



### General Description

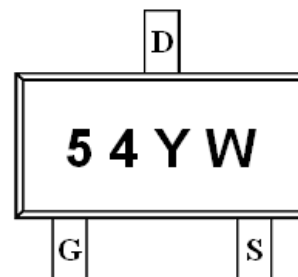
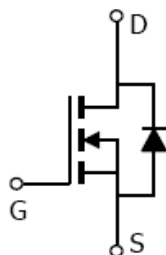
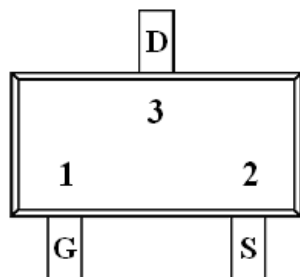
AFN2354, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

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

- 100V/3.2A,  $R_{DS(ON)}=145m\Omega@V_{GS}=10V$
- 100V/2.6A,  $R_{DS(ON)}=160m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23-3L package design

### Pin Description ( SOT-23-3L )



### Application

- DC/DC Converters
- Load Switch
- LED Backlighting in LCD TVs

### Pin Define

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

### Ordering Information

| Part Ordering No. | Part Marking | Package   | Unit        | Quantity |
|-------------------|--------------|-----------|-------------|----------|
| AFN2354S23RG      | 54YW         | SOT-23-3L | Tape & Reel | 3000 EA  |

- ※ 54 parts code
- ※ Y year code ( 0 ~ 9 )
- ※ W week code ( A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52 )
- ※ AFN2354S23RG : 7" Tape & Reel ; Pb- Free ; Halogen- Free



### Absolute Maximum Ratings

(T<sub>A</sub>=25°C Unless otherwise noted)

| Parameter                                       | Symbol           | Typical                      | Unit |
|-------------------------------------------------|------------------|------------------------------|------|
| Drain-Source Voltage                            | V <sub>DSS</sub> | 100                          | V    |
| Gate –Source Voltage                            | V <sub>GSS</sub> | ±20                          | V    |
| Continuous Drain Current(T <sub>J</sub> =150°C) | I <sub>D</sub>   | T <sub>A</sub> =25°C<br>3.2  | A    |
|                                                 |                  | T <sub>A</sub> =70°C<br>2.6  |      |
| Pulsed Drain Current                            | I <sub>DM</sub>  | 10                           | A    |
| Continuous Source Current(Diode Conduction)     | I <sub>S</sub>   | 1.6                          | A    |
| Power Dissipation                               | P <sub>D</sub>   | T <sub>A</sub> =25°C<br>1.25 | W    |
|                                                 |                  | T <sub>A</sub> =70°C<br>0.8  |      |
| Operating Junction Temperature                  | T <sub>J</sub>   | 150                          | °C   |
| Storage Temperature Range                       | T <sub>STG</sub> | -55/150                      | °C   |
| Thermal Resistance-Junction to Ambient          | R <sub>θJA</sub> | 120                          | °C/W |

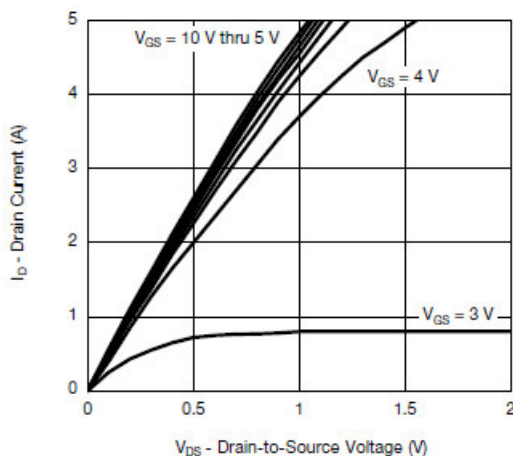
### Electrical Characteristics

(T<sub>A</sub>=25°C Unless otherwise noted)

