# XPX9926AXS

## *20V Dual N-Channel Enhancement Mode MOSFET*

## ■ *DESCRIPTION*

The XP9926 is the N-Channel logic enhancement mode power field effect transistor, is produced using high cell density advanced 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.

## ■ *FEATURE*

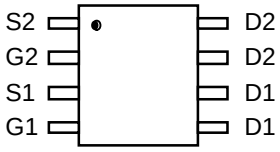
- ***20V/6.0A, $R_{DS(ON)}$=15mΩ (typ.)@VGS= 10V***
- ***20V/6 .0A, $R_{DS(ON)}$=17mΩ (typ.)@VGS= 4.5V***
- ***20V/6.0A, $R_{DS(ON)}$=22mΩ (typ.)@VGS= 2.5V***
- ***20V/2.0A, $R_{DS(ON)}$=30mΩ (typ.)@VGS= 1.8V***
- Super high design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and Maximum DC current capability
- Full RoHS compliance
- SOP8 package design

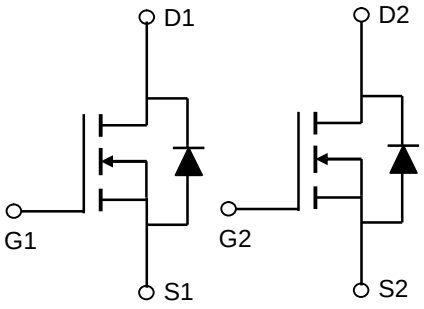
## ■ *APPLICATIONS*

- Power Management
- Portable Equipment
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

## ■ *PIN CONFIGURATION*

**Top View**



## ■ *PART NUMBER INFORMATION*

| | |
|---|---|
| XP9926AA-BB C | A= Package Code<br>S: SOP<br>BB=Handing Code<br>TR: Tape&Reel<br>C=Lead Plating Code<br>G: Green Product |

## ■ *ORDERING INFROMATION*

| Part Number | Package Code | Package | Shipping |
|---|---|---|---|
| **XP9926AS-TRG** | **S** | **SOP8** | **2500EA / T&R** |

※ Year Code : 0~9

※ Week Code : A~Z(1-26); a~z(27~52)

※ G : Green Product. This product is RoHS compliant.

## ■ *ABSOLUTE MAXIMUM RATINGS* ( $T_A$ = 25℃ *Unless otherwise noted* )

| Parameter | | Symbol | Maximum | Units |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 20 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±12 | V |
| Continuous Drain Current [A] | $T_A$=25℃ | $I_D$ | 6.0 | A |
| | $T_A$=70℃ | | 5.5 | |
| Pulsed Drain Current [B] | | $I_{DM}$ | 40 | |
| Power Dissipation | $T_A$=25℃ | $P_D$ | 2 | W |
| | $T_A$=70℃ | | 1.28 | |
| Junction and Storage Temperature Range | | $T_J$, $T_{STG}$ | -55 to 150 | ℃ |

| Thermal Characteristics | | | | | |
|---|---|---|---|---|---|
| **Parameter** | | **Symbol** | **Typ** | **Max** | **Units** |
| Maximum Junction-to-Ambient [A] | t ≤ 10s | $R_{\theta JA}$ | 50 | 62.5 | ℃/W |
| Maximum Junction-to-Ambient [A] | Steady-State | | 73 | 110 | ℃/W |
| Maximum Junction-to-Lead [C] | Steady-State | $R_{\theta JL}$ | 31 | 40 | ℃/W |

**Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress rating only and functional device operation is not implied**

## ■ *ELECTRICAL CHARACTERISTICS($T_A$=25℃ Unless otherwise noted)*

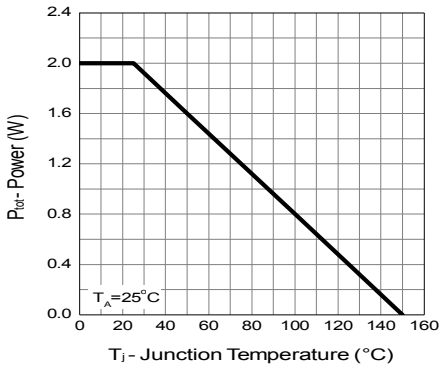
| Symbol | Parameter | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Parameters** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$= 250uA | 20 | | | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$= 250uA | 0.4 | 0.75 | 1.1 | V |
| $I_{GSS}$ | Gate Leakage Current | $V_{DS}$=0V, $V_{GS}$=±12V | | | ±100 | nA |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$= 20V, $V_{GS}$=0 | | | 1 | uA |
| | | $V_{DS}$= 20V, $V_{GS}$=0 $T_J$=55℃ | | | 5 | |
| $R_{DS(ON)}$ | Drain-Source On-Resistance | $V_{GS}$= 10V, $I_D$= 6.0A | | 15 | 23 | mΩ |
| | | $V_{GS}$= 4.5V, $I_D$= 6.0A | | 17 | 26 | |
| | | $V_{GS}$= 2.5V, $I_D$= 6.0A | | 22 | 34 | mΩ |
| | | $V_{GS}$= 1.8V, $I_D$= 2.0A | | 30 | 52 | |
| **Source-Drain Diode** | | | | | | |
| $V_{SD}$ | Diode Forward Voltage | $I_S$= 1.0A, $V_{GS}$=0V | | 0.8 | 1.3 | V |
| **Dynamic Parameters** | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{DS}$= 15V $V_{GS}$= 10V $I_D$= 7.6A | | 15.6 | | nC |
| $Q_{gs}$ | Gate-Source Charge | | | 1.3 | | |
| $Q_{gd}$ | Gate-Drain Charge | | | 2.5 | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$= 15V $V_{GS}$=0V f=1MHz | | 520 | | pF |
| $C_{oss}$ | Output Capacitance | | | 105 | | |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 60 | | |
| $T_{d(on)}$ | Turn-On Time | $V_{DS}$= 15V $I_D$= 1A $V_{GEN}$= 10V $R_G$=3Ω | | 4 | | nS |
| $T_r$ | | | | 6 | | |
| $T_{d(off)}$ | Turn-Off Time | | | 25 | | |
| $T_f$ | | | | 4 | | |

**Note: 1. Pulse test: pulse width<=300uS, duty cycle<=2%**

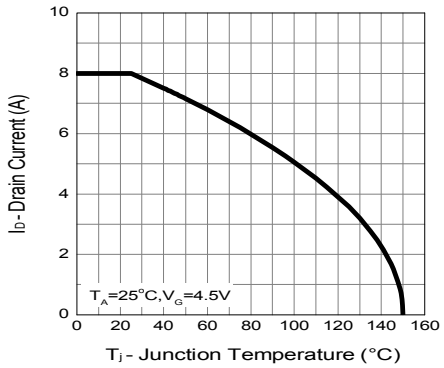
**2.Static parameters are based on package level with recommended wire bonding**

