

FLIP CHIP & UNDERFILL DESIGN RULES & GUIDELINES

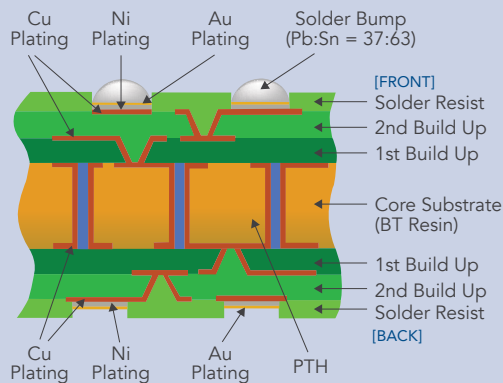
Samtec Microelectronics Group provides extensive advanced package design and assembly capabilities, including package design, flip chip, die attach, wirebond and sealing, as well as the ability to assist in choosing the best technology and materials for your specific application. Please visit www.samtecmicroelectronics.com for additional information.

The following dimensions are guidelines designed to help release product to manufacturing as quickly as possible. Full capabilities are not limited to the specifications included in this document. Please contact SME@samtec.com for applications with tighter requirements.

PACKAGE & SOLDER BALL DESIGN RULES (TYPICAL)

| PACKAGE SIZE | FLUX | SUBSTRATE BGA SOLDER BALL | SUBSTRATE BGA PAD |
|--|--|--|--|
| Min: 10 mm x 10 mm (approximate) Max: 63 mm x 63 mm (approximate) | Tac-Flux-025 & WS-609 Other no-clean flux types Water soluble flux types | Min Size: 0.18" dia. (approx.) Max Size: 0.025" dia. (approx.) Material: Eutectic Pb:Sn (37:63) or Pb-Free | Closest Pitch: 0.80 mm x 0.80 mm Furthest Pitch: No constraint Pad Layout: Any configuration is acceptable |

SUBSTRATE STRUCTURE (TYPICAL)

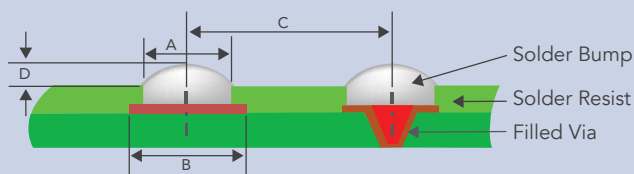


LAYER THICKNESS (TYPICAL)

| LOCATION | STANDARD (μm) | CUSTOM (μm) |
|---------------------|---------------|-------------|
| Core Substrate | 800 | 400* |
| Core Cu | 25 | 21 |
| Build-up Cu | 14.5 | 2 |
| Insulation Layer | 33 | 12 |
| Solder Resist Layer | 21 | 18 |
| Nickel Plating | 3 - 7 | |
| Gold Plating | 0.03 ~ 0.12 | |

No. of Build Up Layers: 1, 2, 3, 4 per side; No. of Core Layers: 2, 4
*Coreless also available

FLIP CHIP PAD DESIGN RULE



LAYER THICKNESS (TYPICAL)

| | ITEM | STANDARD (μm) | CUSTOM (μm) |
|---|--|---------------|-------------|
| A | Flip Chip Pad Diameter (Solder Resist Opening) | 100 | 75 |
| B | Flip Chip Pad Metal Land Diameter | 145 | 100 |
| C | Flip Chip Pad Pitch | 225 | 130 |
| D | Solder Bump Height | 32 ± 5 | |

For more IC Packaging solutions, please visit www.samtecmicroelectronics.com or contact SME@samtec.com.