12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20251103000.2
Qualify MLA as an additional Assembly/Test site for select devices
Change Notification / Sample Request

Date: November 03, 2025
To: MOUSER 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.

Texas Instruments requires acknowledgement of receipt of this notification within 60 days of the date of this notice. Lack of acknowledgement of this notice within 60 days constitutes acceptance and approval of this change. If samples or additional data are required, requests must be received within 60 days of this notification.

The changes discussed within this PCN will not take effect any earlier than the proposed first ship date on Page 3 of this notification, unless customer agreement has been reached on an earlier implementation of the change.

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 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.

TI values customer engagement and feedback related to TI changes. Customers should contact TI if there are questions or concerns regarding a change notification.

Sincerely,

Change Management Team
SC Business Services

20251103000.2
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
INA229AQDGSRQ1	NULL
INA300AQDGSRQ1	INA300AQDGSRQ1
INA239AQDGSRQ1	NULL
INA220BQDGSRQ1	INA220BQDGSRQ1
INA238AQDGSRQ1	NULL
INA228AQDGSRQ1	NULL
INA237AQDGSRQ1	NULL

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

PCN Number:	20251103000.2	**PCN Date:**	November 03, 2025
Title:	Qualify MLA as an additional Assembly/Test site for select devices		
Customer Contact:	Change Management team	**Dept:**	Quality Services
Proposed 1st Ship Date:	May 02, 2026	**Sample requests accepted until:**	January 02, 2026*

***Sample requests received after** January 02, 2026 **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 TI Malaysia (MLA) as an additional Assembly/Test site for the list of devices shown below. Material differences between sites are as follows.

Group 1 Device

	Current site	Additional site
Assembly site	**ASESH**	**MLA**
Wire diam/type	0.8mil Au	0.8mil Cu
Mold compound	SID#EN2000515 EME-G700LY	4228573 EME-G700QB
Mount compound	SID#EY1000063 EN-4900GC	4211470 CRM1076WD

Group 2 Device

	Current site	Additional site
Assembly site	**ASESH**	**MLA**
Wire diam/type	1.0mil Au	1.0mil Cu
Mold compound	SID#EN2000515 EME-G700LY	4211880 EME-G633C
Mount compound	SID#EY1000063 EN-4900GC	4147858 QMI505MT

Qual details are provided in the Qual Data Section.
Test coverage, insertions, conditions will remain consistent with current testing.

Reason for Change:

Continuity of supply.

Anticipated impact on Fit, Form, 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:

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

Sample product shipping label (not actual product label)

Group 1 Product Affected:

INA228AQDGSRQ1	INA238AQDGSRQ1
INA229AQDGSRQ1	INA239AQDGSRQ1
INA237AQDGSRQ1	

Group 2 Product Affected:

INA2181A1QDGSRQ1	INA2181A4QDGSRQ1	INA381A1QDGSRQ1	INA381A3QDGSRQ1
INA2181A2QDGSRQ1	INA220BQDGSRQ1	INA381A2QDGSRQ1	INA381A4QDGSRQ1
INA2181A3QDGSRQ1	INA300AQDGSRQ1		

Group 1 Qualification Report
Automotive Qualification Summary
(As per AEC-Q100 Rev. J and JEDEC Guidelines)
Approve Date 02-October-2025

Product Attributes

Attributes	Qual Device: INA229AQDGSRQ1	QBS Process Reference: INA229AQDGSRQ1
Automotive Grade Level	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125
Product Function	Signal Chain	Signal Chain
Wafer Fab Supplier	RFAB	RFAB
Assembly Site	MLA	ASESHAT
Package Group	VSSOP	VSSOP
Package Designator	DGS	DGS
Pin Count	10	10

QBS: Qual By Similarity, also known as Generic Data
Qual Device INA229AQDGSRQ1 is qualified at MSL1 260C

