

PCN Number:	20230522004.1	PCN Date:	May 24, 2023
Title:	Qualification of additional Fab sites (CFAB & DL-LIN) using qualified Process Technology and additional Assembly sites options for select devices		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Aug 24, 2023	Sample requests accepted until:	Jun 24, 2023*

***Sample requests received after Jun 24, 2023 will not be supported.**

Change Type:

<input checked="" type="checkbox"/>	Assembly Site	<input checked="" type="checkbox"/>	Assembly Process	<input checked="" type="checkbox"/>	Assembly Materials
<input type="checkbox"/>	Design	<input type="checkbox"/>	Electrical Specification	<input type="checkbox"/>	Mechanical Specification
<input type="checkbox"/>	Test Site	<input type="checkbox"/>	Packing/Shipping/Labeling	<input type="checkbox"/>	Test Process
<input type="checkbox"/>	Wafer Bump Site	<input type="checkbox"/>	Wafer Bump Material	<input type="checkbox"/>	Wafer Bump Process
<input checked="" type="checkbox"/>	Wafer Fab Site	<input checked="" type="checkbox"/>	Wafer Fab Materials	<input type="checkbox"/>	Wafer Fab Process
		<input type="checkbox"/>	Part number change		

PCN Details

Description of Change:

Qualification of additional Fab sites (CFAB & DL-LIN) using qualified Process Technology and additional Assembly sites options for the list of devices in the product affected section below.

Current Fab Site			Additional Fab site		
Current Fab Site	Process	Wafer Diameter	Additional Fab site	Process	Wafer Diameter
DL-LIN	LBC3S	150mm	CFAB	LBC3S	200mm
	LBC4X		DL-LIN	LBC4X	

Construction differences are noted below (There are no construction differences for Groups 1, 2, 3, 6, and 7)

Group 4 (CFAB as additional Fab site, CDAT as additional Assembly site) BOM Table

	TFME	CDAT
Mold Compound	SID #R-13	4222198
Bond wire composition, diameter	Au, 1.0 mil	Cu, 1.0 mil
Mount Compound	SID # A-03	4207123

Group 5 (CFAB & DFAB8 as additional Fab sites & TIPI as additional Assembly site) BOM Table

	LEN	TIPI
Mold Compound	SID#0011G60007	4222198
Bond wire composition, diameter	Au, 1.0 mil	Cu, 1.0 mil
Mount Compound	SID#0003C10332	4207123

Group 6 (CFAB as additional Fab site & TI Mexico, Malaysia, & Taiwan Assembly sites) BOM Table (BOM is the same between the 3 sites)

Group 7 (CFAB & DFAB8 as additional Fab sites & TI Mexico, Malaysia, & Taiwan Assembly sites) BOM Table (BOM is the same between the 3 sites)

For groups 6 and 7 above, all devices are currently in one or two of the 3 of these Assembly sites: TI Malaysia, TI Taiwan, or TI Mexico. After expiration of this PCN, all devices can be built from any

of these 3 assembly sites. BOM Materials are the same between all three sites.

Qual details are provided in the Qual Data Section.

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
DL-LIN	DLN	USA	Dallas
CFAB	CU3	CHN	Chengdu
DL-LIN	DLN	USA	Dallas

Assembly Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
LEN	LIN	TWN	Taichung
TFME	NFM	CHN	Economic Development Zone
TI Mexico	MEX	MEX	Aguascalientes
TI Malaysia	MLA	MYS	KUALA LUMPUR
TI Taiwan	TAI	TWN	Chung Ho, New Taipei City
CDAT	CDA	CHN	Chengdu
TIPI	PHI	PHL	Baguio City

Sample product shipping label (not actual product label)

TEXAS INSTRUMENTS
 MADE IN: Malaysia
 2DC: 20:
 MSL 2 /260C/1 YEAR SEAL DT
 MSL 1 /235C/UNLIM 03/29/04
 OPT:
 ITEM: 39
LBL: 5A (L)T0:1750

(Pb) G4


(1P) SN74LS07NSR
 (Q) 2000 (D) 0336
 (31T) LOT: 3959047MLA
 (4W) TKY (1T) 7523483SI2
 (P)
 (2P) REV: (V) 0000017
 (20L) CSO: SHE (21L) CCO:USA
 (22L) ASO: MLA (23L) ACO: MYS

