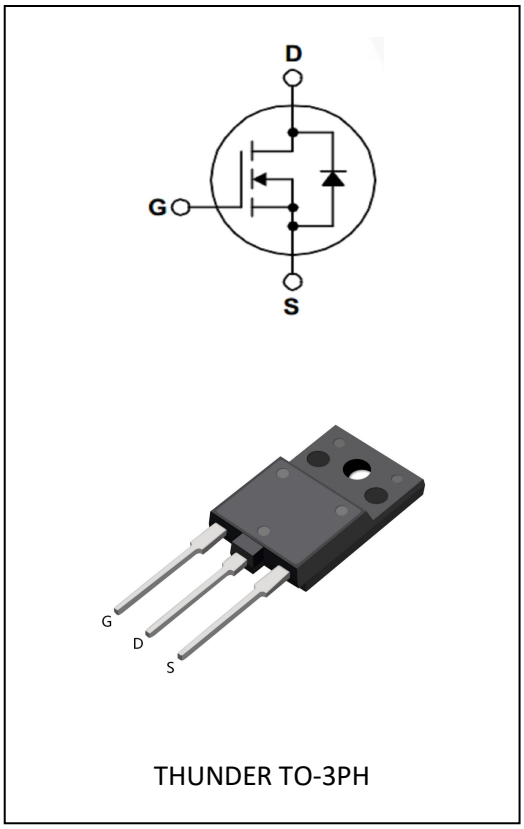
Thunder High Power Products

Silicon N-Channel Power MOSFET

Description

The TH3N120PH uses advanced technology and design to provide excellent $R_{DS(ON)}$. It can be used in a wide variety of applications.



THUNDER TO-3PH

General Features

- V_{DS}=1200V,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 @ Ta=25℃ (unless otherwise specified)

a) Absolute Maximum Ratings:

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-to-Source Breakdown Voltage	1200	V
I_D	Drain Current (continuous) at Tc=25℃	3	A
I_{DM}	Drain Current (pulsed)	12	A
V_{GS}	Gate to Source Voltage	+/-30	V
P_{tot}	Total Dissipation at Tc=25℃	250	W
T_j	Max. Operating Junction Temperature	175	℃
E_{AS}	Single Pulse Avalanche Energy	30	mJ

b) Electrical Parameters:

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{DS}	Drain-source Voltage	V_{GS}=0V, I_D=250μA	1200			V
$R_{DS(on)}$	Static Drain-to-Source on-Resistance	V_{GS}=10V, I_D=1.5A		5.1	6.0	Ω
$V_{GS(th)}$	Gated Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	3.0	4.0	5.0	V
I_{DSS}	Drain to Source leakage Current	V_{DS}=1200V, V_{GS} = 0V			5.0	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		1006		pF
C_{oss}	Output Capacitance			59.8		pF
C_{rss}	Reverse Transfer Capacitance			2.2		pF

c) Switching Characteristics:

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=600V,I_D=3A, R_G=10Ω		15.1		nS
t_r	Turn-on Rise Time			19.4		nS
$t_{d(off)}$	Turn-off Delay Time			25.6		nS
t_f	Turn-off Fall Time			76.2		nS
Q_g	Total Gate Charge	V_{DS}=960V I_D=3A V_{GS}=10V		19.7		nC
Q_{gs}	Gate-Source Charge			7.5		nC
Q_{gd}	Gate-Drain Charge			5.4		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℃,I_F=3.0A di/dt=100A/us		526		nS
Q_{rr}	Reverse Recovery Charge			2.0		μC
	*Pulse Test: Pulse Width <= 300μs, Duty Cycle< =2%					

Symbol	Parameter	Typ.	Unit
$R_{\theta JC}$	Junction-to-Case	0.6	℃/W

Electrical performance (typical)

