



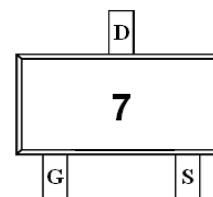
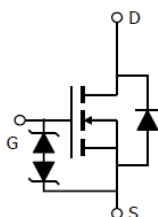
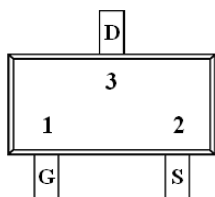
General Description

AFN7002ES, 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, such as smart phone and notebook computer, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

- 60V/0.5A , $R_{DS(ON)}=2400m\Omega@V_{GS}=10V$
- 60V/0.05A , $R_{DS(ON)}=3000m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low RDS (ON)
- Exceptional on-resistance and maximum DC current capability
- ESD Protection (2KV) Diode design-in
- SOT-723 package design

Pin Description (SOT-723)



Application

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Smart Phones, Paggers

Pin Define

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

Ordering Information

| Part Ordering No. | Part Marking | Package | Unit | Quantity |
|-------------------|--------------|---------|-------------|----------|
| AFN7002ESS72RG | 7 | SOT-723 | Tape & Reel | 8000 EA |

※ AFN7002ESS72RG : 7" 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} | 60 | V |
| Gate –Source Voltage | V _{GSS} | ±20 | V |
| Continuous Drain Current(T _J =150°C) | I _D | T _A =25°C | 0.115 |
| | | T _A =70°C | 0.075 |
| Pulsed Drain Current | I _{DM} | 0.8 | A |
| Continuous Source Current(Diode Conduction) | I _S | 0.3 | A |
| Power Dissipation | P _D | T _A =25°C | 0.27 |
| | | T _A =70°C | 0.16 |
| Operating Junction Temperature | T _J | -55/150 | °C |
| Storage Temperature Range | T _{STG} | -55/150 | °C |

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 | 60 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250uA | 1.0 | | 2.0 | |
| Gate Leakage Current | I _{GSS} | V _{DS} =0V, V _{GS} =±20V | | | 3 | uA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =60V, V _{GS} =0V | | | 1 | uA |
| | | V _{DS} =60V, V _{GS} =0V T _J =85°C | | | 10 | |
| Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =10V, I _D =0.5A | | 1200 | 2400 | mΩ |
| | | V _{GS} = 4.5V, I _D =0.05A | | 1600 | 3000 | |
| Forward Transconductance | g _{FS} | V _{DS} =10V, I _D =0.2A | | 0.2 | | S |
| Diode Forward Voltage | V _{SD} | I _S =0.2A, V _{GS} =0V | | 0.75 | 1.4 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q _g | V _{DS} =10V, V _{GS} =4.5V I _D ≅0.25A | | 500 | | pC |
| Gate-Source Charge | Q _{gs} | | | 100 | | |
| Gate-Drain Charge | Q _{gd} | | | 150 | | |
| Input Capacitance | C _{iss} | V _{DS} =25V, V _{GS} =0V f=1MHz | | 30 | | pF |
| Output Capacitance | C _{oss} | | | 8 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 5 | | |
| Turn-On Time | t _{d(on)} | V _{DD} =30V, R _L =150Ω I _D ≅0.2A, V _{GEN} =-4.5V R _G =10Ω | | 10 | 20 | ns |
| | t _r | | | 35 | 50 | |
| Turn-Off Time | t _{d(off)} | | | 20 | 30 | |
| | t _f | | | 40 | 60 | |



