



General Description

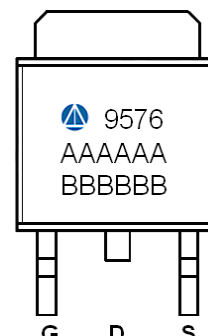
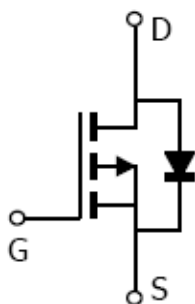
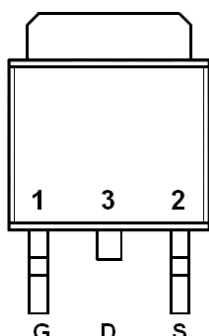
AFP9576, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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/-14A, $R_{DS(ON)} = 115m\Omega @ V_{GS} = -10V$
- -60V/-10A, $R_{DS(ON)} = 125m\Omega @ V_{GS} = -4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- TO-252-2L package design

Pin Description (TO-252-2L)



Application

- Backlight Inverter for LCD Display
- Full Bridge DC/DC Converter
- LED Display
- Load Switch
- CCFL Inverter

Pin Define

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

Ordering Information

| Part Ordering No. | Part Marking | Package | Unit | Quantity |
|-------------------|--------------|-----------|-------------|----------|
| AFP9576T252RG | 9576 | TO-252-2L | Tape & Reel | 2500 EA |

※ A Lot code

※ B Date code

※ AFP9576T252RG : 13" 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} | -60 | V |
| Gate –Source Voltage | V_{GSS} | ± 20 | V |
| Continuous Drain Current($T_J=150^{\circ}\text{C}$) | I_D | $T_A=25^{\circ}\text{C}$ | -14 |
| | | $T_A=70^{\circ}\text{C}$ | -10 |
| Pulsed Drain Current | I_{DM} | -30 | A |
| Continuous Source-Drain Diode Current | I_S | -8 | A |
| Single Pulse Avalanche Current | $L = 0.1 \text{ mH}$ I_{AS} | -12 | A |
| Avalanche Energy | | E_{AS} | 23 |
| 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 | $^{\circ}\text{C/W}$ |

