

PCN Number:	20210625000.1	PCN Date:	June 29, 2021
Title:	Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision, Datasheet update and additional Assembly site/BOM options for select devices		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Sep 29, 2021	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 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 (RFAB, LBC7) and assembly (MLA) site/BOM options for selected devices as listed below in the product affected section.

Current Fab Site			New Fab Site		
Fab Site	Process	Wafer Diameter	Fab Site	Process	Wafer Diameter
DL-LIN	LBC3S	150 mm	RFAB	LBC7	300 mm
DL-LIN	LBC3S	200 mm			
CFAB	LBC3S	200 mm			

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

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.



TRS3232E
SLLS790D – JUNE 2007 – REVISED JUNE 2021

Changes from Revision C (June 2021) to Revision D (June 2021) Page

- Added *Applications*: Industrial PCs, Wired networking, and Data center and enterprise computing..... 1
- Changed the table note in the *ESD Ratings - IEC Specifications* to make it applicable to D, DB and PW packages. 4
- Changed the thermal parameter values for D, DB and PW packages in the *Thermal Information* table..... 5



TRSF3232E
SLLS825B – AUGUST 2007 – REVISED JUNE 2021

Changes from Revision A (December 2020) to Revision B (June 2021) Page

- Added *Applications*: Industrial PCs, Wired networking, and Data center and enterprise computing..... 1
- Changed the table note in the *ESD Protection, Driver* table to make it applicable to D and PW packages..... 4
- Changed the table note in the *ESD Protection, Receiver* table to make it applicable to D and PW packages.... 4
- Changed the thermal parameter values for D and PW packages in the *Thermal Information* table..... 5

Changes from Revision D (May 2017) to Revision E (June 2021) Page

- Added *Applications*: Industrial PCs, Wired networking, and Data center and enterprise computing..... 1
 - Added the *ESD Ratings - IEC Specifications* table. Added a table note about 1- μ F capacitor requirement between V_{CC} and GND for D, DB and PW packages..... 4
 - Changed the thermal parameter values for D, DB and PW packages in the *Thermal Information* table..... 5
-

Changes from Revision A (July 2015) to Revision B (June 2021) Page

- Added *Applications*: Industrial PCs, Wired networking, and Data center and enterprise computing..... 1
 - Added additional thermal parameters for all packages in *Thermal Information* table..... 5
-

Changes from Revision N (June 2017) to Revision O (June 2021) Page

- Added *Applications*: Industrial PCs, Wired networking, and Data center and enterprise computing..... 1
 - Changed the thermal parameter values for D, DB and PW packages in the *Thermal Information* table..... 5
-

Changes from Revision B (November 2004) to Revision C (June 2021) Page

- Added *Device Information* table, *Pin Configuration and Functions* section, *ESD Ratings* table, *Feature Description* section, *Device Functional Modes, Application and Implementation* section, *Power Supply Recommendations* section, *Layout* section, *Device and Documentation Support* section, and *Mechanical, Packaging, and Orderable Information* section 1
 - Added *Applications*: Industrial PCs, Wired networking, and Data center and enterprise computing..... 1
 - Added thermal parameter values for all packages and changed the thermal parameters for D package in the *Thermal Information* table..... 5
-

Changes from Revision A (December 2007) to Revision B (June 2021) Page

- Added *Device Information* table, *Pin Configuration and Functions* section, *Thermal Information* tables, *Feature Description* section, *Device Functional Modes, Application and Implementation* section, *Power Supply Recommendations* section, *Layout* section, *Device and Documentation Support* section, and *Mechanical, Packaging, and Orderable Information* section 1
 - Updated the list of *Applications* 1
 - Added a note specifying a minimum capacitor of 1 μ F between V_{CC} and GND to satisfy IEC ESD specifications in the *ESD Protection, Driver* table..... 4
 - Added a note specifying the need for a 1- μ F capacitor between V_{CC} and GND to satisfy IEC ESD specifications in the *ESD Protection, Receiver* table..... 4
-

Product Folder	Current Datasheet Number	New Datasheet Number	Link to full datasheet
TRS3232E	SLLS790C	SLLS790D	http://www.ti.com/product/TRS3232E
TRSF3232E	SLLS825A	SLLS825B	http://www.ti.com/product/TRSF3232E
MAX3232E	SLLS664D	SLLS664E	http://www.ti.com/product/MAX3232E
TRS3232	SLLS812A	SLLS812B	http://www.ti.com/product/TRS3232
MAX3232	SLLS410N	SLLS410O	http://www.ti.com/product/MAX323
SN65C3232 SN75C3232	SLLS540B	SLLS540C	http://www.ti.com/product/SN65C3232
SN65C3232E, SN75C3232E	SLLS697A	SLLS697B	http://www.ti.com/product/SN65C3232E

Construction differences are noted below:

Group 1 MLA A/T site & BOM updates for D Devices:

	ASESH	FMX	MLA – New Site
Mount compound	EY1000063 (EN-4900GC)	4147858 (QMI 505MT)	4147858 (QMI 505MT)
Mold Compound	EN2000506 (CEL-9240HF-10AK)	4211880 (EME-G633C)	4211880 (EME-G633C)
Lead finish	Matte Sn	NiPdAu	NiPdAu

Group 2 MLA A/T site & BOM updates for PW Devices:

	ASESH	MLA – New Site
Mount compound	EY1000063 (EN-4900GC)	4147858 (QMI 505MT)
Mold Compound	EN2000506 (CEL-9240HF-10AK)	4211471 (EME-G610TA)
Lead Finish	Matte Sn	NiPdAu

Tube versions of the devices are included in EOL notice PDN# 20210625001.3

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

Anticipated impact on Material Declaration

<input type="checkbox"/>	No Impact to the Material Declaration	<input checked="" type="checkbox"/>	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:

Fab Site Information:

Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
DL-LIN	DLN	USA	Dallas
CFAB	CU3	CHN	Chengdu
RFAB – New Fab	RFB	USA	Richardson

Die Rev:

Product Family	Current Die Rev [2P]	New Die Rev [2P]
MAX3232C, MAX3232I, TRS3232I	D	B
MAX3232E, SN65C3232E, SN75C3232E, TRS3232E	F	B
SN65C3232	B	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
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) CSO: SHE (21L) CCO:USA
 (22L) ASO: MLA (23L) ACO: MYS

Product Affected:

Group 1 - RFAB/Process migration, Die Rev, Datasheet, MLA A/T site & BOM updates for D Devices:			
MAX3232CDR	SN65C3232DR	SN75C3232DR	SN75C3232DRE4
Group 2 - RFAB/Process migration, Die Rev, Datasheet, MLA A/T site & BOM updates for PW Devices:			
MAX3232CPWR	MAX3232IPWR		
Group 3 - RFAB/Process migration, Die Rev & Datasheet changes:			
MAX3232CDBR	MAX3232EIDBRE4	SN65C3232EDBRG4	TRS3232EIDBR
MAX3232CDBRE4	MAX3232EIDR	SN65C3232EDR	TRS3232EIDR
MAX3232CPWRE4	MAX3232EIPWR	SN65C3232EDRG4	TRS3232EIPWR
MAX3232CPWRG4	MAX3232EIPWRG4	SN65C3232EPWR	TRS3232EIPWRG4
MAX3232ECDBR	MAX3232IDBR	SN65C3232PWR	TRS3232IPWR
MAX3232ECDR	MAX3232IDBRE4	SN65C3232PWRE4	TRSF3232ECDR

MAX3232ECDRE4	MAX3232IPWRE4	SN75C3232EPWR	TRSF3232ECPWR
MAX3232ECPWR	MAX3232IPWRG4	TRS3232ECDR	TRSF3232EIDR
MAX3232EIDBR	SN65C3232EDBR	TRS3232ECPWR	TRSF3232EIPWR

Group 1 & 3 Qual Memo:

Qualification Report

Approve Date 01-Jun-2021

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: TRS3232EIDR	QBS Product Reference: TRS3232EIPW (PG2.0)	QBS Process Reference: TPS51217DSC	QBS Process Reference: TPS53605DSQ	QBS Package Reference: ULQ2003AQDRQ1
AC	Autoclave 121C	96 Hours	-	-	3/231/0	-	3/231/0
CDM	ESD - CDM	1500 V	1/3/0	-	-	-	-
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	-	-	-
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	-	3/2999/0	-
HAST	Biased HAST 130C/85%RH	96 Hours	-	-	3/231/0	-	3/231/0
HAST	Biased HAST, 110C/85%RH	264 Hours	-	-	-	3/231/0	-
HBM	ESD - HBM (All Pins)	4000 V	-	3/9/0	-	-	-
HBM	ESD - HBM (Bus Pins)	16000 V	-	3/9/0	-	-	-
HTOL	Life Test, 125C	1000 Hours	-	3/231/0	-	3/231/0	3/231/0
HTOL	Life Test, 135C	635 Hours	-	-	3/231/0	-	-
HTSL	High Temp Storage Bake 150C	1000 Hours	-	-	-	-	3/135/0
HTSL	High Temp Storage Bake 170C	420 Hours	-	-	3/231/0	2/90/0	-
LU	Latch-up	(Per JESD78)	-	1/6/0	-	-	-
TC	Temperature Cycle - 65/150C	500 Cycles	-	-	3/231/0	3/231/0	3/231/0
UHAST	Unbiased HAST 110C/85%RH	264 Hours	-	-	-	3/231/0	-
WBP	Bond Pull	Wires	1/76/0	1/76/0	-	3/228/0	-
WBS	Ball Bond Shear	Wires	1/76/0	1/76/0	-	3/228/0	-

- QBS: Qual By Similarity

- Qual Device TRS3232EIDR 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

Group 1 & 3 Qual Memo:

Qualification Report

Approve Date 03-Jun-2021

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: TRSF3232EIDR	QBS Product Reference: TRSF3232EIPWR	QBS Product Reference: TRSF3232EIRGT	QBS Process Reference: TPS51217DSC	QBS Process Reference: TPS53605DSQ	QBS Package Reference: ULQ2003AQDRQ1
AC	Autoclave 121C	96 Hours	-	-	-	3/231/0	-	3/231/0
CDM	ESD - CDM	1500 V	1/3/0	-	-	-	-	-
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	Pass	-	-	-
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	-	-	3/2999/0	-
HAST	Biased HAST, 110C/85%RH	264 Hours	-	-	-	-	3/231/0	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-	3/231/0	-	3/231/0
HBM	ESD - HBM (All Pins)	4000 V	-	1/3/0	-	-	-	-
HBM	ESD - HBM (Bus Pins)	16000 V	-	1/3/0	-	-	-	-
HTOL	Life Test, 125C	1000 Hours	-	-	-	-	3/231/0	3/231/0
HTOL	Life Test, 135C	635 Hours	-	-	-	3/231/0	-	-
HTSL	High Temp Storage Bake 150C	1000 Hours	-	-	-	-	-	3/135/0
HTSL	High Temp Storage Bake, 170C	420 Hours	-	-	-	3/231/0	2/90/0	-
LU	Latch-up	(per JESD78)	-	-	1/6/0	-	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	-	3/231/0	3/231/0	3/231/0
UHAST	Unbiased HAST 110C/85%RH	264 Hours	-	-	-	-	3/231/0	-
WBP	Bond Pull	Wires	1/76/0	1/76/0	1/76/0	-	3/228/0	-

Type	Test Name / Condition	Duration	Qual Device: TRSF3232EIDR	QBS Product Reference: TRSF3232EIPWR	QBS Product Reference: TRSF3232EIRGT	QBS Process Reference: TPS51217DSC	QBS Process Reference: TPS53605DSQ	QBS Package Reference: ULQ2003AQDRQ1
WBS	Ball Bond Shear	Wires	1/76/0	1/76/0	1/76/0	-	3/228/0	-

- QBS: Qual By Similarity

- Qual Device TRSF3232EIDR 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

Group 2 & 3 Qual Memo:

Qualification Report Approved Date 14-Dec-2020

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: TRS3232EIPW (PG2.0)	QBS Process Reference: TPS51217DSC	QBS Process Reference: TPS53605DSQ	QBS Package Reference: TMUX1308QPWRQ1
AC	Autoclave 121C	96 Hours	-	3/231/0	-	3/231/0
CDM	ESD - CDM	1500 V	3/9/0	-	-	-
ED	Electrical Characterization	Per Datasheet Parameters	Pass	-	-	-
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	3/2999/0	-
HAST	Biased HAST 130C/85%RH	96 Hours	-	3/231/0	-	3/231/0
HAST	Biased HAST, 110C/85%RH	264 Hours	-	-	3/231/0	-
HBM	ESD - HBM (All Pins)	4000 V	3/9/0	-	-	-
HBM	ESD - HBM (Bus Pins)	16000 V	3/9/0	-	-	-
HTOL	Life Test, 125C	1000 Hours	3/231/0	-	3/231/0	-
HTOL	Life Test, 135C	635 Hours	-	3/231/0	-	-
HTOL	Life Test, 150C	300 Hours	-	-	-	3/231/0
HTSL	High Temp Storage Bake 175C	500 Hours	-	-	-	3/135/0
HTSL	High Temp Storage Bake, 170C	420 Hours	-	3/231/0	2/90/0	-
LU	Latch-up	(<u>Per</u> JESD78)	1/6/0	-	-	-
TC	Temperature Cycle - 65/150C	500 Cycles	-	3/231/0	3/231/0	3/231/0
UHAST	Unbiased HAST 110C/85%RH	264 Hours	-	-	3/231/0	-
WBP	Bond Pull	Wires	1/76/0	-	3/228/0	3/90/0
WBS	Ball Bond Shear	Wires	1/76/0	-	3/228/0	3/90/0

- QBS: Qual By Similarity

- Qual Device TRS3232EIPW (PG2.0) 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

Group 3 Qual Memo:

Qualification Report

Approve Date 01-Jun-2021

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

Type	Test Name / Condition	Duration	Qual Device: TRS3232EIDBR	QBS Product Reference: TRS3232EIPW (PG2.0)	QBS Process Reference: TP551217D5C	QBS Process Reference: TP553605D5Q	QBS Package Reference: TL1454ACDBR	QBS Package Reference: TPD3S714QDBQRQ1
AC	Autoclave 121C	96 Hours	1/77/0	-	3/231/0	-	3/231/0	3/231/0
CDM	ESD - CDM	1500 V	1/3/0	-	-	-	-	-
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	-	-	-	-
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	-	3/2999/0	-	-
HAST	Biased HAST 130C/85%RH	96 Hours	-	-	3/231/0	-	-	3/231/0
HAST	Biased HAST, 110C/85%RH	264 Hours	-	-	-	3/231/0	-	-
HBM	ESD - HBM (All Pins)	4000 V	-	3/9/0	-	-	-	-
HBM	ESD - HBM (Bus Pins)	16000 V	-	3/9/0	-	-	-	-
HTOL	Life Test, 125C	1000 Hours	-	3/231/0	-	3/231/0	-	-
HTOL	Life Test, 135C	635 Hours	-	-	3/231/0	-	-	-
HTOL	Life Test, 150C	408 hours	-	-	-	-	-	3/231/0
HTSL	High Temp Storage Bake 170C	420 Hours	-	-	3/231/0	2/90/0	3/227/0	-
HTSL	High Temp Storage Bake 175C	500 hours	-	-	-	-	-	3/135/0
LU	Latch-up	(Per JESD78)	-	1/6/0	-	-	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	3/231/0	3/231/0	3/231/0	3/231/0
UHAST	Unbiased HAST 110C/85%RH	264 Hours	-	-	-	3/231/0	-	-
WBP	Bond Pull	Wires	1/76/0	1/76/0	-	3/228/0	-	3/228/0
WBS	Ball Bond Shear	Wires	1/76/0	1/76/0	-	3/228/0	-	3/90/0

- QBS: Qual By Similarity

- Qual Device TRS3232EIDBR 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

Group 3 Qual Memo:

**Qualification Report
Approve Date 03-Jun-2021**

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: <u>TRSF3232EIPWR</u>	QBS Product Reference: <u>TRSF3232EIRGT</u>	QBS Process Reference: <u>TPS51217DSC</u>	QBS Process Reference: <u>TPS53605DSQ</u>	QBS Package Reference: <u>TMUX1308QPWRQ1</u>
AC	Autoclave 121C	96 Hours	-	-	3/231/0	-	3/231/0
CDM	ESD - CDM	1500 V	1/3/0	-	-	-	-
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	-	-	-
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	-	3/2999/0	-
HAST	Biased HAST 130C/85%RH	96 Hours	-	-	3/231/0	-	3/231/0
HAST	Biased HAST, 110C/85%RH	264 Hours	-	-	-	3/231/0	-
HBM	ESD - HBM (All Pins)	4000 V	1/3/0	-	-	-	-
HBM	ESD - HBM (Bus Pins)	16000 V	1/3/0	-	-	-	-
HTOL	Life Test, 125C	1000 Hours	-	-	-	3/231/0	-
HTOL	Life Test, 135C	635 Hours	-	-	3/231/0	-	-
HTOL	Life Test, 150C	300 Hours	-	-	-	-	3/231/0
HTSL	High Temp Storage Bake 170C	420 Hours	-	-	3/231/0	-	-
HTSL	High Temp Storage Bake 175C	500 Hours	-	-	-	-	3/135/0
LU	Latch-up	(per JESD78)	-	1/6/0	-	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	3/231/0	3/231/0	3/231/0
UHAST	Unbiased HAST 110C/85%RH	264 Hours	-	-	-	3/231/0	-
WBP	Bond Pull	Wires	1/76/0	1/76/0	-	3/228/0	3/90/0
WBS	Ball Bond Shear	Wires	1/76/0	1/76/0	-	3/228/0	3/90/0

- QBS: Qual By Similarity

- Qual Device TRSF3232EIPWR 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

Group 3 Qual Memo:

Qualification Report

Approve Date 03-Jun-2021

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: TRSF3232EIDBR	QBS Product Reference: TRSF3232EIPWR	QBS Product Reference: TRSF3232EIRGT	QBS Process Reference: TPS51217DSC	QBS Process Reference: TPS53605DSQ	QBS Package Reference: TL1454ACDBR	QBS Package Reference: TPD3S714QDBQRQ1
AC	Autoclave 121C	96 hours	-	-	-	3/231/0	-	3/231/0	3/231/0
CDM	ESD - CDM	1500 V	1/3/0	-	-	-	-	-	-
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	Pass	-	-	-	-
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	-	-	3/2999/0	-	-
HAST	Biased HAST, 110C/85%RH	264 Hours	-	-	-	-	3/231/0	-	-
HAST	Biased HAST, 130C/85%RH	96 hours	-	-	-	3/231/0	-	-	3/231/0
HBM	ESD - HBM (All Pins)	4000 V	-	1/3/0	-	-	-	-	-
HBM	ESD - HBM (Bus Pins)	16000 V	-	1/3/0	-	-	-	-	-
HTOL	Life Test, 125C	1000 Hours	-	-	-	-	3/231/0	-	-
HTOL	Life Test, 135C	635 Hours	-	-	-	3/231/0	-	-	-
HTOL	Life Test, 150C	408 hours	-	-	-	-	-	-	3/231/0
HTSL	High Temp Storage Bake 175C	500 hours	-	-	-	-	-	-	3/135/0
HTSL	High Temp Storage Bake, 170C	420 Hours	-	-	-	3/231/0	2/90/0	3/227/0	-
LU	Latch-up	(Per JESD78)	-	-	1/6/0	-	-	-	-
SD	Solderability	Pb-Solder (Post 8hr steam)	-	-	-	-	-	-	3/45/0
TC	Temperature Cycle, -65/150C	500 cycles	-	-	-	3/231/0	3/231/0	3/231/0	3/231/0

Type	Test Name / Condition	Duration	Qual Device: TRSF3232EIDBR	QBS Product Reference: TRSF3232EIPWR	QBS Product Reference: TRSF3232EIRGT	QBS Process Reference: TPS51217DSC	QBS Process Reference: TPS53605DSQ	QBS Package Reference: TL1454ACDBR	QBS Package Reference: TPD3S714QDBQRQ1
UHAIST	Unbiased HAST 110C/85%RH	264 Hours	-	-	-	-	3/231/0	-	-
WBP	Bond Pull	Wires	1/76/0	1/76/0	1/76/0	-	3/228/0	-	3/228/0
WBS	Ball Bond Shear	Wires	1/76/0	1/76/0	1/76/0	-	3/228/0	-	3/90/0

- QBS: Qual By Similarity

- Qual Device TRSF3232EIDBR 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 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
WW PCN Team	PCN_ww_admin_team@list.ti.com

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to TI's Terms of Sale (www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.