PCN Number:	20220617000.2A	PCN Date:	December 09, 2022
Title:	Qualification of TI Chengdu as an additional Assembly and Test site for select devices		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Dec 17, 2022	Sample requests accepted until:	Jan 09, 2023*

*Sample requests received after (Jan 09, 2023) will not be supported.

Change Type:

☒	Assembly Site	☐	Design	☐	Wafer Bump Site
☐	Assembly Process	☐	Data Sheet	☐	Wafer Bump Material
☒	Assembly Materials	☐	Part number change	☐	Wafer Bump Process
☐	Mechanical Specification	☒	Test Site	☐	Wafer Fab Site
☒	Packing/Shipping/Labeling	☐	Test Process	☐	Wafer Fab Materials
				☐	Wafer Fab Process

PCN Details

Description of Change:

Revision A is to announce the addition of new devices that was not included on the original PCN notification. The new devices are highlighted and **bolded** in the device list below. The expected first shipment date for the new device will be 180 days from this notice (May 09, 2023) for the newly added device only. The proposed 1st ship date of Dec 17, 2022 still applies for the original set of devices.

Texas Instruments is pleased to announce the qualification of TI Chengdu as additional Assembly and Test Site for Select Devices listed in the "Product Affected" Section. Material differences are as follows.

Assembly Site	Assembly Site Origin	Assembly Country Code	Assembly City
UTAC	NSE	THA	Bangkok
TI Chengdu	CDA	CHN	Chengdu

Material and Test site Differences:

	UTAC	TI Chengdu
Mount Compound	PZ0035	4207123
Lead finish	Matte Sn	NiPdAu

Upon expiry of this PCN TI will combine lead free solutions in a single ***standard part number***, for the devices in the "Product Affected" Section. For example; ***LM73605QRNPRQ1*** – can ship with both Matte Sn and NiPdAu.

Example:

- Customer order for 7500 units of LM73605QRNPRQ1 with 2500 units SPQ (Standard Pack Quantity per Reel).
- TI can satisfy the above order in one of the following ways.
  - I. 3 Reels of NiPdAu finish.
  - II. 3 Reels of Matte Sn finish
  - III. 2 Reels of Matte Sn and 1 reel of NiPdAu finish.
  - IV. 2 Reels of NiPdAu and 1 reel of Matte Sn finish.

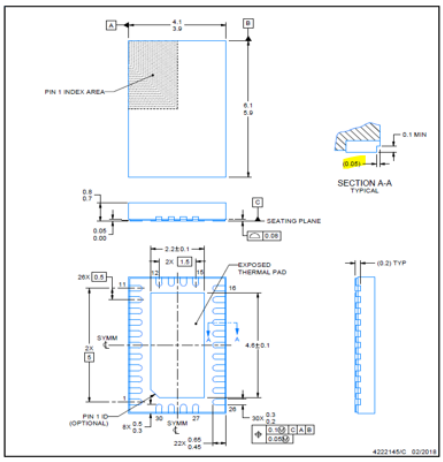
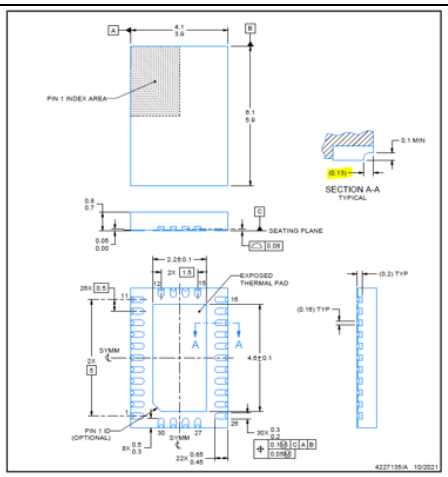
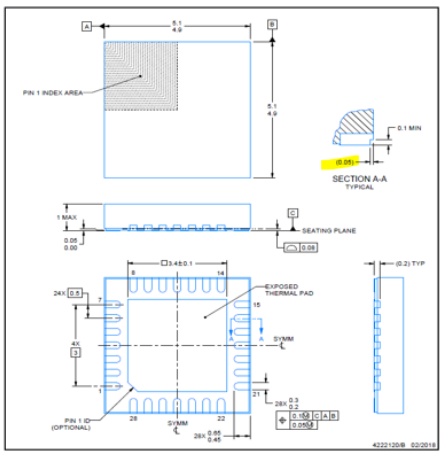
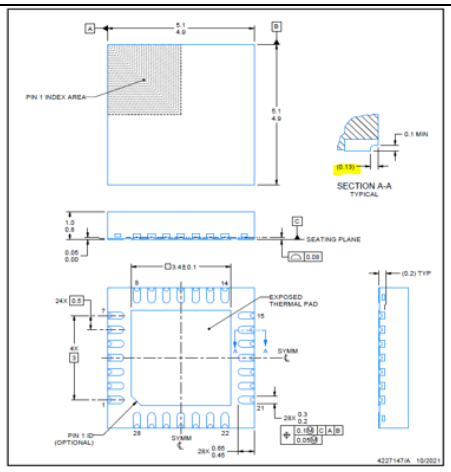
Marking Differences:

