

PCN Number:	20220317000.1	PCN Date:	March 30, 2022
Title:	Qualification of new Fab site (FFAB) using qualified Process Technology, Die Revision, Datasheet update and additional Assembly site for select devices		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Jun 30, 2022	Estimated Sample Availability:	Date provided at sample request.
Change Type:			
<input checked="" type="checkbox"/>	Assembly Site	<input type="checkbox"/>	Assembly Process
<input checked="" type="checkbox"/>	Design	<input checked="" type="checkbox"/>	Electrical Specification
<input type="checkbox"/>	Test Site	<input checked="" type="checkbox"/>	Packing/Shipping/Labeling
<input type="checkbox"/>	Wafer Bump Site	<input type="checkbox"/>	Wafer Bump Material
<input checked="" type="checkbox"/>	Wafer Fab Site	<input checked="" type="checkbox"/>	Wafer Fab Materials
		<input type="checkbox"/>	Part number change

PCN Details

Description of Change:

Texas Instruments is pleased to announce the qualification of a new fab & process technology (FFAB, BICOMHD) and additional Assembly site (MLA) for selected devices as listed below in the product affected section.



Current Fab Site			Additional Fab Site		
Current Fab Site	Process	Wafer Diameter	Additional Fab Site	Process	Wafer Diameter
DL-LIN	BICOM	150 mm	FFAB	BICOMHD	200 mm

The die was also changed as a result of the process change.

Construction differences are noted below:

	TAI	MLA
Bond wire	0.96mil Au	1.0mil Cu

Package Marking difference (sample):

	TAI	MLA
		
Pin 1 ID	Stripe	Dot

The datasheet will be changing as a result of the above mentioned changes. The datasheet change details can be reviewed in the datasheet revision history. The link to the revised datasheet is available in the table below.

Changes from Revision C (September 2015) to Revision D (March 2022)	Page
• Updated the numbering format for tables, figures, and cross-references throughout the document.....	1
• Updated <i>Features</i> section.....	1
• Updated <i>Applications</i> section.....	1
• Updated <i>Description</i> section.....	1
• Changed nominal body size for both SOIC and MSOP-PowerPAD packages in <i>Description</i> section.....	1
• Updated <i>Pin Configuration and Functions</i> section.....	4
• Added Supply turn-on/off dV/dT specification to <i>Absolute Maximum Ratings</i> table.....	5
• Added continuous input current specification to <i>Absolute Maximum Ratings</i> table.....	5
• Changed differential input voltage in <i>Absolute Maximum Ratings</i> table from $\pm 3V$ to $\pm 1.5V$	5
• Changed charged-device model (CDM) reference from JESD22-C101 to JS-002 in <i>ESD Ratings</i> table.....	5
• Changed minimum temperature range from $0.4^{\circ}C$ to $-40^{\circ}C$ in <i>Recommended Operating Conditions</i> table.....	5
• Updated thermal specifications for D package in <i>Thermal Information</i> table.....	6
• Changed typical offset voltage vs temperature from $\pm 5 \mu V/^{\circ}C$ to $\pm 2.5 \mu V/^{\circ}C$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed PSRR minimum limit of $316 \mu V/V$ to maximum limit in <i>Electrical Characteristics: OPA1632D</i> table ...	7
• Changed typical input bias current limit from $2\mu A$ to $7.9\mu A$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed Max input bias current limit from $6\mu A$ to $14\mu A$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed typical input voltage noise from $1.3nV/\sqrt{Hz}$ to $1.25nV/\sqrt{Hz}$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed typical input current noise from $0.4 pA/\sqrt{Hz}$ to $1.7 pA/\sqrt{Hz}$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed input impedance spec to show both common-mode and differential impedances in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed SSBW at $G = +2$, $R_F = 602 \Omega$ from $90 MHz$ to $104 MHz$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed SSBW at $G = +5$, $R_F = 1.5 k\Omega$ from $36 MHz$ to $46 MHz$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed SSBW at $G = +5$, $R_F = 1.5 k\Omega$ from $18 MHz$ to $24 MHz$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed typical Large-Signal Bandwidth from $800 kHz$ to $1.8 MHz$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed typical slew rate from $50 V/\mu s$ to $72 V/\mu s$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed typical rise/fall time from $100 ns$ to $69 ns$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed typical settling time to 0.1% from $75 ns$ to $36 ns$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed typical settling time to 0.01% from $200 ns$ to $49ns$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed typical THD+N with Differential Input/Output and $R_L = 600 \Omega$ from 0.0003% to 0.00003% in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed typical THD+N with Differential Input/Output and $R_L = 2k\Omega$ from 0.000022% to 0.000028% in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed typical THD+N with single-ended Input/Output and $R_L = 600\Omega$ from 0.000059% to 0.000036% in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed typical THD+N with single-ended Input/Output and $R_L = 2k\Omega$ from 0.000043% to 0.000031% in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed IMD at differential input/output and $R_L = 600\Omega$ from 0.00008% to 0.000061% in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed IMD at differential input/output and $R_L = 2k\Omega$ from 0.00005% to 0.000061% in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed IMD at single-ended input/output and $R_L = 600\Omega$ from 0.0001% to 0.00007% in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed IMD at single-ended input/output and $R_L = 2k\Omega$ from 0.0007% to 0.000073% in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Removed specified operating voltage specifications from <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed typical I_Q from $14mA$ to $13mA$ in <i>Electrical Characteristics: OPA1632D</i> table.....	7
• Changed title of <i>Electrical Characteristics</i> table to <i>Electrical Characteristics: OPA1632DGN</i>	9

