

PCN Number:	20190403000		PCN Date:	June 11, 2019												
Title:	Selective Roughened to Single-side Roughened Leadframe															
Customer Contact:	PCN Manager		Dept:	Quality Services												
Proposed 1st Ship Date:	December 11, 2019	Estimated Sample Availability:	Date provided at sample request													
Change Type:																
<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"/>		<input type="checkbox"/>	Wafer Fab Process											
PCN Details																
Description of Change:																
Texas Instruments Incorporated is announcing the qualification of Single-side Roughened Leadframe to replace Selective Roughened Leadframe on select devices.																
<table border="1"> <thead> <tr> <th>Description</th> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td>Leadframe</td> <td>Selective Roughened</td> <td>Single-side Roughened</td> </tr> <tr> <td>Supplier</td> <td>No change</td> <td>No change</td> </tr> <tr> <td>Plating</td> <td>No change</td> <td>No change</td> </tr> </tbody> </table>					Description	From	To	Leadframe	Selective Roughened	Single-side Roughened	Supplier	No change	No change	Plating	No change	No change
Description	From	To														
Leadframe	Selective Roughened	Single-side Roughened														
Supplier	No change	No change														
Plating	No change	No change														
Reason for Change:																
Improve leadframe supplier delivery.																
Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):																
None.																
Changes to product identification resulting from this PCN:																
None.																
Product Affected:																
LP8860EQVFPRQ1	S301030BB2PZPR	TAS5414CTPHDRQ1														
LP8860FQVFPRQ1	S301030MBB2PZPR	TPIC8101DW														
LP8860GQVFPRQ1	SN0208018DWRG4	TPIC8101DWR														
P106049BC1PZPR	SN0508068PHPR															
P106049BC2PZPR	SN1508068PHPR															
P301030BB1PZPR	TAS5404TPHDRQ1															
S106049AC3PZPR	TAS5412TPHDRQ1															
S106049BC3PZPR	TAS5414BTPHDQ1															
S106049MBC3PZPR	TAS5414BTPHDRQ1															
S1105082F4PLPR	TAS5414CTPHD															
S301030AB2PZPR	TAS5414CTPHDR															

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

Product Attributes

Attributes	Qual Device: <u>S1105082F4PLPR</u>	Qual Device: <u>SN0302035DWRG4</u>	Qual Device: <u>SN0508068PHPR</u>	QBS Package Reference: <u>LP8860AQVFPRO1</u>	QBS Package Reference: <u>P1105082FIPLPR</u>	QBS Package Reference: <u>SN0302035DWRG4</u>
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	ASIC	Signal Chain	Interface	Power Management	ASIC	Signal Chain
Wafer Fab Supplier	RFAB	DFAB	DMO5S	MAINE	DMO5S	DFAB
Die Revision	A5	C	A1	A	A0	C
Assembly Site	TAI	TAI	TAI	TITL	TITL	TAI
Package Type	HLQFP	SOIC	HTQFP	HLQFP	HLQFP	SOIC
Package Designator	PNP	DW	PHP	VFP	PLP	DW
Ball/Lead Count	128	20	48	32	128	20

- QBS: Qual By Similarity
- Qual Device and SN0302035DWRG4 and S1105082F4PLPR are qualified at LEVEL3-260C
- Qual Device SN0508068PHPR is qualified at LEVEL4-260CG

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: <u>S1105082F4PLPR</u>	Qual Device: <u>SN0302035DWRG4</u>	Qual Device: : <u>SN0508068PHPR</u>	QBS Package Reference: <u>LP8860AQVFPRO1</u>	QBS Package Reference: <u>P1105082FIPLPR / PRP1105082FIPLPR / P1105082F3PLP</u>	QBS Package Reference: <u>SN0302035DWRG4</u>
Test Group A – Accelerated Environment Stress Tests												
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Auto Preconditioning	Level 3-260C	-	-	-	-	No Fails	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 2-260C	-	-	-	No Fails	-	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 3-260C	-	-	-	-	-	No Fails
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	-	-	-	1/77/0	3/231/0	3/231/0
TC	A4	JEDEC	3	77	Tempera	1000	-	-	-	-	-	3/228/0

