					<u> </u>				
PCN Numl		20221216	, .						
Title:	Qualification o (CLARK-PR & 0						itiona	l wafe	r Probe site
Customer	Contact:	PCN Ma	a nage	<u>er</u>		De	pt:		Quality Services
Proposed	1 <sup>st</sup> Ship Date:	Jun 22	, 202	3		ample recepted	-		Jan 22, 2023*
*Sample r	requests receiv	ed after	Janu	ıary 22, 2	2023 w	vill not l	e su	port	ed.
Change Type:									
	bly Site			Design					Bump Site
	nbly Process			Data Sheet					Bump Material
	bly Materials			Part number	er chan	ge			Bump Process
	nical Specificati		_	est Site					Fab Site
□   Packin	g/Shipping/Labe	eling		est Proce	SS		_		Fab Materials
			_	OCN Det	la ila			vaier	Fab Process
Description	n of Change			PCN Det	talis				
Revision A is to announce the <u>addition</u> of a probe site change for TPD3S716QDBQRQ1 under Group 1 device that was not included on the original PCN notification. The device affected is highlighted and <b>bolded</b> in the device list below.  Texas Instruments is pleased to announce the qualification of its RFAB fabrication facility as an additional Wafer Fab source and CLARK-PR and CDAT-PR as an additional probe site options for the selected devices listed in the "Product Affected" section.									
the selecte	d devices listed	in the "Pr					UILIOTIA	ii piot	de site options foi
the selecte	cd devices listed  Current Fa					n.		•	b Site
Current Site	Current Fa	b Site		Affected'		Ado	dition	•	· 
Current	Current Fa Fab Proce	b Site ss	oduct <b>Waf</b>	eter	" section  Addition	Adonal ite	dition Pro	al Fa	b Site Wafer
Current Site MIHO	Current Fa Fab Proce  LBC7  changes are as	b Site ss [	oduct Waf Diame	eter	" section  Addition  Fab S	Adonal ite	dition Pro	al Fal	b Site Wafer Diameter
Current Site MIHO Probe site	Current Fa Fab Proce  LBC7  changes are as	ss C	Waf Diame 200 r	eter	" section  Addition  Fab S	Adonal ite	dition Pro	al Fal	b Site Wafer Diameter
Current Site MIHO Probe site	Current Fa Fab Proce  LBC7  changes are as a	b Site ss [7] follows:	Waf Diame 200 r	Ser eter mm	Addition Fab S	Adonal ite B	dition Pro	al Fal	b Site Wafer Diameter
Current Site MIHO Probe site	Current Fa Fab Proce  LBC7  changes are as a services: Current Pr  DL-MC  devices:	ss [7] follows:	Waf Diame 200 r	ier eter mm	Addition Fab S RFA  Probe S ARK-PF	Adonal ite B	dition Pro	al Fal	b Site Wafer Diameter
Current Site MIHO Probe site of	Current Fa Fab Proce  LBC7  changes are as a  evices: Current Pr  DL-MC  evices: Current Pr	b Site ss [7] follows: robe Site	Waf Diame 200 r	ier eter mm	Addition Fab S RFA	Adonal ite B	dition Pro	al Fal	b Site Wafer Diameter
Current Site MIHO Probe site of	Current Fa Fab Proce  LBC7  changes are as a  evices: Current Pr  DL-MC  evices: Current Pr  CLARE	follows:  robe Site  robe Site  (-PR	Waf Diame 200 r	Ser eter mm   CL	Addition Fab S RFA  Probe S ARK-PF	Addonal ite B	dition Pro	al Fal	b Site Wafer Diameter
Current Site MIHO Probe site of	Current Fa Fab Proce  LBC7  changes are as a  evices: Current Pr  DL-MC  evices: Current Pr	follows:  robe Site  robe Site  (-PR	Waf Diame 200 r	Ser eter mm   CL	Addition Fab S RFA  Probe S ARK-PF	Addonal ite B	dition Pro	al Fal	b Site Wafer Diameter
Current Site MIHO Probe site of Group 2 D  Group 3 D	Current Fa Fab Proce  LBC7  changes are as a series of the composition	follows:  robe Site  C-PR IN	Waf Diame 200 r	Rew I CL	Additice Fab S RFA  Probe S ARK-PF  Probe S DAT-PR	Adonal ite B	Pro LE	al Falcess	Wafer Diameter 300 mm
Current Site MIHO Probe site of Group 2 D  Group 3 D  Test covera Reason fo	Current Fa  Fab Proce  LBC7  changes are as a  evices: Current Pr  DL-MC  evices: Current Pr  CLARE DL-L  age, insertions, ar Change:	follows:  robe Site  C-PR IN	Waf Diame 200 r	Rew I CL	Additice Fab S RFA  Probe S ARK-PF  Probe S DAT-PR	Adonal ite B	Pro LE	al Falcess	Wafer Diameter 300 mm
Current Site MIHO Probe site of Group 2 D  Group 3 D  Test covera Reason fo Continuity	Current Fa Fab Proce  LBC7  changes are as a  devices:     Current Pr     DL-MC  devices:     Current Pr     CLARA     DL-L  age, insertions,     r Change:     of Supply	follows:  robe Site  C-PR IN  conditions	Waf Diame 200 r	New I CL New I CI remain co	Addition Fab S RFA  Probe S ARK-PF  Probe S  DAT-PR  Insistent	Adonal ite B Site Site t with cu	Pro LE	al Falcess 3C7	Wafer Diameter 300 mm
Current Site MIHO Probe site of Group 2 D  Group 3 D  Test covera Reason fo Continuity	Current Fa Fab Proce  LBC7  changes are as a  devices:     Current Pr     DL-MC  devices:     Current Pr     CLARA     DL-L  age, insertions,     r Change:     of Supply	follows:  robe Site  C-PR IN  conditions	Waf Diame 200 r	New I CL New I CI remain co	Addition Fab S RFA  Probe S ARK-PF  Probe S  DAT-PR  Insistent	Adonal ite B Site Site t with cu	Pro LE	al Falcess 3C7	Wafer Diameter 300 mm

