



General Description

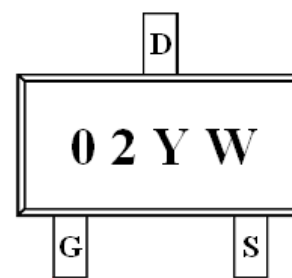
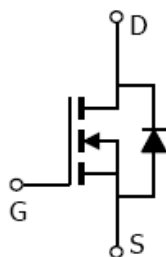
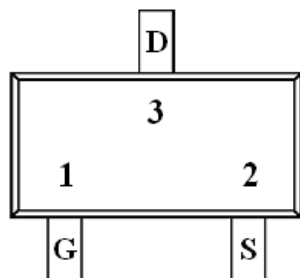
AFN7402, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

- 20V/3.6A, $R_{DS(ON)}=60m\Omega@V_{GS}=4.5V$
- 20V/3.2A, $R_{DS(ON)}=70m\Omega@V_{GS}=2.5V$
- 20V/2.8A, $R_{DS(ON)}=90m\Omega@V_{GS}=1.8V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-323 package design

Pin Description (SOT-323)



Application

- Portable Equipment
- Battery Powered System
- Net Working System

Pin Define

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

Ordering Information

| Part Ordering No. | Part Marking | Package | Unit | Quantity |
|-------------------|--------------|---------|-------------|----------|
| AFN7402S32RG | 02YW | SOT-323 | Tape & Reel | 3000 EA |

- ※ 02 parts code
- ※ Y year code (0 ~ 9)
- ※ W week code (A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52)
- ※ AFN7402S32RG : 7" Tape & Reel ; Pb- Free ; Halogen- Free



Absolute Maximum Ratings

(T_A=25°C Unless otherwise noted)

| Parameter | Symbol | Typical | Unit |
|---|------------------|----------------------|------|
| Drain-Source Voltage | V _{DSS} | 20 | V |
| Gate –Source Voltage | V _{GSS} | ±12 | V |
| Continuous Drain Current(T _J =150°C) | I _D | T _A =25°C | 3.6 |
| | | T _A =70°C | 2.6 |
| Pulsed Drain Current | I _{DM} | 10 | A |
| Continuous Source Current(Diode Conduction) | I _S | 1.6 | A |
| Power Dissipation | P _D | T _A =25°C | 0.35 |
| | | T _A =70°C | 0.22 |
| Operating Junction Temperature | T _J | 150 | °C |
| Storage Temperature Range | T _{STG} | -55/150 | °C |
| Thermal Resistance-Junction to Ambient | R _{θJA} | 120 | °C/W |

