PCN Number:	20120808000D	**PCN Date:**	03/12/2014

Title:	Qualification of Alternate Material Set for Assembly with Au Wire and Cu as Additional Wire Base Metal Option for Select SOIC Package Devices

Customer Contact:	PCN_ww_admin_team@list.ti.com	**Phone:**	+1(214)480-6037	**Dept:**	Quality Services

Change Type:

☐	Assembly Site	☐	Assembly Process	☒	Assembly Materials
☐	Design	☐	Electrical Specification	☐	Mechanical Specification
☐	Test Site	☐	Packing/Shipping/Labeling	☐	Test Process
☐	Wafer Bump Site	☐	Wafer Bump Material	☐	Wafer Bump Process
☐	Wafer Fab Site	☐	Wafer Fab Materials	☐	Wafer Fab Process

PCN Details

Description of Change:

Revision D is to remove select devices in the Product Affected Section (with ~~strikethrough~~) and highlighted in yellow. These devices were inadvertently added and not affected by this change.

PCN No.	Rev	Date Issued	Remarks
20120808000	N/A	8/24/2012	Original notification
	A	9/7/2012	Retract select devices; no change to 1st ship date
	B	9/28/2012	Retract select devices; add 1.98mil wire ; update qual vehicle wire diam; no change to 1st ship date
	C	2/13/2013	Customer specific PCN notification

Qualification of an alternate material set for assembly with Au wire and add Cu as an additional wire base metal option for select devices in the SOIC package. See table below:

Material set	**Current Assembly Au wire**	**Alternate Assembly Au wire**	**Cu Bond wire option**
Mold compound	4205694	4211880	4211880
Wire dia. (Mils)	0.8, 0.9, 0.96, 1.0, 1.15, 1.3	0.8, 0.9, 0.96, 1.0, 1.15, 1.3	0.96, 1.98

Qualification references are provided for further test data validation (See Qualification References Section).

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

Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):
None.
Changes to product identification resulting from this PCN:
None.
Product Affected:

~~INA271AID~~	~~SN65LVDS047DRG4~~	~~SN65LVDS179DR~~	~~THS4062IDG4~~
~~INA271AIDG4~~	~~SN65LVDS048AD~~	~~SN65LVDS179DRG4~~	~~THS4062IDR~~
~~INA271AIDR~~	~~SN65LVDS048ADG4~~	~~SN65LVDS391D~~	~~THS4062IDRG4~~
~~INA271AIDRG4~~	~~SN65LVDS048ADR~~	~~SN65LVDS391DG4~~	~~THS4502ID~~
~~OPA1632D~~	~~SN65LVDS048ADRG4~~	~~SN65LVDS391DR~~	~~THS4502IDG4~~
~~OPA1632DG4~~	~~SN65LVDS100D~~	~~SN65LVDS391DRG4~~	~~THS4502IDR~~
~~OPA1632DR~~	~~SN65LVDS100DG4~~	~~SN65LVDT33D~~	~~THS4502IDRG4~~
~~OPA1632DRG4~~	~~SN65LVDS100DR~~	~~SN65LVDT33DG4~~	~~THS4631D~~
~~SN65HVD35D~~	~~SN65LVDS100DRG4~~	~~SN65LVDT33DR~~	~~THS4631DE4~~
~~SN65HVD35DG4~~	~~SN65LVDS101D~~	~~SN65LVDT33DRG4~~	~~THS4631DR~~
~~SN65HVD35DR~~	~~SN65LVDS101DG4~~	~~THS4031CD~~	~~THS4631DRE4~~
~~SN65HVD35DRG4~~	~~SN65LVDS101DR~~	~~THS4031CDG4~~	~~TLC5620CD~~
~~SN65LVDS047D~~	~~SN65LVDS101DRG4~~	~~THS4031CDR~~	~~TLC5620CDG4~~
~~SN65LVDS047DG4~~	~~SN65LVDS179D~~	~~THS4031CDRG4~~	~~TLC5620CDR~~
~~SN65LVDS047DR~~	~~SN65LVDS179DG4~~	~~THS4062ID~~	~~TLC5620CDRG4~~

Qualification Data: Approved 02/04/2013

This qualification has been specifically developed for the validation of this change. The qualification data validates that the proposed change meets the applicable released technical specifications.