Qualification Results

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

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: INA229AQDGSRQ1	QBS Process Reference: INA229AQDGSRQ1
Test Group A - Accelerated Environment Stress Tests									
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL1 260C	-	3/231/0	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	-	3/231/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	3/231/0	3/231/0
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Unbiased HAST	130C/85%RH	96 Hours	3/231/0	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	3/231/0	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	-	-	1/5/0	1/5/0
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	150C	1000 Hours	3/135/0	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	175C	500 Hours	-	3/231/0
Test Group B - Accelerated Lifetime Simulation Tests									
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	125C	1000 Hours	3/231/0	3/231/0
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate	125C	48 Hours	-	3/2400/0
Test Group C - Package Assembly Integrity Tests									
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0	3/90/0
SD	C3	JEDEC J-STD-002	1	15	PB-Free Solderability	>95% Lead Coverage	-	1/15/0	1/15/0
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions	Cpk>1.67	-	3/30/0	3/30/0
Test Group D - Die Fabrication Reliability Tests									
EM	D1	JESD61	-	-	Electromigration	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
TDDB	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
HCI	D3	JESD60 & 28	-	-	Hot Carrier Injection	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
BTI	D4	-	-	-	Bias Temperature Instability	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
SM	D5	-	-	-	Stress Migration	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
Test Group E - Electrical Verification Tests									
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	2000 Volts	1/3/0	1/3/0
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	500 Volts	1/3/0	1/3/0
LU	E4	AEC Q100-004	1	3	Latch-Up	Per AEC Q100-004	-	1/3/0	1/6/0
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	3/90/0	3/90/0

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 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
Ambient Operating Temperature by Automotive Grade Level:
Grade 0 (or E): -40C to +150C
Grade 1 (or Q): -40C to +125C
Grade 2 (or T): -40C to +105C
Grade 3 (or I) : -40C to +85C
E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):
Room/Hot/Cold : HTOL, ED
Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
Room : AC/uHAST
Quality and Environmental data is available at TI's external Web site: http://www.ti.com/
TI Qualification ID: R-CHG-2308-034

Qualification Report
Automotive Qualification Summary
(As per AEC and JEDEC Guidelines)

Q006 {VSSOP} at {MLA}
Approve Date 02-October-2025

Product Attributes

Attributes	Qual Device: INA229AQDGSRQ1
Automotive Grade Level	Grade 1
Operating Temp Range (C)	-40 to 125
Product Function	Signal Chain
Wafer Fab Supplier	RFAB
Assembly Site	MLA
Package Group	VSSOP
Package Designator	DGS
Pin Count	10

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

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: INA229AQDGSRQ1
Test Group A - Accelerated Environment Stress Tests								
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL1 260C	-	3/231/0
PC	A1.1	-	3	22	SAM Precon Pre	Review for delamination	-	3/66/0
PC	A1.2	-	3	22	SAM Precon Post	Review for delamination	-	3/66/0
HAST	A2.1	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	3/231/0

