



# Product Training Module: PH3: Heat Spreader

Jan 2013



# Introduction

- Purpose
  - This training module is used to give an introduction to t-Global Technology's PH3 Heat Spreader product line
- Objectives
  - To identify the key properties of the PH3 product range
  - To identify the key design criteria for product selection
  - To identify common applications for the product
- Content
  - Introduction and background to the PH3 product range
- Learning time
  - 30 mins



# PH3

- PH3 is t-Global Technology's thermal heat spreader
- PH3 is a thin heat spreader that provides a low-cost, effective means of cooling IC devices in restricted spaces where conventional heat sinks are inappropriate
- PH3 spreaders consist of flexible copper foil between electrically insulating films.
- High strength acrylic PSA (pressure-sensitive adhesive) provides a strong bond to the component.
- The compliant nature of these heat spreaders permits nearly 100% adhesive contact with non-flat package surfaces, optimizing thermal and mechanical performance.

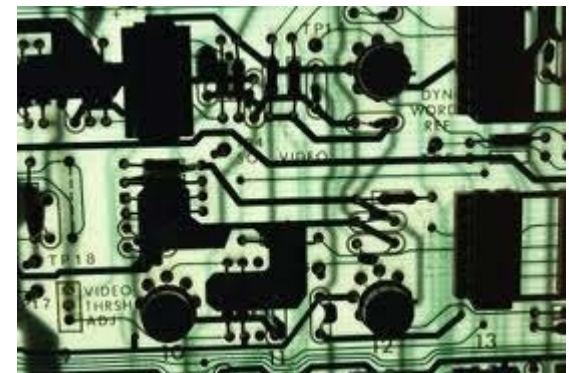


# PH3 Benefits

- PH3 offers the following benefits:
  - Component junction temperature reduction of 10-20°C
  - Easily added to existing designs to lower component temperatures and improve reliability
  - Custom shapes available for complex designs
  - Low profile allows use in limited space environments
  - Easy peel and stick adhesion to almost all surfaces including packages with residual silicon mould release agent
  - Offers low cost cooling for many applications
  - Low application force to minimise component damage
  - Pliable nature allows conformance to non-flat surfaces for optimal thermal and mechanical performance
  - Easily removed for rework

# PH3 Applications

- PH3 is commonly used for the following applications:
  - Microprocessors
  - Memory modules
  - Laptop PCs
  - Hand held electronics
  - TVs and Display units
  - High speed disk drives





# PH3 Application Instructions

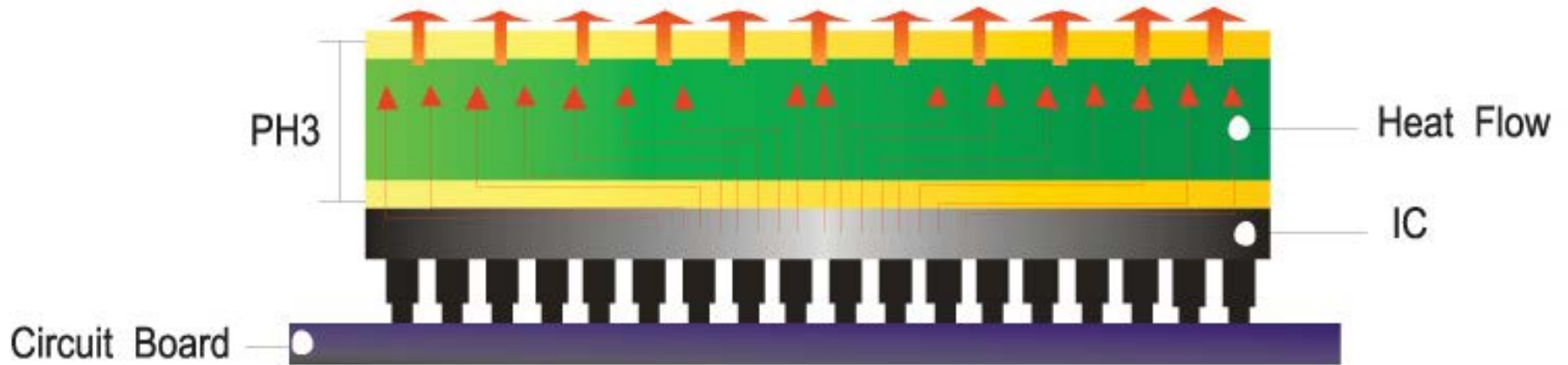
- For best results, clean the top surface of the component using a lint- free cotton cloth
- Wipe the bonding surface of the component with an industrial solvent, such as MEK, acetone or isopropyl alcohol
- In the case of a plastic package, select a cleaner that will not chemically attack the plastic substrate
- Do not touch the cleaned surface during any part of the assembly process. If the surface has been contaminated, repeat Steps 1 and 2



# PH3 Application Instructions

- Remove the clear release liner exposing the pressure-sensitive adhesive (PSA)
- Avoid touching exposed adhesive with fingers
- For best bond strength and contact area, center the exposed PSA onto the component
- Press and smooth the entire bonding area with firm finger pressure of about 5 psi, for 5 seconds
- Bond strength will increase as a function of time as the adhesive continues to wet out the bonding surface. Increasing any of the application variables (pressure, temperature and time) can improve bonding results

# PH3 - Application







# PH3 - Datasheet

Property	PH3	Unit
Colour	Black	-
Thickness	0.21	mm
Thermal Conductor	Copper	-
Thermal Conductor Thickness	0.1	mm
Insulator	Polyester	-
Insulator Thickness	0.05	mm
Pressure-sensitive Adhesive (PSA) system	Acrylic PSA	-
PSA thickness	0.05	mm
Dielectric Breakdown Voltage	3.5	kV
Specific Gravity	7.5	g/cm <sup>3</sup>

# Summary

- PH3 is a thin heat spreader that provides a low-cost, effective means of cooling IC devices in restricted spaces where conventional heat sinks are inappropriate
- PH3 spreaders consist of flexible copper foil between electrically insulating films.
- High strength acrylic PSA (pressure-sensitive adhesive) provides a strong bond to the component
- Low application force to minimise component damage
- Pliable nature allows conformance to non-flat surfaces for optimal thermal and mechanical performance