

TN9928JNPA

Dual N-Channel Enhancement Mode Power MOSFET

SOP-8

Product Summary

- $V_{DS} = 20V, I_D = 10.5A$
- $R_{DS(on)} < 18m\Omega @ V_{GS} = 4.5V$
- $R_{DS(on)} < 25m\Omega @ V_{GS} = 2.5V$

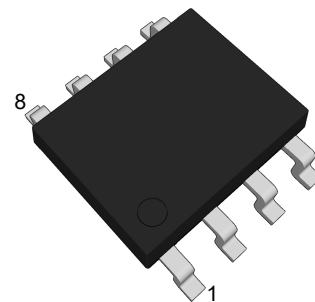
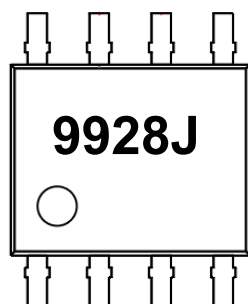
Features

- 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

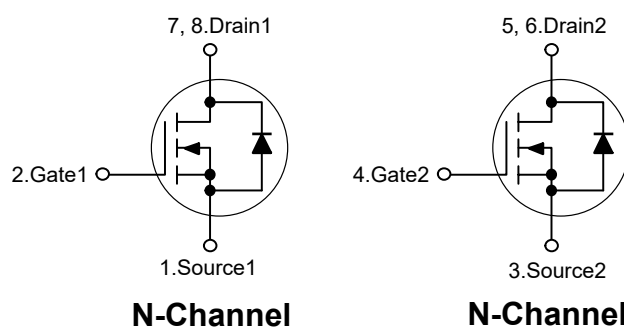
Marking Code



(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	10.0	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)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$			1	μA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 8V, V_{DS} = 0V$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -8V, V_{DS} = 0V$			-100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	0.4		1	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 4A$			18	m Ω
		$V_{GS} = 2.5V, I_D = 2A$			25	m Ω
Dynamic Characteristics ^d						
Input Capacitance	C_{iss}	$V_{DS} = 10V, V_{GS} = 0V, f = 1.0\text{ MHz}$		1400		pF
Output Capacitance	C_{oss}			205		pF
Reverse Transfer Capacitance	C_{rss}			165		pF
Switching Characteristics ^d						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15V, I_D = 5A, V_{GS} = 5V, R_{GEN} = 3\Omega$		18		ns
Turn-On Rise Time	t_r			11		ns
Turn-Off Delay Time	$t_{d(off)}$			48		ns
Turn-Off Fall Time	t_f			10		ns
Total Gate Charge	Q_g	$V_{DS} = 15V, I_D = 5A, V_{GS} = 4.5V$		18		nC
Gate-Source Charge	Q_{gs}			3.5		nC
Gate-Drain Charge	Q_{gd}			4		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current ^b	I_S				1.7	A
Drain-Source Diode Forward Voltage ^c	V_{SD}	$V_{GS} = 0V, I_S = 1.7A$			1.2	V
Notes : □ a.Repetitive Rating : Pulse width limited by maximum junction temperature.□ b.Surface Mounted on FR4 Board, $t \leq 10\text{ sec.}$□ c.Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.□ d.Guaranteed by design, not subject to production testing.□ □						

