PCN Number: 202		1032	326001.2		PCN Date:		ite:	Mar 29, 2021	
			v Fab site (CFAB) using qualified Process Technology, Die Revision, litional Assembly site/BOM options for select devices						
Cus	tomer	Contact:				Dept:			Quality Services
Proposed 1 <sup>st</sup> Ship Date:			Sept 25, 2021 Estimated Sample Availability:		Date provided at sample request.				
Change Type:									
Assembly Site			$\boxtimes$	Assembly Process			Assembly Materials		
Design				Electrical Specification				Mechanical Specification	
Test Site			Packing/Shipping/Labeling		]		Test I	Process	
Wafer Bump Site			Wafer Bump Material				Wafer Bump Process		
			$\boxtimes$	★ Wafer Fab Materials			$\boxtimes$	Wafei	r Fab Process
			Part number change						
PCN Details									

## **Description of Change:**

Texas Instruments is pleased to announce the qualification of a new fab & process technology, (CFAB, JI3), die revisions, probe site, and AT (FMX) site/BOM (MLA) options for selected devices as listed below in the product affected section. Construction differences are noted below:

С	urrent Fab Site	9	Additional Fab Site		
Current Fab Site	Process	Wafer Diameter	Additional Fab Site	Process	Wafer Diameter
SFAB	JI1	150 mm	CFAB	JI3	200 mm

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

Probe site change:

	Current:	New:
Probe Site	TI Sherman-Probe (SH-BIP)	) None

Construction differences are noted below:

## Group 1 CFAB/Process migration & updated BOM in FMX for SOIC Devices:

	Current - FMX	New - FMX
Lead finish	NiPdAu, non RLF or RLF	NiPdAu, RLF
Mold Compound	4211880 or 4205694	4211880
Bond wire diameter	Cu, 1.0 mils or Au, 0.96 mils	Cu, 0.80 mils

## Group 2 CFAB/Process migration & additional AT (FMX) for LBT-LM2903DR:

	MLA	FMX
Lead finish	NiPdAu, Non RLF	NiPdAu, RLF
Mount Compound	4208458	4147858
Mold Compound	4209640	4211880
Bond wire diameter	Au, 0.96 mils	Cu, 0.80 mils

### Group 3 CFAB/Process migration & updated BOM in MLA for PW devices:

	Current - MLA	New - MLA
Lead finish	NiPdAu, RLF or Non RLF	NiPdAu, RLF
Bond wire diameter	Au, 0.96 mils or Cu, 1.0 mils	Cu, 0.80 mils

### **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

Anticipated impact on Material Declaration						
	No Impact to the Material Declaration		Material Declarations or Product Content reports are driven from production data and will be available following the production release. Upon production release the revised reports can be obtained from the TLECO website.			

## 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
CFAB	CU3	CHN	Chengdu

### Die Rev:

Current New

Die Rev [2P]	Die Rev [2P]
Α	A

**Assembly Site Information:** 

FMX	MEX	MEX	Aguascalientes
MLA	MLA	MYS	Kuala Lumpur
Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly 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

5A (L)T0:3750



(1P) SN74LS07NSR (a) 2000 (D) 0336 31T)LOT: 3959047MLA 4W) TKY(1T) 7523483SI2 (2P) REV:

(201) 030: SHE (211) 000:USA (221) ASO: MLA (23L) ACO: MYS

# **Product Affected:**

### Group 1 Device list: CFAB/Process migration & updated BOM in FMX for SOIC Devices:

LM2903DRCT	LM2903QDRQ1	MLA00338DRG4	LM2903VQDRG4Q1
SN104611DR	LM2903VQDRQ1	LM2903AVQDRQ1	LM2903AVQDRG4Q1
LM2903IDRDL	LM2903ZQDRQ1	LM2903QDRG4Q1	

