STATSChipPAC®

PBGA-MD

Plastic Ball Grid Array - Multi-Die

- **Strip molded, cost-effective, high I/O, multi-die packaging solution**
- **Enables space efficient side by side and stacked die packaging options**
- **Wide range of pre-existing body sizes**
- **Available in eutectic and Pb-free versions**

FEATURES

- Full in-house package and substrate design capability
- Full in-house electrical, thermal and mechanical simulation and measurement capability
- Multiple metal layer options for signal, power and ground planes for improved electrical performance
- Flexible body sizes ranging from 19mm x 19mm to 40mm x 40mm
- Accommodates both side by side and/or stacked die configurations
- Multiple chip design and optional passive / discrete components available (SiP)
- 0.80, 1.00, 1.27mm and 1.5mm ball pitch with greater than 1000 I/O available
- Perimeter or full ball array
- Eutectic solder balls (62Sn/36Pb/2Ag)
- Pb-free and green material set options
- JEDEC standard compliant

APPLICATIONS

- ASIC
- DSPs and Memory
- Gate Arrays
- Microprocessors/Controllers/Graphics
- PC chipsets
- Other advanced applications involving package level integration of memory and logic devices

DESCRIPTION

STATS ChipPAC's Plastic Ball Grid Array - Multi-Die (PBGA-MD) packages utilize laminate substrates and are available in a variety of standard JEDEC body sizes and ball counts to meet a wide range of customer requirements. This package provides a cost-effective advanced packaging solution and is a direct extension of our single die product offerings to multi-die configurations. STATS ChipPAC's PBGA-MD offerings support either side by side and/or stacked die configurations. Advanced design and simulation capabilities are used in these multi-die packaging applications for maximum electrical and thermal performance. STATS ChipPAC combines state of the art processing and equipment with proven material sets to achieve enhanced yield, reliability and performance. Green and lead-free material sets are available for all PBGA-MD package types.

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SPECIFICATIONS

Die Thickness	150-381µm (6-15mils)
Gold Wire	22.5-30µm (0.9/1.0/1.2mils) diameter
Bond Pad Pitch	45µm inline or 25/50µm staggered capable
Marking	Laser/ink
Packing Options	JEDEC tray/tape and reel

RELIABILITY

Moisture Sensitivity Level	JEDEC Level 3
Temperature Cycling	-65°C/150°C, 1000 cycles (typical)
High Temperature Storage	150°C, 1000 hrs (typical)
Pressure Cooker Test	121°C, 100%RH, 2 atm, 168 hrs
Liquid Thermal Shock	(Condition B) -55°C/125°C, 1000 cycles

THERMAL PERFORMANCE

The thermal performance of each die in the package is influenced by other die in the package. Thermal performance is highly dependent on package size, die size, substrate layers and thickness, and solder ball configuration. Simulation for specific applications should be performed.

ELECTRICAL PERFORMANCE

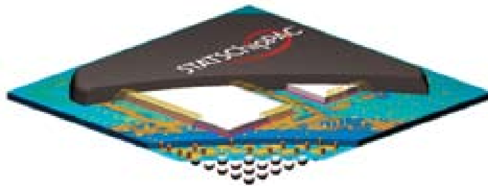
Electrical parasitic data is highly dependent on the package layout. 3D electrical simulation can be used on the specific package design to provide the best prediction of electrical behavior. First order approximations can be calculated using parasitics per unit length for the constituents of the signal 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	0.1	0.01 - 0.02
Net (2L)	2 - 7	34 - 119	1.3 - 4.55	0.26 - 2.28	0.25 - 0.95	0.06 - 0.42
Total (2L)		154 - 239	2.95 - 6.2	0.71 - 3.13	0.35 - 1.05	0.07 - 0.44
Wire	2	120	1.65	0.45 - 0.85	0.1	0.01 - 0.02
Net (4L)	2 - 7	34 - 119	0.9 - 3.15	0.18 - 1.58	0.35 - 1.1	0.06 - 0.42
Total (4L)		154 - 239	2.55 - 4.80	0.63 - 2.43	0.45 - 1.2	0.07 - 0.44

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

CROSS-SECTION

PBGA-MD



PACKAGE CONFIGURATIONS

Package Size (mm)	Ball Count
14 x 22	119
15 x 15	74, 121, 160, 176, 196
17 x 17	208, 256
19 x 19	225, 233, 260, 324, 484
23 x 23	169, 192, 196, 208, 217, 225, 241, 304, 316, 324, 340, 360, 376, 388, 484
27 x 27	225, 256, 272, 292, 300, 316, 320, 324, 336, 352, 384, 388, 392, 400, 484, 484, 512, 625, 672
31 x 31	329, 353, 360, 385, 421, 433, 560, 604, 608, 676, 692, 701
35 x 35	312, 352, 363, 385, 388, 420, 452, 454, 456, 468, 492, 496, 512, 516, 544, 548, 564, 580, 680, 700, 740, 788
37.5 x 37.5	435, 625, 784, 840
40 x 40	503, 596, 600, 900, 928, 1253

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