Process Change Notice #1311071

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PCN Date: 11/7/2013	**Effective Date:** 2/13/2014	
Title: C8051F92x/F93x Revision G		
Originator: Atsushi Ninomiya	**Phone:** 512-532-5828	**Dept:** Marketing
Customer Contact: Kathy Haggar	**Phone:** 512-532-5261	**Dept:** Sales

PCN Type:

☒ **Datasheet**
☒ **Product Revision**
☐ **Discontinuance**

☐ **Foundry**
☐ **Assembly**
☐ **Test**

☐ **Packing**
☐ **Labeling**
☐ **Other**

Last Order Date: Not Applicable.

PCN Details

Description of Change:
Silicon Labs is pleased to announce hardware revision G of the C8051F92x/F93x devices. Revision 1.4 of the corresponding datasheet for these products and Revision 1.3 of the C8051F930-GDI datasheet addendum for wafer sales reflect this change.

For customers using Revision E the change to Revision G eliminates a potential issue with the RTC after a Sleep wake up in some applications. This behavior could occur in one-cell mode when VBAT falls below 1.5V and the MCU was in Sleep mode for ~100ms. If the behavior occurred, the RTC would either miss a clock period or change in frequency. This revision change also improved robustness of the device during VBAT ramp time that exceeds maximum datasheet specifications.

For customers using Revision F the change to Revision G eliminates a potential issue with the RTC after a Sleep wake up in some applications. This behavior could occur in one-cell mode when VBAT falls below 1.5V and the MCU was in Sleep mode for ~100ms. If the behavior occurred, the RTC would either miss a clock period or change in frequency.

C8051F92x/F93x Datasheet revision 1.4 updates the orderable part number to revision G along with other minor edits. C8051F930-GDI Datasheet revision 1.3 updates the orderable part number to revision G and adds Failure Analysis guidelines for wafer sales.

After the effective date of this PCN, Silicon Labs reserves the right to deliver Revision G to customer ordering Revision E or F. Refer to Product Identification section of this PCN for details.

Reason for Change:
C8051F92x/F93x Revision G release
C8051F92x/F93x Datasheet revision 1.4 release
C8051F930-GDI Datasheet revision 1.3 release

Impact on Form, Fit, Function, Quality, Reliability:
There is no impact to form, fit, quality or reliability.

The following functions are impacted:

- The reset value of REVID SFR will read 0x06 for Revision G instead of 0x05 for Revision F or 0x04 for Revision E.
- Behavior with the RTC after a Sleep wake up has been fixed.
- (For customer currently using Revision E) Improved robustness of the device during VBAT ramp time that exceeds maximum datasheet specifications

Product Identification:
The following orderable part numbers are affected:

After the effective date of this PCN, Silicon Labs reserves the right to deliver Revision G to customer ordering Revision E or F.

Revision F Existing OPN	Revision G Replacement OPN
C8051F920-F-GM	C8051F920-G-GM
C8051F920-F-GQ	C8051F920-G-GQ
C8051F921-F-GM	C8051F921-G-GM
C8051F930-F-GM	C8051F930-G-GM
C8051F930-F-GQ	C8051F930-G-GQ
C8051F931-F-GM	C8051F931-G-GM
C8051F930-F-GDI	C8051F930-G-GDI
CF92x-xxxxxGM	CF92xxxxxxGGM
CF92x-xxxxxGQ	CF92xxxxxxGGQ
CF93x-xxxxxGM	CF93xxxxxxGGM
CF93x-xxxxxGQ	CF93xxxxxxGGQ

Revision E Existing OPN	Revision G Replacement OPN
C8051F920-GM	C8051F920-G-GM
C8051F920-GQ	C8051F920-G-GQ
C8051F921-GM	C8051F921-G-GM
C8051F930-GM	C8051F930-G-GM
C8051F930-GQ	C8051F930-G-GQ
C8051F931-GM	C8051F931-G-GM
C8051F930-GDI	C8051F930-G-GDI
CF92x-xxxxxGM	CF92xxxxxxGGM
CF92x-xxxxxGQ	CF92xxxxxxGGQ
CF93x-xxxxxGM	CF93xxxxxxGGM
CF93x-xxxxxGQ	CF93xxxxxxGGQ

Note: The part numbers above include tape and reel variants which are denoted with an "R" at the end of the orderable part number.

Last Date of Unchanged Product: 2/13/2014

Qualification Samples:

Samples are available now. Please contact your Silicon Labs sales representative to order samples. A list of Silicon Labs sales representatives is available at www.silabs.com.