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
MIHO8	MH8	JPN	Iba ra ki
RFAB	RFB	USA	Richardson

Sample product shipping label (not actual product label)

TEXAS
INSTRUMENTS
MADE IN: Malaysia
2DC: 20:

MSL 2 /260C/1 YEAR SEAL DT MSL 1 /235C/UNLIM 03/29/04

PTEM: LBL: 5A (

5A (L)TO:1750



(1P) \$N74L\$07N\$R (Q) 2000 (D) 0336 (31T)LOT: 3959047MLA (4W) TKY(1T) 7523483\$I2 (P) (2D) REY: (V) 0033817 (20L) CSO: SHE (21L) CCO: USA (22L) ASO: MLA (23L) ACO: MYS

### **Product Affected:**

Group 1 device list - MIHO adding RFAB as an additional Fab site:

SN2002036QRTERQ1	TLC59116ITPWTQ1	TPS62260QDRVRMU	TPS62290IDRVRQ1
SN55340QRTERQ1	TPD3S716QDBQRQ1	TPS62260TDDCRQ1	TPS62290TDRVRQ1
SN55340QRTETQ1	TPS55340QRTERQ1	TPS62260TDRVRQ1	TPS62293TDRVRQ1
TAS6422QDKQQ1	TPS55340QRTERWB	TPS62261TDRVRQ1	TPS62590TDRVRQ1
TAS6422QDKQRQ1	TPS55340QRTETQ1	TPS62262TDRVRQ1	
TLC59116ITPWRQ1	TPS62260IDRVRQ1	TPS62263TDRVRQ1	

### **Group 2 device list - MIHO adding RFAB and CLARK-PR Probe site:**

TPA3110D2QPWPRQ1 TPA3111D1QPWPRQ1 TPA3112D1QPWPRQ1 TPD3S716QDBQRQ1

### Group 3 device list - MIHO adding RFAB and CDAT-PR Probe site:

TPS54388CQRTERQ1	TPS54618CQRTERQ1	TPS57114CQRTERQ1
TPS54388QRLBRQ1	TPS57112CQRTERQ1	TPS57114QRLBRQ1
TPS54618AQRLBRQ1	TPS57112QRLBRQ1	TPS57114QRTERDN