	UTAC	TI Chengdu

	RNP Package	LM73605R NPQ1 TI YMJ PLLLL G3 O TI = TI LETTERS YM = YEAR MONTH DATE CODE LLLL = ASSEMBLY LOT CODE J = PRIMARY SITE CODE P = SECONDARY SITE CODE O = PIN 1 INDICATOR	LM73605R NPQ1 TI YMS LLLL G4 O TI = TI LETTERS YM = YEAR MONTH DATE CODE LLLL = ASSEMBLY LOT CODE S = ASEMBLY SITE CODE O = PIN 1 INDICATOR
	RHD Package	LP8733 22-Q1 TI YMS LLLL G3 O TI = TI LETTERS YM = YEAR MONTH DATE CODE LLLL = ASSEMBLY LOT CODE S = ASEMBLY SITE CODE O = PIN 1 INDICATOR	LP8733 22-Q1 TI YMS LLLL G4 O TI = TI LETTERS YM = YEAR MONTH DATE CODE LLLL = ASSEMBLY LOT CODE S = ASEMBLY SITE CODE O = PIN 1 INDICATOR
	ECAT	G3	**G4**

Test coverage, insertions, conditions will remain consistent with current testing.

Package Outline Drawing Differences:

	UTAC	**TI Chengdu**
RNP Package Drawing		
RHD Package Drawing		
Wettable Flank design	Step Cut	Dimple

Reason for Change:

Continuity of supply.

Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):

None

Impact on Environmental Ratings

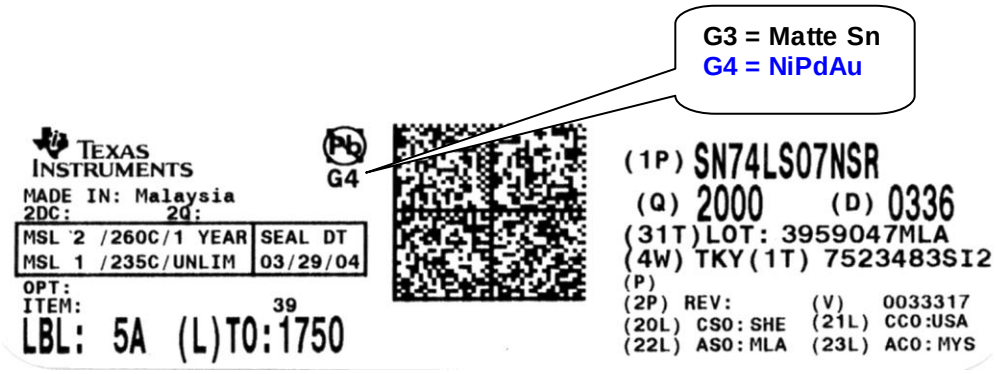
Checked boxes indicate the status of environmental ratings following implementation of this change. If below boxes are checked, there are no changes to the associated environmental ratings.

