

20V P-Channel Enhancement-Mode MOSFET

FEATURES

- $R_{DS(ON)} \leq 110m\Omega @ V_{GS} = -4.5V$
- $R_{DS(ON)} \leq 150m\Omega @ V_{GS} = -2.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

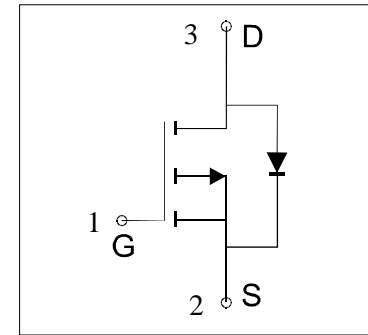
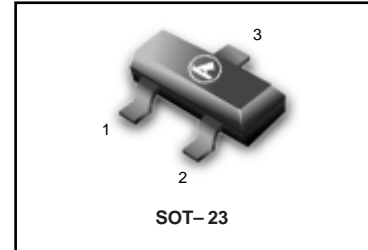
APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- Load Switch
- DSC
- We declare that the material of product are Halogen Free and compliance with RoHS requirements.

Ordering Information

| Device | Marking | Shipping |
|------------------------------|---------|-----------------|
| LP2301ALT1G S-LP2301ALT1G | 01A | 3000/Tape&Reel |
| LP2301ALT3G S-LP2301ALT3G | 01A | 10000/Tape&Reel |

LP2301ALT1G
S-LP2301ALT1G



Absolute Maximum Ratings (TA=25°C Unless Otherwise Noted)

| Parameter | Symbol | Limit | Unit |
|--|-----------------|--------------------|------------|
| Drain-Source Voltage | V_{DSS} | -20 | V |
| Gate-Source Voltage | V_{GSS} | ± 8 | V |
| Continuous Drain Current ($T_j = 150^\circ C$)* | I_D | $T_A = 25^\circ C$ | -2.0 |
| | | $T_A = 70^\circ C$ | -1.6 |
| Pulsed Drain Current | I_{DM} | -10 | A |
| Maximum Power Dissipation | P_D | $T_A = 25^\circ C$ | 0.7 |
| | | $T_A = 70^\circ C$ | 0.45 |
| Operating Junction Temperature | T_J | -55 to 150 | $^\circ C$ |
| Storage Temperature Range | T_{stg} | -55 to 150 | $^\circ C$ |
| Thermal Resistance-Junction to Ambient* | $R_{\theta JA}$ | Typical | Maximum |
| | | 100 | 175 |

