12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN#20170228002B2
Qualification of a new Die Attach Material for Select Devices
Change Notification / Sample Request

Date: July 13, 2017
To: PREMIER FARNELL PCN

Dear Customer:

Revision B2 is to announce the retraction of Select devices.

This is an announcement of a change to a device that is currently offered by Texas Instruments. The details of this change are on the following pages.

We request you acknowledge receipt of this notification within **30** days of the date of this notice. Lack of acknowledgement of this notice within 30 days constitutes acceptance of the change. If you require samples or additional data to support your evaluation, please request within 30 days.

The proposed first ship date is indicated on page 3 of this notification, unless customer agreement has been reached on an earlier implementation of the change.

This notice does not change the end-of-life status of any product. Should product affected be on a previously issued product withdrawal/discontinuance notice, this notification does not extend the life of that product or change the life time buy offering/discontinuance plan.

For questions regarding this notice, contact your local Field Sales Representative or the PCN Manager (PCN_ww_admin_team@list.ti.com).

Sincerely,

PCN Team
SC Business Services

20170228002B2
Attachment: 1

Products Affected:

The devices listed on this page are a subset of the complete list of affected devices. According to our records, these are the devices that you have purchased within the past twenty-four (24) months. The corresponding customer part number is also listed, if available.

DEVICE	CUSTOMER PART NUMBER
TPS73233DCQR	null
TPS78601DCQ	null
TPS73201DCQR	null
TPS79501DCQR	null

Technical details of this Product Change follow on the next page(s).

PCN Number:	20170228002B2	**PCN Date:**	July 13, 2017
Title:	Qualification of a new Die Attach Material for Select Devices		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	June 1, 2017	**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:

Revision B2 is to announce the retraction of select devices. These devices will continue to be manufactured as prior and will not be subjected to the change described in this notification. Affected devices are identified with a ~~strikethrough~~ and are highlighted in yellow in the Product Affected Section.

This notification is to announce the qualification of a new die attach material for the devices in the product affected section below as follows:

Group 1 Devices:

Current	Proposed
SID#142010015	SID#14201002

Group 2 Devices:

Current	Proposed
8087417	4222215

Reason for Change:

Die Attach Supplier change no longer producing current material. No current material available after PCN expiration.

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:

Group 1 Devices:

OPA2541AM	OPA2541SM	OPA541AM	OPA541SM
OPA2541BM	OPA2541SMQ	OPA541BM	

Group 2 Devices:

905X5433200	REG103GA-3.3/2K5	TPS5450DDA-P	TPS78625DCQ
HPA00295DDAR	REG103GA-3.3/2K5G4	TPS5450DDAR	TPS78625DCQG4
LM22670TJ-5.0/NOPB	REG103GA-3.3G4	TPS5450DDARG4	TPS78625DCQR
LM22670TJ-ADJ/NOPB	REG103GA-5	TPS5450DDAR-P	TPS78625DCQRG4
LM22670TJE-5.0/NOPB	~~REG103GA-5/2K5~~	TPS72501DCQ	TPS78628DCQR
LM22670TJE-ADJ/NOPB	REG103GA-5/2K5G4	TPS72501DCQG4	TPS78630DCQ
LM22673TJ-5.0/NOPB	REG103GA-5G4	TPS72501DCQR	TPS78630DCQR
LM22673TJ-ADJ/J7002341	REG103GA-A	TPS72501DCQRG4	TPS78633DCQ
LM22673TJ-ADJ/NOPB	REG103GA-A/2K5	TPS72515DCQ	TPS78633DCQG4
LM22673TJE-5.0/NOPB	REG103GA-A/2K5G4	TPS72515DCQG4	TPS78633DCQR
LM22673TJE-ADJ/J7002342	REG103GA-AG4	TPS72515DCQR	TPS78633DCQRG4
LM22673TJE-ADJ/NOPB	REG104GA-2.5	TPS72515DCQRG4	TPS79401DCQ
LM22676TJ-5.0/NOPB	REG104GA-2.5/2K5	TPS72516DCQ	TPS79401DCQR
LM22676TJ-ADJ/J7002452	REG104GA-2.5G4	TPS72516DCQR	TPS79401DCQRG4
LM22676TJ-ADJ/NOPB	REG104GA-3.3	TPS72516DCQRG4	TPS79418DCQ
LM22676TJE-5.0/NOPB	REG104GA-3.3/2K5	TPS72518DCQ	TPS79418DCQR
LM22676TJE-ADJ/J7002453	REG104GA-3.3G4	TPS72518DCQG4	TPS79425DCQ
LM22676TJE-ADJ/NOPB	REG104GA-5/2K5G4	TPS72518DCQR	TPS79425DCQG4
LM22677TJ-5.0/NOPB	REG104GA-5G4	TPS72518DCQRG4	TPS79425DCQR
LM22677TJ-ADJ/J7002401	REG104GA-A/2K5	TPS72525DCQ	TPS79428DCQ
LM22677TJ-ADJ/NOPB	REG104GA-A/2K5G4	TPS72525DCQG4	TPS79428DCQG4
LM22677TJE-5.0/NOPB	REG104GA-AG4	TPS72525DCQR	TPS79428DCQR
LM22677TJE-ADJ/J7002402	REG1117	TPS72525DCQRG4	TPS79430DCQ
LM22677TJE-ADJ/NOPB	REG1117/2K5	TPS726126DCQ	TPS79430DCQG4
LM22678TJ-5.0/NOPB	REG1117/2K5G4	TPS726126DCQG4	TPS79430DCQR
LM22678TJ-ADJ/J7002567	REG1117-2.85	TPS726126DCQR	TPS79433DCQ
LM22678TJ-ADJ/NOPB	REG1117-2.85/2K5	TPS726126DCQRG4	TPS79433DCQR
LM22678TJE-5.0/NOPB	REG1117-2.85G4	TPS72615DCQ	TPS79501DCQG4
LM22678TJE-ADJ/J7002566	REG1117-3.3	TPS72615DCQG4	~~TPS79501DCQR~~
LM22678TJE-ADJ/NOPB	REG1117-3.3/2K5	TPS72615DCQR	TPS79516DCQ
LM22679TJ-5.0/NOPB	REG1117-3.3/2K5G4	TPS72616DCQ	TPS79516DCQG4
LM22679TJ-ADJ/NOPB	REG1117-3.3G4	TPS72616DCQR	TPS79516DCQR
LM22679TJE-5.0/NOPB	REG1117-5	TPS72618DCQ	TPS79516DCQRG4
LM22679TJE-ADJ/NOPB	REG1117-5/2K5	TPS72618DCQR	TPS79518DCQ
LP38500ATJ-ADJ/NOPB	REG1117-5G4	TPS72618DCQRG4	TPS79518DCQG4
LP38500TJ-ADJ/NOPB	REG1117A	TPS72625DCQ	TPS79518DCQR

