

GSM2306A

20V N-Channel Enhancement Mode MOSFET

Product Description

GSM2306A, 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.

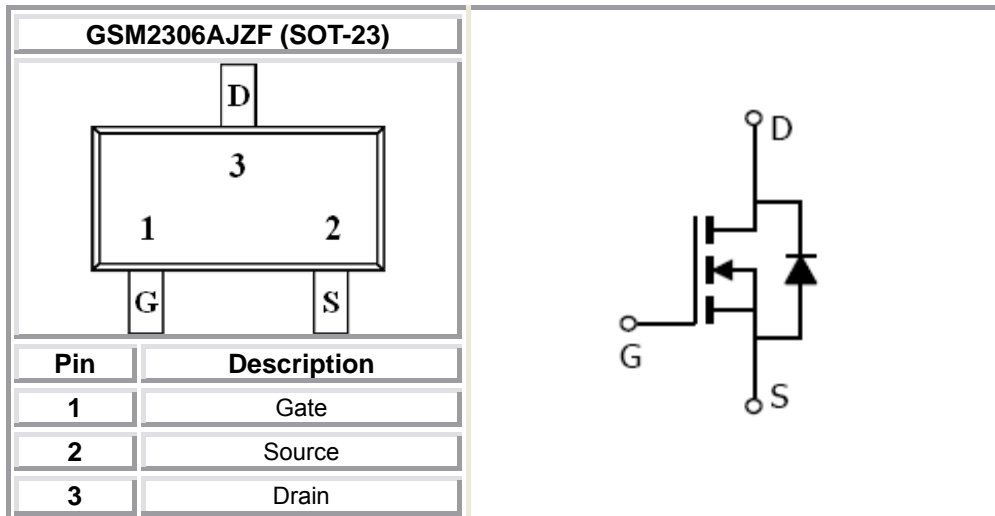
Features

- 20V/1.8A, $R_{DS(ON)}=280m\Omega@V_{GS}=4.5V$
- 20V/1.5A, $R_{DS(ON)}=340m\Omega@V_{GS}=2.5V$
- 20V/1.2A, $R_{DS(ON)}=750m\Omega@V_{GS}=1.8V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23 package design

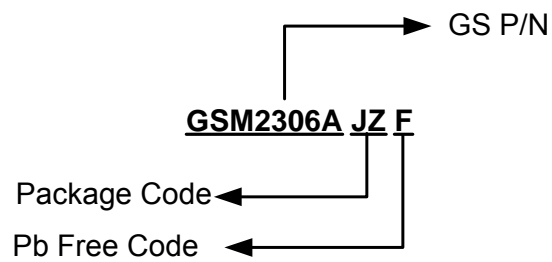
Applications

- Portable Equipment
- Battery Powered System
- Net Working System

Packages & Pin Assignments

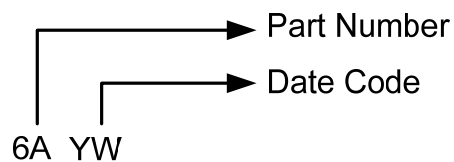


Ordering Information



| Part Number | Package | Quantity Reel |
|-------------|---------|---------------|
| GSM2306AJZF | SOT-23 | 3000 PCS |

Marking Information



Absolute Maximum Ratings

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

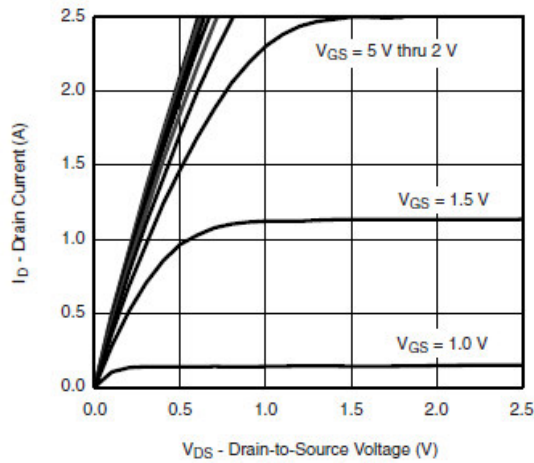
| Symbol | Parameter | Typical | Unit |
|-----------------|---|------------------------|--------------------|
| V_{DSS} | Drain-Source Voltage | 20 | V |
| V_{GSS} | Gate -Source Voltage | ± 12 | V |
| I_D | Continuous Drain Current($T_J=150^\circ\text{C}$) | $T_A=25^\circ\text{C}$ | 1.8 |
| | | $T_A=70^\circ\text{C}$ | 1.2 |
| I_{DM} | Pulsed Drain Current | 6 | A |
| I_S | Continuous Source Current(Diode Conduction) | 1 | A |
| P_D | Power Dissipation | $T_A=25^\circ\text{C}$ | 1.25 |
| | | $T_A=70^\circ\text{C}$ | 0.8 |
| T_J | Operating Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | -55/150 | $^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient | 120 | $^\circ\text{C/W}$ |