• Changed test condition of power-down shutdown current from $V_{ENABLE} = -15\text{ V}$ to $V_S = \pm 5\text{ V}$, $V_{ENABLE} = -5\text{ V}$ for <i>Electrical Characteristics: OPA1632DGN Package</i>	9
• Added power-down shutdown current spec at $V_{ENABLE} = -15\text{ V}$ for <i>Electrical Characteristics: OPA1632DGN table</i>	9
• Changed max specified operating voltage from $\pm 16\text{ V}$ to $\pm 15\text{ V}$ on <i>Electrical Characteristics: OPA1632DGN table</i> to align with recommended operating conditions.....	9
• Removed typical specified operating voltage from <i>Electrical Characteristics: OPA1632DGN table</i>	9
• Changed typical sinking short-circuit current from 85 mA to -85 mA on <i>Electrical Characteristics: OPA1632DGN table</i>	9
• Added new Typical Characteristics section for D package.....	11
• Updated <i>Fully-Differential Amplifiers</i> section.....	15
• Updated <i>Feature Description</i> section.....	15
• Updated <i>Output Common-Mode Voltage</i> section.....	17
• Updated <i>Resistor Matching</i> section.....	17
• Updated <i>Application Curves</i> section.....	19
• Updated <i>Power Supply Recommendations</i> section.....	20
• Updated the <i>Power Dissipation and Thermal Considerations</i> section.....	21
• Updated <i>Layout Example</i> section.....	22
• Changed list of documentation in <i>Related Documentation</i> section.....	24



