PCN Number:	20220913000.2	**PCN Date:**	September 13, 2022

Title:	Qualification of Cu as an alternate bond wire & other BOM elements for Select Devices

Customer Contact:	PCN Manager	**Dept:**	Quality Services

Proposed 1st Ship Date:	Mar 12, 2023	**Sample Requests accepted until:**	Oct 13, 2022

***Sample requests received after Oct 13, 2022 will not be supported.**

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:

This PCN is to inform of an alternative bond wire & new die coat qualification for the devices in the product affected section as follows:

What	Current	Additional
Current Bond wire, Diameter	**Au, 1.0, 1.2, or 1.3 mils**	**Cu, 0.8 or 1.3 mils**
Die Coat Material	**BCP**	**PI**

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

Impact on Environmental Ratings

Checked boxes indicate the status of environmental ratings following implementation of this change. If below boxes are checked, there are no changes to the associated environmental ratings.

RoHS	REACH	Green Status	IEC 62474
☒ No Change	☒ No Change	☒ No Change	☒ No Change

Changes to product identification resulting from this PCN:

None

Product Affected:

DP83848QSQ/NOPB	FDC2212QDNTTQ1	LDC1614QRGHTQ1	LM34937QPSQ/NOPB
DP83848QSQE/NOPB	LDC1312QDNTRQ1	LM25117QPSQ/NOPB	LM34937QPSQX/NOPB

DP83848QSQX/NOPB	LDC1312QDNTTQ1	LM25117QPSQE/NOPB	LM5117QPSQ/NOPB
FDC2112QDNTRQ1	LDC1314QRGHRQ1	LM25117QPSQX/NOPB	LM5117QPSQE/NOPB
FDC2112QDNTTQ1	LDC1314QRGHTQ1	LM25119QPSQ/NOPB	LM5117QPSQX/NOPB
FDC2114QRGHRQ1	LDC1612QDNTRQ1	LM25119QPSQX/NOPB	LM5119QPSQ/NOPB
FDC2114QRGHTQ1	LDC1612QDNTTQ1	LM26420Q1XSQ/NOPB	LM5119QPSQX/NOPB
FDC2212QDNTRQ1	LDC1614QRGHRQ1	LM26420Q1XSQX/NOPB	

TI Information
Selective Disclosure

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

Qualification of 0.8mil / 1.3mil PCC wire as alternate bonding material for QFN CMOS9T, ABCD5 and PVIP50 for Automotive Devices
Approved 12-Jul-2022

Product Attributes

Attributes	Qual Device: DP83848QSQNOPB	Qual Device: LM26420Q1XQMGR	Qual Device: LM5119QPSQX/NO
Automotive Grade Level	Grade 2	Grade 1	Grade 1
Operating Temp Range	-40 to +105 C	-40 to +125 C	-40 to +125 C
Product Function	Interface	Interface	Interface
Wafer Fab Supplier	MAINEFAB	MAINEFAB	MAINEFAB
Die Revision	A	B	A
Assembly Site	TIEMA	TIEMA	TIEMA
Package Type	WQFN; 6 x 6 MM	QFN; 5 X 5 MM	QFN: 5 X 5 MM
Package Designator	RTA	RUM	RTV
Ball/Lead Count	40	16	32

- QBS: Qual By Similarity
- Qual Device LM5119QPSQX/NO is qualified at LEVEL3-260CG
- Qual Device LM26420Q1XQMGR is qualified at LEVEL1-260CG
- Qual Device DP83848QSQNOPB is qualified at LEVEL3-260CG

Qualification Results
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: DP83848QSQNOPB	Qual Device: LM26420Q1XQMGR	Qual Device: LM5119QPSQX/NO
Test Group A – Accelerated Environment Stress Tests									
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 3-260C	No Fails	No Fails	No Fails
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 110C/85%RH	264 Hours	-	3/231/0	3/231/0
UHAST	A3	JEDEC JESD22-A118	3	77	Unbiased HAST, 110C/85%RH	264 Hours	3/231/0	-	-
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	3/231/0
TC-WBP	A4	MIL-STD883 Method 2011	1	60	Bond Pull over Ball Post T/C 500 Cycles	Wires	3/90/0	3/90/0	3/90/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	N/A
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 150C	1000 Hours	-	-	3/135/0
Test Group B – Accelerated Lifetime Simulation Tests									
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	N/A	N/A
Test Group C – Package Assembly Integrity Tests									
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear (Cpk>1.67)	-	3/90/0	3/90/0	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull (Cpk>1.67)	-	3/90/0	3/90/0	3/90/0
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability >95% Lead Coverage	-	-	-	-
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	-	-	-	-
SBS	C5	AEC Q100-010	3	50	Solder Ball Shear (Cpk>1.67)	Post HTSL/Bump	-	-	-
SBS	C5	AEC Q100-010	3	50	Solder Ball Shear (Cpk>1.67)	Solder Balls	-	-	-
LI	C6	JEDEC JESD22-B105	1	50	Lead Integrity	-	-	-	-

							Test Group D – Die Fabrication Reliability Tests				
	EM	D1	JESD61	-	-	Electromigration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
	TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
	NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
	SM	D5	-	-	-	Stress Migration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements

A1 (PC): Preconditioning:
Performed for THB, Biased HAST, AC, uHAST, TC & PTC 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

