



191212653 EFR32xG12/13/14 , 48-QFN-7x7, Assembly, Test and Ship Site Addition (UTL)

PCN Issue Date: 12/12/2019

Effective Date: 3/18/2020

PCN Type: Assembly

Description of Change

Silicon Labs is pleased to announce the successful qualification of UTAC Thailand (UTL) as an additional Assembly, Test & Shipping site for EFR32xG12/13/14 , 48-QFN-7x7. UTL is an existing Assembly, Test & Shipping site for Silicon Labs, and is certified to ISO9001, ISO14001 and IATF16949.

UTL Ship Address:
UTAC Thai Limited
Wellgrow Industrial Estate, 73 Moo 5, Bangna-Trad (KM.36)
T.Bangsamak, Bangpakong Chachoengsao 24180 Thailand
Bangkok
Zip code: 24180

As of the effective date of the PCN, Silicon Labs may assemble, test and ship from either of the qualified Assembly, Test and Ship sites.

Reason for Change

The additional assembly, test and ship locations will provide additional capacity for supply assurance.

Impact on Form, Fit, Function, Quality, Reliability

There is no impact on form, fit, function, quality, or reliability. The devices assembled and tested at UTL will comply with Silicon Labs' relevant datasheets and quality levels.

The same test equipment including ATE, test load board hardware, and test application software will be used at both locations.

Product Identification

Existing Part #
EFR32BG12P132F1024GM48-B
EFR32BG12P132F1024GM48-BR
EFR32BG12P132F1024GM48-C
EFR32BG12P132F1024GM48-CR
EFR32BG12P232F1024GM48-B
EFR32BG12P232F1024GM48-BR
EFR32BG12P232F1024GM48-C
EFR32BG12P232F1024GM48-CR
EFR32BG12P332F1024GM48-B
EFR32BG12P332F1024GM48-BR
EFR32BG12P332F1024GM48-C
EFR32BG12P332F1024GM48-CR
EFR32BG12P332F1024IM48-B
EFR32BG12P332F1024IM48-BR
EFR32BG12P332F1024IM48-C
EFR32BG12P332F1024IM48-CR
EFR32BG12P433F1024GM48-B
EFR32BG12P433F1024GM48-BR
EFR32BG12P433F1024GM48-C
EFR32BG12P433F1024GM48-CR

EFR32BG12P432F1024GM48-B
EFR32BG12P432F1024GM48-BR
EFR32BG12P432F1024GM48-C
EFR32BG12P432F1024GM48-CR
EFR32BG13P632M1470GM48-D
EFR32BG13P632M1470GM48-DR
EFR32BG13P532F512GM48-C
EFR32BG13P532F512GM48-CR
EFR32BG13P532F512GM48-D
EFR32BG13P532F512GM48-DR
EFR32BG13P632F512GM48-C
EFR32BG13P632F512GM48-CR
EFR32BG13P632F512GM48-D
EFR32BG13P632F512GM48-DR
EFR32BG13P632F512IM48-C
EFR32BG13P632F512IM48-CR
EFR32BG13P632F512IM48-D
EFR32BG13P632F512IM48-DR
EFR32BG13P733F512GM48-C
EFR32BG13P733F512GM48-CR
EFR32BG13P733F512GM48-D
EFR32BG13P733F512GM48-DR
EFR32BG13P732F512GM48-C
EFR32BG13P732F512GM48-CR
EFR32BG13P732F512GM48-D
EFR32BG13P732F512GM48-DR
EFR32BG14P532F256GM48-B
EFR32BG14P532F256GM48-BR
EFR32BG14P632F256GM48-B
EFR32BG14P632F256GM48-BR
EFR32BG14P632F256IM48-B
EFR32BG14P632F256IM48-BR
EFR32BG14P733F256GM48-B
EFR32BG14P733F256GM48-BR
EFR32BG14P732F256GM48-B
EFR32BG14P732F256GM48-BR
EFR32FG12P232F1024GM48-B
EFR32FG12P232F1024GM48-BR
EFR32FG12P232F1024GM48-C
EFR32FG12P232F1024GM48-CR
EFR32FG12P231F1024GM48-B
EFR32FG12P231F1024GM48-BR
EFR32FG12P231F1024GM48-C
EFR32FG12P231F1024GM48-CR
EFR32FG12P433F1024GM48-B
EFR32FG12P433F1024GM48-BR
EFR32FG12P433F1024GM48-C
EFR32FG12P433F1024GM48-CR
EFR32FG12P432F1024GM48-B
EFR32FG12P432F1024GM48-BR
EFR32FG12P432F1024GM48-C
EFR32FG12P432F1024GM48-CR
EFR32FG12P431F1024GM48-B
EFR32FG12P431F1024GM48-BR
EFR32FG12P431F1024GM48-C
EFR32FG12P431F1024GM48-CR
EFR32FG12P431F1024IM48-B
EFR32FG12P431F1024IM48-BR
EFR32FG12P431F1024IM48-C
EFR32FG12P431F1024IM48-CR
EFR32FG13P231C1473GM48-D
EFR32FG13P231C1473GM48-DR
EFR32FG13P233F512GM48-C
EFR32FG13P233F512GM48-CR
EFR32FG13P233F512GM48-D
EFR32FG13P233F512GM48-DR
EFR32FG13P232F512GM48-C

