



SPN9928

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN9928 is the Dual N-Channel logic enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application , notebook computer power management and other battery powered circuits where high-side switching .

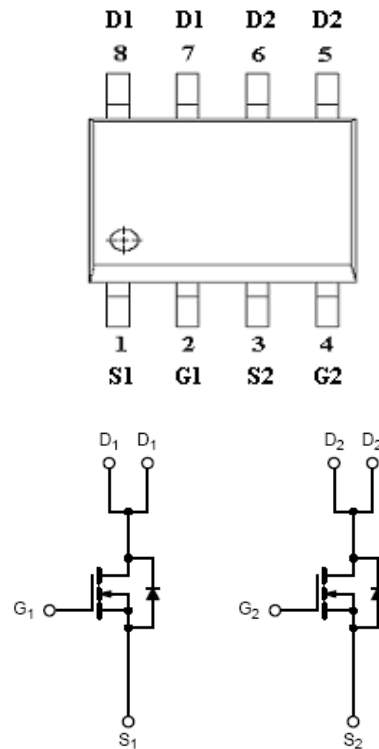
FEATURES

- ◆ 20V/6.0A, $R_{DS(ON)}=25m\Omega@V_{GS}=4.5V$
- ◆ 20V/5.0A, $R_{DS(ON)}=32m\Omega@V_{GS}=2.5V$
- ◆ 20V/4.0A, $R_{DS(ON)}=50m\Omega@V_{GS}=1.8V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOP-8 package design

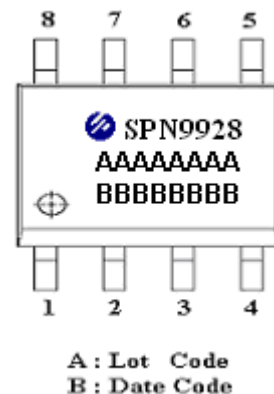
APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

PIN CONFIGURATION(SOP-8)



PART MARKING





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PIN DESCRIPTION

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1 | S1 | Source 1 |
| 2 | G1 | Gate 1 |
| 3 | S2 | Source 2 |
| 4 | G2 | Gate 2 |
| 5 | D2 | Drain 2 |
| 6 | D2 | Drain 2 |
| 7 | D1 | Drain 1 |
| 8 | D1 | Drain 1 |

ORDERING INFORMATION

| Part Number | Package | Part Marking |
|--------------|---------|--------------|
| SPN9928S8RGB | SOP-8 | SPN9928 |

※ SPN9928S8RGB : 13" Tape Reel ; Pb – Free ; Halogen – Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

| Parameter | Symbol | Typical | Unit | |
|---|------------------|---------|------|---|
| Drain-Source Voltage | V _{DSS} | 20 | V | |
| Gate –Source Voltage | V _{GSS} | ±12 | V | |
| Continuous Drain Current(T _J =150°C) | I _D | TA=25°C | 6.8 | A |
| | | TA=70°C | 4.8 | |
| Pulsed Drain Current | I _{DM} | 30 | A | |
| Continuous Source Current(Diode Conduction) | I _S | 1.6 | A | |
| Power Dissipation | P _D | TA=25°C | 2.8 | W |
| | | TA=70°C | 1.8 | |
| Operating Junction Temperature | T _J | -55/150 | °C | |
| Storage Temperature Range | T _{STG} | -55/150 | °C | |
| Thermal Resistance-Junction to Ambient | R _{θJA} | 105 | °C/W | |