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

## Approved 17-Jun-2020

### **Qualification Results** Data Displayed as: Number of lots / Total sample size / Total failed

Туре	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: TAS5441QPWPRQ1	QBS Process Reference: TPS2543QRTE
		Tes						
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning, L2	Level 2-260C	-	3/765/0
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning, L3	Level 3-260C	3/1258/0	-
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST 130C/85%RH	96 Hours	3/231/0	3/240/0
AC	А3	JEDEC JESD22-A102	3	77	Auto Autoclave 121C	96 Hours	3/231/0	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C, Grade-1	500 Cycles	3/231/0	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	30	Post Temp. Cycle Bond Pull	500 Cycles	1/30/0	1/30/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle, -40/125C	1000 Cycles	1/45/0	1/45/0
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	3/135/0	3/135/0
		Tes	t Group	B – Acce	lerated Lifetime Simulation Tests			
HTOL	В1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	3/231/0	-
HTOL	В1	JEDEC JESD22-A108	3	77	Life Test, 150C	408 Hours	•	3/231/0
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 150C	24 Hours	-	3/2400/0
EDR	В3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	-

		Test	Group (	C – Pa	ckage Assembly Integrity Tests			
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear (Cpk>1.67)	Wires	3/90/0	-
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull (Cpk>1.67)	Wires	3/90/0	-
SD	СЗ	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Free	1/15/0 (1)	2/30/0
SD	СЗ	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb	1/15/0 (1)	-
PD	C4	JEDEC JESD22-B100 and B108	3	10	Auto Physical Dimensions	Cpk>1.67	3/30/0	3/30/0
LI	C6	JEDEC JESD22-B105	1	50	Lead Pull to Destruction	Leads	1/48/0	-
		Tes	t Group	D – E	Die Fabrication Reliability Tests			
EM	D1	JESD61	,	-	Electromigration	-	Completed Per Process Technology Requirements	-
TDDB	D2	JESD35	,	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	-
HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	Completed Per Process Technology Requirements	-
NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	Completed Per Process Technology Requirements	-
SM	D5	-	-	-	Stress Migration	-	Completed Per Process Technology Requirements	-
		T	est Grou	ıр E -	- Electrical Verification Tests			
НВМ	E2	AEC Q100-002	1	3	ESD - HBM - Q100	1500 V	1/3/0	-
НВМ	E2	AEC Q100-002	1	3	ESD - HBM - Q100	4000 V	-	1/3/0
CDM	E3	AEC Q100-011	1	3	ESD - CDM - Q100	1000 V	1/3/0	-
CDM	E3	AEC Q100-011	1	3	ESD - CDM - Q100	1500 V	-	1/3/0
LU	E4	AEC Q100-004	1	6	Auto Latch-up	(Per AEC Q100- 004)	1/6/0	1/6/0
ED	E5	AEC Q100-009	3	30	Auto Electrical Distributions	Cpk>1.67	3/90/0	3/90/0
				A	dditional Tests			
MSL			•	-	Automotive L3 Powerpad Moisture Sensitivity	Level 3-260C	3/35/0	-
MSL S: Qual			-	-	Automotive L2 Powerpad Moisture Sensitivity	Level 2-260C	-	3/35/0

- QBS: Qual By Similarity
- Qual Device TAS5441QPWPRQ1 is qualified at LEVEL3-260C
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

Note (1): Solderability results are from Qual ID# 20090826-9343.