EFR32FG13P232F512GM48-CR
EFR32FG13P232F512GM48-D
EFR32FG13P232F512GM48-DR
EFR32FG13P231F512GM48-C
EFR32FG13P231F512GM48-CR
EFR32FG13P231F512GM48-D
EFR32FG13P231F512GM48-DR
EFR32FG13P231F512IM48-C
EFR32FG13P231F512IM48-CR
EFR32FG13P231F512IM48-D
EFR32FG13P231F512IM48-DR
EFR32FG14P233F128GM48-B
EFR32FG14P233F128GM48-BR
EFR32FG14P233F256GM48-B
EFR32FG14P233F256GM48-BR
EFR32FG14P232F128GM48-B
EFR32FG14P232F128GM48-BR
EFR32FG14P232F256GM48-B
EFR32FG14P232F256GM48-BR
EFR32FG14P231F128GM48-B
EFR32FG14P231F128GM48-BR
EFR32FG14P231F256GM48-B
EFR32FG14P231F256GM48-BR
EFR32FG14P231F256IM48-B
EFR32FG14P231F256IM48-BR
EFR32FG14V132F256GM48-B
EFR32FG14V132F256GM48-BR
EFR32MG12P232P1412GM48-C
EFR32MG12P232P1412GM48-CR
EFR32MG12P132F1024GM48-B
EFR32MG12P132F1024GM48-BR
EFR32MG12P132F1024GM48-C
EFR32MG12P132F1024GM48-CR
EFR32MG12P232F1024GM48-B
EFR32MG12P232F1024GM48-BR
EFR32MG12P232F1024GM48-C
EFR32MG12P232F1024GM48-CR
EFR32MG12P332F1024GM48-B
EFR32MG12P332F1024GM48-BR
EFR32MG12P332F1024GM48-C
EFR32MG12P332F1024GM48-CR
EFR32MG12P332F1024IM48-B
EFR32MG12P332F1024IM48-BR
EFR32MG12P332F1024IM48-C
EFR32MG12P332F1024IM48-CR
EFR32MG12P433F1024GM48-B
EFR32MG12P433F1024GM48-BR
EFR32MG12P433F1024GM48-C
EFR32MG12P433F1024GM48-CR
EFR32MG12P433F1024IM48-B
EFR32MG12P433F1024IM48-BR
EFR32MG12P433F1024IM48-C
EFR32MG12P433F1024IM48-CR
EFR32MG12P432F1024GM48-B
EFR32MG12P432F1024GM48-BR
EFR32MG12P432F1024GM48-C
EFR32MG12P432F1024GM48-CR
EFR32MG12P432F1024IM48-B
EFR32MG12P432F1024IM48-BR
EFR32MG12P432F1024IM48-C
EFR32MG12P432F1024IM48-CR
EFR32MG13P632M1471GM48-D
EFR32MG13P632M1471GM48-DR
EFR32MG13P632F512GM48-C
EFR32MG13P632F512GM48-CR
EFR32MG13P632F512GM48-D
EFR32MG13P632F512GM48-DR