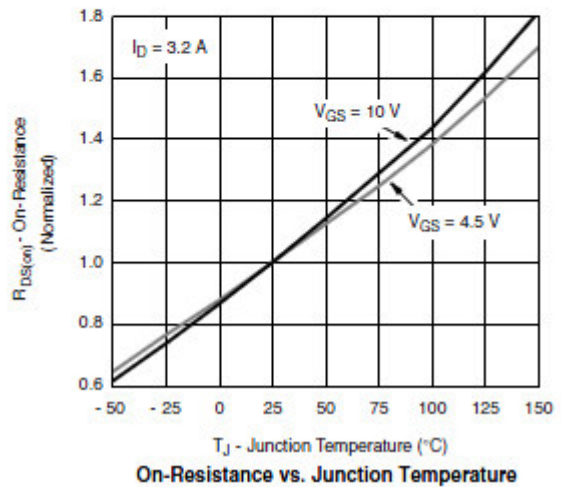
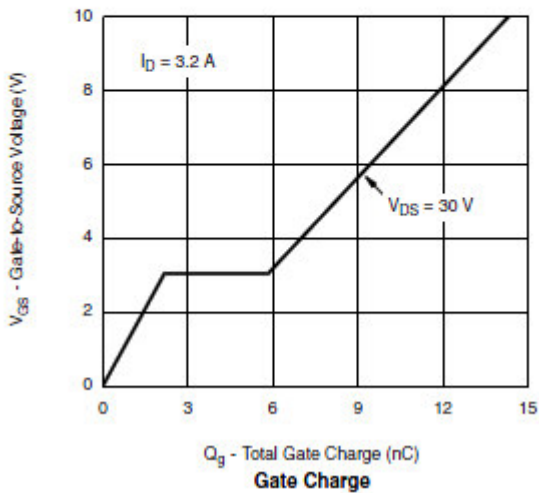
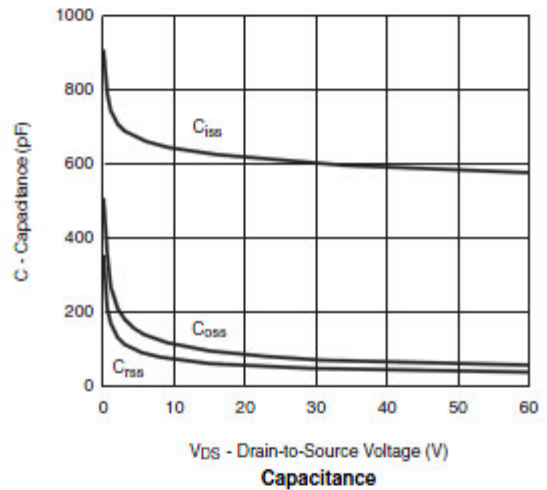
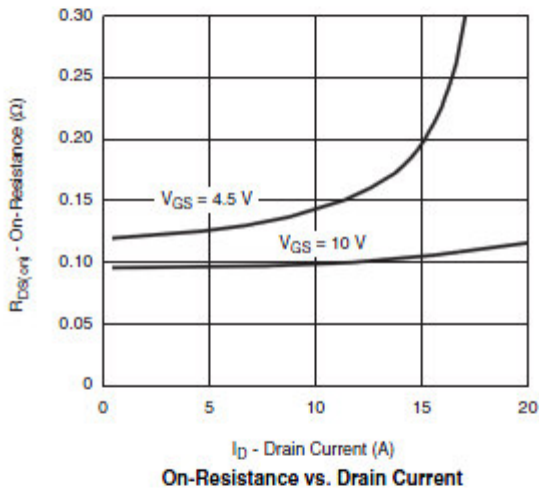
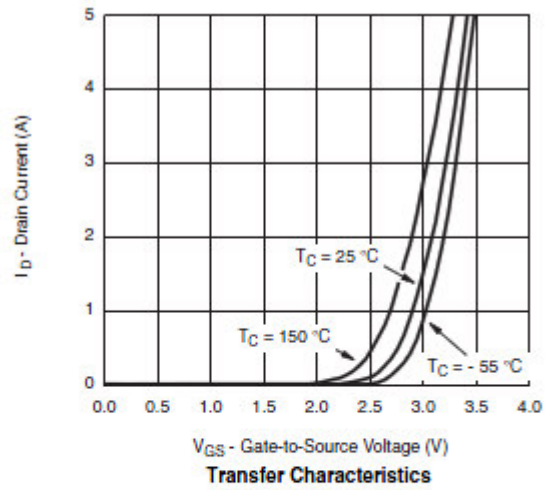
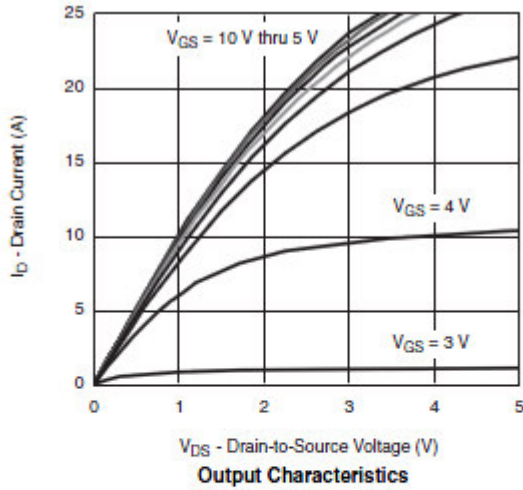
Electrical Characteristics

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

| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---------------------------------|---------------|--|------|------|-----------|------------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D = -250\mu A$ | -60 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D = -250\mu A$ | -0.8 | | -2.5 | |
| 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 | $I_{D(on)}$ | $V_{DS} \geq -5V, V_{GS} = -10V$ | -20 | | | A |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS} = -10V, I_D = -14A$ | | 105 | 115 | m Ω |
| | | $V_{GS} = -4.5V, I_D = -10A$ | | 110 | 125 | |
| Forward Transconductance | g_{FS} | $V_{DS} = -15V, I_D = -3.2A$ | | 12 | | S |
| Diode Forward Voltage | V_{SD} | $I_S = -2A, V_{GS} = 0V$ | | -0.8 | -1.2 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = -30V, V_{GS} = -10V$ $I_D = -4.0A$ | | 12 | 20 | nC |
| Gate-Source Charge | Q_{gs} | | | 2.5 | | |
| Gate-Drain Charge | Q_{gd} | | | 3.5 | | |
| Input Capacitance | C_{iss} | $V_{DS} = -30V, V_{GS} = 0V$ $f = 1\text{MHz}$ | | 980 | | pF |
| Output Capacitance | C_{oss} | | | 110 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 45 | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD} = -30V, R_L = 7.5\Omega$ $I_D = -3.8A, V_{GEN} = -10V$ $R_G = 3\Omega$ | | 10 | 20 | ns |
| | t_r | | | 6 | 10 | |
| Turn-Off Time | $t_{d(off)}$ | | | 30 | 45 | |
| | t_f | | | 12 | 25 | |

