



SPN4416B

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN4416B is the 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 .

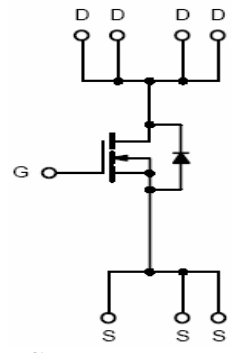
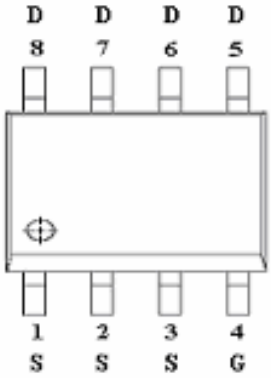
FEATURES

- ◆ 20V/10.0A, $R_{DS(ON)}= 12m\Omega@V_{GS}= 4.5V$
- ◆ 20V/ 7.0A, $R_{DS(ON)}= 25m\Omega@V_{GS}= 2.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOP – 8P package design

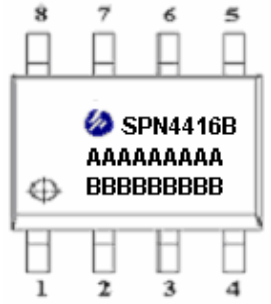
APPLICATIONS

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

PIN CONFIGURATION(SOP – 8P)



PART MARKING



A : Lot Code
B : Date Code



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PIN DESCRIPTION

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1 | S | Source |
| 2 | S | Source |
| 3 | S | Source |
| 4 | G | Gate |
| 5 | D | Drain |
| 6 | D | Drain |
| 7 | D | Drain |
| 8 | D | Drain |

ORDERING INFORMATION

| Part Number | Package | Part Marking |
|---------------|---------|--------------|
| SPN4416BS8RGB | SOP- 8P | SPN4416B |

※ SPN4416BS8RGB : Tube ; 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 | 10.0 | A |
| | | TA=70°C | 7.6 | |
| Pulsed Drain Current | I _{DM} | 35 | A | |
| Continuous Source Current(Diode Conduction) | I _S | 2.3 | A | |
| Power Dissipation | P _D | TA=25°C | 2.5 | W |
| | | TA=70°C | 1.6 | |
| Operating Junction Temperature | T _J | -55/150 | °C | |
| Storage Temperature Range | T _{STG} | -55/150 | °C | |
| Thermal Resistance-Junction to Ambient | R _{θJA} | 80 | °C/W | |