Qual Vehicle 1 : CDCVF25081DR (MSL 1-260C)

Package Construction Details

Assembly Site:	TI Taiwan	Mold Compound:	4211880
# Pins-Designator, Family:	16-D, SOIC	Mount Compound:	4042500
Lead frame (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu

Qualification: ☐ **Plan** ☒ **Test Results**

Reliability Test	Conditions	Sample Size/Fail		
		Lot#1	Lot#2	Lot#3
**High Temp. Storage Bake	150C (1000hrs)	77/0	77/0	77/0
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	77/0	77/0
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0
Manufacturability	(per mfg. Site specification)	Pass	Pass	Pass
Moisture Sensitivity	(level 1 @ 260C peak +5/-0C)	12/0	-	-
Notes	**- Preconditioning sequence: Level 1-260C.			

Qual Vehicle 2 : SN65HVD1050DR (MSL 1-260C)			
Package Construction Details			
Assembly Site:	TI Taiwan	Mold Compound:	4211880
# Pins-Designator, Family:	8-D, SOIC	Mount Compound:	4042500
Lead frame (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu

Qualification: ☐ **Plan** ☒ **Test Results**

Reliability Test	Conditions	Sample Size/Fail
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0
Manufacturability	(per mfg. Site specification)	Pass
Moisture Sensitivity	(level 1 @ 260C peak +5/-0C)	11/0
Notes **- Preconditioning sequence: Level 1-260C.		

Qual Vehicle 3 : TB3R2DR (MSL 2-260C)			
Package Construction Details			
Assembly Site:	TI Taiwan	Mold Compound:	4211880
# Pins-Designator, Family:	16-D, SOIC	Mount Compound:	4042500
Lead frame (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu

Qualification: ☐ **Plan** ☒ **Test Results**

Reliability Test	Conditions	Sample Size/Fail		
		Lot#1	Lot#2	Lot#3
**High Temp. Storage Bake	150C (1000hrs)	77/0	77/0	77/0
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	77/0	77/0
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0
Manufacturability	(per mfg. Site specification)	Pass	Pass	Pass
Moisture Sensitivity	(level 2 @ 260C peak +5/-0C)	12/0	-	-
Notes **- Preconditioning sequence: Level 2-260C.				

Qual Vehicle 4 : TLC3702CDR (MSL 1-260C)			
Package Construction Details			
Assembly Site:	TI Taiwan	Mold Compound:	4211880
# Pins-Designator, Family:	8-D, SOIC	Mount Compound:	4042500
Lead frame (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu

Qualification: ☐ **Plan** ☒ **Test Results**

Reliability Test	Conditions	Sample Size/Fail		
		Lot#1	Lot#2	Lot#3
**High Temp. Storage Bake	150C (1000hrs)	77/0	77/0	77/0
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	77/0	77/0
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0
Manufacturability	(per mfg. Site specification)	Pass	Pass	Pass
Moisture Sensitivity	(level 1 @ 260C peak +5/-0C)	12/0	-	-
Notes **- Preconditioning sequence: Level 1-260C.				

Qual Vehicle 5 : TPS2058AD (MSL 1-260C)			
Package Construction Details			
Assembly Site:	TI Taiwan	Mold Compound:	4211880
# Pins-Designator, Family:	16-D, SOIC	Mount Compound:	4042500
Lead frame (Finish, Base):	NiPdAu, Cu	Bond Wire:	1.98 Mil Dia., Cu

Qualification: ☐ **Plan** ☒ **Test Results**

Reliability Test	Conditions	Sample Size/Fail	
		Lot#1	Lot#2
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	77/0
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0
Manufacturability	(per mfg. Site specification)	Pass	Pass
Moisture Sensitivity	(level 1 @ 260C peak +5/-0C)	12/0	-

Notes **- Preconditioning sequence: Level 1-260C.

