Process Change Notice #1310312

PCN Date: 10/31/2013		Effective Date: 2/5/2014	
Title: C8051F90x/F91x Revision D			
Originator: Atsushi Ninomiya	**Phone:** 512-532-5828		**Dept:** Marketing
Customer Contact: Kathy Haggar	**Phone:** 512-532-5261		**Dept:** Sales

PCN Type:

☒ Datasheet ☐ Foundry ☐ Packing

☒ Product Revision ☐ Assembly ☐ Labeling

☐ Discontinuance ☐ Test ☐ Other

Last Order Date: Not Applicable.

PCN Details

Description of Change:

Silicon Labs is pleased to announce hardware revision D of the C8051F90x/F91x devices and revision 1.3 of the corresponding datasheet for these products.

For customers using Revision B the change to Revision D 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 C the change to Revision D 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.

Datasheet revision 1.3 updates the orderable part number to revision D along with other minor edits.

After the effective date of this PCN, Silicon Labs reserves the right to deliver C8051F90x/F91x-D-GM/GU (Revision D) for customers ordering C8051F90x/F91x-C-GM/GU (Revision C) or C8051F90x/F91x-GM/GU (Revision B).

Reason for Change:
C8051F90x/F91x Revision D release
C8051F90x/F91x 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 0x03 for Revision D instead of 0x02 for Revision C or 0x01 for Revision B.
- Behavior with the RTC after a Sleep wake up has been addressed.
- (For customer currently using Revision B) 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 the C8051F90x/F91x-D-GM/GU (Revision D) for customer ordering C8051F90x/F91x-C-GM/GU (Revision C) or C8051F90x/F91x-GM/GU (Revision B)

Revision C Products
C8051F901-C-GM
C8051F901-C-GU
C8051F902-C-GM
C8051F902-C-GU
C8051F911-C-GM
C8051F911-C-GU
C8051F912-C-GM
C8051F912-C-GU

Revision B Products
C8051F901-GM
C8051F901-GU
C8051F902-GM
C8051F902-GU
C8051F911-GM
C8051F911-GU
C8051F912-GM
C8051F912-GU

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: 2/5/2014

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.

W7206F1 Process Change Notice Form rev AJ

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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

C8051F90x/1x , Rev D Qualification Report

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C8051F90x/1x, Rev D, TSMC 0.18um Fabrication

TEST NAME	TEST CONDITION	QUALIFICATION	Lot ID or Start	Fail/Pass or End	Summary	Status
Die Qualification Tests						
High Temp Operating Life	JA108 125°C, Dynamic Vcc=3.6V for 1000 hours	3 lots, N=>77	Q26146 Q26266 Q27065	0/80 0/80 0/88	0/248	Pass
Low Temp Operating Life	JA108 -10°C, Dynamic Vcc=3.6V for 1000 hours	1 lot, N=>32	Q25548	0/39	0/39	Pass
ELFR	JA108 125°C, Dynamic Vcc=3.6V for 48 hours	3 lots, N>=500	Q27619 Q27049 Q27592 Q32887 Q34489	0/520 0/545 0/520 0/520 0/510	0/2615	Pass
ESD: Human Body Model	JA114	1 lot / 3 devices	Q27568 Q33125	0/3 0/3	2000 V	Pass
ESD: Machine Model	JA115	1 lot / 3 devices	Q27425 Q32827	0/3 0/3	200V	Pass
ESD: Charged Device Model	JC101	1 lot / 3 devices	Q26989 Q32826 Q34478	0/3 0/3 0/3	2000V	Pass
Latch-up	JESD87, ±200mA	1 lot / 6 devices	Q27644 Q27643 Q32828	0/6 0/6 0/6	85 °C 25 °C 25 °C	Pass
High Temperature Data Retention / Cycling Endurance for NVM	JESD22-A117 500 cycles @ Vcc=1.4V 88/130°C for 500 hours	3 lots, N>=39	Q26232 Q26231 Q26235	0/40 0/40 0/40	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	0/120	Pass

Approved by: K. Torres   1 of 1   Prepared on: 18-Sept-13

C8051F90x/1x , Rev D Qualification Report

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Supplemental Package Qualification Data

Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
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
Test Group A - Accelerated Environment Stress Tests - UNISEM - QSOP							
HAST	JA110 130°C, 85%RH 96 hours	3 lots, N=>25	Q29019 Q29022 Q29163	0/80 0/77 0/78		3 lots 0/235	Pass
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q29023 Q29026 Q29162	0/81 0/77 0/78		3 lots 0/236	Pass
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q29021 Q29024 Q29161	0/58 0/33 0/46		3 lots 0/137	Pass

C8051F90x/1x , Rev D Qualification Report

Supplemental Package Qualification Data

Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Test Group A - Accelerated Environment Stress Tests - UNISEM - TSSOP							
HAST	JA110 130°C, 85%RH 96 hours	3 lots, N=>25	Q26294 Q26339 Q26276	0/79 0/80 0/80		3 lots 0/239	Pass
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q26298 Q26337 Q26348	0/79 0/80 0/80		3 lots 0/239	Pass
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q26295 Q26338 Q26352	0/80 0/82 0/80		3 lots 0/242	Pass

This report applies to the following part numbers:

C8051F901-GM	C8051F902-GM	C8051F911-GM	C8051F911-GU	C8051F912-GU
C8051F901-GU	C8051F902-GU	C8051F911-GT	C8051F912-GM	
C8051F912-C-GM	C8051F912-C-GU	C8051F912-C-GDI	C8051F911-C-GM	C8051F911-C-GU
C8051F911-C-GDI	C8051F902-C-GM	C8051F902-C-GU	C8051F902-C-GDI	C8051F901-C-GM
C8051F901-C-GU	C8051F901-C-GDI	C8051F901-D-GM	C8051F901-D-GU	C8051F902-D-GM
C8051F902-D-GU	C8051F911-D-GM	C8051F911-D-GU	C8051F912-D-GM	C8051F912-D-GU