

Named for their precise height tolerance and burr free edges, these non-collapse spacer blocks are designed to be automatically placed and reflowed onto a PCB pad with a nominal amount of solder paste.



# ALPHA® TrueHeight™ Spacer Block

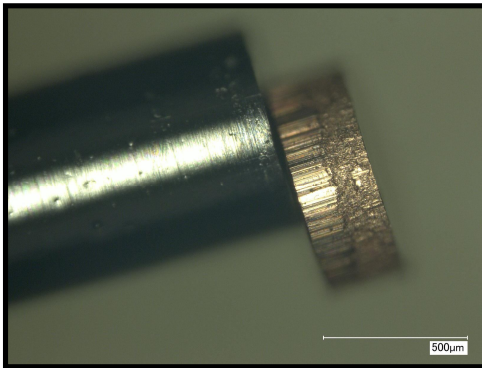
## Product Guide

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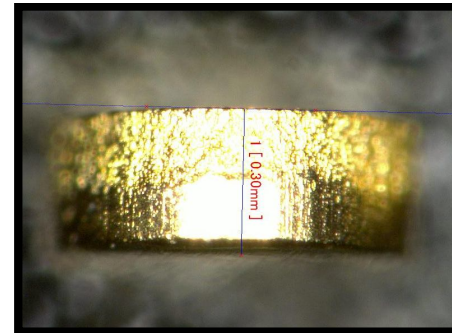
## TrueHeight™ Spacer Block

**Designed for permanent attach  
to a PCB SMT pad**

- Non-collapse (non-solder) height
- Copper disc with gold over nickel plating for long term reliability

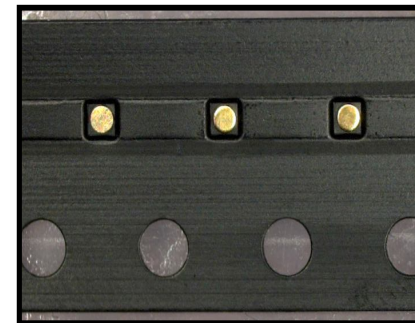


✓ **Features** **Burr-free edges** allowing  
repeatable height control



✓ **Features**

**Precise height control**  
 $\pm 0.010\text{mm}$  (0.0004")



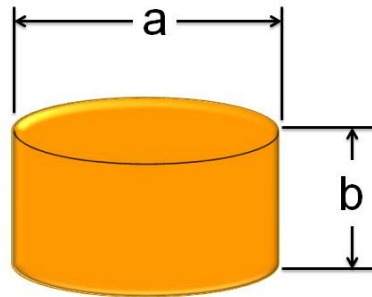
✓ **Features** **T&R packaging**  
for easy SMT integration

  
alpha®  
TrueHeight

# TrueHeight™ Spacer Block

## Product Information

- Two sizes currently available
- Other sizes can be made available
  - *Based on opportunity & volumes*



| Part Type<br>mm | Part Type<br>inch | a           |       | b           |       |
|-----------------|-------------------|-------------|-------|-------------|-------|
|                 |                   | mm          | inch  | mm          | inch  |
| DS-D076H030     | DS-D030H012       | <b>0.70</b> | 0.030 | <b>0.30</b> | 0.012 |
| DS-D076H038     | DS-D030H015       | <b>0.76</b> | 0.030 | <b>0.38</b> | 0.015 |

• **Tolerances:**  $\pm 0.05\text{mm}$  for Dim. a;  $\pm 0.010\text{mm}$  for Dim. B

## TrueHeight™ Spacer Block

### Applications:

1. Prevents corner solder bridging commonly seen during reflow of large BGA components
2. Creates clearance for paste and preforms under component bodies in Pin-in-Paste (PiP) applications



## Improves Yield - Prevents Solder Bridging in Large BGAs

- **Issue**

- Large BGAs commonly warp during reflow causing corner solder bridging/shorting which impacts production yield.
  - Causes significant rework expense
  - Rework produces hotter heat than reflow, exhibiting even more warping