HAST	A2.1.2	-	3	1	Cross Section, post bHAST, 1X	Post stress cross section	Completed	3/3/0
HAST	A2.1.3	-	3	3	Wire Bond Shear, post bHAST, 1X	Post stress	-	3/9/0
HAST	A2.1.4	-	3	3	Bond Pull over Stitch, post bHAST, 1X	Post stress	-	3/9/0
HAST	A2.1.5	-	3	3	Bond Pull over Ball, post bHAST, 1X	Post stress	-	3/9/0
HAST	A2.2	JEDEC JESD22-A110	3	70	Biased HAST	130C/85%RH	192 Hours	3/231/0
HAST	A2.2.1	-	3	22	SAM Analysis, post bHAST 2X	Review for delamination	Completed	3/66/0
HAST	A2.2.2	-	3	1	Cross Section, post bHAST, 2X	Post stress cross section	Completed	3/3/0
HAST	A2.2.3	-	3	3	Wire Bond Shear, post bHAST, 2X	Post stress	-	3/9/0
HAST	A2.2.4	-	3	3	Bond Pull over Stitch, post bHAST, 2X	Post stress	-	3/9/0
HAST	A2.2.5	-	3	3	Bond Pull over Ball, post bHAST, 2X	Post stress	-	3/9/0
TC	A4.1	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	3/231/0
TC	A4.1.1	-	3	22	SAM Analysis, post TC 1X	Review for delamination	Completed	3/66/0
TC	A4.1.2	-	3	1	Cross Section, post TC, 1X	Post stress cross section	Completed	3/3/0
TC	A4.1.3	-	3	3	Wire Bond Shear, post TC, 1X	Post stress	-	3/9/0
TC	A4.1.4	-	3	3	Bond Pull over Stitch, post TC, 1X	Post stress	-	3/9/0
TC	A4.1.5	-	3	3	Bond Pull over Ball, post TC, 1X	Post stress	-	3/9/0
TC	A4.2	JEDEC JESD22-A104 and Appendix 3	3	70	Temperature Cycle	-65C/150C	1000 Cycles	3/231/0
TC	A4.2.1	-	3	22	SAM Analysis, post TC, 2X	Review for delamination	Completed	3/66/0
TC	A4.2.2	-	3	1	Cross Section, post TC, 2X	Post stress cross section	Completed	3/3/0
TC	A4.2.3	-	3	3	Wire Bond Shear, post TC, 2X	Post stress	-	3/9/0
TC	A4.2.4	-	3	3	Bond Pull over Stitch, post TC, 2X	Post stress	-	3/9/0
TC	A4.2.5	-	3	3	Bond Pull over Ball, post TC, 2X	Post stress	-	3/9/0
HTSL	A6.1	JEDEC JESD22-A103	3	45	High Temperature Storage Life	150C	1000 Hours	3/135/0
HTSL	A6.1.1	-	3	1	Cross Section, post HTSL, 1X	Post stress cross section	Completed	3/3/0
HTSL	A6.2	JEDEC JESD22-A103	3	44	High Temperature Storage Life	150C	2000 Hours	3/135/0
HTSL	A6.2.1	-	3	1	Cross Section, post HTSL, 2X	Post stress cross section	Completed	3/3/0
Test Group C - Package Assembly Integrity Tests								
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0

QBS: Qual By Similarity, also known as Generic Data
Qual Device INA229AQDGSRQ1 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
Ambient Operating Temperature by Automotive Grade Level:
Grade 0 (or E): -40C to +150C
Grade 1 (or Q): -40C to +125C
Grade 2 (or T): -40C to +105C
Grade 3 (or I) : -40C to +85C
E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):
Room/Hot/Cold : HTOL, ED
Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
Room : AC/uHAST
Quality and Environmental data is available at TI's external Web site: http://www.ti.com/
TI Qualification ID: R-CHG-2308-034

Group 2 Qualification Report

Automotive Qualification Summary

(As per AEC-Q100 Rev. J and JEDEC Guidelines)

Approve Date 31-July-2025

Product Attributes

Attributes	Qual Device: INA220BQDGSRQ1	QBS Process Reference: INA215AQDCKRQ1	QBS Package Reference: SN74LV244AQDGSRQ1	QBS Package Reference: SN74LV273AQDGSRQ1	QBS Package Reference: SN74LV541AQDGSRQ1	QBS Package Reference: TPS92622QDGNRQ1	QBS Package Reference: TPS92620QDGNRQ1	QBS Package, Package Reference: CLXC8T245QDGSRQ1	QBS Product Reference: INA303A1QPWRQ1	QBS Product Reference: INA303A2QPWRQ1	QBS Product Reference: INA303A3QPWRQ1	QBS Package, Package Reference: TPS48111LQDGSRQ1	QBS Package Reference: TLV1812QDGKRQ1	QBS Package Reference: TMP411AQDGKRQ1	QBS Package Reference: LMV772QMMX/E7002761
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125
Product Function	Signal Chain	Signal Chain	Logic	Logic	Logic	Power Management	Power Management	Logic	Signal Chain	Signal Chain	Signal Chain	Power Management	Signal Chain	Signal Chain	Signal Chain
Wafer Fab Supplier	DP1DM5	AIZU	RFAB	RFAB	RFAB	RFAB	RFAB	RFAB	AIZU	AIZU	AIZU	RFAB	RFAB	RFAB	MAINEFAB
Assembly Site	MLA	TFME	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA
Package Group	VSSOP	SOT	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	TSSOP	TSSOP	TSSOP	VSSOP	VSSOP	VSSOP	VSSOP
Package Designator	DGS	DCK	DGS	DGS	DGS	DGN	DGN	DGS	PW	PW	PW	DGS	DGK	DGK	DGK
Pin Count	10	6	20	20	20	12	12	24	14	14	14	20	8	8	8

