

Small Signal Schottky (double) diodes

BAT54N3/BAT54AN3

BAT54CN3/BAT54SN3

Description

Planar silicon Schottky barrier diodes encapsulated in a SOT-23 small plastic SMD package. Single diodes and double diodes with different pinning are available.

Features

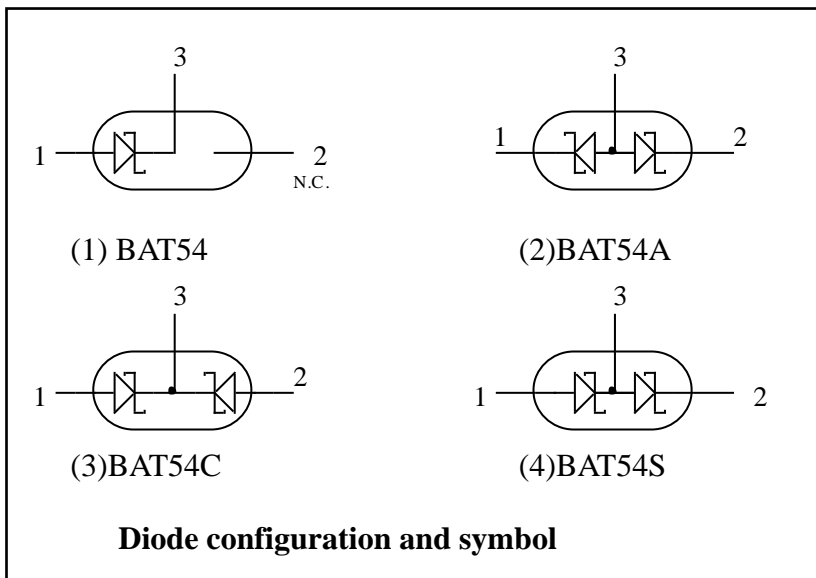
- Very small conduction losses
- Low forward voltage drop
- Small plastic SMD package
- Pb-free lead-free and halogen-free package

Applications

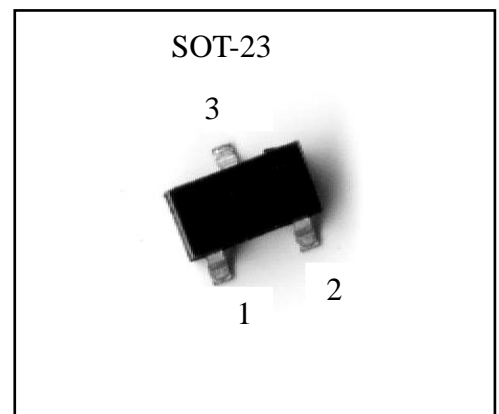
- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes

Pinning

| Pin | Description | | | |
|-----|-------------|--------|--------|--------|
| | BAT54 | BAT54A | BAT54C | BAT54S |
| 1 | A | K1 | A1 | A1 |
| 2 | NC | K2 | A2 | K2 |
| 3 | K | A1,A2 | K1,K2 | K1,A1 |



Outline



Marking:

| Type | Marking Code |
|----------|--------------|
| BAT54 N3 | JV3 |
| BAT54AN3 | B6 |
| BAT54CN3 | 5C |
| BAT54SN3 | LD3 |



Absolute Maximum Ratings

- Maximum Temperatures
 - Storage Temperature Tstg..... -65 ~ +150 °C
 - Operating Junction Temperature Tj -65 ~ +150°C
- Maximum Power Dissipation
 - Total Power Dissipation (Ta=25°C) Ptot (Note) 230 mW
- Maximum Voltages and Currents (Ta=25°C)
 - Repetitive Peak Reverse Voltage VRRM..... 30 V
 - Continuous Forward Current IF 200 mA
 - Repetitive Peak Forward Current(tp≤1s,duty cycle≤0.5)..... 300mA
 - Non-repetitive Peak Forward Current (tp<10ms, sinusoidal) IFSM..... 600 mA

Note : For double diodes, Ptot is the total power dissipation of both diodes.

