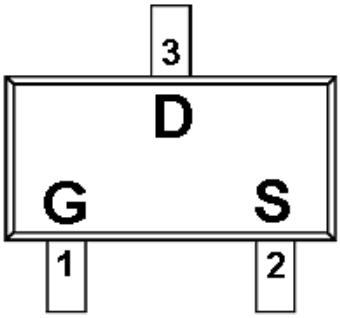
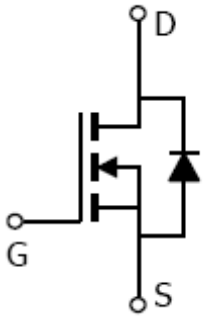
# SPN2346W
## N-Channel Enhancement Mode MOSFET

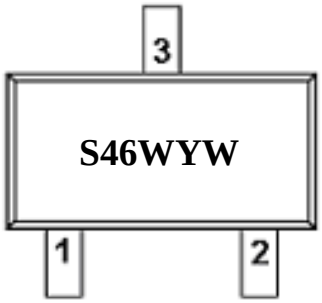
### DESCRIPTION
The SPN2346W is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology.
This high density process is especially tailored to minimize on-state resistance.
These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits, and low in-line power loss are needed in a very small outline surface mount package.

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

### FEATURES
- 20V/6.0A,$R_{DS(ON)}$=35mΩ@$V_{GS}$=4.5V
- 20V/5.0A,$R_{DS(ON)}$=40mΩ@$V_{GS}$=2.5V
- 20V/4.0A,$R_{DS(ON)}$=100mΩ@$V_{GS}$=1.8V
- 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



Y : Year Code
W : Week Code

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## N-Channel Enhancement Mode MOSFET

**PIN DESCRIPTION**

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

**ORDERING INFORMATION**

| Part Number | Package | Part Marking |
|---|---|---|
| SPN2346WS23RGB | SOT-23 | S46W |

※ Week Code : A ~ Z( 1 ~ 26 ) ; a ~ z( 27 ~ 52 )
※ SPN2346WS23RGB : Tape Reel ; Pb – Free ; Halogen – Free

**ABSOULTE MAXIMUM RATINGS**

($T_A$=25℃ 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℃) | $T_A$=25℃ | $I_D$ | 4.0 | A |
| | $T_A$=70℃ | | 3.0 | |
| Pulsed Drain Current | | $I_{DM}$ | 13 | A |
| Continuous Source Current(Diode Conduction) | | $I_S$ | 1.0 | A |
| Power Dissipation | $T_A$=25℃ | $P_D$ | 1.25 | W |
| | $T_A$=70℃ | | 0.8 | |
| Operating Junction Temperature | | $T_J$ | -55/150 | ℃ |
| Storage Temperature Range | | $T_{STG}$ | -55/150 | ℃ |
| Thermal Resistance-Junction to Ambient | | $R_{\theta JA}$ | 140 | ℃/W |

# SPN2346W
## N-Channel Enhancement Mode MOSFET

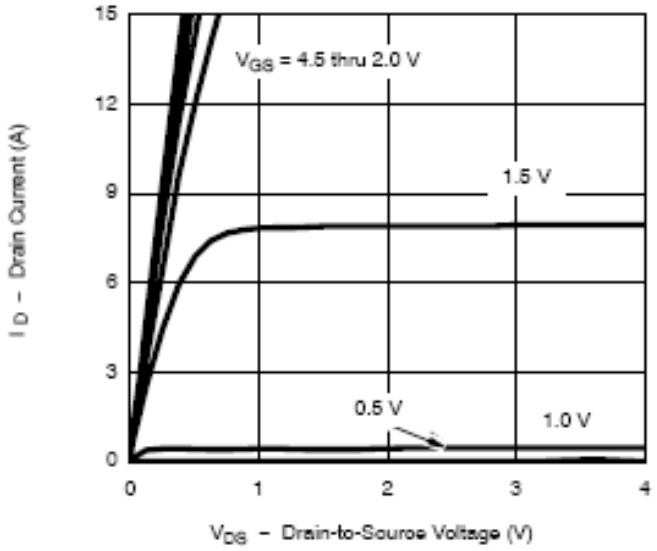
**ELECTRICAL CHARACTERISTICS**

($T_A$=25℃ Unless otherwise noted)