Typical Characteristic Curves

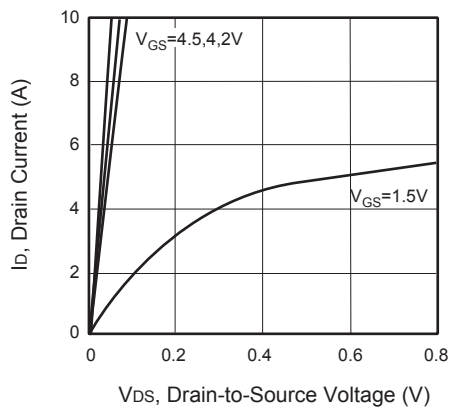


Figure 1. Output Characteristics

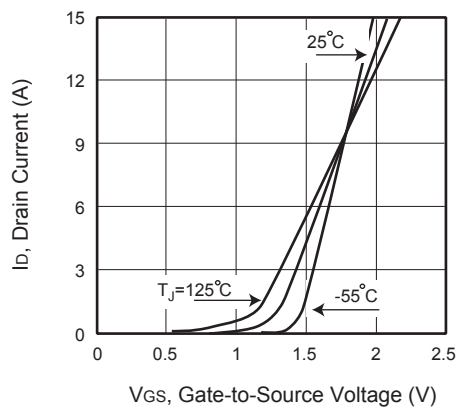


Figure 2. Transfer Characteristics

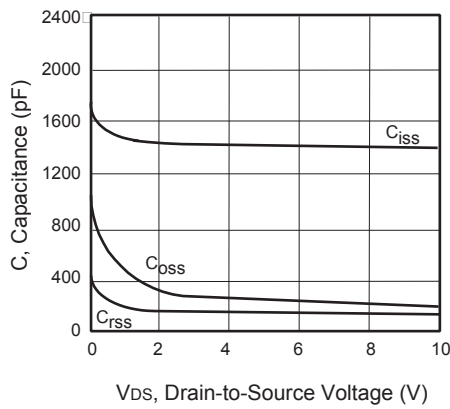


Figure 3. Capacitance

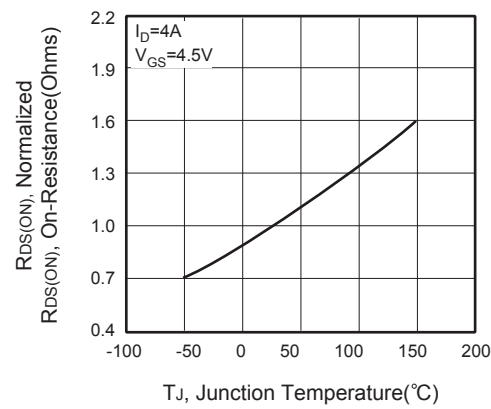


Figure 4. On-Resistance Variation with Temperature

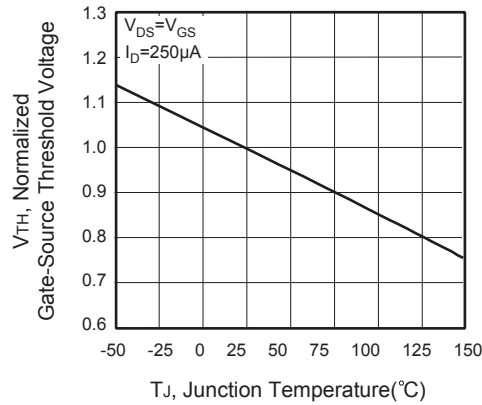