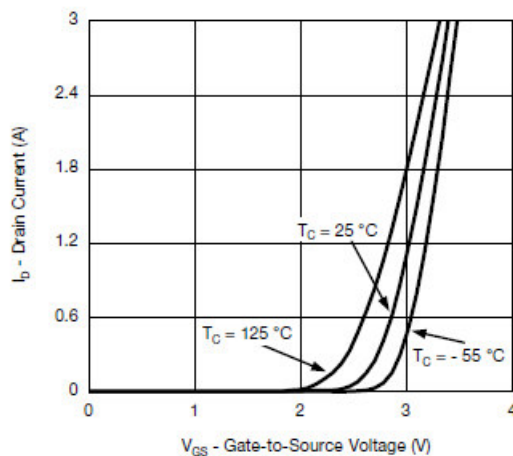
| Parameter                       | Symbol               | Conditions                                                                                                      | Min. | Typ  | Max. | Unit |
|---------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------|------|------|------|------|
| <b>Static</b>                   |                      |                                                                                                                 |      |      |      |      |
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA                                                                      | 100  |      |      | V    |
| Gate Threshold Voltage          | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA                                                        | 0.8  |      | 2.5  |      |
| Gate Leakage Current            | I <sub>GSS</sub>     | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V                                                                      |      |      | ±100 | nA   |
| Zero Gate Voltage Drain Current | I <sub>DSS</sub>     | V <sub>DS</sub> =80V, V <sub>GS</sub> =0V                                                                       |      |      | 5    | uA   |
|                                 |                      | V <sub>DS</sub> =80V, V <sub>GS</sub> =0V<br>T <sub>J</sub> =85°C                                               |      |      | 10   |      |
| On-State Drain Current          | I <sub>D(on)</sub>   | V <sub>DS</sub> ≥ 5V, V <sub>GS</sub> =4.5V                                                                     | 5    |      |      | A    |
| Drain-Source On-Resistance      | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =3.2A                                                                      |      | 120  | 145  | mΩ   |
|                                 |                      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.6A                                                                     |      | 130  | 160  |      |
| Forward Transconductance        | g <sub>FS</sub>      | V <sub>DS</sub> =20V, I <sub>D</sub> =1.5A                                                                      |      | 2    |      | S    |
| Diode Forward Voltage           | V <sub>SD</sub>      | I <sub>S</sub> =1.6A, V <sub>GS</sub> =0V                                                                       |      | 0.85 | 1.2  | V    |
| <b>Dynamic</b>                  |                      |                                                                                                                 |      |      |      |      |
| Total Gate Charge               | Q <sub>g</sub>       | V <sub>DS</sub> =50V, V <sub>GS</sub> =4.5V<br>I <sub>D</sub> ≧1.6A                                             |      | 5    | 10   | nC   |
| Gate-Source Charge              | Q <sub>gs</sub>      |                                                                                                                 |      | 1.5  |      |      |
| Gate-Drain Charge               | Q <sub>gd</sub>      |                                                                                                                 |      | 2.5  |      |      |
| Input Capacitance               | C <sub>iss</sub>     | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V<br>f=1MHz                                                             |      | 450  |      | pF   |
| Output Capacitance              | C <sub>oss</sub>     |                                                                                                                 |      | 50   |      |      |
| Reverse Transfer Capacitance    | C <sub>rss</sub>     |                                                                                                                 |      | 25   |      |      |
| Turn-On Time                    | t <sub>d(on)</sub>   | V <sub>DD</sub> =50V, R <sub>L</sub> =39Ω<br>I <sub>D</sub> ≧1.3A, V <sub>GEN</sub> =4.5V<br>R <sub>G</sub> =1Ω |      | 45   | 60   | ns   |
|                                 | t <sub>r</sub>       |                                                                                                                 |      | 35   | 55   |      |
| Turn-Off Time                   | t <sub>d(off)</sub>  |                                                                                                                 |      | 25   | 40   |      |
|                                 | t <sub>f</sub>       |                                                                                                                 |      | 20   | 35   |      |