Changes from Revision I (August 2015) to Revision J (March 2022) Page

• Updated the numbering format for tables, figures, and cross-references throughout the document.....	1
• Updated <i>Features</i> section.....	1
• Updated <i>Applications</i> section.....	1
• Updated <i>Description</i> section.....	1
• Updated <i>Available Device Packages</i> table.....	5
• Removed <i>Device Description</i> table.....	5
• Updated <i>Pin Configuration and Functions</i> section.....	5
• Changed footnote 1 on <i>Absolute Maximum Ratings</i> table to add additional clarification.....	6
• Removed minimum supply voltage on <i>Absolute Maximum Ratings</i> table.....	6
• Removed continuous total power dissipation specification in <i>Absolute Maximum Ratings</i> table.....	6
• Added continuous input current specification to <i>Absolute Maximum Ratings</i> table.....	6
• Changed charged-device model (CDM) reference from JESD22-C101 to JS-002 in <i>ESD Ratings</i> table.....	6
• Updated thermal specifications for D package in <i>Thermal Information</i> table.....	7
• Changed VSSOP and HVSSOP to MSOP and MSOP-PowerPad in <i>Thermal Information</i> table.....	7
• Changed small signal bandwidth at $G = 1$, $V_{CC} = 5\text{ V}$ from 125 MHz to 165 MHz in <i>Electrical Characteristics: THS413xD table</i>	7
• Changed small signal bandwidth at $G = 1$, $V_{CC} = \pm 5\text{ V}$ from 135 MHz to 166 MHz in <i>Electrical Characteristics: THS413xD table</i>	7
• Changed small signal bandwidth at $G = 1$, $V_{CC} = \pm 15\text{ V}$ from 150 MHz to 170 MHz in <i>Electrical Characteristics: THS413xD table</i>	7
• Changed small signal bandwidth at $G = 2$, $V_{CC} = 5\text{ V}$ from 80 MHz to 97 MHz in <i>Electrical Characteristics: THS413xD table</i>	7
• Changed small signal bandwidth at $G = 2$, $V_{CC} = \pm 5\text{ V}$ from 85 MHz to 98 MHz in <i>Electrical Characteristics: THS413xD table</i>	7
• Changed small signal bandwidth at $G = 2$, $V_{CC} = \pm 15\text{ V}$ from 90 MHz to 100 MHz in <i>Electrical Characteristics: THS413xD table</i>	7
• Changed slew rate from 52 V/ μs to 67 V/ μs in <i>Electrical Characteristics: THS413xD table</i>	7
• Changed settling time to 0.1% typical specification from 78 ns to 39 ns on <i>Electrical Characteristics: THS413xD table</i>	7