RoHS	REACH	Green Status	IEC 62474
☒ No Change	☒ No Change	☒ No Change	☒ No Change

Changes to product identification resulting from this PCN:

Assembly Site		
UTAC	Assembly Site Origin (22L)	ASO: NSE
CDAT	Assembly Site Origin (22L)	ASO: CDA

Sample product shipping label (not actual product label)



Product Affected:

LM73605QRNPRQ1	LP873221RHDTQ1	**LP87324ARHDRQ1**	LP87332ARHDRQ1
LM73605QRNPTQ1	LP873222RHDRQ1	LP873300RHDRQ1	LP87332ARHDTQ1
LM73606QRNPRQ1	LP873222RHDTQ1	LP873300RHDTQ1	LP87332BRHDRQ1
LM73606QRNPTQ1	LP87322ERHDRQ1	LP87331BRHDRQ1	LP87332BRHDTQ1
LM76002QRNPRQ1	LP87322ERHDTQ1	LP87331BRHDTQ1	LP87332DRHDRQ1
LM76002QRNPTQ1	LP87322FRHDRQ1	LP873321RHDRQ1	LP87332DRHDTQ1
LM76003QRNPRQ1	LP87322FRHDTQ1	LP873321RHDTQ1	LP873343RHDRQ1
LM76003QRNPTQ1	LP873241RHDRQ1	LP873322RHDRQ1	LP873343RHDTQ1
LM76005QRNPRQ1	LP873241RHDTQ1	LP873324RHDRQ1	LP873344RHDRQ1
LP873200RHDRQ1	LP873242RHDRQ1	LP873324RHDTQ1	LP873344RHDTQ1
LP873200RHDTQ1	LP873242RHDTQ1	LP873325RHDRQ1	LP873349RHDRQ1
LP873220RHDRQ1	LP873244RHDRQ1	LP873325RHDTQ1	**LP87334ARHDRQ1**
LP873220RHDTQ1	LP873244RHDTQ1	LP873327RHDRQ1	TPS6565342RHDRQ1
LP873221RHDRQ1	**LP873245RHDRQ1**	LP873327RHDTQ1	TPS6565342RHDTQ1

RHD Qualification Report

Automotive New Product Qualification Summary
(As per AEC-Q100 and JEDEC Guidelines)

Approve Date 09-June-2022

Product Attributes

Attributes	Qual Device: LP873322RHDRQ1	QBS Reference: LM2775QDSGRQ1	QBS Reference: LP87332ARHDRQ1	QBS Reference: DRV8703QRHBRQ1
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125	-40 to 125	-40 to 125
Product Function	Power Management	Power Management	Power Management	Signal Chain
Wafer Fab Supplier	RFAB	RFAB	RFAB	RFAB
Assembly Site	CDAT	CDAT	UTL1	CDAT
Package Group	QFN	QFN	QFN	QFN
Package Designator	RHD	DSG	RHD	RHB
Pin Count	28	8	28	32

QBS: Qual By Similarity
Qual Device LP873322RHDRQ1 is qualified at MSL2 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: LP873322RHDRQ1	QBS Reference: LM2775QDSGRQ1	QBS Reference: LP87332ARHDRQ1	QBS Reference: DRV8703QRHBRQ1
Test Group A - Accelerated Environment Stress Tests											
PC	A1	JEDEC JSTD-020 JESD22A113	3	77	Preconditioning	MSL2 260C	-	-	Pass	Pass	Pass
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85 %RH	96 Hours	-	3/231/0	3/231/0	3/231/0
AC/UHAST	A3	JEDEC JESD22A102/JEDEC JESD22-A118	3	77	Autoclave	121C/15psig	96 Hours	-	3/231/0	-	3/231/0
AC/UHAST	A3	JEDEC JESD22A102/JEDEC JESD22A118	3	77	Unbiased HAST	130C/85 %RH	96 Hours	-	-	3/231/0	-

