

<b>PCN Number:</b>	20220727000.2		<b>PCN Date:</b>	July 28, 2022								
<b>Title:</b>	Qualification of New Substrate Core Material for Select Devices											
<b>Customer Contact:</b>	<a href="#">PCN Manager</a>	<b>Dept:</b>	Quality Services									
<b>Proposed 1<sup>st</sup> Ship Date:</b>	Jan 28, 2023	<b>Sample requests accepted until:</b>	Aug 28, 2022*									
*Sample requests received after (Aug 28 2022) will not be supported.												
<b>Change Type:</b>												
<input type="checkbox"/>	Assembly Site	<input type="checkbox"/>	Design	<input type="checkbox"/>	Wafer Bump Site							
<input type="checkbox"/>	Assembly Process	<input type="checkbox"/>	Data Sheet	<input type="checkbox"/>	Wafer Bump Material							
<input checked="" type="checkbox"/>	Assembly Materials	<input type="checkbox"/>	Part number change	<input type="checkbox"/>	Wafer Bump Process							
<input type="checkbox"/>	Mechanical Specification	<input type="checkbox"/>	Test Site	<input type="checkbox"/>	Wafer Fab Site							
<input type="checkbox"/>	Packing/Shipping/Labeling	<input type="checkbox"/>	Test Process	<input type="checkbox"/>	Wafer Fab Materials							
				<input type="checkbox"/>	Wafer Fab Process							
<b>PCN Details</b>												
<b>Description of Change:</b>												
Texas Instruments is pleased to announce the qualification of a new substrate core material for Select Devices listed in the "Product Affected" Section.												
<table border="1"> <thead> <tr> <th>What</th> <th>Current</th> <th>New</th> </tr> </thead> <tbody> <tr> <td>Substrate Core material</td> <td>E679FGB/E679FGB(M)</td> <td>HL832NX(A-HS)</td> </tr> </tbody> </table>					What	Current	New	Substrate Core material	E679FGB/E679FGB(M)	HL832NX(A-HS)		
What	Current	New										
Substrate Core material	E679FGB/E679FGB(M)	HL832NX(A-HS)										
<b>Reason for Change:</b>												
Continuity of supply												
<b>Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):</b>												
None												
<b>Impact on Environmental Ratings</b>												
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.												
<table border="1"> <thead> <tr> <th>RoHS</th> <th>REACH</th> <th>Green Status</th> <th>IEC 62474</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> No Change</td> <td><input checked="" type="checkbox"/> No Change</td> <td><input checked="" type="checkbox"/> No Change</td> <td><input checked="" type="checkbox"/> No Change</td> </tr> </tbody> </table>					RoHS	REACH	Green Status	IEC 62474	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change
RoHS	REACH	Green Status	IEC 62474									
<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change									
<b>Changes to product identification resulting from this PCN:</b>												
None												
<b>Product Affected:</b>												
DRA604BIZCZQ1	O9039A390IZWSRQ1	PO9039A371IZWSRQ1	PTPS659039PIZWSRQ1									
DRA604BIZCZRQ1	O9039A391IZWSRQ1	PO9039A372IZWSRQ1	S5LS10106ASZWTQQ1									
DRA605BIZCZQ1	O9039A392IZWSRQ1	PO9039A373TZWSRQ1	S5LS10116ASZWTQQ1									
DRA606BIZCZQ1	O9039A471IZWSRQ1	PO9039A374IZWSRQ1	S5LS10206ASZWTQQ1									
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DRA615BIZCZQ1	OMAPL138EZCEQ4R	PO9039A37DIZWSRQ1	S5LS20216ASZWTQQ1R									
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DRA618BIZCZQ1	PO9038A142IZWSRQ1	PO9039A385IZWSRQ1	TMS320F28379DZWTQR									
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O9038A342IZW SRQ1	PO9038A344IZW SRQ1	PO9039A38CIZW SRQ1	TMS5701213BZWTSQ1R
O9038A352IZW SRQ1	PO9038A352IZW SRQ1	PO9039A38DIZW SRQ1	TMS5701213CZWTQQ1
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O9039A385IZW STQ1	PO9039A363IZW SRDL	PTPS659039EIZW SRQ1	TMS5704355BZWTSQ1R
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O9039A389IZW SRQ1	PO9039A368IZW SRQ1	PTPS659039IIZW SRQ1	TPS6590372ZWSR
O9039A389IZW STQ1	PO9039A369IZW SRQ1	PTPS659039JIZW SRQ1	TPS6590373ZWSR
O9039A38DIZW SRQ1	PO9039A36AIZW SRQ1	PTPS659039KIZW SRQ1	TPS6590374ZWSR
O9039A38EIZW SRQ1	PO9039A36CIZW SRQ1	PTPS659039LIZW SRQ1	TPS6590374ZWST
O9039A38ETZW SRQ1	PO9039A36DTZW SQ1	PTPS659039MIZW SRQ1	TPS6590375ZWSR
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O9039A390IZW SRDL	PO9039A370IZW SRDL	PTPS659039OIZW SRQ1	

# Qualification Report

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

Approve Date 10-Jan-2019

### Product Attributes

Attributes	Qual Device: CODMIOAZWCR	Process QBS: TPS2543QRTERQ1
Automotive Grade Level	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C
Product Function	ASIC	Power Management
Die Revision	C1	A
Assembly Site	TIPI	Clark
Package Type	BGA	QFN
Package Designator	ZWC	RTE
Ball/Lead Count	255	16

