

TN9928ANPA

Dual N-Channel Enhancement Mode Power MOSFET

SOP-8

Product Summary

- $V_{DS} = 20V, I_D = 10A$
- $R_{DS(on)} < 20m\Omega @ V_{GS} = 4.5V$
- $R_{DS(on)} < 28m\Omega @ V_{GS} = 2.5V$

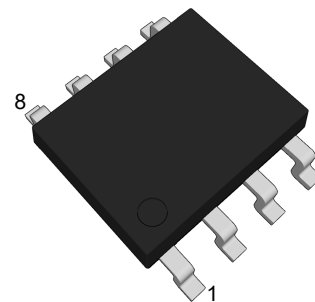
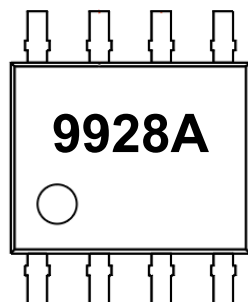
Features

- Advanced Trench Technology
- RoHS and Reach Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

Application

- Power Switching Application
- Hard Switched and High Frequency Circuits
- Uninterruptible Power Supply

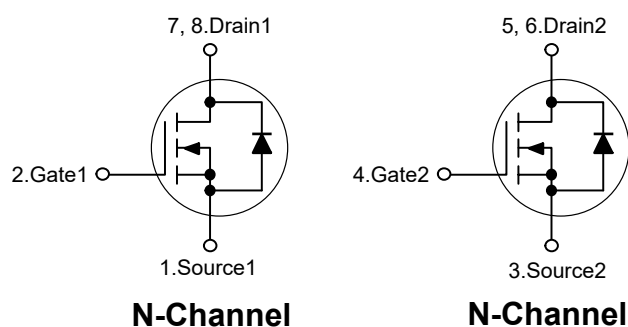
Marking Code



(Top View)

Pin	Description	Pin	Description
1	Source1	4	Gate2
2	Gate1	5,6	Drain2
3	Source2	7,8	Drain1

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous	I_D	10	A
Drain Current-Pulsed ^{Note1}	I_{DM}	40	A
Maximum Power Dissipation	P_D	2.0	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Ambient ^{Note2}	$R_{\theta JA}$	62.5	°C/W
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Electrical Characteristics

(T_J=25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	20	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =20V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 12V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	0.5	0.7	1	V
R _{DS(ON)}	Drain-Source On Resistance②	V _{GS} =4.5V, I _D =4A	---	16	20	m Ω
		V _{GS} =2.5V, I _D =3A	---	20	28	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz	---	775	---	pF
C _{Oss}	Output Capacitance		---	135	---	
C _{rss}	Reverse Transfer Capacitance		---	75	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =10V, I _D =3.5A R _G =3 Ω . V _{GS} =4.5V,	---	8.5	---	ns
t _r	Rise Time		---	29	---	ns
t _{d(off)}	Turn-Off Delay Time		---	34	---	ns
t _f	Fall Time		---	9.5	---	ns
Q _g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =10V, I _D =3.5A	---	10	---	nC
Q _{gs}	Gate-Source Charge		---	2.2	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	2.8	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Forward Voltage②	V _{GS} =0V, I _{SD} =6.8A	---	---	1.2	V
I _S	Source drain current(Body Diode)	T _A =25℃	---	---	6.8	A

