

# **Wire-bonded BGA Package Substrate Core Source Addition**

## ***Qualification Report***

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## Revision History

The following table shows the revision history for this document.

Date	Version	Revision
07/22/11	1.0	Initial Xilinx release.
07/26/11	1.0.1	Changed substrate core supplier for packages CSG484 and FGG676 from Nanya to Hitachi, deleted devices XC3S200AN, XC3S200AN, and XC3S700A in <a href="#">Table 1</a> . Changed qualification vehicle XC3S400A/FTG484 to XC3S400A/FTG256 in <a href="#">Table 2</a> and <a href="#">Table 3</a> .

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# *Wire-bonded BGA Package Substrate Core Source Addition Qualification Report*

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## Overview

This report summarizes the reliability test results that were performed to qualify the alternate sources of package substrate cores on Xilinx's Wire-bonded BGA packages.

## Qualification Objective

The objective of this qualification report is to provide the reliability stress qualification data on selected Xilinx wire-bonded BGA packages assembled at both our assembly suppliers, SPIL and AMKOR, with substrate cores sourced from three new suppliers; namely Nanya, Hitachi and Doosan.

## Qualification Plan

Selected reliability stress tests for qualification were run on Xilinx wire-bonded BGA packages specifically selected as qualification vehicles based on package type, package size, pin count, substrate core suppliers, and known reliability risk factors.

[Table 1](#) provides a summary of the Qualification Plan which includes the selected reliability tests on the selected Qualification Vehicles, as well as the substrate core suppliers.

## Reliability Test Conditions and Results

[Table 2](#) through [Table 4](#) provide a summary of reliability testing results and the environmental stress conditions.

Based on the data gathered to date, the new sources of substrate cores have demonstrated a satisfactory result and meet the qualification requirements for release to wire-bonded BGA package production assembly.

Table 1: Qualification Plan Summary

Xilinx Device	Package	Assembly Supplier	Substrate Core Supplier	Precondition	Temperature Cycling 'C' Condition (T/C-C)	Highly Accelerated Stress Test (HAST)	Unbiased Accelerated Stress Test (UHAST)
XC2V3000	FGG676	SPIL	Nanya	X	X		
XC3S1200E	FTG256	SPIL	Nanya	X	X		
XC6SLX45T	FGG484	SPIL	Nanya	X		X	
XC6SLX16	CSG324	SPIL	Nanya	X		X	
XC3SD3400A	CSG484	SPIL	Hitachi	X	X	X	
XC3S1400A	FGG676	SPIL	Hitachi	X	X	X	
XC3S400A	FTG256	AMKOR	Doosan	X	X	X	
XC2S150	FGG456	AMKOR	Doosan	X	X		X

Table 2: Reliability Test Conditions and Results

Reliability Test	Test Conditions	Qualification Vehicle	Xilinx Lot Number	Sample Size	Result	Conclusion
HAST	130°C, 85%RH, 230KPa, Bias at V <sub>CCMAX</sub>	XC6SLX45T/ FGG484	20606	77 units x 1 lot	0/77	Pass
		XC6SLX16/ CSG324	20607	77 units x 1 lot	0/77	Pass
		XC3SD3400A/ CSG484	20608	77 units x 1 lot	0/77	Pass
		XC3S1400A/ FGG676	20609	77 units x 1 lot	0/77	Pass
		XC3S400A/ FTG256	20628	77 units x 1 lot	0/77	Pass

**Table 3: Reliability Test Conditions and Results**

Reliability Test	Test Conditions	Qualification Vehicle	Xilinx Lot Number	Sample Size	T/C-C 250 Cycles	T/C-C 500 Cycles	Conclusion
T/C-C	-65°C to 150°C	XC2V3000/ FGG676	20603	77 units x 1 lot	0/77	0/77	Pass
		XC3S1200E/ FTG256	20604	77 units x 1 lot	0/77	0/77	Pass
		XC3SD3400A/ CSG484	20608	77 units x 1 lot	0/77	0/77	Pass
		XC3S1400A/ FGG676	20609	77 units x 1 lot	0/77	0/77	Pass
		XC3S400A/ FTG256	20628	77 units x 1 lot	0/77	0/77	Pass
		XC2S150/ FGG456	20653	77 units x 1 lot	0/77	0/77	Pass

**Table 4: Reliability Test Conditions and Results**

Reliability Test	Test Conditions	Qualification Vehicle	Xilinx Lot Number	Sample Size	Result	Conclusion
UHAST	130°C, 85%RH, 230KPa, Unbiased	XC2S150/ FGG456	20653	77 units x 1 lot	0/77	Pass

