



TN13N30PA

N-Channel Enhancement Mode Power MOSFET

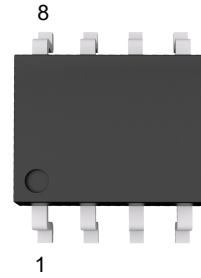
Features

- High density cell design for ultra low $R_{DS(on)}$
- Advanced trench technology
- $V_{DS}=30V, I_D=13A$
 $R_{DS(on)} < 12m\Omega @ V_{GS}=10V$

Applications

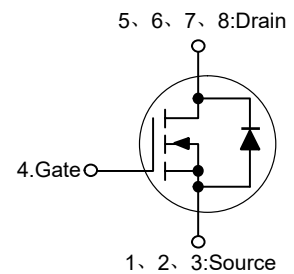
- PWM applications
- Load switch
- Power management

SOP-8



Marking code: 13N30

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	13	A
Drain Current-Pulsed ^{Note1}	I_{DM}	52	A
Single Pulsed Avalanche Energy ^{Note4}	E_{AS}	35.7	mJ
Maximum Power Dissipation	P_D	3.5	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance,Junction-to-Ambient ^{Note2}	$R_{\theta JA}$	35.7	°C/W
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Electrical Characteristics

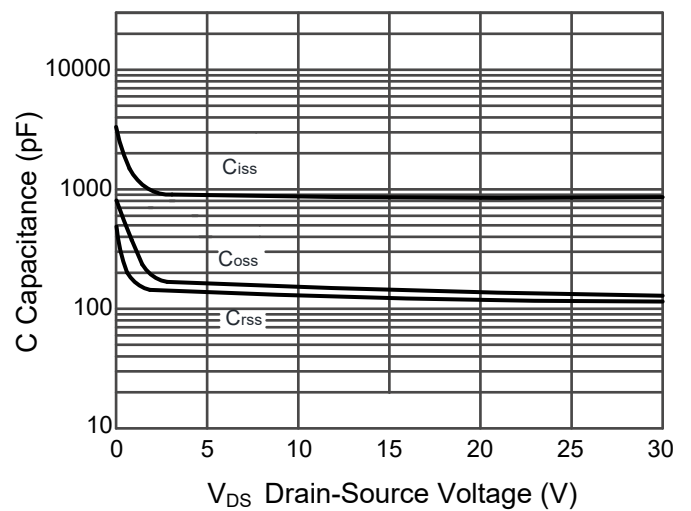
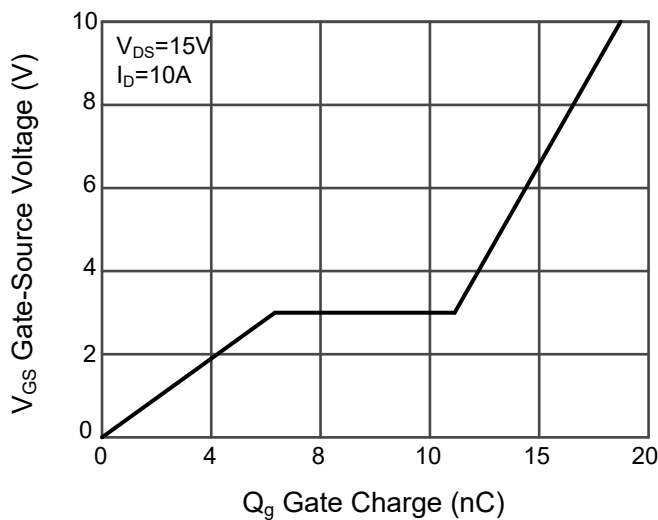
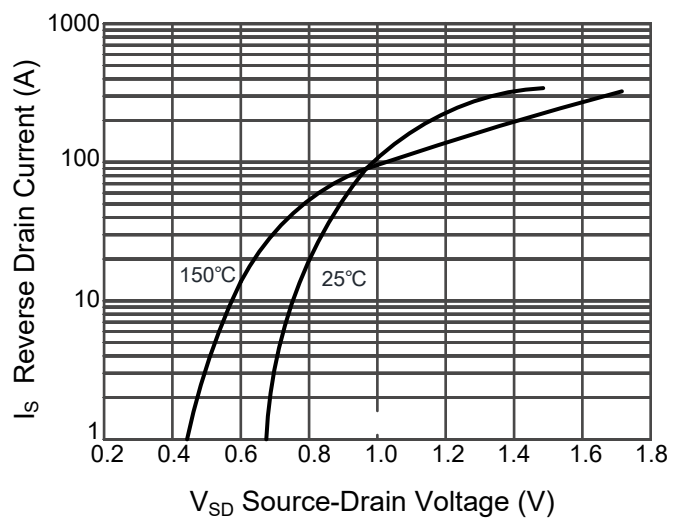
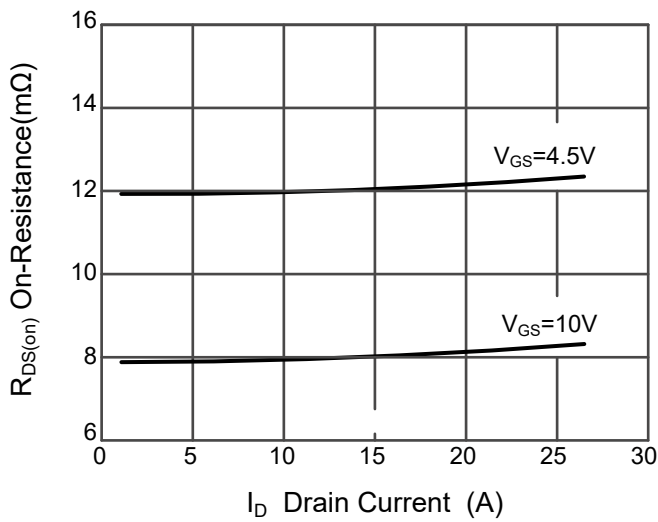
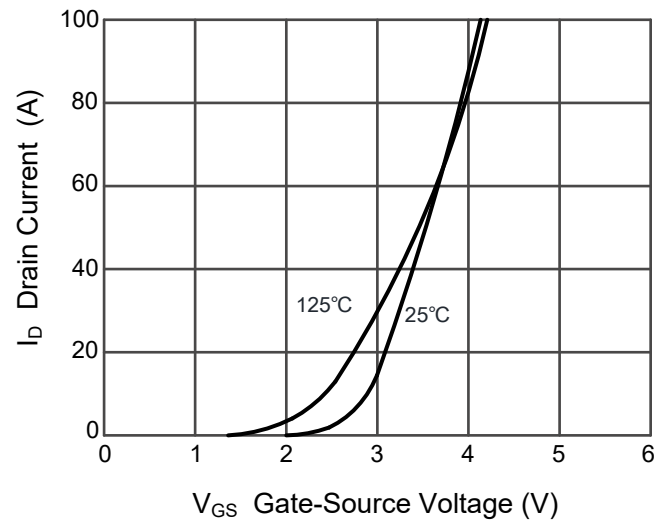
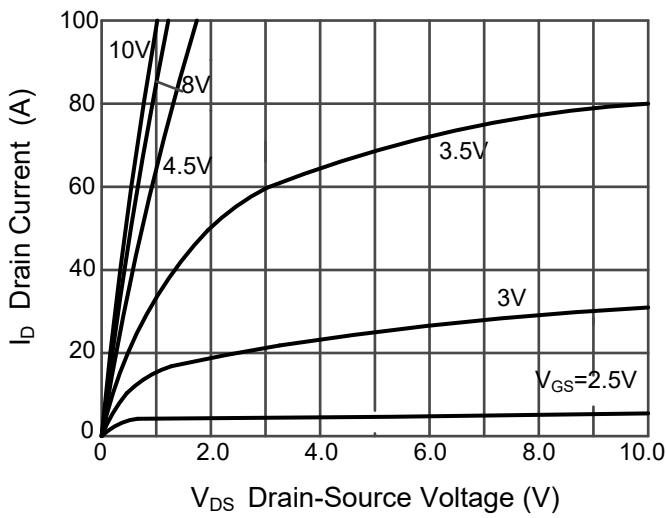
(T_J=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	30	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	--	--	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
