PRODUCT/PROCESS CHANGE NOTIFICATION

PCN CRP/13/8033
Dated 30 Jul 2013

Qualification of 2nd Source Tray Suppliers for BGA 16x16

Table 1. Change Implementation Schedule

Forecasted implementation date for change	22-Oct-2013
Forecasted availability date of samples for customer	23-Jul-2013
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	23-Jul-2013
Estimated date of changed product first shipment	31-Oct-2013

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	BGA
Type of change	Package assembly material change
Reason for change	Dual material sourcing
Description of the change	The impacted tray is BGA 16x16 packages. Current supplier is ITW. New qualified supplier is UBOT.
Change Product Identification	see attached
Manufacturing Location(s)	

DOCUMENT APPROVAL

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

Qualification of 2nd Source Tray Suppliers for BGA 16x16

WHAT:

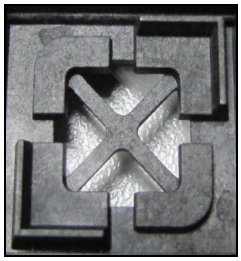
The impacted tray is BGA 16x16 ITW packages: the new qualified supplier is UBOT.

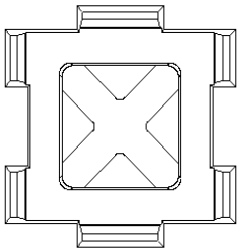
New suppliers of trays have been qualified. The key dimensions of these new trays are identical to the ones provided by the current supplier ITW. In addition the new one is Multi-Fence and Anti-Reverse Design (when two trays stacked with wrong orientation, feature help operator see wrong stacking easily).

It concerns the products whose testing and finishing plants are located in Muar and at our subcontractors

The only change being introduced is a visual difference as indicated below:

ITW **UBOT**





WHY:

To qualify UBOT as 2nd source for dual material sourcing and cost reduction.

WHEN:

1 month after PCN is approved by customer.

HOW:

UBOT is already qualified in Muar and subcontractors have already pass workability tests.
Listed below there are the reports:

Annex 1: Qualification Report of Muar

Annex 2: UBOT drawings

Annex 3: UBOT fit analysis

Annex 1: Qualification Report of MUAR

BGA 16X16 Tray Qualification

Qualification Report- Muar

Date – 2nd. Nov. 2011

V.VINCEN- CTF Coordinator
Rosnah – CTF Technician
Steve Lim- ESD Coordinator
CW Lim – QA Eng.
YN Chua – BGA Assy
Boon AW- BGA Finishing
ERIC CE – BGA Test
CF Lui – BGA Test MGR..

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Parts Description

- Part Description
  - Group-
  - Package: BGA 16X16
  - Package Code (Test Vehicle) HY
  - *Reason: Replace ITW . (ITW will no more prefer supplier for ST).*
  - Division Contact- CPTM trigger project. Yi Chua.
- Material Description
  - Supplier: UBOT
  - Supplier code: UB1616 2.0 0614XAU
  - Material: MPPO
  - Tray Temperature: 150 Degree C.
  - Number of supplier : One. (UBOT will be replacing ITW.)

Comparison Report

Comparison Report between ITW & Peak

Items	ITW	UBOT	Remarks
Tray Matrix	6X14	6X14	Same
Tray Pitch X-Direction	X- Edge- 14.50 X- Pitch – 22.00 Y- Edge- 14.45 Y- Pitch – 21.40	X- Edge- 14.50 X- Pitch – 22.00 Y- Edge- 14.45 Y- Pitch – 21.40	Same
Top cavity design	Floor Support	Floor Support	Same
Anti –reverse feature	No	Yes	UBOT tray has anti-reverse feature.
Stack height	2.0	2.0	Same

Qualification Test Result

Items	Result	Remarks
Visual Inspection	Pass	
Workability Test	Pass	
Drop Test	Pass	
Baking Test	Pass	
ESD Test	Pass	
FIT Test	Pass	

Conclusion: UBOT Tray BGA 16x16 is passed all the Qualification Criteria and able to use for mass production.

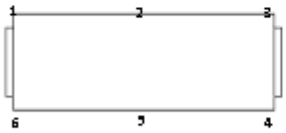
Visual Inspection on Virgin Sample

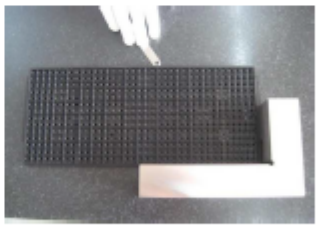
Visual Inspection Items	Yes /No	Remarks
Chip/Crack tray	No	
Tray align with ST Spec	Yes	
Tray matrix align with ST Spec	Yes	
Tray has Anti-reverse Feature	Yes	
Contain stain or foreign material.	No	
Others		

Visual Inspection Result: Pass

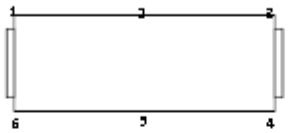
Baking Test

- 3 cycle baking test
  - Sample: 10 trays
  - Duration: 24hrs for each cycle. After each cycle, the tray must leave at production environment for a minimum of 1 hr before start the second baking.
  - Temperature: 125 degree C
  - Strapping method 3width and 1 length (Longer side)
  - Measure the tray warp after the 3rd. Cycle on all 6 corner.
  - Use shim gauge to measure the war-page.





3th. cycle baking test result



War page measurements	Side1	Side2	Side 3	Side4	Side5	Side6
Sample1	0.05	0.25	0.05	0.05	0.40	0.05
Sample2	0.05	0.25	0.05	0.05	0.30	0.05
Sample3	0.05	0.20	0.05	0.05	0.30	0.05
Sample4	0.05	0.30	0.10	0.05	0.25	0.05
Sample5	0.00	0.25	0.05	0.00	0.25	0.05
Sample6	0.05	0.20	0.10	0.05	0.30	0.05
Sample7	0.05	0.25	0.05	0.05	0.25	0.00
Sample8	0.05	0.20	0.15	0.05	0.25	0.05
Sample9	0.05	0.20	0.10	0.05	0.20	0.05
Sample10	0.05	0.25	0.10	0.05	0.15	0.05

Max. war-page is 0.4mm versus spec of 0.5mm

3cycle baking result: Pass

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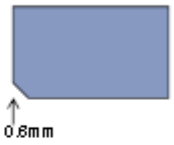
Single baking

- Single baking
  - **Sample**: 6 trays not stacked
  - Duration: 48hrs.
  - Temperature: 150 degree C
  - Strapping method: No Strapping
  - Measure the tray warp, all 6 corner.
  - Use shim gauge to measure the war-page.



Items	Descriptions	Result
1	Point on tray (Any melting)	No
2	On Overall Length (Any shrinkage)	No
3	On overall thickness (Any shrinkage)	No
4	On pocket dimension (Any shrinkage)	No
5	6 corner reading on war page, not more than 0.76mm	0.6 mm

One cycle baking result: Pass

Workability Test

Process	Machine	Objective	Samples	Reject Criteria	Result
Assy- SSS Process Step	Hanmi 3500	1.Pick and Place trial on tray 2. Jamming check 3. Tray Matrix check 4.No Damage Ball	5 substrates	Placement issue Chip Package	Good
Test Handler	Mutitest 9510		10 trays	Placement issue Chip Package	Good
Finishing	MIT			Placement issue Chip Package	Good

Workability Result: Pass.

Drop Test Procedure

- Drop test procedure
  - One tray with units prepared as normal production packing.
  - The reel drop at 1.2 meters height for 3 times.
  - The units were re-inspect to determine the integrity of the quality

1st Drop: Flat at bottom

2nd Drop: on the side

3rd Drop: on the angle

- **Visual inspection after drop test:**

Inspection Items	Visual Inspection Results
Damage Ball	No
Chip Package	No
Chip Tray	No
Crack tray	No

Drop Test Result: Pass

ESD Test

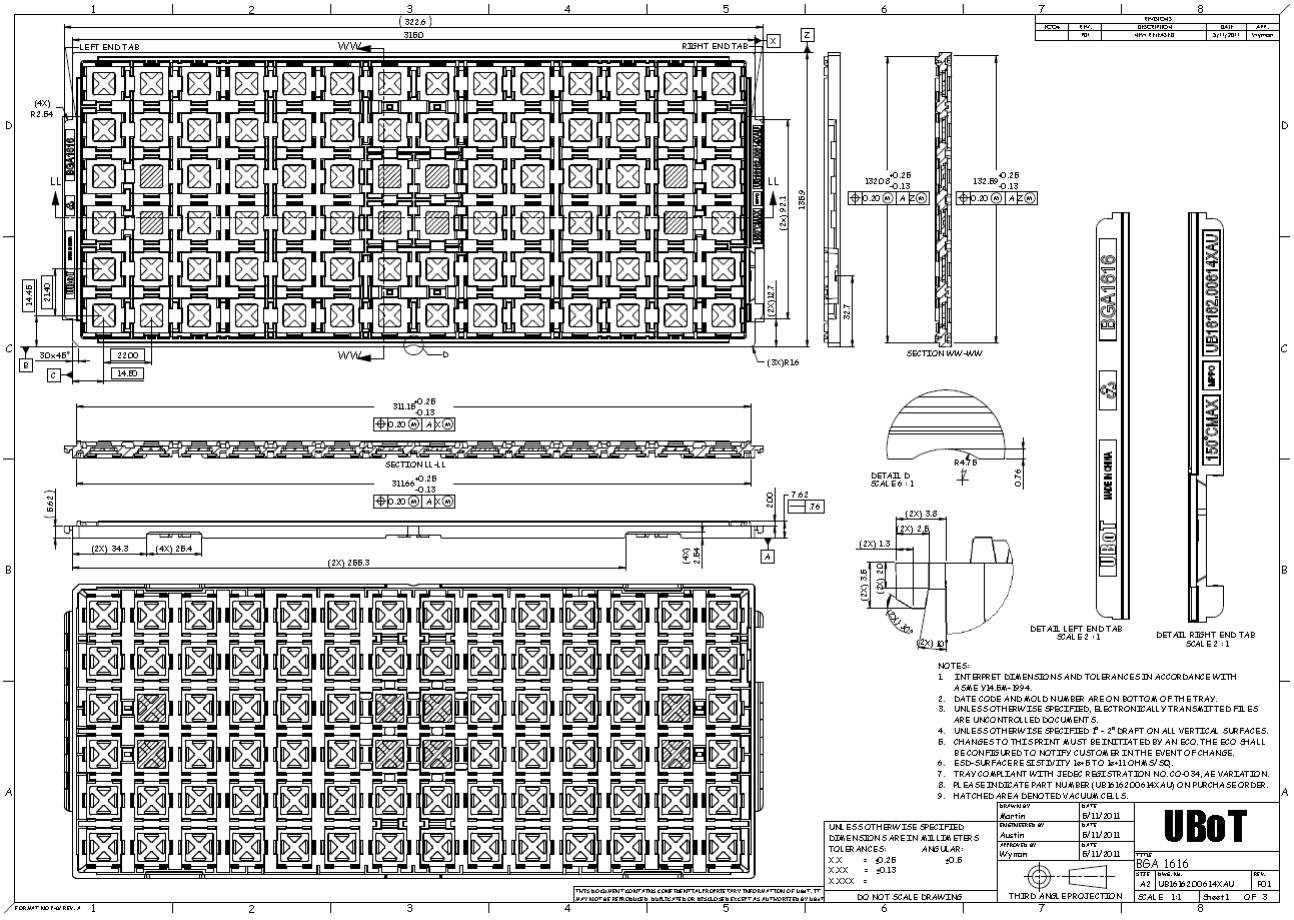
Surface Resistance on UBOT BGA 16MM X 16MM(Blue Color Insert) Trays			
(1) 1.2E 06 ohms	(2) 1.0 E 06 ohms	(3) 1.8 E 06 ohms	(4) 1.1 E 06 ohms
Passed	Passed	Passed	Passed

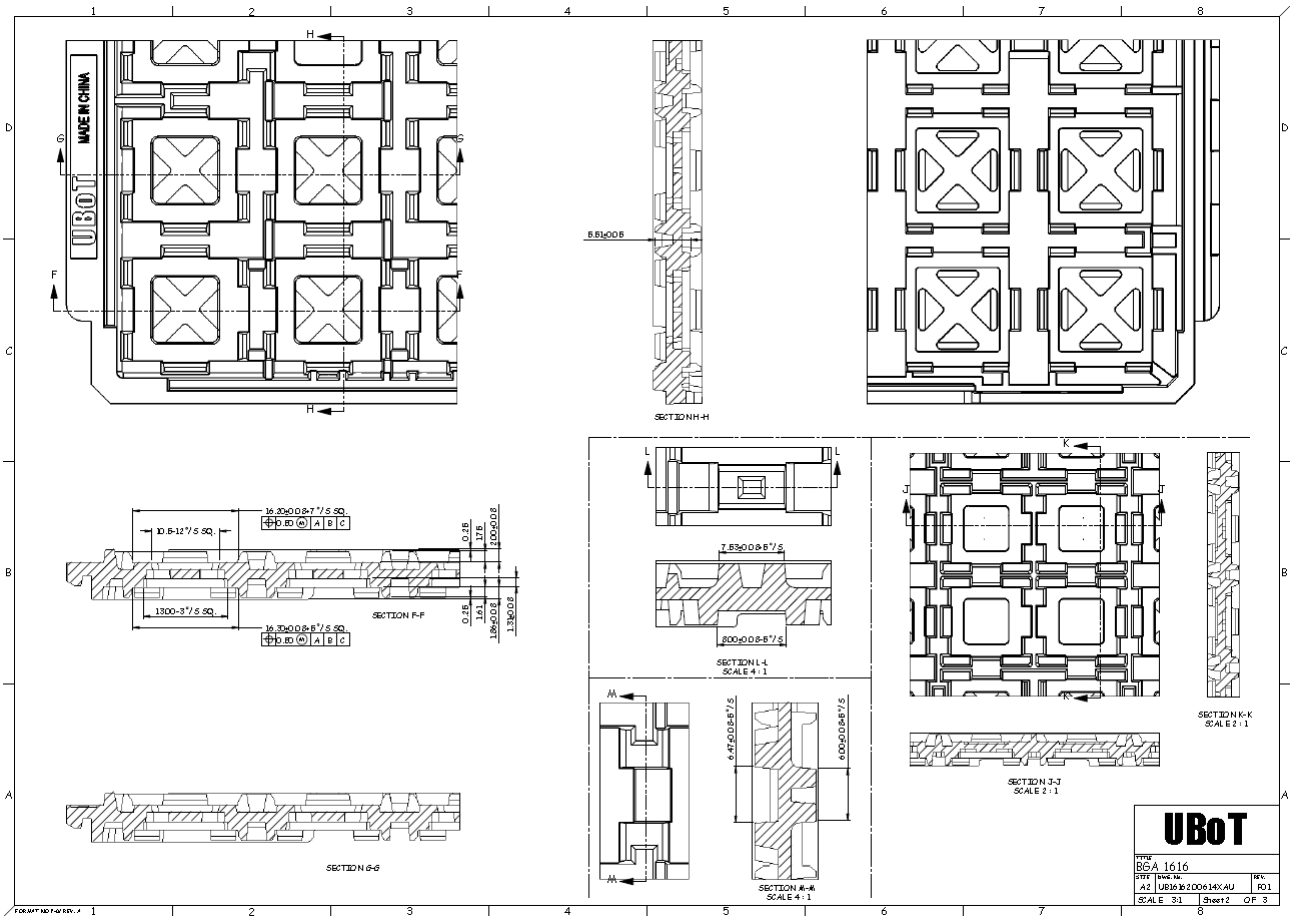
Conclusion : The evaluated(BGA 16X16) trays had Passed in ESD assessment and meet our ESD criteria requirement.

