PCN Number:	20191016000.2	**PCN Date:**	Oct 23, 2019
Title:	Qualification of new Leadframe for Select Devices		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	Apr 23, 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 announcing the qualification of a new leadframe for Select devices as follows:

	Current	New
Leadframe p/n	4222995(D)/FM0016(DGS)	4223705 (D)/FM0064(DGS)
Lead finish	Non-roughened	Roughened (Top side)

Reason for Change:

Continuity of supply

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

None

Anticipated impact on Material Declaration

☒	No Impact to the Material Declaration	☐	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 TI Eco-Info website. There is no impact to the material meeting current regulatory compliance requirements with this PCN change.

Changes to product identification resulting from this PCN:

None

Product Affected:

ADS1015QDGSRQ1	ISO7221CQDRQ1	ISO7310FCQDRQ1	ISO7321CQDQ1
ADS1115QDGSRQ1	ISO722QDRQ1	ISO7320CQDQ1	ISO7321CQDRQ1
ISO721QDRQ1	ISO7310CQDQ1	ISO7320CQDRQ1	ISO7321FCQDQ1
ISO7220AQDRQ1	ISO7310CQDRQ1	ISO7320FCQDQ1	ISO7321FCQDRQ1
ISO7221AQDRQ1	ISO7310FCQDQ1	ISO7320FCQDRQ1	

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TI Information
Selective Disclosure

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

4223705-0003 stamped Leadframe for select automotive devices
(Q100H, Grade 1, -40/125C)

Product Attributes

Attributes	Qual Device: ISO721QDQ1	Qual Device: ISO7221AQDQ1	Qual Device: ISO7320CQDQ1	QBS Package Reference: ISO7221AQDRQ1	QBS Package Reference: ISO7320CQDRQ1	QBS Package Reference: ISO7321CQDRQ1
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Interface	Interface	Interface	Interface	Interface	Interface
Wafer Fab Supplier	DFAB	DMOS5	DFAB	DFAB	DMOS5	DMOS5
Die Revision	-	B	-	A	A	A
Assembly Site	TAI	TAI	TAI	TAI	TAI	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC
Package Designator	D	D	D	D	D	D
Ball/Lead Count	8	8	8	8	8	8

- QBS: Qual By Similarity
- Qual Device ISO7221AQDRQ1 and ISO721QDQ1 are qualified at LEVEL3-260C
- Qual Device ISO7320CQDQ1 is qualified at LEVEL 2-260C
-Devices ISO721QDQ1, ISO7221AQDRQ1 and ISO7320CQDQ1 contain multiple dies.

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: ISO721QDQ1	Qual Device: ISO7221AQDQ1	Qual Device: ISO7320CQDQ1	QBS Package Reference: ISO7221AQDRQ1	QBS Package Reference: ISO7320CQDRQ1	QBS Package Reference: ISO7321CQDRQ1
Test Group A – Accelerated Environment Stress Tests													
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	-	-	No Fails	-	No Fails	No Fails
	PC	A1	JEDEC J-STD-020 JESD22-	3	77	Preconditioning	Level 3-260C	No Fails	-	-	No Fails	-	-

Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: ISO721QDQ1	Qual Device: ISO7221AQDQ1	Qual Device: ISO7320CQDQ1	QBS Package Reference: ISO7221AQDRQ1	QBS Package Reference: ISO7320CQDRQ1	QBS Package Reference: ISO7321CQDRQ1
		A113										
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	-	-	-	3/231/0	1/77/0	2/154/0
AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	-	1/77/0	3/231/0	1/77/0	2/154/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	1/77/0	3/231/0	1/77/0	2/154/0
TC-BP	A4	MIL-STD883 Method 2011	1	50	Post Temp Cycle Bond Pull	Wires	-	-	1/50/0	1/60/0	1/50/0	1/50/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	N/A	-	-	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	-	-	-	3/135/0	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	1/77/0
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test 140C	480 Hours	-	-	-	3/231/0	-	-
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	Wire Bond Shear Cpk>1.67	Wires	1/76/0	1/76/0	1/76/0	3/228/0	1/30/0	1/30/0
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull Cpk>1.67	Wires	1/76/0	1/76/0	1/76/0	3/228/0	1/30/0	1/30/0
SD	C3	JEDEC JESD22-	1	15	Surface Mount Solderability	Pb Free Solder	-	1/15/0	1/15/0	-	-	-

Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: ISO721QDQ1	Qual Device: ISO7221AQDQ1	Qual Device: ISO7320CQDQ1	QBS Package Reference: ISO7221AQDRQ1	QBS Package Reference: ISO7320CQDRQ1	QBS Package Reference: ISO7321CQDRQ1
		B102										
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Solder	-	1/15/0	1/15/0	-	-	-
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions	Cpk > 1.67	-	-	-	3/30/0	-	3/30/0
Test Group D – Die Fabrication Reliability Tests												
EM	D1	JESD61	-	-	Electromigration	-	Completed Per Process Technology Requirements			-	-	-
TDDB	D2	JESD35	-	-	Time Dependent 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			-	-	-

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

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TI Information
Selective Disclosure

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

Qualify 2nd Source Lead Frame for UTL SID#FM0016 (SID#FM0064) - Automotive
Approved 29-May-2019

Product Attributes

Attributes	QBS Device: TMP411DQDGKRQ1	QBS Device: TPS61085TDGKRQ1	QBS Device: TPS79801QDGNRQ1
Automotive Grade Level	Grade 1	Grade 1	Grade 1
Operating Temp Range	–40°C to +125°C	–40°C to +125°C	–40°C to +125°C
Product Function	Remote temperature sensor monitor	DC-DC boost converter	High-voltage micropower LDO
Wafer Fab Supplier	DP1DM5	MH8	SH-BIP-1
Die Revision	B	B	C
Assembly Site	UTL2	UTL2	UTL2
Package Type	VSSOP	VSSOP	HVSSOP
Package Designator	DGK	DGK	DGN
Ball/Lead Count	8	8	8

- QBS: Qual By Similarity
- Qual Device TMP411DQDGKRQ1 is qualified at LEVEL3-260C
- Qual Device TPS61085TDGKRQ1 is qualified at LEVEL3-260C
- QBS Device TPS79801QDGNRQ1 is qualified at LEVEL2-260C

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: TMP411DQDGKRQ1	Qual Device: TPS61085TDGKRQ1	QBS Device: TPS79801QDGNRQ1
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Auto Preconditioning	Level 3 - 260C	3/231/0	3/231/0	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Auto Preconditioning	Level 2 - 260C	-	-	3/462/0
AC	A3	JEDEC JESD22-A102	3	77	Autoclave, 121C	96 Hours	-	-	3/231/0
TC	A4	JEDEC JESD22-A104 & Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	3/231/0
TC-WBP	A4	MIL-STD883 Method 2011	1	60	Auto Post TC Bond Pull	Wires	3/90/0	3/90/0	3/90/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	N/A
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	N/A	N/A	N/A
ELFR	B2	AEC Q100-008	3	77	Early Failure Rate, 125C	48 Hours	N/A	N/A	N/A
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, Operational Life	-	N/A	N/A	N/A
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear (Cpk>1.67)	-	-	-	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull (Cpk>1.67)	Wires	3/228/0	3/228/0	3/228/0
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability (Pb)	>95% Lead Coverage 8 Hours Steam Age	-	3/45/0	3/45/0
SD	C3	JEDEC	1	15	Surface Mount	>95% Lead	-	3/45/0	3/45/0

Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: TMP411DQDGKRQ1	Qual Device: TPS61085TDGKRQ1	QBS Device: TPS79801QDGNRQ1
		JESD22-B102			Solderability (Pb-Free)	Coverage 8 Hours Steam Age			
PD	C4	JEDEC JESD22-B100 and B108	3	10	Auto Physical Dimensions	Devices (Cpk>1.67)	-	3/30/0	3/30/0
LI	C6	JEDEC JESD22-B105	1	50	Lead Integrity	# of leads to destruction	-	-	3/72/0
EM	D1	JESD61	-	-	Electromigration	-	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
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
DS	G7	MIL-STD-883 Method 2019	1	5	Die Shear	Die	3/30/0	3/30/0	3/30/0
MQ			-	-	Manufacturability (Auto Assembly)	(per automotive requirements)	3/Pass	3/Pass	3/Pass
MSL			-	-	Moisture Sensitivity	Level 2 - 260C	-	-	3/36/0
MSL			-	-	Moisture Sensitivity	Level 3 - 260C	3/36/0	3/36/0	
XRAY			-	-	X-Ray	Top side only	3/15/0	3/15/0	3/15/0
YLD			-	-	FTY & Bin Summary	-	3/Pass	3/Pass	3/Pass

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

Ambient Operating Temperature by Automotive Grade Level:
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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

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