



12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20240221008.1

**Qualification of RFAB using qualified Process Technology, Die Revision, Datasheet
and additional Assembly site options for select devices
Change Notification / Sample Request**

Date: February 21, 2024

To: Newark/Farnell PCN

Dear Customer:

This is an announcement of a change to a device that is currently offered by Texas Instruments (TI). The details of this change are on the following pages, and are in alignment with our standard product change notification (PCN) [process](#).

TI requires acknowledgement of receipt of this notification within 30 days of the date of this notice. Lack of acknowledgement of this notice within 30 days constitutes acceptance and approval of this change. If samples or additional data are required, requests must be received within 30 days of this notification, given that samples are not built ahead of the change.

The Proposed First Ship date in this PCN letter is the earliest possible date that customers could receive the changed material. It is our commitment that the changed device will not ship before that date. If samples are requested within the 30 day sample request window, customers will still have 30-days to complete their evaluation regardless of the proposed 1st ship date.

This particular PCN is related to TI's multiyear transition plan for our two remaining factories with 150-millimeter production (DFAB in Dallas, Texas, and SFAB in Sherman, Texas). DFAB will remain open, but will focus on 200-mm production, with a smaller set of technologies. SFAB will close no earlier than 2024 and no later than 2025. As referenced in the "reason for change" below, these changes are part of our multiyear plan to transition these products to newer, more efficient manufacturing processes and technologies, underscoring our commitment to product longevity and supply continuity.

For questions regarding this notice or to provide acknowledgement of this PCN, you may contact your local Field Sales Representative or the Change Management team. For sample requests or sample related questions, contact your local Field Sales Representative. As always, we thank you for your continued business.

Change Management Team
SC Business Services

20240221008.1
Attachment: 1

Products Affected:

The devices listed on this page are a subset of the complete list of affected devices. According to our records, you have recently purchased these devices. The corresponding customer part number is also listed, if available.

DEVICE	CUSTOMER PART NUMBER
MAX232DR	NULL

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

PCN Number:	20240221008.1	PCN Date:	February 21, 2024																					
Title:	Qualification of RFAB using qualified Process Technology, Die Revision, Datasheet and additional Assembly site options for select devices																							
Customer Contact:	Change Management Team	Dept:	Quality Services																					
Proposed 1st Ship Date:	May 21, 2024	Sample requests accepted until:	March 22, 2024*																					
*Sample requests received after March 22, 2024 will not be supported.																								
Change Type:																								
☒ Assembly Site	☒ Design	☐ Wafer Bump Material																						
☐ Assembly Process	☒ Data Sheet	☐ Wafer Bump Process																						
☐ Assembly Materials	☐ Part number change	☒ Wafer Fab Site																						
☐ Mechanical Specification	☐ Test Site	☒ Wafer Fab Material																						
☒ Packing/Shipping/Labeling	☐ Test Process	☒ 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 an Assembly site options for the devices listed below.																								
<table border="1"> <thead> <tr> <th colspan="3">Current Fab Site</th> <th colspan="3">Additional Fab Site</th> </tr> <tr> <th>Fab Site</th> <th>Process</th> <th>Wafer Diameter</th> <th>Fab Site</th> <th>Process</th> <th>Wafer Diameter</th> </tr> </thead> <tbody> <tr> <td>DL-LIN</td> <td>LBC3S</td> <td>200 mm</td> <td rowspan="2">RFAB</td> <td rowspan="2">LBC7</td> <td rowspan="2">300 mm</td> </tr> <tr> <td>CFAB</td> <td>LBC3S</td> <td>200 mm</td> </tr> </tbody> </table>			Current Fab Site			Additional Fab Site			Fab Site	Process	Wafer Diameter	Fab Site	Process	Wafer Diameter	DL-LIN	LBC3S	200 mm	RFAB	LBC7	300 mm	CFAB	LBC3S	200 mm	
Current Fab Site			Additional Fab Site																					
Fab Site	Process	Wafer Diameter	Fab Site	Process	Wafer Diameter																			
DL-LIN	LBC3S	200 mm	RFAB	LBC7	300 mm																			
CFAB	LBC3S	200 mm																						
The die was also changed as a result of the process change.																								
There are no construction differences, but only additional assembly site qualifications for some of the devices. Please see product affected section below for details.																								
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 link to the revised datasheet is available in the table below.																								
 MAX232 SLLS047N – FEBRUARY 1989 – REVISED FEBRUARY 2024 <table border="0" style="width: 100%;"> <tr> <td style="width: 80%;">Changes from Revision M (November 2004) to Revision N (February 2024)</td> <td style="text-align: right;">Page</td> </tr> <tr> <td>• Changed the Handling Ratings table to the <i>ESD Ratings</i> table.....</td> <td style="text-align: right;">4</td> </tr> <tr> <td>• Changed the <i>Thermal Information</i> table.....</td> <td style="text-align: right;">4</td> </tr> </table>				Changes from Revision M (November 2004) to Revision N (February 2024)	Page	• Changed the Handling Ratings table to the <i>ESD Ratings</i> table.....	4	• Changed the <i>Thermal Information</i> table.....	4															
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 MAX202 SLLS576G – JULY 2003 – REVISED FEBRUARY 2024 <table border="0" style="width: 100%;"> <tr> <td style="width: 80%;">Changes from Revision F (September 2016) to Revision G (February 2024)</td> <td style="text-align: right;">Page</td> </tr> <tr> <td>• Changed the <i>Package Information</i> table.....</td> <td style="text-align: right;">1</td> </tr> <tr> <td>• Changed values in the <i>Thermal Information</i> table.....</td> <td style="text-align: right;">4</td> </tr> </table>				Changes from Revision F (September 2016) to Revision G (February 2024)	Page	• Changed the <i>Package Information</i> table.....	1	• Changed values in the <i>Thermal Information</i> table.....	4															
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 MAX232E SLLS723D – APRIL 2006 – REVISED FEBRUARY 2024 <table border="0" style="width: 100%;"> <tr> <td style="width: 80%;">Changes from Revision C (August 2016) to Revision D (February 2024)</td> <td style="text-align: right;">Page</td> </tr> <tr> <td>• Changed the Device Information table to the <i>Package Information</i> table.....</td> <td style="text-align: right;">1</td> </tr> <tr> <td>• Changed the <i>Thermal Information</i> table.....</td> <td style="text-align: right;">5</td> </tr> </table>				Changes from Revision C (August 2016) to Revision D (February 2024)	Page	• Changed the Device Information table to the <i>Package Information</i> table.....	1	• Changed the <i>Thermal Information</i> table.....	5															
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Changes from Revision D (March 2021) to Revision E (February 2024)	Page
• Changed the numbering format for tables, figures, and cross-references throughout the document.....	1

Changes from Revision E (November 2016) to Revision F (February 2024)	Page
• Changed the <i>Package Information</i> table.....	1
• Changed the <i>Thermal Information</i> table.....	5

Product Folder	Current Datasheet Number	New Datasheet Number	Link to full datasheet
MAX232	SLLS047M	SLLS047N	http://www.ti.com/product/MAX232
MAX202	SLLS576F	SLLS576G	http://www.ti.com/product/MAX202
MAX232E	SLLS723C	SLLS723D	http://www.ti.com/product/MAX232E
TRS232E	SLLS791C	SLLS791D	http://www.ti.com/product/TRS232E
TRS202E	SLLS847E	SLLS847F	http://www.ti.com/product/TRS202E

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 200-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
☒ No Change	☒ No Change	☒ No Change	☒ 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
CFAB	CU3	CHN	Chengdu
DL-LIN	DLN	USA	Dallas
RFAB	RFB	USA	Richardson

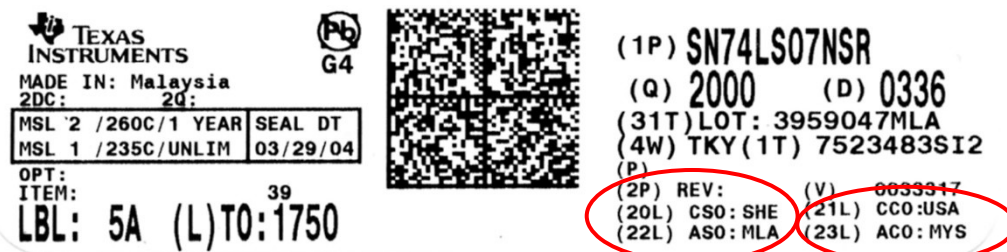
Die Rev:

Current	New
Die Rev [2P]	Die Rev [2P]
A, B, -	-

Assembly Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
ASESH	ASH	CHN	Shanghai
TI Mexico	MEX	MEX	Aguascalientes
MLA	MLA	MYS	Kuala Lumpur

Sample product shipping label (not actual product label):



Product Affected:

Group 1 Device Table (RFAB/Process migration only):

MAX202IDR	MAX232EIN	MAX232IDR	MAX232NSR
MAX202IDRE4	MAX232EINE4	MAX232IDRG4	TRS202EIPWR
MAX202IDWR	MAX232EIPWR	MAX232IDWR	TRS232EIDWR
MAX202IPWR			

Group 2 Device Table (RFAB/Process migration plus TI Mexico as additional Assembly site):

MAX232DR	MAX232ECDR	MAX232EIDR	TRS202EIDR
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Group 3 Device Table (RFAB/Process migration plus TI Malaysia as additional Assembly site):

MAX232N	MAX232NE4
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For alternate parts with similar or improved performance, please visit the product page on [TI.com](https://www.ti.com)

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: CD4051BM96	Qual Device: CD4052BM96	Qual Device: CD4053BM96	QBS Reference (Process, Product): TMUX4051PWR	QBS Reference (Process): TPS25221DEVR	QBS Reference (Process, Product): TMUX4053PWR	QBS Reference (Package): ULQ200SAQDRQ1	QBS Reference (Package, Product): MC3395AADR	QBS Reference (Process, Product): TMUX4051PWRQ1	QBS Reference (Process, Product): TMUX4053PWRQ1	QBS Reference (Process, Product): TMUX4053PWR
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	-	-	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	-	-	-	3/231/0	3/231/0	-	-	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	-	-	3/135/0	-	-	-	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	-	-	-	-	-	3/231/0	-	-	-
HTOL	B1	Life Test	140C	480 Hours	-	-	-	-	3/231/0	-	-	-	-	-	-
HTOL	B1	Life Test	150C	300 Hours	-	-	-	-	-	-	-	-	1/77/0	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	-	-	3/2400/0	-	-	-	-	-	-
SD	C3	PB Solderability	Precondition w/155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	-	-	-	1/15/0	-	-	-	-
SD	C3	PB-Free Solderability	Precondition w/155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	-	-	-	1/15/0	-	-	-	-
ESD	E2	ESD CDM	-	250 Volts	1/3/0	-	-	-	-	-	-	-	-	-	-
ESD	E2	ESD HBM	-	1000 Volts	1/3/0	-	-	-	-	-	-	-	-	-	-
LU	E4	Latch-Up	Per JESD78	-	-	-	-	1/3/0	-	-	-	-	1/6/0	1/6/0	1/3/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	1/30/0	1/30/0	1/30/0	-	1/30/0	-	-	1/30/0	1/30/0	1/30/0

- QBS: Qual By Similarity
- Qual Device CD4051BM96 is qualified at MSL1 260C
- Qual Device CD4052BM96 is qualified at MSL1 260C
- Qual Device CD4053BM96 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-2110-063

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: CD4051BNSR	Qual Device: CD4052BNSR	Qual Device: CD4053BNSR	QBS Reference (Package): TL092CPS	QBS Reference (Package): SN75ALS1177NS	QBS Reference (Process, Product): TMUX4053PWR	QBS Reference (Package, Product): AMP6LS32ACN	QBS Reference (Process, Product): TMUX4051PWRQ1	QBS Reference (Process, Product): TMUX4052PWRQ1
UHA	A3	Autoclave	121C/15psig	96 Hours	-	-	-	3/230/0	3/231/0	-	-	-	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	3/231/0	3/231/0	-	-	-	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	-	3/231/0	-	-	-	-	-
HTOL	B1	Life Test	150C	300 Hours	-	-	-	-	-	-	-	1/77/0	-
WBS	C1	Ball Shear	76 balls, 3 units min	Wires	-	-	-	-	-	1/76/0	1/76/0	-	-
WBP	C2	Bond Pull	76 Wires, 3 units min	Wires	-	-	-	-	-	1/76/0	1/76/0	-	-
ESD	E2	ESD CDM	-	250 Volts	1/3/0	-	-	-	-	-	-	-	-
ESD	E2	ESD HBM	-	1000 Volts	1/3/0	-	-	-	-	-	-	-	-
LU	E4	Latch-Up	Per JESD78	-	-	-	-	-	-	-	-	1/6/0	1/6/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/10/0	1/10/0	1/10/0	-	-	-	-	-	-
FTY	E6	Final Test Yield	-	-	-	-	-	-	-	-	1/1/0	-	-

- QBS: Qual By Similarity
- Qual Device CD4051BNSR is qualified at MSL1 260C
- Qual Device CD4052BNSR is qualified at MSL1 260C
- Qual Device CD4053BNSR 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-2308-005

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: CD4051BE	Qual Device: CD4052BE	Qual Device: CD4053BE	QBS Reference (Package): SN74HC595N	QBS Reference (Package, Process, Product): TPS25221DBVR	QBS Reference (Package, Process): AM26LS32ACN	QBS Reference (Process, Product): TMUX4051PWRQ1	QBS Reference (Process, Product): TMUX4052PWRQ1	QBS Reference (Process, Product): TMUX4053PWR
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	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	-	-	-	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	3/231/0	3/231/0	-	-	-	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	-	3/231/0	3/231/0	-	-	-	-
HTOL	B1	Life Test	140C	480 Hours	-	-	-	-	3/231/0	-	-	-	-
HTOL	B1	Life Test	150C	300 Hours	-	-	-	-	-	-	1/77/0	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	-	-	3/2400/0	-	-	-	-
WBS	C1	Ball Shear	76 balls, 3 units min	Wires	-	-	-	-	3/9/0	1/76/0	-	-	-
WBP	C2	Bond Pull	76 Wires, 3 units min	Wires	-	-	-	-	3/9/0	1/76/0	-	-	-
SD	C3	PB-Free Solderability	8 Hours Steam Age	-	-	-	-	3/66/0	-	-	-	-	-
ESD	E2	ESD CDM	-	250 Volts	1/3/0	-	-	-	-	-	-	-	-
ESD	E2	ESD HBM	-	1000 Volts	1/3/0	-	-	-	-	-	-	-	-

Type	#	Test Name	Condition	Duration	Qual Device: CD4051BE	Qual Device: CD4052BE	Qual Device: CD4053BE	QBS Reference (Package): SN74HC595N	QBS Reference (Package, Process, Product): TPS25221DBVR	QBS Reference (Package, Process): AM26LS32ACN	QBS Reference (Process, Product): TMUX4051PWRQ1	QBS Reference (Process, Product): TMUX4052PWRQ1	QBS Reference (Process, Product): TMUX4053PWR
LU	E4	Latch-Up	Per JESD78	-	-	-	-	-	-	-	1/6/0	1/6/0	1/3/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/10/0	1/10/0	1/10/0	-	-	-	-	-	-
FTY	E6	Final Test Yield	-	-	-	-	-	-	-	1/1/0	-	-	-

- QBS: Qual By Similarity
- Qual Device CD4051BE is qualified at MSL1 260C
- Qual Device CD4052BE is qualified at MSL1 260C
- Qual Device CD4053BE 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-2307-070

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: TRS202EIDR	QBS Reference (Process): TPS51217DSCR	QBS Reference (Package): ULQ2003AQDRQ1	QBS Reference (Package, Process, Product): MAX232EIDR
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	-
UHA	A3	Autoclave	121C/15psig	96 Hours	-	-	3/231/0	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	3/231/0	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	3/135/0	-
HTOL	B1	Life Test	135C	635 Hours	-	3/231/0	-	-
WBS	C1	Ball Shear	76 balls, 3 units min	Wires	-	-	-	1/76/0
WBP	C2	Bond Pull	76 Wires, 3 units min	Wires	-	-	-	1/76/0
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	-

Type	#	Test Name	Condition	Duration	Qual Device: TRS202EIDR	QBS Reference (Process): TPS51217DSCR	QBS Reference (Package): ULQ2003AQDRQ1	QBS Reference (Package, Process Product): MAX232EIDR
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	-
ESD	E2	ESD CDM	-	1500 Volts	1/3/0	-	-	-
ESD	E2	ESD HBM (Bus Pins)	-	15000 Volts	-	-	-	1/3/0
ESD	E2	ESD HBM	-	2000 Volts	-	-	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	1/3/0	-	-	-
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	-	-	-

- QBS: Qual By Similarity
- Qual Device TRS202EIDR 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-2302-013

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: MAX232EIPWR	Qual Device: MAX232NSR	Qual Device: TRS202EIPWR	Qual Device: MAX232EIN	QBS Reference (Package): SN74HC595N	QBS Reference (Process): TPS51217DSCR	QBS Reference (Package): SN74LVC8T245NSR	QBS Reference (Package): OPA4992QFWRQ1	QBS Reference (Package, Process, Product): MAX232EIDR
HAST	A2	Biased HAST	110C/85%RH	264 Hours	-	-	-	-	-	-	-	1/77/0	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	-	3/231/0	-	-	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	-	3/231/0	-	-	-	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	-	-	-	-	-	1/77/0	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	-	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	-	-	-	-	3/231/0	-	-	-	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	-	-	-	-	1/77/0	-
HTOL	B1	Life Test	135C	635 Hours	-	-	-	-	-	3/231/0	-	-	-
WBS	C1	Ball Shear	76 balls, 3 units min	Wires	-	-	-	-	-	-	-	-	1/76/0
WBP	C2	Bond Pull	76 Wires, 3 units min	Wires	-	-	-	-	-	-	-	-	1/76/0
SD	C3	PB-Free Solderability	8 Hours Steam Age	-	-	-	-	-	3/66/0	-	-	-	-

Type	#	Test Name	Condition	Duration	Qual Device: MAX232EIPWR	Qual Device: MAX232NSR	Qual Device: TRS202EIPWR	Qual Device: MAX232EIN	QBS Reference (Package): SN74HC595N	QBS Reference (Process): TPS51217DSCR	QBS Reference (Package): SN74LVC8T245NSR	QBS Reference (Package): OPA4992QFVIRQ1	QBS Reference (Package, Process, Product): MAX232EIDR
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	-	-	-	-	-	1/10/0	-
ESD	E2	ESD CDM	-	1000 Volts	-	1/3/0	-	-	-	-	-	-	-
ESD	E2	ESD CDM	-	1500 Volts	1/3/0	-	1/3/0	1/3/0	-	-	-	-	1/3/0
ESD	E2	ESD HBM (Bus Pins)	-	15000 Volts	-	-	-	-	-	-	-	-	1/3/0
ESD	E2	ESD HBM	-	2000 Volts	-	1/3/0	-	-	-	-	-	-	-
ESD	E2	ESD HBM	-	3000 Volts	1/3/0	-	-	1/3/0	-	-	-	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	-	-	-	-	-	-	-	-	1/3/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	1/30/0	1/30/0	1/30/0	-	-	-	-	1/30/0

