12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN#20211220002.1
Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision, and additional Assembly & BOM option for select devices
Change Notification / Sample Request

Date: December 22, 2021
To: TOKYO ELECTRON DEVICE (DSTR) PCN

Dear Customer:

This is an announcement of a change to a device that is currently offered by Texas Instruments (TI). The details of this change are on the following pages, and are in alignment with our standard product change notification (PCN) process.

TI requires acknowledgement of receipt of this notification within 30 days of the date of this notice. Lack of acknowledgement of this notice within 30 days constitutes acceptance of the change. If samples or additional data are required, requests must be received within 30 days of this notification, given that samples are not built ahead of the change.

The Proposed First Ship date in this PCN letter is the earliest possible date that customers could receive the changed material. It is our commitment that the changed device will not ship before that date. If samples are requested within the 30 day sample request window, customers will still have 30-days to complete their evaluation regardless of the proposed 1st ship date.

This particular PCN is related to TI's previous announcement to close our two remaining factories with 150-millimeter production (DFAB in Dallas, Texas, and SFAB in Sherman, Texas). As referenced in the "reason for change" below, these changes are part of our multiyear plan to transition these products to newer, more efficient manufacturing processes and technologies, underscoring our commitment to product longevity and supply continuity.

For questions regarding this notice or to provide acknowledgement of this PCN, you may contact your local Field Sales Representative or the PCN Team (PCN_ww_admin_team@list.ti.com). For sample requests or sample related questions, contact your local Field Sales Representative. As always, we thank you for your continued business.

PCN Team
SC Business Services

20211220002.1
Attachment: 1

Products Affected:

The devices listed on this page are a subset of the complete list of affected devices. According to our records, these are the devices that you have purchased within the past twenty-four (24) months. The corresponding customer part number is also listed, if available.

DEVICE	CUSTOMER PART NUMBER
SN74HCT74PWR	null
SN74HCT04NSR	null
SN74HCT08PWR	null
CD74HCT125M96	null
SN74HCT04DR	null
SN74HCT04PWR	null
SN74HCT32N	null
SN74HCT04ANSR	null
SN74HCT125DR	null
SN74HCT02PWR	null
SN74HCT32PWR	null

Technical details of this Product Change follow on the next page(s).

PCN Number:	20211220002.1	PCN Date:	December 22, 2021
Title:	Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision, and additional Assembly & BOM options for select devices		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Mar 22, 2022	Estimated Sample Availability:	Date provided at sample request.

Change Type:					
☒	Assembly Site	☐	Assembly Process	☒	Assembly Materials
☒	Design	☐	Electrical Specification	☐	Mechanical Specification
☐	Test Site	☐	Packing/Shipping/Labeling	☐	Test Process
☐	Wafer Bump Site	☐	Wafer Bump Material	☐	Wafer Bump Process
☒	Wafer Fab Site	☒	Wafer Fab Materials	☒	Wafer Fab Process
		☐	Part number change		

PCN Details

Description of Change:

Texas Instruments is pleased to announce the qualification of a new fab & process technology (RFAB, LBC9) and Assembly & BOM option for selected devices as listed below in the product affected section. Construction differences are noted below:

Current Fab Site			Additional Fab Site		
Current Fab Site	Process	Wafer Diameter	Additional Fab Site	Process	Wafer Diameter
SFAB	HCMOS	150 mm	RFAB	LBC9	300 mm

The die was also changed as a result of the process change.

Additionally, there will be a BOM/Assembly options introduced for these devices:

Group 1 - RFAB/Process migration & BOM Update for N & NS Packaged Devices

	Current	Additional
Bond wire diameter (Cu)	0.96 mils	0.8 mils

Group 2 - RFAB/Process migration, BOM update & HFTF as alternate Assembly site for SOIC Packaged Devices

	MLA Current	MLA New	HFTF
Bond wire diameter (Cu)	0.96 mil	0.8 mils	0.8 mils
Mount Compound	4147858	4147858	SID#A-03
Mold Compound	4211880	4211880	SID#R-30

Group 3 - RFAB/Process migration BOM update & TFME as alternate Assembly site for PW Packaged devices

	MLA Current	MLA New	TFME
Bond wire diameter (Cu)	0.96 mil	0.8 mils	0.8 mils
Mount Compound	4147858	4147858	SID#A-03
Mold Compound	4211471	4211471	SID#R-31
Lead Finish	NiPdAu	NiPdAu	Matte Sn

Upon expiry of this PCN TI will combine lead free solutions in a single ***standard part number***, for the devices in group 3. For example; ***SN74HCT04PWR*** – can ship with both Matte Sn and NiPdAu/Ag.

Example:

- Customer order for 7500 units of SN74HCT04PWR 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.