EFR32MG13P733F512GM48-C
EFR32MG13P733F512GM48-CR
EFR32MG13P733F512GM48-D
EFR32MG13P733F512GM48-DR
EFR32MG13P733F512IM48-C
EFR32MG13P733F512IM48-CR
EFR32MG13P733F512IM48-D
EFR32MG13P733F512IM48-DR
EFR32MG13P732F512GM48-C
EFR32MG13P732F512GM48-CR
EFR32MG13P732F512GM48-D
EFR32MG13P732F512GM48-DR
EFR32MG13P732F512IM48-C
EFR32MG13P732F512IM48-CR
EFR32MG13P732F512IM48-D
EFR32MG13P732F512IM48-DR
EFR32MG14P632F256GM48-B
EFR32MG14P632F256GM48-BR
EFR32MG14P733F256GM48-B
EFR32MG14P733F256GM48-BR
EFR32MG14P733F256IM48-B
EFR32MG14P733F256IM48-BR
EFR32MG14P732F256GM48-B
EFR32MG14P732F256GM48-BR
EFR32MG14P732F256IM48-B
EFR32MG14P732F256IM48-BR
EFR32ZG13P531F512GM48-D
EFR32ZG13P531F512GM48-DR
EFR32RZ13P531M1442GM48-D
EFR32RZ13P531M1442GM48-DR

Last Date of Unchanged Product: 3/18/2020

Qualification Samples

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 PCNEarlyAcceptance@silabs.com

User Registration

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Qualification Data

Qualification data is attached.

EFR32xG12 Qualification Report



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Part Rev C, TSMC 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 - BGA							
HAST	JA110 110°C, 85%RH Vcc=3.8V, 264 hours	3 lots, N=>25	Q039924	0/28	1		Pass
			Q039925	0/28	1	3 lots	
			Q039926	0/28	1	0/84	
UFAST	JA118 130°C, 85%RH 96 hours	3 lots, N=>25	Q039915	0/28	1		Pass
			Q039916	0/28	1	3 lots	
			Q039917	0/28	1	0/84	
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q039918	0/27	1		Pass
			Q039919	0/28	1	3 lots	
			Q039920	0/28	1	0/83	
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q039921	0/27	1		Pass
			Q039922	0/28	1	3 lots	
			Q039923	0/28	1	0/83	
Test Group A – Accelerated Environment Stress Tests - 7x7 QFN							
HAST	JA110 130°C, 85%RH Vcc=3.8V, 96 hours	3 lots, N=>25	Q039879	1/30	2, 5		Pass
			Q040220	0/30	2	4 lots	
			Q039877	0/30	2		
			Q039878	0/30	2	1/120	
UFAST	JA118 130°C, 85%RH 96 hours	3 lots, N=>25	Q039876	0/30	2		Pass
			Q039875	0/30	2	3 lots	
			Q039874	0/30	2	0/90	
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q039882	0/30	2		Pass
			Q039881	0/30	2	3 lots	
			Q039880	0/30	2	0/90	
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q038038	0/28	2		Pass
			Q038124	0/28	2	3 lots	
			Q037590	0/25	2	0/81	
Test Group A – Accelerated Environment Stress Tests - 7x7 QFN - UTL							
HAST	JA110 130°C, 85%RH Vcc=3.8V, 96 hours	3 lots, N=>25	Q044141	0/25	2	3 lots	Pass
			Q044140	0/25	2		
			Q044139	0/25	2	0/75	
UFAST	JA118 130°C, 85%RH 96 hours	3 lots, N=>25	Q044478	0/25	2		Pass
			Q044477	0/25	2	3 lots	
			Q044476	0/25	2	0/75	
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q044472	0/25	2		Pass
			Q044471	0/25	2	3 lots	
			Q044470	0/25	2	0/75	
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q044475	0/25	2		Pass
			Q044474	0/25	2	3 lots	
			Q044473	0/25	2	0/75	

