

PCN#20230327003.1 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:March 30, 2023To: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) <u>process</u>.

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 multiyear transition plan for our two remaining factories with 150-millimeter production (DFAB in Dallas, Texas, and SFAB in Sherman, Texas). DFAB will remain open, but will focus on 200-mm production, with a smaller set of technologies. SFAB will close no earlier than 2024 and no later than 2025. 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 (<u>PCN ww admin team@list.ti.com</u>). 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

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
SN74LV174APWR	null
SN74LV06ANSR	null
SN74LV06APWR	null
SN74LV166APWR	null
SN74LV393APWR	null
SN74LV541APWR	null
SN74LV540APWR	null
SN74LV541ADBR	null
SN74LV541APWRG4	null
SN74LV573APWR	null
SN74LV05APWR	null
SN74LV175APWR	null
SN74LV244ADBR	null
SN74LV367APWR	null
SN74LV10APWR	null
SN74LV165ADRG4	null

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

PCN Number: 20230327			7003.1 P		PC	N Date: March 30, 202		March 30, 2023							
Title: Qualification of nev			w Fa	Fab site (RFAB) using qualified Process Technology, Die Revision,				iology, Die Revision,							
TIC	с.	and addi	tional Ass	embl	y & BOM options fo	r select o	devi	ces							
Cus	stomer	Contact:		PCN	<u>I Manager</u>		De	pt:		Quality Services					
Proposed 1 st Ship Date:		Jun	un 27, 2023 Sample requests accepted until:			Apr 29, 2023*									
*Sa	*Sample requests received after April 29, 2023 will not be supported.														
Cha	ange Ty	pe:													
\boxtimes	Assem	bly Site		\boxtimes	Assembly Process			\boxtimes	Assembly Materials						
\boxtimes	Design			\boxtimes	Electrical Specifica	ation			Mech	anical Specification					
	Test Si	ite		Packing/Shipping/Labeling		Labeling			Test Process						
	Wafer	Bump Sit	е	Wafer Bump Material				Wafer Bump Process							
X	Wafer	Fab Site		Wafer Fab Materials			\boxtimes	Wafei	r Fab Process						
Part number change			ge												

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			A	dditional Fab S	ite
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 Device list (RFAB/Process migration & TFME as new Assembly and BOM options- PW packaged devices)

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

Group 2 Device list (RFAB/Process migration & HFTF as new Assembly and BOM options – D Packaged Device)

	MLA	MLA (New)	HFTF
	(Current)		
Bond wire diameter (Cu)	0.96 mil	0.8mil	0.8 mil
Lead finish	NiPdAu	NiPdAu	Matte Sn
Mount Compound	4147858	4147858	SID#R-03
Mold Compound	4211880	4211880	SID#R-30

Group 3 Device list (RFAB/Process migration & BOM Option – PW, NS, DW & DB

packaged devices)

	MLA Current	MLA New
Bond wire diameter (Cu)	0.96 mil	0.8 mil

Group 4 Device list (RFAB/Process migration & FMX as new Assembly and BOM options-D packaged devices)

	MLA (Current)	MLA (New)	FMX
Bond wire diameter (Cu)	0.96 mil	0.8mil	0.8 mil

Group 5 Device list (RFAB/Process migration & MLA as new Assembly and BOM options – D packaged devices)

	ASESH	FMX Current	FMX (New)	MLA (New)
Bond wire diameter (Cu)	0.8 mil	0.96 mil	0.8mil	0.8 mil
Lead finish	Matte Sn	NiPdAu	NiPdAu	NiPdAu
Mount Compound	SID#EY1000063	4147858	4147858	4147858
Mold Compound	SID#EN2000506	4211880	4211880	4211880

Upon expiry of this PCN TI will combine lead free solutions in a single <u>standard part number</u>, for the devices in groups 1 & 2. For example; <u>SN74LV10APWR</u> – can ship with both Matte Sn and NiPdAu/Ag.

Example:

- Customer order for 7500 units of SN74LV10APWR 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.

Additionally, as a result of these changes, some of the impacted device datasheets will be updated. Target for these datasheet updates is the start of production. For a preview of these upcoming datasheet changes, please see below:

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
🛛 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]		
H, I, M	Α		

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
MLA	MLA	MYS	Kuala Lumpur
ASESH	ASH	CHN	Shanghai
FMX	MEX	MEX	Aguascalientes
HFTFAT	HFT	CHN	Hefei
TFME	NF M	CHN	Economic Development Zone

Sample product shipping label (not actual product label)



SN74LV05APWR	SN74LV10APWR	SN74LV174APWR	SN74LV367APWR
SN74LV06APWR	SN74LV166APWR	SN74LV175APWR	SN74LV393APWR
Group 2 Device list	(RFAB/Process migra	tion & HETE as new /	Assembly and BOM o
- D Packaged Devic			assembly and borne
SN74LV06ADR			
-	(RFAB/Process migra	ition & BOM Option –	PW, NS, DW & DB
packaged devices)			
SN74LV06ANSR	SN74LV244ADWRG4	SN74LV374ADWR	SN74LV541APWR
SN74LV244ADBR	SN74LV273ADBR	SN74LV540APWR	SN74LV541APWRG4
SN74LV244ADBRE4	SN74LV273ADBRE4	SN74LV541ADBR	SN74LV573APWR
SN74LV244ADBRG4	SN74LV273ADBRG4	SN74LV541ADBRE4	SN74LV573APWRG4
SN74LV244ADWR	SN74LV273ADWR	SN74LV541ADWR	
	(RFAB/Process migra	ition & FMX as new A	ssembly and BOM o
D packaged devices)	_	
SN74LV164ADR	SN74LV393ADR		
SN/4LVI04ADR			
		ition & MLA as new A	ssembly and BOM o
Group 5 Device list	(RFAB/Process migra		
Group 5 Device list			
		SN74LV174ADR	SN74LV595ADR

