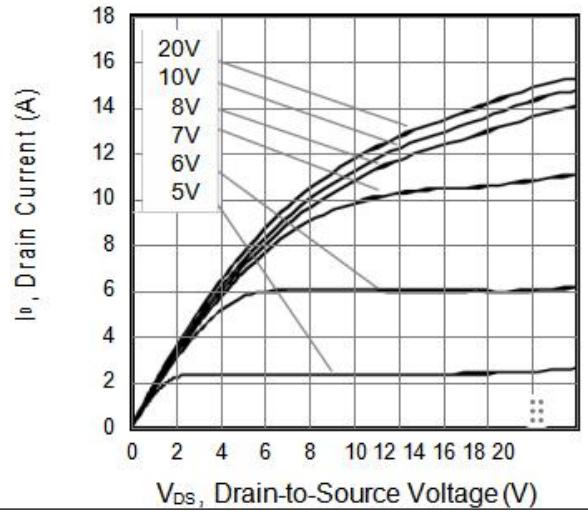


Figure 2. Body Diode Forward Voltage

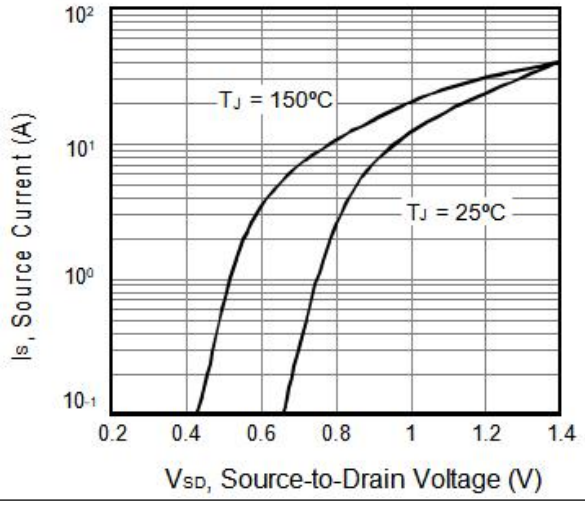


Figure 3. Drain Current vs. Temperature

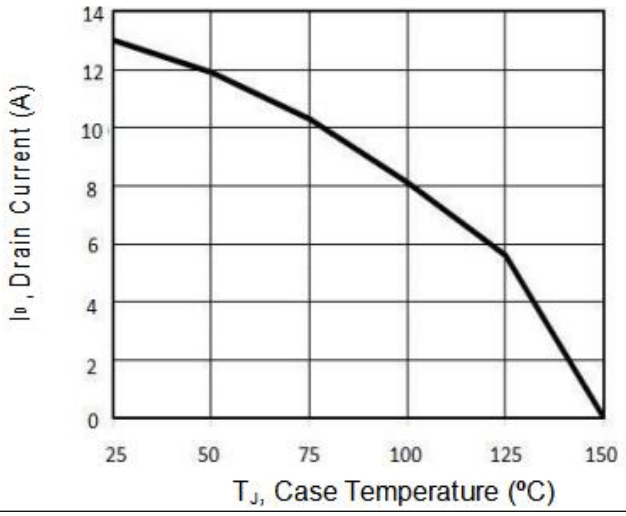


