



2405011529 Additional Source for EFR32xG21 SoCs, Datasheet and Errata Updates

PCN Issue Date: May 01, 2024

Effective Date: Aug 07, 2024

PCN Type: Datasheet; Errata; Foundry

Description of Change

Silicon Labs is pleased to announce an additional source for EFR32BG21 and EFR32MG21 SoCs (jointly referred to as xG21) at Semiconductor Manufacturing International Corporation (SMIC). This change is needed to increase capacity to ensure supply continuity due to increased demand for our Wireless SoCs and MCUs.

As of the effective date of this PCN, Silicon Labs will start porting xG21 from TSMC to SMIC. All existing OPNs will be updated by replacing the revision character with "D" to identify the ICs from SMIC foundry.

Updated datasheets:

EFR32BG21 v1.2: <https://www.silabs.com/documents/public/data-sheets/efr32bg21-datasheet.pdf>

EFR32MG21 v1.2: <https://www.silabs.com/documents/public/data-sheets/efr32mg21-datasheet.pdf>

The main changes:

- Added all Revision D OPNs.
 - Capacitive Sense feature of ACMP has been noted as deprecated.
 - Merged xG21 (Secure Vault Mid) & xG21B (Secure Vault High) datasheets
- Please refer to the datasheet revision history for a complete list of changes.

Updated errata (adds the latest available revision D):

EFR32BG21 v1.0: <https://www.silabs.com/documents/public/errata/efr32bg21-errata.pdf>

EFR32MG21 v1.1: <https://www.silabs.com/documents/public/errata/efr32mg21-errata.pdf>

Reason for Change

Alternate foundry for capacity expansion.

Impact on Form, Fit, Function, Quality, Reliability

No impact on form, fit, quality or reliability. Impact on function will be explained in errata and an update to the new software that will need to be ported which is explained in the application note "AN1377: EFR32xG21 Revision B to Revision C+ Compatibility and Migration Guide" available at: <https://www.silabs.com/documents/public/application-notes/an1377-xg21-revb-to-revc-migration.pdf>

Product Identification

Revision B and D will both be available for order.

Existing Part #

EFR32BG21A010F1024IM32-D
EFR32BG21A010F1024IM32-DR
EFR32BG21A010F512IM32-D
EFR32BG21A010F512IM32-DR
EFR32BG21A010F768IM32-D
EFR32BG21A010F768IM32-DR
EFR32BG21A020F1024IM32-D
EFR32BG21A020F1024IM32-DR
EFR32BG21A020F512IM32-D
EFR32BG21A020F512IM32-DR
EFR32BG21A020F768IM32-D