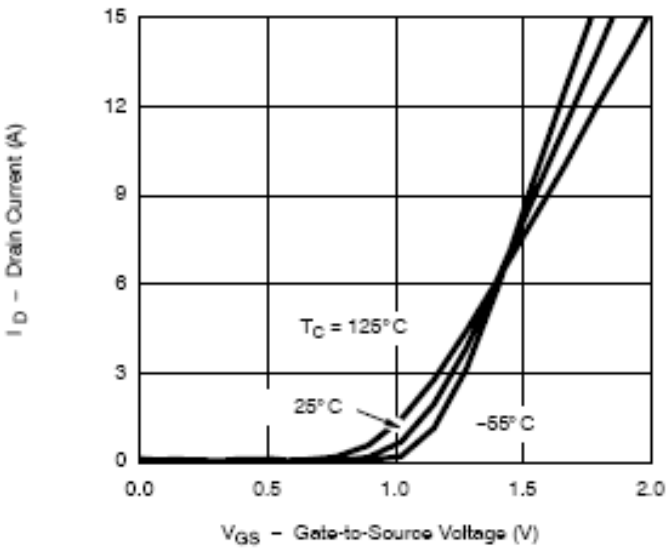
| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V,$I_D$=250uA | 20 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250uA | 0.4 | | 1.0 | |
| Gate Leakage Current | $I_{GSS}$ | $V_{DS}$=0V,$V_{GS}$=±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℃ | | | 10 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS}$≥5V,$V_{GS}$=4.5V | 6 | | | A |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$= 4.5V,$I_D$=6.0A | | 0.028 | 0.035 | Ω |
| | | $V_{GS}$= 2.5V,$I_D$=5.0A | | 0.036 | 0.040 | |
| | | $V_{GS}$= 1.8V,$I_D$=4.0A | | 0.080 | 0.100 | |
| Forward Transconductance | gfs | $V_{DS}$=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 | | 10 | 13 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 1.4 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 2.1 | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=10V,$V_{GS}$=0V f=1MHz | | 600 | | pF |
| Output Capacitance | $C_{oss}$ | | | 120 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 100 | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD}$=10V,$R_L$=10Ω $I_D$≡1.0A,$V_{GEN}$=4.5V $R_G$=6Ω | | 15 | 25 | nS |
| | $t_r$ | | | 40 | 60 | |
| Turn-Off Time | $t_{d(off)}$ | | | 45 | 65 | |
| | $t_f$ | | | 30 | 40 | |