Typical Characteristics

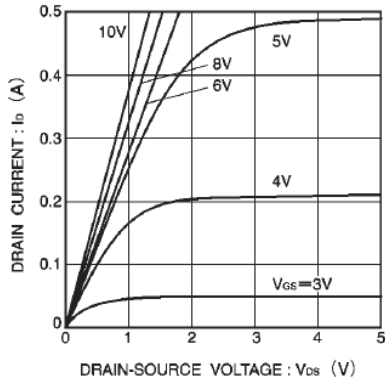


Fig.1 Typical output characteristics

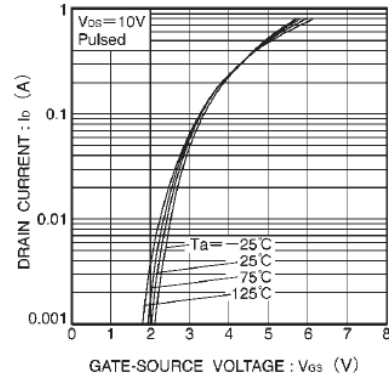


Fig.2 Typical transfer characteristics

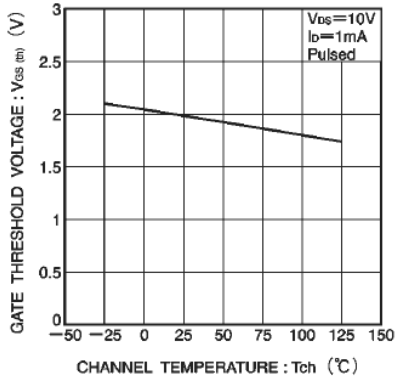


Fig.3 Gate threshold voltage vs. channel temperature

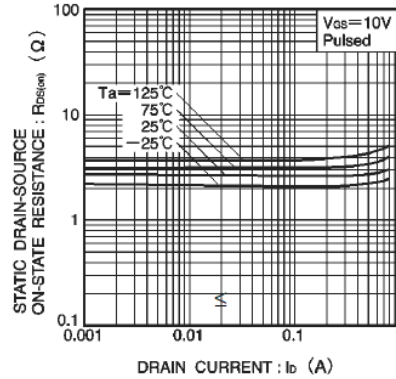


Fig.4 Static drain-source on-state resistance vs. drain current

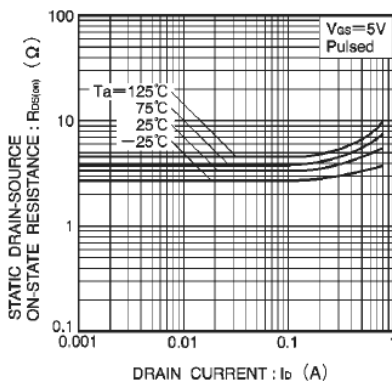


Fig.5 Static drain-source on-state resistance vs. drain current

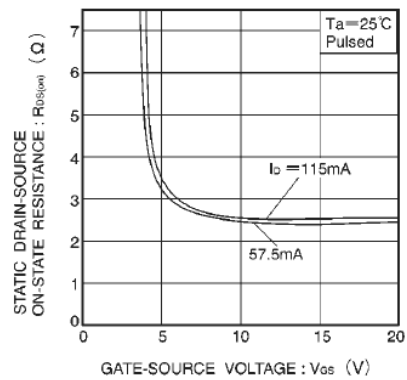


Fig.6 Static drain-source on-state resistance vs. gate-source voltage



Typical Characteristics

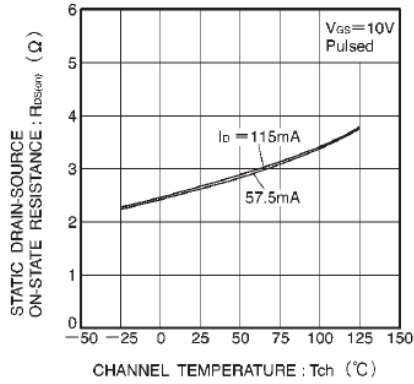


Fig.7 Static drain-source on-state resistance vs. channel temperature

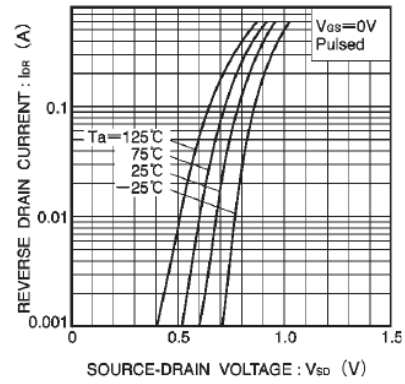


Fig.8 Reverse drain current vs. source-drain voltage

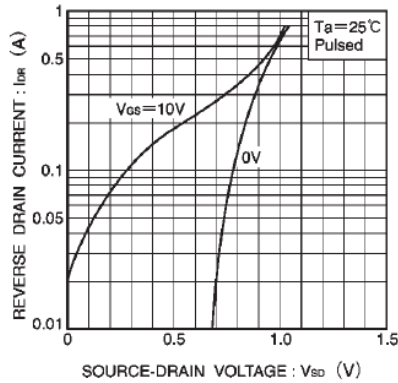


Fig.9 Reverse drain current vs. source-drain voltage