Customer Early Acceptance Sign Off:

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

Early Acceptance: **Date:** ______________________________

Name: ____________________________

Company: __________________________

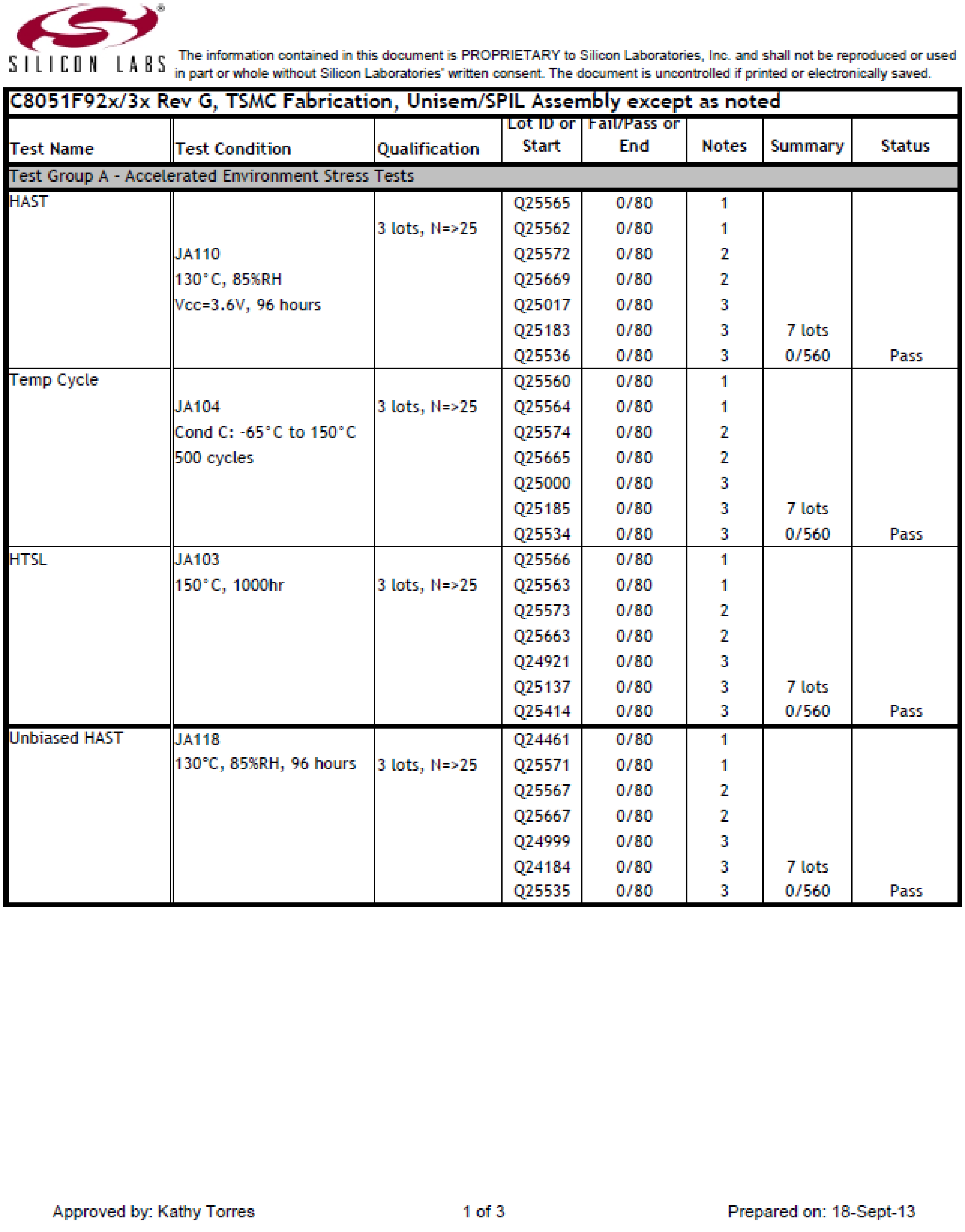
Email your early Acceptance approval to: katherine.haggar@silabs.com

Qualification Data:

See Appendix.