TC	A4	JEDEC JESD22A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	-	3/231/0	3/231/0	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	-	-	-	3/15/0	3/15/0	3/15/0
PTC	A5	JEDEC JESD22-A105	1	45	PTC	-40/125C	1000 Cycles	-	1/45/0	1/45/0	-
HTSL	A6	JEDEC JESD22A103	1	45	High Temperature Storage Life	150C	1000 Hours	-	-	3/135/0	3/135/0
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	175C	500 Hours	-	3/135/0	-	-
Test Group B - Accelerated Lifetime Simulation Tests											
HTOL	B1	JEDEC JESD22-A108	1	77	Life Test	125C	1000 Hours	-	3/231/0	-	-
HTOL	B1	JEDEC JESD22A108	1	77	Life Test	150C	1000 Hours	-	-	3/231/0	-
ELFR	B2	AEC Q100008	1	77	Early Life Failure Rate	150C	24 Hours	-	-	3/2400/0	-
Test Group C - Package Assembly Integrity Tests											
WBS	C1	AEC Q100001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	3/90/0	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	3/90/0	3/90/0
SD	C3	JEDEC JESD22B102	1	15	PB Solderability	>95% Lead Coverage	-	1/15/0	1/15/0	-	1/15/0
SD	C3	JEDEC JESD22-B102	1	15	PB-Free Solderability	>95% Lead Coverage	-	1/15/0	1/15/0	-	1/15/0
PD	C4	JEDEC JESD22B100 and B108	1	10	Physical Dimensions	Cpk>1.67	-	1/10/0	3/30/0	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	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements

TDDB	D 2	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
HCI	D 3	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
NBTI	D 4	-	-	-	Negative Bias Temperature Instability	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
SM	D 5	-	-	-	Stress Migration	-	-	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	E 2	AEC Q100002	1	3	ESD HBM	-	2000 Volts	-	-	1/3/0	1/3/0
ESD	E 3	AEC Q100011	1	3	ESD CDM	-	500 Volts	-	-	1/3/0	1/3/0
LU	E 4	AEC Q100004	1	6	Latch-Up	Per AEC Q100-004	-	-	-	1/6/0	1/6/0
ED	E 5	AEC Q100009	3	30	Electrical Distributions		-	1/30/0	3/90/0	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/

RNP Qualification Report

Automotive New Product Qualification Summary
(As per AEC-Q100 and JEDEC Guidelines)

Approve Date 09-June-2022

Product Attributes

Attributes	Qual Device: LM73605QRNPRQ1	Qual Device: LM76005QRNPRQ1	QBS Reference: PCM6260QRTVRQ1	QBS Reference: DRV8703QRHBRQ1	QBS Reference: LM46002AQPWPRQ1
Automotive Grade Level	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
Product Function	Power Management	Power Management	Signal Chain	Signal Chain	Power Management
Wafer Fab Supplier	MH8	MH8	RFAB	RFAB	MH8
Assembly Site	CDAT	CDAT	CDAT	CDAT	TAI
Package Group	QFN	QFN	QFN	QFN	TSSOP
Package Designator	RNP	RNP	RTV	RHB	PWP
Pin Count	30	30	32	32	16

QBS: Qual By Similarity
Qual Device LM73605QRNPRQ1 and LM76005QRNPRQ1 are qualified at MSL2 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: LM73605QRNPRQ1	Qual Device: LM76005QRNPRQ1	QBS Reference: PCM6260QRTVRQ1	QBS Reference: DRV8703QRHBRQ1	QBS Reference: LM46002AQPWPRQ1
Test Group A - Accelerated Environment Stress Tests												
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	1 Step	Pass	-	Pass	Pass	-
PC	A1	JEDEC J-STD-020 JESD22A113	3	77	Preconditioning	MSL3 260C	1 Step	-	-	-	-	Pass
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	3/231/0	-
HAST	A2	JEDEC JESD22-A110	3	77	Temperature Humidity Bias	85C/85%RH	1000 Hours	-	-	-	-	3/231/0
AC/UHAST	A3	JEDEC JESD22A102/ JEDEC JESD22A118	3	77	Autoclave	121C/15psig	96 Hours	3/231/0	-	-	-	3/231/0

