201117929 EFM8 BB3 Silicon Revision D

PRCN Issue Date: 11/17/2020   **Effective Date:**   2/23/2021

PCN Type: Product Revision

Description of Change

Silicon Labs is pleased to announce the release of revision D of EFM8BB3 devices.

This release is accompanied by version 1.4 of the EFM8BB3 Datasheet, version 1.0 of the EFM8BB3 errata, and version 0.7 of the EFM8BB3 reference manual.

Note: After the effective date of the PRCN, Silicon Labs reserves the right not to accept orders for the old revision.

Reason for Change

Revision D devices resolve 2 errata issues related to LIN communication and external crystal oscillators. LIN communication will now function correctly as errata item UART1_E101 has been resolved. External crystal oscillators are now supported on revision D devices as errata item XOSC_E101 has been resolved.

Please view the version 1.0 of the errata for details on the errata items.

Please see the revision history section of version 1.4 of the datasheet for details on updates made.

Please see the revision history section of version 0.7 of the reference manual details on updates made.

Impact on Form, Fit, Function, Quality, Reliability

There is no impact for form, fit, quality or reliability. Function is impacted as described in the change reason section and relevant errata items.

Product Identification

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Existing Part #         Replacement Part #      DropInCompInd.
EFM8BB31F16A-C-4QFN24   EFM8BB31F16A-D-4QFN24   Yes
EFM8BB31F16A-C-4QFN24R  EFM8BB31F16A-D-4QFN24R  Yes
EFM8BB31F16A-C-5QFN32   EFM8BB31F16A-D-5QFN32   Yes
EFM8BB31F16A-C-5QFN32R  EFM8BB31F16A-D-5QFN32R  Yes
EFM8BB31F16G-C-QFN24    EFM8BB31F16G-D-QFN24    Yes
EFM8BB31F16G-C-QFN24R   EFM8BB31F16G-D-QFN24R   Yes
EFM8BB31F16G-C-QFN32    EFM8BB31F16G-D-QFN32    Yes
EFM8BB31F16G-C-QFN32R   EFM8BB31F16G-D-QFN32R   Yes
EFM8BB31F16G-C-QFP32    EFM8BB31F16G-D-QFP32    Yes
EFM8BB31F16G-C-QFP32R   EFM8BB31F16G-D-QFP32R   Yes
EFM8BB31F16G-C-QSOP24   EFM8BB31F16G-D-QSOP24   Yes
EFM8BB31F16G-C-QSOP24R  EFM8BB31F16G-D-QSOP24R  Yes
EFM8BB31F16I-C-4QFN24   EFM8BB31F16I-D-4QFN24   Yes
EFM8BB31F16I-C-4QFN24R  EFM8BB31F16I-D-4QFN24R  Yes
EFM8BB31F16I-C-5QFN32   EFM8BB31F16I-D-5QFN32   Yes
EFM8BB31F16I-C-5QFN32R  EFM8BB31F16I-D-5QFN32R  Yes
EFM8BB31F16I-C-QFN24    EFM8BB31F16I-D-QFN24    Yes
EFM8BB31F16I-C-QFN24R   EFM8BB31F16I-D-QFN24R   Yes
EFM8BB31F16I-C-QFN32    EFM8BB31F16I-D-QFN32    Yes
EFM8BB31F16I-C-QFN32R   EFM8BB31F16I-D-QFN32R   Yes
EFM8BB31F16I-C-QFP32    EFM8BB31F16I-D-QFP32    Yes
EFM8BB31F16I-C-QFP32R   EFM8BB31F16I-D-QFP32R   Yes
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EFM8BB31F16I-C-QSOP24   EFM8BB31F16I-D-QSOP24   Yes
