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### Understanding [Embedded - FPGAs \(Field Programmable Gate Array\)](#)

Embedded - FPGAs, or Field Programmable Gate Arrays, are advanced integrated circuits that offer unparalleled flexibility and performance for digital systems. Unlike traditional fixed-function logic devices, FPGAs can be programmed and reprogrammed to execute a wide array of logical operations, enabling customized functionality tailored to specific applications. This reprogrammability allows developers to iterate designs quickly and implement complex functions without the need for custom hardware.

### Applications of Embedded - FPGAs

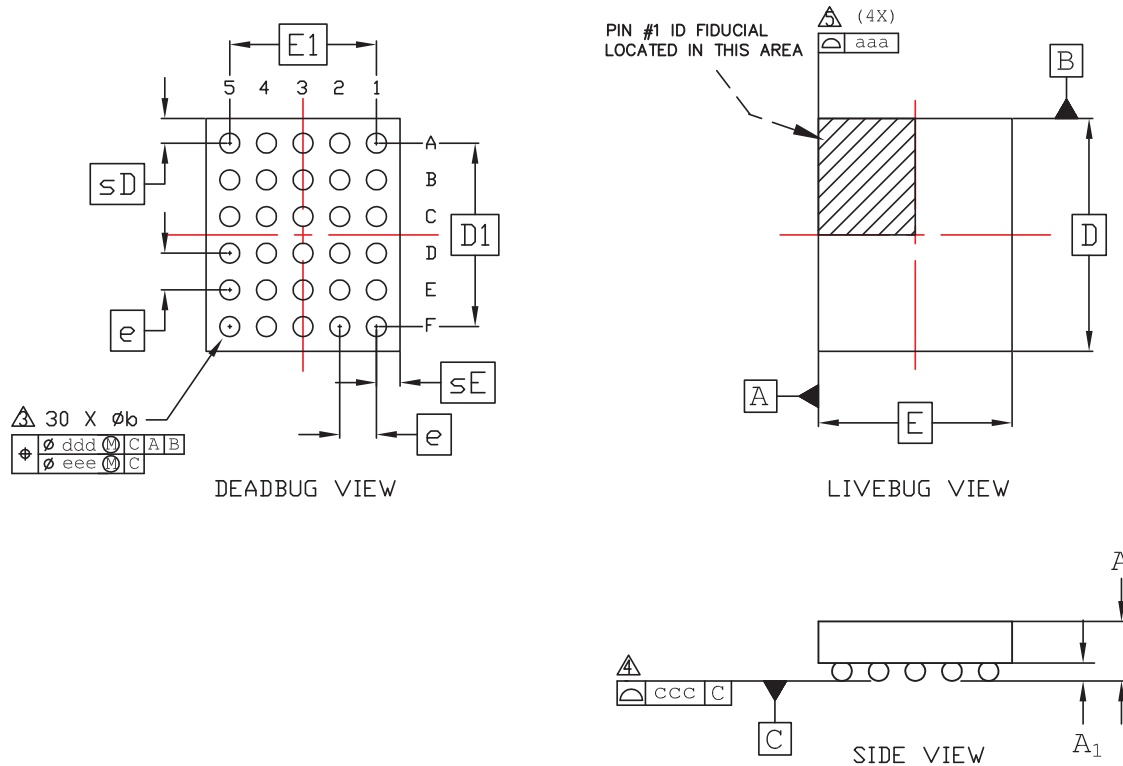
The versatility of Embedded - FPGAs makes them indispensable in numerous fields. In telecommunications.

