



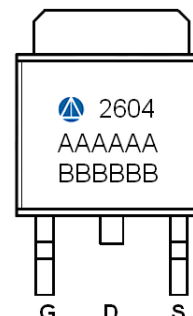
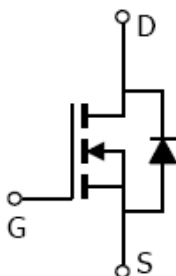
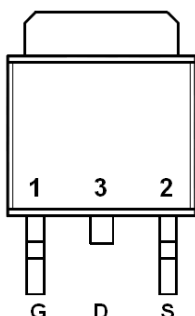
General Description

AFN2604, N-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

- 40V/20A, $R_{DS(ON)} = 22m\Omega @ V_{GS} = 10V$
- 40V/12A, $R_{DS(ON)} = 40m\Omega @ V_{GS} = 4.5V$
- 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

Pin Define

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

Ordering Information

| Part Ordering No. | Part Marking | Package | Unit | Quantity |
|-------------------|--------------|-----------|-------------|----------|
| AFN2604T252RG | 2604 | TO-252-2L | Tape & Reel | 2500 EA |

- ※ A Lot code
- ※ B Date code
- ※ AFN2604T252RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings

(T_A=25°C Unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|------------------|----------------------|------|
| Drain-Source Voltage | V _{DSS} | 40 | V |
| Gate –Source Voltage | V _{GSS} | ±20 | V |
| Continuous Drain Current(T _J =150°C) | I _D | T _A =25°C | 25 |
| | | T _A =70°C | 20 |
| Pulsed Drain Current | I _{DM} | 40 | A |
| Continuous Source-Drain Diode Current | I _S | 8 | A |
| Single Pulse Avalanche Current | I _{AS} | 25 | A |
| Avalanche Energy | E _{AS} | 35 | mJ |
| Power Dissipation | P _D | T _A =25°C | 40 |
| | | T _A =70°C | 15 |
| Operating Junction Temperature | T _J | 150 | °C |
| Storage Temperature Range | T _{STG} | -55/150 | °C |
| Thermal Resistance-Junction to Ambient | R _{θJA} | 62.5 | °C/W |

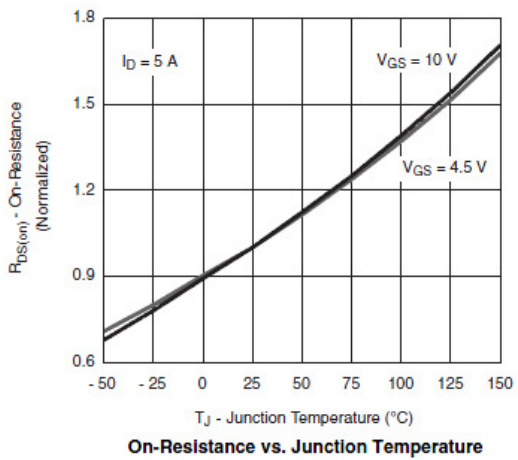
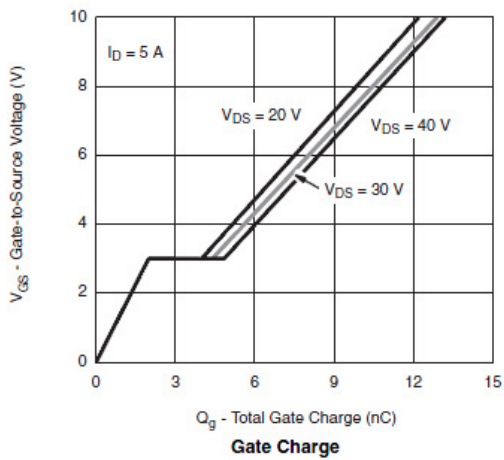
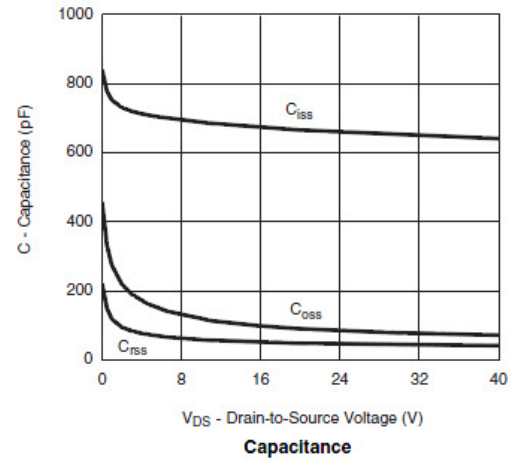
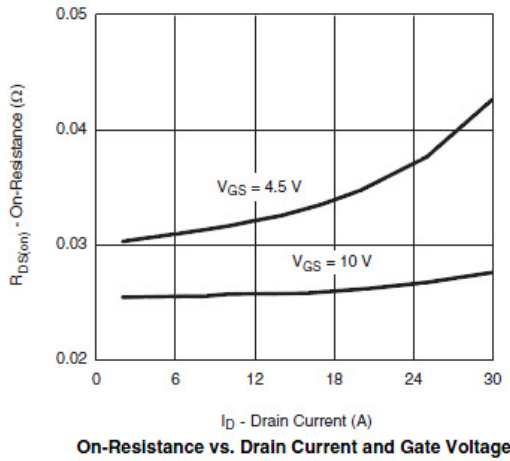
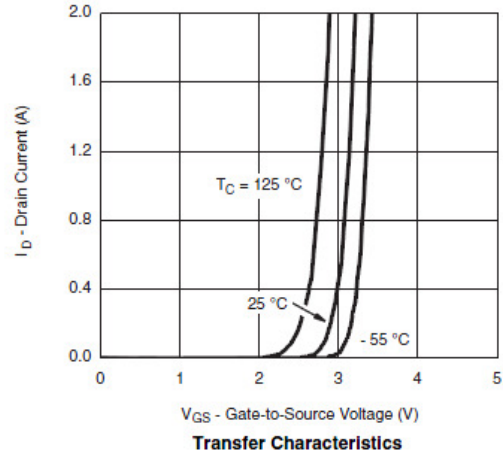
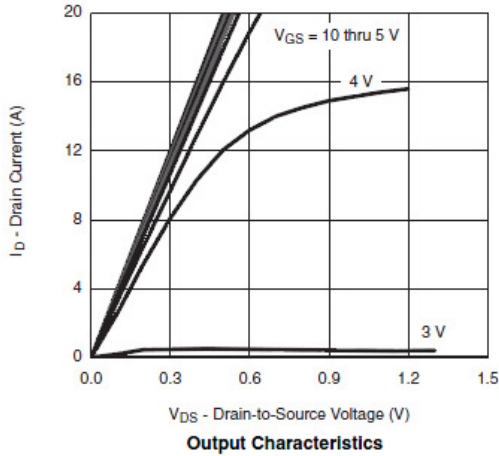
Electrical Characteristics