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV573APWR</u>	Qual Device: <u>SN74LV540APWR</u>	QBS Reference: <u>SN74HCS244QPWRQ1</u>	QBS Reference: <u>SN74LV244AQWRKSRQ1</u>	QBS Reference: <u>SN74LV240APWR</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	1/77/0	1/77/0	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	3/231/0	1/77/0	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	-	1/77
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	1/77/0	1/77/0	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	1/45/0	1/45/0	-
HTOL	B1	Life Test	125C	1000 Hours	-	-	-	1/77/0	-
HTOL	B1	Life Test	150C	300 Hours	-	-	1/77/0	-	-
ESD	E2	ESD CDM	-	250 Volts	1/3/0	1/3/0	-	-	1/3/0
ESD	E2	ESD CDM	-	500 Volts	-	-	1/3/0	1/3/0	-
ESD	E2	ESD HBM	-	1000 Volts	1/3/0	1/3/0	-	-	1/3/0
ESD	E2	ESD HBM	-	2000 Volts	-	-	1/3/0	1/3/0	-
LU	E4	Latch-Up	Per JESD78	-	1/3/0	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	1/30/0	-	-	1/30/0
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	-	3/90/0	3/90/0	-

QBS: Qual By Similarity

Qual Device SN74LV573APWR is qualified at MSL1 260C

Qual Device SN74LV540APWR 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/

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Qualification ID: R-CHG-2210-016

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: SN74LV244ADWR	Qual Device: SN74LV273ADWR	Qual Device: SN74LV374ADWR	Qual Device: SN74LV541ADWR	QBS Reference: <u>SN74HCS244QPWRQ1</u>	QBS Reference: <u>SN74LV244AQWRKSRQ1</u>	QBS Reference: SN74LV240APWR	QBS Reference: SN74LV374APWR	QBS Referen <u>SN74LV574AF</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours					1/77/0	1/77/0			
UHAST	A3	Autoclave	121C/15psig	96 Hours					3/231/0	1/77/0			
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	-	1/77/0	1/77/0	-	-	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours			-	-	1/45/0	1/45/0	-	-	-
HTOL	B1	Life Test	125C	1000 Hours	-	-	-	-		1/77/0	-	-	-
HTOL	B1	Life Test	150C	300 Hours	-	-	-	-	1/77/0	-	-	-	-
ESD	E2	ESD CDM	-	250 Volts	1/3/0	1/3/0	1/3/0	1/3/0	-	-	1/3/0	1/3/0	1/3/0
ESD	E2	ESD CDM	-	500 Volts					1/3/0	1/3/0			
ESD	E2	ESD HBM	-	1000 Volts			-	-	-	-	1/3/0	1/3/0	1/3/0
ESD	E2	ESD HBM	-	2000 Volts	-	-	-	-	1/3/0	1/3/0	-	-	-
LU	E4	Latch-Up	Per JESD78	-	-	-	-	-	-	-	1/3/0	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	1/30/0	1/30/0	1/30/0	-	-	1/30/0	1/30/0	1/30/0
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-			-	-	3/90/0	3/90/0	-	-	-

QBS: Qual By Similarity
 Qual Device SN74LV244ADWR is qualified at MSL1 260C
 Qual Device SN74LV273ADWR is qualified at MSL1 260C
 Qual Device SN74LV374ADWR is qualified at MSL1 260C
 Qual Device SN74LV541ADWR is qualified at MSL1 260C

Preconditioning was performed for Autoclave, Unbiased HAST, THB/Blased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
 The following are equivalent HTOL optoms based on an activation energy of 0.74V : 125/C1k Hours, 140C/480 Hours, 190C/300 Hours, and 155C/240 Hours
 The following are equivalent HTSL optom based on an activation energy of 0.74V : 155C/L1k Hours, and 170C/420 Hours, and 155C/240 Hours
 The following are equivalent TESL potom based on an activation energy of 0.74V : 155C/L1k Hours, and 170C/420 Hours, and 155C/240 Hours
 The following are equivalent Temp Cycle options per JESD47 : 55C/125C/700 Cycles and -65C/L50C/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: R-CHG-2210-017

Qualification Report Approve Date 17-MARCH -2023 Qualification Results

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

Туре		Test Name	Condition	Duration	Qual Device: SN74LV244ADBR	Qual Device: SN74LV273ADBR	Qual Device: SN74LV541ADBR	QBS Reference: SN74HCS244QPWRQ1	QBS Reference: <u>TL494IDR</u>	QBS Reference: TLC320AD77CDBR	QBS Reference: <u>SN74LV244AQWRKSRQ</u> 1	QBS Reference: <u>SN74LV273AQWRKSRQ</u> 1	QBS Reference: <u>SN74LV541AQWRKSRQ1</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-		3/231/0	-	-		
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	1/77/0			1/77/0		-
UHAST	A3	Autoclave	121C/15psig	96 Hours				3/231/0			1/77/0		
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	-	-	-	3/231/0	-		-
тс	A 4	Temperature Cycle	-65C/150C	500 Cycles	-	-				3/231/0			
тс	A4	Temperature Cycle	-65C/150C	500 Cycles				1/77/0			1/77/0		
HTSL	A6	High Temperature Storage Life	150C	1000 Hours					-	3/231/0			
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	1/45/0	-	-	1/45/0	-	-
HTOL	81	Life Test	125C	1000 Hours		-	-				1/77/0		
HTOL	81	Life Test	150C	300 Hours		-	-	1/77/0					-
PD	C4	Physical Dimensions	Cpk>1.67									1/10/0	1/10/0
ESD	E2	ESD CDM	-	500 Volts		-					-	1/3/0	1/3/0
ESD	E2	ESD CDM		500 Volts	-	-		1/3/0	-		1/3/0		
ESD	E2	ESD HBM		2000 Volts								1/3/0	1/3/0
ESD	E2	ESD HBM	-	2000 Volts	-	-	-	1/3/0	-	-	1/3/0		-
LU	E4	Latch-Up	Per JESD78		-	-	-	1/6/0	-	-	1/6/0	1/6/0	1/6/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters		1/30/0	1/30/0	1/30/0			-	-		-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold		-	-	-	3/90/0		-	3/90/0	1/30/0	1/30/0

QBS: Qual By Similarity
Qual Device SN74LV244ADBR is qualified at MSL1 260C

Qual Device SN74LV273ADBR is qualified at MSL1 260C
 Qual Device SN74LV541ADBR is qualified at MSL1 260C

