CCGA to CLGA Adapter Socket

Table of Contents

Introduction . . . 1
CG to LG Adapter Socket . . . 1
CG to LG Adapter Socket Assembly Procedure . . . 3
CG1272 to LG1272 Adapter Socket Outline Drawing . . . 6
Reflow Profile . . . 7
CCGA to LG1272 Adapter Pin Mapping List . . . 8
Prototyped Product, Adapter, and PCB Design Matrix . . . 8
Support . . . 8
List of Changes . . . 9

Introduction

RTAX-S/SL is next generation, designed-for-space, metal-to-metal antifuse field programmable gate array (FPGA) family by Microsemi. RTAX-S/SL is a derivative of the Axcelerator® family with up to two million-system gates. RTAX-S/SL FPGAs provide the designer with nearly 500K ASIC gates and embedded static RAM. Microsemi offers RTAX-S/SL devices in two package styles: the ceramic column grid array (CCGA or CG) and ceramic quad flat pack (CQFP or CQ).

Microsemi has developed prototyping methods for RTAX-S/SL devices in CCGA and CQFP packages, using the ceramic land grid array (LGA) package as a prototyping vehicle with the CQ to LG and CG to LG adapter sockets. This document describes the procedure for assembling the CG to LG adapter socket.

CG to LG Adapter Socket

The CG to LG adapter socket has an LG configuration on the top and a CG configuration on the bottom. The adapter socket enables customers to use an LG package during prototyping, and then switch to an equivalent CG package for production. There is one CG to LG adapter socket available. The top and bottom ordering part numbers are listed in Table 1.

Table 1 • **Adapter Socket Part Number**

Adapter Socket	Ordering Part Number	Prototyped and Prototype Device
CG1272 to LG1272	SK-RT4K-KITTOP SK-RT4K-CG1272-KITBTM	For prototyping RTAX4000S/SL-CG1272 using RTAX4000S/SL-LG1272 package

© 2012 Microsemi Corporation

Figure 1 shows the complete CG1272 to LG1272 assembly kit. SK-RT4K-KITTOP contains an interposer (3), a socket lid (4), and eight screws (5). SK-RT4K-CG1272-KITBTM contains a ceramic adapter (1), which is an unique adapter for RTAX4000S/SL, socket housing (2), and eight screws (5).

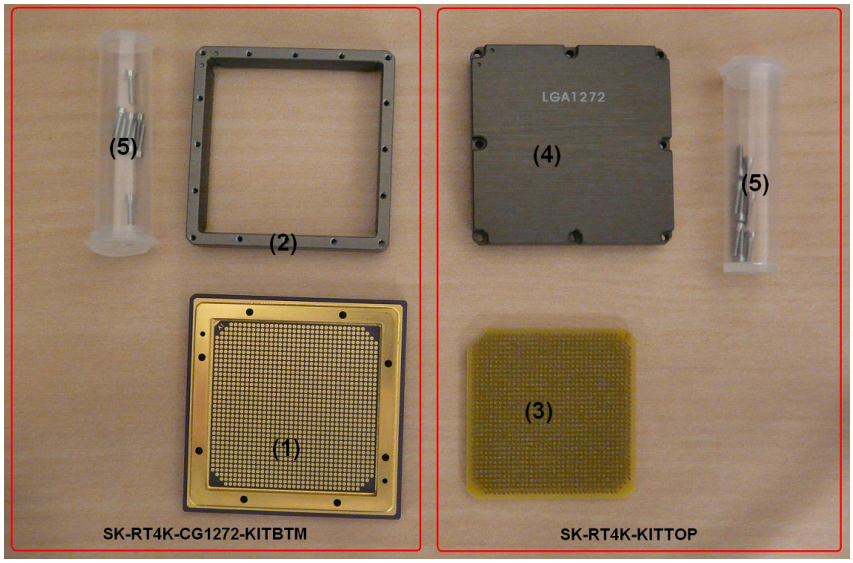

***Figure 1* • Parts of CG1272 to LG1272 Adapter Socket**
(1) Ceramic Adapter, (2) Socket Housing, (3) Socket Interposer, (4) Socket Lid, (5) Fixing Screws

Figure 2 shows the top view, bottom view, and orientation view of the RTAX4000S/SL CG1272 to LG1272 adapter.