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristic Curves

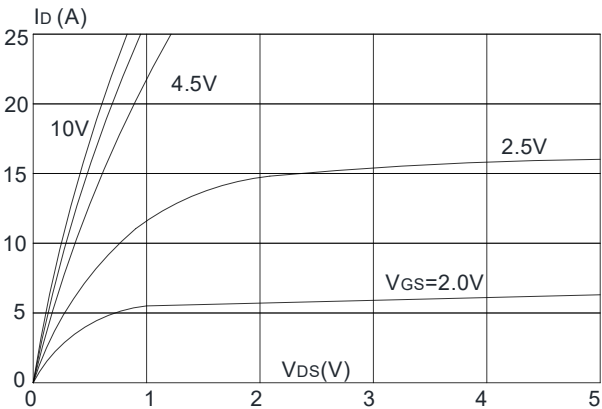


Figure1: Output Characteristics

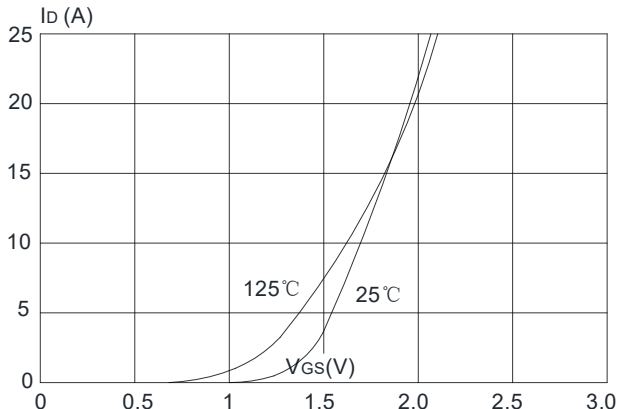


Figure 2: Typical Transfer Characteristics

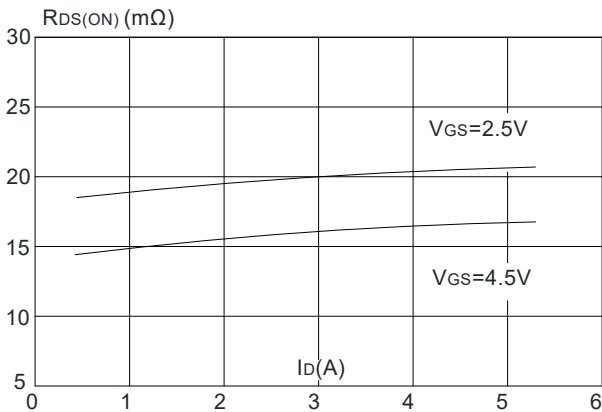


Figure 3: On-resistance vs. Drain Current

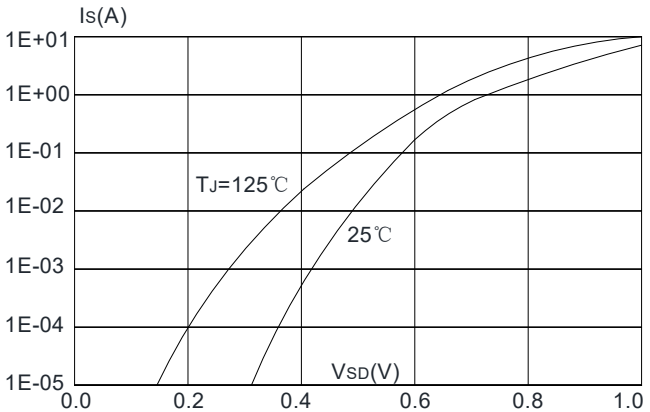


Figure 4: Body Diode Characteristics

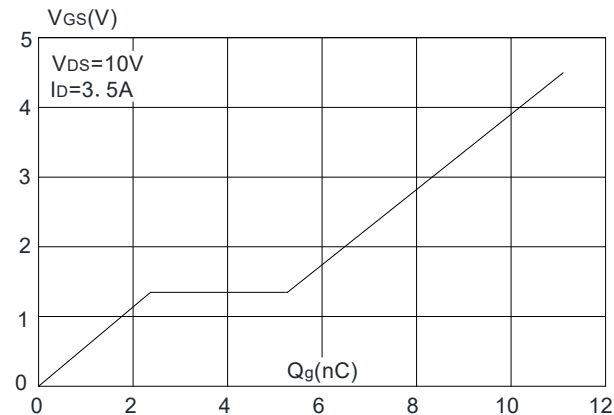


