PCN Number:	20221013001.2	PCN Date:	October 14, 2022
Title:	Qualification of new Fab site (DMOS6) using qualified Process Technology, Die Revision, and additional BOM option for select devices		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Apr 12, 2023	Sample requests accepted until:	Nov 14, 2022*

***Sample requests received after Oct 14, 2022 will not be supported.**

Change Type:

☐	Assembly Site	☒	Assembly Process	☒	Assembly Materials
☒	Design	☐	Electrical Specification	☐	Mechanical Specification
☐	Test Site	☐	Packing/Shipping/Labeling	☐	Test Process
☐	Wafer Bump Site	☐	Wafer Bump Material	☐	Wafer Bump Process
☒	Wafer Fab Site	☒	Wafer Fab Materials	☒	Wafer Fab Process
		☐	Part number change		

PCN Details

Description of Change:

Texas Instruments is pleased to announce the qualification of a new fab & process technology (DMOS6, LBC9) and BOM option for selected devices as listed below in the product affected section. Construction differences are noted below:

Current Fab Site			Additional Fab Site		
Current Fab Site	**Process**	**Wafer Diameter**	**Additional Fab Site**	**Process**	**Wafer Diameter**
DL-LIN	PRISM	200 mm	DMOS6	LBC9	300 mm

The die was also changed as a result of the process change.

Additionally, there will be a BOM/Assembly options introduced for these devices:

Group 1 (DW20) BOM options

	Current	Additional
Bond wire composition, Diameter	Au, 1.15 mils	Cu, 0.96 mil
Mount Compound	4042500	4147858
Mold Compound	4205694	4211880
Probe Site	Not in Process flow	CDPR

Group 2 (DW24) BOM options

	Current	Additional
Bond wire composition, Diameter	Au, 1.15 mils	Cu, 0.96 mil
Probe Site	Not in Process flow	CDPR

Tube and some G4 versions of the devices are included in EOL notice PDN# 20221013002.3

Reason for Change:

These changes are part of our multiyear plan to transition products from our 150-milimeter factories to newer, more efficient manufacturing processes and technologies, underscoring our commitment to product longevity and supply continuity.

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

None

Impact on Environmental Ratings

Checked boxes indicate the status of environmental ratings following implementation of this

change. If below boxes are checked, there are no changes to the associated environmental ratings.

RoHS	REACH	Green Status	IEC 62474
☒ No Change	☒ No Change	☒ No Change	☒ No Change

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
SH-BIP-1	DLN	USA	Dallas
DMOS6	**DM6**	**USA**	**Dallas**

Die Rev:

Current	**New**
Die Rev [2P]	**Die Rev [2P]**
A,B,C	**A**

Sample product shipping label (not actual product label)

Product Affected:

Group 1 Device list (DW20)

TPIC6595DWR	TPIC6596DWRG4	TPIC6B595DWR	TPIC6B596DWR

Group 2 Device list (DW24)

TPIC6A595DWR	TPIC6A596DWRG4

For alternate parts with similar or improved performance, please visit the product page on ti.com.

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

TPIC6x59xDW Qualification
Approved 16-Sept-2022

Product Attributes

Attributes	Qual Device: TPIC6595DWR	Qual Device: TPIC6A595DWR	Qual Device: TPIC6596DWRG4	Qual Device: TPIC6B595DWR	Qual Device: TPIC6B596DWR	Qual Device: TPIC6A596DWRG4	QBS Process Reference: LMR33630CQRNXRQ1	QBS Package Reference: AMC1305M25QDWRQ1
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40C to 125C	-40C to 125C	-40C to 125C	-40C to 125C	-40C to 125C	-40C to 125C	-40C to 125C	-40 to +125 C
Product Function	Power Management	Power Management	Power Management	Power Management	Power Management	Power Management	Power Management	Signal Chain
Wafer Fab Supplier	DMOS6	DMOS6	DMOS6	DMOS6	DMOS6	DMOS6	DMOS6	AIZU, DMOS5
Die Revision	A0	A0	A0	A0	A0	A0	B	C, F
Assembly Site	TAI	TAI	TAI	TAI	TAI	TAI	CDAT	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC	VQFN-HR	SOIC
Package Designator	DW	DW	DW	DW	DW	DW	RNX	DW
Ball/Lead Count	20	24	20	20	20	24	12	16