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Part Rev C, TSMC 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 - 8x8 QFN							
HAST	JA110 130°C, 85%RH Vcc=3.8V, 96 hours	3 lots, N=>25	Q040220	0/30	2	3 lots 0/90	Pass
			Q039877	0/30	2		
			Q039878	0/30	2		
UHAST	JA118 130°C, 85%RH 96 hours	3 lots, N=>25	Q041904	0/30	1	3 lots 0/90	Pass
			Q039875	0/30	2		
			Q039874	0/30	2		
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q041903	0/30	1	3 lots 0/90	Pass
			Q041902	0/30	1		
			Q041901	0/30	1		
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q038011	0/35	2	3 lots 0/92	Pass
			Q041907	0/30	1		
			Q037774	0/27	2		
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	JA108 T _J ≥ 125°C, Dynamic Vcc=3.8V, 1000 hours	3 lots, N=>77	Q039946	0/77		3 lots 0/234	Pass
			Q040071	0/77			
			Q040505	0/80			
LTOL	JA108 T _A = -10°C, Dynamic Vcc=3.8V, 1000 hours	1 lot, N=>32	Q040261	0/35		1 lots 0/35	Pass
ELFR	JA108 T _J ≥ 125°C, Dynamic Vcc=3.8V, 48 hours	3 lots, N=>500	Q039943	0/500		3 lots 0/1502	Pass
			Q040035	0/502			
			Q040504	0/500			
NVM Endurance, Retention and Operating Life	JESD22-A117 25°C 500 hours	3 lots, N=>39	Q040213	0/40	3	3 lots 0/120	Pass
			Q040274	0/40	3		
			Q040278	0/40	3		
NVM Endurance, Retention and Operating Life	JESD22-A117 150°C 1000 hours	3 lots, N=>39	Q040279	0/40	4	3 lots 0/120	Pass
			Q040275	0/40	4		
			Q040214	0/40	4		

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Part Rev C, TSMC Fabrication, SPIL Assembly except as noted							
Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Test Group E – Electrical Verification							
ESD-HBM	JS-001	1 lot, N=>3	Q039756			2 kV	Class 2
ESD-CDM	JS-002	1 lot, N=>3	Q042050		6	500 V	Class C2A
			Q042047		7	650 V	Class C2A
			Q042046		8	1000 V	Class C3
			Q042048		9	500 V	Class C2A
			Q042049		10	650 V	Class C2A
			Q045339		11	500 V	Class C2A
Latch Up	JESD78 ±100mA	1 lot, N=>3	Q039757	25 °C			Pass
Latch Up	JESD78 ±100mA	1 lot, N=>3	Q039764	125 °C			Pass

Notes:

- Parts are Pre-conditioned at MSL3/260°C
- 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
- 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.
- BGA Package, dual band
- 7x7 QFN package, dual band
- 7x7 QFN Package, sub GHz
- 7x7 QFN Package, 2.4 GHz
- 8x8 QFN Package
- 7x7 QFN Package, 2.4 GHz at UTL

This report applies to the following part numbers:

EFR32BG12P132F1024GL125-C	EFR32FG12P232F1024GL125-C	EFR32MG12P132F1024GL125-C
EFR32BG12P132F1024GM48-C	EFR32FG12P232F1024GM48-C	EFR32MG12P132F1024GM48-C
EFR32BG12P232F1024GL125-C	EFR32FG12P231F1024GL125-C	EFR32MG12P232F1024GL125-C
EFR32BG12P232F1024GM48-C	EFR32FG12P231F1024GM48-C	EFR32MG12P232F1024GM48-C
EFR32BG12P332F1024GL125-C	EFR32FG12P433F1024GL125-C	EFR32MG12P332F1024GL125-C
EFR32BG12P332F1024GM48-C	EFR32FG12P433F1024GM48-C	EFR32MG12P332F1024GM48-C
EFR32BG12P433F1024GL125-C	EFR32FG12P432F1024GL125-C	EFR32MG12P433F1024GL125-C
EFR32BG12P433F1024GM48-C	EFR32FG12P432F1024GM48-C	EFR32MG12P433F1024GM48-C
EFR32BG12P432F1024GL125-C	EFR32FG12P431F1024GL125-C	EFR32MG12P432F1024GL125-C
EFR32BG12P432F1024GM48-C	EFR32FG12P431F1024GM48-C	EFR32MG12P432F1024GM48-C
EFR32BG12P332F1024IM48-C	EFR32FG12P431F1024IM48-C	EFR32MG12P332F1024IM48-C
EFR32MG12P433F1024IL125-C	EFR32MG12P433F1024IM48-C	EFR32MG12P432F1024IM48-C
EFR32MG12P433F1024GM68-C	EFR32MG12P432F1024GM68-C	EFR32MG12P232F1024GM68-C
EFR32FG12P433F1024GM68-C	EFR32FG12P431F1024GM68-C	EFR32FG12P231F1024GM68-C
EFR32MG12P431F1024GM68-C	EFR32MG12P231F1024GM68-C	EFR32FG12P431F512GM68-C
EFR32FG12P231F512GM68-C	EFR32MG12P232F512GM68-C	EFR32MG12P132F512GM68-C
EFR32BG12P433F1024GM68-C	EFR32BG12P232F1024GM68-C	EFR32BG12P232F512GM68-C
EFR32BG12P232F512IM68-C	EFR32BG12P232F1024IM68-C	EFR32BG12P433F1024IM68-C