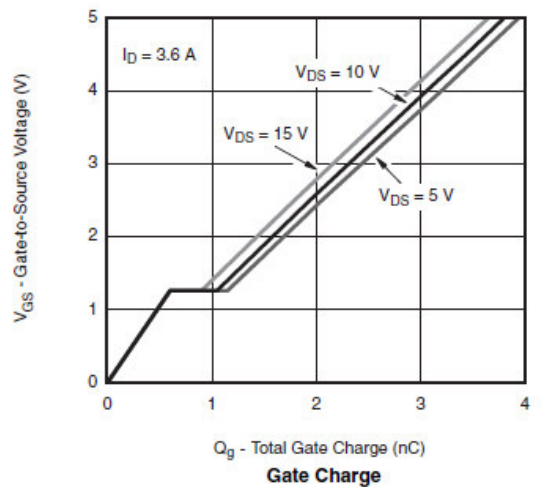
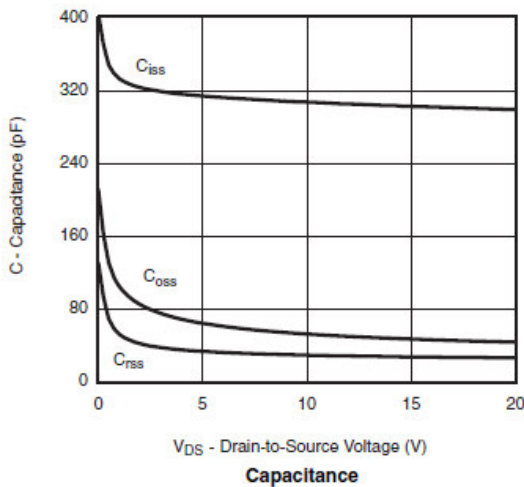
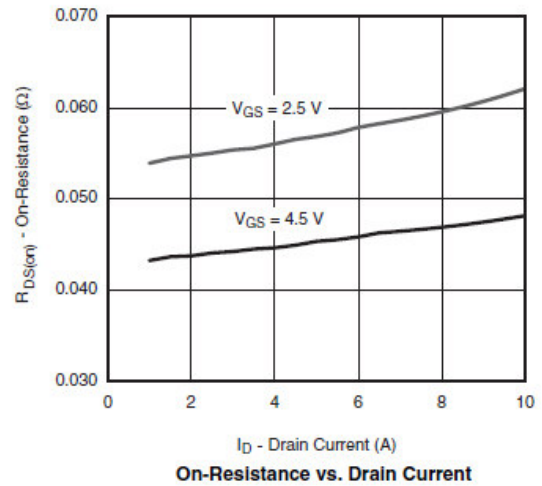
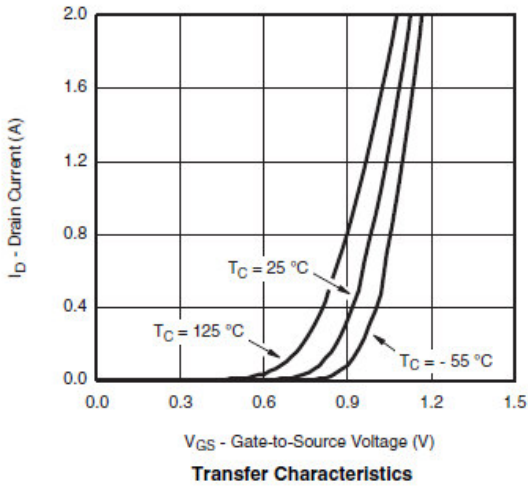
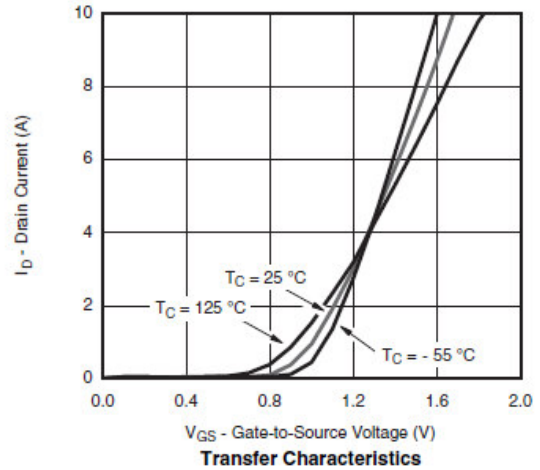
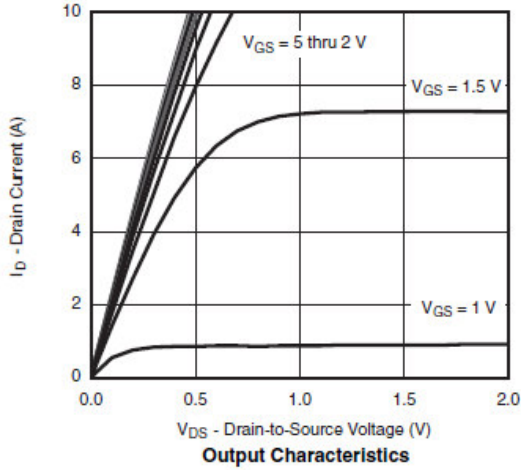
Electrical Characteristics

