

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

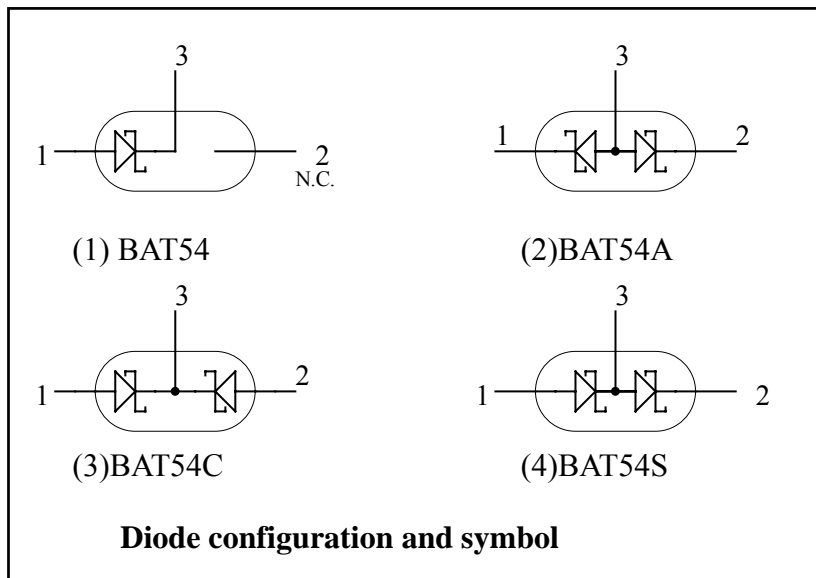
- Very small conduction losses
- Low forward voltage drop
- Small plastic SMD package
- Pb-free lead-free and halogen-free package

Applications

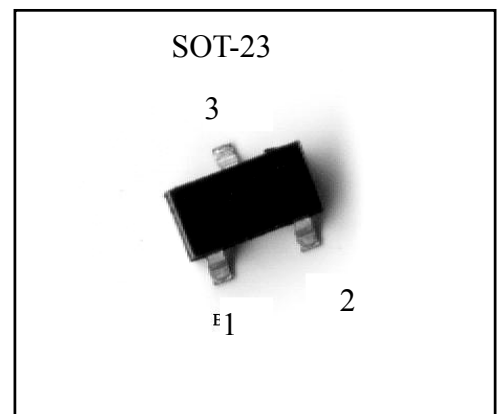
- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes

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 T_{stg} -65 ~ +150 °C
 - Operating Junction Temperature T_j -65 ~ +150°C
- Maximum Power Dissipation
 - Total Power Dissipation ($T_a=25^\circ C$) P_{tot} (Note) 230 mW
- Maximum Voltages and Currents ($T_a=25^\circ C$)
 - Repetitive Peak Reverse Voltage V_{RRM} 30 V
 - Continuous Forward Current I_F 200 mA
 - Repetitive Peak Forward Current($t_p \le 1s, duty\ cycle \le 0.5$)..... 300mA
 - Non-repetitive Peak Forward Current ($t_p < 10ms, sinusoidal$) I_{FSM} 600 mA

Note : For double diodes, P_{tot} is the total power dissipation of both diodes.

Thermal Performance

| Parameter | Symbol | Limit | Unit |
|--|-----------------|-------|------|
| Thermal Resistance, Junction-to-Ambient, max | $R_{\theta JA}$ | 435 | °C/W |
| Thermal Resistance, Junction-to-Case, max | $R_{\theta JC}$ | 270 | |

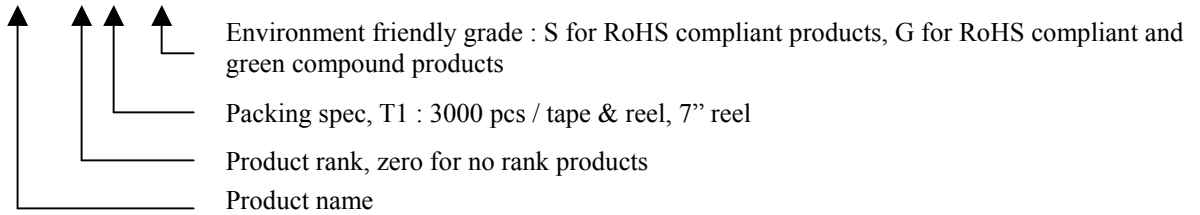
Characteristics ($T_a=25^\circ C$)