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ELECTRICAL CHARACTERISTICS

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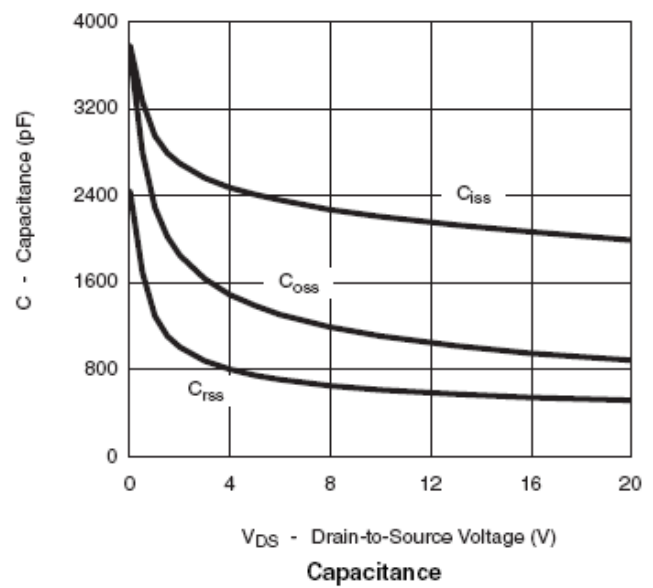
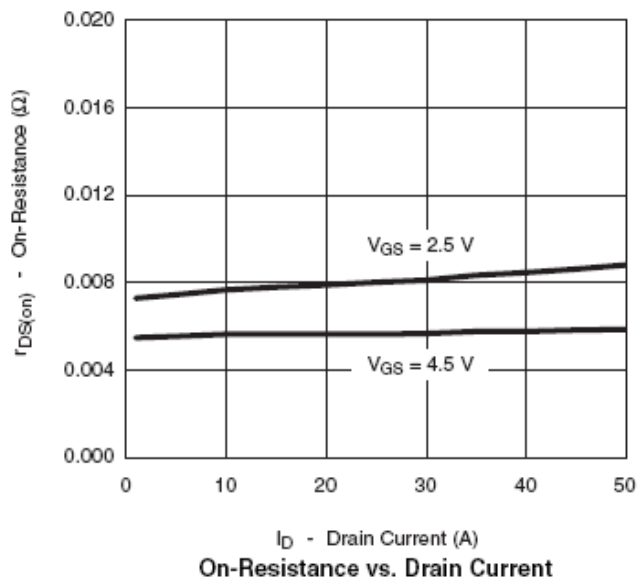
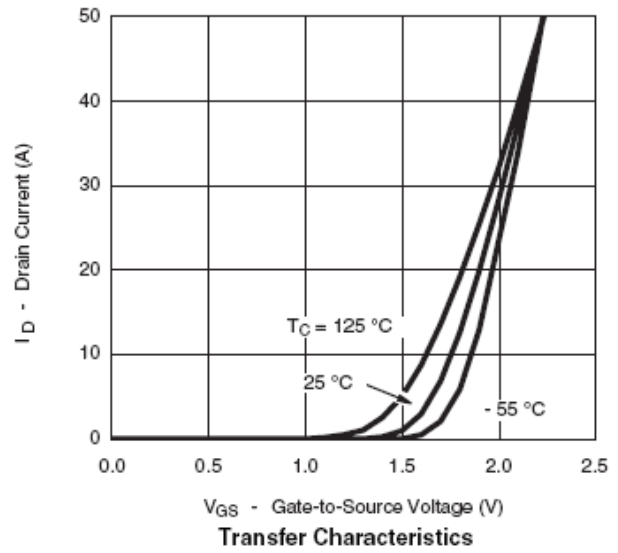
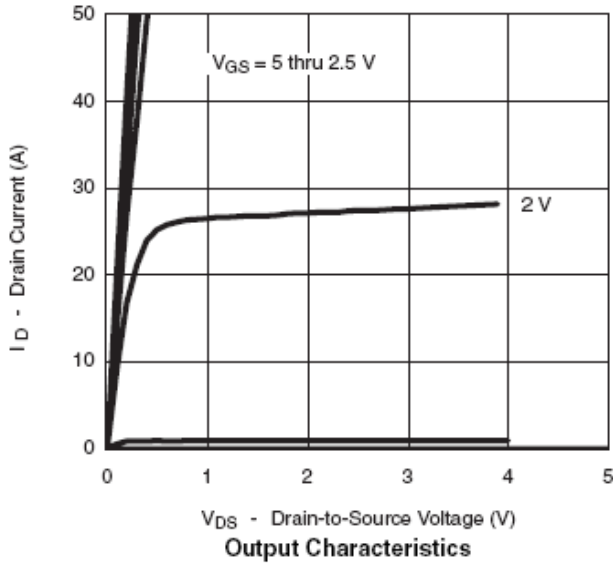
| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---------------------------------|---------------|---|------|-------|-----------|----------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 20 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.6 | | 1.4 | 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 |
| | | $V_{DS}=20V, V_{GS}=0V$ $T_J=55^\circ C$ | | | 10 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS}\geq 5V, V_{GS}=4.5V$ | 6 | | | A |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=10.0A$ | | 0.008 | 0.012 | Ω |
| | | $V_{GS}=2.5V, I_D=7.0A$ | | 0.020 | 0.025 | |
| Forward Transconductance | g_{fs} | $V_{DS}=15V, I_D=5.0A$ | | 30 | | S |
| Diode Forward Voltage | V_{SD} | $I_S=1.0A, V_{GS}=0V$ | | 0.8 | 1.2 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=10V, V_{GS}=4.5V$ $I_D=5.0A$ | | 18 | 25 | nC |
| Gate-Source Charge | Q_{gs} | | | 4.2 | | |
| Gate-Drain Charge | Q_{gd} | | | 6.8 | | |
| Input Capacitance | C_{iss} | $V_{DS}=10V, V_{GS}=0V$ $f=1MHz$ | | 850 | | pF |
| Output Capacitance | C_{oss} | | | 135 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 105 | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD}=10V, R_L=10\Omega$ $I_D=1.0A, V_{GEN}=4.5V$ $R_G=6\Omega$ | | 12 | 16 | ns |
| | t_r | | | 10 | 28 | |
| Turn-Off Time | $t_{d(off)}$ | | | 30 | 55 | |
| | t_f | | | 35 | 58 | |