Approved by: K. Torres

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Prepared on: 25-Oct-2019

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Part Rev D, TSMC 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 - 7x7 QFN							
HAST	JA110 130°C, 85%RH Vcc=3.8V, 96 hours	3 lots, N=>25	Q039879	1/30	1, 5	4 lots	Pass
			Q040220	0/30			
			Q039877	0/30			
			Q039878	0/30			
UHAST	JA118 130°C, 85%RH 96 hours	3 lots, N=>25	Q039876	0/30	1	3 lots	Pass
			Q039875	0/30			
			Q039874	0/30			
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q039882	0/30	1	3 lots	Pass
			Q039881	0/30			
			Q039880	0/30			
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q038038	0/28	1	3 lots	Pass
			Q038124	0/28			
			Q037590	0/25			
Test Group A – Accelerated Environment Stress Tests - 7x7 QFN - UTATCH							
HAST	JA110 130°C, 85%RH Vcc=3.8V, 96 hours	3 lots, N=>25	Q044141	0/25	1	3 lots	Pass
			Q044140	0/25			
			Q044139	0/25			
UHAST	JA118 130°C, 85%RH 96 hours	3 lots, N=>25	Q044478	0/25	1	3 lots	Pass
			Q044477	0/25			
			Q044476	0/25			
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q044472	0/25	1	3 lots	Pass
			Q044471	0/25			
			Q044470	0/25			
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q044475	0/25	1	3 lots	Pass
			Q044474	0/25			
			Q044473	0/25			

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Part Rev D, TSMC 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 - 5x5 QFN - UTACTH							
HAST	JA110 110°C, 85%RH Vcc=3.8V, 264 hours	3 lots, N=>25	Q042485	0/30	1, 5		
			Q042327	0/30	1	3 lots	Pass
			Q042484	0/30	1	0/90	
UFAST	JA118 110°C, 85%RH 264 hours	3 lots, N=>25	Q042492	0/30	1		
			Q042491	0/30	1	3 lots	Pass
			Q042329	0/30	1	0/90	
Temp Cycle	JA104 Cond B: -55°C to 125°C 700 cycles	3 lots, N=>25	Q042490	0/30	1		
			Q042489	0/30	1	3 lots	Pass
			Q042326	0/30	1	0/90	
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q042488	0/30	1		
			Q042487	0/30	1	3 lots	Pass
			Q042325	0/30	1	0/90	
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	JA108 T _j ≥ 125°C, Dynamic Vcc=3.8V, 1000 hours	3 lots, N=>77	Q040470	0/55			
			Q040650	0/79			
			Q040471	0/80		4 lots	Pass
			Q041124	0/80		0/374	
			Q043966	0/80			
LTOL	JA108 T _A = -10°C, Dynamic Vcc=3.8V, 1000 hours	1 lot, N=>32	Q040451	0/80		1 lots 0/80	Pass
ELFR	JA108 T _j ≥ 125°C, Dynamic Vcc=3.8V, 48 hours	3 lots, N=>500	Q040472	0/516			
			Q040651	0/515		3 lots	Pass
			Q040450	0/505		0/2052	
			Q043941	0/516			
NVM Endurance, Retention and Operating Life	JESD22-A117 25°C 500 hours	3 lots, N=>39	Q040213	0/40	6		
			Q040274	0/40	6	3 lots	
			Q040278	0/40	6	0/120	Pass
NVM Endurance, Retention and Operating Life	JESD22-A117 125°C 1000 hours	3 lots, N=>39	Q040279	0/40	7		
			Q040275	0/40	7	3 lots	
			Q040214	0/40	7	0/120	Pass

