

## General Purpose Transistors

### NPN Silicon

#### FEATURE

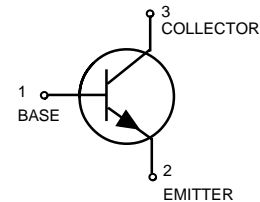
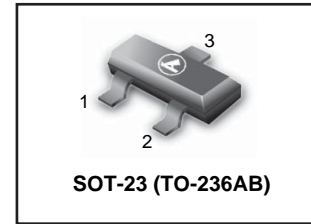
We declare that the material of product compliance with RoHS requirements.

S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

**L9013PLT1G**  
**Series**  
**S-L9013PLT1G**  
**Series**

#### DEVICE MARKING AND ORDERING INFORMATION

| Device                     | Marking | Shipping        |
|----------------------------|---------|-----------------|
| L9013PLT1G<br>S-L9013PLT1G | 13P     | 3000/Tape&Reel  |
| L9013PLT3G<br>S-L9013PLT3G | 13P     | 10000/Tape&Reel |
| L9013QLT1G<br>S-L9013QLT1G | 13Q     | 3000/Tape&Reel  |
| L9013QLT3G<br>S-L9013QLT3G | 13Q     | 10000/Tape&Reel |
| L9013RLT1G<br>S-L9013RLT1G | 13R     | 3000/Tape&Reel  |
| L9013RLT3G<br>S-L9013RLT3G | 13R     | 10000/Tape&Reel |
| L9013SLT1G<br>S-L9013SLT1G | 13S     | 3000/Tape&Reel  |
| L9013SLT3G<br>S-L9013SLT3G | 13S     | 10000/Tape&Reel |



#### MAXIMUM RATINGS

| Rating                       | Symbol    | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Emitter Voltage    | $V_{CEO}$ | 20    | V    |
| Collector-Base Voltage       | $V_{CBO}$ | 40    | V    |
| Emitter-Base Voltage         | $V_{EBO}$ | 5     | V    |
| Collector current-continuoun | $I_C$     | 500   | mAdc |

#### THERMAL CHARATEERISTICS

| Characteristic   | Symbol          | Max         | Unit            |
|--|-----------------|-------------|-----------------|
| Total Device Dissipation FR-5 Board, (1)<br>$T_A=25^{\circ}C$        | $P_D$           | 225         | mW              |
| Derate above $25^{\circ}C$   |                 | 1.8         | mW/ $^{\circ}C$ |
| Thermal Resistance, Junction to Ambient                              | $R_{\theta JA}$ | 556         | $^{\circ}C/W$   |
| Total Device Dissipation<br>Alumina Substrate, (2) $T_A=25^{\circ}C$ | $P_D$           | 300         | mW              |
| Derate above $25^{\circ}C$   |                 | 2.4         | mW/ $^{\circ}C$ |
| Thermal Resistance, Junction to Ambient                              | $R_{\theta JA}$ | 417         | $^{\circ}C/W$   |
| Junction and Storage Temperature                                     | $T_j, T_{stg}$  | -55 to +150 | $^{\circ}C$     |

1. FR-5 = 1.0 x 0.75 x 0.062 in.

2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

#### OFF CHARACTERISTICS

|  |               |    |   |     |    |
|--|---------------|----|---|-----|----|
| Collector-Emitter Breakdown Voltage<br>( $I_C=1.0mA$ ) | $V_{(BR)CEO}$ | 20 | - | -   | V  |
| Emitter-Base Breakdown Voltage<br>( $I_E=100\mu A$ )   | $V_{(BR)EBO}$ | 5  | - | -   | V  |
| Collector-Base Breakdown Voltage<br>( $I_C=100\mu A$ ) | $V_{(BR)CBO}$ | 40 | - | -   | V  |
| Collector Cutoff Current ( $V_{CB}=35V$ )              | $I_{CBO}$     | -  | - | 150 | nA |
| Emitter Cutoff Current ( $V_{EB}=4V$ )                 | $I_{EBO}$     |    |   | 150 | nA |

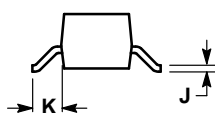
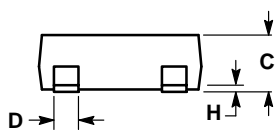
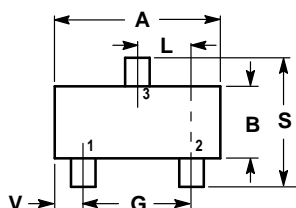
**ON CHARACTERISTICS**

|   |             |     |   |     |   |
|---|-------------|-----|---|-----|---|
| DC Current Gain<br>( $I_c=50mA, V_{CE}=1V$ )                      | $H_{fe}$    | 100 | - | 600 |   |
| Collector-Emitter Saturation Voltage<br>( $I_c=500mA, I_b=50mA$ ) | $V_{CE(S)}$ | -   | - | 0.6 | V |

NOTE:

|          |         |         |         |         |
|----------|---------|---------|---------|---------|
| *        | P       | Q       | R       | S       |
| $H_{FE}$ | 100~200 | 150~300 | 200~400 | 300~600 |

**SOT-23 (TO-236AB)**



NOTES:

1. CONTROLLING DIMENSION: MILLIMETERS
2. LEAD THICKNESS SPECIFIED PER L / F DRAWING WITH SOLDER PLATING.

| 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   | 0.0180 | 0.0236 | 0.45        | 0.60  |
| L   | 0.0350 | 0.0401 | 0.89        | 1.02  |
| S   | 0.0830 | 0.0984 | 2.10        | 2.50  |
| V   | 0.0177 | 0.0236 | 0.45        | 0.60  |

- PIN 1. BASE
- EMITTER
- COLLECTOR

