

**PCN# 20161118002**  
**OPA2317/2330/2333, OPA317/330/333, TLV2333/333 Product Family Die**  
**Enhancement**  
**Change Notification / Sample Request**

**Date:** December 05, 2016  
**To:** TOKYO ELECTRON DEVICE (DSTR) PCN

Dear Customer:

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 changes discussed within this PCN will not take effect any earlier than **90** days from the date of this notification, unless customer agreement has been reached on an earlier implementation of the change. This notification period is per TI's standard process.

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](mailto:PCN_ww_admin_team@list.ti.com)).

PCN Team  
SC Business Services

**20161118002**  
**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.

<b>DEVICE</b>	<b>CUSTOMER PART NUMBER</b>
OPA2333AID	null
OPA2333AIDG4	null
OPA2333AIDRBR	null
OPA2333AIDRBRG4	null
OPA333AIDBVT	null
TLV2333IDGKT	null
OPA2333AIDR	null
OPA2330AID	null
TLV2333IDR	null
OPA2330AIDR	null
OPA333AIDBVR	null
OPA2333AIDGKT	null
OPA2333AIDGKR	null
OPA330AIDBVR	null
OPA2330AIDGKT	null
OPA2333AIDRBT	null

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

<b>PCN Number:</b>	20161118002		<b>PCN Date:</b>	Dec 5, 2016
<b>Title:</b>	OPA2317/2330/2333, OPA317/330/333, TLV2333/333 Product Family Die Enhancement			
<b>Customer Contact:</b>	<a href="#">PCN Manager</a>		<b>Dept:</b>	Quality Services
<b>Proposed 1<sup>st</sup> Ship Date:</b>	Mar 5, 2017	<b>Estimated Sample Availability:</b>	Date provided at sample request.	
<b>Change Type:</b>				
<input type="checkbox"/> Assembly Site	<input type="checkbox"/> Assembly Process	<input type="checkbox"/> Assembly Materials		
<input checked="" type="checkbox"/> Design	<input type="checkbox"/> Electrical Specification	<input type="checkbox"/> Mechanical Specification		
<input type="checkbox"/> Test Site	<input type="checkbox"/> Packing/Shipping/Labeling	<input type="checkbox"/> Test Process		
<input type="checkbox"/> Wafer Bump Site	<input type="checkbox"/> Wafer Bump Material	<input type="checkbox"/> Wafer Bump Process		
<input type="checkbox"/> Wafer Fab Site	<input type="checkbox"/> Wafer Fab Materials	<input type="checkbox"/> Wafer Fab Process		
	<input type="checkbox"/> Part number change			

### PCN Details

**Description of Change:**

This notification is to announce a die enhancement to the affected product families listed in the Products Affected section of this document. This change will result in enhanced manufacturability for these products. There is no change to device performance or datasheet specifications.

Affected devices are listed in the product affected section of this document.

**Reason for Change:**

Die Enhancement

**Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):**

None

**Changes to product identification resulting from this PCN:**

Die Rev designator (Aizu fab only) will change as shown in the table and sample label below:

Current		New	
Product Family	Wafer fab	Die Rev [2P]	Die Rev [2P]
OPA2317/2330/2333, TLV2333	Aizu	C	E

Current		New	
Product Family	Wafer fab	Die Rev [2P]	Die Rev [2P]
OPA317/330/333, TLV333	Aizu	F	A

Sample product shipping label (not actual product label)



MADE IN: Malaysia  
2DC: 20:

MSL 2 / 260C / 1 YEAR	SEAL DT
MSL 1 / 235C / UNLIM	03/29/04

OPT:  
ITEM: 39  
LBL: 5A (L) TO: 1750





(1P) SN74LS07NSR  
(Q) 2000 (D) 0336  
(31T) LOT: 3959047MLA  
(4W) TKY (1T) 7523483S12  
(P)  
(2P) REV: (V) 0033317  
(20L) 030: SHE (21L) CCO: USA  
(22L) ASO: MLA (23L) ACO: MYS