Gate Threshold Voltage ^{Note3}	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.4	2.5	V
Drain-Source On-Resistance ^{Note3}	R _{DS(on)}	V _{GS} =10V, I _D =13A	--	8	12	mΩ
		V _{GS} =4.5V, I _D =10A	--	12	18	mΩ
Forward Transconductance ^{Note3}	g _{FS}	V _{DS} =5V, I _D =1A	--	6	--	S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	850	--	pF
Output Capacitance	C _{oss}		--	142	--	pF
Reverse Transfer Capacitance	C _{rss}		--	119	--	pF
Gate Resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1MHz	--	1.6	--	Ω
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =15V, I _D =13A, V _{GS} =10V, R _{GEN} =3Ω	--	6	--	nS
Turn-on Rise Time	t _r		--	5	--	nS
Turn-off Delay Time	t _{d(off)}		--	25	--	nS
Turn-off Fall Time	t _f		--	7	--	nS
Total Gate Charge	Q _g	V _{DS} =15V, I _D =6A, V _{GS} =10V	--	19	--	nC
Gate-Source Charge	Q _{gs}		--	6.3	--	nC
Gate-Drain Charge	Q _{gd}		--	4.5	--	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note3}	V _{SD}	V _{GS} =0V, I _S =13A	--	--	1.2	V
Diode Forward Current ^{Note2}	I _S		--	--	13	A

Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse width ≤ 300μs, duty cycle ≤ 0.5%.
4. The test condition is V_{DD}=20V, V_{GS}=10V, L=0.5mH, I_{AS}=12A, R_G=25Ω, T_J=25°C.



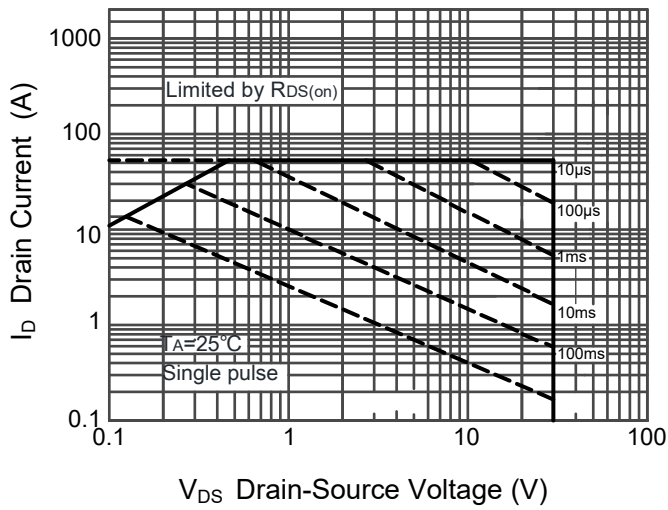
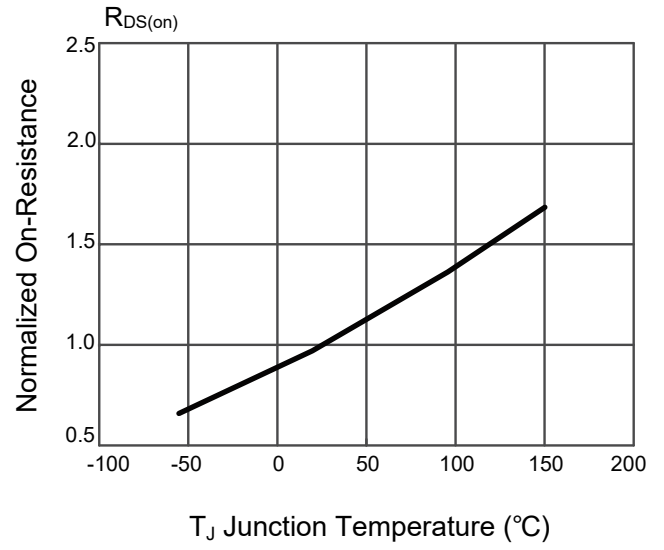
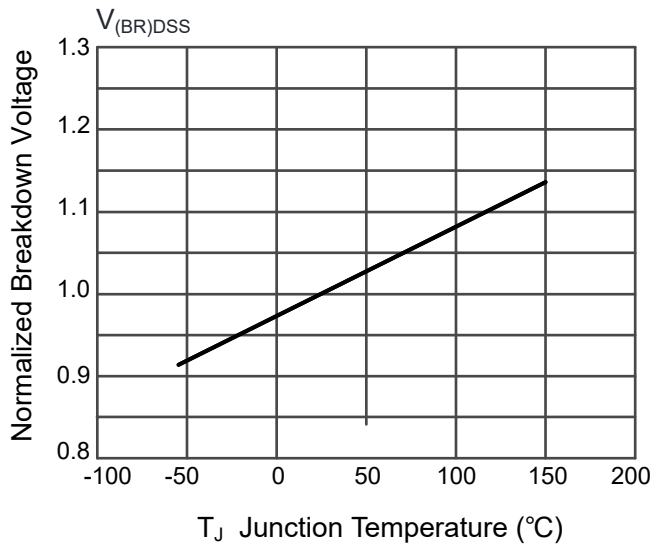
Typical Characteristic Curves