EFR32BG21A020F768IM32-DR
EFR32BG21B010F1024IM32-D
EFR32BG21B010F1024IM32-DR
EFR32BG21B010F512IM32-D
EFR32BG21B010F512IM32-DR
EFR32BG21B010F768IM32-D
EFR32BG21B010F768IM32-DR
EFR32BG21B020F1024IM32-D
EFR32BG21B020F1024IM32-DR
EFR32BG21B020F512IM32-D
EFR32BG21B020F512IM32-DR
EFR32BG21B020F768IM32-D
EFR32BG21B020F768IM32-DR
EFR32MG21A010F1024IM32-D
EFR32MG21A010F1024IM32-DR
EFR32MG21A010F512IM32-D
EFR32MG21A010F512IM32-DR
EFR32MG21A010F768IM32-D
EFR32MG21A010F768IM32-DR
EFR32MG21A020F1024IM32-D
EFR32MG21A020F1024IM32-DR
EFR32MG21A020F512IM32-D
EFR32MG21A020F512IM32-DR
EFR32MG21A020F768IM32-D
EFR32MG21A020F768IM32-DR
EFR32MG21B010F1024IM32-D
EFR32MG21B010F1024IM32-DR
EFR32MG21B010F512IM32-D
EFR32MG21B010F512IM32-DR
EFR32MG21B010F768IM32-D
EFR32MG21B010F768IM32-DR
EFR32MG21B020F1024IM32-D
EFR32MG21B020F1024IM32-DR
EFR32MG21B020F512IM32-D
EFR32MG21B020F512IM32-DR
EFR32MG21B020F768IM32-D
EFR32MG21B020F768IM32-DR
EFR32BG21A010F1024IM32-B
EFR32BG21A010F1024IM32-BR
EFR32BG21A010F512IM32-B
EFR32BG21A010F512IM32-BR
EFR32BG21A010F768IM32-B
EFR32BG21A010F768IM32-BR
EFR32BG21A010X1652IM32-B
EFR32BG21A010X1652IM32-BR
EFR32BG21A020F1024IM32-B
EFR32BG21A020F1024IM32-BR
EFR32BG21A020F512IM32-B
EFR32BG21A020F512IM32-BR
EFR32BG21A020F768IM32-B
EFR32BG21A020F768IM32-BR
EFR32BG21B010F1024IM32-B
EFR32BG21B010F1024IM32-BR
EFR32BG21B010F512IM32-B
EFR32BG21B010F512IM32-BR
EFR32BG21B010F768IM32-B
EFR32BG21B010F768IM32-BR
EFR32BG21B010X1653IM32-B
EFR32BG21B010X1653IM32-BR
EFR32BG21B020F1024IM32-B
EFR32BG21B020F1024IM32-BR
EFR32BG21B020F512IM32-B
EFR32BG21B020F512IM32-BR
EFR32BG21B020F768IM32-B
EFR32BG21B020F768IM32-BR
EFR32BG21B020P1689IM32-B
EFR32BG21B020P1689IM32-BR

EFR32BG21B020P1693IM32-B
EFR32BG21B020P1693IM32-BR
EFR32BG21B020P1697IM32-B
EFR32BG21B020P1697IM32-BR
EFR32BG21B020P1712IM32-B
EFR32BG21B020P1712IM32-BR
EFR32MG21A010F1024IM32-B
EFR32MG21A010F1024IM32-BR
EFR32MG21A010F512IM32-B
EFR32MG21A010F512IM32-BR
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EFR32MG21A020F512IM32-B
EFR32MG21A020F512IM32-BR
EFR32MG21A020F768IM32-B
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EFR32MG21A020PZ024IM32-B
EFR32MG21A020PZ024IM32-BR
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EFR32MG21B010F1024IM32-BR
EFR32MG21B010F512IM32-B
EFR32MG21B010F512IM32-BR
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EFR32MG21B010F768IM32-BR
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EFR32MG21B020F1024IM32-B
EFR32MG21B020F1024IM32-BR
EFR32MG21B020F512IM32-B
EFR32MG21B020F512IM32-BR
EFR32MG21B020F768IM32-B
EFR32MG21B020F768IM32-BR

Last Date of Unchanged Product: Aug 07, 2024

Qualification 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 PCN@silabs.com

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Qualification Data

See attached.



EFR32xG21x010 Revision D Qualification Report

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Part Rev D, SMIC Fabrication, 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	3 lots, N=>25	Q048960	0/80	1	3 lots 0/239	Pass
	130°C, 85%RH		Q048971	0/79	1		
	Vcc=3.8V, 96 hours		Q048975	0/80	1		
Temp Cycle	JA104	3 lots, N=>25	Q048962	0/80	1	3 lots 0/239	Pass
	Cond C: -65°C to 150°C		Q048973	0/79	1		
	500 cycles		Q048977	0/80	1		
UHAST	JA110	3 lots, N=>25	Q048961	0/79	1	3 lots 0/239	Pass
	130°C, 85%RH		Q048972	0/80	1		
	96 hours		Q048976	0/80	1		
HTSL	JA103	3 lots, N=>25	Q048963	0/33	1	3 lots 0/113	Pass
	150°C, 1000hr		Q048974	0/40	1		
			Q048978	0/40	1		
Test Group A – Accelerated Environment Stress Tests - ASECL Assembly							
HAST	JA110	3 lots, N=>25	Q049957	0/80	1	3 lots 0/239	Pass
	130°C, 85%RH		Q048979	0/80	1		
	Vcc=3.8V, 96 hours		Q048964	0/79	1		
Temp Cycle	JA104	3 lots, N=>25	Q049959	0/80	1	3 lots 0/240	Pass
	Cond C: -65°C to 150°C		Q048966	0/80	1		
	500 cycles		Q048981	0/80	1		
UHAST	JA110	3 lots, N=>25	Q049958	0/80	1	3 lots 0/240	Pass
	130°C, 85%RH		Q048965	0/80	1		
	96 hours		Q048980	0/80	1		
HTSL	JA103	3 lots, N=>25	Q049960	0/40	1	3 lots 0/120	Pass
	150°C, 1000hr		Q048967	0/40	1		
			Q048982	0/40	1		
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	JA108	3 lots, N=>77	Q050234	0/83	7	3 lots 0/323	Pass
	T _j ≥ 135°C, Dynamic		Q050020	0/102			
	Vcc=3.8V, 1000 hours		Q050021	0/138			



