

PCN Number: 20181004002.2 **PCN Date:** Oct 11, 2018

Title: Transfer of select LFAST devices from GFAB to SFAB Wafer Fab site

Customer Contact: [PCN Manager](#) **Dept:** Quality Services

Proposed 1st Ship Date: Apr 11, 2019 **Estimated Sample Availability:** Date provided at sample request.

Change Type:

<input type="checkbox"/>	Assembly Site	<input type="checkbox"/>	Assembly Process	<input type="checkbox"/>	Assembly Materials
<input type="checkbox"/>	Design	<input type="checkbox"/>	Electrical Specification	<input type="checkbox"/>	Mechanical Specification
<input type="checkbox"/>	Test Site	<input type="checkbox"/>	Packing/Shipping/Labeling	<input type="checkbox"/>	Test Process
<input type="checkbox"/>	Wafer Bump Site	<input type="checkbox"/>	Wafer Bump Material	<input type="checkbox"/>	Wafer Bump Process
<input checked="" type="checkbox"/>	Wafer Fab Site	<input checked="" type="checkbox"/>	Wafer Fab Materials	<input checked="" type="checkbox"/>	Wafer Fab Process
		<input type="checkbox"/>	Part number change		

PCN Details

Description of Change:

This change notification is to announce the transfer of select LFAST devices from GFAB to the SFAB (SH-BIP-1) Wafer Fab site for the selected devices listed in the "Product Affected" section.

Current Fab Site			New Fab Site		
Current Fab Site	Process	Wafer Diameter	New Fab Site	Process	Wafer Diameter
GFAB6	LFAST	150 mm	SH-BIP-1	LFAST	150 mm
GFAB8	LFAST	200 mm	SH-BIP-1	LFAST	150 mm

GFAB6 Die Metallization	GFAB8 Die Metallization	SH-BIP-1 Die Metallization
Al/1%Si	TiW/Al 0.5%Cu	TiW/Al 0.5%Cu

Qual details are provided in the Qual Data Section.

Reason for Change:

Greenock, Scotland (GFAB) Wafer Fab site closure.

Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):

None

Changes to product identification resulting from this PCN:

Current:

Current Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
GFAB6	GF6	GBR	Greenock
GFAB8	GF8	GBR	Greenock

New Fab Site:

New Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
SH-BIP-1	SHE	USA	Sherman

Sample product shipping label (not actual product label)

TEXAS INSTRUMENTS
 MADE IN: Malaysia
 2DC: 20:
 MSL 2 /260C/1 YEAR SEAL DT
 MSL 1 /235C/UNLIM 03/29/04
 OPT: 39
 ITEM:
LBL: 5A (L)T0:1750



(1P) SN74LS07NSR
 (Q) 2000 (D) 0336
 (31T) LOT: 3959047MLA
 (4W) TKY (1T) 7523483S12
 (P)
 (2P) REV: (V) 0033317
 (20L) CSO: SHE (21L) CCO:USA
 (22L) ASO: MLA (23L) ACO: MYS

Product Affected:

LM4040QAIM3-2.5/NOPB	LM4041QCIM3-1.2/NO	LM4050QAIM3-2.0/NOPB	LM4050QBIM3-5.0/NOPB
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LM4040QAIM3X2.5/NOPB	LM4041QCIM3-ADJ/NO	LM4050QAIM3-2.5/NOPB	LM4050QBIM3-8.2/NOPB
LM4040QBIM3-2.5/NOPB	LM4041QDEM3-1.2/NO	LM4050QAIM3-4.1/NOPB	LM4050QCEM3-10/NOPB
LM4040QBIM3X2.5/E7002932	LM4041QDEM3-ADJ/NO	LM4050QAIM3-8.2/NOPB	LM4050QCEM3-2.0/NOPB
LM4040QBIM3X2.5/NOPB	LM4041QDIM3-1.2/NO	LM4050QAIM3X4.1/NOPB	LM4050QCEM3-2.5/NOPB
LM4040QCEM3-2.5/NOPB	LM4041QDIM3-ADJ/NO	LM4050QBEM3-10/NOPB	LM4050QCEM3-4.1/NOPB
LM4040QCEM3-3.0/NOPB	LM4041QEEM3-1.2/NO	LM4050QBEM3-2.0/NOPB	LM4050QCEM3-5.0/NOPB
LM4040QCIM3-2.5/NOPB	LM4041QEEM3X-1.2NO	LM4050QBEM3-2.5/NOPB	LM4050QCEM3-8.2/NOPB
LM4040QCIM3X2.5/NOPB	LM4041QEIM3-1.2/NO	LM4050QBEM3-4.1/NOPB	LM4050QCEM3X10/NOPB
LM4040QDEM3-2.5/NOPB	LM4050QAEM3-10/NOPB	LM4050QBEM3-5.0/NOPB	LM4050QCEM3X2.0/NOPB
LM4040QDEM3-3.0/NOPB	LM4050QAEM3-2.0/NOPB	LM4050QBEM3-8.2/NOPB	LM4050QCEM3X2.5/NOPB
LM4040QDIM3-2.5/NOPB	LM4050QAEM3-2.5/NOPB	LM4050QBEM3X10/NOPB	LM4050QCEM3X4.1/NOPB
LM4040QDIM3X2.5/NOPB	LM4050QAEM3-4.1/NOPB	LM4050QBEM3X2.0/NOPB	LM4050QCEM3X5.0/NOPB
LM4040QEEM3-2.5/NOPB	LM4050QAEM3-5.0/NOPB	LM4050QBEM3X2.5/NOPB	LM4050QCEM3X8.2/NOPB
LM4040QEEM3-3.0/NOPB	LM4050QAEM3-8.2/NOPB	LM4050QBEM3X4.1/NOPB	LM4050QCIM3-2.0/NOPB
LM4040QEIM3-2.5/NOPB	LM4050QAEM3X10/NOPB	LM4050QBEM3X5.0/NOPB	LM4050QCIM3-4.1/NOPB
LM4040QEIM3X2.5/NOPB	LM4050QAEM3X2.0/NOPB	LM4050QBEM3X8.2/NOPB	LM4050QCIM3-5.0/NOPB
LM4041QAIM3-1.2/NO	LM4050QAEM3X2.5/NOPB	LM4050QBIM3-10/NOPB	LM50QIM3/NOPB
LM4041QBIM3-1.2/NO	LM4050QAEM3X4.1/NOPB	LM4050QBIM3-2.0/NOPB	LM50QIM3X/NOPB
LM4041QCEM3-1.2NO	LM4050QAEM3X5.0/NOPB	LM4050QBIM3-2.5/NOPB	LM60QIM3/NOPB
LM4041QCEM3-ADJ/NO	LM4050QAEM3X8.2/NOPB	LM4050QBIM3-4.1/NOPB	LM60QIM3X/NOPB
LM4041QCEM3X-1.2NO	LM4050QAIM3-10/NOPB		

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

SFAB Process qualification LFAST - SLFMC60AZS- LM60QIM3X/NOPB

Approve Date 26-Sept-2018

Product Attributes

Attributes	Qual Device: LM60QIM3X/NOPB	QBS Device: LM4041QCEM3-1.2NO
Automotive Grade Level	1	1
Operating Temp Range	-40°C to +125°C	-40°C to +125°C
Product Function	Analog Output Temperature Sensor	Automotive Shunt Voltage Reference
Die Attributes		
Wafer Fab Supplier	SFAB	SFAB
Die Revision	A	B
Assembly Site	TIEM	TIEM
Package Type	SOT-23	SOT-23
Package Designator	DBZ	DBZ
Ball/Lead Count	3	3

