

Silicon N-Channel Power MOSFET

Description

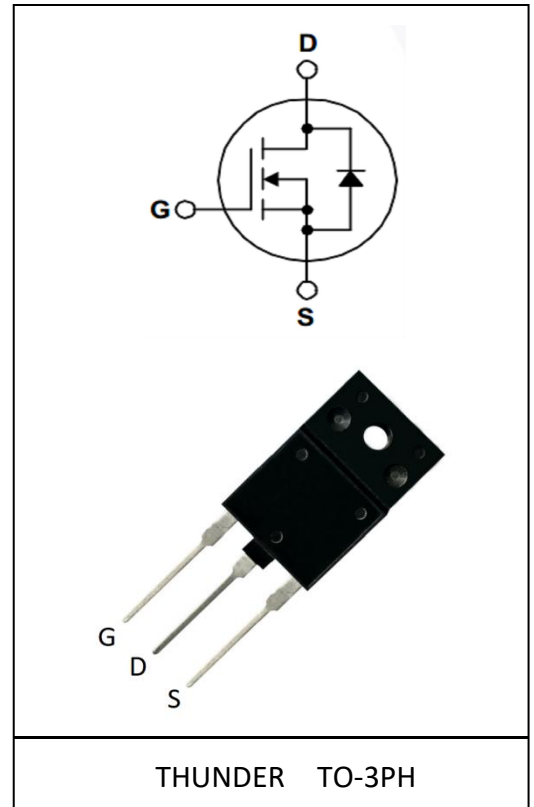
The TH3N150PH uses advanced technology and design to provide excellent $R_{DS(ON)}$. It can be used in a wide variety of applications.

General Features

- $V_{DS}=1500V, I_D=3A$
- 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	1500	V
I_D	Drain Current (continuous) at $T_c=25^\circ\text{C}$	3	A
I_{DM}	Drain Current (pulsed)	12	A
V_{GS}	Gate to Source Voltage	+/-30	V
P_{tot}	Total Dissipation at $T_c=25^\circ\text{C}$	250	W
T_j	Max. Operating Junction Temperature	175	$^\circ\text{C}$
E_{AS}	Single Pulse Avalanche Energy	125	mJ

b) Electrical Parameters:

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{DS}	Drain-source Voltage	$V_{GS}=0V, I_D=250\mu A$	1500			V
$R_{DS(on)}$	Static Drain-to-Source on-Resistance	$V_{GS}=10V, I_D=1.5A$		5.2	9.0	Ω
$V_{GS(th)}$	Gated Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	3.0	4.1	5.0	V
I_{DSS}	Drain to Source leakage Current	$V_{DS}=1500V, V_{GS}=0V$			1	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	$V_{GS}=0V,$ $V_{DS}=25V,$ $f=1.0MHz$		1938		pF
C_{oss}	Output Capacitance			5104		pF
C_{rss}	Reverse Transfer Capacitance			2.4		pF

c) Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=750V, I_D=3A,$ $R_G=10\Omega$		33.8		nS
t_r	Turn-on Rise Time			16.7		nS
$t_{d(off)}$	Turn-off Delay Time			56		nS
t_f	Turn-off Fall Time			27.6		nS
Q_g	Total Gate Charge	$V_{DS}=750V$ $I_D=3A$ $V_{GS}=10V$		9.3		nC
Q_{gs}	Gate-Source Charge			174.9		nC
Q_{gd}	Gate-Drain Charge			5.3		nC

d) Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
I_{SD}	S-D Current(Body Diode)				3	A
I_{SDM}	Pulsed S-D Current(Body Diode)				12	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_{DS}=3.0A$			1.5	V
t_{rr}	Reverse Recovery Time	$T_J=25^\circ C, I_F=3.0A$ $di/dt=100A/us$		302.3		nS
Q_{rr}	Reverse Recovery Charge				9.9	
*Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$						

