

<b>PCN Number:</b>	20150624002	<b>PCN Date:</b>	07/06/2015
<b>Title:</b>	Qualify New Assembly Material set for Selected Device(s)		
<b>Customer Contact:</b>	<a href="#">PCN Manager</a>	<b>Dept:</b>	Quality Services
<b>Proposed 1<sup>st</sup> Ship Date:</b>	01/06/2016	<b>Estimated Sample Availability:</b>	Date provided at sample request
<b>Change Type:</b>			
<input type="checkbox"/>	<a href="#">Assembly Site</a>	<input type="checkbox"/>	<a href="#">Design</a>
<input checked="" type="checkbox"/>	<a href="#">Assembly Process</a>	<input type="checkbox"/>	<a href="#">Data Sheet</a>
<input checked="" type="checkbox"/>	<a href="#">Assembly Materials</a>	<input type="checkbox"/>	<a href="#">Part number change</a>
<input type="checkbox"/>	<a href="#">Mechanical Specification</a>	<input type="checkbox"/>	<a href="#">Test Site</a>
<input type="checkbox"/>	<a href="#">Packing/Shipping/Labeling</a>	<input type="checkbox"/>	<a href="#">Test Process</a>
<input type="checkbox"/>		<input type="checkbox"/>	<a href="#">Wafer Bump Site</a>
<input type="checkbox"/>		<input type="checkbox"/>	<a href="#">Wafer Bump Material</a>
<input type="checkbox"/>		<input type="checkbox"/>	<a href="#">Wafer Bump Process</a>
<input type="checkbox"/>		<input type="checkbox"/>	<a href="#">Wafer Fab Site</a>
<input type="checkbox"/>		<input type="checkbox"/>	<a href="#">Wafer Fab Materials</a>
<input type="checkbox"/>		<input type="checkbox"/>	<a href="#">Wafer Fab Process</a>
<b>PCN Details</b>			
<b>Description of Change:</b>			
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:			
<b>Group 1 Devices:</b>			
	<b>Material</b>	<b>Current</b>	<b>Additional Material</b>
	Wire (mil)	0.96 Au	1.0 Cu
	Mount compound	4042504	4208458
	Mold compound	4205443	4211649
<b>Group 2 Devices:</b>			
	<b>Material</b>	<b>Current</b>	<b>Additional Material</b>
	Wire (mil)	0.96 Au	1.0 Cu
	Mold compound	4205443	4211649
<b>Group 3 Devices:</b>			
	<b>Material</b>	<b>Current</b>	<b>Additional Material</b>
	Wire (mil)	0.8, 0.96, 1.15 Au	1.0 Cu
	Mold compound	4205694	4211880
	Leadframe surface	Standard NiPdAu	Roughened NiPdAu
<b>Reason for Change:</b>			
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			
<b>Anticipated impact on Material Declaration</b>			
<input type="checkbox"/>	No Impact to the Material Declaration	<input checked="" type="checkbox"/>	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 <a href="#">TI ECO website</a> .

**Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):**

None.

**Changes to product identification resulting from this PCN:**

None.

**Product Affected Group 1 Device:**

MLA00346PWPR	TPS76801QPWPRG4CT	TPS77601QPWPRG4CT
TLC084QPWPRQ1	TPS76801QPWPRMO	

**Product Affected Group 2 Device:**

MLA00418PWPR	TPS76801QPWPRQ1	TPS76850QPWPRQ1	TPS77601QPWPRG4Q1
TPS76733QPWPRQ1	TPS76818QPWPRQ1	TPS77501QPWPRQ1	TPS77601QPWPRQ1
TPS76750QPWPRQ1	TPS76825QPWPRQ1	TPS77533QPWPRCT	TPS77618QPWPRQ1
TPS76801QPWPRG4Q1	TPS76833QPWPRQ1	TPS77533QPWPRQ1	TPS77633QPWPRQ1