## ■ TYPICAL CHARACTERISTICS (25℃ Unless Note)

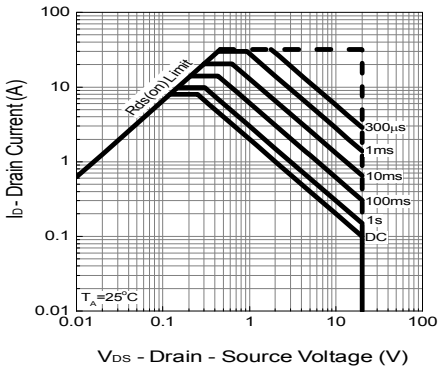
**Power Dissipation**



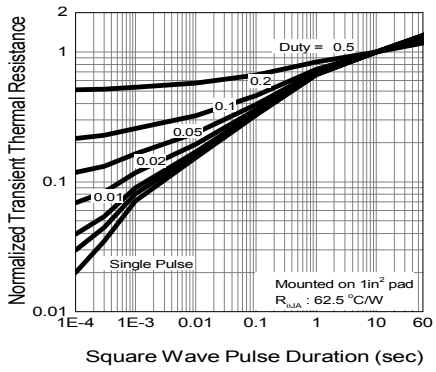

**Drain Current**



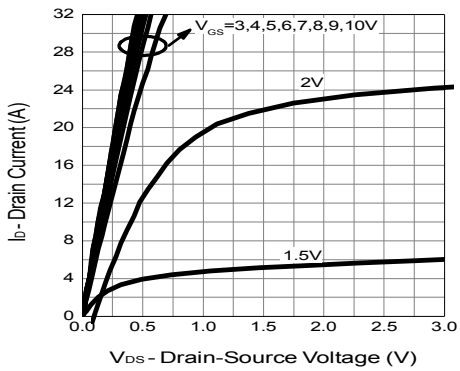

**Safe Operation Area**



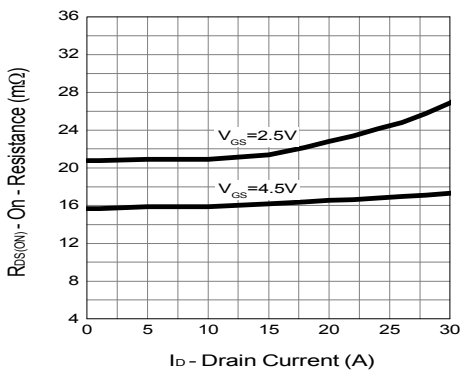

**Thermal Transient Impedance**



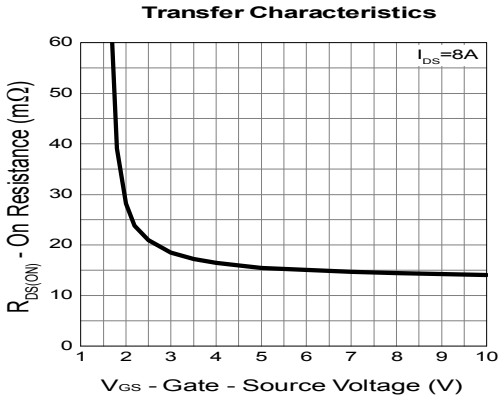

**Output Characteristics**

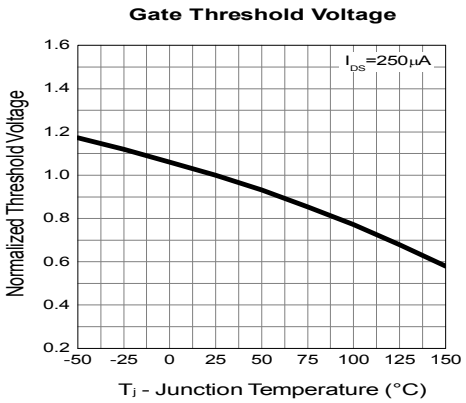


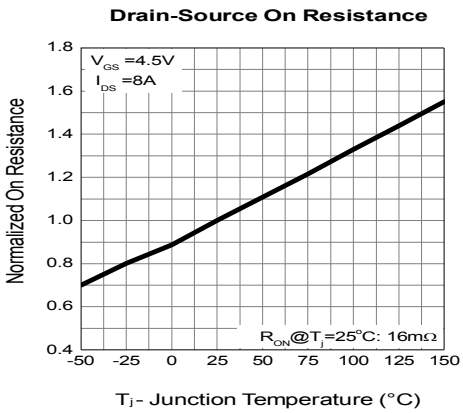

**Drain-Source On Resistance**

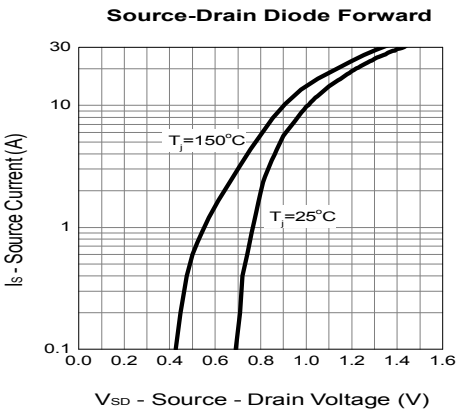


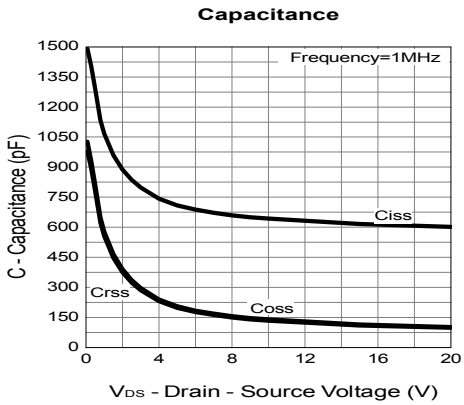
## ■ TYPICAL CHARACTERISTICS (continuous)