EFM8BB31F16I-C-QSOP24R  EFM8BB31F16I-D-QSOP24R  Yes
EFM8BB31F32A-C-4QFN24   EFM8BB31F32A-D-4QFN24   Yes
EFM8BB31F32A-C-4QFN24R  EFM8BB31F32A-D-4QFN24R  Yes
EFM8BB31F32A-C-5QFN32   EFM8BB31F32A-D-5QFN32   Yes
EFM8BB31F32A-C-5QFN32R  EFM8BB31F32A-D-5QFN32R  Yes
EFM8BB31F32G-C-QFN24    EFM8BB31F32G-D-QFN24    Yes
EFM8BB31F32G-C-QFN24R   EFM8BB31F32G-D-QFN24R   Yes
EFM8BB31F32G-C-QFN32    EFM8BB31F32G-D-QFN32    Yes
EFM8BB31F32G-C-QFN32R   EFM8BB31F32G-D-QFN32R   Yes
EFM8BB31F32G-C-QFP32    EFM8BB31F32G-D-QFP32    Yes
EFM8BB31F32G-C-QFP32R   EFM8BB31F32G-D-QFP32R   Yes
EFM8BB31F32G-C-QSOP24   EFM8BB31F32G-D-QSOP24   Yes
EFM8BB31F32G-C-QSOP24R  EFM8BB31F32G-D-QSOP24R  Yes
EFM8BB31F32I-C-4QFN24   EFM8BB31F32I-D-4QFN24   Yes
EFM8BB31F32I-C-4QFN24R  EFM8BB31F32I-D-4QFN24R  Yes
EFM8BB31F32I-C-5QFN32   EFM8BB31F32I-D-5QFN32   Yes
EFM8BB31F32I-C-5QFN32R  EFM8BB31F32I-D-5QFN32R  Yes
EFM8BB31F32I-C-QFN24    EFM8BB31F32I-D-QFN24    Yes
EFM8BB31F32I-C-QFN24R   EFM8BB31F32I-D-QFN24R   Yes
EFM8BB31F32I-C-QFN32    EFM8BB31F32I-D-QFN32    Yes
EFM8BB31F32I-C-QFN32R   EFM8BB31F32I-D-QFN32R   Yes
EFM8BB31F32I-C-QFP32    EFM8BB31F32I-D-QFP32    Yes
EFM8BB31F32I-C-QFP32R   EFM8BB31F32I-D-QFP32R   Yes
EFM8BB31F32I-C-QSOP24   EFM8BB31F32I-D-QSOP24   Yes
EFM8BB31F32I-C-QSOP24R  EFM8BB31F32I-D-QSOP24R  Yes
EFM8BB31F64A-C-4QFN24   EFM8BB31F64A-D-4QFN24   Yes
EFM8BB31F64A-C-4QFN24R  EFM8BB31F64A-D-4QFN24R  Yes
EFM8BB31F64A-C-5QFN32   EFM8BB31F64A-D-5QFN32   Yes
EFM8BB31F64A-C-5QFN32R  EFM8BB31F64A-D-5QFN32R  Yes
EFM8BB31F64G-C-QFN24    EFM8BB31F64G-D-QFN24    Yes
EFM8BB31F64G-C-QFN24R   EFM8BB31F64G-D-QFN24R   Yes
EFM8BB31F64G-C-QFN32    EFM8BB31F64G-D-QFN32    Yes
EFM8BB31F64G-C-QFN32R   EFM8BB31F64G-D-QFN32R   Yes
EFM8BB31F64G-C-QFP32    EFM8BB31F64G-D-QFP32    Yes
EFM8BB31F64G-C-QFP32R   EFM8BB31F64G-D-QFP32R   Yes
EFM8BB31F64G-C-QSOP24   EFM8BB31F64G-D-QSOP24   Yes
EFM8BB31F64G-C-QSOP24R  EFM8BB31F64G-D-QSOP24R  Yes
EFM8BB31F64I-C-4QFN24   EFM8BB31F64I-D-4QFN24   Yes
EFM8BB31F64I-C-4QFN24R  EFM8BB31F64I-D-4QFN24R  Yes
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EFM8BB31F64I-C-5QFN32R  EFM8BB31F64I-D-5QFN32R  Yes
EFM8BB31F64I-C-QFN24    EFM8BB31F64I-D-QFN24    Yes
EFM8BB31F64I-C-QFN24R   EFM8BB31F64I-D-QFN24R   Yes
EFM8BB31F64I-C-QFN32    EFM8BB31F64I-D-QFN32    Yes
EFM8BB31F64I-C-QFN32R   EFM8BB31F64I-D-QFN32R   Yes
EFM8BB31F64I-C-QFP32    EFM8BB31F64I-D-QFP32    Yes
EFM8BB31F64I-C-QFP32R   EFM8BB31F64I-D-QFP32R   Yes
EFM8BB31F64I-C-QSOP24   EFM8BB31F64I-D-QSOP24   Yes
EFM8BB31F64I-C-QSOP24R  EFM8BB31F64I-D-QSOP24R  Yes
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Kit Identification

Kits impacted by the above product are listed below.
Orders for the following obsolete kits will no longer be accepted.