- Changed settling time to 0.01% typical specification from 213 ns to 61 ns on *Electrical Characteristics: THS413xD table* 7
- Changed THD typical at $V_{CC} = 5\text{ V}$, $f = 250\text{ kHz}$ from -95 dBc to -101 dBc in *Electrical Characteristics: THS413xD table* 7
- Changed THD typical at $V_{CC} = 5\text{ V}$, $f = 1\text{ MHz}$ from -81 dBc to -87 dBc in *Electrical Characteristics: THS413xD table* 7
- Changed THD typical at $V_{CC} = \pm 5\text{ V}$, $f = 250\text{ kHz}$ from -96 dBc to -100 dBc in *Electrical Characteristics: THS413xD table* 7
- Changed THD typical at $V_{CC} = \pm 5\text{ V}$, $f = 1\text{ MHz}$ from -80 dBc to -87 dBc in *Electrical Characteristics: THS413xD table* 7
- Changed THD typical at $V_{CC} = \pm 15\text{ V}$, $f = 250\text{ kHz}$ from -97 dBc to -102 dBc in *Electrical Characteristics: THS413xD table* 7
- Changed THD typical at $V_{CC} = \pm 15\text{ V}$, $f = 1\text{ MHz}$ from -80 dBc to -88 dBc in *Electrical Characteristics: THS413xD table* 7
- Changed THD typical at $V_{CC} = \pm 5\text{ V}$, $f = 250\text{ kHz}$, $V_O = 4V_{PP}$ from -91 dBc to -94 dBc in *Electrical Characteristics: THS413xD table* 7
- Changed THD typical at $V_{CC} = \pm 5\text{ V}$, $f = 1\text{ MHz}$, $V_O = 4V_{PP}$ from -75 dBc to -79 dBc in *Electrical Characteristics: THS413xD table* 7
- Changed THD typical at $V_{CC} = \pm 15\text{ V}$, $f = 250\text{ kHz}$, $V_O = 4V_{PP}$ from -91 dBc to -95 dBc..... 7
- Changed THD typical at $V_{CC} = \pm 15\text{ V}$, $f = 1\text{ MHz}$, $V_O = 4V_{PP}$ from -75 dBc to -80 dBc in *Electrical Characteristics: THS413xD table* 7
- Changed SFDR typical at $V_{CC} = \pm 2.5\text{ V}$, $V_O = 2\text{ V}_{PP}$ from 97 dB to 103 dB in *Electrical Characteristics: THS413xD table* 7
- Changed SFDR typical at $V_{CC} = \pm 5\text{ V}$, $V_O = 2\text{ V}_{PP}$ from 98 dB to 106 dB in *Electrical Characteristics: THS413xD table* 7
- Changed SFDR typical at $V_{CC} = \pm 15\text{ V}$, $V_O = 2\text{ V}_{PP}$ from 99 dB to 108 dB in *Electrical Characteristics: THS413xD table* 7
- Changed SFDR typical at $V_{CC} = \pm 5\text{ V}$, $V_O = 4\text{ V}_{PP}$ from 98 dB to 106 dB in *Electrical Characteristics: THS413xD table* 7
- Changed SFDR typical at $V_{CC} = \pm 15\text{ V}$, $V_O = 4\text{ V}_{PP}$ from 95 dB to 100 dB in *Electrical Characteristics: THS413xD table* 7
- Changed input voltage noise typical from 1.3 nV/ $\sqrt{\text{Hz}}$ to 1.25 nV/ $\sqrt{\text{Hz}}$ on *Electrical Characteristics: THS413xD table*..... 7
- Changed input current noise typical from 1.3 nV/ $\sqrt{\text{Hz}}$ to 1.7 nV/ $\sqrt{\text{Hz}}$ on *Electrical Characteristics: THS413xD table*..... 7
- Changed common-mode input offset voltage maximum from 3.5 mV to 5.5 mV in *Electrical Characteristics: THS413xD table* 7
- Changed typical input offset voltage drift from 4.5 $\mu\text{V}/^\circ\text{C}$ to 2 $\mu\text{V}/^\circ\text{C}$ in *Electrical Characteristics: THS413xD table* 7
- Changed typical input bias current spec from 2 μA to 5 μA in *Electrical Characteristics: THS413xD table* 7
- Changed Max input bias current limit from 6 μA to 15.4 μA in *Electrical Characteristics: THS413xD table* 7
- Changed typical offset current drift from 2 nA/ $^\circ\text{C}$ to 1 nA/ $^\circ\text{C}$ in *Electrical Characteristics: THS413xD table* 7
- Removed input resistance specification from *Electrical Characteristics: THS413xD table* 7
- Added common-mode input resistance and differential input resistance specifications to *Electrical Characteristics: THS413xD table* 7
- Removed input capacitance, closed loop specification from *Electrical Characteristics: THS413xD table* 7
- Added common-mode input capacitance, closed loop and differential input capacitance, closed loop specifications to *Electrical Characteristics: THS413xD table* 7
- Changed minimum output current at $\pm 15\text{ V}$, $T_A = 25^\circ\text{C}$, from 60 mA to 65 mA in *Electrical Characteristics: THS413xD table* 7
- Changed minimum output current at $\pm 15\text{ V}$, full temperature range, from 65 mA to 60 mA in *Electrical Characteristics: THS413xD table* 7
- Changed Typical I_{CC} at $V_{CC} = \pm 5\text{ V}$ from 12.3 mA to 10.3 mA in *Electrical Characteristics: THS413xD table* 7

- Changed title of *Electrical Characteristics* table to *Electrical Characteristics: THS413xDGK, THS413xDGN* 9
- Changed min/max single power supply range from 4V/33 V to 5V/30 V on *Electrical Characteristics: THS413xDGK, THS413xDGN* table to align with recommended operating conditions..... 9
- Changed min/max dual power supply range from $\pm 2V/\pm 16.5 V$ to $\pm 2.5 V/\pm 15 V$ on *Electrical Characteristics: THS413xDGK, THS413xDGN* table to align with recommended operating conditions..... 9
- Removed *Dissipation Ratings* table..... 9
- Changed minimum output current under $V_{CC} = \pm 15 V, R_L = 7 \Omega, T_A = +25^\circ C$, from 60 mA to 65 mA on *Electrical Characteristics: THS413xDGK, THS413xDGN* table..... 9
- Changed minimum output current under $V_{CC} = \pm 15 V, R_L = 7 \Omega, T_A = \text{full range}$, from 65 mA to 60 mA on *Electrical Characteristics: THS413xDGK, THS413xDGN* table..... 9
- Added new Typical Characteristics section for D package..... 11
- Updated Overview Section..... 21
- Updated Feature Description section..... 22
- Updated Power-Down Mode section..... 22
- Added Output Common-Mode Voltage section..... 24
- Updated Resistor Matching section..... 24
- Updated Driving a Capacitive Load section..... 25
- Updated Data Converters section..... 25
- Updated Single-Supply Applications section..... 26
- Updated large-signal frequency response figure in Application Curve section 28
- Updated Power Supply Recommendations section..... 28
- Updated Layout Guidelines section..... 28
- Updated Layout Example section..... 29
- Changed list of documentation in Related Documentation section..... 31