Appendix

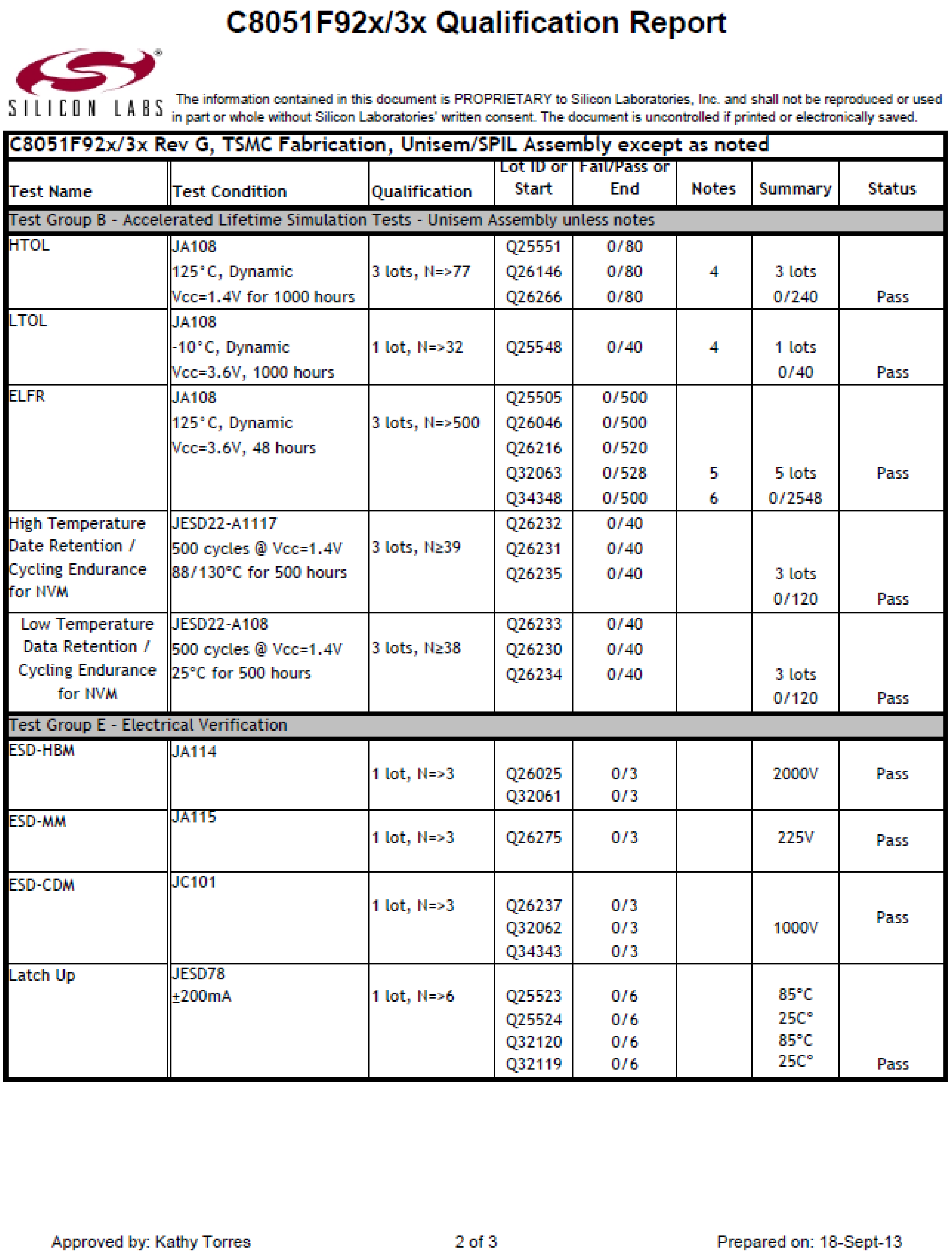
C8051F92x/3x Qualification Report



C8051F92x/3x Rev G, TSMC Fabrication, Unisem/SPIL Assembly except as noted

Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Test Group A - Accelerated Environment Stress Tests							
HAST	JA110 130°C, 85%RH Vcc=3.6V, 96 hours	3 lots, N=>25	Q25565	0/80	1	7 lots 0/560	Pass
			Q25562	0/80	1		
			Q25572	0/80	2		
			Q25669	0/80	2		
			Q25017	0/80	3		
			Q25183	0/80	3		
			Q25536	0/80	3		
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q25560	0/80	1	7 lots 0/560	Pass
			Q25564	0/80	1		
			Q25574	0/80	2		
			Q25665	0/80	2		
			Q25000	0/80	3		
			Q25185	0/80	3		
			Q25534	0/80	3		
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q25566	0/80	1	7 lots 0/560	Pass
			Q25563	0/80	1		
			Q25573	0/80	2		
			Q25663	0/80	2		
			Q24921	0/80	3		
			Q25137	0/80	3		
			Q25414	0/80	3		
Unbiased HAST	JA118 130°C, 85%RH, 96 hours	3 lots, N=>25	Q24461	0/80	1	7 lots 0/560	Pass
			Q25571	0/80	1		
			Q25567	0/80	2		
			Q25667	0/80	2		
			Q24999	0/80	3		
			Q24184	0/80	3		
			Q25535	0/80	3		