Qual Vehicle 6 : TPS3705-33DR (MSL 1-260C)			
Package Construction Details			
Assembly Site:	TI Taiwan	Mold Compound:	4211880
# Pins-Designator, Family:	8-D, SOIC	Mount Compound:	4042500
Lead frame (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu

Qualification: ☐ **Plan** ☒ **Test Results**

Reliability Test	Conditions	Sample Size/Fail
Electrical Characterization	-	Pass

Reference Qualification:

Qualification Data: Approved 09/19/2012

This qualification has been specifically developed for the validation of this change. The qualification data validates that the proposed change meets the applicable released technical specifications.

Qual Vehicle 1 : MAX232DR (MSL 1-260C)			
Package Construction Details			
Assembly Site:	TIM	Mold Compound:	4211880
# Pins-Designator, Family:	16-D, SOIC	Mount Compound:	40402500
Leadframe (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu

Qualification: ☐ Plan ☒ Test Results				
Reliability Test	Conditions	Sample Size/Fail		
		Lot#1	Lot#2	Lot#3
Electrical Characterization	-	Pass	-	-
**High Temp. Storage Bake	170C (420hrs)	77/0	77/0	77/0
**Biased HAST	130C/85%RH (96 Hrs)	77/0	77/0	77/0
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	77/0	77/0
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0
Life Test	150C (300 Hrs)	77/0	77/0	77/0
Lead Pull	--	22/0	22/0	22/0
Bond Strength	76 ball bonds, min. 3 units	76/0	76/0	76/0
Flammability	(IEC 695-2-2)	5/0	5/0	5/0
Flammability	(UL-1694)	5/0	5/0	5/0
Flammability	(UL 94V-0)	5/0	5/0	5/0
Manufacturability	(per mfg. Site specification)	Pass	Pass	Pass
Moisture Sensitivity	(level 1 @ 260C peak +5/-0C)	12/0	12/0	12/0
Notes **- Preconditioning sequence: Level 1-260C.				

Qual Vehicle 2 : RC4558DR (MSL 1-260C)

Package Construction Details

Assembly Site:	TIM	Mold Compound:	4211880
# Pins-Designator, Family:	8-D, SOIC	Mount Compound:	40402500
Leadframe (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu

Qualification: ☐ Plan ☒ Test Results				
Reliability Test	Conditions	Sample Size/Fail		
		Lot#1	Lot#2	Lot#3
Electrical Characterization	-	Pass	-	-
**High Temp. Storage Bake	150C (1000hrs)	77/0	77/0	77/0
**Biased HAST	130C/85%RH (96 Hrs)	77/0	-	-
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	-	-
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0
Life Test	150C (300 Hrs)	77/0	-	-
Lead Pull	--	22/0	-	-
Bond Strength	76 ball bonds, min. 3 units	76/0	-	-
Flammability	(IEC 695-2-2)	5/0	-	-
Flammability	(UL-1694)	5/0	-	-
Flammability	(UL 94V-0)	5/0	-	-
Manufacturability	(per mfg. Site specification)	Pass	-	-
X-ray	(top side only)	5/0	-	-
Moisture Sensitivity	(level 1 @ 260C peak +5/-0C)	12/0	12/0	12/0
Notes **- Preconditioning sequence: Level 1-260C.				

