



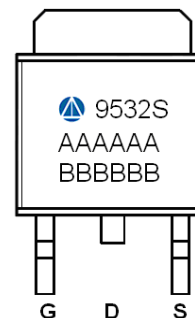
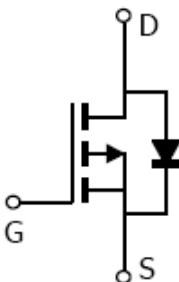
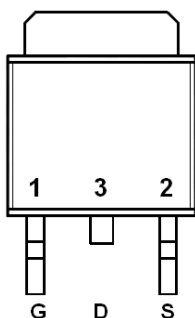
General Description

AFP9532S, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge. These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

- -60V/-20A, $R_{DS(ON)} = 37m\Omega @ V_{GS} = -10V$
- -60V/-10A, $R_{DS(ON)} = 45m\Omega @ V_{GS} = -4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- TO-252-2L package design

Pin Description (TO-252-2L)



Application

- Load Switches
- Half-Bridge Motor Drives
- High Voltage Non-Synchronous Buck Converters

Pin Define

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

Ordering Information

| Part Ordering No. | Part Marking | Package | Unit | Quantity |
|-------------------|--------------|-----------|-------------|----------|
| AFP9532ST252RG | 9532S | TO-252-2L | Tape & Reel | 2500 EA |

- ※ A Lot code
- ※ B Date code
- ※ AFP9532ST252RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings

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

| Parameter | Symbol | Value | Unit |
|--|-----------------|------------------------|--------------------|
| Drain-Source Voltage | V_{DS} | -60 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ($T_J=150^\circ\text{C}$) | I_D | $T_c=25^\circ\text{C}$ | -20 |
| | | $T_c=70^\circ\text{C}$ | -10 |
| Pulsed Drain Current | I_{DM} | -25 | A |
| Continuous Source-Drain Diode Current | I_S | -6 | A |
| Power Dissipation | P_D | $T_A=25^\circ\text{C}$ | 40 |
| | | $T_A=70^\circ\text{C}$ | 15 |
| Operating Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{STG} | -55/150 | $^\circ\text{C}$ |
| Thermal Resistance-Junction to Ambient | $R_{\theta JA}$ | 62.5 | $^\circ\text{C/W}$ |