EFR32xG21x010 Revision D Qualification Report

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Part Rev D, SMIC Fabrication, SPIL Assembly except as noted							
Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
LTOL	JA108	1 lot, N=>32	Q049691	0/61		1 lots	Pass
	T _A = -10°C, Dynamic					0/61	
	V _{cc} =3.8V, 1000 hours						
ELFR	JA108	3 lots, N=>500	Q049731	0/541		3 lots	Pass
	T _J ≥ 125°C, Dynamic		Q050185	0/577		0/1679	
	V _{cc} =3.8V, 48 hours		Q050302	0/561			
NVM Endurance, Retention and Operating Life	JESD22-A117	3 lots, N=>39	Q049719	0/40	2	3 lots	Pass
	25°C		Q049993	0/40	2	0/120	
	500 hours		Q049992	0/40	2		
NVM Endurance, Retention and Operating Life	JESD22-A117 +	3 lots, N=>39	Q049718	0/40	3	3 lots	Pass
	JESD22-A103		Q049899	0/40	3	0/120	
	150°C, 1000 hours		Q049900	0/40	3		
Test Group E – Electrical Verification							
ESD-HBM	JS-001	1 lot, N=>3	Q050115			3 kV	Class 2
ESD-CDM	JS-002	1 lot, N=>3	Q050191		4	TC 1000	Class 3
			Q050116		5	TC 1000	Class 3
Latch Up	JESD78 ±100mA	1 lot, N=>3	Q050117 Q050118	25 °C 135 °C	6 6		Pass

Notes:

- Parts are Pre-conditioned at MSL2/260°C
- Preconditioned with 10K write/erase cycles at 25°C
- Preconditioned with 10K write/erase cycles at 125°C
- ASECL Assembly
- SPIL Assembly
- Passes ±200mA
- An additional 700 hrs HTOL on 92 units completed successfully to evaluate extended lifetime

This report applies to the following part numbers:

EFR32BG21A010F512IM32-D	EFR32BG21B010F512IM32-D
EFR32BG21A010F768IM32-D	EFR32BG21B010F768IM32-D
EFR32BG21A010F1024IM32-D	EFR32BG21B010F1024IM32-D
EFR32MG21A010F512IM32-D	EFR32MG21B010F512IM32-D
EFR32MG21A010F768IM32-D	EFR32MG21B010F768IM32-D
EFR32MG21A010F1024IM32-D	EFR32MG21B010F1024IM32-D



