

Silicon N-Channel Power MOSFET

Description

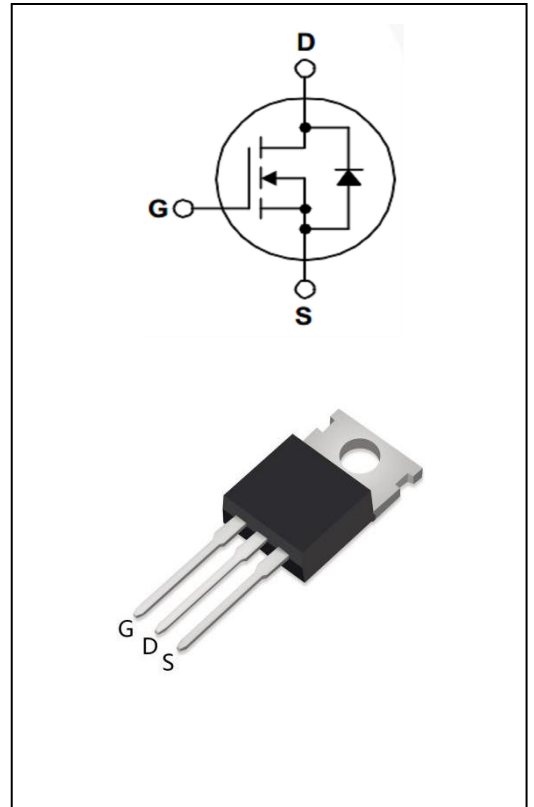
The TH5N50PC uses advanced technology and design to provide excellent $R_{DS(ON)}$. It can be used in a wide variety of applications.

General Features

- $V_{DS}=500V, I_D=5A$
- Low ON Resistance
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Application

- Power switching application
- Adapter and charger



Electrical Characteristics @ $T_a=25^\circ\text{C}$ (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 $T_c=25^\circ\text{C}$	5	A
I_{DM}	Drain Current (pulsed)	20	A
V_{GS}	Gate to Source Voltage	+/-30	V
P_{tot}	Total Dissipation at $T_c=25^\circ\text{C}$	40	W
	Derating Factor above 25°C	1.5	W/ $^\circ\text{C}$
T_j	Max. Operating Junction Temperature	175	$^\circ\text{C}$
E_{AS}	Single Pulse Avalanche Energy	250	mJ

b) 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	$V_{GS}=10V, I_D=2.5A$		1.25	1.5	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 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	$V_{GS}=0V,$ $V_{DS}=25V,$ $f=1.0MHz$		584		pF
C_{oss}	Output Capacitance			61		pF
C_{rss}	Reverse Transfer Capacitance			4		pF

c) Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=250V, I_D=5A,$ $R_G=10\Omega$		14		nS
t_r	Turn-on Rise Time			18		nS
$t_{d(off)}$	Turn-off Delay Time			32		nS
t_f	Turn-off Fall Time			11		nS
Q_g	Total Gate Charge	$V_{DS}=400V$ $I_D=5A$ $V_{GS}=10V$		12.6		nC
Q_{gs}	Gate-Source Charge			3.1		nC
Q_{gd}	Gate-Drain Charge			4.9		nC

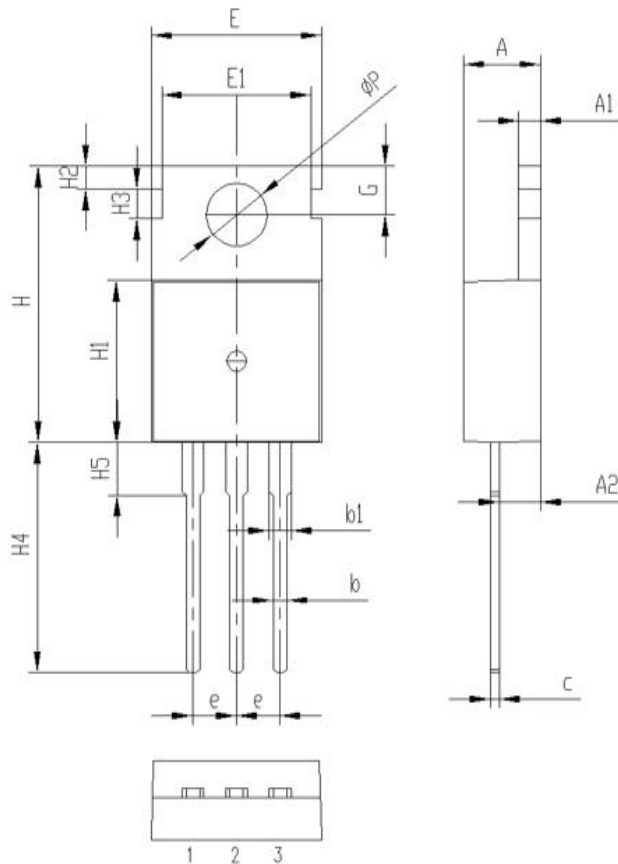
d) Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
I_{SD}	S-D Current(Body Diode)				5	A
I_{SDM}	Pulsed S-D Current(Body Diode)				20	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_{DS}=5A$			1.5	V
t_{rr}	Reverse Recovery Time	$T_J=25^\circ C, I_F=5A$ $di/dt=100A/us$		328		nS
Q_{rr}	Reverse Recovery Charge			1.55		μC
*Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$						

Symbol	Parameter	Typ	Units
$R_{\theta JC}$	Junction-to-Case	3.75	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient	100	$^\circ C/W$

Package Information

TO-220C PACKAGE



Symbol	单位 mm		
	Min	Nom	Max
A	4.30	4.5	4.70
A1	1.20	1.30	1.40
A2	2.20	2.4	2.60
b	0.60	0.8	1.00
b1	1.20	1.30	1.40
c	0.40	0.5	0.60
e	2.44	2.54	2.64
E	9.80	10.0	10.2
E1	8.50	8.70	8.90
H	15.5	15.7	15.9
H1	9.00	9.2	9.40
H2	1.10	1.34	1.50
H3	1.50	1.7	1.90
H4	12.9	13.3	13.7
H5	2.80	3.0	3.20
G	2.60	2.8	3.00
ΦP	3.40	3.6	3.80

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