Fig. 1. Output Characteristics @ 25 Deg. C

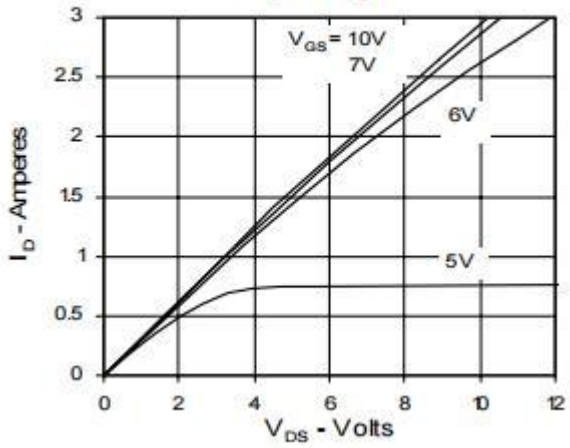


Fig. 2. Extended Output Characteristics @ 25 deg. C

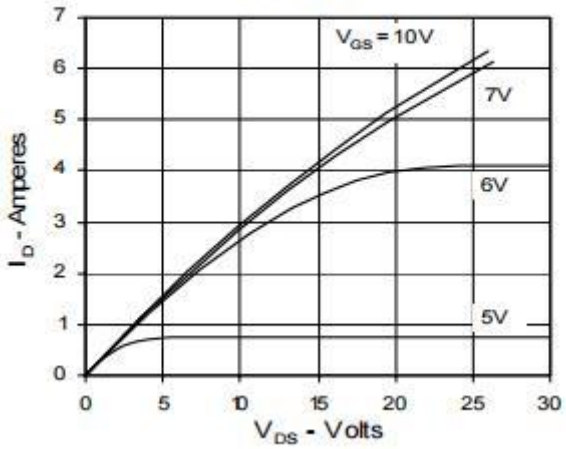


Fig. 3. Output Characteristics @ 125 Deg. C

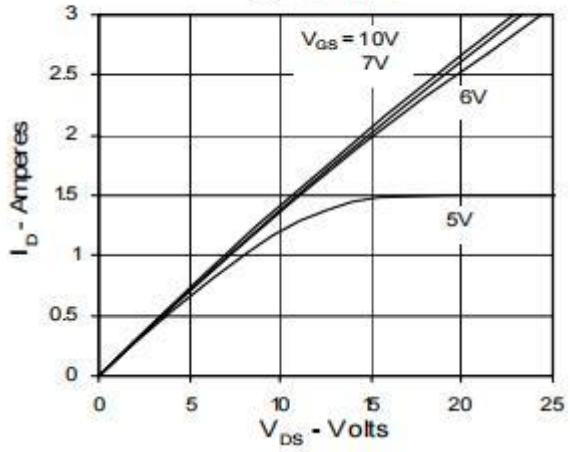


Fig. 4. $R_{DS(on)}$ Normalized to I_{D25} Value vs. Junction Temperature

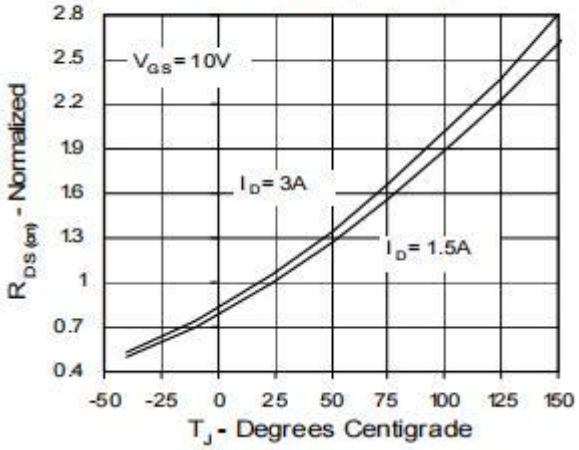


Fig. 5. $R_{DS(on)}$ Normalized to I_{D25} Value vs. I_D

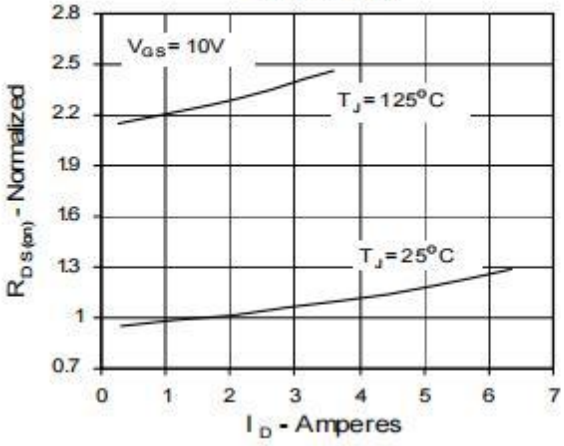