# Group 2 Device list: CFAB/Process migration & additional AT (FMX) for LBT-LM2903DR:

LBT-LM2903DR

### Group 3 Device list: CFAB/Process migration & updated BOM in MLA for PW devices:

MLA00414PWR	LM2903QPWRRB	LM2903AVQPWRQ1	LM2903VQPWRG4Q1
LM2903QPWRKN	LM2903VQPWRQ1	LM2903QPWRG4Q1	LM2903AVQPWRG4Q1
LM2903QPWRQ1	LM2903AVQPWRDL	LM2903QPWRRBG4	

**Group 1 & 2 (SOIC Devices) Qual report:** 



# Approve Date 12-Mar-2021

# **Product Attributes**

Attributes	Qual Device: LM2903AVQDRQ1	QBS Package Reference: <u>LM2904BQDRQ1</u>
Operating Temp Range	-40 to +125 C	-40 to +125 C
Automotive Grade Level	Grade 1	Grade 1
Product Function	Signal Chain	Signal Chain
Wafer Fab Supplier	CFAB	CFAB
Die Revision	A0	В
Assembly Site	FMX	FMX
Package Type	SOIC	SOIC
Package Designator	D	D
Ball/Lead Count	8	8

<sup>-</sup> QBS: Qual By Similarity

- Qual Device LM2903AVQDRQ1 is qualified at LEVEL1-260C

Туре	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: LM2903AVQDRQ1	QBS Package Reference: LM2904BQDRQ1
		Test Group /	A – Acceler	ated Envi	ronment Stress Tests			
		AEC-Q006	3	11	SAM Analysis, Pre Stress	-	1/22/0	3/Pass
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 2-260C	1/308/0	3/1499/10 (1)
		AEC-Q006	3	11	SAM Analysis, Post Stress	-	1/22/0	3/Pass
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 1-260C	3/36/0	-
		AEC-Q006	3	11	SAM Analysis, Post Stress	-	3/36/0	-
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	1/77/0	3/231/0
HAST	A2	AEC-Q006	3	1	Cross Section, Post bHAST 96 Hours	-	1/1/0	3/3/0
HAST	A2	AEC-Q006	3	3	Wire Bond Shear, Post bHast, 96 Hours	-	1/3/0	3/9/0
HAST	A2	AEC-Q006	3	3	Bond Pull over Stitch, post bHAST, 96 Hours	-	1/3/0	3/9/0
HAST	A2	AEC-Q006	3	3	Bond Pull over Ball, Post bHAST, 96 Hours	-	1/3/0	3/9/0
HAST	A2	JEDEC JESD22-A110	3	70	Biased HAST, 130C/85%RH	192 Hours	1/70/0	3/21/0
HAST	A2	AEC-Q006	3	1	Cross Section, Post bHAST 192 Hours	-	1/1/0	3/3/0
HAST	A2	AEC-Q006	3	22	SAM Analysis, Post bHAST, 192 Hours	-	1/22/0	3/66/0
HAST	A2	AEC-Q006	3	2	Wire Bond Shear, Post bHast, 192 Hours	-	1/2/0	3/6/0
HAST	A2	AEC-Q006	3	2	Bond Pull over Stitch, post bHAST, 192 Hours	-	1/2/0	3/6/0
HAST	A2	- AEC-Q006	3	2	Bond Pull over Ball, Post bHAST, 192 Hours	-	1/2/0	3/6/0
UHAST	А3	JEDEC JESD22-A118	3	77	Unbiased HAST, 130C/85%RH	96 Hours	1/77/0	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	3/231/0
TC	A4	-	3	1	Cross Section, Post T/C 500 Cycles	-	1/1/0	3/3/0