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

Approved 03/17/2015

# Qualification Results

					Data Displayed as: Numb	er of lots / Total sampl				
Туре	#	Test Spec	Min Lot Qty	SS /Lot	Test Name / Condition	Duration	Qual Device: TPS62090QRGTRQ1	Qual Device: TP \$65263QRHBRQ1	Qual Device: TPS62065QDSGRQ1	QBS Process/Package: TPS2543QRTE
Test Group A - Accelerated Environ	nment									
HAST	A2	JESD22- A110	3	77	Biased HAST, 130C/85%RH	96 Hours	1/77/0	1/77/0	1/77/0	3/231/0
AC	A3	JESD22- A102	3	77	Autoclave 121C	96 Hours	1/77/0	1/77/0	1/77/0	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	30	Post Temp. Cycle Bond Pull	Wires	1/30/0	1/30/0	1/30/0	1/30/0
TC	A4	JESD22- A104	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	1/77/0	1/77/0	3/231/0
PTC	A5	JESD22- A105	1	45	Power Temperature Cycle, - 40/125C	1000 Cycles	1/45/0	1/45/0	1/45/0	1/45/0
HTSL	A6	JESD22- A103	1	45	High Temp. Storage Bake, 150C	1000 Hours	-	1/45/0	1/45/0	-
HTSL	A6	JESD22- A103	1	45	High Temp. Storage Bake, 175C	500 Hours	1/45/0	-	-	1/45/0
Test Group B - Accelerated Lifetime	e Simi	ılation Test								
HTOL	В1	JESD22-	3	77	Life Test, 125C	1000 Hours	1/77/0	1/77/0	1/770	
HTOL	B1	A108 JESD22-	3		Life Test, 150C	408 Hours	-	-	-	3/231/0
ELFR	B2	A108 AEC-Q100-	3		Early Life Failure Rate, 125C	48 Hours	1/800/0	_	_	-
	B2	008 AEC-Q100-								
ELFR	+	008 AEC-Q100-	3		Early Life Failure Rate, 150C NVM Endurance, Data	24 Hours	-	-	-	3/2400/0
EDR	В3	005	3	77	Retention, and Operational Life	-	N/A	-	-	-
Test Group C - Package Assembly I	Integri									
WBS	C1	AEC-Q100- 001	1	30	Bond Shear (Cpk>1.67)	Wires	1/30/0	-	1/30/0	-
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67	Wires	1/30/0	-	1/30/0	-
SD	С3	JESD22- B102	1	15	Surface Mount Solderability	Pb	1/15/0	-	-	-
SD	C3	JESD22- B102	1	15	Surface Mount Solderability	Pb Free	1/15/0	-	-	-
PD	C4	JESD22 B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	-	3/30/0	-	-	-
Test Group D - Die Fabrication Relia	ability	Tests								
EM	D1	JESD61	-	-	Electromigration	-	Completed Per Process Technology Requirements	Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	Completed Per Process Technology Requirements	Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	Completed Per Process Technology Requirements	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
Test Group E - Electrical Verificatio	n									
НВМ	E2	AEC-Q100- 002	1	3	ESD - HBM	4000 V	-	1/3/0	1/3/0	1/3/0
CDM	E3	AEC-Q100- 011	1	3	ESD - CDM	1500 V	-	1/3/0	1/3/0	1/3/0
LU	E4	AEC-Q100- 004	1	6	Auto Latch-up	(Per AEC Q100- 004)	-	1/6/0	1/6/0	1/6/0
ED	E5	AEC-Q100- 009	3	30	Electrical Distributions	Cpk>1.67	-	3/90/0	3/90/0	3/90/0

- QBS: Qual By Similarity - Qual Device TPS62090QRGTRQ1 is qualified at LEVEL2-260C

A1 (PC): Preconditioning:
Performed for THB, Biased HAST, AC, uHAST & TC samples, as applicable.

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  $\underline{\mathbb{Q}}$  -40C to +85C

C1/C2 (WBS / WBP): Wire Bond Shear & Wire Bond Pull data from eQDB 20140626-106021

C4 (Physical dimensions): Physical Dimensions data from eQDB 20140626-106021

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

# Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

# Approved 24-Oct-2018

### Qualification Results

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

Туре	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: TPS61088QRHLQ1	QBS Process Reference: <u>TPS2543QRTE</u>		
Test Group A – Accelerated Environment Stress Tests										
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 2- 260C	3/AII/0	3/AII/0		
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	1/77/0	3/240/0		
AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	3/237/0		
TC	Α4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/238/0		
TC-BP	Α4	MIL-STD883 Method 2011	1	5	Post Temp. Cycle Bond Pull	500 Cycles	1/5/0	1/5/0		
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle, -40/125C	1000 Cycles	1/45/0	1/50/0		
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp. Storage Bake, 150C	1000 Hours	1/45/0	-		
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp. Storage Bake, 175C	500 Hours	•	3/149/0		
		Test Group B – Accelerat	ed Lifeti	me Sin	nulation Tests					
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	1/77/0	-		
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 150C	408 Hours	•	3/231/0		
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 125C	48 Hours	•	-		
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 150C	24 Hours	-	3/2640/0		
EDR	В3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	-		