(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 | 20 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250uA | 0.3 | | 0.8 | |
| Gate Leakage Current | I _{GSS} | V _{DS} =0V, V _{GS} =±12V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =16V, V _{GS} =0V | | | 1 | uA |
| | | V _{DS} =16V, V _{GS} =0V T _J =85°C | | | 10 | |
| On-State Drain Current | I _{D(on)} | V _{DS} ≥ 5V, V _{GS} =4.5V | 6 | | | A |
| | | V _{DS} ≥ 5V, V _{GS} =2.5V | 4 | | | |
| Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =4.5V, I _D =3.6A | | 52 | 60 | mΩ |
| | | V _{GS} =2.5V, I _D =3.2A | | 62 | 70 | |
| | | V _{GS} =1.8V, I _D =2.8A | | 78 | 90 | |
| Forward Transconductance | g _{FS} | V _{DS} =5V, I _D =3.6A | | 10 | | S |
| Diode Forward Voltage | V _{SD} | I _S =1.6A, V _{GS} =0V | | 0.85 | 1.2 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q _g | V _{DS} =10V, V _{GS} =4.5V I _D ≧3.6A | | 4.2 | 5.0 | nC |
| Gate-Source Charge | Q _{gs} | | | 0.6 | | |
| Gate-Drain Charge | Q _{gd} | | | 0.4 | | |
| Input Capacitance | C _{iss} | V _{DS} =10V, V _{GS} =0V f=1MHz | | 340 | | pF |
| Output Capacitance | C _{oss} | | | 115 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 33 | | |
| Turn-On Time | t _{d(on)} | V _{DD} =10V, R _L =2.8Ω I _D ≧3.6A, V _{GEN} =4.5V R _G =1Ω | | 8 | 15 | ns |
| | t _r | | | 8 | 15 | |
| Turn-Off Time | t _{d(off)} | | | 25 | 40 | |
| | t _f | | | 8 | 15 | |

