



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
EFR32MG21A010F768IM32-B
EFR32MG21A010F768IM32-BR
EFR32MG21A010M1475IM32-B
EFR32MG21A010M1475IM32-BR
EFR32MG21A020F1024IM32-B
EFR32MG21A020F1024IM32-BR
EFR32MG21A020F512IM32-B
EFR32MG21A020F512IM32-BR
EFR32MG21A020F768IM32-B
EFR32MG21A020F768IM32-BR
EFR32MG21A020PZ013IM32-B
EFR32MG21A020PZ013IM32-BR
EFR32MG21A020PZ024IM32-B
EFR32MG21A020PZ024IM32-BR
EFR32MG21B010F1024IM32-B
EFR32MG21B010F1024IM32-BR
EFR32MG21B010F512IM32-B
EFR32MG21B010F512IM32-BR
EFR32MG21B010F768IM32-B
EFR32MG21B010F768IM32-BR
EFR32MG21B010PZ045IM32-B
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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

User Registration

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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 | | |
| UFAST | 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 | | |
| UFAST | 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 T _A = -10°C, Dynamic Vcc=3.8V, 1000 hours | 1 lot, N=>32 | Q049691 | 0/61 | | 1 lots 0/61 | Pass |
| ELFR | JA108 T _J ≥ 125°C, Dynamic Vcc=3.8V, 48 hours | 3 lots, N=>500 | Q049731 Q050185 Q050302 | 0/541 0/577 0/561 | | 3 lots 0/1679 | Pass |
| NVM Endurance, Retention and Operating Life | JESD22-A117 25°C 500 hours | 3 lots, N=>39 | Q049719 | 0/40 | 2 | 3 lots 0/120 | Pass |
| | | | Q049993 | 0/40 | 2 | | |
| | | | Q049992 | 0/40 | 2 | | |
| NVM Endurance, Retention and Operating Life | JESD22-A117 + JESD22-A103 150°C, 1000 hours | 3 lots, N=>39 | Q049718 | 0/40 | 3 | 3 lots 0/120 | Pass |
| | | | Q049899 | 0/40 | 3 | | |
| | | | 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 130°C, 85%RH Vcc=3.8V, 96 hours | 3 lots, N=>25 | Q048960 | 0/80 | 1 | 3 lots 0/239 | Pass |
| | | | Q048971 | 0/79 | 1 | | |
| | | | Q048975 | 0/80 | 1 | | |
| Temp Cycle | JA104 Cond C: -65°C to 150°C 500 cycles | 3 lots, N=>25 | Q048962 | 0/80 | 1 | 3 lots 0/239 | Pass |
| | | | Q048973 | 0/79 | 1 | | |
| | | | Q048977 | 0/80 | 1 | | |
| UHAST | JA110 130°C, 85%RH 96 hours | 3 lots, N=>25 | Q048961 | 0/79 | 1 | 3 lots 0/239 | Pass |
| | | | Q048972 | 0/80 | 1 | | |
| | | | Q048976 | 0/80 | 1 | | |
| HTSL | JA103 150°C, 1000hr | 3 lots, N=>25 | Q048963 | 0/33 | 1 | 3 lots 0/113 | Pass |
| | | | Q048974 | 0/40 | 1 | | |
| | | | Q048978 | 0/40 | 1 | | |
| Test Group A – Accelerated Environment Stress Tests - ASECL Assembly | | | | | | | |
| HAST | JA110 130°C, 85%RH Vcc=3.8V, 96 hours | 3 lots, N=>25 | Q049957 | 0/80 | 1 | 3 lots 0/239 | Pass |
| | | | Q048979 | 0/80 | 1 | | |
| | | | Q048964 | 0/79 | 1 | | |
| Temp Cycle | JA104 Cond C: -65°C to 150°C 500 cycles | 3 lots, N=>25 | Q049959 | 0/80 | 1 | 3 lots 0/240 | Pass |
| | | | Q048966 | 0/80 | 1 | | |
| | | | Q048981 | 0/80 | 1 | | |
| UHAST | JA110 130°C, 85%RH 96 hours | 3 lots, N=>25 | Q049958 | 0/80 | 1 | 3 lots 0/240 | Pass |
| | | | Q048965 | 0/80 | 1 | | |
| | | | Q048980 | 0/80 | 1 | | |
| HTSL | JA103 150°C, 1000hr | 3 lots, N=>25 | Q049960 | 0/40 | 1 | 3 lots 0/120 | Pass |
| | | | Q048967 | 0/40 | 1 | | |
| | | | Q048982 | 0/40 | 1 | | |
| Test Group B – Accelerated Lifetime Simulation Tests | | | | | | | |
| HTOL | JA108 T _J ≥ 135°C, Dynamic Vcc=3.8V, 1000 hours | 3 lots, N=>77 | Q050234 | 0/83 | 7 | 3 lots 0/323 | Pass |
| | | | Q050020 | 0/102 | | | |
| | | | Q050021 | 0/138 | | | |
| HTOL | JA108 T _J ≥ 135°C, Dynamic Vcc=3.8V, 100 hours | 3 lots, N=>77 | Q050251 | 0/83 | 8 | 3 lots 0/250 | Pass |
| | | | Q050139 | 0/83 | | | |
| | | | Q050141 | 0/84 | | | |