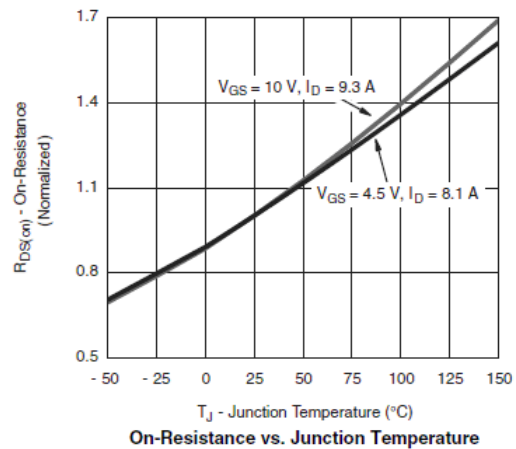
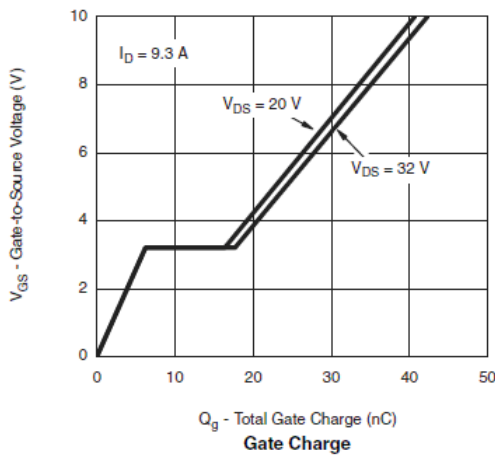
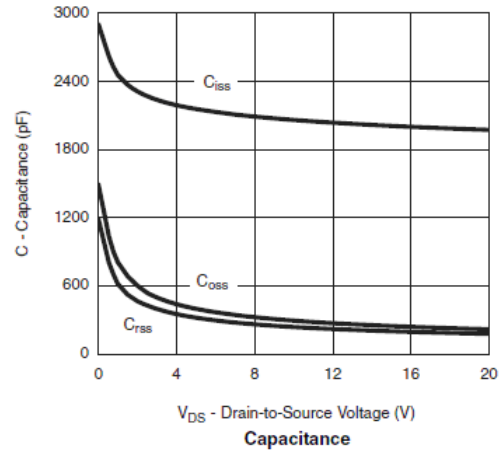
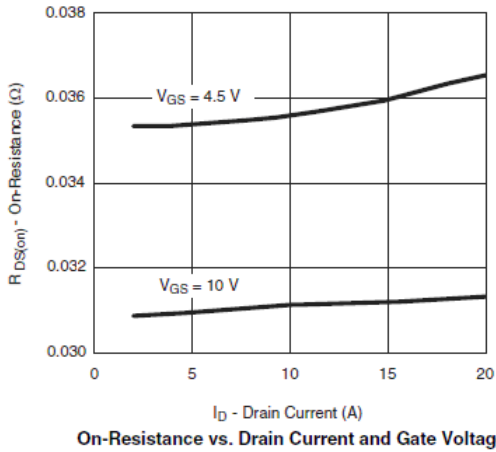
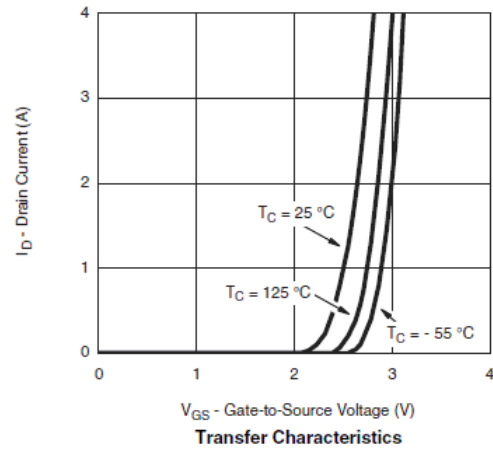
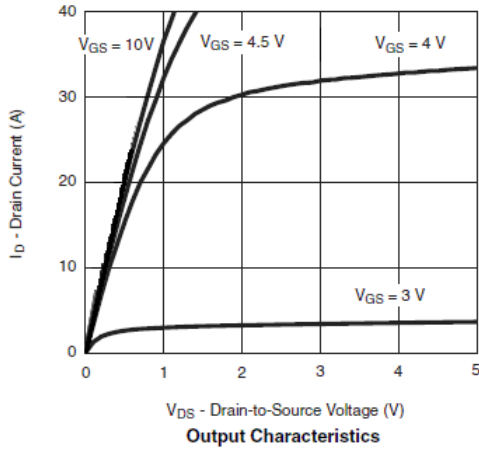
Electrical Characteristics

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

| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---------------------------------|---------------|--|------|------|-----------|------------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=-250\mu\text{A}$ | -60 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu\text{A}$ | -1.0 | | -2.0 | |
| Gate Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 20V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=-48V, V_{GS}=0V$ | | | -1 | uA |
| | | $V_{DS}=-48V, V_{GS}=0V$ $T_J=85^\circ\text{C}$ | | | -20 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS} \geq -5V, V_{GS}=-10V$ | -10 | | | A |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=-10V, I_D=-20A$ | | 31 | 37 | m Ω |
| | | $V_{GS}=-4.5V, I_D=-10A$ | | 35 | 45 | |
| Forward Transconductance | g_{FS} | $V_{DS}=-15V, I_D=-10A$ | | 25 | | S |
| Diode Forward Voltage | V_{SD} | $I_S=-3A, V_{GS}=0V$ | | -0.8 | -1.3 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=-30V, V_{GS}=-4.5V$ $I_D=-9.0A$ | | 20 | 38 | nC |
| Gate-Source Charge | Q_{gs} | | 8 | | | |
| Gate-Drain Charge | Q_{gd} | | 10 | | | |
| Input Capacitance | C_{iss} | $V_{DS}=-30V, V_{GS}=0V$ $f=1\text{MHz}$ | | 1900 | | pF |
| Output Capacitance | C_{oss} | | 210 | | | |
| Reverse Transfer Capacitance | C_{rss} | | 170 | | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD}=-30V, R_L=5.0\Omega$ $I_D=-9.0A, V_{GEN}=-10V$ $R_G=1.0\Omega$ | | 10 | 20 | ns |
| | t_r | | | 12 | 25 | |
| Turn-Off Time | $t_{d(off)}$ | | | 30 | 60 | |
| | t_f | | | 10 | 20 | |