QBS: Qual By Similarity, also known as Generic Data
Qual Device INA220BQDGSRQ1 is qualified at MSL1 260C

Qualification Results

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

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: INA220BQDGSRQ1	QBS Process Reference: INA215AQDCKRQ1	QBS Package Reference: SN74LV244AQDGSRQ1	QBS Package Reference: SN74LV273AQDGSRQ1	QBS Package Reference: SN74LV541AQDGSRQ1	QBS Package Reference: TPS92622QDGNRQ1	QBS Package Reference: TPS92620QDGNRQ1	QBS Package, Package Reference: CLXC8T245QDGSRQ1	QBS Product Reference: INA303A1QPWRQ1	QBS Product Reference: INA303A2QPWRQ1	QBS Product Reference: INA303A3QPWRQ1	QBS Package, Package Reference: TPS48111LQDGSRQ1	QBS Package Reference: TLV1812QDGKRQ1	QBS Package Reference: TMP411AQDGKRQ1	QBS Package Reference: LMV772QMMX/E7002761
Test Group A - Accelerated Environment Stress Tests																							
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL1 260C	-	3/0/0	-	1/0/0	1/0/0	1/0/0	3/0/0	3/0/0	3/0/0	-	-	-	-	1/308/0	1/0/0	3/0/0
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	-	3/0/0	-	-	-	-	-	-	2/0/0	2/0/0	1/0/0	3/615/0	-	-	-
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	1/77/0	3/231/0	1/77/0	1/77/0	1/77/0	1/77/0	1/77/0	1/77/0	1/77/0	1/55/0	-	3/231/0	1/77/0	1/77/0	-
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Autoclave	121C/15psig	96 Hours	-	3/231/0	1/77/0	1/77/0	1/77/0	-	-	-	-	-	-	3/231/0	-	-	-
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Unbiased HAST	130C/85%RH	96 Hours	1/77/0	-	-	-	-	3/231/0	3/231/0	1/77/0	1/77/0	1/77/0	1/77/0	-	1/77/0	1/77/0	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	3/231/0	3/231/0	1/77/0	1/77/0	1/77/0	3/231/0	3/231/0	3/231/0	1/77/0	1/77/0	1/77/0	3/231/0	1/77/0	1/77/0	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	-	-	1/5/0	1/30/0	1/5/0	-	-	-	-	1/5/0	-	-	-	-	1/5/0	1/5/0	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	150C	1000 Hours	1/45/0	-	1/45/0	1/45/0	1/45/0	1/45/0	1/45/0	1/45/0	-	-	-	3/135/0	-	-	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	175C	500 Hours	-	-	-	-	-	-	-	-	-	-	-	-	1/77/0	1/77/0	-
Test Group B - Accelerated Lifetime Simulation Tests																							
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	125C	1000 Hours	1/80/0[1]	3/231/0	1/77/0	-	-	-	-	1/77/0	1/77/0	1/77/0	1/77/0	3/231/0	-	-	-
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	150C	300 Hours	-	-	-	-	-	-	-	-	-	-	-	-	1/77/0	1/77/0	-
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate	125C	48 Hours	-	3/2400/0	-	-	-	-	-	-	-	-	-	-	-	-	-
Test Group C - Package Assembly Integrity Tests																							
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/90/0	3/90/0	3/90/0	-	-	-	3/90/0	1/30/0	1/30/0	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/90/0	3/90/0	3/90/0	-	-	-	3/90/0	1/30/0	1/30/0	3/90/0
SD	C3	JEDEC J-STD-002	1	15	PB Solderability	>95% Lead Coverage	-	-	-	1/15/0	-	-	1/15/0	1/15/0	1/15/0	1/15/0	1/15/0	1/15/0	1/15/0	1/15/0	1/15/0	-
SD	C3	JEDEC J-STD-002	1	15	PB-Free Solderability	>95% Lead Coverage	-	1/15/0	-	1/15/0	-	-	1/15/0	1/15/0	1/15/0	1/15/0	1/15/0	1/15/0	1/15/0	1/15/0	1/15/0	-
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions	Cpk>1.67	-	1/10/0	-	1/10/0	1/10/0	1/10/0	3/30/0	3/30/0	3/30/0	-	-	-	3/30/0	1/10/0	1/10/0	3/30/0
Test Group D - Die Fabrication Reliability Tests																							
EM	D1	JESD61	-	-	Electromigration	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
TDDB	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
HCI	D3	JESD60 & 28	-	-	Hot Carrier Injection	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
BTI	D4	-	-	-	Bias Temperature Instability	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
SM	D5	-	-	-	Stress Migration	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
Test Group E - Electrical Verification Tests																							
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	2000 Volts	1/3/0	-	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-	-	-	-	1/3/0	1/3/0	-
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	3000 Volts	-	-	-	-	-	-	-	-	-	-	1/3/0	-	-	-	-
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	4000 Volts	-	-	-	-	-	-	-	-	1/3/0	1/3/0	-	-	-	-	-
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	1500 Volts	-	-	-	-	-	-	-	-	1/3/0	1/3/0	1/3/0	-	-	-	-
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	500 Volts	1/3/0	-	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-	-	-	-	1/3/0	1/3/0	-
LU	E4	AEC Q100-004	1	3	Latch-Up	Per AEC Q100-004	-	1/3/0	-	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0	-	1/6/0	1/3/0	-
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	3/90/0	-	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/90/0	1/30/0	1/30/0	1/30/0	3/90/0	1/30/0	1/30/0	1/30/0

