

<b>PCN Number:</b>	20170622001		<b>PCN Date:</b>	June 29, 2017									
<b>Title:</b>	Add Cu as Alternative Wire Base Metal 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>	Sept 29, 2017		<b>Estimated Sample Availability:</b>	Date provided at sample request									
<b>Change Type:</b>													
<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								
<b>PCN Details</b>													
<b>Description of Change:</b>													
<p>Texas Instruments is pleased to announce the qualification of Cu as an additional bond wire option for selected devices listed in "Product affected" section below. Devices will remain in current assembly facilities and there will be no other piece part changes:</p> <p><b>Group 1 device (no change on wire diam):</b></p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Current Wire</th> <th>Additional Wire</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Au</td> <td style="text-align: center;">Cu</td> </tr> </tbody> </table> <p><b>Group 2 device:</b></p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Current Wire</th> <th>Additional Wire</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2.0 mil Au</td> <td style="text-align: center;">0.96 mil Cu</td> </tr> </tbody> </table>						Current Wire	Additional Wire	Au	Cu	Current Wire	Additional Wire	2.0 mil Au	0.96 mil Cu
Current Wire	Additional Wire												
Au	Cu												
Current Wire	Additional Wire												
2.0 mil Au	0.96 mil Cu												
<b>Reason for Change:</b>													
<p>Continuity of supply.</p> <ol style="list-style-type: none"> <li>1) To align with world technology trends and use wiring with enhanced mechanical and electrical properties</li> <li>2) Maximize flexibility within our Assembly/Test production sites.</li> <li>3) Cu is easier to obtain and stock</li> </ol>													
<b>Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):</b>													
None													
<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-Info website</a> . There is no impact to the material meeting current regulatory compliance requirements with this PCN change.										
<b>Changes to product identification resulting from this PCN:</b>													
None													
<b>Group 1 Product Affected:</b>													

LM5101AM/NOPB	TPS2001CDGNR	TPS2064CDGN-2	TPS2066CDGNR-2
LM5101AMX/NOPB	TPS2052CDGN	TPS2064CDGNR	TPS2068CDGN
LM5101AMX/S7003027	TPS2052CDGNR	TPS2064CDGNR-2	TPS2068CDGNR
TPS2000CDGK	TPS2060CDGN	TPS2065CDGN	TPS2069CDGN
TPS2000CDGKR	TPS2060CDGNR	TPS2065CDGN-2	TPS2069CDGN-2
TPS2000CDGN	TPS2061CDGN	TPS2065CDGNR	TPS2069CDGNR
TPS2000CDGNR	TPS2061CDGNR	TPS2065CDGNR-2	TPS2069CDGNR-2
TPS2001CDGK	TPS2062CDGN	TPS2066CDGN	
TPS2001CDGKR	TPS2062CDGNR	TPS2066CDGN-2	
TPS2001CDGN	TPS2064CDGN	TPS2066CDGNR	

**Group 2 Product Affected:**

SN65LBC184D	SN65LBC184DR	SN75LBC184D	SN75LBC184DR
SN65LBC184DG4	SN65LBC184DRG4	SN75LBC184DG4	SN75LBC184DRG4

## Group 1 Qualification Report

### LM5101AMX - Qualification of 1 mils Cu wire on ABCD SOIC package as alternate bonding material

Approve Date 07-Mar-2017

#### Product Attributes

Attributes	Qual Device: LM5101AMX/NOPB	QBS Package Reference: LM3423MHX/NOPB	QBS Package Reference: LM5010MH/NOPB	QBS Package Reference: LM5037MTNOPB
Assembly Site	TIEM-MALACCA	TIEMA	TIEMA	TIEM-MALACCA
Package Family	SOIC	HTSSOP	HTSSOP	TSSOP
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0
Wafer Fab Supplier	GK	GFAB	GFAB	GFAB
Wafer Process	BCAXV2.21.2	ABCD150XV1	ABCD150XV1	ABCDXV1