Thermal Performance

| Parameter | Symbol | Limit | Unit |
|--|--------|-------|------|
| Thermal Resistance, Junction-to-Ambient, max | RθJA | 435 | °C/W |
| Thermal Resistance, Junction-to-Case, max | RθJC | 270 | |

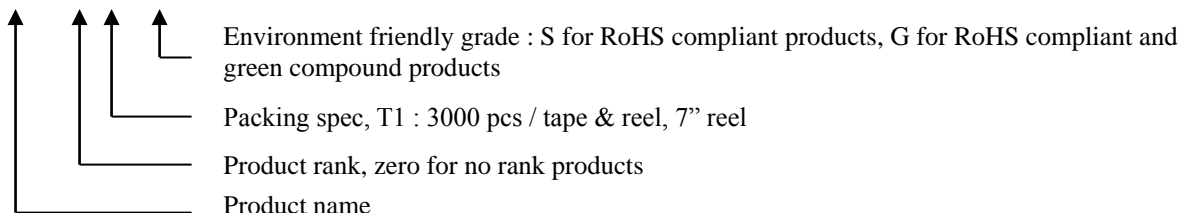
Characteristics (Ta=25°C)

| Characteristic | Symbol | Condition | Min. | Max. | Unit |
|----------------------------------|--------|--|------|------|------|
| Reverse Breakdown Voltage | VBR | IR=100µA | 30 | - | V |
| Forward Voltage (Note 1) | VF(1) | IF=0.1mA | - | 240 | mV |
| | VF(2) | IF=1mA | - | 320 | mV |
| | VF(3) | IF=10mA | - | 400 | mV |
| | VF(4) | IF=30mA | - | 500 | mV |
| | VF(5) | IF=100mA | - | 800 | mV |
| Reverse Leakage Current (Note 2) | IR | VR=25V,Tj=25°C | - | 2 | µA |
| Diode Capacitance | CD | VR=1V, f=1MHz | - | 10 | pF |
| Reverse Recovery Time | trr | IF=IR=10mA RL=100Ω measured at IR=1mA | - | 5 | ns |

Notes: 1.pulse test, tp=380µs,duty cycle<2%.
 2.pulse test, tp=5ms,duty cycle<2%.

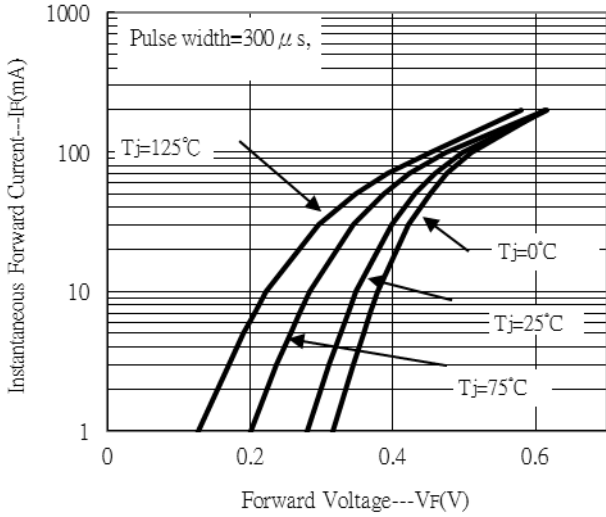
Ordering Information

| Device | Package | Shipping | Marking |
|-----------------|---|------------------------|---------|
| BAT54N3-0-T1-G | SOT-23 (Pb-free lead plating and halogen-free package) | 3000 pcs / Tape & Reel | JV3 |
| BAT54AN3-0-T1-G | | | B6 |
| BAT54CN3-0-T1-G | | | 5C |
| BAT54SN3-0-T1-G | | | LD3 |