EFR32xG13 Qualification Report



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Part Rev D, TSMC Fabrication, SPIL Assembly except as noted							
Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
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
			Q042558		9	800 V	Class C2b
			Q043952		2	500 V	Class C2a
			Q044557		10	650 V	Class C2a
Latch Up	JESD78 ±100mA Overvoltage = 6V	1 lot, N=>3	Q040907 Q040908	25 °C 125 °C			Pass

Notes:

- Parts are Pre-conditioned at MSL2/260°C
- Dual-band bondout option, 7x7 QFN
- Sub GHz bondout option, 7x7 QFN
- 2.4 GHz bondout option, 7x7 QFN
- 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.
- Preconditioned with 10K write/erase cycles at 25°C
- Preconditioned with 10K write/erase cycles at 125°C
- Parts are Pre-conditioned at MSL3/260°C
- 2.4 GHz bondout option, 5x5 QFN
- 2.4 GHz bondout option, 7x7 QFN - UTATCH

This report applies to the following part numbers:		
EFR32BG13P532F512GM48-D	EFR32FG13P233F512GM48-D	EFR32MG13P733F512GM48-D
EFR32BG13P632F512GM48-D	EFR32FG13P232F512GM48-D	EFR32MG13P733F512IM48-D
EFR32BG13P632F512IM48-D	EFR32FG13P231F512GM48-D	EFR32MG13P732F512GM48-D
EFR32BG13P733F512GM48-D	EFR32FG13P231F512IM48-D	EFR32MG13P732F512IM48-D
EFR32BG13P732F512GM48-D	EFR32MG13P632F512GM48-D	EFR32MG13P732F512GM32-D
EFR32MG13P732F512IM32-D	EFR32MG13P632F512GM32-D	EFR32FG13P232F512GM32-D
EFR32FG13P231F512GM32-D	EFR32FG13P231F512IM32-D	EFR32BG13P732F512GM32-D
EFR32BG13P632F512IM32-D	EFR32BG13P632F512GM32-D	EFR32BG13P532F512GM32-D

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Approved by: K. Torres

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Prepared on: 5 Sept 2019



EFR32 BG14 / FG14 / MG14 Qualification Report

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Part Rev B, TSMC 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 - 32-QFN-5x5							
HAST	JA110 130°C, 85%RH Vcc=3.8V, 96 hours	3 lots, N=>25	Q041347	0/27	1	3 lots 0/80	Pass
			Q041352	0/27	1		
			Q041357	0/26	1		
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q041346	0/30	1	3 lots 0/90	Pass
			Q041351	0/30	1		
			Q041356	0/30	1		
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q041349	0/27	1	3 lots 0/81	Pass
			Q041354	0/27	1		
			Q041359	0/27	1		
uHAST	JA103 130°C, 85%RH 96 hours	3 lots, N=>25	Q041348	0/27	1	3 lots 0/81	Pass
			Q041353	0/27	1		
			Q041358	0/27	1		
Test Group A – Accelerated Environment Stress Tests - 48-QFN-7x7							
HAST	JA110 130°C, 85%RH Vcc=3.8V, 96 hours	3 lots, N=>25	Q039879	1/30	1, 2	4 lots 1/120	Pass
			Q040220	0/30	1		
			Q039877	0/30	1		
			Q039878	0/30	1		
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q041274	0/27	1	4 lots 0/117	Pass
			Q039882	0/30	1		
			Q039881	0/30	1		
			Q039880	0/30	1		
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q038038	0/28	1	3 lots 0/81	Pass
			Q038124	0/28	1		
			Q037590	0/25	1		
uHAST	JA103 130°C, 85%RH 96 hours	3 lots, N=>25	Q039876	0/30	1	3 lots 0/90	Pass
			Q039875	0/30	1		
			Q039874	0/30	1		
Test Group A – Accelerated Environment Stress Tests - 48-QFN-7x7 - UTL							
HAST	JA110 130°C, 85%RH Vcc=3.8V, 96 hours	3 lots, N=>25	Q044141	0/25	2	3 lots 0/75	Pass
			Q044140	0/25	2		
			Q044139	0/25	2		
UHAST	JA118 130°C, 85%RH 96 hours	3 lots, N=>25	Q044478	0/25	2	3 lots 0/75	Pass
			Q044477	0/25	2		
			Q044476	0/25	2		
Temp Cycle	JA104 Cond C: -65°C to 150°C 500 cycles	3 lots, N=>25	Q044472	0/25	2	3 lots 0/75	Pass
			Q044471	0/25	2		
			Q044618	0/25	2		
HTSL	JA103 150°C, 1000hr	3 lots, N=>25	Q044475	0/25	2	3 lots 0/75	Pass
			Q044474	0/25	2		
			Q044473	0/25	2		