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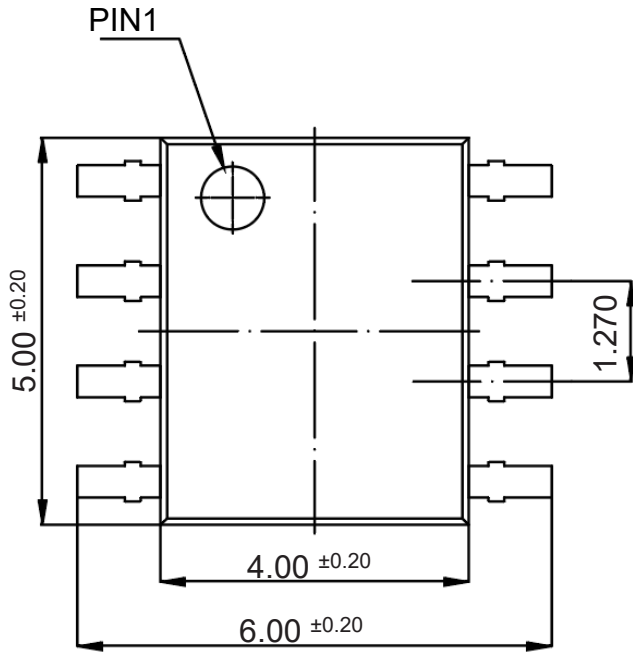
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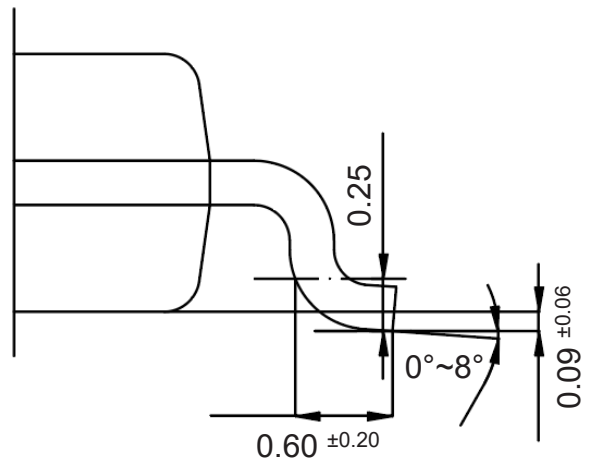
Package Outline

SOP-8

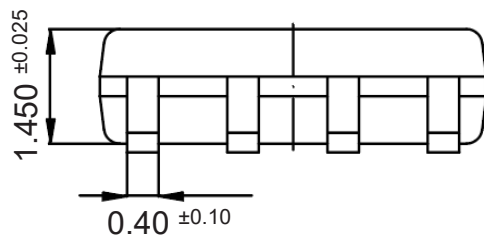
Dimensions in mm



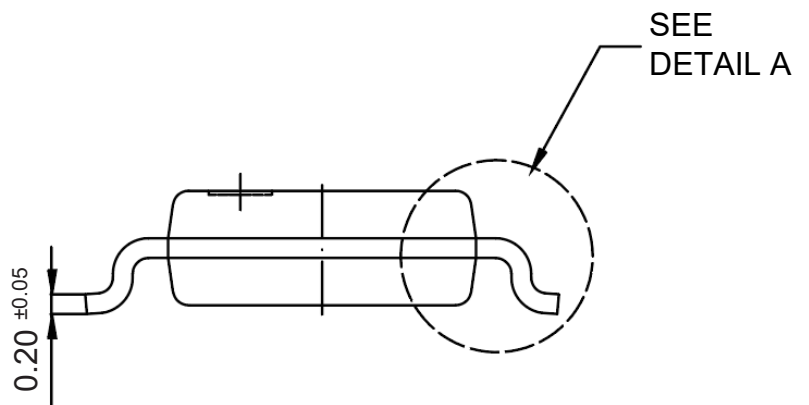
TOP VIEW



DETAIL A



SIDE VIEW



FRONT VIEW

Ordering Information

Device	Package	Shipping
TN13N30PA	SOP-8	4,000PCS/Reel&13inches



Contact Information

TANI website: <http://www.tanisemi.com> Email: tani@tanisemi.com

For additional information, please contact your local Sales Representative.

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