Electrical Characteristics

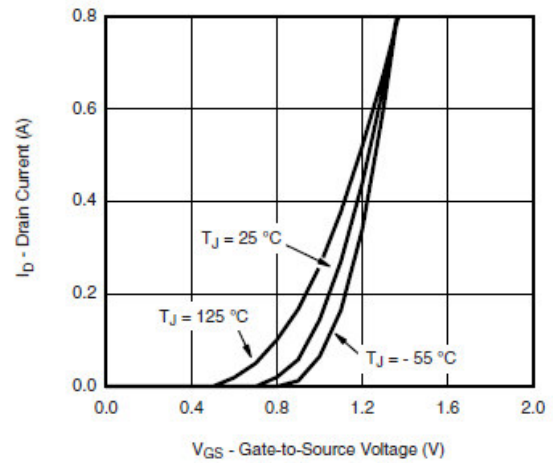
($T_A=25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------|---------------------------------|---|-----|------|-----------|------------|
| Static | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 20 | | | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.4 | | 1.0 | V |
| I_{GSS} | Gate Leakage Current | $V_{DS}=0V, V_{GS}=\pm 12V$ | | | ± 100 | nA |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=20V, V_{GS}=0V$ | | | 1 | uA |
| | | $V_{DS}=20V, V_{GS}=0V, T_J=85^\circ\text{C}$ | | | 5 | |
| $I_{D(on)}$ | On-State Drain Current | $V_{DS}\geq 5V, V_{GS}=4.5V$ | 1.8 | | | A |
| $R_{DS(on)}$ | Drain-Source On-Resistance | $V_{GS}=4.5V, I_D=1.8A$ | | 220 | 280 | m Ω |
| | | $V_{GS}=2.5V, I_D=1.5A$ | | 260 | 340 | |
| | | $V_{GS}=1.8V, I_D=1.2A$ | | 540 | 750 | |
| g_{FS} | Forward Transconductance | $V_{DS}=10V, I_D=1.0A$ | | 1 | | S |
| V_{SD} | Diode Forward Voltage | $I_S=1.0A, V_{GS}=0V$ | | 0.65 | 1.2 | V |
| Dynamic | | | | | | |
| C_{iss} | Input Capacitance | $V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$ | | 70 | | pF |
| C_{oss} | Output Capacitance | | | 20 | | |
| C_{rss} | Reverse Transfer Capacitance | | | 8 | | |
| Q_g | Total Gate Charge | $V_{DS}=10V, V_{GS}=4.5V, I_D=1.2A$ | | 1.06 | 1.38 | nC |
| Q_{gs} | Gate-Source Charge | | | 0.18 | | |
| Q_{gd} | Gate-Drain Charge | | | 0.32 | | |
| $t_{d(on)}$ | Turn-On Time | $V_{DD}=10V, R_L=20\Omega, I_D=1.2A, V_{GEN}=4.5V, R_G=1\Omega$ | | 18 | 26 | ns |
| t_r | | | | 20 | 28 | |
| $t_{d(off)}$ | Turn-Off Time | | | 70 | 110 | |
| t_f | | | | 25 | 40 | |