Preconditioning was performed for Autoclave, Unbiased HAST, THBIBiased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
 The following are equivalent HTOL options based on an activation energy of 0.7eV : 125C/14 Hours, 140CH80 Hours, 150C/300 Hours, and 155C/240 Hours
 The following are equivalent HTSL options based on an activation energy of 0.7eV : 150C/14 Hours, and 170CH20 Hours,
 The following are equivalent HTSL options based on an activation energy of 0.7eV : 150C/14 Hours, and 170CH20 Hours
 The following are equivalent TEmp Cycle options per JESD47 : 35C/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: R-CHG-2210-018

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV541APWR</u>	Qual Device: <u>SN74LV541APWRG4</u>	QBS Reference: <u>SN74HCS244QPWRQ1</u>	QBS Reference: <u>SN74LV244AQWRK SRQ1</u>	QBS Reference: <u>SN74LV240APWR</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	1/77/0	1/77/0	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	3/231/0	1/77/0	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	1/77/0	1/77/0	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	1/45/0	1/45/0	-
HTOL	B1	Life Test	125C	1000 Hours	-	-	-	1/77/0	-
HTOL	B1	Life Test	150C	300 Hours	-	-	1/77/0	-	-
ESD	E2	ESD CDM	-	250 Volts	1/3/0	-	-	-	1/3/0
ESD	E2	ESD CDM	-	500 Volts	-	-	1/3/0	1/3/0	-
ESD	E2	ESD HBM	-	1000 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	-	1/3/0	-	-	-	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	1/30/0	-	-	1/30/0
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	-	3/90/0	3/90/0	-

QBS: Qual By SimilarityQual Device SN74LV541APWR is qualified at MSL1 260C

Qual Device SN74LV541APWRG4 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/

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Oualification ID: R-CHG-2212-003

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV175APWR</u>	Qual Device: <u>SN74LV166APWR</u>	Qual Device: <u>SN74LV174APWR</u>	QBS Reference: <u>SN74HCS74QPWRQ1</u>	QBS Reference: <u>SN74HCS74PWR</u>	QBS Reference: SN74LV138APWR	QBS Reference: <u>SN74LV595AQWBQBRQ1</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	3/231/0	-	-
HAST	A 2	Biased HAST	130C/85%RH	96 Hours	-	-	-	3/231/0	-	-	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	-	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	-	-	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	3/231/0	-	-	
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	-	-	3/231/0	-	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	-	3/231/0	1/77	
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	3/231/0	-	-	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	3/231/0	-	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	3/135/0	-	-	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	-	-	-	1/45/0
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	-	-	-

SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	1/15/0	-	-	-
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes); PB Solder;	-	-	-	-	-	3/66/0	-	-
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	1/15/0	-	-	-
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes); PB- Free Solder;	-	-	-	-	-	3/66/0	-	-
PD	C4	Physical Dimensions	(per mechanical drawing)	-	-	-	-	-	3/15/0	-	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	-	3/30/0	-	-	-
ESD	E2	ESD CDM	-	250 Volts	-	-	-	-	3/9/0	1/3/0	-
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	1/30/0	1/30/0	-	3/90/0	1/30/0	-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	-	-	3/90/0	-	-	3/90/0

QBS: Qual By Similarity
 Qual Device SNT4LV175APWR is qualified at MSL1 260C
 Qual Device SNT4LV166APWR is qualified at MSL1 260C
 Qual Device SNT4LV174APWR 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 : 125C/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: R-CHG-2212-036

TI Information Selective Disclosure

Qualification Report Approve Date 17-MARCH -2023

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV393APWR</u>	QBS Reference: <u>SN74HCS74QPWRQ1</u>	QBS Reference: <u>SN74HCS74PWR</u>	QBS Reference: <u>SN74LV164APWR</u>	QBS Reference: <u>SN74LV595AQWBQBRQ1</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	-	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	-	-	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	3/231/0	-	-	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	3/231/0	-	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	3/231/0	-	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	3/231/0	-	-	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	3/231/0	-	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	3/135/0	-	-	-

		-							
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	-	1/45/0
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	-	-	-
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	1/15/0	-	-	-
SD	СЗ	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes); PB Solder;	-	-	-	3/66/0	-	-
SD	СЗ	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	1/15/0	-	-	-
SD	СЗ	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes); PB- Free Solder;	-	-	-	3/66/0	-	-
PD	C4	Physical Dimensions	(per mechanical drawing)	-	-	-	3/15/0	-	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	3/30/0	-	-	-
ESD	E2	ESD CDM	-	250 Volts	-	-	3/9/0	1/3/0	-
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	-	3/90/0	1/30/0	-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	3/90/0	-	-	3/90/0

QBS: Qual By Similarity

Qual Device SN74LV393APWR 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/

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Qualification ID: R-CHG-2212-037



Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV166APWR</u>	Qual Device: <u>SN74LV174APWR</u>	Qual Device: <u>SN74LV175APWR</u>	QBS Reference: <u>TMUX1308QPWRQ1</u>	QBS Reference: <u>SN74HCS74QPWRQ1</u>	QBS Reference: <u>SN74LV595AQWBQBRQ1</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	3/231/0	3/231/0	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	3/231/0	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	-	3/231/0	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	3/231/0	3/231/0	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	3/135/0	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	3/135/0	-	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	-	-	1/45/0
HTOL	B1	Life Test	125C	1000 Hours	-	-	-	-	3/231/0	-
HTOL	B1	Life Test	150C	300 Hours	-	-	-	3/231/0	-	1/77/0
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	-	-	3/2400/0	-
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	1/15/0	1/15/0	-
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	1/15/0	1/15/0	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	-	3/30/0	3/30/0	-
ESD	E2	ESD CDM		2000 Volts	-	-	-	1/3/0		
ESD	E2	ESD CDM	-	250 Volts	1/3/0	-	-	-	-	-
ESD	E2	ESD CDM	-	500 Volts	-	-	-	-	1/3/0	1/3/0
ESD	E2	ESD HBM	-	2000 Volts	-	-	-	-	1/3/0	1/3/0
ESD	E2	ESD HBM	-	5000 Volts	-	-	-	1/3/0		
LU	E4	Latch-Up	Per JESD78	-	-	-	-	1/6/0	1/6/0	1/6/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	1/30/0	1/30/0	-	-	-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	-	-	3/90/0	3/90/0	3/90/0

