



# Process Change Notice #1211021

## User Registration

Register today to create your account on Silabs.com. Your personalized profile allows you to receive technical document updates, new product announcements, "how-to" and design documents, product change notices (PCN) and other valuable content available only to registered users. <http://www.silabs.com/profile>

<b>PCN Date:</b> 11/2/2012		<b>Effective Date:</b> 2/7/2013																			
<b>Title:</b> SL28X_48QFN6x6_Assembly_&_Test_Site_Change_UTACTH																					
<b>Originator:</b> Jimmy Ma		<b>Phone:</b> (408) 702-1322	<b>Dept:</b> Marketing																		
<b>Customer Contact:</b> Kathy Haggar		<b>Phone:</b> (512) 5325261	<b>Dept:</b> Sales																		
<b>PCN Type:</b> <input type="checkbox"/> Datasheet <input type="checkbox"/> Foundry <input type="checkbox"/> Packing <input type="checkbox"/> Product Revision <input checked="" type="checkbox"/> Assembly <input type="checkbox"/> Labeling <input type="checkbox"/> Discontinuance <input checked="" type="checkbox"/> Test <input type="checkbox"/> Other																					
<b>Last Order Date:</b> 2/7/2013																					
<b>PCN Details</b>																					
<b>Description of Change:</b> <p>Silicon Laboratories, Inc (Silicon Labs) is pleased to announce the successful qualification of United Test and Assembly Center Ltd, Thailand (UTAC-TH) as a new assembly site and test site for the 48-QFN-6x6, SL28X silicon clock product family with copper-palladium wire. Silicon Laboratories has proactively invested in copper-palladium bond wire process to insulate customers from the impact of escalating gold prices. To date, Silicon Laboratories has been absorbing gold related cost adders.</p> <p>UTAC-TH is an existing assembly site and test site for Silicon Labs and is certified and registered to ISO9001, ISO14001, ISO/TS16949 and is a Sony Green Partner. UTAC-TH is part of the UTAC Group.</p> <p>1. Assembly Site Change:          The qualified supplier employing Copper-Palladium (CuPd) wire for the SL28X part family packaged in the 48-pin QFN-6x6 is United Test and Assembly Center Ltd. (UTAC-TH) in Thailand.</p> <p>Qualified Bills-of-Material:</p> <table border="1"> <thead> <tr> <th>Supplier</th> <th>MHT (Existing)</th> <th>UTAC-TH (Replacing)</th> </tr> </thead> <tbody> <tr> <td><b>Leadframe</b></td> <td>C194-PPF</td> <td>C194-PPF</td> </tr> <tr> <td><b>Die Attach</b></td> <td>Hitachi EN-4900GC</td> <td>Ablebond 8600</td> </tr> <tr> <td><b>Wire bond</b></td> <td>0.8 mil AU wire</td> <td>0.8 mil CUPd wire</td> </tr> <tr> <td><b>Mold Compound</b></td> <td>SUMITOMO G770 series</td> <td>SUMITOMO G770 series</td> </tr> <tr> <td><b>Lead finish</b></td> <td>NiPdAu PPF</td> <td>NiPdAu PPF</td> </tr> </tbody> </table> <p>2. Test Site Change:          UTAC-TH is an existing test site for Silicon Laboratories uses the same testing equipment and hardware and test programs used at all other Silicon Labs' approved sites in the Thailand location for the SL28X Silicon Clocks.</p> <p><b>Reason for Change:</b>          Move to Copper-Palladium wire and site change for sustainability, supplier diversity and flexibility, and in providing supply continuation to mitigate the increasing gold prices.</p>				Supplier	MHT (Existing)	UTAC-TH (Replacing)	<b>Leadframe</b>	C194-PPF	C194-PPF	<b>Die Attach</b>	Hitachi EN-4900GC	Ablebond 8600	<b>Wire bond</b>	0.8 mil AU wire	0.8 mil CUPd wire	<b>Mold Compound</b>	SUMITOMO G770 series	SUMITOMO G770 series	<b>Lead finish</b>	NiPdAu PPF	NiPdAu PPF
Supplier	MHT (Existing)	UTAC-TH (Replacing)																			
<b>Leadframe</b>	C194-PPF	C194-PPF																			
<b>Die Attach</b>	Hitachi EN-4900GC	Ablebond 8600																			
<b>Wire bond</b>	0.8 mil AU wire	0.8 mil CUPd wire																			
<b>Mold Compound</b>	SUMITOMO G770 series	SUMITOMO G770 series																			
<b>Lead finish</b>	NiPdAu PPF	NiPdAu PPF																			

**Impact on Form, Fit, Function, Quality, Reliability:**

There is no impact on form, fit, function, quality or reliability. The SL28X Silicon Clocks manufactured/assembled or tested at UTAC-TH will fully comply with datasheet parameters and quality levels.

