



12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN 20161017001
New Assembly Materials for Select Automotive Devices in SOIC & TSSOP Package
Final Change Notification

Date: November 02, 2016
To: TOKYO ELECTRON DEVICE (DSTR) PCN

Dear Customer:

This is an announcement of change to a device that is currently offered by Texas Instruments. The details of this change are on the following pages.

Texas Instruments 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. The proposed first ship date is indicated on page 3 of this notification, unless customer agreement has been reached on an earlier implementation of the change.

If samples or additional data are required, requests must be received within 30 days of acknowledgement as samples are not built ahead of the change. You may contact the PCN Manager or your local Field Sales Representative to acknowledge this PCN and request samples or additional data.

This notice does not change the end-of-life status of any product. Should product affected be on a previously issued product withdrawal/discontinuance notice, this notification does not extend the life of that product or change the life time buy offering/discontinuance plan.

For questions regarding this notice, contact your local Field Sales Representative or the PCN Manager (PCN_ww_admin_team@list.ti.com).

Sincerely,

PCN Team
SC Business Services

20161017001
Final Change Notification
Attachments

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
LM2901AVQPWRQ1	null
SN74LV123ATPWRG4Q1	null
TPIC6C596PWR	null
SN74LV4052ATPWRQ1	null
SN74HC08QPWRG4Q1	null
SN74HC14QPWRG4Q1	null
SN74HC74QPWRG4Q1	null
SN74LV4051AQPWRQ1	null
LM2901QPWRQ1	null
SN74LV11ATPWRG4Q1	null
SN74HC21QPWRG4Q1	null
SN74AC14QPWRQ1	null
SN74AHCT244QPWRQ1	null
LM2903AVQPWRG4Q1	null
SN74AHC541QPWRQ1	null
LM2903QPWRG4Q1	null
TPIC6C595DR	null

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

PCN Number:	20161017001		PCN Date:	Nov. 2, 2016																														
Title:	New Assembly Materials For Select Automotive Devices in SOIC & TSSOP Package																																	
Customer Contact:	PCN Manager		Dept:	Quality Services																														
Proposed 1st Ship Date:	May 2, 2017	Estimated Sample Availability:	Date provided at sample request																															
Change Type:																																		
☐ Assembly Site	☐ Design	☐ Wafer Bump Site																																
☒ Assembly Process	☐ Data Sheet	☐ Wafer Bump Material																																
☒ Assembly Materials	☐ Part number change	☐ Wafer Bump Process																																
☐ Mechanical Specification	☐ Test Site	☐ Wafer Fab Site																																
☐ Packing/Shipping/Labeling	☐ Test Process	☐ Wafer Fab Materials																																
	☐ Wafer Fab Process																																	
PCN Details																																		
Description of Change:																																		
Texas Instruments is pleased to announce the qualification of new assembly material set to add Cu as an additional bond wire option for devices listed in "Product affected" section below. Devices will remain in current assembly facility and piece part changes as follows: <u>SOIC – Group 1</u> <table border="1"> <thead> <tr> <th>Material</th> <th>Current</th> <th>Additional Material</th> </tr> </thead> <tbody> <tr> <td>Wire (mil)</td> <td>0.96 Au</td> <td>1.0 Cu</td> </tr> <tr> <td>Mount Compound</td> <td>4042500, 4208458</td> <td>4147858</td> </tr> <tr> <td>Mold Compound</td> <td>4205694, 4209640</td> <td>4211880</td> </tr> <tr> <td>Leadframe Surface</td> <td>Standard NiPdAu</td> <td>Roughened NiPdAu</td> </tr> </tbody> </table> <u>TSSOP - Group 2</u> <table border="1"> <thead> <tr> <th>Material</th> <th>Current</th> <th>Additional Material</th> </tr> </thead> <tbody> <tr> <td>Wire (mil)</td> <td>0.8, 0.96, 1.15 Au</td> <td>1.0 Cu</td> </tr> <tr> <td>Mount Compound</td> <td>4042500, 4208458, 4211470</td> <td>4147858</td> </tr> <tr> <td>Mold Compound</td> <td>4209640, 4206193</td> <td>4211471</td> </tr> <tr> <td>Leadframe Surface</td> <td>Standard NiPdAu</td> <td>Roughened NiPdAu</td> </tr> </tbody> </table>					Material	Current	Additional Material	Wire (mil)	0.96 Au	1.0 Cu	Mount Compound	4042500, 4208458	4147858	Mold Compound	4205694, 4209640	4211880	Leadframe Surface	Standard NiPdAu	Roughened NiPdAu	Material	Current	Additional Material	Wire (mil)	0.8, 0.96, 1.15 Au	1.0 Cu	Mount Compound	4042500, 4208458, 4211470	4147858	Mold Compound	4209640, 4206193	4211471	Leadframe Surface	Standard NiPdAu	Roughened NiPdAu
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Reason for Change:																																		
Continuity of supply. 1) To align with world technology trends and use wiring with enhanced mechanical and electrical properties. 2) Maximize flexibility within our Assembly/Test production sites. 3) Cu is easier to obtain and stock. 4) Reduced delamination risk. Enhanced part reliability.																																		
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 TI ECO website .																															

Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):		
None		
Changes to product identification resulting from this PCN:		
None		
Product Affected:		
SOIC - Group 1		
TPIC6C595DG4	TPIC6C596DG4	TPIC6C595D
TPIC6C596D	TPIC6C596DRG4	TPIC6C596DR
TPIC6C595DRG4	TPIC6C595DR	TPIC6C596DRQ1
(p/n's color coded to qual summary)		
TSSOP - Group 2		
CD74HC125QPWRG4Q1	SN74AHCT244QPWR	LM2901VQPWRQ1
CD74HC125QPWRQ1	SN74AHCT244QPWRQ1	LM2902KAVQPWR
CD74HC4017QPWRG4Q1	SN74AC04QPWRQ1	LM2902KAVQPWRQ1
CD74HC4051QPWRG4Q1	SN74AHC541QPWRQ1	LM2902KVQPWRG4Q1
CD74HC4051QPWRQ1	SN74HC4851QPWRG4Q1	LM2904QPWRQ1
CD74HC4538QPWRG4Q1	SN74HC4851QPWRQ1	LM2904VQPWRG4Q1
CD74HC4538QPWRQ1	SN74HC4852QPWRQ1	LM2901AVQPWR
CD74HCT4066QPWRQ1	SN74LV393ATPWRQ1	LM2901VQPWRG4
CD74HCU04QPWRQ1	SN74LV4051ATPWRQ1	LM2902KAVQPWRG4
HCT4066QPWRG4Q1	SN74AHCT244IPWRQ1	LM2902KVQPWR
SN74HC00QPWRG4Q1	SN74LV123ATPWRQ1	LM2902QPWRQ1
SN74HC00QPWRQ1	SN74LV4052AQPWRQ1	LM2903AVQPWR
SN74HC02QPWRG4Q1	SN74LV4052ATPWRQ1	LM2903AVQPWRG4
SN74HC02QPWRQ1	SN74AC08QPWRG4Q1	LM2903AVQPWRQ1
SN74HC04IPWRG4Q1	SN74AC08QPWRQ1	LM2903QPWRG4Q1
SN74HC08IPWRG4Q1	SN74ACT244IPWRG4Q1	LM2903QPWRQ1
SN74HC08IPWRQ1	SN74AHC244QPWRG4Q1	LM2903VQPWRG4Q1
SN74HC08QPWRG4Q1	SN74AHC541QPWRG4Q1	LM2903VQPWRQ1
SN74HC08QPWRQ1	SN74LV221AQPWRQ1	LM2904AVQPWRG4
SN74HC10QPWRG4Q1	CAHCT244IPWRG4Q1	LM2904VQPWR
SN74HC125IPWRG4Q1	SN74AHC244QPWRQ1	LM2904VQPWRG4
SN74HC132QPWRG4Q1	SN74LV4053AQPWRQ1	LM2901AVQPWRG4
SN74HC132QPWRQ1	SN74AC14QPWRQ1	LM2901AVQPWRG4Q1
SN74HC138QPWRG4Q1	SN74ACT244IPWRQ1	LM2901AVQPWRQ1
SN74HC138QPWRQ1	SN74AHC244QPWR	LM2901QPWRQ1
SN74HC139QPWRG4Q1	SN74LV4051AQPWRQ1	LM2901VQPWRG4Q1
SN74HC139QPWRQ1	SN74LV4053ATPWRQ1	LM2902KVQPWRQ1
SN74HC14QPWRG4Q1	SN74LV123ATPWRG4Q1	LM2901QPWRG4Q1
SN74HC14QPWRQ1	SN74AHC244QPWRG4	LM2904AVQPWRQ1
SN74HC14QPWRQ1HY	CLV4051ATPWRG4Q1	LM2901VQPWR
SN74HC163IPWRG4Q1	CLV4052ATPWRG4Q1	LM2903AVQPWRG4Q1
SN74HC165QPWRG4Q1	SN74LV11ATPWRG4Q1	LM2904AVQPWR
SN74HC165QPWRQ1	SN74LV221AQPWRG4Q1	LM2904VQPWRQ1

