PCN Number:	20210427002.2	**PCN Date:**	May 11, 2021

Title:	Qualify TI Malaysia as an additional Assembly site for select devices

Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	Nov. 11, 2021	**Estimated Sample Availability:**	Provided upon Request

Change Type:

☒	Assembly Site	☐	Design	☐	Wafer Bump Site
☐	Assembly Process	☐	Data Sheet	☐	Wafer Bump Material
☒	Assembly Materials	☐	Part number change	☐	Wafer Bump Process
☐	Mechanical Specification	☐	Test Site	☐	Wafer Fab Site
☒	Packing/Shipping/Labeling	☐	Test Process	☐	Wafer Fab Materials
				☐	Wafer Fab Process

PCN Details

Description of Change:

Texas Instruments is pleased to announce the qualification of TI Malaysia as additional Assembly Site for Select Devices listed in the "Product Affected" Section. Material differences are as follows.

Material Differences:

	TI Melaka	TI Malaysia
Mount compound	8075531	4147858
Mold compound	8096859	4211880
Lead finish	Matte Sn	Roughened NiPdAu (Single side top)

Upon expiry of this PCN TI will combine lead free solutions in a single ***standard part number***, for this device. For example; ***LMV324Q1MA/NOPB*** – can ship with both Matte Sn and NiPdAu.

Example:

- Customer order for 7500 units of LMV324Q1MA/NOPB with 2500 units SPQ (Standard Pack Quantity per Reel).
- TI can satisfy the above order in one of the following ways.
  - I. 3 Reels of NiPdAu finish.
  - II. 3 Reels of Matte Sn finish
  - III. 2 Reels of Matte Sn and 1 reel of NiPdAu finish.
  - IV. 2 Reels of NiPdAu and 1 reel of Matte Sn finish.

Reason for Change:

Continuity of Supply

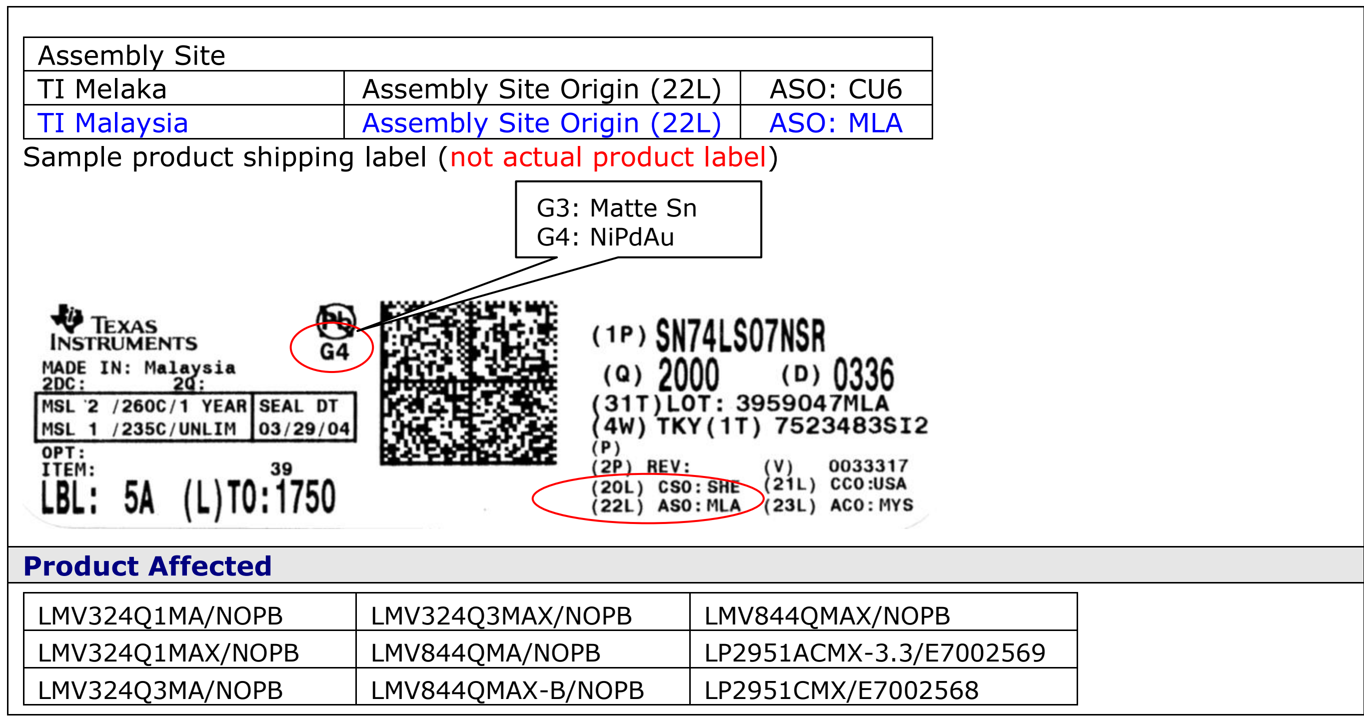
Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):