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

TI Qualification ID: 20201209-137458

TI Information
Selective Disclosure

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

0.8mil / 1.3mil PCC wire in QFN
(Q100H, Q006, Grade 1, -40/125C & Grade 2, -40/105C)
Approved 12-Jul-2022

Product Attributes

Attributes	Qual Device: DP83848QSQNOPB	Qual Device: LM26420Q1XQMGR	Qual Device: LM5119QPSQX/NO
Operating Temp Range	-40 to +105 C	-40 to +125 C	-40 to +125 C
Automotive Grade Level	Grade 2	Grade 1	Grade 1
Product Function	Interface	Interface	Interface
Wafer Fab Supplier	MAINEFAB	MAINEFAB	MAINEFAB
Die Revision	A	B	A
Assembly Site	TIEMA	TIEMA	TIEMA
Package Type	WQFN; 6 x 6 MM	QFN; 5 X 5 MM	QFN: 5 X 5 MM
Package Designator	RTA	RUM	RTV
Ball/Lead Count	40	16	32

- QBS: Qual By Similarity

Qualification Results

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: DP83848QSQNOPB	Qual Device: LM26420Q1XQMGR	Qual Device: LM5119QPSQX/NO
Test Group A – Accelerated Environment Stress Tests										
	PC	A1	-	3	22	SAM Analysis, Pre Stress	Completed	3/66/0	3/66/0	3/66/0
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 3-260C	No fails	No fails	No fails
	PC	A1	-	3	22	SAM Analysis, Post Precon	Completed	3/66/0	3/66/0	3/66/0
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 110C/85%RH	264 Hours	-	3/231/0	3/231/0
	HAST	A2	-	3	1	Cross Section, Post bHAST 264 Hours	Completed	-	-	-
	HAST	A2	-	3	30	Wire Bond Shear, Post bHast, 264 Hours	Wires	-	-	-
	HAST	A2	-	3	30	Bond Pull over Stitch, post bHAST, 264 Hours	Wires	-	-	-
	HAST	A2	-	3	30	Bond Pull over Ball, Post bHAST, 264 Hours	Wires	-	-	-
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 110C/85%RH	528 Hours	-	3/210/0	3/210/0
	HAST	A2	-	3	1	Cross Section, Post bHAST 528 Hours	Completed	-	3/3/0	3/3/0
	HAST	A2	-	3	22	SAM Analysis, Post bHAST, 528 Hours	Completed	-	3/66/0	3/66/0
	HAST	A2	-	3	30	Wire Bond Shear, Post bHast, 528 Hours	Wires	-	3/90/0	3/90/0
	HAST	A2	-	3	30	Bond Pull over Stitch, post bHAST, 528 Hours	Wires	-	3/90/0	3/90/0
	HAST	A2	-	3	30	Bond Pull over Ball, Post bHAST, 528 Hours	Wires	-	3/90/0	3/90/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	3/231/0
	TC	A4	-	3	1	Cross Section, Post T/C 500 Cycles	Completed	3/3/0	3/3/0	3/3/0
	TC	A4	-	3	22	SAM Analysis, Post T/C, 500 Cycles	Completed	3/66/0	3/66/0	3/66/0
	TC	A4	-	3	30	Wire Bond Shear, Post T/C 500 Cycles	Wires	-	-	-
	TC	A4	-	3	30	Bond Pull over Stitch Post T/C 500 Cycles	Wires	-	-	-
	TC	A4	-	3	30	Bond Pull over Ball Post T/C 500 Cycles	Wires	-	-	-

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: DP83848QSQNOPB	Qual Device: LM26420Q1XQMGR	Qual Device: LM5119QPSQX/NO
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	1000 Cycles	3/210/0	3/210/0	3/210/0
	TC	A4	-	3	1	Cross Section, Post T/C 1000 Cycles	Completed	3/3/0	3/3/0	3/3/0
	TC	A4	-	3	22	SAM Analysis, Post T/C, 1000 Cycles	Completed	3/66/0	3/66/0	3/66/0
	TC	A4	-	3	30	Wire Bond Shear, Post T/C 1000 Cycles	Wires	3/90/0	3/90/0	3/90/0
	TC	A4	-	3	30	Bond Pull over Stitch, Post T/C, 1000 Cycles	Wires	3/90/0	3/90/0	3/90/0
	TC	A4	-	3	30	Bond Pull over Ball, Post T/C, 1000 Cycles	Wires	3/90/0	3/90/0	3/90/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle -40/125C	1000 Cycles	-	-	-
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle -40/125C	2000 Cycles	-	-	-
	HTSL	A6	JEDEC JESD22-A103	3	45	High Temp Storage Bake 150C	1000 Hours	-	-	3/135/0
	HTSL	A6	-	3	1	Cross Section, Post HTSL 1000 Hours	Completed	-	-	-
	HTSL	A6	JEDEC JESD22-A103	3	44	High Temp Storage Bake 150C	2000 Hours	-	-	3/132/0
	HTSL	A6	-	3	1	Cross Section, Post HTSL 2000 Hours	Completed	-	-	3/3/0
Test Group C – Package Assembly Integrity Tests										
	WBS	C1	AEC Q100-001	3	30	Wire Bond Shear, Cpk>1.67	Wires	3/90/0	3/90/0	3/90/0
	WBP	C2	MIL-STD883 Method 2011	3	30	Bond Pull over Ball, Cpk >1.67	Wires	3/90/0	3/90/0	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): -40C to +150C
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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

TI Qualification ID: 20201209-137458

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Location	E-Mail
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