**Product Affected Group 3 Device:**

LM111QDRG4CT	LM2902KAVQDR	LM2904DRCT	SN103325DRG4
LM111QDRG4DL	LM2902KAVQDRCT	LM2904DRG4CT	SN103442DR
LM124AQDRDL	LM2902KAVQDRDL	LM2904QDRDL	SN103442DRG4
LM124AQDRG4DL	LM2902KAVQDRG4	LM2904QDRG4-M	SN103660DRG4
LM124DRG4	LM2902KAVQDRG4CT	LM2904QDRG4DL	SN104549DRG4
LM124QDRG4RB	LM2902KAVQDRG4DL	LM2904QDRG4Q1	SN104569DR
LM158AQDRDL	LM2902KAVQDRG4HL	LM2904QDRG4SV	SN104569DRG4
LM158AQDRG4DL	LM2902KAVQDRG4RB	LM2904QDRQ1	SN104611DR
LM158MDRG4TY	LM2902KAVQDRHL	LM2904QDRSV	SN104611DRG4
LM193MDRG4TY	LM2902KAVQDRQ1	LM2904VQDR	SN104613DR
LM211QD	LM2902KAVQDRRB	LM2904VQDRCT2	SN104613DRG4
LM211QDG4	LM2902KVQDR	LM2904VQDRG4	SN104630DR
LM211QDR	LM2902KVQDRDL2	LM2904VQDRG4HL	SN104630DRG4
LM211QDRG4	LM2902KVQDRG4	LM2904VQDRG4Q1	SN104633DR
LM211QDRG4HT	LM2902KVQDRQ1	LM2904VQDRHL	SN104633DRG4
LM211QDRG4Q1	LM2902KVQDRVS	LM2904VQDRQ1	SN301152DR
LM211QDRG4RB	LM2902QDRG4-M	LM324IDRG4GT	SN301152DRG4
LM211QDRG4VS	LM2902QDRG4Q1	LM324QDRG4SV	SN75469DRG4SV
LM211QDRQ1	LM2902QDRG4SV	LM339IDRG4MO	SN75469DRSV
LM211QDRRB	LM2902QDRG4VS	LM339QDRG4MO	TL1431QDR
LM218IDRG4Q1	LM2902QDRQ1	LM358MDRG4VS	TL1431QDRG4Q1
LM239AQDRG4Q1	LM2902QDRSV	LP2901IDRG4Q1	TL1431QDRG4VS
LM239AQDRQ1	LM2902QDRVS	LP2901IDRQ1	TL1431QDRQ1
LM285IDRMO-1-2	LM2902VQDRQ1	LP2901TDRG4MO	TL7705AIDRG4CT
LM285QDR-1-2-M	LM2903AVQDR	MC33063AQDRQ1	ULN2003IDRG4SV
LM285QDRG4Q1-1-2	LM2903AVQDRDL	MC34063AQDRG4Q1	ULN2003TDRG4SV
LM285QDRQ1-1-2	LM2903AVQDRG4	MC34063AQDRQ1	ULQ2003AD
LM2901AVQDR	LM2903AVQDRG4Q1	MLA00014DR	ULQ2003ADG4
LM2901AVQDRCM	LM2903AVQDRQ1	MLA00103DR	ULQ2003ADR

LM2901AVQDRDL	LM2903DRCT	MLA00171DR	ULQ2003ADRG4
LM2901AVQDRG4	LM2903DRG4CT	MLA00269DR	ULQ2003AQDRQ1
LM2901AVQDRG4Q1	LM2903DRG4SV	MLA00282DR	ULQ2003ATDG4Q1
LM2901AVQDRQ1	LM2903DRSV	MLA00301DR	ULQ2003ATDQ1
LM2901DRCT	LM2903IDRDL	MLA00310DR	ULQ2003ATDRCT
LM2901DRG4CT	LM2903IDRG4DL	MLA00314DR	ULQ2003ATDRG4AS
LM2901QDG4Q1	LM2903IDRG4MO	MLA00332DR	ULQ2003ATDRG4CT
LM2901QDRDL	LM2903QDRG4CM	MLA00338DR	ULQ2003ATDRG4Q1
LM2901QDRG4DL	LM2903QDRG4Q1	MLA00338DRG4	ULQ2003ATDRG4YZ
LM2901QDRG4HL	LM2903QDRMO	MLA00339DR	ULQ2003ATDRQ1
LM2901QDRG4Q1	LM2903QDRQ1	MLA00339DRG4	ULQ2003ATDRRB
LM2901QDRG4SV	LM2903VQDR	MLA00356DR	ULQ2003ATDRYZ
LM2901QDRHL	LM2903VQDRG4	MLA00407DR	ULQ2003IDRG4SV
LM2901QDRQ1	LM2903VQDRG4Q1	MPL2670DR	ULQ2003TDRG4SV
LM2901QDRSV	LM2903VQDRQ1	RC4580QDRQ1	ULQ2004AD
LM2901VQDR	LM2904AVQDR	SA555IDRG4VS	ULQ2004ADG4
LM2901VQDRG4	LM2904AVQDRG4	SN101967DR	ULQ2004ADR
LM2901VQDRG4Q1	LM2904AVQDRG4Q1	SN101967DRG4	ULQ2004ADRG4
LM2901VQDRQ1	LM2904AVQDRG4RB	SN102157DR	ULQ2004ATDRG4Q1
LM2902DRCT	LM2904AVQDRG4VS	SN102157DRG4	ULQ2004ATDRQ1
LM2902DRG4CT	LM2904AVQDRQ1	SN102755DR	
LM2902IDRG4SV	LM2904AVQDRRB	SN102755DRG4	
LM2902IDRSV	LM2904AVQDRVS	SN103325DR	