| Characteristic | Symbol | Condition | Min. | Max. | Unit |
|----------------------------------|----------|--|------|------|---------|
| Reverse Breakdown Voltage | V_{BR} | $I_R=100\mu A$ | 30 | - | V |
| Forward Voltage (Note 1) | $V_F(1)$ | $I_F=0.1mA$ | - | 240 | mV |
| | $V_F(2)$ | $I_F=1mA$ | - | 320 | mV |
| | $V_F(3)$ | $I_F=10mA$ | - | 400 | mV |
| | $V_F(4)$ | $I_F=30mA$ | - | 500 | mV |
| | $V_F(5)$ | $I_F=100mA$ | - | 800 | mV |
| Reverse Leakage Current (Note 2) | I_R | $V_R=25V, T_j=25^\circ C$ | - | 2 | μA |
| Diode Capacitance | C_D | $V_R=1V, f=1MHz$ | - | 10 | pF |
| Reverse Recovery Time | t_{rr} | $I_F=I_R=10mA, R_L=100\Omega$ measured at $I_R=1mA$ | - | 5 | ns |

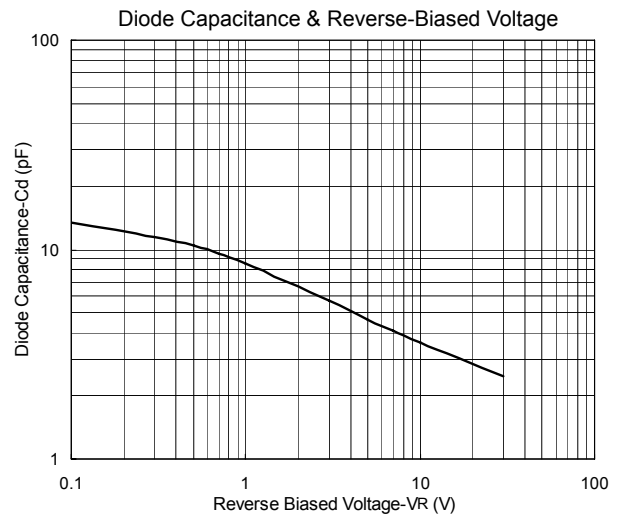
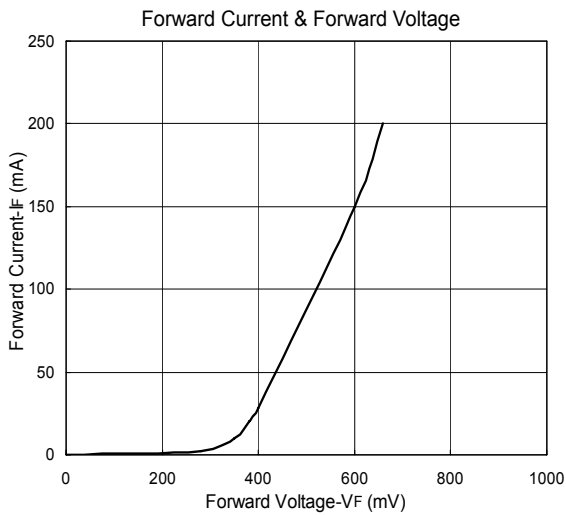
Notes: 1.pulse test, $t_p=380\mu s, duty\ cycle < 2\%$.
 2.pulse test, $t_p=5ms, duty\ cycle < 2\%$.

Ordering Information

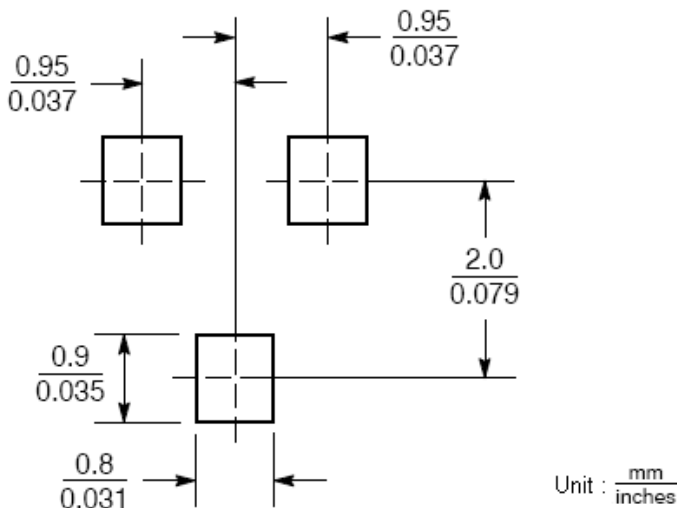
| Device | Package | Shipping | Marking |
|-----------------|---|------------------------|---------|
| BAT54N3-0-T1-G | SOT-23 (Pb-free lead plating and halogen-free package) | 3000 pcs / Tape & Reel | JV3 |
| BAT54AN3-0-T1-G | | | B6 |
| BAT54CN3-0-T1-G | | | 5C |
| BAT54SN3-0-T1-G | | | LD3 |