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ELECTRICAL CHARACTERISTICS

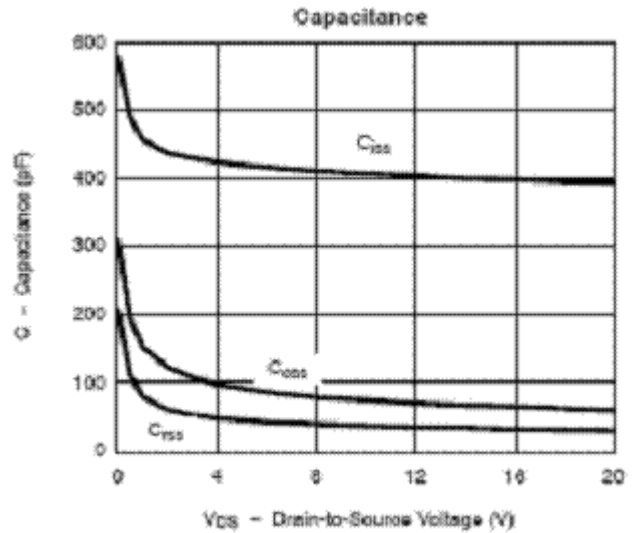
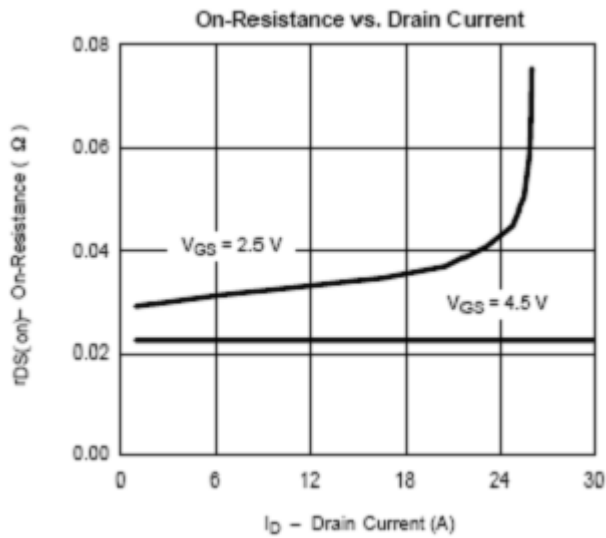
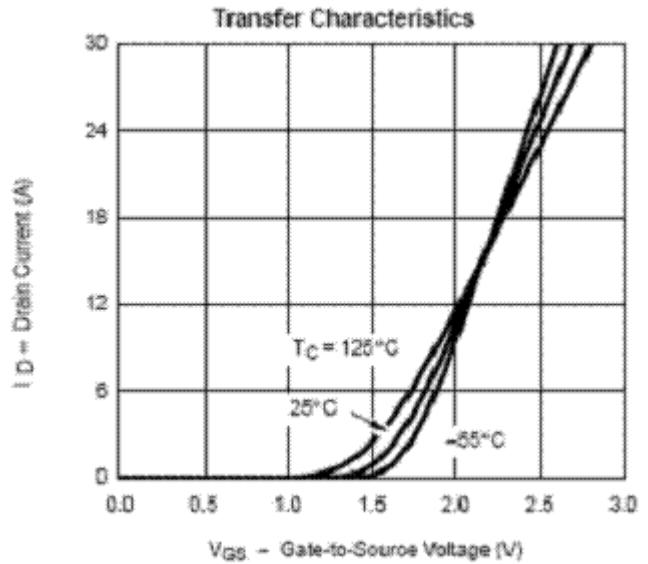
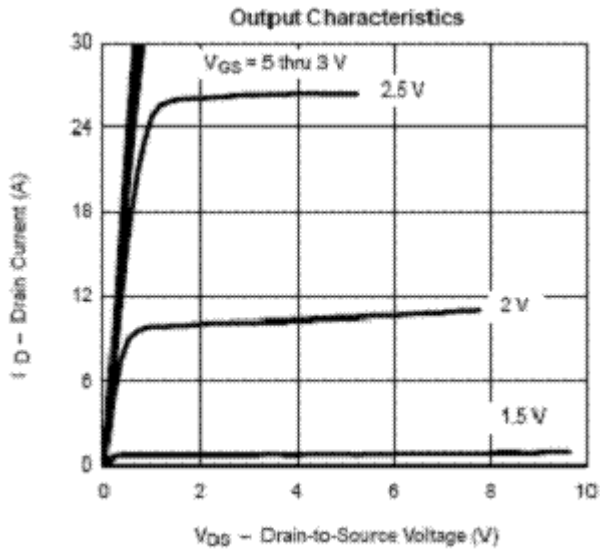
(TA=25°C Unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---------------------------------|---------------|--|------|-------|-----------|----------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 20 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.5 | | 1.0 | V |
| Gate Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 12V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=20V, V_{GS}=0V$ | | | 1 | uA |
| | | $V_{DS}=20V, V_{GS}=0V$ $T_J=55^\circ C$ | | | 5 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS} \leq 5V, V_{GS}=4.5V$ | 6 | | | A |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=6.0A$ | | 0.023 | 0.025 | Ω |
| | | $V_{GS}=2.5V, I_D=5.0A$ | | 0.028 | 0.032 | |
| | | $V_{GS}=1.8V, I_D=4.0A$ | | 0.040 | 0.050 | |
| Forward Transconductance | g_{fs} | $V_{DS}=5V, I_D=-3.6A$ | | 10 | | S |
| Diode Forward Voltage | V_{SD} | $I_S=1.7A, V_{GS}=0V$ | | 0.8 | 1.2 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=10V, V_{GS}=4.5V,$ $I_D=6.0A$ | | 2 | | nC |
| Gate-Source Charge | Q_{gs} | | | 2.5 | | |
| Gate-Drain Charge | Q_{gd} | | | 2.1 | | |
| Input Capacitance | C_{iss} | $V_{DS}=8V, V_{GS}=0V$ $f=1MHz$ | | 575 | | pF |
| Output Capacitance | C_{oss} | | | 84 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 22 | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD}=10V, R_L=6\Omega$ $I_D=1.0A, V_{GEN}=4.5V$ $R_G=6\Omega$ | | 10 | 14 | nS |
| | t_r | | | 16 | 20 | |
| Turn-Off Time | $t_{d(off)}$ | | | 35 | 40 | |
| | t_f | | | 3 | 10 | |



