



SPN5001 N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN5001 is the N-Channel logic enhancement mode power field effect transistor which is produced with high voltage BiCMOS technology. This device is particularly suited for reducing the no load consumption in PC power, TV power and Adapter.

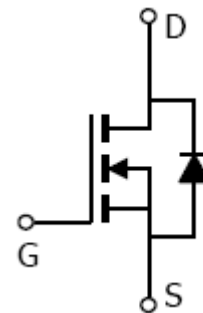
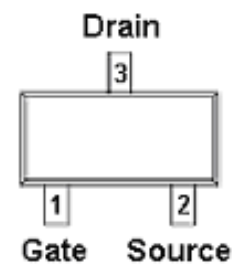
APPLICATIONS

- Desk PC Power Supply
- AC adapter
- LCD TC Power Supply

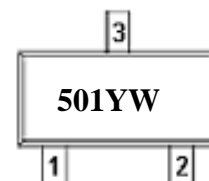
FEATURES

- ◆ 600V/27mA , $R_{DS(ON)} = 300\Omega @ V_{GS} = 10V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOT-23 package design

PIN CONFIGURATION(SOT-23)



PART MARKING



YW: Date Code



SPN5001

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PIN DESCRIPTION

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1 | G | Gate |
| 2 | S | Source |
| 3 | D | Drain |

ORDERING INFORMATION

| Part Number | Package | Part Marking |
|---------------|---------|--------------|
| SPN5001S23RGB | SOT-23 | 501YW |

※ SPN5001S23RGB : Tape Reel ; Pb – Free ; Halogen – Free

ABSOLUTE MAXIMUM RATINGS (TA=25°C Unless otherwise noted)

| Parameter | Symbol | Typical | Unit |
|--|------------------|-----------|------|
| Drain-Source Voltage | V _{DSS} | 600 | V |
| Gate –Source Voltage - Continuous | V _{GSS} | ±20 | V |
| Continuous Drain Current | I _D | 27 | mA |
| Power Dissipation | P _D | 0.5 | W |
| Operating Junction Temperature | T _J | -55 ~ 150 | °C |
| Storage Temperature Range | T _{STG} | -55 ~ 150 | °C |
| Thermal Resistance-Junction to Ambient | R _{θJA} | 250 | °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 =250uA | 600 | | | V | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250uA | 3.0 | | 4.5 | | |
| Gate Leakage Current | I _{GSS} | V _{DS} =0V, V _{GS} =±20V | | | ±100 | nA | |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =480V, V _{GS} =0V T _J =25°C | | | 25 | uA | |
| Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =10V, I _D =16mA | | | 300 | Ω | |
| Forward Transconductance | G _{fs(1)} | V _{DS} = 10 V, I _D =16mA | | 28 | | mS | |
| Dynamic | | | | | | | |
| Total Gate Charge | Q _g | V _{DD} = 200 V, I _D = 0.1 A, V _{GS} = 10 V | 1.8 | 2.5 | 3.2 | nC | |
| Gate-Source Charge | Q _{gs} | | | | 1.3 | | |
| Gate-Drain Charge | Q _{gd} | | | | 0.8 | | |
| Input Capacitance | C _{iss} | V _{DS} = 25 V, f = 1 MHz, V _{GS} = 0 | 8.8 | 12.5 | 16.2 | pF | |
| Output Capacitance | C _{oss} | | | 7 | 10 | | 13 |
| Reverse Transfer Capacitance | C _{rss} | | | 5 | 7 | | 9 |
| Turn-On Time | t _{d(on)} | V _{DS} = 300 V, I _D = 10m A R _G = 3.3Ω V _{GS} = 10.0 V R _D = 30kΩ | | 11.5 | | ns | |
| | t _r | | | 14.5 | | | |
| Turn-Off Time | t _{d(off)} | | | | 14 | | |
| | t _f | | | | 120 | | |