The following table provides the updated thermal characteristics to all devices contained within this PCN. All thermal values can be compared to the existing devices by reviewing the datasheets currently on TI.com. The impact to the customer system is anticipated to be negligible, however the customer must review their system design to assess any risk due to the change in thermal characteristics. Please see the table below which provides a summary of thermal values that the devices will be updated to based on each pin/pkg combination.

THERMAL METRIC		D (SOIC)	N (PDIP)	NS (SO)	PW (TSSOP)	UNIT
		14 PINS	14 PINS	14 PINS	14 PINS	
RθJA	Junction-to-ambient thermal resistance	138.7	103.8	129.3	157.6	°C/W
RθJC(top)	Junction-to-case (top) thermal resistance	93.8	91.6	85.7	84.1	°C/W
RθJB	Junction-to-board thermal resistance	94.7	83.5	89.9	100.8	°C/W
ΨJT	Junction-to-top characterization parameter	49.1	71.1	48.2	27.5	°C/W
ΨJB	Junction-to-board characterization parameter	94.3	83.4	89.4	100.2	°C/W
RθJC(bot)	Junction-to-case (bottom) thermal resistance	N/A	N/A	N/A	N/A	°C/W

Reason for Change:

These changes are part of our multiyear plan to transition products from our 150-milimeter 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
☒ No Change	☒ No Change	☒ No Change	☒ 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]**
G,E,K, -	**A**

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
MLA	MLA	MYS	Kuala Lumpur
HFTFAT	**HFT**	**CHN**	**Hefei**
TFME	**NFM**	**CHN**	**Economic Development Zone**

Sample product shipping label (not actual product label)

Product Affected:

Group 1 Device list (RFAB/Process migration & BOM Update for select N & NS Packaged Devices)

SN74HCT08N	SN74HCT04NSR	SN74HCT32NE4	SN74HCT04ANSRE4
SN74HCT32N	SN74HCT08NE4	SN74HCT04ANSR	

Group 2 Device list (RFAB/Process migration BOM update & HFTF as alternate Assembly site for select SOIC Packaged devices)

SN74HCT00DR	SN74HCT74DR	CD74HCT11M96	CD74HCT86M96
SN74HCT02DR	CD74HCT02M96	CD74HCT27M96	SN74HCT125DR
SN74HCT04DR	CD74HCT03M96	CD74HCT32M96	CD74HCT125M96
SN74HCT08DR	CD74HCT04M96	CD74HCT74M96	CD74HCT126M96
SN74HCT32DR	CD74HCT08M96		

Group 3 Device list (RFAB/Process migration BOM Update & TFME as alternate Assembly site for select PW packaged devices)

SN74HCT00PWR	SN74HCT04PWR	SN74HCT32PWR	SN74HCT74PWR
SN74HCT02PWR	SN74HCT08PWR		

Group 1 Qual Memo:

TI Information
Selective Disclosure

Qualification Report

Approve Date 05-Nov-2021

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

Type	Test Name / Condition	Duration	Qual Device: SN74HCT04NSR	QBS Product Reference: SN74HCT04PWR	QBS Process Reference: SN74HCS74QPWRQ1	QBS Package Reference: 1P8T245NSR
AC	Autoclave 121C	96 Hours	-	-	3/231/0	3/231/0
CDM	ESD - CDM	1500 V	1/3/0	1/3/0	1/3/0	-
ED	Electrical Characterization	Per Datasheet Parameters	-	Pass	Pass	-
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	3/2400/0	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	3/231/0	-
HBM	ESD - HBM	2000V	-	1/3/0	1/3/0	-
HTOL	Life Test, 150C	300 Hours	-	-	3/231/0	-
HTSL	High Temp Storage Bake 150C	1000 Hours	-	-	3/135/0	-
HTSL	High Temp Storage Bake 170C	420 Hours	-	-	-	3/135/0
LU	Latch-up	(Per JESD78)	-	1/6/0	1/6/0	-
PC	Preconditioning	Level 1-260C	-	-	No Fails	-
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	3/231/0	3/231/0

- QBS: Qual By Similarity
- Qual Device SN74HCT04NSR is qualified at LEVEL1-260C
- 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/
Green/Pb-free Status:
Qualified Pb-Free(SMT) and Green

