



PRODUCT/PROCESS CHANGE NOTIFICATION

PCN CRP/12/7298
Notification Date 06/11/2012

Modification of trays for QFP 7x7x1.4mm packages

Table 1. Change Implementation Schedule

Forecasted implementation date for change	10-Sep-2012
Forecasted availability date of samples for customer	11-Jun-2012
Forecasted date for STMicroelectronics change Qualification Plan results availability	11-Jun-2012
Estimated date of changed product first shipment	10-Sep-2012

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	product delivered in tray for QFP 7x7x1.4mm
Type of change	Packing
Reason for change	standardization
Description of the change	A modification of trays for QFP 7x7x1.4mm is being introduced. This change is characterized by: - a full fence type to prevent potential fence breakage issues due to partial fence design - the introduction of the supplier UBOT as a new source
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	QA Number
Manufacturing Location(s)	1]Amkor Korea Ews 2]Kyec Ews 2 (Be) 3]St Muar - Malaysia 4]Sc Chippac - China

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt		PCN CRP/12/7298
Please sign and return to STMicroelectronics Sales Office		Notification Date 06/11/2012
☐ Qualification Plan Denied ☐ Qualification Plan Approved ☐ Change Denied ☐ Change Approved	Name:	
	Title:	
	Company:	
	Date:	
	Signature:	
Remark		

DOCUMENT APPROVAL

Name	Function
Livache, Veronique	Corporate Quality Manager
Low, Patrick	Process Owner

Modification of trays for QFP 7x7x1.4mm packages

WHAT:

A modification of trays for QFP 7x7x1.4mm is being introduced. This change is characterized by:

- a full fence type to prevent potential fence breakage issues due to partial fence design
- the introduction of the supplier UBOT as a new source

As indicated in the below table, the key dimensions remain unchanged. These new trays (PEAK REV G & UBOT) are inter-stackable with each other but also with the old PEAK REV A & REV B trays. In addition, they are also stackable with trays from the supplier ITW

Information	Current product		New changed product		Remarks
Supplier	PEAK	PEAK	PEAK	UBOT	
Supplier Tray Code	ND 0707 1.4 1025 6 REV.A bL2	ND 0707 1.4 1025 6 REV.B bL2	ND 0707 1.4 1025 6 REV.G bL2	UQ07071.41025X BU	For tray standardization
Material	MPPO	MPPO	MPPO	MPPO	
X-offset (M)	11.10mm	11.10mm	11.10mm	11.10mm	Key dimensions remains unchanged
Y-offset (M1)	11.25mm	11.25mm	11.25mm	11.25mm	
Nominal Pocket Depth	1.70mm	1.70mm	1.70mm	1.70mm	No changes for customers' pick up height settings
Nominal Pocket Dimension	6.87x6.87mm	6.92x6.92mm	6.92x6.92mm	6.92x6.92mm	Pocket dimension taken with reference to PEAK REV B
Nominal Fence height	0.30mm	0.30mm	0.30mm	0.40mm	Full fence design for both UBOT & PEAK REV G, thus, reducing the risk of bent leads
Nominal Fence thickness	0.30mm	0.275mm	0.265mm	0.265mm	
Fence Type	Partial	Full	Full	Full	

WHY:

The purpose of this change is to standardize the trays between ST and its subcontractors reducing the risk of potential mixing issues or bent leads.

WHEN:

Unless specific customer requirements, this new tray will be introduced at minimum 3 month after the delivery of this notification

HOW:

The following pages introduce

- the qualification and workability tests that have been carried out for each tray
- the drawings of trays.



Qualification Report For QFP 7x7 1.4mm UBOT trays

Objective:

To evaluate UQ0707 1.4 1025 XBU P-bin tray from UBot

Material details:

Tray type	: UQ0707 1.4 1025 XBU
Material type	: MPPO
Supplier	: Supplier
Part number	: 3CP30510 (Black tray with blue insert) 3CP30508 (Black tray with green insert)

Workability (Pick and Place trial)



	Machine	Samples size	Reject criteria	Results
Cropping machine	MP209	1500 units	Bend lead, package crack, tray is jamming when machine running	Pass
Strip test machine	MP209	1500 units	Bend lead, package crack, tray is jamming when machine running	Pass
Test handler	Synax	1500 units	Bend lead, package crack, tray is jamming when machine running	Pass
Finishing scanning machine	STI	1500 units	Bend lead, package crack, tray is jamming when machine running	Pass

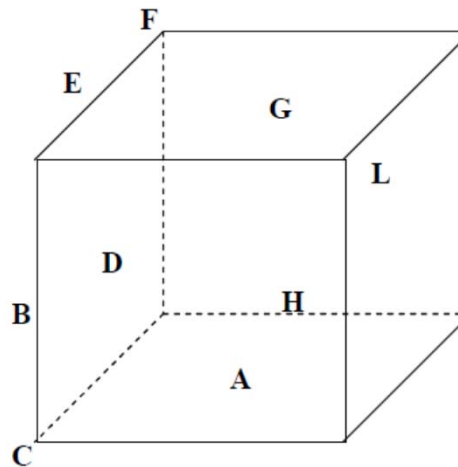
Workability results: Pass

Drop test



- Drop test procedure

1. 6 trays full with 48 leads device were scanned using STI Handler to ensure only good units were used.
2. The trays were strapped in the full bulk 6 + 1 configuration (with units), with sponge & end cap as per normal production packing.
3. The trays were dropped from a height of 1.2 meter on sides ABC, DEF and GHI respectively.
4. The units were rescanned using STI Handler to determine the integrity of the units.