	Туре	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: LM2903AVQDRQ1	QBS Package Reference: LM2904BQDRQ1
	TC	A4	-	3	22	SAM Analysis, Post T/C, 500 Cycles	-	1/22/0	3/66/0
	TC	A4	-	3	3	Wire Bond Shear, Post T/C 500 Cycles	Wires	1/3/0	3/9/0
	TC	A4	-	3	3	Bond Pull over Stitch Post T/C 500 Cycles	Wires	1/3/0	3/9/0
	TC	A4	-	3	3	Bond Pull over Ball Post T/C 500 Cycles	Wires	1/3/0	3/9/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	70	Temperature Cycle, -65/150C	1000 Cycles	1/70/0	3/210/0
	TC	A4	-	3	1	Cross Section, Post T/C 1000 Cycles	-	1/1/0	3/3/0
	TC	A4	-	3	22	SAM Analysis, Post T/C, 1000 Cycles	-	1/22/0	3/66/0
	TC	A4	-	3	2	Wire Bond Shear, Post T/C 1000 Cycles	-	1/2/0	3/6/0
	TC	A4	-	3	2	Bond Pull over Stitch, Post T/C, 1000 Cycles	-	1/2/0	3/6/0
	TC	A4	-	3	2	Bond Pull over Ball, Post T/C, 1000 Cycles	-	1/2/0	3/6/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle - 40/125C	1000 Cycles	-	-
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle - 40/125C	2000 Cycles	-	-
	HTSL	A6	JEDEC JESD22-A103	3	45	High Temp Storage Bake 175C	500 Hours	1/45/0	3/135/0
	HTSL	A6	-	3	1	Cross Section, Post HTSL 500 Hours	-	1/1/0	3/3/0
	HTSL	A6	JEDEC JESD22-A103	3	44	High Temp Storage Bake 175C	1000 Hours	1/44/0	3/132/0
	HTSL	A6	-	3	1	Cross Section, Post HTSL 1000 Hours	-	1/1/0	3/3/0
			Test Group	B – Accele	rated Life	etime Simulation Tests			
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 150C	300 Hours	3/231/0	-
	ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 125C	48 Hours	1/800/0	3/2400/4 (1)
			Test Group	C – Packa	ge Asser	nbly Integrity Tests			
Ш	WBS	C1	AEC Q100-001	3	30	Wire Bond Shear, Cpk>1.67	Wires	3/90/0	3/90/0
	WBP	C2	MIL-STD883 Method 2011	3	30	Bond Pull over Ball, Cpk >1.67	Wires	3/90/0	3/90/0

Туре	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: LM2903AVQDRQ1	QBS Package Reference: <u>LM2904BQDRQ1</u>
SD	СЗ	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Free	1/15/0	1/15/0
SD	СЗ	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb	1/15/0	1/15/0
PD		JEDEC JESD22-B100 and B108	3	10	Physical Dimensions	Cpk>1.67	3/30/0	3/30/0
		Test Grou	ıp D – Die F	abricatio	n Reliability Tests			
EM	D1	JESD61	-	-	Electromigration	-	Completed Per Process Technology Requirements	-
TDDB	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	-	Completed Per Process Technology Requirements	-
HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	Completed Per Process Technology Requirements	-
NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	Completed Per Process Technology Requirements	-
SM	D5	-	-	-	Stress Migration		Completed Per Process Technology Requirements	-
		Test Gr	oup E – Ele	ectrical Ve	erification Tests			
НВМ	E2	AEC Q100-001	1	3	ESD-HBM	2000V	3/9/0	-
CDM	E3	AEC Q100-011	1	3	ESD-CDM	1500V	3/9/0	-
LU	E4	AEC Q100-004	1	6	Latch-up, 125C	(Per AEC-Q100- 004)	3/18/0	-
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold test	3/90/0	-

Note (1): Precon and ELFR fails due to a defect screenable at production test. A1 (PC): Preconditioning:
Performed for THB, Blased HAST, AC, uHAST & TC samples, as applicable.