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Existing Kit #   Replacement Kit #
NA               NA
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Last Date of Unchanged Product: 2/23/2021

Qualification Samples

Commercial and industrial grade device samples available, automotive grade samples available upon request.

Customer Response

Lack of acknowledgment of the PCN within 30 days constitutes acceptance of the change, Ref. JEDEC-J-STD-046.

To request further data or inquire about this notification, please contact your Silicon Labs sales representative. A list of Silicon Labs sales representatives is available at http://www.silabs.com.

Customers may approve early PCN acceptance by emailing approval, along with PCN # to PCNEarlyAcceptance@silabs.com

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Qualification Data

See appendix.

Part Rev D, GSMC Fabrication

Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Test Group A – Accelerated Environment Stress Tests - 32TQFP-ASECL assembly							
HAST	JA110		Q038332	0/82	1		
	130°C, 85%RH	3 lots, N=>77	Q038502	0/82	1	3 lots	Pass
	Vcc=3.6V, 96 hours		Q038506	0/82	1	0/246	
UHAST	JA110		Q038334	0/82	1		
	130°C, 85%RH	3 lots, N=>77	Q038504	0/82	1	3 lots	Pass
	96 hours		Q038508	0/80	1	0/244	
Temp Cycle	JA104		Q038333	0/86	1		
	Cond C: -65°C to 150°C	3 lots, N=>77	Q038501	0/81	1	3 lots	Pass
	500 cycles		Q038505	0/81	1	0/248	
HTSL	JA103		Q038315	0/46	1		
	150°C, 1000hr	1 lot, N=>45	Q038503	0/50	1	3 lots	Pass
			Q038507	0/50	1	0/146	
Test Group A – Accelerated Environment Stress Tests - 24 QSOP-UTACTH assembly							
HAST	JA110		Q038411	0/78	1		
	130°C, 85%RH	3 lots, N=>77	Q036513	0/80	1	3 lots	Pass
	Vcc=3.6V, 96 hours		Q036515	0/80	1	0/238	
UHAST	JA110		Q038412	0/78	1		
	130°C, 85%RH	3 lots, N=>77	Q036526	0/80	1	3 lots	Pass
	96 hours		Q036527	0/80	1	0/238	
Temp Cycle	JA104		Q038413	0/79	1		
	Cond C: -65°C to 150°C	3 lots, N=>77	Q036523	0/80	1	3 lots	Pass
	500 cycles		Q036524	0/80	1	0/239	
HTSL	JA103		Q038366	0/50	1		
	150°C, 1000hr	1 lot, N=>45	Q036520	0/28	1	3 lots	Pass
			Q036521	0/28	1	0/106	
Test Group A – Accelerated Environment Stress Tests - 24-QFN-ASECL assembly							
HAST	JA110		Q038217	0/80	1		
	130°C, 85%RH	3 lots, N=>77	Q038218	0/80	1	3 lots	Pass
	Vcc=3.6V, 96 hours		Q038219	0/80	1	0/240	
UHAST	JA110		Q038223	0/80	1		
	130°C, 85%RH	3 lots, N=>77	Q038224	0/80	1	3 lots	Pass
	96 hours		Q038225	0/80	1	0/240	
Temp Cycle	JA104		Q038220	0/80	1		
	Cond C: -65°C to 150°C	3 lots, N=>77	Q038221	0/80	1	3 lots	Pass
	500 cycles		Q038222	0/80	1	0/240	
HTSL	JA103		Q038181	0/48	1		
	150°C, 1000hr	1 lot, N=>45	Q038182	0/48	1	3 lots	Pass
			Q038183	0/48	1	0/144	