Figure 5. Gate Threshold Variation with Temperature

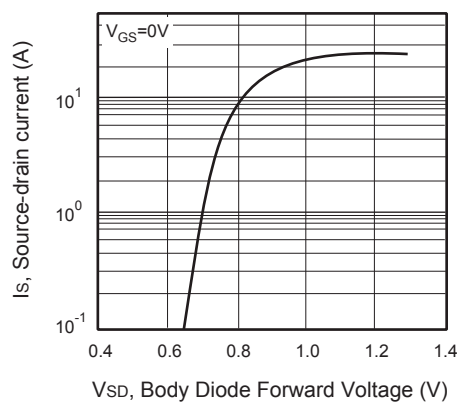


Figure 6. Body Diode Forward Voltage Variation with Source Current

Typical Characteristic Curves

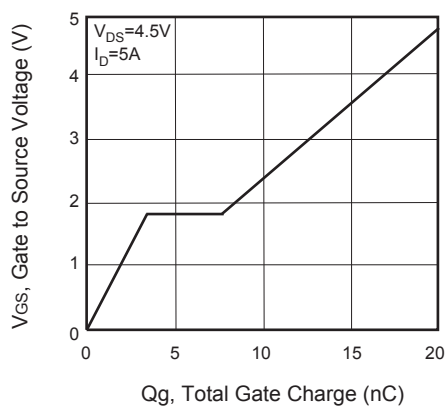


Figure 7. Gate Charge

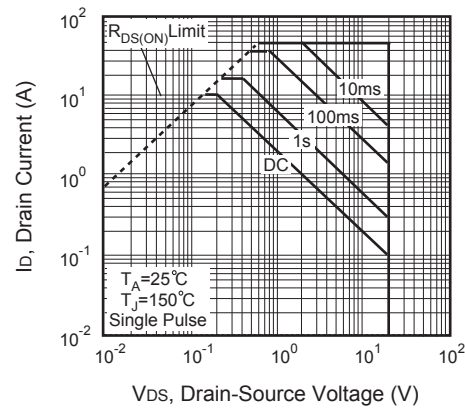


Figure 8. Maximum Safe Operating Area

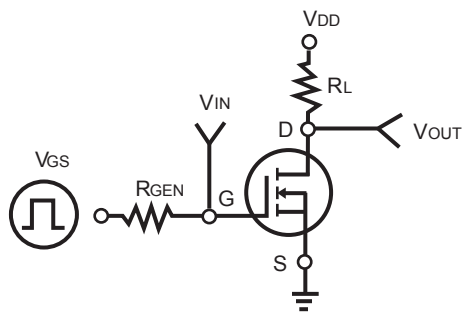


Figure 9. Switching Test Circuit