EFR32 BG14 / FG14 / MG14 Qualification Report

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Part Rev B, TSMC Fabrication, SPIL Assembly except as noted							
Test Name	Test Condition	Qualification	Lot ID of Start	Fail/Pass of End	Notes	Summary	Status
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	JA108 T _J ≥ 125°C, Dynamic V _{CC} =3.8V, 1000 hours	3 lots, N=>77	Q041280 Q040470 Q040471	0/85 0/77 0/77		3 lots 0/239	Pass
LTOL	JA108 T _A = -10°C, Dynamic V _{CC} =3.8V, 1000 hours	1 lot, N=>32	Q040451	0/80		1 lots 0/80	Pass
ELFR	JA108 T _J ≥ 125°C, Dynamic V _{CC} =3.8V, 48 hours	3 lots, N=>500	Q041279 Q041617 Q040472	0/507 0/609 0/516		3 lots 0/1632	Pass
NVM Endurance, Retention and Operating Life	JESD22-A117 25°C 500 hours	3 lots, N=>39	Q040213 Q040274 Q040278	0/40 0/40 0/40		3 lots 0/120	Pass
NVM Endurance, Retention and Operating Life	JESD22-A117 125°C 500 hours	3 lots, N=>39	Q040279 Q040275 Q040214	0/40 0/40 0/40		3 lots 0/120	Pass
Test Group E – Electrical Verification							
ESD-HBM	JS-001	1 lot, N=>3	Q041276 Q041284		3 4	2 kV 2.5 kV	Class 2 Class 2
ESD-CDM	JESD22-C101	1 lot, N=>3	Q041275 Q041282 Q041283 Q041422 Q041425		5 6 7 8 9	650 V 500 V 1000 V 800 V 1000 V	Class III Class III Class IV Class III Class IV
ESD-CDM	JS-002	1 lot, N=>3	Q041946 Q041948 Q041945 Q041947 Q041944 Q044672		5 6 7 8 9 10	500 V 500 V 1000 V 650 V 1000 V 650 V	Class C2A Class C2A Class C3 Class C2A Class C3 Class C2A
Latch Up	JESD78 ±100mA Overvoltage = 5.25V	1 lot, N=>3	Q041277 Q041278 Q041285 Q041286	25 °C 125 °C 25 °C 125 °C	3 3 4 4		Pass Pass Pass Pass