* The device mounted on 1in² FR4 board with 2 oz copper

LP2301ALT1G , S-LP2301ALT1G

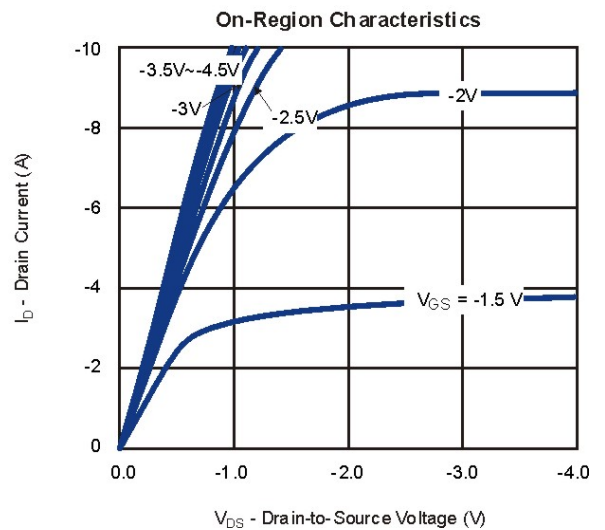
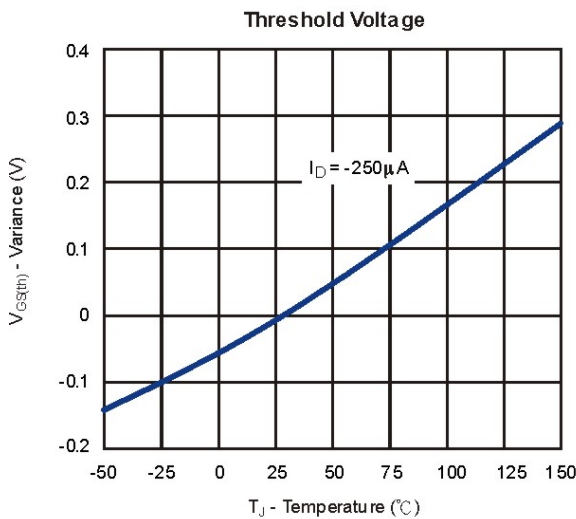
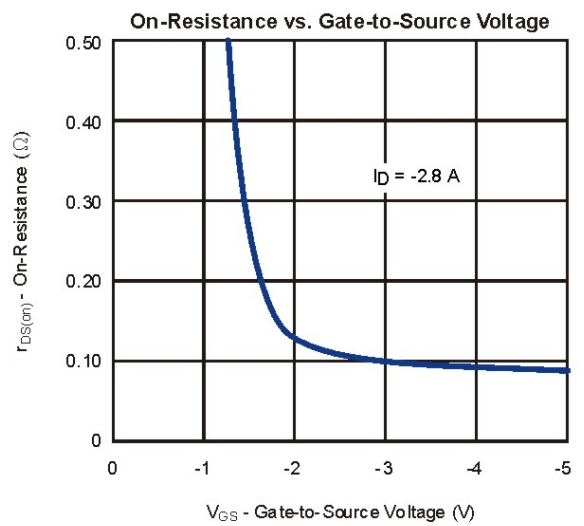
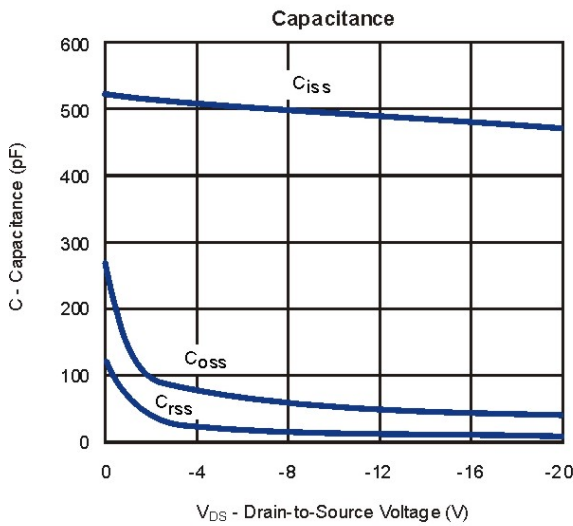
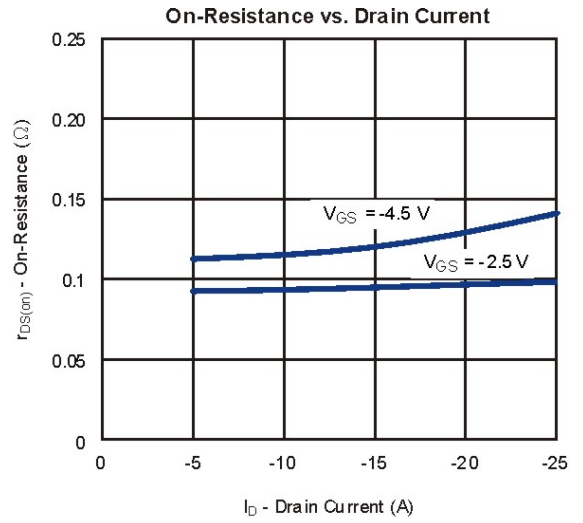
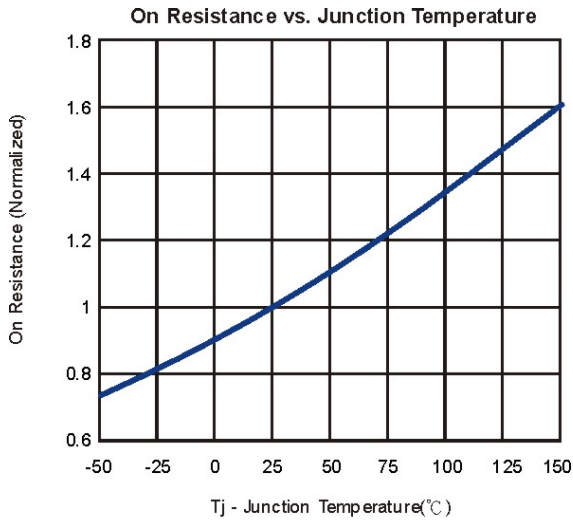
ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Limit | 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 | -0.6 | -1 | V |
| I_{GSS} | Gate Leakage Current | $V_{DS}=0V, V_{GS}=\pm 8V$ | | | ± 100 | nA |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=-20V, V_{GS}=0V$ | | | -1 | μA |
| $R_{DS(ON)}$ | Drain-Source On-Resistance ^a | $V_{GS}=-4.5V, I_D=-2.8A$ | | 90 | 110 | m Ω |
| | | $V_{GS}=-2.5V, I_D=-2.0A$ | | 110 | 150 | |
| V_{SD} | Diode Forward Voltage | $I_S=-1A, V_{GS}=0V$ | | -0.7 | -1.4 | V |
| DYNAMIC | | | | | | |
| Q_g | Total Gate Charge | $V_{DS}=-6V, V_{GS}=-4.5V,$ $I_D=-2.8A$ | | 7.2 | | nC |
| Q_{gs} | Gate-Source Charge | | | 2.2 | | |
| Q_{gd} | Gate-Drain Charge | | | 1.2 | | |
| R_g | Gate resistance | $V_{DS}=0V, V_{GS}=0V, f=1MHz$ | | 7.5 | | Ω |
| C_{iss} | Input Capacitance | $V_{DS}=-15V, V_{GS}=0V,$ $f=1MHz$ | | 480 | | pF |
| C_{oss} | Output Capacitance | | | 46 | | |
| C_{rss} | Reverse Transfer Capacitance | | | 10 | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DS}=-6V, R_L=6 \Omega$ $R_{GEN}=6 \Omega, V_{GS}=-4.5V$ | | 50 | | ns |
| t_r | Turn-On Rise Time | | | 30 | | |
| $t_{d(off)}$ | Turn-Off Delay Time | | | 40 | | |
| t_f | Turn-Off Fall time | | | 11 | | |

