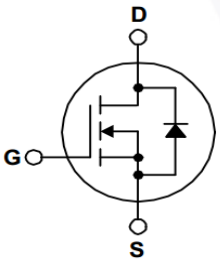
TH3N150PF

1500V 3A 5.5Ω Silicon N-Channel Planar Power MOSFET

Features of this MOSFET are 150℃ operating junction temperature and high repetitive peak current capability. These features combine to make this MOSFET a highly efficient, robust and reliable device for PDP driving applications.





Package view and circuit symbol

General Features

- V_{DS}=1500V,I_D=3A
- Low ON Resistance,$R_{DS(on)}$,typ.=5.5Ω@V_{GS}=10V,I_D=1.5A
- Low reverse transfer capacitance
- Low Qg for fast response
- Short fall & rise times for fast switching
- 100% single pulse avalanche energy Test

Applications

- Power switching application
- Digital amplifier
- Adapter and charger

Key Performance Parameters

Parameter	Value	Unit
V_{DSS}, min @ T_{J} = 25 °C	**1500**	V
T_J, maximum junction temperature	**150**	°C
I_D @ T_C = 25 °C(Silicon Limit)	**3**	A
$I_{D,pulse}$ @ T_C = 25 °C, tp limited by Tjmax.	**12**	A
$R_{DS(on)}$, typ. @ T_J = 25 °C ,V_{GS} = 10 V	**5.5**	Ω
E_{AS}, typ. @ T_J = 25 °C	**600**	mJ

RoHS SGS

Marking Information

Product Name	Package	Marking
TH3N150PF	TO-220F	TH3N150PF

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Maximum Ratings (T_J = 25℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain to Source Voltage		V_{DSS}	1500	V
Gate to Source Voltage		V_{GSS}	±30	V
Drain Current(Silicon limit)	T_C=25℃	I_D	3	A
Pulsed Drain Current(Silicon limit)	T_C=25℃ tp limited by T_{vjmax}	I_{DM}	12	A
Avalanche energy, single pulse	L=40mH, R_g=25Ω	E_{AS}	600	mJ
Power Dissipation	T_C=25℃	P_D	41	W
Operating Junction and Storage Temperature Range		T_J,T_{stg}	-55 To +150	℃
Lead Temperature for Soldering Purposes		T_L	270	

Thermal Characteristics

Parameter	Symbol	Max Value	Unit
Thermal Resistance, Junction−to−Case	R_{thJC}	3	℃/W
Thermal Resistance, Junction−to−Ambient	R_{thJA}	62	

Electerical Characteristics (T_J = 25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Drain-to-Source Breakdown Voltage	B_{VDSS}	V_{GS}=0V,I_D=250μA	1500	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V V_{DS}=V_{DSS} T_J=25℃	-	-	1	μA
		V_{GS}=0V V_{DS}=80%V_{DSS} T_J=125℃	-	-	10	
Gate−to−Source leakage Current	I_{GSS}	V_{GS}=±30V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D=250uA T_J=25℃	2.5	-	4.5	V
Drain-Source on-state resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=1.5A T_J=25℃	-	5.5	6.8	Ω
Gate resistance	Rg	V_{GS}=0V,V_{DS}=0V,f=1MHz	-	1.4	-	Ω
Transconductance	g_{fs}	V_{DS}=15V,I_D=1.5A	-	3	-	S
Input Capacitance	C_{ISS}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz	-	1250	-	pF
Output Capacitance	C_{OSS}		-	115	-	
Reverse Transfer Capacitance	C_{RSS}		-	15	-	
Total Gate Charge	Qg	V_{DS} = 1200 V, V_{GS} = 0/10 V, I_D = 3 A	-	36	-	nC
Gate- Source charge	Qgs			9		
Gate-Drain charge	Qgd			12		
Turn−On Delay Time	td(on)	V_{DS} = 750 V V_{GS} = 10 V I_D = 3 A R_G = 25 Ω T_J = 25℃	-	25	-	ns
Turn−Off Delay Time	td(off)		-	57	-	
Rise time	tr		-	48	-	
Fall time	tf		-	52	-	