## Qualification Report: Group 1 & 2 Devices

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

#### TITL: 1.0mil PCC Wire Qualification for Analog Automotive Device – TPS76801QPWPRG4Q1

#### Product Attributes

Attributes	Qual Device: TPS76801QPWPRG4Q1
<b>Operating Temp Range</b>	-40°C to +125°C
<b>Automotive Grade Level</b>	Grade 1
<b>Wafer Fab Supplier</b>	DFAB
<b>Die Revision</b>	A
<b>Assembly Site</b>	TAI / TITL
<b>Package Type</b>	TSSOP
<b>Package Designator</b>	PWP
<b>Ball/Lead Count</b>	20

- QBS: Qual By Similarity

- Qual Device TPS76801QPWPRG4Q1 is qualified at LEVEL3-260C

#### Qualification Results

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

Type	#	Test Name / Condition	Duration	Qual Device: TPS76801QPWPRG4Q1
<b>Test Group A - Accelerated Environment Stress Test</b>				
PC	A1	Auto Preconditioning Level 3	Level 3-260C	3/1095/0
HAST	A2	Biased HAST, 130C/85%RH	96 Hours	3/231/0
AC	A3	Autoclave 121C	192 Hours	3/231/0
TC-BP	A4	Post Temp. Cycle Bond Pull	Wires	1/5/0
TC	A4	Temperature Cycle, -65/150C	1000 Cycles	3/231/0
HTSL	A6	High Temp Storage Bake 175C	500 Hours	3/231/0
<b>Test Group C - Package Assembly Integrity Tests</b>				
WBS	C1	Bond Shear (Ppk > 1.67 and Cpk > 1.33)	Wires	3/240/0
WBP	C2	Bond Pull (Ppk > 1.67 and Cpk > 1.33)	Wires	3/240/0
<b>Test Group E - Electrical Verification</b>				
ED	E5	Electrical Distributions Cpk > 1.67	--	3/90/0

#### **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): -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

Grade 4 (or C): -40°C to +70°C

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

Room/Hot/Cold : HTOL

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

Room : AC/uHAST

#### **Green/Pb-free Status:**

Qualified Pb-Free(SMT) and Green

## Qualification Report: Group 3 Device

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

#### Automotive SOIC PCC Wire AI pad Qualification JI-1 Technology at TMEX – ULQ2003AQDRQ1

##### Product Attributes

Attributes	Qual Device: ULQ2003AQDRQ1 (Roughened LF)	Qual Device: ULQ2003AQDRQ1 (Standard LF)
<b>Automotive Grade Level</b>	Grade 1	Grade 1
<b>Operating Temp Range</b>	-40°C to +125°C	-40°C to +125°C
<b>Die Revision</b>	C	C
<b>Assembly Site</b>	FMX	FMX
<b>Package Type</b>	SOIC	SOIC
<b>Package Designator</b>	D	D
<b>Ball/Lead Count</b>	16	16

- QBS: Qual By Similarity

- Qual Devices qualified at LEVEL1-260C: ULQ2003AQDRQ1\_RLF, ULQ2003AQDRQ1\_STDLF