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

### 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: CODMIOAZWCR	Process QBS: TPS2543QRTERQ1
<b>Test Group A – Accelerated Environment Stress Tests</b>								
PC	A 1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	Passed	Passed
HAST	A 2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0
AC	A 3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	3/231/0
TC	A 4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	3/231/0
TC-BP	A 4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	Wires	Passed	Passed
PTC	A 5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	-	1/45/0
HTSL	A 6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 150C	1000 Hours	1/77/0	3/231/0
<b>Test Group B – Accelerated Lifetime Simulation Tests</b>								
HTOL	B 1	JEDEC JESD22-A108	3	77	Life Test 125C	1000 Hours	1/77/0	3/231/0
ELFR	B 2	AEC Q100-008	3	800	Early Life Failure Rate, 125C	24 Hours	-	3/2400/0
EDR	B 3	AEC Q100-005	3	77	NVM Endurance,	1000 Hours	-	-

Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: CODMIOAZWCR	Process QBS: TPS2543QRTERQ1
					Data Retention, and Operational Life			
<b>Test Group C – Package Assembly Integrity Tests</b>								
WBS	C 1	AEC Q100-001	1	30	Wire Bond Shear Cpk>1.67	Wires	1/30/0	1/30/0
WBP	C 2	MIL-STD883 Method 2011	1	30	Wire Bond Pull Cpk>1.67	Wires	1/30/0	1/30/0
SD	C 3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	-	-	1/15/0
PD	C 4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	-	3/30/0	3/30/0
<b>Test Group D – Die Fabrication Reliability Tests</b>								
EM	D 1	JESD61	-	-	Electromigration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
Tddb	D 2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
HCI	D 3	JESD60 & 28	-	-	Hot Injection Carrier	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
NBTI	D 4	-	-	-	Negative Bias Temperature Instability	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
SM	D 5	-	-	-	Stress Migration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
<b>Test Group E – Electrical Verification Tests</b>								
HBM	E 2	AEC Q100-002	1	3	ESD – HBM	1500 V	1/3/0	-
						2000 V	-	1/3/0
CDM	E 3	AEC Q100-011	1	3	ESD – CDM	500 V (all pins) 750V (corner pins only)	1/3/0	1/3/0
LU	E 4	AEC Q100-004	1	6	Latch-up (125C)	Per AEC Q100-004	1/6/0	1/6/0
ED	E 5	AEC Q100-009	3	30	Electrical Distributions (-40, 25C, 125C)	Cpk>1.67	3/90/0	3/90/0

**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): -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

## Qualification Report

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

Approve Date 16-Dec-2013

#### Product Attributes

Attributes	Qual Device: TMS320DM6437ZWTQ6
Automotive Grade Level	Grade 1
Operating Temp Range	-40 to +125 C
Product Function	Microprocessor
Die Revision	B
Assembly Site	PHI
Package Type	NFBGA
Package Designator	ZWT
Ball/Lead Count	361

- QBS: Qual By Similarity

- Qual Device TMS320DM6437ZWTQ6 is qualified at LEVEL3-260CG

#### 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: TMS320DM6437ZWTQ6
<b>Test Group A – Accelerated Environment Stress Tests</b>							
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 3-260C	No Fails
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 110C/85%RH	264 Hours	3/231/0
UHAST	A3	JEDEC JESD22-A102	3	77	Unbiased HAST 110C/85%RH	96 Hours	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -55/125C	1000 Cycles	3/231/0
TC-WBP	A4	MIL-STD883 Method 2011	1	60	Post Temp Cycle Bond Pull	Wires	-
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	3/231/0
<b>Test Group B – Accelerated Lifetime Simulation Tests</b>							
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	-
ELFR	B2	AEC Q100-008	3	800	Auto Early Life Failure Rate Grade 1	150C(24 Hrs)	-
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A
<b>Test Group C – Package Assembly Integrity Tests</b>							
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear, Cpk>1.67	Wires	3/90/0

Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: TMS320DM6437ZWTQ6
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull, Cpk>1.67	Wires	3/90/0
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Free Solder	-
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Solder	-
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions	Cpk>1.67	3/30/0
SBS	C5	AEC Q100-010	3	50	Solder Ball Shear (Cpk>1.67)	Solder Balls	3/96/0
LI	C6	JEDEC JESD22-B105	1	50	Lead Fatigue	Leads	N/A
LI	C6	JEDEC JESD22-B105	1	50	Lead Pull to Destruction	Leads	N/A
<b>Test Group D – Die Fabrication Reliability Tests</b>							
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
<b>Test Group E – Electrical Verification Tests</b>							
HBM	E2	AEC Q100-002	1	3	Auto ESD HBM	2000V	-
CDM	E3	AEC Q100-011	1	3	Auto ESD CDM	250V	3/9/0
LU	E4	AEC Q100-004	1	6	Auto Latch-up	25C, 125C	-
ED	E5	AEC Q100-009	3	30	Auto Electrical Distributions	Cpk>1.67 Room, hot, and cold test	-

**A1 (PC): Preconditioning:**

Performed for THB, Biased HAST, AC, uHAST, TC & PTC samples, as applicable.

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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

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
WW PCN Team	<a href="mailto:PCN_ww_admin_team@list.ti.com">PCN_ww_admin_team@list.ti.com</a>

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