Figure 4. BVDSS Variation vs.Temperature

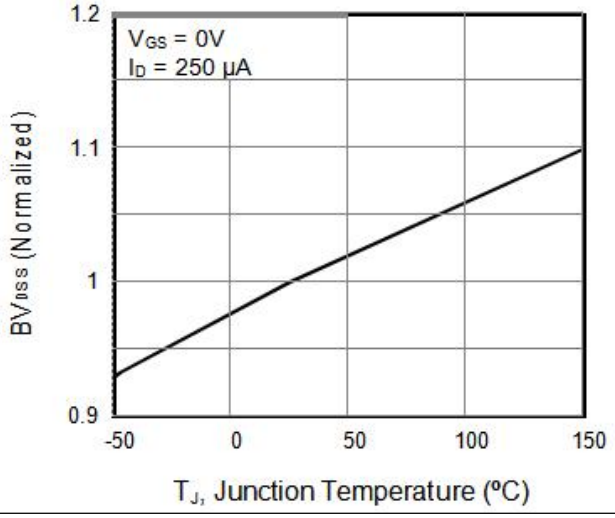


Figure 5. Transfer Characteristics

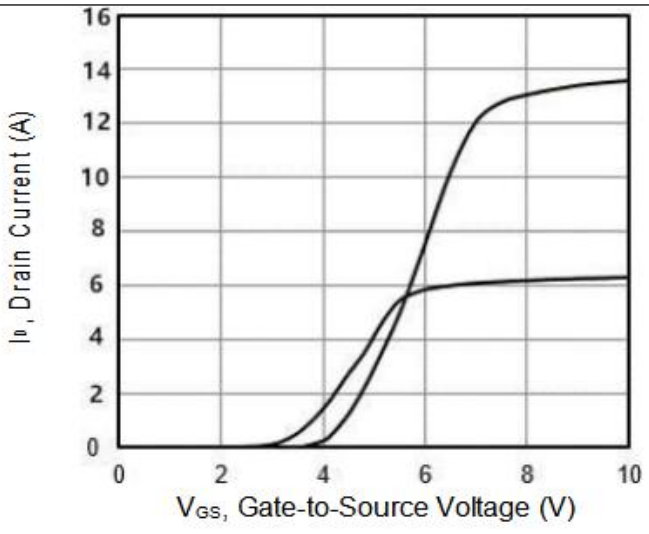
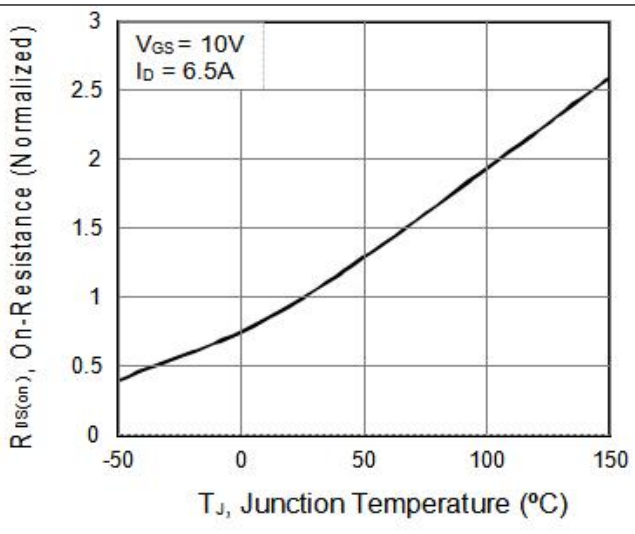