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TYPICAL CHARACTERISTICS

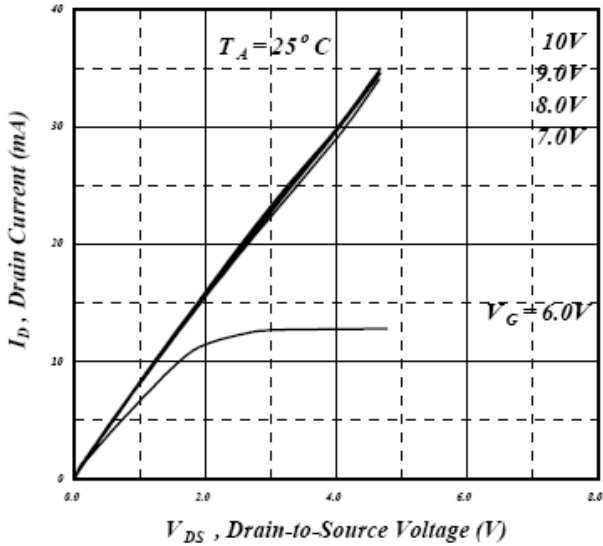


Fig 1. Typical Output Characteristics

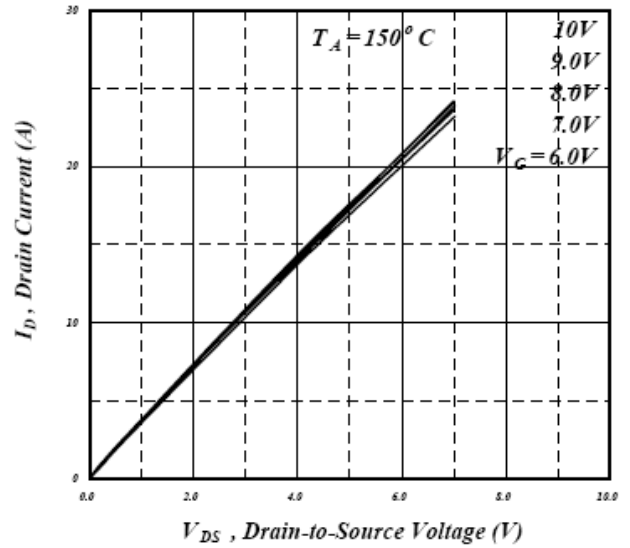


Fig 2. Typical Output Characteristics

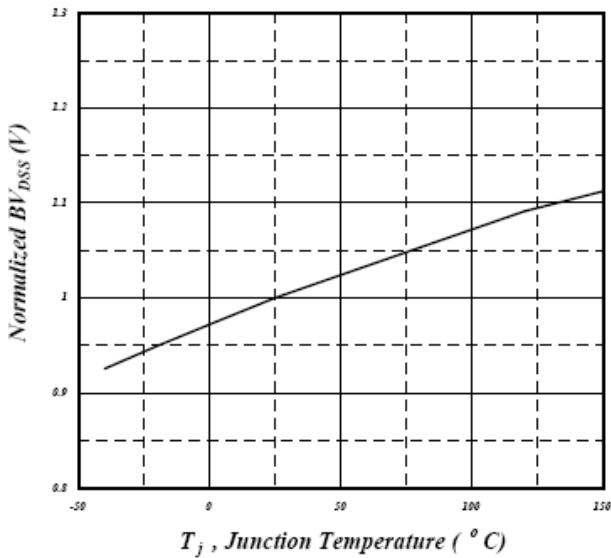


Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

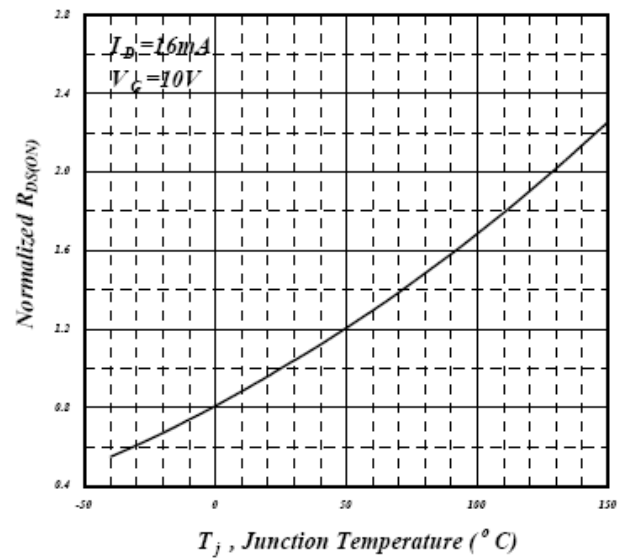


Fig 4. Normalized On-Resistance v.s. Junction Temperature



