

Mechanical Differences Between the 252-pin MAP-BGA and 252-pin PBGA Packages

This document describes the differences between the 252-pin MAP-BGA (Mold Array Process-Ball Grid Array) and the 252-pin PBGA (Plastic Ball Grid Array) packages. The MAP-BGA pinout is identical to the PBGA pinout, and it drops into a board laid out for PBGA. This document provides the information required to simplify the transition to the 252-pin MAP-BGA package.

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1 Summary of Differences

The 252-pin MAP-BGA is Freescale’s production ball grid array (BGA) package that replaces the 252-pin plastic ball grid array (PBGA) on selected members of the DSP56300 family. **Table 1** summarizes the differences between these two packages.

Table 1. Differences Between 252-Pin MAP-BGA and PBGA

	252-pin MAP-BGA	252-pin PBGA	Difference
X-Y Dimensions	21 x 21mm	21 x 21 mm	N/A
Ball Pitch	1.27 mm	1.27 mm	N/A
Pinout			N/A
Electrical Performance			N/A
Package Height	1.90 mm max	2.85 mm max	MAP-BGA has lower maximum profile
θ_{JA} (deg. C/W)	50 (no airflow)	50 (no airflow)	N/A
Moisture Sensitivity	MSL3 capable	MSL3 capable	N/A
Coplanarity Specification	0.10 mm	0.15 mm	MAP-BGA has a tighter spec.
Encapsulant Method	Transfer Molding	Liquid dispensing	Different
Tg	175 degrees C	159 degrees C	Map-BGA superior
Singulation	Saw cutting	Punch shear	Different process but no mechanical differences
Flammability Rating	VO	HB	MAP-BGA is superior
Package Identifier	VF	GC	Different
Packing Trays/ Tape and Reel			N/A
Solder Balls			N/A

2 Pinout and Electrical Performance

Pinout and electrical performance is identical for a given device on both MAP-BGA and PBGA packages. For details on pinout and electrical performance, refer to the technical data sheet of the particular device.

3 Dimensions

Mechanical drawings of each package are shown in **Figure 1** through **Figure 4**.

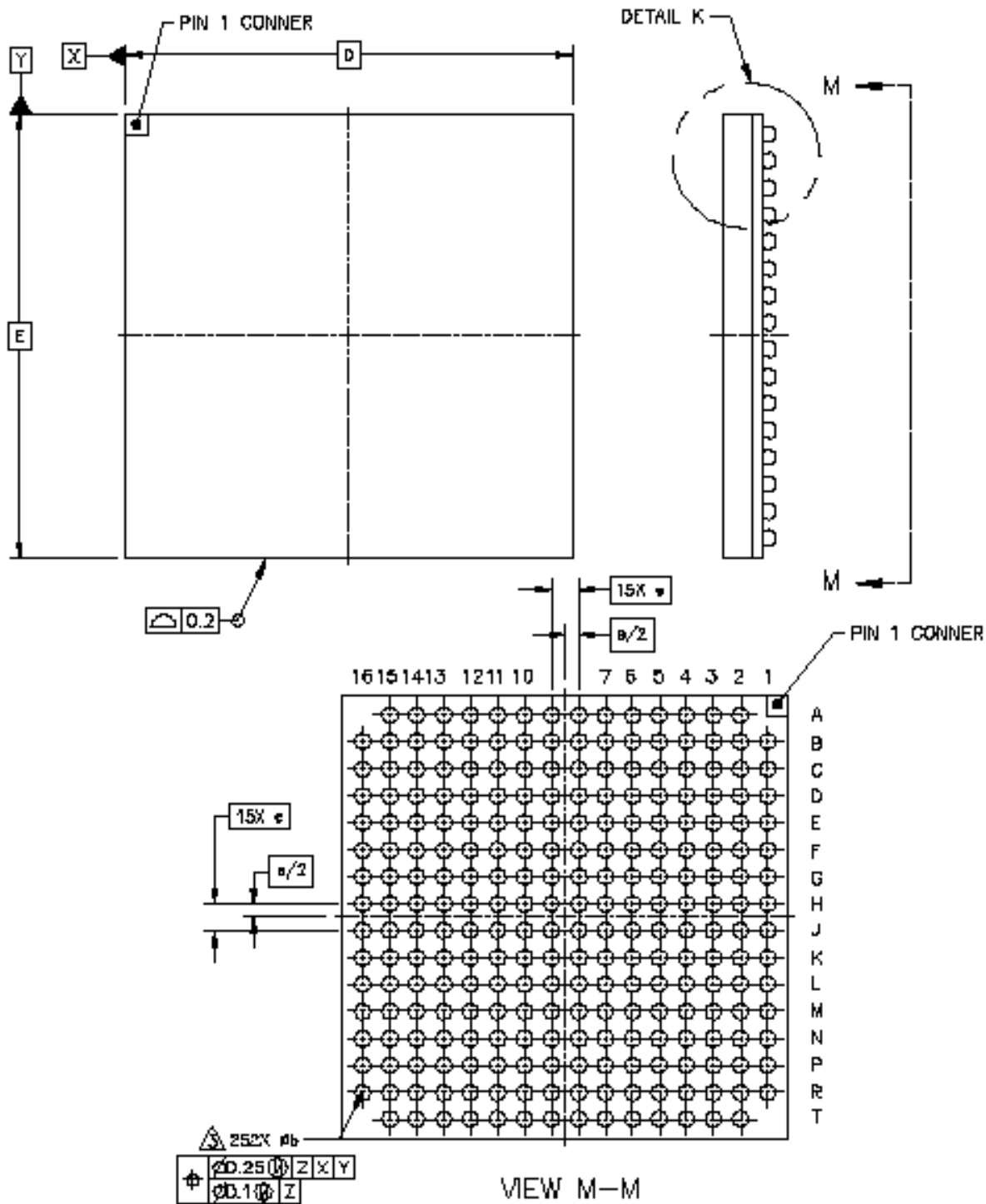
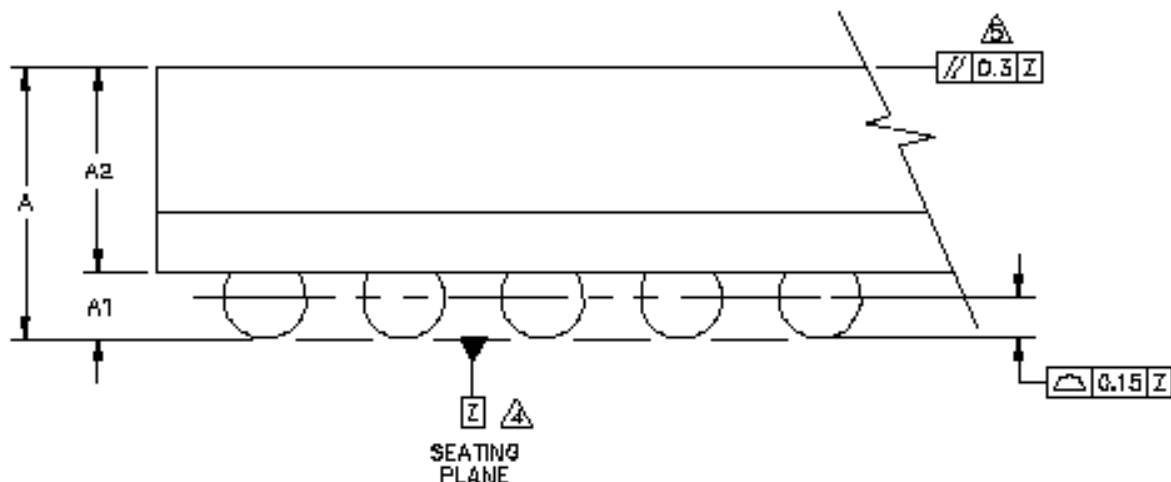


