

Silicon N-Channel Power MOSFET

Description

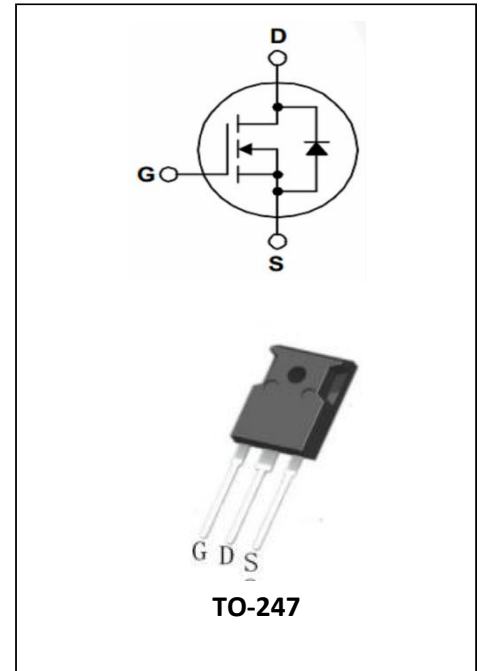
The MD50N50 uses advanced technology and design to provide excellent RDS(ON) . It can be used in a wide variety of applications.

General Features

- ①  $V_{DS}=500V, I_D=50A$
- 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 @ Ta=25°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 Tc=25°C	50	A
$I_{DM}$	Drain Current (pulsed)	160	A
$V_{GS}$	Gate to Source Voltage	+/-30	V
$P_{tot}$	Total Dissipation at Tc=25°C	250	W
$T_j$	Max. Operating Junction Temperature	175	°C
$E_{AS}$	Single Pulse Avalanche Energy	3200	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	$V_{GS}=10V, I_D=15A$		0.09	0.12	$\Omega$
$V_{GS(th)}$	Gated Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	3.5	4.5	V



$I_{DSS}$	Drain to Source leakage Current	$V_{DS}=500V, V_{GS}=0V$			1.0	$\mu A$
$I_{GSS(F)}$	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	$V_{GS}=0V,$ $V_{DS}=25V,$ $f=1.0MHz$			7857.9	pF
$C_{oss}$	Output Capacitance				751.2	pF
$C_{rss}$	Reverse Transfer Capacitance				29.7	pF

### Switching Characteristics

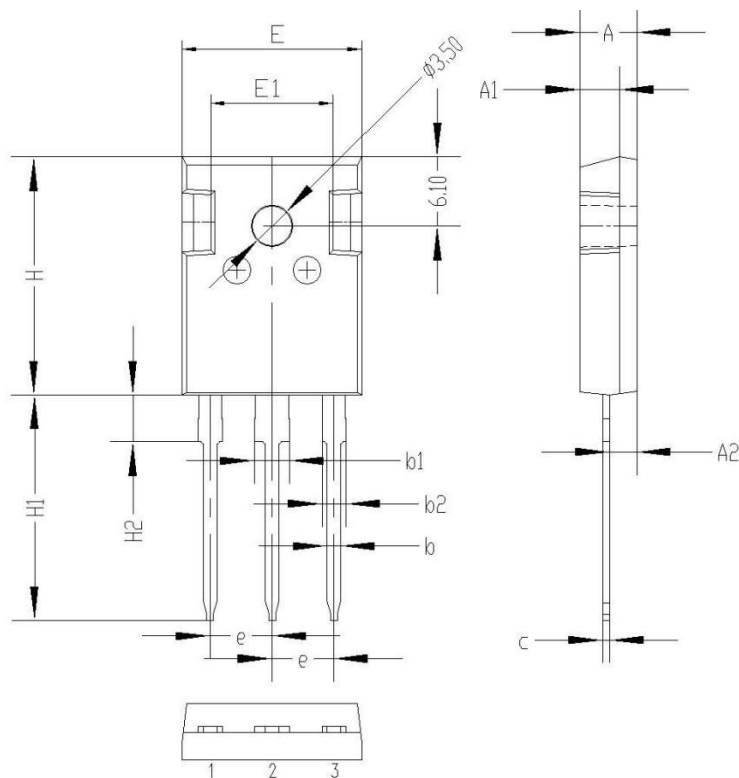
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=250V, I_D=30A,$ $R_G=25\Omega$		68		nS
$t_r$	Turn-on Rise Time			141		nS
$t_{d(off)}$	Turn-off Delay Time			213		nS
$t_f$	Turn-off Fall Time			97.3		nS
$Q_g$	Total Gate Charge	$V_{DS}=400V$ $I_D=30A$ $V_{GS}=10V$		153		nC
$Q_{gs}$	Gate-Source Charge			36.3		nC
$Q_{gd}$	Gate-Drain Charge			57.9		nC

### Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$I_{SD}$	S-D Current(Body Diode)				40	A
$I_{SDM}$	Pulsed S-D Current(Body Diode)				160	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_{DS}=20A$			1.5	V
$t_{rr}$	Reverse Recovery Time	$T_J=25^\circ C, I_F=88A$ $di/dt=100A/us$			482	nS
$Q_{rr}$	Reverse Recovery Charge				8.5	$\mu C$
*Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$						

Symbol	Parameter	Typ	Units
$R_{\theta JC}$	Junction-to-Case	0.6	$^\circ C/W$

Package Description



Symbol	Unit mm		
	Min	Typ	Max
A	4.8	5.00	5.20
A1	3.3	3.5	3.7
A2	2.20	2.40	2.60
b	1.00	1.2	1.40
b1	2.90	3.10	3.30
b2	1.80	2.00	2.20
c	0.50	0.60	0.70
e	5.25	5.45	5.65
E	15.2	15.7	16.2
H	20.8	21	21.2
H1	19.5	20.0	20.5
H2	3.9	4.1	4.3
G	5.9	6.1	6.3
$\Phi P$	3.30	3.50	3.70



**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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