Attributes	QBS Package Reference: LM5037MTNOPB(CL)	QBS Package Reference: LM5072MH-80/NOPB	QBS Package Reference: TPL5010Q
Assembly Site	TIEM-MALACCA	TIEMA	TIEMA
Package Family	TSSOP	FRAME;TSSOP;16L;3.000X3.000; EXP PAD;CU;ETCHED;MAT	TSOT 6lds (DDC)
Flammability Rating	UL 94 V-0	UL 94 V-0	-
Wafer Fab Supplier	GFAB	GFAB	MFAB
Wafer Process	ABCDXV1	ABCD150XV2	CMOS9T-5V

- QBS: Qual By Similarity
- Qual Device LM5101AMX/NOPB is qualified at LEVEL1-260C

## Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: LM5101AMX/NOPB	QBS Package Reference: LM3423MHX/NOPB	QBS Package Reference: LM5010MH/NOPB	QBS Package Reference: LM5037MTNOPB
AC	Autoclave 121C	96 Hours	3/231/0	3/231/0	3/231/0	3/231/0
HAST	Biased HAST, 130C/85%RH	96 Hours	3/231/0	-	3/231/0	-
HTOL	Life Test, 125C	1000 Hours	-	-	-	-
HTOL	Life Test, 150C	500 Hours	-	-	2/154/0	-
HTSL	High Temp. Storage Bake, 150C	1000 Hours	3/231/0	3/231/0	-	1/77/0
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	3/231/0	3/231/0
THB	Biased Temperature and Humidity, 85C/85%RH	1000 Hours	-	-	-	3/231/0
UHAST	Unbiased HAST, 130C/85%RH	96 Hours	-	-	-	-

Type	Test Name / Condition	Duration	QBS Package Reference: LM5037MTNOPB(CL)	QBS Package Reference: LM5072MH- 80/NOPB	QBS Package Reference: TPL5010Q
AC	Autoclave 121C	96 Hours	1/77/0	3/231/0	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	3/231/0
HTOL	Life Test, 125C	1000 Hours	-	-	3/77/0
HTOL	Life Test, 150C	500 Hours	-	-	-
HTSL	High Temp. Storage Bake, 150C	1000 Hours	1/77/0	3/231/0	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	1/77/0	3/231/0	3/231/0
THB	Biased Temperature and Humidity, 85C/85%RH	1000 Hours	1/9/0	-	-
UHAST	Unbiased HAST, 130C/85%RH	96 Hours	-	-	3/231/0

- 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

**Change from Au to Cu wire on PWR-LP-PI (Pwr Int) METDCu devices in AESH for (DGN & DGK) Package**  
Approve Date 05-Jun-2017

Attributes	Qual Device: TPS2001CD GKR	Qual Device: TPS2052CD GNR	Qual Device: TPS2062CD GNR	Qual Device: TPS2065CD GNR	QBS Product Reference: TPS2000CD GK	QBS Product Reference: TPS2001CD GK	QBS Product Reference: TPS2001CD GN
<b>Assembly Site</b>	ASE SHANGHAI	ASE SHANGHAI	ASE SHANGHAI	ASE SHANGHAI	ASE SHANGHAI	ASE SHANGHAI	UTAC
<b>Package Family</b>	VSSOP	HVSSOP	HVSSOP	HVSSOP	VSSOP	VSSOP	HVSSOP
<b>Flammability Rating</b>	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0
<b>Wafer Fab Supplier</b>	MH8	RFAB	RFAB	RFAB	MIHO8+DM0 S5	MIHO8+DM0 S5	MIHO8+DM0 S5
<b>Wafer Process</b>	LBC7	LBC7	LBC7	LBC7	LBC7X DCU	LBC7X DCU	LBC7