SN74HC166AIPWRG4Q1	CAHCT244QPWRG4Q1	LM2902KAVQPWRG4Q1
SN74HC21QPWRG4Q1	CLV4053ATPWRG4Q1	LM2903VQPWR
SN74HC21QPWRQ1	SN74AC11IPWRG4Q1	LM2902KVQPWRG4
SN74HC244QPWRG4Q1	SN74AC240QPWRQ1	LM2903VQPWRG4
SN74HC244QPWRQ1	SN74ACT10QPWRG4Q1	LM2904AVQPWRG4Q1
SN74HC273QPWRG4Q1	SN74AHCT244QPWRG4	RC4580QPWRQ1
SN74HC273QPWRQ1	SN74LV393ATPWRG4Q1	LM2904QPWRG4Q1
SN74HC74QPWRG4Q1	SN74AHC573QPWRQ1	LM2902QPWRG4Q1
SN74HC74QPWRQ1	SN74AC04QPWRG4Q1	LM2903QPWRKN
SN74HC86IPWRG4Q1	CAHCT240IPWRG4Q1	TPIC6C596PWRG4
SN74HC86QPWRG4Q1	SN74AHC573QPWRG4Q1	TPIC6C595PWR
SN74HC86QPWRQ1		TPIC6C596PWG4
SN74HCT14QPWRG4Q1		TPIC6C596PWR
SN74HCT14QPWRQ1		TPIC6C595PWG4
SN74HCT244QPWRG4Q1		TPIC6C596PW
SN74HCT244QPWRQ1		TPIC6C595PWRG4
		TPIC6C595PW

SOIC - Group 1



TI Confidential
NDA Restrictions

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

Approved 22-Sep-2016
Product Attributes

Attributes	Qual Device: TPIC6C596DRQ1
Operating Temp Range	-40 to +125 C
Automotive Grade Level	Grade 1
Product Function	Logic
Wafer Fab Supplier	DFAB
Die Revision	B
Assembly Site	TAI
Package Type	SOIC
Package Designator	D
Ball/Lead Count	16

- QBS: Qual By Similarity
- Qual Device TPIC6C596DRQ1 is qualified at LEVEL1-260C

Qualification Results

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

Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: TPIC6C596DRQ1
Test Group A – Accelerated Environment Stress Tests							
		AEC-Q006	-	-	Pre-Preconditioning SAM	-	Pass
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 1-260C	Pass
		AEC-Q006	-	-	Post-Preconditioning	-	Pass

						SAM		
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0
			AEC-Q006	3	22	HAST SAM	Post 96 Hours	3/66/0
			AEC-Q006	3	3	HAST Bond Pull (Ball Bond)	Post 96 Hours	3/9/0
			AEC-Q006	3	3	HAST Bond Pull (Stitch Bond)	Post 96 Hours	3/9/0
			AEC-Q006	3	3	HAST Bond Shear	Post 96 Hours	3/9/0
			AEC-Q006	3	1	HAST Cross-Section	Post 96 Hours	3/3/0
	HAST	A2	JEDEC JESD22-A110	3	70	Biased HAST, 130C/85%RH	192 Hours	3/210/0
			AEC-Q006	3	22	HAST SAM	Post 192 Hours	3/66/0
			AEC-Q006	3	2	HAST Bond Pull (Ball Bond)	Post 192 Hours	3/6/0
			AEC-Q006	3	2	HAST Bond Pull (Stitch Bond)	Post 192 Hours	3/6/0
			AEC-Q006	3	2	HAST Bond Shear	Post 192 Hours	3/6/0
			AEC-Q006	3	1	HAST Cross-Section	Post 192 Hours	3/3/0
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	3/231/0
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	192 Hours	3/231/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0
			AEC-Q006	3	22	Temp Cycle SAM	Post 500 Cycles	3/66/0
			AEC-Q006	3	3	Temp Cycle Bond Pull (Ball Bond)	Post 500 Cycles	3/9/0
			AEC-Q006	3	3	Temp Cycle Bond Pull (Stitch Bond)	Post 500 Cycles	3/9/0
			AEC-Q006	3	3	Temp Cycle Bond Shear	Post 500 Cycles	3/9/0
			AEC-Q006	3	1	Temp Cycle Cross-Section	Post 500 Cycles	3/3/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	70	Temperature Cycle, -65/150C	1000 Cycles	3/210/0
			AEC-Q006	3	22	Temp Cycle SAM	Post 1000 Cycles	3/66/0
			AEC-Q006	3	2	Temp Cycle Bond Pull (Ball Bond)	Post 1000 Cycles	3/6/0
			AEC-Q006	3	2	Temp Cycle Bond Pull (Stitch Bond)	Post 1000 Cycles	3/6/0
			AEC-Q006	3	2	Temp Cycle Bond Shear	Post 1000 Cycles	3/6/0
			AEC-Q006	3	1	Temp Cycle Cross-Section	Post 1000 Cycles	3/3/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle, -40/125C	1000 Cycles	1/45/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle, -40/125C	2000 Cycles	1/45/0
	HTSL	A6	JEDEC JESD22-A103	3	45	High Temp. Storage Bake, 150C	1000 Hours	3/135/0
			AEC-Q006	3	1	HTSL Cross-Section	Post 1000 Hours	3/3/0
	HTSL	A6	JEDEC JESD22-A103	3	44	High Temp. Storage Bake, 150C	2000 Hours	3/132/0
			AEC-Q006	3	1	HTSL Cross-Section	Post 2000 Hours	3/3/0
Test Group B – Accelerated Lifetime Simulation Tests								
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	3/231/0
	EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A
Test Group C – Package Assembly Integrity Tests								
	WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	3/90/0
	WBP	C2	MIL-STD883	1	30	Bond Pull Cpk>1.67	Wires	3/90/0

