

## **Altera Device Package Information**

04R-00233-2.0

### 324-Pin FineLine Ball-Grid Array (FBGA) - Wire Bond - A:1.90

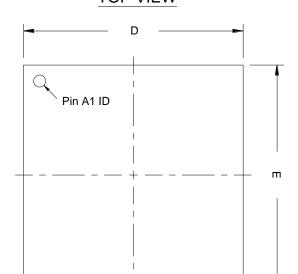
- All dimensions and tolerances conform to ASME Y14.5M 1994.
- Controlling dimension is in millimeters.
- Pin A1 may be indicated by an ID dot, or a special feature, in its proximity on package surface.

Package Information		
Description	Specification	
Ordering Code Reference	F	
Package Acronym	FBGA	
Substrate Material	ВТ	
Solder ball composition	Regular: 63Sn:37Pb (Typ.) Pb-free: Sn:3Ag:0.5Cu (Typ.)	
JEDEC Outline Reference	MS-034 Variation: AAG-1	
Lead Coplanarity	0.008 inch (0.20 mm)	
Weight	1.4 g (Typ.)	
Moisture Sensitivity Level	Printed on moisture barrier bag	

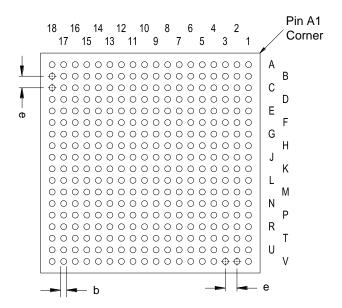
Symbol	Millimeters			
	Min.	Nom.	Max.	
Α	1.60	1.75	1.90	
A1	0.40	0.50	0.60	
A2	1.00	1.25	1.50	
A3	0.65	0.70	0.75	
D		19.00 BSC		
E		19.00 BSC		
b	0.50	0.60	0.70	
е		1.00 BSC		

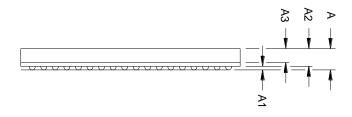
#### Package Outline

# TOP VIEW



### **BOTTOM VIEW**





#### **Document Revision History**

Table 1 shows the revision history for this document.

Table 1. Document Revision History

Date	Version	Changes
June 2011	1.0	Initial release
August 2014	2.0	Correct typo on JEDEC Outline Reference from "MO-034 Variation: AAG-1" to "MS-034 Variation: AAG-1"



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