Attributes	QBS Product Reference: TPS2051C DBVR	QBS Product Reference: TPS2064C DGN (Core ESD TPS2052)	QBS Product Reference: TPS2066C DGN (ESD TPS2062)	QBS Product Reference: TPS2065C DGN	QBS Process Reference: TAS5727P HP	QBS Process Reference: TPX3110D 2PWP	QBS Package Reference: LM358ADG KR	QBS Package Reference: TPS7B425 3QDDARQ 1
<b>Assembly Site</b>	PHI (TIPI)	ASE SHANGHAI	ASE SHANGHAI	ASE SHANGHAI	TAI	TAI	ASE SHANGHAI	ASE SHANGHAI
<b>Package Family</b>	SOT-23	HVSSOP	HVSSOP	HVSSOP	HTQFP	TSSOP	VSSOP	DDA
<b>Flammability Rating</b>	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0
<b>Wafer Fab Supplier</b>	RFAB	MIHO 8	RFAB	MIHO8+DM0 S5	RFAB, RFAB/DM6 MFF	MIHO8	SFAB	DMO5
<b>Wafer Process</b>	LBC7 X DCU	LBC7	LBC7	LBC7 DCU	1833C05, LBC7	LBC7	J11	LBC8

- QBS: Qual By Similarity

- Qual Devices qualified at LEVEL2-260CG: TPS2062CDGNR, TPS2065CDGNR, TPS2001CDGKR, TPS2052CDGNR

## Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: TPS2001C DGKR	Qual Device: TPS2052 CDGNR	Qual Device: TPS2062 CDGNR	Qual Device: TPS2065 CDGNR	QBS Product Reference: TPS2000 CDGK	QBS Product Reference: TPS2001 CDGK	QBS Product Reference: TPS2001 CDGN
AC	Autoclave 121C	96 Hours	3/231/0	3/231/0	-	1/77/0	1/77/0	1/77/0	-
ED	Electrical Characterization	Per Datasheet Parameters	-	-	-	-	Pass	-	Pass
ELFR	Early Life Failure Rate, 150C	24 Hours	-	-	-	-	-	-	-
HAST	Biased HAST, 130C/85%RH	96 Hours	3/231/0	3/231/0	-	1/77/0	-	-	-
HBM	ESD - HBM	2000 V							
CDM	ESD - CDM	500 V							
HTOL	Life Test, 125C	1000 Hours	-	-	1/77/0	-	-	-	-
HTOL	Life Test, 150C	300 Hours	-	-	-	-	-	-	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	3/231/0	3/231/0	-	1/77/0	-	-	-
HTSL	High Temp. Storage Bake, 175C	500 Hours	-	-	-	-	-	-	-
LI	Lead Fatigue	Leads	-	-	-	-	-	-	-
LI	Lead Pull to Destruction	Leads	-	-	-	-	-	-	-
LU	Latch-up	(per JESD78)	-	-	-	-	-	-	1/6/0
PD	Physical Dimensions	--	-	-	-	-	-	-	-
SD	Solderability	Pb-Free	-	-	-	-	-	-	-
TC	Temperature Cycle, -55/125C	700 Cycles	-	-	-	-	-	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	-	1/77/0	1/77/0	1/77/0	1/76/0
TS	Thermal Shock, -65/150C	500 Cycles	-	-	-	-	-	-	-
WBP	Bond Pull	Wires	1/76/0	3/228/0	-	1/76/0	-	-	-
WBS	Ball Bond Shear	Wires	1/76/0	3/228/0	-	1/76/0	-	-	-

