PCN Number:	20160608001	**PCN Date:**	06/17/2016
Title:	Add Cu as Alternative Wire Base Metal for Selected Device(s)		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	09/17/2016	**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 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:

Pkg Family	Current Wire	Additional Wire
SOT_6	Au 0.6, 0.8, or 1.0 mils	Cu, 0.8 mils
SOT_3	Au, 1.0 mils	Cu, 1.0 mils
TSSOP	Au, 0.96 mils	Cu, 0.8 mils
TSSOP	Au, 1.3 mils	Cu, 1.3 mils
SOIC	Au, 1.3 mils	Cu, 1.3 mils
QFN	Au, 0.96 mils	Cu, 1.0 mils

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 Form, Fit, Function, Quality or Reliability (positive / negative):

None

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.

Changes to product identification resulting from this PCN:

None

Product Affected:

Device	Package Family	Device	Package Family
PSN807046B1PW	TSSOP	LM3578AMX	SOIC
PSN807046B1PWR	TSSOP	LM3578AMX/J7001347	SOIC
SN807046B1PWR	TSSOP	LM3578AMX/NOPB	SOIC
SN807046PWR	TSSOP	LM360MX	SOIC
LM25005MH	TSSOP	LM360MX/NAK2	SOIC
LM25005MH/NOPB	TSSOP	LM360MX/NOPB	SOIC
LM25005MHX/NOPB	TSSOP	TL431ACDBZR	SOT_3
LM25010MH/NOPB	TSSOP	TL431ACDBZRG4	SOT_3
LM25010MHX/NOPB	TSSOP	TL431ACDBZT	SOT_3
LM25088MH-1/NOPB	TSSOP	TL431ACDBZTG4	SOT_3
LM25088MH-2/NOPB	TSSOP	TL431AIDBZR	SOT_3
LM25088MHX-1/NOPB	TSSOP	TL431AIDBZR-P	SOT_3
LM25088MHX-2/NOPB	TSSOP	TL431AIDBZRG4	SOT_3
LM25116MH	TSSOP	TL431AIDBZT	SOT_3
LM25116MH/J7002045	TSSOP	TL431AIDBZTG4	SOT_3
LM25116MH/NOPB	TSSOP	TL431AQDBZR	SOT_3
LM25116MHX/J7002046	TSSOP	TL431AQDBZRG4	SOT_3
LM25116MHX/NOPB	TSSOP	TL431AQDBZT	SOT_3
LM25575MH	TSSOP	TL431AQDBZTG4	SOT_3
LM25575MH/NOPB	TSSOP	TL431BCDBZR	SOT_3
LM25575MHX/NOPB	TSSOP	TL431BCDBZRG4	SOT_3
LM25576MH/J7001798	TSSOP	TL431BCDBZT	SOT_3
LM25576MH/NOPB	TSSOP	TL431BCDBZTG4	SOT_3
LM25576MHX	TSSOP	TL431BIDBZR	SOT_3
LM25576MHX/J7001799	TSSOP	TL431BIDBZRG4	SOT_3
LM25576MHX/NOPB	TSSOP	TL431BIDBZT	SOT_3
LM26001BMH/NOPB	TSSOP	TL431BIDBZTG4	SOT_3
LM26001BMHX/NOPB	TSSOP	TL431BQDBZR	SOT_3
LM26001MXA/NOPB	TSSOP	TL431BQDBZRG4	SOT_3
LM26001MXAX/NOPB	TSSOP	TL431BQDBZT	SOT_3
LM26003MH/NOPB	TSSOP	TL431BQDBZTG4	SOT_3
LM26003MHX/NOPB	TSSOP	TL431CDBZR	SOT_3
LM2695MH/NOPB	TSSOP	TL431CDBZRG4	SOT_3
LM2696MXA/NOPB	TSSOP	TL431CDBZT	SOT_3
LM2696MXAX/NOPB	TSSOP	TL431CDBZTG4	SOT_3
LM3100MH	TSSOP	TL431IDBZR	SOT_3
LM3100MH/NOPB	TSSOP	TL431IDBZRG4	SOT_3
LM3100MHX	TSSOP	TL431IDBZT	SOT_3
LM3100MHX/NOPB	TSSOP	TL431IDBZTG4	SOT_3
LM3102MH/NOPB	TSSOP	TL431QDBZR	SOT_3
LM3102MHX/NOPB	TSSOP	TL431QDBZRG4	SOT_3
LM3103MH/NOPB	TSSOP	TL431QDBZT	SOT_3