Symbol	Parameter	Typ	Units
$R_{\theta JC}$	Junction-to-Case	1.7	$^\circ C/W$

Typical Performance Characteristics

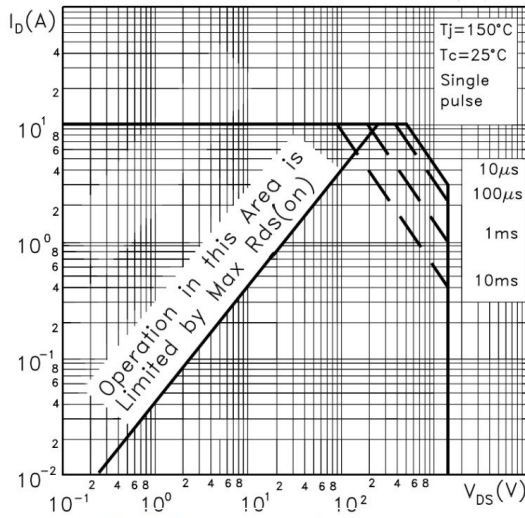


Fig.1 Safty peration area

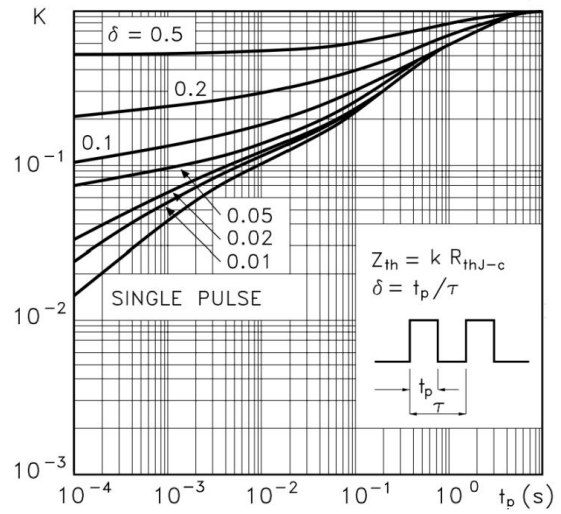


Fig.2 Thermal impedance

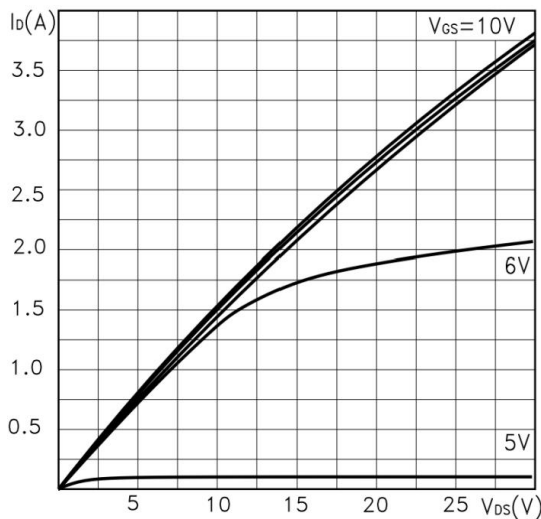


Fig.3 Output characteristics

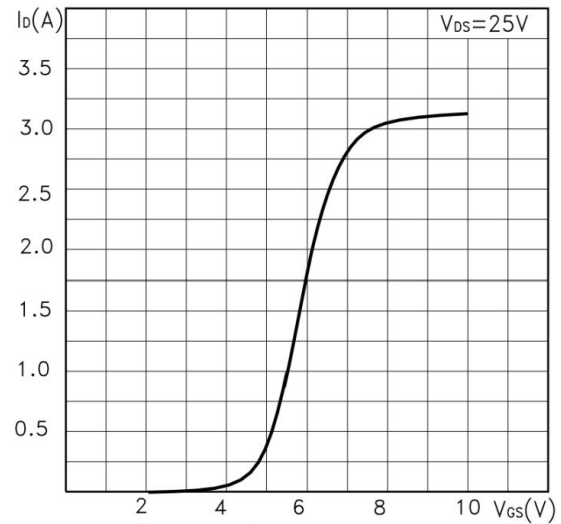


Fig.4 Transfer characteristics

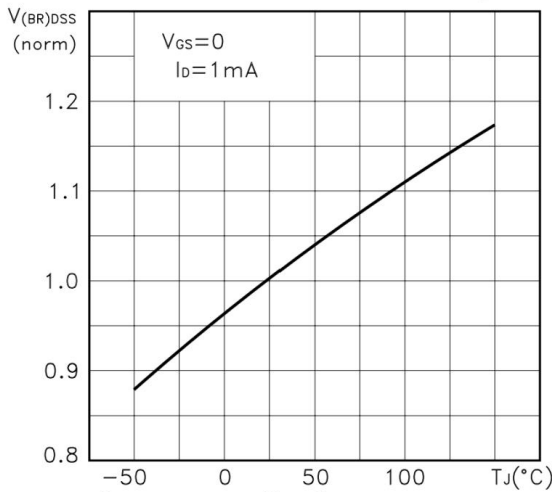


Fig.5 Normalized BVDSS vs. temperature

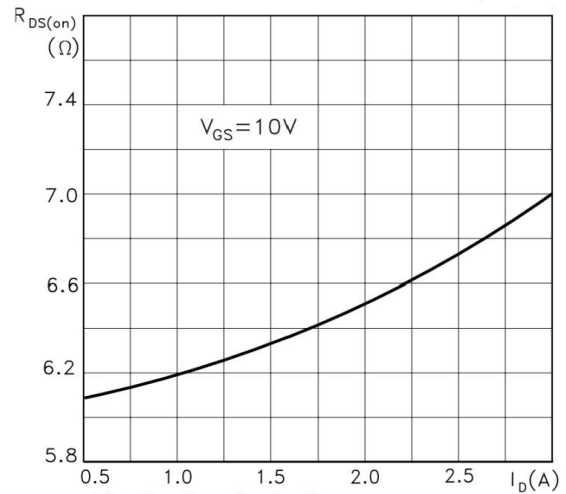