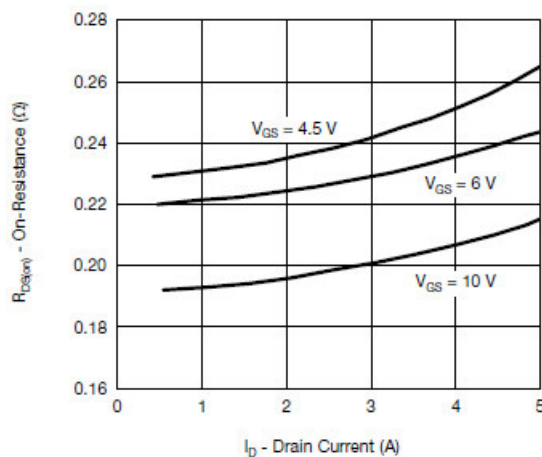
### Typical Characteristics



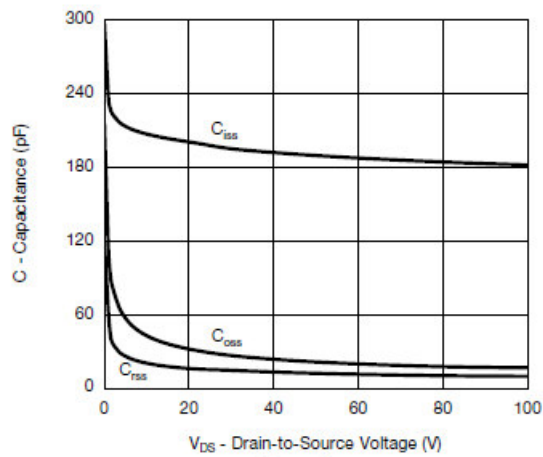
Output Characteristics



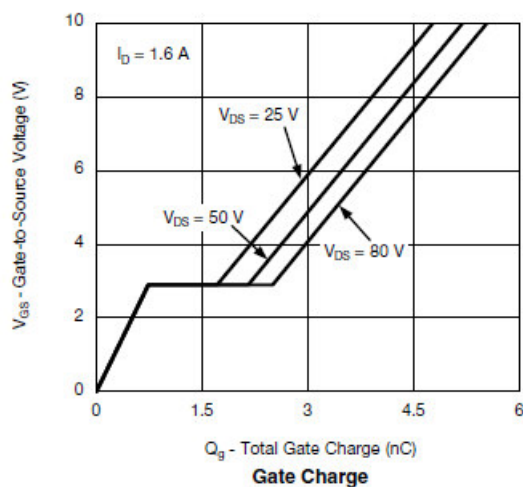
Transfer Characteristics



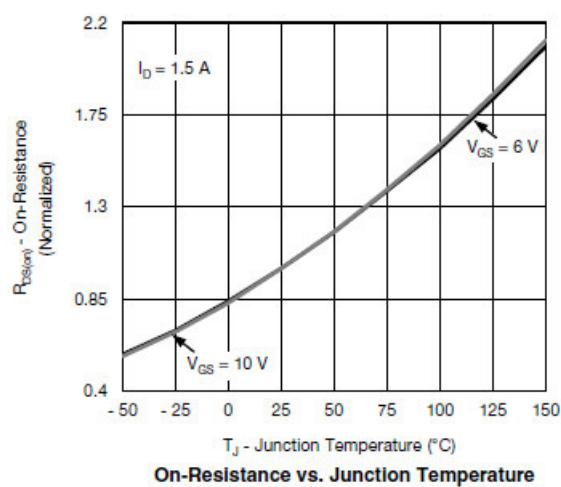
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