Typical Characteristics



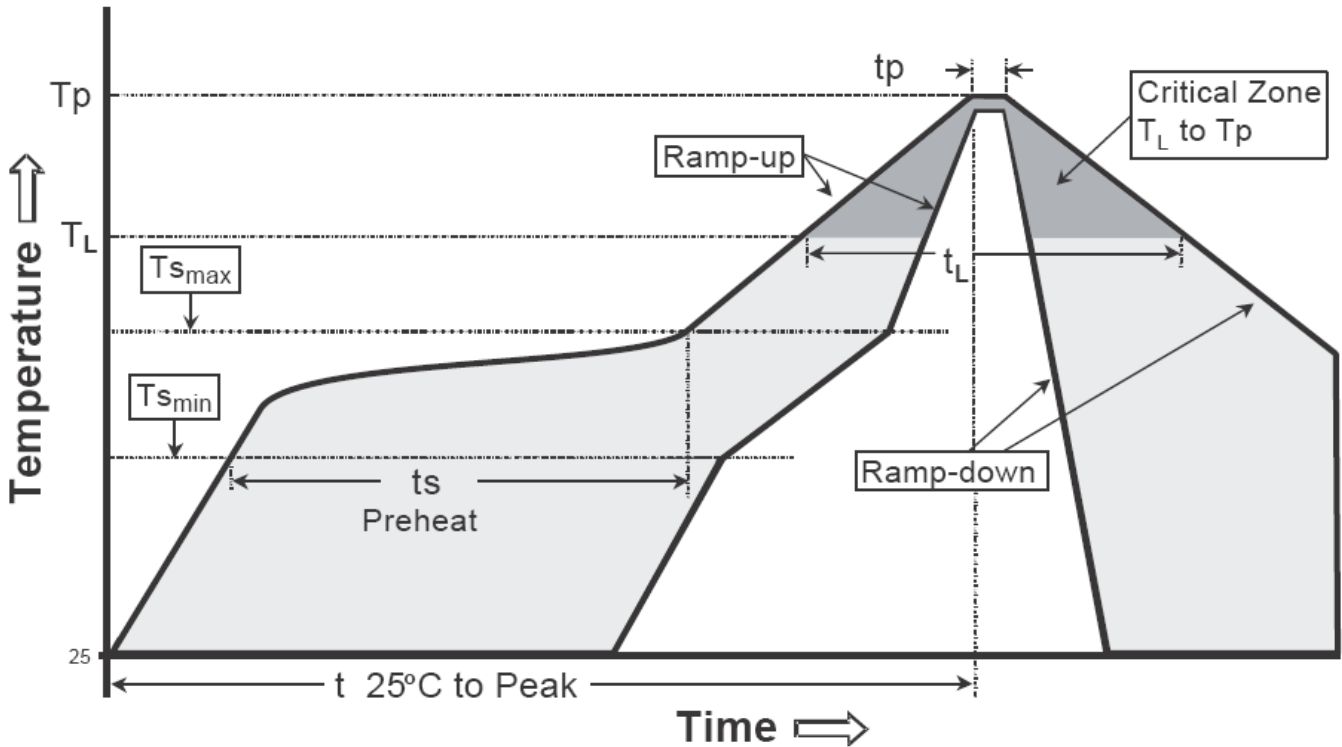
Recommended Soldering Footprint



Recommended wave soldering condition