# Ambient Operating Temperature by Automotive Grade Level: Grade 0 (or E): -40C to +150C

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

# 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

## **Group 3 (PW Devices) Qual report:**



**TI Information** Selective Disclosure

# **Automotive New Product Qualification Summary** (As per AEC-Q100 / Q006 and JEDEC Guidelines)

# Approved 20-Mar-2021

### **Product Attributes**

Attributes	Qual Device: LM2903AVQPWRQ1	QBS Product Reference: <u>LM2903BQDRQ1</u>	QBS Process Reference: <u>LM2904BQDRQ1</u>
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C
Automotive Grade Level	Grade 1	Grade 1	Grade 1
Product Function	Signal Chain	Signal Chain	Signal Chain
Wafer Fab Supplier	CFAB	CFAB	CFAB
Die Revision	A0	A0	В
Assembly Site	MLA	FMX	FMX
Package Type	TSSOP	SOIC	SOIC
Package Designator	PW	D	D
Ball/Lead Count	8	8	8

<sup>-</sup> QBS: Qual By Similarity

### Qualification Results

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

Туре	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: LM2903AVQPWRQ1	QBS Product Reference: LM2903BQDRQ1	QBS Process Reference: LM2904BQDRQ1
		Test Group A	– Acceler	ated Envi	ronment Stress Tests				
		AEC-Q006	3	11	SAM Analysis, Pre Stress	-	3/66/0	-	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 1-260C	3/924/0	-	-
		AEC-Q006	3	11	SAM Analysis, Post Stress	-	3/66/0	-	-
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0	-	-