OBS: Oual By Similarity

Qual Device SN74LV166APWR is qualified at MSL1 260C

Qual Device SN74LV174APWR is qualified at MSL1260C
 Qual Device SN74LV175APWR is qualified at MSL1260C
 Qual Device SN74LV175APWR is qualified at MSL1260C

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: R-CHG-2212-038

Qualification Report Approve Date 21-SEPTEMBER-2022

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV4T125PWR</u>	QBS Reference: <u>SN74HCS74QPWRQ1</u>	QBS Reference: <u>SN74HCS74PWR</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	3/231/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	1/77/0	-	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	3/231/0	3/231/0
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	1/77/0	3/231/0	3/231/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	3/135/0	3/231/0
HTOL	B1	Life Test	125C	1000 Hours	-	3/231/0	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	3/2400/0	-
PD	C4	Physical Dimensions	(per mechanical drawing)	-	-	3/30/0	3/15/0
ESD	E2	ESD CDM	-	1500 Volts	1/3/0	1/3/0	3/9/0
ESD	E2	ESD HBM	-	4000 Volts	-	1/3/0	-
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	-	3/90/0	3/90/0

- QBS: Qual By Similarity
- Qual Device SN74LV00APWR is gualified at MSL1 260C
- Qual Device SN74LV04APWR is qualified at MSL1 260C
- Qual Device SN74LV02APWR is qualified at MSL1 260C
- Qual Device SN74LV05APWR is qualified at MSL1 260C
- Qual Device SN74LV06APWR is qualified at MSL1 260C
- Qual Device SN74LV07APWR is qualified at MSL1 260C
- Qual Device SN74LV07APWRG3 is qualified at MSL1 260C
- Oual Device SN74LV08APWR is gualified at MSL1 260C
- Qual Device SN74LV10APWR is qualified at MSL1 260C
- Qual Device SN74LV11APWR is qualified at MSL1 260C
- Qual Device SN74LV125APWR is qualified at MSL1 260C
- Qual Device SN74LV126APWR is qualified at MSL1 260C
- Qual Device SN74LV132APWR is qualified at MSL1 260C
- Qual Device SN74LV14APWR is qualified at MSL1 260C
- Qual Device SN74LV20APWR is qualified at MSL1 260C
- Qual Device SN74LV21APWR is qualified at MSL1 260C
- Qual Device SN74LV27APWR is qualified at MSL1 260C
- Qual Device SN74LV32APWR is qualified at MSL1 260C
- Qual Device SN74LV74APWR is qualified at MSL1 260C
- Qual Device SN74LV86APWR is qualified at MSL1 260C
- Qual Device SN74LV4T125PWR 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/

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Qualification ID: R-NPD-2111-095

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV164ADR</u>	Qual Device: <u>SN74LV393ADR</u>	QBS Reference: <u>SN74HCS74QPWRQ1</u>	QBS Reference: <u>SN74HCS74QDRQ1</u>	QBS Reference: <u>SN74LV164APWR</u>	QBS Reference: <u>SN74LV164ADR</u>	QBS Reference: <u>SN74LV393ADR</u>	QBS Reference: <u>SN74LV595AQWBQBRQ1</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours			3/231/0	3/231/0				
HAST	A2	Biased HAST	130C/85%RH	96 Hours							-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours					-	-	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours			3/231/0			-	-	
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours			-	3/231/0	-	-	-	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-		3/231/0	3/231/0	-	-	-	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-		3/135/0	3/135/0		-	-	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-		-	-		-	-	1/45/0
HTOL	В1	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	-	-	-	-	-
SD	СЗ	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	3/45/0	-	-	-	-
SD	СЗ	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	3/45/0	-	-	-	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	3/30/0	3/30/0	-	-	-	-

ESD	E2	ESD CDM		250 Volts	-	-		-	1/3/0	1/3/0	1/3/0	
ESD	E2	ESD CDM		500 Volts	-	-	1/3/0	1/3/0		-	-	1/3/0
ESD	E2	ESD HBM		2000 Volts	-	-	1/3/0	1/3/0		-	-	1/3/0
LU	E4	Latch-Up	Per JESD78		-	-	1/6/0	1/6/0		-	-	1/6/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	1/30/0	-	-	1/30/0	1/30/0	1/30/0	-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold		-	-	3/90/0	3/90/0		-	-	3/90/0

QBS: Qual By Similarity
 Qual Device SN74LV164ADR is qualified at MSL1 260C
 Qual Device SN74LV393ADR 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 HTGL options based on an activation energy of 0.7eV: 125C/IX 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: 125C/IX Hours, and 170C/420 Hours
 The following are equivalent TFMC options partsE017: -55C/125C/700 Cycles and -65C/150C/S00 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: R-NPD-2112-012

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV164APWR</u>	Qual Device: <u>SN74LV393APWR</u>	QBS Reference: <u>SN74HCS74QPWRQ1</u>	QBS Reference: <u>SN74LV164APWR</u>	QBS Reference: <u>SN74LV595AQWBQBRQ1</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	-	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	3/231/0	-	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	3/231/0	-	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	3/135/0	-	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	-	1/45/0
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	-	-

SD	СЗ	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	-	-
SD	СЗ	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	-	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	3/30/0	-	-
ESD	E2	ESD CDM	-	250 Volts	1/3	-	-	1/3/0	-
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	1/30/0	-	1/30/0	-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	-	3/90/0	-	3/90/0

• QBS: Qual By Similarity

Qual Device SN74LV164APWR is qualified at MSL1 260C

Qual Device SN74LV393APWR 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/

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Qualification ID: R-NPD-2112-016