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TYPICAL CHARACTERISTICS

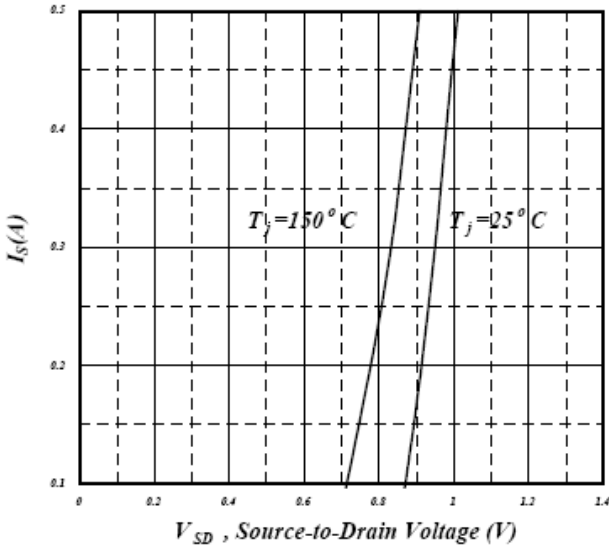


Fig 5. Forward Characteristic of Reverse Diode

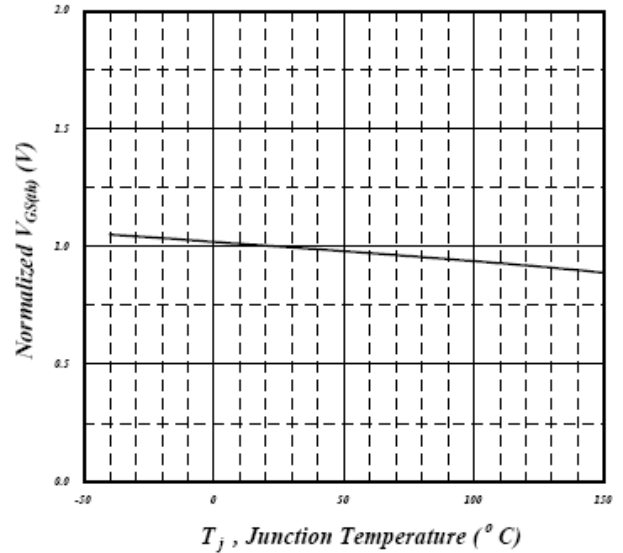


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

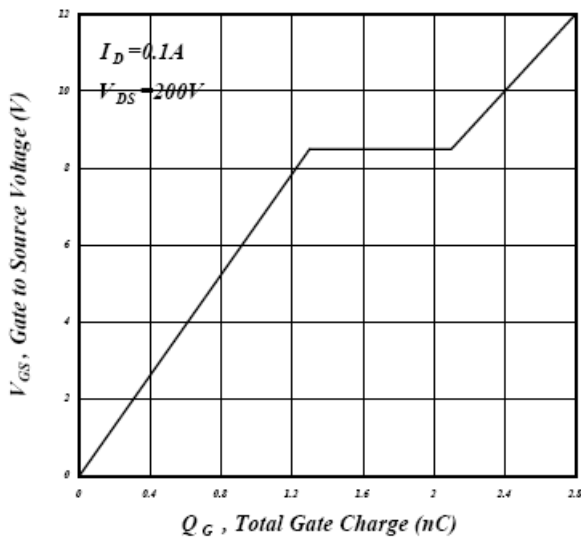


Fig 7. Gate Charge Characteristics

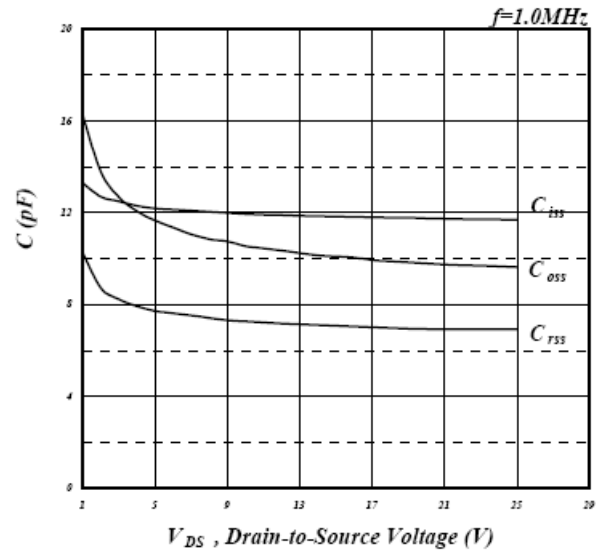


Fig 8. Typical Capacitance Characteristics