EFR32 BG14 / FG14 / MG14 Qualification Report

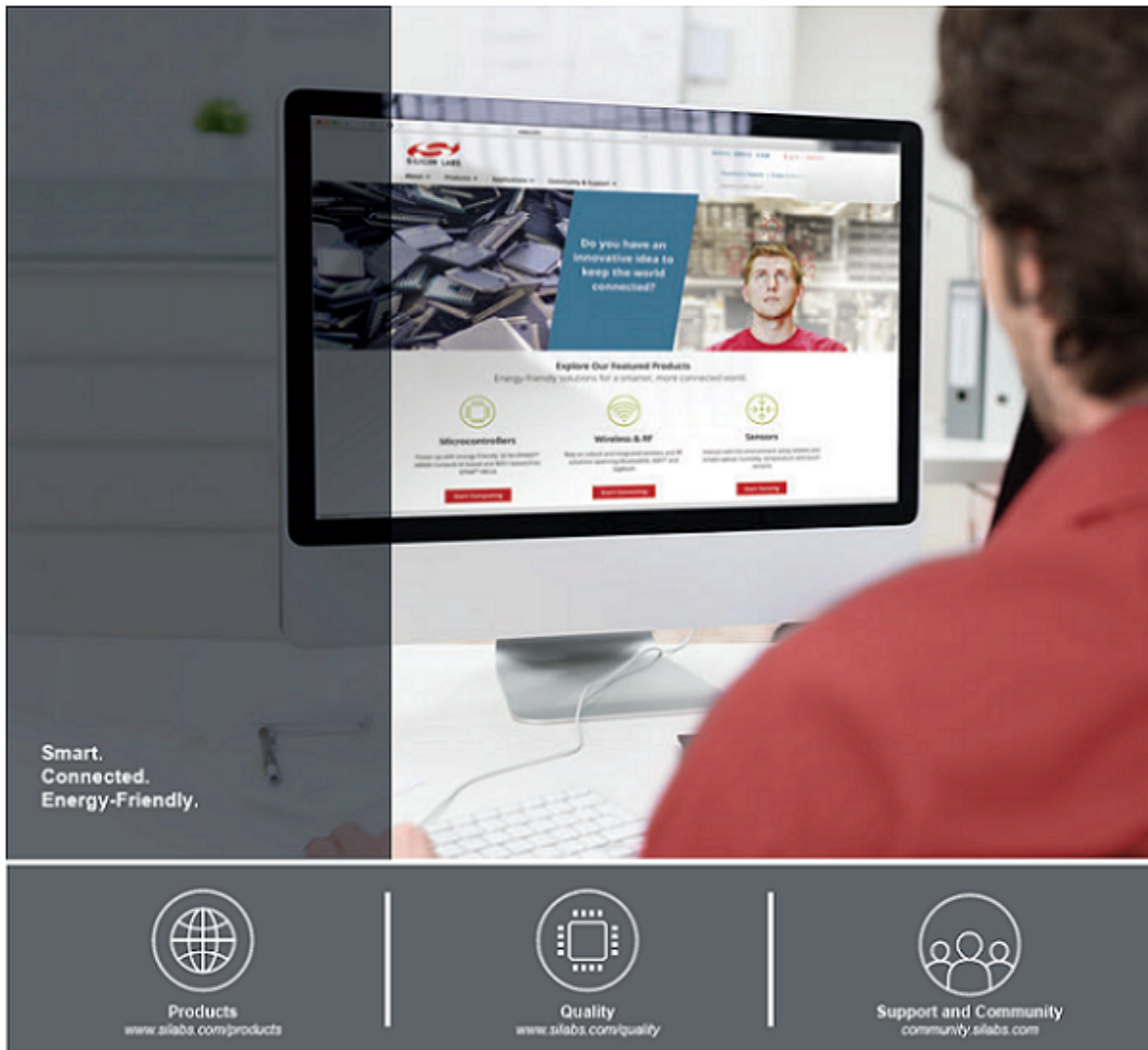
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Part Rev B, TSMC Fabrication, SPIL Assembly except as noted							
Test Name	Test Condition	Qualification	Lot ID of Start	Fail/Pass of End	Notes	Summary	Status

Notes:

- Parts are Pre-conditioned at MSL2/260°C
- 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.
- EFR32MG14x
- EFR32FG14x
- 7x7 Dual Band bond out
- 7x7 2.4Ghz bond out
- 7x7 Sub Ghz bond out
- 5x5 2.4Ghz bond out
- 5x5 Sub Ghz bond out
- 7x7 2.4 GHz bond out at UTL

This report applies to the following part numbers:		
EFR32BG14P532F256GM32-B	EFR32FG14P233F128GM48-B	EFR32MG14P632F256GM32-B
EFR32BG14P532F256GM48-B	EFR32FG14P233F256GM48-B	EFR32MG14P632F256GM48-B
EFR32BG14P632F256GM32-B	EFR32FG14P232F128GM32-B	EFR32MG14P733F256GM48-B
EFR32BG14P632F256GM48-B	EFR32FG14P232F128GM48-B	EFR32MG14P733F256IM48-B
EFR32BG14P632F256IM32-B	EFR32FG14P232F256GM32-B	EFR32MG14P732F256GM32-B
EFR32BG14P632F256IM48-B	EFR32FG14P232F256GM48-B	EFR32MG14P732F256GM48-B
EFR32BG14P733F256GM48-B	EFR32FG14P231F128GM32-B	EFR32MG14P732F256IM32-B
EFR32BG14P732F256GM32-B	EFR32FG14P231F128GM48-B	EFR32MG14P732F256IM48-B
EFR32BG14P732F256GM48-B	EFR32FG14P231F256GM32-B	
	EFR32FG14P231F256GM48-B	
	EFR32FG14P231F256IM32-B	
	EFR32FG14P231F256IM48-B	
	EFR32FG14V132F256GM32-B	
	EFR32FG14V132F256GM48-B	



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