Product Affected:**Group 1 Device list (CFAB as an additional fab only)**

TLV2462CDGKRG4	TLC2274IPWRG4	TLV2374IPWRG4	TPS63700DRCTG4
TLV2463CDGSRG4	TLV2254AIPWRG4	TLV271IDBVRG4	UCC28600DG4
TLV2463IDGSG4	TLV2371IDBVRG4	TLV271IDBVTG4	UCC28600DRG4
TLC2254AIPWRG4	TLV2371IDBVTG4	TLV272IDGKG4	UCC29002DG4
TLC2264AIPWRG4	TLV2372IDGKG4	TLV272IDGKRG4	TLC2272IPE4
TLC2274ACPWRG4	TLV2372IDGKRG4	TLV274CPWRG4	TLC2272IPWRG4
TLC2274AIPWRG4	TLV2373IDGSRG4	TLV274IPWG4	TLV2371IPE4
TLC2274CNE4	TLV2374IPWG4	TLV274IPWRG4	

Group 2 Device list (DFAB8 as an additional fab site only)

MAX3238CDBR	TLC072CDGNR	TLV2375IPWR	TPS40057PWP
SN0405001PWPR	TLC072IDGNR	TLV2462CP	TPS40057PWPR
SN0805014PWPR	TLV2372IP		

Group 3 Device list (CFAB & DFAB8 as additional Fab sites)

TPS3619-33DGKG4	TLC072CDGNRG4	SN0405001PWPRG4	XTR300AIRGWTG4
TPS3619-33DGKRG4	TLC072IDGNRG4	SN0805014PWPRG4	MAX3238CDBRE4
TPS3838E18DBVRG4	TLV2372IPE4	TPS40057PWPG4	TLV2462CPE4
TPS3838J25DBVRG4	TLV2375IPWRG4	TPS40057PWPRG4	TPS3705-50DGNG4
TPS3838K33DBVRG4			

Group 4 Device list (CFAB as additional Fab site, CDAT as additional Assembly site)

TLV271CDBVRG4	TLV271CDBVTG4
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Group 5 Device list (CFAB & DFAB8 as additional Fab sites & TIPI as additional Assembly site)

TLV2370IDBVRG4	TLV2370IDBVTG4
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Group 6 Device list (CFAB as additional Fab site & TI Mexico, Malaysia, & Taiwan Assembly sites)

TLC084AIDG4	TLC2254IDG4	TLC2274ACDG4	TLV2264AIDRG4
TLC084IDRG4	TLC2264AIDG4	TLC2274ACDRG4	TLV2371IDG4
TLC2252AIDG4	TLC2272ACDG4	TLC2274CDG4	TLV2371IDRG4
TLC2252AIDRG4	TLC2272ACDRG4	TLC2274IDG4	TLV2374IDG4
TLC2252CDG4	TLC2272AIDG4	TLV2252AIDG4	TLV274CDG4
TLC2254AIDG4	TLC2272AIDRG4	TLV2252IDRG4	TLV274IDG4
TLC2254AIDRG4	TLC2272CDRG4	TLV2254IDG4	TLV274IDRG4

Group 7 Device list (CFAB & DFAB8 as additional Fab sites & TI Mexico, Malaysia, & Taiwan Assembly sites)

TLC072AIDG4	TLC082CDG4	TLV2462IDG4	TLV272IDRG4
TLC072CDG4	TLC082IDRG4	TLV2474CDG4	TPS3705-33DG4
TLC072CDRG4	TLV2372IDRG4	TLV272CDG4	TPS3705-50DG4
TLC082AIDG4	TLV2462CDG4	TLV272CDRG4	TPS3705-50DRG4
TLC082AIDRG4	TLV2462CDRG4	TLV272IDG4	

For alternate parts with similar or improved performance, please visit the product page on TI.com

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

Type	Test Name / Condition	Duration	Qual Device: TLC2264AQPWRQ1	Qual Device: TLC2264AIDRCT	QBS Process Reference: CD3301RHHR	QBS Package Reference: TLV9064QPWRQ1
HTOL	Life Test, 150C	300 Hours	1/3/0	-	3/231/0	-
HTSL	High Temp Storage Bake 170C	420 Hours	-	-	3/231/0	1/45/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	3/231/0	-
AC	Autoclave 121C	96 Hours	-	-	3/231/0	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	3/231/0	3/231/0
HBM	ESD - HBM	2000 V	1/3/0	-	1/3/0	-
CDM	ESD - CDM	750 V	1/3/0	--	1/3/0	-
LU	Latch-up	(per JESD78)	1/6/0	-	1/6/0	-
ED	Electrical Characterization	Per Datasheet Parameters	1/30/0	-	1/30/0	-
MQ	Assembly MQ	Per Site Specifications	Pass	Pass	Pass	Pass

