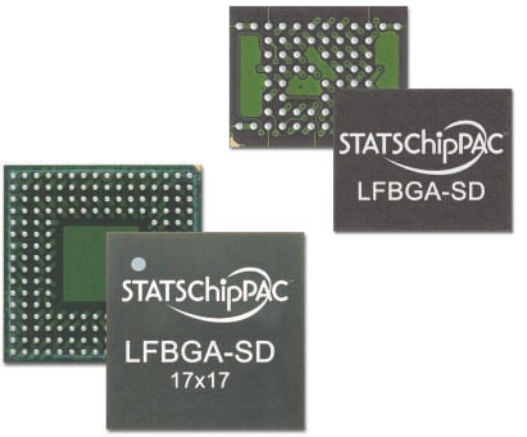
FBGA-SD

Fine Pitch Ball Grid Array - Stacked Die

- FBGA-SD: Laminate substrate based enabling 2 & 4 layers of routing flexibility
- FBGA-T-SD: Single metal layer tape based substrate with dense routing & good electrical performance
- Available in 1.4mm (LFBGA-SD), 1.2mm (TFBGA-SD/TFBGA-T-SD), 1.0mm (VFBGA-SD/VFBGA-T-SD) & 0.80mm (WFBGA-SD) maximum package thickness
- Stacking of die allows for more functionality in an array molded, cost effective, space saving package solution



FEATURES

- 2 die to 7 die stack with spacer capability
- 5 x 5mm to 23 x 23mm body size
- Package height at 1.0, 1.2, 1.4 and 1.7mm max.
- Flexible die stacking options (“pyramid,” “same die,” etc.)
- 0.5mm to 1.0mm ball pitch, Eutectic and Lead-free solder ball
- Flash/SRAM/PSRAM/Logic/Analog combinations
- JEDEC standard package outlines
- Die thinning to 75um (3mils) capability
- Low loop wire bonding; reverse and die to die
- Up to 2mm die overhang per side
- Halogen-free and Low-K wafer compatible BOM
- Ball counts up to 450 balls

APPLICATIONS

- Suitable for a variety of applications including memory integration (ASIC or Logic)
- Chipset integration (Analog/Digital), mixed technologies integration (Baseband/RF)
- Handheld products (Cellular Phones, Pagers, MP3 Players, GPS)
- Consumer electronics (Internet applications, Digital Cameras/Camcorders)
- Computers (Network PCs)
- PC peripherals (Disk Drivers, DC-R/RW, Mini Disk, DVD Drivers)

DESCRIPTION

STATS ChipPAC’s Fine Pitch Ball Grid Array Stacked Die (FBGA-SD) offering includes LFBGA-SD, TFBGA-SD, VFBGA-SD and WFBGA-SD packages. Tape versions of VFBGA-SD and TFBGA-SD are also available. STATS ChipPAC’s chip stack technology offers the flexibility of stacking 2 to 7 die in a single package. Die to die bonding capability enables device and signal integration to improve electrical performance and reduce overall package I/O requirements. Wafer thinning technology, overhang wire bond technology and the use of spacers between stacked die provide the flexibility to stack almost any desirable configuration of die in one package. This capability uses existing assembly infrastructure, which results in more functional integration with lower overall package cost. The use of the latest packaging materials allows this package to meet JEDEC Moisture Resistance Test Level 2a with Lead-free reflow conditions. This is an ideal package for cell phone applications where Digital, Flash, SRAM, PSRAM and Logic are stacked into a single package.