ESD Good Acceptance Limit Is > 1.0X10exp05ohms to <1.0X10exp11 ohms

ESD results: Passed in ESD buyoff and meet our ESD criteria requirement.

Annex 2: UBOT drawings

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MADE IN CHINA
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SECTION F-F
SECTION G-G
SECTION L-L
SCALE 4 : 1
SECTION K-K
SCALE 2 : 1
SECTION J-J
SCALE 2 : 1
SECTION M-M
SCALE 4 : 1
UBoT
BGA 1616
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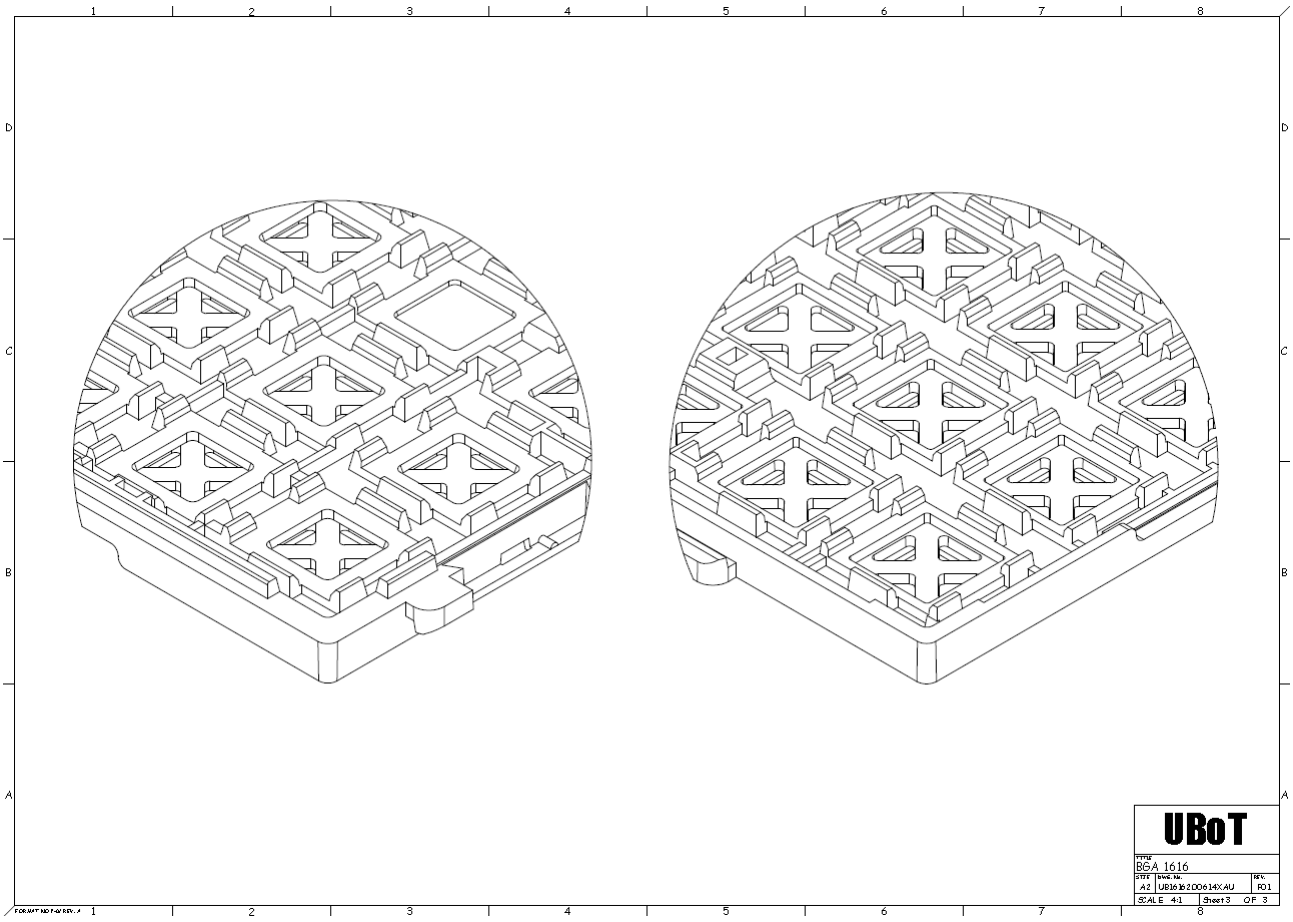
Sheet 2 OF 3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UB1616ZD0614XAU
R01
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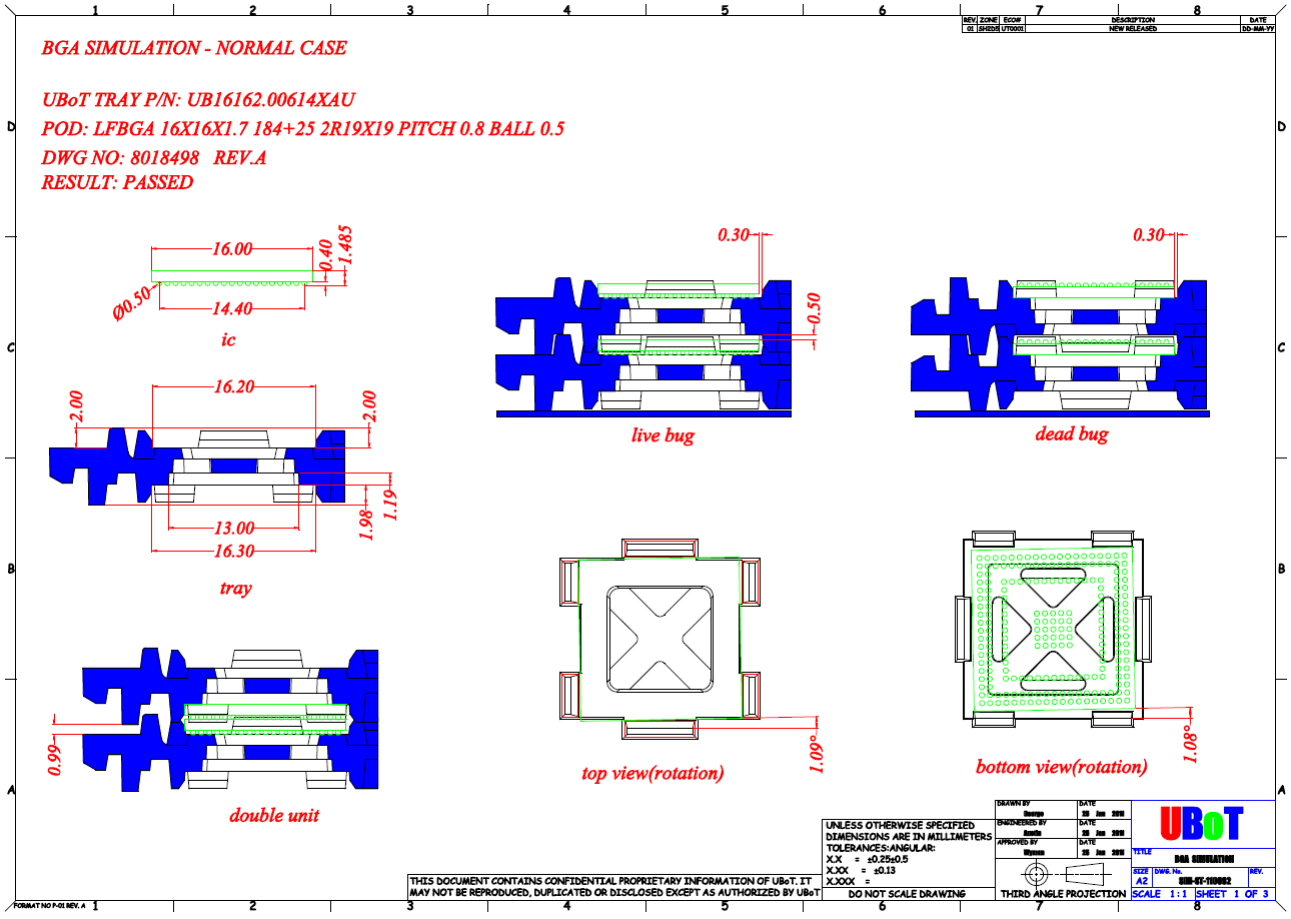
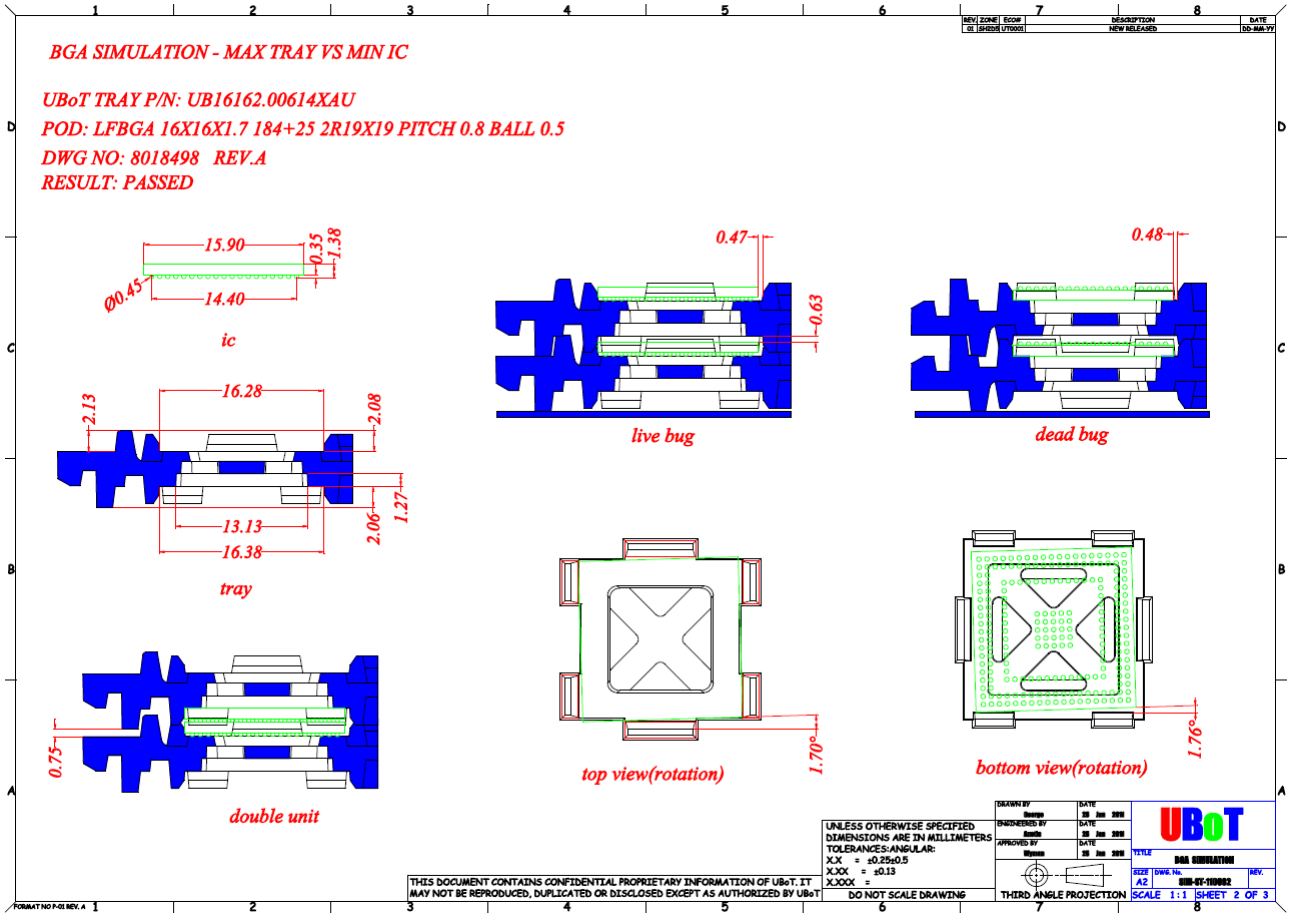
Sheet 3 OF 3