Figure 5: Gate Charge Characteristics

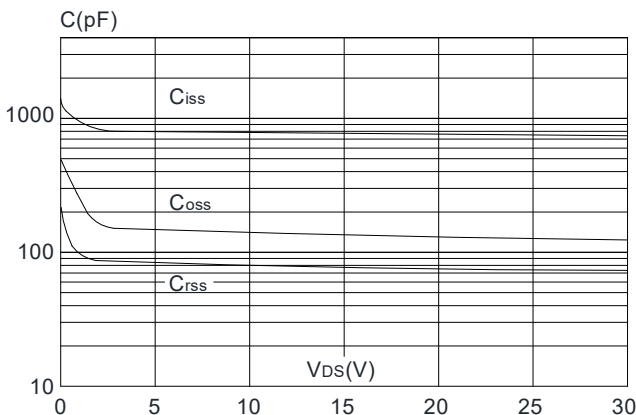


Figure 6: Capacitance Characteristics

Typical Characteristic Curves

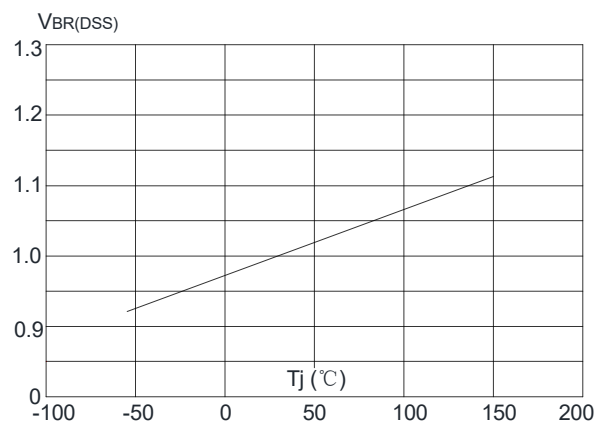


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

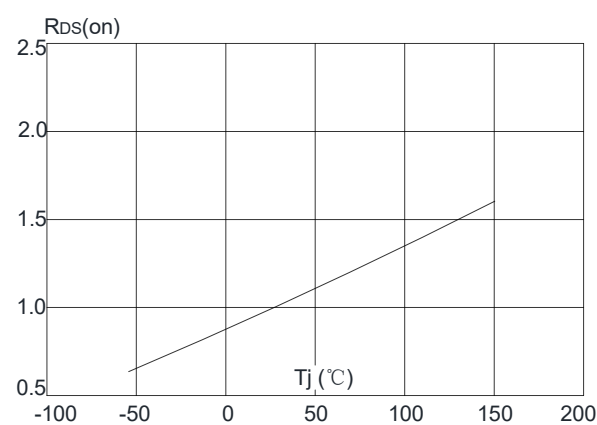


Figure 8: Normalized on Resistance vs. Junction Temperature

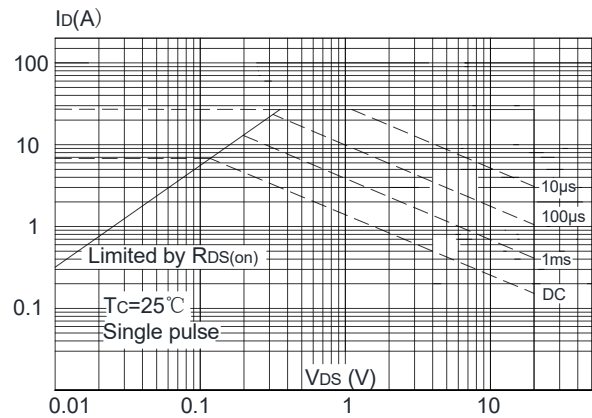


Figure 9: Maximum Safe Operating Area