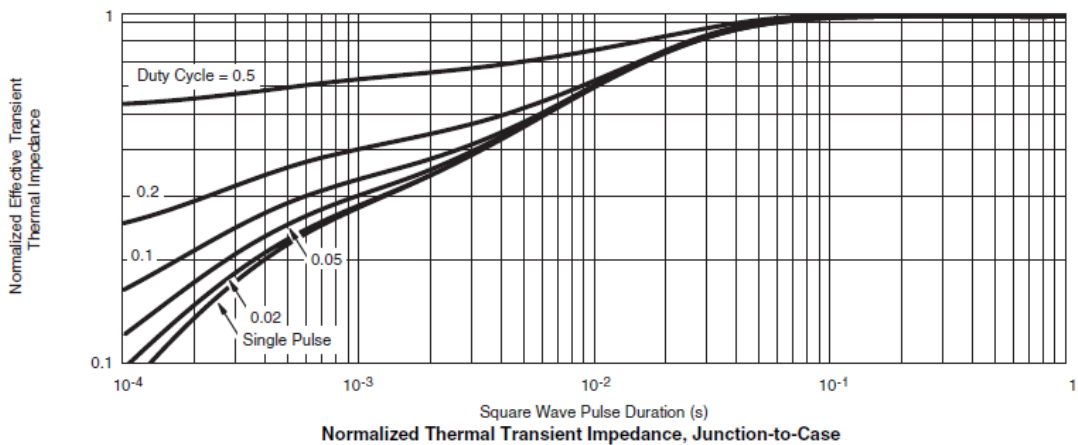
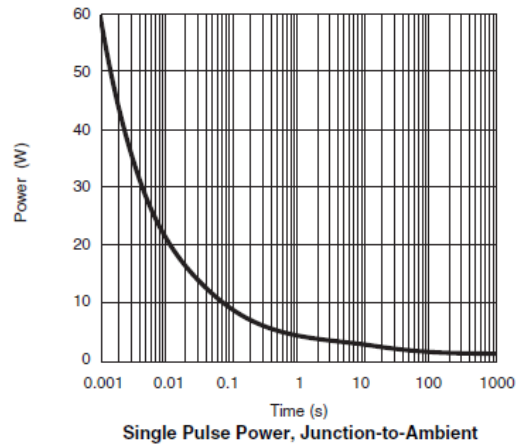
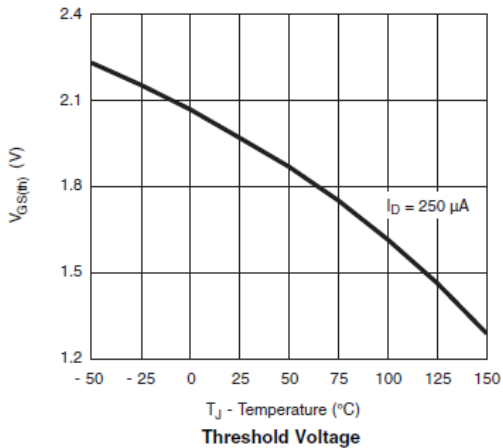
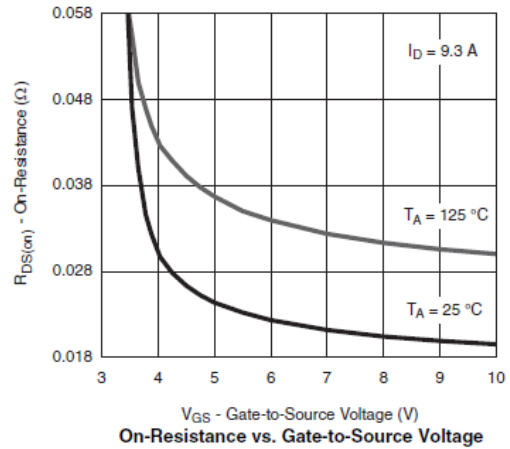
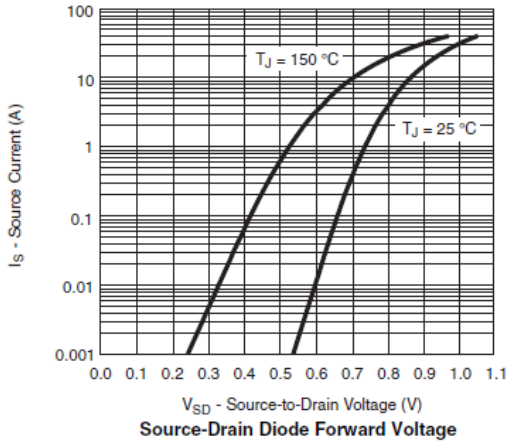