Annex 3.1: UBOT fit analysis




BGA SIMULATION - MAX TRAY VS MIN IC
UBoT TRAY P/N: UB16162.00614XAU
POD: LFBGA 16X16X1.7 184+25 2R19X19 PITCH 0.8 BALL 0.5
DWG NO: 8018498 REV.A
RESULT: PASSED
15.90
0.35
1.38
Ø0.45
14.40
ic
16.28
2.13
2.08
13.13
16.38
2.06
1.27
tray
0.75
double unit
0.47
0.63
live bug
0.48
dead bug
1.70°
top view(rotation)
1.76°
bottom view(rotation)
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
X.X = ±0.25±0.5
XXX = ±0.13
XXXX =
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
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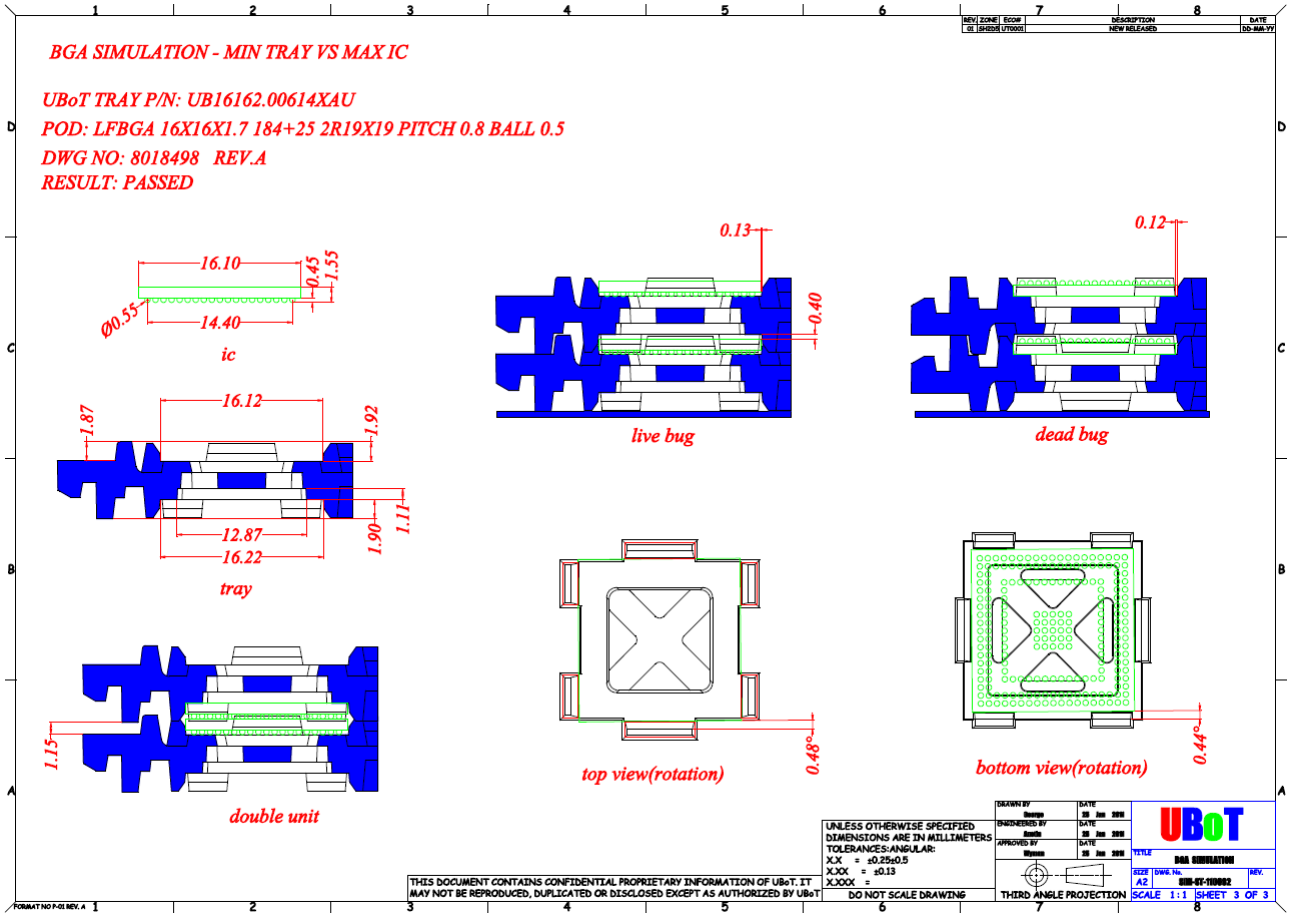
BGA SIMULATION
SCALE 1:1 SHEET 2 OF 3


BGA SIMULATION - MIN TRAY VS MAX IC
UBoT TRAY P/N: UB16162.00614XAU
POD: LFBGA 16X16X1.7 184+25 2R19X19 PITCH 0.8 BALL 0.5
DWG NO: 8018498 REV.A
RESULT: PASSED
16.10
0.45
1.55
Ø0.55
14.40
ic
0.13
0.40
live bug
0.12
dead bug
16.12
1.87
1.92
1.11
1.90
12.87
16.22
tray
1.15
double unit
0.48°
top view(rotation)
0.44°
bottom view(rotation)
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
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XXXX =
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BGA SIMULATION
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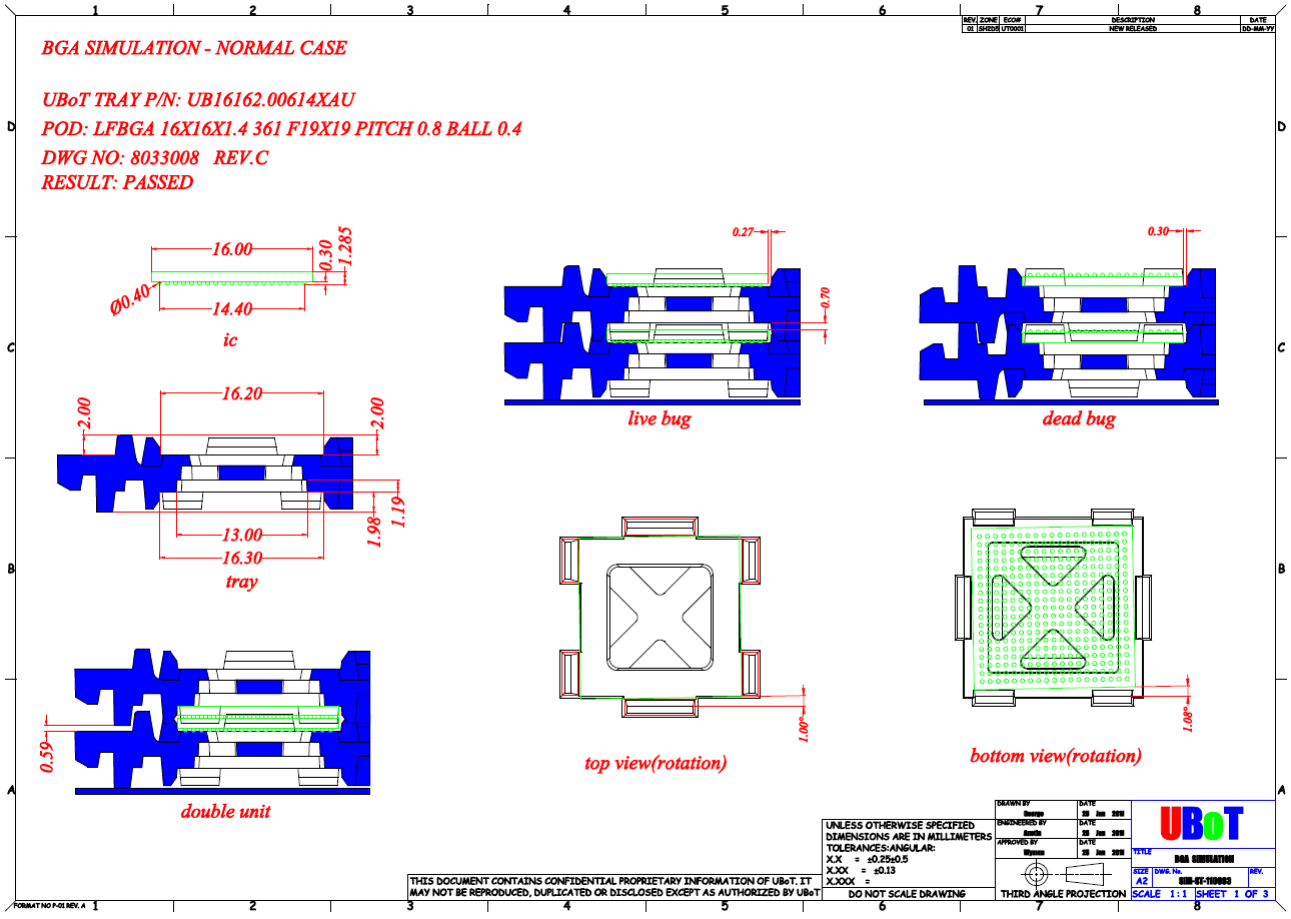
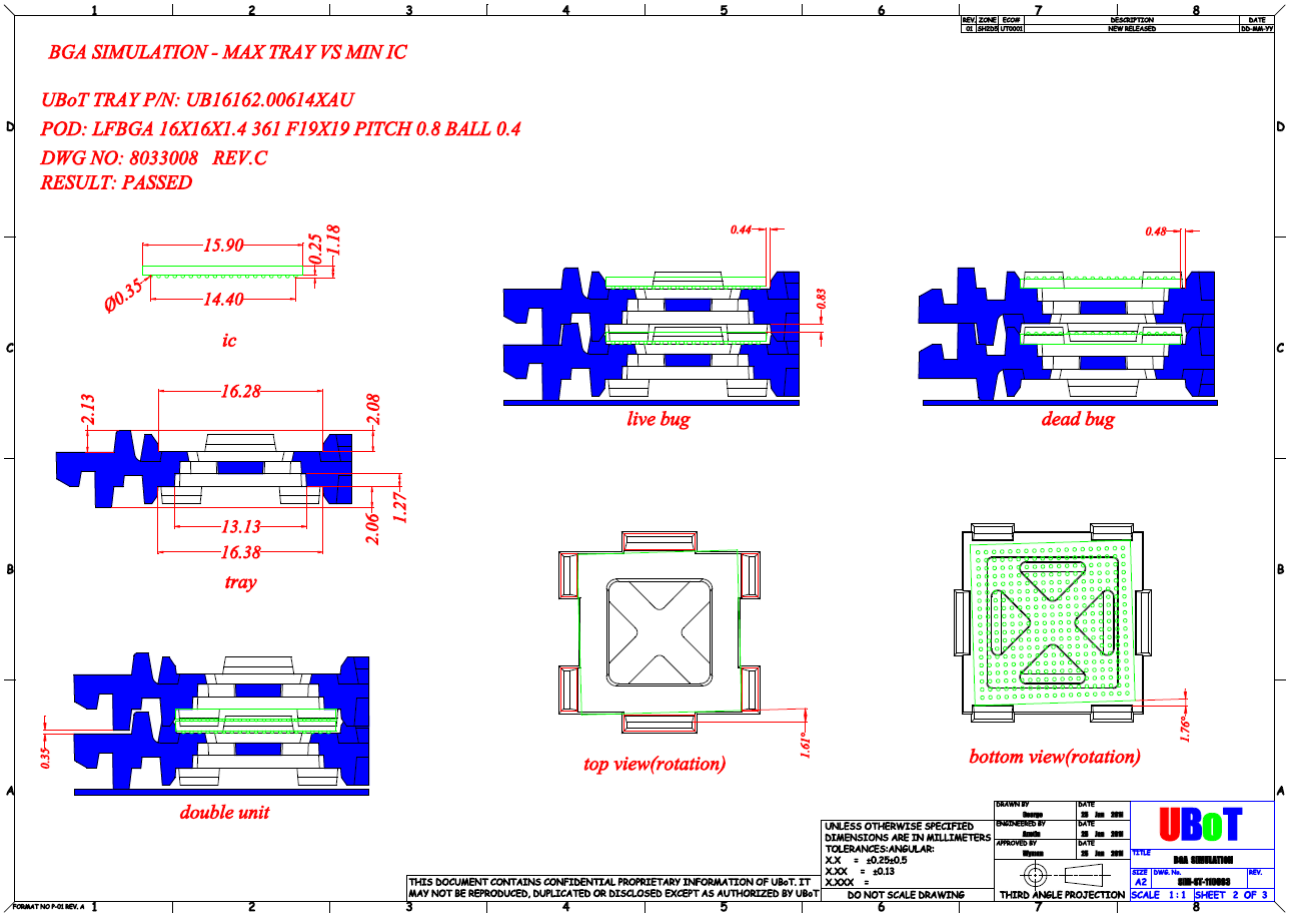
Annex 3.2: UBOT fit analysis




