

PCN Number:		20180110006A		PCN Date:		Feb 28, 2018																			
Title:		Add Cu as Alternative Wire Base Metal for Selected Device(s)																							
Customer Contact:		PCN Manager		Dept:		Quality Services																			
Proposed 1st Ship Date:			May 28, 2018		Estimated Sample Availability:		Date provided at sample request																		
Change Type:																									
<input type="checkbox"/>	Assembly Site		<input type="checkbox"/>	Design		<input type="checkbox"/>	Wafer Bump Site																		
<input checked="" type="checkbox"/>	Assembly Process		<input type="checkbox"/>	Data Sheet		<input type="checkbox"/>	Wafer Bump Material																		
<input checked="" type="checkbox"/>	Assembly Materials		<input type="checkbox"/>	Part number change		<input type="checkbox"/>	Wafer Bump Process																		
<input type="checkbox"/>	Mechanical Specification		<input type="checkbox"/>	Test Site		<input type="checkbox"/>	Wafer Fab Site																		
<input type="checkbox"/>	Packing/Shipping/Labeling		<input type="checkbox"/>	Test Process		<input type="checkbox"/>	Wafer Fab Materials																		
						<input type="checkbox"/>	Wafer Fab Process																		
PCN Details																									
Description of Change:																									
<p>Revision A is to announce the <u>addition</u> of new devices that were not included on the original PCN notification. These new devices are under Group 2 in the product affected section below. The expected first shipment date for these new devices will be 90 days from this notice for these newly added devices only.</p> <p>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:</p> <p>Group 1:</p> <table border="1"> <thead> <tr> <th>Material</th> <th>Current</th> <th>Proposed</th> </tr> </thead> <tbody> <tr> <td>Wire</td> <td>Au</td> <td>Cu</td> </tr> </tbody> </table> <p>Group 2:</p> <table border="1"> <thead> <tr> <th>Material</th> <th>Current</th> <th>Proposed</th> </tr> </thead> <tbody> <tr> <td>Wire</td> <td>Au</td> <td>Cu</td> </tr> <tr> <td>Mount Compound</td> <td>4042504</td> <td>4208458</td> </tr> <tr> <td>Leadframe finish</td> <td>NiPdAu</td> <td>Roughened NiPdAu</td> </tr> </tbody> </table>								Material	Current	Proposed	Wire	Au	Cu	Material	Current	Proposed	Wire	Au	Cu	Mount Compound	4042504	4208458	Leadframe finish	NiPdAu	Roughened NiPdAu
Material	Current	Proposed																							
Wire	Au	Cu																							
Material	Current	Proposed																							
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Mount Compound	4042504	4208458																							
Leadframe finish	NiPdAu	Roughened NiPdAu																							
Reason for Change:																									
<p>Continuity of supply.</p> <ol style="list-style-type: none"> 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 Material Declaration																									
<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 TI Eco-Info website . There is no impact to the material meeting current regulatory compliance requirements with this PCN change.																					
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			
LM22670MR-5.0/NOPB	LM22673MR-5.0/NOPB	LM22676MR-ADJ/NOPB	
LM22670MR-ADJ/NOPB	LM22673MR-ADJ/NOPB	LM22676MR-ADJ/S7002530	
LM22670MRE-5.0/NOPB	LM22673MRE-5.0/NOPB	LM22676MRE-5.0/NOPB	
LM22670MRE-ADJ/NOPB	LM22673MRE-ADJ/NOPB	LM22676MRE-ADJ/NOPB	
LM22670MRX-5.0/NOPB	LM22673MRX-5.0/NOPB	LM22676MRX-5.0/NOPB	
LM22670MRX-ADJ/NOPB	LM22673MRX-ADJ/NOPB	LM22676MRX-ADJ/NOPB	
LM22671MR-5.0/NOPB	LM22674MR-5.0/NOPB	LM22676MRX-ADJ/S7002776	
LM22671MR-ADJ/NOPB	LM22674MR-ADJ/NOPB	LM22680MR-ADJ/NOPB	
LM22671MRE-5.0/NOPB	LM22674MRE-5.0/NOPB	LM22680MRE-ADJ/NOPB	
LM22671MRE-ADJ/NOPB	LM22674MRE-ADJ/NOPB	LM22680MRX-ADJ/E7002609	
LM22671MRX-5.0/NOPB	LM22674MRX-5.0/NOPB	LM22680MRX-ADJ/NOPB	
LM22671MRX-ADJ/NOPB	LM22674MRX-ADJ/NOPB	LV13602MRX-ADJ/NOPB	
LM22672MR-5.0/NOPB	LM22675MR-5.0/NOPB	LV13603AMRX-ADJ/NOPB	
LM22672MR-ADJ/NOPB	LM22675MR-ADJ/NOPB	LV13603AMRX-H/NOPB	
LM22672MRE-5.0/NOPB	LM22675MRE-5.0/NOPB	LV13603BMRX-ADJ/NOPB	
LM22672MRE-ADJ/NOPB	LM22675MRE-ADJ/NOPB	LV13603BMRX-H/NOPB	
LM22672MRX-5.0/NOPB	LM22675MRX-5.0/NOPB	LV13603CMRX-ADJ/NOPB	
LM22672MRX-5.0S1	LM22675MRX-ADJ/NOPB	LV13603CMRX-H/NOPB	
LM22672MRX-ADJ/NOPB	LM22676MR-5.0/NOPB		
Product Affected: Group 2			
TFP101APZP	TFP201APZPG4	TFP401APZPG4	TFP403PZP
TFP101APZPG4	TFP201PZP	TFP401PZP	TFP403PZPG4
TFP201APZP	TFP401APZP	TFP401PZPG4	

Group 1 Qualification Report
Cu wire Qualification for SOIC Devices at TIEMA
Approve Date 20-Dec-2017

