



12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20240806005.2

**Qualification of FFAB using qualified Process Technology, Die Revision, and
Assembly BOM options for select devices
Change Notification / Sample Request**

Date: August 06, 2024

To: MOUSER 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

20240806005.2
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
INA148QDRQ1	NULL

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

PCN Number:	20240806005.2	PCN Date:	August 06, 2024
Title:	Qualification of FFAB using qualified Process Technology, Die Revision, and Assembly BOM options for select devices		
Customer Contact:	Change Management team	Dept:	Quality Services
Proposed 1st Ship Date:	February 02, 2025	Sample requests accepted until:	September 05, 2024*
*Sample requests received after September 05, 2024 will not be supported.			
Change Type:			
<input type="checkbox"/> Assembly Site	<input checked="" 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 checked="" type="checkbox"/>	Wafer Fab Site
<input type="checkbox"/> Mechanical Specification	<input type="checkbox"/> Test Site	<input checked="" type="checkbox"/>	Wafer Fab Materials
<input checked="" type="checkbox"/> Packing/Shipping/Labeling	<input type="checkbox"/> Test Process	<input checked="" type="checkbox"/>	Wafer Fab Process

PCN Details

Description of Change:

Texas Instruments is pleased to announce the addition of FFAB using the BICOM3XHV qualified process technology and additional Assembly BOM options for the devices listed below.

Current Fab Site			Additional Fab Site		
Current Fab Site	Process	Wafer Diameter	Additional Fab Site	Process	Wafer Diameter
SFAB	JIBB	150 mm	FFAB	BICOM3XHV	200 mm

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

Construction differences are as follows:

	Current	Proposed
Wire diam/type	1.2mil Au	1.0mil Cu
Mount compound	4205846	4147858
Mold compound	4209640	4226323
Device marking	TI logo, pin 1 stripe	TI letters, pin 1 dot

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 and 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
<input checked="" type="checkbox"/> No Change			

Changes to product identification resulting from this PCN:

Fab Site

Information:

Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
SH-BIP-1	SHE	USA	Sherman
FR-BIP-1	TID	DEU	Freising

Die Rev:**Current****New**

Die Rev [2P]	Die Rev [2P]
C	A

Sample product shipping label (not actual product label)

**Product Affected:**

INA148QDRQ1

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

TI Information
Selective Disclosure

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

Redbull INA148QDRQ1, Grade 1, AEC Q100J, Q006 assembled in MLA
Approve Date 20-June-2024

Product Attributes

Attributes	Qual Device: INA148QDRQ1	Qual Device: INA148QDRQ1	QBS Package Reference: SN74HCS74QDRQ1	QBS Process Reference: OPA1662AIDGKRQ1	QBS Product Reference: OPA1612AQDRQ1	QBS Product Reference: OPA2863QDRQ1	QBS Package Reference: SN65HVD195QDRQ1
Automotive Grade Level	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
Product Function	Signal Chain	Signal Chain	Logic	Signal Chain	Signal Chain	Signal Chain	Interface
Wafer Fab Supplier	FR-BIP-1	FR-BIP-1	RFAB	FR-BIP-1	FR-BIP-1	FR-BIP-1, FR-BIP-1	CFAB
Assembly Site	MLA	MLA	MLA	ASESHAT	MLA	MLA	MLA
Package Group	SOIC	SOIC	SOIC	VSSOP	SOIC	SOIC	SOIC
Package Designator	D	D	D	DGK	D	D	D
Pin Count	8	8	14	8	8	8	8

- QBS: Qual By Similarity
- Qual Device INA148QDRQ1 is qualified at MSL1 260C
- Qual Device INA148QDRQ1 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: INA148QDRQ1	Qual Device: INA148QDRQ1	QBS Package Reference: SN74HCS74QDRQ1	QBS Process Reference: OPA1662AIDGKRQ1	QBS Product Reference: OPA1612AQDRQ1	QBS Product Reference: OPA2863QDRQ1	QBS Package Reference: SN65HVD195QDRQ1
Test Group A - Accelerated Environment Stress Tests														
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL1 260C	-	-	-	3/1050/0	3/0/0	-	-	3/0/0