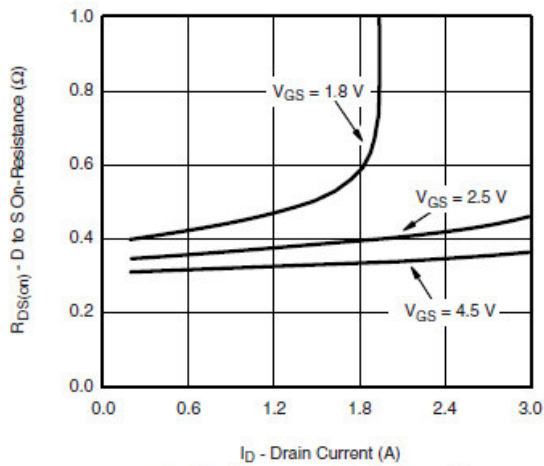
Typical Performance Characteristics



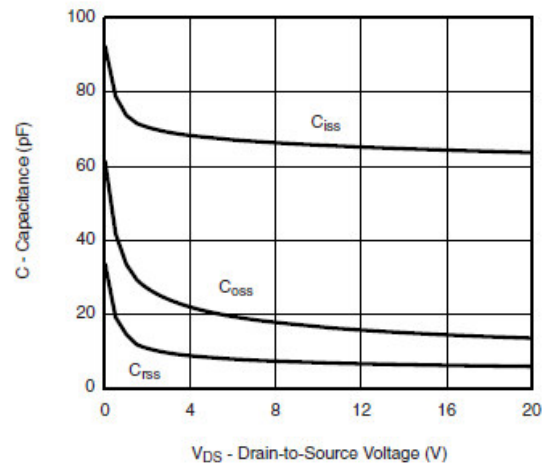
Output Characteristics



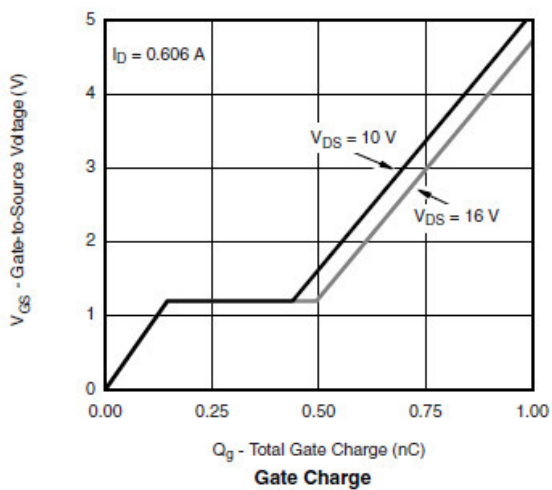
Transfer Characteristics



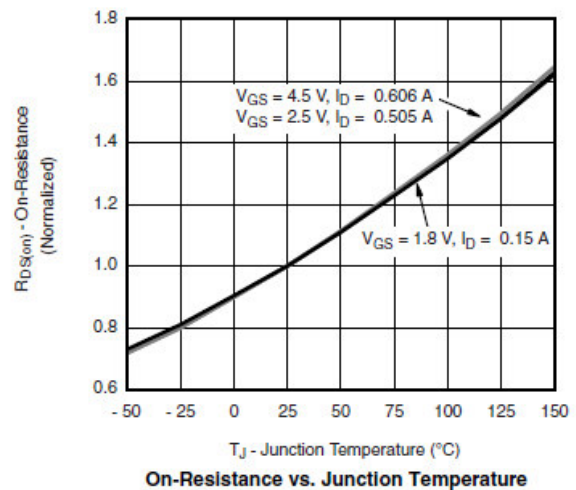
