# Alfa-MOS Technology

# AFN3402A

## 30V N-Channel Enhancement Mode MOSFET

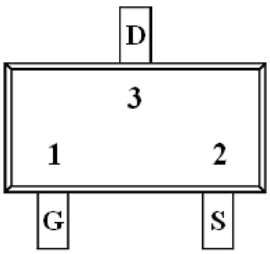
### General Description

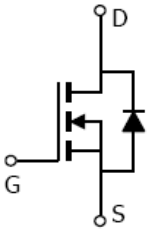
AFN3402A, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.
These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

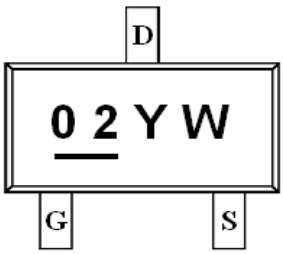
### Features

- 30V/2.4A,$R_{DS(ON)}$=82mΩ@$V_{GS}$=10V
- 30V/2.0A,$R_{DS(ON)}$=87mΩ@$V_{GS}$=4.5V
- 30V/1.5A,$R_{DS(ON)}$=110mΩ@$V_{GS}$=2.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23 package design

### Pin Description ( SOT-23 )




### 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 |
|---|---|---|---|---|
| AFN3402AS23RG | 02YW | SOT-23 | Tape & Reel | 3000 EA |

※ 02 parts code
※ Y year code ( 0 ~ 9 )
※ W week code ( A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52 )
※ AFN3402AS23RG : 7" Tape & Reel ; Pb- Free ; Halogen –Free

## Absolute Maximum Ratings

($T_A$=25℃ Unless otherwise noted)

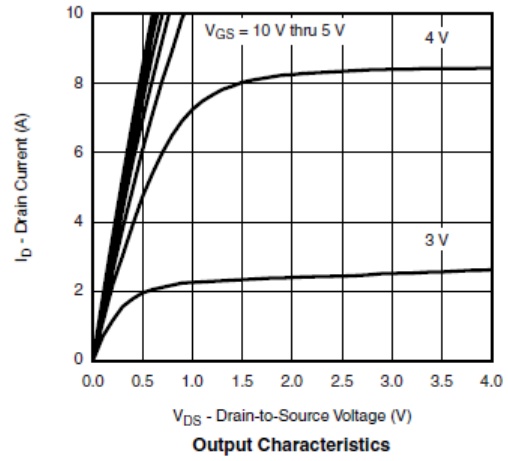
| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 30 | V |
| Gate –Source Voltage | | $V_{GSS}$ | ±12 | V |
| Continuous Drain Current($T_J$=150℃) | $T_A$=25℃ | $I_D$ | 3.6 | A |
| | $T_A$=70℃ | | 2.0 | |
| Pulsed Drain Current | | $I_{DM}$ | 10 | A |
| Continuous Source Current(Diode Conduction) | | $I_S$ | 1.6 | A |
| Power Dissipation | $T_A$=25℃ | $P_D$ | 1.25 | W |
| | $T_A$=70℃ | | 0.8 | |
| Operating Junction Temperature | | $T_J$ | 150 | ℃ |
| Storage Temperature Range | | $T_{STG}$ | -55/150 | ℃ |
| Thermal Resistance-Junction to Ambient | | $R_{\theta JA}$ | 120 | ℃/W |

## Electrical Characteristics

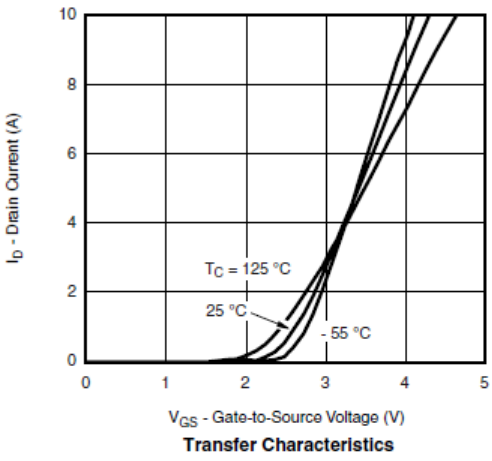
($T_A$=25℃ Unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V,$I_D$=250uA | 30 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250uA | 0.3 | | 1.2 | |
| Gate Leakage Current | $I_{GSS}$ | $V_{DS}$=0V,$V_{GS}$=±12V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=24V,$V_{GS}$=0V | | | 1 | uA |
| | | $V_{DS}$=24V,$V_{GS}$=0V<br>$T_J$=85℃ | | | 30 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS}$≧5V,$V_{GS}$=4.5V | 30 | | | A |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=10V ,$I_D$=2.4A | | 72 | 82 | mΩ |
| | | $V_{GS}$=4.5V,$I_D$=2.0A | | 77 | 87 | |
| | | $V_{GS}$=2.5V,$I_D$=1.5A | | 100 | 110 | |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=10V,$I_D$=1.6A | | 20 | | S |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=1.7A,$V_{GS}$=0V | | 0.8 | 1.2 | V |
| **Dynamic** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=15V,$V_{GS}$=4.5V<br>$I_D$≡3.6A | | 2.3 | 3 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 1.0 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 0.6 | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=15V,$V_{GS}$=0V<br>f=1MHz | | 280 | | pF |
| Output Capacitance | $C_{oss}$ | | | 40 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 20 | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD}$=15V,$R_L$=15Ω<br>$I_D$≡1.0A,$V_{GEN}$=10V<br>$R_G$=6Ω | | 10 | 15 | ns |
| | $t_r$ | | | 12 | 20 | |
| Turn-Off Time | $t_{d(off)}$ | | | 15 | 25 | |
| | $t_f$ | | | 10 | 15 | |

