PCN Number:	20200330001.2	**PCN Date:**	April 9, 2020
Title:	Qualification of TI Chengdu Assembly site and RFAB Wafer Fab site for 6PAIC310x-Q1		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	October 9, 2020	**Estimated Sample Availability:**	Date provided at sample request

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:

Texas Instruments Incorporated is pleased to announce the qualification of RFAB Wafer Fab site as a second source for p/n's under Product Affected section and Qualification of Chengdu Assembly/Test site (CDAT) with BOM changes for 6PAIC3104IRHBRQ1.

Description	**From**	**To**
Wafer Fab site	DMOS5	DMOS5 and RFAB
Material	200mm	300mm
Process	C05	C05

For p/n **6PAIC3104IRHBRQ1** only:

Description	**From**	**To**
Assembly site	TI Malaysia	TI Chengdu
Mold Compound	4208625	4222198
Mount Compound	4205846	4207123
Leadframe	Non-RLF	Single side RLF

RLF = Roughened Leadframe

Reason for Change:

- DMOS5 capacity relief
- MLA QFN capacity relief

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

None

Changes to product identification resulting from this PCN:

Current

Wafer Site	Wafer site code (20L)	Wafer country code (21L)	Wafer site City
DMOS5	DM5	USA	Dallas

New

Wafer Site	Wafer site code (20L)	Wafer country code (21L)	Wafer site City
RFAB	**RFB**	**USA**	**Richardson**

Current

Assembly Site	Assy Site Origin (22L)	Assy Site Country Code (23L)	Assembly City
TI Malaysia	MLA	MYS	Kuala Lumpur

New

Assembly Site	Assy Site Origin (22L)	Assy Site Country Code (23L)	Assembly City
TI Chengdu	**CDA**	**CHN**	**Chengdu**

Example shipping label (not actual product label)

Product Affected:

6PAIC3104IRHBRQ1
6PAIC3104IRLARQ1
6PAIC3106IRGZRQ1

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

Approved 27-Feb-2020

Updated 02/27/2020-Added QBS Data

RFAB/CDAT 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: 6PA3104IRHBRQ1	QBS Process Reference: PCM5100AQPWRQ1	QBS Product/Package Reference: 6PAIC3104IRHBRQ1
	Test Group A – Accelerated Environment Stress Tests									
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 1-260C	-	3/720/0	-
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	-		3/764/0
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0	3/231/0
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	-	3/231/0	3/231/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	-	3/231/0	3/231/0
	TC-BP	A4	MIL-STD883 Method 2011	1	60	Post TC Bond Pull	Wires	-	1/30/0	1/30/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	-	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 150C	1000 Hours	-	1/45/0	1/45/0
	Test Group B – Accelerated Lifetime Simulation 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	-	2/154/0	-
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 85C	1000 Hours	-		3/231/0
	ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 125C	48 Hours	-	1/800/0	-
	ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 150C	24 Hours	-	2/1600/0	-
	ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 85C	24 Hours	-	-	3/2400/0
	EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A		-
	Test Group C – Package Assembly Integrity Tests									
	WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	1/30/0	3/90/0	3/90/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	1/30/0	3/90/0	3/90/0

	SD	C3	JEDEC JESD22-B102	1	15	Solderability	Pb Free, 8 Hours Steam Age	-	-	1/15/0
	PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	--	-	-	3/30/0
Test Group D – 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	-	-
Test Group E – Electrical Verification Tests										
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	2000 V	1/3/0	1/3/0	1/3/0
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1000 V	-	1/3/0	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 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	1/6/0
	ED	E5	AEC Q100-009	3	30	Auto Electrical Distributions	Cpk>1.67	-	3/90/0	3/90/0

- QBS: Qual By Similarity
- Qual Device 6PA3104IRHBRQ1 is qualified at LEVEL2-260C

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

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

Approved 27-Feb-2020

Updated 03/03/2020-Added QBS Data

RFAB/MLA 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: 6PA3104IRHBRQ1	Qual Device: 6PA3104IRLARQ1	Qual Device: 6PAIC3106RGZQ1	QBS Product/Process Reference: 6PAIC3104IRHBRQ1
Test Group A – Accelerated Environment Stress Tests										
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 3-260C	1/90/0	1/80/0	1/100/0	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	-	-	-	3/764/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	-	-	-	3/231/0
AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	-	-	-	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	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
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle, -40/125C	1000 Cycles	N/A	N/A	N/A	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp. Storage Bake, 150C	1000 Hours	-	-	-	1/45/0
Test Group B – Accelerated Lifetime Simulation Tests										
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 85C	1000 Hours	-	-	-	3/231/0
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 85C	24 Hours	-	-	-	3/2400/0
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	--	N/A	N/A	N/A	-
Test Group C – Package Assembly Integrity Tests										
WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	1/30/0	1/30/0	1/30/0	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	1/30/0	1/30/0	1/30/0	3/90/0
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Free	-	-	-	1/15/0
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	--	-	-	-	3/30/0
LI	C6	JEDEC JESD22-B105	1	50	Lead Integrity	Leads	-	-	-	-
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	-
	TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	--	Completed Per Process Technology Requirements	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	Completed Per Process Technology Requirements	-
	SM	D5	-	-	-	Stress Migration	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-
Test Group E – Electrical Verification Tests											
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	2000 V	1/3/0	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	1/3/0
	LU	E4	AEC Q100-004	1	6	Latch-up	(Per AEC Q200-004)	1/6/0	1/6/0	1/6/0	1/6/0
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	1/30/0	1/30/0	1/30/0	3/90/0

- QBS: Qual By Similarity
- Qual Devices qualified at LEVEL3-260C: 6PA3104IRHBRQ1, 6PA3104IRLARQ1, 6PAIC3106RGZQ1

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
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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

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