**Product Affected:**

OPA2317ID	OPA2330AIDRG4	OPA317ID	OPA333AIDBVRG4
OPA2317IDGKR	OPA2333AID	OPA317IDBVR	OPA333AIDBVT
OPA2317IDGKT	OPA2333AIDG4	OPA317IDBVT	OPA333AIDBVTG4
OPA2317IDR	OPA2333AIDGKR	OPA317IDR	OPA333AIDG4
OPA2330AID	OPA2333AIDGKRG4	OPA330AID	OPA333AIDR
OPA2330AIDGKR	OPA2333AIDGKT	OPA330AIDBVR	OPA333AIDRG4
OPA2330AIDGKRG4	OPA2333AIDGKTG4	OPA330AIDBVRG4	TLV2333IDGKR
OPA2330AIDGKT	OPA2333AIDR	OPA330AIDBVT	TLV2333IDGKT
OPA2330AIDR	OPA2333AIDRBR	OPA330AIDBVTG4	TLV2333IDR
OPA2330AIDRBR	OPA2333AIDRBRG4	OPA330AIDR	TLV333IDBVR
OPA2330AIDRBRG4	OPA2333AIDRBT	OPA330AIDRG4	TLV333IDBVT
OPA2330AIDRBT	OPA2333AIDRBTG4	OPA333AID	TLV333IDR
OPA2330AIDRBTG4	OPA2333AIDRG4	OPA333AIDBVR	

**Qualification Report**  
**OPA2333 die qualification in AIZU**  
 Approve Date 29-Aug-2016

Product Attributes

Attributes	Qual Device: OPA2333AIDGKR	Qual Device: OPA2333AIDR	Qual Device: OPA2333AIDRBR	QBS Process Reference: BUF12840AIRGE	QBS Process Reference: INA210AIDCK	QBS Process Reference: INA219AIDCN	QBS Process Reference: OPA2333AIDGK	QBS Package Reference: SN0903048DRG	QBS Package Reference: SNS5HVD1780DR	QBS Package Reference: SNS5LVC222DR	QBS Package Reference: SNT4LV138ATDR	QBS Package Reference: TH5430AIDGK	QBS Package Reference: TL1454ACDDBR	QBS Package Reference: TPA4860DR	QBS Package Reference: TPS51427ARH8	QBS Package Reference: TPS51620RHA8	QBS Package Reference: TPS51042DRB	QBS Package Reference: TP582410DRC
Assembly Site	ASESH	MLA	MLA	CLARK	HNT	NS2	ASESH	MLA	MLA	TAI	MLA	ASESH	MLA	TAI	MLA	MLA	MLA	MLA
Package Family	VSSOP	SOIC	SON	VQFN	SOT	SOT	VSSOP	SON 3X3	SOIC	SOIC	SOIC	VSSOP	SSOP	SOIC	VQFN	VQFN	SON	SON
Flammability Rating	UL94 Class V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL94 Class 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	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL 94 V-0
Wafer Fab Supplier	AIZU	AIZU	AIZU	AIZU	AIZU	AIZU	AIZU	DM055	DM055	FFAB	SFAB	FFAB	SFAB	DFAB	MIH08	DFAB	MIH08	FFAB
Wafer Process	50HPA07	50HPA07	50HPA07	50HPA07	50HPA07	50HPA07	50HPA07	50HPA07	LBC5X	RF_BICOM3	EPIC1-S_DJM	BICOM3	J11	LBC3S	LBC7	LBC4X	3370A12	3370A12