- QBS: Qual By Similarity
 - Qual Device TLC2264AQPWRQ1s 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: 20200903-135990

Automotive New Product Qualification Summary
(As per AEC-Q100 and JEDEC Guidelines)

Q100H Grade-1 qual for TLV27L2QDRQ1 (DFAB/LBC3S) in FMX using 8-pin SOIC pkg
 Approved 03-Sep-2015
 Updated 08/03/2015-Added QBS Data
 Product Attributes

Attributes	Qual Device: TLV2372QDRG4Q1	Qual Device: TLV2372QDRQ1	Qual Device: TLV27L2QDRQ1	QBS Process Reference: MAX3243IPWG4DL	QBS Package Reference: SN65HVD230D	QBS Package Reference: TPS28225TDRQ1
Operating Temp Range	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C	-40°C to +105°C
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 2
Product Function	Signal Chain	Signal Chain	Signal Chain	-	-	-
Wafer Fab Supplier	DFAB	DFAB	DFAB	DFAB	DFAB	DMOS5
Die Revision	A	A	A	A	B	D
Assembly Site	FMX	FMX	FMX	MLA	FMX	FMX
Package Type	SOIC	SOIC	SOIC	TSSOP	SOIC	SOIC
Package Designator	D	D	D	PW	D	D
Ball/Lead Count	8	8	8	28	8	8

- QBS: Qual By Similarity
 - Qual Devices qualified at LEVEL1-260C: TLV2372QDRG4Q1, TLV2372QDRQ1, TLV27L2QDRQ1

Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: TLV2372QDRG4Q1	Qual Device: TLV2372QDRQ1	Qual Device: TLV27L2QDRQ1	QBS Process Reference: MAX3243IPWG4DL	QBS Package Reference: SN65HVD230D	QBS Package Reference: TPS28225TDRQ1
Test Group A – Accelerated Environment Stress Tests												
PC	A1	JEDEC J-STD-020 JESD22-A113	1	0	Automotive Preconditioning	Level 3-260C	1/243/0	1/240/0	1/300/0	-	-	-
THB	A2	JEDEC JESD22-A101	3		Biased Temperature and Humidity, 85C/85%RH	1000 Hours	1/77/1 (Note 1)	1/77/0	-	-	-	-
HAST	A2	JEDEC JESD22-A110	1	77	Biased HAST, 130C/85%RH	96 Hours	-	-	1/77/0	3/231/0	-	-
AC	A3	JEDEC JESD22-A102	1	77	Autoclave 121C	96 Hours	1/77/0	1/77/0	1/77/0	3/231/0	-	-
TC	A4	JEDEC JESD22-A104 and Appendix 3	1	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	1/77/0	1/77/0	3/231/0	-	-
TC-BP		MIL-STD883 Method 2011	1	30	Post Temp Cycle Bond Pull	Wires	-	-	1/30/0	-	-	-
PTC	A5	JEDEC JESD22-A105	1		Power Temperature Cycle, -40/105C	1000 Cycles	N/A	N/A	N/A	-	-	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp. Storage Bake, 150C	1000 Hours	-	-	-	1/45/0	-	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp. Storage Bake, 175C	500 Hours	-	-	1/45/0	-	-	-
Test Group B – Accelerated Lifetime Simulation Tests												
HTOL	B1	JEDEC JESD22-A108	1	77	Life Test, 150C	408 Hours	1/77/0	1/77/0	1/77/0	3/231/0	-	-
ELFR	B2	AEC Q100-008	3		Early Life Failure Rate, 125C	48 Hours	-	-	-	1/800/0	-	-
ELFR	B2	AEC Q100-008	3		Early Life Failure Rate, 150C	48 Hours	-	-	-	2/1600/0	-	-
EDR	B3	AEC Q100-005	3		NVM Endurance, Data Retention, and Operational Life	-	N/A	N/A	N/A	-	-	-