Qual Vehicle 3 : SN74LV14ADR (MSL 1-260C)					
Package Construction Details					
Assembly Site:	TIM	Mold Compound:	4211880		
# Pins-Designator, Family:	14-D, SOIC	Mount Compound:	40402500		
Leadframe (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu		
Qualification: ☐ **Plan** ☒ **Test Results**					
Reliability Test	Conditions	Sample Size/Fail			
		Lot#1	Lot#2	Lot#3	
Electrical Characterization	-	Pass	-	-	
**High Temp. Storage Bake	150C (1000hrs)	77/0	77/0	77/0	
**Biased HAST	130C/85%RH (96 Hrs)	77/0	-	-	
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0	
Life Test	150C (300 Hrs)	77/0	-	-	
Lead Pull	--	22/0	-	-	
Bond Strength	76 ball bonds, min. 3 units	76/0	-	-	
Flammability	(IEC 695-2-2)	5/0	-	-	
Flammability	(UL-1694)	5/0	-	-	
Flammability	(UL 94V-0)	5/0	-	-	
Manufacturability	(per mfg. Site specification)	Pass	-	-	
X-ray	(top side only)	5/0	-	-	
Moisture Sensitivity	(level 1 @ 260C peak +5/-0C)	12/0	12/0	12/0	
Notes **- Preconditioning sequence: Level 1-260C.					

Qual Vehicle 4 : ULN2003ADR (MSL 1-260C)					
Package Construction Details					
Assembly Site:	TIM	Mold Compound:	4211880		
# Pins-Designator, Family:	16-D, SOIC	Mount Compound:	40402500		
Leadframe (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu		
Qualification: ☐ **Plan** ☒ **Test Results**					
Reliability Test	Conditions	Sample Size/Fail			
		Lot#1	Lot#2	Lot#3	
Electrical Characterization	-	Pass	-	-	
**High Temp. Storage Bake	170C 420hrs)	77/0	77/0	77/0	
**Biased HAST	130C/85%RH (96 Hrs)	77/0	-	-	
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	-	-	
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0	
Life Test	150C (300 Hrs)	77/0	-	-	
Lead Pull	--	22/0	-	-	
Bond Strength	76 ball bonds, min. 3 units	76/0	-	-	
Flammability	(IEC 695-2-2)	5/0	-	-	
Flammability	(UL-1694)	5/0	-	-	
Flammability	(UL 94V-0)	5/0	-	-	
Manufacturability	(per mfg. Site specification)	Pass	-	-	
X-ray	(top side only)	5/0	-	-	
Moisture Sensitivity	(level 1 @ 260C peak +5/-0C)	12/0	12/0	12/0	
Notes **- Preconditioning sequence: Level 1-260C.					

Qual Vehicle 5 : CD4053BM96 (MSL 1-260C)			
Package Construction Details			
Assembly Site:	TI Mexico	Mold Compound:	4211880
# Pins-Designator, Family:	16-D, SOIC	Mount Compound:	4147858
Leadframe (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu

Qualification: ☐ **Plan** ☒ **Test Results**

Reliability Test	Conditions	Sample Size/Fail
**Steady-state Life Test	150C (300 Hrs)	77/0
Electrical Characterization	-	Pass
**High Temp. Storage Bake	170C (600 Hrs)	77/0
**Biased HAST	130C/85%RH (192 Hrs)	77/0
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0
Visual / Mechanical	-	Pass
Lead Pull	# of leads to destruction, min. 3 units	22/0
Bond Strength	76 ball bonds, min. 3 units	76/0
Manufacturability	(per mfg. Site specification)	Pass
**Thermal Shock	-65C/+150C (500 Cyc)	77/0
X-ray	(Top-side only)	5/0
Moisture Sensitivity	(level 1 @ 260C peak +0/-5C)	12/0
Notes **- Preconditioning sequence: Level 1-260C.		