Qualification Report Approve Date 17-March-2023

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

								Data Displayed as	. Number of fots	i i iotai sampre	size / rotar lane						
Type		Test Name	Condition	Duration	Qual Device: SN74LV138ADR	Qual Device: SN74LV157ADR	Qual Device: SN74LV165ADR	Qual Device: SN74LV165ADR04	Quel Device: SN74LV174ADR	Qual Device: SIN74LV367ADR	Qual Device: SN74LV595ADR	QBS Reference: SN74HCS740PWR01	QBS Reference: SN74HCS740DR01	QBS Reference: SN74LV138ADR	QBS Reference: SN74LV367ADR	QBS Reference: SIN74LV595ADR	QBS Reference: SN74LV595AOWB0BR01
HAST	A2	Blased HAST	130C/85%RH	96 Hours		-		-		•		3/231/0	3/231/0		•	•	
HAST	A2	Blaced HAST	130C/85%RH	96 Hours		-						-	-				1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours		-						-	-		•	•	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours		-						3/231/0					
UHAST	A3	Unblased HAST	130C/85%RH	96 Hours				•	•	•		-	3/231/0		•	•	
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	•	-		•	•	•	•	3/231/0	3/231/0	•	•	•	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours					•			3/135/0	3/135/0				-
HTSL	A6	High Temperature Storage Life	175C	500 Hours													1/45/0
HTOL	81	Life Test	125C	1000 Hours					•			3/231/0	3/231/0			•	
HTOL	81	Life Test	150C	300 Hours		-						-	-		•		1/77/0
ELFR	82	Early Life Failure Rate	125C	48 Hours		-			•		•	3/2400/0				•	
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-								1/15/0	3/45/0				
SD	C3	PB-Pree Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)			-	-					1/15/0	3145/0				
PD	C4	Physical Dimensions	Cpk>1.67		•	-		•	•			3/30/0	3/30/0	•	•		
ESD	E2	ESD CDM	-	250 Volts	•	-			•	•		-		1/3/0	1/3/0	1/3/0	
ESD	E2	ESD CDM		500 Volts	•	•		-				1/3/0	1/3/0		•		1/3/0
ESD	E2	ESD HBM		2000 Volts	•	-	-	-				1/3/0	1/3/0		•		1/3/0
LU	E4	Latch-Up	Per JESD78	-	•	•			•	•	•	1/6/0	1/6/0	•	•	•	1/6/0
CHAR	65	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	1/30/0	1/30/0	1/30/0	1/90/0	1/30/0	1/30/0	-		1/30/0	1/90/0	1/30/0	
CHAR	ES	Electrical Distributions	Cpl>1.67 Room, hot, and cold			-						3/90/0	3/90/0				3/90/0

all by Similarity wice SINT4U/18ADR is qualified at MSL1 260C wice SINT4U/17ADR is qualified at MSL1 260C wice SINT4U/59ADR is qualified at MSL1 260C

andforling was performed for Autoclaw, Unbiased HAST, TheBlased HAST, Tempenture Cycle, Thermal Shock, and HTSL, as applicable blowing are equivalent HTDL, optics based on an activation energy of 7:14°:125/0214 Hours, 140/0249 Hours, 150/0309 Hours, and 1555/0240 Hours blowing are equivalent PTLs, optics based on an activation energy of 7:24°:125/0214 Hours, and 170/0240 Hours blowing are equivalent Temp Cycle options per J&50/17:65/0125/0700 Cycles and -850/18506 Cycles

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Quality and Environmental data is available at TI's external Web site: http://wwwti.com/

Green/Pb-free Status: Qualified Pb-Free(SMT) and Green TI Qualification ID: R-NPD-2112-020

TI Information Selective Disclosure

Qualification Report Approve Date 16-NOVEMBER -2022

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

								Data Displa	yed as: Number o	of lots / Total san	ple size / Total faile	d					
Type		Test Name	Condition	Duration	Qual Device: SN74LV138APWR	Qual Device: SN74LV139APWR	Qual Device: SN74LV157APWR	Qual Device: SN74LV151APWR	Qual Device: SN74LV163APWR	Qual Device: SN74LV165APWR	Qual Device: SIN74LV165APWR03	Qual Device: SN74LV357APWR	Qual Device: SIN74LV594APWR	Qual Device: SN74LV595APWR	QBS Reference: SN74HCS740PWR01	Q85 Reference: SN74HCS74PWR	QBS Reference: SN74LV595AOWBOBR01
HAST	A2	Blased HAST	130C/85%RH	96 Hours												3/2310	
HAST	A2	Blased HAST	130C/85%RH	96 Hours		-	-		-	-		-			3/231/0	•	-
HAST	A2	Blased HAST	130C/85%RH	96 Hours	-	-	-		-	-	-	-	-				1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	-	-	-	-	-	-	-	-	•	1/77/0
UHAST	A3	Unblased HAST	130C/85%RH	96 Hours	-	-	-	•	-	-	-	-	-	-	-	3/231/0	-
UHAST	A3	Unblased HAST	130C/85%RH	96 Hours	-	-	-	•	-	-	-	-	-		3/231/0		-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	771	-	-		-	-	-	-				3/231/0	
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-		-				-	-		3/231/0	•	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	-		-	-	-		-	3/231/0	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-			-		-		-		3/135/0		
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-		-	-		-		-		-		1/45/0
HTOL	81	Life Test	125C	1000 Hours	-					-					3/231/0		
HTOL	81	Life Test	150C	300 Hours	-	-	-	•	-	-	-	-	-	-	-	•	1/77/0
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	-	-	-	-	-	-	-	-	3/2400/0	•	•
SD	СЗ	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)			-	-	-	-	-	-	-	-		1/15/0		
SD	сз	PB Solderability	Precondition w155C Dry Bake (4 hrs +/- 15 minutes); PB Solder;			-				-	-	-				3/66/0	
SD	СЗ	PB-Free Solderability	Precondition w155C Dry Bake (4 hrs +(- 15 minutes)	-		-	-	-	-	-	-	-	-		1/15/0		
SD	СЗ	PB-Free Solderability	Precondition w155C Dry Bake (4 hrs +/- 15 minutes); PB- Free Solder;			-	-		-	-	-	-	-			3/66/0	
PD	C 4	Physical Dimensions	(per mechanical drawing)	-		-	-		-	-	-	-	-		-	3/15/0	
PD	C4	Physical Dimensions	Cpk>1.67	-		-	-			-	-	-			3/30/0		
ESD	E2	ESD CDM		250 Volts	1/3/0	-	-	-	-	-	-	1/3/0	-	1/3/0	-	3/9/0	•
ESD	E2	ESD CDM	-	500 Volts	-	-	-		-	-	-	-	-		1/3/0		130