Diode Characteristics (T_J = 25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Diode Continous Forward Current	I_S	T_C=25℃	-	-	3	A
Pulsed Diode Forward Current	I_{SM}		-	-	12	
Diode Forward Voltage	V_{SD}	I_S = 3A T_J = 25℃	-	-	1.5	V
Reverse Recovery Time	trr	V_R = 750 V, I_S = 3 A, dI_S/dt = 100 A/μs,T_J = 25℃	-	250	-	ns
Reverse Recovery Charge	Qrr		-	1.1	-	uC

Typical Performance Characteristics

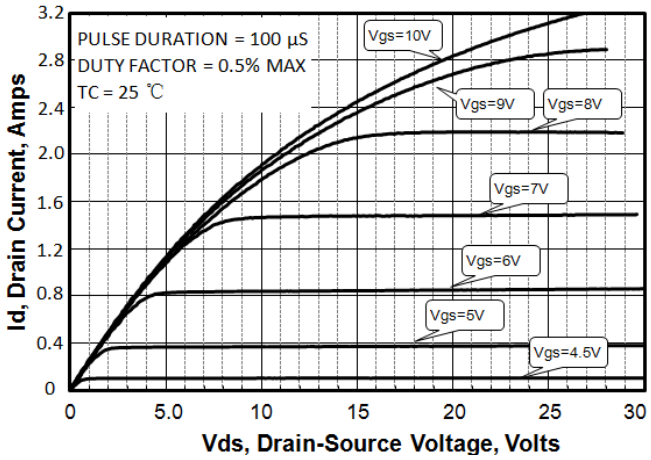


Fig 1. Typical output characteristic

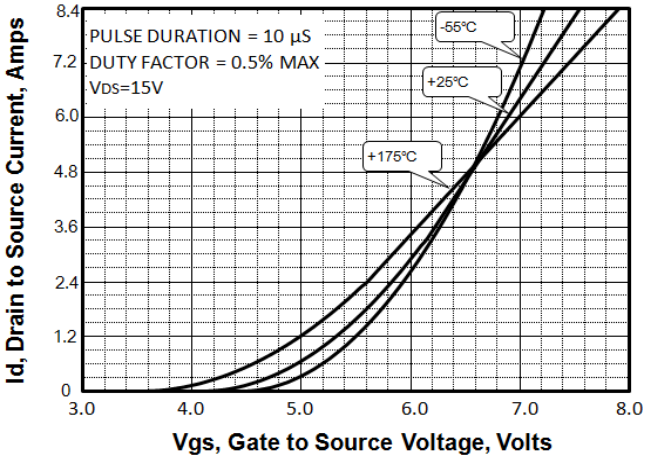


Fig 2. Typical transfer characteristic

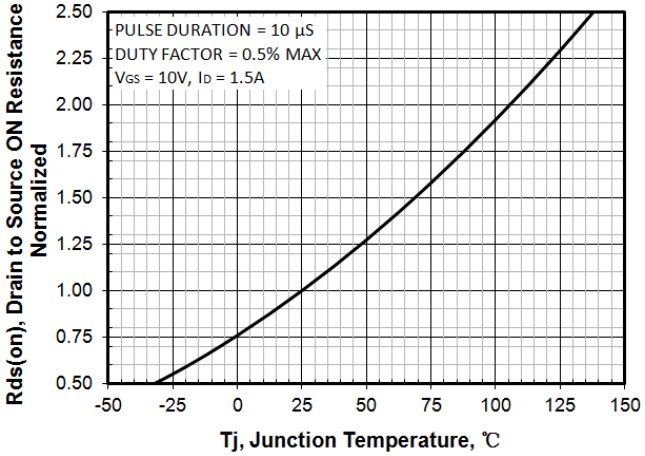


Fig 3. On-Resistance vs. Junction Temperature

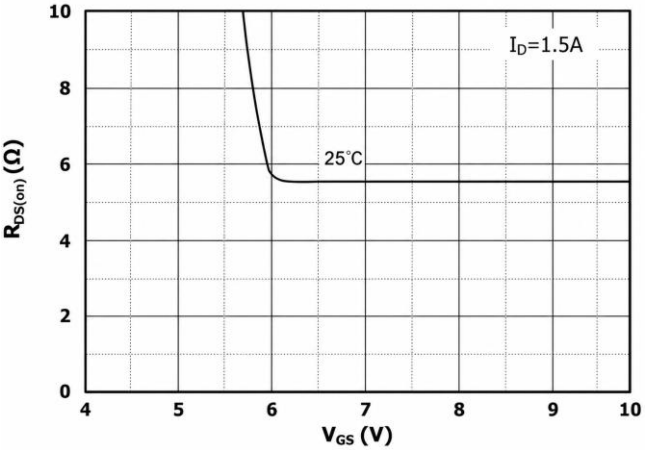