#### Details

Product Status	Obsolete
Number of LABs/CLBs	-
Number of Logic Elements/Cells	1500
Total RAM Bits	18432
Number of I/O	97
Number of Gates	-
Voltage - Supply	1.14V ~ 1.26V
Mounting Type	Surface Mount
Operating Temperature	-40°C ~ 100°C (TJ)
Package / Case	144-LQFP
Supplier Device Package	144-TQFP (20x20)
Purchase URL	<a href="https://www.e-xfl.com/product-detail/lattice-semiconductor/lfec1e-3t144i">https://www.e-xfl.com/product-detail/lattice-semiconductor/lfec1e-3t144i</a>

## 30-Ball WLSC Package

Dimensions in Millimeters



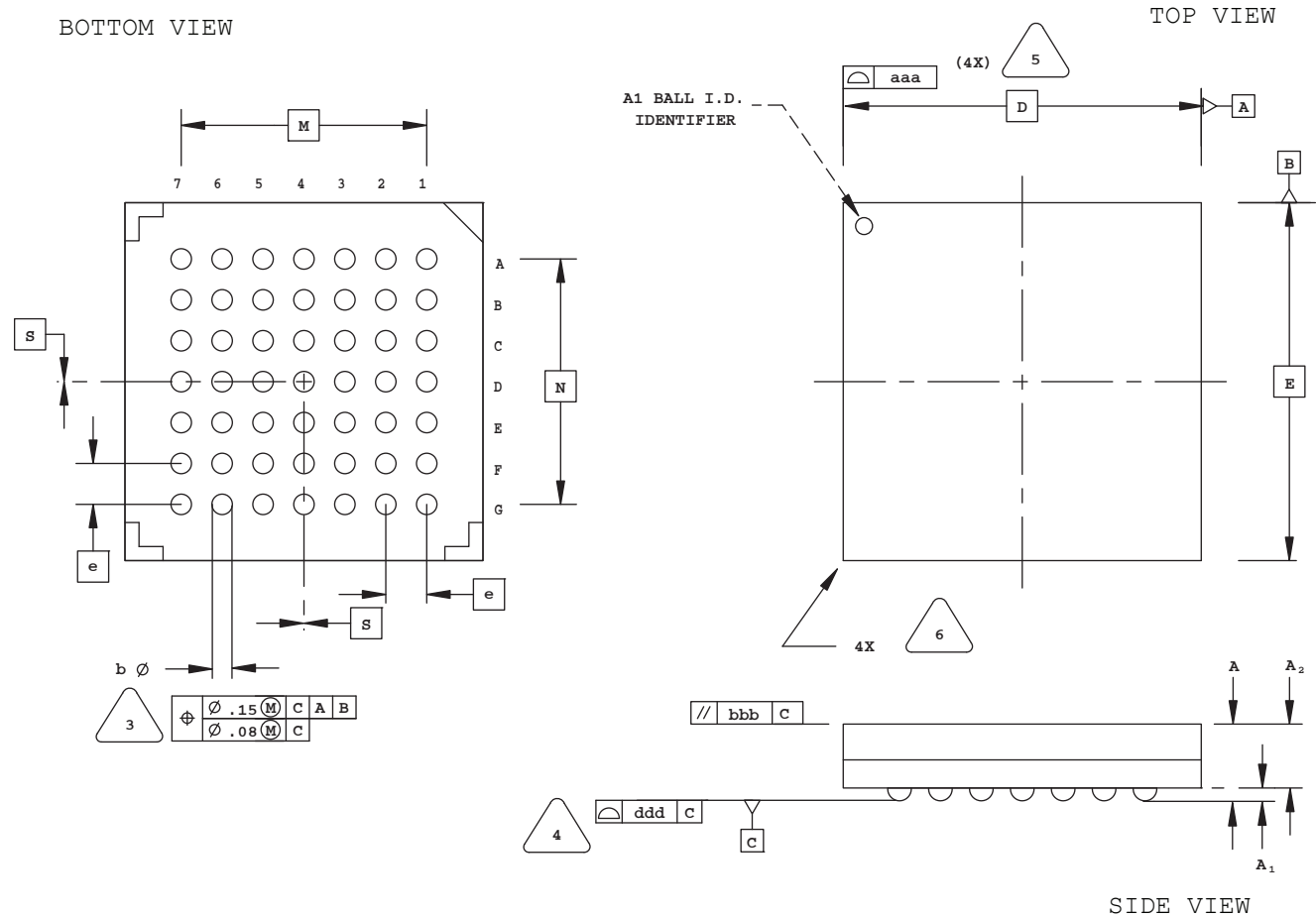
### Notes:

- 1 ALL DIMENSIONS AND TOLERANCE PER ASME Y 14.5M - 1994.
  - 2 ALL DIMENSIONS ARE IN MILLIMETERS.
- △ DIMENSION "b" IS MEASURED AT THE MAXIMUM BUMP DIAMETER PARALLEL TO PRIMARY DATUM C.
- △ PRIMARY DATUM C AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BUMPS.
- △ BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.

REF.	Min.	Nom.	Max.
A	-	-	0.600
A1	0.140	-	-
b	0.230	0.260	0.290
D	2.537 BSC		
E	2.114 BSC		
D1	2.00 BSC		
E1	1.60 BSC		
e	0.40 BSC		
sD	-	0.26	-
sE	-	0.27	-
aaa	0.030		
ccc	0.050		
ddd	0.015		
eee	0.050		

## 49-Ball caBGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

- DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
- ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM **C**



PRIMARY DATUM **C** AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.

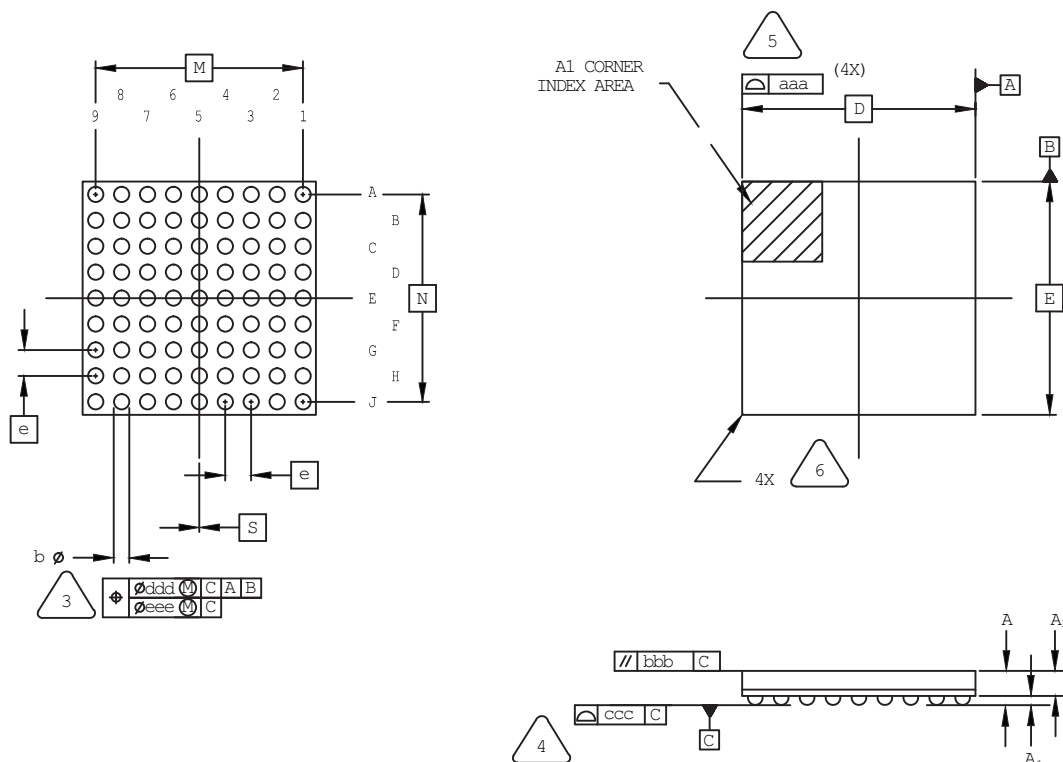


EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	1.30	1.40	1.50
A1	0.31	0.36	0.41
A2	0.99	1.04	1.09
D/E	7.00 BSC		
M/N	4.80 BSC		
S	0 BSC		
b	0.40	0.46	0.52
e	0.80 BSC		
aaa	-	-	0.10
bbb	-	-	0.10
ddd	-	-	0.12

## 81-Ball csfBGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
2. ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM [C].