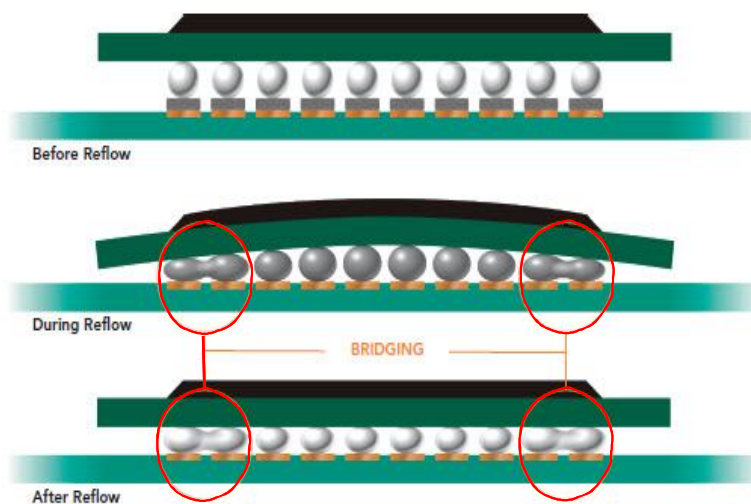
- **Resolution**

- Add Alpha TrueHeight™ Spacers to the 4 corners of the large BGA
  - 45 mil pad on each of four corners of PBGA footprint
  - 25 mil aperture, 5 mil thick printed solder paste
  - Locate TrueHeight™ as far under the BGA as practical



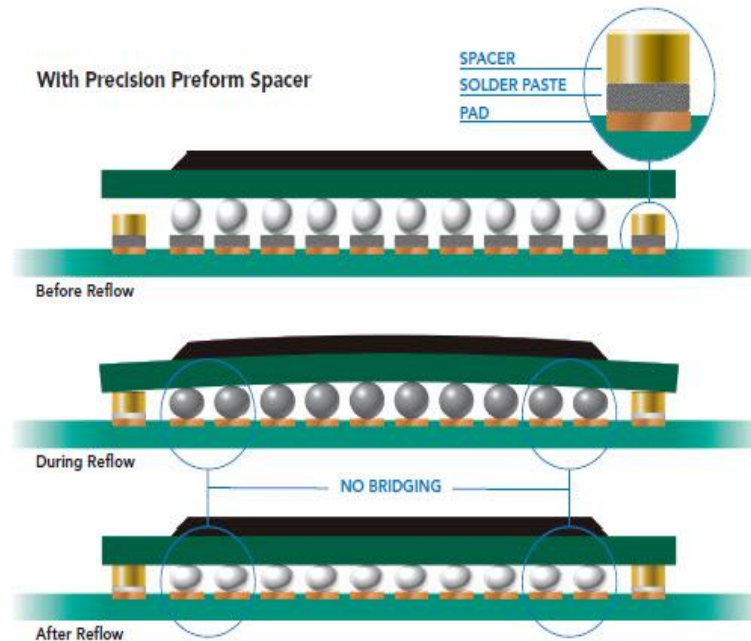
## Improves Yield - Prevents Solder Bridging in Large BGAs

With No Precision Preform Spacer



During the liquidous phase, solder is squeezed and forms a bridge due to either substrate warpage or component weight.

With Precision Preform Spacer



Maintain minimum stand-off height, allowing solder to form a more spherical ball and prevent bridging.