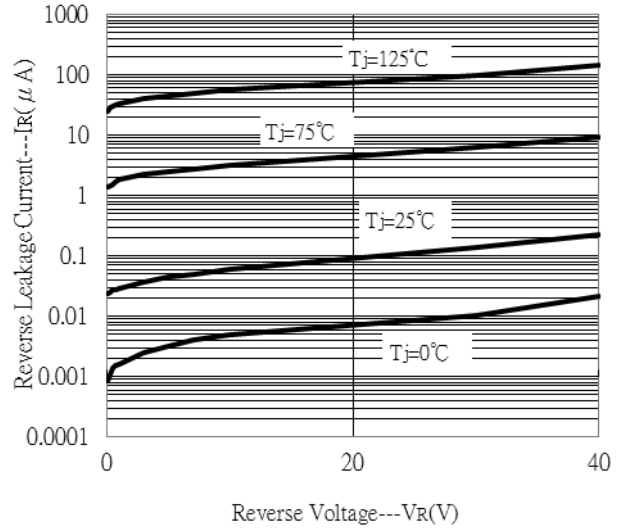


Typical Characteristics

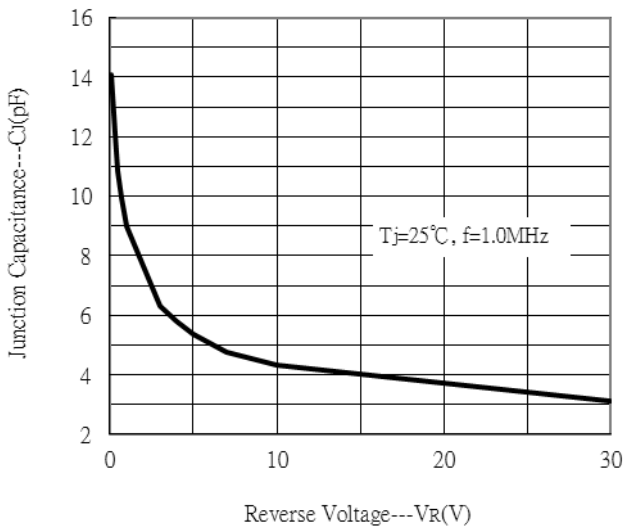
Forward Current vs Forward Voltage



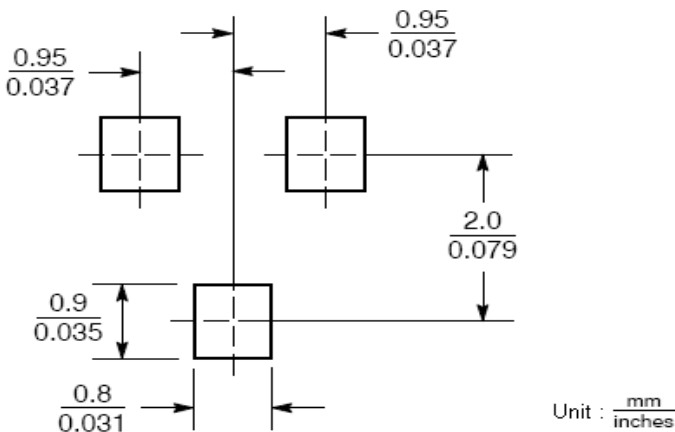
Reverse Leakage Current vs Reverse Voltage