Drop test results



- Drop test results:

Inner Box Drop	Coplanarity (0-75um)	Standoff (50-150um)	Pitch (415-585um)	Results
ABC	0 reject	0 reject	0 reject	Pass
DEF	0 reject	0 reject	0 reject	Pass
GHI	0 reject	0 reject	0 reject	Pass

Visual inspection after drop test:

Inspection items	Sample size	Reject quantity at ABC	Reject quantity at DEF	Reject quantity at GHI
Unit chip	1500 units	0/1500	0/1500	0/1500
Unit stuck	1500 units	0/1500	0/1500	0/1500
Unit misplace	1500 units	0/1500	0/1500	0/1500
Chip trays	7 trays	0/7	0/7	0/7

Baking Test



- Baking test procedure:
 1. 10 trays were strap by 3W+1L method and subjected to 3 baking cycles, each cycle take 24 hrs and bake under 125 °C.
 2. The warpage should be measure for each baking. The reading should not more than 0.50mm after 3 cycles baking.
 3. After each baking, strapping belt should be open and leave for production environment more than 2 hours before the next strapping and baking.

- Baking test results

	Specification	UBot
Zero baking (Max readings)	>0.50mm	0.20mm
1 st baking (Max readings)	>0.50mm	0.20mm
2 nd baking (Max readings)	>0.50mm	0.25mm
3 rd baking (Max readings)	>0.50mm	0.30mm

Baking test results: Pass

Single Bake



- Single bake procedure:
 1. 6 pieces of single trays (not stacked) was bake under 150 °C (base on the temperature mark on the tray) and 48 hours.
 2. Trays were bake without unit and without strap with Velcro or PP belt.
- Single bake results:

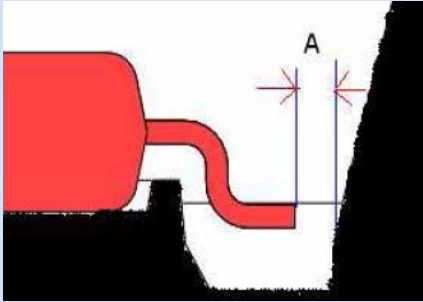
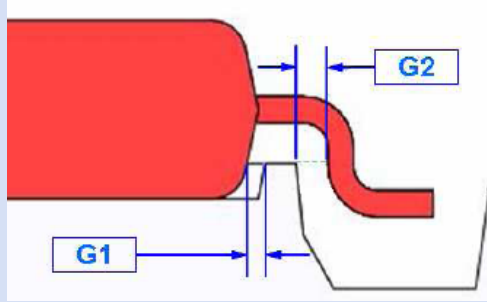
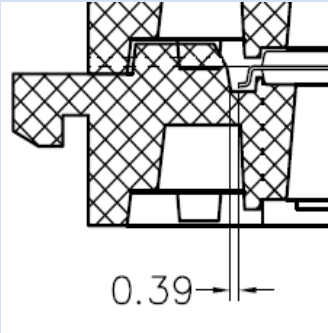
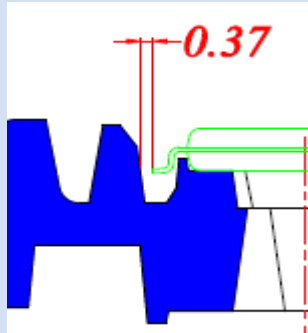
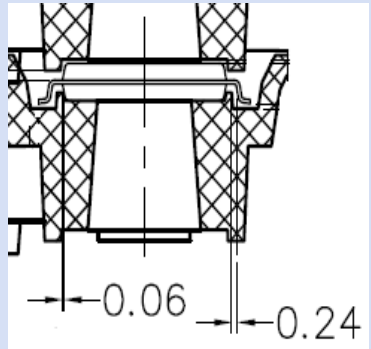
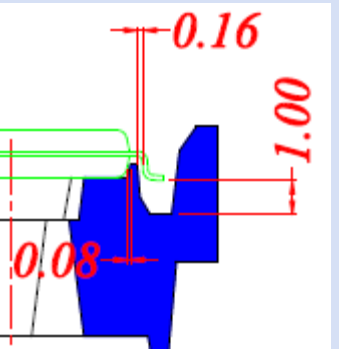
Inspection items	Sample size	Results, Yes/No
Any shrinkage on overall length	6 pcs	No
Any shrinkage on pocket dimension	6 pcs	No
Any shrinkage on overall thickness	6 pcs	No
Warpage readings (should less than 0.76)	6 pcs	0.75mm

Single bake results: Pass

Fit Analysis

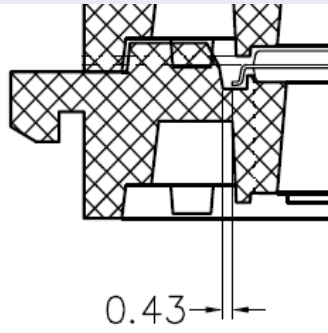
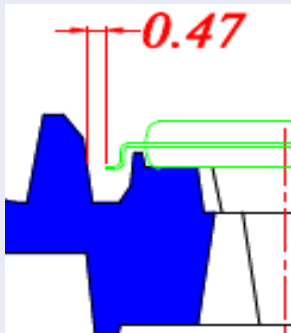
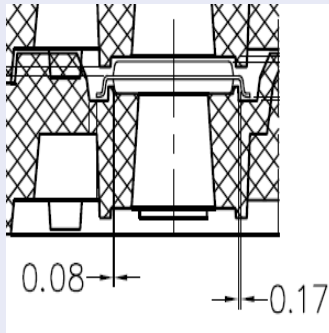
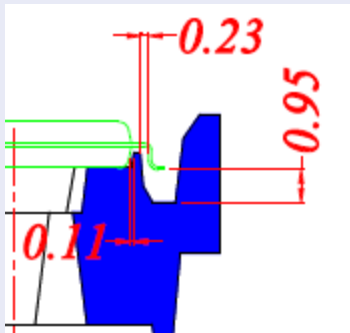
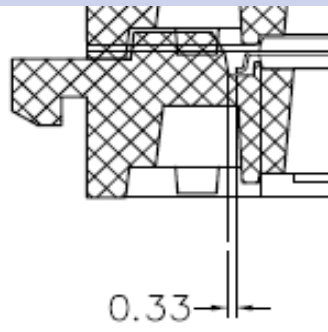
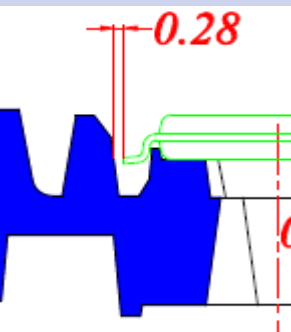
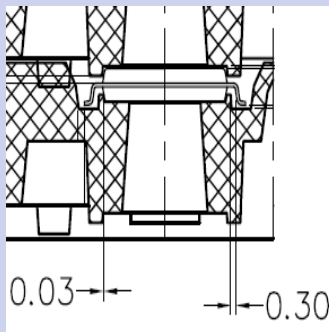
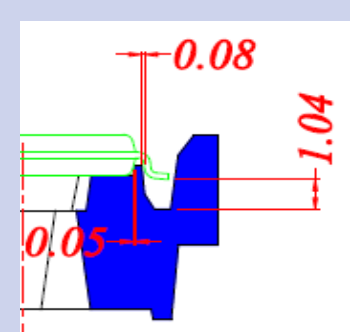


- Fit analysis test is to ensure units' positions in tray are good.

	Clearance between lead tip and pocket wall		Pocket fence clearance	
Specification	$A > 0.1\text{mm}$ 		$G1 < G2$ 	
Normal case	PEAK Rev A	UBot	PEAK Rev A	UBot
				

Fit Analysis



	Clearance between lead tip and pocket wall		Package clearance	
Max Tray vs Min Unit	PEAK Rev A	UBot	PEAK Rev A	UBot
				
Min Tray vs Max Unit	PEAK Rev A	UBot	PEAK Rev A	UBot
				

Fit analysis results: Pass for both revision tray

Misplace and Double Units Detection Check



Misplace unit
Old: PEAK REV A



Misplace unit
New: Ubot



Double units
Old: PEAK REV A



Double Units
New: Ubot



Results: Both PEAK Rev A and Rev F able to detect misplace and double units

Stack-ability Feature



A Tray	B Tray	Stackability
UBot	PEAK Rev A	Yes
PEAK Rev A	UBot	Yes
UBot	PEAK Rev B	Yes
PEAK Rev B	UBot	Yes
UBot	ITW	Yes
ITW	UBot	Yes

Results: UBot tray is stackable with PEAK Rev A and Rev B.

ESD Check



- The good ESD acceptance limit is 1.0×10^5 ohms to 1.0×10^{11} ohms

	QFP 7x7 1.4 mm (UBot)		
	Sample 1	Sample 2	Sample 3
Min Readings	1 E 07 ohms	1 E 08 ohms	1 E 07 ohms
Max Readings	1 E 07 ohms	1 E 08 ohms	1 E 08 ohms
Results	Passed	Passed	Passed

ESD results: Pass

Conclusion



- With above mentioned results, UQ0707 1.4 1025 XBU P-bin tray from UBot is qualified to run for a mass production.



