

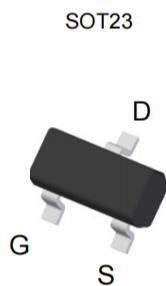
Product Summary

| | |
|--------------|--------------|
| V_{DS} | 20V |
| $R_{DS(ON)}$ | 22m Ω |
| I_D | 6.5A |

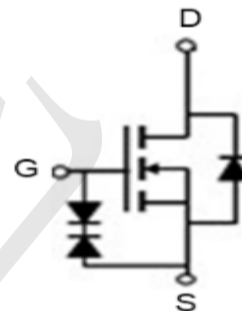
Application

- Load Switch for Portable Devices
- DC/DC Converter

Package and Pin Configuration



Circuit diagram



Marking: AF

Absolute Maximum Ratings ($T_a=25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Limit | Unit |
|---|----------------|------------|------------------|
| Drain-Source Voltage | V_{DS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ± 8 | V |
| Drain Current-Continuous@ Current-Pulsed (Note 1) | I_D | 6.5 | A |
| | I_{DM} | 30 | A |
| Maximum Power Dissipation | P_D | 1.4 | W |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 To 150 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| | | | |
|--|-----------------|----|--------------------|
| Thermal Resistance, Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 90 | $^\circ\text{C/W}$ |
|--|-----------------|----|--------------------|

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|--------------|--|-----|------|----------|-----------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 20 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=20V, V_{GS}=0V$ | | | 1 | μA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 4.5V, V_{DS}=0V$ | | | ± 1 | μA |
| | | $V_{GS}=\pm 8V, V_{DS}=0V$ | | | ± 10 | μA |
| ON CHARACTERISTICS (Note 3) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.4 | 0.6 | 1 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}=4.5V, I_D=6.5A$ | | 18 | 22 | $m\Omega$ |
| | | $V_{GS}=2.5V, I_D=5.5A$ | | 24 | 30 | $m\Omega$ |
| | | $V_{GS}=1.8V, I_D=5A$ | | 40 | 55 | $m\Omega$ |
| Forward Transconductance | g_{FS} | $V_{DS}=5V, I_D=6.5A$ | | 7 | | S |
| DYNAMIC CHARACTERISTICS (Note 4) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=10V, V_{GS}=0V,$ $F=1.0MHz$ | | 1160 | | PF |
| Output Capacitance | C_{oss} | | | 200 | | PF |
| Reverse Transfer Capacitance | C_{riss} | | | 140 | | PF |
| SWITCHING CHARACTERISTICS (Note 4) | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}=10V, I_D=1A$ $V_{GS}=5V, R_{GEN}=3\Omega$ | | 6.5 | | nS |
| Turn-on Rise Time | t_r | | | 13 | | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 50 | | nS |
| Turn-Off Fall Time | t_f | | | 30 | | nS |
| Total Gate Charge | Q_g | $V_{DS}=10V, I_D=6.5A,$ $V_{GS}=4.5V$ | | 10 | | nC |
| Gate-Source Charge | Q_{gs} | | | 2.3 | | nC |
| Gate-Drain Charge | Q_{gd} | | | 3 | | nC |
| DRAIN-SOURCE DIODE CHARACTERISTICS | | | | | | |
| Diode Forward Voltage (Note 3) | V_{SD} | $V_{GS}=0V, I_S=1A$ | | 0.76 | 1 | V |

