



SPN1014

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN1014 is the N-Channel 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 and provide superior switching performance. These devices are particularly suited for low voltage applications such as notebook computer power management and other battery powered circuits where high-side switching , low in-line power loss, and resistance to transients are needed.

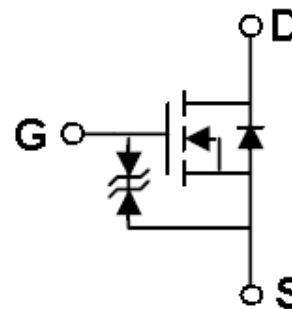
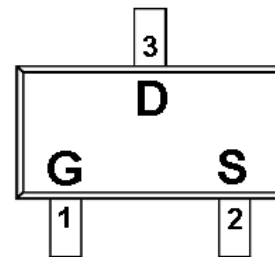
FEATURES

- ◆ N-Channel
20V/0.65A, $R_{DS(ON)}=380m\Omega@V_{GS}=4.5V$
20V/0.55A, $R_{DS(ON)}=450m\Omega@V_{GS}=2.5V$
20V/0.45A, $R_{DS(ON)}=800m\Omega@V_{GS}=1.8V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ ESD protected
- ◆ SOT-523 (SC-89) package design

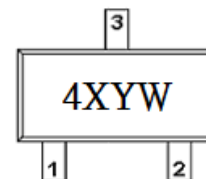
APPLICATIONS

- Drivers : Relays/Solenoids/Lamps/Hammers
- Power Supply Converter Circuits
- Load/Power Switching Cell Phones, Pagers

PIN CONFIGURATION (SOT-523 / SC-89)



PART MARKING



Y : year
W: week



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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 |
|---------------|---------|--------------|
| SPN1014S52RGB | SOT-523 | 4X |

※ SPN1014S52RGB : Tape Reel ; Pb – Free, Halogen – Free

ABSOLUTE MAXIMUM RATINGS

($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

| Parameter | Symbol | Typical | Unit | |
|---|-----------|--------------------------|--------------------|---|
| Drain-Source Voltage | V_{DSS} | 20 | V | |
| Gate –Source Voltage | V_{GSS} | ± 12 | V | |
| Continuous Drain Current($T_J=150^{\circ}\text{C}$) | I_D | $T_A=25^{\circ}\text{C}$ | 0.65 | A |
| | | $T_A=80^{\circ}\text{C}$ | 0.45 | |
| Pulsed Drain Current | I_{DM} | 1.0 | A | |
| Continuous Source Current(Diode Conduction) | I_S | 0.3 | A | |
| Power Dissipation | P_D | $T_A=25^{\circ}\text{C}$ | 0.27 | W |
| | | $T_A=70^{\circ}\text{C}$ | 0.16 | |
| Operating Junction Temperature | T_J | -55/150 | $^{\circ}\text{C}$ | |
| Storage Temperature Range | T_{STG} | -55/150 | $^{\circ}\text{C}$ | |



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ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