			Test Group C – Pack	age .	Asser	nbly Integrity Tests			
	WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	1/30/0	-
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	1/30/0	-
	SD	С3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Free	1/15/0	2/30/0
	SD	С3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Solder	1/15/0	-
	PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Ppk>1.67)		3/90/0	3/90/0
	SBS	C5	AEC Q100-010	3	50	Solder Ball Shear (Cpk>1.67)	Post HTSL/Bump	N/A	-
	LI	C6	JEDEC JESD22-B105	1	50	Lead Integrity	Leads	N/A	-
			Test Group D – Die	Fabr	ricatio	n Reliability Tests			
	ЕМ	D1	JESD61	-		Electromigration		Completed Per Process Technology Requirements	-
	TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown		Completed Per Process Technology Requirements	-
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier		Completed Per Process Technology Requirements	-
	NBTI	D4	-	-	-	Negative Bias Temperature Instability		Completed Per Process Technology Requirements	-
	SM	D5	-	-	-	Stress Migration		Completed Per Process Technology Requirements	-
			Test Group E – E						
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	2500 V	1/3/0	1/3/0
Ш	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1000 V	1/3/0	1/3/0
	LU	E4	AEC Q100-004	1	6	Latch-up	(Per AEC Q100- 004)	1/6/0	1/6/0
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, Hot, & Cold	3/90/0	3/90/0

