



## SOT-23 Plastic-Encapsulate Transistors

### S9013LT1 TRANSISTOR ( NPN )

#### FEATURES

Power dissipation

$$P_{CM} : 0.3 \text{ W ( } T_{amb}=25 \text{ )}$$

Collector current

$$I_{CM} : 0.5 \text{ A}$$

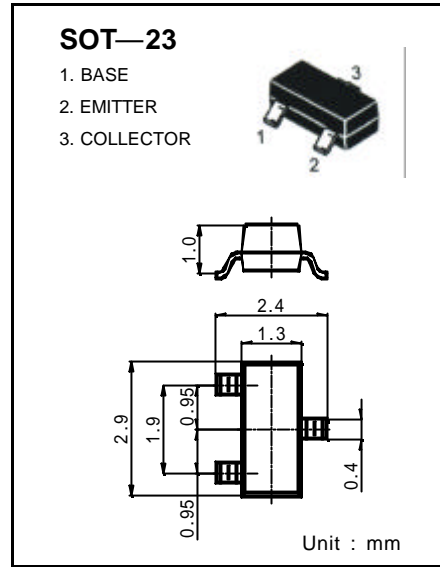
Collector-base voltage

$$V_{(BR)CBO} : 40 \text{ V}$$

Operating and storage junction temperature range

$$T_J, T_{stg} : -55 \text{ to } +150$$

**ELECTRICAL CHARACTERISTICS (  $T_{amb}=25$  unless otherwise specified )**



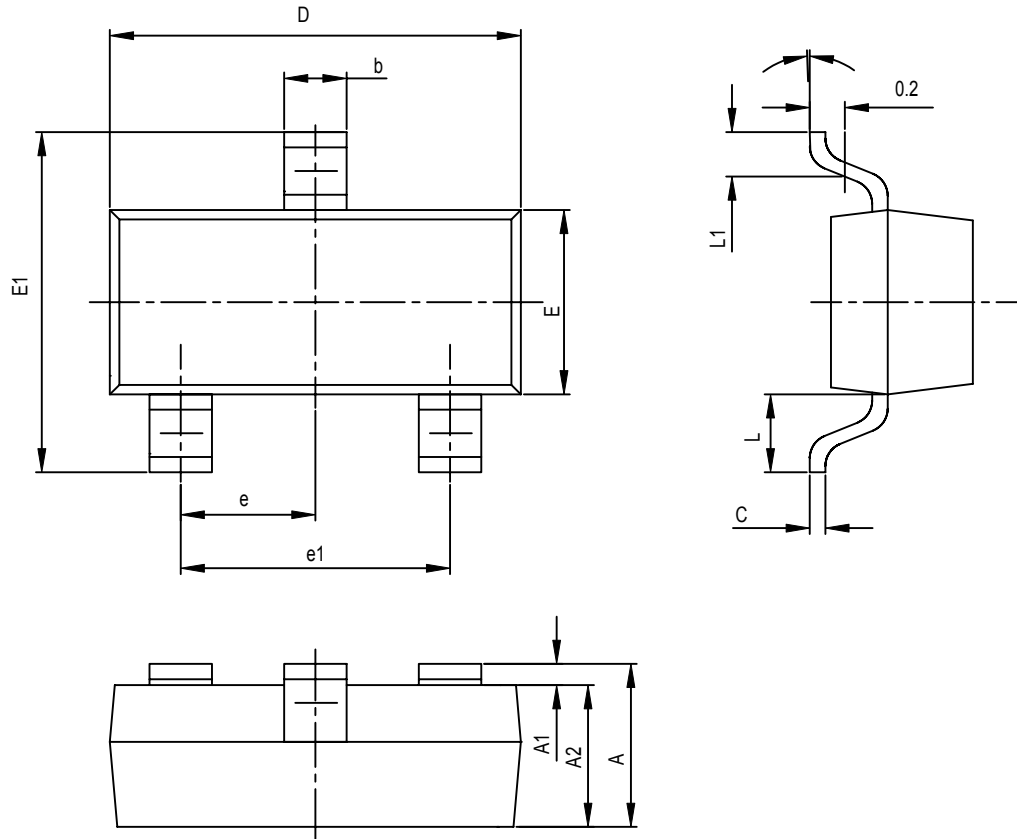
| Parameter                            | Symbol        | Test conditions                    | MIN | TYP | MAX | UNIT    |
|--------------------------------------|---------------|------------------------------------|-----|-----|-----|---------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C=100 \mu A, I_E=0$             | 40  |     |     | V       |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C=0.1mA, I_B=0$                 | 25  |     |     | V       |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E=100 \mu A, I_C=0$             | 5   |     |     | V       |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB}=40V, I_E=0$                |     |     | 0.1 | $\mu A$ |
| Collector cut-off current            | $I_{CEO}$     | $V_{CE}=20V, I_B=0$                |     |     | 0.1 | $\mu A$ |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB}=5V, I_C=0$                 |     |     | 0.1 | $\mu A$ |
| DC current gain                      | $H_{FE(1)}$   | $V_{CE}=1V, I_C=50mA$              | 120 |     | 350 |         |
|                                      | $H_{FE(2)}$   | $V_{CE}=1V, I_C=500mA$             | 40  |     |     |         |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=500mA, I_B=50mA$              |     |     | 0.6 | V       |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C=500mA, I_B=50mA$              |     |     | 1.2 | V       |
| Transition frequency                 | $f_T$         | $V_{CE}=6V, I_C=20mA$<br>$f=30MHz$ | 150 |     |     | MHz     |

#### CLASSIFICATION OF $h_{FE(1)}$

| Rank  | L       | H       |
|-------|---------|---------|
| Range | 120-200 | 200-350 |

DEVICE MARKING: S9013LT1=J3

## SOT-23 PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.100 | 0.035                | 0.043 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.000 | 0.035                | 0.039 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950TPY                  |       | 0.037TPY             |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550REF                  |       | 0.022REF             |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |