PCN Number:		2	20160301000					<b>PCN Date:</b> 03/01/2016				
Titl	Title:Qualification o Devices			of Carsem Suzhou (CSZ) as additional Assembly and Test Site for Select								
<b>Customer Con</b>		<b>Contact:</b>	<u>PC</u>	<u>IN Manage</u>	r C	)ept	:	Quality Serv	ices	5		
Pro	posed	1 <sup>st</sup> Ship D	ate:	06/01/2016		Est	Estimated Sample Avail		ability: Date Provided at Sample request			
Cha	nge Ty	ype:										
$\boxtimes$	Assen	nbly Site				[	Design			Wafer Bump Site		
	Assen	nbly Proces	SS			[	Data Shee	t		Wafer Bump Material		
	Assen	nbly Mater	als			F	Part numb	er change		Wa	fer Bump Process	
	Mecha	anical Spec	ificatio	on			Test Site			Wa	fer Fab Site	
	Packii	ng/Shippin	g/Labe	eling			lest Proce	SS		Wa	fer Fab Materials	
							N Data:			wa	ter Fab Process	
<b>D</b> -						PCI		IS				
Des	scriptio	on of Char	ige:									
Qua liste follo	ed in th	e "Product	m Suz Affect	ed" Secti	z) as a ion. C	Curre	ent assem	oly sites and N	at S 1ate	erial d	lifferences are as	
	Asser	nbly Site	Asse	mbly Site	Origin	n /	Assembly Country Code			Assembly Site City		
	TIM	lalaysia		MLA			MYS			Kuala Lumpur		
	TI	Clark		QAB	3		F	PHL		Angele	es City, Pampanga	
	Carser	n Suzhou		CSZ				HN			Jiangsu	
Mat	t <u>erial C</u>	Difference	s:									
				TI Malaysia			1	'I Clark		Car	sem Suzhou	
	Mour	nt compour	nd 4	205846, 420776			4	207768			435143	
Test coverage, insertions, conditions will remain consistent with current testing and verified with test MQ.												
Rea	ison fo	or Change										
Con	Continuity of Supply											
Anticipated impact on Material Declaration												
No Impact to the Material DeclarationMaterial DeclarationMaterial DeclarationMaterial DeclarationProduction data and will be available following the production release. Upon production release the revised reports can be obtained from the <u>TI ECO website</u> .						orts are driven from ng the production d reports can be						
Ant	icipate	ed impact	on Fo	orm, Fit,	Func	tion	, Quality	or Reliability	(	oositi	ve / negative):	
Non	e											
Cha	inges t	o product	t iden	tificatio	n resi	ultin	ig from t	nis PCN:				



# **Qualification Report**

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

#### **Product Attributes**

Attributes	Qual Device: SN0706026RHH	Qual Device: TPS54320RHL	Qual Device: TPS54622RHLR	
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: TPS54622RHLR, TPS54320RHL, SN0706026RHHR

### **Qualification Results**

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

Туре	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

Туре	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

validates that the proposed change meets the applicable released technical specifications.								
Qual Vehicle # 1: 2ELVC412CDRTJR (MSL2-260C)								
Package Construction Details								
Assembly Site: C	RSEM SUZHOU Mold Compour		nd: SID#441086					
# Pins-Designator, Family: 20	)-RTJ, WOFN	-RTJ, WQFN Mount Compour		nd: SID#435143				
Lead frame (Finish, Base): Ni	'dAu, Cu Bond Wir		re: 1.0 Mil Dia Cu					
Qualification: Plan I Test Results								
Sample Size/Fail								
Reliability Test	Conditions		Lot	#1	Lot#2	Lot#3		
**High Temp. Storage Bake	170C (420hrs)			/0	77/0	77/0		
**Autoclave 121C	121C, 2 atm (96 H	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 spe	cification)	Pas	SS	Pass	Pass		
Moisture Sensitivity	(level 2 @ 260C p	eak +5/-0C)	12/	/0	-	-		
Notes **- Preconditioning se	quence: Level 2-260	)C.						
Qual Ve	hicle # 2: ONET85	01PBRGTR (MSL2-26	50C)					
	Package Constr	uction Details						
Assembly Site: C	ARSEM SUZHOU	Mold Compour	nd: S	SID#	441086			
# Pins-Designator, Family: 16	5-RGT, VQFN	Mount Compoun	nd: SID#435143					
Lead frame (Finish, Base): NiPdAu, Cu Bond Wire: 1.0 Mil Dia., Cu					u			
Qualification: 🗌 Plan 🛛 Test Results								
Reliability Test Conditions Sample Size/Fail								
Reliability rest			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)			/0	77/0	77/0		
**T/C -65C/150C	-65C/+150C (500 Cyc)			/0	77/0	77/0		
Manufacturability (Assembly)	(per mfg. Site specification)			SS	Pass	Pass		
Moisture Sensitivity	(level 2 @ 260C peak +5/-0C)			/0	-	-		
Notes **- Preconditioning se	quence: Level 2-260							
Qual V	enicie # 3: TPS517	28RHAR (MSL3-260	JC)					
Assembly Cites			CID	<u> </u>	1000			
# Ding Designator Family		ARSEM SUZHOU Mount Compound		SID#441086				
# Pills-Designator, Failiny:	20-RTJ, VQFN Mount Compound		SID#435143					
Qualification:		Donu wire.	11.0	1*111 L	Jia., Cu			
				Sam	nla Siza/	Fail		
Reliability Test	Conditions		L ot f	3aiii #1	Lot#2			
**High Temp Storage Bake 170C (420 Hrs) 77/0 77/0 77/0 77/0						77/0		
**Autoclave 121C	121C 2 atm (96 Hrs)			/0	75/0	77/0		
**T/C -65C/150C	-65C/+150C (500 Cvc)			/0	77/0	77/0		
Manufacturability	(per mfg. Site specification)			SS	Pass	Pass		
Moisture Sensitivity	(level 3 @ 260C peak +5/-0C)			/0	-	-		
Notes **- Preconditioning sequence: Level 3-260C.								
Qual Vehicle # 4: TPS53211RGTR (MSL2-260C)								
Package Construction Details								

Assembly Site: CAR		RSEM SUZHOU	Mold Compound:	SID#44	1086		
# Pins-Designator, Family: 16-I		RGT, VQFN	Mount Compound:	SID#435143			
Lead frame (Finish, Base): NiPo		dAu, Cu Bond Wire:		1.0 Mil Dia., Cu			
Qualification:  Plan  Test Results							
Peliability Test		Conditions		Sample Size/Fail			
		Conditions	Lot#1	Lot#2	Lot#3		
**Biased HAST		130C/85%RH (96	bhrs)	77/0	76/0	77/0	
**High Temp. Storage Bake	è	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 spe	ecification)	Pass	Pass	Pass	
Moisture Sensitivity		(level 2 @ 260C p	beak +5/-0C)	12/0	-	-	
Notes **- Preconditioning	j seq	uence: Level 2-26	0C.				
Qual Vehicle # 5: UCD9211RHAR (MSL3-260C)							
Package Construction Details							
		Package Constr	uction Details				
Assembly Site:	CAI	Package Constr RSEM SUZHOU	Mold Compound:	SID#44	1086		
Assembly Site: # Pins-Designator, Family:	CA 40-	Package Constr RSEM SUZHOU RHA, VQFN	Mold Compound: Mount Compound:	SID#44 SID#43	1086 5143		
Assembly Site: # Pins-Designator, Family: Lead frame (Finish, Base):	CAI 40- NiPo	Package Constr RSEM SUZHOU RHA, VQFN dAu, Cu	Mold Compound: Mount Compound: Bond Wire:	SID#44 SID#43 0.8 Mil 0	1086 5143 Dia., Cu		
Assembly Site: # Pins-Designator, Family: Lead frame (Finish, Base): Qualification: Plan	CAI 40- NiPo	Package Constr RSEM SUZHOU RHA, VQFN dAu, Cu Test Results	Mold Compound: Mount Compound: Bond Wire:	SID#44 SID#43 0.8 Mil [	1086 5143 Dia., Cu		
Assembly Site: # Pins-Designator, Family: Lead frame (Finish, Base): Qualification: Plan	CAI 40- NiPo	Package Constr RSEM SUZHOU RHA, VQFN dAu, Cu Test Results	Mold Compound: Mount Compound: Bond Wire:	SID#44 SID#43 0.8 Mil t	1086 5143 Dia., Cu pple Size/		
Assembly Site: # Pins-Designator, Family: Lead frame (Finish, Base): Qualification: Plan Reliability Test	CAI 40- NiPe	Package Constr RSEM SUZHOU RHA, VQFN dAu, Cu Test Results Conditions	Mold Compound: Mount Compound: Bond Wire:	SID#44 SID#43 0.8 Mil I Sam Lot#1	1086 5143 Dia., Cu ple Size/ Lot#2	Fail	
Assembly Site: # Pins-Designator, Family: Lead frame (Finish, Base): Qualification: Plan Reliability Test **High Temp. Storage Bake	CAI 40- NiPe	Package Constr RSEM SUZHOU RHA, VQFN dAu, Cu Test Results Conditions 170C (420hrs)	Mold Compound: Mount Compound: Bond Wire:	SID#44 SID#43 0.8 Mil 0 Sam Lot#1 77/0	1086 5143 Dia., Cu ple Size/ Lot#2 77/0	Fail Lot#3 77/0	
Assembly Site: # Pins-Designator, Family: Lead frame (Finish, Base): Qualification: Plan Reliability Test **High Temp. Storage Bake **Autoclave 121C	CAI 40- NiPo	Package Constr RSEM SUZHOU RHA, VQFN dAu, Cu Test Results Conditions 170C (420hrs) 121C, 2 atm (96	Mold Compound: Mount Compound: Bond Wire: Hrs)	SID#44 SID#43 0.8 Mil 0 Sam Lot#1 77/0 77/0	1086 5143 Dia., Cu ple Size/ Lot#2 77/0 77/0	Fail Lot#3 77/0 77/0	
