

JEDEC DESIGN STANDARD

DESIGN REQUIREMENTS FOR OUTLINES OF SOLID STATE AND RELATED PRODUCTS

JEDEC PUBLICATION 95

DESIGN GUIDE 4.17

**BGA (Ball Grid Array) Package
Measuring and Methodology**

**JEDEC
SOLID STATE TECHNOLOGY ASSOCIATION**

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BGA (BALL GRID ARRAY) PACKAGE MEASURING AND METHODOLOGY

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4.17.1 INTRODUCTION:

External dimensions of BGA packages are specified in the design guide and the individual standard. However, the specified external dimensions have been measured in a variety of methods by different companies and individuals. As a result, there were some differences between the semiconductor manufacturers and the end users. Furthermore, there are some dimensions in the design guide that are very difficult to measure. This guideline was created to clear and to standardize the measuring method for BGA packages.

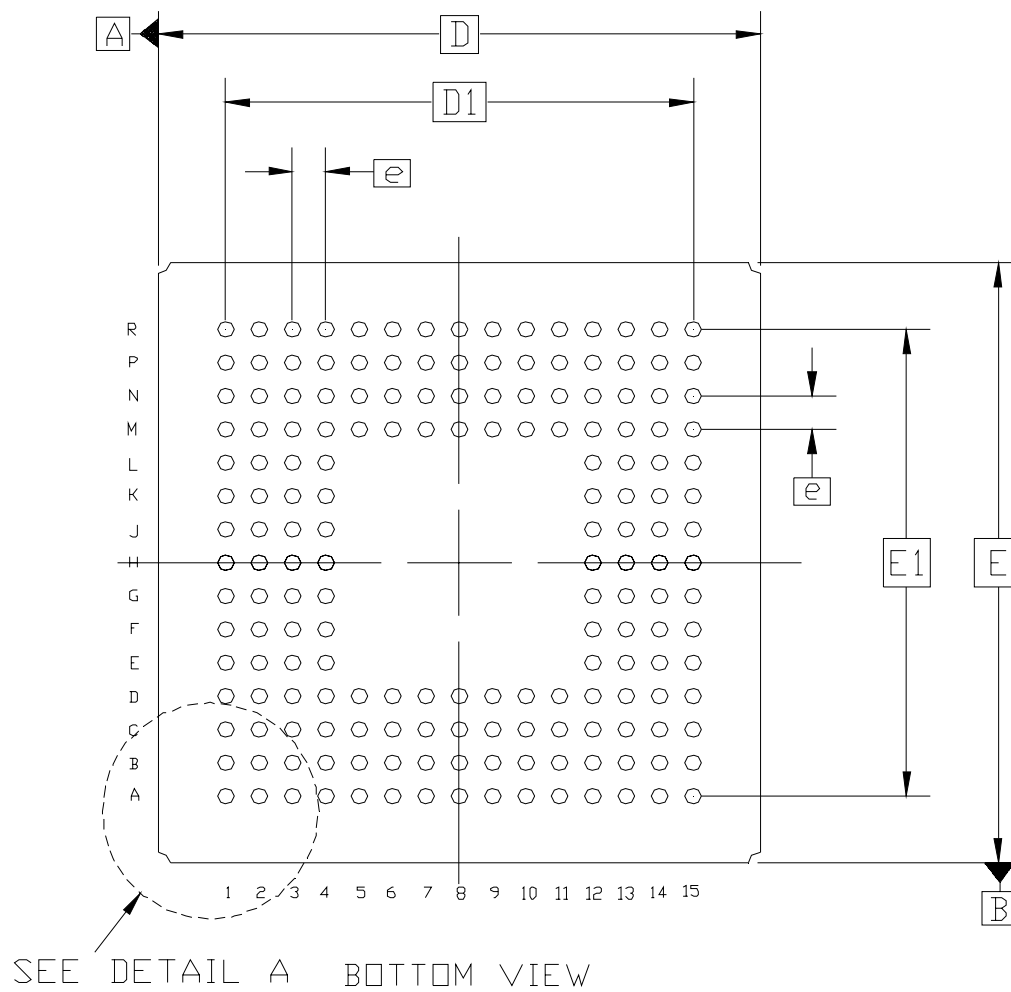


