170817142 EFR32MG13, EFR32BG13 & EFR32FG13 Revision C and Data Sheet Revision 1.0

PRCN Issue Date: 8/17/2017   **Effective Date:** 11/23/2017

PCN Type: Datasheet; Product Revision

Description of Change

Silicon Labs is pleased to announce hardware revision C for the EFR32MG13 Mighty Gecko Multi-Protocol, EFR32BG13 Blue Gecko Bluetooth® Low Energy and EFR32FG13 Flex Gecko Proprietary Wireless SoC families. All Rev C OPNs have achieved Full Production (FP). Datasheets and errata have been updated for these products. The new revision is a pin-compatible replacement for the previous revision B devices.

The datasheets are updated to version 1.0. Notable changes from Revision 0.5 are:
• Updated specification tables with latest characterization values and production test min/max limits
• Added high-temperature OPNs and associated specifications
• Corrected Typical Sub-GHz Impedance-matching network circuits Figure
• Updated Sensitivity in Table 4.15 (RF Receiver characteristics for Bluetooth Low Energy in the 2.4 GHz Band, 1 Mbps Data Rate) to reflect new PHY configuration that fixes Interoperability issues identified with previous PHY configuration

The Errata is updated to Revision 0.3. Revision C eliminated the following errata in revision B:
ADC_E224: ADC Warm-Up Ready Can Cause IDAC, ACMP, or CSEN to Not Function
ADC_E225: Using the ADC in High Accuracy Bias Mode Will Force All Analog Peripherals to High Accuracy Bias Mode
RMU_E203: AVDD Ramp Issue
Additionally, the following new Errata has been added since the previous revision of the document:
PLFRCO_E201: Output Frequency Error Below 0 °C Causing Bluetooth Communication
Issues

After the effective date of this PCN, Silicon Labs reserves the right to deliver product revision C for customers ordering product revision B.

Reason for Change

See Above.

Impact on Form, Fit, Function, Quality, Reliability

The new revision is a pin compatible replacement for the previous revision B devices. There have been no changes to device pin-out (fit), functionality quality or reliability.