Products using CuPd wire meet all Moisture Sensitivity Level (MSL) specifications and are a direct replacement for the existing 48-QFN-6x6 package. There are no changes to the mechanical specifications or drawings. Products using CuPd wire meet all RoHS requirements where applicable.

**Product Identification:**

Ordering Part Number
SL28610BLC
SL28610BLI
SL28775BLC
SL28EB636ALC
SL28EB717ALI
SL28EB720ALC
SL28EB721ALC
SL28EB731ALC
SL28EB735ALC
SL28EB797ALI
SL28PCIE19ALC
SL28PCIE19ALI
SL28PCIE50ALC
SL28PCIE50ALI

**Last Date of Unchanged Product: 2/7/2013**

**Qualification Samples:**

Samples are available now. Please contact your local Silicon Laboratories sales representative to order samples. A list of Authorized representatives may be found at [www.silabs.com](http://www.silabs.com)



# Process Change Notice #1211021

**Customer Early Acceptance Sign Off:**

Customers may approve early PCN acceptance by completing the information below:

Early Acceptance:    Date: \_\_\_\_\_

   Name: \_\_\_\_\_

   Company: \_\_\_\_\_

Email your early Acceptance approval to: [katherine.haggard@silabs.com](mailto:katherine.haggard@silabs.com)

**Qualification Data:**

See detailed Assembly report in Appendix A, detailed Test report in Appendix B, and test summary below.

- 1. Package Covered: 48QFN  
    Part Numbers Covered: Si52147 / Si53159 / Si52131  
    Die Families Covered: Si52000/ Si53000  
    Test Vehicle: Si52147A01AGM

Qualification Tests	Test Golden Units	Test Known Good Correlation Units	Test Rejected Correlation Units	Test Qualification Lot(s)
<b>Passing Criteria</b>	All Must Pass	All Must Pass	All Must Fail	100% Retest of Good Devices. All must pass
<b>Results</b>	Pass	Pass	Pass	Pass

Appendix A - Assembly Qualification

**SL28xxxx Qualification Report**



W7101F1 Product Qualification Plan and Report Rev. D

The information contained in this document is PROPRIETARY to Silicon Laboratories, Inc. and shall not be reproduced or used in part or whole without Silicon Laboratories' written consent. The document is uncontrolled if printed or electronically saved.

Part Rev SL28xxxx QFN-48-6x6 (PK701), UTL Assembly							
Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
<b>Test Group A - Accelerated Environment Stress Tests</b>							
Moisture/Reflow Sensitivity	JA113 Reflow 3x @260°C, 22 pc CSAM per qual	3 lots, N=>22	Q32393	0/28			
			Q31941	0/28		3 lots	
			Q31949	0/28		0/84	Pass
HAST	JA110 130°C, 85%RH Vcc=3.465, 96 hours	3 lots, N=>25	Q31950	0/80			
			Q32396	0/80		3 lots	
			Q32397	0/80		0/240	Pass
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q31951	0/28			
			Q31943	0/28		3 lots	
			Q31959	0/28		0/84	Pass
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q31960	0/28			
			Q31952	0/28		3 lots	
			Q31944	0/28		0/84	Pass
<b>Test Group C - Package Assembly Integrity Tests</b>							
Wire Bond Shear	JB116	5 units, N=>30	Q31947	0/10			
			Q31955	0/10		3 lots	
			Q31963	0/10		0/40	Pass
Wire Bond Pull	M2011	5 units, N=>30	Q31946	0/10			
			Q31954	0/10		3 lots	
			Q31962	0/10		0/40	Pass
Physical Dimensions	JB100	3 lots, N=>10	Q31945	0/10			
			Q31953	0/10		3 lots	
			Q31961	0/10		0/40	Pass
Solderability	JB102	3 lots, 15 leads	Q31948	0/10			
			Q31956	0/10		3 lots	
			Q31964	0/10		0/40	Pass

