



12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20211220003.1

**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 29, 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. 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

20211220003.1
Attachments.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
SN74HCT240PWR	null
SN74HC175PWR	null
SN74HCT541APWR	null
SN74HCT541PWR	null
SN74HC244NSR	null
SN74HCT574PWR	null
SN74HCT244PWR	null
SN74HC244N	null
SN74HC244PWR	null
SN74HCT574N	null
CD74HC688NSR	null
SN74HCT244APWR	null
SN74HCT240NSR	null
SN74HCT244ANSR	null
SN74HCT541N	null
SN74HCT573N	null
SN74HC688PWR	null
SN74HC244DBR	null
CD74HC541M96	null
SN74HCT574NSR	null
SN74HCT244NSR	null
SN74HC244APWR	null
CD74HC564M96	null
SN74HCT240ANSR	null
CD74HC688E	null
CD74HC73M96	null
SN74HC688N	null
SN74HCT374NSR	null
SN74HCT244PWRG4	null
SN74HCT541NSR	null
CD74HC688M96	null
SN74HCT373PWR	null
SN74HCT374PWR	null
CD74HC244M96	null
SN74HCT244DBR	null

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

PCN Number:	20211220003.1		PCN Date:	December 29, 2021	
Title:	Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision, and additional Assembly & BOM option for select devices				
Customer Contact:	PCN Manager	Dept:	Quality Services		
Proposed 1st Ship Date:	Mar 28, 2022		Estimated Sample Availability:	Date provided at sample request	
Change Type:					
<input checked="" type="checkbox"/> Assembly Site	<input checked="" type="checkbox"/> Design	<input type="checkbox"/> Wafer Bump Site			
<input type="checkbox"/> Assembly Process	<input type="checkbox"/> Data Sheet	<input type="checkbox"/> Wafer Bump Material			
<input checked="" type="checkbox"/> Assembly Materials	<input type="checkbox"/> Part number change	<input type="checkbox"/> Wafer Bump Process			
<input type="checkbox"/> Mechanical Specification	<input type="checkbox"/> Test Site	<input checked="" type="checkbox"/> Wafer Fab Site			
<input type="checkbox"/> Packing/Shipping/Labeling	<input type="checkbox"/> Test Process	<input checked="" type="checkbox"/> Wafer Fab Materials			
		<input checked="" type="checkbox"/> Wafer Fab Process			
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 Select PW, N NS, DW, DB, & D Packaged Devices					
	Current	Additional			
Bond wire diameter (Cu)	0.96 mils	0.8 mils			
Group 2 - 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		
Mold Compound	4211471	4211471	SID#R-31		
Mount Compound	4147858	4147858	SID# A-03		
Lead Finish	NiPdAu	NiPdAu	Matte Sn		
Group 3 - 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		
Lead Finish	NiPdAu	NiPdAu	Matte Sn		
Upon expiry of this PCN TI will combine lead free solutions in a single <u>standard part number</u> , for the devices in group 3. For example; <u>SN74HCT04PWR</u> – 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)	D (SOIC)	PW (TSSOP)	DB (SSOP)	DW (SOIC)	N (PDIP)	NS (SO)	PW (TSSOP)	UNIT
		14 PINS	16 PINS	16 PINS	20 PINS	20 PINS	20 PINS	20 PINS	20 PINS	
RθJA	Junction-to-ambient thermal resistance	138.7	117.2	137.5	122.7	109.1	84.6	113.4	131.8	°C/W
RθJC(top)	Junction-to-case (top) thermal resistance	93.8	77.2	75.3	81.6	76	72.5	78.6	72.2	°C/W
RθJB	Junction-to-board thermal resistance	94.7	75.6	82.2	77.5	77.6	65.3	78.4	82.8	°C/W
ψJT	Junction-to-top characterization parameter	49.1	38.1	25.1	46.1	51.5	55.3	47.1	21.5	°C/W
ψJB	Junction-to-board characterization parameter	94.3	75.3	81.8	77.1	77.1	65.2	78.1	82.4	°C/W
RθJC(bot)	Junction-to-case (bottom) thermal resistance	N/A	N/A	N/A	N/A	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
<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,E,F,G,H,-	A, B

