

PCN Number:	20231219002.1		PCN Date:	December 21, 2023																			
Title:	Qualification of RFAB as an additional Fab site option and Assembly site/BOM Options for select devices																						
Customer Contact:	Change Management Team		Dept:	Quality Services																			
Proposed 1st Ship Date:	Mar 19, 2024		Sample requests accepted until:	Jan 20, 2024*																			
*Sample requests received after Jan 20, 2024 will not be supported.																							
Change Type:																							
<input checked="" type="checkbox"/>	Assembly Site	<input checked="" type="checkbox"/>	Design	<input type="checkbox"/>	Wafer Bump Material																		
<input checked="" type="checkbox"/>	Assembly Process	<input type="checkbox"/>	Data Sheet	<input type="checkbox"/>	Wafer Bump Process																		
<input checked="" type="checkbox"/>	Assembly Materials	<input type="checkbox"/>	Part number change	<input checked="" type="checkbox"/>	Wafer Fab Site																		
<input type="checkbox"/>	Mechanical Specification	<input type="checkbox"/>	Test Site	<input checked="" type="checkbox"/>	Wafer Fab Material																		
<input checked="" type="checkbox"/>	Packing/Shipping/Labeling	<input type="checkbox"/>	Test Process	<input checked="" type="checkbox"/>	Wafer Fab Process																		
PCN Details																							
Description of Change:																							
Texas Instruments is pleased to announce the qualification of its RFAB fabrication facility as an additional Wafer Fab option in addition to Assembly site/BOM options for the devices listed below.																							
<table border="1"> <thead> <tr> <th colspan="3">Current Fab Site</th> <th colspan="3">Additional Fab site</th> </tr> <tr> <th>Current Fab Site</th> <th>Process</th> <th>Wafer Diameter</th> <th>Additional Fab site</th> <th>Process</th> <th>Wafer Diameter</th> </tr> </thead> <tbody> <tr> <td>SH-BIP-1</td> <td>J11</td> <td>150mm</td> <td>RFAB</td> <td>TIB</td> <td>300mm</td> </tr> </tbody> </table>			Current Fab Site			Additional Fab site			Current Fab Site	Process	Wafer Diameter	Additional Fab site	Process	Wafer Diameter	SH-BIP-1	J11	150mm	RFAB	TIB	300mm			
Current Fab Site			Additional Fab site																				
Current Fab Site	Process	Wafer Diameter	Additional Fab site	Process	Wafer Diameter																		
SH-BIP-1	J11	150mm	RFAB	TIB	300mm																		
The die was also changed as a result of the process change.																							
Construction differences are noted below:																							
Group 1: RFAB/Process migration & BOM Option qualifications																							
		Current	New																				
Bond wire composition, diameter diameter		0.96/1.0 mil Cu, 0.8 mil Au	0.80 mil Cu																				
Group 2: RFAB/Process migration & MLA (from FMX) as an additional Assembly site																							
		FMX	MLA																				
Bond wire composition, diameter diameter		1.0 mil Cu	0.80 mil Cu																				
Group 3 RFAB/Process migration & MLA (from TAI) as an additional Assembly site																							
		TAI	MLA																				
Bond wire composition, diameter diameter		0.96 mil Au	0.80 mil Cu																				
Reason for Change:																							
These changes are part of our multiyear plan to transition products from our 150-millimeter factories to newer, more efficient manufacturing processes and technologies, underscoring our commitment to product longevity and supply continuity.																							
Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):																							
None																							
Impact on Environmental Ratings																							
Checked boxes indicate the status of environmental ratings following implementation of this change. If below boxes are checked, there are no changes to the associated environmental ratings.																							