BGA SIMULATION - MAX TRAY VS MIN IC
UBoT TRAY P/N: UB16162.00614XAU
POD: LFBGA 16X16X1.4 361 F19X19 PITCH 0.8 BALL 0.4
DWG NO: 8033008 REV.C
RESULT: PASSED
15.90
0.25
1.18
Ø0.35
14.40
ic
16.28
2.13
2.08
1.27
2.06
13.13
16.38
tray
0.44
0.83
live bug
0.48
dead bug
0.35
double unit
1.61
top view(rotation)
1.76
bottom view(rotation)
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
X.X = ±0.25±0.5
XXX = ±0.13
XXXX =
DO NOT SCALE DRAWING
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BGA SIMULATION
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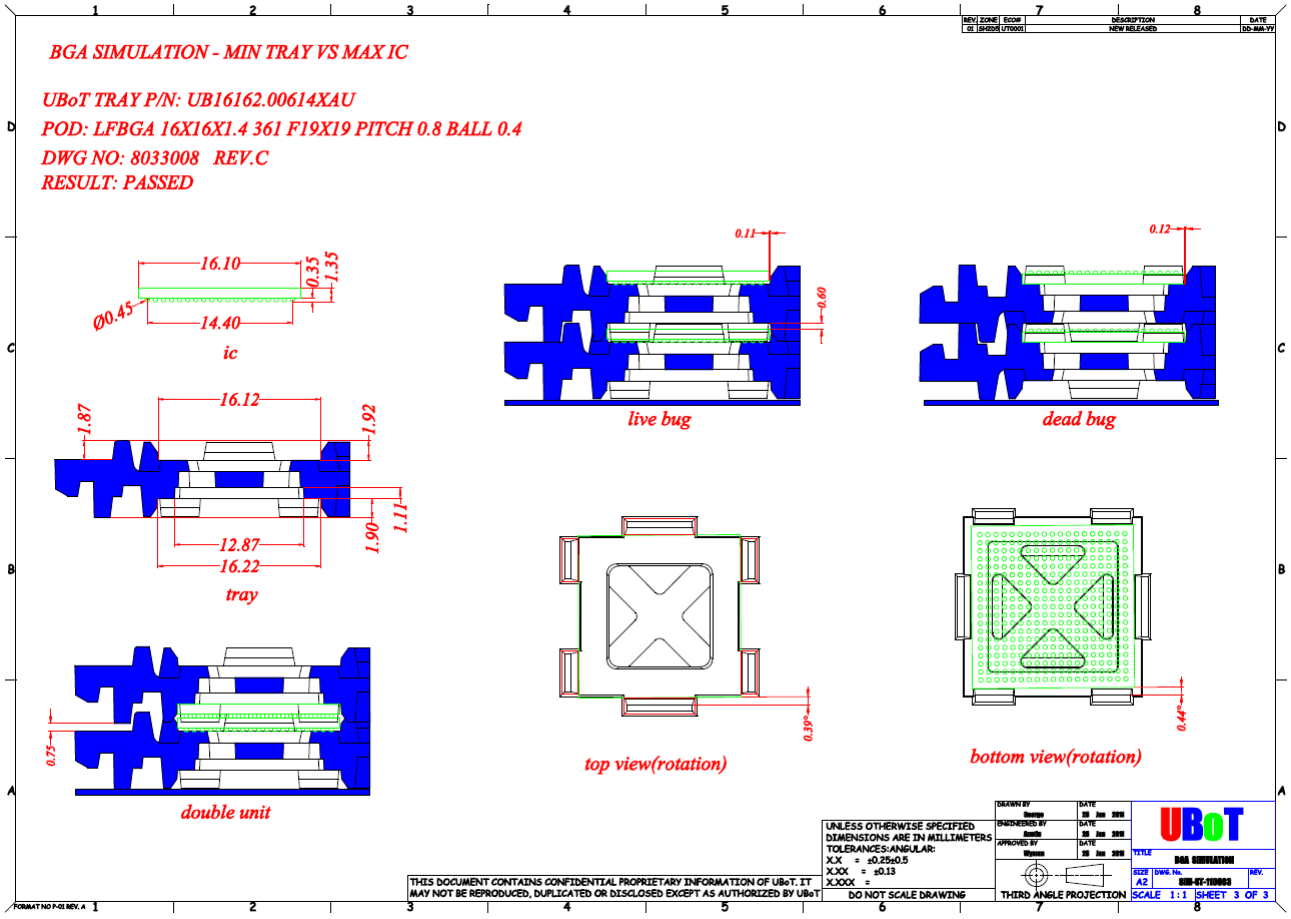
BGA SIMULATION - MIN TRAY VS MAX IC
UBoT TRAY P/N: UB16162.00614XAU
POD: LFBGA 16X16X1.4 361 F19X19 PITCH 0.8 BALL 0.4
DWG NO: 8033008 REV.C
RESULT: PASSED
16.10
0.35
1.35
Ø0.45
14.40
ic
16.12
1.87
1.92
1.11
1.90
12.87
16.22
tray
0.75
double unit
0.11
0.60
live bug
0.12
dead bug
0.39
top view(rotation)
0.44
bottom view(rotation)
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
X.X = ±0.25±0.5
XXX = ±0.13
XXXX =
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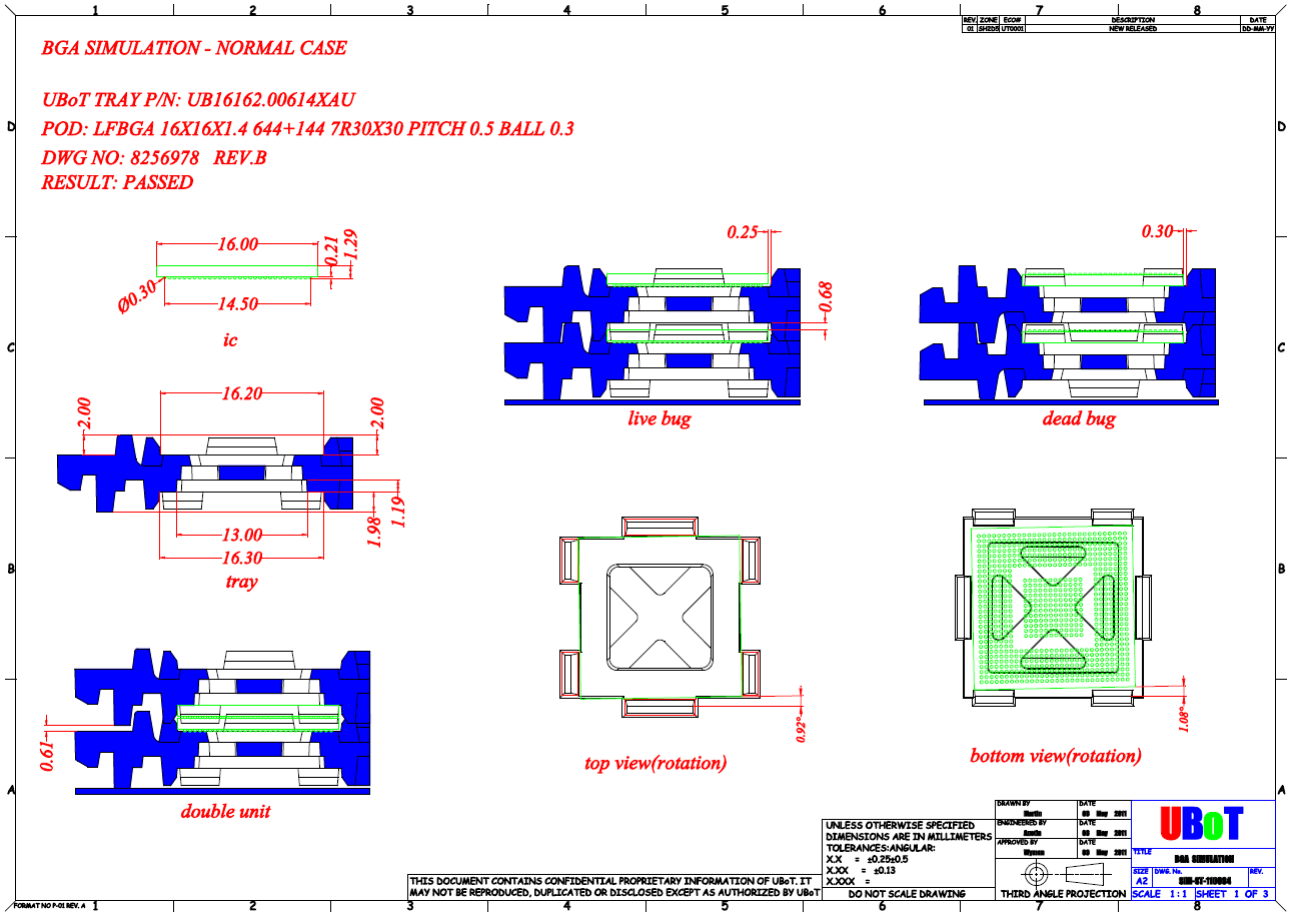
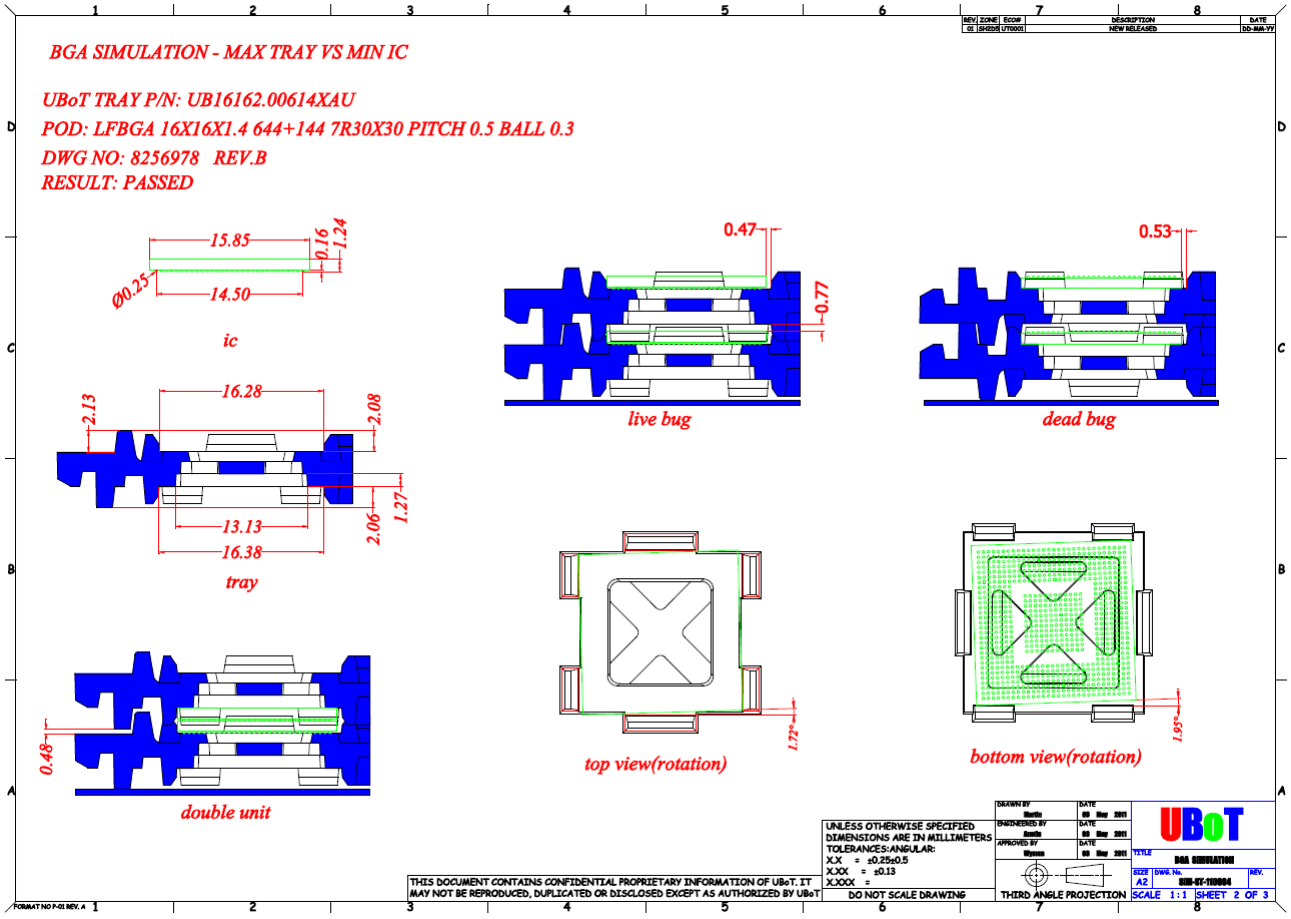
Annex 3.3: UBOT fit analysis