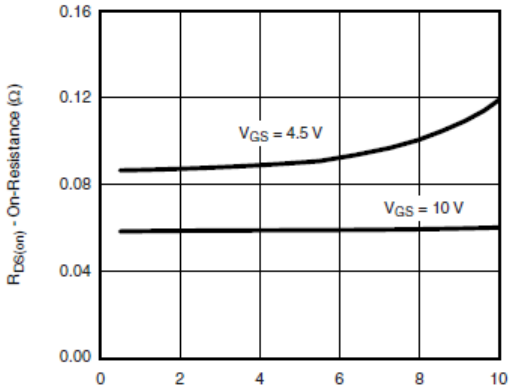
## Typical Characteristics



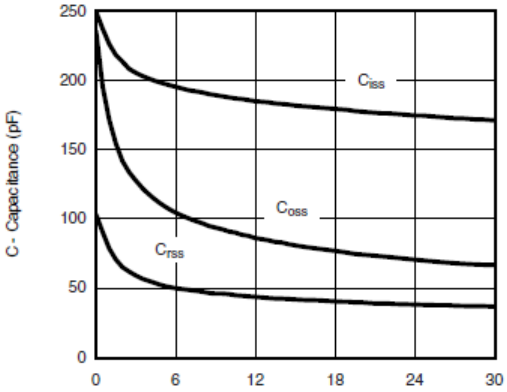

**Output Characteristics**



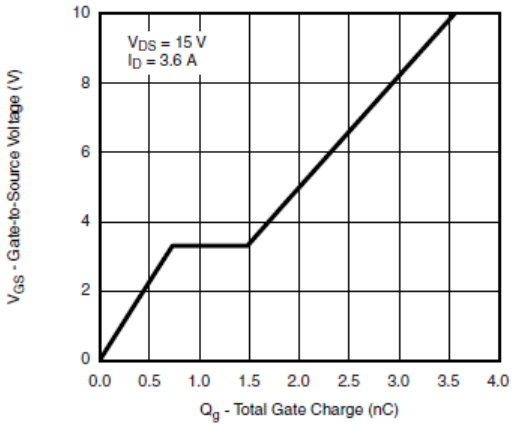

**Transfer Characteristics**



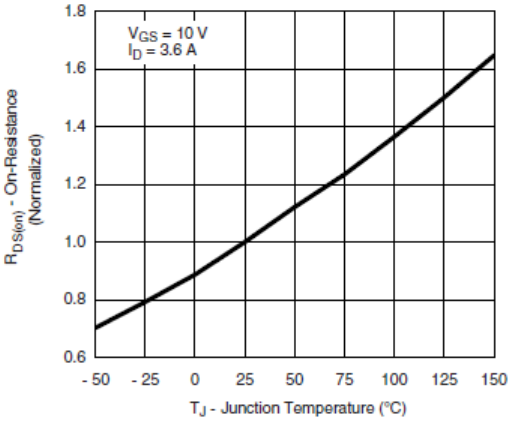

**On-Resistance vs. Drain Current**




**Capacitance**

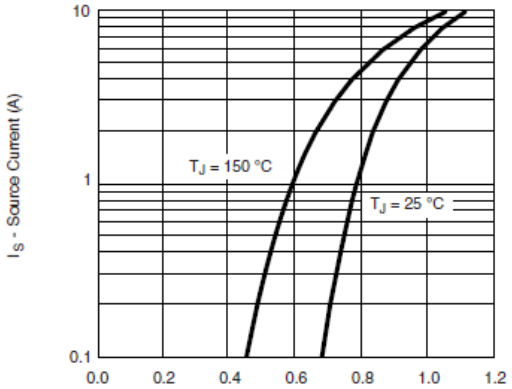



**Gate Charge**

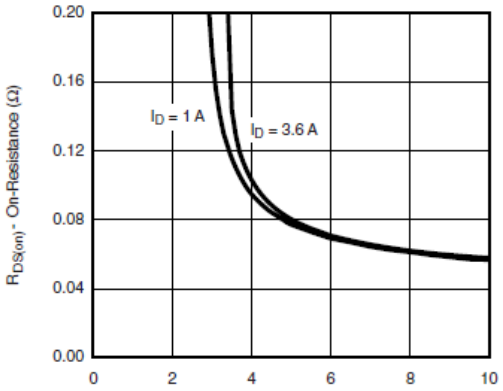



**On-Resistance vs. Junction Temperature**

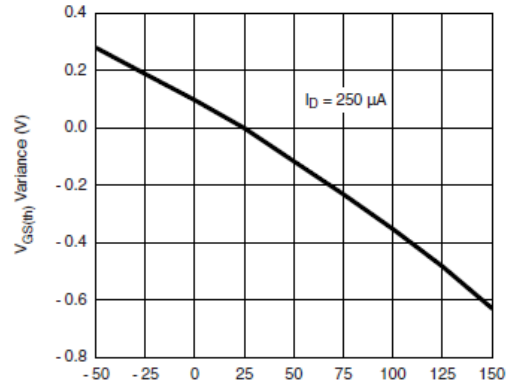
## Typical Characteristics



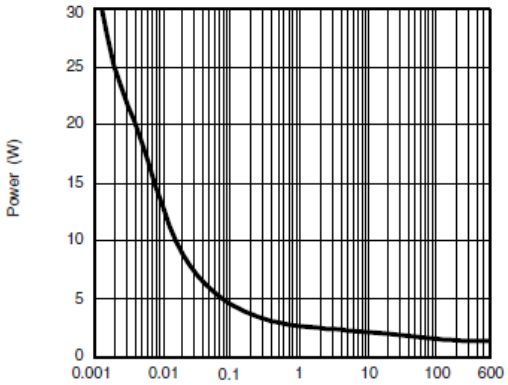