TI Qualification ID: 20210330-139366

TI Information
Selective Disclosure

Qualification Report
Approve Date 05-Nov-2021

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

Type	Test Name / Condition	Duration	Qual Device: SN74HCT32N_FMX	QBS Product Reference: SN74HCT00PWR	QBS Product Reference: SN74HCT04PWR	QBS Product Reference: SN74HCT08PWR	QBS Product Reference: SN74HCT32PWR	QBS Process Reference: SN74HCS74QPWRQ1	QBS Package Reference: L293DNE
AC	Autoclave 121C	96 Hours	-	-	-	-	-	3/231/0	3/231/0
CDM	ESD - CDM	1500 V	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-
ED	Electrical Characterization	Per Datasheet Parameters	-	Pass	Pass	Pass	Pass	Pass	-
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	-	-	-	3/2400/0	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-	-	-	3/231/0	-
HBM	ESD - HBM	2000V	-	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-
HTOL	Life Test, 150C	300 Hours	-	-	-	-	-	3/231/0	-
HTSL	High Temp Storage Bake 150C	1000 Hours	-	-	-	-	-	3/135/0	-
HTSL	High Temp Storage Bake 170C	420 Hours	-	-	-	-	-	-	3/135/0
LU	Latch-up	(Per AEC-Q100-004)	-	-	-	-	-	1/6/0	-
LU	Latch-up	(Per JESD78)	-	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0	-
PC	Preconditioning	Level 1-260C	-	-	-	-	-	No Fails	No Fails
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	-	-	-	3/231/0	3/225/0
WBP	Wire Bond Pull (Cpk>1.67)	Wires	-	-	-	-	-	3/90/0	-
WBS	Wire Bond Shear (Cpk>1.67)	Wires	-	-	-	-	-	3/90/0	-

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

Type	Test Name / Condition	Duration	QBS Package Reference: MSP430F2013IN	QBS Package Reference: SN74HC00N	QBS Package Reference: SN74HCS74QDRQ1
WBP	Wire Bond Pull	Wires	-	-	3/90/0
AC	Autoclave 121C	96 Hours	3/231/0	-	3/231/0
CDM	ESD - CDM	2000V	-	1/3/0	1/3/0
ED	Electrical Characterization	Per Datasheet Parameters	-	-	Pass
HAST	Biased HAST, 130C/85%RH	96 Hours	-	1/77/0	3/231/0
HBM	ESD - HBM	2000V	-	-	1/3/0
HTOL	Life Test, 150C	300 Hours	-	-	1/77/0
HTSL	High Temp Storage Bake 150C	1000 Hours	-	-	3/135/0
HTSL	High Temp Storage Bake 170C	420 Hours	3/231/0	-	-
LU	Latch-up	(Per JESD78)	-	-	1/6/0
PC	Preconditioning	Level 1-260C	No Fails	-	No Fails
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	1/77/0	3/231/0
WBS	Wire Bond Shear (Cpk>1.67)	Wires	-	-	3/90/0

- QBS: Qual By Similarity
- Qual Device SN74HCT32N_FMX is qualified at LEVEL1-260C
- 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/

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Qualification ID: 20210329-139365

Group 2 Qual Memo:

TI Information
Selective Disclosure

Qualification Report

Approve Date 29-Nov-2021

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

Type	Test Name / Condition	Duration	Qual Device: CD74HCT03M96	Qual Device: CD74HCT04M96	Qual Device: CD74HCT11M96	Qual Device: CD74HCT125M96	Qual Device: CD74HCT126M96	Qual Device: CD74HCT27M96	Qual Device: CD74HCT86M96
CDM	ESD - CDM	1500 V	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0
ED	Electrical Characterization	Per Datasheet Parameters	Pass	-	Pass	Pass	Pass	Pass	Pass
HBM	ESD - HBM	2000V	1/3/0	-	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0
LU	Latch-up	(Per JESD78)	1/6/0	-	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0

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

Type	Test Name / Condition	Duration	Qual Device: SN74HCT00DR_MLA	QBS Process Reference: SN74HCS74QPWRQ1	QBS Package Reference: SN74HCS74DR	QBS Package Reference: SN74HCS74QDRQ1
AC	Autoclave 121C	96 Hours	-	3/231/0	-	3/231/0
CDM	ESD - CDM	1500V	-	1/3/0	3/9/0	1/3/0
ED	Electrical Characterization	Per Datasheet Parameters	-	Pass	Pass	Pass
ELFR	Early Life Failure Rate, 125C	48 Hours	-	3/2400/0	-	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0	3/231/0	3/231/0
HTOL	Life Test, 150C	300 Hours	-	3/231/0	3/231/0	1/77/0
HTSL	High Temp Storage Bake 150C	1000 Hours	-	3/135/0	-	3/135/0
HTSL	High Temp Storage Bake 170C	420 Hours	-	-	3/1350	-
LU	Latch-up	(Per JESD78)	-	1/6/0	-	1/6/0
PC	Preconditioning	Level 1-260C	-	No Fails	No Fails	No Fails
TC	Temperature Cycle, -65/150C	500 Cycles	-	3/231/0	3/231/0	3/231/0
UHAST	Unbiased HAST 130C/85%RH	96 Hours	-	-	3/231/0	-
WBP	Wire Bond Pull (Cpk>1.67)	Wires	-	3/90/0	-	3/90/0
WBS	Wire Bond Shear (Cpk>1.67)	Wires	-	3/90/0	-	3/90/0