Test Group C – Package Assembly Integrity Tests											
WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	-	-	1/30/0	-	-
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	-	-	1/30/0	-	-
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb	-	-	-	-	1/15/0
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb-Free	-	-	-	-	1/15/0
PD	C4	JEDEC JESD22-B100 and B108	3		Physical Dimensions (Cpk>1.67)	--	-	-	-	3/30/0	3/30/0
Test Group E – Electrical Verification Tests											
HBM	E2	AEC Q100-002	1	3	ESD - HBM	2000 V	-	-	1/3/0	-	-
CDM	E3	AEC Q100-011	1	3	ESD - CDM	1000 V	-	-	1/3/0	-	-
LU	E4	AEC Q100-004	1	6	Latch-up	(Per AEC-Q100-004)	-	-	1/6/0	-	-
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	-	-	3/90/0	-	-

A1 (PC): Preconditioning:
Performed for THB, Biased HAST, AC, uHAST & TC samples, as applicable.

Junction Operating Temperature by Automotive Grade Level:
Grade 0 (or E): -40°C to +150°C
Grade 1 (or Q): -40°C to +125°C
Grade 2 (or T): -40°C to +105°C
Grade 3 (or I): -40°C to +85°C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):
Room/Hot/Cold: HTOL, ED
Room/Hot: THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
Room: AC/uHAST

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

Note (1): Die EOS, 1 unit – capacitor pinhole, discounted (QTS 439122-1)

TI Qualification ID: 20150513-113887



TI Information
Selective Disclosure

Product Attributes

Attributes	Qual Device: 1P8T245NSR	Qual Device: ADS900E	Qual Device: PCM1801U	Qual Device: SN65HVD1781DR	Qual Device: TCA9546ADR	Qual Device: TCA9546ADR_RLF	Qual Device: TL494IDR
Assembly Site	MLA	MLA	MLA	MLA	MLA	MLA	FMX
Package Family	SOP	SSOP	SOIC	SOIC	SOIC	SOIC	SOIC
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 V0
Wafer Fab Supplier	FFAB	TSMC WF2	TSMC WF2	DM5	MH8	MH8	SFAB
Wafer Fab Process	ASL3C	0.6-DPDM	0.6-DPDM	LBC5X	LBC7	LBC7	J11

Product Attributes

Attributes	Qual Device: TLC320AD77CDBR	Qual Device: TPS2074DB	Qual Device: TPS2101D	Qual Device: TPS2214ADB	Qual Device: TSS721AD	Qual Device: UC27131D	QBS Package Reference: ULQ2003AQDRQ1_STDLF
Assembly Site	MLA	MLA	TAI	MLA	TAI	FMX	FMX
Package Family	SSOP	SSOP	SOIC	SSOP	SOIC	SOIC	SOIC
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
Wafer Fab Supplier	ANAM-1, DFAB	DFAB	DFAB	DFAB	SFAB	SFAB	SFAB
Wafer Fab Process	33A21X3, 33C10X3	LBC3S	LBC3S	LBC3S	J11	J1-PWR1	J11-SLM

- QBS: Qual By Similarity

- Qual Devices qualified at LEVEL1-260C: TL494IDR, TSS721AD, 1P8T245NSR, PCM1801U, TLC320AD77CDBR, TPS2074DB, TPS2101D, SN65HVD1781DR, TCA9546ADR, TPS2214ADB

- Qual Devices qualified at LEVEL2-260C: ADS900E, UC27131D

- Device TLC320AD77CDBR contains multiple dies.

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: 1P8T245NSR	Qual Device: ADS900E	Qual Device: PCM1801U	Qual Device: SN65HVD1781DR	Qual Device: TCA9546ADR	Qual Device: TCA9546ADR_RLF	Qual Device: TL494IDR
AC	Autoclave 121C	96 Hours	3/231/0	-	3/231/0	-	3/231/0	3/231/0	-
FLAM	Flammability (UL 94V-0)	-	-	-	-	-	3/15/0	3/15/0	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-	-	-	-	3/231/0
HTSL	High Temp Storage Bake 170C	420 Hours	3/231/0	-	3/231/0	-	3/231/0	3/231/0	-
MQ	Manufacturability (Assembly)	(per mfg. Site specification)	Pass	Pass	Pass	Pass	Pass	Pass	-
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/222/0	3/231/0	3/231/0	3/231/0	3/231/0	-
TC-BP	Post TC Bond Pull	Wires	-	-	-	3/90/0	3/162/0	3/90/0	-