	LM3103MHX/NOPB	TSSOP	TL431QDBZTG4	SOT_3	
	LM3406HVMH/NOPB	TSSOP	TL432ACDBZR	SOT_3	
	LM3406HVMHX/NOPB	TSSOP	TL432ACDBZRG4	SOT_3	
	LM3406MH/NOPB	TSSOP	TL432ACDBZT	SOT_3	
	LM3406MHX/NOPB	TSSOP	TL432ACDBZTG4	SOT_3	
	LM3421MH/NOPB	TSSOP	TL432AIDBZR	SOT_3	
	LM3421MHX/NOPB	TSSOP	TL432AIDBZRG4	SOT_3	
	LM3423MH/NOPB	TSSOP	TL432AIDBZT	SOT_3	
	LM3423MHX/NOPB	TSSOP	TL432AIDBZTG4	SOT_3	
	LM3424MH/NOPB	TSSOP	TL432AQDBZR	SOT_3	
	LM3424MHX/NOPB	TSSOP	TL432AQDBZRG4	SOT_3	
	LM3429MH/NOPB	TSSOP	TL432AQDBZT	SOT_3	
	LM3429MHX/J7002541	TSSOP	TL432AQDBZTG4	SOT_3	
	LM3429MHX/NOPB	TSSOP	TL432BCDBZR	SOT_3	
	LM5005MH	TSSOP	TL432BCDBZT	SOT_3	
	LM5005MH/NOPB	TSSOP	TL432BCDBZTG4	SOT_3	
	LM5005MHX/NOPB	TSSOP	TL432BIDBZR	SOT_3	
	LM5010AMH/NOPB	TSSOP	TL432BIDBZR-P	SOT_3	
	LM5010AMHE/NOPB	TSSOP	TL432BIDBZRG4	SOT_3	
	LM5010AMHX	TSSOP	TL432BIDBZT	SOT_3	
	LM5010AMHX/NOPB	TSSOP	TL432BIDBZTG4	SOT_3	
	LM5010MH	TSSOP	TL432CDBZR	SOT_3	
	LM5010MH/NOPB	TSSOP	TL432IDBZR	SOT_3	
	LM5010MHX/NOPB	TSSOP	TL432IDBZT	SOT_3	
	LM5072MH-80/NOPB	TSSOP	TL432QDBZR	SOT_3	
	LM5072MHX-80/NOPB	TSSOP	TLV431ACDBZR	SOT_3	
	LM5072MHX-80/S7003078	TSSOP	TLV431ACDBZRG4	SOT_3	
	LM5088MH-1/NOPB	TSSOP	TLV431AIDBZR	SOT_3	
	LM5088MH-2/NOPB	TSSOP	TLV431AIDBZRG4	SOT_3	
	LM5088MHX-1/NOPB	TSSOP	TLV431BCDBZR	SOT_3	
	LM5088MHX-2/NOPB	TSSOP	TLV431BCDBZRG4	SOT_3	
	LM5116MH	TSSOP	TLV431BCDBZT	SOT_3	
	LM5116MH/NOPB	TSSOP	TLV431BCDBZTG4	SOT_3	
	LM5116MHX	TSSOP	TLV431BIDBZR	SOT_3	
	LM5116MHX/NOPB	TSSOP	TLV431BIDBZRG4	SOT_3	
	LM5575MH	TSSOP	TLV431BIDBZT	SOT_3	
	LM5575MH/NOPB	TSSOP	TLV431BIDBZTG4	SOT_3	
	LM5575MHX/NOPB	TSSOP	TLV431BQDBZR	SOT_3	
	LM5576MH	TSSOP	TLV431BQDBZRG4	SOT_3	
	LM5576MH/NOPB	TSSOP	TLV431BQDBZT	SOT_3	
	LM5576MHX/NOPB	TSSOP	TLV431BQDBZTG4	SOT_3	
	LV16001MHX/NOPB	TSSOP	TLV431CDBZR	SOT_3	
	LV16003MHX/NOPB	TSSOP	TLV431CDBZRG4	SOT_3	
	TPS92690PWP/NOPB	TSSOP	TLV431IDBZR	SOT_3	