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)



(1P) SN74LS07NSR
(Q) 2000 (D) 0336
(31T) LOT: 3959047MLA
(4W) TKY (1T) 7523483SI2
(P)
(2P) REV: (V) 0033317
(20L) C30: SHE (21L) C60: USA
(22L) AS0: MLA (23L) AC0: MYS

Product Affected:
Group 1 Device list (RFAB/Process migration & BOM Update for select PW, N NS, DW, DB, & D Packaged Devices)

CD74HC688E	SN74HC374DWR	SN74HCT541NSR	SN74HCT240ANSR
SN74HC244N	SN74HC377DWR	SN74HCT541PWR	SN74HCT244ANSR
SN74HC688N	SN74HC540DWR	SN74HCT573DBR	SN74HCT244APWR
CD74HCT244E	SN74HC541DWR	SN74HCT573DWR	SN74HCT541APWR
CD74HCT373E	SN74HC563DWR	SN74HCT573NSR	CD74HCT541M96E
CD74HCT374E	SN74HC574DWR	SN74HCT574DWR	CD74HCT541M96C
SN74HCT240N	SN74HC688DWR	SN74HCT574NE4	CD74HCT573M96C
SN74HCT244N	SN74HC688NE4	SN74HCT574NSR	SN74HC244QPWR
SN74HCT373N	SN74HC688PWR	SN74HCT574PWR	SN74HC573ADWR
SN74HCT374N	CD74HCT244M96	CD74HC244M96E4	SN74HCT240DWR
SN74HCT541N	CD74HCT374EE4	CD74HC244M96G4	SN74HCT244DWR
SN74HCT573N	CD74HCT541M96	CD74HC273M96E4	SN74HCT244DWR
SN74HCT574N	CD74HCT573M96	CD74HC541M96G4	SN74HCT244NSR
CD74HC244M96	CD74HCT574PWR	CD74HC564M96E4	SN74HCT244PWR
CD74HC273M96	SN74HC244APWR	CD74HC573M96G4	SN74HCT373DWR
CD74HC373M96	SN74HC573ADWR	CD74HC574M96E4	SN74HCT373PWR

CD74HC541M96	SN74HCT240DWR	CD74HC574M96G4	SN74HCT374DWRE4
CD74HC564M96	SN74HCT240NSR	CD74HC688M96E4	SN74HCT541DWRE4
CD74HC573M96	SN74HCT240PWR	SN74HC241DWRG4	SN74HCT541DWRG4
CD74HC574M96	SN74HCT244DBR	SN74HC244DWRE4	SN74HCT541NSRE4
CD74HC688M96	SN74HCT244DWR	SN74HC244DWRG4	SN74HCT541NSRG4
CD74HC688NSR	SN74HCT244NE4	SN74HC244NSRG4	SN74HCT541PWRE4
CD74HC688PWR	SN74HCT244NSR	SN74HC244PWRE4	SN74HCT541PWRG4
SN74HC240DWR	SN74HCT244PWR	SN74HC244PWRG4	SN74HCT573DBRG4
SN74HC241DWR	SN74HCT373DWR	SN74HC373DWRE4	SN74HCT573DWRE4
SN74HC244DBR	SN74HCT373NE4	SN74HC374DWRG4	SN74HCT573DWRG4
SN74HC244DWR	SN74HCT373PWR	SN74HC540DWRE4	SN74HCT574DWRG4
SN74HC244NE4	SN74HCT374DWR	SN74HC688DWRE4	SN74HCT574PWRG4
SN74HC244NSR	SN74HCT374NSR	SN74HC688DWRG4	SN74HCT244QPWRQ1
SN74HC244PWR	SN74HCT374PWR	SN74HC688PWRE4	SN74HC244QPWRG4Q1
SN74HC273DWR	SN74HCT541DWR	SN74HC688PWRG4	SN74HC573AQPWRG4Q1
SN74HC373DWR	SN74HCT541NE4		
Group 2 Device list (RFAB/Process migration BOM update & TFME as alternate Assembly site for select SOIC Packaged devices)			
CD74HC112PWR	SN74HC175PWR	SN74HC368PWR	
Group 3 Device list (RFAB/Process migration BOM Update & HFTF as alternate Assembly site for select PW packaged devices)			
CD74HC73M96	SN74HC112DR	SN74HC368DR	CD74HCT21M96
SN74HC109DR	SN74HC175DR		