- QBS: Qual by Similarity  
 - Qual Devices qualified at LEVEL1-260CG: OPA2333AIDR, OPA2333AIDGKR  
 - Qual Device OPA2333AIDRBR 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: OPAZ2333AI DGKR	Qual Device: OPAZ2333AI DR	Qual Device: OPAZ2333AI DRBR	QBS Process Reference: BUF12840AI RGE	QBS Process Reference: INA210AIDC K	QBS Process Reference: INA210AIDC N	QBS Process Reference: OPAZ2333AI DGK	QBS Package Reference: SN890204SD RG	QBS Package Reference: SN65HVD17 80DR	QBS Package Reference: SN65LVCP2 2DR	QBS Package Reference: SN74LV138 ATDR	QBS Package Reference: TH54004DG K	QBS Package Reference: TL145AICD BR	QBS Package Reference: TPA4860D R	QBS Package Reference: TPS5142Z ARHB	QBS Package Reference: TPS51620 RHAR	QBS Package Reference: TPS61042 DRB	QBS Package Reference: TPS62410 DRC	
AC	Autoclave 121C	96 Hours	-	-	-	-	-	-	-	-	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0	1/77/0	3/231/0	3/231/0	-	3/231/0	
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	-	-	-	-	-	-	-	-	-	-	
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	-	-	-	-	1/77/0	1/77/0	1/77/0	3/231/0	-	-	-	3/231/0	-	-	-	-	-	3/228/0	-
HBM	ESD - HBM	4000 V	-	1/3/0	1/3/0	-	-	-	-	3/9/0	-	-	-	-	-	-	-	-	-	-	
CDM	ESD - CDM	1500 V	1/3/0	1/3/0	1/3/0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3/9/0	
HTOL	Life Test, 150C	300 Hours	-	1/77/0	-	1/77/0	1/77/0	1/77/0	1/77/0	1/77/0	-	-	-	-	-	-	-	-	-	-	
HTOL	Life Test, 155C	240 Hours	-	-	-	-	-	-	-	-	-	-	-	3/231/0	-	-	-	-	-	3/231/0	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	-	-	-	1/77/0	1/77/0	1/77/0	-	1/77/0	-	3/231/0	-	3/231/0	3/227/0	-	3/231/0	3/230/0	-	3/231/0	
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	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0	-	-	-	-	-	-	-	-	-	-	
PD	Physical Dimensions	--	-	-	-	-	-	-	-	-	-	-	-	1/20/0	-	-	-	-	-	3/15/0	
PKG	Lead Finish Adhesion	Leads	-	-	-	-	-	-	-	-	-	-	-	3/49/0	-	-	-	-	-	-	
SD	Surface Mount Solderability	8 Hours Steam Age	-	-	-	-	-	-	-	-	-	-	-	3/66/0	-	-	-	-	-	-	
SD	Surface Mount Solderability	Pb Free	-	-	-	-	-	-	-	-	-	-	-	3/66/0	-	-	-	-	-	-	
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	-	1/77/0	1/77/0	1/77/0	1/77/0	3/175/0	3/231/0	3/231/0	3/231/0	3/212/0	3/231/0	1/77/0	3/231/0	3/231/0	-	3/231/0	
TS	Thermal Shock, -65/150C	500 Cycles	-	-	-	-	-	-	-	-	-	-	-	3/231/0	-	-	3/231/0	3/231/0	-	3/231/0	
UHAST	Unbiased HAST, 130C/85%RH	96 Hours	-	-	-	1/77/0	1/77/0	1/77/0	1/77/0	2/154/0	-	-	-	-	-	-	-	-	-	-	
WBP	Bond Pull	Wires	-	-	-	-	-	-	-	-	-	-	-	3/240/0	-	-	-	-	-	3/228/0	3/228/0
WBS	Ball Bond Shear	Wires	-	-	-	-	-	-	-	-	-	-	-	3/240/0	-	-	-	-	-	3/90/0	3/228/0

- Preconditioning was performed for Autoclave, Unbiased HAST, THS/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**  
**OPA333 die shrink qualification in AIZU**  
**Approve Date 15-Nov-2016**