			Method 2011					
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb	3/45/0
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Free	3/45/0
	LI	C6	JEDEC JESD22-B105	1	50	Lead Fatigue	Leads	3/66/0
	LI	C6	JEDEC JESD22-B105	1	50	Lead Pull to Destruction	Leads	3/66/0
Test Group E – Electrical Verification Tests								
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	3/90/0
Additional Tests								
	FLAM			-	-	Flammability	(UL 94V-0)	1/5/0

A1 (PC): Preconditioning:

Performed for Biased HAST, AC, TC, PTC, HTSL 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 : HAST, TC / PTC, HTSL,

Room : AC

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

TSSOP - Group 2



TI Information
Selective Disclosure

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

Approved 24-Jul-2016

Product Attributes

Attributes	Qual Device: LM2901QPWRQ1	Qual Device: LM2902KVQPWGRG4Q1	Qual Device: LM2903QPWRQ1
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	SFAB	SFAB	SFAB
Die Revision	-	A	A
Assembly Site	MLA	MLA	MLA
Package Type	TSSOP	TSSOP	TSSOP
Package Designator	PW	PW	PW
Ball/Lead Count	14	14	8

- QBS: Qual By Similarity

- Qual Devices qualified at LEVEL1-260CG: LM2901QPWRQ1, MLA00414PWR,

- Qual Devices qualified at LEVEL1-260C: LM2902KVQPWGRG4Q1

Qualification Results

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

Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: LM2901QPWRQ1	Qual Device: LM2902KVQPWGRG4Q1	Qual Device: LM2903QPWRQ1
Test Group A – Accelerated Environment Stress Tests									
		AEC-Q006	-	-	Pre-Preconditioning SAM	-	3/Pass	3/Pass	1/Pass
PC	A1	JEDEC J-STD-	3	77	Automotive Preconditioning	Level 1-260C	3/Pass	3/Pass	1/Pass