- QBS: Qual By Similarity
- Qual Device TPIC6595DWR is qualified at MSL1 260C
- Qual Device TPIC6A595DWR is qualified at MSL1 260C
- Qual Device TPIC6596DWRG4 is qualified at MSL1 260C
- Qual Device TPIC6B595DWR is qualified at MSL1 260C
- Qual Device TPIC6B596DWR is qualified at MSL1 260C
- Qual Device TPIC6A596DWRG4 is qualified at MSL1 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: TPIC6595DWR	Qual Device: TPIC6A595DWR	Qual Device: TPIC6596DWRG4	Qual Device: TPIC6B595DWR	Qual Device: TPIC6B596DWR	Qual Device: TPIC6A596DWRG4	QBS Process Reference: LMR33630CQRNXRQ1	QBS Package Reference: AMC1305M25QDWRQ1
Test Group A – Accelerated Environment Stress Tests															
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	231	Automotive Preconditioning	Level 1-260C	-	-	-	-	-	Pass	-	-
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	231	Automotive Preconditioning	Level 2-260C	-	-	-	-	-	-	Pass	-
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	231	Automotive Preconditioning	Level 3-260C	-	-	-	-	-	-	-	Pass
	bHAST	A2	JEDEC JESD22-A101	3	77	Biased HAST, 130C/85%RH	96 Hours	-	-	-	-	-	3/231/0	-	3/231/0
	bHAST	A2	JEDEC JESD22-A101	3	77	Biased HAST, 110C/85%RH	264 Hours	-	-	-	-	-	-	3/231/0	-
	uHAST	A3	JEDEC JESD22-A102	3	77	Unbiased HAST, 130C/85%RH	96 Hours	-	-	-	-	-	3/231/0	-	-
	uHAST	A3	JEDEC JESD22-A102	3	77	Unbiased HAST, 110C/85%RH	264 Hours	-	-	-	-	-	-	3/231/0	-
	AC		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	-	-	-	-	-	3/231/0	3/231/0	3/231/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	-	-	-	-	-	1/45/0	-	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp. Storage Life, 150C	1000 Hours	-	-	-	-	-	3/135//0	3/135//0	1/45/0

Test Group B – Accelerated Lifetime Simulation Tests														
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	-	-	-	-	-	3/231/0	3/231/0	-
	ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 125C	48 Hours	-	-	-	-	-	-	3/2400/0	-
	EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	10000 Cycles	-	-	-	-	-	-	3/231/0	-
Test Group C – Package Assembly Integrity Tests														
	WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	-	-	-	-	-	1/30/0	N/A	3/90/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	-	-	-	-	-	1/30/0	N/A	3/90/0
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability >95% Lead Coverage	15	-	-	-	-	-	-	1/15/0	1/15/0
	PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	30 units	-	-	-	-	-	3/90/0	3/90/0	-
	SBS	C5	AEC Q100-010	3	50	Solder Ball Shear (Cpk>1.67)	Solder Balls	-	-	-	-	-	N/A	N/A	N/A
	LI	C6	JEDEC JESD22-B105	1	50	Lead Integrity	Leads	-	-	-	-	-	N/A	N/A	N/A
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	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
	TDDB	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	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	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	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	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	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	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	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	2500 V	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	750 V	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	-
	LU	E4	AEC Q100-004	1	6	Latch-up	+/100mA, 150C	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0	-
	ED	E5	AEC Q100-005	3	30	Electrical Distribution	Cpk > 1.67	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/30/0	3/30/0	3/30/0