Typical Characteristics





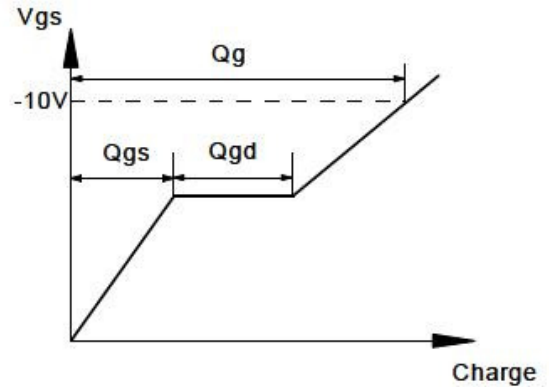
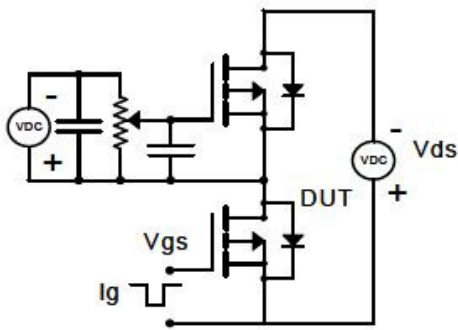
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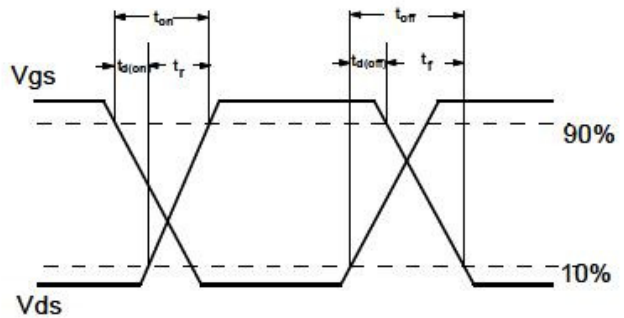
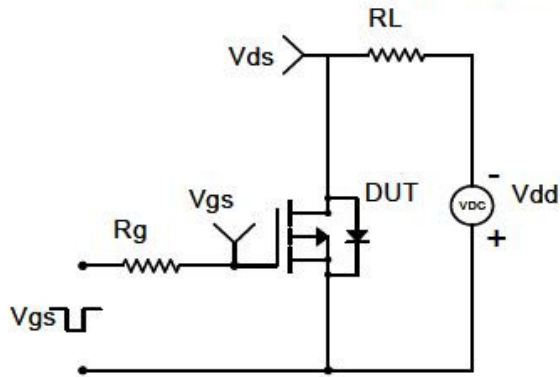