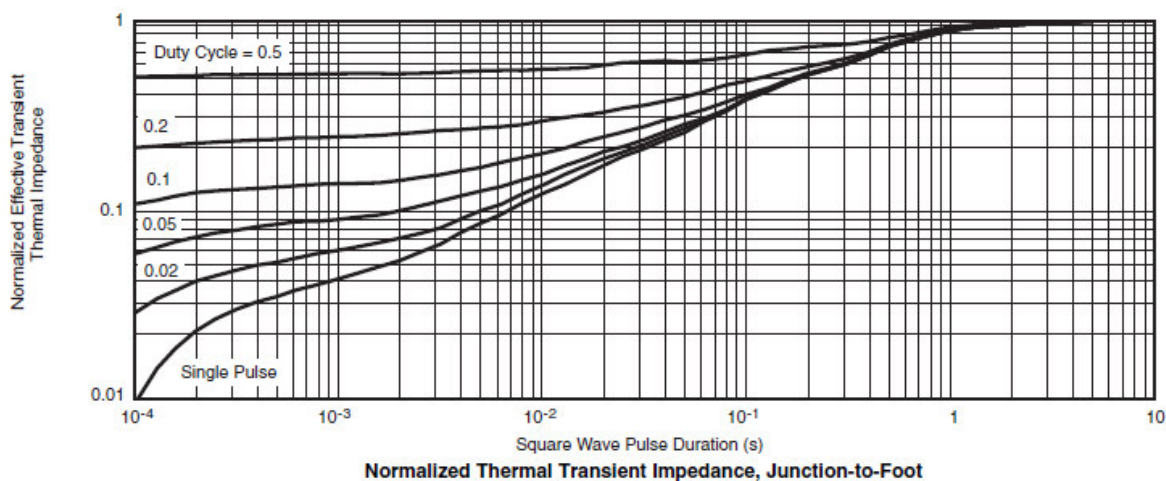
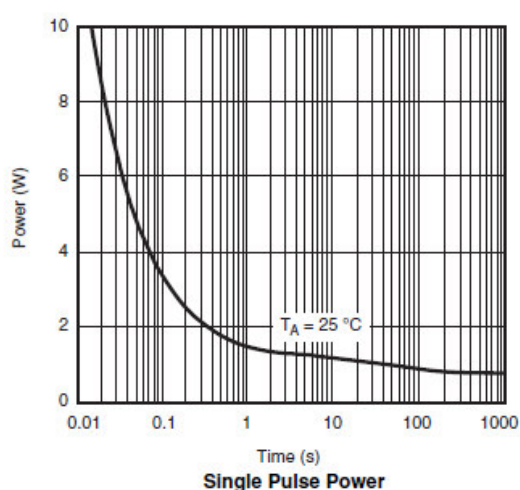
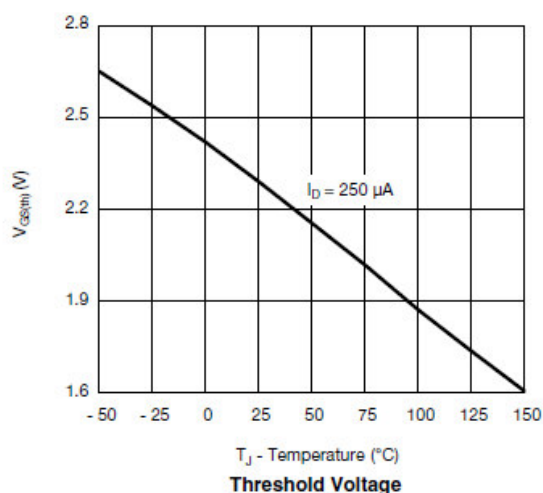
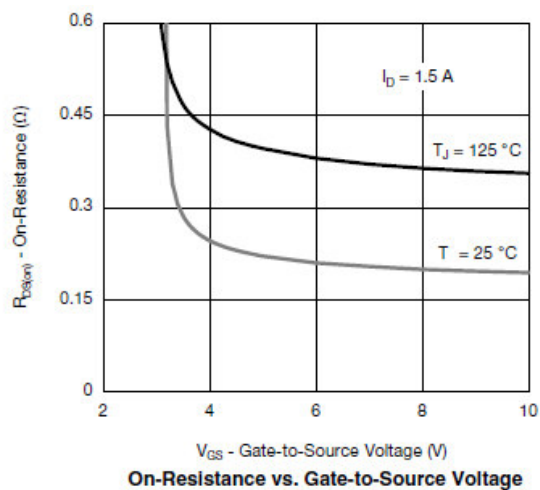
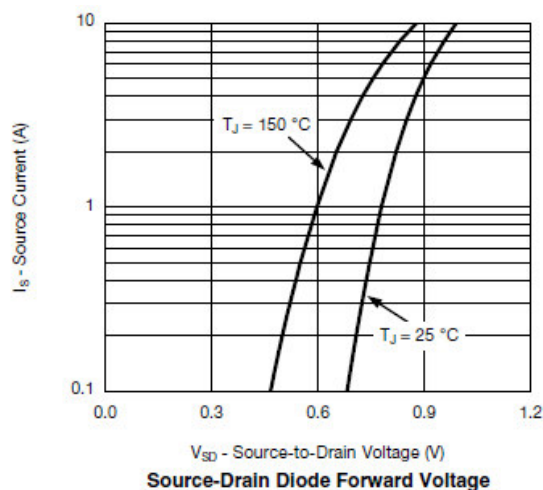
Gate Charge