<sup>-</sup> Qual Device LM2903AVQPWRQ1 is qualified at LEVEL1-260C

	Туре	#	Test Spec	Min Lot	SS/Lot	Test Name / Condition	Duration	Qual Device: LM2903AVQPWRQ1	QBS Product Reference:	QBS Process Reference:
	HAST	A2	AEC-Q006	Qty 3	1	Cross Section, Post bHAST 96		-	LM2903BQDRQ1	LM2904BQDRQ1
H	HAST	A2	AEC-Q006	3	3	Hours Wire Bond Shear, Post bHast,		_	_	<u> </u>
H	HAST	A2	AEC-Q006	3	3	96 Hours Bond Pull over Stitch, post		_		-
H	HAST	A2	AEC-Q006	3	3	bHAST, 96 Hours Bond Pull over Ball, Post		_	_	_
Н	HAST	A2	JEDEC JESD22-A110	3	70	bHAST, 96 Hours Biased HAST, 130C/85%RH	192 Hours	3/210/0	_	
H	HAST	A2	AEC-Q006	3	1	Cross Section, Post bHAST	-	3/3/0	-	_
Н	HAST	A2	AEC-Q006	3	22	192 Hours SAM Analysis, Post bHAST,		3/66/0	_	_
Н	HAST	A2	AEC-Q006	3	2	192 Hours Wire Bond Shear, Post bHast,		3/6/0	_	-
Н	HAST	A2	AEC-Q006	3	2	192 Hours Bond Pull over Stitch, post		3/6/0	-	_
	HAST	A2	- AEC-Q006	3	2	bHAST, 192 Hours Bond Pull over Ball, Post		3/6/0	_	_
	UHAST	A3	JEDEC JESD22-A118	3	77	bHAST, 192 Hours Unbiased HAST, 130C/85%RH	96 Hours	3/231/0	_	_
H	TC	A4	JEDEC JESD22-A104	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0	-	-
H	TC	A4	and Appendix 3	3	1	Cross Section, Post T/C 500	-	-	-	-
	TC	A4	-	3	22	Cycles SAM Analysis, Post T/C, 500		3/66/0	-	-
	TC	A4	-	3	3	Cycles Wire Bond Shear, Post T/C 500	Wires	-	-	-
Н	TC	A4	-	3	3	Cycles  Bond Pull over Stitch Post T/C	Wires	-	-	-
Н	TC	A4	-	3	3	500 Cycles  Bond Pull over Ball Post T/C	Wires	-	-	-
H	TC	A4	JEDEC JESD22-A104	3	70	500 Cycles Temperature Cycle, -65/150C	1000 Cycles	3/210/0	-	-
Н	TC	A4	and Appendix 3	3	1	Cross Section, Post T/C 1000	-	3/3/0	-	_
Н	TC	A4	-	3	22	Cycles SAM Analysis, Post T/C, 1000		3/66/0	-	_
Н	TC	A4	_	3	2	Cycles Wire Bond Shear, Post T/C		3/6/0	_	_
						1000 Cycles		Qual Device:	QBS Product	QBS Process
										WD3 FIUCESS
	Туре	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	LM2903AVQPWRQ1	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1
	Type TC	# A4	Test Spec		SS/Lot 2	Bond Pull over Stitch, Post T/C, 1000 Cycles	Duration -		Reference:	Reference:
			Test Spec - -	Qty		Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles		LM2903AVQPWRQ1	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1
	TC	A4	Test Spec  -  -  JEDEC JESD22-A105	Qty 3	2	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C		1/6/0	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1 -
	TC TC	A4 A4	-	Qty 3	2	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle -	-	3/6/0 3/6/0	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1 - -
	TC TC PTC	A4 A4 A5	- JEDEC JESD22-A105	3 3 1	2 2 45	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C	- - 1000 Cycles	3/6/0 3/6/0	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1 - -
	TC TC PTC PTC	A4 A4 A5 A5	JEDEC JESD22-A105 JEDEC JESD22-A105	3 3 1 1 1	2 2 45 45	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C	- 1000 Cycles 2000 Cycles	3/6/0 3/6/0 -	Reference: LM2993BQDRQ1	Reference: LM2904BQDRQ1 - - -
	TC TC PTC PTC HTSL HTSL	A4 A4 A5 A5 A6 A6	JEDEC JESD22-A105 JEDEC JESD22-A105	3 3 1 1 3 3 3 3	2 2 45 45 45 45 1	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C Cross Section, Post HTSL 500 Hours High Temp Storage Bake 175C	- 1000 Cycles 2000 Cycles	3/6/0 3/6/0 3/231/0 - 3/228/0	Reference: LM2993BQDRQ1	Reference: LM2904BQDRQ1 - - -