Type	Test Name / Condition	Duration	QBS Product Reference: TPS2051 CDBVR	QBS Product Reference: TPS2064 CDGN	QBS Product Reference: TPS2066 CDGN	QBS Product Reference: TPS2065 CDGN	QBS Process Reference: TAS5727PHP	QBS Process Reference: TPX3110D2PW P	QBS Package Reference: LM358A DGKR	QBS Package Reference: TPS7B4253QDD ARQ1
AC	Autoclave 121C	96 Hours	3/231/0	1/77/0	-	-	6/231/0	3/231/0	3/231/0	6/231/0
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	Pass-	Pass	-	Pass	-	-
ELFR	Early Life Failure Rate, 150C	24 Hours	-	-	-	-	-	3/2400/0	-	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-		-	6/224/0	3/231/0	-	3/231/0
HBM	ESD - HBM	2000 V		1/3/0						
CDM	ESD - CDM	500 V		1/3/0	1/3/0					
HTOL	Life Test, 125C	1000 Hours	-	-	-	-	6/230/0	-	-	1/77/0
HTOL	Life Test, 150C	300 Hours	-	-	-	1/77/0	-	3/231/0	-	-
HTSL	High Temp. Storage	420 Hours	3/231/0	-	-	-	-	3/231/0	3/231/0	-

	Bake, 170C									
HTSL	High Temp. Storage Bake, 175C	500 Hours	-	-	-	-	-	-	-	1/50/0
LI	Lead Fatigue	Leads	-	-	-	-	-	-	3/66/0	-
LI	Lead Pull to Destruction	Leads	-	-	-	-	-	-	3/66/0	-
LU	Latch-up	(per JESD78)	-	1/6/0	-	1/6/0	-	-	-	2/12/0
PD	Physical Dimensions	--	3/15/0	-	-	-	-	-	3/15/0	-
SD	Solderability	Pb-Free	-	-	-	-	-	-	3/66/0	-
TC	Temperature Cycle, -55/125C	700 Cycles	-	-	-	-	-	3/231/0	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	1/77/0			-	3/231/0	3/231/0	3/231/0
TS	Thermal Shock, -65/150C	500 Cycles	-	-	-	-	-	3/228/0	3/231/0	-
WBP	Bond Pull	Wires	3/228/0	-	-	-	-	-	3/228/0	-
WBS	Ball Bond Shear	Wires	3/228/0	-	-	-	-	-	3/228/0	-

TPS2062 and TPS2065 share same ESD cell structure.

TPS2052 and TPS2064 share same ESD cell structure.

- 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

### SN75/65LBC184D in FMX with 0.96 mil Cu wire

Approve Date 19-Jun-2017

#### Product Attributes

Attributes	Qual Device: SN65LBC184D	QBS Package Reference: CD4053BM96	QBS Package Reference: LM358DR	QBS Package Reference: TL494IDR	QBS Package Reference: ULN2003ADR
Assembly Site	FMX	FMX	FMX	FMX	FMX
Package Family	SOIC	SOIC	SOIC	SOIC	SOIC
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0
Wafer Fab Supplier	DFAB	SFAB	SFAB	SFAB	SFAB
Wafer Fab Process	LBC2	CD	JI-SLM	JI-LIN	JI-SLM

- QBS: Qual By Similarity

- Qual Device SN65LBC184D is qualified at LEVEL1-260C

## Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: SN65LBC184D	QBS Package Reference: CD4053BM96	QBS Package Reference: LM358DR	QBS Package Reference: TL494IDR	QBS Package Reference: ULN2003ADR
AC	Autoclave 121C	96 Hours	-	1/77/0	1/77/0	3/231/0	3/231/0
ED	Electrical Characterization	Per Datasheet Parameters	Pass	-	-	-	-
HAST	Biased HAST, 130C/85%RH	192 Hours	-	1/77/0	1/77/0	3/229/0	1/77/0
HTOL	Life Test, 150C	300 Hours	-	1/77/0	1/77/0	3/231/0	1/77/0
HTSL	High Temp Storage Bake 170C	420 Hours	-	1/77/0	1/77/0	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	-	1/77/0	3/231/0	3/231/0	3/231/0
TS	Thermal Shock -65/150C	500 Cycles	-	1/77/0	3/231/0	3/231/0	3/231/0
WBP	Bond Pull	Wires	1/32/0	-	-	-	-
WBS	Ball Bond Shear	Wires	1/32/0	-	-	-	-

- 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.

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USA	<a href="mailto:PCNAmericasContact@list.ti.com">PCNAmericasContact@list.ti.com</a>
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