EFR32xG21x020 Revision D Qualification Report

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Part Rev D, SMIC Fabrication, 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	3 lots, N=>25	Q048960	0/80	1	3 lots 0/239	Pass
	130°C, 85%RH		Q048971	0/79	1		
	Vcc=3.8V, 96 hours		Q048975	0/80	1		
Temp Cycle	JA104	3 lots, N=>25	Q048962	0/80	1	3 lots 0/239	Pass
	Cond C: -65°C to 150°C		Q048973	0/79	1		
	500 cycles		Q048977	0/80	1		
UHAST	JA110	3 lots, N=>25	Q048961	0/79	1	3 lots 0/239	Pass
	130°C, 85%RH		Q048972	0/80	1		
	96 hours		Q048976	0/80	1		
HTSL	JA103	3 lots, N=>25	Q048963	0/33	1	3 lots 0/113	Pass
	150°C, 1000hr		Q048974	0/40	1		
			Q048978	0/40	1		
Test Group A – Accelerated Environment Stress Tests - ASECL Assembly							
HAST	JA110	3 lots, N=>25	Q049957	0/80	1	3 lots 0/239	Pass
	130°C, 85%RH		Q048979	0/80	1		
	Vcc=3.8V, 96 hours		Q048964	0/79	1		
Temp Cycle	JA104	3 lots, N=>25	Q049959	0/80	1	3 lots 0/240	Pass
	Cond C: -65°C to 150°C		Q048966	0/80	1		
	500 cycles		Q048981	0/80	1		
UHAST	JA110	3 lots, N=>25	Q049958	0/80	1	3 lots 0/240	Pass
	130°C, 85%RH		Q048965	0/80	1		
	96 hours		Q048980	0/80	1		
HTSL	JA103	3 lots, N=>25	Q049960	0/40	1	3 lots 0/120	Pass
	150°C, 1000hr		Q048967	0/40	1		
			Q048982	0/40	1		
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	JA108	3 lots, N=>77	Q050234	0/83	7	3 lots 0/323	Pass
	T _j ≥ 135°C, Dynamic		Q050020	0/102			
	Vcc=3.8V, 1000 hours		Q050021	0/138			
HTOL	JA108	3 lots, N=>77	Q050251	0/83	8	3 lots 0/250	Pass
	T _j ≥ 135°C, Dynamic		Q050139	0/83	8		
	Vcc=3.8V, 100 hours		Q050141	0/84	8		