Qualification Report For QFP 7x7 1.4mm PEAK trays

Objective:

To evaluate ND0707 1.4 1025 6 REV.G bL2 P-bin tray from PEAK

Material details:

Tray type	: ND0707 1.4 1025 6 REV.G bL2
Material type	: MPPO
Supplier	: PEAK
Part number	: 3CP30510 (Black tray with blue insert) 3CP30508 (Black tray with green insert)

Workability (Pick and Place trial)



	Machine	Samples size	Reject criteria	Results
Cropping	ASM	1500 units	Bend lead, package crack, tray is jamming when machine running	Pass
Tester	Synax	1500 units	Bend lead, package crack, tray is jamming when machine running	Pass
Finishing	STI	1500 units	Bend lead, package crack, tray is jamming when machine running	Pass

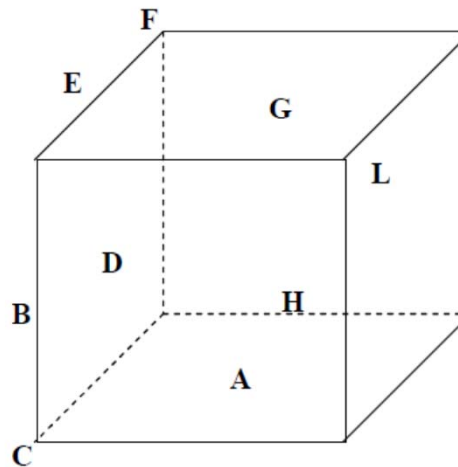
Workability results: Pass

Drop test



- Drop test procedure

1. 6 trays full with 48 leads device were scanned using STI Handler to ensure only good units were used.
2. The trays were strapped in the full bulk 6 + 1 configuration (with units), with sponge & end cap as per normal production packing.
3. The trays were dropped from a height of 1.2 meter on sides ABC, DEF and GHI respectively.
4. The units were rescanned using STI Handler to determine the integrity of the units.



Drop test results



- Drop test results:

Inner Box Drop	Coplanarity (0-75um)	Standoff (50-150um)	Pitch (415-585um)	Results
ABC	0 reject	0 reject	0 reject	Pass
DEF	0 reject	0 reject	0 reject	Pass
GHI	0 reject	0 reject	0 reject	Pass

Visual inspection after drop test:

Inspection items	Sample size	Reject quantity at ABC	Reject quantity at DEF	Reject quantity at GHI
Unit chip	1500 units	0/1500	0/1500	0/1500
Unit stuck	1500 units	0/1500	0/1500	0/1500
Unit misplace	1500 units	0/1500	0/1500	0/1500
Chip trays	7 trays	0/7	0/7	0/7

Baking Test



- Baking test procedure:
 1. 10 trays were strap by 3W+1L method and subjected to 3 baking cycles, each cycle take 24 hrs and bake under 125 °C.
 2. The warpage should be measure for each baking. The reading should not more than 0.50mm after 3 cycles baking.
 3. After each baking, strapping belt should be open and leave for production environment more than 2 hours before the next strapping and baking.

- Baking test results

	Specification	Rev G PEAK
Zero baking (Max readings)	>0.50mm	0.10mm
1 st baking (Max readings)	>0.50mm	0.15mm
2 nd baking (Max readings)	>0.50mm	0.15mm
3 rd baking (Max readings)	>0.50mm	0.20mm

Baking test results: Pass

Single Bake



- Single bake procedure:
 1. 6 pieces of single trays (not stacked) was bake under 150 °C (base on the temperature mark on the tray) and 48 hours.
 2. Trays were bake without unit and without strap with Velcro or PP belt.
- Single bake results:

Inspection items	Sample size	Results, Yes/No
Any shrinkage on overall length	6 pcs	No
Any shrinkage on pocket dimension	6 pcs	No
Any shrinkage on overall thickness	6 pcs	No
Warpage readings (should less than 0.76)	6 pcs	0.50mm

Single bake results: Pass

Stack-ability Feature



A Tray	B Tray	Stackability
PEAK Rev G	PEAK Rev A	Yes
PEAK Rev A	PEAK Rev G	Yes
PEAK Rev G	PEAK Rev B	Yes
PEAK Rev B	PEAK Rev G	Yes
PEAK Rev G	ITW	Yes
ITW	PEAK Rev G	Yes

Results: PEAK Rev G is stackable with PEAK Rev A and Rev B.