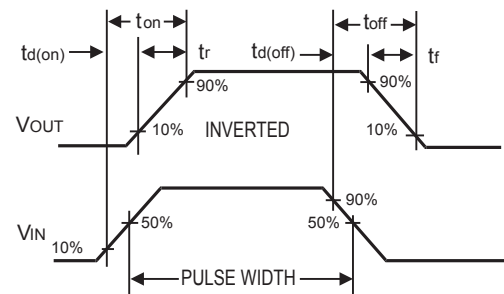


Figure 10. Switching Waveforms

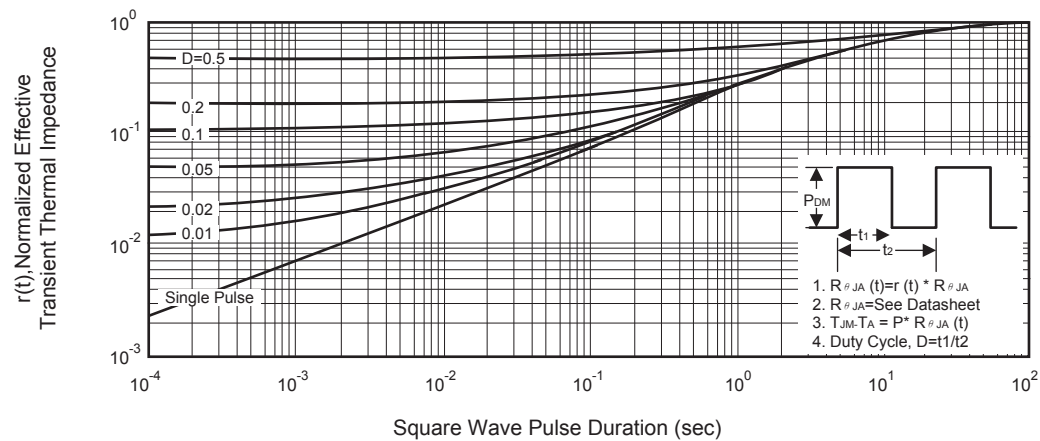
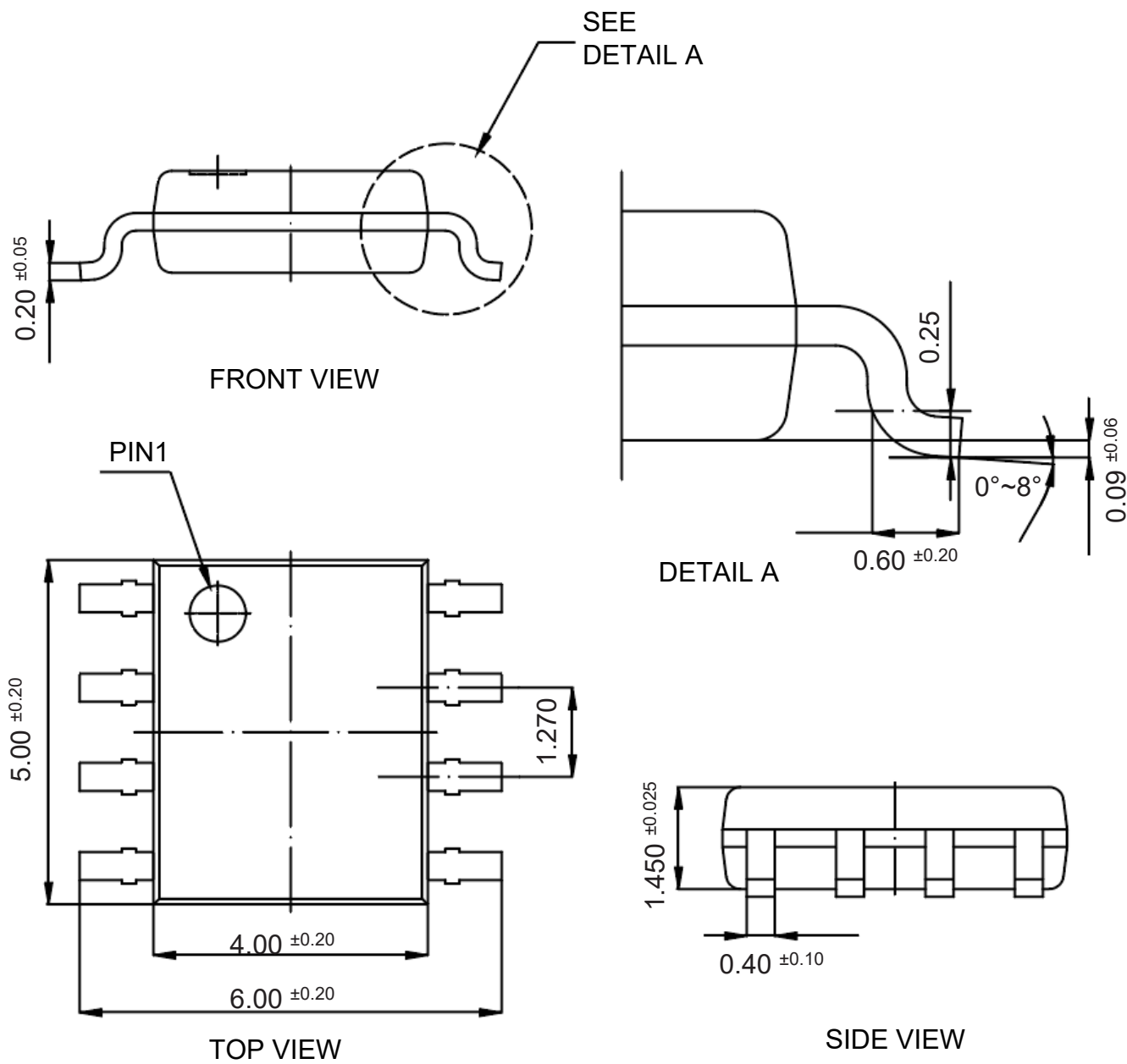


Figure 11. Normalized Thermal Transient Impedance Curve

Package Outline

SOP-8 Dimensions in mm



Ordering Information

Device	Package	Shipping
TN9928JNPA	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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