TPS92690PWPR/NOPB	TSSOP	TLV431IDBZRG4	SOT_3
SN74AUC2G07DBVR	SOT_6	TLVH431ACDBZR	SOT_3
SN74AUP1G97DBVR	SOT_6	TLVH431ACDBZRG4	SOT_3
SN74LVC1G3157DBVR	SOT_6	TLVH431ACDBZT	SOT_3
SN74LVC2G04DBVR	SOT_6	TLVH431AIDBZR	SOT_3
SN74LVC2G04DBVT	SOT_6	TLVH431AIDBZRG4	SOT_3
SN74LVC2G07DBVR	SOT_6	TLVH431AIDBZT	SOT_3
SN74LVC2G14DBVR	SOT_6	TLVH431AIDBZTG4	SOT_3
SN74LVC2G14DBVT	SOT_6	TLVH431AQDBZR	SOT_3
SN74LVC2G17DBVR	SOT_6	TLVH431AQDBZRG4	SOT_3
SN74LVC2G17DBVRG4	SOT_6	TLVH431AQDBZT	SOT_3
SN74LVC2G17DBVT	SOT_6	TLVH431AQDBZTG4	SOT_3
TS5A63157DBVR	SOT_6	TLVH431BCDBZR	SOT_3
CRF7964ARHBR	QFN	TLVH431BCDBZRG4	SOT_3
TRF7960ARHBR	QFN	TLVH431BCDBZT	SOT_3
TRF7960ARHBT	QFN	TLVH431BCDBZTG4	SOT_3
TRF7960RHBR	QFN	TLVH431BIDBZR	SOT_3
TRF7960RHBRG4	QFN	TLVH431BIDBZRG4	SOT_3
TRF7960RHBT	QFN	TLVH431BIDBZT	SOT_3
TRF7960RHBTG4	QFN	TLVH431BIDBZTG4	SOT_3
TRF7961RHBR	QFN	TLVH431BQDBZR	SOT_3
TRF7961RHBRG4	QFN	TLVH431BQDBZRG4	SOT_3
TRF7961RHBT	QFN	TLVH431BQDBZT	SOT_3
TRF7961RHBTG4	QFN	TLVH431BQDBZTG4	SOT_3
TRF7962ARHBR	QFN	TLVH431CDBZR	SOT_3
TRF7962ARHBT	QFN	TLVH431CDBZRG4	SOT_3
TRF7962RHBR	QFN	TLVH431CDBZT	SOT_3
TRF7962RHBT	QFN	TLVH431CDBZTG4	SOT_3
TRF7963ARHBR	QFN	TLVH431IDBZR	SOT_3
TRF7963ARHBT	QFN	TLVH431IDBZRG4	SOT_3
TRF7963RHBR	QFN	TLVH431IDBZT	SOT_3
TRF7963RHBT	QFN	TLVH431QDBZR	SOT_3
TRF7964ARHBR	QFN	TLVH431QDBZT	SOT_3
TRF7964ARHBT	QFN	TLVH431QDBZTG4	SOT_3
TRF7970ARHBR	QFN	TLVH432ACDBZR	SOT_3
TRF7970ARHBT	QFN	TLVH432ACDBZRG4	SOT_3
TRF7970BRHBR	QFN	TLVH432ACDBZT	SOT_3
TRF7970BRHBT	QFN	TLVH432AIDBZR	SOT_3
DS36C278TMX	SOIC	TLVH432AQDBZR	SOT_3
DS36C278TMX/NOPB	SOIC	TLVH432AQDBZT	SOT_3
DS485TMX	SOIC	TLVH432BCDBZR	SOT_3
DS485TMX/NAK2	SOIC	TLVH432BCDBZRG4	SOT_3
DS485TMX/NOPB	SOIC	TLVH432BIDBZR	SOT_3
LM1881MX/NOPB	SOIC	TLVH432BQDBZR	SOT_3