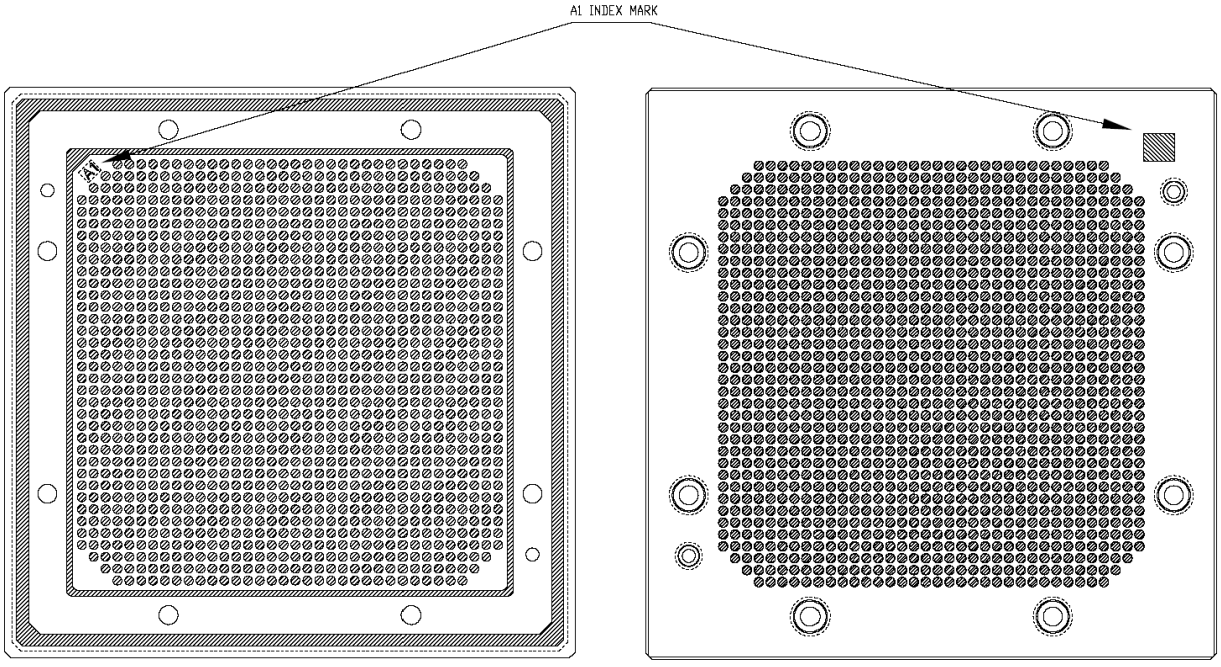

***Figure 2* • RTAX4000S/SL CG1272 to LG1272 Ceramic Adapter**
Top View, Bottom View and Orientation Drawing

CG to LG Adapter Socket Assembly Procedure

Step 1

Solder column attachment to ceramic adapter.

Note: Do not reflow the adapter to the circuit board until the housing has been attached, as detailed in Step 2 below.

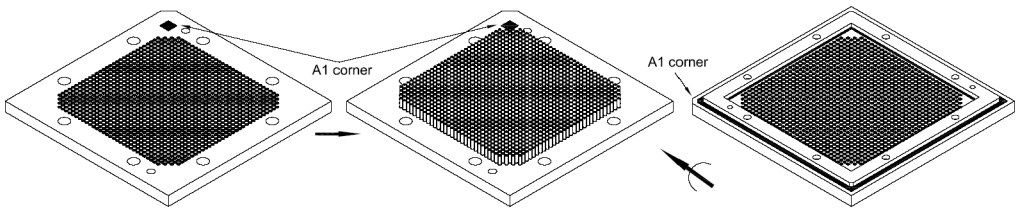

***Figure 3* • CG1272 to LG1272 Adapter Solder Column Attachment**

Step 2

Assemble socket housing to adapter. A torque limit screw driver is not required (Figure 4).