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

Type	Test Name / Condition	Duration	Qual Device: CD74HC73M96 HF TF	Qual Device: CD74HC73M96 M LA	Qual Device: CD74HCT21M96 M LA	Qual Device: SN74HC109DR M LA	Qual Device: SN74HC112DR HF TF	Qual Device: SN74HC112DR M LA	Qual Device: SN74HC175DR HF TF
CD M	ESD - CDM	1500 V	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-	-
ED	Electrical Characterization	Per Datasheet Parameters	-	Pass	Pass	Pass	-	-	-
HBM	ESD - HBM	5000V	-	1/3/0	1/3/0	1/3/0	-	-	-
LU	Latch-up	(Per JESD78)	-	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: SN74HC175DR MLA	Qual Device: SN74HC368DR HFTF	Qual Device: SN74HC368DR MLA	QBS Process Reference: SN74HCS74QPWRQ1	QBS Package Reference: SN74HCS74DR	QBS Package Reference: SN74HCS74QDRQ1
-	Wire Bond Pull (Cpk>1.67)	Wires	-	-	-	3/90/0	-	3/90/0
AC	Autoclave 121C	96 Hours	-	-	-	3/231/0	-	3/231/0
CDM	ESD - CDM	1500 V	-	-	-	-	3/9/0	-
CDM	ESD - CDM - Q100	1500V	-	-	-	1/3/0	-	-
CDM	ESD - CDM - Q100	2000V	-	-	-	-	-	1/3/0
ED	Electrical Distributions	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

Type	Test Name / Condition	Duration	Qual Device: SN74HC175DR MLA	Qual Device: SN74HC368DR HFTF	Qual Device: SN74HC368DR MLA	QBS Process Reference: SN74HCS74QPWRQ1	QBS Package Reference: SN74HCS74DR	QBS Package Reference: SN74HCS74QDRQ1
HBM	ESD - HBM	7000V	-	-	-	1/3/0	-	-
HBM	ESD - HBM	8000V	-	-	-	-	-	1/3/0
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	-	-	-	-	3/231/0	-
LU	Latch-up	(Per JESD78)	-	-	-	1/6/0	-	1/6/0
PC	Preconditioning	Level 1-260C	-	-	-	9/828/0	4/1300/0	12/1038/0
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	-
WBS	Wire Bond Shear (Cpk>1.67)	Wires	-	-	-	3/90/0	-	3/90/0

- QBS: Qual By Similarity

- Qual Device CD74HCT21M96_MLA is qualified at LEVEL1-260C
- Qual Device SN74HC112DR_MLA is qualified at LEVEL1-260C
- Qual Device SN74HC175DR_HFTF is qualified at LEVEL1-260C
- Qual Device SN74HC368DR_MLA is qualified at LEVEL1-260C
- Qual Device CD74HC73M96_HFTF is qualified at LEVEL1-260C
- Qual Device SN74HC175DR_MLA is qualified at LEVEL1-260C
- Qual Device SN74HC112DR_HFTF is qualified at LEVEL1-260C
- Qual Device CD74HC73M96_MLA is qualified at LEVEL1-260C
- Qual Device SN74HC109DR_MLA is qualified at LEVEL1-260C
- Qual Device SN74HC368DR_HFTF 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: 20210124-138251