PRIMARY DATUM [C] AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.

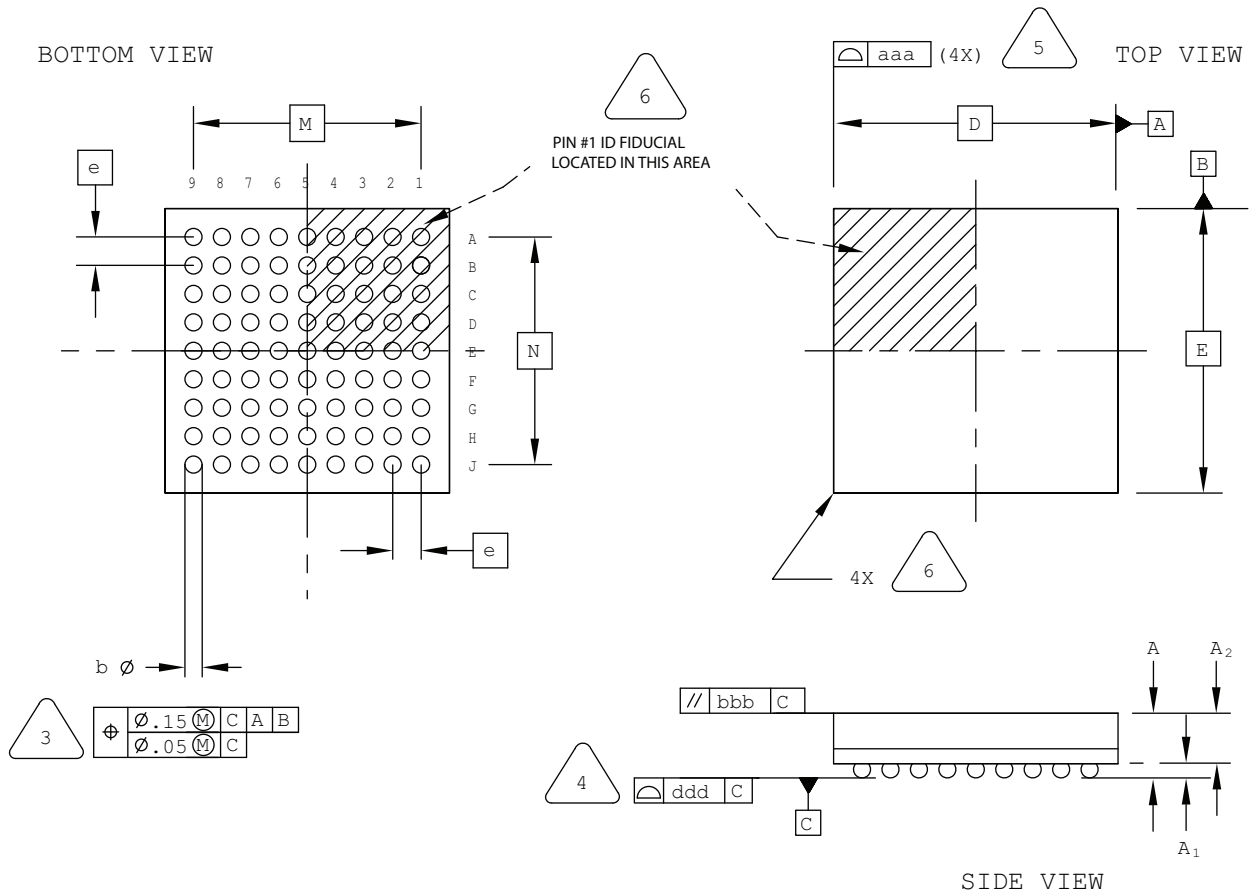


EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.00
A1	0.11	-	-
A2	0.64	-	-
D/E	4.50 BSC		
M/N	4.00 BSC		
S	0.00 BSC		
b	0.20	0.25	0.30
e	0.50 BSC		
aaa	0.10		
bbb	0.10		
ccc	0.08		
ddd	0.15		
eee	0.08		

# 81-Ball ucBGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

- DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
- ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM  $C$



PRIMARY DATUM  $C$  AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.