	TC TC PTC PTC HTSL	A4 A4 A5 A5 A6 A6	JEDEC JESD22-A105  JEDEC JESD22-A105  JEDEC JESD22-A103  -  JEDEC JESD22-A103	3 3 1 1 3 3 3 3 3 3	2 2 45 45 45 1 44	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C Cross Section, Post HTSL 500 Hours High Temp Storage Bake 175C Cross Section, Post HTSL 1000 Hours	- 1000 Cycles 2000 Cycles 500 Hours	3/6/0 3/6/0 3/6/0 - - 3/231/0	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1
	TC TC PTC PTC HTSL HTSL	A4 A4 A5 A5 A6 A6	JEDEC JESD22-A105  JEDEC JESD22-A105  JEDEC JESD22-A103  -  JEDEC JESD22-A103	3 3 1 1 3 3 3 3 3 3	2 2 45 45 45 1 44	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C Cross Section, Post HTSL 500 Hours High Temp Storage Bake 175C Cross Section, Post HTSL	- 1000 Cycles 2000 Cycles 500 Hours	3/6/0 3/6/0 3/231/0 - 3/228/0	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1
	TC TC PTC PTC HTSL HTSL HTSL	A4 A4 A5 A5 A6 A6 A6	JEDEC JESD22-A105  JEDEC JESD22-A105  JEDEC JESD22-A103  -  JEDEC JESD22-A103  -  Test Group	3 3 1 1 3 3 3 3 B – Accele	2 2 45 45 45 1 44 1 1 erated Life	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C Cross Section, Post HTSL 500 Hours High Temp Storage Bake 175C Cross Section, Post HTSL 1000 Hours High Temp Storage Bake 175C Section, Post HTSL 1000 Hours	- 1000 Cycles 2000 Cycles 500 Hours - 1000 Hours -	3/6/0 3/6/0 3/231/0 - 3/228/0 3/3/0	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1
	TC TC PTC PTC HTSL HTSL HTSL HTSL	A4 A4 A5 A5 A6 A6 A6 B1	JEDEC JESD22-A105  JEDEC JESD22-A105  JEDEC JESD22-A103  -  JEDEC JESD22-A103  -  Test Group  JEDEC JESD22-A108  AEC Q100-008  Test Group	Qty 3 3 1 1 1 3 3 3 B - Accele	2 2 45 45 45 1 44 1 1 erated Life 77 800 age Asser	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C Cross Section, Post HTSL 500 Hours High Temp Storage Bake 175C Cross Section, Post HTSL 1000 Hours Life Test, 150C	- 1000 Cycles 2000 Cycles 500 Hours - 1000 Hours - 300 Hours	3/6/0 3/6/0 3/231/0 - 3/228/0 3/231/0	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1
	TC TC PTC PTC HTSL HTSL HTSL HTSL HTSL WBS	A4 A4 A5 A5 A6 A6 A6 B1 B2	JEDEC JESD22-A105  JEDEC JESD22-A105  JEDEC JESD22-A103  -  JEDEC JESD22-A103  -  Test Group  JEDEC JESD22-A108  AEC Q100-008  Test Group	9 Qty 3 3 1 1 1 3 3 3 3 B – Accele 3 3 C – Packs 3	2 2 45 45 45 1 1 44 1 1 erated Life 77 800 age Asser 30	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C Cross Section, Post HTSL 500 Hours High Temp Storage Bake 175C Cross Section, Post HTSL 1000 Hours Life Test, 150C Early Life Failure Rate, 125C  This Power Temperature Cycle - 40/125C  Life Test, 150C  Early Life Failure Rate, 125C  This Power Temperature Cycle - 40/125C  Life Test, 150C  Early Life Failure Rate, 125C  This Power Temperature Cycle - 40/125C	- 1000 Cycles 2000 Cycles 500 Hours - 1000 Hours - 300 Hours 48 Hours	3/6/0 3/6/0 3/6/0 3/231/0 - 3/228/0 3/3/0 3/231/0 - 3/231/0 - 3/90/0	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1