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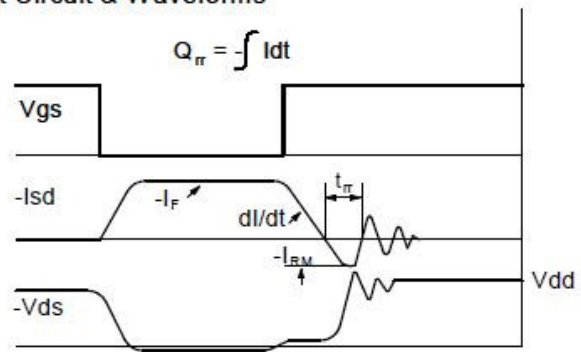
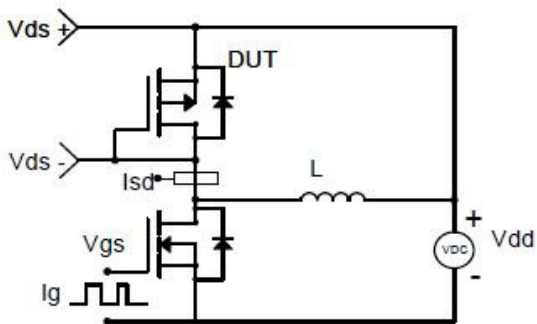
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

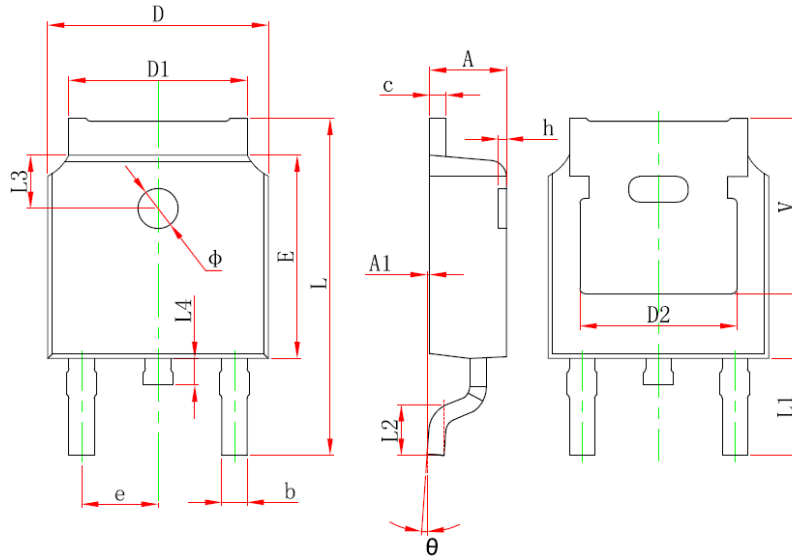


Diode Recovery Test Circuit & Waveforms





Package Information (TO-252-2L)



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.127 | 0.000 | 0.005 |
| b | 0.660 | 0.860 | 0.026 | 0.034 |
| c | 0.460 | 0.580 | 0.018 | 0.023 |
| D | 6.500 | 6.700 | 0.256 | 0.264 |
| D1 | 5.100 | 5.460 | 0.201 | 0.215 |
| D2 | 4.830 REF. | | 0.190 REF. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.800 | 10.400 | 0.386 | 0.409 |
| L1 | 2.900 REF. | | 0.114 REF. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 REF. | | 0.063 REF. | |
| L4 | 0.600 | 1.000 | 0.024 | 0.039 |
| Φ | 1.100 | 1.300 | 0.043 | 0.051 |
| θ | 0° | 8° | 0° | 8° |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| V | 5.350 REF. | | 0.211 REF. | |

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 2F, No.80, Sec.1, Cheng Kung Rd., Nan Kang Dist., Taipei City 115, Taiwan (R.O.C.)
 Tel : 886 2) 2651 3928
 Fax : 886 2) 2786 8483
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