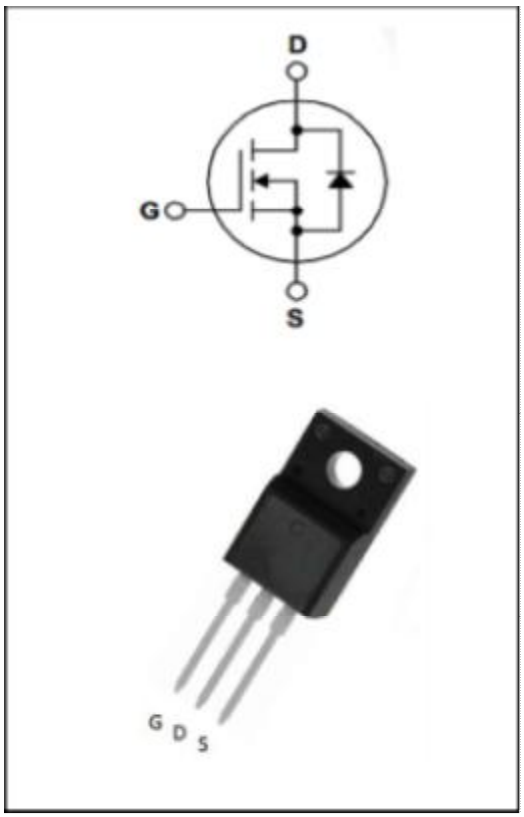
迈诺斯科技

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.



General Features

- V_{DS}=500V,I_D=13A
- Low ON Resistance
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Application

- Power switching application
- Adapter and charger

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

a) 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

b) 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 37	0.45	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

c) 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

d) 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 T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics (T_J = 25ºC)