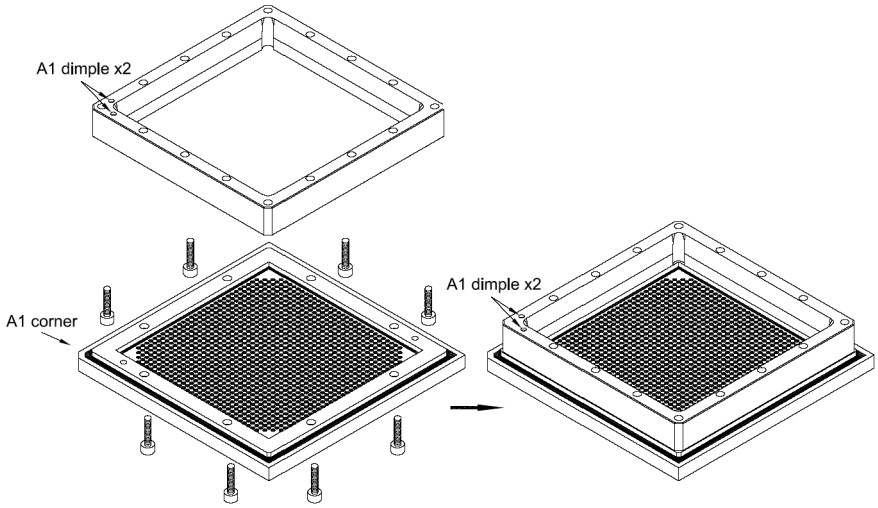

***Figure 4* • Assemble Socket Housing to CG1272 to LG1272 Adapter**

Note: The housing, eight screws, and ceramic adapter form the –KITBTM assembly.

Step 3

Reflow the adapter to the printed circuit board (PCB) as shown in (Figure 5).

Note: Since reflow profiles depend upon the size of the board and its components, perform reflow process optimization for better results.

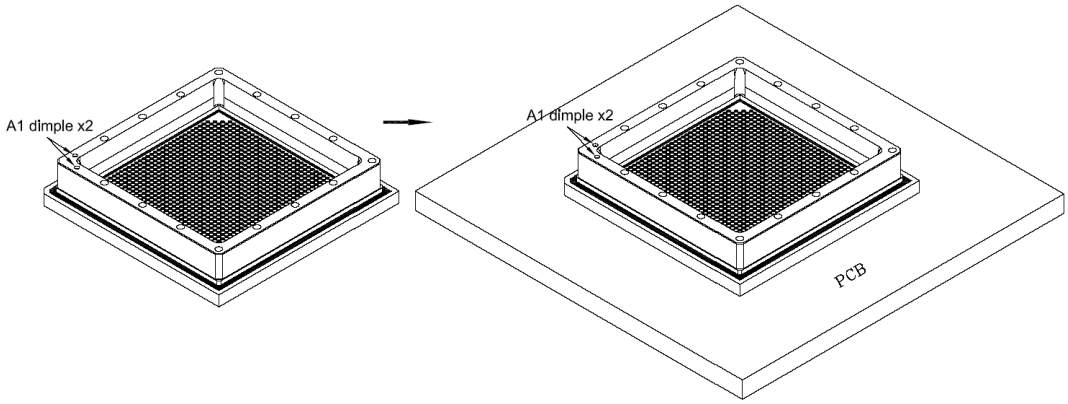

***Figure 5* • Reflow Adapter (with socket housing mounted) to PCB**

Step 4

Place the socket interposer into the adapter (Figure 6).