Fig.6 Static drain-source on resistance

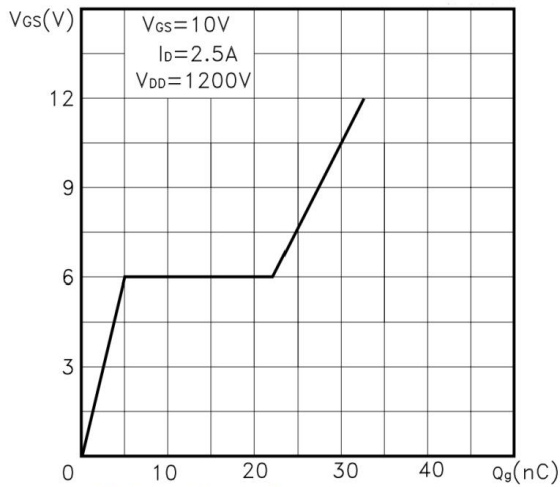


Fig.7 Gate charge vs. gate-source voltage

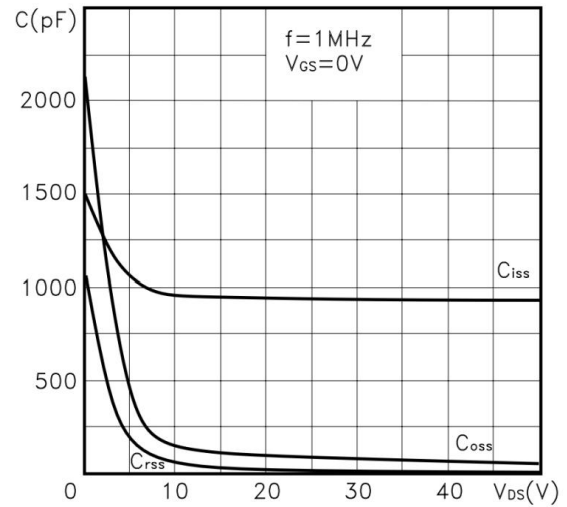


Fig.8 Capacitance variations

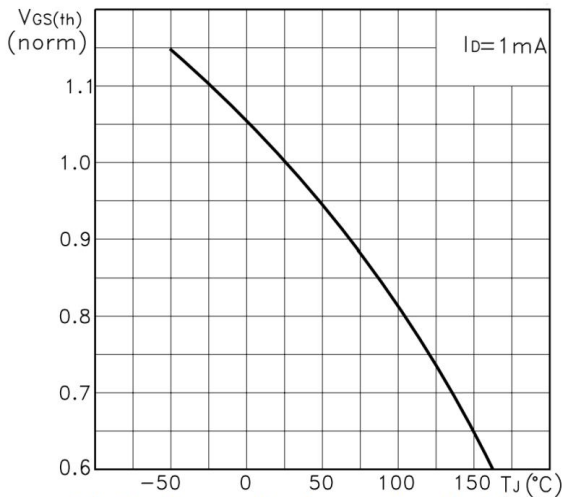


Fig.9 Normalized gate threshold voltage vs. temperature

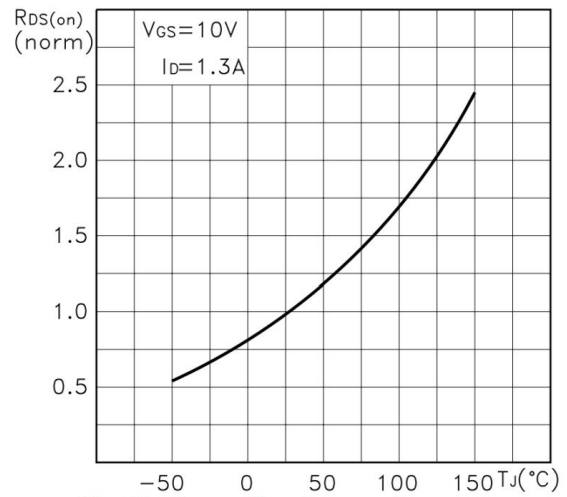


Fig.10 Normalized on resistance vs. temperature

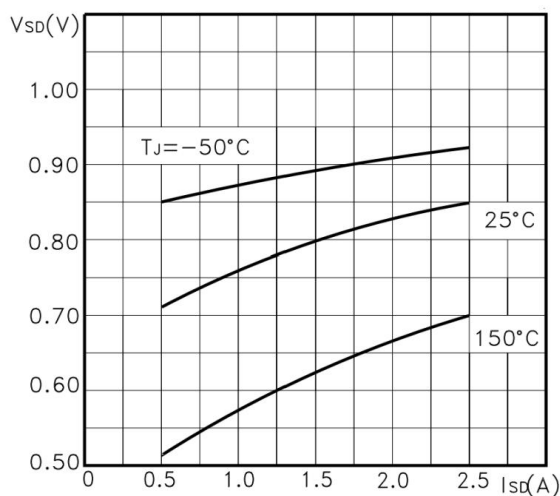


Fig.11 Source-drain diode forward characteristics

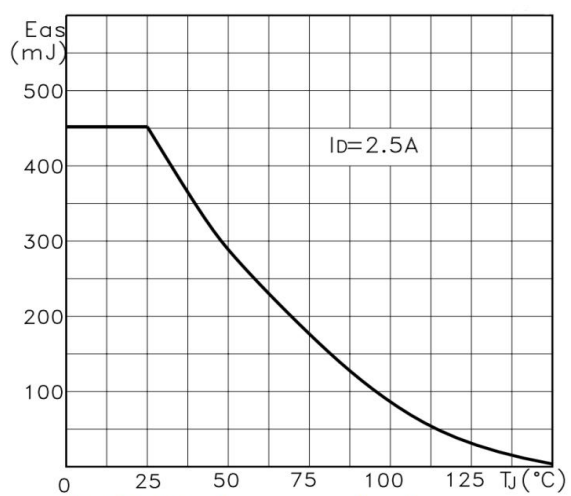