(T_A=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 =250uA | 40 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250uA | 1.5 | | 3.0 | |
| Gate Leakage Current | I _{GSS} | V _{DS} =0V, V _{GS} =±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =32V, V _{GS} =0V | | | 1 | uA |
| | | V _{DS} =32V, V _{GS} =0V T _J =85°C | | | 10 | |
| On-State Drain Current | I _{D(on)} | V _{DS} ≥ 5V, V _{GS} =10V | 20 | | | A |
| Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =10V, I _D =20A | | 16 | 22 | mΩ |
| | | V _{GS} =4.5V, I _D =12A | | 30 | 40 | |
| Forward Transconductance | g _{FS} | V _{DS} =15V, I _D =5.0A | | 25 | | S |
| Diode Forward Voltage | V _{SD} | I _S =2A, V _{GS} =0V | | 0.85 | 1.2 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q _g | V _{DS} =20V, V _{GS} =4.5V I _D = 5A | | 10 | 14 | nC |
| Gate-Source Charge | Q _{gs} | | | 2.8 | | |
| Gate-Drain Charge | Q _{gd} | | | 3.2 | | |
| Input Capacitance | C _{iss} | V _{DS} =20V, V _{GS} =0V f=1MHz | | 850 | | pF |
| Output Capacitance | C _{oss} | | | 110 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 75 | | |
| Turn-On Time | t _{d(on)} | V _{DD} =20V, R _L =4Ω I _D ≅5.0A, V _{GEN} =10V R _G =1Ω | | 6 | 12 | ns |
| | t _r | | | 10 | 20 | |
| Turn-Off Time | t _{d(off)} | | | 20 | 36 | |
| | t _f | | | 6 | 12 | |

