



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

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)


TEXAS INSTRUMENTS
 MADE IN: Malaysia
 2DC: 2Q:
 MSL 2 / 260C / 1 YEAR
 MSL 1 / 235C / UNLIM
 OPT: 39
 ITEM: 03/29/04
 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

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	3/9/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/9/0

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	QBS/QS Package Reference [QBS/QS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]
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
Memory Package	QFN64	AQ2	WQAF	WQAF	WQAF	WQAF	WQAF	WQAF	AQ2	AQ2	WQAF	WQAF	WQAF	WQAF	WQAF
Assembly Site	MLA	THB	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	D05	D01	D05	D05	D05	D05	D05	D05	PM	PM	PM	D05	D01	D01	D01
Pin Count	20	8	20	20	20	20	20	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 Size	Lot Size	Test Method	Condition	Duration	QBS/QS Package Reference [QBS/QS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]	QBS Package Reference [QBS PACKAGE]
Test Group A: Accelerated Endurance Stress Tests																				
PC	A1	JEDEC J170-020 [JEDEC J170-020]	5	11	Preconditioning	ML1 260C	-	1000	-	-	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
PC	A2	JEDEC J170-020 [JEDEC J170-020]	5	11	Preconditioning	ML1 260C	-	-	-	-	1000	-	-	-	-	1000	1000	1000	1000	1000
HAST	A2	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	Unbiased HAST	150C/85%RH	96 Hours	1770	925/0	1770	1770	1770	1770	1770	1770	1770	1770	1770	1770	1770
ACUHAFT	A3	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	Autoclave	121C/95%RH	96 Hours	-	-	-	1770	1770	1770	1770	1770	1770	1770	1770	1770	1770
ACUHAFT	A3	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	Unbiased HAST	150C/85%RH	96 Hours	1770	-	-	-	-	925/0	925/0	1770	1770	1770	1770	1770	925/0
TC	AA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	Temperature Cycle	40C/125C	800 Cycles	925/0	925/0	1770	1770	1770	925/0	925/0	1770	1770	1770	1770	1770	925/0
TLAP	AA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	Power Temp Cycle	125C	160 Hours	-	-	-	160	160	160	160	160	160	160	160	160	160
HTSL	AB	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	High Temperature Storage Life	150C	1000 Hours	1480	-	-	1480	1480	1480	1480	1480	1480	1480	1480	1480	1480
HTSL	AB	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	High Temperature Storage Life	170C	160 Hours	-	-	-	-	-	-	-	-	160	160	160	160	160
Test Group B: Mechanical Shock Tests																				
HTSL	BA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	Low Temp Shock	125C	1600	925/0	1770	-	-	-	-	-	1770	1770	1770	925/0	-	-
ELFR	BA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	Low Temp Shock	150C	800 Hours	-	-	-	-	-	-	-	-	-	1770	1770	-	-
ELFR	BA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	High Temp Shock	150C	160 Hours	-	-	-	10400	-	-	-	-	-	-	-	-	-
Test Group C: Functional Performance Tests																				
WBS	CA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	Wire Bond Stress	Minimum of 8 Wires, 20 Wires Cap-L1	Wires	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
WBS	CA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	Wire Bond Pull	Minimum of 8 Wires, 20 Wires Cap-L1	Wires	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
ISD	CB	JEDEC J170-020	5	15	PS Load Capability	100% Load	-	-	-	1000	-	-	1000	1000	1000	1000	1000	1000	1000	1000
ISD	CB	JEDEC J170-020	5	15	PS Load Capability	100% Load	-	-	-	1000	-	-	1000	1000	1000	1000	1000	1000	1000	1000
PD	CA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	11	Physical Dimensions	Cap-L1	-	1000	-	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Test Group D: On-Chip Temperature Monitoring Tests																				
DM	DA	JEDEC	-	-	Dissemination	-	-	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
TDCC	DA	JEDEC	-	-	Thermal Characterization	-	-	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	DA	JEDEC-013.0	-	-	High Current 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
BTI	DA	-	-	-	Blue 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
SM	DA	-	-	-	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
Test Group E: Electrical Verification Tests																				
ESD	EA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	9	ESD HBM	2000 VES	1000	-	-	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
ESD	EA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	9	ESD HBM	2000 VES	-	-	-	-	-	-	-	-	-	1000	1000	1000	1000	1000
ESD	EA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	9	ESD HBM	2000 VES	-	-	-	-	-	-	-	-	-	1000	1000	1000	1000	1000
ESD	EA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	9	ESD HBM	2000 VES	-	-	-	-	-	-	-	-	-	1000	1000	1000	1000	1000
ESD	EA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	9	ESD CDH	2000 VES	-	-	-	-	-	-	-	-	-	1000	1000	1000	1000	1000
ESD	EA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	9	ESD CDH	2000 VES	-	-	-	-	-	-	-	-	-	1000	1000	1000	1000	1000
LU	EA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	9	Load Regulation	PM/AC Q100-004	-	1000	-	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
SD	EA	JEDEC JEDEC-013.0 [JEDEC JEDEC-013.0]	5	9	Static Discharge	Cap-L1, Resist, Induct	-	1000	-	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