Product Family	Current Datasheet Number	New Datasheet Number	Link to full datasheet
OPA1632	SBOS286C	SBOS286D	http://www.ti.com/product/OPA1632
THS413x	SLOS318I	SLOS318J	http://www.ti.com/product/THS4130

Qual details are provided in the Qual Data Section.

Reason for Change:

These changes are part of our multiyear plan to transition products from our 150-millimeter factories to newer, more efficient manufacturing processes and technologies, underscoring our commitment to product longevity and supply continuity.

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
<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change

Changes to product identification resulting from this PCN:

Fab Site Information:

Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
DL-LIN	DLN	USA	Dallas
FR-BIP-1	TID	DEU	Freising

Die Rev:

Current

New

Die Rev [2P]	Die Rev [2P]
A	A

Assembly Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
TI Taiwan	TAI	TWN	Chung Ho
TI Malaysia	MLA	MYS	Kuala Lumpur

Sample product shipping label (not actual product label)

TEXAS INSTRUMENTS
 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)T0:1750

(1P) SN74LS07NSR
 (Q) 2000 (D) 0336
 (31T) LOT: 3959047MLA
 (4W) TKY (1T) 7523483SI2
 (P)
 (2P) REV: (V) 0033317
 (20L) ~~SSO: SHE~~ (21L) ~~CCO: USA~~
 (22L) ASO: MLA (23L) ACO: MYS

Product Affected:

OPA1632D	THS4130CDG4	THS4131CD	THS4131IDG4
OPA1632DG4	THS4130ID	THS4131CDG4	THS4131IDR
OPA1632DR	THS4130IDR	THS4131CDR	
THS4130CD	THS4130IDRG4	THS4131ID	

Qualification Report

Approve Date 12-Aug-2021

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: THS4130ID	QBS Process Reference: OPA2810IDGK	QBS Package Reference: OPA348AIDR	QBS Package Reference: TL7702ACDR	QBS Package Reference: TLV9032QDRQ1
HTOL	Life Test, 125C	1000 Hours	-	3/231/0	-	-	-
ELFR	Early Life Failure Rate, 125C	48 Hours	-	3/2400/0	-	-	-
HBM	ESD - HBM	2500 V	1/3/0	3/9/0	-	-	-
HBM	ESD - HBM - Q100	2000 V/ESDH	-	-	-	-	1/3/0
CDM	ESD - CDM	1500 V	1/3/0	2/6/0	-	-	-
CDM	ESD - CDM - Q100	1500 V/ESDC	-	-	-	-	1/3/0
LU	Latch-up	Per JESD78	1/6/0	3/18/0	-	-	1/6/0
ED	Electrical Characterization	Per Datasheet Parameters	1/30/0	3/90/0	-	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	-	3/231/0	3/224/0	3/231/0	3/231/0
AC	Autoclave 121C	96 Hours	-	-	3/231/0	3/231/0	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0	-	-	3/231/0
HTSL	High Temp Storage Bake 150C	1000 Hours	-	-	-	-	3/231/0
HTSL	High Temp Storage Bake 170C	420 Hours	-	3/231/0	-	-	-
UHAST	Unbiased HAST 130C/85%RH	96 Hours	-	3/231/0	-	-	3/231/0

- QBS: Qual By Similarity

- Qual Device THS4130ID is qualified at LEVEL1-260C

- 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

Approve Date 01-Dec-2021

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: OPA1632D	QBS Product Reference: THS4130ID	QBS Process Reference: OPA2810IDGK	QBS Package Reference: LM2903BQDRQ1	QBS Package Reference: OPA348AIDR	QBS Package Reference: TL7702ACDR	QBS Package Reference: TLV9032QDRQ1
HTOL	Life Test, 125C	1000 Hours	-	-	3/231/0	-	-	-	-
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	39/3000/0	-	-	-	-
HBM	ESD - HBM	1000 V	-	1/3/0	3/9/0	-	-	-	-
HBM	ESD - HBM	1500 V	-	1/3/0	3/9/0	-	-	-	-
HBM	ESD - HBM	2000 V	-	1/3/0	3/9/0	-	-	-	-
HBM	ESD - HBM	2500 V	-	1/3/0	3/9/0	-	-	-	-
CDM	ESD - CDM	1000 V	-	1/3/0	3/9/0	-	-	-	-
CDM	ESD - CDM	1500 V	-	1/3/0	3/9/0	-	-	-	1/3/0
LU	Latch-up	Per JESD78	-	1/6/0	3/18/0	-	-	-	1/6/0
ED	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	3/90/0	-	-	-	-
AC	Autoclave 121C	96 Hours	-	-	-	1/77/0	3/231/0	3/231/0	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	3/231/0	-	-	-	3/231/0
HTSL	High Temp Storage Bake 150C	1000 Hours	-	-	-	-	-	-	3/231/0
HTSL	High Temp Storage Bake 170C	420 Hours	-	-	3/231/0	-	-	-	-
SD	Surface Mount Solderability	Pb Free	-	-	-	1/15/0	-	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	3/231/0	1/77/0	3/224/0	3/231/0	3/231/0
UHAST	Unbiased HAST 130C/85%RH	96 Hours	-	-	3/231/0	-	-	-	3/231/0
YLD	FTY and Bin Summary	-	1/Pass	-	-	-	-	-	-

- QBS: Qual By Similarity

- Qual Device OPA1632D is qualified at LEVEL1-260C

- 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

Approve Date 01-Dec-2021

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: THS4131D	QBS Product Reference: THS4130ID	QBS Process Reference: OPA2810IDGK	QBS Package Reference: LM2903BQDRQ1	QBS Package Reference: OPA348AIDR	QBS Package Reference: TL7702ACDR	QBS Package Reference: TLV9032QDRQ1
HTOL	Life Test, 125C	1000 Hours	-	-	3/231/0	-	-	-	3/231/0
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	3/3000/0	-	-	-	-
HBM	ESD - HBM	2000 V	-	1/3/0	3/9/0	-	-	-	-
CDM	ESD - CDM	1500 V	-	1/3/0	3/9/0	-	-	-	1/3/0
LU	Latch-up	Per JESD78	-	1/6/0	3/18/0	-	-	-	1/6/0
ED	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	3/90/0	-	-	-	-
AC	Autoclave 121C	96 Hours	-	-	-	1/77/0	3/231/0	3/231/0	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	3/231/0	-	-	-	3/231/0
HTSL	High Temp Storage Bake 150C	1000 Hours	-	-	-	-	-	-	3/231/0
HTSL	High Temp Storage Bake 170C	420 Hours	-	-	3/231/0	-	-	-	-
SD	Surface Mount Solderability	Pb Free	-	-	-	1/15/0	-	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	3/231/0	1/77/0	3/224/0	3/231/0	3/231/0
UHAST	Unbiased HAST 130C/85%RH	96 Hours	-	-	3/231/0	-	-	-	3/231/0-
YLD	FTY and Bin Summary	-	1/Pass	-	-	-	-	-	-

- QBS: Qual By Similarity

- Qual Device THS4131 is qualified at LEVEL1-260C

- 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

For questions regarding this notice, e-mails can be sent to the contact below or your local Field Sales Representative.

Location	E-Mail
WW Change Management Team	PCN_ww_admin_team@list.ti.com

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