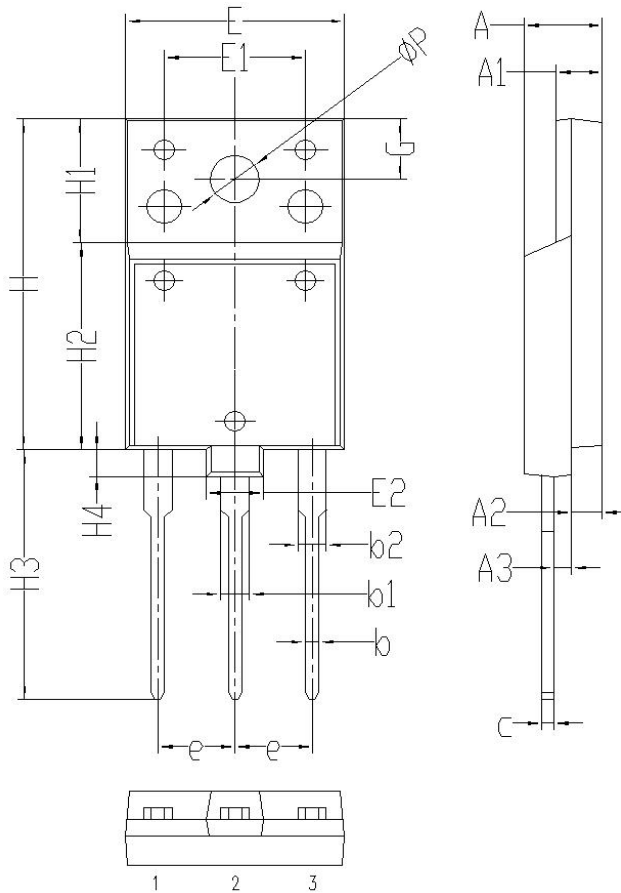


Fig.12 Maximum avalanche energy vs Tj

Package Information

TO-3PH PACKAGE



Symbol	单位 mm		
	Min	Nom	Max
A	5.35	5.55	5.75
A1	2.80	3.00	3.20
A2	1.90	2.10	2.30
A3	1.10	1.30	1.50
b	0.65	0.75	0.85
b1	1.80	2.00	2.20
b2	1.80	2.00	2.20
c	0.70	0.90	1.10
e	5.25	5.45	5.65
E	15.3	15.5	15.7
E1	9.80	10.0	10.2
E2	3.80	4.00	4.20
H	24.3	24.5	24.7
H1	9.00	9.20	9.40
H2	15.1	15.3	15.5
H3	18.5	19.0	19.5
H4	1.80	2.00	2.20
H5	4.80	5.00	5.20
G	4.3	4.5	4.7
ΦP	3.40	3.60	3.80

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