Assembly Site: # Pins-Designator, Family: Lead frame (Finish, Base): Qualification: Plan Reliability Test **High Temp. Storage Bake **Autoclave 121C **T/C -65C/150C	CAI 40- NiPo	Package Constr RSEM SUZHOU RHA, VQFN dAu, Cu Test Results Conditions 170C (420hrs) 121C, 2 atm (96 -65C/+150C (500	Mold Compound: Mount Compound: Bond Wire: Hrs)	SID#44 SID#43 0.8 Mil 0 Sam Lot#1 77/0 77/0 77/0	1086 5143 Dia., Cu ple Size/ Lot#2 77/0 77/0 77/0	Fail Lot#3 77/0 77/0 77/0	
Assembly Site: # Pins-Designator, Family: Lead frame (Finish, Base): Qualification: Plan Reliability Test **High Temp. Storage Bake **Autoclave 121C **T/C -65C/150C Salt Atmosphere	CAI 40- NiPe	Package Constr RSEM SUZHOU RHA, VQFN dAu, Cu Test Results Conditions 170C (420hrs) 121C, 2 atm (96 -65C/+150C (500 24 hrs	Hrs) O Cyc)	SID#44 SID#43 0.8 Mil 0 Sam Lot#1 77/0 77/0 77/0 22/0	1086 5143 Dia., Cu ple Size/ Lot#2 77/0 77/0 77/0 22/0	Fail Lot#3 77/0 77/0 77/0 22/0	
Assembly Site: # Pins-Designator, Family: Lead frame (Finish, Base): Qualification: Plan Reliability Test **High Temp. Storage Bake **Autoclave 121C **T/C -65C/150C Salt Atmosphere Manufacturability (Assembly	CAI 40- NiPo	Package Constr RSEM SUZHOU RHA, VQFN dAu, Cu Test Results Conditions 170C (420hrs) 121C, 2 atm (96 -65C/+150C (500 24 hrs (per mfg. Site spe	Mold Compound: Mount Compound: Bond Wire: Hrs) O Cyc) ecification)	SID#44 SID#43 0.8 Mil 0 Sam Lot#1 77/0 77/0 77/0 22/0 Pass	1086 5143 Dia., Cu ple Size/ Lot#2 77/0 77/0 77/0 22/0 Pass	Fail Lot#3 77/0 77/0 77/0 22/0 Pass	
Assembly Site: # Pins-Designator, Family: Lead frame (Finish, Base): Qualification: Plan Reliability Test **High Temp. Storage Bake **Autoclave 121C **T/C -65C/150C Salt Atmosphere Manufacturability (Assembly Moisture Sensitivity	CAI 40- NiPo 2	Package Constr RSEM SUZHOU RHA, VQFN dAu, Cu Test Results Conditions 170C (420hrs) 121C, 2 atm (96 -65C/+150C (500 24 hrs (per mfg. Site spe (level 3 @ 260C p	Mold Compound: Mount Compound: Bond Wire: Hrs) O Cyc) ecification) peak +5/-0C)	SID#44 SID#43 0.8 Mil 0 Sam Lot#1 77/0 77/0 77/0 22/0 Pass 12/0	1086 5143 Dia., Cu ple Size/ Lot#2 77/0 77/0 77/0 22/0 Pass -	Fail Lot#3 77/0 77/0 77/0 22/0 Pass -	

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	PCNAmericasContact@list.ti.com
Europe	PCNEuropeContact@list.ti.com
Asia Pacific	PCNAsiaContact@list.ti.com
Japan	PCNJapanContact@list.ti.com