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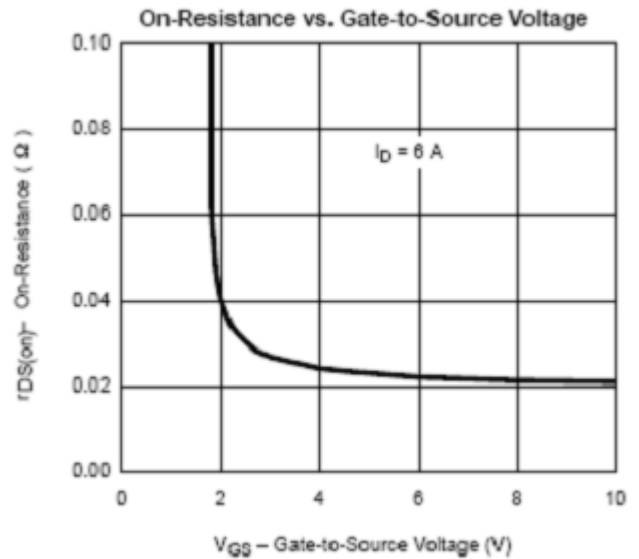
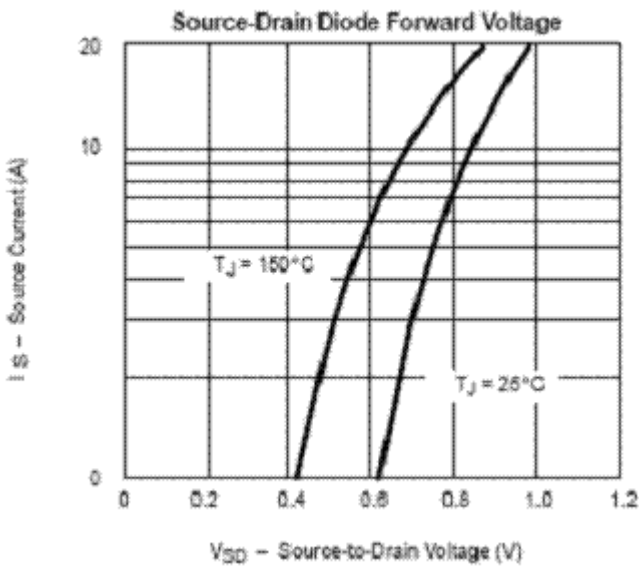
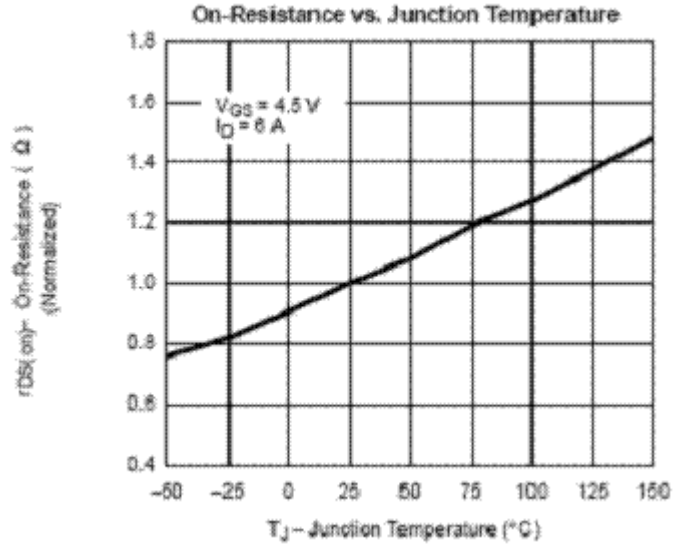
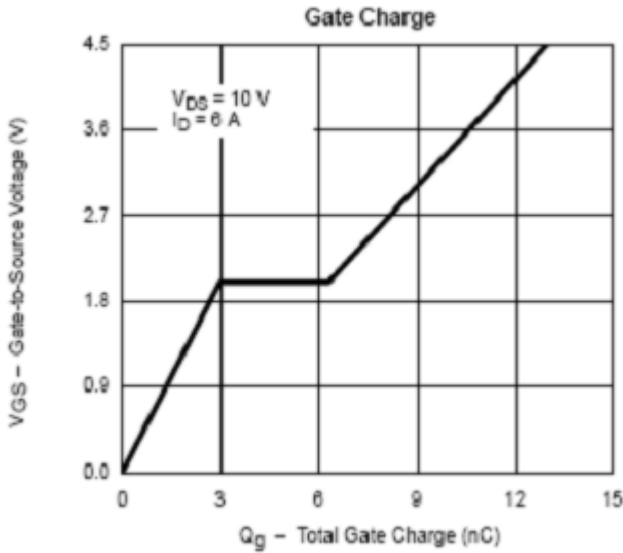
TYPICAL CHARACTERISTICS