RoHS	REACH	Green Status	IEC 62474
<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change

Changes to product identification resulting from this PCN:

Fab Site Information:

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

Die Rev:

Current

New

Die Rev [2P]	Die Rev [2P]
-	A

Assembly Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
TI Mexico	MEX	MEX	Aguascalientes
TI Taiwan	TAI	TWN	Chung Ho, New Taipei City
TI Malaysia	MLA	MYS	Kuala Lumpur

Sample product shipping label (not actual product label):



Product Affected:

Group 1 Device list (RFAB/Process migration & BOM Option qualifications)

LM239ADR	LM2901AVQPWRG4	LM339APWR	LM339APWRG4
LM2901AVQPWR	LM339ADR		

Group 2 Device list (RFAB/Process migration & MLA (from FMX) as an additional Assembly site)

LM2901AVQDR	LM2901AVQDRG4
-------------	---------------

Group 3 Device list (RFAB/Process migration & MLA (from TAI) as an additional Assembly site)

LM139ADR	LM139ADRG4	
----------	------------	--

For alternate parts with similar or improved performance, please visit the product page on [TI.com](http://www.ti.com)

TI Information
Selective Disclosure

Qualification Report

**LM2901AVQDR Commercial Qualification New Process TIB (RFAB) in D package (MLA).
Approve 13-OCTOBER -2023**

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: LM2901AVQDR	QBS Reference: SN74HCS74QDRQ1	QBS Reference: LM324BIPWR	QBS Reference: LM2901BQDRQ1	QBS Reference: MC33063ADR	QBS Reference: LM2901BQPWRQ1
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	-	1/77/0	3/231/0	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	3/231/0	-	1/77/0	3/231/0	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	3/231/0	-	1/77/0	3/231/0	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	3/135/0	-	-	-	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	-	-	3/231/0	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	1/77/0	-	-
HTOL	B1	Life Test	125C	1000 Hours	-	-	3/231/0	-	2/154/0	-
HTOL	B1	Life Test	150C	300 Hours	-	-	-	1/77/0	-	1/77/0
ESD	E2	ESD CDM	-	500 Volts	1/3/0	-	-	1/3/0	-	-
ESD	E2	ESD HBM	-	2000 Volts	-	-	-	1/3/0	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	-	-	-	1/6/0	-	1/6/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	-	-	-	-	-

- QBS: Qual By Similarity
- Qual Device LM2901AVQDR is qualified at MSL1 260C

- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
- The following are equivalent HTOL options based on an activation energy of 0.7eV : 125C/1k Hours, 140C/480 Hours, 150C/300 Hours, and 155C/240 Hours
- The following are equivalent HTSL options based on an activation energy of 0.7eV : 150C/1k Hours, and 170C/420 Hours
- The following are equivalent Temp Cycle options per JESD47 : -55C/125C/700 Cycles and -65C/150C/500 Cycles

Quality and Environmental data is available at TI's external Web site: <http://www.ti.com/>

TI Qualification ID: R-CHG-2310-026

[1]-Unit damaged prior to ATE
Package cracked down the middle

Qualification Report

LM339 / LM2901 A-Grade TSSOP Commercial Device Red Bull Refresh.
Approve Date 23-OCTOBER -2023

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: LM2901AVQPWR	Qual Device: LM339AVQPWR	QBS Reference: LM324BIPWR
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	3/231/0
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	3/231/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	3/231/0
HTOL	B1	Life Test	125C	1000 Hours	-	-	3/231/0
HTOL	B1	Life Test	150C	300 Hours	1/77/0	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	3/2400/0
ESD	E2	ESD CDM	-	1500 Volts	1/3/0	-	-
ESD	E2	ESD HBM	-	2000 Volts	1/3/0	-	-
LU	E4	Latch-Up	Per JESD78	-	1/6/0	-	-
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	-	-

- QBS: Qual By Similarity
- Qual Device LM2901AVQPWR is qualified at MSL1 260C

- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
- The following are equivalent HTOL options based on an activation energy of 0.7eV : 125C/1k Hours, 140C/480 Hours, 150C/300 Hours, and 155C/240 Hours
- The following are equivalent HTSL options based on an activation energy of 0.7eV : 150C/1k Hours, and 170C/420 Hours
- The following are equivalent Temp Cycle options per JESD47 : -55C/125C/700 Cycles and -65C/150C/500 Cycles

Quality and Environmental data is available at TI's external Web site: <http://www.ti.com/>

TI Qualification ID: R-CHG-2310-029

For questions regarding this notice, e-mails can be sent to the Change Management team or your local Field Sales Representative.

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 disdains 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.