Junction Capacitance vs Reverse Voltage



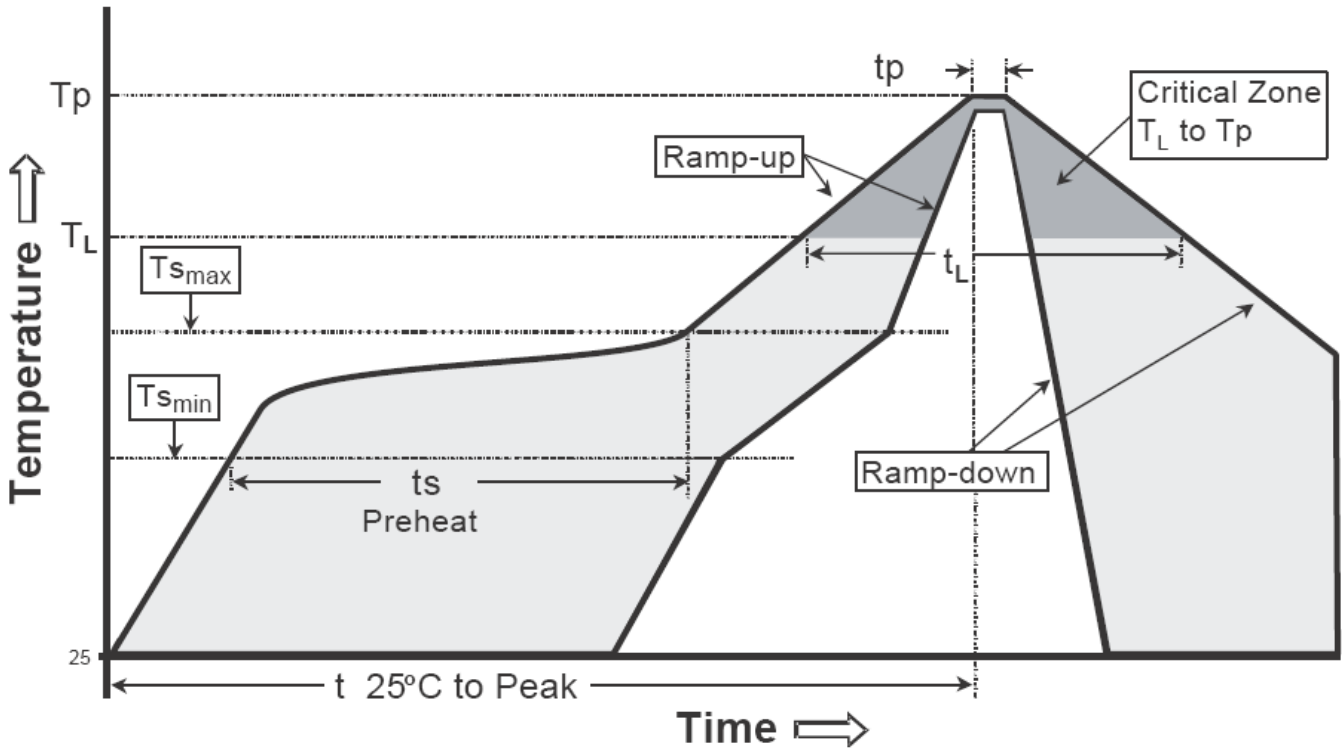
Recommended Soldering Footprint



Recommended wave soldering condition

| | | |
|-----------------|------------------|-----------------|
| Product | Peak Temperature | Soldering Time |
| Pb-free devices | 260 +0/-5 °C | 5 +1/-1 seconds |