BGA SIMULATION - MAX TRAY VS MIN IC
UBoT TRAY P/N: UB16162.00614XAU
POD: LFBGA 16X16X1.4 644+144 7R30X30 PITCH 0.5 BALL 0.3
DWG NO: 8256978 REV.B
RESULT: PASSED
15.85
0.16
1.24
Ø0.25
14.50
ic
16.28
2.13
2.08
13.13
16.38
2.06
1.27
tray
0.48
double unit
0.47
0.77
live bug
0.53
dead bug
1.72°
top view(rotation)
1.93°
bottom view(rotation)
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
X.X = ±0.25±0.5
XXX = ±0.13
XXXX =
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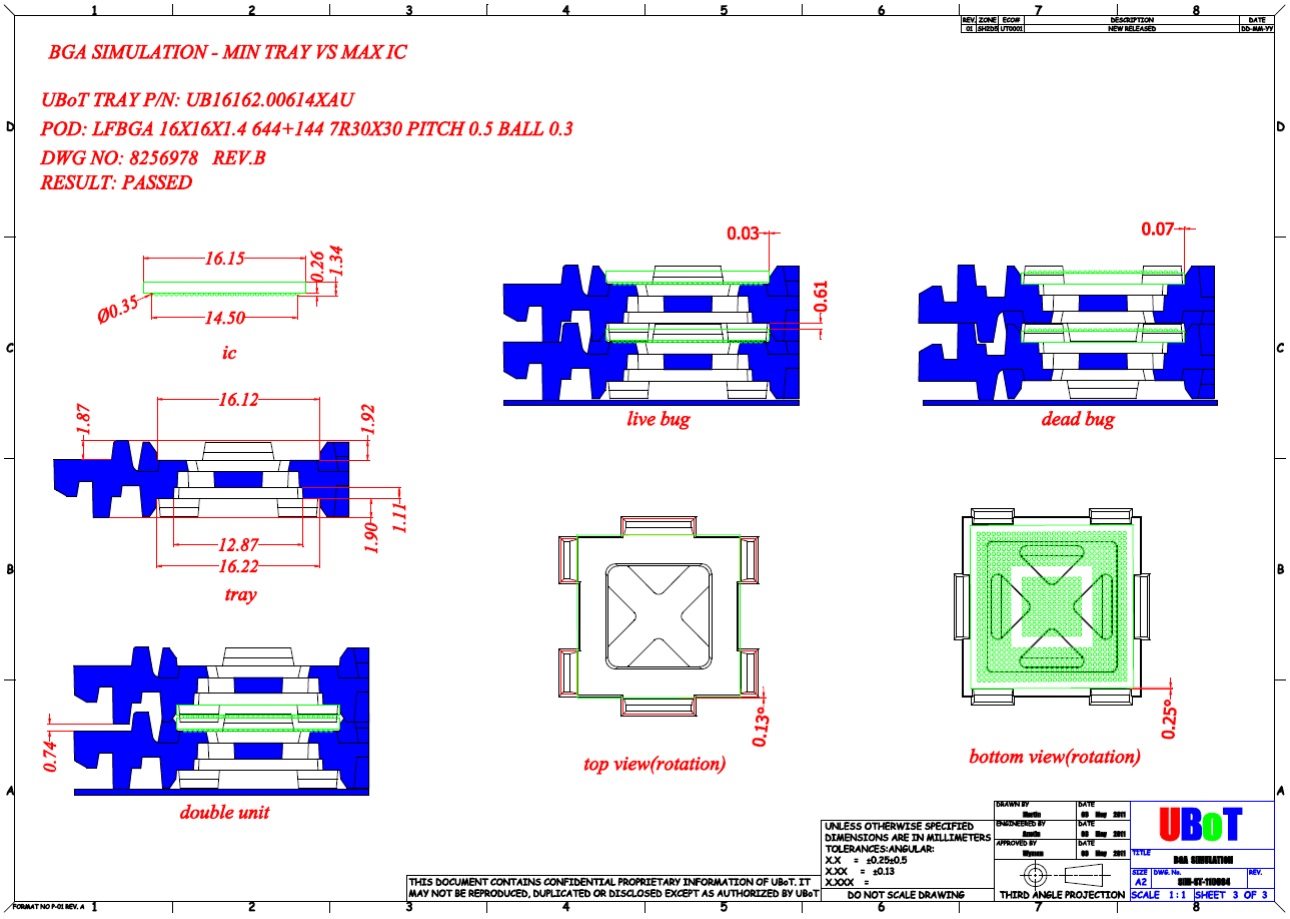
BGA SIMULATION - MIN TRAY VS MAX IC
UBoT TRAY P/N: UB16162.00614XAU
POD: LFBGA 16X16X1.4 644+144 7R30X30 PITCH 0.5 BALL 0.3
DWG NO: 8256978 REV.B
RESULT: PASSED
16.15
0.26
1.34
Ø0.35
14.50
ic
16.12
1.87
1.92
1.11
1.90
12.87
16.22
tray
0.74
double unit
0.03
0.61
live bug
0.07
dead bug
0.13°
top view(rotation)
0.25°
bottom view(rotation)
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
X.X = ±0.25±0.5
XXX = ±0.13
XXXX =
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THIRD ANGLE PROJECTION
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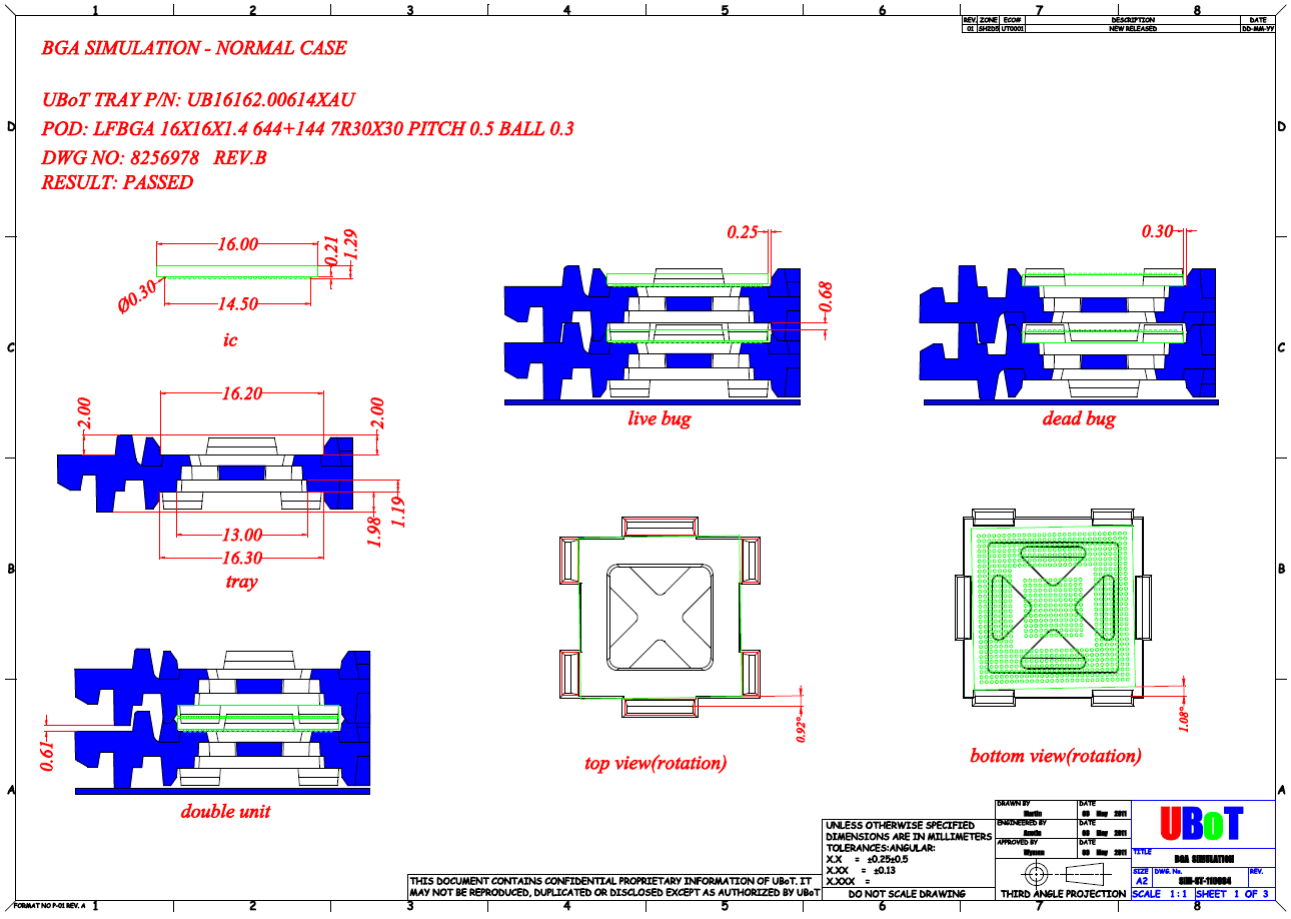
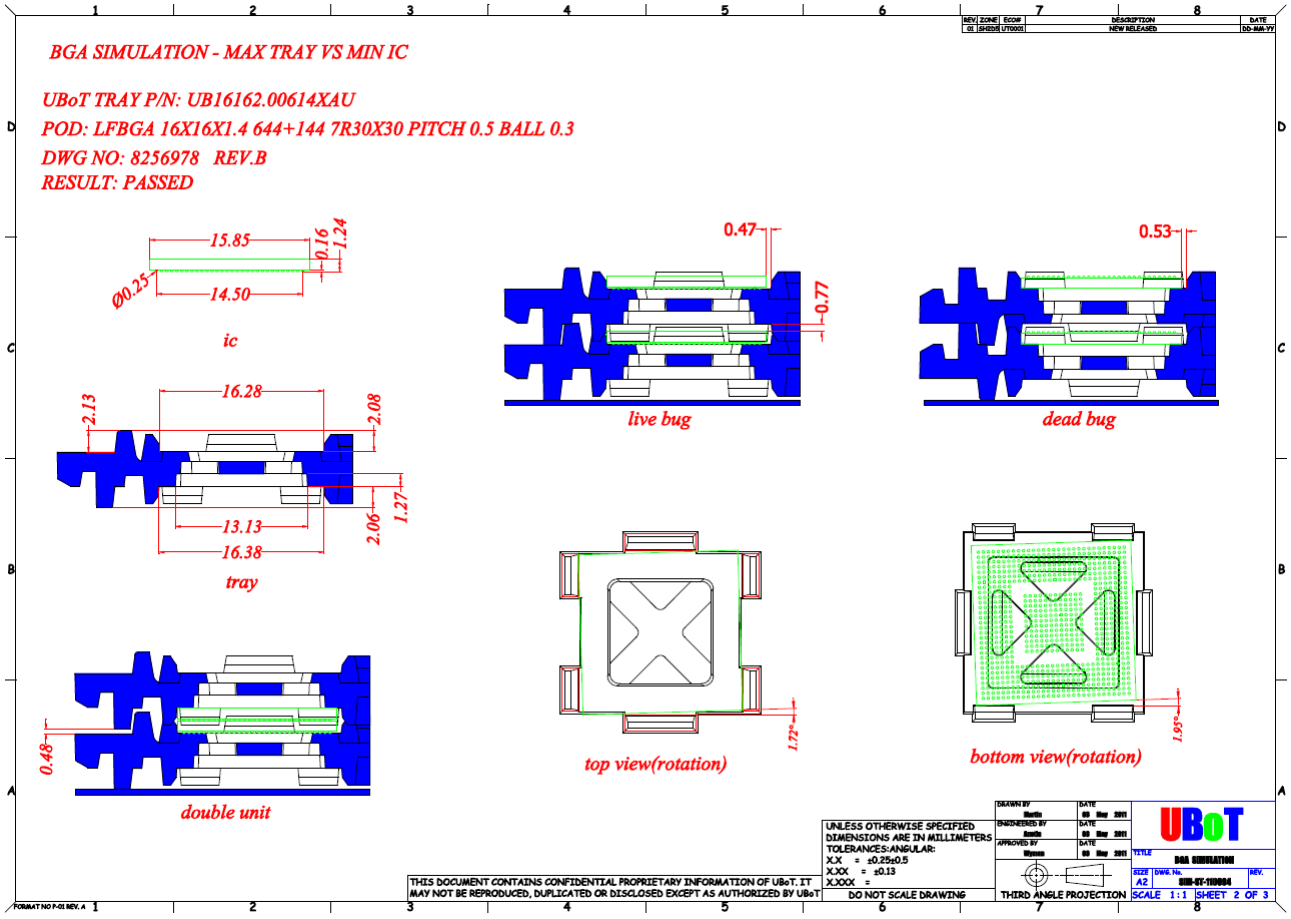
Annex 3.4: UBOT fit analysis




BGA SIMULATION - MAX TRAY VS MIN IC
UBoT TRAY P/N: UB16162.00614XAU
POD: LFBGA 16X16X1.4 644+144 7R30X30 PITCH 0.5 BALL 0.3
DWG NO: 8256978 REV.B
RESULT: PASSED
15.85
0.16
1.24
Ø0.25
14.50
ic
16.28
2.13
2.08
13.13
16.38
2.06
1.27
tray
0.48
double unit
0.47
0.77
live bug
0.53
dead bug
1.72°
top view(rotation)
1.93°
bottom view(rotation)
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
X.X = ±0.25±0.5
XXX = ±0.13
XXXX =
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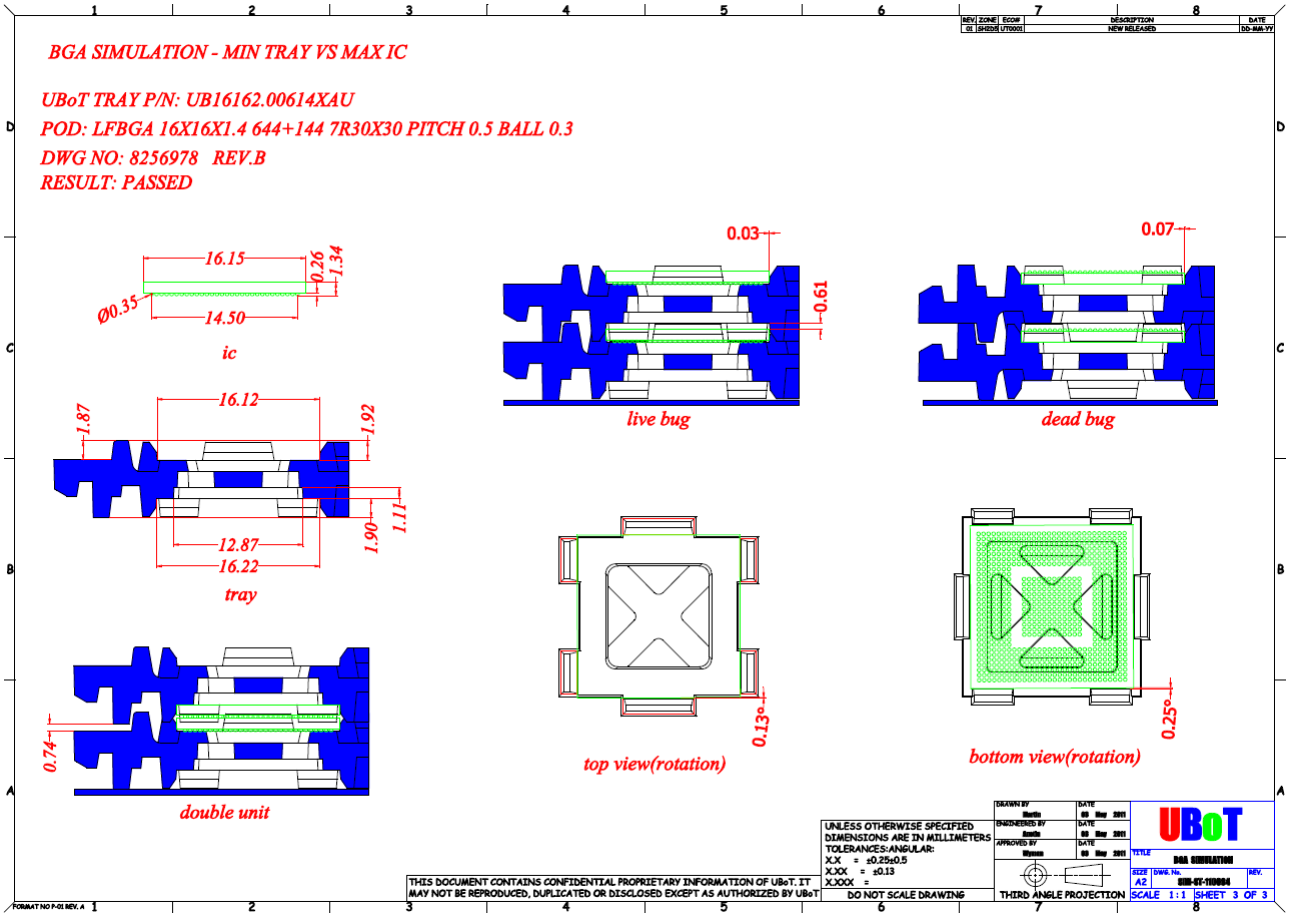
BGA SIMULATION
SCALE 1:1 SHEET 2 OF 3