	TC TC PTC PTC HTSL HTSL HTSL HTSL WBS	A4 A4 A5 A6 A6 A6 B1 B2 C1 C2	JEDEC JESD22-A105  JEDEC JESD22-A105  JEDEC JESD22-A103  -  JEDEC JESD22-A103  -  Test Group  JEDEC JESD22-A108  AEC Q100-008  Test Group  AEC Q100-001  MIL-STD883 Method 2011	3 3 1 1 3 3 3 3 B – Accele 3 3 C – Packs	2 2 45 45 45 1 44 1 1 erated Life 77 800 30 30	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C Cross Section, Post HTSL 500 Hours High Temp Storage Bake 175C Cross Section, Post HTSL 1000 Hours Stimulation Tests Life Test, 150C Early Life Failure Rate, 125C mbly Integrity Tests Wire Bond Shear, Cpk>1.67 Bond Pull over Ball, Cpk >1.67	- 1000 Cycles 2000 Cycles 500 Hours - 1000 Hours - 300 Hours Wires Wires	3/6/0 3/6/0 3/231/0 3/228/0 3/3/0 3/90/0 3/90/0	Reference: LM2993BQDRQ1  1/800/0	Reference: LM2904BQDRQ1
	TC TC PTC PTC HTSL HTSL HTSL HTSL WBS WBP SD	A4 A4 A5 A5 A6 A6 A6 C1 C2 C3	JEDEC JESD22-A105  JEDEC JESD22-A105  JEDEC JESD22-A103  -  JEDEC JESD22-A103  -  Test Group  JEDEC JESD22-A108  AEC Q100-008  Test Group  AEC Q100-001  MIL-STD883 Method 2011  JEDEC JESD22-B102	9 Qty 3 3 1 1 1 3 3 3 3 8 – Accele 3 3 0 C – Packs 3 1	2 2 45 45 45 1 1 44 1 1 erated Life 77 800 age Asser 30 30 15	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C Cross Section, Post HTSL 500 Hours High Temp Storage Bake 175C Cross Section, Post HTSL 1000 Hours Life Test, 150C Early Life Failure Rate, 125C Mire Bond Shear, Cpk>1.67 Bond Pull over Ball, Cpk >1.67 Surface Mount Solderability	- 1000 Cycles 2000 Cycles 500 Hours - 1000 Hours - 300 Hours 48 Hours Wires Wires Pb Free	3/6/0 3/6/0 3/6/0 3/231/0 3/228/0 3/3/0 3/231/0 3/90/0 3/90/0 1/15/0	Reference: LM2903BQDRQ1 1/800/0	Reference: LM2904BQDRQ1
	TC TC PTC PTC HTSL HTSL HTSL HTSL WBS WBP SD SD	A4 A4 A5 A6 A6 A6 B1 B2 C1 C2	JEDEC JESD22-A105  JEDEC JESD22-A105  JEDEC JESD22-A103  -  JEDEC JESD22-A103  -  Test Group  JEDEC JESD22-A108  AEC Q100-008  Test Group  AEC Q100-001  MIL-STD883 Method 2011	Qty 3 3 1 1 1 3 3 3 B - Accele 3 3 C - Pack: 3 1 1 1	2 2 45 45 45 1 1 44 1 1 erated Life 77 800 30 30 15 15	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C Cross Section, Post HTSL 500 Hours High Temp Storage Bake 175C Cross Section, Post HTSL 1000 Hours Life Test, 150C Early Life Failure Rate, 125C high Temp Storage Bake 175C Surface Mount Solderability Surface Mount Solderability	- 1000 Cycles 2000 Cycles 500 Hours - 1000 Hours - 300 Hours 48 Hours Wires Wires Pb Free Pb	3/6/0 3/6/0 3/6/0 3/231/0 3/228/0 3/3/0 3/390/0 1/15/0 1/15/0	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1
	TC TC PTC PTC HTSL HTSL HTSL HTSL WBS WBP SD	A4 A4 A5 A5 A6 A6 A6 C1 C2 C3	JEDEC JESD22-A105  JEDEC JESD22-A105  JEDEC JESD22-A103  -  JEDEC JESD22-A103  -  Test Group  JEDEC JESD22-A108  AEC Q100-008  Test Group  AEC Q100-001  MIL-STD883 Method 2011  JEDEC JESD22-B102  JEDEC JESD22-B102  JEDEC JESD22-B100 and B108	3 3 1 1 3 3 3 3 B - Accele 3 3 3 1 1 1 3	2 2 45 45 45 1 1 44 1 1 erated Life 77 800 30 30 15 15 10	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C Cross Section, Post HTSL 500 Hours High Temp Storage Bake 175C Cross Section, Post HTSL 1000 Hours Life Test, 150C Early Life Failure Rate, 125C https://doi.org/10.1001/10.10	- 1000 Cycles 2000 Cycles 500 Hours - 1000 Hours - 300 Hours 48 Hours Wires Wires Pb Free	3/6/0 3/6/0 3/6/0 3/231/0 3/228/0 3/3/0 3/231/0 3/90/0 3/90/0 1/15/0	Reference: LM2903BQDRQ1 1/800/0	Reference: LM2904BQDRQ1
