

OMLF/HDLF Discontinuance and Conversion to UDLF/XDLF & Panasonic System Networks (PCC) Leadframe Business Closure

Product Change Information

1- What is the change:

- Panasonic System Networks (PCC) lead frame supplier has informed Amkor Philippines (ST' subcontractor) on its decision to close their lead frame business after September 2015.
- This factory closure of PCC lead frame will impact Amkor Philippines (ST's subcontractor) production after ww39 (Sep, 2015 time frame)
- This PCC lead frame will be replaced by ASM, Mitsui High Tech (Malaysia) and MALAYSIAN SH ELECTRONICS SDN BHD that depends on different device.
- The change is also including the conversion for TSSOP28 & 38 pins from OMLF to UDLF lead frames
- The impacted packages are TSSOP20 leads, TSSOP28 leads, and TSSOP38 leads

Plant	Package	Current Lead frame Format	Qualified Lead frame Format
ATP1	TSSOP20	HDLF	XDLF
	TSSOP28	OMLF	UDLF
	TSSOP38	OMLF	UDLF

2- WHY:

Reasons for these changes are:

- PANASONIC System Networks (PCC) has announced the closure of their lead frame business
- OMLF manufacturing lines will be discontinued at AMKOR ATP1

3- WHEN will this change occur:

Target date for full conversion is on W41'2015 onwards.

4- HOW will the change be qualified:

- Risk have been evaluated (Refer to Annex 1)
- Approach for selecting the alternative lead frames in UDLF and XDLF format is same specifications, same materials, same finishing.
- This change will be qualified using the standard ST/Amkor procedures that agree by ST for quality and reliability evaluation. Major steps of the qualification plan are:
 - Process assessment
 - Workability
 - Construction checking
 - Reliability checking

5- IMPACTS OF THE CHANGE:

Form: No change
Fit: No change
Function: No change

6 - APPENDICES:

APPENDIX 1 Risk assessment

APPENDIX 2 Qualification / Reliability Plan

APPENDIX 3 Construction / Reliability / Qualification Results based on Amkor's qualification data

APPENDIX 1: RISK ASSESSMENT

#	Risks identified	Potential risk resulting from	Class	Considered action
1	Workability issues on machines at different process step (Die attach, wire bonding, molding, plating, cropping)	Difference of leadframe size (Length x Width), leadframe matrix and leadframe plating	Low	<ul style="list-style-type: none"> To validate if any impact (yield, Non-stick on lead, machine stops) in workability
		Difference in machine models used at mold	Medium	<ul style="list-style-type: none"> New mold system To validate if any impact (yield, delamination, wiresweep, machine stops) in workability
2	D/A Quality problem	Results not in accordance with ST requirements on following: - void - coverage - Bond line thickness - Die shear	Low	<ul style="list-style-type: none"> Same material use, same process control, no change in specification. Validated during workability exercise
3	Wire bonding quality problems	Results not in accordance with ST requirements on following: - Non-stick on Leads (NSOL). Poor bond ability of 2 nd bond - Pull test	Low	<ul style="list-style-type: none"> Same material use, same process control, no change in specification. Validated during workability exercise and qualification
4	Mold quality problems	Results not in accordance with ST requirements on following: -delamination -wiresweep -package mismatch	Medium	<ul style="list-style-type: none"> Same material use, same process control, difference on the pellet size Validated during workability exercise and qualification
5	Reliability	Delamination	Medium	<ul style="list-style-type: none"> Delamination issue checked during qualification exercise (MSL3)
6	Product performance	Electrical performance deterioration due to difference of POA	Low	<ul style="list-style-type: none"> Control of LF Dimension at IQC (each lead frame lot) LF Dimension measurement during LF qualification Check at Electrical test P/N and specific test vehicles selected to ensure it complies with standard requirements
7	Manufacturing issues	Yield degradation due to possible difference of Lead Frame plating type (R-Ag, DR-Ag, Spot-Ag, TPPF) and leadframe surface morphology	Low	To validate impact (if any) during workability
		Low Productivity due to possible difference of Lead Frame plating type (R-Ag, DR-Ag, Spot-Ag, TPPF) and leadframe surface morphology	Low	To validate impact (if any) during workability
		Lead frame quality issue brought instability performances	Low	Checked during workability exercise
8	Supply Chain: To guarantee parts delivery to our customers and avoid business disruption	Due to this unpredicted crisis, no sufficient stock of lead frames is available.	Medium	<ul style="list-style-type: none"> Fast generation of PCI towards customer for immediate approval
9	Supply Chain: Quality issues	Quality or reliability problems in the field	Low	<ul style="list-style-type: none"> Re-enforced IQC controls (each lead frame lot) Designed a Fast safe Launch exercise with a Lot Acceptance Test (LAT) approach

APPENDIX 2: Qualification / Reliability Plan

Test Name	Conditions	Lots #	Sample Size	Notes
JL3	24h bake @ 125C + MSLn TH soak + reflow simulation (3 times JEDEC J-STD -020D)	1 per L/F Option	22 pcs/lot	1, 2, 3
JL3 + TCT	Ta = - 50/150C, 500 cycles	1 per L/F Option	77 pcs / lot	1, 2
HTSL	HTSL (static storage at 150degC): 500H/1000H	1 per L/F Option	45 pcs / lot	1
PPT	PPT @ 121°C/2 Atm (96H)	1 per L/F Option	77 pcs / lot	1 & 2

Notes	Description	Sample size
1	Electrical test	100%
2	SAM analysis in C and T mode to check delamination resin-die, resin-lead, resin-die pad , DA integrity	20pcs /lot min
3	pull test after de-capsulation (to collect pull strength and failure mode and to inspect by SEM all abnormal failure mode)	30 wire from 5 units min

Note: More stringent tests have been performed according to product specificities.

APPENDIX 3: Qualification execution & results summary according to Amkor's qualification

Plant	Packages	Construction analysis	Qualification on process	Reliability	Qualification completion
ATP1	TSSOP20	Pass	Pass	Pass	Pass
ATP1	TSSOP28	Pass	Pass	Pass	Pass
ATP1	TSSOP38	Pass	Pass	Pass	Pass