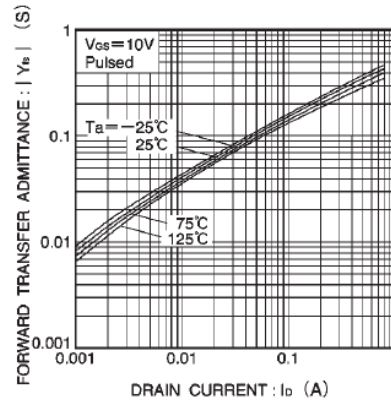


Fig.10 Forward transfer admittance vs. drain current

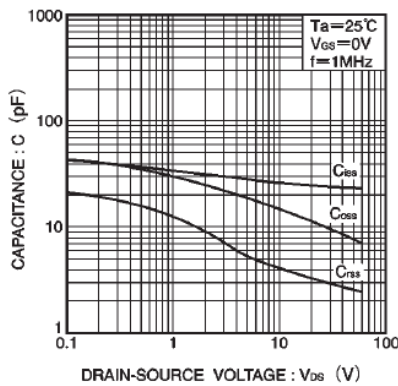


Fig.11 Typical capacitance vs. drain-source voltage

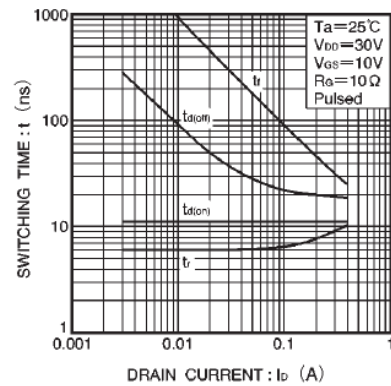


Fig. Switching characteristics

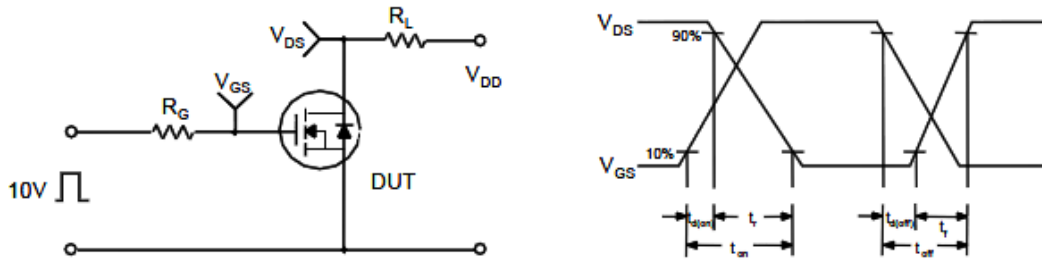


Typical Characteristics

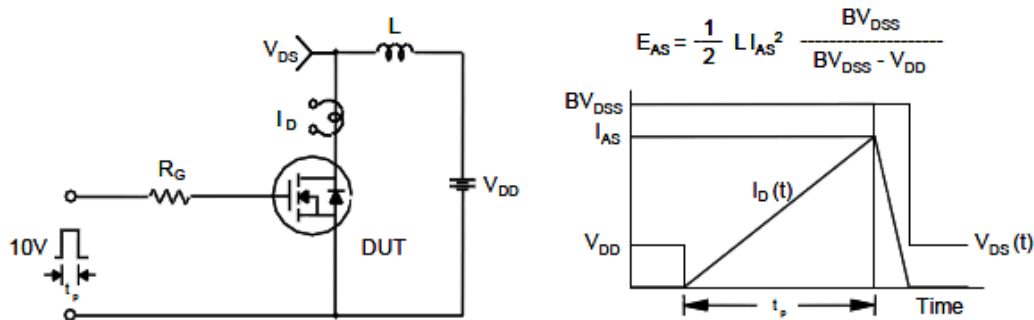
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

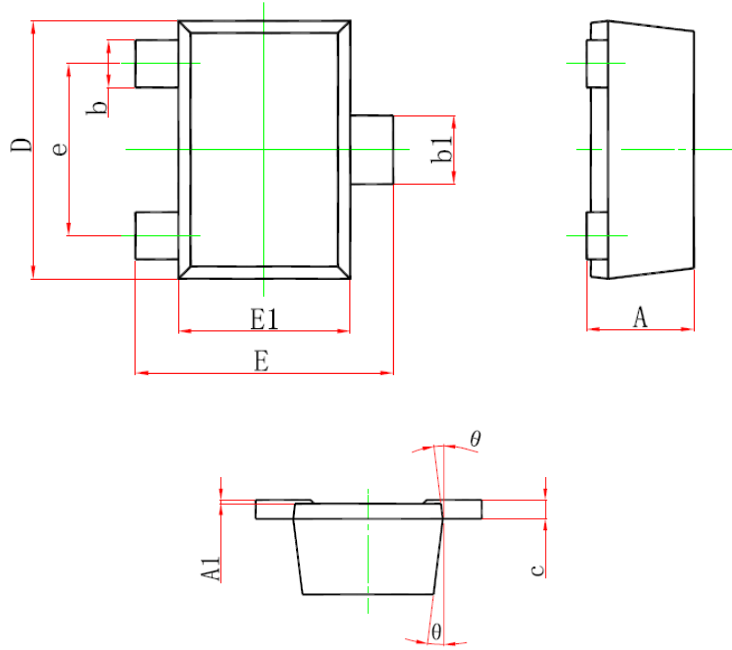


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (SOT-723)



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | | 0.500 | | 0.020 |
| A1 | 0.000 | 0.050 | 0.000 | 0.002 |
| b | 0.170 | 0.270 | 0.007 | 0.011 |
| b1 | 0.270 | 0.370 | 0.011 | 0.015 |
| c | | 0.150 | | 0.006 |
| D | 1.150 | 1.250 | 0.045 | 0.049 |
| E | 1.150 | 1.250 | 0.045 | 0.049 |
| E1 | 0.750 | 0.850 | 0.030 | 0.033 |
| e | 0.800TYP. | | 0.031TYP. | |
| θ | 7° REF. | | 7° REF. | |

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