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	Q006 Device Reference INA220BQDGSRQ1	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA
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	Grade 1	Grade 1	Grade 1
Operating Temp Range (Tj)	-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	-40 to 125	-40 to 125	-40 to 125
Product Function	ASIC	Signal Chain	Logic	Logic	Logic	Logic	Logic	Logic	Logic	Logic	Logic	Logic	Logic	Logic	Logic	Logic	Logic	Logic
Active Part Number	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006
Assembly Site	MLA	TIME	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA
Package Group	VSSOP	DOT	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP	VSSOP
Package Designator	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006	Q006
Pin Count	20	6	20	20	20	12	12	12	14	14	14	14	20	6	6	6	6	6

Qualification Results

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

Test	#	Test Name	Ref. Part No.	Lot No.	Test Name	Condition	Duration	Q006 Device Reference INA220BQDGSRQ1	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA	Q006 Package Reference JEDEC-MS-012AA
Test Group A: Ambient Chamber Stress Tests																		
PC	A1	JESD47-1470-100 JEDEC-A119	3	77	Preconditioning	MLL2 260C	-	3900	-	3900	3900	3900	3900	3900	-	-	-	3900
PC	A2	JESD47-1470-100 JEDEC-A119	3	77	Preconditioning	MLL2 260C	-	-	-	-	-	-	-	-	200	200	3900	-
PC	A12.1	-	3	22	Salt Precip. Test	Review for observation	-	3900	-	2040	2040	2040	2040	2040	-	-	-	3900
PC	A12.2	-	3	22	Salt Precip. Test	Review for observation	-	3900	-	2040	2040	2040	2040	2040	-	-	-	3900
HAST	A2.1	JESD2-1000-110 JEDEC-A119	3	77	Biased HAST	150C/85%RH	96 Hours	-	-	1770	1770	1770	1770	-	1770	1860	-	1770
HAST	A2.2	-	3	1	Cross Section, post HAST	Post stress cross section	Completed	-	-	100	100	100	100	-	-	-	100	-
HAST	A2.3	-	3	3	Wire Bond Stress, post HAST	Post stress	-	-	-	100	100	100	100	-	-	-	100	-
HAST	A2.4	-	3	3	Bond Pull over 100%RH, post HAST	Post stress	-	-	-	100	100	100	100	-	-	-	100	-
HAST	A2.5	-	3	3	Bond Pull over 100%RH, post HAST	Post stress	-	-	-	100	100	100	100	-	-	-	100	-
HAST	A2.6	JESD2-1000-110 JEDEC-A119	3	70	Biased HAST	150C/85%RH	264 Hours	-	-	-	-	-	-	-	1890 ¹	1870	-	-
HAST	A2.7	JESD2-1000-110 JEDEC-A119	3	70	Biased HAST	150C/85%RH	180 Hours	-	-	1770	1770	1770	1770	-	1770	1860	-	1770
HAST	A2.8	JESD2-1000-110 JEDEC-A119	3	70	Biased HAST	150C/85%RH	96 Hours	-	-	-	-	-	-	-	1770	1770	-	-
HAST	A2.9	-	3	20	Salt Amalgam, post HAST	Review for observation	Completed	-	-	1020	1020	1020	1020	-	-	1040	1040	1000
HAST	A2.10	-	3	1	Cross Section, post HAST	Post stress cross section	Completed	-	-	100	100	100	100	-	-	-	100	-
HAST	A2.11	-	3	3	Wire Bond Stress, post HAST	Post stress	-	-	-	100	100	100	100	-	-	-	100	-
HAST	A2.12	-	3	3	Bond Pull over 100%RH, post HAST	Post stress	-	-	-	100	100	100	100	-	-	-	100	-