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: INA148QDRQ1	Qual Device: INA148QDRQ1	QBS Package Reference: SN74HCS74QDRQ1	QBS Process Reference: OPA1662AIDGKRQ1	QBS Product Reference: OPA1612AQDRQ1	QBS Product Reference: OPA2863QDRQ1	QBS Package Reference: SN65HVDAA195QDRQ1	
PC	A1	JEDEC J-STD-020 JEDEC JESD22-A113	3	77	Preconditioning	MSL2 260C	-	-	-	-	-	3/0/0	3/915/0	-	
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	-	1/77/0	3/231/0	-	3/231/0	3/231/0	3/231/0	
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Autoclave	121C/15psig	96 Hours	-	-	3/231/0	-	3/231/0	-	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	-	
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	175C	500 Hours	1/50/0	-	-	-	1/45/0	-	1/45/0	
Test Group B - Accelerated Lifetime Simulation Tests															
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	125C	1000 Hours	-	-	1/77/0	-	-	3/231/0	-	3/231/0
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	150C	300 Hours	-	1/77/0	-	-	-	3/231/0	-	-
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate	125C	48 Hours	-	-	-	3/240/0	-	3/240/0	3/240/0	3/240/0
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	-	1/3/0/0	3/90/0	-	1/3/0	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	-	1/3/0/0	3/90/0	-	1/3/0	3/90/0	3/90/0	
SD	C3	JEDEC J-STD-002	1	15	PB Solderability	>95% Lead Coverage	-	-	-	3/45/0	-	-	1/15/0	1/15/0	
SD	C3	JEDEC J-STD-002	1	15	PB-Free Solderability	>95% Lead Coverage	-	1/15/0	-	3/45/0	-	-	1/15/0	1/15/0	
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions	Cpk>1.67	-	-	1/10/0	3/30/0	-	1/10/0	3/30/0	3/30/0	
Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: INA148QDRQ1	Qual Device: INA148QDRQ1	QBS Package Reference: SN74HCS74QDRQ1	QBS Process Reference: OPA1662AIDGKRQ1	QBS Product Reference: OPA1612AQDRQ1	QBS Product Reference: OPA2863QDRQ1	QBS Package Reference: SN65HVDAA195QDRQ1	
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	
TDBB	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	
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	
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	
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	
Test Group E - Electrical Verification Tests															
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	11000 Volts	-	-	-	-	-	-	1/3/0	
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	12000 Volts	-	-	-	-	-	-	1/3/0	
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	1500 Volts	-	1/3/0	-	-	-	-	-	
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	2000 Volts	-	-	1/3/0	-	1/3/0	1/3/0	-	
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	4000 Volts	-	-	-	-	-	-	1/3/0	
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	1500 Volts	-	-	-	-	-	-	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	-	
LU	E4	AEC Q100-004	1	6	Latch-Up	Per AEC Q100-004	-	-	1/3/0	1/6/0	-	1/6/0	1/6/0	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	-	3/90/0	3/90/0	3/90/0	
Additional Tests															
<ul style="list-style-type: none"> 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-2209-087

TI Information
Selective Disclosure

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

Q006 {SOIC} at {MLA}
Approve Date 20-June-2024

Attributes		Qual Device: INA148QDRQ1	Qual Device: INA148QDRQ1	QBS Package Reference: SN74HCS74QDRQ1	QBS Process Reference: OPA1662AIDGKRQ1	QBS Product Reference: OPA1612AQDRQ1	QBS Product Reference: OPA2863QDRQ1	QBS Package Reference: SN65HVDA195QDRQ1
Automotive Grade Level		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
Product Function		Signal Chain	Signal Chain	Logic	Signal Chain	Signal Chain	Signal Chain	Interface
Wafer Fab Supplier		FR-BIP-1	FR-BIP-1	RFAB	FR-BIP-1	FR-BIP-1	FR-BIP-1, FR-BIP-1	CFAB
Assembly Site		MLA	MLA	MLA	ASESHAT	MLA	MLA	MLA
Package Group		SOIC	SOIC	SOIC	VSSOP	SOIC	SOIC	SOIC
Package Designator		D	D	D	DGK	D	D	D
Pin Count		8	8	14	8	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: INA148QDRQ1	Qual Device: INA148QDRQ1	QBS Reference: SN74HCS74QDRQ1	QBS Reference: OPA1612AQDRQ1	QBS Reference: OPA2863QDRQ1	QBS Reference: SN65HVDA195QDRQ1	
Test Group A - Accelerated Environment Stress Tests														
PC	A1	JEDEC J-STD-020 JE3022-A113	3	77	Preconditioning	MSL1 260C	-	-	3/1050/0	3/Pass	-	-	-	-