LP38501ATJ-ADJ/NOPB	REG1117A/2K5	TPS72625DCQG4	TPS79518DCQRG4
LP38501TJ-ADJ/NOPB	REG1117A/2K5G4	TPS72625DCQR	TPS79525DCQ
LP38502ATJ-ADJ/NOPB	REG1117A-1.8	TPS73201DCQ	TPS79525DCQG4
LP38502TJ-ADJ/NOPB	REG1117A-1.8/2K5	~~**TPS73201DCQR**~~	TPS79525DCQR
LP38503ATJ-ADJ/NOPB	REG1117A-1.8G4	TPS73215DCQ	TPS79525DCQRG4
LP38503TJ-ADJ/NOPB	REG1117A-2.5	TPS73215DCQR	TPS79530DCQ
LP38511TJ-1.8/NOPB	REG1117A-2.5/2K5	TPS73218DCQ	TPS79530DCQG4
LP38511TJ-ADJ/NOPB	REG1117A-2.5G4	~~**TPS73218DCQR**~~	TPS79530DCQR
LP38512TJ-1.8/NOPB	REG1117AG4	TPS73225DCQ	TPS79533DCQG4
LP38512TJ-ADJ/NOPB	REG1117G4	TPS73225DCQG4	TPS79533DCQRG4
LP38513TJ-ADJ/NOPB	REG1118-2.85	TPS73225DCQR	TPS79601DCQG4
LV13603ATJ-ADJ/NOPB	REG1118-2.85/2K5	TPS73230DCQR	~~**TPS79601DCQR**~~
LV13603ATJ-H/NOPB	REG1118-2.85/2K5G4	TPS73233DCQ	TPS79601DCQRG4
LV13603BTJ-ADJ/NOPB	SN0804036DCQR	~~**TPS73233DCQR**~~	TPS79618DCQ
LV13603BTJ-H/NOPB	TL1963A-15DCQR	TPS73250DCQ	TPS79618DCQRG4
LV13603CTJ-ADJ/NOPB	TL1963A-15DCQT	TPS73250DCQG4	TPS79625DCQ
LV13603CTJ-H/NOPB	TL1963A-18DCQR	TPS73250DCQR	TPS79625DCQRG4
LV13605TJ-ADJ/NOPB	TL1963A-18DCQT	TPS73601DCQG4	TPS79628DCQ
LV13605TJ-H/NOPB	TL1963A-25DCQR	~~**TPS73601DCQR**~~	TPS79628DCQR
OPA2211AIDDA	TL1963A-25DCQT	TPS73601DCQRG4	TPS79630DCQ
OPA2211AIDDAR	TL1963A-33DCQR	TPS73615DCQ	TPS79630DCQG4
OPA2677IDDA	TL1963A-33DCQT	TPS73615DCQRG4	TPS79630DCQR
OPA2677IDDAG4	TL1963ADCQR	TPS73618DCQ	TPS79633DCQG4
OPA2677IDDAR	TL1963ADCQT	TPS73618DCQRG4	TPS79633DCQRG4
OPA2677IDDARG4	TPS2376DDA-H	TPS73625DCQ	TPS79650DCQ
OPA454AIDDA	TPS2376DDA-HG4	~~**TPS73625DCQR**~~	TPS79650DCQG4
OPA454AIDDAG4	TPS2376DDAR-H	TPS73630DCQ	TPS79650DCQR
OPA454AIDDAR	TPS2376DDAR-HG4	TPS73630DCQG4	TPS7A4501DCQR
OPA454AIDDARG4	TPS2421-1DDA	TPS73630DCQR	TPS7A4501DCQT
REG102GA-2.5	TPS2421-1DDAR	TPS73633DCQ	TPS7A4515DCQR
REG102GA-2.5G4	TPS2421-2DDA	TPS73633DCQR	TPS7A4515DCQT
REG102GA-2.85	TPS2421-2DDAR	TPS73701DCQG4	TPS7A4518DCQR
REG102GA-2.85G4	TPS5430DDA	TPS73701DCQRG4	TPS7A4518DCQT
REG102GA-3	TPS5430DDAG4	TPS73718DCQG4	TPS7A4525DCQR
REG102GA-3.3	TPS5430DDA-P	TPS73718DCQRG4	TPS7A4525DCQT
REG102GA-3.3/2K5	TPS5430DDAR	TPS73725DCQ	TPS7A4533DCQR
REG102GA-3.3G4	TPS5430DDARG4	TPS73725DCQRG4	TPS7A4533DCQT
REG102GA-3G4	TPS5430DDAR-P	TPS73733DCQG4	UCC27200ADDA
REG102GA-5	TPS5431DDA	TPS73733DCQRG4	UCC27200ADDAR
REG102GA-5G4	TPS5431DDAG4	TPS73734DCQ	UCC27200DDA
REG102GA-A	TPS5431DDAR	TPS73734DCQR	UCC27200DDAG4
REG102GA-A/2K5	TPS5431DDARG4	TPS73801DCQR	UCC27200DDAR
REG102GA-A/2K5G4	TPS54331DDA	~~**TPS78601DCQ**~~	UCC27201ADDA
REG102GA-AG4	TPS54331DDAR	TPS78601DCQRG4	UCC27201ADDAR