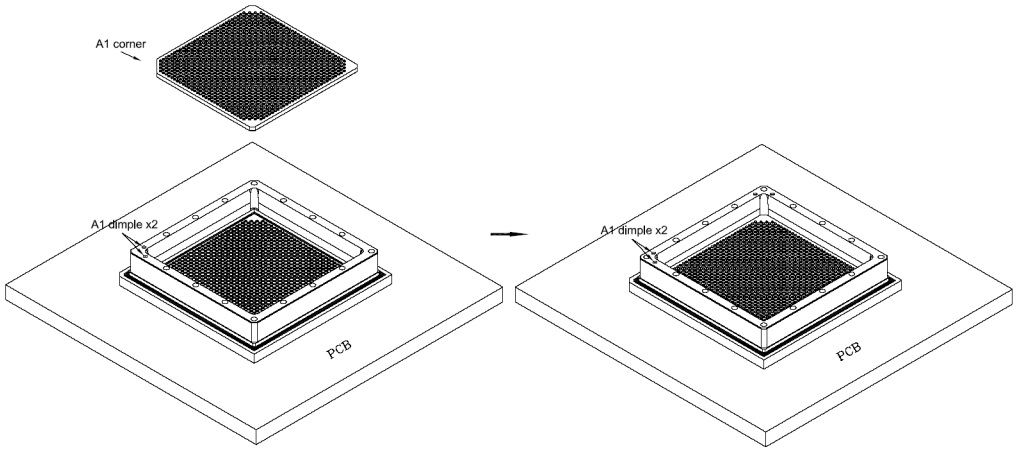

***Figure 6* • Place the Socket Interposer into Adapter Assembly**

Step 5

Place the LG1272 package into the adapter (Figure 7).

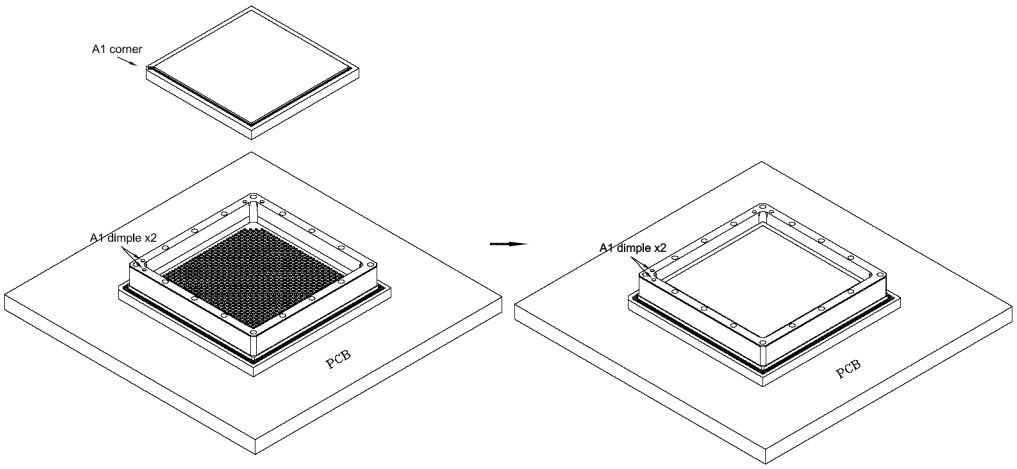

Figure 7 • **Place LG1272 Package into Adapter Assembly**

Step 6

Place and tighten the socket lid to the socket housing with the remaining eight screws (Figure 8). A torque limit screw diver is not required.