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 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
Ambient Operating Temperature by Automotive Grade Level:
Grade 0 (or E): -40C to +150C
Grade 1 (or Q): -40C to +125C
Grade 2 (or T): -40C to +105C
Grade 3 (or I) : -40C to +85C
E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):
Room/Hot/Cold : HTOL, ED
Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
Room : AC/uHAST
Quality and Environmental data is available at TI's external Web site: http://www.ti.com/
TI Qualification ID: R-CHG-2308-032

Qualification Report

Automotive Qualification Summary

(As per AEC and JEDEC Guidelines)

Q006 {VSSOP} at {MLA}

Approve Date 31-July-2025

Product Attributes

Attributes	Qual Device: INA220BQDGSRQ1	QBS Process Reference: INA215AQDCKRQ1	QBS Package Reference: SN74LV244AQDGSRQ1	QBS Package Reference: SN74LV273AQDGSRQ1	QBS Package Reference: SN74LV541AQDGSRQ1	QBS Package Reference: TPS92622QDGNRQ1	QBS Package Reference: TPS92620QDGNRQ1	QBS Package, Package Reference: CLXC8T245QDGSRQ1	QBS Product Reference: INA303A1QPWRQ1	QBS Product Reference: INA303A2QPWRQ1	QBS Product Reference: INA303A3QPWRQ1	QBS Package, Package Reference: TPS48111LQDGSRQ1	QBS Package Reference: TLV1812QDGKRQ1	QBS Package Reference: TMP411AQDGKRQ1	QBS Package Reference: LMV772QMMX/E7002761
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125
Product Function	ASIC	Signal Chain	Logic	Logic	Logic	Power Management	Power Management	Logic	Signal Chain	Signal Chain	Signal Chain	Power Management	Signal Chain	Signal Chain	Signal Chain
Wafer Fab Supplier	DP1DM5	AIZU	RFAB	RFAB	RFAB	RFAB	RFAB	RFAB	AIZU	AIZU	AIZU	RFAB	RFAB	RFAB	MAINEFAB
Assembly Site	MLA	TFME	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA
Package Group	VSSOP	SOT	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	TSSOP	TSSOP	TSSOP	VSSOP	VSSOP	VSSOP	VSSOP
Package Designator	DGS	DCK	DGS	DGS	DGS	DGN	DGN	DGS	PW	PW	PW	DGS	DGK	DGK	DGK
Pin Count	10	6	20	20	20	12	12	24	14	14	14	20	8	8	8