EFR32xG21x020 Revision D Qualification Report

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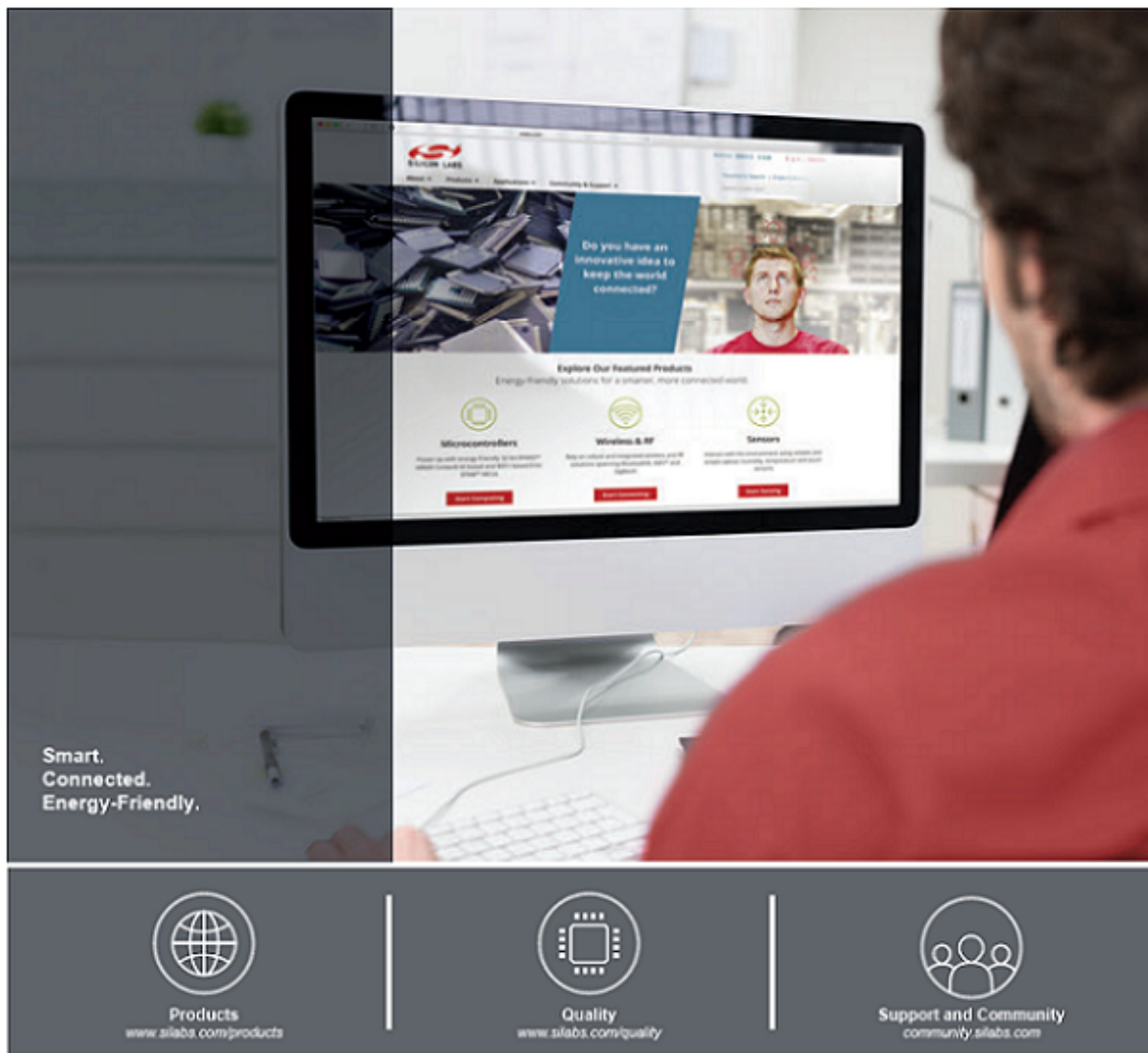
Part Rev D, SMIC Fabrication, SPIL Assembly except as noted							
Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
LTOL	JA108	1 lot, N=>32	Q049691	0/61		1 lots 0/61	Pass
	T _A = -10°C, Dynamic V _{cc} =3.8V, 1000 hours						
ELFR	JA108	3 lots, N=>500	Q049731	0/541		3 lots 0/1679	Pass
	T _J ≥ 125°C, Dynamic		Q050185	0/577			
	V _{cc} =3.8V, 48 hours		Q050302	0/561			
NVM Endurance, Retention and Operating Life	JESD22-A117	3 lots, N=>39	Q049719	0/40	2	3 lots 0/120	Pass
	25°C		Q049993	0/40	2		
	500 hours		Q049992	0/40	2		
NVM Endurance, Retention and Operating Life	JESD22-A117 +	3 lots, N=>39	Q049718	0/40	3	3 lots 0/120	Pass
	JESD22-A103		Q049899	0/40	3		
	150°C, 1000 hours		Q049900	0/40	3		
Test Group E – Electrical Verification							
ESD-HBM	JS-001	1 lot, N=>3	Q050115			3 kV	Class 2
ESD-CDM	JS-002	1 lot, N=>3	Q050191		4	TC 1000	Class 3
			Q050116		5	TC 1000	Class 3
Latch Up	JESD78 ±100mA	1 lot, N=>3	Q050117 Q050118	25 °C 135 °C	6 6		Pass

Notes:

1. Parts are Pre-conditioned at MSL2/260°C
2. Preconditioned with 10K write/erase cycles at 25°C
3. Preconditioned with 10K write/erase cycles at 125°C
4. ASECL Assembly
5. SPIL Assembly
6. Passes ±200mA
7. An additional 700 hrs HTOL on 92 units completed successfully to evaluate extended lifetime
8. HTOL for 20dBm PA. Actual duty cycle of 20dBm PA is <10% of the device duty cycle, therefore HTOL time is 100 hrs

This report applies to the following part numbers:

EFR32BG21A020F512IM32-D	EFR32BG21B020F512IM32-D
EFR32BG21A020F768IM32-D	EFR32BG21B020F768IM32-D
EFR32BG21A020F1024IM32-D	EFR32BG21B020F1024IM32-D
EFR32MG21A020F512IM32-D	EFR32MG21B020F512IM32-D
EFR32MG21A020F768IM32-D	EFR32MG21B020F768IM32-D
EFR32MG21A020F1024IM32-D	EFR32MG21B020F1024IM32-D



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