			020 JESD22- A113							
			AEC- Q006	-	-	Post- Preconditioning SAM	-	3/Pass	3/Pass	1/Pass
	HAST	A2	JEDEC JESD22- A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0	-	-
			AEC- Q006	3	22	HAST SAM	Post 96 Hours	3/66/0	-	-
			AEC- Q006	3	3	HAST Bond Pull (Ball Bond)	Post 96 Hours	3/9/0	-	-
			AEC- Q006	3	3	HAST Bond Pull (Stitch Bond)	Post 96 Hours	3/9/0	-	-
			AEC- Q006	3	3	HAST Bond Shear	Post 96 Hours	3/9/0	-	-
			AEC- Q006	3	1	HAST Cross- Section	Post 96 Hours	3/3/0	-	-
	HAST	A2	JEDEC JESD22- A110	3	70	Biased HAST, 130C/85%RH	192 Hours	3/210/0	-	-
			AEC- Q006	3	22	HAST SAM	Post 192 Hours	3/66/0	-	-
			AEC- Q006	3	2	HAST Bond Pull (Ball Bond)	Post 192 Hours	3/6/0	-	-
			AEC- Q006	3	2	HAST Bond Pull (Stitch Bond)	Post 192 Hours	3/6/0	-	-
			AEC- Q006	3	2	HAST Bond Shear	Post 192 Hours	3/6/0	-	-
			AEC- Q006	3	1	HAST Cross- Section	Post 192 Hours	3/3/0	-	-
	AC	A3	JEDEC JESD22- A102	3	77	Autoclave 121C	96 Hours	-	3/231/0	1/77/0
	AC	A3	JEDEC JESD22- A102	3	77	Autoclave 121C	192 Hours	-	3/231/0	1/77/0
	TC	A4	JEDEC JESD22- A104 and Appendix 3	3	77	Temperature Cycle, - 65/150C	500 Cycles	3/231/0	3/231/0	1/77/0
			AEC- Q006	3	22	Temp Cycle SAM	Post 500 Cycles	3/66/0	3/66/0	3/66/0
			AEC- Q006	3	3	Temp Cycle Bond Pull (Ball Bond)	Post 500 Cycles	3/9/0	3/9/0	-
			AEC- Q006	3	3	Temp Cycle Bond Pull (Stitch Bond)	Post 500 Cycles	3/9/0	3/9/0	-
			AEC- Q006	3	3	Temp Cycle Bond Shear	Post 500 Cycles	3/9/0	3/9/0	-
			AEC- Q006	3	1	Temp Cycle Cross-Section	Post 500 Cycles	3/3/0	3/3/0	-
	TC	A4	JEDEC JESD22- A104 and Appendix 3	3	70	Temperature Cycle, - 65/150C	1000 Cycles	3/210/0	3/210/0	1/70/0
			AEC- Q006	3	22	Temp Cycle SAM	Post 1000 Cycles	3/66/0	3/66/0	3/66/0
			AEC-	3	2	Temp Cycle	Post	3/6/0	3/6/0	-

			Q006			Bond Pull (Ball Bond)	1000 Cycles			
			AEC-Q006	3	2	Temp Cycle Bond Pull (Stitch Bond)	Post 1000 Cycles	3/6/0	3/6/0	-
			AEC-Q006	3	2	Temp Cycle Bond Shear	Post 1000 Cycles	3/6/0	3/6/0	-
			AEC-Q006	3	1	Temp Cycle Cross-Section	Post 1000 Cycles	3/3/0	3/3/0	-
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	N/A
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 150C	1000 Hours	-	3/135/0	-
			AEC-Q006	3	1	HTSB Cross-Section	Post 1000 Hours		3/3/0	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 150C	2000 Hours	-	3/132/0	-
			AEC-Q006	3	1	HTSB Cross-Section	Post 2000 Hours	3/3/0	3/3/0	-
Test Group B – Accelerated Lifetime Simulation Tests										
	HTO L	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	3/231/0	-	-
	EDR	B3	AEC Q100-005	3	77	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	3/90/0	3/90/0	1/30/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	3/90/0	3/90/0	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	-
	LI	C6	QSS 009-110	1	22	Lead Fatigue	Wires	-	1/22/0	-
	LI	C6	QSS 009-134	1	22	Lead Pull to Destruction	Wires	-	1/22/0	-
	FL	-	QSS 009-111	1	5	Flammability, Method A (UL94-0)	-	-	1/5/0	-
Test Group E – Electrical Verification Tests										
	ED	E5	AEC Q100-009	3	30	Auto Electrical Distributions	Cpk>1.67	-	3/90/0	-
Additional Tests										
	FL	-	QSS 009-111	1	5	Flammability, Method A (UL94-0)	-	-	1/5/0	-

A1 (PC): Preconditioning:

Performed for , Biased HAST, AC, HTSL &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 : HAST, TC, HTSL
 Room : AC

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green



TI Information
Selective Disclosure

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

Approved 22-Sep-2016

Product Attributes

Attributes	Qual Device: TPIC6C596PWRG4
Operating Temp Range	-40 to +125 C
Automotive Grade Level	Grade 1
Product Function	Logic
Wafer Fab Supplier	DFAB
Die Revision	B
Assembly Site	TAI
Package Type	TSSOP
Package Designator	PW
Ball/Lead Count	16