Fig. 6. Drain Current vs. Case Temperature

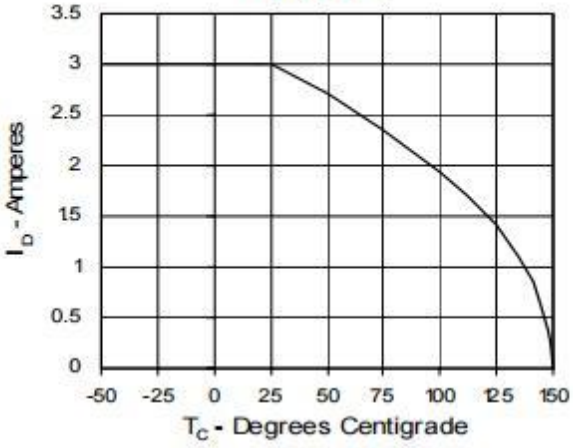


Fig. 7. Input Admittance

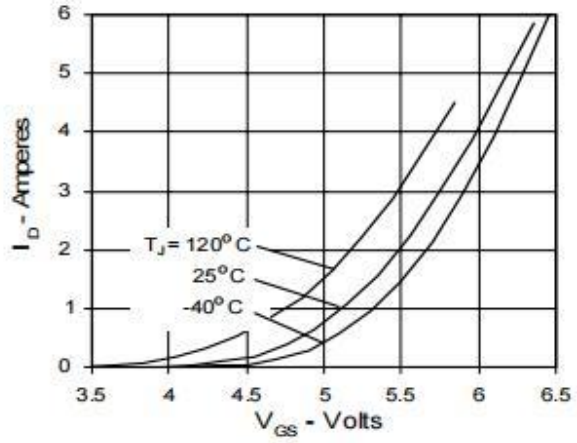


Fig. 8. Transconductance

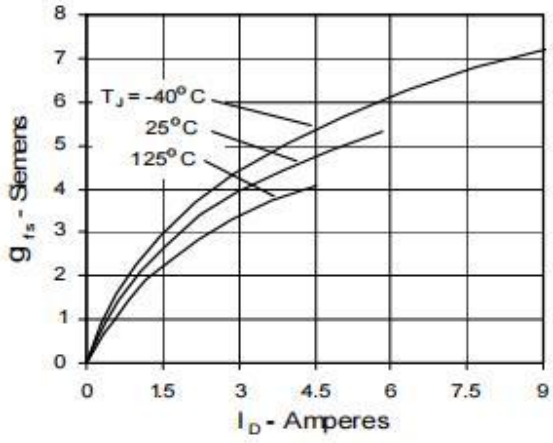


Fig. 9. Source Current vs. Source-To-Drain Voltage

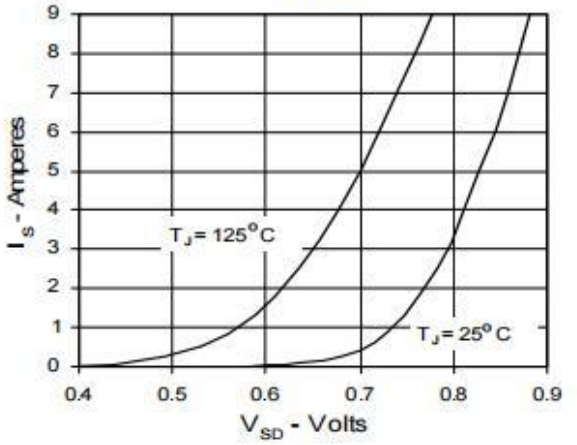


Fig. 10. Gate Charge

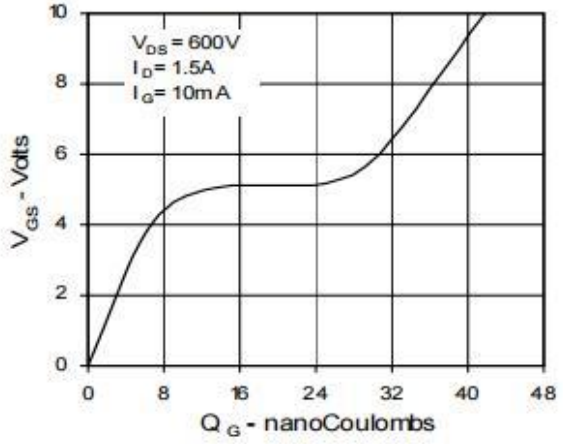


Fig. 11. Capacitance

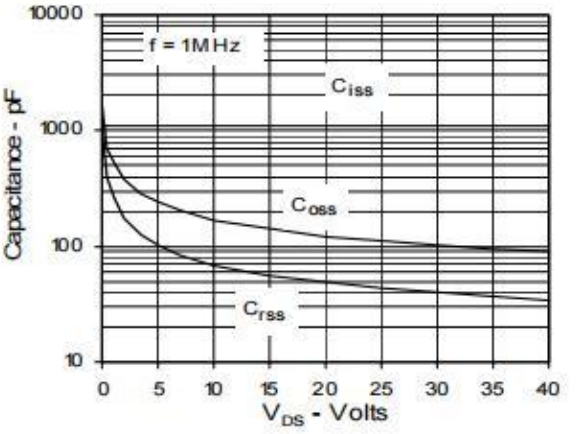
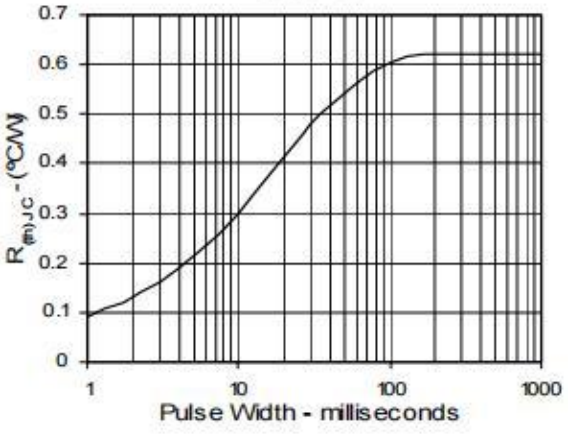