LM2674M-ADJ/NOPB	SOIC	TLVH432BQDBZT	SOT_3
LM2674MX-5.0/NAK2	SOIC	TLVH432BQDBZTG4	SOT_3
LM2674MX-5.0/NOPB	SOIC	TLVH432CDBZR	SOT_3
LM2674MX-ADJ/NOPB	SOIC	TLVH432CDBZT	SOT_3
LM2675M-5.0	SOIC	TLVH432IDBZR	SOT_3
LM2675M-5.0/NOPB	SOIC	TLVH432QDBZR	SOT_3
LM2675MX-5.0/NOPB	SOIC	TLVH432QDBZT	SOT_3
LM3578AM	SOIC	TPD2E009DBZR	SOT_3
LM3578AM/NOPB	SOIC		

TI Information
Selective Disclosure

Qualification Report

0.8 mils Cu wire qualification on E035 Si technology in TSSOP package

Approve Date 02-Mar-2016

Product Attributes

Package Attributes	Qual Device: SN807046B1PWR	QBS Product Reference: SN807046B0PW
Assembly Site	MLA (TIM)	MLA
Package Family	TSSOP	TSSOP
Package Designator	PW (TSSOP)	PW
Package Size (mils)	173.23 X 118.11	173.23 X 118.11
Body Thickness (mils)	43.31	47.24
Pin Count	8	8
Lead Frame Type	CU	Cu
Lead Finish	NIPDAU	NiPdAu
Lead Pitch(mils)	25.59	25.59
Bond Wire Composition	Cu	Au
Bond Wire Diameter(mils)	0.8	.95
Flammability Rating	UL 94 V-0	UL 94 V-0

- QBS: Qual By Similarity
- Qual Device SN807046B1PWR is qualified at LEVEL2-260CG

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: SN807046B1PWR	QBS Product Reference: SN807046B0PW
AC	Autoclave 121C	96 Hours	3/231/0	3/230/0
ED	Electrical Characterization	Per Datasheet Parameters	-	1/30/0
EDR	Write/Erase Endurance 25C	48 Hours	-	3/231/0
ELFR	Early Life Failure Rate, 125C	168 Hours	-	3/2400/0
HAST	Biased HAST, 110C/85%RH	528 Hours	-	3/231/0
HBM	ESD - HBM	4000 V	-	1/3/0
CDM	ESD - CDM	1500 V	-	1/3/0
HTOL	Life Test, 125C	1000 Hours	-	3/231/0
HTOL	Post Temp Cycle Life Test, 125	1000 Hours	-	3/231/0
HTSL	High Temp. Storage Bake, 125C	1000 Hours	-	9/551/1*
HTSL	High Temp. Storage Bake, 170C	420 Hours	3/231/0	-
LU	Latch-up	(per JESD78)	-	1/6/0
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0
TS	Thermal Shock, -65/150C	500 Cycles	-	3/228/0

- 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

Qualification Report

1.3 mil Cu wire qualification for TSSOP (PWP) at TIEMA

Approved 5/11/16

Product Attributes

Die Attributes	Qual Device: LM5072MH-80/NOPB	Qual Device: LM3423MHX/NOPB	Qual Device: LM5010MH/NOPB
Die Revision	A	A	A
Wafer Fab Site	GFAB	GFAB	GFAB
Wafer Fab Process	ABCD150XV2	ABCD150XV1	ABCD150XV1
Die Size (mm)	2.59 X 2.57	2.31 X 2.35	1.85 X 2.54
Package Attributes	**Qual Device: LM5072MH-80/NOPB**	**Qual Device: LM3423MHX/NOPB**	**Qual Device: LM5010MH/NOPB**
Assembly Site	TIEMA	TIEMA	TIEMA
Package Family	TSSOP	TSSOP	TSSOP
Package Designator	PWP	PWP	PWP
Package Size (mils)	196.8 X 173.2	255.9 X 173.2	196.8 X 173.2
Body Thickness (mils)	39.37	39.37	39.37
Pin Count	16	20	14
Lead Frame Material	CU	CU	Cu
Lead Finish	Matte SN	Matte SN	Matte SN
Lead Pitch (mils)	0.65	0.65	0.65
Bond Wire Composition	Cu	Cu	Cu
Bond Wire Diameter (mils)	33 UM (1.3 MIL)	33 UM (1.3 MIL)	33 UM (1.3 MIL)
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0