Qualification Report

Approve Date 14-Sep-2021

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: SN74HC273NSR	Qual Device: SN74HC374NSR	QBS Product Reference: CD74HC377PWR	QBS Product Reference: SN74HC240PWR	QBS Product Reference: SN74HC241PWR	QBS Product Reference: SN74HC273PWR	QBS Product Reference: SN74HC373PWR
CDM	ESD - CDM	1500 V	1/3/0	-	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0
HBM	ESD - HBM	5000V	-	-	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0

Qualification Results

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

Type	Test Name / Condition	Duration	QBS Product Reference: SN74HC374PWR	QBS Product Reference: SN74HC540PWR	QBS Product Reference: SN74HC541PWR	QBS Product Reference: SN74HC573APWR	QBS Product Reference: SN74HC574PWR	QBS Product Reference: SN74HCT573PWR	QBS Process Reference: SN74HCS245QPWRQ1
AC	Autoclave 121C	96 Hours	-	-	-	-	-	-	1/77/0
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
EC	Electrical Characterization	Per Datasheet Parameters	-	-	-	-	-	-	3/90/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-	-	-	-	1/77/0
HBM	ESD - HBM	5000V	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0
HTOL	Life Test, 150C	300 Hours	-	-	-	-	-	-	1/77/0

Type	Test Name / Condition	Duration	QBS Product Reference: SN74HC374PWR	QBS Product Reference: SN74HC540PWR	QBS Product Reference: SN74HC541PWR	QBS Product Reference: SN74HC573APWR	QBS Product Reference: SN74HC574PWR	QBS Product Reference: SN74HCT573PWR	QBS Process Reference: SN74HCS245QPWRQ1
HTSL	High Temp Storage Bake 150C	1000 Hours	-	-	-	-	-	-	1/45/0
LU	Latch-up	(Per JESD78)	1/6/0	1/6/0	1/6/0	1/3/0	1/6/0	1/6/0	1/3/0
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	-	-	-	-	1/77/0
WBP	Wire Bond Pull	Wires	-	-	-	-	-	-	1/30/0
WBS	Wire Bond Shear	Wires	-	-	-	-	-	-	1/30/0

Type	Test Name / Condition	Duration	QBS Process Reference: SN74HCS273QPWRQ1	QBS Package Reference: 1P8T245NSR	QBS Package Reference: SN74HC253NSR	QBS Package Reference: SN74HC257NSR	QBS Package Reference: ULQ2003AQDRQ1_RLF	QBS Package Reference: ULQ2003AQDRQ1_STDLF
AC	Autoclave 121C	96 Hours	1/77/0	3/231/0	-	-	3/231/0	3/231/0
CDM	ESD - CDM	1500 V	1/3/0	-	1/3/0	-	-	-
EC	Electrical Characterization	Per Datasheet Parameters	No Fails	-	-	-	No Fails	-
HAST	Biased HAST, 130C/85%RH	96 Hours	1/77/0	-	-	-	-	3/231/0
HTOL	Life Test, 150C	300 Hours	1/77/0	-	-	-	-	-
HTOL	Life Test, 150C	408 Hours	-	-	-	-	-	3/231/0
HTSL	High Temp Storage Bake 150C	1000 Hours	1/45/0	-	-	-	1/45/0	1/45/0
HTSL	High Temp Storage Bake 170C	420 Hours	-	3/231/0	-	-	-	-
LU	Latch-up	(Per JEDEC78)	1/6/0	-	-	-	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	1/77/0	3/231/0	-	-	3/231/0	3/231/0
WBP	Wire Bond Pull	Wires	1/30/0	-	-	-	-	-
WBS	Wire Bond Shear	Wires	1/30/0	-	-	-	-	-

- QBS: Qual By Similarity
- Qual Device SN74HC374NSR is qualified at LEVEL1-260C
- Qual Device SN74HC273NSR 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: 20210125-138306