✓ Proven  
✓ Verified

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TrueHeight™

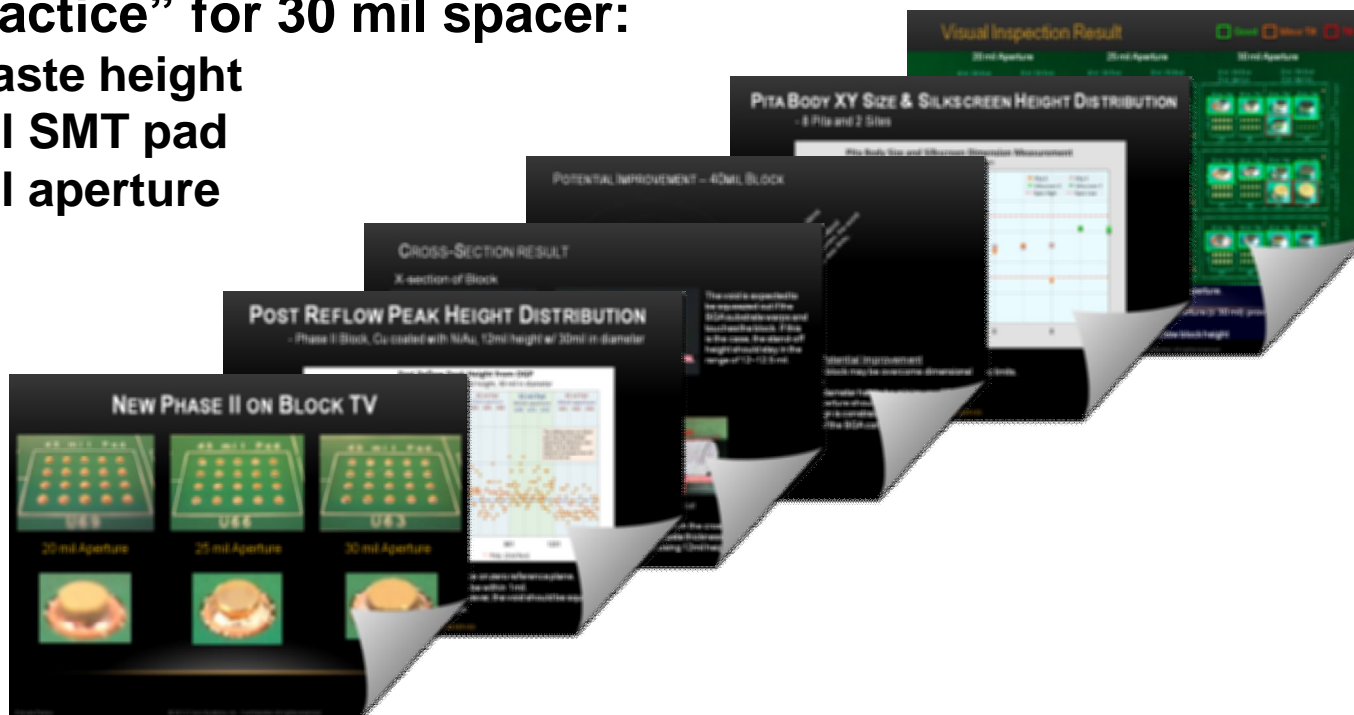
TrueHeight™ sets a fixed spacer height at the corners of the BGA during reflow allowing for the formation of more spherical balls and preventing solder bridging due to BGA warp

## Proven Design to prevent warping of Large BGAs

*Extensive studies were conducted by a large network equipment provider to determine paste thickness, optimized SMT pad size, aperture size, and TrueHeight™ block height.*

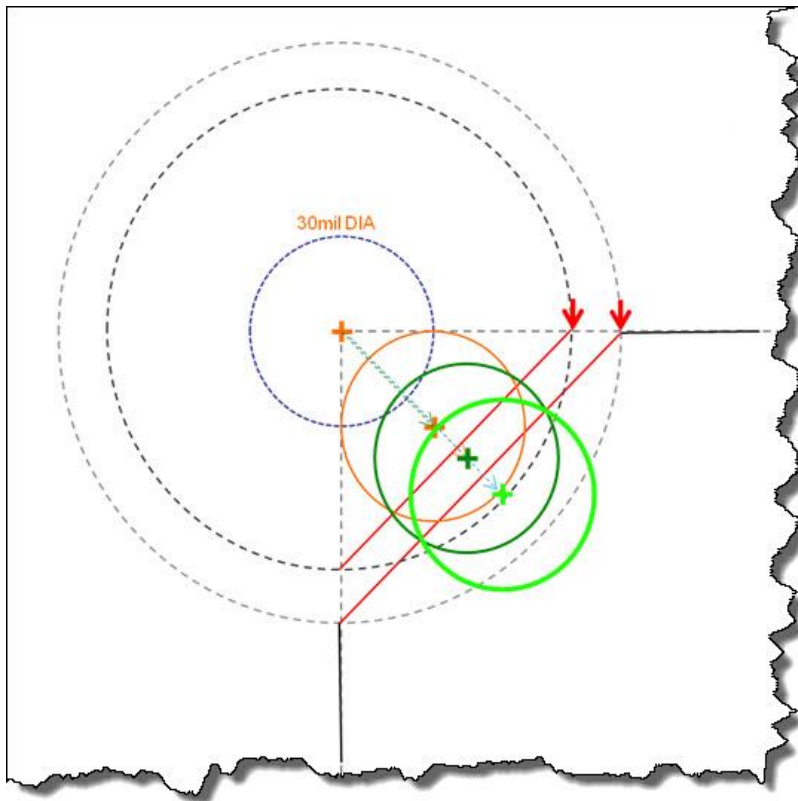
### “Best Practice” for 30 mil spacer:

- 2 mil paste height
- > 35 mil SMT pad
- < 30 mil aperture





## Proven Design to prevent warping of Large BGAs



### Placement Position of TrueHeight™ *corner reference to the BGA*

- At **15 mil**, the spacer is tangent to the silkscreen (OK)
- At 20mil, the spacer moves further inside (Better)
- At 25mil, the spacer moves further inside (Best, If space is allowed)

*Position the spacer adequately from the edge of the PBGA corner reference for best control of warping*

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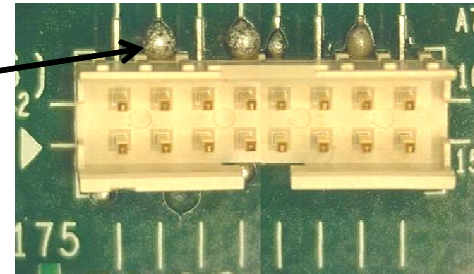


### Reduces Processing Costs: Eliminate wave soldering Improves Yield: Creates clearance for paste & preforms

- **Issue**

- A through hole component used in an SMT reflow process does not provide adequate clearance off the PCB surface enabling the paste and preforms to flow under the component and fill the plated through holes

Solder balls formed due to inadequate clearance under the header



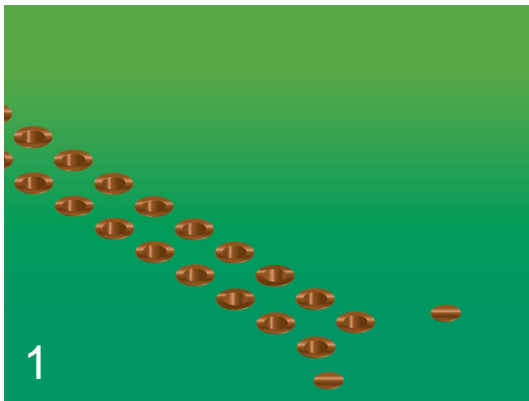
- **Resolution**

- Add TrueHeight™ blocks to the corners of the component and create the necessary clearance
  - 45 mil pad on each of four corners of the component
  - Calculate the paste and preform stack height and select the proper TrueHeight™ Spacer.

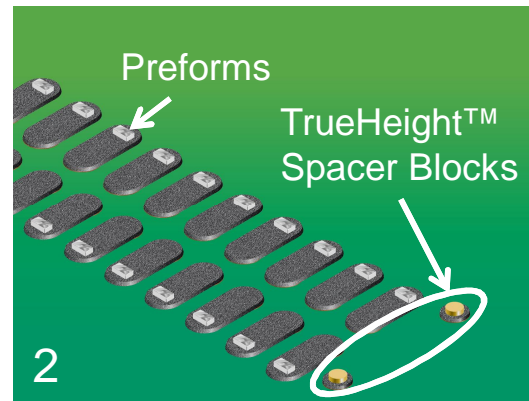
# application #2 – eliminate wave



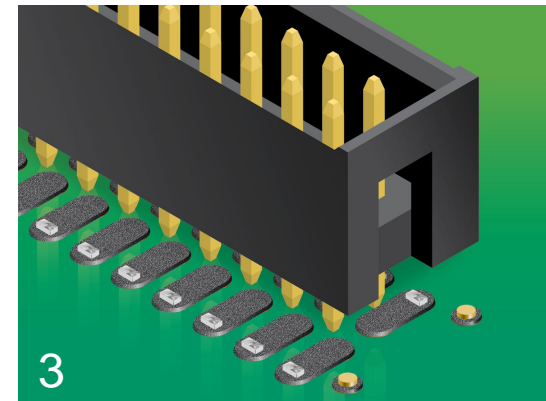
## Enables Clearance under Through-hole Components in PiP\* Applications