- QBS: Qual By Similarity

- Qual Device TPIC6C596PWRG4 is qualified at LEVEL1-260CG

Qualification Results

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

Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: TPIC6C596PWRG4
Test Group A – Accelerated Environment Stress Tests							
		AEC-Q006	-	-	Pre-Preconditioning SAM	-	Pass
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 1-260C	Pass
		AEC-Q006	-	-	Post-Preconditioning SAM	-	Pass
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0
		AEC-Q006	3	22	HAST SAM	Post 96 Hours	3/66/0
		AEC-Q006	3	3	HAST Bond Pull (Ball Bond)	Post 96 Hours	3/9/0
		AEC-Q006	3	3	HAST Bond Pull (Stitch Bond)	Post 96 Hours	3/9/0
		AEC-Q006	3	3	HAST Bond Shear	Post 96 Hours	3/9/0
		AEC-Q006	3	1	HAST Cross-Section	Post 96 Hours	3/3/0
HAST	A2	JEDEC JESD22-	3	70	Biased HAST,	192 Hours	3/210/0

		A110			130C/85%RH		
		AEC-Q006	3	22	HAST SAM	Post 192 Hours	3/66/0
		AEC-Q006	3	2	HAST Bond Pull (Ball Bond)	Post 96 Hours	3/6/0
		AEC-Q006	3	2	HAST Bond Pull (Stitch Bond)	Post 96 Hours	3/6/0
		AEC-Q006	3	2	HAST Bond Shear	Post 96 Hours	3/6/0
		AEC-Q006	3	1	HAST Cross-Section	Post 96 Hours	3/3/0
AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	3/231/0
AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	192 Hours	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0
		AEC-Q006	3	22	Temp Cycle SAM	Post 500 Cycles	3/66/0
		AEC-Q006	3	3	Temp Cycle Bond Pull (Ball Bond)	Post 500 Cycles	3/9/0
		AEC-Q006	3	3	Temp Cycle Bond Pull (Stitch Bond)	Post 500 Cycles	3/9/0
		AEC-Q006	3	3	Temp Cycle Bond Shear	Post 500 Cycles	3/9/0
		AEC-Q006	3	1	Temp Cycle Cross-Section	Post 500 Cycles	3/3/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	70	Temperature Cycle, -65/150C	1000 Cycles	3/210/0
		AEC-Q006	3	22	Temp Cycle SAM	Post 1000 Cycles	3/66/0
		AEC-Q006	3	2	Temp Cycle Bond Pull (Ball Bond)	Post 1000 Cycles	3/6/0
		AEC-Q006	3	2	Temp Cycle Bond Pull (Stitch Bond)	Post 1000 Cycles	3/6/0
		AEC-Q006	3	2	Temp Cycle Bond Shear	Post 1000 Cycles	3/6/0
		AEC-Q006	3	1	Temp Cycle Cross-Section	Post 1000 Cycles	3/3/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle, -40/125C	1000 Cycles	1/45/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle, -40/125C	2000 Cycles	1/45/0
HTSL	A6	JEDEC JESD22-A103	3	45	High Temp. Storage Bake, 150C	1000 Hours	3/135/0
		AEC-Q006	3	1	HTSL Cross-Section	Post 1000 Hours	3/3/0
HTSL	A6	JEDEC JESD22-A103	3	45	High Temp. Storage Bake, 150C	2000 Hours	3/132/0
		AEC-Q006	3	1	HTSL Cross-Section	Post 2000 Hours	3/3/0
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	3/231/0
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	--	N/A
Test Group C – Package Assembly Integrity Tests							
WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	3/90/0
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb	3/45/0
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Free	3/45/0
LI	C6	JEDEC JESD22-B105	1	50	Lead Fatigue	Leads	3/66/0
LI	C6	JEDEC JESD22-B105	1	50	Lead Pull to Destruction	Leads	3/66/0
Test Group E – Electrical Verification Tests							
ED	E5	AEC Q100-009	3	30	Auto Electrical Distributions	Cpk>1.67	3/90/0

Additional Tests							
FLAM			-	-		Method A	3/15/0

A1 (PC): Preconditioning:

Performed for Biased HAST, AC, PTC, HTSL&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



TI Information
Selective Disclosure

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

Approved 24-Jul-2016

Product Attributes

Attributes	Qual Device: SN74AC240QPWRQ1	Qual Device: SN74HC4851QPWRQ1
Operating Temp Range	-40 to +125 C	-40 to +125 C
Automotive Grade Level	Grade 1	Grade 1
Product Function	Logic	Logic
Wafer Fab Supplier	SFAB	SFAB
Die Revision	A	-
Assembly Site	MLA	MLA
Package Type	TSSOP	TSSOP
Package Designator	PW	PW
Ball/Lead Count	20	16