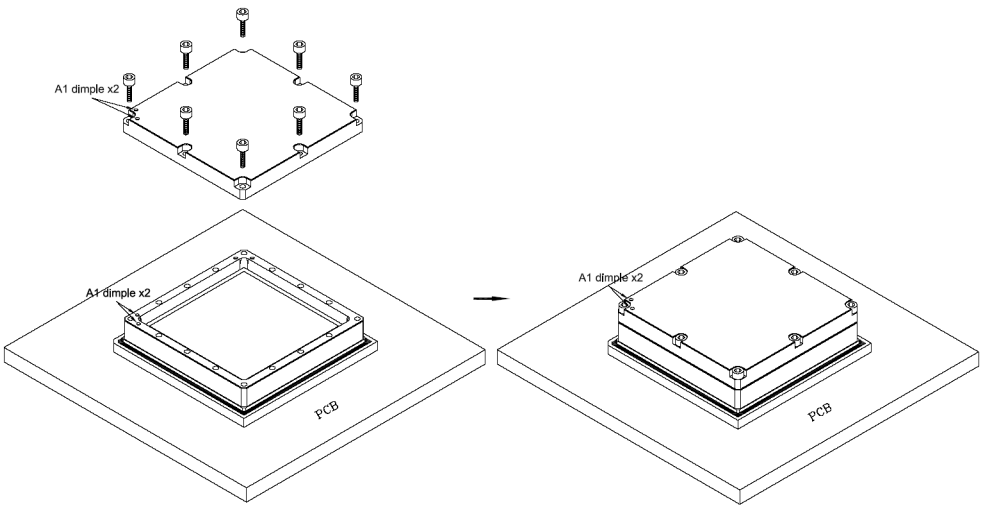

Figure 8 • **Place and Tighten Socket Lid Using Eight Screws and Optional Alignment Pins**