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

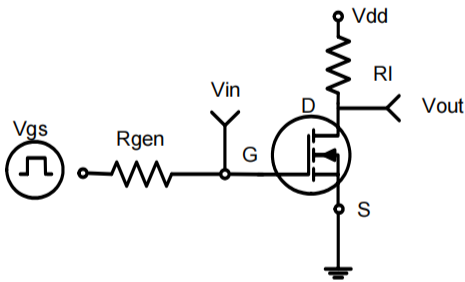


Figure 1. Switching Test Circuit

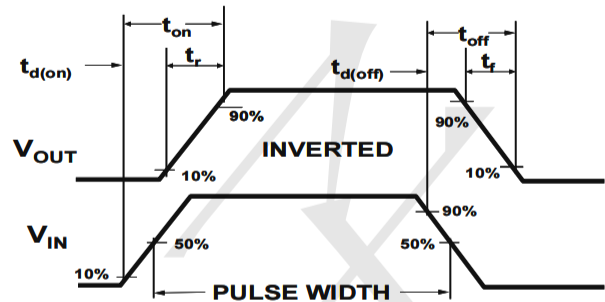


Figure 2. Switching Waveforms

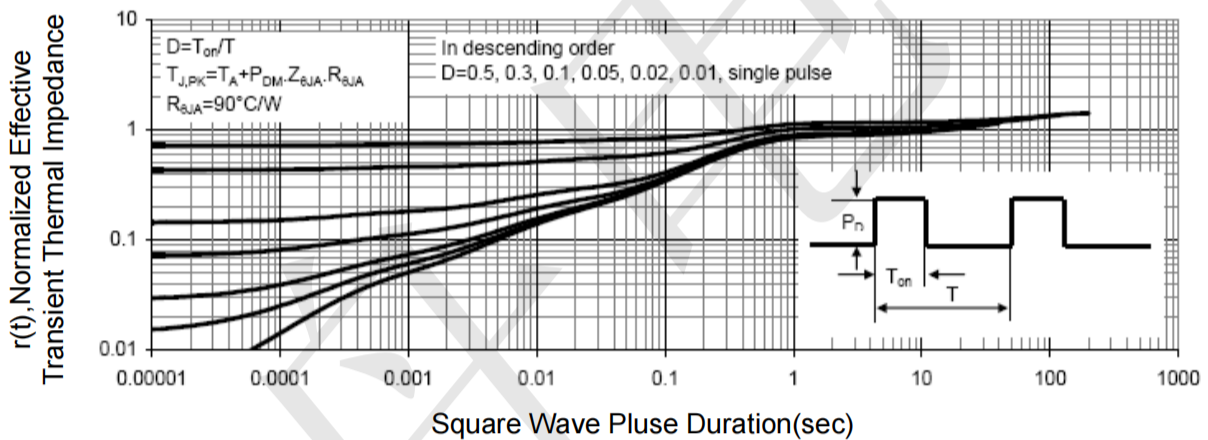
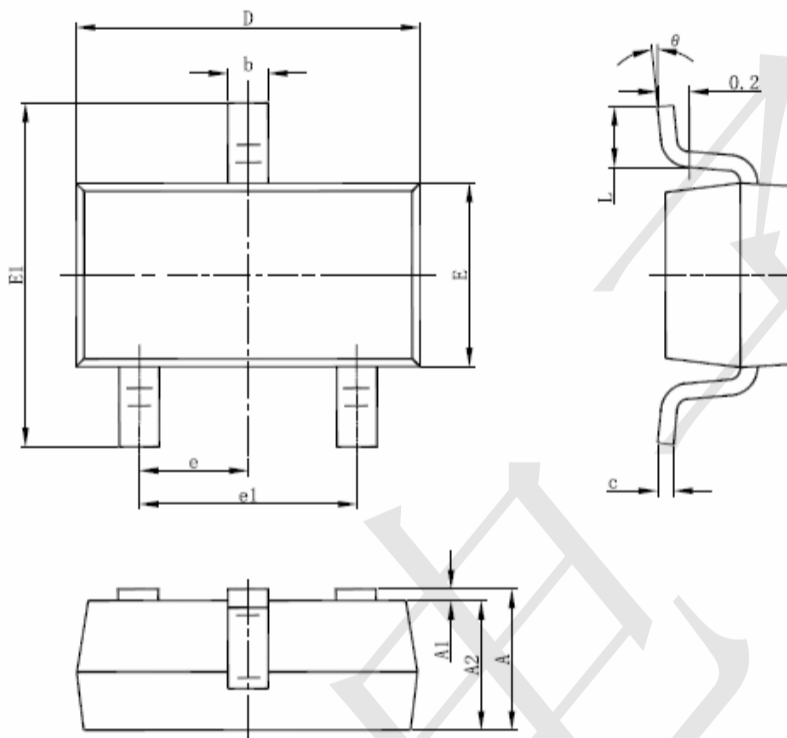


Figure 3. Normalized Maximum Transient Thermal Impedance

SOT-23-3L Package Information



| 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 | 0.500 | 0.012 | 0.020 |
| 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 | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |