

PCN Number:	20231130002.1	PCN Date:	December 05, 2023
Title:	Qualification of RFAB using qualified Process Technology, Die Revision, Datasheet update and additional Assembly Site/BOM options for select devices		
Customer Contact:	Change Management team	Dept:	Quality Services
Proposed 1st Ship Date:	Mar 4, 2024	Sample requests accepted until:	Jan 4, 2024*

***Sample requests received after January 4, 2024 will not be supported.**

Change Type:

<input checked="" type="checkbox"/>	Assembly Site	<input checked="" type="checkbox"/>	Design	<input type="checkbox"/>	Wafer Bump Material
<input checked="" type="checkbox"/>	Assembly Process	<input checked="" type="checkbox"/>	Data Sheet	<input type="checkbox"/>	Wafer Bump Process
<input checked="" type="checkbox"/>	Assembly Materials	<input type="checkbox"/>	Part number change	<input checked="" type="checkbox"/>	Wafer Fab Site
<input type="checkbox"/>	Mechanical Specification	<input type="checkbox"/>	Test Site	<input checked="" type="checkbox"/>	Wafer Fab Material
<input type="checkbox"/>	Packing/Shipping/Labeling	<input type="checkbox"/>	Test Process	<input checked="" type="checkbox"/>	Wafer Fab Process

PCN Details

Description of Change:

Texas Instruments is pleased to announce the qualification of its RFAB fabrication facility as an additional Wafer Fab option in addition to new Assembly sites (MLA/FMX) for the devices listed in the "Product Affected" section.

Current Fab Site			New Fab Site		
Fab Site	Process	Wafer Diameter	Fab Site	Process	Wafer Diameter
DL-LIN	LINCMOS	150 mm	RFAB	HPA9	300 mm

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

Construction differences and Assembly site options are as follows:

Group 1 BOM table (RFAB/Process migration & BOM Option):

	Current	Additional
Bond wire diameter (Cu)	0.96 mil	0.8mil

Group 2 BOM table (RFAB/Process migration plus FMX as additional Assembly site):

	TAI	FMX
Bond wire Composition, diameter	Au, 0.96 mil	Cu, 0.8mil

Group 3 BOM table (RFAB/Process migration plus MLA as additional Assembly site & Bom Option):

	TAI	FMX Current	FMX Additional	MLA
Bond wire diameter (Cu)	0.96 mil	0.96 mil	0.8 mil	0.8 mil

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



TLC555
SLFS043J – AUGUST 1983 – REVISED NOVEMBER 2023

Changes from Revision I (July 2019) to Revision J (November 2023) **Page**

- Changed ESD protection specification from 2000 V per MIL-STD-883C, method 3015.2, to 1000 V per ANSI/ESDA/JEDEC JS-001, in *Features* 1
- Changed *Device Information* table to *Package Information*, and changed *Body Size (Nom)* to *Package Size*, in *Description* section..... 1
- Added *ESD Ratings* table and HBM, CDM, and MM specifications..... 4
- Changed thermal resistance and characterization parameter values for SOIC and PDIP packages in *Thermal Information* table..... 5
- Changed reset current (I_{RESET}) test conditions to $V_{RESET} = V_{DD}$, in *Electrical Characteristics: $V_{DD} = 5\text{ V}$* and *Electrical Characteristics: $V_{DD} = 15\text{ V}$* 6
- Added new reset current (I_{RESET}) typical specification, for test condition $V_{RESET} = 0\text{ V}$, to *Electrical Characteristics: $V_{DD} = 5\text{ V}$* and *Electrical Characteristics: $V_{DD} = 15\text{ V}$* 6
- Changed supply current (I_{DD}) typical value from 170 μA to 180 μA in *Electrical Characteristics: $V_{DD} = 5\text{ V}$* 6
- Changed title of *Operating Characteristics* section to *Timing Characteristics* and clarified that values are specified by design or characterization..... 9
- Deleted Initial error of timing interval specification in *Timing Characteristics* 9
- Added Figure 5-4, *Supply Current vs Supply Voltage, Unit 2* 10
- Changed Figure 5-3, *Supply Current vs Supply Voltage*, to add "Unit 1" to title, and deleted 0°C and 70°C curves..... 10
- Changed functional block diagram to simplified schematic and moved to *Overview* 12
- Updated *Functional Block Diagram* 12
- Added guidance for RESET pin pullup resistance and CONT pin voltage range to *Monostable Operation* ... 12
- Added clarity regarding nominal operating frequency and parasitic terms in *Astable Operation* 14
- Deleted link to deprecated TLC555 Design Calculator in *Astable Operation* 14
- Deleted Figure 17, *Equivalent Schematic*, and added guidance concerning the RESET pin in *Device Functional Modes* 16

Product Folder	Current Datasheet Number	New Datasheet Number	Link to full datasheet
TLC555	SLFS043I	SLFS043J	http://www.ti.com/product/TLC555

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
RFAB	RFB	USA	Richardson

Die Rev:

Current	New
Die Rev [2P]	Die Rev [2P]
F	A

Assembly Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
TAI	TAI	TWN	Chung Ho, New Taipei City
FMX	MEX	MEX	Aguascalientes
MLA	MLA	MYS	Kuala Lumpur

Sample product shipping label (not actual product label):

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

Product Affected:

Group 1 Device list (RFAB/Process migration & BOM Option):

TLC555CDR	TLC555CP	TLC555IP	TLC555QDRNS
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Group 2 Device list (RFAB/Process migration Plus FMX as additional Assembly site)

TLC555QDR	TLC555QDRG4
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Group 3 Device list (RFAB/Process migration Plus MLA as additional Assembly site & Bom Option)

TLC555IDR

For alternate parts with similar or improved performance, please visit the product page on TI.com

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: TLC555JP	QBS Package Reference: LT1013CP	QBS Package Reference: NE5532P	QBS Package Reference: TS12A4514P	QBS Process Reference: OPA391DCKT	QBS Product Reference: TLC555IDR
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	-	3/231/0	-
UHA	A3	Autoclave	121C/15psig	96 Hours	-	-	-	1/77/0	-	-
UHA	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	-	-	3/231/0	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	3/231/0	-	1/77/0	3/231/0	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	3/231/0	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	-	1/77/0	-	-
HTOL	B1	Life Test	125C	1000 Hours	-	-	-	-	3/231/0	-
HTOL	B1	Life Test	150C	300 Hours	-	-	3/231/0	-	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	-	-	3/2400/0	-
SD	C3	PB-Free Solderability	8 Hours Steam Age	-	-	-	3/66/0	-	1/22/0	-

SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes); PB-Free Solder;	-	-	-	3/66/0	-	1/22/0	-
ESD	E2	ESD CDM	-	250 Volts	1/3/0	-	-	-	1/3/0	1/3/0
ESD	E2	ESD HBM	-	1000 Volts	-	-	-	-	1/3/0	1/3/0
LU	E4	Latch-Up	Per JESD78	-	-	-	-	-	1/3/0	1/3/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	-	-	-	-	3/90/0	1/30/0

- QBS: Qual By Similarity
- Qual Device TLC555JP is NOT CLASSIFIED

- 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

TI Qualification ID: R-NPD-2112-058

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: TLC555IDR	QBS Product Reference: TLC555IDR	QBS Process Reference: OPA391DCKT	QBS Package Reference: CD4053BM96	QBS Package Reference: LM358DR	QBS Package Reference: TL494IDR	QBS Package Reference: ULN2003ADR	QBS Package Reference: TLV8542D
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	1/77/0	1/77/0	3/231/0	1/77/0	1/77/0
UHA	A3	Autoclave	121C/15psig	96 Hours	-	-	-	1/77/0	1/77/0	3/231/0	3/231/0	1/77/0
UHA	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	3/231/0	-	-	-	-	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	3/231/0	1/77/0	3/231/0	3/231/0	3/231/0	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	3/231/0	-	-	-	-	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	-	1/77/0	1/77/0	3/231/0	3/231/0	-
HTOL	B1	Life Test	125C	1000 Hours	-	-	3/231/0	-	-	-	-	-
HTOL	B1	Life Test	150C	300 Hours	-	-	-	1/77/0	1/77/0	3/231/0	1/77/0	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	3/2400/0	-	-	-	-	-

Type	#	Test Name	Condition	Duration	Qual Device: TLC555IDR	QBS Product Reference: TLC555IDR	QBS Process Reference: OPA391DCKT	QBS Package Reference: CD4053BM96	QBS Package Reference: LM358DR	QBS Package Reference: TL494IDR	QBS Package Reference: ULN2003ADR	QBS Package Reference: TLV8542D
WBP	C2	Bond Pull	76 Wires, 3 units min	Wires	-	-	-	1/76/0	1/76/0	3/228/0	1/76/0	-
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes); PB-Free Solder;	-	-	-	1/22/0	-	-	-	-	-
ESD	E2	ESD CDM	-	1500 Volts	-	-	-	-	-	-	-	1/3/0
ESD	E2	ESD CDM	-	250 Volts	-	1/3/0	1/3/0	-	-	-	-	-
ESD	E2	ESD HBM	-	1000 Volts	-	1/3/0	1/3/0	-	-	-	-	-
ESD	E2	ESD HBM	-	1500 Volts	-	-	-	-	-	-	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	-	1/3/0	1/3/0	-	-	-	-	1/6/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	-	1/30/0	3/90/0	1/30/0	1/30/0	1/30/0	1/30/0	-

- QBS: Qual By Similarity
- Qual Device TLC555IDR is qualified at MSL1 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/>

TI Qualification ID: R-CHG-2209-039

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: TLC555IDR	QBS Process Reference: OPA391DCKT	QBS Package Reference: TCAN1044VDRQ1	QBS Package Reference: OPA2991QDRQ1
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	-	3/231/0
UHA	A3	Autoclave	121C/15psig	96 Hours	-	-	3/231/0	-
UHA	A3	Unbiased HAST	130C/85%RH	96 Hours	-	3/231/0	-	3/231/0
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	3/231/0	3/231/0	3/231/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	3/231/0	-	3/135/0
HTOL	B1	Life Test	125C	1000 Hours	-	3/231/0	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	3/2400/0	-	-
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	3/66/0	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	3/30/0	3/30/0
ESD	E2	ESD CDM	-	250 Volts	1/3/0	1/3/0	-	-
ESD	E2	ESD CDM	-	500 Volts	-	-	-	1/3/0
ESD	E2	ESD HBM	-	1000 Volts	1/3/0	1/3/0	-	-
ESD	E2	ESD HBM	-	2000 Volts	-	-	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	1/3/0	1/3/0	-	1/6/0

CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	3/90/0	-	3/90/0
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- QBS: Qual By Similarity
- Qual Device TLC555IDR is qualified at MSL1 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

TI Qualification ID: R-NPD-2112-056

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

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