None

Anticipated impact on Material Declaration

☐	No Impact to the Material Declaration	☒	Material Declarations or Product Content reports are driven from production data and will be available following the production release. Upon production release the revised reports can be obtained from the TI Eco-Info website. There is no impact to the material meeting current regulatory compliance requirements with this PCN change.

Changes to product identification resulting from this PCN:



Assembly Site		
TI Melaka	Assembly Site Origin (22L)	ASO: CU6
TI Malaysia	Assembly Site Origin (22L)	ASO: MLA

Sample product shipping label (not actual product label)

Product Affected

LMV324Q1MA/NOPB	LMV324Q3MAX/NOPB	LMV844QMAX/NOPB
LMV324Q1MAX/NOPB	LMV844QMA/NOPB	LP2951ACMX-3.3/E7002569
LMV324Q3MA/NOPB	LMV844QMAX-B/NOPB	LP2951CMX/E7002568

Qualification Report

Approved 22-Feb-2021

Product Attributes

Attributes	Qual Device: LMV324Q1MAX/NOPB	Qual Device: LMV844QMAX/NOPB	Qual Device: LP2951ACMX-3.3/E7002569	QBS Product Reference: LM9061QDRQ1	QBS Process Reference: DS90LV019TMX	QBS Process Reference: LM2576HVT-5.0	QBS Process Reference: LMP8601EDRQ1	QBS Package Reference: CAHCT244QDWRQ1	QBS Package Reference: ULQ2003AQDRQ1
Automotive Grade Level	Grade 1	Grade 1	Grade S	Grade 1	Grade 1	Grade 1	Grade 0	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +150 C	-40 to +125 C	-40 to +125 C
Product Function	Signal Chain	Signal Chain	Power Management	Power Management	Signal Chain	Power Management	Signal Chain	Signal Chain	Power Management
Die Attributes	-	-	-	-	-	-	-	-	-
Wafer Fab Supplier	MFAB	MFAB	GFAB	GFAB	MFAB	GFAB	MFAB	SFAB	SFAB
Wafer Process Technology	High precision Analog CMOS	High speed BiCMOS	Bipolar	Bipolar	High precision Analog CMOS	Bipolar	High Speed BiCMOS	Analog CMOS	Bipolar
Die Revision	D2	A	C	B	A	F	D	B	C
Package Attributes	-	-	-	-	-	-	-	-	-
Assembly Site	MLA	MLA	MLA	MLA	TIEMA	TIEMA	TIEMA	MLA	MLA
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	TO-220	SOIC	SOIC	SOIC
Package Designator	D	D	D	D	D	KC	D	DW	D
Ball/Lead Count	14	14	8	8	14	5	8	20	16

- QBS: Qual By Similarity
- Qual Devices LP2951ACMX-3.3/E7002569, LMV844QMAX/NOPB, LMV324Q1MAX/NOPB are qualified at LEVEL1-260C

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: LMV324Q1MAX /NOPB	Qual Device: LMV844QMAX /NOPB	Qual Device: LP2951ACMX-3.3/E7002569	QBS Product Reference: LM9061QDRQ1	QBS Process Reference: DS90LV019TMX	QBS Process Reference: LM2576HVT-5.0	QBS Process Reference: LMP8601EDRQ1	QBS Package Reference: CAHCT244QDWRQ1	QBS Package Reference: ULQ2003AQDRQ1
Test Group A – Accelerated Environment Stress Tests															
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 3-260C	-	-	-	3/750/0	-	-	-	-	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	LEVEL1-235C	-	-	-	-	3/693/0	-	-	-	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 1-260C	Note 1.	3/630/0	3/490/0	-	-	-	3/693/0	3/750/0	3/1770/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	Note 1.	Note 2.	3/231/0	3/231/0	-	3/231/0	3/231/0	-	3/231/0
HAST	A2	JEDEC JESD22-A110	3	77	Temperature Humidity Biased, 85C/85%RH	1000 Hours	-	-	-	-	3/231/0	-	-	-	-
AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	Note 1.	3/231/0	1/77/0 Note 3.	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	Note 1.	3/231/0	1/77/0 Note 3.	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	60	Post Temp Cycle Bond Pull	Wires	Note 1.	1/60/0	1/60/0	1/60/0	1/60/0	1/60/0	1/60/0	3/90/0	3/90/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 150C	1000 Hours	-	-	-	1/45/0	1/45/0	1/45/0	-	-	3/135/0
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	Note 1.	3/135/0	1/45/0	-	-	-	-	3/135/0	-

	Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: LMV324Q1MAX/NOPB	Qual Device: LMV844QMAX/NOPB	Qual Device: LP2951ACMX-3.3/E7002569	QBS Product Reference: LM9061QDRQ1	QBS Process Reference: DS90LV019TMX	QBS Process Reference: LM2576HVT-5.0	QBS Process Reference: LMP8601EDRQ1	QBS Package Reference: CAHCT244QDWRQ1	QBS Package Reference: ULQ2003AQDRQ1
Test Group B – Accelerated Lifetime Simulation Tests																
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	-	-	1/77/0 Note 3.	1/77/0	-	3/231/0	-	-	3/231/0
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 150C	1000 Hours	Note 1.	Note 2.	-	-	3/231/0	-	3/231/0	-	-
	ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 125C	48 Hours	-	-	Note 3.	-	-	3/2400/0	-	-	-
	ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 150C	48 Hours	Note 1.	Note 2.	-	-	3/2400/0	-	3/2400/0	-	-
	EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	N/A	N/A	-	-	-	-	-	-
Test Group C – Package Assembly Integrity Tests																
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear (Cpk>1.67)	Wires	3/90/0	3/90/0	3/90/0	1/30/0	1/30/0	1/30/0	1/30/0	3/90/0	3/90/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull (Cpk>1.67)	Wires	3/90/0	3/90/0	3/90/0	1/30/0	1/30/0	1/30/0	1/30/0	3/90/0	3/90/0
	SD	C3	JEDEC JESD22-B102	1	15	Solderability	Pb	Note 1.	Note 2.	Note 3.	-	-	-	-	2/30/0	1/15/0
	SD	C3	JEDEC JESD22-B102	1	15	Solderability	Pb Free	Note 1.	Note 2.	Note 3.	-	-	-	3/66/0	3/45/0	1/15/0
	PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	-	1/30/0	1/30/0	1/30/0	-	-	-	3/30/0	3/30/0	-
	SBS	C5	AEC Q100-010	3	50	Solder Ball Shear (Cpk>1.67)	Solder Balls	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	LI	C6	JEDEC JESD22-B105	1	50	Lead Integrity	Leads	-	-	-	-	-	-	-	-	1/22/0

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: LMV324Q1MAX/NOPB	Qual Device: LMV844QMAX/NOPB	Qual Device: LP2951ACMX-3.3/E7002569	QBS Product Reference: LM9061QDRQ1	QBS Process Reference: DS90LV019TMX	QBS Process Reference: LM2576HVT-5.0	QBS Process Reference: LMP8601EDRQ1	QBS Package Reference: CAHCT244QDWRQ1	QBS Package Reference: ULQ2003AQDRQ1
Test Group D – Die Fabrication Reliability Tests																
	EM	D1	JESD 61	-	-	Electromigration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-	-	-
	TDDB	D2	JESD 35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-	-	-
	HCI	D3	JESD 60 & 28	-	-	Hot Injection Carrier	-	Completed Per Process Technology Requirements	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	Completed Per Process Technology Requirements	-	-	-	-	-	-
	SM	D5	-	-	-	Stress Migration	-	Completed Per Process Technology Requirements	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 - Q100	2000 Volts	-	-	-	1/3/0	1/9/0	3/9/0	1/3/0	-	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM - Q100	750V corner pins, 500V all other pins	-	-	-	1/3/0	1/9/0	3/9/0	1/3/0	-	-
	LU	E4	AEC Q100-004	1	6	Latch-up	(Per AEC-Q100-004)	-	-	-	1/6/0	1/6/0	3/18/0	1/6/0	-	-
	ED	E5	AEC Q100-009	3	30	Auto Electrical Distributions	Cpk>1.67 Room, hot, and cold test	3/90/0	3/90/0	1/30/0	3/90/0	-	-	3/90/0	-	3/90/0
Additional Tests																
	FLAM			1	5	Flammability (UL 94V-0)	Method A	-	-	-	-	-	-	-	-	1/5/0

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

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

Location	E-Mail
USA	PCNAmericasContact@list.ti.com
Europe	PCNEuropeContact@list.ti.com
Asia Pacific	PCNAsiaContact@list.ti.com
WW PCN Team	PCN_ww_admin_team@list.ti.com

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale (www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.