Approved by: Kathy Torres 1 of 3 Prepared on: 18-Sept-13



C8051F92x/3x Qualification Report

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C8051F92x/3x Rev G, TSMC Fabrication, Unisem/SPIL Assembly except as noted

Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Test Group B - Accelerated Lifetime Simulation Tests - Unisem Assembly unless notes							
HTOL	JA108 125°C, Dynamic Vcc=1.4V for 1000 hours	3 lots, N=>77	Q25551 Q26146 Q26266	0/80 0/80 0/80	4	3 lots 0/240	Pass
LTOL	JA108 -10°C, Dynamic Vcc=3.6V, 1000 hours	1 lot, N=>32	Q25548	0/40	4	1 lots 0/40	Pass
ELFR	JA108 125°C, Dynamic Vcc=3.6V, 48 hours	3 lots, N=>500	Q25505 Q26046 Q26216 Q32063 Q34348	0/500 0/500 0/520 0/528 0/500	5 6	5 lots 0/2548	Pass
High Temperature Date Retention / Cycling Endurance for NVM	JESD22-A1117 500 cycles @ Vcc=1.4V 88/130°C for 500 hours	3 lots, N≥39	Q26232 Q26231 Q26235	0/40 0/40 0/40		3 lots 0/120	Pass
Low Temperature Data Retention / Cycling Endurance for NVM	JESD22-A108 500 cycles @ Vcc=1.4V 25°C for 500 hours	3 lots, N≥38	Q26233 Q26230 Q26234	0/40 0/40 0/40		3 lots 0/120	Pass
Test Group E - Electrical Verification							
ESD-HBM	JA114	1 lot, N=>3	Q26025 Q32061	0/3 0/3		2000V	Pass
ESD-MM	JA115	1 lot, N=>3	Q26275	0/3		225V	Pass
ESD-CDM	JC101	1 lot, N=>3	Q26237 Q32062 Q34343	0/3 0/3 0/3		1000V	Pass
Latch Up	JESD78 ±200mA	1 lot, N=>6	Q25523 Q25524 Q32120 Q32119	0/6 0/6 0/6 0/6		85°C 25C° 85°C 25C°	Pass

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C8051F92x/3x Qualification Report

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C8051F92x/3x Rev G, TSMC Fabrication, Unisem/SPIL Assembly except as noted							
Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Supplemental Package Qualification Data							
Test Group A - Accelerated Environment Stress Tests - ASECL - QFN							
HAST	JA110 130°C, 85%RH 96 hours	3 lots, N=>25	Q29385 Q29331 Q29336	0/78 0/80 0/80		3 lots 0/238	Pass
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q29387 Q29391 Q29395	0/77 0/77 0/77		3 lots 0/231	Pass
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q29388 Q29392 Q29396	0/77 0/77 0/77		3 lots 0/231	Pass
Test Group A - Accelerated Environment Stress Tests - UNISEM - QFN							
HAST	JA110 130°C, 85%RH 96 hours	3 lots, N=>25	Q26130 Q26179 Q26439	0/80 0/80 0/80		3 lots 0/240	Pass
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q26129 Q26182 Q26441	0/80 0/80 0/100		3 lots 0/260	Pass
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q26131 Q26180 Q26440	0/84 0/85 0/101		3 lots 0/270	Pass

Notes:

1. SPIL 32LQFP, Precond MSL3@260C
2. SPIL 48TQFP, Precond MSL2@260C
3. SPIL 64 TQFP, Precond MSL3@260C
4. Qualification performed on Carsem 32QFN
5. Die revision F
6. Die revision G

This report applies to the following part numbers:			
C8051F920-F-GM	C8051F920-GQ	C8051F930-F-GM	C8051F930-GQ
C8051F920-F-GQ	C8051F921-F-GM	C8051F930-F-GQ	C8051F931-F-GM
C8051F920-GM	C8051F921-GM	C8051F930-GM	C8051F931-GM
C8051F920-G-GQ	C8051F921-G-GM	C8051F930-G-GQ	C8051F931-G-GM
C8051F920-G-GM	C8051F930-G-GM		C8051F930-G-GDI

Approved by: Kathy Torres

Prepared on: 18-Sept-13