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Fine Pitch Ball Grid Array - Stacked Die

SPECIFICATIONS

Die Thickness	75-165µm (3-6.5 mils)
Mold Cap Thickness	0.45-0.9mm
Marking	Laser
Packing Options	JEDEC tray/tape and reel

RELIABILITY

Moisture Sensitivity Level	JEDEC Level 2A, 260°C reflow
Temperature Cycling	Condition C (-65°C to 150°C, 1000 cycles
High Temperature Storage	150°C, 1000 hrs
Pressure Cooker Test	121°C/100% RH/2 atm, 168 hrs
Temperature/Humidity Test	85°C/85% RH, 1000 hrs
Unbiased HAST	130°C/85% RH, 2 atm, 96 hrs

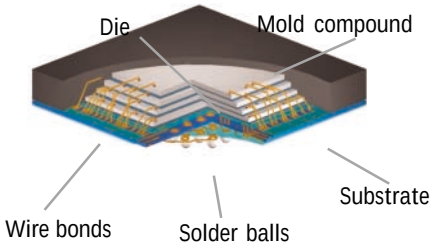
ELECTRICAL PERFORMANCE

Electrical parasitic data is highly dependent on the package layout. 3D electrical simulation can be used on the specific package design to provide the best prediction of electrical behavior. First order approximations can be calculated using parasitics per unit length for the constituents of the signal path. Data below is for a frequency of 100MHz and assumes 1.0 mil gold bonding wire.

Conductor Component	Length (mm)	Resistance (mOhms)	Inductance (nH)	Inductance Mutual (nH)	Capacitance (pF)	Capacitance Mutual (pF)
Wire	2	120	1.65	0.45 - 0.85	0.10	0.01 - 0.02
Net (2L)	2 - 7	34 -119	1.30 - 4.55	0.26 - 2.28	0.25 - 0.95	0.06 - 0.42
Total (2L)	4 - 9	154 - 239	2.95 - 6.20	0.71 - 3.13	0.35 - 1.05	0.07 - 0.44
Wire	2	120	1.65	0.45 - 0.85	0.10	0.01 - 0.02
Net (4L)	2 - 7	34 - 119	0.90 - 3.15	0.18 - 1.58	0.35 - 1.10	0.06 - 0.42
Total (4L)	4 - 9	154 - 239	2.55 - 4.80	0.63 - 2.43	0.45 - 1.20	0.07 - 0.44

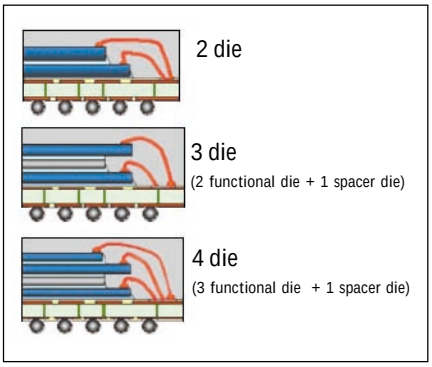
Note: Net = Total Trace Length + Via + Solder Ball.

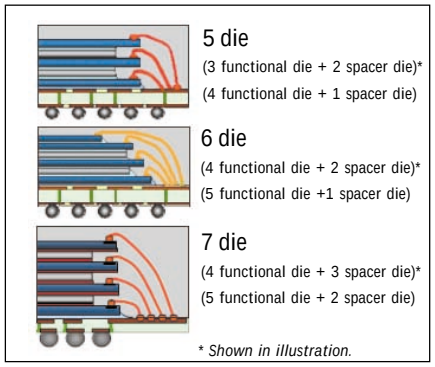
CROSS-SECTION



PACKAGE CONFIGURATIONS

Package Type	Pkg Thickness (typical) mm	Body Size (mm)	Ball Count	Ball Pitch (mm)
LFBGA-SD TFBGA-SD VFBGA-SD WFBGA-SD	1.7, 1.4 max 1.2 max 1.0 max 0.8 max	Range: 4x4 ~ 23x23 Common Sizes: 5x10, 7x9, 8x10, 8x11, 8x14, 10x12, 10x14, 13x13, 15x15, 16x16, 17x17	40-450	0.5 - 0.8
TFBGA-T-SD VFBGA-T-SD	1.2 max 1.0 max	4x4 ~ 16x16	40-280	0.5 - 0.8





** Shown in illustration.*

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