**TYPICAL CHARACTERISTICS**

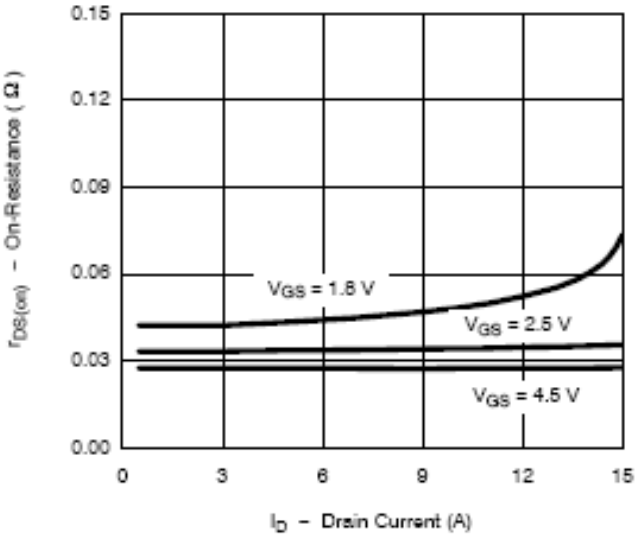
Output Characteristics



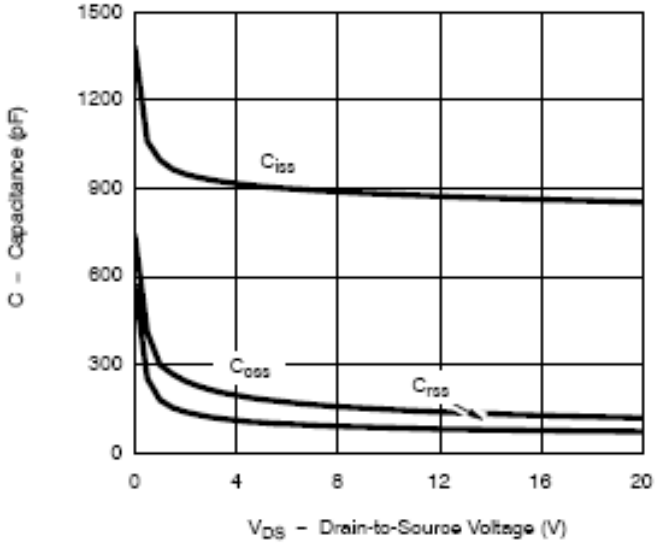

Transfer Characteristics




On-Resistance vs. Drain Current




Capacitance



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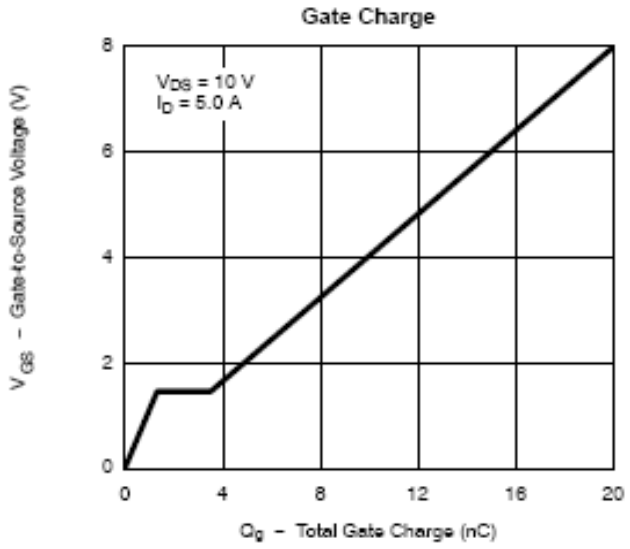


