12500 TI Boulevard, MS 8640, Dallas, Texas 75243

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

Date: March 20, 2017
To: TOKYO ELECTRON DEVICE (DSTR) PCN

Dear Customer:

Revision A is to add additional devices not included in PCN#20170228002.

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

20170228002A
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
LM22678TJ-ADJ/NOPB	null
LM22678TJE-ADJ/NOPB	null
LM22677TJE-ADJ/NOPB	null
LP38512TJ-ADJ/NOPB	null
LP38511TJ-ADJ/NOPB	null

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

PCN Number:	20170228002A	**PCN Date:**	March 20, 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 A is to announce additional devices not included in the original publication. This additional devices included below are in **bold highlight font**. The expected first shipment date for these new devices will be 90 days from this notice for these newly added devices only.

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#142010022

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:

LM22670TJ-5.0/NOPB	LM22676TJE-ADJ/J7002453	LM22678TJE-ADJ/NOPB	LP38511TJ-1.8/NOPB
LM22670TJ-ADJ/NOPB	LM22676TJE-ADJ/NOPB	LM22679TJ-5.0/NOPB	LP38511TJ-ADJ/NOPB
LM22670TJE-5.0/NOPB	LM22677TJ-5.0/NOPB	LM22679TJ-ADJ/NOPB	LP38512TJ-1.8/NOPB
LM22670TJE-ADJ/NOPB	LM22677TJ-ADJ/J7002401	LM22679TJE-5.0/NOPB	LP38512TJ-ADJ/NOPB
LM22673TJ-5.0/NOPB	LM22677TJ-ADJ/NOPB	LM22679TJE-ADJ/NOPB	LP38513TJ-ADJ/NOPB
LM22673TJ-ADJ/J7002341	LM22677TJE-5.0/NOPB	LP38500ATJ-ADJ/NOPB	LV13603ATJ-ADJ/NOPB
LM22673TJ-ADJ/NOPB	LM22677TJE-ADJ/J7002402	LP38500TJ-ADJ/NOPB	LV13603ATJ-H/NOPB
LM22673TJE-5.0/NOPB	LM22677TJE-ADJ/NOPB	LP38501ATJ-ADJ/NOPB	LV13603BTJ-ADJ/NOPB
LM22673TJE-ADJ/J7002342	LM22678TJ-5.0/NOPB	LP38501TJ-ADJ/NOPB	LV13603BTJ-H/NOPB
LM22673TJE-ADJ/NOPB	LM22678TJ-ADJ/J7002567	LP38502ATJ-ADJ/NOPB	LV13603CTJ-ADJ/NOPB
LM22676TJ-5.0/NOPB	LM22678TJ-ADJ/NOPB	LP38502TJ-ADJ/NOPB	LV13603CTJ-H/NOPB
LM22676TJ-ADJ/J7002452	LM22678TJE-5.0/NOPB	LP38503ATJ-ADJ/NOPB	LV13605TJ-ADJ/NOPB
LM22676TJ-ADJ/NOPB	LM22678TJE-ADJ/J7002566	LP38503TJ-ADJ/NOPB	LV13605TJ-H/NOPB
LM22676TJE-5.0/NOPB			

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

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