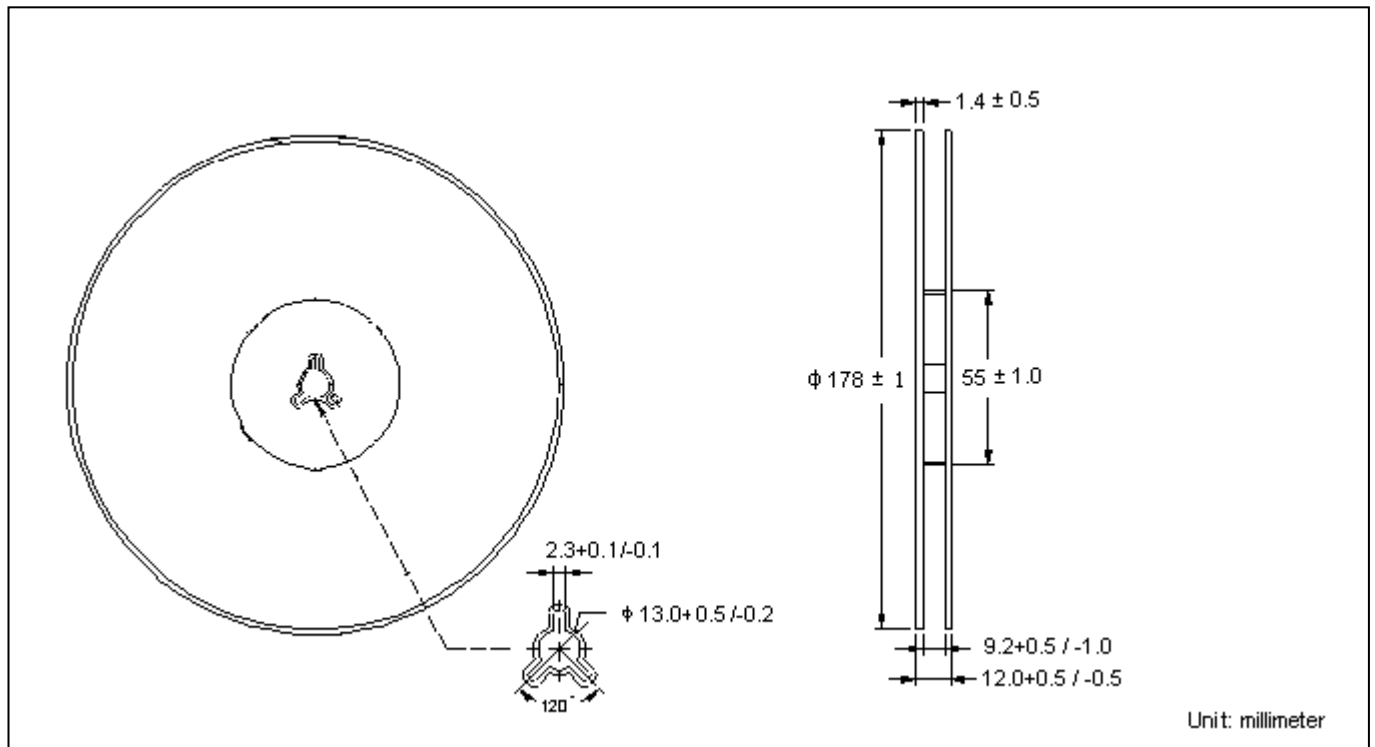
Recommended temperature profile for IR reflow