ESD Check



- The good ESD acceptance limit is 1.0×10^5 ohms to 1.0×10^{11} ohms

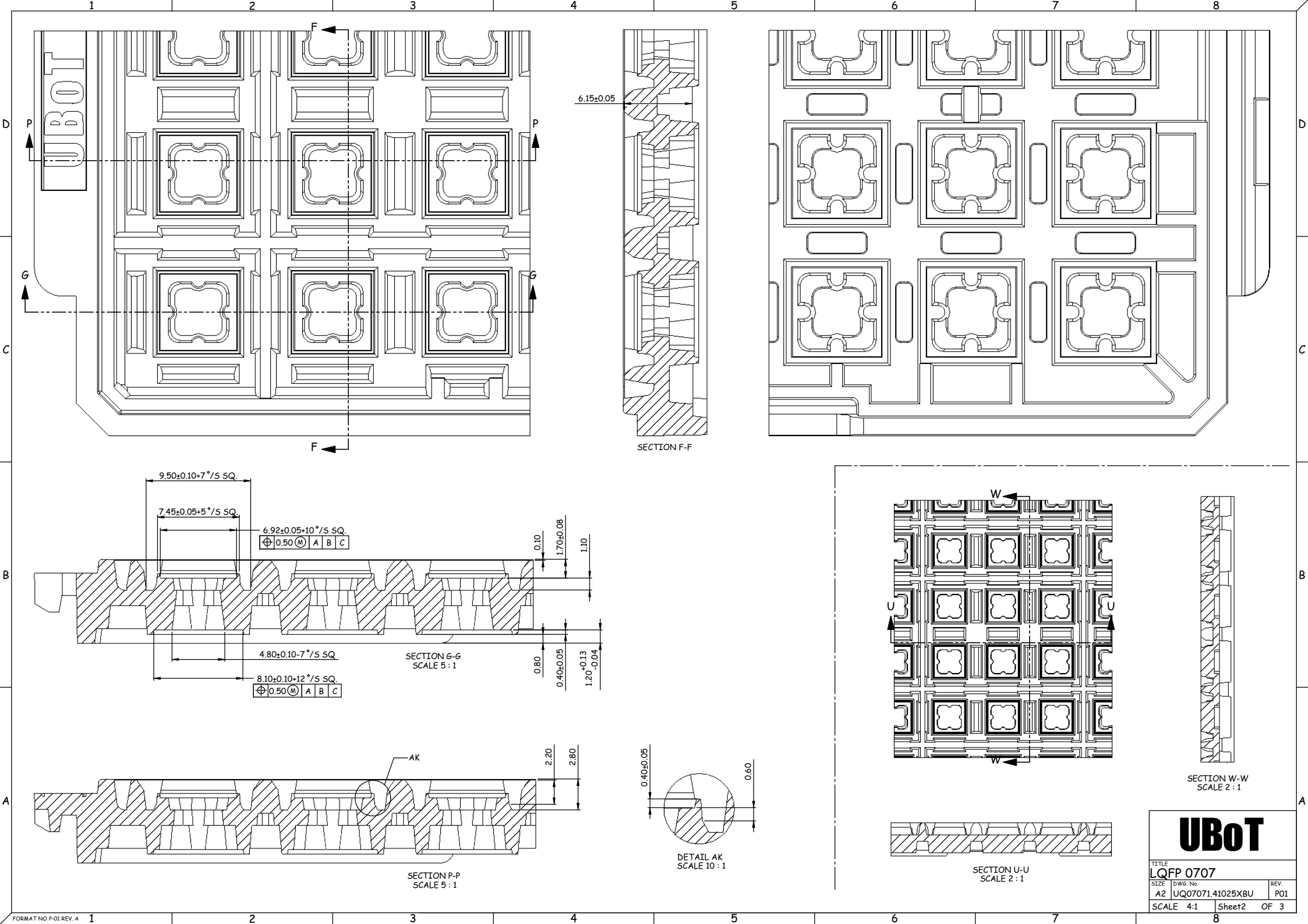
	QFP 7x7 1.4 mm (PEAK)		
	Sample 1	Sample 2	Sample 3
Min Readings	1 E 05 ohms	1 E 05 ohms	1 E 05 ohms
Max Readings	1 E 06 ohms	1 E 05 ohms	1 E 06 ohms
Results	Passed	Passed	Passed