On-Resistance vs. Drain Current



Capacitance

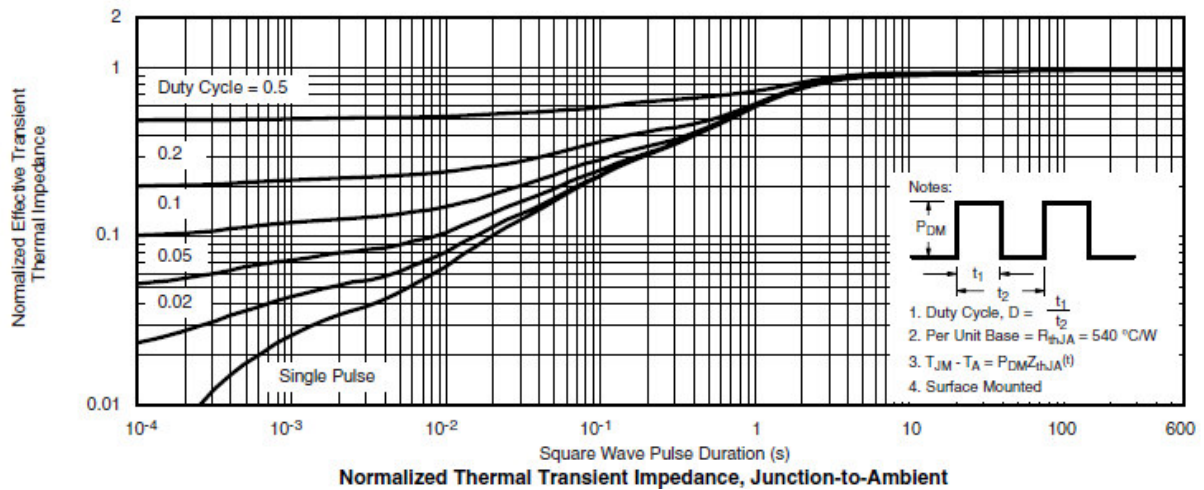
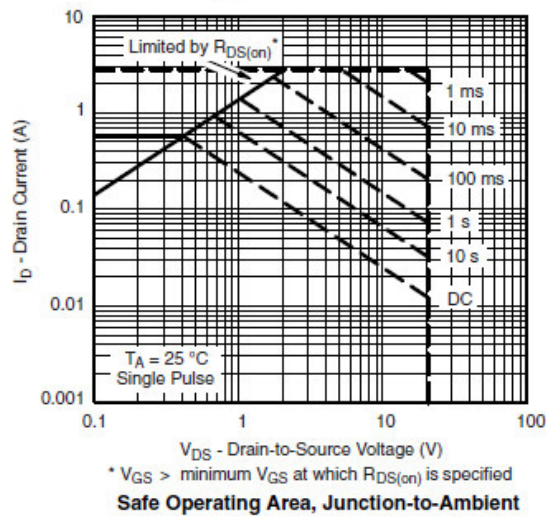
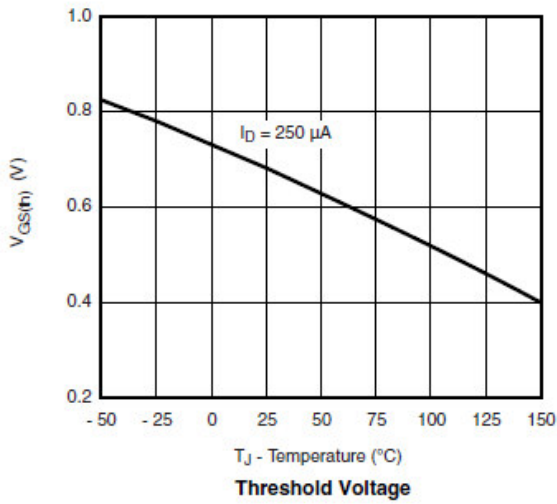
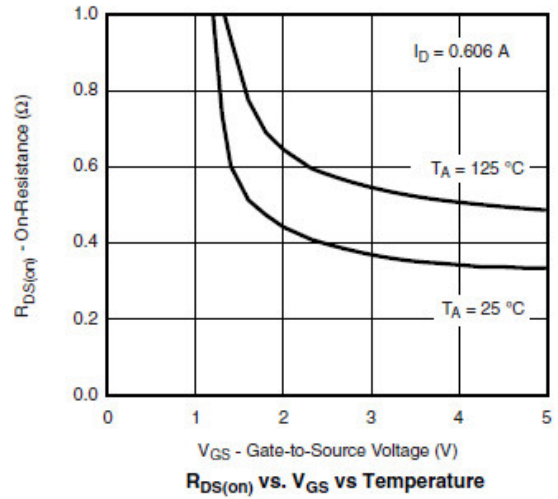
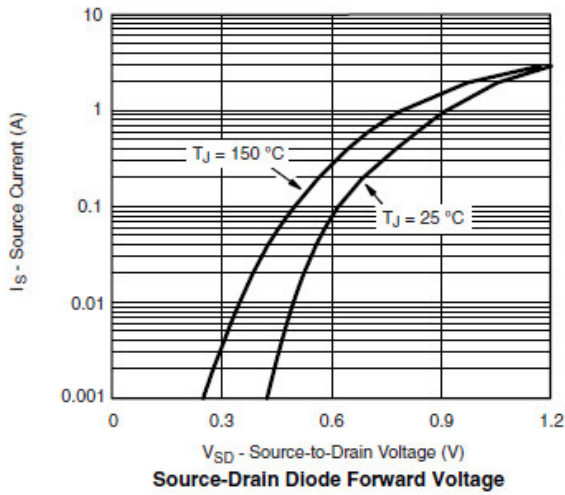