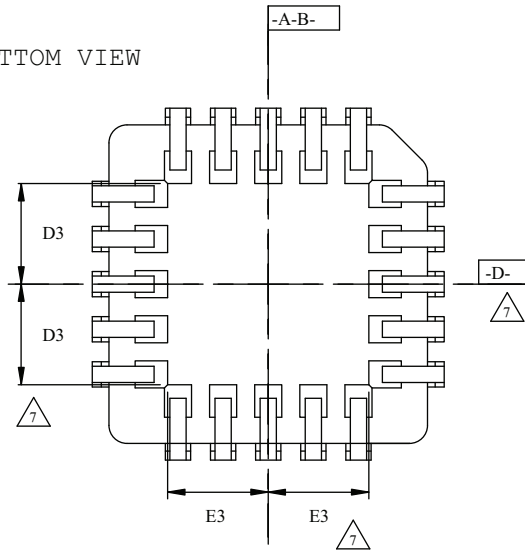
EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.00
A1	0.10	-	-
A2	-	-	0.90
D/E	4.00 BSC		
M/N	3.20 BSC		
b	0.20	0.25	0.30
e	0.40 BSC		
aaa	-	-	0.10
bbb	-	-	0.10
ddd	-	-	0.10

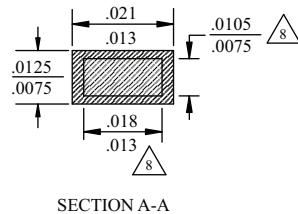
# 84-Pin PLCC Package

Dimensions in Inches

BOTTOM VIEW

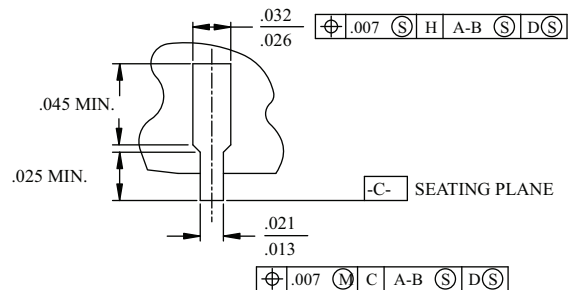
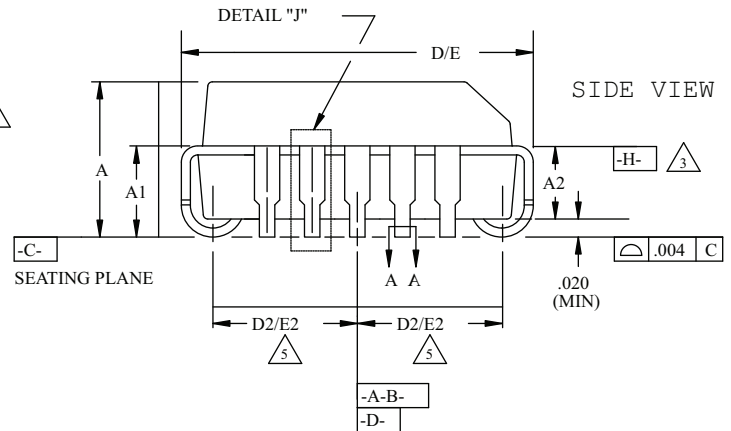
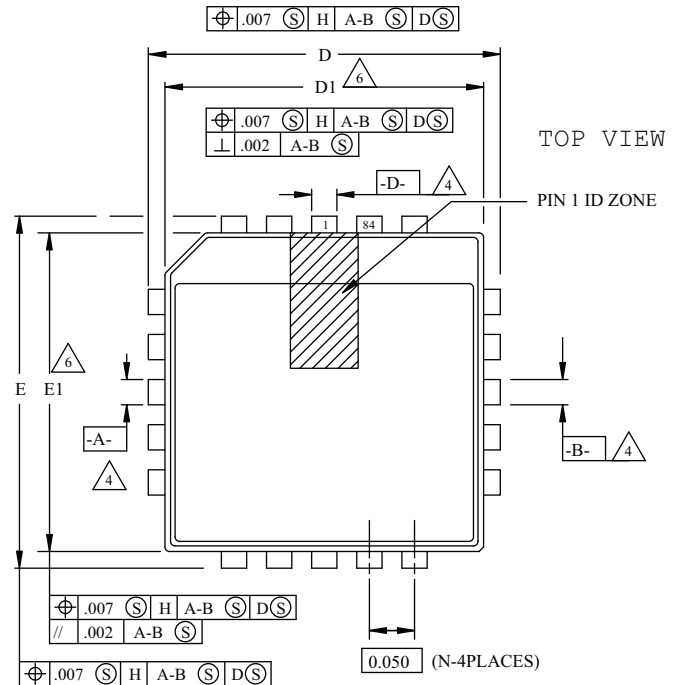