Fig 4. Rds(on) vs Gate Voltage

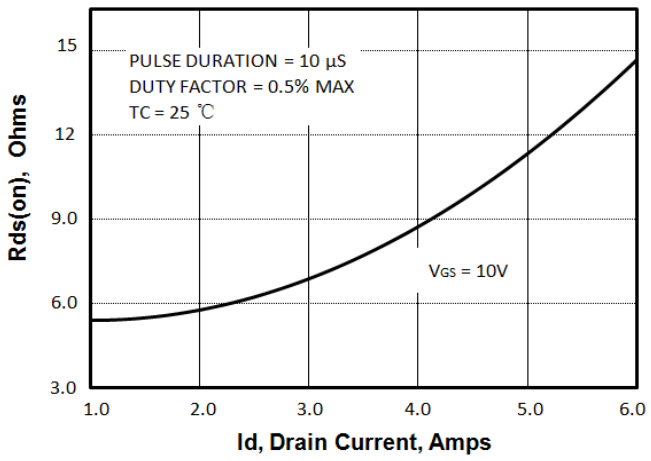


Fig 5. Rds(on) vs Drain Currentand Gate Voltage

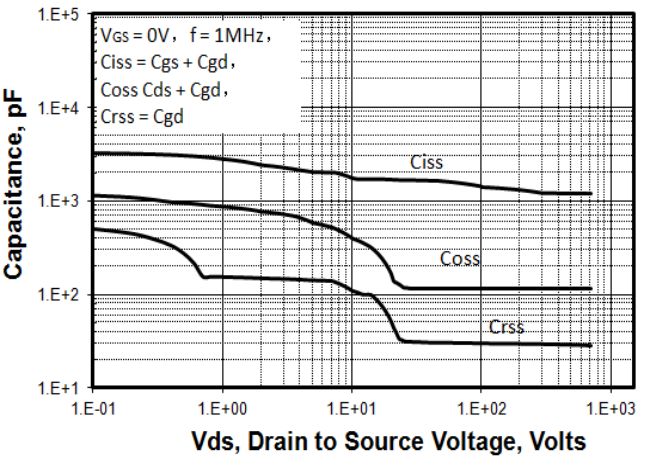


Fig 6. Capacitance Characteristics

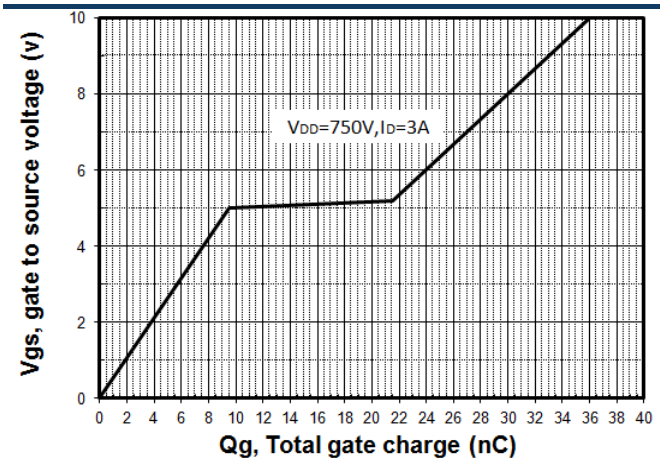


Fig 7. Gate Charge Characteristics

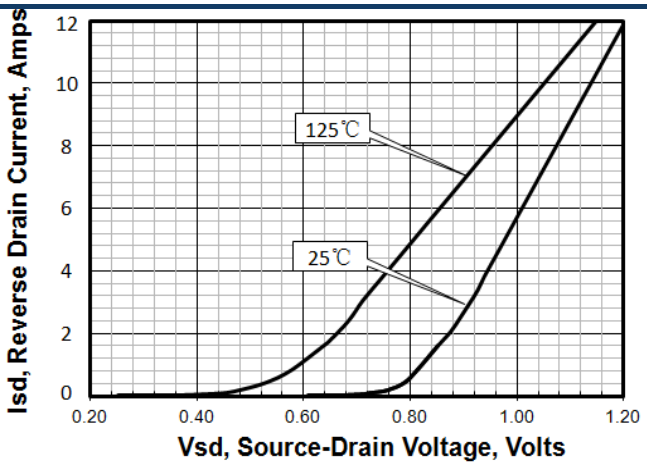


Fig 8. Body-diode Forward Characteristics