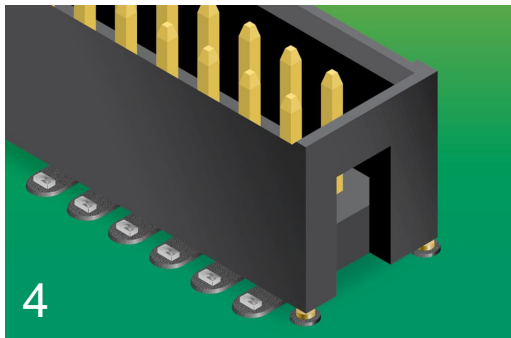
1  
\* Plated through holes for a PiP application and SMT pads for TrueHeight™ Spacer Blocks



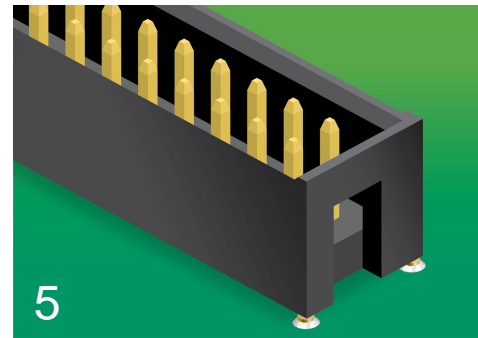
2  
\* Printed paste with preforms and TrueHeight™



3  
\* Through hole component prior to insertion into the PCB



4  
\* Connector bottoms out on TrueHeight™ Spacers at the 4 corners



5  
\* Reflow result - TrueHeight™ remains fixed while the solder is free to flow under the component body

TrueHeight™ blocks supporting clearances for various T&R preform sizes will be developed as needed

- Marketing is looking for customer engagements or trials to prove in this technology

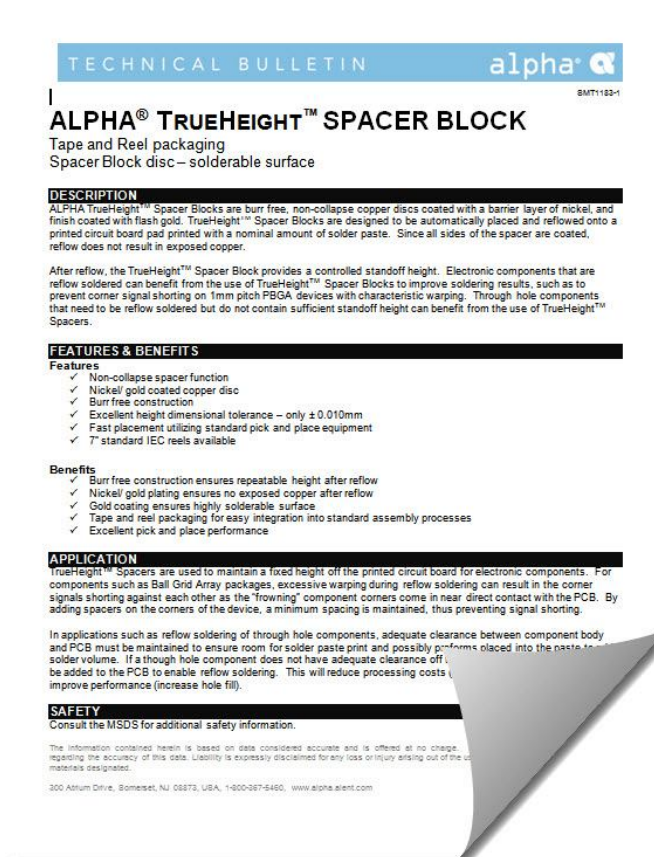
*TrueHeight™ Spacer Blocks create clearance for paste and preforms to flow freely under through-hole components in SMT applications*



\* Pin in Paste

## Technical Bulletin and MSDS

- Available through your local service personnel or on our website



**Thank you for your attention!**