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TYPICAL CHARACTERISTICS

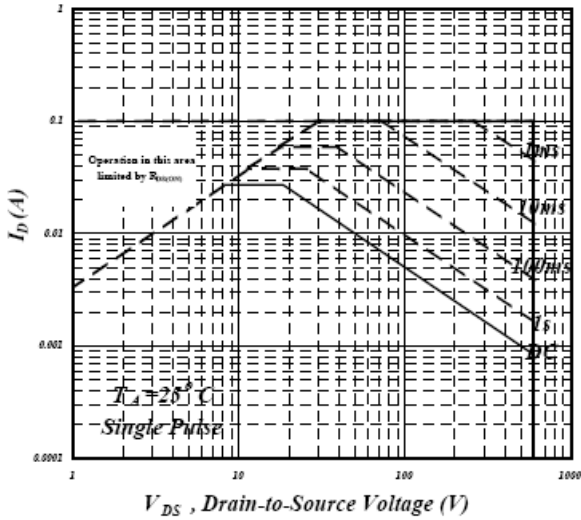


Fig 9. Maximum Safe Operating Area

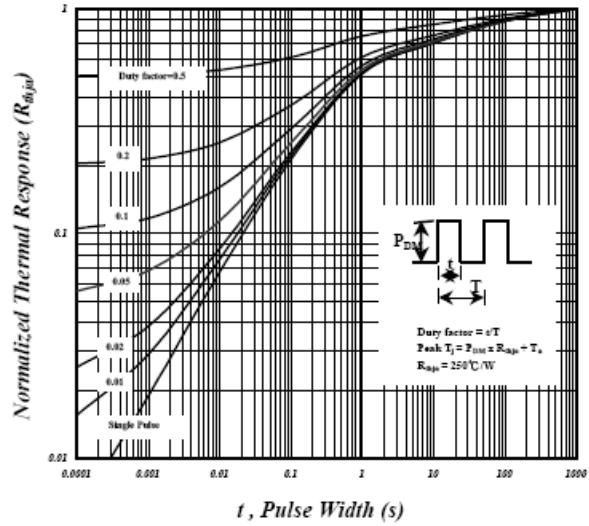


Fig 10. Effective Transient Thermal Impedance

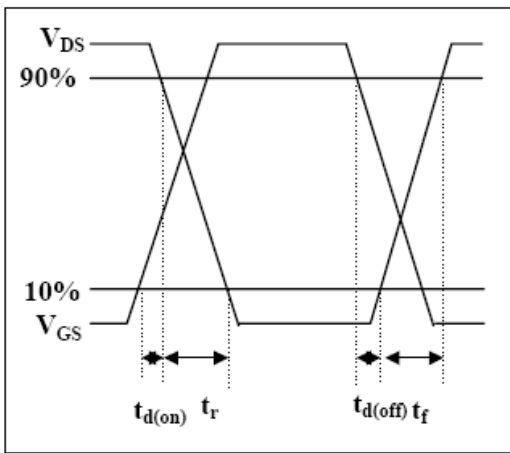


Fig 11. Switching Time Waveform

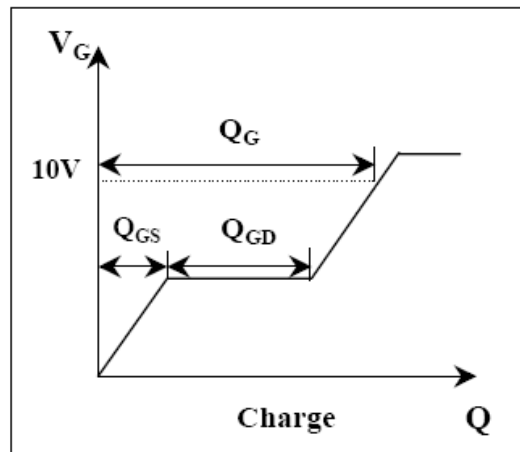
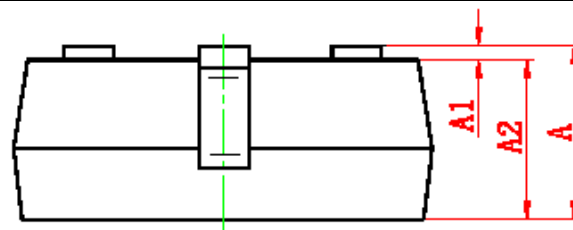
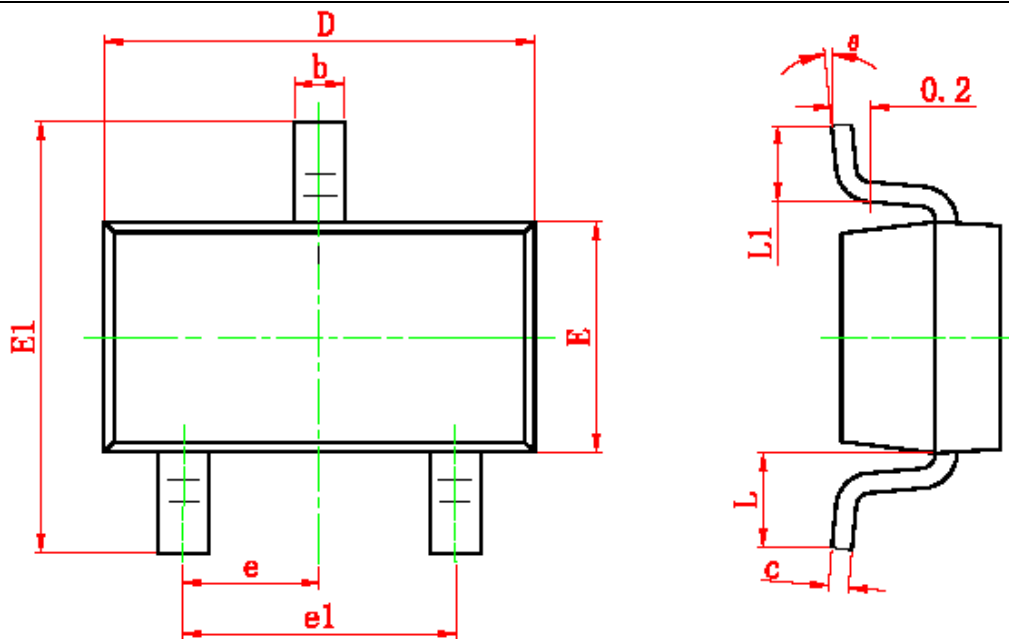


Fig 12. Gate Charge Circuit



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SOT-23 PACKAGE OUTLINE



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.200 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.100 | 0.035 | 0.039 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF | | 0.022 REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 6° |



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