BGA SIMULATION - MIN TRAY VS MAX IC
UBoT TRAY P/N: UB16162.00614XAU
POD: LFBGA 16X16X1.4 644+144 7R30X30 PITCH 0.5 BALL 0.3
DWG NO: 8256978 REV.B
RESULT: PASSED
16.15
0.26
1.34
Ø0.35
14.50
ic
16.12
1.87
1.92
1.11
1.90
12.87
16.22
tray
0.74
double unit
0.03
0.61
live bug
0.07
dead bug
0.13°
top view(rotation)
0.25°
bottom view(rotation)
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
X.X = ±0.25±0.5
XXX = ±0.13
XXXX =
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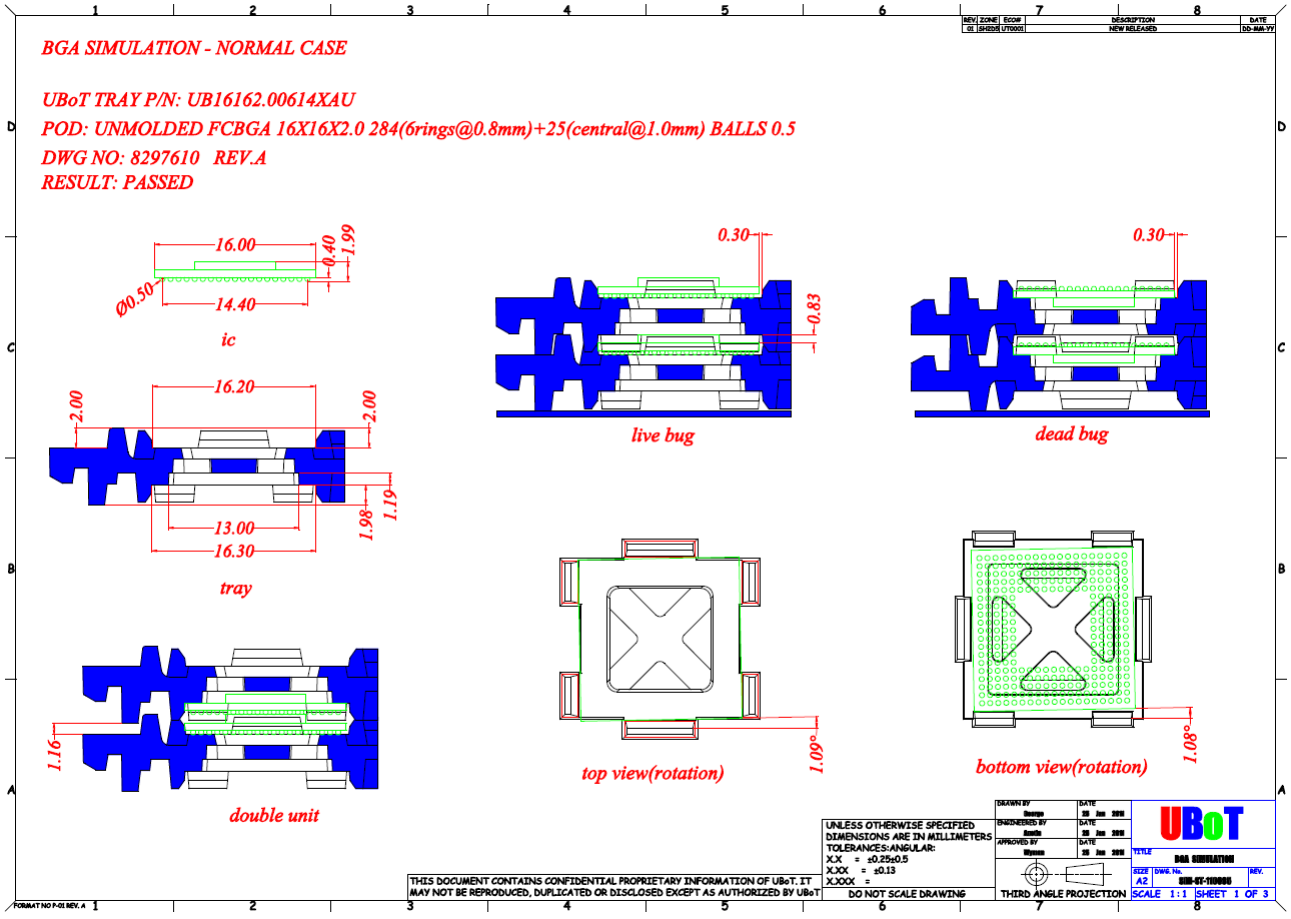
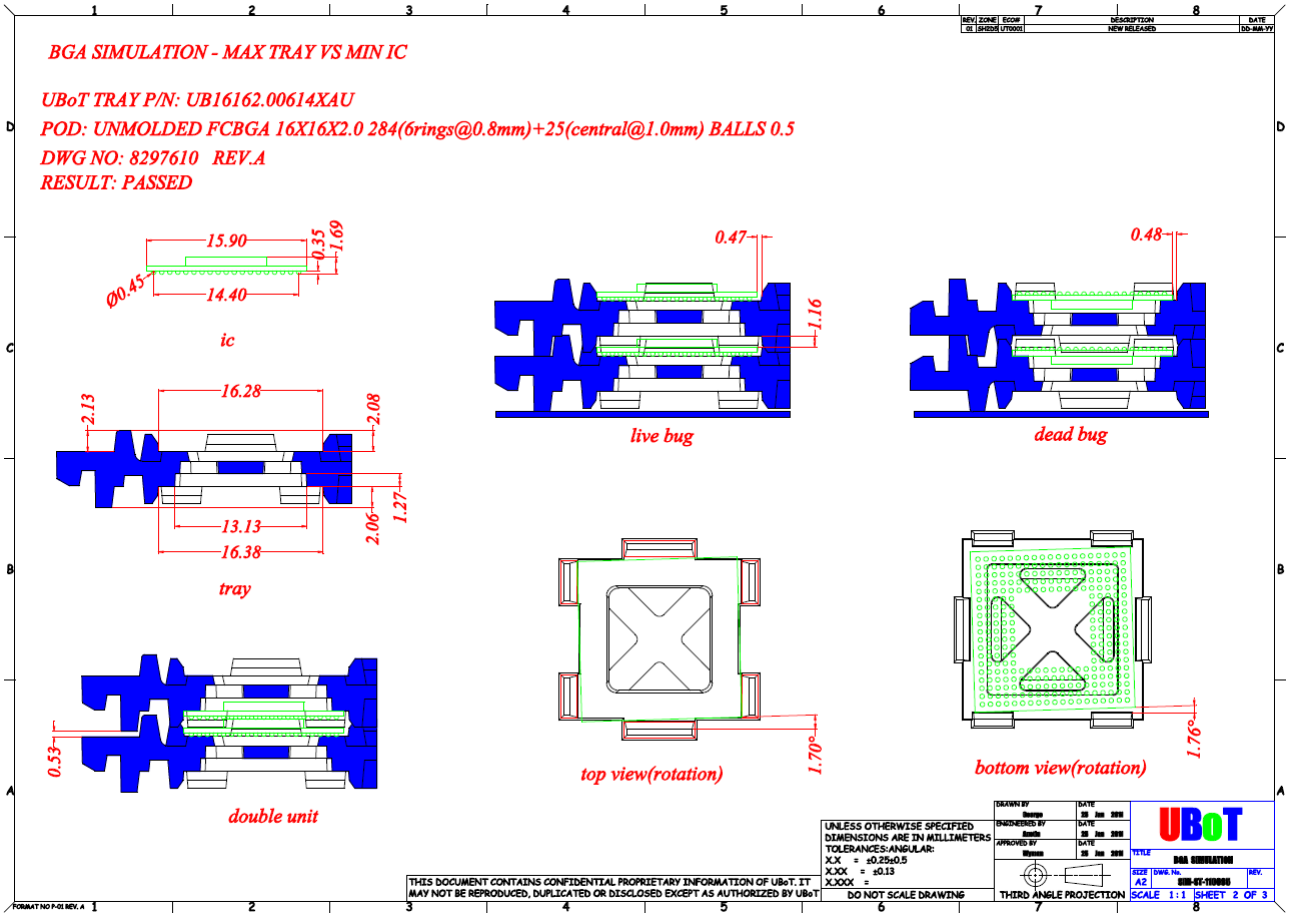
BGA SIMULATION
SCALE 1:1 SHEET 3 OF 3

Annex 3.5: UBOT fit analysis




BGA SIMULATION - MAX TRAY VS MIN IC
UBoT TRAY P/N: UB16162.00614XAU
POD: UNMOLDED FCBGA 16X16X2.0 284(6rings@0.8mm)+25(central@1.0mm) BALLS 0.5
DWG NO: 8297610 REV.A
RESULT: PASSED
15.90
0.35
1.69
Ø0.45
14.40
ic
16.28
2.13
2.08
13.13
16.38
2.06
1.27
tray
0.53
double unit
0.47
1.16
live bug
0.48
dead bug
1.70°
top view(rotation)
1.76°
bottom view(rotation)
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
X.X = ±0.25±0.5
XXX = ±0.13
XXXX =
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
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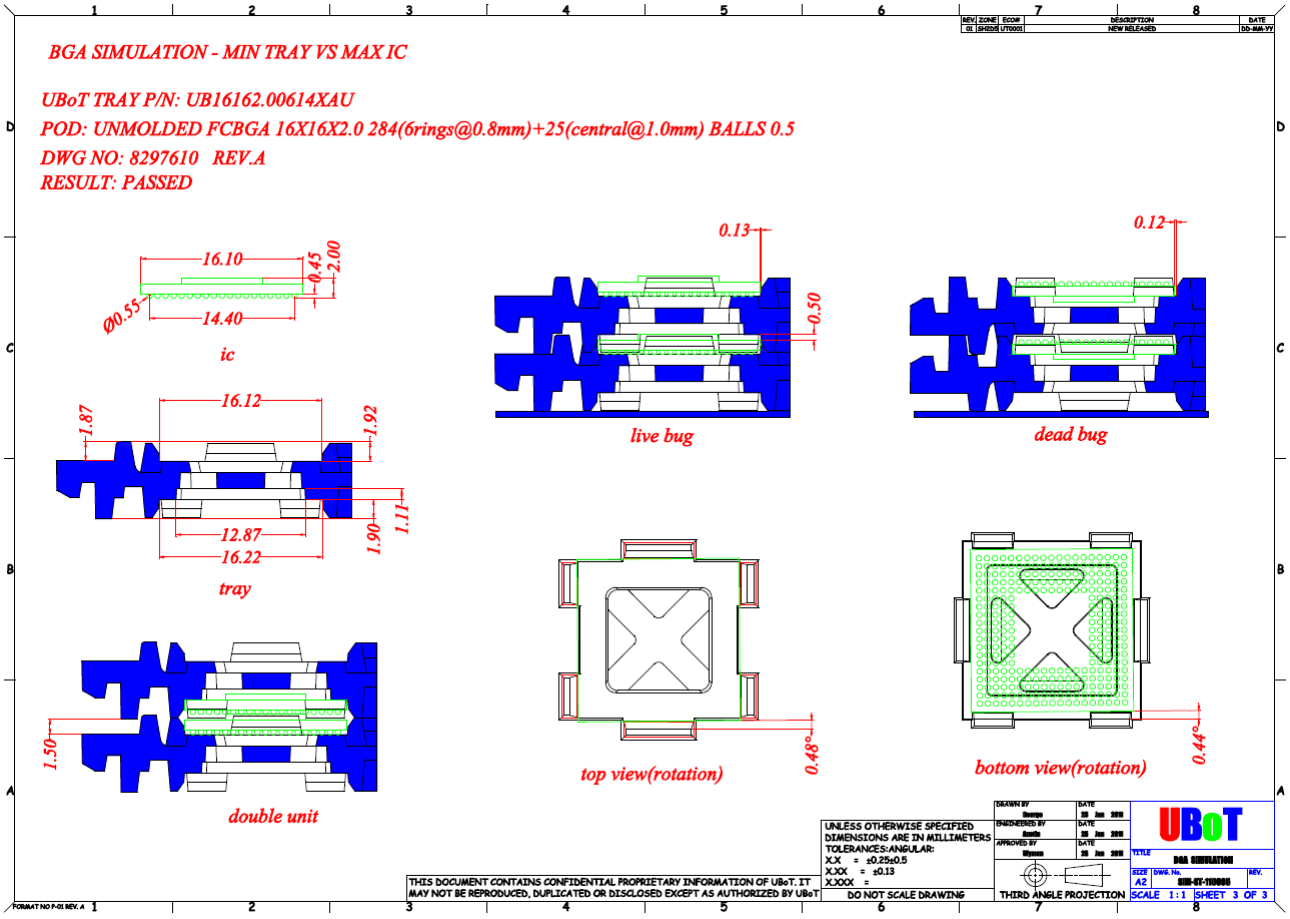
UBoT
BGA SIMULATION
SCALE 1:1 SHEET 2 OF 3