 Notes: a. Pulse test; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

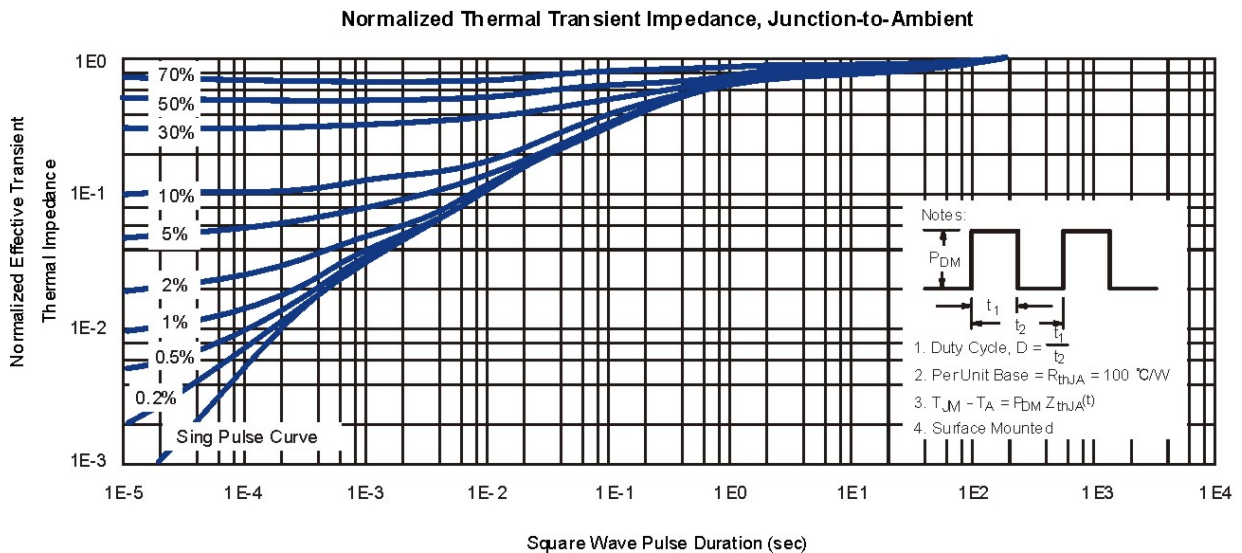
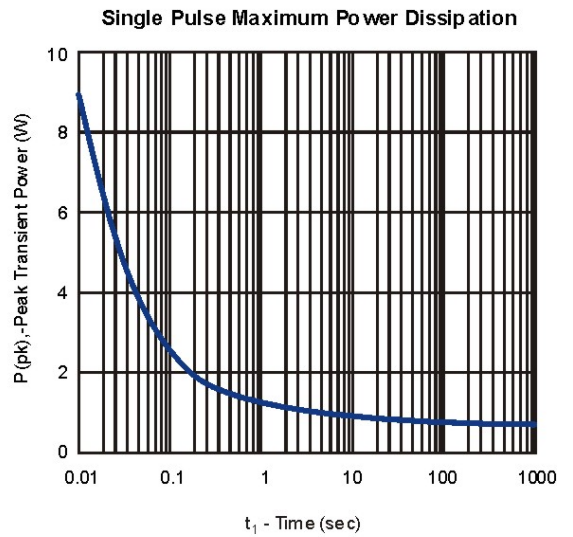
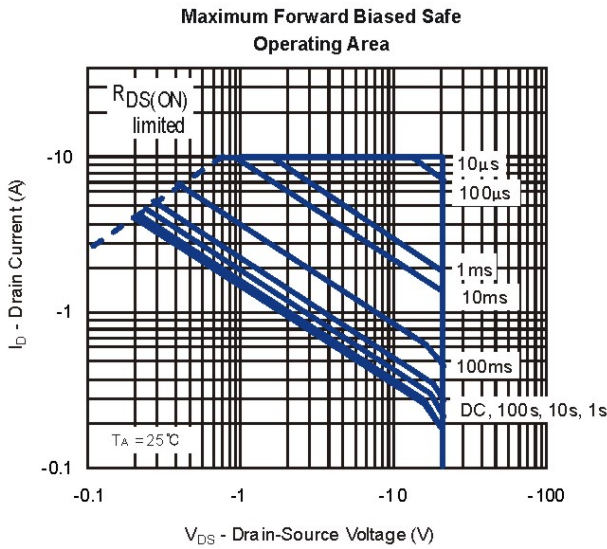
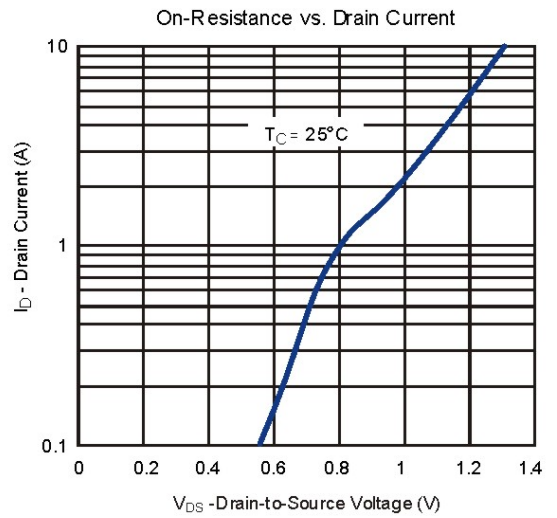
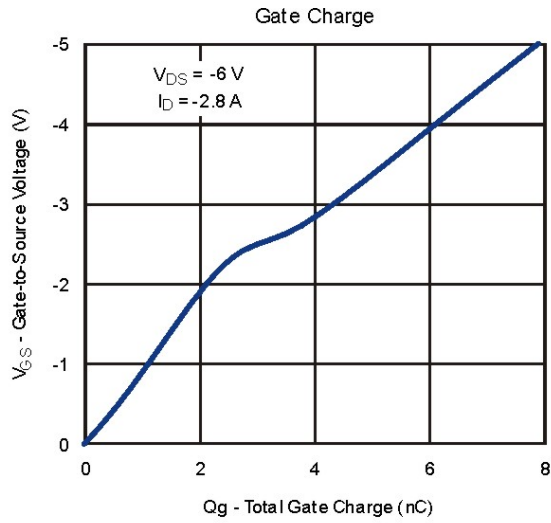
Typical Characteristics (T_J =25°C Noted)