Qual Vehicle 6 : LM358DR (MSL 1-260C)			
Package Construction Details			
Assembly Site:	TI Mexico	Mold Compound:	4211880
# Pins-Designator, Family:	8-D, SOIC	Mount Compound:	4147858
Leadframe (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu

Qualification: ☐ **Plan** ☒ **Test Results**

Reliability Test	Conditions	Sample Size/Fail		
		Lot#1	Lot#2	Lot#3
Steady-state Life Test	150C (168, 300 hrs)	77/0	-	-
Electrical Characterization	-	Pass	-	-
**High Temp. Storage Bake	170C (420hrs)	77/0	-	-
**Biased HAST	130C/85%RH (192 Hrs)	77/0	-	-
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	-	-
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0
Visual / Mechanical	-	Pass	-	-
Lead Pull	--	22/0	-	-
Bond Strength	76 ball bonds, min. 3 units	76/0	-	-
Manufacturability	(per mfg. Site specification)	Pass	-	-
**Thermal Shock	-65C/+150C (500 Cyc)	77/0	77/0	77/0
X-ray	(top side only)	5/0	-	-
Moisture Sensitivity	(level 1 @ 260C peak +5/-0C)	12/0	12/0	12/0
Notes **- Preconditioning sequence: Level 1-260C.				

Qual Vehicle 7 : TL494IDR (MSL 1-260C)			
Package Construction Details			
Assembly Site:	TI Mexico	Mold Compound:	4211880
# Pins-Designator, Family:	16-D, SOIC	Mount Compound:	4147858
Leadframe (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu

Qualification: ☐ **Plan** ☒ **Test Results**

Reliability Test	Conditions	Sample Size/Fail		
		Lot#1	Lot#2	Lot#3
Steady-state Life Test	150C (168, 300 hrs)	77/0	77/0	77/0
Electrical Characterization	-	Pass	-	-
**High Temp. Storage Bake	170C (600hrs)	77/0	77/0	77/0
**Biased HAST	130C/85%RH (192 Hrs)	77/0	77/0	77/0
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	77/0	77/0
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0
Visual / Mechanical	-	Pass	Pass	Pass
Lead Pull	--	22/0	22/0	22/0
Flammability	Method A - UL94-0	5/0	5/0	5/0
Flammability	Method B - IEC 695-2-2	5/0	5/0	5/0
Flammability	Method C - UL 1694	5/0	5/0	5/0
Bond Strength	76 ball bonds, min. 3 units	76/0	76/0	76/0
Manufacturability	(per mfg. Site specification)	Pass	Pass	Pass
**Thermal Shock	-65C/+150C (500 Cyc)	77/0	77/0	77/0
X-ray	(top side only)	5/0	5/0	5/0
Moisture Sensitivity	(level 1 @ 260C peak +5/-0C)	12/0	12/0	12/0

Notes **- Preconditioning sequence: Level 1-260C.

Qual Vehicle 8 : ULN2003ADR (MSL 1-260C)			
Package Construction Details			
Assembly Site:	TI Mexico	Mold Compound:	4211880
# Pins-Designator, Family:	16-D, SOIC	Mount Compound:	4147858
Leadframe (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.96 Mil Dia., Cu

Qualification: ☐ **Plan** ☒ **Test Results**				
Reliability Test	Conditions	Sample Size/Fail		
		Lot#1	Lot#2	Lot#3
**Steady-state Life Test	150C (300 Hrs)	77/0	-	-
Electrical Characterization	-	Pass	-	-
**High Temp. Storage Bake	170C (600 Hrs)	77/0	77/0	77/0
**Biased HAST	130C/85%RH (192 Hrs)	77/0	-	-
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	77/0	77/0
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0
Visual / Mechanical	-	Pass	-	-
Lead Pull	--	22/0	22/0	22/0
Bond Strength	76 ball bonds, min. 3 units	76/0	-	-
Manufacturability	(per mfg. Site specification)	Pass	-	-
**Thermal Shock	-65C/+150C (500 Cyc)	77/0	77/0	77/0
X-ray	(Top-side only)	5/0	5/0	5/0
Moisture Sensitivity	(level 1 @ 260C peak +0/-5C)	12/0	12/0	12/0
Notes **- Preconditioning sequence: Level 1-260C.				

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