Product Identification

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Existing Part #          Replacement Part #        DropInCompInd.
EFR32BG13P532F512GM48-B   EFR32BG13P532F512GM48-C   Yes
EFR32BG13P532F512GM48-BR  EFR32BG13P532F512GM48-CR  Yes
EFR32BG13P632F512GM48-B   EFR32BG13P632F512GM48-C   Yes
EFR32BG13P632F512GM48-BR  EFR32BG13P632F512GM48-CR  Yes
EFR32BG13P733F512GM48-B   EFR32BG13P733F512GM48-C   Yes
EFR32BG13P733F512GM48-BR  EFR32BG13P733F512GM48-CR  Yes
EFR32BG13P732F512GM48-B   EFR32BG13P732F512GM48-C   Yes
EFR32BG13P732F512GM48-BR  EFR32BG13P732F512GM48-CR  Yes
EFR32FG13P233F512GM48-B   EFR32FG13P233F512GM48-C   Yes
EFR32FG13P233F512GM48-BR  EFR32FG13P233F512GM48-CR  Yes
EFR32FG13P232F512GM48-B   EFR32FG13P232F512GM48-C   Yes
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EFR32FG13P232F512GM48-BR EFR32FG13P232F512GM48-CR Yes
EFR32FG13P231F512GM48-B  EFR32FG13P231F512GM48-C  Yes
EFR32FG13P231F512GM48-BR EFR32FG13P231F512GM48-CR Yes
EFR32MG13P632F512GM48-B  EFR32MG13P632F512GM48-C  Yes
EFR32MG13P632F512GM48-BR EFR32MG13P632F512GM48-CR Yes
EFR32MG13P733F512GM48-B  EFR32MG13P733F512GM48-C  Yes
EFR32MG13P733F512GM48-BR EFR32MG13P733F512GM48-CR Yes
EFR32MG13P732F512GM48-B  EFR32MG13P732F512GM48-C  Yes
EFR32MG13P732F512GM48-BR EFR32MG13P732F512GM48-CR Yes
```

Last Date of Unchanged Product: 11/23/2017

Qualification Samples

Samples Available upon request.

Specific conditions of acceptance of this change will be considered on a case by case basis if written notice is submitted within 30 days of this notice. To request further data or inquire about this notification, please contact your local Silicon Labs sales representative. A list of Silicon Labs sales representatives is available at http://www.silabs.com.

In some cases rejection of a change notice may impact Silicon Labs product pricing, delivery, quality, or reliability.

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: PCNEarlyAcceptance@silabs.com

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**

Qualification Data

Please see attached Qualification Report in the Appendix.

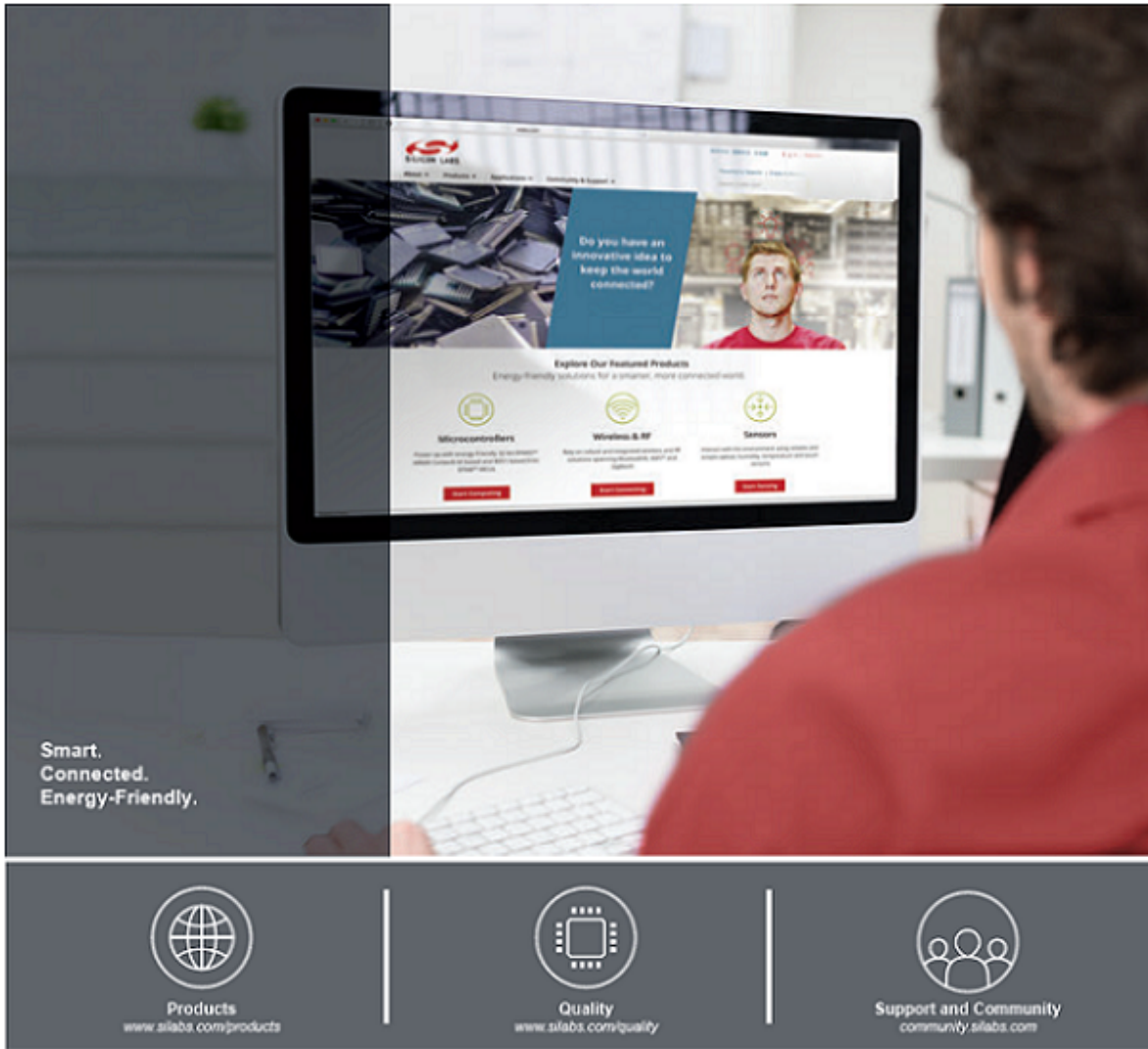# EFR32xG13 RevC 48QFN Qualification Report

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Part Rev B, TSMC Fabrication, SPIL Assembly

Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Test Group A – Accelerated Environment Stress Tests - QFN							
HAST			Q039879	1/30	1, 5		
	JA110	3 lots, N=>25	Q040220	0/30	1	4 lots	Pass
	130°C, 85%RH		Q039877	0/30	1		
	Vcc=3.8V, 96 hours		Q039878	0/30	1	1/120	
UHAST	JA118		Q039876	0/30	1		