Gate Charge



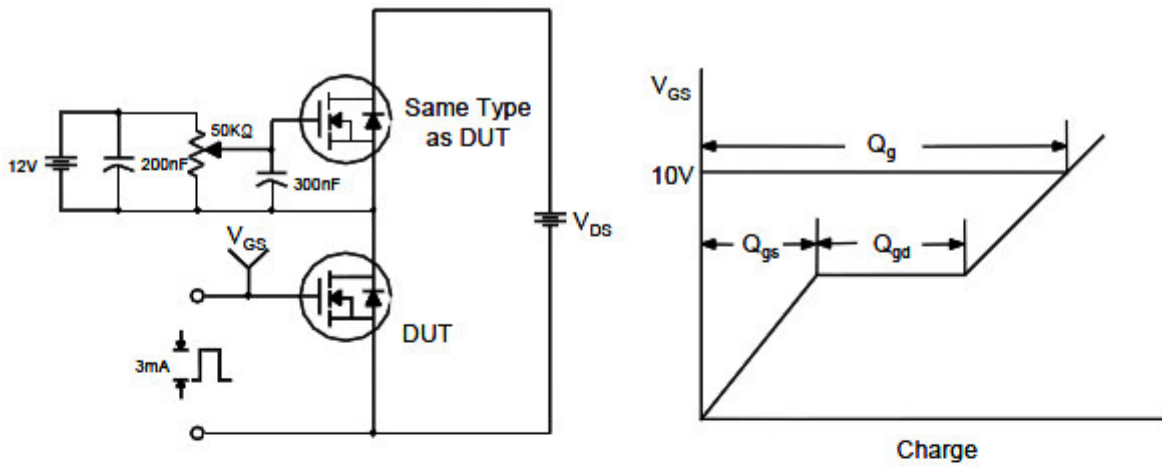
On-Resistance vs. Junction Temperature

Typical Performance Characteristics (continue)

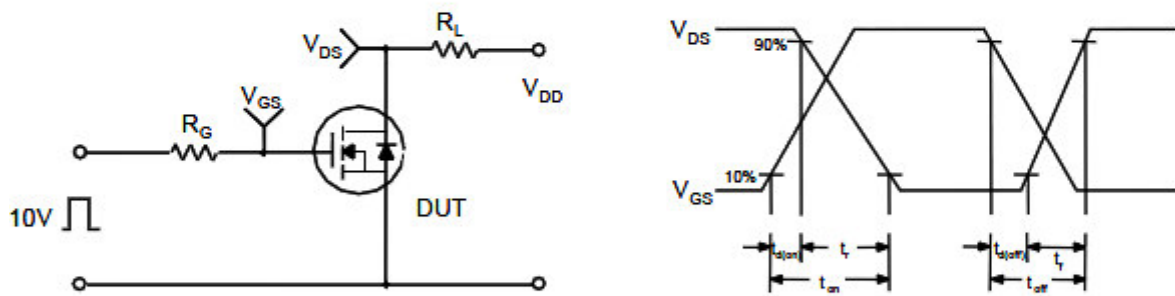


Typical Performance Characteristics (continue)

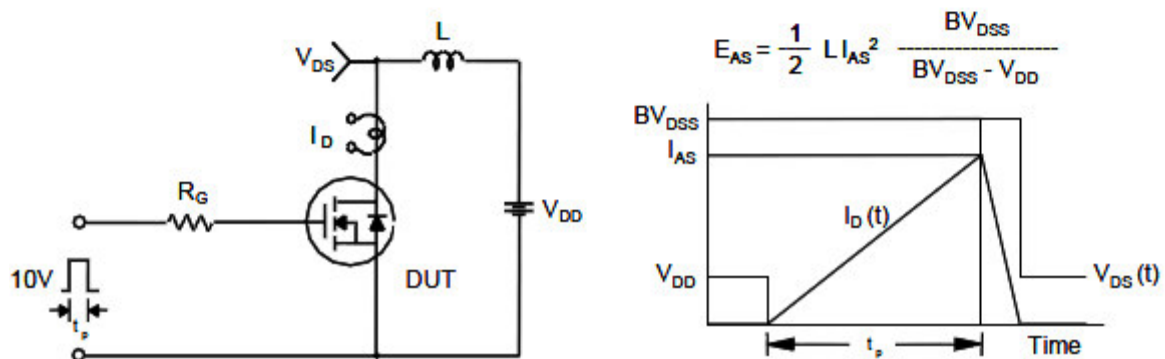
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