<sup>-</sup> QBS: Qual By Similarity

### 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

<sup>-</sup> Qual Device TPS61088QRHLQ1 is qualified at LEVEL2-260C

#### Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

Approve Date 10-July-2018

### **Qualification Results**

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

PC	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: TLC6C5724QDAP RQ1	Qual Device: TLC6C5712QP WPRQ1	QBS Process Reference: TPS2543QRTE
PC	vironment Stress Tests							
HAST	C J-STD-020 JESD22-A113	-	-	Automotive Preconditioning	Level 2-260C	-	-	3/765/0
AC	C J-STD-020 JESD22-A113	-	-	Automotive Preconditioning	Level 3-260C	3/738/0	3/738/0	-
TC	JEDEC JESD22-A110	1	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0	3/231/0	3/231/0
TC-BP	JEDEC JESD22-A102	1	77	Autoclave 121C	96 Hours	3/231/0	3/231/0	3/231/0
PTC	JESD22-A104 and Appendix	3 1	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	3/231/0
HTSL	IIL-STD883 Method 2011	1	5	Post Temp. Cycle Bond Pull	per MIL-STD 883 Method 2011	1/5/0	-	1/5/0
HTSL	JEDEC JESD22-A105	1	45	Power Temperature Cycle, -40/125C	1000 Cycles	1/45/0	-	1/45/0
Test Group B	JEDEC JESD22-A103	1	77	High Temp. Storage Bake, 150C	1000 Hours	1/77/0	-	-
HTOL	JEDEC JESD22-A103	1	45	High Temp. Storage Bake, 175C	500 Hours	-	1/45/0	3/135/0
HTOL	etime Simulation Tests							
ELFR   B2	JEDEC JESD22-A108	1	77	Life Test, 150C	408 Hours	1/77/0	3/231/0	-
ELFR   B2	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	-	-	3/231/0
Test Group C	AEC Q100-008	3	800	Early Life Failure Rate, 150C	24 Hours	-	3/2400/0	3/2240/0
WBS	AEC Q100-008	3	800	Early Life Failure Rate, 125C	48 Hours	-	-	-
WBS	nbly Integrity Tests							
SD   C3   JEDEC JESD22-E	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	3/90/0	-	-
SD   C3   JEDEC JESD22-E     PD   C4   JEDEC JESD22-B100     Test Group D - Die Fabrication Reliability Tests     EM   D1   JESD61     TDDB   D2   JESD35     HCI   D3   JESD60 & 28     NBTI   D4   -     SM   D5   -     Test Group E - Electrical Verification Tests     HBM   E2   AEC Q100-002     HBM   E2   AEC Q100-002     CDM   E3   AEC Q100-011     CDM   E3   AEC Q100-011     CDM   E3   AEC Q100-011     Test Group E - Electrical Verification Tests     HBM   E2   AEC Q100-001     CDM   E3   AEC Q100-011     CDM   C3   C3   C3     C3   C3   C3   C3     C4   C4   C4   C5   C5     C5   C5   C5   C5   C5     C5   C5	IIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	3/90/0	-	-
SD   C3   JEDEC JESD22-E     PD   C4   JEDEC JESD22-B100     Test Group D - Die Fabrication Reliability Tests     EM   D1   JESD61     TDDB   D2   JESD35     HCI   D3   JESD60 & 28     NBTI   D4   -     SM   D5   -     Test Group E - Electrical Verification Tests     HBM   E2   AEC Q100-002     HBM   E2   AEC Q100-002     CDM   E3   AEC Q100-011     CDM   E3   AEC Q100-011     CDM   E3   AEC Q100-011     Test Group E - Electrical Verification Tests     HBM   E2   AEC Q100-001     CDM   E3   AEC Q100-011     CDM   C3   C3   C3     C3   C3   C3   C3     C4   C4   C4   C5   C5     C5   C5   C5   C5   C5     C5   C5				Surface Mount Solderability >95% Lead	8 Hours Steam Age,			
PD	JEDEC JESD22-B102	1	15	Coverage Surface Mount Solderability >95% Lead	Pb Pb	-	-	1/15/0
Test Group D - Die Fabrication Reliability Tests	JEDEC JESD22-B102	1	15	Coverage	8 Hours Steam Age, Pb Free	1/22/0	-	1/15/0
EM   D1   JESD61	EC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	-	3/30/0	-	3/30/0
TDDB   D2	Reliability Tests							
TDDB   D2						Completed Per	Completed Per	Completed Per
TDDB   D2	IESD61		١.	Electromigration	_	Process	Process	Process
HCI   D3   JESD60 & 28	3E3D01	-	-	Liectioniigration	_	Technology	Technology	Technology
HCI   D3   JESD60 & 28						Requirements	Requirements	Requirements
HCI   D3   JESD60 & 28						Completed Per	Completed Per	Completed Per
HCI   D3   JESD60 & 28	JESD35		_	Time Dependent Dielectric Breakdown		Process	Process	Process
NBTI   D4   -						Technology	Technology	Technology
NBTI   D4   -						Requirements	Requirements	Requirements
NBTI   D4   -						Completed Per	Completed Per	Completed Per
SM   D5   -	JESD60 & 28	-	-	Hot Injection Carrier	-	Process Technology	Process Technology	Process Technology
SM   D5   -						Requirements	Requirements	Requirements
SM   D5   -		_				Completed Per	Completed Per	Completed Per
SM   D5   -						Process	Process	Process
Test Group E - Electrical Verification Tests	-	-	-	Negative Bias Temperature Instability	-	Technology	Technology	Technology
Test Group E - Electrical Verification Tests   HBM						Requirements	Requirements	Requirements
Test Group E - Electrical Verification Tests   HBM						Completed Per	Completed Per	Completed Per
Test Group E - Electrical Verification Tests   HBM						Process	Process	Process
HBM   E2   AEC Q100-002   HBM   E2   AEC Q100-002   CDM   E3   AEC Q100-011   CDM   E3   AEC Q100-011	-	-	-	Stress Migration	-	Technology	Technology	Technology
HBM   E2   AEC Q100-002   HBM   E2   AEC Q100-002   CDM   E3   AEC Q100-011   CDM   E3   AEC Q100-011						Requirements	Requirements	Requirements
HBM   E2   AEC Q100-002   CDM   E3   AEC Q100-011   CDM   E3   AEC Q100-011   AEC Q100-011   CDM   E3   AEC Q100-011   CDM   E3   AEC Q100-011   CDM   E3   AEC Q100-011   CDM   E3   AEC Q100-011   CDM   CDM	cation Tests		_					
CDM E3 AEC Q100-011 CDM E3 AEC Q100-011	AEC Q100-002	1	3	ESD - HBM	2000 V	1/3/0	1/3/0	1/3/0
CDM E3 AEC Q100-011	AEC Q100-002	1	3	ESD - HBM	4000 V	-	1/3/0	-
	AEC Q100-011	1	3	ESD - CDM	500 V	1/3/0	-	-
	AEC Q100-011	1	3	ESD - CDM	750 V	1/3/0	1/3/0	-
	AEC Q100-011	1	3	ESD - CDM	1000 V	-	1/3/0	1/3/0
LU E4 AEC Q100-004	AEC Q100-004	1	6	Latch-up	(Per AEC Q100-004)	1/6/0	1/6/0	1/6/0
	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold test	3/90/0	3/90/0	3/90/0

A1 (PC): Preconditioning:
Performed for THB, Biased HAST, AC, uHAST &TC samples, as applicable

Junction Operating Temperature by Automotive Grade Level:
Grade 0 (or E): -40°C to +150°C
Grade 1 (or Q): -40°C to +128°C
Grade 2 (or T): -40°C to +108°C
Grade 3 (or 1): -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 contact below or your local Field Sales Representative.

Location	E-Mail
WW Change Management Team	PCN ww admin team@list.ti.com

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