

Altera Device Package Information

04R-00366-1.0

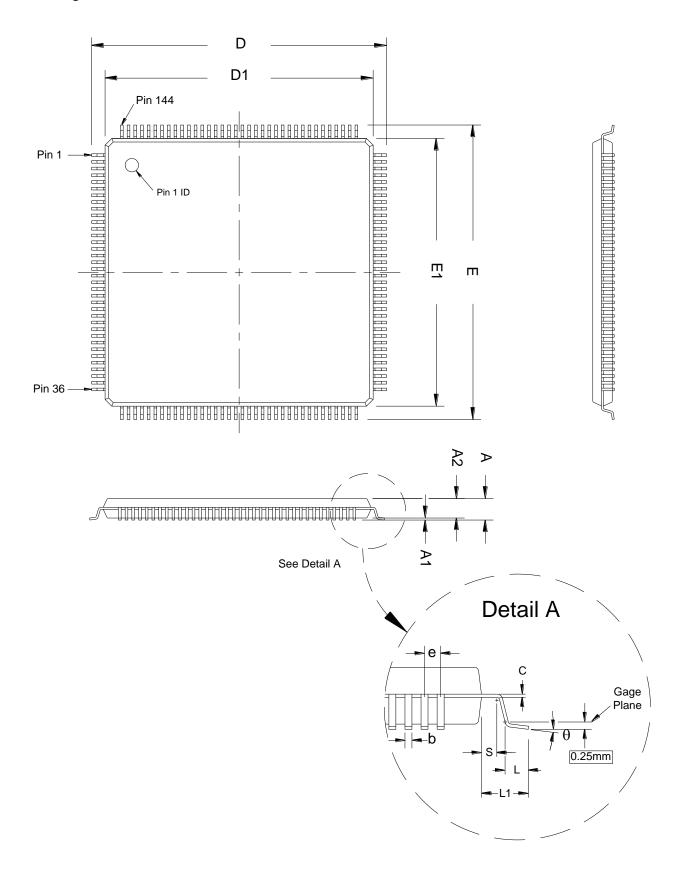
144-Pin Plastic Thin Quad Flat Pack (TQFP) - Wire Bond - A:1.60

- All dimensions and tolerances conform to ASME Y14.5M 1994.
- Controlling dimension is in millimeters.
- Pin 1 may be indicated by an ID dot, or a special feature, in its proximity on package surface.

Package Information		
Description	Specification	
Ordering Code Reference	Т	
Package Acronym	TQFP	
Substrate Material	Copper	
Lead Finish (plating)	Regular: 85Sn:15Pb (Typ.) Pb-free: Matte Sn	
JEDEC Outline Reference	MS-029 Variation: BFB	
Lead Coplanarity	0.003 inch (0.08 mm)	
Weight	1.0 g (Typ.)	
Moisture Sensitivity Level	Printed on moisture barrier bag	

Symbol	Millimeters			
	Min.	Nom.	Max.	
Α	1.40	1.50	1.60	
A1	0.05	0.10	0.15	
A2	1.35	1.40	1.45	
D	22.00 BSC			
D1	20.00 BSC			
E	22.00 BSC			
E1	20.00 BSC			
L	0.45	0.60	0.75	
L1	1.00 REF			
S	0.20	-	-	
b	0.17	0.22	0.27	
С	0.09	-	0.20	
е	0.50 BSC			
θ	0°	3.5°	7°	

Package Outline



Document Revision History

Table 1 shows the revision history for this document.

Table 1. Document Revision History

Date	Version	Changes
July 2011	1.0	Initial release



101 Innovation Drive San Jose, CA 95134 www.altera.com © 2011 Altera Corporation. All rights reserved. ALTERA, ARRIA, CYCLONE, HARDCOPY, MAX, MEGACORE, NIOS, QUARTUS and STRATIX are Reg. U.S. Pat. & Tm. Off. and/or trademarks of Altera Corporation in the U.S. and other countries. All other trademarks and service marks are the property of their respective holders as described at www.altera.com/common/legal.html. Altera warrants performance of its semiconductor products to current specifications in accordance with Altera's standard warranty, but reserves the right to make changes to any products and services at any time without notice. Altera assumes no responsibility or liability arising out of the application or use of any information, product, or service described herein except as expressly agreed to in writing by Altera. Altera customers are advised to obtain the latest version of device specifications before relying on any published information and before placing orders for products or services.