Notes:

- 1.Devices subjected to moisture preconditioning at MSL2 @260C
- 2.SL28775BLC used as qualification vehicle

This report applies to the following part numbers:			
SL28610BLC	SL28610BLI	SL28755BLC	SL28EB636ALC
SL28EB717ALI	SL28EB720ALC	SL28EB721ALC	SL28EB731ALC
SL287EB735ALC	SL28EB797ALI	SL28PCIE19ALC	SL28PCIE19ALI
SL28PCIE50ALC	SL28PCIE50ALI		

## Appendix B - Test Qualification

Date: Dec 27, 2011

Evaluation of the test capabilities at UTL

Device: SI52147

### Executive Summary

In order to implement the test capability for the SI52147 device, an evaluation of the UTL Test Facility in Thailand was performed.

One load board for SI52147 device which was being used to test Engineering lots at ITC was shipped to UTL.

The UTL facility utilized identical test equipment OSC50 Tester an identical handler NS8080 and identical production test software. This allowed direct comparison of test data results from devices tested at both facilities.

After comparing the test data from devices tested at UTL, the Test/Product Engineer recommends the acceptance of UTL to test the SI52147 family of devices.

### Background

In order to implement the test capacity for the SI52147, an evaluation was performed at UTL. The goal was to evaluate UTL ability to test the following device for Silicon Labs:

- SI52147 rev. A

To prove UTL ability to test this device, four different correlations were performed:

1. At UTL, 16 Golden Units (defined as Bin 1 devices taken from raw stock) were used. Note that the loadboards utilize single site testing.
  - The load board was shipped to UTL from OSEP.
  - The Golden Units were tested at UTL using test program version A.
  - The Golden Units were tested at 90deg.
  - Data logs from these tests were collected and the devices pass datasheet limits
2. At UTL, 65 Reject Correlation Units (defined as devices taken from production reject tubes of raw stock) were tested in at 90 deg.
  - The devices were selected from a large pool of rejects to ensure that they covered all of the major tests performed on the device.
  - The Reject Correlation Units from raw stock were tested at UTL with the production test condition for the device and with test program version A. A NS8080 handler operating at the production test temperature was used to test the devices.
  - All the rejects failed.
3. 100 Good Correlation Units were generated at UTL from the Raw stock.
  - The Correlation Units from the raw stock were tested at UTL with the production test condition for the device and with test program version A. A handler operating at the production test temperature was used to test the devices.
  - All the 100 units passed at UTL
4. One SI52147 raw stock lot 509911.1 consisting of 953 untested devices was built at UTL for qualifying test at UTL.

- UTL tested the qualification lot with test program version A using a handler, operating at the production test temperature (90deg) and production test condition required for this device.
- SiLabs instructed UTL to retest the Bin 1 devices to determine if material handling or other issues occurred that could cause failing devices to get mixed with good devices. All the Bin1 units passed and were binned to Bin1 again.
- Silicon Labs reviewed both of the test results.

Results

1. All of the 16 Golden Units tested at UTL passed, and had parametric measurements within datasheet limits.
2. All of the 100 Reject Correlation Units failed.
3. All of the 100 Correlation Units passed at UTL when tested with a handler operating at the production test temperature (90 deg) and using the production test condition.
4. 888 out of 888 from 953 untested devices (93.17% yield) in the qualification lot passed at production testing in UTL also passed when retested at UTL using QA HOT ILG program.

Conclusion

Based on the successful results from the four types of correlations performed at UTL the Test/Product Engineer recommends the acceptance of UTL for production testing for the following 48QFN family of devices.

Ordering Part Number
SL28610BLC
SL28610BLI
SL28775BLC
SL28EB636ALC
SL28EB717ALI
SL28EB720ALC
SL28EB721ALC
SL28EB731ALC
SL28EB735ALC
SL28EB797ALI
SL28PCIE19ALC
SL28PCIE19ALI
SL28PCIE50ALC
SL28PCIE50ALI
Si53159
Si52147

The Quality Assurance department will continue to monitor outgoing quality through the use of in-line electrical test gates to assure continued conformance.

Sincerely,

Alban Haynse Immanuel