Qualification Results

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

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: INA220BQDGSRQ1	QBS Reference: INA215AQDCKRQ1	QBS Reference: SN74LV244AQDGSRQ1	QBS Reference: SN74LV273AQDGSRQ1	QBS Reference: SN74LV541AQDGSRQ1	QBS Reference: TPS92622QDGNRQ1	QBS Reference: TPS92620QDGNRQ1	QBS Reference: CLXC8T245QDGSRQ1	QBS Reference: INA303A1QPWRQ1	QBS Reference: INA303A2QPWRQ1	QBS Reference: INA303A3QPWRQ1	QBS Reference: TPS48111LQDGSRQ1	QBS Reference: TLV1812QDGKRQ1	QBS Reference: TMP411AQDGKRQ1	QBS Reference: LMV772QMMX/E7002761
Test Group A - Accelerated Environment Stress Tests																						
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL1 260C	-	3/0/0	-	1/0/0	1/0/0	1/0/0	3/0/0	3/0/0	3/0/0	-	-	-	-	-	-	3/0/0
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	-	-	-	-	-	-	-	-	2/0/0	2/0/0	1/0/0	3/615/0	-	-	-
PC	A1.1	-	3	22	SAM Precon Pre	Review for delamination	-	3/66/0	-	2/44/0	2/44/0	2/44/0	3/66/0	3/66/0	3/66/0	-	-	-	-	-	-	3/66/0
PC	A1.2	-	3	22	SAM Precon Post	Review for delamination	-	3/66/0	-	2/44/0	2/44/0	2/44/0	3/66/0	3/66/0	3/66/0	-	-	-	3/66/0	-	-	3/66/0
HAST	A2.1	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	-	-	1/77/0	1/77/0	1/77/0	1/77/0	1/77/0	-	1/77/0	1/55/0	-	3/231/0	-	-	-
HAST	A2.1.2	-	3	1	Cross Section, post bHAST, 1X	Post stress cross section	Completed	-	-	1/1/0	1/1/0	1/1/0	1/1/0	1/1/0	-	-	-	-	3/3/0	-	-	-
HAST	A2.1.3	-	3	3	Wire Bond Shear, post bHAST, 1X	Post stress	-	-	-	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-	-	-	-	3/9/0	-	-	-
HAST	A2.1.4	-	3	3	Bond Pull over Stitch, post bHAST, 1X	Post stress	-	-	-	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-	-	-	-	3/9/0	-	-	-
HAST	A2.1.5	-	3	3	Bond Pull over Ball, post bHAST, 1X	Post stress	-	-	-	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-	-	-	-	3/9/0	-	-	-
HAST	A2.2	JEDEC JESD22-A110	3	70	Biased HAST	110C/85%RH	264 Hours	-	-	-	-	-	-	-	-	-	1/63/12[1]	1/67/0	-	-	-	-
HAST	A2.2	JEDEC JESD22-A110	3	70	Biased HAST	130C/85%RH	192 Hours	-	-	1/77/0	1/77/0	1/77/0	1/77/0	1/77/0	-	1/77/0	1/55/0	-	3/231/0	-	-	-
HAST	A2.2	JEDEC JESD22-A110	3	70	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	-	-	-	-	1/77/0	1/77/0	1/77/0	-	-	-	-
HAST	A2.2.1	-	3	22	SAM Analysis, post bHAST 2X	Review for delamination	Completed	-	-	1/22/0	1/22/0	1/22/0	1/22/0	1/22/0	-	-	1/14/0	1/14/0	3/66/0	-	-	-
HAST	A2.2.2	-	3	1	Cross Section, post bHAST, 2X	Post stress cross section	Completed	-	-	1/1/0	1/1/0	1/1/0	1/1/0	1/1/0	-	-	-	-	3/3/0	-	-	-
HAST	A2.2.3	-	3	3	Wire Bond Shear, post bHAST, 2X	Post stress	-	-	-	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-	-	-	-	3/9/0	-	-	-
HAST	A2.2.4	-	3	3	Bond Pull over Stitch, post bHAST, 2X	Post stress	-	-	-	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-	-	-	-	3/9/0	-	-	-
HAST	A2.2.5	-	3	3	Bond Pull over Ball, post bHAST, 2X	Post stress	-	-	-	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-	-	-	-	3/9/0	-	-	-