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

Type	Test Name / Condition	Duration	Qual Device: TLC320AD77CDBR	Qual Device: TPS2074DB	Qual Device: TPS2101D	Qual Device: TPS2214ADB	Qual Device: TSS721AD	Qual Device: UC27131D	QBS Package Reference: ULQ2003AQDRQ1_STDLF
AC	Autoclave 121C	96 Hours	3/231/0	3/231/0	-	3/231/0	-	-	3/231/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-	-	-	-	3/231/0
HTOL	Life Test, 150C	408 Hours	-	-	-	-	-	-	3/231/0
HTSL	High Temp Storage Bake 150C	1000 Hours	-	-	-	-	-	-	1/45/0
HTSL	High Temp Storage Bake 170C	420 Hours	3/231/0	3/231/0	-	3/231/0	-	-	-
MQ	Manufacturability (Assembly)	(per mfg. Site specification)	Pass	Pass	Pass	Pass	Pass	Pass	-
MQ	Manufacturability (Auto Assembly)	(per automotive requirements)	-	-	-	-	-	-	Pass
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0	-	3/231/0
TC-BP	Post TC Bond Pull	Wires	-	-	-	-	-	-	1/30/0

- 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
- 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: 20141019-109101, 20140520-104903 (QBS)

Qualification Report

Approve Date 6-May-2022

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

Type	Test Name / Condition	Duration	Qual Device: BQ24085DRCR	QBS Process Reference: TLC5970RHPR	QBS Package Reference: UCC27201AQDMKRQ1
HTOL	Life Test, 125C	1000 Hours	-	3/231/0	-
HTSL	High Temp Storage Bake 170C	420 Hours	-	3/231/0	1/77/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0	3/231/0
AC	Autoclave 121C	96 Hours	-	3/231/0	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	-	3/231/0	3/231/0
HBM	ESD - HBM	3000 V	1/3/0	-	-
HBM	ESD - HBM	2000 V	-	3/9/0	-
CDM	ESD - CDM	1500 V	1/3/0	-	-
CDM	ESD - CDM	500 V	-	3/9/0	-
LU	Latch-up	(per JESD78)	1/6/0	3/18/0	-
ED	Electrical Characterization	Per Datasheet Parameters	1/30/0	1/30/0	-
MQ	Assembly MQ	Per Site Specifications	Pass	Pass	Pass

- QBS: Qual By Similarity
- Qual Device BQ24085DRCR is qualified at LEVEL2-260C
- 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

Qualification Report

Approve Date 6-May-2022

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: TPS63700DRCR	QBS Process Reference: TLC5970RHPR	QBS Package Reference: TPS2559DRCR
HTOL	Life Test, 125C	1000 Hours	1/77/0	3/231/0	-
HTSL	High Temp Storage Bake 170C	420 Hours	-	3/231/0	2/154/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0	3/231/0
uHAST	Unbiased HAST, 130C/85%RH	96 Hours	-	-	3/231/0
AC	Autoclave 121C	96 Hours	-	3/231/0	-
TC	Temperature Cycle, -65/150C	500 Cycles	-	3/231/0	3/231/0
HBM	ESD - HBM	2000 V	1/3/0	-	-
HBM	ESD - HBM	2000 V	-	3/9/0	-
CDM	ESD - CDM	1000 V	1/3/0	-	-
CDM	ESD - CDM	500 V	-	3/9/0	-
LU	Latch-up	(per JESD78)	1/6/0	3/18/0	-
ED	Electrical Characterization	Per Datasheet Parameters	1/30/0	1/30/0	-
MQ	Assembly MQ	Per Site Specifications	Pass	Pass	Pass

- QBS: Qual By Similarity

- Qual Device TPS63700DRCR is qualified at LEVEL2-260C

- 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

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: SN65HVDA1040AQDRQ1
HAST	Biased HAST, 130C/85%RH	96 Hours	3/231/0
AC	Autoclave 121C	96 Hours	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0
HTSL	High Temp Storage Bake 150C	1000 Hours	3/135/0
HTOL	Life Test, 125C	1000 Hours	3/231/0
ELFR	Early Life Failure Rate, 125C	48 Hours	3/2400/0
HBM	ESD - HBM	4000 V	1/3/0
HBM	ESD - HBM (Pin 5)	10000 V	1/3/0
HBM	ESD - HBM (Pin 6 & 7)	12000 V	1/3/0
CDM	ESD - CDM	1500 V	1/3/0
LU	Latch-up	(per JESD78)	1/6/0
ED	Electrical Distributions	Per Datasheet parameters	3/90/0