- QBS: Qual By Similarity

- Qual Devices qualified at LEVEL1-260C: SN74AC240QPWRQ1, SN74HC4851QPWRQ1

Qualification Results

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

	Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: SN74AC240QPWRQ1	Qual Device: SN74HC4851QPWRQ1
Test Group A – Accelerated Environment Stress Tests									
			AEC-Q006	-	-	Pre-Preconditioning SAM	-	3/Pass	3/Pass
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 1-260C	3/Pass	1/Pass
			AEC-Q006	-	-	Post-Preconditioning SAM	-	3/Pass	3/Pass
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0	-
			AEC-Q006	3	22	HAST SAM	Post 96 Hours	3/66/0	-
	HAST	A2	JEDEC	3	70	Biased HAST,	192 Hours	3/210/0	-

			JESD22-A110			130C/85%RH			
			AEC-Q006	3	22	HAST SAM	Post 192 Hours	3/66/0	-
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	3/231/0	-
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	192 Hours	3/231/0	-
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, - 65/150C	500 Cycles	3/231/0	1/77/0
			AEC-Q006	3	22	Temp Cycle SAM	Post 500 Cycles	3/66/0	-
			AEC-Q006	3	3	Temp Cycle Bond Pull (Ball Bond)	Post 500 Cycles	3/9/0	3/9/0
			AEC-Q006	3	3	Temp Cycle Bond Pull (Stitch Bond)	Post 500 Cycles	3/9/0	3/9/0
			AEC-Q006	3	3	Temp Cycle Bond Shear	Post 500 Cycles	3/9/0	3/9/0
			AEC-Q006	3	1	Temp Cycle Cross-Section	Post 500 Cycles	3/3/0	3/3/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	70	Temperature Cycle, - 65/150C	1000 Cycles	3/210/0	1/70/0
			AEC-Q006	3	22	Temp Cycle SAM	Post 1000 Cycles	3/66/0	-
			AEC-Q006	3	2	Temp Cycle Bond Pull (Ball Bond)	Post 1000 Cycles	3/6/0	3/6/0
			AEC-Q006	3	2	Temp Cycle Bond Pull (Stitch Bond)	Post 1000 Cycles	3/6/0	3/6/0
			AEC-Q006	3	2	Temp Cycle Bond Shear	Post 1000 Cycles	3/6/0	3/6/0
			AEC-Q006	3	1	Temp Cycle Cross-Section	Post 1000 Cycles	3/3/0	3/3/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp. Storage Bake, 150C	1000 Hours	3/135/0	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp. Storage Bake, 150C	2000 Hours	3/132/0	-
Test Group B – Accelerated Lifetime Simulation Tests									
	EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	N/A
Test Group C – Package Assembly Integrity Tests									
	WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	3/90/0	1/30/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	3/90/0	1/30/0
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb	2/30/0	-
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Free	2/30/0	-
	LI	C6	QSS 009-110	1	22	Lead Fatigue	Wires	2/44/0	-
	LI	C6	QSS 009-134	1	22	Lead Pull to Destruction	Wires	2/44/0	-
Test Group E – Electrical Verification Tests									

	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	3/90/0	-
Additional Tests									
	FL	-	QSS 009-111	1	5	Flammability, Method A (UL94-0)	-	2/10/0	-

A1 (PC): Preconditioning:

Performed for THB, Biased HAST, AC, HTSL&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

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green



TI Information
Selective Disclosure

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

Approved 30-Jul-2016

Product Attributes

Attributes	Qual Device: SN74HC244QPWRG4Q1	QBS Package Reference: LM2902KVQPWRG4Q1	QBS Package Reference: SN74AC240QPWRQ1
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	Logic	Signal Chain	Logic
Wafer Fab Supplier	SFAB	SFAB	SFAB
Die Revision	-	A	A
Assembly Site	MLA	MLA	MLA
Package Type	TSSOP	TSSOP	TSSOP
Package Designator	PW	PW	PW
Ball/Lead Count	20	14	20

- QBS: Qual By Similarity

- Qual Device SN74HC244QPWRG4Q1 is qualified at LEVEL1-260C

Qualification Results

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

Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: SN74HC244QPWRG4Q1	QBS Package Reference: LM2902KVQPWRG4Q1	QBS Package Reference: SN74AC240QPWRQ1
Test Group A – Accelerated Environment Stress Tests									
		AEC-Q006	-	-	Pre-Preconditioning SAM	-	2/Pass	3/Pass	3/Pass
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 1-260C	2/Pass	3/Pass	3/Pass
		AEC-Q006	-	-	Post-Preconditioning SAM	-	2/Pass	3/Pass	3/Pass
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	-	-	3/231/0
		AEC-	3	22	HAST SAM	Post 96	-	-	3/66/0