**Product Attributes**

Attributes	Qual Device: OPA333AID	Qual Device: OPA333AIDBV	Qual Device: OPA333AIDCK	QBS Process Reference: OPA2333AIDGK	QBS Process Reference: TMP431ADGK	QBS Package Reference: OPA2330AIDR	QBS Package Reference: OPA333AIDCK	QBS Package Reference: SN74AHCT14DR	QBS Package Reference: SN74LVC86ADR	QBS Package Reference: TL431CDBV	QBS Package Reference: TP53808G50QDBVRQ1	QBS Package Reference: T512A4517DR
Die Attributes	-	-	-	-	-	-	-	-	-	-	-	-
Die Revision	A	A	A	C	B	C	F	D	K	E	A	A
Wafer Fab Supplier	AIZU	AIZU	AIZU	AIZU	AIZU	AIZU	AIZU	SFAB	FFAB	SFAB	FFAB	DFAB
Wafer Process	50HPA07	50HPA07	50HPA07	50HPA07	50HPA07	50HPA07	50HPA07	EPIC1TS1	ACTPI	JI Bipolar	3370A12X3	LBC3S
Die Size (L,W) (mm)	0.676 X 0.796	0.676 X 0.796	0.676 X 0.796	1.04 X 1.56	1.14 X 2.13	1.04 X 1.57	0.83 X 0.99	0.84 X 0.97	1.02 X 0.84	1.0287 X 1.26/46	1.44 X 0.78	0.55 X 0.59
Passivation	8KASION	8KASION	8KASION	8KASION	8KASION	8KASION	8KASION	-	-	10KACN	CN 11KA	-
Package Attributes	-	-	-	-	-	-	-	-	-	-	-	-
Assembly Site	MLA	UTAC	NFME	ASESH	HNY	MLA	NFME	MLA	MLA	UTAC	UTAC	MLA
Package Family	SOIC	SOT	SOT	VSSOP	VSSOP	SOIC	SOT	SOIC	SOIC	SOT	SOT	SOIC
Package Designator	D	DBV	DCK	DGK	DGK	D	DCK	D	D	DBV	DBV	D
Package Size (mils)	192.9 X 153.9	114.17 X 63	78.74 X 49.21	118.11 X 118.11	118.11 X 118.11	192.9 X 153.9	78.74 X 49.21	340.55 X 153.93	340.55 X 153.93	114.17 X 63	114.17 X 63	192.9 X 153.9
Body Thickness (mils)	62.2	47.24	35.43	38.18	39.37	62.2	35.43	62.2	62.2	47.24	47.24	62.2
Pin Count	8	5	5	8	8	8	5	14	14	5	6	8
Lead Frame Type	Cu	Cu	Cu	Cu	Cu	Cu	Cu	Cu	Cu	Cu	Cu	Cu
Lead Finish	NIPdAu	NIPdAu	NIPdAu	NIPdAuAg	NIPdAu	NIPdAu	NIPdAu	NIPdAu	NIPdAu	NIPdAu	NIPdAu	NIPdAu
Lead Pitch(mils)	50	37.4	25.59	25.59	25.59	50	25.59	50	50	37.4	37.4	50
Mount Compound Supplier	HENKEL	HENKEL	HENKEL	HITACHI	HENKEL	HITACHI	HENKEL	HITACHI	HITACHI	HENKEL	HENKEL	HITACHI
Mount Compound Supplier Number	QM1505MT	ABLEBOND 84-1LM1SH4	ABLECOAT 8006NS	EN-4900G	Ablebond 84-1LM1SH4	EN-4088Z	AbleCoat 8006NS	EN-4088Z	EN-4088Z	Ablebond 84-1LM1SH4	Ablebond 84-1LM1SR4	EN-4088Z
Mold Compound Supplier	Sumitomo	Sumitomo	Sumitomo	Sumitomo	Sumitomo	Sumitomo	Sumitomo	Sumitomo	Sumitomo	Sumitomo	Sumitomo	Sumitomo
Mold Compound Supplier Number	EME-G633C	EME-G600	EME-G600F	EME-G700LY	EME-G700FGT	EME-G633C	EME-G600F	EME-G633C	EME-G633C	EME-G600	EME-G600	EME-G633C
Bond Wire Composition	Au	Au	Au	Au	Au	Cu	Au	Cu	Cu	Au	Au	Cu
Bond Wire Diameter(mils)	0.96	1.0	1.0	1.0	1.0	0.96	1.0	0.96	0.96	1.0	1.0	0.96
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0	UL94 Class V-0	UL94 Class 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