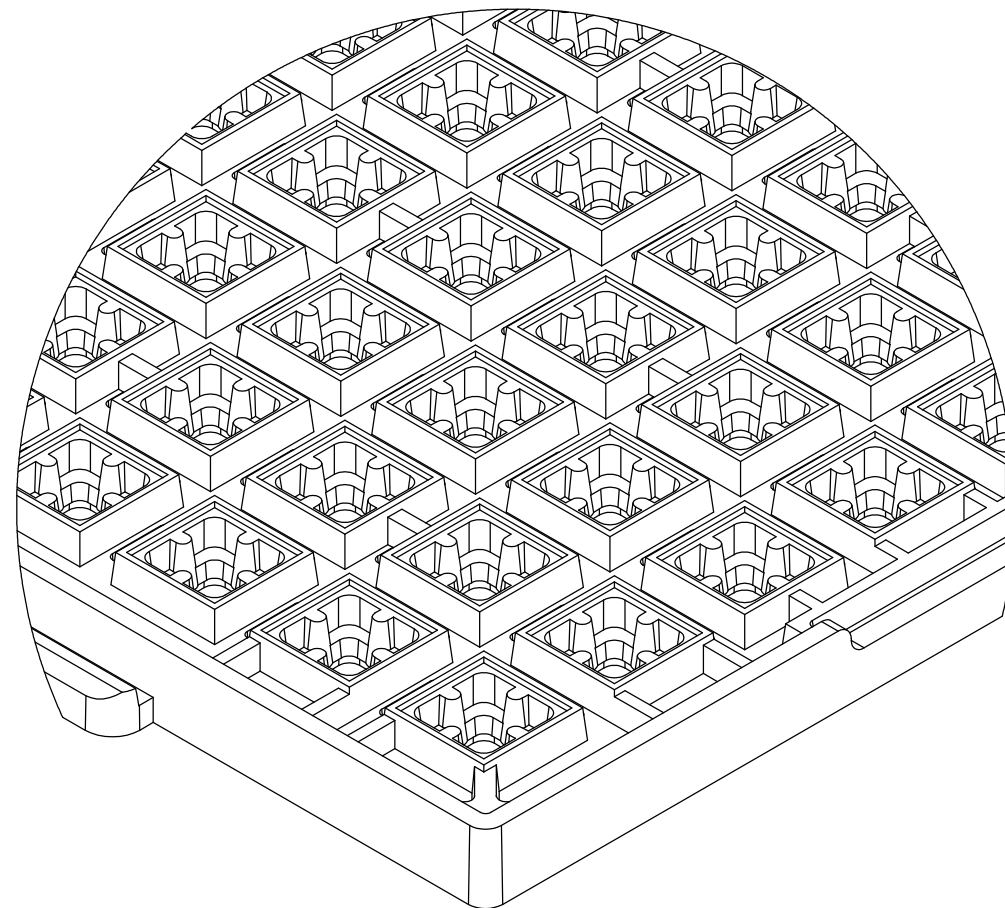
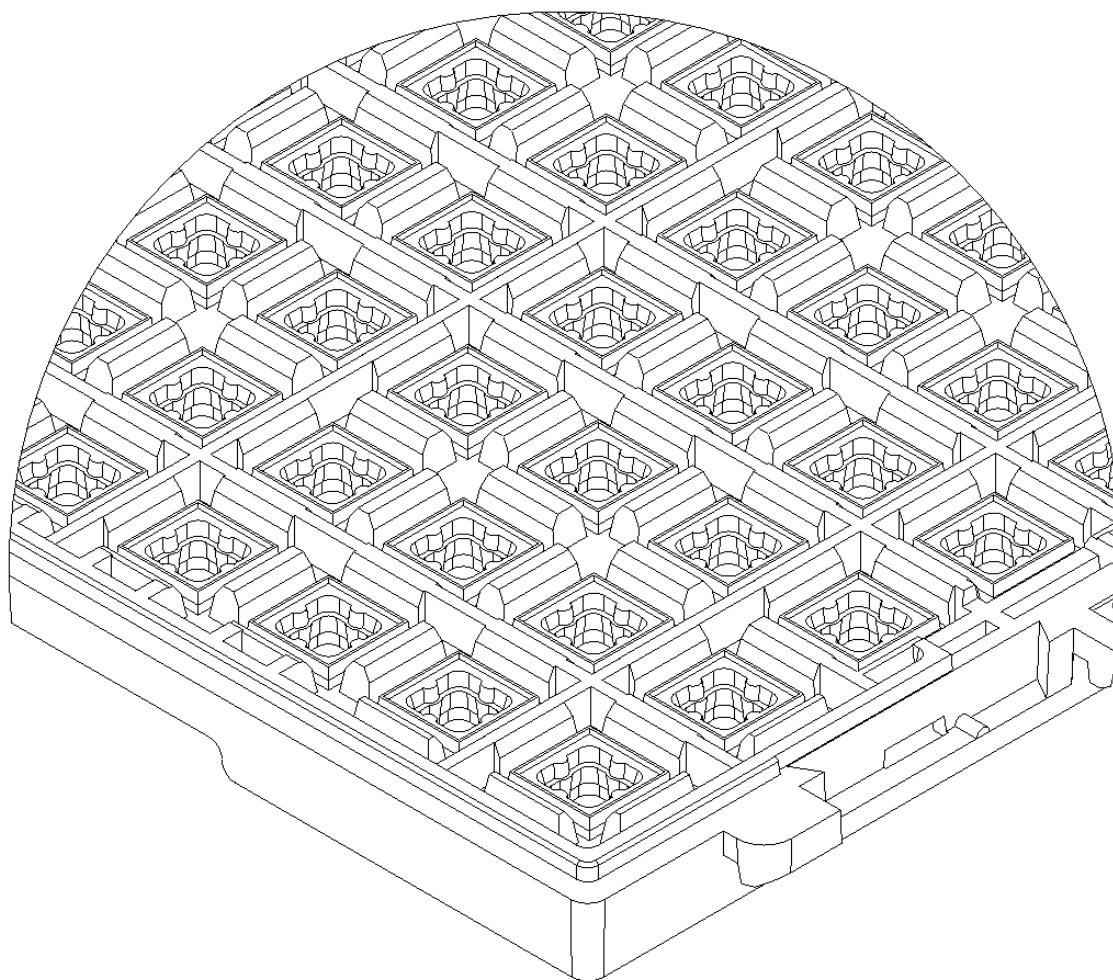
ESD results: Pass