			Q006				Hours			
	HAST	A2	JEDEC JESD22- A110	3	70	Biased HAST, 130C/85%RH	192 Hours	-	-	3/210/0
			AEC- Q006	3	22	HAST SAM	Post 192 Hours	-	-	3/66/0
	AC	A3	JEDEC JESD22- A102	3	77	Autoclave 121C	96 Hours	2/154/0	3/231/0	3/231/0
	AC	A3	JEDEC JESD22- A102	3	77	Autoclave 121C	192 Hours	2/154/0	3/231/0	3/231/0
	TC	A4	JEDEC JESD22- A104 and Appendix 3	3	77	Temperature Cycle, - 65/150C	500 Cycles	2/154/0	3/231/0	3/231/0
			AEC- Q006	3	22	Temp Cycle SAM	Post 500 Cycles	2/44/0	3/66/0	3/66/0
			AEC- Q006	3	3	Temp Cycle Bond Pull (Ball Bond)	Post 500 Cycles	2/6/0	3/9/0	3/9/0
			AEC- Q006	3	3	Temp Cycle Bond Pull (Stitch Bond)	Post 500 Cycles	2/6/0	3/9/0	3/9/0
			AEC- Q006	3	3	Temp Cycle Bond Shear	Post 500 Cycles	2/6/0	3/9/0	3/9/0
			AEC- Q006	3	1	Temp Cycle Cross-Section	Post 500 Cycles	2/2/0	3/3/0	3/3/0
	TC	A4	JEDEC JESD22- A104 and Appendix 3	3	70	Temperature Cycle, - 65/150C	1000 Cycles	2/140/0	3/210/0	3/210/0
			AEC- Q006	3	22	Temp Cycle SAM	Post 500 Cycles	2/44/0	3/66/0	3/66/0
			AEC- Q006	3	2	Temp Cycle Bond Pull (Ball Bond)	Post 500 Cycles	2/4/0	3/9/0	3/9/0
			AEC- Q006	3	2	Temp Cycle Bond Pull (Stitch Bond)	Post 500 Cycles	2/4/0	3/9/0	3/9/0
			AEC- Q006	3	2	Temp Cycle Bond Shear	Post 500 Cycles	2/4/0	3/9/0	3/9/0
			AEC- Q006	3	1	Temp Cycle Cross-Section	Post 500 Cycles	2/2/0	3/3/0	3/3/0
	PTC	A5	JEDEC JESD22- A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	-	-
	HTSL	A6	JEDEC JESD22- A103	1	45	High Temp Storage Bake 150C	1000 Hours	-	3/135/0	3/135/0
			AEC- Q006	3	1	HTSB Cross- Section	Post 1000 Hours	-	3/3/0	-
	HTSL	A6	JEDEC JESD22- A103	1	45	High Temp Storage Bake 150C	2000 Hours	-	3/132/0	3/132/0
			AEC- Q006	3	1	HTSB Cross- Section	Post 2000 Hours	-	3/3/0	-
Test Group B – Accelerated Lifetime Simulation Tests										
	EDR	B3	AEC Q100- 005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	-	-
Test Group C – Package Assembly Integrity Tests										
	WBS	C1	AEC	1	30	Bond Shear	Wires	2/60/0	3/90/0	3/90/0

			Q100-001			(Cpk>1.67)				
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	2/60/0	3/90/0	3/90/0
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb	-	1/15/0	2/30/0
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Free	-	1/15/0	2/30/0
	LI	C6	QSS 009-110	1	22	Lead Fatigue	Leads	-	1/22/0	2/44/0
	LI	C6	QSS 009-134	1	22	Lead Pull to Destruction	Leads	-	1/22/0	2/44/0
Test Group E – Electrical Verification Tests										
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	2/60/0	3/90/0	3/90/0
Additional Tests										
	FL	-	QSS 009-111	1	5	Flammability (UL 94V-0)	-	-	1/5/0	2/10/0

A1 (PC): Preconditioning:

Performed for Biased HAST, AC, HTSL & 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 : HAST, TC, HTSL

Room : AC

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

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

Location	E-Mail
USA	PCNAmericasContact@list.ti.com
Europe	PCNEuropeContact@list.ti.com
Asia Pacific	PCNAsiaContact@list.ti.com
Japan	PCNJapanContact@list.ti.com