Figure 6. On-Resistance vs. Temperature



Typical Characteristics TJ = 25ºC, unless otherwise noted

Figure 7. Capacitance

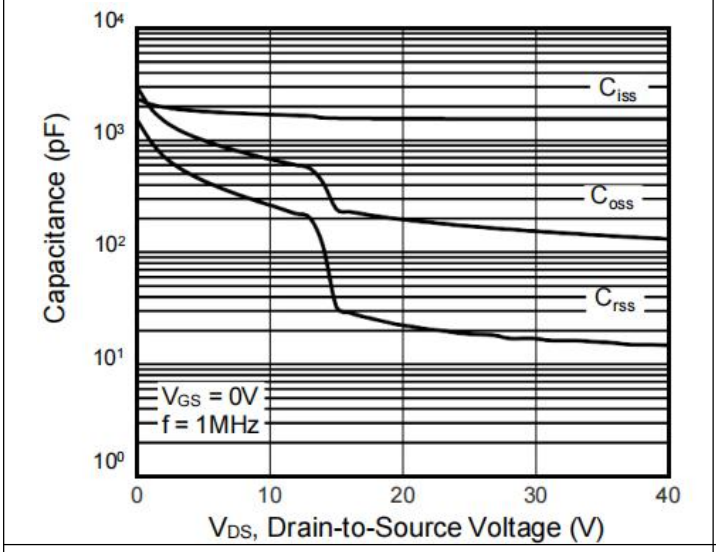


Figure 8. Gate Charge

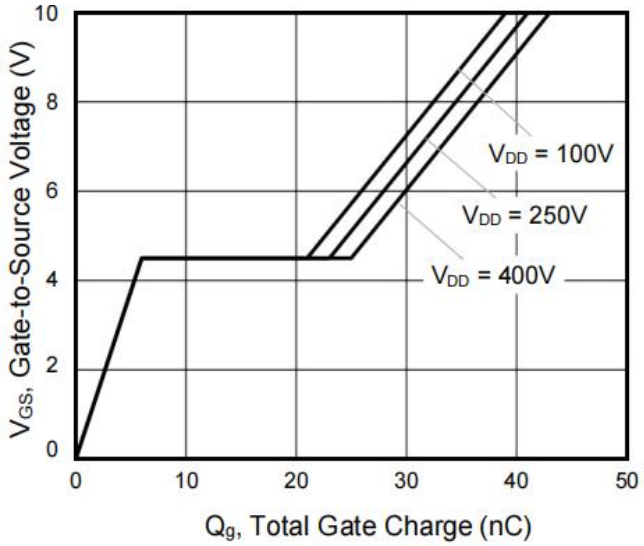


Figure 9. Transient Thermal Impedance (TO-220F)