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name / Condition	Duration	Qual Device: <u>S1105082F4PLPR</u>	Qual Device: <u>SN0302035DWRG4</u>	Qual Device : <u>SN0508068PHPR</u>	QBS Package Reference: <u>LP8860AOVFPRO1</u>	QBS Package Reference: <u>P1105082F1PLPR / P1105082F3PLP</u>	QBS Package Reference: <u>SN0302035DWRG4</u>
		JESD22-A104 and Appendix 3			ture Cycle, -55/150C	Cycles						
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	-	-	-	3/231/0	3/231/0	-
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	1000 Cycles	-	-	-	3/231/0	3/229/0	-
TC-WBP	A4	MIL-STD883 Method 2011	3	30	Bond Pull over Ball Post T/C 1000 Cycles	Wires	-	-	-	3/90/0		3/90/0
TC-WBP	A4	MIL-STD883 Method 2011	3	30	Bond Pull over Ball Post T/C 500 Cycles	Wires	3/90/0	-	3/90/0	3/90/0	-	-
TC-WBP	A4	MIL-STD883 Method 2011	3	30	Bond Pull over Stitch Post T/C 1000 Cycles	Wires	-	-	-	3/90/0	-	-
TC-WBP	A4	MIL-STD883 Method 2011	3	30	Bond Pull over Stitch Post T/C 500 Cycles	Wires	3/90/0	-	3/90/0	1/30/0	-	-
TC-WBS	A4	MIL-STD883 Method 2011	3	30	Wire Bond Shear, Post T/C 500 Cycles	Wires	3/90/0	-	3/90/0	3/90/0	-	-
TC-WBS	A4		3	30	Wire Bond Shear, Post T/C 1000 Cycles	Wires	-	-	-	3/90/0	-	-
PT	A5	JEDEC	1	45	Power	1000	N/A	N/A	N/A	N/A	1/45/0	N/A

Type	#	Test Spec	Min Lot Qty	SS /Lot	Test Name / Condition	Duration	Qual Device: <u>S1105082F4PLPR</u>	Qual Device: <u>SN0302035DWRG4</u>	Qual Device : <u>SN0508068PHPR</u>	QBS Package Reference: <u>LP8860AOVFPRO1</u>	QBS Package Reference: <u>P1105082F1PLPR / P1105082F3PLP</u>	QBS Package Reference: <u>SN0302035DWRG4</u>
C		JESD22-A105			Temperature Cycle, -40/125C	Cycles						
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	-	-	-	-	1/45/0	3/135/0
Test Group B – Accelerated Lifetime Simulation Tests												
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1073 Hrs	-	-	-	-	3/231/0	-
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 125C	72 Hr	-	-	-	-	3/2400/0	-
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	N/A	N/A	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	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull (Cpk>1.67)	Wires	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0
SD	C3	JEDEC JESD22-B102	1	15	Solderability	Pb-Free	3/45/0	3/45/0	3/45/0	3/45/0	-	3/45/0
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	1/30/0	1/30/0	1/30/0	1/30/0	3/30/0	-	3/30/0
SBS	C5	AEC Q100-010	3	50	Solder Ball Shear (Cpk>1.67)	Solder Balls	N/A	N/A	N/A	N/A	N/A	N/A

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LI	C6	JEDEC JESD22-B105	1	50	Lead Integrity	-	3/135/0	3/135/0	3/135/0	-	-	-
LI	C6	JEDEC JESD22-B105	1	50	Lead Pull	Leads	-	-	-	-	-	1/60/0
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 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	-	-	-

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									Requirements			
Test Group E – Electrical Verification Tests												
HBM	E2	AEC Q100-002	1	3	ESD - HBM - Q100	2000 V	-	-	-	-	1/3/0	-
CDM	E3	AEC Q100-011	1	3	ESD - CDM - Q100	750 V	-	-	-	-	1/3/0	-
LU	E4	AEC Q100-004	1	6	Latch-up	Latchup	-	-	-	-	1/6/0	-
ED	E5	AEC Q100-009	3	30	Auto Electrical Distributions	Cpk>1.67 Room, hot, and cold test	-	-	-	-	1/90/0	-
Additional Tests												
MSL			-	-	Moisture Sensitivity, JEDEC	Level 3-260C	-	3/36/0	-	-	-	3/36/0
MSL			-	-	Thermal Integrity Sequence	Level 3-260C	3/36/0	-	-	-	3/36/0	-
MSL			-	-	Thermal Integrity Sequence	Level 4-260C	-	-	3/36/0	-	-	-

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

For questions regarding this notice, e-mails can be sent to the contacts shown below or your local Field Sales Representative.

Location	E-Mail
USA	PCNAmericasContact@list.ti.com
Europe	PCNEuropeContact@list.ti.com
Asia Pacific	PCNAsiaContact@list.ti.com
WW PCN Team	PCN_ww_admin_team@list.ti.com