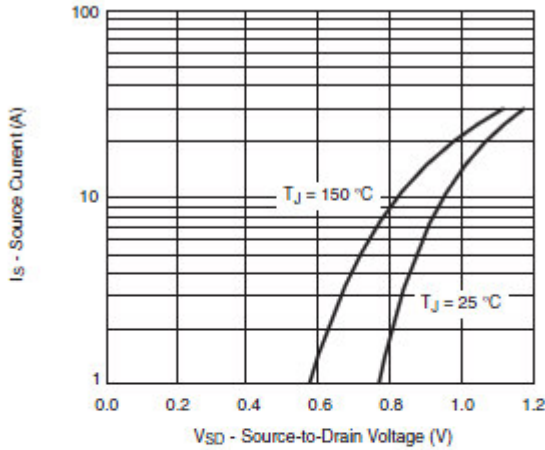


Typical Characteristics

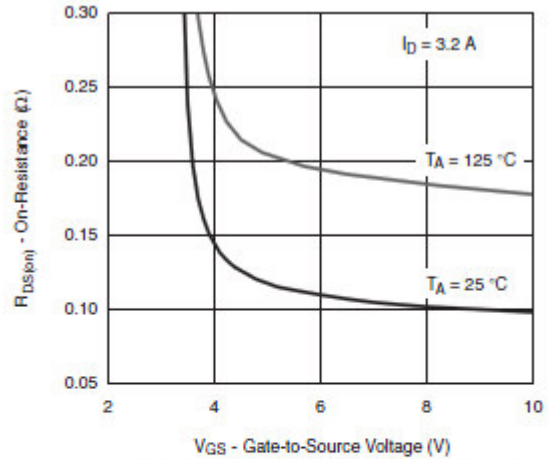




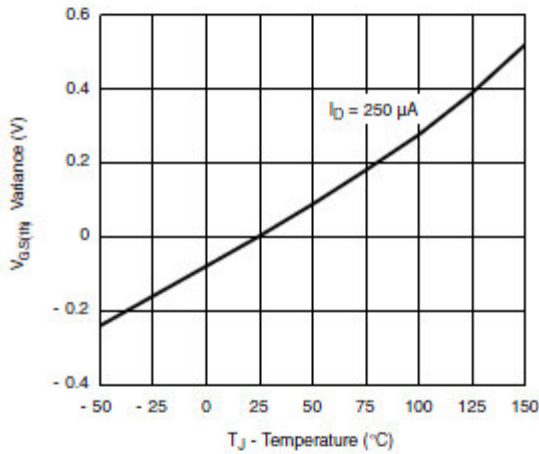
Typical Characteristics



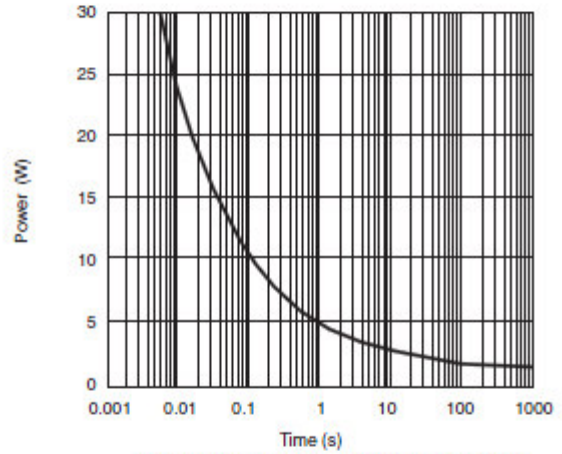
Source-Drain Diode Forward Voltage



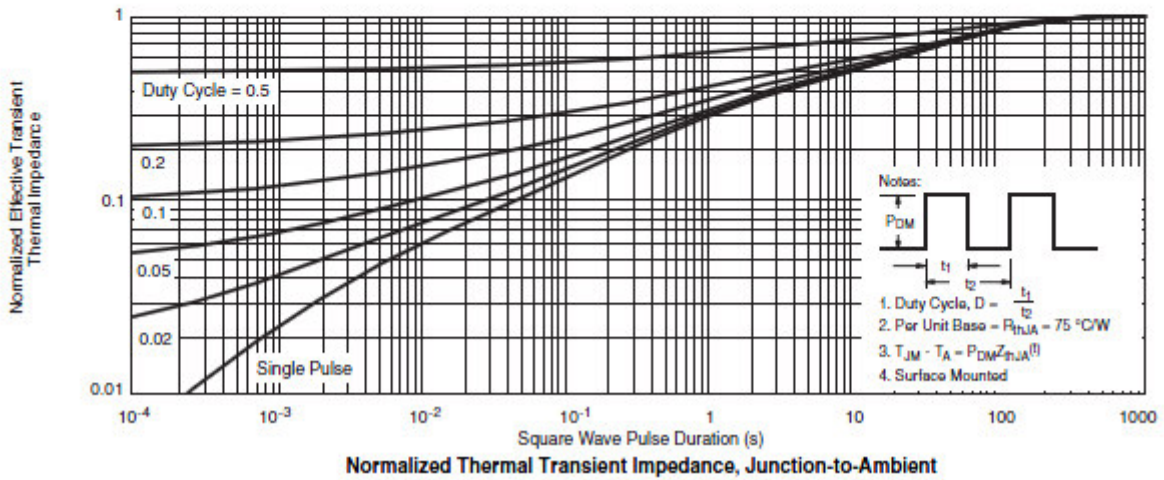