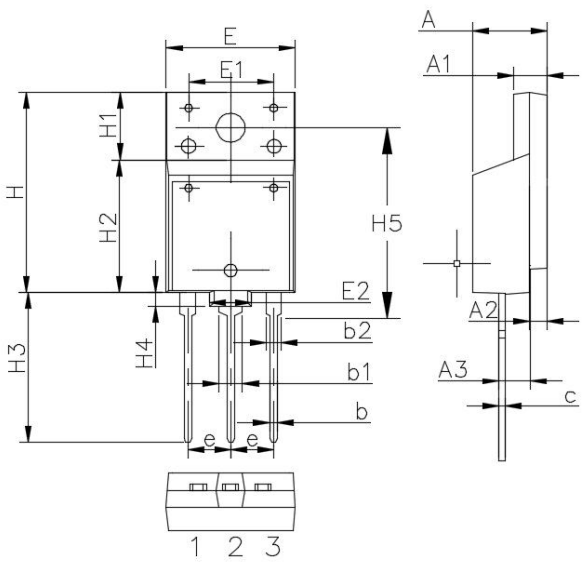


Fig. 12. Maximum Transient Thermal Resistance



Package Information

TO-3PH PACKAGE



基本尺寸

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	1.00	1.20	1.40
b	0.80	0.90	1.00
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	15.2	15.4	15.6
E1	9.80	10.0	10.2
E2	3.80	4.00	4.20
H	24.3	24.5	24.7
H1	9.80	10.0	10.2
H2	14.3	14.5	14.7
H3	18.5	19.0	19.5
H4	2.00	2.20	2.40
H5	24.0	24.5	25.0
G	4.3	4.5	4.7
ΦP	3.30	3.50	3.70

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