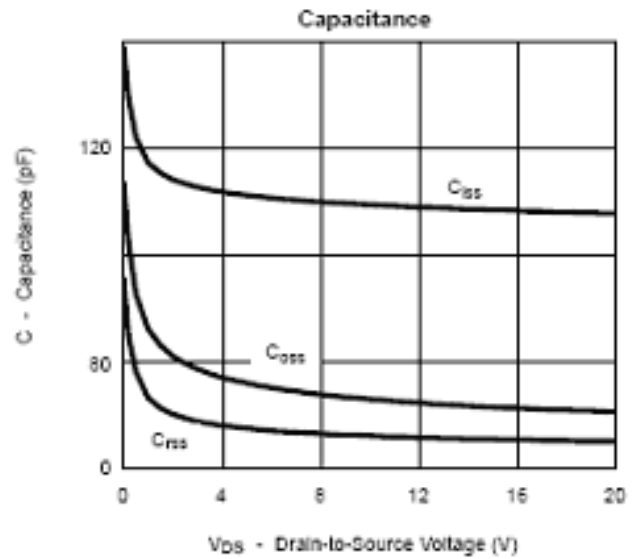
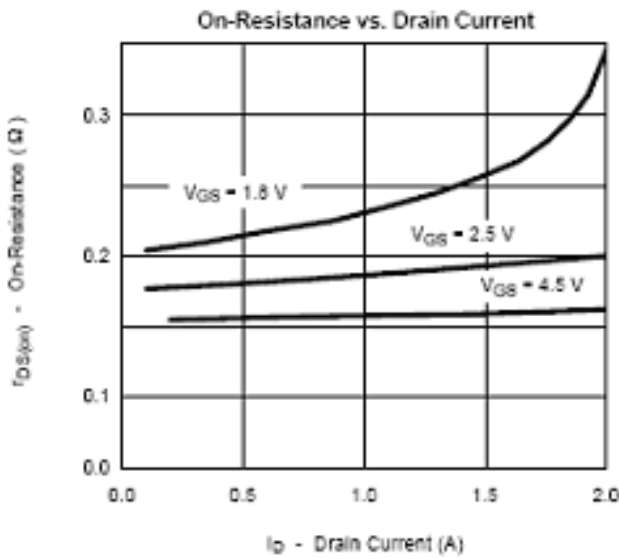
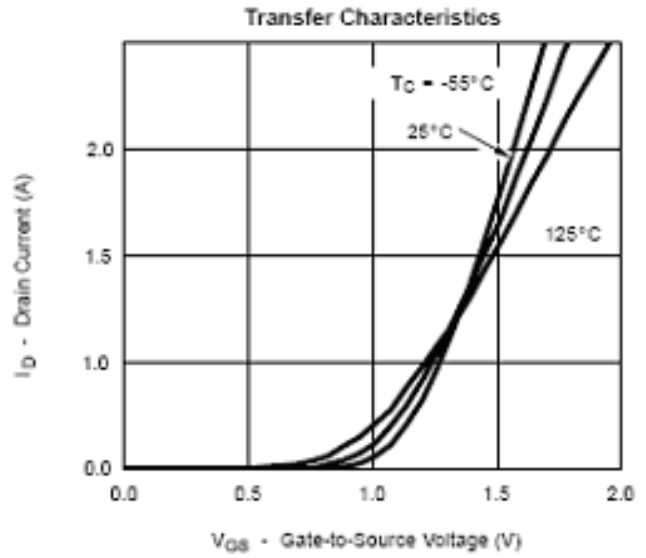
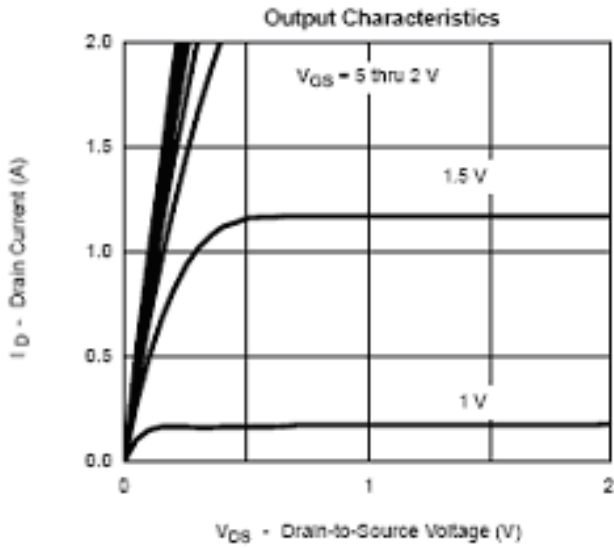
| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---------------------------------|---------------|--|------|------|------|----------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 20 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.35 | | 1.0 | |
| Gate Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 12V$ | | | 10 | μA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=16V, V_{GS}=0V$ | | | 1 | μA |
| | | $V_{DS}=16V, V_{GS}=0V$ $T_J=55^\circ C$ | | | 5 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS}\geq 4.5V, V_{GS}=5V$ | 0.7 | | | A |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=0.65A$ | | 0.26 | 0.38 | Ω |
| | | $V_{GS}=2.5V, I_D=0.55A$ | | 0.32 | 0.45 | |
| | | $V_{GS}=1.8V, I_D=0.45A$ | | 0.42 | 0.80 | |
| Forward Transconductance | g_{fs} | $V_{DS}=10V, I_D=0.4A$ | | 1.0 | | S |
| Diode Forward Voltage | V_{SD} | $I_S=0.15A, V_{GS}=0V$ | | 0.8 | 1.2 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=10V, V_{GS}=4.5V,$ $I_D=0.6A$ | | 1.2 | 1.5 | nC |
| Gate-Source Charge | Q_{gs} | | | 0.2 | | |
| Gate-Drain Charge | Q_{gd} | | | 0.3 | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD}=10V, R_L=10\Omega,$ $I_D=0.5A$ $V_{GEN}=4.5V, R_G=6\Omega$ | | 5 | 10 | nS |
| | t_r | | | 8 | 15 | |
| Turn-Off Time | $t_{d(off)}$ | | | 10 | 18 | |
| | t_f | | | 1.2 | 2.8 | |