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient

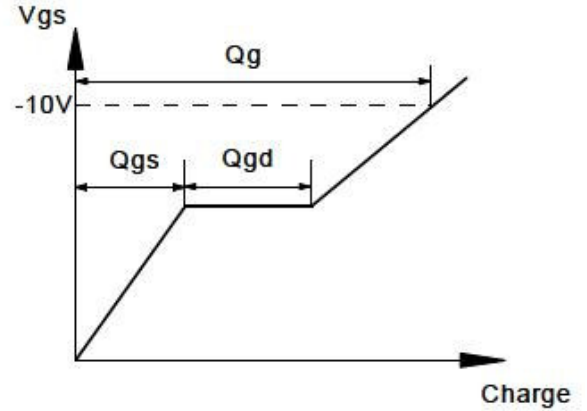
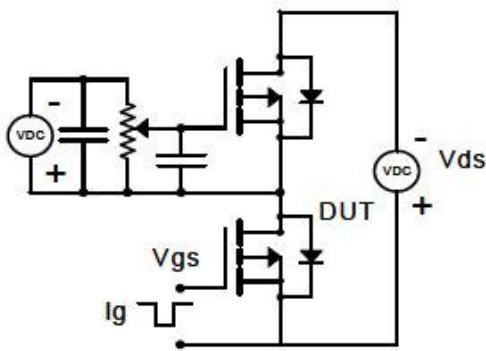


Normalized Thermal Transient Impedance, Junction-to-Ambient

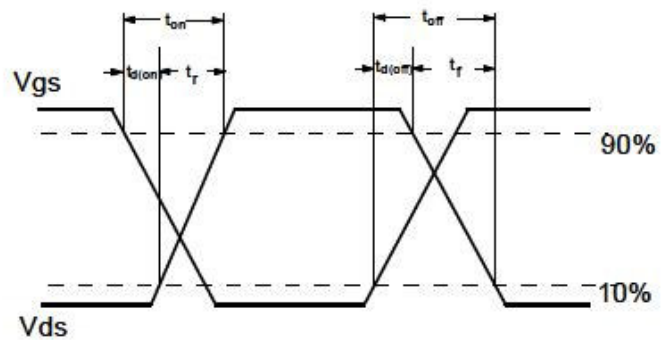
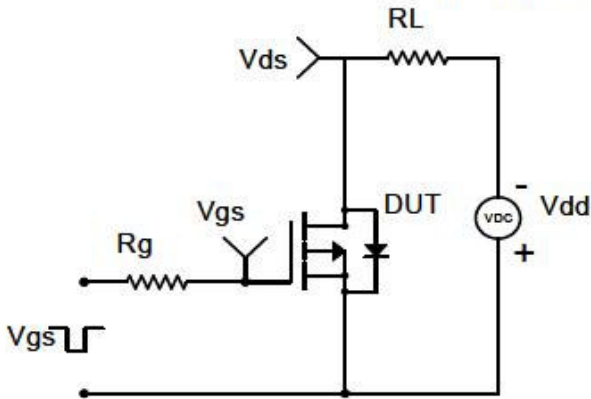