- Qual Devices qualified at LEVEL1-260CG: LM60QIM3X/NOPB

Qualification Results

Data Displayed as: Number of lots / Total sample size / Total failed

Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: LM60QIM3X/NOBP	QBS Device: LM4041QCEM3-1.2NO
Test Group A – Accelerated Environment Stress Tests								
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 1-260C	3/231/0	3/231/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0	3/231/0
AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	3/231/0	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	30	Post Temp. Cycle Bond Pull	Wires	-	3/90/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp. Storage Bake, 150C	1000 Hours	3/231/0	3/231/0
Test Group B – Accelerated Lifetime Simulation Tests								
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	3/231/0	3/231/0
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 150C	24 Hours	-	3/2400/0
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	--	N/A	N/A
Test Group C – Package Assembly Integrity Tests								
WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.33, Ppk>1.67)	Wires	-	1/30/0
WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	-	1/30/0
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	-	1/30/0
SD	C3	JEDEC JESD22-B102	1	15	Solderability	Pb	-	1/15/0
SD	C3	JEDEC JESD22-B102	1	15	Solderability	Pb free	-	1/15/0
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	--	-	3/30/0
Test Group D – Die Fabrication Reliability Tests								
EM	D1	JESD61	-	-	Electromigration	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
NBTI	D4	-	-	-	Negative Bias Temperature Instability	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
SM	D5	-	-	-	Stress Migration	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
Test Group E – Electrical Verification Tests								
HBM	E2	AEC Q100-002	1	3	ESD - HBM	2500 V	3/9/0	3/9/0
CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	3/9/0	3/9/0
LU	E4	AEC Q100-004	1	6	Latch-up	(Per AEC Q100-004)	3/18/0	-
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, Hot, & Cold Test	3/90/0	3/90/0
Additional Tests								
MQ			-	-	Manufacturability (Auto Assembly)	(per automotive requirements)	Pass	Pass
MQ			-	-	Manufacturability (Wafer Fab)	(per mfg. Site specification)	Pass	Pass

A1 (PC): Preconditioning:

Performed for THB, Biased HAST, AC, uHAST, TC & PTC samples, as applicable.

Ambient Operating Temperature by Automotive Grade Level:

Grade 0 (or E): -40°C to +150°C

Grade 1 (or Q): -40°C to +125°C

Grade 2 (or T): -40°C to +105°C

Grade 3 (or I): -40°C to +85°C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

Room/Hot/Cold: HTOL, ED

Room/Hot: THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU

Room: AC/uHAST

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

SFAB Process qualification LFAST - SLFMC404012BZS- LM4041QCEM3-1.2NO

Approve Date 2-Oct-2018

Product Attributes

Attributes	Qual Device: LM4041QCEM3-1.2NO
Automotive Grade Level	1
Operating Temp Range	-40°C to +125°C
Product Function	Automotive Shunt Voltage Reference
Wafer Fab Supplier	SFAB
Die Revision	B
Assembly Site	TIEM
Package Type	SOT-23
Package Designator	DBZ
Ball/Lead Count	3

- Qual Devices qualified at LEVEL1-260CG: LM4041QCEM3-1.2NO

Qualification Results

Data Displayed as: Number of lots / Total sample size / Total failed

Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: LM4041QCEM3-1.2NO
Test Group A – Accelerated Environment Stress Tests							
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 1-260C	3/231/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0
AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	30	Post Temp. Cycle Bond Pull	Wires	3/90/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp. Storage Bake, 150C	1000 Hours	3/231/0
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	3/231/0
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 150C	24 Hours	3/2400/0
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	--	N/A

Test Group C – Package Assembly Integrity Tests								
	WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.33, Ppk>1.67)	Wires	1/30/0
	WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	1/30/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	1/30/0
	SD	C3	JEDEC JESD22-B102	1	15	Solderability	Pb	1/15/0
	SD	C3	JEDEC JESD22-B102	1	15	Solderability	Pb free	1/15/0
	PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	--	3/30/0
Test Group D – Die Fabrication Reliability Tests								
	EM	D1	JESD61	-	-	Electromigration	--	Completed Per Process Technology Requirements
	TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	--	Completed Per Process Technology Requirements
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	--	Completed Per Process Technology Requirements
	NBTI	D4	-	-	-	Negative Bias Temperature Instability	--	Completed Per Process Technology Requirements
	SM	D5	-	-	-	Stress Migration	--	Completed Per Process Technology Requirements
Test Group E – Electrical Verification Tests								
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	2500 V	3/9/0
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	3/9/0
	LU	E4	AEC Q100-004	1	6	Latch-up	(Per AEC Q100-004)	2/12/0
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, Hot, & Cold Test	3/90/0
Additional Tests								
	MQ			-	-	Manufacturability (Auto Assembly)	(per automotive requirements)	Pass
	MQ			-	-	Manufacturability (Wafer Fab)	(per mfg. Site specification)	Pass

A1 (PC): Preconditioning:

Performed for THB, Biased HAST, AC, uHAST, TC & PTC samples, as applicable.