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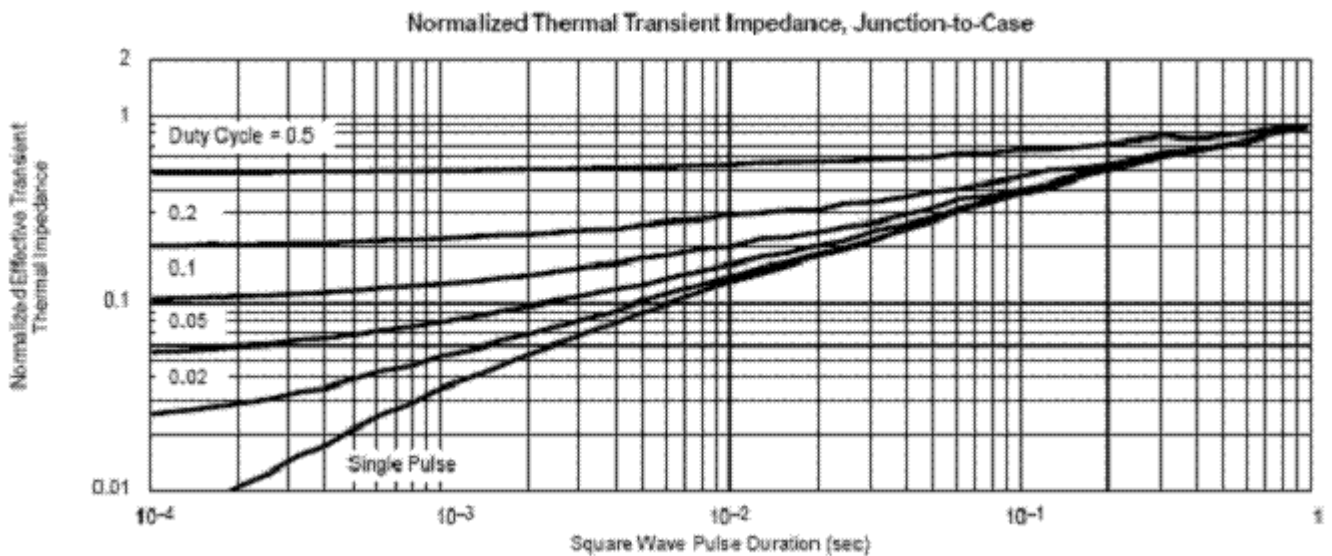
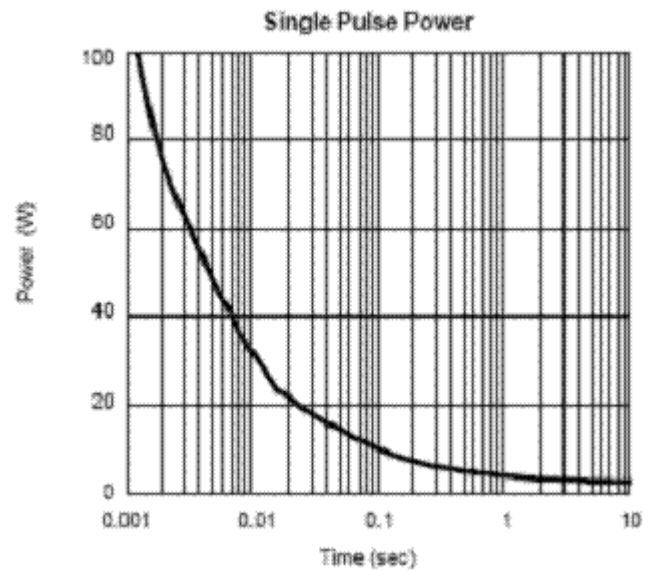
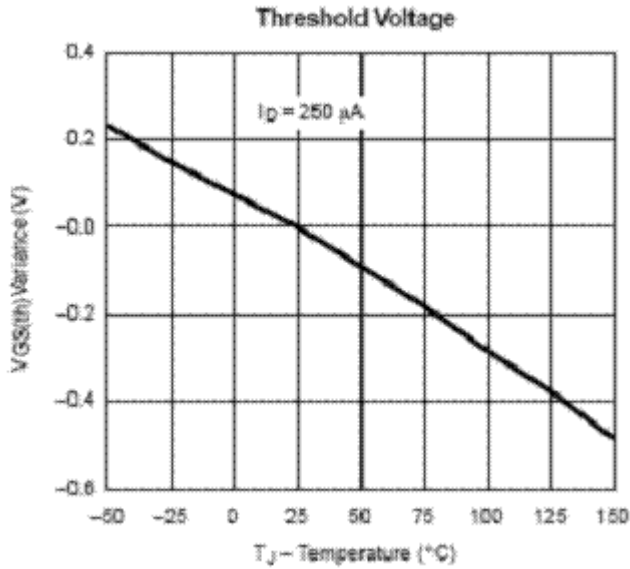
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