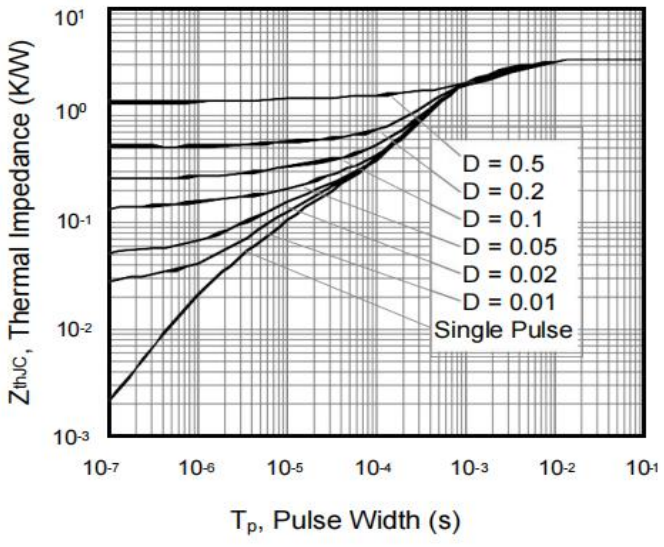
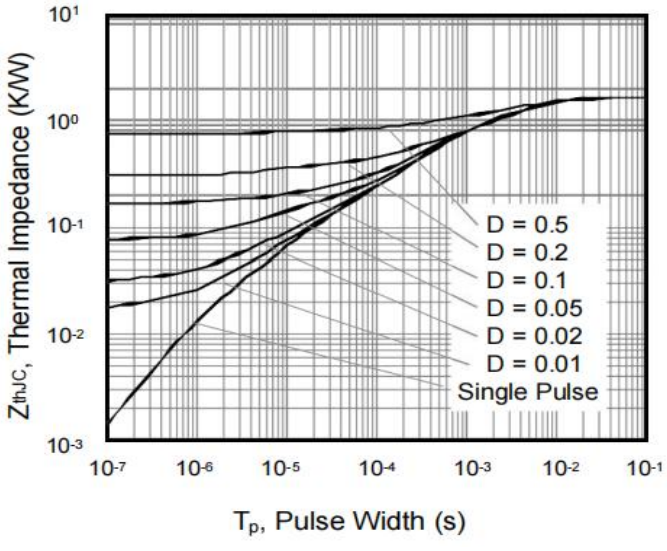
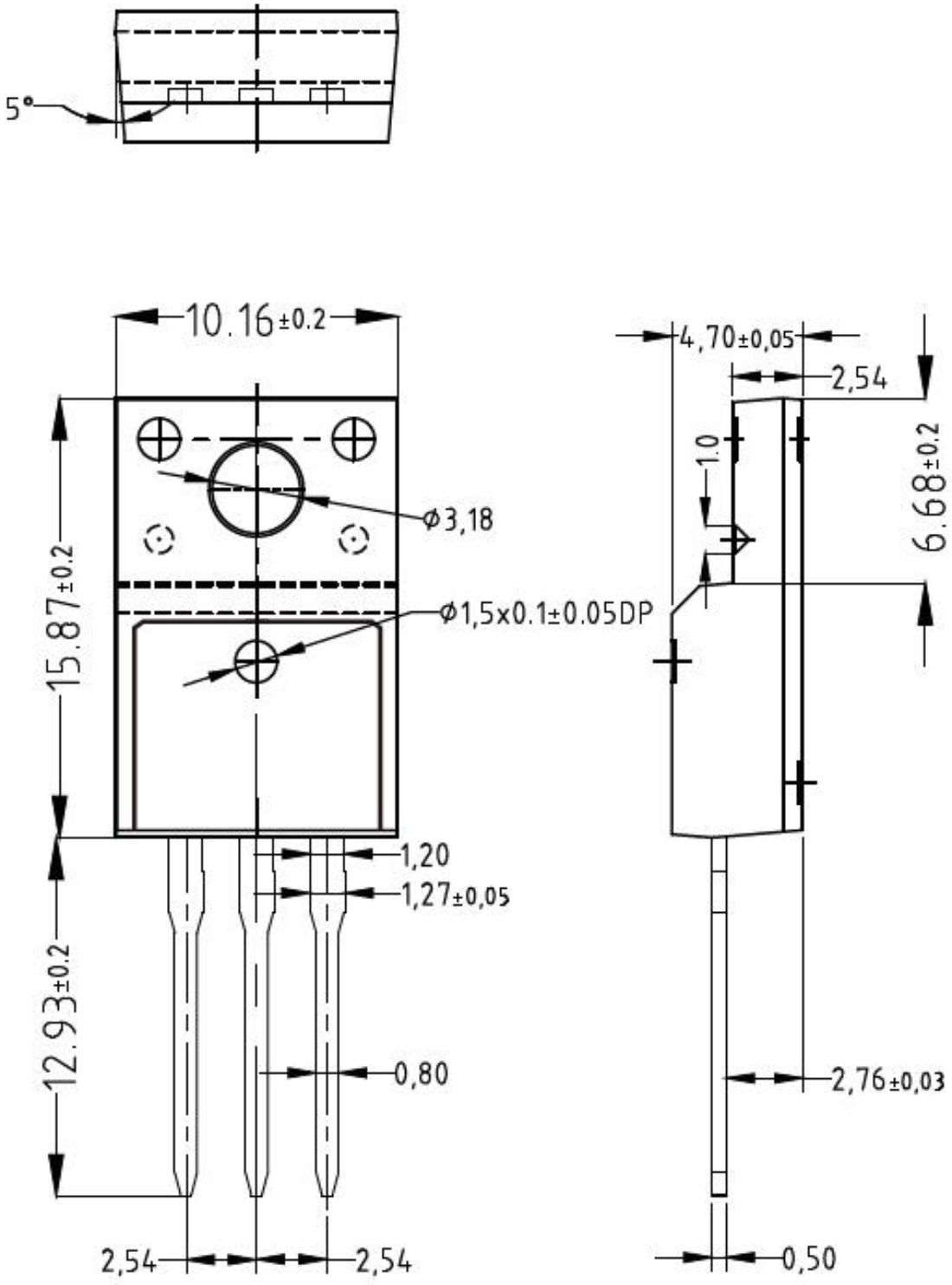


Figure 10. Transient Thermal Impedance (TO-220)



Package Information



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 withoutprior notice.

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