- QBS: Qual By Similarity
- Qual Device MAX232EIPWR is qualified at MSL1 260C
- Qual Device MAX232NSR is qualified at MSL1 260C
- Qual Device TRS202EIPWR is qualified at MSL1 260C
- Qual Device MAX232EIN is qualified at NOT CLASSIFIED 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

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TI Qualification ID: R-CHG-2302-014

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: MAX202IDWR	Qual Device: TRS232EIDWR	QBS Reference (Process): TPS51217DSCR	QBS Reference (Package): TLC59116ITPWRQ1	QBS Reference (Package): TPIC6A596DW	QBS Reference (Package, Process, Product): MAX232EIDR
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	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	3/231/0	3/231/0	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	3/135/0	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	1/45/0	-	-
HTOL	B1	Life Test	135C	635 Hours	-	-	3/231/0	-	-	-

Type	#	Test Name	Condition	Duration	Qual Device: MAX202IDWR	Qual Device: TRS232EIDWR	QBS Reference (Process): TPS51217DSCR	QBS Reference (Package): TLC59116ITPWRQ1	QBS Reference (Package): TPIC6A596DW	QBS Reference (Package, Process, Product): MAX232EIDR
WBS	C1	Ball Shear	76 balls, 3 units min	Wires	-	-	-	-	-	1/76/0
WBP	C2	Bond Pull	76 Wires, 3 units min	Wires	-	-	-	-	-	1/76/0
ESD	E2	ESD CDM	-	1000 Volts	-	1/3/0	-	-	-	-
ESD	E2	ESD CDM	-	1500 Volts	1/3/0	-	-	-	-	-
ESD	E2	ESD HBM (Bus Pins)	-	15000 Volts	-	-	-	-	-	1/3/0
ESD	E2	ESD HBM	-	3000 Volts	-	1/3/0	-	-	-	-
LU	E4	Latch-Up	Per JESD78	-	-	-	-	-	-	1/3/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	1/30/0	-	-	-	1/30/0

- QBS: Qual By Similarity
- Qual Device MAX202IDWR is qualified at MSL1 260C
- Qual Device TRS232EIDWR 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

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TI Qualification ID: R-CHG-2302-015

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: MAX232EIDR	QBS Reference (Process): TPS51217DSCR	QBS Reference (Package): ULQ2003AQDRQ1	QBS Reference (Product, Package): MAX232DR
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	3/231/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	3/231/0	3/231/0
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	3/231/0	3/231/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	3/135/0	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	-	3/231/0
HTOL	B1	Life Test	135C	635 Hours	-	3/231/0	-	-
WBS	C1	Ball Shear	76 balls, 3 units min	Wires	1/76/0	-	-	-
WBP	C2	Bond Pull	76 Wires, 3 units min	Wires	1/76/0	-	-	-
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	-
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	-

Type	#	Test Name	Condition	Duration	Qual Device: MAX232EIDR	QBS Reference (Process): TPS51217DSCR	QBS Reference (Package): ULQ2003AQDRQ1	QBS Reference (Product, Package): MAX232DR
ESD	E2	ESD CDM	-	1500 Volts	1/3/0	-	-	-
ESD	E2	ESD HBM (Bus Pins)	-	15000 Volts	1/3/0	-	-	-
ESD	E2	ESD HBM	-	3000 Volts	1/3/0	-	-	-
LU	E4	Latch-Up	Per JESD78	-	1/3/0	-	-	-
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	-	-	-

- QBS: Qual By Similarity
- Qual Device MAX232EIDR 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

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TI Qualification ID: R-CHG-2302-012

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