EFR32xG21x020 Revision D Qualification Report

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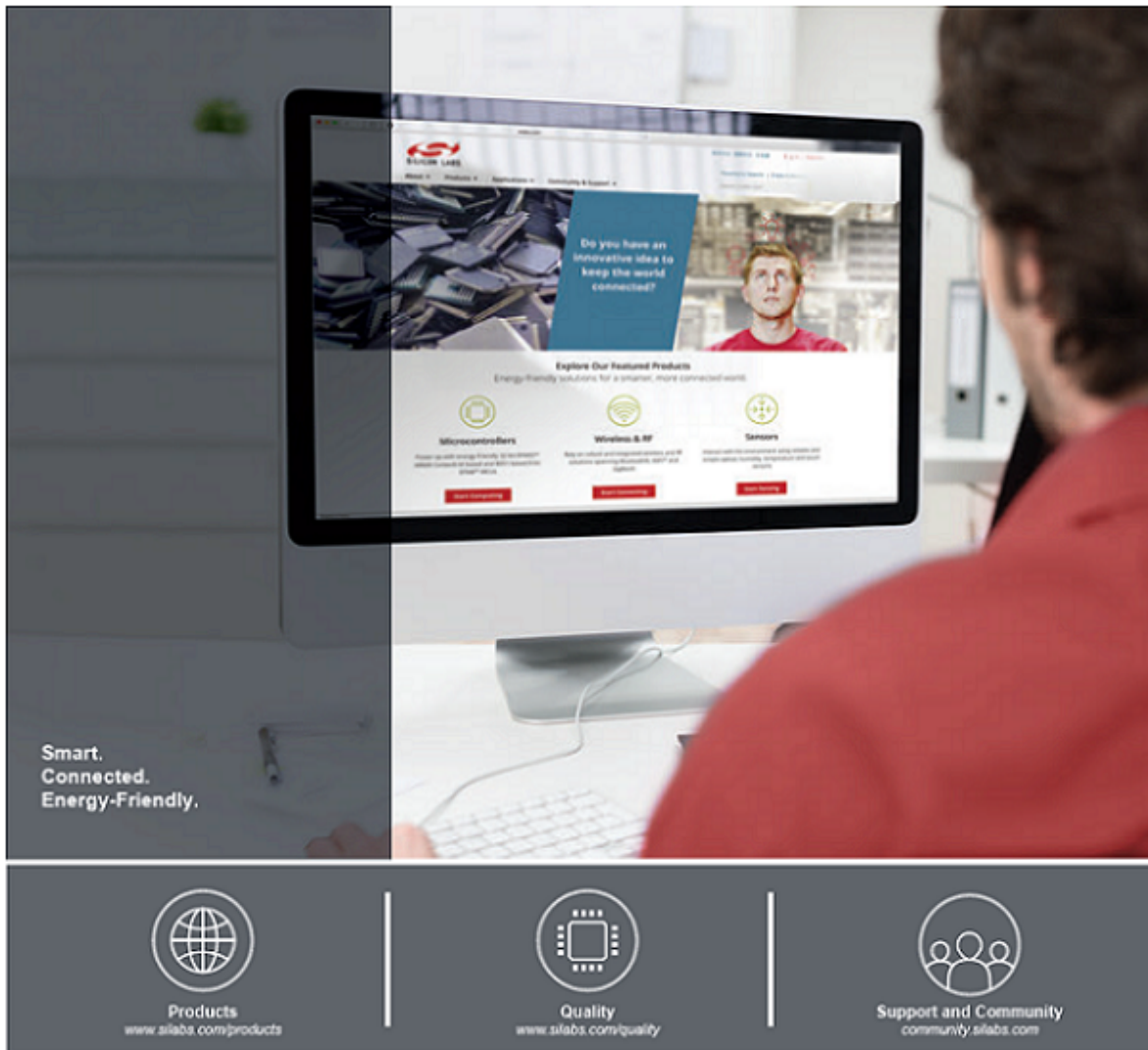
| Part Rev D, SMIC Fabrication, SPIL Assembly except as noted | | | | | | | |
|---|---|----------------|-------------------------------|-------------------------|-------------|--------------------|--------------------|
| Test Name | Test Condition | Qualification | Lot ID or Start | Fail/Pass or End | Notes | Summary | Status |
| LTOL | JA108 T _A = -10°C, Dynamic V _{cc} =3.8V, 1000 hours | 1 lot, N=>32 | Q049691 | 0/61 | | 1 lots 0/61 | Pass |
| ELFR | JA108 T _J ≥ 125°C, Dynamic V _{cc} =3.8V, 48 hours | 3 lots, N=>500 | Q049731 Q050185 Q050302 | 0/541 0/577 0/561 | | 3 lots 0/1679 | Pass |
| NVM Endurance, Retention and Operating Life | JESD22-A117 25°C 500 hours | 3 lots, N=>39 | Q049719 Q049993 Q049992 | 0/40 0/40 0/40 | 2 2 2 | 3 lots 0/120 | Pass |
| NVM Endurance, Retention and Operating Life | JESD22-A117 + JESD22-A103 150°C, 1000 hours | 3 lots, N=>39 | Q049718 Q049899 Q049900 | 0/40 0/40 0/40 | 3 3 3 | 3 lots 0/120 | Pass |
| 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 Q050116 | | 4 5 | TC 1000 TC 1000 | Class 3 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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