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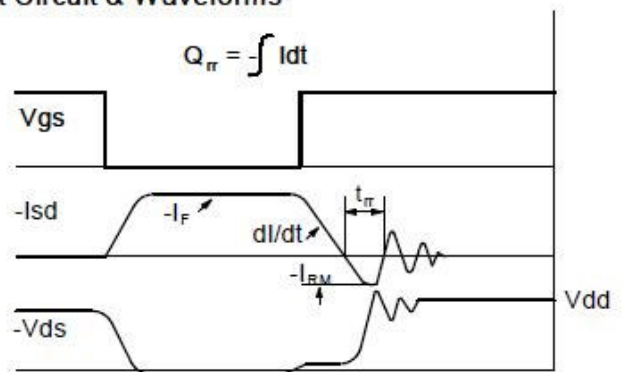
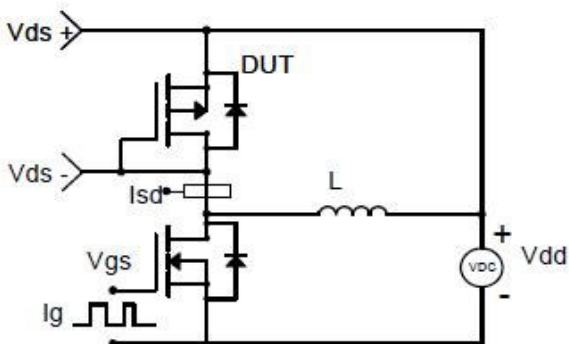
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

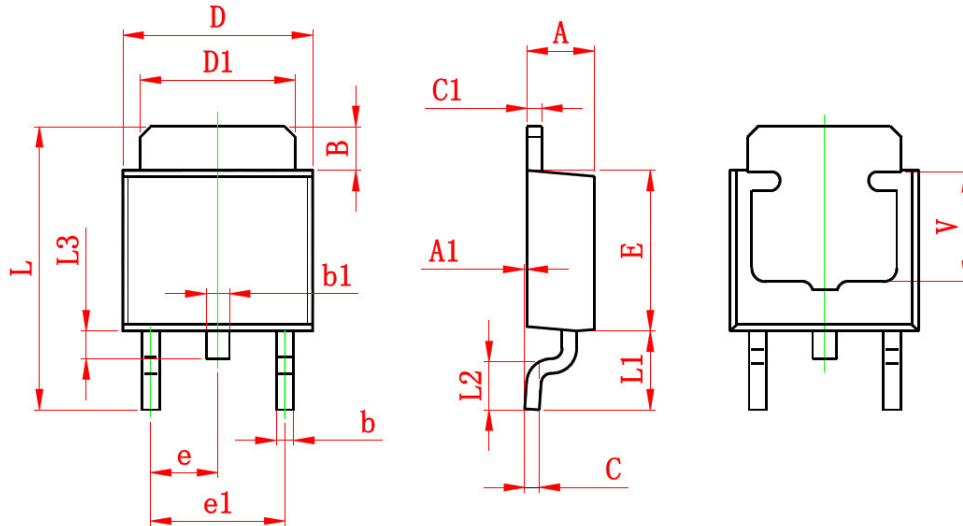


Diode Recovery Test Circuit & Waveforms





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 | 1.350 | 1.650 | 0.053 | 0.065 |
| b | 0.500 | 0.700 | 0.020 | 0.028 |
| b1 | 0.700 | 0.900 | 0.028 | 0.035 |
| c | 0.430 | 0.580 | 0.017 | 0.023 |
| c1 | 0.430 | 0.580 | 0.017 | 0.023 |
| D | 6.350 | 6.650 | 0.250 | 0.262 |
| D1 | 5.200 | 5.400 | 0.205 | 0.213 |
| E | 5.400 | 5.700 | 0.213 | 0.224 |
| e | 2.300 TYP. | | 0.091 TYP. | |
| e1 | 4.500 | 4.700 | 0.177 | 0.185 |
| L | 9.500 | 9.900 | 0.374 | 0.390 |
| L1 | 2.550 | 2.900 | 0.100 | 0.114 |
| L2 | 1.400 | 1.780 | 0.055 | 0.070 |
| L3 | 0.600 | 0.900 | 0.024 | 0.035 |
| V | 3.800 REF. | | 0.150 REF. | |

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