- 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

TI Qualification ID: R-NPD-2202-065

TI Information
Select Disclosure

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

LBC9 MetDCU with 1.0 mil Cu wire in TITL SOIC PKG
Approved 13-Sept-2022

Product Attributes

Attributes	Qual Device: TPIC6A596DWRG4
Automotive Grade Level	Grade 1
Operating Temp Range	-40 to +125 C
Product Function	Power Management
Wafer Fab Supplier	DMOS6
Die Revision	A0
Assembly Site	TAI
Package Type	SOIC
Package Designator	DW
Ball/Lead Count	24

- QBS: Qual By Similarity
- Qual Device TPS22919QDCKRQ1 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: TPIC6A596DWRG4
Test Group A – Accelerated Environment Stress Tests								
	PC	A1	-	3	22	SAM Analysis, Pre Stress	Completed	3/66/0
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	No fails
	PC	A1	-	3	22	SAM Analysis, Post Stress	Completed	3/66/0
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0
	HAST	A2	-	3	1	Cross Section, Post bHAST 96 Hours	Completed	3/3/0
	HAST	A2	-	3	30	Wire Bond Shear, Post bHast, 96 Hours	Wires	3/90/0
	HAST	A2	-	3	30	Bond Pull over Stitch, post bHAST, 96 Hours	Wires	3/90/0
	HAST	A2	-	3	30	Bond Pull over Ball, Post bHAST, 96 Hours	Wires	3/90/0
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	192 Hours	3/210/0
	HAST	A2	-	3	1	Cross Section, Post bHAST 192 Hours	Completed	3/3/0
	HAST	A2	-	3	22	SAM Analysis, Post bHAST, 192 Hours	Completed	3/66/0
	HAST	A2	-	3	30	Wire Bond Shear, Post bHast, 192 Hours	Wires	3/90/0
	HAST	A2	-	3	30	Bond Pull over Stitch, post bHAST, 192 Hours	Wires	3/90/0
	HAST	A2	-	3	30	Bond Pull over Ball, Post bHAST, 192 Hours	Wires	3/90/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0
	TC	A4	-	3	1	Cross Section, Post T/C 500 Cycles	Completed	3/3/0
	TC	A4	-	3	22	SAM Analysis, Post T/C, 500 Cycles	Completed	3/66/0
	TC	A4	-	3	30	Wire Bond Shear, Post T/C 500 Cycles	Wires	3/90/0
	TC	A4	-	3	30	Bond Pull over Stitch Post T/C 500 Cycles	Wires	3/90/0
	TC	A4	-	3	30	Bond Pull over Ball Post T/C 500 Cycles	Wires	3/90/0

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: TPIC6A596DWRG4
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	1000 Cycles	3/210/0
	TC	A4	-	3	1	Cross Section, Post T/C 1000 Cycles	Completed	3/3/0
	TC	A4	-	3	22	SAM Analysis, Post T/C, 1000 Cycles	Completed	3/66/0
	TC	A4	-	3	30	Wire Bond Shear, Post T/C 1000 Cycles	Wires	3/90/0
	TC	A4	-	3	30	Bond Pull over Stitch, Post T/C, 1000 Cycles	Wires	3/90/0
	TC	A4	-	3	30	Bond Pull over Ball, Post T/C, 1000 Cycles	Wires	3/90/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle -40/125C	1000 Cycles	1/45/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle -40/125C	2000 Cycles	1/45/0
	HTSL	A6	JEDEC JESD22-A103	3	45	High Temp Storage Bake 150C	1000 Hours	3/135/0
	HTSL	A6	-	3	1	Cross Section, Post HTSL 1000 Hours	Completed	3/3/0
	HTSL	A6	JEDEC JESD22-A103	3	44	High Temp Storage Bake 150C	2000 Hours	3/132/0
	HTSL	A6	-	3	1	Cross Section, Post HTSL 2000 Hours	Completed	3/3/0

Test Group C – Package Assembly Integrity Tests								
	WBS	C1	AEC Q100-001	3	30	Wire Bond Shear, Cpk>1.67	Wires	3/30/0
	WBP	C2	MIL-STD883 Method 2011	3	30	Bond Pull over Ball, Cpk >1.67	Wires	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

TI Qualification ID: R-NPD-2209-054

For questions regarding this notice, e-mails can be sent to the contacts shown 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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