AC/UHAST	A3	JEDEC JESD22A102/ JEDEC JESD22A118	3	77	Unbiased HAST	130C/85%RH	96 Hours	-	-	3/231/0	3/231/0	-
TC	A4	JEDEC JESD22A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	3/231/0	-	3/231/0	3/231/0	-
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	-	-	3/15/0	-	-	3/15/0	1/5/0
PTC	A5	JEDEC JESD22A105	1	45	PTC	-40/125C	1000 Cycles	-	-	1/45/0	-	-
HTSL	A6	JEDEC JESD22A103	1	45	High Temperature Storage Life	150C	1000 Hours	-	-		3/135/0	3/135/0
Test Group B - Accelerated Lifetime Simulation Tests												
HTOL	B1	JEDEC JESD22A108	1	77	Life Test	125C	1000 Hours	-	-	3/231/0	-	-
ELFR	B2	AEC Q100008	1	77	Early Life Failure Rate	125C	48 Hours	-	-	3/2400/0	-	-
ELFR	B2	AEC Q100008	1	77	Early Life Failure Rate	150C	24 Hours	-	-	-	-	3/2400/0
Test Group C - Package Assembly Integrity Tests												
WBS	C1	AEC Q100001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0	1/30/0	3/90/0	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	3/90/0	1/30/0	3/90/0	3/90/0	3/90/0
SD	C3	JEDEC JESD22-B102	1	15	PB Solderability	>95% Lead Coverage	-	1/15/0	-	1/15/0	1/15/0	1/15/0
SD	C3	JEDEC JESD22B102	1	15	PB-Free Solderability	>95% Lead Coverage	-	1/15/0	-	1/15/0	1/15/0	1/15/0
PD	C4	JEDEC JESD22B100 and B108	1	10	Physical Dimensions	Cpk>1.67	-	3/30/0	1/10/0	3/30/0	3/30/0	3/30/0
Test Group D - Die Fabrication Reliability Tests												
EM	D1	JESD61	-	-	Electromigration	-	-	Completed Per Process Technology Requiremen	Completed Per Process Technology Requiremen	Completed Per Process Technology Requiremen	Completed Per Process Technology Requiremen	Completed Per Process Technology Requirement

								ts	ts	ts	ts	s
TDDB	D 2	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
HCI	D 3	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
NBTI	D 4	-	-	-	Negative 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
SM	D 5	-	-	-	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
Test Group E - Electrical Verification Tests												
ESD	E 2	AEC Q100002	1	3	ESD HBM	-	2000 Volts	-	-	1/3/0	1/3/0	1/3/0
ESD	E 3	AEC Q100011	1	3	ESD CDM	-	500 Volts	-	-	1/3/0	1/3/0	1/3/0
LU	E 4	AEC Q100004	1	6	Latch-Up	Per AEC Q100-004	-	-	-	1/6/0	1/6/0	1/6/0
ED	E 5	AEC Q100009	3	30	Electrical Distributions	Cpk> 1.67 Room, hot, and cold	-	1/30/0	1/30/0	3/90/0	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/

RHD Qualification Report

Automotive New Product Qualification Summary
(As per AEC-Q100 and JEDEC Guidelines)

Approve Date 09-June-2022

Product Attributes

For questions regarding this notice, e-mails can be sent to the regional contacts shown below or your local Field Sales Representative.

Location	E-Mail
WW PCN Team	PCN_ww_admin_team@list.ti.com