- QBS: Qual By Similarity
- Qual Device SN65HVDA1040AQDRQ1 qualified at LEVEL1-280C
- Qual Devices SN65HVDA1040AQDRQ1 (MLA) and SN65HVDA1040AQDRQ1 (TAI) are qualified at LEVEL1-280C

A1 (PC): Preconditioning:

Performed for THB, Biased HAST, AC, uHAST, TC & PTC samples, as applicable.

Ambient Operating Temperature by Automotive Grade Level:

- Grade 0 (or E): -40°C to +150°C
- Grade 1 (or Q): -40°C to +125°C
- Grade 2 (or T): -40°C to +105°C
- Grade 3 (or I): -40°C to +85°C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

Room/Hot/Cold: HTOL, ED
 Room/Hot: THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
 Room: AC/uHAST

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TI Qualification ID: 20170424-121679

Qualification Report
Approve Date 06-MAY-2022

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: BQ24085DRCR	Package QBS: TPS63000DRCR	Package QBS: MSP430FR5969IRGZR	Process QBS: SN65HVDA195QDRQ1
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	3/231/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	3/231/0	3/231/0	3/231/0
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	3/231/0	3/231/0	3/231/0
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	1/45/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	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
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)	-	-	3/66/0	-	1/15/0
PD	C4	Physical Dimensions	Cpk>1.67	-	-	3/15/0	-	3/30/0
ESD	E2	ESD CDM	-	2000 Volts	1/3/0	-	-	-
ESD	E2	ESD HBM	-	3000 Volts	1/3/0	-	-	-
LU	E3	Latch-up	-	Per JESD78	1/6/0	-	-	-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	1/Pass	-	-	3/90/0

- QBS: Qual By Similarity
- Qual Device BQ24085DRCR is qualified at MSL2 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

Qualification Report

Approve Date 18-May-2022

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: BQ30420DBTR	QBS Process Reference: TLC5970RHPR	QBS Package Reference: BQ8015DBT
HTOL	Life Test, 125C	1000 Hours	-	3/231/0	-
HTSL	High Temp Storage Bake 170C	420 Hours	-	3/231/0	3/231/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0	3/120/0
AC	Autoclave 121C	96 Hours	-	3/231/0	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	-	3/231/0	3/231/0
HBM	ESD - HBM	1500 V	1/3/0	-	-
HBM	ESD - HBM	2000 V	-	3/9/0	-
CDM	ESD - CDM	1500 V	1/3/0	-	-
CDM	ESD - CDM	500 V	-	3/9/0	-
LU	Latch-up	(per JESD78)	1/6/0	3/18/0	-
ED	Electrical Characterization	Per Datasheet Parameters	1/30/0	1/30/0	-
MQ	Assembly MQ	Per Site Specifications	Pass	Pass	Pass

- QBS: Qual By Similarity

- Qual Device BQ30420DBTR is qualified at LEVEL2-260C

- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable

- LU passed according to AEC Q100 Rev H Immunity Level B

- 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

Qualification Report

Approve Date 13-Sept-2021

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: TLV2464CPWR	QBS Process Reference: CD3301RHHR	QBS Package Reference: TP52042BD	QBS Package Reference: TP52419DR
HTOL	Life Test, 150C	300 Hours	-	3/231/0	-	-
HTSL	High Temp Storage Bake 170C	420 Hours	-	3/231/0	3/231/0	3/231/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0	-	3/231/0
AC	Autoclave 121C	96 Hours	-	3/231/0	3/231/0	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	-	3/231/0	3/231/0	3/231/0
HBM	ESD - HBM	4000 V	1/3/0	1/3/0	-	-
CDM	ESD - CDM	1000 V	1/3/0	1/3/0	-	-
LU	Latch-up	(per JESD78)	1/6/0	1/6/0	-	-
ED	Electrical Characterization	Per Datasheet Parameters	1/30/0	1/30/0	-	-
MQ	Assembly MQ	Per Site Specifications	Pass	Pass	Pass	Pass