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TYPICAL CHARACTERISTICS

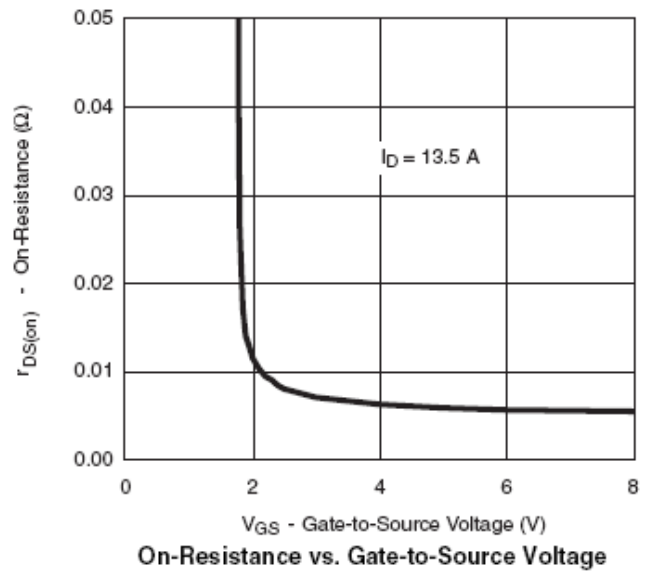
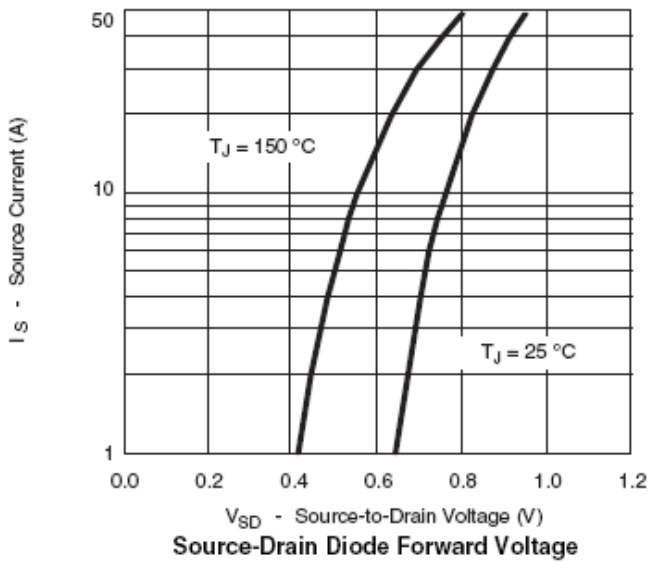
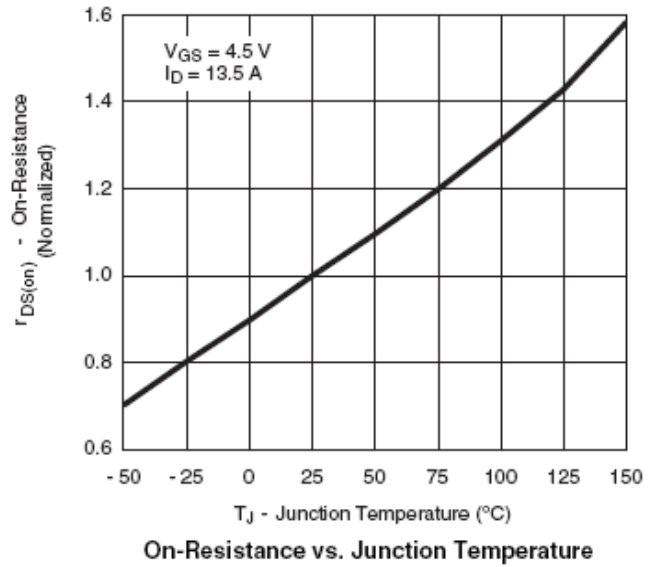
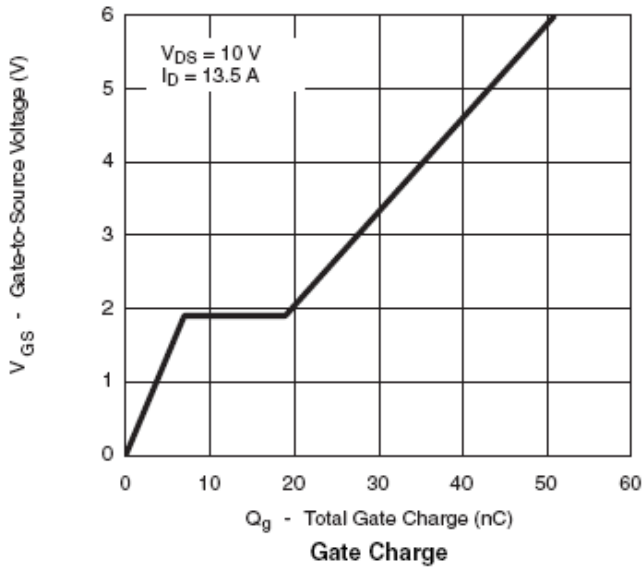