ESD	E2	ESD HBM	•	1000 Volts	•			-	-			1/8/0					
ESD	E2	ESD HBM		2000 Volts	•					-	•				1/3/0		1/3/0
LU	E4	Latch-Up	Per JESD78	-					-			1/3/0					
LU	E4	Latch-Up	Per JESD78	-					-	-					1/6/0		1/6/0
CHAR	ES	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0		390/0	
CHAR	ES	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-											3/90/0		3/90/0

05: Que By Similary Quel Decis (IV 41/338/PAR) a qualified at MIL 2000 Quel Decis (IV 41/338/PAR) a qualified at MIL 2000 Quel Decis (IV 41/35/PAR) a qualified at MIL 2000 Quel Decis (IV 41/35/PAR) a qualified at MIL 2000 Quel Decis (IV 41/45/PAR) a qualified at MIL 2000 Quel Decis (IV 41/45/PAR) a qualified at MIL 2000 Quel Decis (IV 41/45/PAR) a qualified at MIL 2000 Quel Decis (IV 41/45/PAR) a qualified at MIL 2000 Quel Decis (IV 41/45/PAR) a qualified at MIL 2000

Preconditioning was performed for Autoclave, Unbiased HAST, TheBlased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
 The tolowing are equivalent TNC, optional based on an activation energy of 77 V1250214 Hours, 130CH80 Hours, 300200 Hours, and 155C/240 Hours
 The tollowing equivalent TR:s, optional based on an activation energy of 77 V1250214 Hours, 130CH80 Hours, and 155C/240 Hours
 The tollowing equivalent TR:s, optional based on an activation energy of 77 V1250214 Hours, 130CH80 Hours, and 155C/240 Hours
 The tollowing equivalent TR:s, optional based on an activation energy of 77 V1250214 Hours, 130CH80 Hours, and 155C/240 Hours
 The tollowing equivalent TR:s, optional based on an activation energy of 77 V1250214 Hours, 130CH80 Hours, and 155C/240 Hours
 The tollowing equivalent TR:s, optional based on an activation energy of 77 V1250214 Hours, 130CH80 Hours, and 155C/240 Hours
 The tollowing equivalent TR:s, optional based on an activation energy of 77 V1250214 Hours, 130CH80 Hours, and 155C/240 Hours
 The tollowing equivalent TR:s, optional based on an activation energy of 77 V125021 Hours, end 155C/240 Hours
 The tollowing equivalent TR:s, optional based on an activation energy of 77 V125021 Hours, end 155C/240 Hours

Quality and Environmental data is available at Tris external Web site: http://www.ii.com/

GreenPb-free Status:

Qualified Pb-Free(SMT) and Green

Ti Qualification ID: R-NPD-2112-024

TI Information Selective Disclosure

Qualification Report Approve Date 17-MARCH -2023

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV164ADR</u>	Qual Device: <u>SN74LV393ADR</u>	QBS Reference: LM2904BQDRQ1	QBS Reference: <u>SN74HCS74QPWRQ1</u>	QBS Reference: <u>SN74LV164APWR</u>	QBS Reference: <u>SN74LV595AQWBQBRQ1</u>
HAST	A2	Biased HAST	130C	96 Hours	-	-	3/231/0	-	-	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	3/231/0	-	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	-	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	3/231/0	-	-
UHAST	A3	Unbiased HAST	130C	192 Hours	-	-	3/231/0	-	-	-
тс	A4	Temperature Cycle	-65/150C	500 Cycles	-	-	3/231/0	-	-	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	3/231/0	-	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	3/135/0	-	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	3/135/0	-	-	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	-	-	1/45/0

HTOL	B1	Life Test	125C	1000 Hours	-	-	-	3/231/0	-	-
HTOL	B1	Life Test	150C	300 Hours	-	-	-	-	-	1/77/0
HTOL	B1	Life Test	150C	408 Hours	-	-	3/231/0	-	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	3/2400/4 ^{1,2}	3/2400/0	-	-
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	1/15/0	-	-
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	1/15/0	-	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	3/30/0	3/30/0	-	-
ESD	E2	ESD CDM	-	250 Volts	1/3/0	1/3/0	-	-	1/3/0	-
ESD	E2	ESD CDM	-	500 Volts	-	-	-	1/3/0	-	1/3/0
ESD	E2	ESD HBM	-	2000 Volts	-	-	3/9/0	1/3/0	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	-	-	3/18/0	1/6/0	-	1/6/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	1/30/0	-	-	1/30/0	-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	-	3/90/0	3/90/0	-	3/90/0

QBS: Qual By Similarity

Qual Device SN74LV164ADR is qualified at MSL1 260C

Qual Device SN74LV393ADR 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/

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Qualification ID: R-NPD-2112-059

[1]-Precon and ELFR fails due to a defect screenable at production test. 8D available upon request. [2]-Precon and ELFR fails due to a defect screenable at production test. 8D available upon request.