	MIN.	NOM.	MAX.
A	.165	.172	.180
A1	.090	.105	.120
A2	.059	-	.080
D	1.185	1.190	1.195
D1	1.150	1.154	1.158
D2	.541	.555	.569
D3		.475	
E	1.185	1.190	1.195
E1	1.150	1.154	1.158
E2	.541	.555	.569
E3		.475	
N	84		



## NOTES:

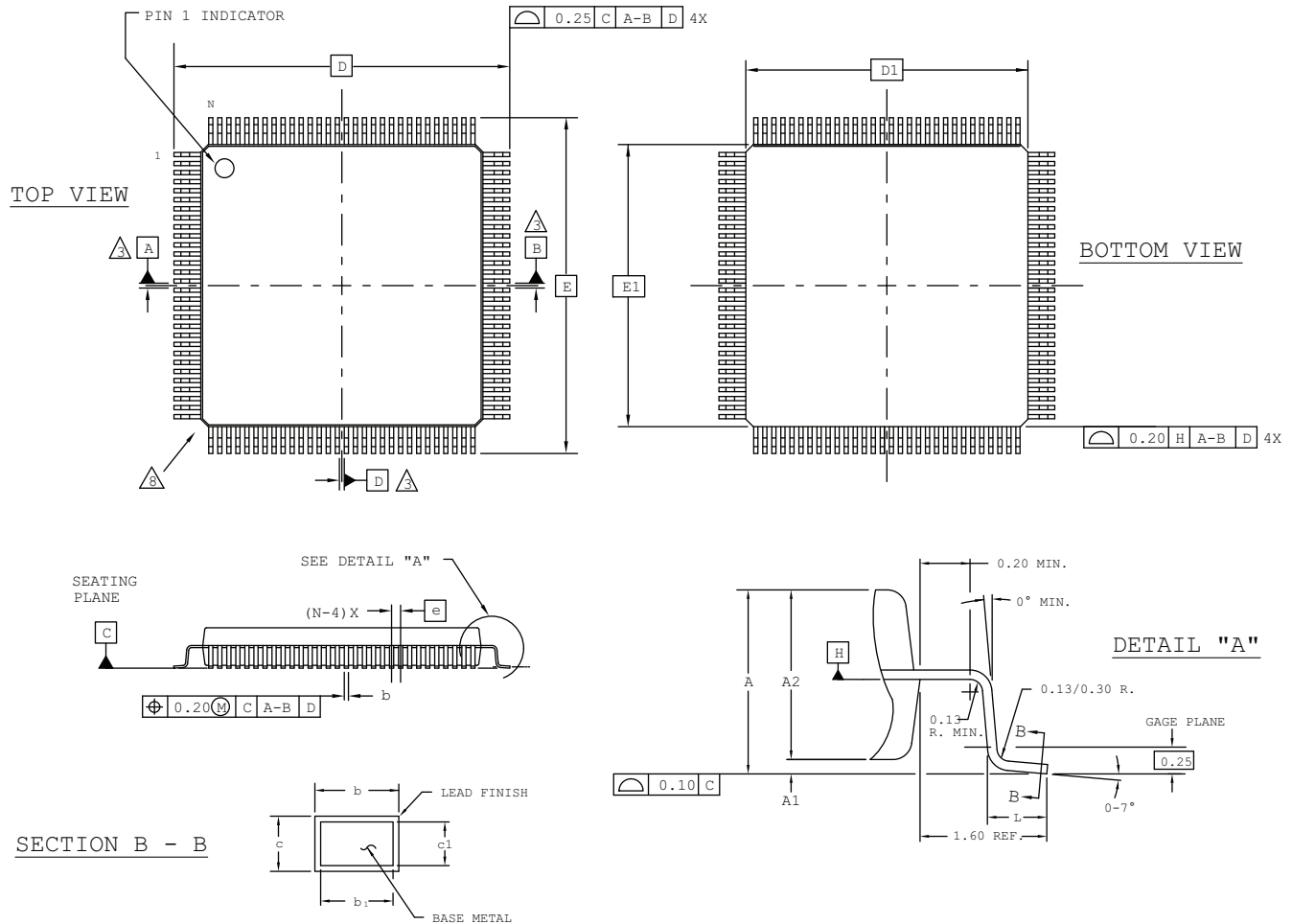
- ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982
- ALL DIMENSIONS IN INCHES
- DATUM PLANE **-H-** LOCATED AT TOP OF MOLD PARTING LINE AND COINCIDENT WITH TOP OF LEAD WHERE LEAD EXITS PLASTIC BODY
- DATUMS **-A-B-** AND **-D-** TO BE DETERMINED WHERE CENTER LEADS EXIT PLASTIC BODY AT DATUM PLANE **-H-**
- TO BE MEASURED AT SEATING PLANE **-C-** CONTACT POINT
- DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS .010 PER SIDE.
- TOP POINT OF MEASUREMENT IS DATUM **-H-**; BOTTOM POINT OF MEASUREMENT IS AT MAJOR FLAT AREA OF LOWER PLASTIC SURFACE DEFINED BY D3/E3
- DIMENSION APPLIES TO BASE METAL ONLY



(TYP ALL SIDES)