TI Information
Selective Disclosure

Approve Date 12-Dec-2021

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

Type	Test Name / Condition	Duration	Qual Device: <u>CD74HC564M</u> 96	Qual Device: <u>SN74HC273D</u> WR	Qual Device: <u>SN74HC563D</u> WR	QBS Process Reference: <u>SN74HCS74QPWR</u> Q1	QBS Package Reference: <u>SN65LBC170DW_QMI505MT_CU</u> STD	QBS Package Reference: <u>SN74AC240QPWR</u> SV	QBS Package Reference: <u>SN74HCS273QPWR</u> Q1
AC	Autoclave 121C	96 Hours	-	-	-	3/231/0	3/231/0	3/231/0	1/77/0
CDM	ESD - CDM	1500V	1/3/0	-	1/3/0	1/3/0	-	-	1/3/0
ED	Electrical Characterization	Per datasheet parameters	Pass	-	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	-	3/231/0	1/77/0
HBM	ESD - HBM	4000V	1/3/0	-	1/3/0	1/3/0	-	-	1/3/0
HTOL	Life Test, 150C	300 Hours	-	-	-	3/231/0	-	-	1/77/0
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	-	-	1/6/0
PC	Preconditioning	Level 1-260C	-	-	-	No Fails	No Fails	No Fails	No Fails
TC	Temperature Cycle, -65/150C	500 Cycles	-	1/77/0	-	3/231/0	3/231/0	3/231/0	1/77/0
WBP	Wire Bond Pull (Cpk>1.67)	Wires	-	-	-	3/90/0	-	3/90/0	1/30/0

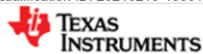
Type	Test Name / Condition	Duration	Qual Device: <u>CD74HC564M96</u>	Qual Device: <u>SN74HC273DWR</u>	Qual Device: <u>SN74HC563DWR</u>	QBS Process Reference: <u>SN74HCS74QPWRQ1</u>	QBS Package Reference: <u>SN65LBC170DW QMI505MT CU STD</u>	QBS Package Reference: <u>SN74AC240QPWR SV</u>	QBS Package Reference: <u>SN74HCS273QPWRQ1</u>
WBS	Wire Bond Shear (Cpk>1.67)	Wires	-	-	-	3/90/0	-	3/90/0	1/30/0

Type	Test Name / Condition	Duration	QBS Package Reference: <u>SN74LVC541ADW QMI505MT AU STD</u>
AC	Autoclave 121C	96 Hours	3/231/0
ED	Electrical Distributions	Per datasheet parameters	Pass
HTSL	High Temp Storage Bake 170C	420 Hours	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0

- QBS: Qual By Similarity
- Qual Device SN74HC563DWR is qualified at LEVEL1-260C
- Qual Device CD74HC564M96 is qualified at LEVEL1-260C
- Qual Device SN74HC273DWR 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: 20210215-138613



TI Information
Selective Disclosure

Approve Date 14-Sep-2021

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

Type	Test Name / Condition	Duration	Qual Device: <u>SN74HC273DBR</u>	QBS Product Reference: <u>SN74HC273PWR</u>	QBS Product Reference: <u>SN74HC541PWR</u>	QBS Product Reference: <u>SN74HCS74PWR</u>	QBS Process Reference: <u>SN74HCS273QPWRQ1</u>	QBS Package Reference: <u>1M16374QDLREP</u>	QBS Package Reference: <u>1R16214CDL</u>
AC	Autoclave 121C	96 Hours	-	-	-	-	1/77/0	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	-	-
ED	Electrical Characterization	Per Datasheet Parameters	-	-	-	-	Pass	Pass	Pass
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-	-	1/77/0	-	-
HBM	ESD - HBM	5000V	-	1/3/0	1/3/0	1/3/0	-	-	-
HTOL	Life Test, 150C	300 Hours	-	-	-	-	1/77/0	-	-
HTSL	High Temp Storage Bake 150C	1000 Hours	-	-	-	-	1/45/0	-	-
HTSL	High Temp Storage Bake 170C	420 Hours	-	-	-	-	-	3/231/0	-
LU	Latch-up	(JESD78)	-	1/6/0	1/6/0	1/6/0	1/6/0	-	-
PC	Automotive Preconditioning Level 1	(Level 1-260C)	-	-	-	-	No Fails	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	-	-	1/77/0	3/231/0	4/308/0
WBP	Bond Pull	Wires	1/76/0	-	-	-	-	-	-
WBS	Ball Bond Shear	Wires	1/76/0	-	-	-	-	-	-