Qualification Report Approve Date 17-MARCH -2023 Qualification Results

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

-	Test Name	Condition	Duration	Qual Device: SN74LV138ADR	Qual Device: SN74LV157ADR	Qual Device: SN74LV165ADR	Qual Device: SN74LV174ADR	Qual Device: SN74LV367ADR	Qual Device: SN74LV595ADR	Qual Device: SN74LV165ADR04	QBS Reference: LM2904BQDRQ1	QBS Reference: <u>SN74HC574QPWRQ1</u>	QBS Reference: SN74LV164APWR	QBS Reference: SN74LV164ADR	QBS Reference: SN74LV393ADR	QBS Reference: SN74LV595AQWBQBRQ
A2	Blased HAST	130C	96 Hours				-			-	3/231/0		-			
A2	Blased HAST	130C/85%RH	96 Hours	-			-	-		-	-	3/231/0	-	-		
A2	Blased HAST	130C/85%RH	96 Hours				-									1/77/0
A3	Autoclave	121C/15psig	96 Hours				-									1/77/0
A3	Autoclave	121C/15psig	96 Hours							-		3/231/0				
A3	Unblaced HAST	130C	192 Hours				-			-	3/231/0		-			
A4	Temperature Cycle	-65/150C	500 Cycles				-			-	3/231/0					
A4	Temperature Cycle	-65C/150C	500 Cycles				-			-		3/231/0				1/77/0
A6	High Temperature Storage Life	150C	1000 Hours	-			-	-		-	-	3/135/0	-	-		-
A6	High Temperature Storage Life	175C	500 Hours				-				3/135/0					-
A6	High Temperature Storage Life	175C	500 Hours	-			-	-		-	-		-	-		1/45/0
81	Life Test	125C	1000 Hours				-	-		-	-	3/231/0	-			
81	Life Test	150C	300 Hours				-			-	-					1/77/0
81	Life Test	150C	408 Hours				-			-	3/231/0		-			
B 2	Early Life Failure Rate	125C	48 Hours				-			-	3/2400/4 ^{1,2}	3/2400/0				
са	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)					-			-	1/15/0	1/15/0				
сз	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-			-			-	1/15/0	1/15/0				
C4	Physical Dimensions	Cpk>1.67	-				-			-	3/30/0	3/30/0				
E2	ESD CDM		250 Volts	1/3/0			-	1/3/0	1/3/0	-	-		1/3/0	1/3/0	1/3/0	
E2	ESD CDM		500 Volts				-			-	-	1/3/0	-			1/3/0
E2	ESD HBM		2000 Volts				-			-	3/9/0	1/3/0	-			1/3/0
E4	Latch-Up	Per JESD78					-				3/18/0	1/6/0				1/6/0
E5	Electrical Characterization	Per Datasheet Parameters		1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	-		1/30/0	1/30/0	1/30/0	-
ES	Electrical	Cpk>1.67 Room, hot,									3/90/0	3/90/0				3/90/0
	A2 A2 A2 A3 A3 A3 A3 A4 A6 B1 B1 B1 B1 B1 B1 C3 C3 C3 C3 C3 C3 C3 C3 C3 C3 C3 C3 C3	A2 Biaced HAST A2 Biaced HAST A3 Autoclave A4 Disced HAST A3 Autoclave A4 Temperature Cycle A4 Temperature Cycle A4 Temperature Cycle A5 Temperature Cycle A6 Temperature Stange Life A6 Temperature A7 Temperature A7 Temperature A7 Temperature A8	A2 Bitsoid HAST 130C A2 Bitsoid HAST 130C65KRH A2 Bitsoid HAST 130C65KRH A3 Audolave 121C15509 A3 Audolave 121C1509 A3 Audolave 121C1509 A3 Audolave 121C1509 A4 Temperature 45150C A4 Temperature 450150C A4 Temperature 450150C A4 Temperature 150C A4 Temperature 150C A4 Temperature 150C A4 Temperature 150C A5 Temperature 150C A6 Temperature 150C B1 Life Test 150C B2 Life Test 150C B3 Unit Test 150C B4 Temperature 150C B2 Life Test 150C B3 Unit Test 150C B4 Life Te	A2 Bitscel HA3T 130C % Hours A2 Bitscel HA3T 130C6500.81.81.81 Hours A2 Bitscel HA3T 130C6500.81.81.81 Hours A3 Autoclave 122C15prig Hours A3 Autoclave 122C15prig Hours A3 Autoclave 122C15prig Hours A3 Autoclave 451250C Cock A4 Temperature 450150C Cock A4 Temperature 450150C Hours A4 Temperature 450150C Hours A4 Temperature 175C Son Hours Hours A5 Temperature 175C Son Hours Hours B1 Life Text 125C Hours Hours B2 Life Text 125C Hours Hours B3 Life Text 125C Hours Hours B4 Temperature Hours Hours Hours B5 Lif	Constraint Constraint Constraint Constraint 22 Biased HAST 130C BMRH Hours - A2 Biased HAST 130C BMRH Hours - A2 Biased HAST 130C BMRH Hours - A2 Biased HAST 130C BMRH Hours - A3 Autroine 121C15prig Hours - A4 Tremperature 130C Hours - A4 Tremperature 130C Hours - A5 Tremperature 135C Hours - A6 Tremperature 135C Hours - B1 Life Test 135C Hours - B2 Life Test 135C Hours - B3	Vestmann Constant Operational Bit (UV) Back of Hours Operational Bit (UV) Back of Hours Operational (UV) Hours Operational (UV) Hours <td>Point Processing Column Column Processing Proclam Processing Proclam Proclam Processing Proclam Proclam Processing Proclam Proclam Processing Proclam Pro</td> <td>Image: Constraint of the second sec</td> <td>Image: Control (Control (Contro) (Contro) (Control (Contro) (Control (Contro) (Control (Contro) (</td> <td>Image: Control in the contro</td> <td>Image: Control of the image: Control of the</td> <td>Normalization Value Name Packar Jakob Nam Pack</td> <td>Value Value <th< td=""><td>Vertual Vertual SPECURATE SP</td><td>Normal Processing Processing<</td><td>Norm Norm Number of the second secon</td></th<></td>	Point Processing Column Column Processing Proclam Processing Proclam Proclam Processing Proclam Proclam Processing Proclam Proclam Processing Proclam Pro	Image: Constraint of the second sec	Image: Control (Control (Contro) (Contro) (Control (Contro) (Control (Contro) (Control (Contro) (Image: Control in the contro	Image: Control of the	Normalization Value Name Packar Jakob Nam Pack	Value Value <th< td=""><td>Vertual Vertual SPECURATE SP</td><td>Normal Processing Processing<</td><td>Norm Norm Number of the second secon</td></th<>	Vertual Vertual SPECURATE SP	Normal Processing Processing<	Norm Norm Number of the second secon

QBS: Quality Similarly
 Quality Similarly
 Quality Device SI/34/1/3360F is qualified at MSL 1560C
 Quality Device SI/34/1/35100F is qualified at MSL 1560C
 Quality Device SI/34/1/3510F is qualified at MSL 1560C

Preconditioning was performed for Autociane, Unbiased HAST, THBBIEased HAST, Temperature Cycle, Thermal Shoot, and HTSL, as applicable
 The biolowing are equivalent HTCL potons based on an activation energy of 0.7 arV. 125CUI: Humun, 140C489 Humur, 180C489 Humur, 180C

Quality and Environmental data is available at TT's external Web site: http://www.ii.com/

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Qualification ID: R-NPD-2112-060

[1]-Precon and ELFR fails due to a detect screenable at production test 8D available upon request. [2]-Precon and ELFR fails due to a detect screenable at production test 8D available upon request.