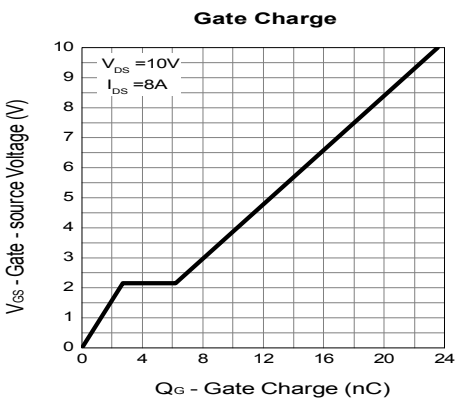


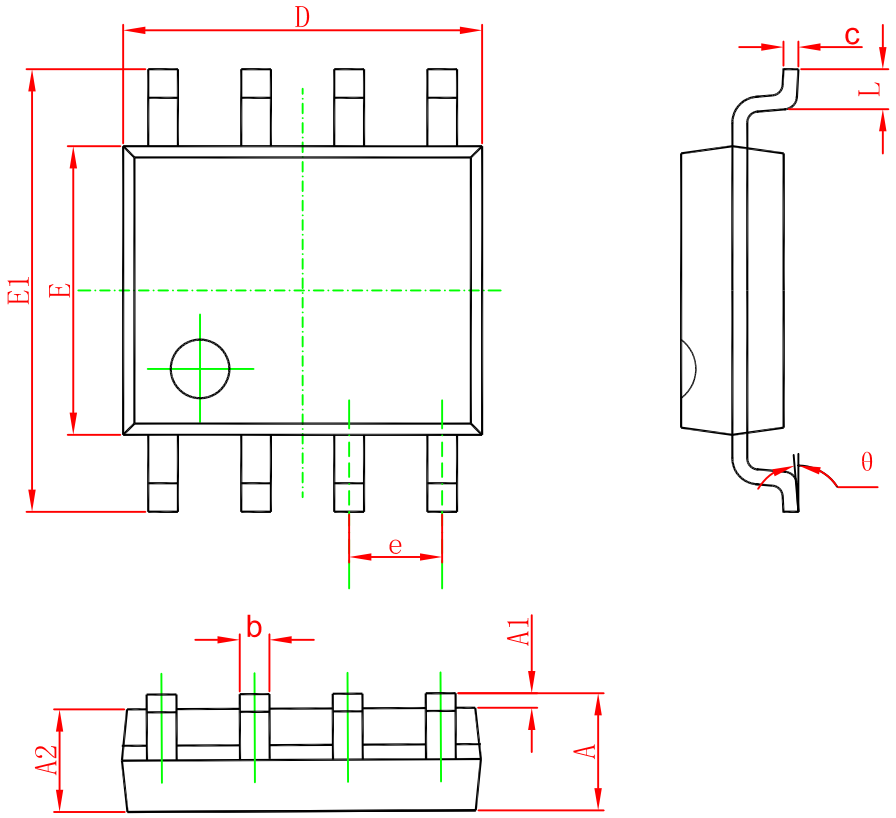



## ■ SOP8 PACKAGE OUTLINE DIMENSIONS

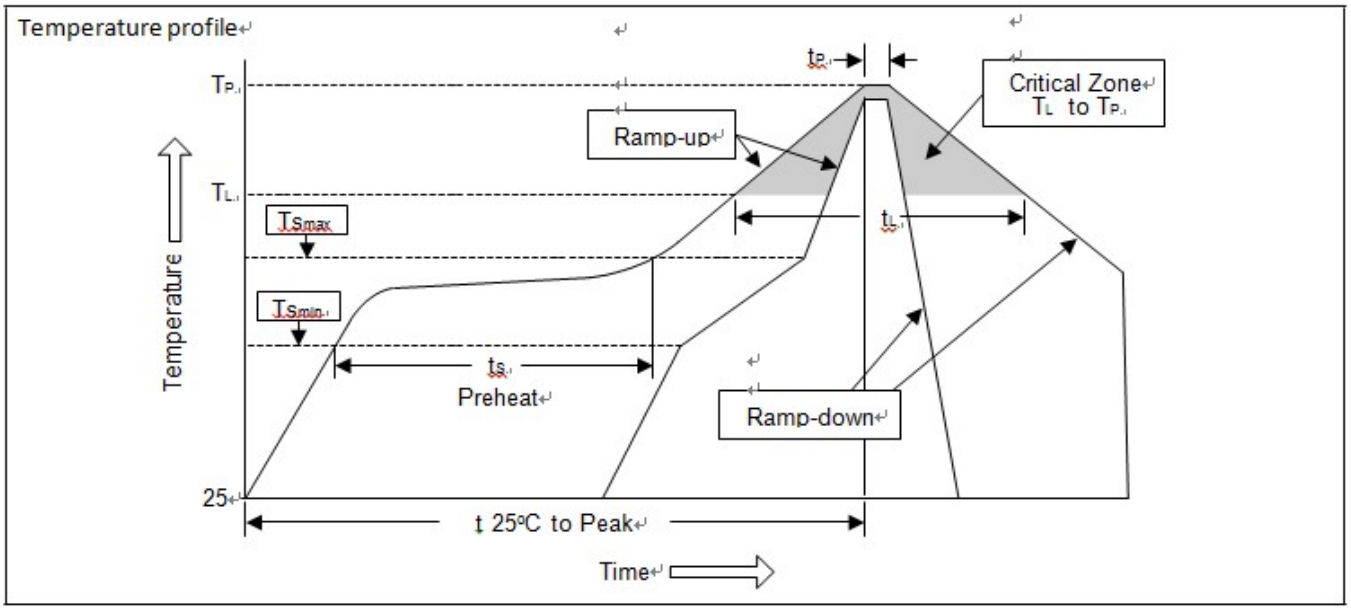



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.350 | 1.750 | 0.053 | 0.069 |
| A1 | 0.100 | 0.250 | 0.004 | 0.010 |
| A2 | 1.350 | 1.550 | 0.053 | 0.061 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| c | 0.170 | 0.250 | 0.006 | 0.010 |
| D | 4.700 | 5.100 | 0.185 | 0.200 |
| E | 3.800 | 4.000 | 0.150 | 0.157 |
| E1 | 5.800 | 6.200 | 0.228 | 0.244 |
| e | 1.270 (BSC) | | 0.050 (BSC) | |
| L | 0.400 | 1.270 | 0.016 | 0.050 |
| θ | 0° | 8° | 0° | 8° |

## ■ SOLDERING METHODS FOR UNIVERCHIP

Storage environment Temperature=10℃~35℃ Humidity=65%±15%

Reflow soldering of surface mount device




| Profile Feature | Sn-Pb Eutectic Assembly | Pb free Assembly |
|---|---|---|
| Average ramp-up rate ($T_L$ to $T_P$) | <3℃/sec | <3℃/sec |
| Preheat<br>-Temperature Min ($Ts_{min}$)<br>-Temperature Max ($Ts_{max}$)<br>-Time (min to max) (ts) | <br>100℃<br>150℃<br>60~120 sec | <br>150℃<br>200℃<br>60~180 sec |
| Tsmax to $T_L$<br>-Ramp-up Rate | <3℃/sec | <3℃/sec |
| Time maintained above<br>-Temperature ($T_L$)<br>-Time ($t_L$) | <br>183℃<br>60~150 sec | <br>217℃<br>60~150 sec |
| Peak Temperature ($T_P$) | 240℃+0/-5℃ | 260℃+0/-5℃ |
| Time within 5℃ of actual Peak Temperature ($t_P$) | 10~30 sec | 20~40 sec |
| Ramp-down Rate | <6℃/sec | <6℃/sec |
| Time 25℃ to Peak Temperature | <6 minutes | <6 minutes |

Flow (wave) soldering (solder dipping)

| Product | Peak Temperature | Dipping Time |
|---|---|---|
| Pb device | 245℃±5℃ | 5sec±1sec |
| Pb-Free device | 260℃+0/-5℃ | 5sec±1sec |

**T**his integrated circuit can be damaged by ESD UniverChip Corporation recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedure can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.