

PCN Number:		20180307000-001		PCN Date:		Mar 9, 2018																									
Title:		Transfer of select P2-AMPS devices from GFAB to DFAB Wafer Fab site																													
Customer Contact:		PCN Manager		Dept:		Quality Services																									
Proposed 1st Ship Date:		Sep 9, 2018		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 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 P2-AMPS devices from GFAB to the DFAB (DL-LIN) Wafer Fab site for the selected devices listed in the "Product Affected" section.																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3">Current Fab Site</th> <th colspan="3">New Fab Site</th> </tr> <tr> <th>Current Fab Site</th> <th>Process</th> <th>Wafer Diameter</th> <th>New Fab Site</th> <th>Process</th> <th>Wafer Diameter</th> </tr> </thead> <tbody> <tr> <td>GFAB6</td> <td>P2-AMPS</td> <td>150 mm</td> <td>DL-LIN</td> <td>P2-AMPS</td> <td>200 mm</td> </tr> <tr> <td>GFAB8</td> <td>P2-AMPS</td> <td>200 mm</td> <td>DL-LIN</td> <td>P2-AMPS</td> <td>200 mm</td> </tr> </tbody> </table>								Current Fab Site			New Fab Site			Current Fab Site	Process	Wafer Diameter	New Fab Site	Process	Wafer Diameter	GFAB6	P2-AMPS	150 mm	DL-LIN	P2-AMPS	200 mm	GFAB8	P2-AMPS	200 mm	DL-LIN	P2-AMPS	200 mm
Current Fab Site			New Fab Site																												
Current Fab Site	Process	Wafer Diameter	New Fab Site	Process	Wafer Diameter																										
GFAB6	P2-AMPS	150 mm	DL-LIN	P2-AMPS	200 mm																										
GFAB8	P2-AMPS	200 mm	DL-LIN	P2-AMPS	200 mm																										
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:																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Current Chip Site</th> <th>Chip Site Origin Code (20L)</th> <th>Chip Site Country Code (21L)</th> <th>Chip Site City</th> </tr> </thead> <tbody> <tr> <td>GFAB6</td> <td>GF6</td> <td>GBR</td> <td>Greenock</td> </tr> <tr> <td>GFAB8</td> <td>GF8</td> <td>GBR</td> <td>Greenock</td> </tr> </tbody> </table>								Current Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City	GFAB6	GF6	GBR	Greenock	GFAB8	GF8	GBR	Greenock												
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:																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>New Chip Site</th> <th>Chip Site Origin Code (20L)</th> <th>Chip Site Country Code (21L)</th> <th>Chip Site City</th> </tr> </thead> <tbody> <tr> <td>DL-LIN</td> <td>DLN</td> <td>USA</td> <td>Dallas</td> </tr> </tbody> </table>								New Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City	DL-LIN	DLN	USA	Dallas																
New Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City																												
DL-LIN	DLN	USA	Dallas																												
Sample product shipping label (not actual product label)																															
Product Affected:																															
LMC6035IMQ1		LMC6772QMMX/NOPB		LMC7101QM5/NOPB		LMC7215QIM5/NOPB																									
LMC6035IMXQ1		LMC6772QMMX/S7002298		LMC7101QM5X/NOPB		LMC7215QIM5X/NOPB																									
LMC6772QMM/NOPB																															

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

DFAB Process qualification P2-AMPS (CP25 with depletion devices and poly 1 to poly 2 Cap) BCPALMC7101CZ8 - LMC7101QM5/NOPB

Approved 08-Feb-2018
Product Attributes

Attributes	Qual Device: LMC7101QM5/NOPB
Operating Temp Range	-40°C to +125°C
Automotive Grade Level	1
Product Function	Op Amp
Wafer Fab Supplier	DFAB -200
Wafer Process	P2-AMPS
Die Revision	C
Assembly Site	TIEM
Package Type	SOT-23
Package Designator	DBV
Ball/Lead Count	5

- QBS: Qual By Similarity

- Qual Devices qualified at LEVEL1-260CG: LMC7101QM5/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: LMC7101QM5/NOPB
Test Group A – Accelerated Environment Stress Tests							
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 1-260C	3/720/0
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 Cycles, -65/150C	500 Cycles	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	60	Post Temp. Cycle Bond Pull	Wires	3/15/0
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>1.67)	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 (>95% Lead Coverage)	Pb & Pb-Free	1/15/0
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	--	1/10/0
SBS	C5	AEC Q100-010	3	50	Solder Ball Shear (Cpk>1.67)	Post HTSL/Bump	N/A
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	1000 V	3/9/0 (1)
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)	3/18/0
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and 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

Note 1: Product datasheet for this device shows maximum ESD HBM voltage of ±1000V.

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

DFAB Process qualification P2-AMPS - BCPALMC6482BC8 - LMC6482AIM/NOPB (CP25 /Poly Fuse)/ Automotive Grade 1

Approved 05-March-2018

Product Attributes

Attributes	Qual Device: LMC6482AIM/NOPB
Operating Temp Range	-40°C to +125°C
Automotive Grade Level	1
Product Function	Op Amp
Wafer Fab Supplier	DFAB - 200
Wafer Process	P2-AMPS
Die Revision	B
Assembly Site	TIEM
Package Type	SOIC
Package Designator	D
Ball/Lead Count	8

- Qual Devices qualified at LEVEL1-260CG: LMC6482AIM/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: LMC6482AIM/NOPB
Test Group A – Accelerated Environment Stress Tests							
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 1-260C	3/720/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/240/0
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	60	Post Temp. Cycle Bond Pull	Wires	3/15/0
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	3/240/0
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	3/240/0
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
SD	C3	JEDEC JESD22-B102	1	15	Solderability (>95% Lead Coverage)	Pb & Pb-Free	1/30/0
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.33 Ppk>1.67)	--	3/90/0
SBS	C5	AEC Q100-010	3	50	Solder Ball Shear (Cpk>1.67)	Post HTSL/Bump	N/A
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	1500 V	3/9/0 (1)
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)	3/18/0
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, Hot, & Cold Test	3/231/0
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

Note 1: Product datasheet for this device shows maximum ESD HBM voltage of $\pm 1500V$.

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