Figure 1. PBGA Mechanical Outline 1



DETAIL K

MIN	MAX	NOTES
1.6	1.9	1. DIMENSIONS ARE IN MILLIMETERS.
0.5	0.7	2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
1.16 REF		
0.6	0.9	<p> DIMENSION b IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO DATUM PLANE Z.</p> <p> DATUM Z IS DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.</p> <p> PARALLELISM MEASUREMENT SHALL EXCLUDE ANY EFFECT OF MARK ON TOP SURFACE OF PACKAGE.</p>
21 BSC		
21 BSC		
1.27 BSC		

Figure 2. PBGA Mechanical Outline 2

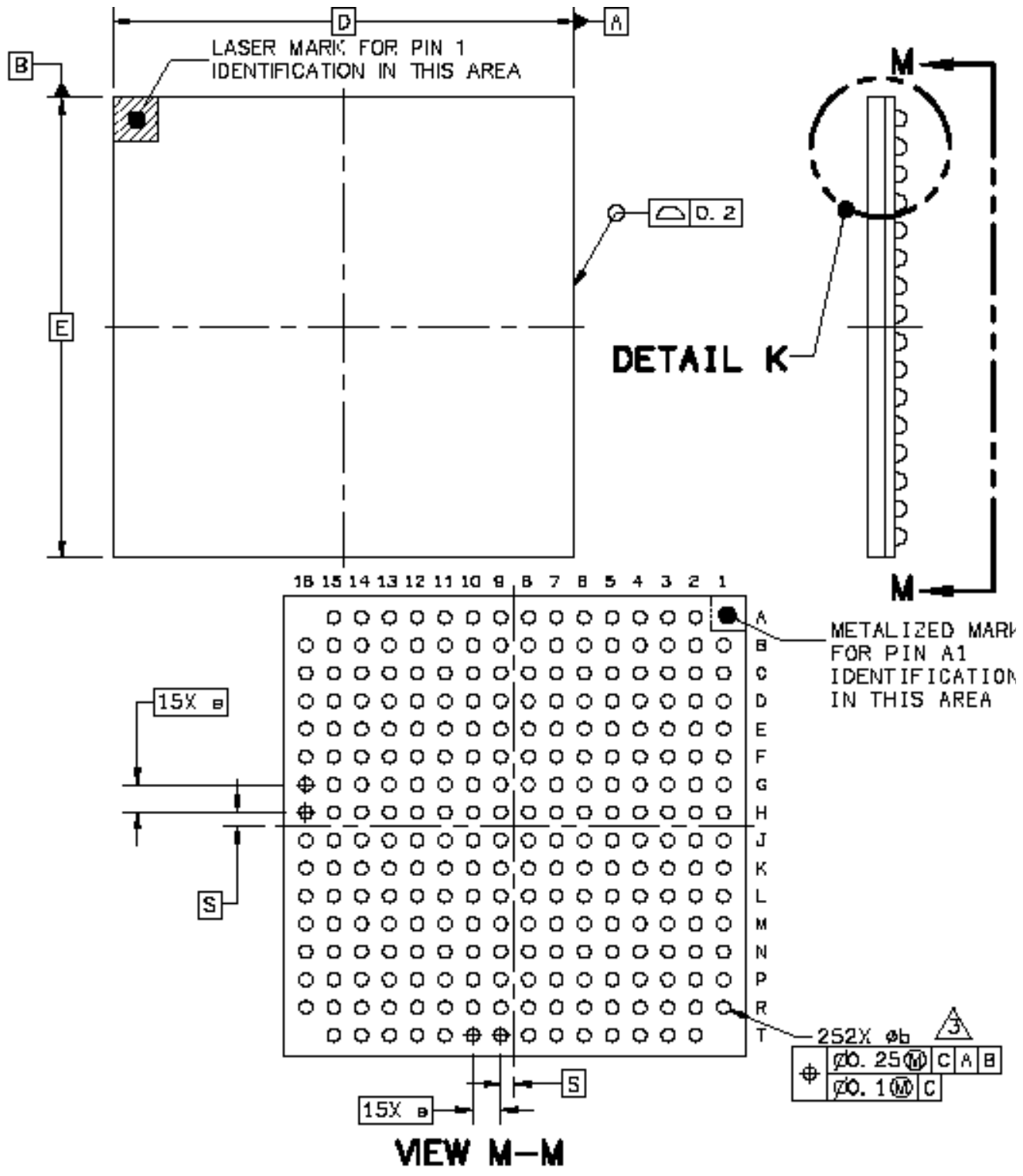
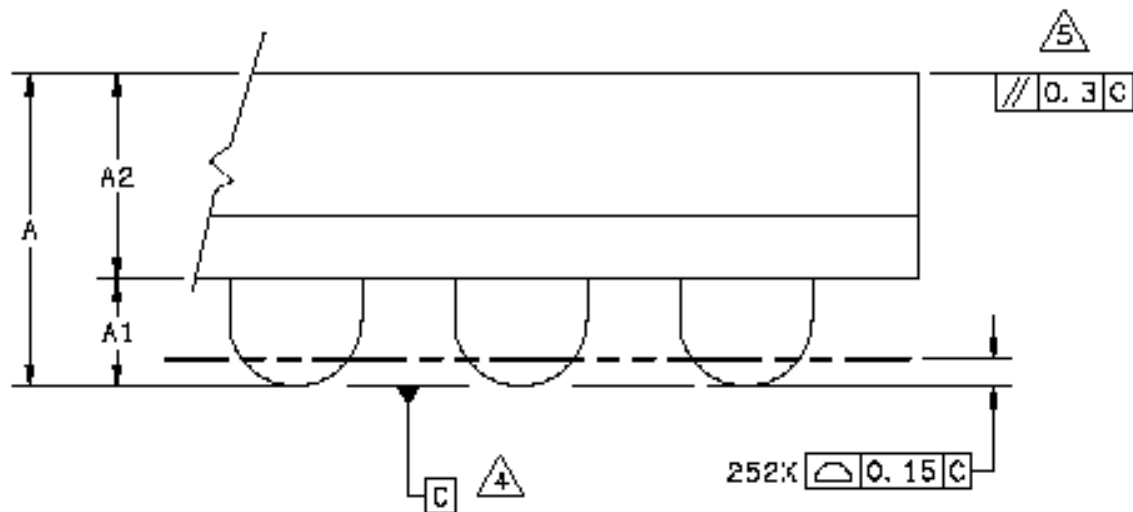


Figure 3. MAP Mechanical Outline 3



DETAIL K
ROTATED 90° CLOCKWISE

MIN	MAX	NOTES
---	1.9	1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
0.5	0.7	
1.16 REF		2. DIMENSIONS IN MILLIMETERS.
0.8	0.9	
21 BSC		3. DIMENSION b IS THE MAXIMUM SOLDER BALL DIAMETER MEASURED PARALLEL TO DATUM C.
21 BSC		
1.27 BSC		4. DATUM C THE SEATING PLANE, IS DETERMINED BY SPHERICAL CROWNS OF THE SOLDER BALLS.
0.635 BSC		
		5. PARALLELISM REQUIREMENT SHALL EXCLUDE ANY EFFECT OF MARKING ON TOP SURFACE.

Figure 4. MAP Mechanical Outline 4

4 Die Changes

There are no changes to the die used in the MAP-BGA package. Identical wafers are used for both MAP-BGA and PBGA packages.

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