EFM8BB3* AEC-Q100 Qualification Report

Part Rev D, GSMC Fabrication							
Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Test Group A – Accelerated Environment Stress Tests - 32-TQFN-UTACTH assembly							
HAST	JA110 130°C, 85%RH Vcc=3.6V, 96 hours	3 lots, N=>77	Q038160 Q038359 Q038363 Q039097	0/84 0/84 0/85 0/87	1 1 1 1	4 lots 0/340	Pass
UHAST	JA110 130°C, 85%RH 96 hours	3 lots, N=>77	Q038161 Q038360 Q038364 Q039095	0/85 0/85 0/80 0/87	1 1 1 1	4 lots 0/337	Pass
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>77	Q038158 Q038357 Q038361 Q039098	0/85 0/85 0/85 0/98	1 1 1 1	4 lots 0/353	Pass
HTSL	JA103 150°C, 1000hr	1 lot, N=>45	Q038159 Q038358 Q039096	0/50 0/49 0/41	1 1 1	3 lots 0/140	Pass
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	JA108 $T_J \geq 125°C$, Dynamic Vcc=3.6V, 1000 hours	3 lots, N=>77	Q038228 Q038640 Q038861	0/84 0/84 0/90		3 lots 0/258	Pass
LTOL	JA108 -10°C, Dynamic Vcc=3.6V, 1000 hours	1 lot, N=>77	Q036550	0/35		1 lots 0/35	Pass
ELFR	AEC-Q100-008 $T_J \geq 125°C$, Dynamic Vcc=3.6V, 48 hours	3 lots, N=>800	Q038355 Q046686 Q038785	0/842 0/849 0/840		3 lots 0/2531	Pass
Data Retention High Temp	AEC-Q100-005 150°C, 1000 hours	3 lots, N=>39	Q038230 Q038627 Q038848	0/44 0/45 0/49		3 lots 0/138	Pass
Data Retention Low Temp	AEC-Q100-005 25°C, 1000 hours	3 lots, N=>38	Q038314 Q038622 Q038846	0/39 0/40 0/45		3 lots 0/124	Pass
NVM P/E Cycling High Temp	AEC-Q100-005 85°C, 1000 hours	3 lots, N=>77	Q038193 Q038588 Q038790	0/140 0/140 0/136		3 lots 0/416	Pass
NVM P/E Cycling Low Temp	AEC-Q100-005 25°C, 1000 hours	3 lots, N=>77	Q038194 Q038589 Q038788	0/40 0/40 0/45		3 lots 0/125	Pass