Conclusion



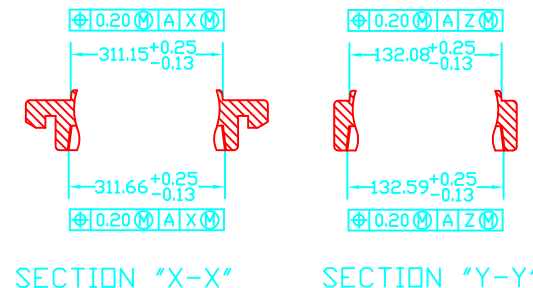
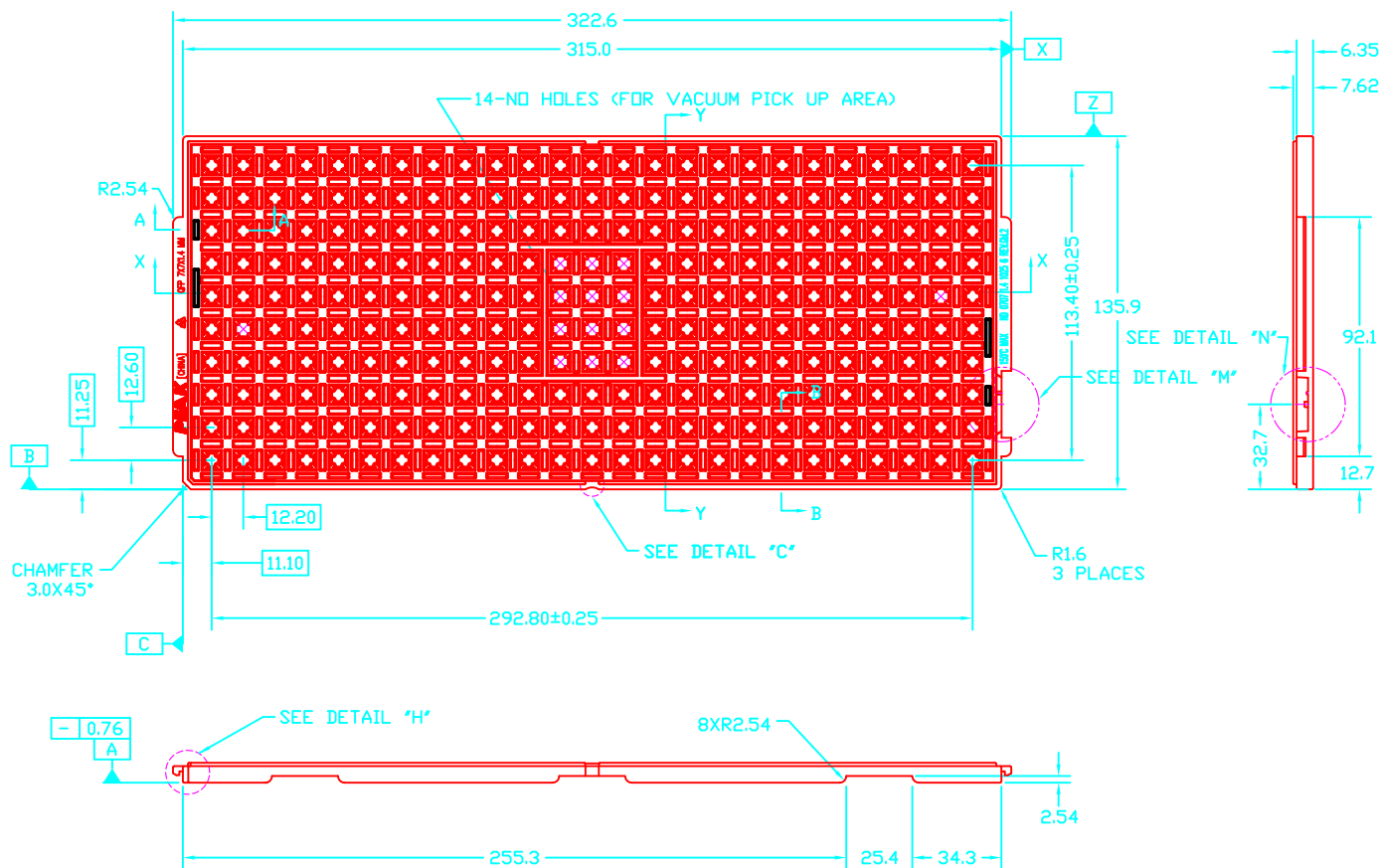
- With above mentioned results, ND0707 1.4 1025 6 REV.GbL2 P-bin tray from PEAK is qualified to run for a mass production.