- QBS: Qual By Similarity

- Qual Device TLV2464CPWR 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

Qualification Report

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

Type	Test Name / Condition	Duration	Qual Device: TLV3401IDBVT	QBS Product Reference : TLV2241D	QBS Package Reference : TPS76933DBVR
AC	Autoclave 121C	96 Hours	-	-	3/231/0
ED	Electrical Characterization	Per Datasheet Parameters	1/Pass	-	-
HAST	Biased HAST, 110C/85%RH	96 Hours	-	-	3/231/0
HTOL	Life Test, 155C	240 Hours	-	1/77/0	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	-	-	3/231/0
HBM	ESD-HBM	2000 V	1/3/0	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	3/231/0
MQ	Manufacturability (Assembly)	(per mfg. Site specification)	1/Pass	-	-
MQ	Test MQ	(per specification)	Pass	-	-
YLD	Yield Evaluation	(per mfg. Site specification)	Pass	-	-

- QBS: Qual By Similarity

- Qual Device TLV3401IDBVT is qualified at LEVEL 1-260C

- 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: 20181113-127568

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

Type	Test Name / Condition	Duration	Qual Device: TLV9061IDBVR	QBS Package Reference: TLV9061IDBVR (Matte Sn)	QBS Package Reference: TPS76933DBVR (PHI)
ED	Electrical Characterization, side by side	Per Datasheet Parameters	Pass	-	-
FLAM	Flammability (UL 94V-0)	-	-	-	3/15/0
FLAM	Flammability (UL-1694)	-	3/15/0	-	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0	-
HTOL	Life Test, 150C	300 Hours	-	3/231/0	-
HTSL	High Temp Storage Bake 170C	420 Hours	3/231/0	-	-
LI	Lead Fatigue	Leads	3/54/0	-	-
LI	Lead Pull	Leads	3/54/0	-	-
MISC	Salt Atmosphere	-	3/66/0	-	-
MQ	Manufacturability (Assembly)	(per mfg. Site specification)	Pass	-	-
PD	Physical Dimensions	(per mechanical drawing)	3/15/0	-	-
PKG	Lead Finish Adhesion	Leads	3/54/0	-	-
SD	Solderability	Pb Free	3/66/0	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	-	-
UHAST	Unbiased HAST 130C/85%RH	96 Hours	3/231/0	-	-
VM	Visual / Mechanical	(per mfg. Site specification)	3/984/0	-	-
WBP	Bond Pull	Wires	3/228/0	-	-
WBS	Ball Bond Shear	Wires	3/228/0	-	-

- QBS: Qual By Similarity

- Qual Device TLV9061IDBVR is qualified at LEVEL 1-260C

- 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: 20200211-132947

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: TLV2401QDBVRQ1	QBS Process Reference: MAX3243IPWG4DL
HAST	Biased HAST, 130C/85%RH	96 Hours	3/231/0	3/231/0
AC	Autoclave 121C	96 Hours	3/231/0	3/231/0
TC	Temperature Cycle, - 65/150C	500 Cycles	3/231/0	3/231/0
HTSL	High Temp Storage Bake 150C	1000 Hours	-	3/231/0
HTSL	High Temp Storage Bake 175C	500 Hours	3/135/0	-
HTOL	Life Test, 150C	408 Hours	3/231/0	3/231/0
ELFR	Early Life Failure Rate, 125C	48 Hours	-	3/2400/0
HBM	ESD - HBM - Q100	500 V	1/3/0	-
CDM	ESD - CDM - Q100	1500 V	1/3/0	-
LU	Latch-up	(per JESD78)	1/6/0	-
ED	Electrical Characterization	Per Datasheet parameters	3/90/0	-

- QBS: Qual By Similarity

- Qual Device TLV2401QDBVRQ1 is qualified at LEVEL1-260C

A1 (PC): Preconditioning:

Performed for THB, Biased HAST, AC, uHAST, TC & PTC samples, as applicable.

Ambient Operating Temperature by Automotive Grade Level:

Grade 0 (or E): -40°C to +150°C

Grade 1 (or Q): -40°C to +125°C

Grade 2 (or T): -40°C to +105°C

Grade 3 (or I): -40°C to +85°C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

Room/Hot/Cold: HTOL, ED

Room/Hot: THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU

Room: AC/uHAST

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

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