	130°C, 85%RH	3 lots, N=>25	Q039875	0/30	1	3 lots	Pass
	96 hours		Q039874	0/30	1	0/90	
Temp Cycle	JA104		Q039882	0/30	1		
	Cond C: -65°C to 150°C	3 lots, N=>25	Q039881	0/30	1	3 lots	Pass
	500 cycles		Q039880	0/30	1	0/90	
HTSL	JA103		Q038038	0/28	1		
	150°C, 1000hr	3 lots, N=>25	Q038124	0/28	1	3 lots	Pass
			Q037590	0/25	1	0/81	
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	JA108		Q040470	0/55			
	$T_J \geq 125°C$, Dynamic	3 lots, N=>77	Q040650	0/79			
			Q040471	0/80		4 lots	Pass
	Vcc=3.8V, 1000 hours		Q041124	0/80		0/294	
LTOL	JA108 T_A = -10°C, Dynamic	1 lot, N=>32	Q040451	0/80		1 lots	Pass
	Vcc=3.8V, 1000 hours					0/80	
ELFR	JA108		Q040472	0/516			
	$T_J \geq 125°C$, Dynamic	3 lots, N=>500	Q040651	0/515		3 lots	Pass
	Vcc=3.8V, 48 hours		Q040450	0/505		0/1536	
NVM Endurance, Retention and Operating Life	JESD22-A117		Q040213	0/40	6		
	25°C	3 lots, N=>39	Q040274	0/40	6	3 lots	
	500 hours		Q040278	0/40	6	0/120	Pass
NVM Endurance, Retention and Operating Life	JESD22-A117		Q040279	0/40	7		
	125°C	3 lots, N=>39	Q040275	0/40	7	3 lots	
	1000 hours		Q040214	0/40	7	0/120	Pass
Test Group E – Electrical Verification							
ESD-HBM	JS-001	1 lot, N=>3	Q040909			2.5 kV	Class 2
ESD-CDM	JS-002	1 lot, N=>3	Q041561		2	500 V	Class C2a
			Q041575		3	1000 V	Class C3
			Q041580		4	500 V	Class C2a
Latch Up	JESD78 ±100mA	1 lot, N=>3	Q040907	25 °C			Pass
	Overvoltage = 6V		Q040908	125 °C			

Approved by: K. Torres   1 of 2   Prepared on: 03-Aug-2017

EFR32xG13 RevC 48QFN Qualification Report

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Part Rev B, TSMC Fabrication, SPIL Assembly							
Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status

Notes:

1. Parts are Pre-conditioned at MSL2/260°C

2. Dual-band bondout option

3. Sub GHz bondout option

4. 2.4 GHz bondout option

5. Failure analysis on the failure was inconclusive. An additional 30 units were stressed from the same assembly lot (Q040220) to reduce the LTPD% below the requirement. JEDEC sample size requirement of 25 units per lot has LTPD% = 9.21 at 90% confidence with 0 fails. With larger sample size = 60, LTPD% = 6.48 at 90% confidence with 1 failure.

6. Preconditioned with 10K write/erase cycles at 25°C

7. Preconditioned with 10K write/erase cycles at 125°C

This report applies to the following part numbers:		
EFR32BG13P733F512GM48-C	EFR32FG13P233F512GM48-C	EFR32MG13P733F512GM48-C
EFR32BG13P732F512GM48-C	EFR32FG13P232F512GM48-C	EFR32MG13P732F512GM48-C
EFR32BG13P632F512GM48-C	EFR32FG13P231F512GM48-C	EFR32MG13P632F512GM48-C
EFR32BG13P532F512GM48-C		

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