- QBS: Qual By Similarity
- Qual Devices qualified at LEVEL1-260CG: LM5072MH-80/NOPB, LM3423MHX/NOPB, LM5010MH/NOPB

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: LM5072MH-80/NOPB	Qual Device: LM3423MHX/NOPB	Qual Device: LM5010MH/NOPB
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	3/231/0
AC	Autoclave 121C	96 Hours	3/231/0	3/231/0	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	3/231/0
HTSL	High Temp. Storage Bake, 150C	500 Hours	3/231/0	3/231/0	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	-	-	3/231/0
HTOL	Life Test, 150C	500 Hours	-	-	2/154/0
WBP	Post Temp. Cycle Bond Pull	500 Cycles	1/5/0	1/5/0	-
VM	Post Temp Cycle. Visual Quality Reliability	500 Cycles	Pass	Pass	Pass
MQ	Manufacturability (Assembly)	(per mfg. Site specification)	Pass	Pass	Pass
WBP	Bond Pull	Wires	3/228/0	3/228/0	3/228/0
WBS	Ball Bond Shear	Wires	3/228/0	3/228/0	3/228/0

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

Qualification Report

Qualification of SOT23 DBV 6p at HNT with Cu wire

Approve Date 13-Nov-2015

Product Attributes

Attributes	Qual Device: LMV341IDBVR	Qual Device: SN74AUC1G19DBVR	Qual Device: TS5A3159DBVR	QBS Package Reference: SN74AHC1G126DBVR	QBS Package Reference: SN74CBTLV1G125DBVR
Assembly Site	HANA (HNT)	HANA (HNT)	HANA (HNT)	HNT	HNT
Package Family	SOT	SOT	SOT	SOT	SOT
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0	TBD	UL 94 V-0
Wafer Fab Supplier	DFAB	FFAB	FFAB	SHE SFAB	FR-BIP-1
Wafer Process	50A21X3	ASLC10	ACTPI	EPIC1S1-SLM	ASL3C

- QBS: Qual by Similarity
- Qual Devices qualified at LEVEL1-260CG: LMV341IDBVR, SN74AUC1G19DBVR, TS5A3159DBVR

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: LMV341IDBVR	Qual Device: SN74AUC1G19DBVR	Qual Device: TS5A3159DBVR	QBS Package Reference: SN74AHC1G126DBVR	QBS Package Reference: SN74CBTLV1G125DBVR
AC	Autoclave 121C	96 Hours	3/231/0	3/231/0	3/231/0	3/231/0	1/77/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-	-	-
HTSL	High Temp. Storage Bake, 150C	1000 Hours	-	3/231/0	3/231/0	-	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	-	-	-	3/231/0	1/77/0
LI	Lead Fatigue	Leads	-	-	3/66/0	-	-
LI	Lead Pull to Destruction	Leads	-	-	3/66/0	-	-
PD	Physical Dimensions	--	-	-	3/15/0	-	-
SD	Surface Mount Solderability	Pb Free	-	-	3/66/0	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	3/231/0	3/231/0	1/77/0

- 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

TEXAS INSTRUMENTS

TI Information
Selective Disclosure

Qualification Report

Qualification of SOT23 DBV 6p at HNT with Cu wire

Approve Date 13-Nov-2015

Product Attributes

Attributes	QBS Package Reference: SN74LVC1GU04DBVR	QBS Package Reference: TS12A4517DBVR	QBS Package Reference: TS321IDBVT	QBS Package Reference: TS5A3166DBVR
Assembly Site	HNT	HNT	HNT	HNT
Package Family	SOT	SOT	SOT	SOT
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0
Wafer Fab Supplier	FR-BIP-1	DL-LIN	SHE SFAB	FR-BIP-1
Wafer Process	ASL3C	LBC3S	JI1	ASLC10