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

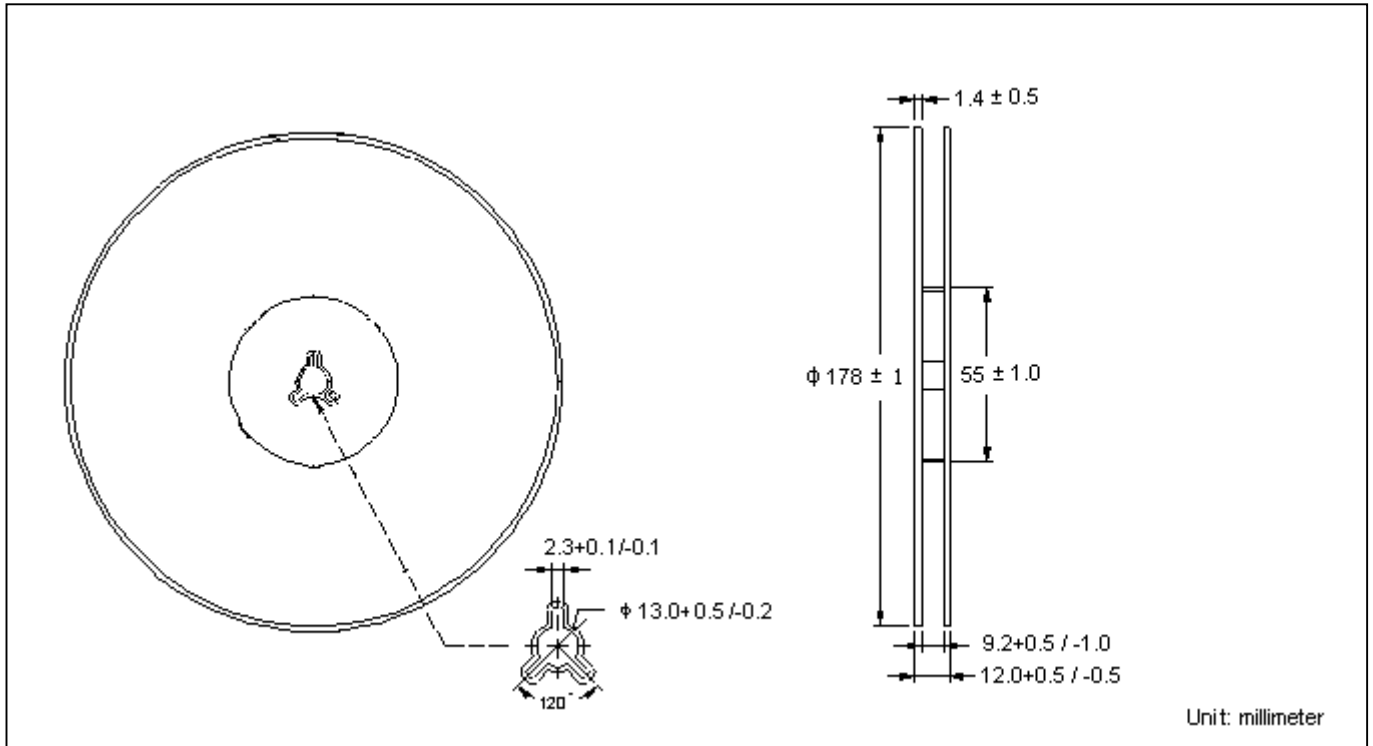
Recommended temperature profile for IR reflow