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: INA148QDRQ1	Qual Device: INA148QDRQ1	QBS Reference: SN74HCS74QDRQ1	QBS Reference: OPA1612AQDRQ1	QBS Reference: OPA2863QDRQ1	QBS Reference: SN65HVDA195QDRQ1
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	-	-	-	-	3/915/0	-
PC	A1.1	-	3	22	SAM Precon Pre	Review for delamination	-	-	3/66/0	3/66/0	-	3/66/0	-
PC	A1.2	-	3	22	SAM Precon Post	Review for delamination	-	-	3/66/0	3/66/0	-	3/66/0	-
HAST	A2.1	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	-	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	-	-	3/210/0	-	3/210/0	-
HAST	A2.2.1	-	3	22	SAM Analysis, post bHAST 2X	Review for delamination	Completed	-	-	3/66/0	-	3/66/0	-
HAST	A2.2.2	-	3	1	Cross Section, post bHAST, 2X	Post stress cross section	Completed	-	-	3/3/0	-	3/2/0	-
HAST	A2.2.3	-	3	3	Wire Bond Shear, post bHAST, 2X	Post stress	-	-	-	3/9/0	-	3/9/0	-
HAST	A2.2.4	-	3	3	Bond Pull over Stitch, post bHAST, 2X	Post stress	-	-	-	3/9/0	-	3/9/0	-
HAST	A2.2.5	-	3	3	Bond Pull over Ball, post bHAST, 2X	Post stress	-	-	-	3/9/0	-	3/9/0	-
TC	A4.1.1	-	3	22	SAM Analysis, post TC 1X	Review for delamination	Completed	-	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	3/3/0	-	-	-

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: INA148QDRQ1	Qual Device: INA148QDRQ1	QBS Reference: SN74HCS74QDRQ1	QBS Reference: OPA1612AQDRQ1	QBS Reference: OPA2863QDRQ1	QBS Reference: SN65HVDA195QDRQ1
TC	A4.1.3	-	3	3	Wire Bond Shear, post TC, 1X	Post stress	-	-	3/9/0	3/9/0	-	-	-
TC	A4.1.4	-	3	3	Bond Pull over Stitch, post TC, 1X	Post stress	-	-	3/9/0	3/9/0	-	-	-
TC	A4.1.5	-	3	3	Bond Pull over Ball, post TC, 1X	Post stress	-	-	3/9/0	3/9/0	-	-	-
TC	A4.2	JEDEC JESD22-A104 and Appendix 3	3	70	Temperature Cycle	-65C/150C	1000 Cycles	-	3/210/0	3/210/0	-	3/2101/0	-
TC	A4.2.1	-	3	22	SAM Analysis, post TC, 2X	Review for delamination	Completed	-	3/66/0	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	3/3/0	-	3/3/0	-
TC	A4.2.3	-	3	3	Wire Bond Shear, post TC, 2X	Post stress	-	-	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	3/9/0	-	3/9/0	-
TC	A4.2.5	-	3	3	Bond Pull over Ball, post TC, 2X	Post stress	-	-	3/9/0	3/9/0	-	3/9/0	-
HTSL	A6.1	JEDEC JESD22-A103	3	45	High Temperature Storage Life	175C	500 Hours	1/50/0	-	-	-	-	-
HTSL	A6.1.1	-	3	1	Cross Section, post HTSL, 1X	Post stress cross section	Completed	1/1/0	-	3/3/0	-	-	-
HTSL	A6.2	JEDEC JESD22-A103	3	44	High Temperature Storage Life	150C	2000 Hours	-	-	3/132/0	-	3/132/0	-
HTSL	A6.2	JEDEC JESD22-A103	3	44	High Temperature Storage Life	175C	1000 Hours	1/49/0	-	-	-	-	-
HTSL	A6.2.1	-	3	1	Cross Section, post HTSL, 2X	Post stress cross section	Completed	1/1/0	-	3/3/0	-	3/3/0	-

Test Group C - Package Assembly Integrity Tests

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: INA148QDRQ1	Qual Device: INA148QDRQ1	QBS Reference: SN74HCS74QDRQ1	QBS Reference: OPA1612AQDRQ1	QBS Reference: OPA2863QDRQ1	QBS Reference: SN65HVDAA195QDRQ1
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	-	1/30/0	3/90/0	1/30/0	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	-	1/30/0	3/90/0	1/30/0	3/90/0	3/90/0

- QBS: Qual By Similarity
- Qual Device [INA148QDRQ1](#) is qualified at MSL1 260C
- Qual Device [INA148QDRQ1](#) 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/u/HAST

Quality and Environmental data is available at TI's external Web site: <http://www.ti.com/>

TI Qualification ID: R-CHG-2209-087

ZVEI ID's: SEM-DE-01, SEM-DE-02, SEM-DE-03, SEM-PW-02, SEM-PW-09, SEM-PW-13, SEM-PA-08, SEM-PA-05, SEM-PA-11, SEM-PA-13

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

IMPORTANT NOTICE AND DISCLAIMER

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