##### Qualification Results (ULQ2003AQDRQ1\_ Roughened LF)

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: ULQ2003AQDRQ1 (Roughened LF)
<b>Test Group A – Accelerated Environment Stress Tests</b>							
PC	A1	JEDEC J-STD-020 JESD22-A113	3	0	Automotive Preconditioning	Level 1-260C	3/735/0
HAST	A2	JEDEC JESD22-A110	3	12	Biased HAST, 130C/85%RH	96 Hours	(Refer to table below)
HAST	A2	JEDEC JESD22-A110	3	12	Post CSAM/TSAM, Biased HAST, 130C/85%RH	96 Hours	(Refer to table below)
AC	A3	JEDEC JESD22-A102	3	12	Autoclave 121C	96 Hours	3/231/0
AC	A3	JEDEC JESD22-A102	3	12	Post CSAM/TSAM, Autoclave 121C	96 Hours	3/36/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	10	Temperature Cycle, -65/150C	500 Cycles	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	10	Post CSAM/TSAM, Temperature Cycle, -65/150C	500 Cycles	3/36/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	10	Post VQR, Temperature Cycle, -65/150C	500 Cycle	3/6/0
TC-BP	A4	MIL-STD883 Method 2011			Post Temp. Cycle Bond Pull	Wires	1/30/0
PTC	A5	JEDEC JESD22-A105	1		Power Temperature Cycle	1000 Cycles	N/A
HTSL	A6	JEDEC JESD22-A103	1	22	High Temp. Storage Bake, 150C	1000 Hours	1/45/0
HTSL	A6	JEDEC JESD22-A103	1	22	Post CSAM/TSAM, High Temp. Storage Bake, 150C	1000 Hours	1/22/0

Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 150C	408 Hours	(Refer to table below)
EDR	B3	AEC Q100-005	3		NVM Endurance, Data Retention, and Operational Life	-	N/A
Test Group C – Package Assembly Integrity Tests							
WBS	C1	AEC Q100-001			Bond Shear (Cpk>1.67)	Wires	3/90/0
WBP	C2	MIL-STD883 Method 2011			Bond Pull (Cpk>1.67)	Wires	3/90/0
SD	C3	JEDEC JESD22-B102	1	30	Solderability	Pb Free	1/15/0
SD	C3	JEDEC JESD22-B102	1	30	Surface Mount Solderability	Pb	1/15/0
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	--	3/30/0
Test Group E – Electrical Verification Tests							
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	(Refer to table below)

### Qualification Results (ULQ2003AQDRQ1\_ Standard LF)

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: ULQ2003AQDRQ1 (Standard LF)
Test Group A – Accelerated Environment Stress Tests							
PC	A1	JEDEC J-STD-020 JESD22-A113	3	0	Automotive Preconditioning	Level 1-260C	3/735/0
HAST	A2	JEDEC JESD22-A110	3	12	Biased HAST, 130C/85%RH	96 Hours	3/231/0
HAST	A2	JEDEC JESD22-A110	3	12	Post CSAM/TSAM, Biased HAST, 130C/85%RH	96 Hours	1/12/0
AC	A3	JEDEC JESD22-A102	3	12	Autoclave 121C	96 Hours	3/231/0
AC	A3	JEDEC JESD22-A102	3	12	Post CSAM/TSAM, Autoclave 121C	96 Hours	3/36/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	10	Temperature Cycle, -65/150C	500 Cycles	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	10	Post CSAM/TSAM, Temperature Cycle, -65/150C	500 Cycles	3/36/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	10	Post VQR, Temperature Cycle, -65/150C	500 Cycle	3/6/0
TC-BP	A4	MIL-STD883 Method 2011			Post Temp. Cycle Bond Pull	Wires	1/30/0
PTC	A5	JEDEC JESD22-A105	1		Power Temperature Cycle	1000 Cycles	N/A
HTSL	A6	JEDEC JESD22-A103	1	22	High Temp. Storage Bake, 150C	1000 Hours	1/45/0
HTSL	A6	JEDEC JESD22-A103	1	22	Post CSAM/TSAM, High Temp. Storage Bake, 150C	1000 Hours	1/22/0
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 150C	408 Hours	3/231/0

EDR	B3	AEC Q100-005	3		NVM Endurance, Data Retention, and Operational Life	-	N/A
<b>Test Group C – Package Assembly Integrity Tests</b>							
WBS	C1	AEC Q100-001			Bond Shear (Cpk>1.67)	Wires	3/90/0
WBP	C2	MIL-STD883 Method 2011			Bond Pull (Cpk>1.67)	Wires	3/90/0
SD	C3	JEDEC JESD22-B102	1	30	Solderability	Pb Free	1/15/0
SD	C3	JEDEC JESD22-B102	1	30	Surface Mount Solderability	Pb	1/15/0
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	--	3/30/0
<b>Test Group E – Electrical Verification Tests</b>							
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

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

<b>Location</b>	<b>E-Mail</b>
USA	<a href="mailto:PCNAmericasContact@list.ti.com">PCNAmericasContact@list.ti.com</a>
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