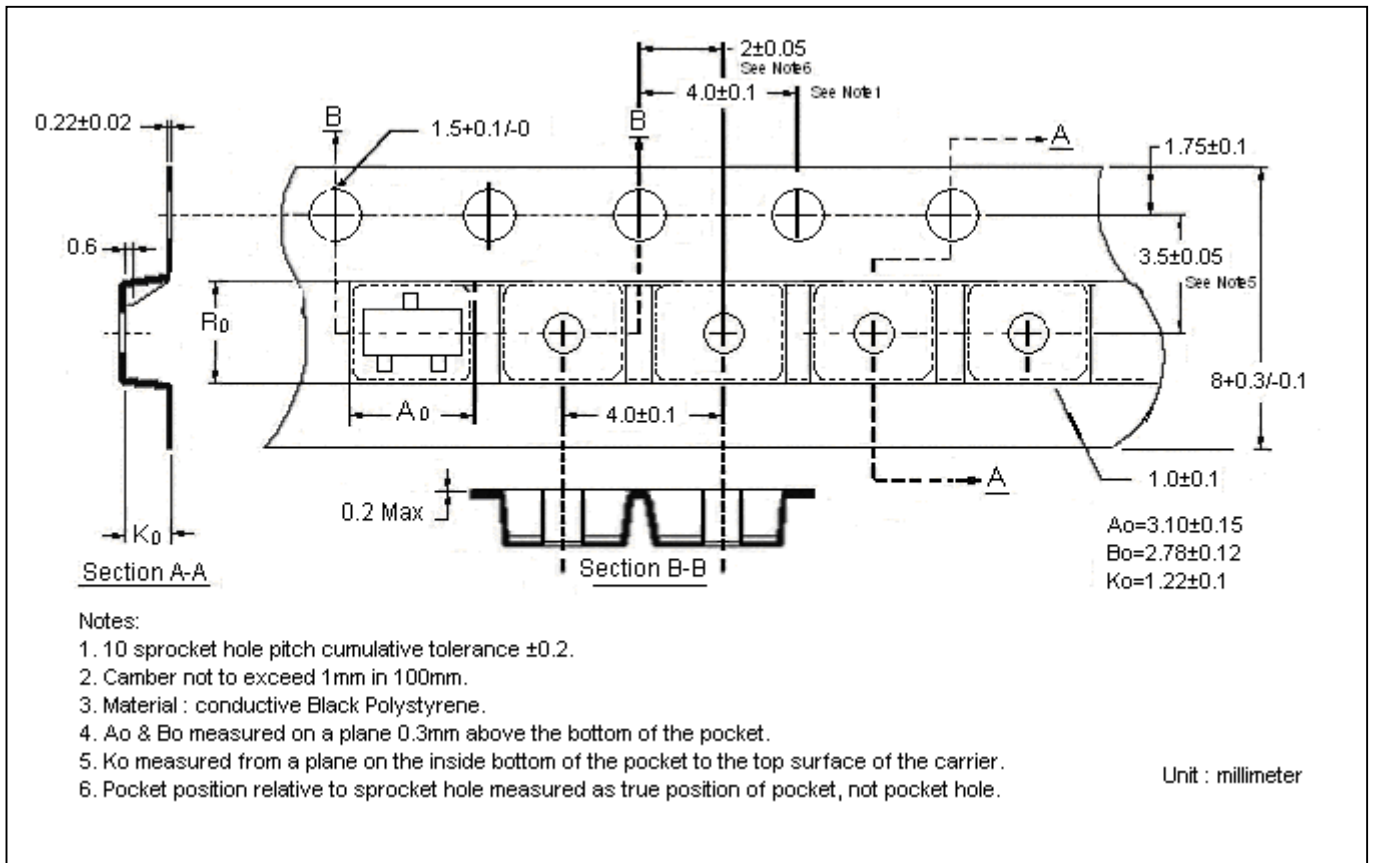
| Profile feature | Sn-Pb eutectic Assembly | Pb-free Assembly |
|---|-------------------------|------------------|
| Average ramp-up rate (T _{smax} to T _p) | 3°C/second max. | 3°C/second max. |
| Preheat | | |
| -Temperature Min(T _{s min}) | 100°C | 150°C |
| -Temperature Max(T _{s max}) | 150°C | 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

Diagram:

BAT54 N3 BAT54AN3

BAT54CN3 BAT54SN3

Marking:

XXX

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 | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|-----|--------|--------|-------------|------|-----|--------|--------|-------------|------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.1102 | 0.1204 | 2.80 | 3.04 | J | 0.0032 | 0.0079 | 0.08 | 0.20 |
| B | 0.0472 | 0.0669 | 1.20 | 1.70 | K | 0.0118 | 0.0266 | 0.30 | 0.67 |
| C | 0.0335 | 0.0512 | 0.89 | 1.30 | L | 0.0335 | 0.0453 | 0.85 | 1.15 |
| D | 0.0118 | 0.0197 | 0.30 | 0.50 | S | 0.0830 | 0.1161 | 2.10 | 2.95 |
| G | 0.0669 | 0.0910 | 1.70 | 2.30 | V | 0.0098 | 0.0256 | 0.25 | 0.65 |
| H | 0.0000 | 0.0040 | 0.00 | 0.10 | L1 | 0.0118 | 0.0197 | 0.30 | 0.50 |

- 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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