Figure 4.17-1

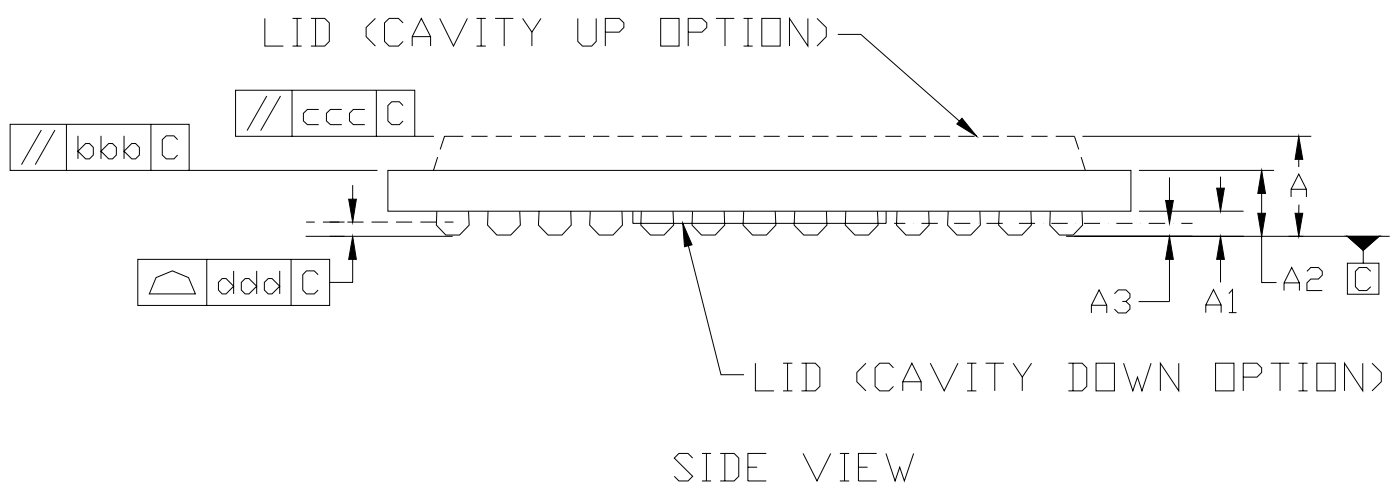


Figure 4.17-2

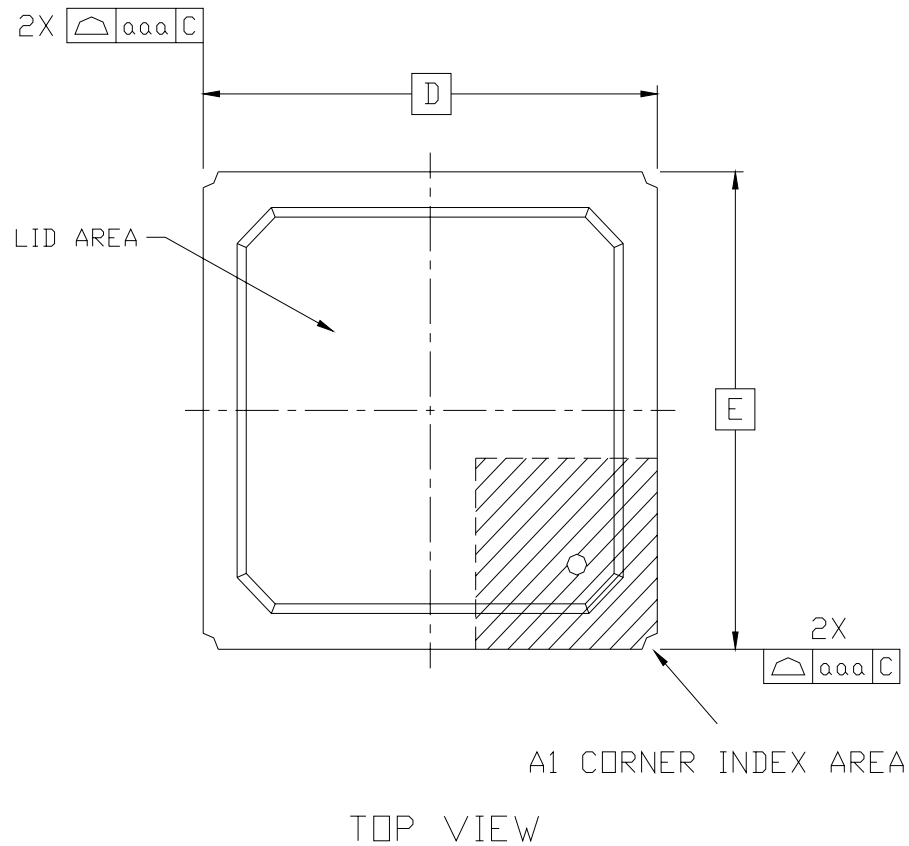
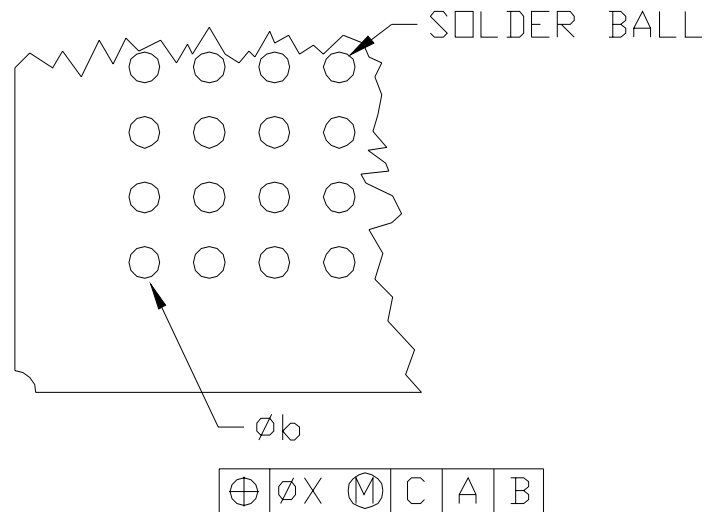


Figure 4.17-3



DETAIL "A"

Figure 4.17-4

BGA (Ball Grid Array) Package Measuring Methodology

4.17.2 Scope

Definition of methodology employed in the measuring of BGA packages.

4.17.3 Purpose and Justification

The purpose of this proposal is to unify the methodologies employed in the mechanical verification of the BGA packages. The methodologies proposed herein are justified as applicable both to automated imaging/measuring systems and simple gauge block systems used in industries that use BGA packages.

This proposal offers suggestions that are in the interest of the package manufacturing, IC test, assembly manufacturing, and consumer industries that use BGA packages. The suggestions do not concentrate on any particular aspect of the BGA applications realm, but instead concentrate on all employment of the packages.

The simplification of the mechanical verification methodologies assures that both the large scale user as well as the low volume user have equal ability to perform the needed tasks in order to verify that the BGA package meets all JEDEC specifications.

These measurements may be taken either manually or automatically. If a specified dimension is too difficult to measure unless the package is destroyed, it may be calculated from other dimensions.

4.17.4 Proposal

Establishing datum

Primary datum used as a measurement reference must first be established before subsequent parameter measurements can be determined. All datum references will be based on JEDEC standard nomenclature.

4.17.5 Secondary Datum (Datum A)

On the E sides of the package (see Fig. 4.17-1), a minimum of 4 points shall be selected (points 1-4) (see Fig. 4.17-5). Lines shall be drawn from these points (1-2 and 3-4). Datum A is the line that passes through the midpoints of these two lines (5 and 6).