CG1272 to LG1272 Adapter Socket Outline Drawing

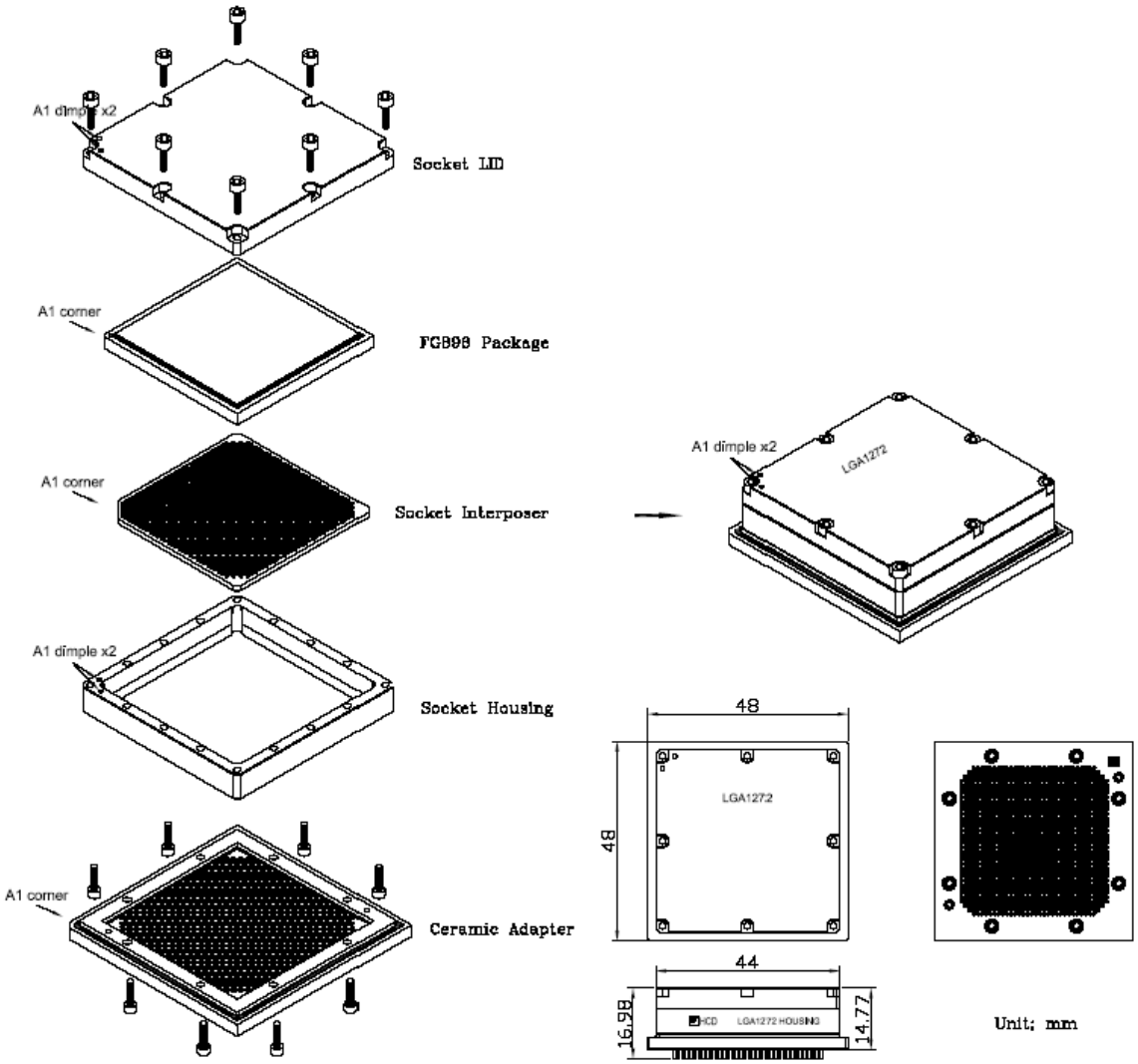

***Figure 9* • CG1272 to LG1272 Adapter Socket Outline Drawing (unit: mm)**

Reflow Profile

Since reflow profile depends upon the size of the board and other components, end users should perform additional fine tuning from the general profile, as shown in Figure 10.

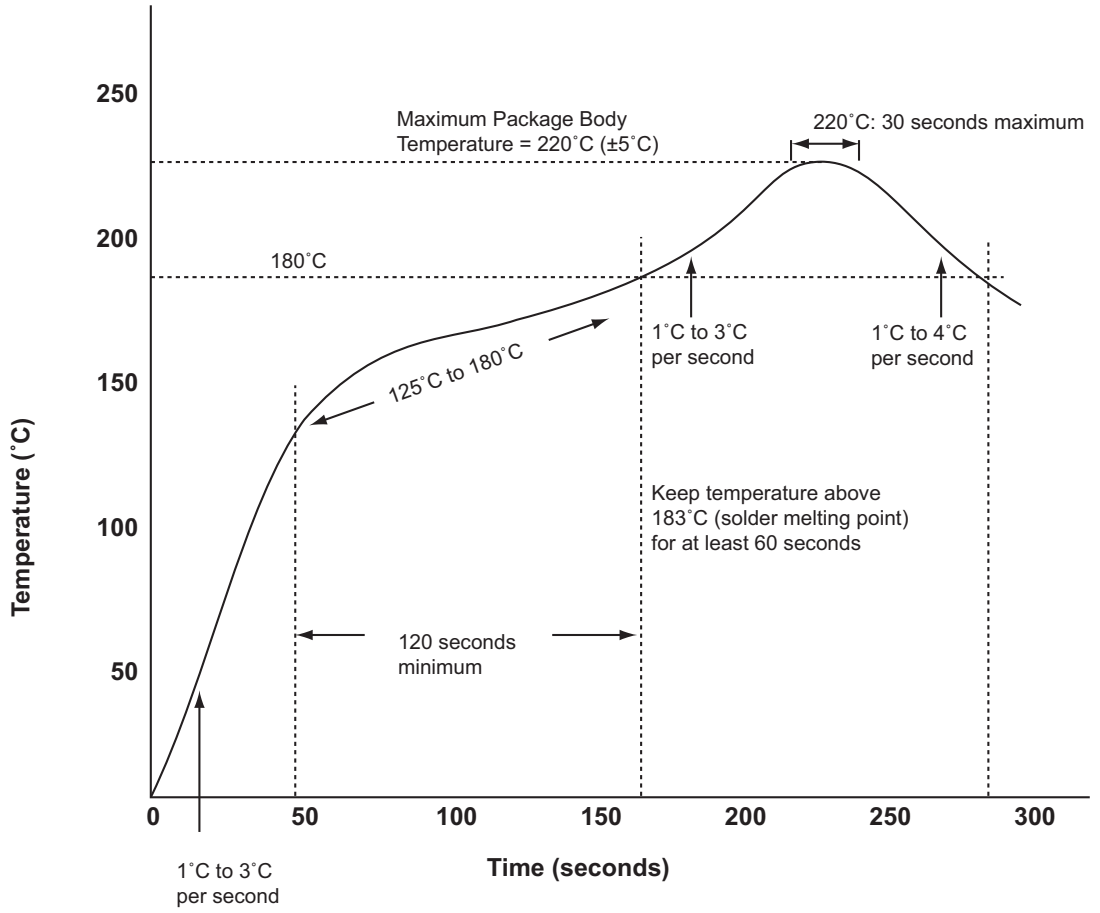

***Figure 10* • Sample Temperature Profile for I/R or Convection Reflow**

Note: This temperature profile guideline is for reference only.