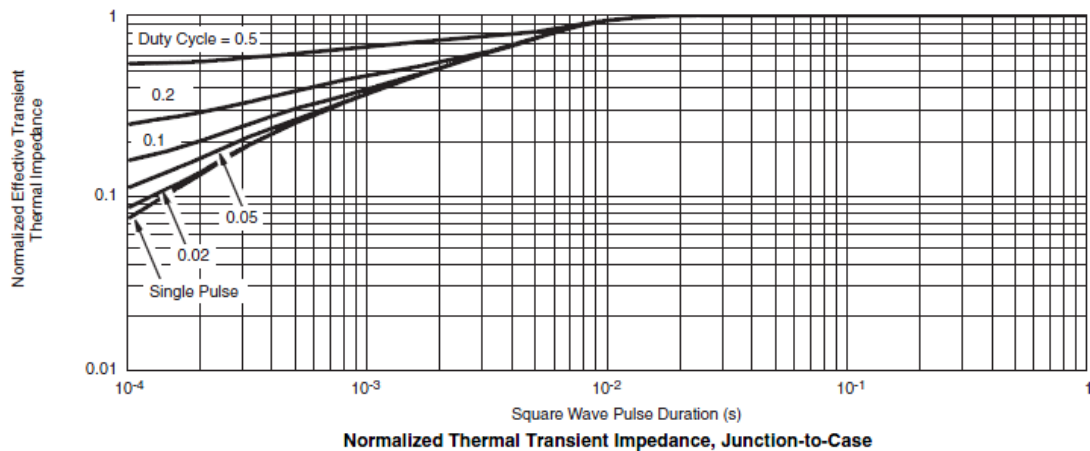
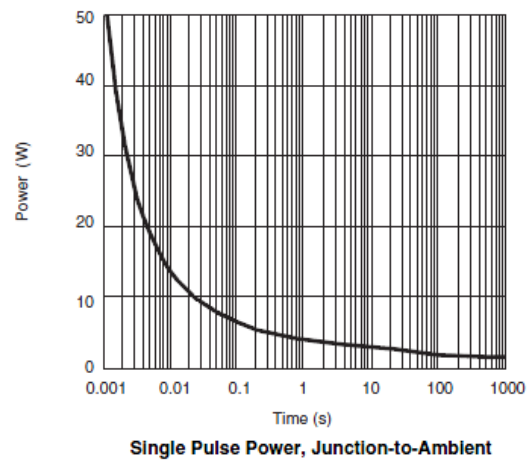
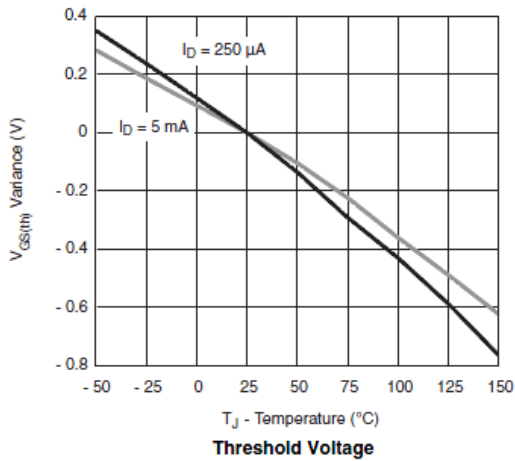
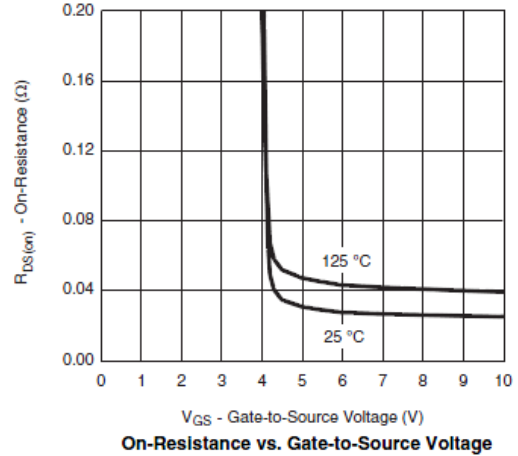
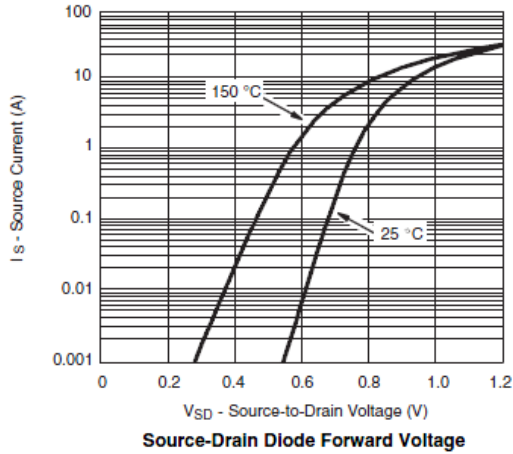