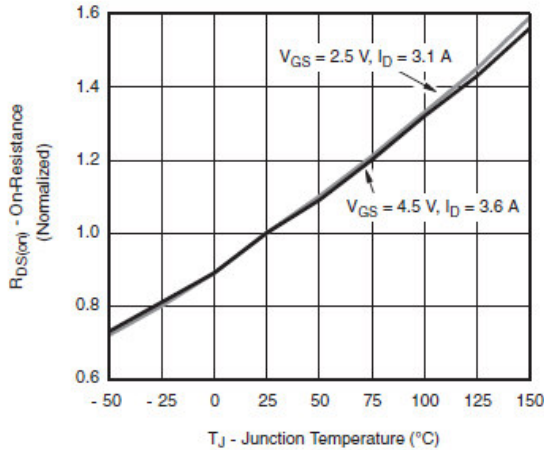


Typical Characteristics

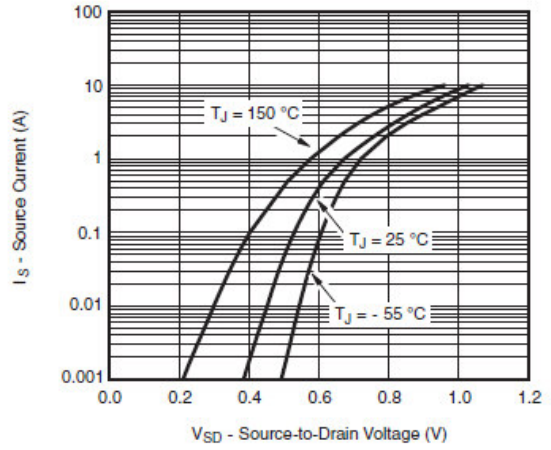




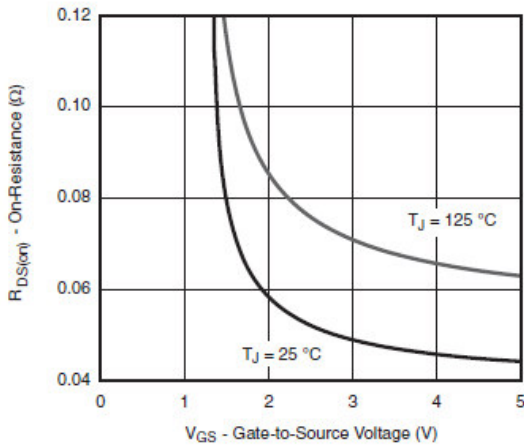
Typical Characteristics



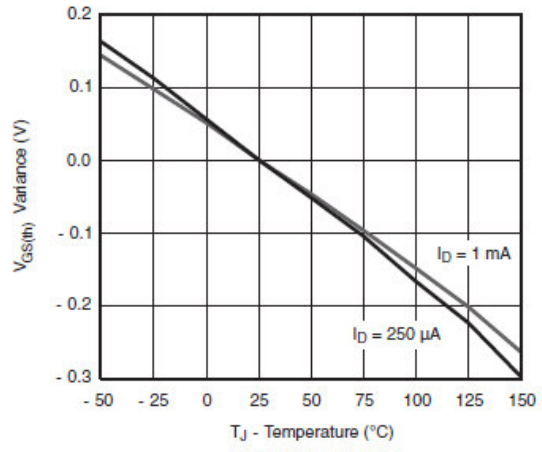
On-Resistance vs. Junction Temperature



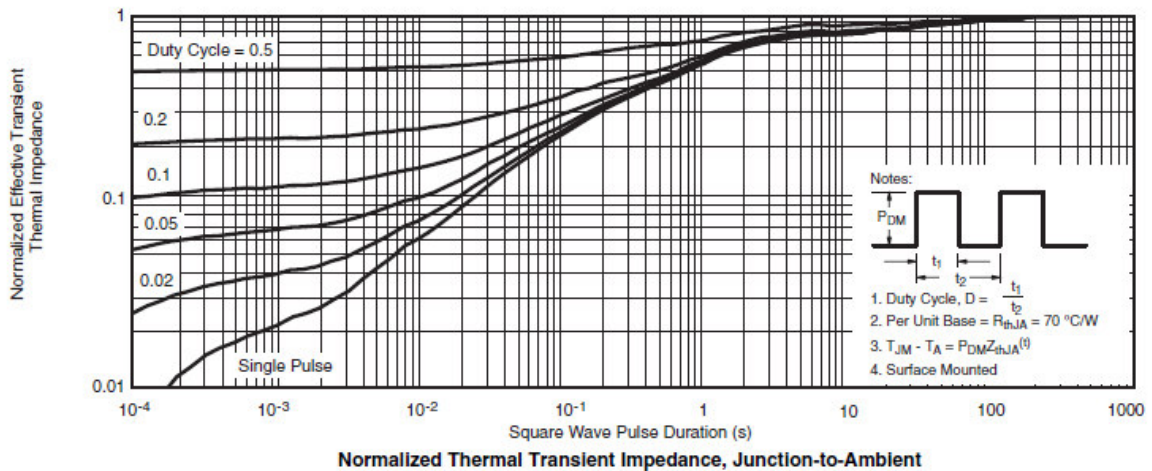
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Normalized Thermal Transient Impedance, Junction-to-Ambient