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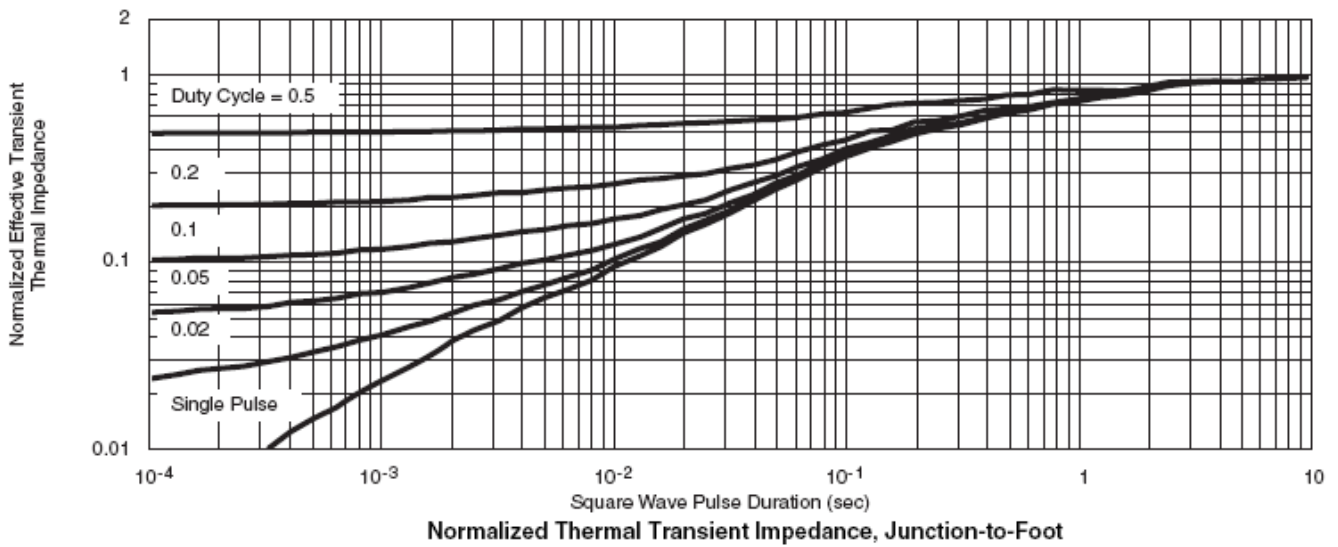
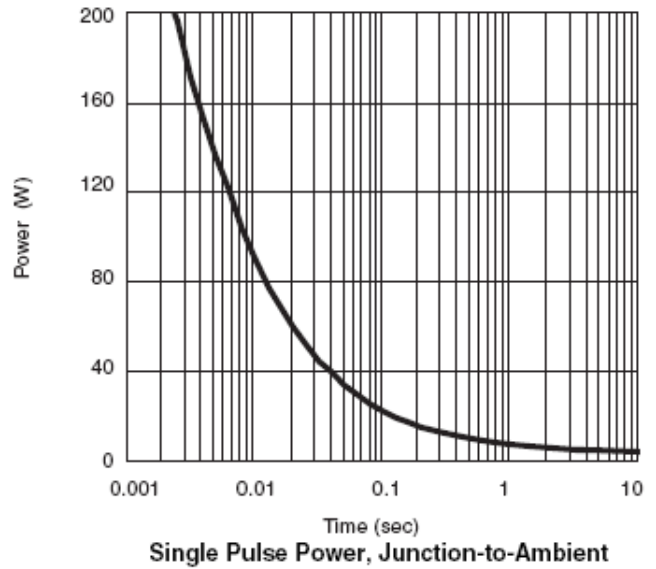
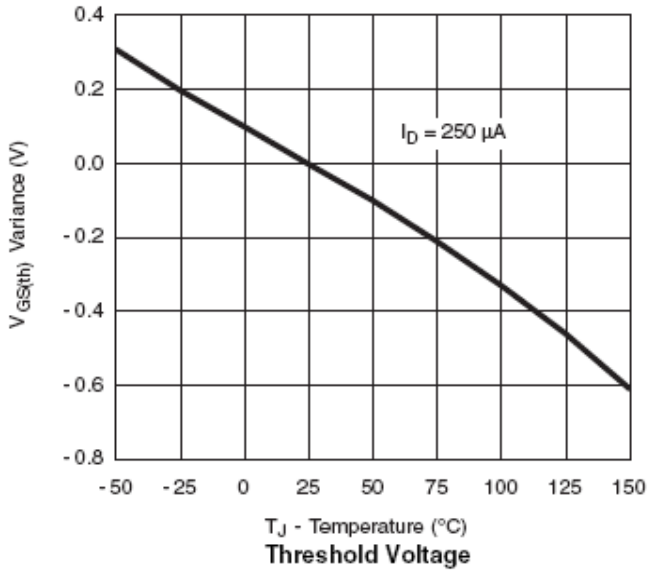