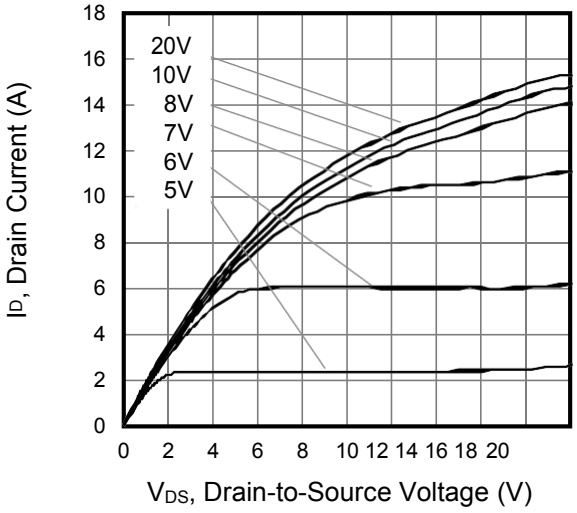


Figure 2. Body Diode Forward Voltage

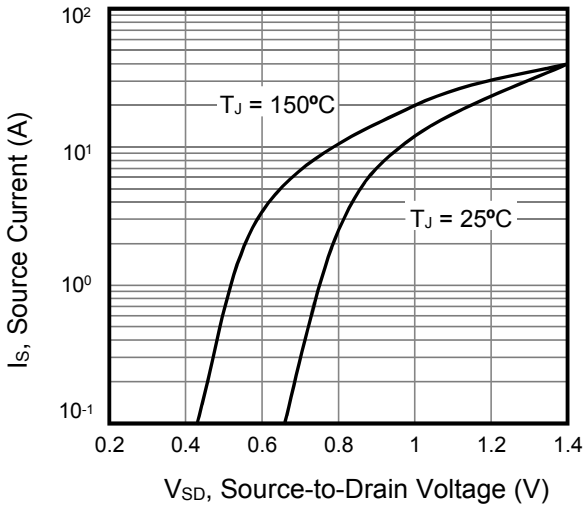


Figure 3. Drain Current vs. Temperature

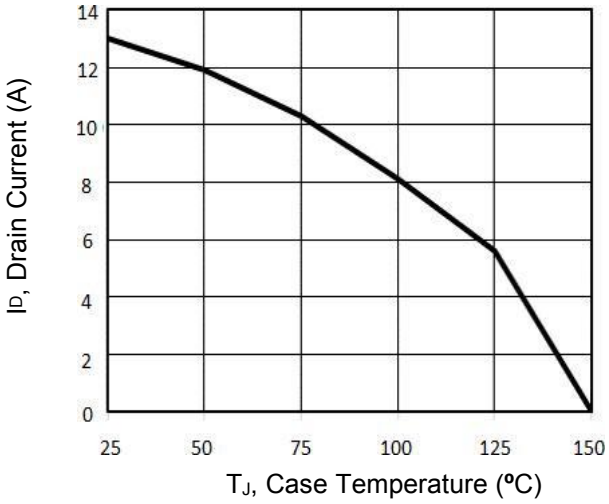


Figure 4. BV_{DSS} Variation vs. Temperature

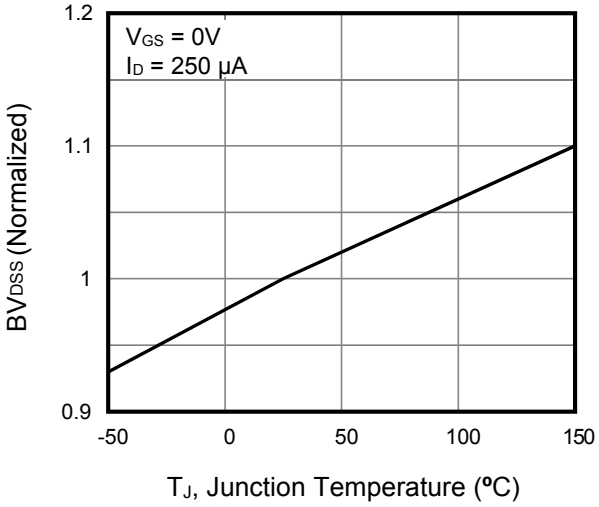


Figure 5. Transfer Characteristics

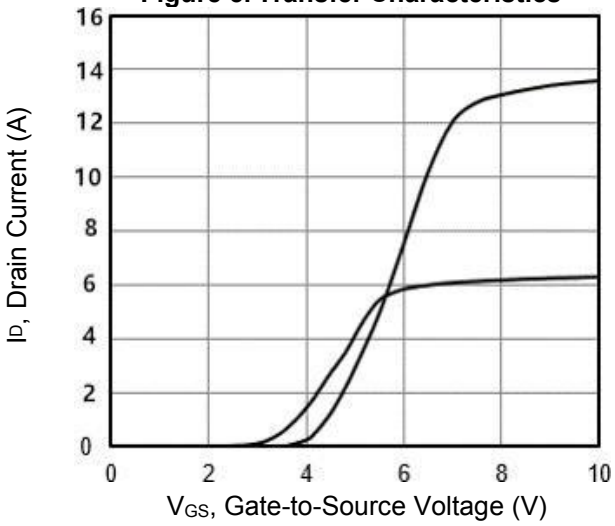
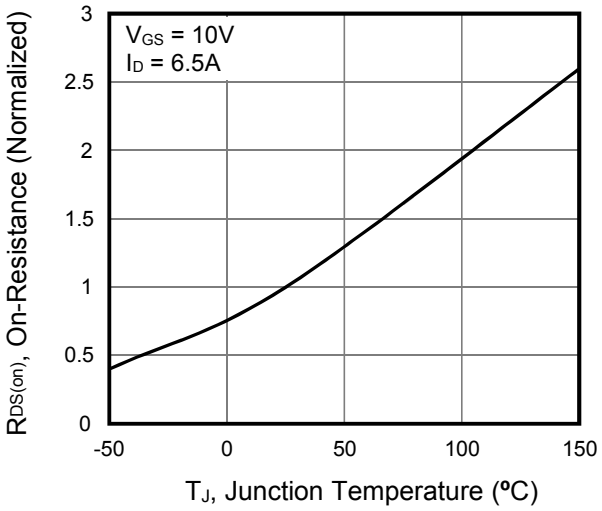