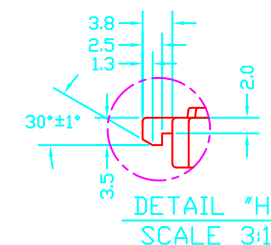


UBoT

TITLE		
LQFP 0707		
SIZE	DWG. No.	REV.
A2	UQ07071.41025X8U	P01
SCALE	4:1	Sheet3 OF 3

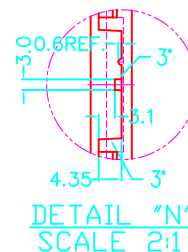
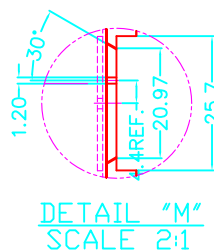
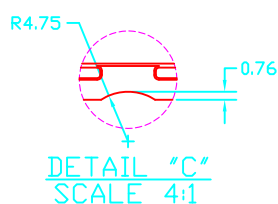


TRAY STACKING DETAIL
SCALE : 3/1



NOTES:

1. MATERIAL -PP6
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. TOLERANCES X.X=±0.25
X.XX=±0.13
UNLESS OTHERWISE SPECIFIED.
4. ESD - SURFACE RESISTIVITY
- 10⁵ TO 10¹¹ OHMS/SQ.
5. FOR PACKAGE - QFP7X7X1.4MM
6. PART NO. ND 0707 1.4 1025 6 REV.GbL2
(PLEASE INDICATE ON PURCHASE ORDER).
7. DATECODE AT TRAY BOTTOM SIDE.



PEAK PLASTIC & METAL
PRODUCTS INT'L LTD.

PEAK

TITLE : ND 0707 1.4 1025 6 REV.GbL2

DWG NO.: ND 0707 1.4 1025 6 REV.GbL2

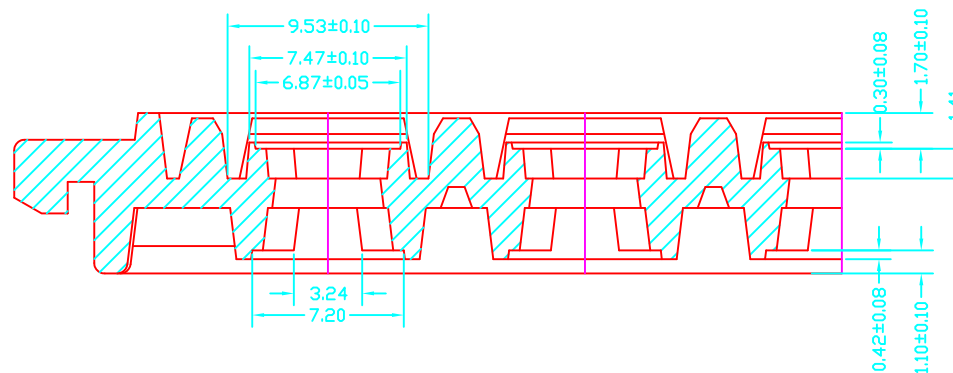
REV. 0A

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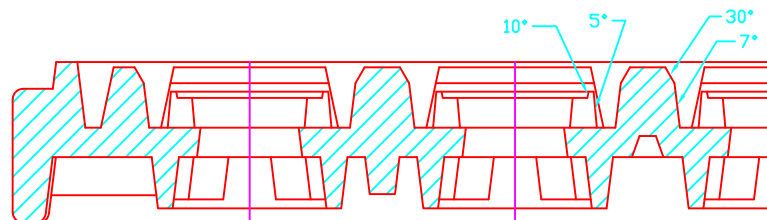
DRAWN BY : LUKE
CHECKED BY : FORD
APPROVED BY :
APPROVED BY :
APPROVED BY :

PAGE 1 OF 3
DATE : 10 NOV 11
DATE : 10 NOV 11
DATE : 10 NOV 11
CODE :

REV.NO.	ECN #	DESCRIPTION	DATE
		PROPOSAL	10 NOV 11



SECTION "A-A"
SCALE 8:1



SECTION "B-B"
SCALE 8:1



PEAK

PEAK PLASTIC & METAL
PRODUCTS INT'L LTD.

PEAK

TITLE : ND 0707 1.4 1025 6 REV.GbL2

DWG NO.: ND 0707 1.4 1025 6 REV.GbL2

REV. 0A

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DATE : 10 NOV 11

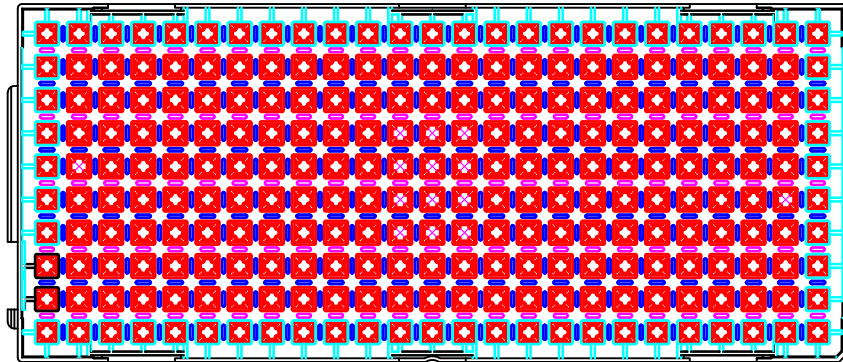
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REV.NO.	ECN #	DESCRIPTION	DATE
		PROPOSAL	10 NOV 11



BOTTOM VIEW
SCALE 1:1

		PROPOSAL	10 NOV 11
REV.NO.	ECN #	DESCRIPTION	DATE

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