On-Resistance vs. Junction Temperature



### Typical Characteristics





## Typical Characteristics

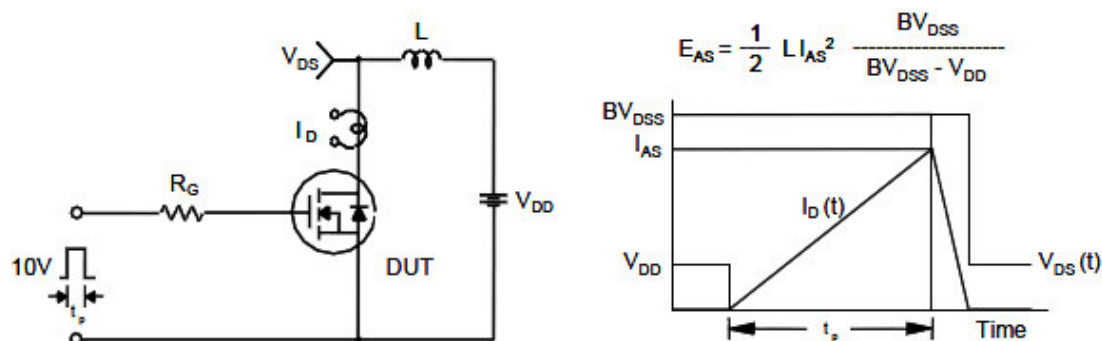
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

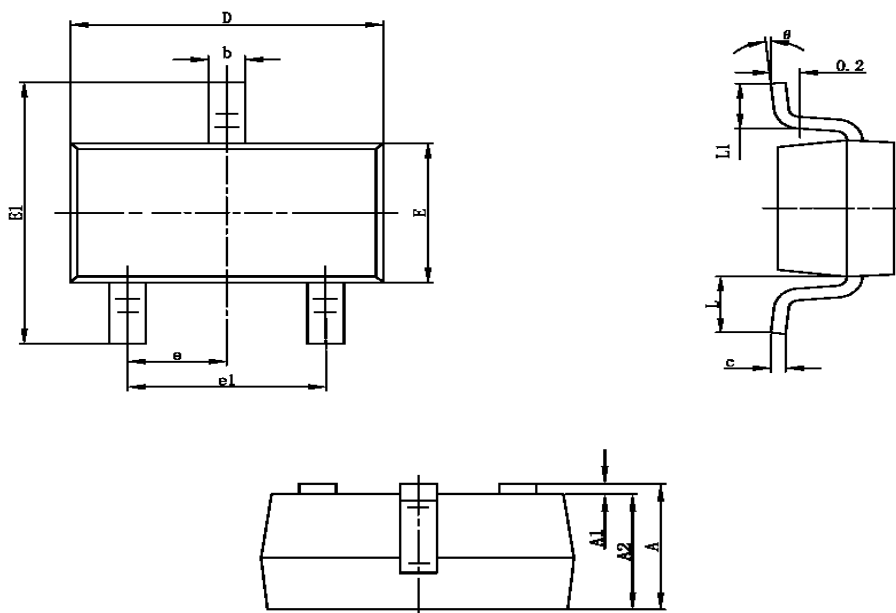


Unclamped Inductive Switching Test Circuit & Waveforms





## Package Information ( SOT-23-3L )



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 1.050                     | 1.150 | 0.041                | 0.045 |
| b      | 0.300                     | 0.400 | 0.012                | 0.016 |
| c      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 2.820                     | 3.020 | 0.111                | 0.119 |
| E      | 1.500                     | 1.700 | 0.059                | 0.067 |
| E1     | 2.650                     | 2.950 | 0.104                | 0.116 |
| e      | 0.950TYP                  |       | 0.037TYP             |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.700REF                  |       | 0.028REF             |       |
| L1     | 0.300                     | 0.600 | 0.012                | 0.024 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

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