

<b>PCN Number:</b>	20160301000		<b>PCN Date:</b>	03/01/2016																
<b>Title:</b>	Qualification of Carsem Suzhou (CSZ) as additional Assembly and 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>	06/01/2016	<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"/>																
<input type="checkbox"/>	Assembly Process	<input type="checkbox"/>	Data Sheet	<input type="checkbox"/>																
<input checked="" type="checkbox"/>	Assembly Materials	<input type="checkbox"/>	Part number change	<input type="checkbox"/>																
<input type="checkbox"/>	Mechanical Specification	<input checked="" type="checkbox"/>	Test Site	<input type="checkbox"/>																
<input type="checkbox"/>	Packing/Shipping/Labeling	<input type="checkbox"/>	Test Process	<input type="checkbox"/>																
		<input type="checkbox"/>	Wafer Bump Site	<input type="checkbox"/>																
		<input type="checkbox"/>	Wafer Bump Material	<input type="checkbox"/>																
		<input type="checkbox"/>	Wafer Bump Process	<input type="checkbox"/>																
		<input type="checkbox"/>	Wafer Fab Site	<input type="checkbox"/>																
		<input type="checkbox"/>	Wafer Fab Materials	<input type="checkbox"/>																
		<input type="checkbox"/>	Wafer Fab Process	<input type="checkbox"/>																
<b>PCN Details</b>																				
<b>Description of Change:</b>																				
Qualification of Carsem Suzhou (CSZ) as additional Assembly and Test Site for Select Devices listed in the "Product Affected" Section. Current assembly sites and Material differences are as follows.																				
<table border="1"> <thead> <tr> <th>Assembly Site</th> <th>Assembly Site Origin</th> <th>Assembly Country Code</th> <th>Assembly Site City</th> </tr> </thead> <tbody> <tr> <td>TI Malaysia</td> <td>MLA</td> <td>MYS</td> <td>Kuala Lumpur</td> </tr> <tr> <td>TI Clark</td> <td>QAB</td> <td>PHL</td> <td>Angeles City, Pampanga</td> </tr> <tr> <td><b>Carsem Suzhou</b></td> <td><b>CSZ</b></td> <td><b>CHN</b></td> <td><b>Jiangsu</b></td> </tr> </tbody> </table>					Assembly Site	Assembly Site Origin	Assembly Country Code	Assembly Site City	TI Malaysia	MLA	MYS	Kuala Lumpur	TI Clark	QAB	PHL	Angeles City, Pampanga	<b>Carsem Suzhou</b>	<b>CSZ</b>	<b>CHN</b>	<b>Jiangsu</b>
Assembly Site	Assembly Site Origin	Assembly Country Code	Assembly Site City																	
TI Malaysia	MLA	MYS	Kuala Lumpur																	
TI Clark	QAB	PHL	Angeles City, Pampanga																	
<b>Carsem Suzhou</b>	<b>CSZ</b>	<b>CHN</b>	<b>Jiangsu</b>																	
<b>Material Differences:</b>																				
<table border="1"> <thead> <tr> <th></th> <th>TI Malaysia</th> <th>TI Clark</th> <th>Carsem Suzhou</th> </tr> </thead> <tbody> <tr> <td>Mount compound</td> <td>4205846, 4207768</td> <td>4207768</td> <td>435143</td> </tr> </tbody> </table>						TI Malaysia	TI Clark	Carsem Suzhou	Mount compound	4205846, 4207768	4207768	435143								
	TI Malaysia	TI Clark	Carsem Suzhou																	
Mount compound	4205846, 4207768	4207768	435143																	
Test coverage, insertions, conditions will remain consistent with current testing and verified with test MQ.																				
<b>Reason for Change:</b>																				
Continuity of Supply																				
<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 from the <a href="#">TI ECO website</a> .																	
<b>Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):</b>																				
None																				
<b>Changes to product identification resulting from this PCN:</b>																				

Assembly Site		
TI Malaysia	Assembly Site Origin (22L)	ASO: MLA
TI Clark Philippines	Assembly Site Origin (22L)	ASO: QAB
Carsem Suzhou	Assembly Site Origin (22L)	ASO: CSZ

Sample product shipping label (not actual product label)

ASSEMBLY SITE CODES: TI-Malaysia = K, TI-Clark = I, Carsem Suzhou = F

**Product Affected:**

SN0706026RHHR	TPS51716RUKT	TPS54320RHLL	TPS54622RHLL
TPS51716RUKR	TPS54320RHLL	TPS54622RHLL	

## Qualification Report

**RHLR & RHHR Package QUAL in CARZ**  
Approve Date 18-Feb-2016

### Product Attributes

Attributes	Qual Device: SN0706026RHH	Qual Device: TPS54320RHL	Qual Device: TPS54622RHLL
Assembly Site	CARSEM SUZHOU	CARSEM SUZHOU	CARSEM SUZHOU
Package Family	QFN/SON	QFN/SON	QFN/SON
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0
Wafer Fab Supplier	DM5-DALLAS	MH8	MIHO 8
Wafer Process	LBC4	LBC7	LBC7

Attributes	QBS Package Reference: SN1010017RSAR2	QBS Package Reference: TPS51123RGE	QBS Package Reference: TPS53211RGT
Assembly Site	CARSEM SUZHOU	CARSEM SUZHOU	CARSEM SUZHOU
Package Family	QFN/SON	QFN/SON	QFN/SON
Flammability Rating	UL 94 V-0	UL 94 V-0	UL 94 V-0
Wafer Fab Supplier	MH8	DL LIN	MIHO8
Wafer Process	LBC7	LBC4	LBC7

- QBS: Qual By Similarity

- Qual Devices qualified at LEVEL2-260C: TPS54622RHLL, TPS54320RHL, SN0706026RHHR

## Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: SN0706026RHH	Qual Device: TPS54320RHL	Qual Device: TPS54622RHL
AC	Autoclave 121C	96 Hours	3/231/0	-	-
ED	Electrical Characterization	Per Datasheet Parameters	-	-	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	-	-	-
SD	Surface Mount Solderability	Pb Free	-	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	-	-
WBP	Bond Pull	Wires	3/228/0	1/76/0	1/76/0
WBS	Ball Bond Shear	Wires	3/228/0	1/76/0	1/76/0

Type	Test Name / Condition	Duration	QBS Package Reference: SN1010017RSAR2	QBS Package Reference: TPS51123RGER	QBS Package Reference: TPS53211RGT
AC	Autoclave 121C	96 Hours	3/231/0	3/231/0	3/231/0
ED	Electrical Characterization	Per Datasheet Parameters	1/10/0	1/10/0	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	3/230/0
HTSL	High Temp. Storage Bake, 170C	420 Hours	3/231/0	3/230/0	3/231/0
SD	Surface Mount Solderability	Pb Free	-	3/66/0	-
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	3/231/0
WBP	Bond Pull	Wires	-	-	-
WBS	Ball Bond Shear	Wires	-	-	-

- 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

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

**Green/Pb-free Status:**

Qualified Pb-Free(SMT) and Green

**Qualification for Carsem Suzhou site for QFNs with Cu wire for thick top metal (>= 6000A) AIPad devices**  
Approved on 12/14/2012

This qualification has been specifically developed for the validation of this change. The qualification data validates that the proposed change meets the applicable released technical specifications.

**Qual Vehicle # 1: 2ELVC412CDRTJR (MSL2-260C)**

**Package Construction Details**

Assembly Site:	CARSEM SUZHOU	Mold Compound:	SID#441086
# Pins-Designator, Family:	20-RTJ, WQFN	Mount Compound:	SID#435143
Lead frame (Finish, Base):	NiPdAu, Cu	Bond Wire:	1.0 Mil Dia., Cu

**Qualification:**     Plan     Test Results

Reliability Test	Conditions	Sample Size/Fail		
		Lot#1	Lot#2	Lot#3
**High Temp. Storage Bake	170C (420hrs)	77/0	77/0	77/0
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	77/0	77/0
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0
Manufacturability	(per mfg. Site specification)	Pass	Pass	Pass
Moisture Sensitivity	(level 2 @ 260C peak +5/-0C)	12/0	-	-

Notes   \*\*- Preconditioning sequence: Level 2-260C.

**Qual Vehicle # 2: ONET8501PBRGTR (MSL2-260C)**

**Package Construction Details**

Assembly Site:	CARSEM SUZHOU	Mold Compound:	SID#441086
# Pins-Designator, Family:	16-RGT, VQFN	Mount Compound:	SID#435143
Lead frame (Finish, Base):	NiPdAu, Cu	Bond Wire:	1.0 Mil Dia., Cu

**Qualification:**     Plan     Test Results

Reliability Test	Conditions	Sample Size/Fail		
		Lot#1	Lot#2	Lot#3
**High Temp. Storage Bake	170C (420hrs)	77/0	77/0	77/0
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	77/0	77/0
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0
Manufacturability (Assembly)	(per mfg. Site specification)	Pass	Pass	Pass
Moisture Sensitivity	(level 2 @ 260C peak +5/-0C)	12/0	-	-

Notes   \*\*- Preconditioning sequence: Level 2-260C.

**Qual Vehicle # 3: TPS51728RHAR (MSL3-260C)**

**Package Construction Details**

Assembly Site:	CARSEM SUZHOU	Mold Compound:	SID#441086
# Pins-Designator, Family:	20-RTJ, VQFN	Mount Compound:	SID#435143
Lead frame (Finish, Base):	NiPdAu, Cu	Bond Wire:	1.0 Mil Dia., Cu

**Qualification:**     Plan     Test Results

Reliability Test	Conditions	Sample Size/Fail		
		Lot#1	Lot#2	Lot#3
**High Temp. Storage Bake	170C (420 Hrs)	77/0	77/0	77/0
**Autoclave 121C	121C, 2 atm (96 Hrs)	76/0	75/0	77/0
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0
Manufacturability	(per mfg. Site specification)	Pass	Pass	Pass
Moisture Sensitivity	(level 3 @ 260C peak +5/-0C)	12/0	-	-

Notes   \*\*- Preconditioning sequence: Level 3-260C.

**Qual Vehicle # 4: TPS53211RGTR (MSL2-260C)**

**Package Construction Details**

Assembly Site:	CARSEM SUZHOU	Mold Compound:	SID#441086		
# Pins-Designator, Family:	16-RGT, VQFN	Mount Compound:	SID#435143		
Lead frame (Finish, Base):	NiPdAu, Cu	Bond Wire:	1.0 Mil Dia., Cu		
<b>Qualification:</b> <input type="checkbox"/> Plan <input checked="" type="checkbox"/> Test Results					
Reliability Test	Conditions	Sample Size/Fail			
		Lot#1	Lot#2	Lot#3	
**Biased HAST	130C/85%RH (96hrs)	77/0	76/0	77/0	
**High Temp. Storage Bake	170C (420hrs)	77/0	77/0	77/0	
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	77/0	77/0	
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0	
Manufacturability (Assembly)	(per mfg. Site specification)	Pass	Pass	Pass	
Moisture Sensitivity	(level 2 @ 260C peak +5/-0C)	12/0	-	-	
Notes    ** - Preconditioning sequence: Level 2-260C.					
<b>Qual Vehicle # 5: UCD9211RHAR (MSL3-260C)</b>					
<b>Package Construction Details</b>					
Assembly Site:	CARSEM SUZHOU	Mold Compound:	SID#441086		
# Pins-Designator, Family:	40-RHA, VQFN	Mount Compound:	SID#435143		
Lead frame (Finish, Base):	NiPdAu, Cu	Bond Wire:	0.8 Mil Dia., Cu		
<b>Qualification:</b> <input type="checkbox"/> Plan <input checked="" type="checkbox"/> Test Results					
Reliability Test	Conditions	Sample Size/Fail			
		Lot#1	Lot#2	Lot#3	
**High Temp. Storage Bake	170C (420hrs)	77/0	77/0	77/0	
**Autoclave 121C	121C, 2 atm (96 Hrs)	77/0	77/0	77/0	
**T/C -65C/150C	-65C/+150C (500 Cyc)	77/0	77/0	77/0	
Salt Atmosphere	24 hrs	22/0	22/0	22/0	
Manufacturability (Assembly)	(per mfg. Site specification)	Pass	Pass	Pass	
Moisture Sensitivity	(level 3 @ 260C peak +5/-0C)	12/0	-	-	
Notes    ** - Preconditioning sequence: Level 3-260C.					

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
USA	<a href="mailto:PCNAmericasContact@list.ti.com">PCNAmericasContact@list.ti.com</a>
Europe	<a href="mailto:PCNEuropeContact@list.ti.com">PCNEuropeContact@list.ti.com</a>
Asia Pacific	<a href="mailto:PCNAsiaContact@list.ti.com">PCNAsiaContact@list.ti.com</a>
Japan	<a href="mailto:PCNJapanContact@list.ti.com">PCNJapanContact@list.ti.com</a>