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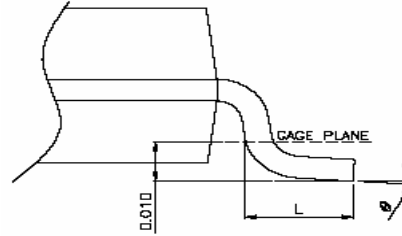
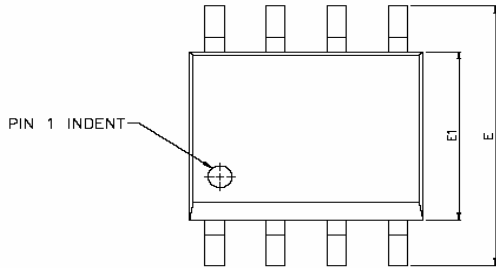
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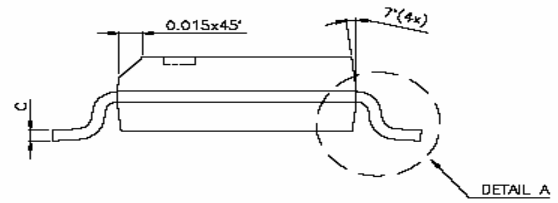
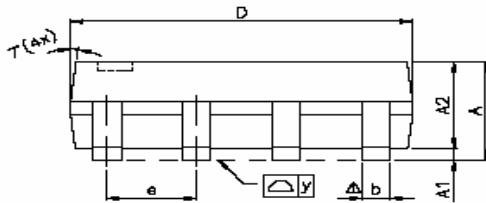


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SOP- 8 PACKAGE OUTLINE



DETAIL A



| SYMBOLS | DIMENSIONS IN MILLIMETERS | | | DIMENSIONS IN INCHES | | |
|------------|---------------------------|------|-------|----------------------|-------|--------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 1.47 | 1.60 | 1.73 | 0.058 | 0.063 | 0.068 |
| A1 | 0.10 | — | 0.25 | 0.004 | — | 0.010 |
| A2 | — | 1.45 | — | — | 0.057 | — |
| b | 0.33 | 0.41 | 0.51 | 0.013 | 0.016 | 0.020 |
| C | 0.19 | 0.20 | 0.25 | 0.0075 | 0.008 | 0.0098 |
| D | 4.80 | 4.85 | 4.95 | 0.189 | 0.191 | 0.195 |
| E | 5.80 | 6.00 | 6.20 | 0.228 | 0.236 | 0.244 |
| E1 | 3.80 | 3.90 | 4.00 | 0.150 | 0.154 | 0.157 |
| e | — | 1.27 | — | — | 0.050 | — |
| L | 0.38 | 0.71 | 1.27 | 0.015 | 0.028 | 0.050 |
| Δ y | — | — | 0.076 | — | — | 0.003 |
| θ | 0° | — | 8° | 0° | — | 8° |



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