BGA SIMULATION - MIN TRAY VS MAX IC
UBoT TRAY P/N: UB16162.00614XAU
POD: UNMOLDED FCBGA 16X16X2.0 284(6rings@0.8mm)+25(central@1.0mm) BALLS 0.5
DWG NO: 8297610 REV.A
RESULT: PASSED
16.10
0.45
2.00
Ø0.55
14.40
ic
0.13
0.50
live bug
0.12
dead bug
16.12
1.87
1.92
1.11
1.90
12.87
16.22
tray
top view(rotation)
0.48°
bottom view(rotation)
0.44°
1.50
double unit
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
X.X = ±0.25±0.5
XXX = ±0.13
XXXX =
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
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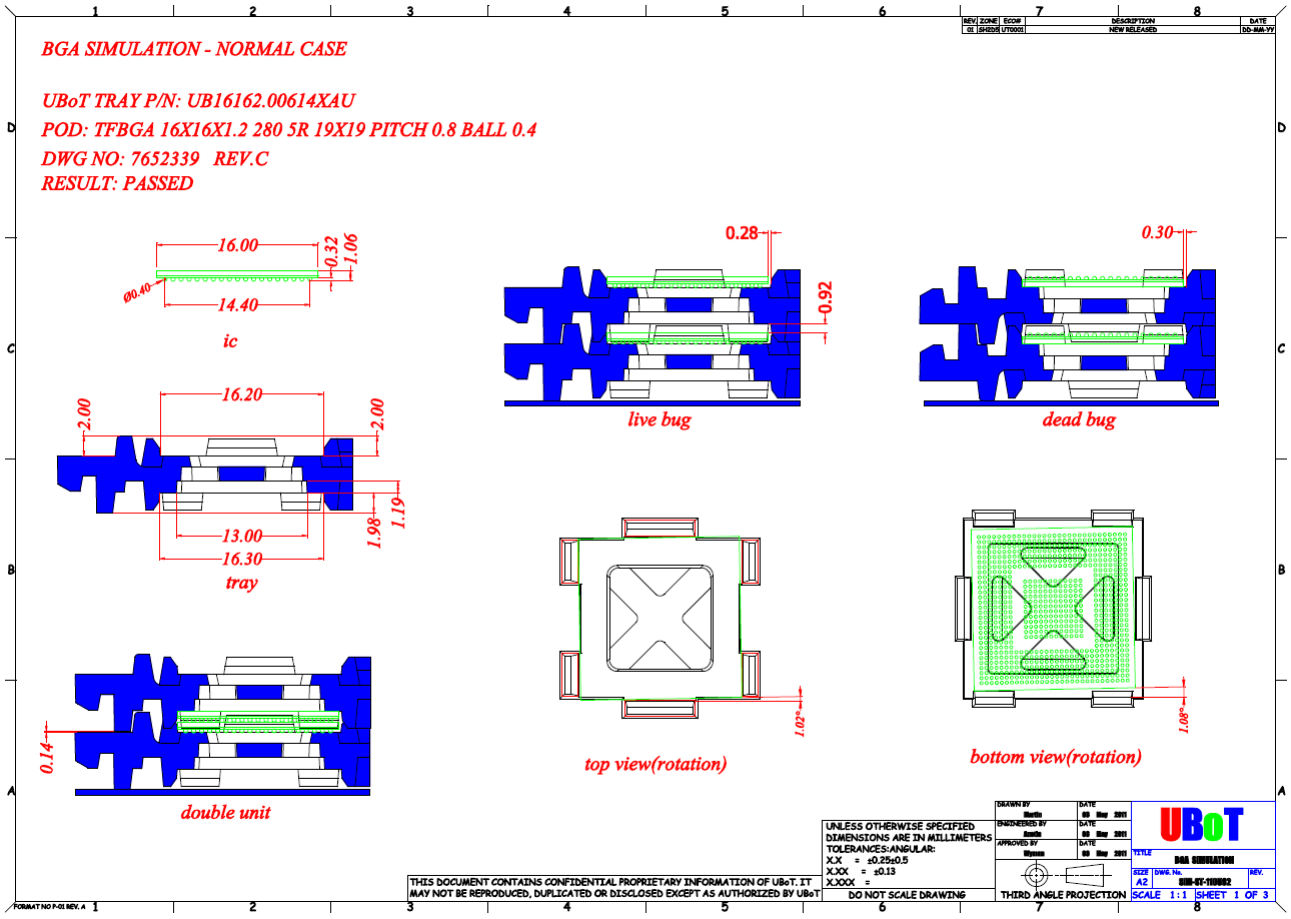
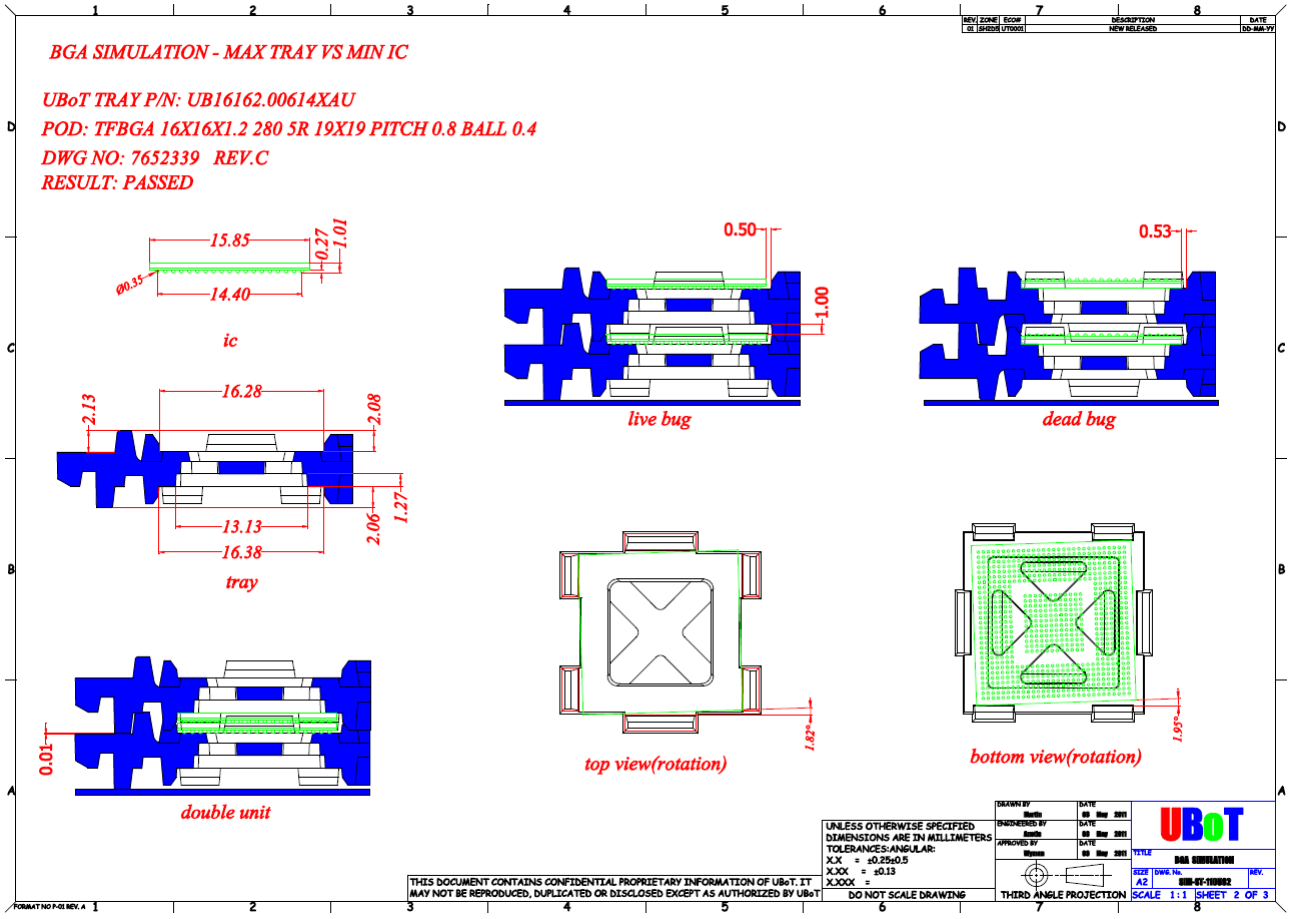
BGA SIMULATION
SCALE 1:1 SHEET 3 OF 3

Annex 3.6: UBOT fit analysis




BGA SIMULATION - MAX TRAY VS MIN IC
UBoT TRAY P/N: UB16162.00614XAU
POD: TFBGA 16X16X1.2 280 5R 19X19 PITCH 0.8 BALL 0.4
DWG NO: 7652339 REV.C
RESULT: PASSED
15.85
0.27
1.01
Ø0.35
14.40
ic
16.28
2.13
2.08
13.13
16.38
2.06
1.27
tray
0.01
double unit
0.50
1.00
live bug
0.53
dead bug
1.82°
top view(rotation)
1.95°
bottom view(rotation)
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
X.X = ±0.25±0.5
XXX = ±0.13
XXXX =
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
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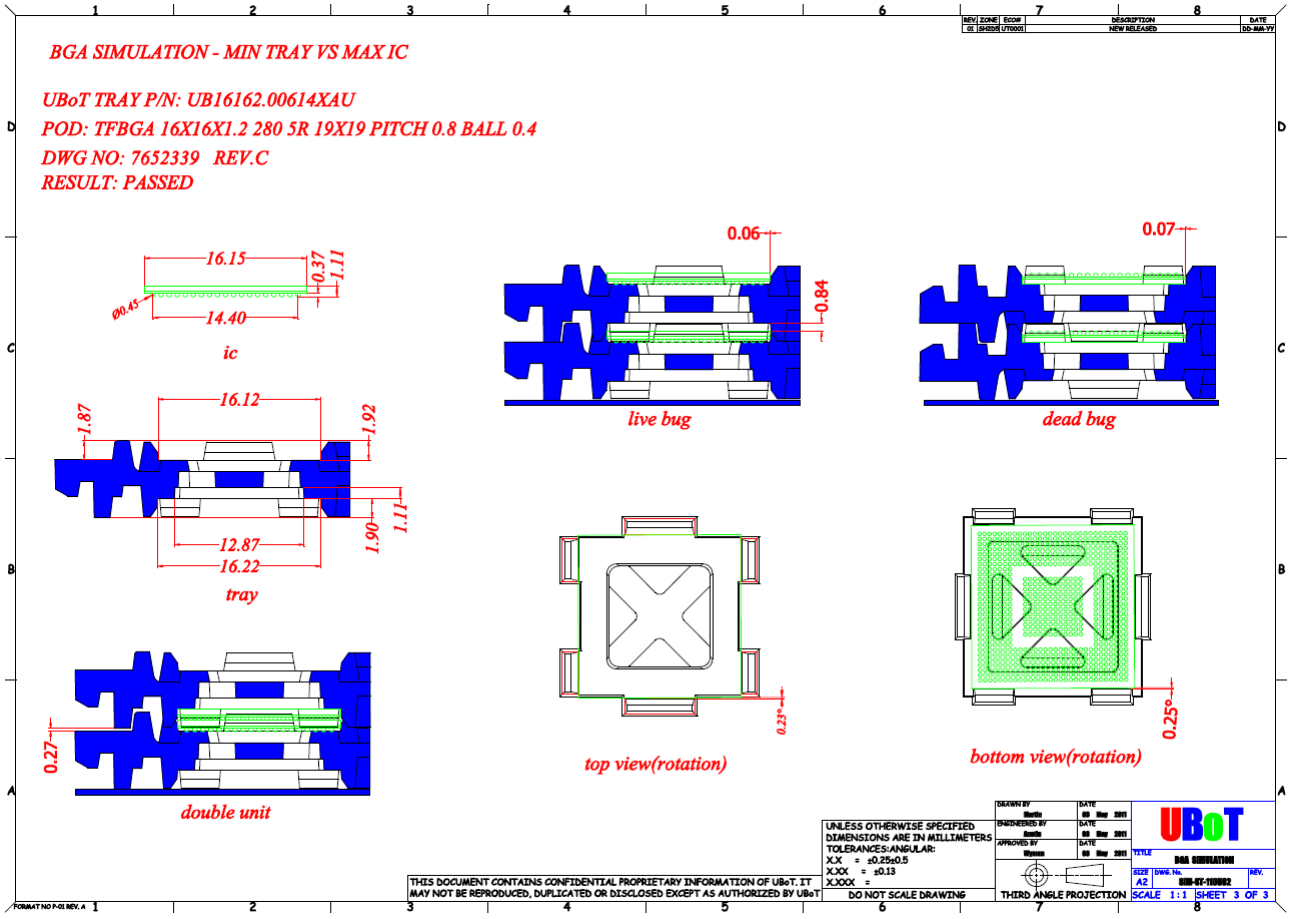
UBoT
BGA SIMULATION
SCALE 1:1 SHEET 2 OF 3


BGA SIMULATION - MIN TRAY VS MAX IC
UBoT TRAY P/N: UB16162.00614XAU
POD: TFBGA 16X16X1.2 280 5R 19X19 PITCH 0.8 BALL 0.4
DWG NO: 7652339 REV.C
RESULT: PASSED
16.15
0.37
1.11
Ø0.45
14.40
ic
0.06
0.84
live bug
0.07
dead bug
16.12
1.87
1.92
1.11
1.90
12.87
16.22
tray
0.27
double unit
0.25°
top view(rotation)
0.25°
bottom view(rotation)
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
X.X = ±0.25±0.5
XXX = ±0.13
XXXX =
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
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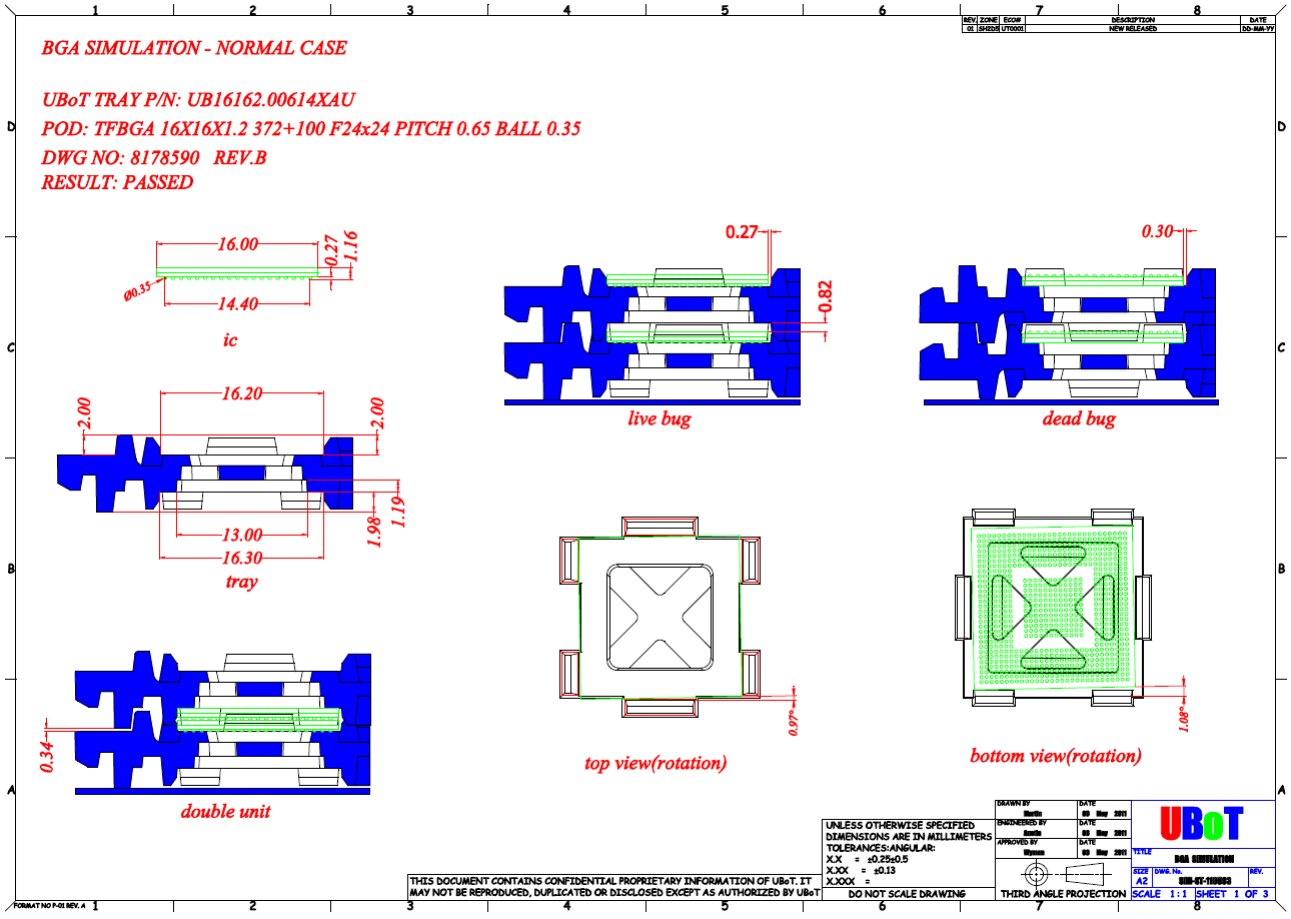
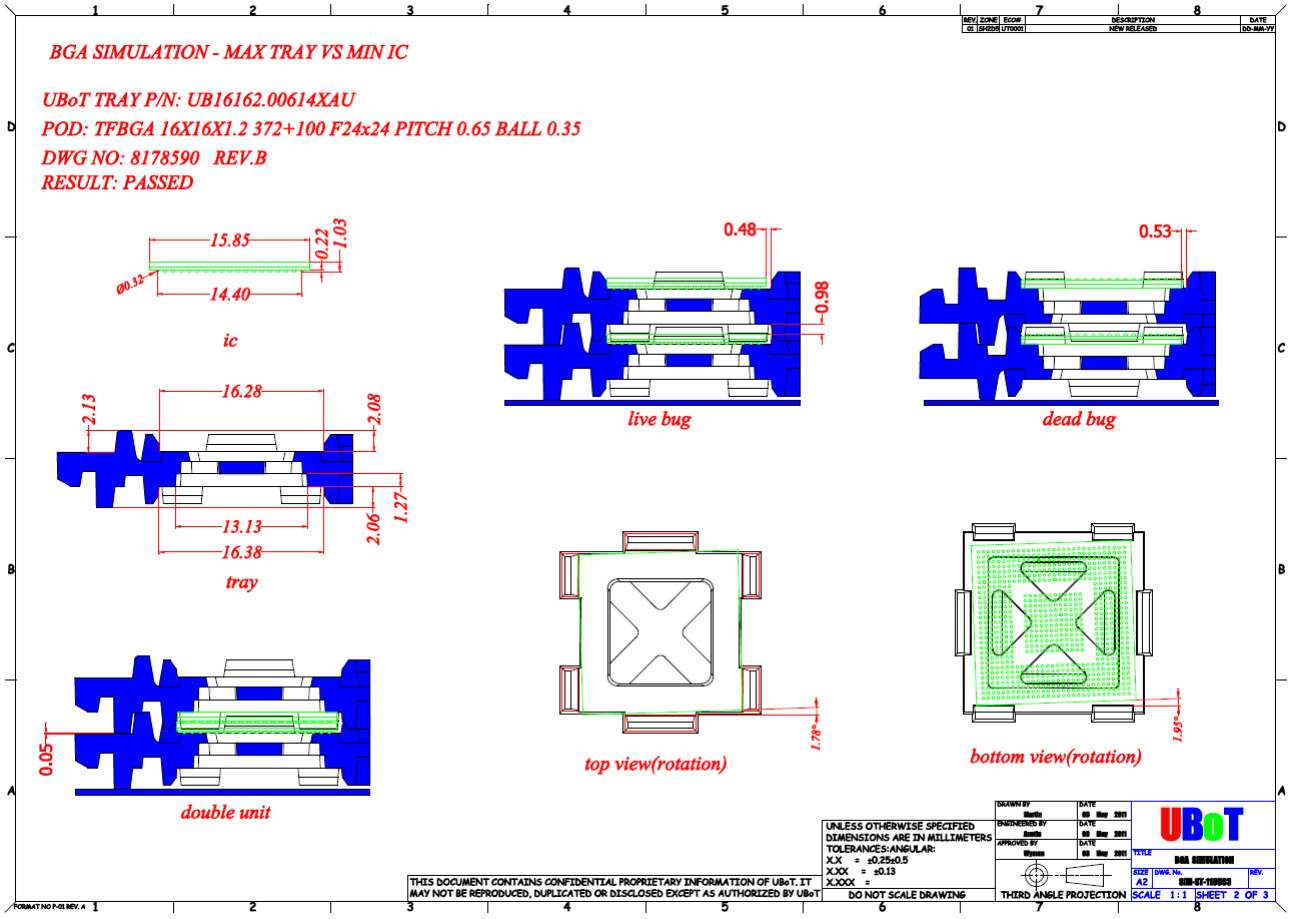
BGA SIMULATION
SCALE 1:1 SHEET 3 OF 3