**Source-Drain Diode Forward Voltage**



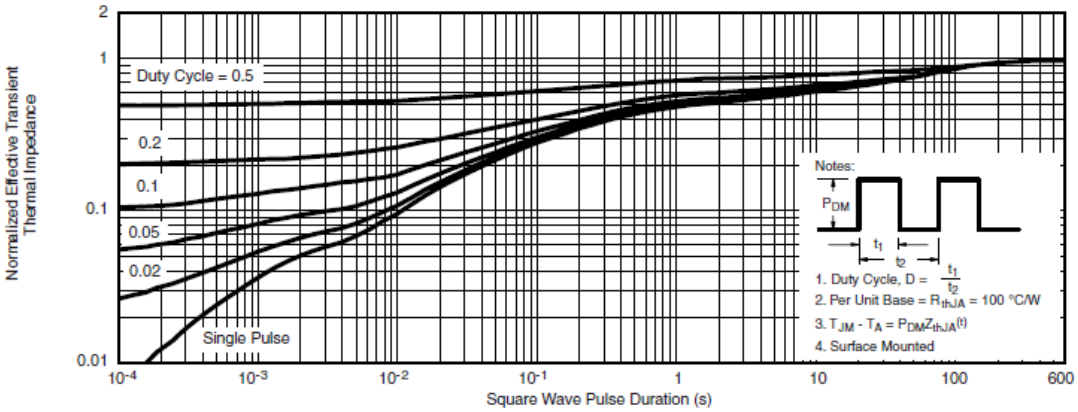

**On-Resistance vs. Gate-to-Source Voltage**




**Threshold Voltage**

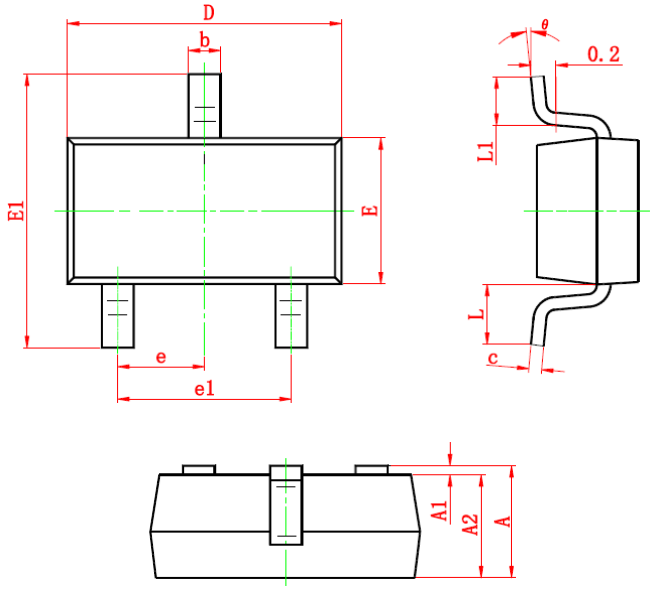



**Single Pulse Power**




**Normalized Thermal Transient Impedance, Junction-to-Ambient**

## Package Information ( SOT-23 )




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.900 | 1.200 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.100 | 0.035 | 0.039 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF | | 0.022 REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 6° |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