Figure 6. On-Resistance vs. Temperature



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Capacitance

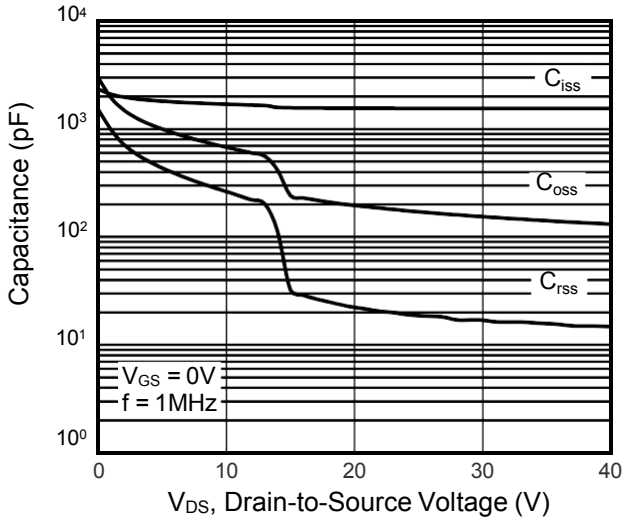


Figure 8. Gate Charge

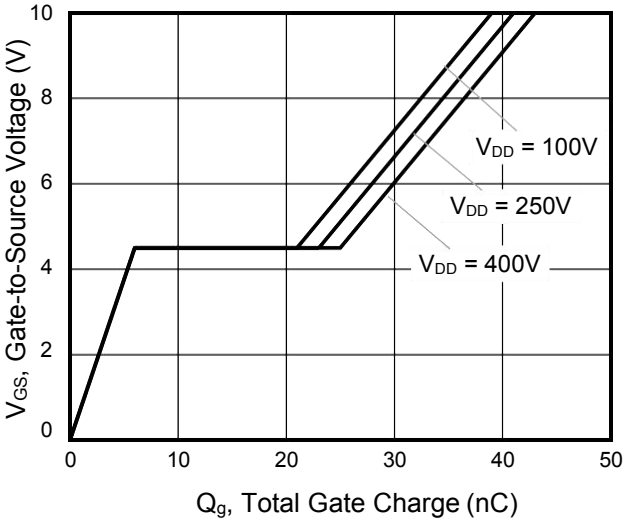


Figure 9. Transient Thermal Impedance TO-220F

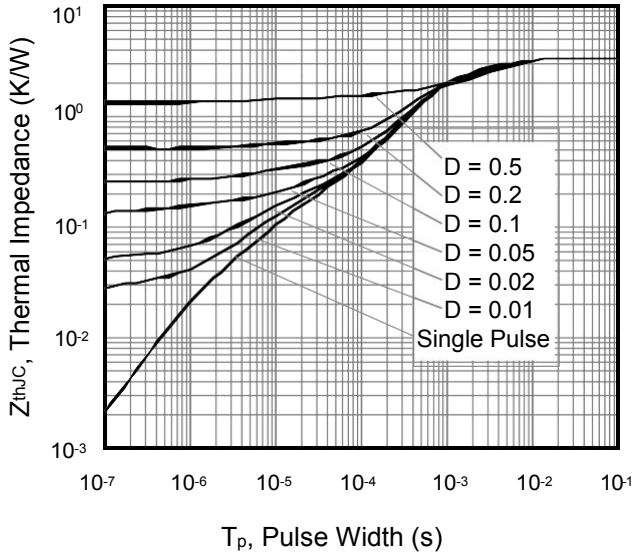
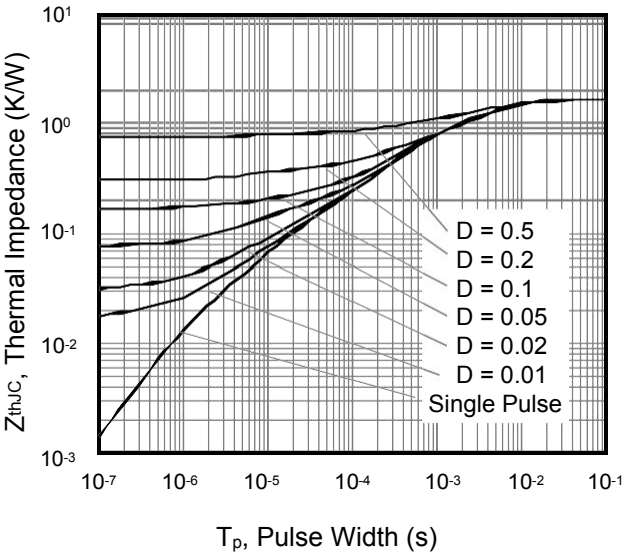


Figure 10. Transient Thermal Impedance TO-220



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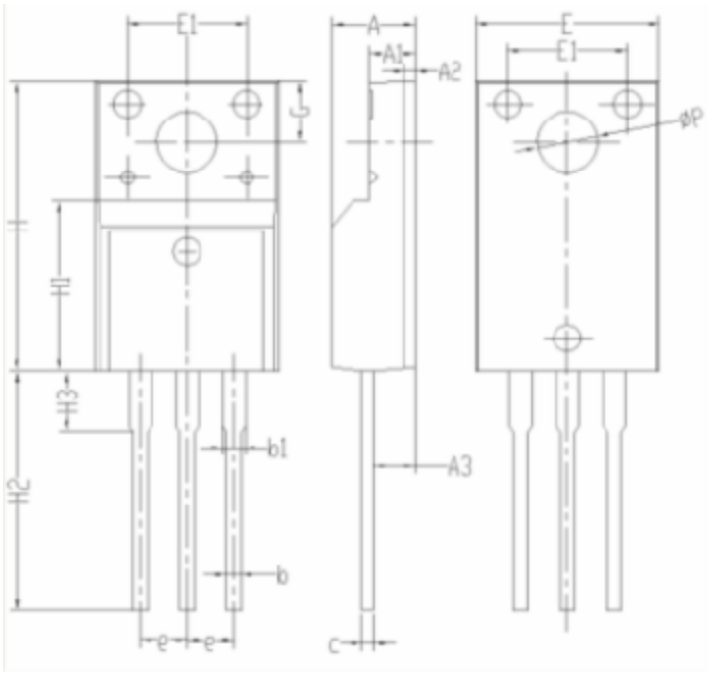
Package Information

TO-220F PACKAGE



Symool	Dimensions(millimeters)	
	Min	Max
A	4.35	4.75
A1	2.30	2.70
A2	0.40	0.80
A3	2.10	2.50
b	0.60	1.00
b1	1.00	1.40
c	0.30	0.70
e	2.30	2.70
E	9.80	10.2
E1	6.30	6.70
H	15.6	16.0
H1	8.80	9.20
H2	12.9	13.5
H3	3.10	3.50
G	3.10	3.50
ΦP	3.10	3.50