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TYPICAL CHARACTERISTICS

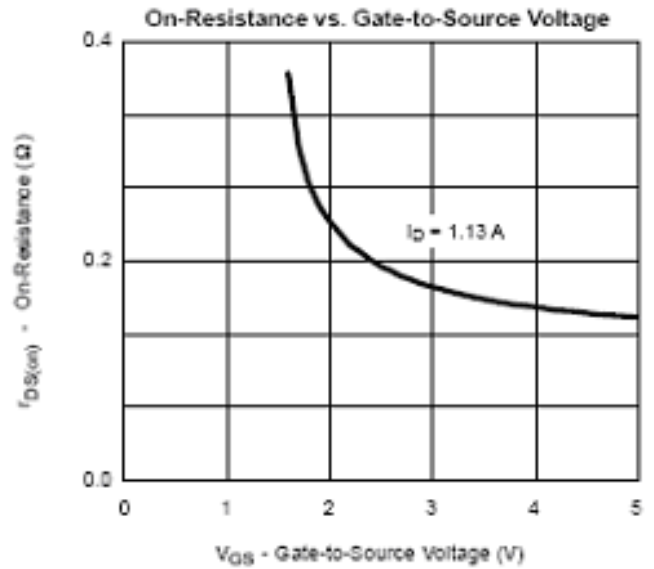
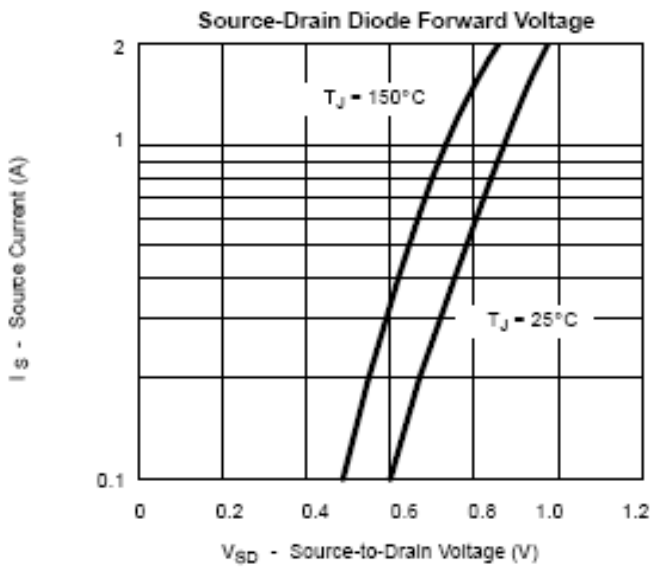
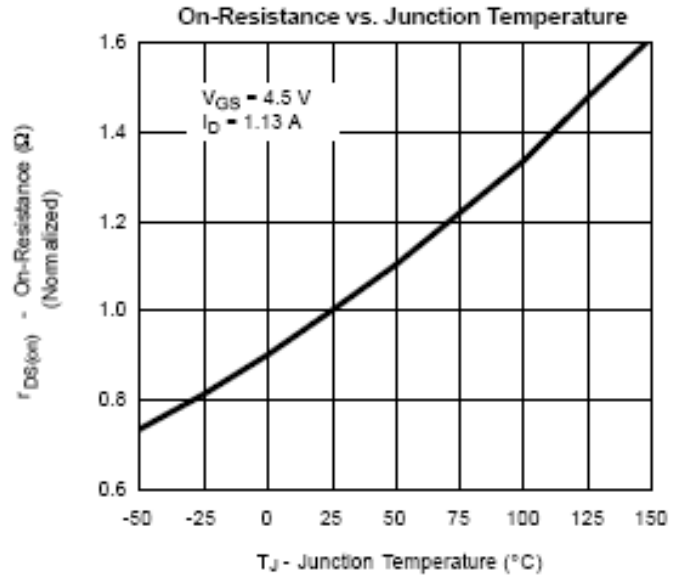
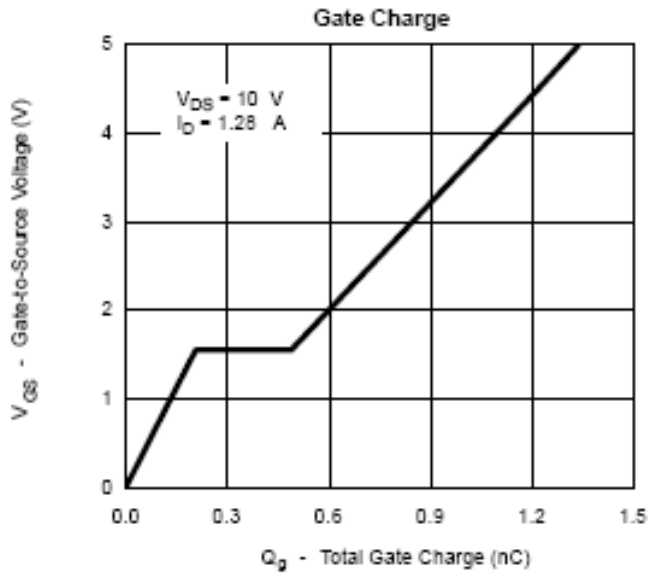