Type	Test Name / Condition	Duration	QBS Package Reference: BQ77PL900DL	QBS Package Reference: SN75976A1DL	QBS Package Reference: TLC5920DLR
AC	Autoclave 121C	96 Hours	-	3/231/0	-
ED	Electrical Characterization	Per Data	-	1/Pass	-
HTSL	High Temp Storage Bake 170C	420 Hours	-	3/231/0	-
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	4/308/0

- QBS: Qual By Similarity
- Qual Device SN74HC273DBR 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: 20210125-138295



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NDA Restrictions

Qualification Report

BD3 HC/HCT PCN Devices : PW/N Commercial - CD74HC112PWR, SN74HC175PWR, SN74HC368PWR, SN74HC244PWR, SN74HC244APWR, CD74HC688PWR, SN74HC688PWR, SN74HCT240PWR, SN74HCT244PWR, SN74HCT244PWG4, SN74HCT244APWR, SN74HCT373PWR, SN74HCT374PWR, SN74HCT541PWR, SN74HCT541APWR, CD74HCT574PWR, SN74HCT574PWR, SN74HC244N, CD74HC688E, SN74HC688N, SN74HCT240N, CD74HCT244E, SN74HCT244N, CD74HCT373E, SN74HCT373N, CD74HCT374E, SN74HCT374N, SN74HCT541N, SN74HCT573N, SN74HCT574N

Approve Date 14-DECEMBER -2021

Product Attributes

Attributes	Qual Device: CD74HC112PWR	Qual Device: SN74HCT373PWR	Qual Device: SN74HC688PWR	Qual Device: SN74HC368PWR	QBS Reference: SN74HCT540N	QBS Reference: SN74LS03N	QBS Reference: SN74HCS74QPWRQ1	QBS Reference: SN74HCS74PWR	QBS Reference: TPIC6A595NE	QBS Reference: SN74HCS273QPWRQ1
Die Attributes										
Wafer Fab Supplier	PFAB	PFAB	PFAB	PFAB	SH-BIP-1	SH-BIP-1	PFAB	PFAB	DL-LIN	PFAB
Wafer Process	LBC9	LBC9	LBC9	LBC9	74HC	J1L	LBC9	LBC9	15P1_PPISM	LBC9
Die Size (L,W) (um)	520 x 679	520 x 679	520 x 679	520 x 679	1447.8 x 2336.8	767.9944 x 951.992	460 x 510	460 x 510	2743.2 x 2489.2	520 x 679
Passivation	Silicon Oxynitride	Silicon Oxynitride	Silicon Oxynitride	Silicon Oxynitride	Silicon Oxynitride	Silicon Oxynitride	Silicon Oxynitride	Silicon Oxynitride	Silicon Oxynitride	Silicon Oxynitride
Package Attributes										
Assembly Site	TFME	MLA	MLA	MLA	MLA	MLA	MLA	TFME	MLA	MLA
Package Group	TSSOP	TSSOP	TSSOP	TSSOP	PDIP	PDIP	TSSOP	TSSOP	PDIP	TSSOP
Package Designator	PW	PW	PW	PW	N	N	PW	PW	NE	PW
Package Size (mm)	5 x 4.4	6.5 x 4.4	6.5 x 4.4	5 x 4.4	24.33 x 6.35	19.3 x 6.35	5 x 4.4	5 x 4.4	24.51 x 6.86	6.5 x 4.4
Body Thickness (mm)	1	1	1	1	4.57	3.9	1	1	4.57	1
Pin Count	16	20	20	16	20	14	14	14	20	20
Lead Finish	MATTE SN	NIPDAU	NIPDAU	NIPDAU	NIPDAU	NIPDAU	NIPDAU	MATTE SN	NIPDAU	NIPDAU
Lead Pitch(mm)	0.65	0.65	0.65	0.65	2.54	2.54	0.65	0.65	2.54	0.65
Mount Compound Supplier	HENKEL	HENKEL	HENKEL	HENKEL	HENKEL	HENKEL	HENKEL	HENKEL	HENKEL	HENKEL
Mount Compound Supplier Number	ABLEBOND 2000T	QMI 505MT	QMI 505MT	QMI 505MT	QMI 505MT	QMI 505MT	QMI 505MT	ABLEBOND 2000T	QMI 505MT	QMI 505MT
Mold Compound Supplier	HITACHI	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	HITACHI	SUMITOMO	SUMITOMO
Mold Compound Supplier Number	CEL-8240HF-10NF-D1	EME-G610TA	EME-G610TA	EME-G610TA	EME-G633C	EME-G633C	EME-G610TA	CEL-8240HF-10NF-D1	EME-G633C	EME-G610TA
Bond Wire Composition	CU	CU	CU	CU	CU	CU	CU	CU	AU	CU
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0