TC	A4.1	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	3/231/0	-	1/77/0	1/77/0	1/77/0	3/231/0	3/231/0	3/231/0	1/77/0	1/77/0	1/77/0	3/231/0	-	-	3/231/0
TC	A4.1.1	-	3	22	SAM Analysis, post TC 1X	Review for delamination	Completed	3/66/0	-	1/22/0	1/22/0	1/22/0	3/66/0	3/66/0	3/66/0	1/15/0	1/15/0	1/15/0	3/66/0	-	-	3/66/0
TC	A4.1.2	-	3	1	Cross Section, post TC, 1X	Post stress cross section	Completed	3/3/0	-	1/1/0	1/1/0	1/1/0	3/3/0	3/3/0	3/3/0	-	-	-	3/3/0	-	-	3/3/0
TC	A4.1.3	-	3	3	Wire Bond Shear, post TC, 1X	Post stress	-	3/9/0	-	1/3/0	1/3/0	1/3/0	3/9/0	3/9/0	3/9/0	-	-	-	3/9/0	-	-	3/9/0
TC	A4.1.4	-	3	3	Bond Pull over Stitch, post TC, 1X	Post stress	-	3/9/0	-	1/3/0	1/3/0	1/3/0	3/9/0	3/9/0	3/9/0	-	-	-	3/9/0	-	-	3/9/0
TC	A4.1.5	-	3	3	Bond Pull over Ball, post TC, 1X	Post stress	-	3/9/0	-	1/3/0	1/3/0	1/3/0	3/9/0	3/9/0	3/9/0	-	-	-	3/9/0	-	-	3/9/0
TC	A4.2	JEDEC JESD22-A104 and Appendix 3	3	70	Temperature Cycle	-65C/150C	1000 Cycles	3/231/0	-	1/77/0	1/77/0	1/77/0	3/231/0	3/231/0	3/231/0	1/69/0	1/69/0	1/69/0	3/231/0	-	-	3/231/0
TC	A4.2.1	-	3	22	SAM Analysis, post TC, 2X	Review for delamination	Completed	3/66/0	-	1/22/0	1/22/0	1/22/0	3/66/0	3/66/0	3/66/0	1/15/0	1/15/0	1/15/0	3/66/0	-	-	3/66/0
TC	A4.2.2	-	3	1	Cross Section, post TC, 2X	Post stress cross section	Completed	3/3/0	-	1/1/0	1/1/0	1/1/0	3/3/0	3/3/0	3/3/0	-	-	-	3/3/0	-	-	3/3/0
TC	A4.2.3	-	3	3	Wire Bond Shear, post TC, 2X	Post stress	-	3/9/0	-	1/3/0	1/3/0	1/3/0	3/9/0	3/9/0	3/9/0	-	-	-	3/9/0	-	-	3/9/0
TC	A4.2.4	-	3	3	Bond Pull over Stitch, post TC, 2X	Post stress	-	3/9/0	-	1/3/0	1/3/0	1/3/0	3/9/0	3/9/0	3/9/0	-	-	-	3/9/0	-	-	3/9/0
TC	A4.2.5	-	3	3	Bond Pull over Ball, post TC, 2X	Post stress	-	3/9/0	-	1/3/0	1/3/0	1/3/0	3/9/0	3/9/0	3/9/0	-	-	-	3/9/0	-	-	3/9/0
HTSL	A6.1	JEDEC JESD22-A103	3	45	High Temperature Storage Life	150C	1000 Hours	-	-	1/45/0	1/45/0	1/45/0	1/45/0	1/45/0	-	-	-	-	3/135/0	-	-	-
HTSL	A6.1.1	-	3	1	Cross Section, post HTSL, 1X	Post stress cross section	Completed	-	-	1/1/0	1/1/0	1/1/0	1/1/0	1/1/0	-	-	-	-	3/3/0	-	-	-
HTSL	A6.2	JEDEC JESD22-A103	3	44	High Temperature Storage Life	150C	2000 Hours	-	-	1/45/0	1/45/0	1/45/0	1/45/0	1/45/0	-	-	-	-	3/135/0	-	-	-
HTSL	A6.2	JEDEC JESD22-A103	3	44	High Temperature Storage Life	175C	1000 Hours	-	-	-	-	-	2/90/0	-	-	1/77/0	1/75/0	1/77/0	-	-	-	-
HTSL	A6.2	JEDEC JESD22-A103	3	44	High Temperature Storage Life	175C	500 Hours	-	1/45/0	-	-	-	-	-	-	-	-	-	-	-	-	-
HTSL	A6.2.1	-	3	1	Cross Section, post HTSL, 2X	Post stress cross section	Completed	-	-	1/1/0	1/1/0	1/1/0	1/1/0	1/1/0	-	-	-	-	3/3/0	-	-	-
Test Group C - Package Assembly Integrity Tests																						
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/90/0	3/90/0	3/90/0	-	-	-	3/90/0	1/30/0	1/30/0	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/90/0	3/90/0	3/90/0	-	-	-	3/90/0	1/30/0	1/30/0	3/90/0