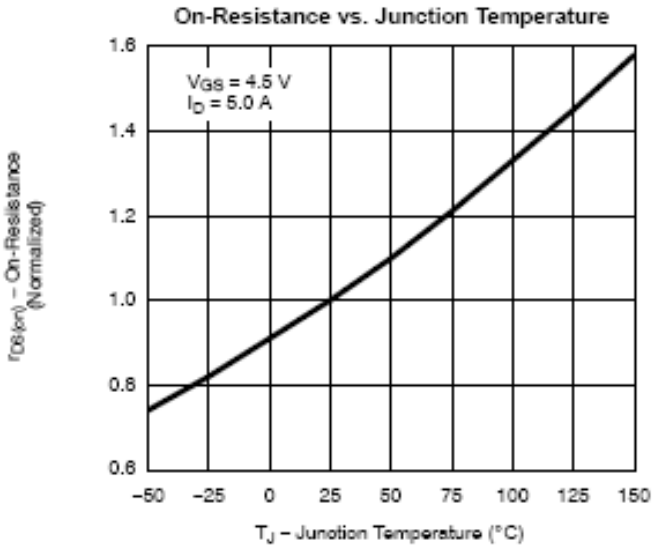


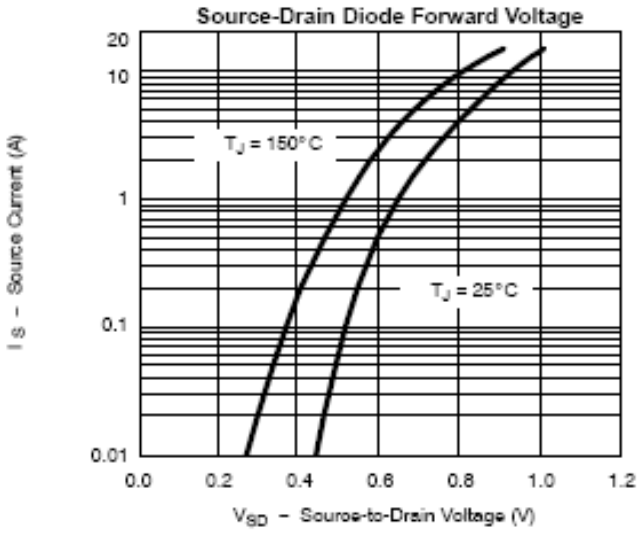


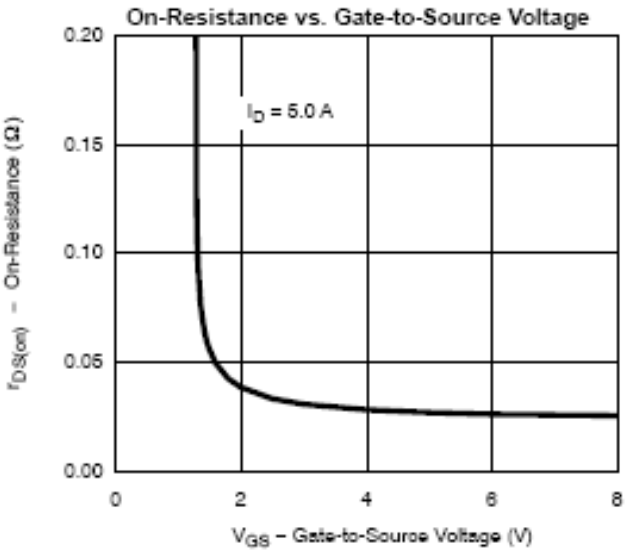

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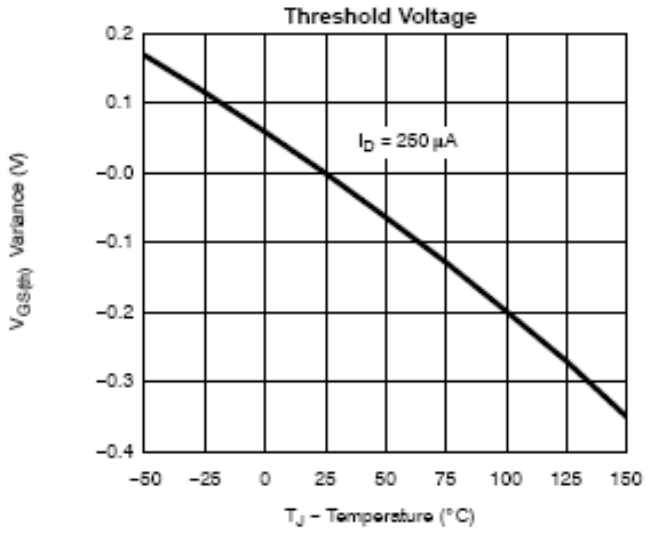


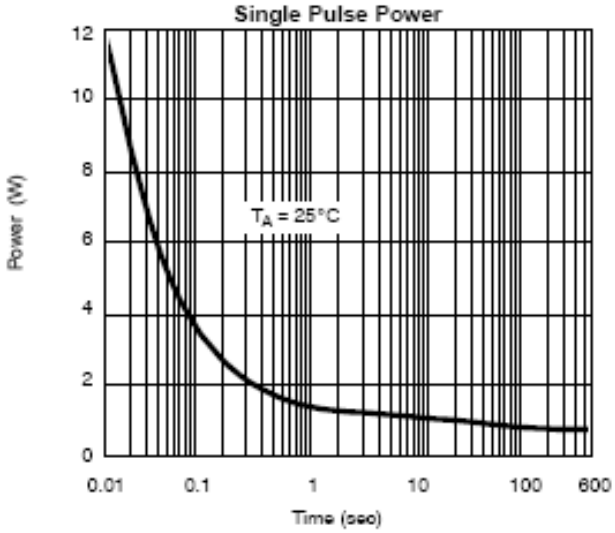


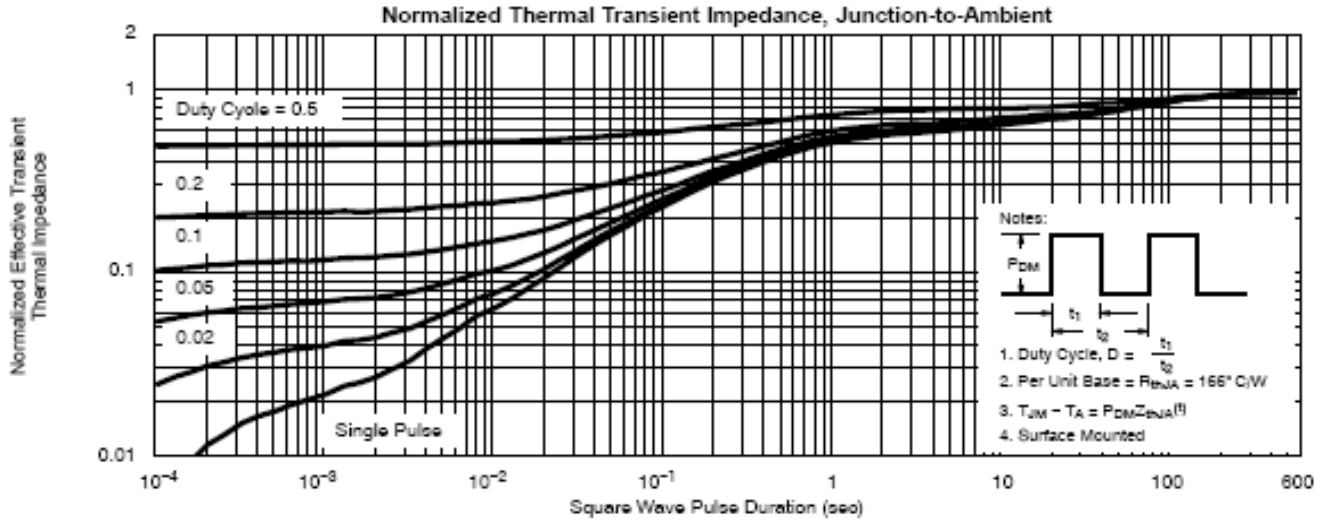

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