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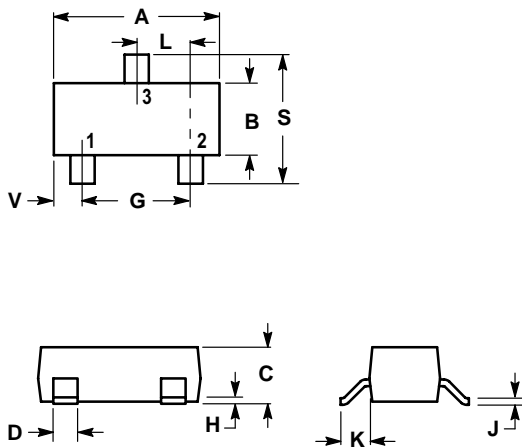


LP2301ALT1G , S-LP2301ALT1G

SOT-23

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,1982
2. CONTROLLING DIMENSION: INCH.



| DIM | INCHES | | MILLIMETERS | |
|-----|--------|--------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.1102 | 0.1197 | 2.80 | 3.04 |
| B | 0.0472 | 0.0551 | 1.20 | 1.40 |
| C | 0.0350 | 0.0440 | 0.89 | 1.11 |
| D | 0.0150 | 0.0200 | 0.37 | 0.50 |
| G | 0.0701 | 0.0807 | 1.78 | 2.04 |
| H | 0.0005 | 0.0040 | 0.013 | 0.100 |
| J | 0.0034 | 0.0070 | 0.085 | 0.177 |
| K | 0.0140 | 0.0285 | 0.35 | 0.69 |
| L | 0.0350 | 0.0401 | 0.89 | 1.02 |
| S | 0.0830 | 0.1039 | 2.10 | 2.64 |
| V | 0.0177 | 0.0236 | 0.45 | 0.60 |