- QBS: Qual By Similarity

Qualification Results

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

Type	Test Name / Condition	Duration	QBS Package Reference: SN74LVC1GU04DBVR	QBS Package Reference: TS12A4517DBVR	QBS Package Reference: TS321IDBVT	QBS Package Reference: TS5A3166DBVR
AC	Autoclave 121C	96 Hours	3/231/0	-	3/231/0	1/77/0
HAST	Biased HAST, 130C/85%RH	96 Hours	3/240/0	-	-	-
HTSL	High Temp. Storage Bake, 150C	1000 Hours	-	-	-	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	3/231/0	-	3/231/0	-
LI	Lead Fatigue	Leads	3/66/0	-	-	-
LI	Lead Pull to Destruction	Leads	3/66/0	-	-	-
PD	Physical Dimensions	--	3/9/0	-	-	-
SD	Surface Mount Solderability	Pb Free	3/66/0	-	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	1/75/0	3/231/0	1/77/0

- 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

TEXAS INSTRUMENTS

TI Information
Selective Disclosure

Qualification Report

CRF7964A / TRF796xx / TRF7970x in 32 pin VQFN: Copper wire
Approve Date 20-Apr-2016

Product Attributes

Attributes	Qual Device: TRF7970ARHBR
Assembly Site	MLA
Package Family	QFN
Flammability Rating	UL-0
Wafer Fab Supplier	AMS
Wafer Fab Process	0.35 MIXED SIGNAL

- QBS: Qual By Similarity

Note on the qualification: TI Malaysia qualified copper wire as a TI enterprise qualification of multiple silicon technologies starting in 2009. All QFN packages use the same mold compound and die attach.

Enterprise Qualification on the 0.35 technology in TI Malaysia was announced under PCN 20091109000 where its qualification data is appended to this document. Qualification 20160420-117564 is an addendum product specific qualification to 20091109000.

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

Type	Test Name / Condition	Duration	Qual Device: TRF7970ARHBR
Qual ID			
-	Temp Cycle (customer conditions)	1000 x-50C to125 C	1/80/0
-	Temp Cycle (customer conditions)	500 x -50 C to 125 C	1/80/0
CDM	ESD - CDM	1000V/#	1/3/0
CDM	ESD - CDM	1500V/#	1/3/0
CDM	ESD - CDM	250V/#	1/3/0
CDM	ESD - CDM	500V/#	1/3/0
CDM	ESD - CDM	750V/#	1/3/0
HBM	ESD - HBM	2000V/#	1/3/0
HBM	ESD - HBM	2500Vx/#	1/3/0
HBM	ESD - HBM	3000Vx/#	1/3/0
HBM	ESD - HBM	4000Vx/#	1/3/0
HTSL	High Temp Storage Bake 125C	1000/+125 C	1/45/0
PC	PreCon Level 2	MSL2/260C	1/255/0
THB	Biased Temperature and Humidity, 85C/85%RH	1000/85 C/85%RH	1/80/0
THB	Biased Temperature and Humidity, 85C/85%RH	2000/85 C/85%RH	1/80/0
WBP	Bond Pull	30 bonds/5 units	1/5/0
WBS	Wire Bond Shear	30 bonds/5 units	1/5/0

- 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

APPENDIX: 0.35 technology: TI Malaysia Enterprise qualification data

Qualification Data:

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.

Qualification: ☐ Plan ☒ Test Results

Qual Device	MSP430F2132PWR	MSP430F2370IRHAR
Package Size	9.7mm x 4.5mm	6mm x 6mm x 1mm
Package Type	TSSOP28 pin	QFN 40pin
Assembly Site	MLA	
Mold Compound	4206193	4208625
Die attach	4042500	4205846
Lead Finish	NiPdAu	
Manufacturability	PASS	PASS
MSL Rating	MSL1	MSL3
Autoclave 121C/96 hrs	231/0	231/0
TempCycle -65/150C 500cycles	231/0	231/0
High Temp Bake 170C/420hrs	231/0	231/0

Reference Qualification Data: Approved March, 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.