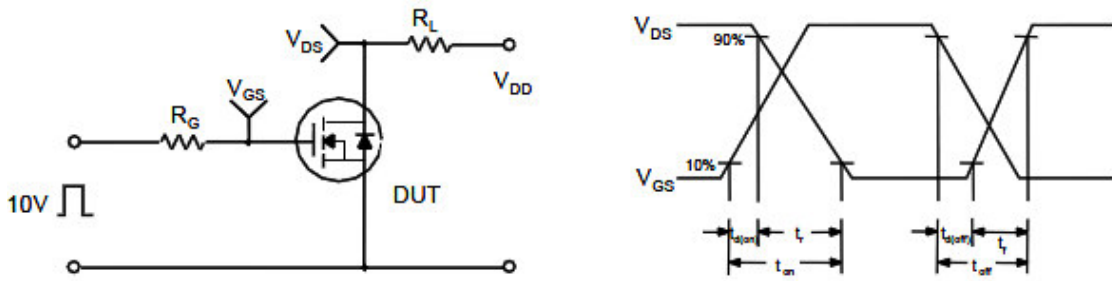


Typical Characteristics

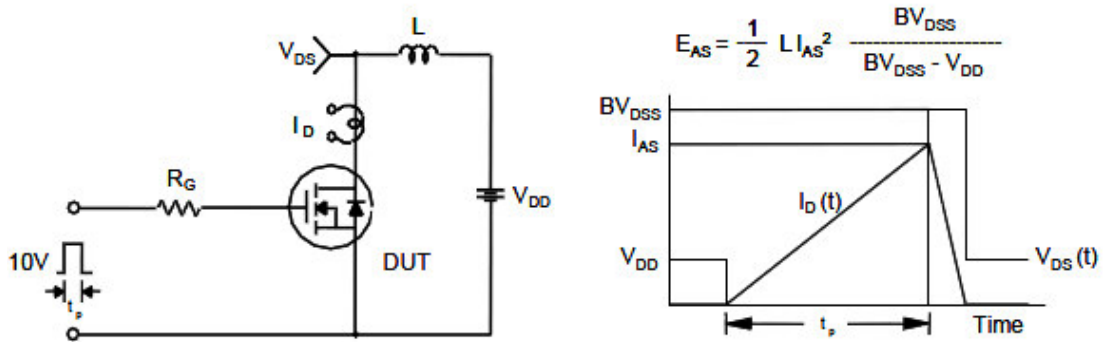
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

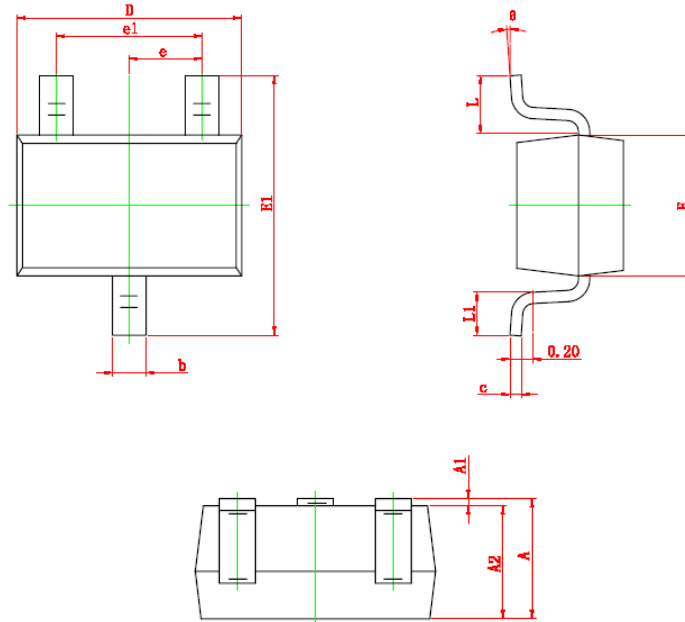


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (SOT-323)



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 |
| b | 0.200 | 0.400 | 0.008 | 0.016 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.000 | 2.200 | 0.079 | 0.087 |
| E | 1.150 | 1.350 | 0.045 | 0.053 |
| E1 | 2.150 | 2.450 | 0.085 | 0.096 |
| e | 0.650 TYP | | 0.026 TYP | |
| e1 | 1.200 | 1.400 | 0.047 | 0.055 |
| L | 0.525 REF | | 0.021 REF | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |

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