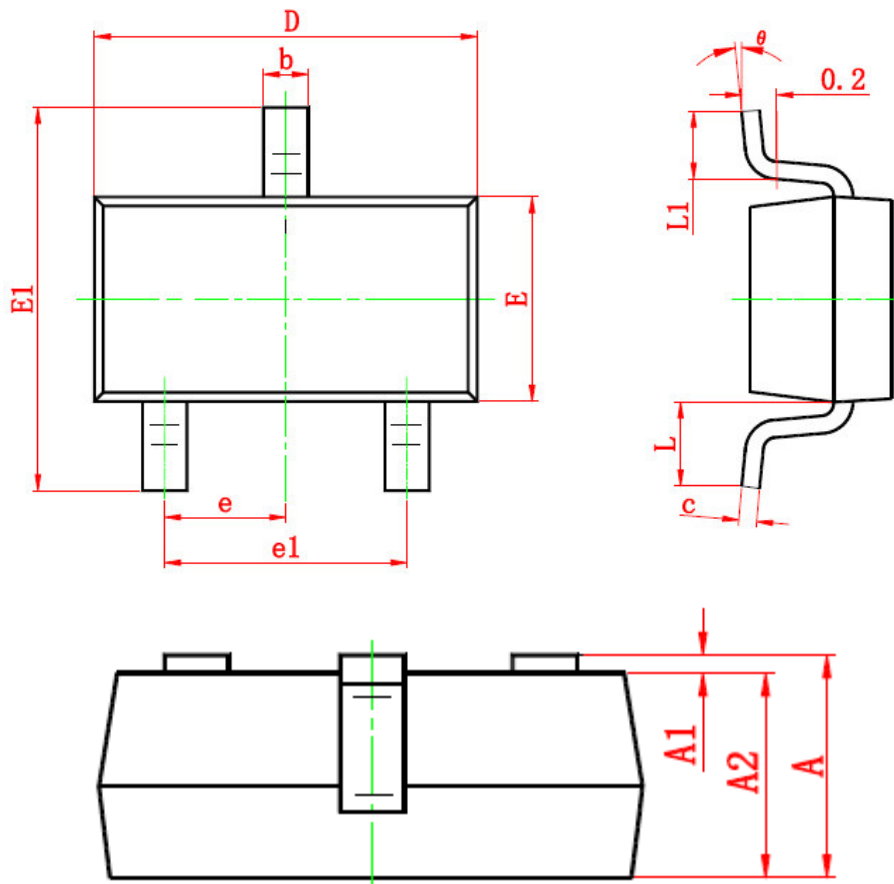


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

SOT-23 PLASTIC PACKAGE







| Dimensions | | | | |
|------------|-------------|------|-------------|-------|
| SYMBOL | Millimeters | | Inches | |
| | MIN | MAX | MIN | MAX |
| A | 0.90 | 1.20 | 0.035 | 0.043 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A2 | 0.90 | 1.10 | 0.035 | 0.039 |
| b | 0.30 | 0.50 | 0.012 | 0.020 |
| c | 0.08 | 0.15 | 0.003 | 0.006 |
| D | 2.80 | 3.00 | 0.110 | 0.118 |
| E | 1.20 | 1.40 | 0.047 | 0.055 |
| E1 | 2.25 | 2.55 | 0.089 | 0.100 |
| e | 0.950 (TYP) | | 0.037 (TYP) | |
| e1 | 1.80 | 2.00 | 0.071 | 0.079 |
| L | 0.550 (REF) | | 0.022 (REF) | |
| L1 | 0.30 | 0.50 | 0.012 | 0.020 |
| Q | 0° | 8° | 0° | 8° |



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