Qualification Device: LMC6482AIM/NOPB (MSL 1-260C)

Package Construction Details

Assembly Site:	TIEM A/T	Mold Compound:	8096859
# Pins-Designator, Family:	8-D, SOIC	Mount Compound:	8080598
Lead Finish:	MATTE TIN	Bond Wire:	1.0 Mil Dia., Cu

Qualification: ☐ Plan ☒ **Test Results**

Reliability Test	Conditions	Sample Size / Fail		
		Lot 1	Lot 2	Lot 3
**Steady-state Life Test	150C (500 Hrs)	77/0	77/0	--
ELFR	150C (48 Hrs)	77/0	77/0	--
HTSL	150C (1000) Hrs)	77/0	--	--
**Biased HAST	130C/85%RH (96 Hrs)	40/0	40/0	40/0
**T/C -65C/150C	-65C/+150C (500Cyc)	77/0	77/0	77/0
**Autoclave 121C	121C, 2 atm (96 Hrs)	80/0	80/0	80/0

Notes: **Tests require preconditioning sequence: MSL1-260C

Reference Qualification Data: Approved March, 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.					
Qualification Device: LM2575HVMX-5.0/NOPB (MSL 3-260C)					
Package Construction Details					
Assembly Site:	TIEM A/T	Mold Compound:	8096859		
# Pins-Designator, Family:	24-DW, SOIC	Mount Compound:	8000160		
Lead Finish:	MATTE TIN	Bond Wire:	2.0 Mil Dia., Cu		
Qualification: ☐ **Plan** ☒ **Test Results**					
Reliability Test	Conditions	Sample Size / Fail			
		Lot 1	Lot 2	Lot 3	
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	77/0	77/0	
**T/C -65C/150C	-65C/+150C (500Cyc)	77/0	77/0	77/0	
Notes: **Tests require preconditioning sequence: MSL3-260C					

Reference Qualification Data: Approved March, 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.					
Qualification Device: LM2574HVMX-15/NOPB (MSL 3-260C)					
Package Construction Details					
Assembly Site:	TIEM A/T	Mold Compound:	8096859		
# Pins-Designator, Family:	14-NPA, SOIC	Mount Compound:	8080598		
Lead Finish:	MATTE TIN	Bond Wire:	1.5 Mil Dia., Cu		
Qualification: ☐ **Plan** ☒ **Test Results**					
Reliability Test	Conditions	Sample Size / Fail			
		Lot 1	Lot 2	Lot 3	
**T/C -65C/150C	-65C/+150C (500Cyc)	77/0	77/0	77/0	
Notes: **Tests require preconditioning sequence: MSL3-260C					

Reference Qualification Data: Approved April, 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.					
Qualification Device: LM2675MX-ADJ/NOPB (MSL 1-260C)					
Package Construction Details					
Assembly Site:	TIEM A/T	Mold Compound:	8096859		
# Pins-Designator, Family:	8-D, SOIC	Mount Compound:	8080598		
Lead Finish:	MATTE TIN	Bond Wire:	1.3 Mil Dia., Cu		
Qualification: ☐ **Plan** ☒ **Test Results**					
Reliability Test	Conditions	Sample Size / Fail			
		Lot 1	Lot 2	Lot 3	
**T/C -65C/150C	-65C/+150C (500Cyc)	77/0	77/0	77/0	
LUPS Post Test	85C	6/0	--	--	
LUPS Stress Test	85C	6/0	--	--	
ESD HBM	2000V	3/0	--	--	
ESD MM	250V	3/0	--	--	
ESD CDM	1000V	3/0	--	--	
Notes: **Tests require preconditioning sequence: MSL1-260C					

Reference Qualification Data: Approved April 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.			
Qualification Device: LMC7101QM5 (MSL1-260C)			
Package Construction Details			
Assembly Site:	NFME A/T	Mold Compound:	8096859
# Pins-Designator, Family:	5-DBV, SOT	Mount Compound:	8080598
Lead Finish:	MATTE TIN	Bond Wire:	1.0 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 (500Cyc)	77/0	77/0
Steady-state Life Test	150C (500 Hrs)	77/0	77/0
ELFR	150C (48 Hrs)	77/0	77/0
**Biased HAST	130C/85%RH (96 Hrs)	77/0	--
ESD HBM	1000V	3/0	--
ESD MM	250V	3/0	--
ESD CDM	1000V	3/0	--

