

Silicon N-Channel Power MOSFET

Description

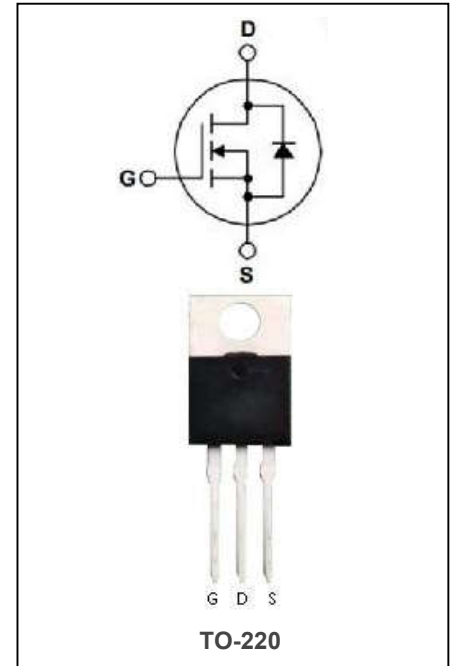
The MP13N50 uses advanced technology and design to provide excellent RDS(ON) . It can be used in a wide variety of applications.

General Features

- ① $V_{DS}=500V, I_D=13A$
- 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



Electrical Characteristics @ $T_a=25^{\circ}C$ (unless otherwise specified)

Absolute Maximum Ratings:

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



Electrical Parameters:

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{DS}	Drain-source Voltage	$V_{GS}=0V, I_D=250\mu A$	500			V
$R_{DS(on)}$	Static Drain-to-Source on-Resistance	$V_{GS}=10V, I_D=6.5A$		0.34	0.50	Ω
$V_{GS(th)}$	Gated Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.1	4.0	V
I_{DSS}	Drain to Source leakage Current	$V_{DS}=500V, V_{GS}=0V$			1.0	μA
$I_{GSS(F)}$	Gated Body Forward Leakage	$V_{GS}=+30V$			100	nA
$I_{GSS(R)}$	Gated Body 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

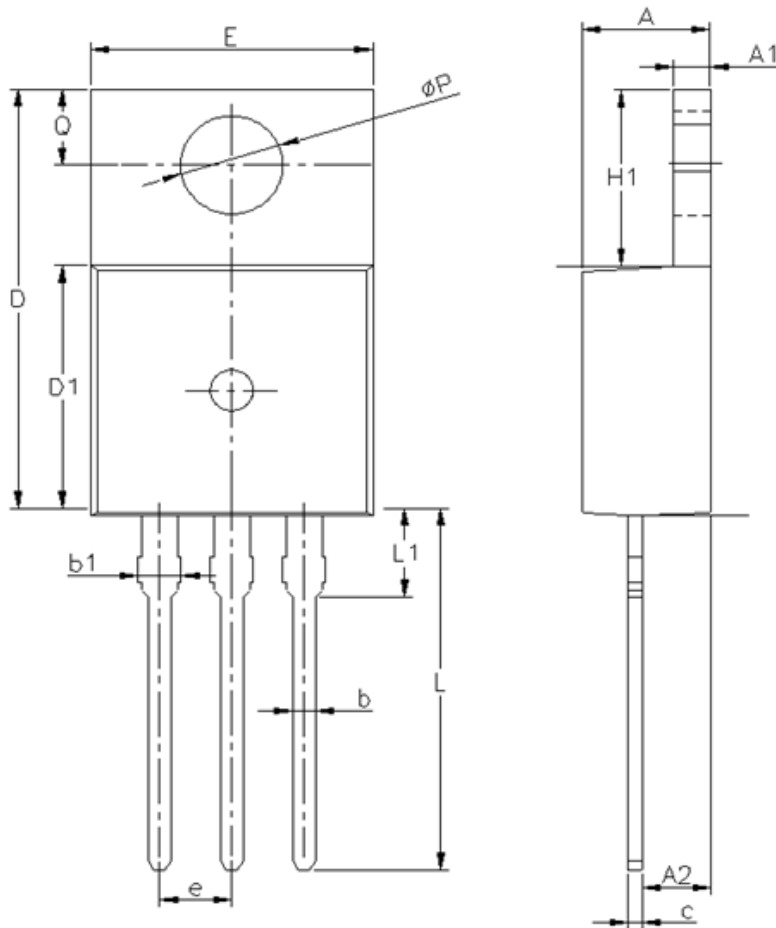
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=250V,$ $I_D=13A,$ $R_G=10\Omega$		28		nS
t_r	Turn-on Rise Time			21		nS
$t_{d(off)}$	Turn-off Delay Time			62		nS
t_f	Turn-off Fall Time			32		nS
Q_g	Total Gate Charge	$V_{DS}=400V$ $I_D=13A$ $V_{GS}=10V$		40		nC
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	$T_J=25^\circ C, I_F=13A$ $di/dt=100A/us$			555	nS
Q_{rr}	Reverse Recovery Charge				4550	μC
*Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$						

Symbol	Parameter	Typ	Units
$R_{\theta JC}$	Junction-to-Case	2.5	$^\circ C/W$

Package Information



SYMBOL	MIN	NOM	MAX
A	4.30	4.50	4.77
A1	1.25	1.27	1.42
A2	1.80	2.50	2.89
b	0.70	0.80	0.96
b1	1.22	1.33	1.50
c	0.33	0.38	0.48
D	15.10	15.70	16.10
D1	8.80	9.15	9.40
E	9.60	10.20	10.40
e	2.54 BSC		
H1	6.10	6.50	7.00
L	12.60	13.10	14.30
L1	—	—	3.50
Q	2.54	—	2.94
ϕP	3.66	3.86	4.06

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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