REG103GA-2.5	TPS54332DDA	TPS78618DCQ	UCC27201DDA
REG103GA-2.5G4	TPS54332DDAR	TPS78618DCQR	UCC27201DDAG4
REG103GA-3	TPS5450DDA	TPS78618DCQRG4	UCC27201DDAR
REG103GA-3.3	TPS5450DDAG4		

Group 1 Device Qual Results:

TI Information
Selective Disclosure

Qualification Report

MMT/ALP Qualification of New Die Attach Epoxy SID#142010022 as Replacement for SID#142010015

Product Attributes

Attributes	Qual Device: OPA2541SMQ
Assembly Site	ALP
Package Family	LMF
Wafer Fab Supplier	SFAB
Wafer Process	BIPOLAR

- Device OPA2541SMQ contains multiple dies.

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

Type	Test Name / Condition	Duration	Qual Device: OPA2541SMQ
-	D4 Constant Acceleration	Condition D, 20 kg, Y1 axis, 1 minute duration	3/32/0
-	D4 Electrical Test	Room temperature	3/32/0
-	D4 Fine and Gross Leak	-	3/32/0
-	D4 Mechanical Shock	Condition B, 1500 g, 0.5 ms Y1 6 pulses	3/32/0
-	D4 Vibration	Condition A, 20 g 20-2000 Hz, All 3 planes (x, y, z)	3/32/0
DS	Die Shear	MIL-STD-883, Method 2019	3/10/0
ED	Electrical Characterization	Per Datasheet Parameters	1/30/0
HTOL	High Temp Operating Life, 125C	1000 Hours	2/77/0
MQ	Manufacturability (Assembly)	(per mfg. Site specification)	PASS
TC	Temperature Cycle, -65C/150C	500 Cycles	3/77/0
XRAY	X-ray	Inspect for attach voids, wire bonds	3/5/0
XRAY	X-ray	Post TC (500 Cycles). Inspect for attach voids	3/5/0
YLD	FTY and Bin Summary	-	PASS

- 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 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 Device Qual Results:

TI Information
Selective Disclosure

Automotive New Die Attach Material Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

8087417 Die Attach Epoxy (TJ263) Replacement BCP
Approved 14-Mar-2017

Product Attributes

Attributes	Qual Device: LM22678QTJSKTW
Operating Temp Range	-40 to +125 C
Automotive Grade Level	Grade 1
Product Function	Power Management
Wafer Fab Supplier	MAINEFAB
Die Revision	A
Assembly Site	TIEM-AT
Package Type	TO-263
Package Designator	NDR
Ball/Lead Count	7

- QBS: Qual By Similarity
- Qual Device LM22678QTJSKTW is qualified at LEVEL1-260CG

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: LM22678QTJSKTW
Test Group A – Accelerated Environment Stress Tests								
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 1-260C	3/720/0
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	3/231/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0
	TC-BP	A4	MIL-STD883 Method 2011	1	30	Post Temp Cycle Bond Pull	500 Cycles	3/15/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake, 150C	1000 Hours	3/231/0
Test Group B – Accelerated Lifetime Simulation Tests								
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	3/231/0
	EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A
Test Group C – Package Assembly Integrity Tests								
	WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	3/90/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	3/90/0
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability >95% Lead Coverage	8 Hour Steam Age	N/A
	PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	--	N/A
	LI	C6	JEDEC JESD22-B105	1	50	Lead Integrity	Leads	N/A
Test Group D – Die Fabrication Reliability Tests								
	EM	D1	JESD61	-	-	Electromigration	--	Completed Per Process Technology Requirements
	TDDB	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	--	Completed Per Process Technology Requirements
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	--	Completed Per Process Technology Requirements
	NBTI	D4	-	-	-	Negative Bias Temperature Instability	--	Completed Per Process Technology Requirements
	SM	D5	-	-	-	Stress Migration	--	Completed Per Process Technology Requirements