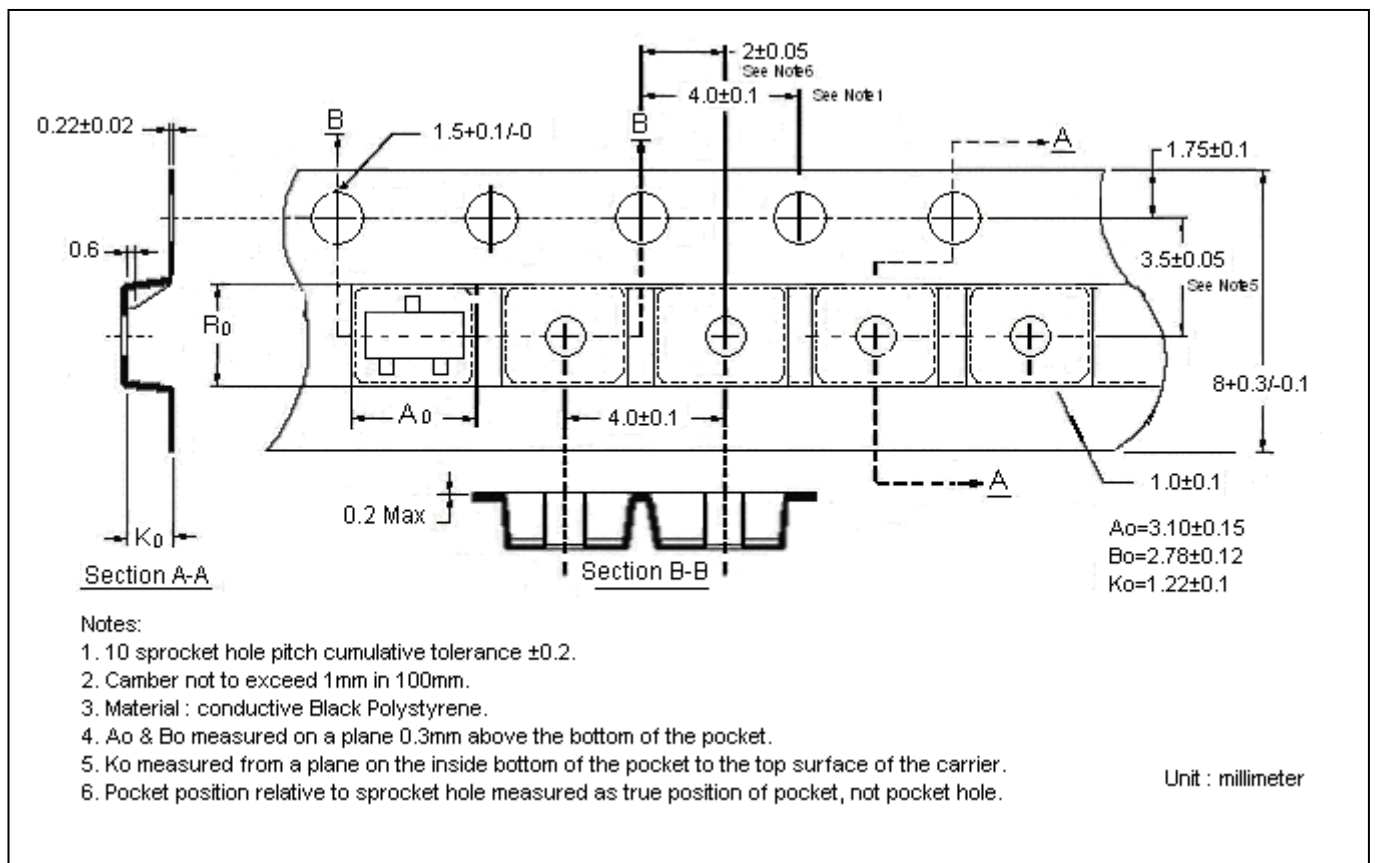
| Profile feature | Sn-Pb eutectic Assembly | Pb-free Assembly |
|---|-------------------------|------------------|
| Average ramp-up rate (T _{smax} to T _p) | 3°C/second max. | 3°C/second max. |
| Preheat | | |
| -Temperature Min(T _{s min}) | 100°C | 150°C |
| -Temperature Max(T _{s max}) | 150°C | 200°C |
| -Time(t _{s min} to t _{s max}) | 60-120 seconds | 60-180 seconds |
| Time maintained above: | | |
| -Temperature (T _L) | 183°C | 217°C |
| - Time (t _L) | 60-150 seconds | 60-150 seconds |
| Peak Temperature(T _p) | 240 +0/-5 °C | 260 +0/-5 °C |
| Time within 5°C of actual peak temperature(tp) | 10-30 seconds | 20-40 seconds |
| Ramp down rate | 6°C/second max. | 6°C/second max. |
| Time 25 °C to peak temperature | 6 minutes max. | 8 minutes max. |

Note : All temperatures refer to topside of the package, measured on the package body surface.