** - Test requires Moisture Preconditioning (MSL1-260C)

TI Information
Selective Disclosure

Qualification Report

Conversion of SOT23 (DBZ) devices from Au wire to Cu wire

Approve Date 04-Jun-2016

Product Attributes

Attributes	Qual Device: TLV431AIDBZR	Qual Device: TLVH431AQDBZR	Qual Device: TPD2E009DBZR	QBS Package Reference: SN74AHC1G126DBVR	QBS Package Reference: SN74LVC1GU04DBVR	QBS Package Reference: TLV431AIDBZ6
Package Attributes	-	-	-	-	-	-
Assembly Site	HNT	HNT	HNT	HNT	HNT	HNT
Package Family	SOT	SOT	SOT	SOT	SOT	SOT
Package Designator	DBZ	DBZ	DBZ	DBV	DBV	DBZ
Package Size (mils)	114.96 X 51.18	114.96 X 51.18	114.96 X 51.18	114.17 X 62.99	114.17 X 62.99	114.96 X 51.18
Body Thickness (mils)	37.4	37.4	37.4	47.24	57.09	37.4
Pin Count	3	3	3	5	5	3
Lead Frame Type	Cu	Cu	Cu	Cu	Cu	Cu
Lead Finish	NiPdAu	NiPdAu	NiPdAu	NiPdAu	NiPdAu	NiPdAu
Lead Pitch(mils)	74.8	74.8	74.8	37.4	37.4	74.8
Bond Wire Composition	Cu	Cu	Cu	Cu	Cu	Au
Bond Wire Diameter(mils)	1.0	1.0	1.0	1.0	0.8	1.0
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0	TBD	UL 94 V-0	UL 94 V 0

- QBS: Qual By Similarity
- Qual Devices qualified at LEVEL1-260CG: TLV431AIDBZR, TPD2E009DBZR, TLVH431AQDBZR

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: TLV431AIDBZR	Qual Device: TLVH431AQDBZR	Qual Device: TPD2E009DBZR	QBS Package Reference: SN74AHC1G126DBVR	QBS Package Reference: SN74LVC1GU04DBVR	QBS Package Reference: TLV431AIDBZ6
AC	Autoclave 121C	96 Hours	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0
FLAM	Flammability (IEC 695-2-2)	--	-	-	-	-	-	3/15/0
FLAM	Flammability (UL 94V-0)	--	-	-	-	-	-	3/15/0
FLAM	Flammability (UL-1694)	--	-	-	-	-	-	3/15/0
HAST	Biased HAST, 130C/85%RH	96 Hours	3/231/0	-	-	-	3/231/0	3/231/0
HTOL	Life Test, 150C	300 Hours	-	-	-	-	-	3/231/0
HTSL	High Temp. Storage Bake, 170C	420 Hours	3/231/0	3/231/0	-	3/231/0	3/231/0	-
HTSL	High Temp. Storage Bake, 150C	1000 Hours	-	-	3/231/0	-	-	3/135/0
LI	Lead Fatigue	Leads	-	-	-	-	3/66/0	-
LI	Lead Integrity	Leads	-	-	-	-	-	3/66/0
LI	Lead Pull	Leads	-	-	-	-	-	3/66/0
LI	Lead Pull to Destruction	Leads	-	-	-	-	3/66/0	-
PD	Physical Dimensions	--	-	-	-	-	3/9/0	3/15/0
PKG	Lead Finish Adhesion	Leads	-	-	-	-	-	3/45/0
SD	Surface Mount Solderability	Pb Free	-	-	-	-	3/66/0	3/66/0
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0
WBP	Bond Pull	Wires	3/228/0	3/228/0	3/228/0	-	-	-
WBS	Ball Bond Shear	Wires	3/228/0	3/228/0	3/228/0	-	-	-

- 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 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

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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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