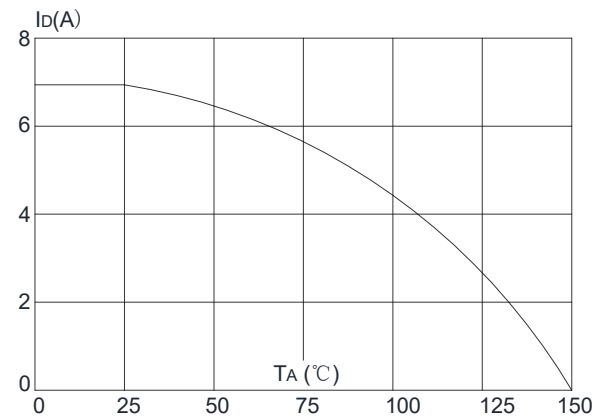


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

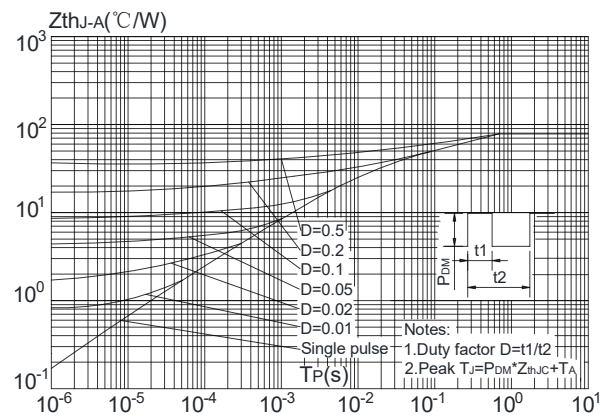
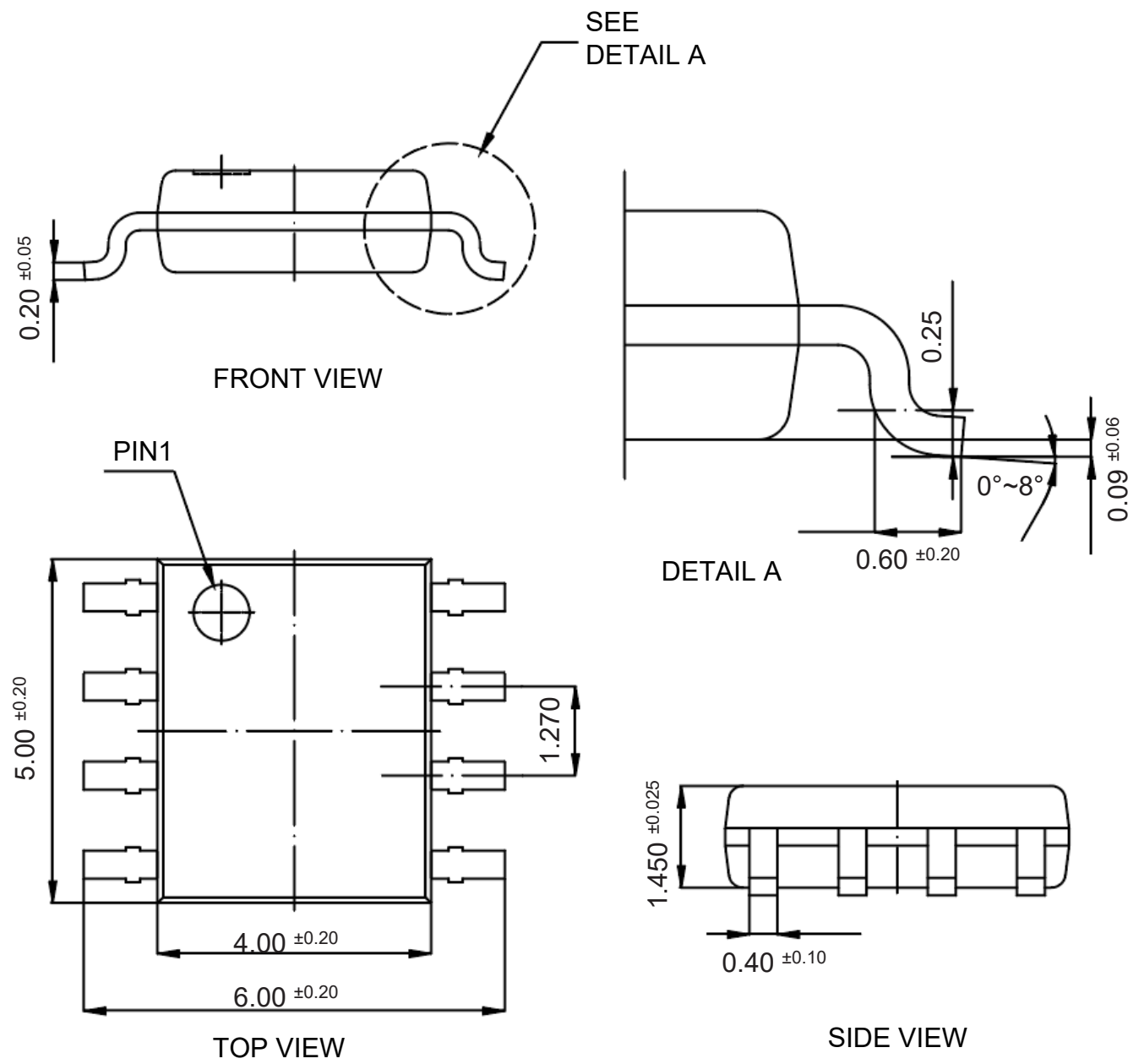


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Package Outline

SOP-8 Dimensions in mm



Ordering Information

Device	Package	Shipping
TN9928ANPA	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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