Ambient Operating Temperature by Automotive Grade Level:

Grade 0 (or E): -40°C to +150°C

Grade 1 (or Q): -40°C to +125°C

Grade 2 (or T): -40°C to +105°C

Grade 3 (or I): -40°C to +85°C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

Room/Hot/Cold: HTOL, ED

Room/Hot: THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU

Room: AC/uHAST

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

SFAB Process qualification LFAST-CCR - SLFMC405050CZS- LM4050QAEM3-5.0/NO

Approve Date 26-Sept-2018

Product Attributes

Attributes	Qual Device LM4050QAEM3-5.0/NO	QBS Device: LM4041QCEM3-1.2NO
Automotive Grade Level	1	1
Operating Temp Range	-40°C to +125°C	-40°C to +125°C
Product Function	Analog Output Temperature Sensor	Automotive Shunt Voltage Reference
Die Attributes		
Wafer Fab Supplier	SFAB	SFAB
Die Revision	A	B
Package Attributes		
Assembly Site	TIEM	TIEM
Package Type	SOT-23	SOT-23
Package Designator	DBZ	DBZ
Ball/Lead Count	3	3

- Qual Devices qualified at LEVEL1-260CG: LM4050QAEM3-5.0/NO

Qualification Results

Data Displayed as: Number of lots / Total sample size / Total failed

Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: LM4050QAEM3-5.0/NO	QBS Device: LM4041QCEM3-1.2/NO
Test Group A – Accelerated Environment Stress Tests								
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 1-260C	3/480/0	3/231/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0	3/231/0
AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	-	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	30	Post Temp. Cycle Bond Pull	Wires	-	3/90/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp. Storage Bake, 150C	1000 Hours	-	3/231/0
Test Group B – Accelerated Lifetime Simulation Tests								
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	3/231/0	3/231/0
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 150C	24 Hours	-	3/2400/0
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	--	N/A	N/A
Test Group C – Package Assembly Integrity Tests								
WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.33, Ppk>1.67)	Wires	-	1/30/0
WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	-	1/30/0
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	-	1/30/0
SD	C3	JEDEC JESD22-B102	1	15	Solderability	Pb	-	1/15/0
SD	C3	JEDEC JESD22-B102	1	15	Solderability	Pb free	-	1/15/0
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	--	-	3/30/0
Test Group D – Die Fabrication Reliability Tests								
EM	D1	JESD61	-	-	Electromigration	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
TDD	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
NBTI	D4	-	-	-	Negative Bias Temperature Instability	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
SM	D5	-	-	-	Stress Migration	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
Test Group E – Electrical Verification Tests								
HBM	E2	AEC Q100-002	1	3	ESD - HBM	2500 V	3/9/0	1/3/0
CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	3/9/0	1/3/0
LU	E4	AEC Q100-004	1	6	Latch-up	(Per AEC Q100-004)	3/18/0	1/6/0
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, Hot, & Cold Test	3/90/0	3/90/0
Additional Tests								
MQ			-	-	Manufacturability (Auto Assembly)	(per automotive requirements)	Pass	Pass
MQ			-	-	Manufacturability (Wafer Fab)	(per mfg. Site specification)	Pass	Pass

A1 (PC): Preconditioning:

Performed for THB, Biased HAST, AC, uHAST, TC & PTC samples, as applicable.

Ambient Operating Temperature by Automotive Grade Level:

Grade 0 (or E): -40°C to +150°C

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Grade 2 (or T): -40°C to +105°C

Grade 3 (or I): -40°C to +85°C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

Room/Hot/Cold : HTOL, ED

Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU

Room : AC/uHAST

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

For questions regarding this notice, e-mails can be sent to the regional contacts shown below, or you can contact your local Field Sales Representative.

Location	E-Mail
USA	PCNAmericasContact@list.ti.com
Europe	PCNEuropeContact@list.ti.com
Asia Pacific	PCNAsiaContact@list.ti.com
Japan	PCNJapanContact@list.ti.com