HAST	A2.13	-	3	3	Bond Pull over 100%RH, post HAST	Post stress	-	-	-	100	100	100	100	-	-	-	100	-
TC	A4.1	JESD47-1470-100 JEDEC-A119	3	77	Temperature Cycle	48C/150C	800 Cycles	3020	-	1770	1770	1770	3030	3030	3030	1770	1770	3030
TC	A4.1.1	-	3	22	Salt Amalgam, post TC	Review for observation	Completed	3900	-	1020	1020	1020	1020	1020	1040	1040	1000	3900
TC	A4.1.2	-	3	1	Cross Section, post TC	Post stress cross section	Completed	390	-	100	100	100	100	100	-	-	-	390
TC	A4.1.3	-	3	3	Wire Bond Stress, post TC	Post stress	-	390	-	100	100	100	100	100	-	-	-	390
TC	A4.1.4	-	3	3	Bond Pull over 100%RH, post TC	Post stress	-	390	-	100	100	100	100	100	-	-	-	390
TC	A4.1.5	-	3	3	Bond Pull over 100%RH, post TC	Post stress	-	390	-	100	100	100	100	100	-	-	-	390
TC	A4.2	JESD47-1470-100 JEDEC-A119	3	70	Temperature Cycle	48C/150C	1000 Cycles	3020	-	1770	1770	1770	3030	3030	3030	1890	1890	3030
TC	A4.2.1	-	3	22	Salt Amalgam, post TC	Review for observation	Completed	3900	-	1020	1020	1020	1020	1020	1040	1040	1000	3900
TC	A4.2.2	-	3	1	Cross Section, post TC	Post stress cross section	Completed	390	-	100	100	100	100	100	-	-	-	390
TC	A4.2.3	-	3	3	Wire Bond Stress, post TC	Post stress	-	390	-	100	100	100	100	100	-	-	-	390
TC	A4.2.4	-	3	3	Bond Pull over 100%RH, post TC	Post stress	-	390	-	100	100	100	100	100	-	-	-	390
TC	A4.2.5	-	3	3	Bond Pull over 100%RH, post TC	Post stress	-	390	-	100	100	100	100	100	-	-	-	390
HTSL	A6.1	JESD2-1000-110 JEDEC-A119	3	46	High Temperature Thermal Shock	150C	1000 Hours	-	-	1460	1460	1460	1460	-	-	-	1460	-
HTSL	A6.1.1	-	3	1	Cross Section, post HTSL	Post stress cross section	Completed	-	-	100	100	100	100	-	-	-	100	-
HTSL	A6.2	JESD2-1000-110 JEDEC-A119	3	44	High Temperature Thermal Shock	150C	2000 Hours	-	-	1460	1460	1460	1460	-	-	-	1460	-
HTSL	A6.2.1	JESD2-1000-110 JEDEC-A119	3	44	High Temperature Thermal Shock	170C	1000 Hours	-	-	-	-	-	-	-	1770	1760	1770	-
HTSL	A6.2.2	JESD2-1000-110 JEDEC-A119	3	44	High Temperature Thermal Shock	170C	800 Hours	1460	-	-	-	-	-	-	-	-	-	1460
HTSL	A6.2.3	-	3	1	Cross Section, post HTSL	Post stress cross section	Completed	-	-	100	100	100	100	-	-	-	100	-
Test Group B: Package Assembly Integrity Tests																		
HTSL	C1	48C/150C/100%RH	1	30	Wire Bond Stress	Maximum of 5 devices, 30 wires Cap-L&T	Wires	1000	1000	1000	1000	1000	1000	1000	-	-	-	1000
HTSL	C2	ML-170000-100000	1	30	Wire Bond Pull	Maximum of 5 devices, 30 wires Cap-L&T	Wires	1000	1000	1000	1000	1000	1000	1000	-	-	-	1000

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

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Ambient Operating Temperature by Automotive Grade Level:

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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

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