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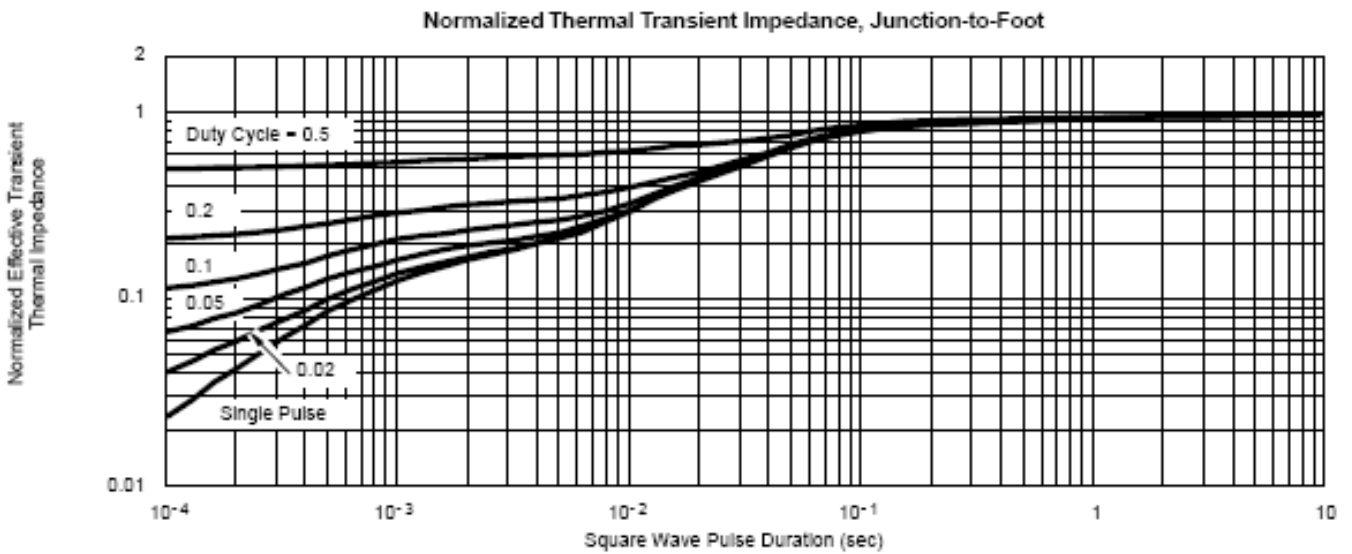
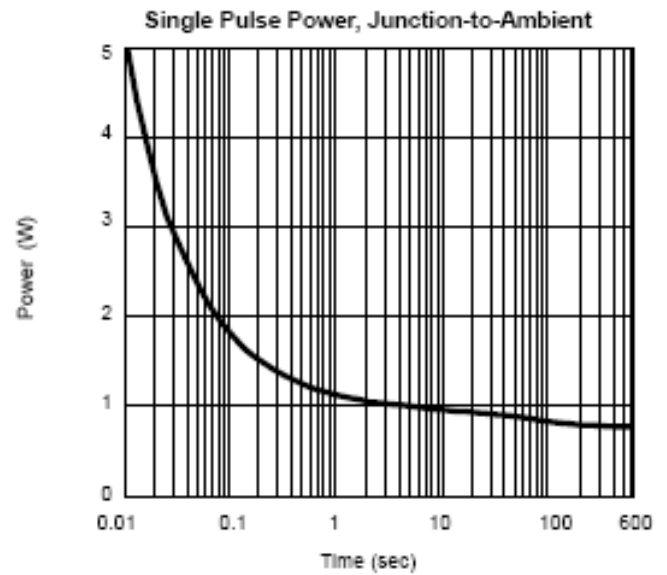
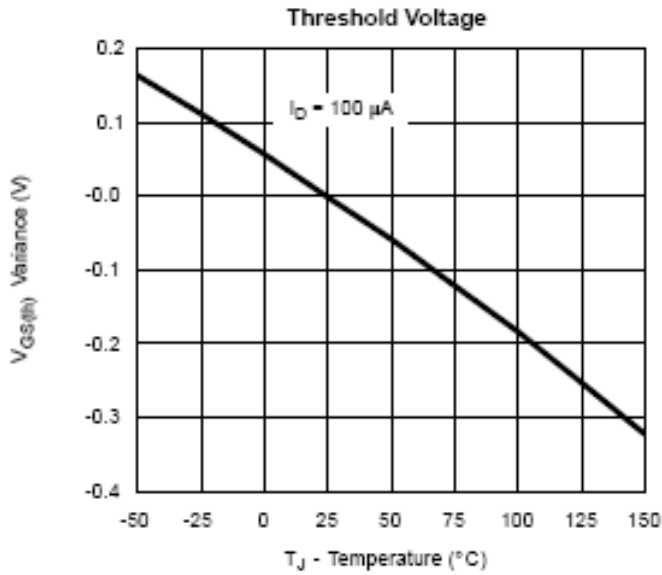




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TYPICAL CHARACTERISTICS





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