QBS: Qual By Similarity, also known as Generic Data
Qual Device INA220BQDGSRQ1 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

Ambient Operating Temperature by Automotive Grade Level:

Grade 0 (or E): -40C to +150C
Grade 1 (or Q): -40C to +125C
Grade 2 (or T): -40C to +105C
Grade 3 (or I) : -40C to +85C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

Room/Hot/Cold : HTOL, ED
Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
Room : AC/uHAST
Quality and Environmental data is available at TI's external Web site: http://www.ti.com/
TI Qualification ID: R-CHG-2308-032
[1]-HAST chamber fail
8D in QDB

In performing change qualifications, Texas Instruments follows integrated circuit industry standards in performing defect mechanism analysis and failure mechanism-based accelerated environmental testing to ensure wafer fab process, assembly process and product quality and reliability. As encouraged by these standards, TI uses both product-specific and generic (family) data in qualifying its changes. For devices to be categorized as a 'product qualification family' for generic data purposes, they must share similar product, wafer fab process and assembly process elements. The applicability of generic data (also known at TI as Qualification by Similarity (QBS)) is determined by the Reliability Engineering function following these industry standards. Generic data is shown in the qualification report in columns titled "QBS Process" (for wafer fab process), "QBS Package" (for assembly process) and "QBS Product" (for product family).

ZVEI ID: SEM-PA-18, SEM-PA-11, SEM-PA-07, SEM-PA-08, SEM-TF-01

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