EFM8BB3* AEC-Q100 Qualification Report

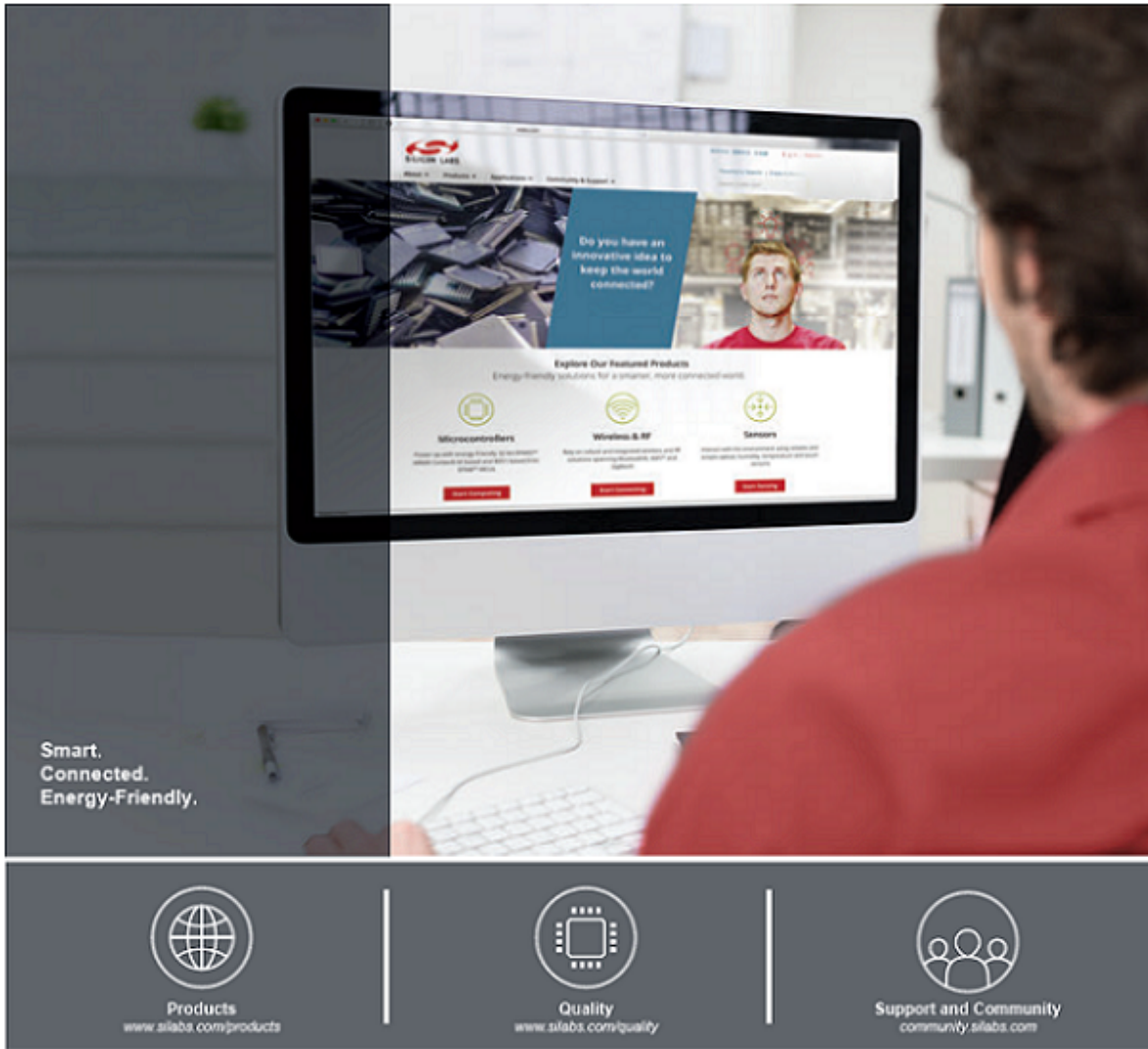| Part Rev D, GSMC Fabrication							
Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Test Group C – Package Assembly Integrity Tests							
Wire Bond Pull	M-STD-883 Performed post-TC	5 units, N=>30	Q038389	0/5	2	1 lots 0/5	Pass
Wire Bond Pull	M-STD-883 Performed post-TC	5 units, N=>30	Q038470	0/5	3	1 lots 0/5	Pass
Wire Bond Pull	M-STD-883 Performed post-TC	5 units, N=>30	Q038480	0/15	4	1 lots 0/15	Pass
Wire Bond Pull	M-STD-883 Performed post-TC	5 units, N=>30	Q038388 Q039289	0/5 0/5	5 5	2 lots 0/10	Pass
Test Group D – Electrical Verification							
ESD-HBM	AEC-Q100-002	1 lot, N=>3	Q043453		2	4 kV	Class 3A
ESD-CDM	AEC-Q100-011	1 lot, N=>3	Q043452 Q038118 Q043616 Q043615		2 3 4 5	1000 V 1000 V 1000 V 1000 V	Class C6 Class C6 Class C6 Class C6
Latch Up	AEC-Q100-004 ±100mA Overvoltage = 5.4V	1 lot, N=>6	Q043450 Q043451	25 °C 105 °C	2 2		Pass Pass
Electromagnetic Compatibility	SAE J1752	1 lot, N=>1	Q039317				Pass

Notes:
1. Parts are Pre-conditioned at MSL2/260°C
2. 32-TQFP
3. 24-QSOP
4. 24-QFN
5. 32-TQFN

This report applies to the following part numbers:		
EFM8BB31F*G-D-QFN24	EFM8BB31F*I-D-QFN24	EFM8BB31F*A-D-4QFN24
EFM8BB31F*G-D-QFN32	EFM8BB31F*I-D-QFN32	EFM8BB31F*A-D-5QFN32
EFM8BB31F*G-D-QFP32	EFM8BB31F*I-D-QFP32	EFM8BB31F*I-D-4QFN24
EFM8BB31F*G-D-QSOP24	EFM8BB31F*I-D-QSOP24	EFM8BB31F*I-D-5QFN32

EFM8BB3* AEC-Q100 Qualification Report

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Silicon Laboratories Inc.
400 West Cesar Chavez
Austin, TX 78701

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