

# PBGA Heat Spreader

## Plastic Ball Grid Array

### SUBSTRATE

Plastic Ball Grid Arrays are typically presented to the Heat Spreader Attach system in the form of a strip. Common presentation methods are a 4, 5, or 6 up strip, depending on the substrate size. Substrates typically range in size



from 27 mm<sup>2</sup> to 37.5 mm<sup>2</sup>. Heat Spreaders for PBGA are typically a single piece with standoffs located at the four corners. These standoffs are used to lift the Heat Spreader slightly off the substrate to allow the molding material, that will be used in the final process to encapsulate the interior.

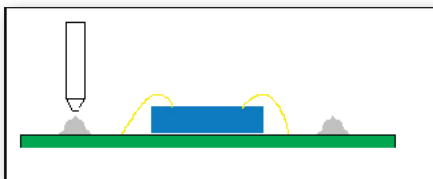


### PROCESS

PBGA Heat Spreader Attach starts with the strips entering the dispense system via conveyor transport. In some cases, a dual speed conveyor is used to slow the speed of the strip as it enters the work area. Once in the work area, the lifter plate, configured with a contact vacuum chuck, lifts the strip from the conveyor. To ensure consistent front-to-back alignment, the strip is aligned to the fixed rail via side-clamping from the opposite rail.



The first process is a conductive adhesive dispense wherein the 4 corners of the Heat Spreader will contact the substrate. The dispense is done using auger valve technology and a needle that does not contact the surface during dispensing. The dispense size is



a dot approximately 0.020" (0.508 mm) in diameter; the key is to avoid material squish-out during Heat Spreader placement. Heat Spreaders are presented to the process through an innovative stack feeder. The stack feeder allows large quantities of Heat Spreaders to be presented to the system at a time by being held in a size-specific magazine. In addition, change-out between varying sizes of Heat Spreaders is very easy and requires just a few minutes.



The placement of the Heat Spreaders is done with a multi P&P tool, rather than a single device; this is done to increase throughput. Accuracy of placement needs to be at least ±0.004" (0.10 mm) Alignment of the Heat Spreaders before placement is done via active centering in the stack feeder.



### SYSTEMS

For Heat Spreader placement of PBGA, GPD Global® MicroMax® systems are equipped with two mounting stations: one station is used for the LX Auger valve to dispense the conductive adhesive, and the second station is configured with a multi P&P tool to place the Heat Spreaders.

Additional system options are a Post Cure and Press station used to initiate the cure process and ensure all lids are level. A loader and unloader may also be added to the system for standalone production.