- QBS: Qual By Similarity
- Qual Device CD74HCT125M96 is qualified at LEVEL1-260C
- Qual Device CD74HCT86M96 is qualified at LEVEL1-260C
- Qual Device CD74HCT04M96 is qualified at LEVEL1-260C
- Qual Device CD74HCT11M96 is qualified at LEVEL1-260C
- Qual Device CD74HCT126M96 is qualified at LEVEL1-260C
- Qual Device CD74HCT27M96 is qualified at LEVEL1-260C
- Qual Device CD74HCT03M96 is qualified at LEVEL1-260C
- Qual Device SN74HCT00DR_MLA is qualified at LEVEL1-260C
- 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/

Green/Pb-free Status:
Qualified Pb-Free(SMT) and Green

TI Qualification ID: 20210326-139325

Group 3 Qual Memo:

TI Information
Selective Disclosure

Qualification Report

Approve Date 29-Nov-2021

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

Type	Test Name / Condition	Duration	Qual Device: SN74HCT00PWR	Qual Device: SN74HCT00PWR_MLA	Qual Device: SN74HCT02PWR	Qual Device: SN74HCT04PWR	Qual Device: SN74HCT04PWR_MLA	Qual Device: SN74HCT08PWR	Qual Device: SN74HCT32PWR
CDM	ESD CDM	1500V	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0
ED	Electrical Characterization	Per Datasheet Parameters	1/30/0	1/30/0	1/30/0	1/30/0	-	1/30/0	1/30/0
HBM	ESD HBM	2000V	1/3/0	1/3/0	1/3/0	1/3/0	-	1/3/0	1/3/0
LU	Latch-up	(Per JESD78)	1/6/0	1/6/0	1/6/0	1/6/0	-	1/6/0	1/6/0

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

Type	Test Name / Condition	Duration	Qual Device: SN74HCT74PWR	QBS Process/Package Reference: SN74HCS74QPWRQ1	QBS Package Reference: SN74HCS595QPWRQ1	QBS Package Reference: SN74HCS74PWR
AC	Autoclave 121C	96 Hours	-	3/231/0	1/77/0	-
CDM	ESD - CDM	2000V	-	1/3/0	1/3/0	3/9/0
CDM	ESD CDM	1500V	1/3/0	1/3/0	-	-
ED	Electrical Characterization	Per Datasheet Parameters	1/30/0	3/90/0	3/90/0	3/90/0
ELFR	Early Life Failure Rate, 125C	48 Hours	-	3/2400/0	-	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0	1/77/0	3/231/0
HBM	ESD HBM	2000V	1/3/0	-	-	-
HTOL	Life Test, 150C	300 Hours	-	3/231/0	1/77/0	3/231/0
HTSL	High Temp Storage Bake 150C	1000 Hours	-	3/135/0	1/45/0	-
HTSL	High Temp Storage Bake 170C	420 Hours	-	-	-	3/231/0
LU	Latch-up	(Per JESD78)	1/6/0	1/6/0	1/6/0	-
PC	Preconditioning	Level 1-260C	-	No Fails	No Fails	No Fails
TC	Temperature Cycle, -65/150C	500 Cycles	-	3/231/0	1/77/0	3/231/0
UHAST	Unbiased HAST 130C/85%RH	96 Hours	-	-	-	3/231/0
WBP	Wire Bond Pull (Cpk>1.67)	Wires	-	3/90/0	1/30/0	-
WBS	Wire Bond Shear (Cpk>1.67)	Wires	-	3/90/0	1/30/0	-

- QBS: Qual By Similarity
- Qual Device SN74HCT00PWR_MLA is qualified at LEVEL1-260CG
- Qual Device SN74HCT02PWR is qualified at LEVEL1-260C
- Qual Device SN74HCT08PWR is qualified at LEVEL1-260C
- Qual Device SN74HCT00PWR is qualified at LEVEL1-260C
- Qual Device SN74HCT04PWR_MLA is qualified at LEVEL1-260CG
- Qual Device SN74HCT04PWR is qualified at LEVEL1-260C
- Qual Device SN74HCT32PWR is qualified at LEVEL1-260C
- Qual Device SN74HCT74PWR is qualified at LEVEL1-260C
- 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/

Green/Pb-free Status:
Qualified Pb-Free(SMT) and Green

TI Qualification ID: 20210326-139322

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

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