	TC TC PTC PTC HTSL HTSL HTSL HTSL WBS WBP SD SD	A4 A4 A5 A5 A6 A6 A6 C1 C2 C3	JEDEC JESD22-A105  JEDEC JESD22-A105  JEDEC JESD22-A103  -  JEDEC JESD22-A103  -  Test Group  JEDEC JESD22-A108  AEC Q100-008  Test Group  AEC Q100-001  MIL-STD883 Method 2011  JEDEC JESD22-B102  JEDEC JESD22-B102  JEDEC JESD22-B100 and B108	3 3 1 1 3 3 3 3 B - Accele 3 3 3 1 1 1 3	2 2 45 45 45 1 1 44 1 1 erated Life 77 800 30 30 15 15 10	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C Cross Section, Post HTSL 500 Hours High Temp Storage Bake 175C Cross Section, Post HTSL 1000 Hours Life Test, 150C Early Life Failure Rate, 125C high Temp Storage Bake 175C Surface Mount Solderability Surface Mount Solderability	- 1000 Cycles 2000 Cycles 500 Hours - 1000 Hours - 300 Hours 48 Hours Wires Wires Pb Free Pb	3/6/0 3/6/0 3/6/0 3/231/0 3/228/0 3/3/0 3/390/0 1/15/0 1/15/0	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1
	TC TC PTC PTC HTSL HTSL HTSL HTSL STORM HTOL ELFR WBS WBP SD SD PD	A4 A4 A5 A6 A6 A6 A6 C1 C2 C3 C3	JEDEC JESD22-A105  JEDEC JESD22-A105  JEDEC JESD22-A103  -  JEDEC JESD22-A103  -  Test Group  JEDEC JESD22-A108  AEC Q100-008  Test Group  AEC Q100-001  MIL-STD883 Method 2011  JEDEC JESD22-B102  JEDEC JESD22-B102  JEDEC JESD22-B100 and B108	3 3 1 1 3 3 3 3 B - Accele 3 3 3 1 1 1 3	2 2 45 45 45 1 44 1 1 erated Life 77 800 age Asser 30 15 15 10 Fabrication	Bond Pull over Stitch, Post T/C, 1000 Cycles Bond Pull over Ball, Post T/C, 1000 Cycles Power Temperature Cycle - 40/125C Power Temperature Cycle - 40/125C High Temp Storage Bake 175C Cross Section, Post HTSL 500 Hours High Temp Storage Bake 175C Cross Section, Post HTSL 1000 Hours Life Test, 150C Early Life Failure Rate, 125C mbly Integrity Tests Wire Bond Shear, Cpk>1.67 Surface Mount Solderability Surface Mount Solderability Physical Dimensions In Reliability Tests	- 1000 Cycles 2000 Cycles 500 Hours - 1000 Hours - 300 Hours 48 Hours Wires Wires Pb Free Pb	3/6/0 3/6/0 3/6/0 3/231/0 3/228/0 3/3/0 3/90/0 3/90/0 1/15/0 1/15/0 3/30/0  Completed Per Process Technology	Reference: LM2903BQDRQ1	Reference: LM2904BQDRQ1

Туре	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: LM2903AVQPWRQ1	QBS Product Reference: LM2903BQDRQ1	QBS Process Reference: LM2904BQDRQ1
							Technology Requirements		
NBT	D4	-	-	-	Negative Bias Temperature Instability	-	Completed Per Process Technology Requirements	-	-
SM	D5	-	-	-	Stress Migration		Completed Per Process Technology Requirements	-	-
		Test Gr	oup E – El	ectrical V	erification Tests				
HBM	E2	AEC Q100-001	1	3	ESD-HBM	2000V	1/3/0	3/9/0	-
CDM	E3	AEC Q100-011	1	3	ESD-CDM	1500V	1/3/0	-	-
LU	E4	AEC Q100-004	1	6	Latch-up, 125C	(Per AEC-Q100- 004)	-	3/18/0	-
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold test	3/90/0	-	-

Note (1): Precon and ELFR fails due to a defect screenable at production test. A1 (PC): Preconditioning: Performed for THB, Biased HAST, AC, uHAST & TC samples, as applicable.

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

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

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

Location	E-Mail
USA	PCNAmericasContact@list.ti.com
Europe	PCNEuropeContact@list.ti.com
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