- QBS: Qual By Similarity
- Qual Device CD74HC112PWR is qualified at MSL1 260C

- Qual Device SN74HCT373PWR is qualified at MSL1 260C
- Qual Device SN74HC688PWR is qualified at MSL1 260C
- Qual Device SN74HC368PWR is qualified at MSL1 260C
- Qual Device SN74HCT574PWR is qualified at MSL1 260C
- Qual Device SN74HCT541PWR is qualified at MSL1 260C
- Qual Device SN74HCT240PWR is qualified at MSL1 260C
- Qual Device SN74HCT374PWR is qualified at MSL1 260C
- Qual Device SN74HC175PWR is qualified at MSL1 260C
- Qual Device CD74HC112PWR is qualified at MSL1 260C

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: CD74HC112PWR	Qual Device: SN74HCT373PWR	Qual Device: SN74HC688PWR	Qual Device: SN74HC368PWR	QBS Reference: SN74HCT540N	QBS Reference: SN74LS03N	QBS Reference: SN74HCS74QFWRQ1	QBS Reference: SN74HCS74PWR	QBS Reference: TPIC3A595NE	QBS Reference: SN74HCS273QFWRQ1
HAST	A2	Biased HAST	130C/85%PH	96 Hours	-	-	-	-	-	-	3/231/0	3/231/0	3/231/0	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	-	3/231/0	3/231/0	-	3/231/0	3/231/0	1/77/0
UHAST	A3	Unbiased HAST	130C/85%PH	96 Hours	-	-	-	-	-	-	3/231/0	3/231/0	-	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	-	3/231/0	3/231/0	-	3/231/0	3/231/0	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	-	-	-	3/135/0	-	1/45/0
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	-	-	3/135/0	3/135/0	-	-	-	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	-	-	-	-	-	3/135/0	-
HTOL	B1	Life Test	125C	1000 Hours	-	-	-	-	-	-	3/231/0	-	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	1/3/0	1/3/0	1/3/0	-	-	-	3/9/0	-	-
ESD	E2	ESD HBM	-	4000 Volts	-	1/3/0	1/3/0	1/3/0	-	-	-	-	-	-
LU	E4	Latch-Up	Per JESD78	-	-	1/3/0	1/3/0	1/3/0	-	-	-	-	-	-
CHAP	E5	Electrical Characterization Per Datasheet Parameters	-	-	-	1/30/0	1/30/0	1/30/0	-	-	3/90/0	3/90/0	3/90/0	3/90/0

- 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
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- The following are equivalent Temp Cycle options per JESD47 : -55C/125C/700 Cycles and -65C/150C/500 Cycles

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Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Qualification ID: P-CHG-2110-006

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