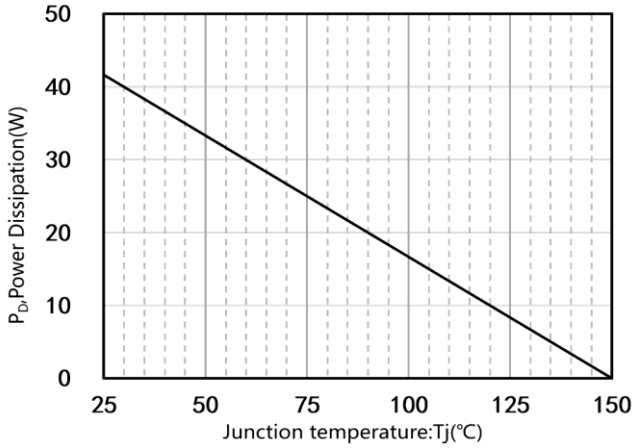


Fig 9. Power Dissipation

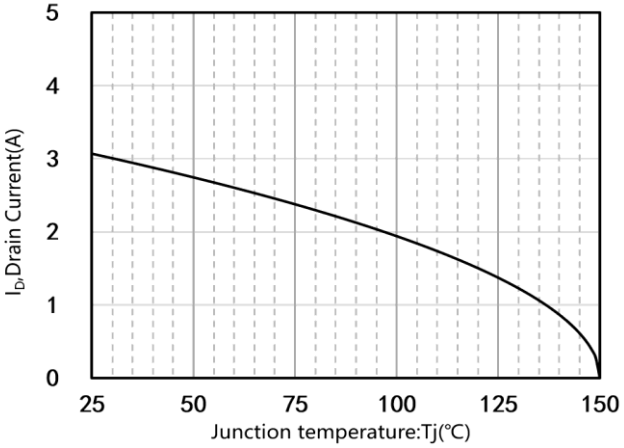


Fig 10. Drain Current Derating

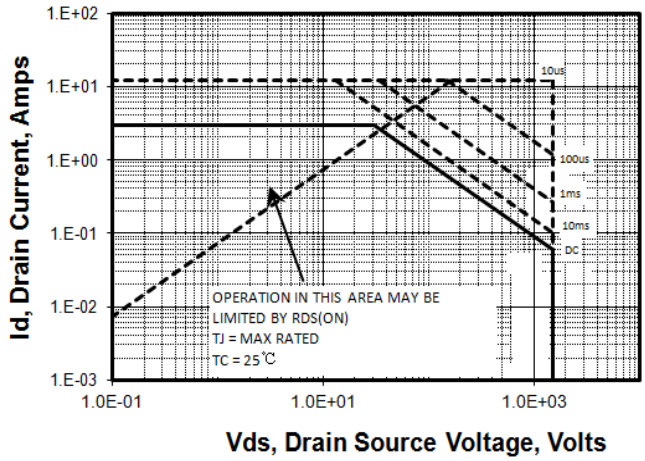


Fig 11. Safe Operating Area

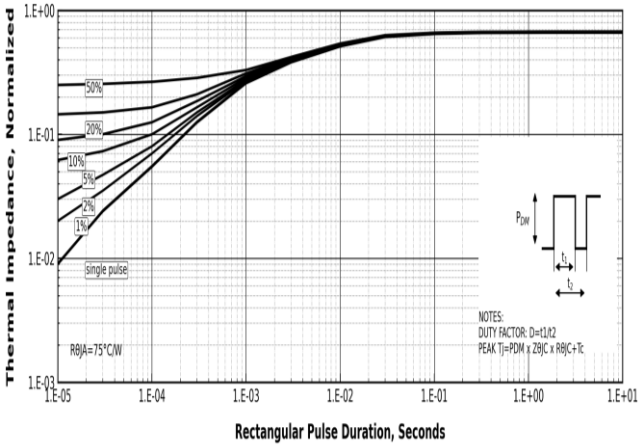
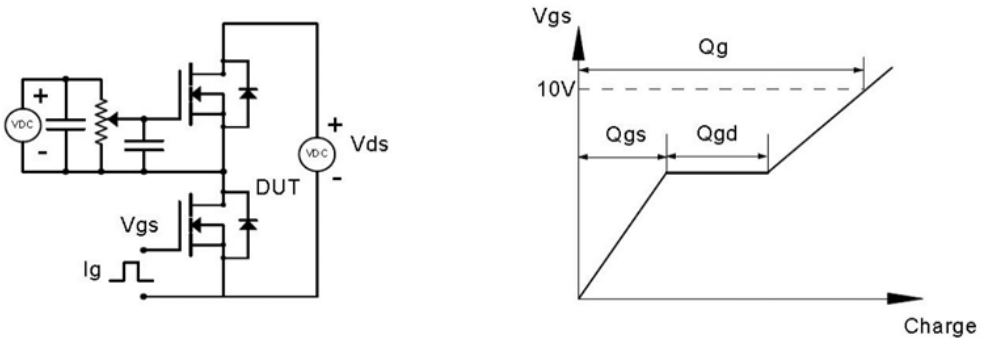
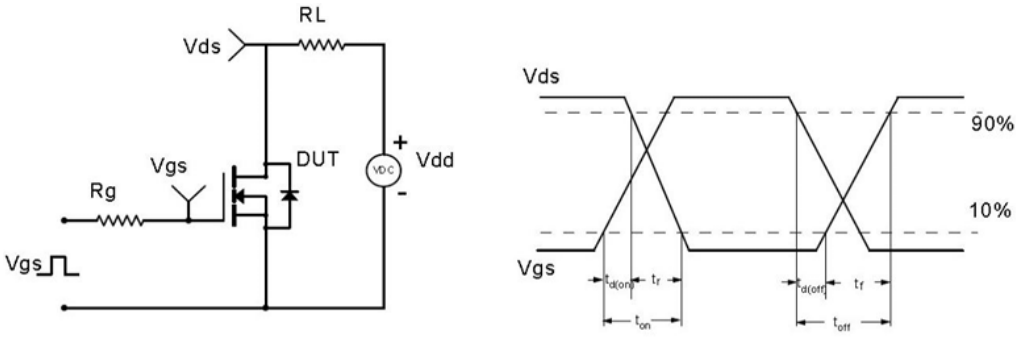