- QBS: Qual By Similarity  
- Qual Device OPA333AIDCK is qualified at LEVEL 1-260C  
- Qual Device OPA333AIDBV is qualified at LEVEL 1-260C  
- Qual Device OPA333AID is qualified at LEVEL 1-260C

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

Type	Test Name / Condition	Duration	Qual Device: OPA333AID	Qual Device: OPA333AIDBV	Qual Device: OPA333AIDCK	QBS Process Reference: OPA2333AIDGK	QBS Process Reference: TMP431ADGK	QBS Package Reference: OPA2330AIDR	QBS Package Reference: OPA333AIDCK	QBS Package Reference: SN74AHCT14DR	QBS Package Reference: SN74LVC86ADR	QBS Package Reference: TL431CDBV	QBS Package Reference: TP53808G50QDBVRQ1	QBS Package Reference: T512A4517DR
AC	Autoclave 121C	96 Hours	-	-	-	-	-	3/230/0	-	3/231/0	3/218/0	-	-	3/231/0
CDM	ESD - CDM	1000 V	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-	3/9/0	-	-	-	-	-
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	Pass	Pass	Pass	-	-	-	-	-	-	-
HAST	biased HAST 130C/85%RH	96 Hours	-	-	-	1/77/0	2/154/0	-	3/231/0	-	-	-	3/231/0	-
HBM	ESD - HBM	2500 V	-	-	-	1/3/0	1/3/0	-	-	-	-	-	-	-
HBM	ESD - HBM	4000 V	-	1/3/0	1/3/0	-	-	-	-	-	-	-	-	-
HTOL	Life Test, 150C	300 Hours	-	-	1/77/0	1/77/0	2/154/0	-	3/228/0	-	-	-	-	-
HTSL	High Temp Storage Bake 170C	420 Hours	-	-	-	-	-	3/231/0	3/231/0	3/205/0	-	-	1/45/0	3/231/0
LI	Lead Fatigue	Leads	-	-	-	-	-	-	-	3/66/0	-	-	-	3/66/0
LU	Latch-up	Per JESD78	-	1/6/0	1/6/0	1/6/0	1/6/0	-	3/18/0	-	-	-	-	-
SD	Solderability	Pb-Free/Solder-	-	-	-	-	-	-	3/99/0	-	-	-	-	-
TC	temperature Cycle -65/150C	500 Cycles	-	-	-	1/77/0	2/154/0	3/222/0	3/231/0	3/231/0	3/231/0	-	3/231/0	3/198/0
UHAST	Unbiased HAST 130C/85%RH	96 Hours	-	-	-	1/77/0	2/154/0	-	-	-	-	-	-	-

- 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 165C/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 Website: <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 you can contact your local Field Sales Representative.

<b>Location</b>	<b>E-Mail</b>
USA	<a href="mailto:PCNAmericasContact@list.ti.com">PCNAmericasContact@list.ti.com</a>
Europe	<a href="mailto:PCNEuropeContact@list.ti.com">PCNEuropeContact@list.ti.com</a>
Asia Pacific	<a href="mailto:PCNAsiaContact@list.ti.com">PCNAsiaContact@list.ti.com</a>
Japan	<a href="mailto:PCNJapanContact@list.ti.com">PCNJapanContact@list.ti.com</a>