Typical Characteristics





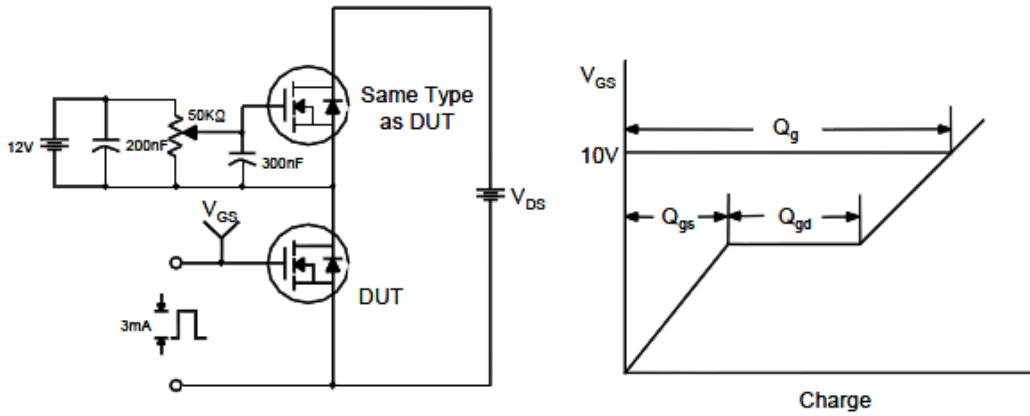
Typical Characteristics



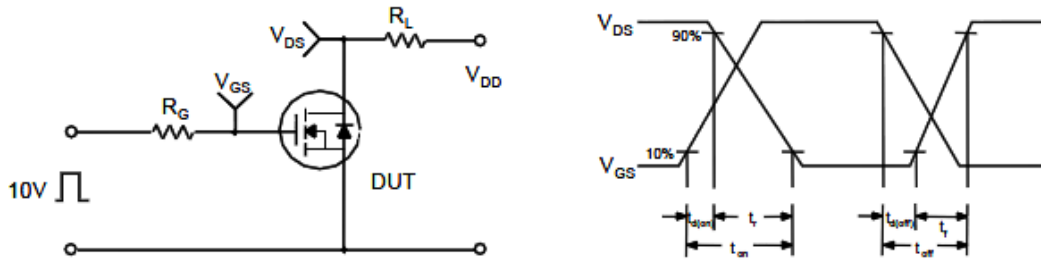


Typical Characteristics

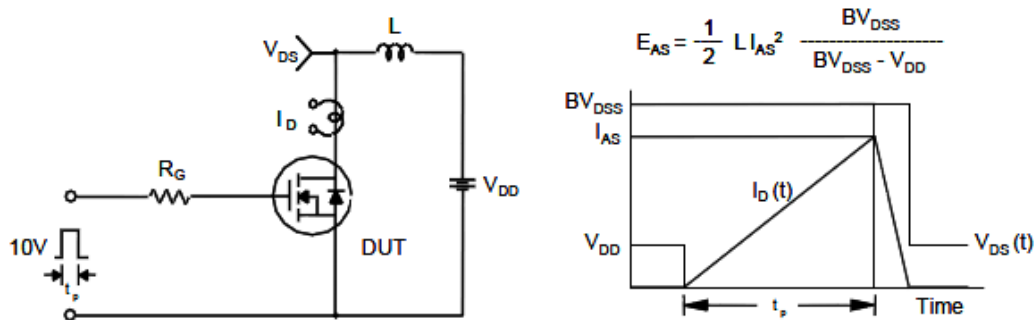
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

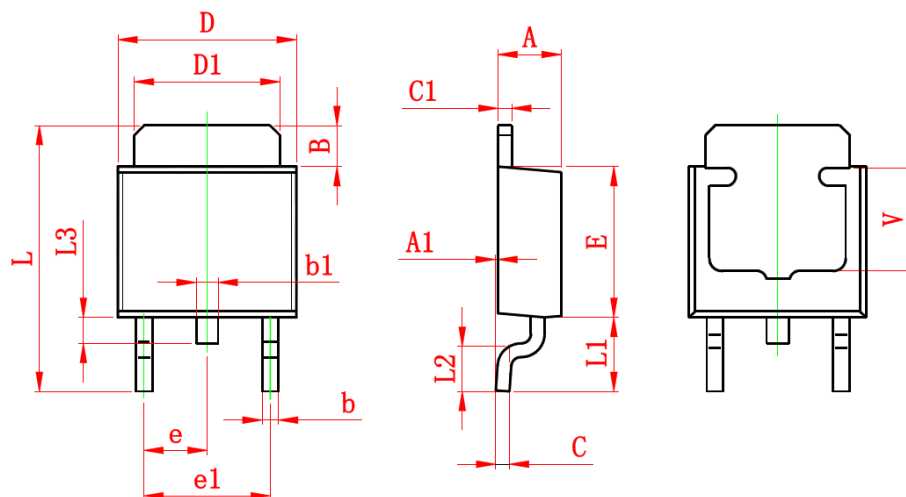


Unclamped Inductive Switching Test Circuit & Waveforms





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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