

<b>PCN Number:</b>	20210427000.2			<b>PCN Date:</b>	Jun 1 2021																									
<b>Title:</b>	Qualification of additional HFTF as additional Assembly/Test site for select devices																													
<b>Customer Contact:</b>	<a href="#">PCN Manager</a>	<b>Dept:</b>	Quality Services																											
<b>Proposed 1<sup>st</sup> Ship Date:</b>	Nov 28 2021	<b>Estimated Sample Availability:</b>	Date provided at sample request																											
<b>Change Type:</b>																														
<input checked="" type="checkbox"/>	Assembly Site	<input type="checkbox"/>	Design	<input type="checkbox"/>	Wafer Bump Site																									
<input type="checkbox"/>	Assembly Process	<input type="checkbox"/>	Data Sheet	<input type="checkbox"/>	Wafer Bump Material																									
<input checked="" type="checkbox"/>	Assembly Materials	<input type="checkbox"/>	Part number change	<input type="checkbox"/>	Wafer Bump Process																									
<input type="checkbox"/>	Mechanical Specification	<input checked="" type="checkbox"/>	Test Site	<input type="checkbox"/>	Wafer Fab Site																									
<input type="checkbox"/>	Packing/Shipping/Labeling	<input type="checkbox"/>	Test Process	<input type="checkbox"/>	Wafer Fab Materials																									
		<input type="checkbox"/>		<input type="checkbox"/>	Wafer Fab Process																									
<b>PCN Details</b>																														
<b>Description of Change:</b>																														
<p>Texas Instruments Incorporated is announcing the qualification of HFTF as an additional Assembly/test site for devices listed below in the product affected section. Construction differences and current assembly sites are as follows:</p> <table border="1"> <thead> <tr> <th></th> <th>UTL2</th> <th>HNA</th> <th>TFME</th> <th>HFTF</th> </tr> </thead> <tbody> <tr> <td>Mount Compound</td> <td>SID#PZ0001</td> <td>SID#400180</td> <td>SID# A-03</td> <td><a href="#">SID# A-03</a></td> </tr> <tr> <td>Mold Compound</td> <td>SID#CZ0096</td> <td>SID#450179</td> <td>SID# R-07</td> <td><a href="#">SID#R-27</a></td> </tr> <tr> <td>Lead Finish</td> <td>NiPdAu</td> <td>NiPdAu</td> <td>NiPdAu</td> <td><a href="#">Matte Sn</a></td> </tr> <tr> <td>Bond wire diameter</td> <td>Au, 1.0 mils</td> <td>Au, 1.0 mils</td> <td>Au, 0.8 mils</td> <td><a href="#">Au, 0.8 mils</a></td> </tr> </tbody> </table> <p>Test coverage, insertions, conditions will remain consistent with current testing and verified with test MQ.</p> <p>Upon expiry of this PCN TI will combine lead free solutions in a single <a href="#">standard part number</a>, for the devices shown below. For example; <a href="#">1P1G125QDCKRQ1</a> – can ship with both Matte Sn and NiPdAu.</p> <p>Example:</p> <ul style="list-style-type: none"> <li>- Customer order for 7500 units of 1P1G125QDCKRQ1 with 2500 units SPQ (Standard Pack Quantity per Reel).</li> <li>- TI can satisfy the above order in one of the following ways. <ul style="list-style-type: none"> <li>I. 3 Reels of NiPdAu finish.</li> <li>II. 3 Reels of Matte Sn finish</li> <li>III. 2 Reels of Matte Sn and 1 reel of NiPdAu finish.</li> <li>IV. 2 Reels of NiPdAu and 1 reel of Matte Sn finish.</li> </ul> </li> </ul>							UTL2	HNA	TFME	HFTF	Mount Compound	SID#PZ0001	SID#400180	SID# A-03	<a href="#">SID# A-03</a>	Mold Compound	SID#CZ0096	SID#450179	SID# R-07	<a href="#">SID#R-27</a>	Lead Finish	NiPdAu	NiPdAu	NiPdAu	<a href="#">Matte Sn</a>	Bond wire diameter	Au, 1.0 mils	Au, 1.0 mils	Au, 0.8 mils	<a href="#">Au, 0.8 mils</a>
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<b>Reason for Change:</b>																														
Supply continuity																														
<b>Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):</b>																														
None																														
<b>Anticipated impact on Material Declaration</b>																														
<input type="checkbox"/>	No Impact to the Material Declaration	<input checked="" type="checkbox"/>	Material Declarations or Product Content reports are driven from production data and will be available following the production release. Upon production release the revised reports can be obtained at the site link below																											

<http://www.ti.com/quality/docs/materialcontentsearch.tsp>

**Changes to product identification resulting from this PCN:**

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
TFME	NFM	CHN	Economic Development Zone
Hana Thailand	HNT	THA	Ayutthaya
UTL2	NS2	THA	Bangpakong, Chachoengsao
<b>HFTF</b>	<b>HFT</b>	<b>CHN</b>	<b>Hefei</b>

Sample product shipping label (not actual product label)

**Product Affected:**

**Group 1 (Current site = HNA, add HFTF as alternate) Device list:**

1P1G125QDCKRQ1	SN74AUP1G08QDCKRQ1
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**Group 2 (Current site = TFME, add HFTF as alternate) Device list:**

SN74AUP1T34QDCKRQ1	SN74LVC1G07QDCKRQ1	SN74LVC1G14QDCKRQ1
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**Group 3 (Current site = UTL2, add HFTF as alternate) Device list:**

SN74LVC1G04QDCKRQ1	SN74LVC1G17QDCKRQ1	SN74LVC1G97QDCKRQ1	SN74LVC2G17QDCKRQ1
SN74LVC1G08QDCKRQ1	SN74LVC1G32QDCKRQ1	SN74LVC2G14IDCKRQ1	

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

**Approved 23-Jun-2020**

**Product Attributes**

Attributes	Qual Device: SN74LVC1G08QDCKRQ1	Qual Device: SN74LVC2G17QDCKRQ1	QBS Product Reference: SN74LVC1G04QDCKRQ1	QBS Product Reference: SN74LVC1G32QDCKRQ1	QBS Process Reference: SN74LVC04AQDRQ1	QBS Process Reference: SN74LVC1G08QDCKRQ1	QBS Package Reference: SN74LVC1G17DCKR
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Logic	Logic	Logic	Logic	Logic	Logic	Logic
Wafer Fab Supplier	FFAB	FFAB	FFAB	FFAB	FR-BIP-1	FFAB	FFAB
Die Revision	-	-	-	-	K	E	G
Assembly Site	HFTFAT	HFTFAT	HFTFAT	HFTFAT	MLA	NS2 (UTAC2)	HFTF
Package Type	SC70	SOT	SC70	SC70	SOIC; 3.91 x 8.65 MM	SOT	SC70
Package Designator	DCK	DCK	DCK	DCK	D	DCK	DCK
Ball/Lead Count	5	6	5	5	14	5	5

- QBS: Qual By Similarity
- Qual Device SN74LVC2G17QDCKRQ1 is qualified at LEVEL1-260C
- Qual Device SN74LVC1G17QDCKRQ1 is qualified at LEVEL1-260C
- Qual Device SN74LVC1G08QDCKRQ1 is qualified at LEVEL1-260C
- Qual Device SN74LVC1G125QDCKRQ1 is qualified at LEVEL1-260C

**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: <u>SN74LVC1G08Q DCKRQ1</u>	Qual Device: <u>SN74LVC2G17Q DCKRQ1</u>	Qual Device: <u>SN74LVC1G04Q DCKRQ1</u>	Qual Device: <u>SN74LVC1G32Q DCKRQ1</u>	QBS Process Reference: <u>SN74LVC04A QDRQ1</u>	QBS Process Reference: <u>SN74LVC1G08Q DCKRQ1</u>	QBS Package Reference: <u>SN74LVC1G17DCKR</u>	
<b>Test Group A – Accelerated Environment Stress Tests</b>													
PC	A1	JEDEC J-STD-020 JESD 22-A113	3	77	Automotive Preconditioning Level 1	(Level 1-260C)	-	-	-	-	Pass	Pass	Pass
HAST	A2	JEDEC JESD 22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	-	-	-	-	-	-	3/231/0
HAST	A2	JEDEC JESD 22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	-	-	-	-	1/77/0	-	-
HAST	A2	JEDEC JESD 22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	-	-	-	-	-	-	3/240/0
AC	A3	JEDEC JESD 22-A102	3	77	Autoclave 121C	96 Hours	-	-	-	-	-	-	3/231/0
AC	A3	JEDEC JESD 22-A102	3	77	Autoclave 121C	96 Hours	-	-	-	-	1/77/0	-	-
TC	A4	JEDEC JESD 22-	3	77	Temperature Cycle, -65/150C	1000 Cycles	-	-	-	-	1/77/0	-	-

Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: <u>SN74LVC1G08Q</u> <u>DCKRQ1</u>	Qual Device: <u>SN74LVC2G17Q</u> <u>DCKRQ1</u>	Qual Device: <u>SN74LVC1G04Q</u> <u>DCKRQ1</u>	Qual Device: <u>SN74LVC1G32Q</u> <u>DCKRQ1</u>	QBS Process Reference: <u>SN74LVC04A</u> <u>QDRQ1</u>	QBS Process Reference: <u>SN74LVC1G08Q</u> <u>DCKRQ1</u>	QBS Package Reference: <u>SN74LVC1G1</u> <u>7DCKR</u>
		A104 and Appendix 3											
PTC	A5	JEDEC JESD 22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	-	-	-	-	-
HTSL	A6	JEDEC JESD 22-A103	1	45	High Temp Storage Bake 170C	420 Hours	-	-	-	-	-	1/45/0	-
HTSL	A6	JEDEC JESD 22-A103	1	45	High Temp Storage Bake, 170C	(420, 600 Hours)	-	-	-	-	-	-	3/231/0
<b>Test Group B – Accelerated Lifetime Simulation Tests</b>													
HTOL	B1	JEDEC JESD 22-A108	3	77	Life Test, 125C	1000 Hours	-	-	-	-	-	1/77/0	-
HTOL	B1	JEDEC JESD 22-A108	3	77	Life Test, 150C	300 Hours	-	-	-	-	-	-	3/231/0
HTOL	B1	JEDEC JESD 22-A108	3	77	Life Test, 150C	500 Hours	-	-	-	-	2/154/0	-	-
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 125C	48 HOURS	-	-	-	-	-	1/800/0	-

Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: <u>SN74LVC1G08Q</u> <u>DCKRQ1</u>	Qual Device: <u>SN74LVC2G17Q</u> <u>DCKRQ1</u>	Qual Device: <u>SN74LVC1G04Q</u> <u>DCKRQ1</u>	Qual Device: <u>SN74LVC1G32Q</u> <u>DCKRQ1</u>	QBS Process Reference: <u>SN74LVC04A</u> <u>QDRQ1</u>	QBS Process Reference: <u>SN74LVC1G08Q</u> <u>DCKRQ1</u>	QBS Package Reference: <u>SN74LVC1G1</u> <u>7DCKR</u>
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 150C	24 Hours	-	-	-	-	2/1600/0	-	-
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	N/A	-	-	-	-	-
<b>Test Group C – Package Assembly Integrity Tests</b>													
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear (Cpk>1.67)	Wires	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Wires	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/90/0
SD	C3	JEDEC JESD 22-B102	1	15	Solderability	Pb Free Solder	-	-	-	-	-	-	3/66/0
PD	C4	JEDEC JESD 22-B100 and B108	3	10	Physical Dimensions	Cpk>1.67	1/30/0	1/30/0	1/30/0	1/30/0	-	-	-
<b>Test Group D – Die Fabrication Reliability Tests</b>													
EM	D1	JESD 61	-	-	Electromigration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-	-
TADB	D2	JESD 35	-	-	Time Dependant	-	Completed Per Process	Completed Per Process	-	-	-	-	-

Type #	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: SN74LVC1G08Q DCKRQ1	Qual Device: SN74LVC2G17Q DCKRQ1	Qual Device: SN74LVC1G04Q DCKRQ1	Qual Device: SN74LVC1G32Q DCKRQ1	QBS Process Reference: SN74LVC04A QDRQ1	QBS Process Reference: SN74LVC1G08Q DCKRQ1	QBS Package Reference: SN74LVC1G17DCKR
				Dielectric Breakdown		Technology Requirements	Technology Requirements					
HCI	D3	JESD 60 & 28	-	Hot Injection Carrier	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-	-
NBTI	D4	-	-	Negative 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	-	-	-	-	-
<b>Test Group E – Electrical Verification Tests</b>												
HBM	E2	AEC Q100-002	1	3	ESD - HBM	2000V	-	1/3/0	-	-	-	-
HBM	E2	AEC Q100-002	1	3	ESD - HBM	4000V	1/3/0	-	1/3/0	1/3/0	-	-
CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500V	1/3/0	1/3/0	1/3/0	1/3/0	-	-
LU	E4	AEC Q100-004	1	6	Latch-up	Elec Test (25C / 125C)	-	-	-	-	1/6/0	-
ED	E5	AEC Q100-009	3	30	Auto Electrical Distributions	Cpk>1.67 Room, hot, and cold test	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/90/0

<b>Test Group G – Cavity Package Integrity Tests</b>												
DS	G7	MIL-STD-883 Method 2019	1	5	Die Shear	QSS 009-009	-	-	-	-	-	3/30/0

**A1 (PC): Preconditioning:**

Performed for THB, Biased HAST, AC, uHAST, TC & PTC samples, as applicable.

**Ambient Operating Temperature by Automotive Grade Level:**

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

**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

**Green/Pb-free Status:**

Qualified Pb-Free(SMT) and Green

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

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