Annex 3.7: UBOT fit analysis




BGA SIMULATION - MAX TRAY VS MIN IC
UBoT TRAY P/N: UB16162.00614XAU
POD: TFBGA 16X16X1.2 372+100 F24x24 PITCH 0.65 BALL 0.35
DWG NO: 8178590 REV.B
RESULT: PASSED
15.85
0.22
1.03
Ø0.32
14.40
ic
16.28
2.13
2.08
13.13
16.38
2.06
1.27
tray
0.05
double unit
0.48
0.98
live bug
0.53
dead bug
1.78°
top view(rotation)
1.95°
bottom view(rotation)
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:ANGULAR:
X.X = ±0.25±0.5
XXX = ±0.13
XXXX =
DO NOT SCALE DRAWING
THIRD ANGLE PROJECTION
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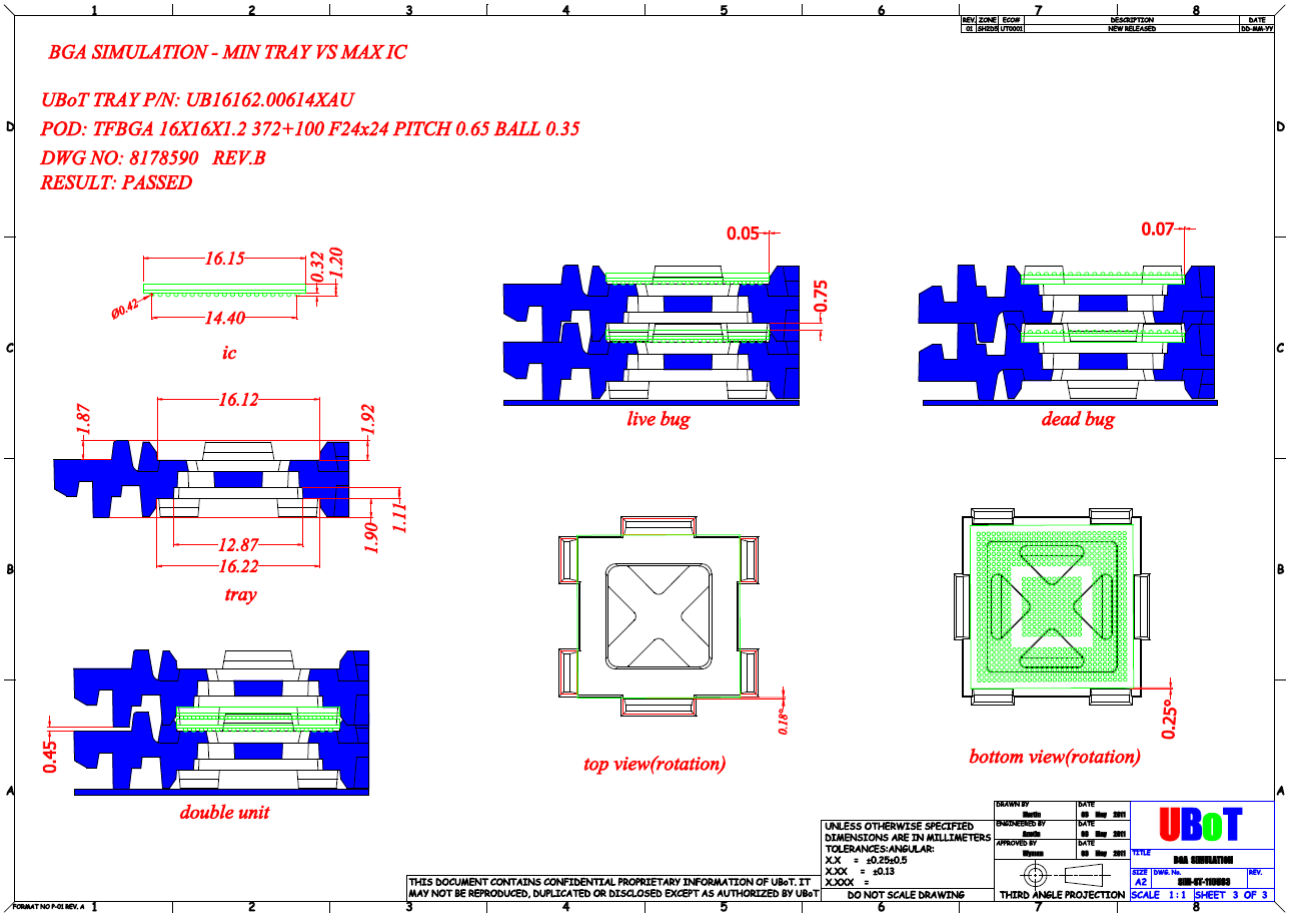
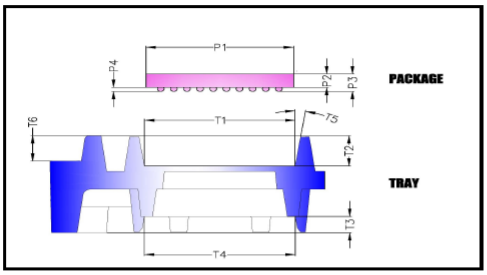
UBoT
BGA SIMULATION
SCALE 1:1 SHEET 2 OF 3


BGA SIMULATION - MIN TRAY VS MAX IC
UBoT TRAY P/N: UB16162.00614XAU
POD: TFBGA 16X16X1.2 372+100 F24x24 PITCH 0.65 BALL 0.35
DWG NO: 8178590 REV.B
RESULT: PASSED
16.15
0.32
1.20
Ø0.42
14.40
ic
0.05
0.75
live bug
0.07
dead bug
16.12
1.87
1.92
1.11
1.90
12.87
16.22
tray
0.45
double unit
0.18°
top view(rotation)
0.25°
bottom view(rotation)
UBoT
BGA SIMULATION
THIRD ANGLE PROJECTION
SCALE 1:1 SHEET 3 OF 3

Annex 3.8: UBOT fit analysis

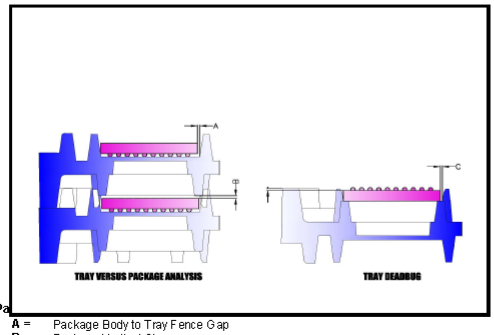
UBoT Incorporated Limited

Customer ST Tray P/N UB16162.00614XAU Simulation Number: SIM-ST-111472
Package LFBAG 16X16X1.7 361 F19X19 PITCH 0.8 BALL 0.4 DWG NO:8125732 REV.B Prepare Martin Check Austin Approve Wyman



PACKAGE INFORMATION
P1 : Package size
P2 : Package thickness (exculding ball)
P3 : Package total thickness (including ball)
P4: Solder ball stand off

TRAY INFORMATION
T1 : Top pocket size
T2 : Top pocket depth
T3 : Bottom pocket depth
T4 : Bottom pocket size
T5 : Pocket wall draft angle
T6 : Stacking height



Pa
A = Package Body to Tray Fence Gap
B = Package Vertical Clearance
C = Distance from package edge to tray wall after flip

Package Information	P1	P2	P3	P4
Nominal	16.000	1.065	1.365	0.300
Minimum	15.900	1.030	1.280	0.250
Maximum	16.100	1.140	1.430	0.350
+ Tol	0.100	0.075	0.065	0.050
- Tol	0.100	0.035	0.085	0.050

Tray Information	T1	T2	T3	T4	T5	T6
Nominal	16.200	2.000	1.860	16.300	7.000	2.000
Minimum	16.120	1.920	1.780	16.220	7.000	1.870
Maximum	16.280	2.080	1.940	16.380	7.000	2.130
+ Tol	0.080	0.080	0.080	0.080	0.000	0.130
- Tol	0.080	0.080	0.080	0.080	0.000	0.130

ANALYSIS / CALCULATIONS

Tray Nominal Dimension – Package Nominal Dimension			Result
A =	0.274	mm	Passed
B =	0.496	mm	Passed
C =	0.300	mm	Passed

Tray Maximum Dimension– Package Minimum Dimension			
A =	0.441	mm	Passed
B =	0.610	mm	Passed
C =	0.480	mm	Passed

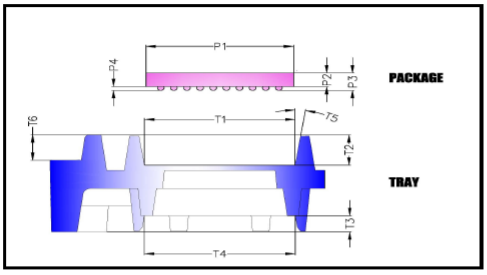
Tray Minimum Dimension – Package Maximum Dimension			
A =	0.106	mm	Passed
B =	0.400	mm	Passed
C =	0.120	mm	Passed

Formula used to compute the various dimensions required
A = [T1 + (P4xTAN(T5)x2) - P1]
B = T2+T3-T6-P3
C = T4-P1

Annex 3.9: UBOT fit analysis

UBoT Incorporated Limited

Customer ST Tray P/N UB16162.00614XAU Simulation Number: SIM-ST-111474
Package LFBAG 16X16X1.7 361 F19X19 PITCH 0.8 BALL 0.4 DWG NO:8125732 REV.B (ASE) Prepare Martin Check Austin Approve Wyman

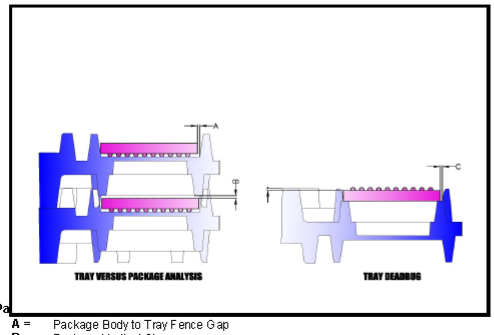


Package Information	P1	P2	P3	P4
Nominal	16.000	1.060	1.380	0.320
Minimum	15.850	0.980	1.250	0.270
Maximum	16.150	1.140	1.460	0.370
+ Tol	0.150	0.080	0.080	0.050
- Tol	0.150	0.080	0.130	0.050

Tray Information	T1	T2	T3	T4	T5	T6
Nominal	16.200	2.000	1.860	16.300	7.000	2.000
Minimum	16.120	1.920	1.780	16.220	7.000	1.870
Maximum	16.280	2.080	1.940	16.380	7.000	2.130
+ Tol	0.080	0.080	0.080	0.080	0.000	0.130
- Tol	0.080	0.080	0.080	0.080	0.000	0.130

PACKAGE INFORMATION
P1 : Package size
P2 : Package thickness (exculding ball)
P3 : Package total thickness (including ball)
P4: Solder ball stand off

TRAY INFORMATION
T1 : Top pocket size
T2 : Top pocket depth
T3 : Bottom pocket depth
T4 : Bottom pocket size
T5 : Pocket wall draft angle
T6 : Stacking height



Pa
A = Package Body to Tray Fence Gap
B = Package Vertical Clearance
C = Distance from package edge to tray wall after flip

ANALYSIS / CALCULATIONS

Tray Nominal Dimension - Package Nominal Dimension			Result
A =	0.279	mm	Passed
B =	0.480	mm	Passed
C =	0.300	mm	Passed
Tray Maximum Dimension - Package Minimum Dimension			
A =	0.496	mm	Passed
B =	0.640	mm	Passed
C =	0.530	mm	Passed
Tray Minimum Dimension - Package Maximum Dimension			
A =	0.061	mm	Passed
B =	0.320	mm	Passed
C =	0.070	mm	Passed

Formula used to compute the various dimensions required
A = [T1 + (P4xTAN(T5)x2) - P1]
B = T2+T3-T6-P3
C = T4-P1

Public Products List

PCN Title : Qualification of 2nd Source Tray Suppliers for BGA 16x16
PCN Reference : CRP/13/8033
PCN Created on : 05-AUG-2013

Subject : Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change:

ST COMMERCIAL PRODUCT

STA2062

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