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): -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

Qualification Report

Qualification of 4222215 Die Attach Epoxy as Replacement of End of Life 8087417 Epoxy for Commercial Devices

Product Attributes

Attributes	Qual Device: OPA2211AIDDAR	Qual Device: OPA454AIDDAR	Qual Device: REG1117A/2K5	Qual Device: TPS72xxxQDCQR
Assembly Site	HNT	HNT	HNT	HNT
Package Family	SOIC (SO PowerPAD)	HSOIC (PowerPAD)	SOT223	SOT223
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	SH-BIP-1	TSMC-WF2
Wafer Process	BICOM3-HV	LBC-SOI	BIPOLAR	0.60UM-TSMC

- QBS: Qual By Similarity
- Qual Device REG1117A/2K5 is qualified at LEVEL1-260C
- Qual Device OPA2211AIDDAR is qualified at LEVEL1-260C
- Qual Device OPA454AIDDAR is qualified at LEVEL2-260C
- Qual Device TPS7xxxxQDCQR is qualified at LEVEL2-260C

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: OPA2211AIDDAR	Qual Device: OPA454AIDDAR	Qual Device: REG1117A/2K5	Qual Device: TPS72xxxQDCQR
PC	Automotive Preconditioning	Level 2-260C	-	-	-	3/308/0
PC	Preconditioning	Level 1-260C	3/154/0	-	3/231/0	-
PC	Preconditioning	Level 2-260C	-	3/308/0	-	-
AC	Autoclave, 121C	96 Hours	3/77/0	3/77/0	3/77/0	3/77/0
DS	Die Shear	QSS 009-009	3/10/0	3/10/0	3/10/0	3/10/0
ED	Electrical Distributions	Cpk>1.67	-	-	-	3/30/0
ED	Electrical Characterization	-	3/15/0	3/15/0	-	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-	3/77/0
HTOL	Life Test, 125C	1000 Hours	-	-	-	3/77/0
HTSL	High Temp. Storage Bake, 150C	1000 Hours	-	3/77/0	3/77/0	3/77/0
MQ	Manufacturability	(per mfg. Site specification)	3/0/0	3/0/0	3/0/0	-
MQ	Manufacturability (Auto Assembly)	(per automotive requirements)	-	-	-	3/0/0
MSL	Moisture Sensitivity	Level 1-260C	-	-	3/12/0	-
MSL	Thermal Integrity Sequence	Level 1-260C	3/12/0	-	-	-
MSL	Thermal Integrity Sequence	Level 2-260C	-	3/12/0	-	3/12/0
TC	Temperature Cycle, -65C/150C	500 Cycles	3/77/0	3/77/0	3/77/0	3/77/0
TC-WBP	Post Temp Cycle Bond Pull	30 ball bonds, min. 5 units	-	-	-	3/5/0
TS	Thermal Shock, -65C/+150C	500 Cycles	-	3/77/0	-	-
XRAY	X-ray	(top side only)	3/5/0	3/5/0	3/5/0	3/5/0
YLD	FTY and Bin Summary	-	3/0/0	3/0/0	3/0/0	3/0/0

- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable.
- 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 Temperature 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
Europe	PCNEuropeContact@list.ti.com
Asia Pacific	PCNAsiaContact@list.ti.com
Japan	PCNJapanContact@list.ti.com