Product Attributes

Attributes	Qual Device: <u>LV13603AMRJA6J</u>	QBS Package Reference: <u>LM3423MHX/NOPB</u>	QBS Package Reference: <u>LM34923MM/NOPB</u>	QBS Package Reference: <u>LM5010MH/NOPB</u>
Assembly Site	TIEMA-AT	TIEMA	TIEM	TIEMA
Package Family	HSOIC	HTSSOP	VSSOP	HTSSOP
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0
Wafer Fab Supplier	MFAB	GFAB	MFAB	GFAB
Wafer Process	A5L27M3T	ABCD150XV1	ABCD05	ABCD150XV1

Attributes	QBS Package Reference: <u>LM5072MH-80/NOPB</u>	QBS Package Reference: <u>LP2996MRX TEST LEG</u>	QBS Package Reference: <u>TPS92560DGQR/NOPB</u>
Assembly Site	TIEMA	TIEMA	TIEM
Package Family	HTSSOP	HSOIC	HVSSOP
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0
Wafer Fab Supplier	GFAB	MAINEFAB	MFAB
Wafer Process	ABCD150XV2	CS065	ABCD5

- QBS: Qual By Similarity
- Qual Device LV13603AMRJA6J is qualified at LEVEL3-260CG

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: <u>LV13603AMRJA6J</u>	QBS Package Reference: <u>LM3423MHX/NOPB</u>	QBS Package Reference: <u>LM34923MM/NOPB</u>	QBS Package Reference: <u>LM5010MH/NOPB</u>
AC	Autoclave 121C	96 Hours	3/231/0	3/231/0	1/77/0	3/231/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-	3/231/0
HTOL	Life Test, 150C	500 Hours	-	-	-	2/154/0
HTSL	High Temp. Storage Bake, 150C	500 Hours	-	3/231/0	-	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	3/135/0	-	3/231/0	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	-	3/231/0
UHA ST	Unbiased HAST, 130C/85%RH	96 Hours	-	-	-	-
WBP	Bond Pull	Wires	Pass	-	-	-
WBS	Ball Bond Shear	Wires	Pass	-	-	-

Type	Test Name / Condition	Duration	QBS Package Reference: <u>LM5072MH-80/NOPB</u>	QBS Package Reference: <u>LP2996MRX TEST LEG</u>	QBS Package Reference: <u>TPS92560DGQR/NOPB</u>
AC	Autoclave 121C	96 Hours	3/231/0	-	1/77/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-
HTOL	Life Test, 150C	500 Hours	-	-	-
HTSL	High Temp. Storage Bake, 150C	500 Hours	3/231/0	-	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	-	-	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	1/77/0	-
UHAST	Unbiased HAST, 130C/85%RH	96 Hours	-	1/77/0	-
WBP	Bond Pull	Wires	-	-	-
WBS	Ball Bond Shear	Wires	-	-	-

- 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

Group 2 Qualification Report

TFP401/APZP, TFP201/APZP, and TFP101APZP with 0.96 Cu Wire

Approve Date 27-Feb-2018

Product Attributes

Attributes	Qual Device: <u>TFP401APZP</u>	Qual Device: <u>TFP401PZP</u>	QBS Package Reference: <u>6964BDC0PAPG4</u>	QBS Package Reference: <u>D610A3BPYP225</u>	QBS Package Reference: <u>P1105182F1PLP</u>
Die Revision	C	C	BD	A	A0
Wafer Fab Supplier	DMOS5	DMOS5	MIHO8	DMOS 5	DMOS5
Wafer Process	1833C07	1833C07	LBC7	1233C035.A6C	LBC8
Assembly Site	TAI	TAI	TAI	TAI	TITL
Package Family	HTQFP	HTQFP	HTQFP	HTQFP	TQFP
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0

- QBS: Qual by Similarity

- Qual Devices qualified at LEVEL3-260C: TFP401PZP, TFP401APZP

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: <u>TFP401APZ</u> <u>P</u>	Qual Device: <u>TFP401PZP</u>	QBS Package Reference: <u>6964BDC0PAP</u> <u>G4</u>	QBS Package Reference: <u>D610A3BPYP225</u>	QBS Package Reference: <u>P1105182F1PLP</u>
AC	Autoclave 121C	96 Hours	1/77/0	-	3/231/0	3/231/0	3/231/0
ED	Electrical Distributions	Cpk>1.67 Room, Hot, & Cold Test	-	-	-	-	1/77/0
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	-	-	-
ELFR	Early Life Failure Rate, 125C	72 Hours	-	-	-	-	3/2400/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-	-	3/231/0
HBM	ESD - HBM	2000 V	-	-	-	-	1/3/0
CDM	ESD - CDM	750 V	-	-	-	-	1/3/0
HTOL	Life Test, 125C	1000 Hours	-	-	-	-	3/231/0

HTSL	High Temp Storage Bake 170C	420 Hours	-	-	-	3/231/0	-
HTSL	High Temp Storage Bake 175C	500 Hours	-	-	-	-	1/45/0
LU	Latch-up	(per JESD78)	-	-	-	-	1/6/0
TC	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	3/231/0	3/231/0	1/77/0
THB	Biased Temperature and Humidity, 85C/85%RH	1000 Hours	-	-	-	1/71/0	-
WBP	Bond Pull	Wires	1/76/0	1/76/0			
WBS	Ball Bond Shear	Wires	1/76/0	1/76/0			
TPI	Thermal Path Integrity	Level 3	1/12/0	-	-	-	-
MQ	Manufacturing (Assembly)	-	Pass	Pass	-	-	-

- 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

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
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Asia Pacific	PCNAsiaContact@list.ti.com
Japan	PCNJapanContact@list.ti.com