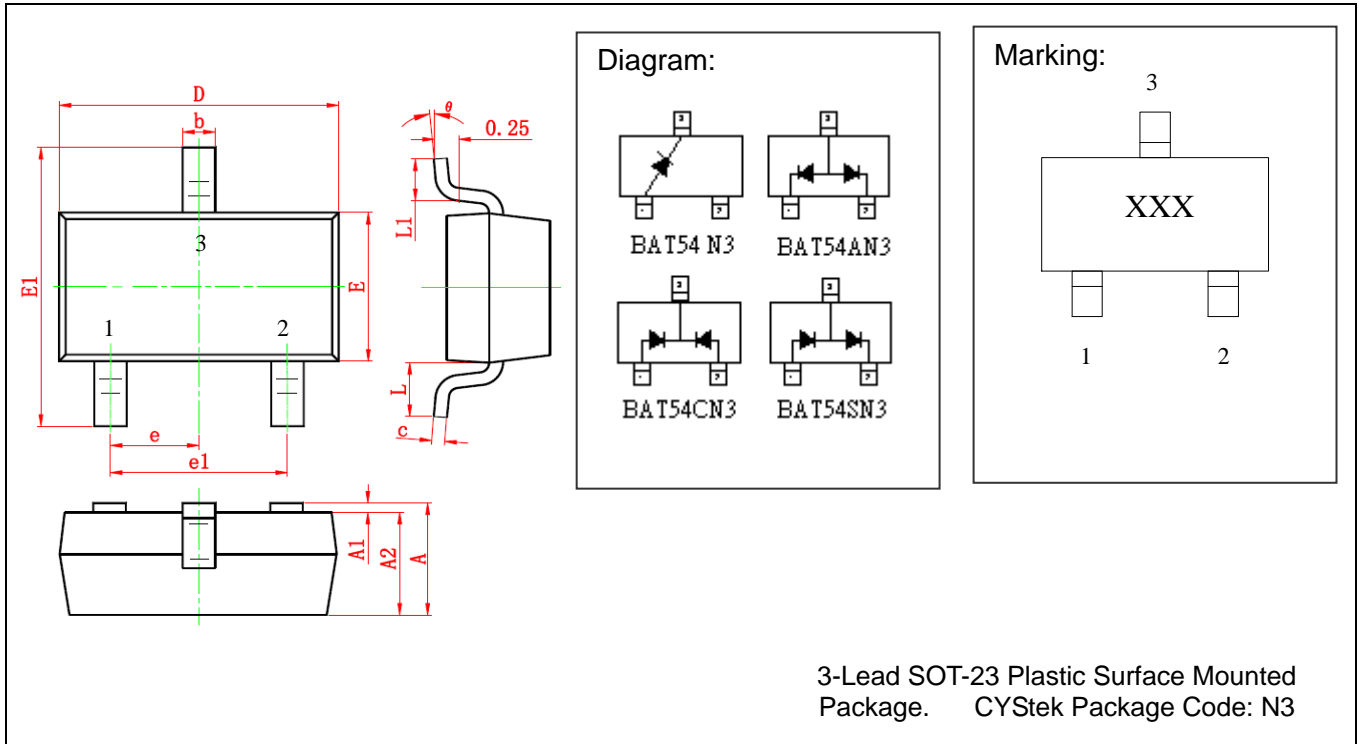
Reel Dimension



Carrier Tape Dimension



SOT-23 Dimension



The diagram shows the mechanical dimensions of the SOT-23 package. Dimensions are labeled as follows: D (total width), b (lead width), E1 (total height), E (body height), e (lead spacing), e1 (lead width at base), L (lead length), L1 (lead length at top), c (lead thickness), and A (lead thickness at base). Lead thicknesses A1 and A2 are also indicated. Lead angle θ is shown as 0.25 degrees.

Diagram:

- BAT54 N3: Single Diode
- BAT54AN3: Common Anode
- BAT54CN3: Common Cathode
- BAT54SN3: Series Connected

Marking:

3
 XXX
 1 2

3-Lead SOT-23 Plastic Surface Mounted Package. CYStek Package Code: N3

- BAT54 N3: Single Diode (Marking Code JV3)
- BAT54AN3: Common Anode. (Marking Code B6)
- BAT54CN3: Common Cathode. (Marking Code 5C)
- BAT54SN3: Series Connected. (Marking Code LD3)

*: Typical

| DIM | Millimeters | | Inches | | DIM | Millimeters | | Inches | |
|-----|-------------|-------|--------|-------|-----|-------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.150 | 0.035 | 0.045 | E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 | e | 0.950 | TYP | 0.037 | TYP |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 | e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| b | 0.300 | 0.500 | 0.012 | 0.020 | L | 0.550 | REF | 0.022 | REF |
| c | 0.080 | 0.150 | 0.003 | 0.006 | L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| D | 2.800 | 3.000 | 0.110 | 0.118 | θ | 0° | 8° | 0° | 8° |
| E | 1.200 | 1.400 | 0.047 | 0.055 | | | | | |

Notes: 1. Controlling dimension: millimeters.
 2. Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 3. If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

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