Fig 12. Transient Thermal Response Curve

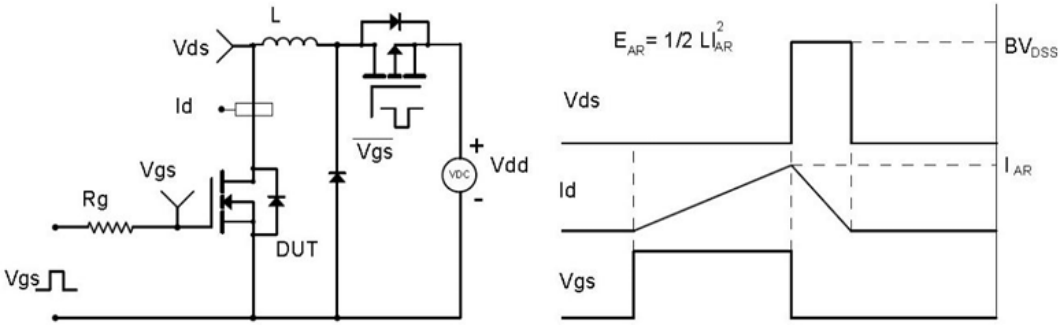
Test Circuit & Waveform



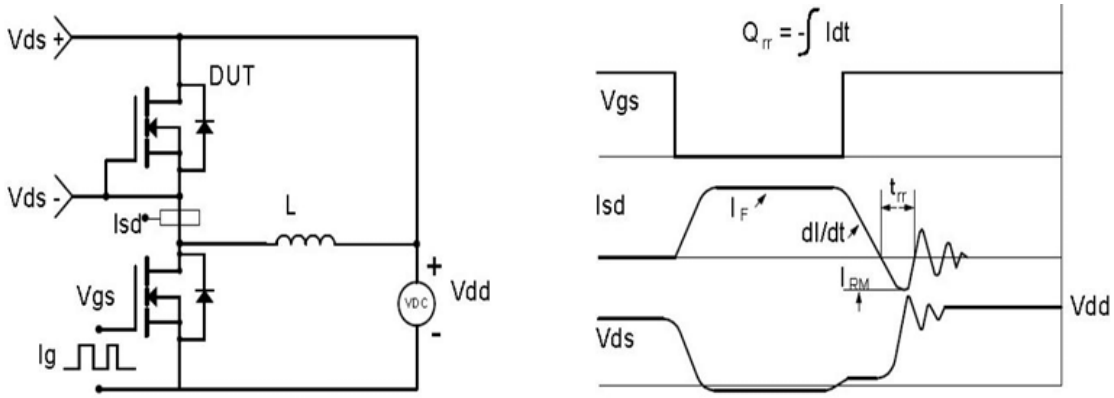
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

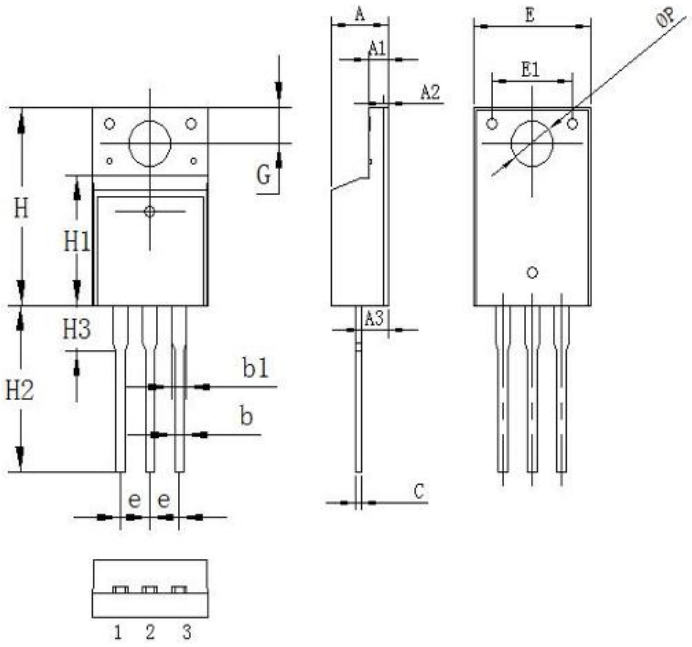


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

Package Information



基本尺寸

Symbol	单位 mm		
	Min	Nom	Max
A	4.55	4.75	4.95
A1	2.40	2.60	2.80
A2	0.40	0.60	0.80
A3	2.10	2.30	2.50
b1	1.10	1.30	1.50
b	0.60	0.80	1.00
c	0.42	0.50	0.58
e	2.30	2.50	2.70
E	9.9	10.1	10.3
E1	6.8	7	7.2
H	15.8	16.0	16.2
H1	9.10	9.30	9.50
H2	12.5	13.0	13.5
H3	3.10	3.30	3.50
G	3.00	3.20	3.40
ΦP	3.00	3.20	3.40

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