CCGA to LG1272 Adapter Pin Mapping List

The CG1272 to LG1272 adapter is same number pad connection routing. For example, LG1272 A1 connects to CG1272 A1, LG1272 A2 connects to CG1272 A2, and so on.

Table 2 • **CCGA to LG1272 Adapter Pin Mapping List**

Adapter Socket	Ordering Part Number	Prototyped and Prototype Device	Adapter Pin Mapping List Document Number
CG1272 to LG1272	SK-RT4K-KITTOP and SK-RT4K-CG1272-KITBTM	For prototyping RTAX4000S/SL-CG1272 using RTAX4000S/SL-LG1272 package	N/A

Prototyped Product, Adapter, and PCB Design Matrix

Designing the PCB for a specific product requires an understanding of which adapter socket will work. Each adapter socket is routed differently based on the corresponding Axcelerator device (or its radiation-tolerant equivalent derivative that is being prototyped) and the commercial Axcelerator FG package used for prototyping. Table 3 shows the combinations that will work.

Table 3 • **Prototyped Product, Adapter, and PCB Design Matrix**

Prototyped Product	Adapter Part Number	Prototype Vehicle	PCB Design
RTAX4000S/SL-CG1272	SK-RT4K-KITTOP and SK-RT4K-CG1272-KITBTM	RTAX4000S/SL-LG1272	RTAX4000S/SL-CG1272

Support

Visit Technical Support online at www.microsemi.com/soc/kb/search.aspx.

Technical Support

For Technical Support, email at soc_tech@microsemi.com.

From North America, call 800.262.1060.

From the rest of the world, call 650.318.4460.

ITAR Technical Support

For technical support on RH and RT FPGAs that are regulated by International Traffic in Arms Regulations (ITAR), contact via web (Select Yes in the ITAR drop-down list), phone, or email at www.microsemi.com/soc/mycases.

For ITAR Technical Support, email at soc_tech_itar@microsemi.com.

From North America, call 888.988.ITAR.

From the rest of the world, call 650.318.4900.

List of Changes

The following table lists critical changes that were made in the current version of the document.

Revision	Changes	Page
Revision 2 (October 2012)	Updated Figure Title for Figure 1 (SAR 41789).	2
	Updated "Support" section.	8
Revision 1 (August 2010)	In the "Introduction" section, the phrase "with error detection and correction (EDAC) protected" [static RAM] was deleted and replaced with "embedded."	1
	The following figures were replaced:	
	Figure 1 • Parts of CG1272 to LG1272 Adapter Socket	2
	Figure 2 • RTAX4000S/SL CG1272 to LG1272 Ceramic Adapter	2
	Figure 5 • Reflow Adapter (with socket housing mounted) to PCB	4
	Figure 9 • CG1272 to LG1272 Adapter Socket Outline Drawing (unit: mm)	6

Microsemi Corporate Headquarters
One Enterprise, Aliso Viejo CA 92656 USA
Within the USA: +1 (949) 380-6100
Sales: +1 (949) 380-6136
Fax: +1 (949) 215-4996

Microsemi Corporation (NASDAQ: MSCC) offers a comprehensive portfolio of semiconductor solutions for: aerospace, defense and security; enterprise and communications; and industrial and alternative energy markets. Products include high-performance, high-reliability analog and RF devices, mixed signal and RF integrated circuits, customizable SoCs, FPGAs, and complete subsystems. Microsemi is headquartered in Aliso Viejo, Calif. Learn more at **www.microsemi.com**.

© 2012 Microsemi Corporation. All rights reserved. Microsemi and the Microsemi logo are trademarks of Microsemi Corporation. All other trademarks and service marks are the property of their respective owners.

51900209-2/10.12