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV06APWR</u>	Qual Device: <u>SN74LV05APWR</u>	Qual Device: <u>SN74LV10APWR</u>	QBS Reference: <u>SN74HCS74QPWRQ1</u>	QBS Reference: <u>PSN74LV4T125QPWRQ1</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	1/77/0
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	3/231/0	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	3/231/0	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	3/231/0	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	-	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	3/135/0	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	1/45/0
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	-
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	1/15/0	-
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	1/15/0	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	-	3/30/0	-
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	1/30/0	1/30/0	-	-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	-	-	3/90/0	3/90/0

QBS: Qual By Similarity

Qual Device SN74LV06APWR is qualified at MSL1 260C

Qual Device SN74LV05APWR is qualified at MSL1 260C

Qual Device SN74LV10APWR 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/

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Qualification ID: R-NPD-2212-044

Texas Instruments Incorporated

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV06ADR</u>	QBS Reference: <u>SN74HCS74QPWRQ1</u>	QBS Reference: PSN74LV4T125QPWRQ1	QBS Reference: <u>OPA4991QDRQ1</u>	QBS Reference: <u>SN74LV14ADR</u>	QBS Reference: <u>SN74LV21ADR</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	1/77/0	-	-	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	-	-	-	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	3/231/0	-	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	1/77/0	3/231/0	-	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	3/231/0	-	-	-	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	3/231/0	-	1/77/0	-	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	1/77/0	2/154/0	-	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	3/135/0	-	-	-	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	1/45/0	-	-	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	1/45/0	-	-
HTOL	В1	Life Test	125C	1000 Hours	-	3/231/0	-	-	-	-
HTOL	В1	Life Test	150C	300 Hours	-	-	1/77/0	-	-	-
HTOL	В1	Life Test	150C	408 Hours	-	-	-	1/77/0	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	3/2400/0	-	-	-	-
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	1/15/0	-	-	-	-
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	1/15/0	-	-	-	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	3/30/0	-	-	-	-
ESD	E2	ESD CDM	-	1500 Volts	-	-	-	1/3/0	-	-
ESD	E2	ESD CDM	-	250 Volts	-	-	-	-	1/3/0	-
ESD	E2	ESD CDM	-	500 Volts	-	1/3/0	1/3/0	-	-	-
ESD	E2	ESD HBM	-	2000 Volts	-	1/3/0	1/3/0	-	-	-
ESD	E2	ESD HBM	-	4000 Volts	-	-	-	1/3/0	-	-
LU	E4	Latch-Up	Per JESD78	-	-	1/6/0	1/6/0	1/6/0	-	-
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	-	-	-	1/30/0	1/30/0
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	3/90/0	3/90/0	3/90/0	-	-

QBS: Qual By Similarity
Qual Device SN74LV06ADR 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/

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Qualification ID: R-NPD-2212-046

TI Information Selective Disclosure

Qualification Report Approve Date 17-MARCH -2023

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV06ADR</u>	QBS Reference: <u>SN74HCS174DR</u>	QBS Reference: <u>SN74HCS74QPWRQ1</u>	QBS Reference: PSN74LV4T125QPWRQ1	QBS Reference: <u>SN74LV21ADR</u>
HAST	A2	Biased HAST	130C	96 Hours	-	3/231/0	-	-	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	1/77/0	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	-	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	1/77/0	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	3/231/0	-	-
UHAST	A3	Unbiased HAST	130C	96 Hours	-	3/231/0	-	-	-
тс	A4	Temperature Cycle	-65/150C	500 Cycles	-	3/231/0	-	-	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	3/231/0	-	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	1/77/0	-

HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	3/135/0	-	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	1/45/0	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	3/231/0	-	-	-
HTOL	B1	Life Test	125C	1000 Hours	-	3/231/0	-	-	-
HTOL	В1	Life Test	125C	1000 Hours	-	-	3/231/0	-	-
HTOL	В1	Life Test	150C	300 Hours	-	-	-	1/77/0	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	3/2400/0	-	-
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	-	-
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes); PB Solder;	-	-	3/66/0	-	-	-
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	-	-
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes); PB- Free Solder;	-	-	3/66/0	-	-	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	3/30/0	-	-
ESD	E2	ESD CDM	-	250 Volts	-	3/9/0	-	-	-
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	Min, Typ, Max Temp	-	1/30/0	3/90/0	-	-	1/30/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	3/90/0	-	-	1/30/0
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	-	3/90/0	3/90/0	-

QBS: Qual By Similarity

Qual Device SN74LV06ADR 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/

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Qualification ID: R-NPD-2212-047

Qualification Results

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

Туре	#	Test Name	Condition	Duration	Qual Device: <u>SN74LV06ANSR</u>	QBS Reference: <u>SN74HCS74QPWRQ1</u>	QBS Reference: PSN74LV4T125QPWRQ1	QBS Reference: SN74LV14ANSR	QBS Reference: <u>SN74LVC8T245NSR</u>
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	1/77/0	-	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	-	-	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	1/77/0	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	1/77/0	-	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	3/231/0	-	-	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	1/77/0	3/231/0
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	3/231/0	-	-	-
тс	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	1/77/0	-	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	3/231/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	3/135/0	-	-	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	1/45/0	-	-
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	-	-	-
WBS	C1	Ball Shear	76 balls, 3 units min	Wires	-	-	-	1/76/0	-
WBP	C2	Bond Pull	76 Wires, 3 units min	Wires	-	-	-	1/76/0	-
SD	СЗ	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	1/15/0	-	-	-
SD	СЗ	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	1/15/0	-	-	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	3/30/0	-	-	-
ESD	E2	ESD CDM	-	250 Volts	-	-	-	1/3/0	-
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	-	-	1/30/0	-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	3/90/0	3/90/0	-	-

- QBS: Qual By Similarity
- Qual Device SN74LV06ANSR 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/

Green/Pb-free Status: Qualified Pb-Free(SMT) and Green TI Qualification ID: R-NPD-2212-048

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Location	E-Mail			
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