## 120-Pin PQFP Package

Dimensions in Millimeters



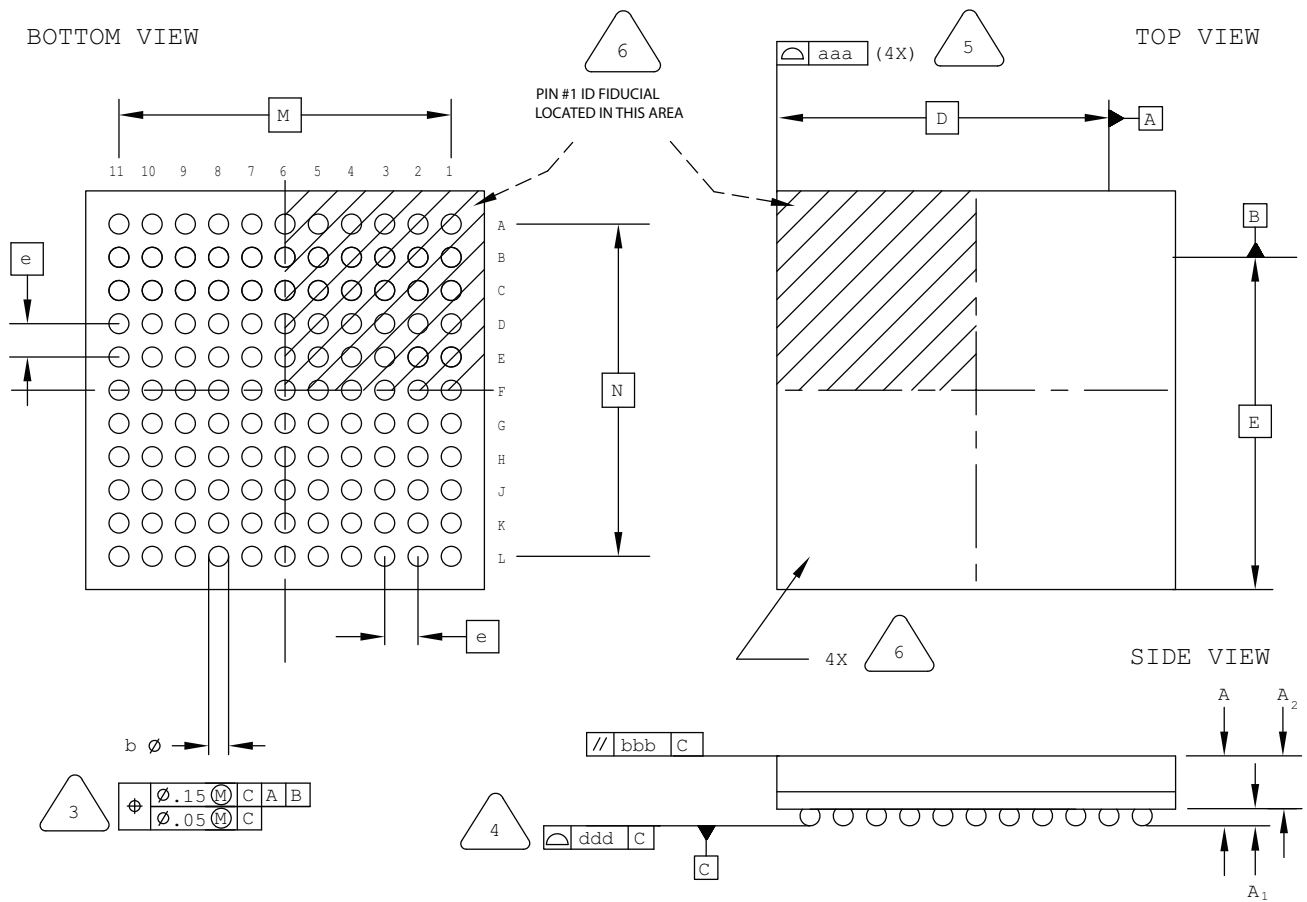
### NOTES:

- 1.0 DIMENSIONING AND TOLERANCING PER ANSI Y14.5 - 1982.
- 2.0 ALL DIMENSIONS ARE IN MILLIMETERS.
- 3.0 DATUMS A, B AND D TO BE DETERMINED AT DATUM PLANE H.
- 4.0 DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION IS 0.254 MM ON D1 AND E1 DIMENSIONS.
- 5.0 THE TOP OF PACKAGE MAY BE SMALLER THAN THE BOTTOM OF THE PACKAGE BY 0.15 MM.
- 6.0 SECTION B-B:  
THESE DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.10 AND 0.25 MM FROM THE LEAD TIP.
- 7.0 A1 IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.
- 8.0 EXACT SHAPE OF EACH CORNER IS OPTIONAL.
- 9.0 EXACT SHAPE OF EXPOSED HEATSINK IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	-	-	4.10
A1	0.25	-	0.50
A2	3.20	3.40	3.60
D	31.20 BSC		
D1	28.00 BSC		
E	31.20 BSC		
E1	28.00 BSC		
L	0.73	0.88	1.03
N	120		
e	0.80 BSC		
b	0.29	-	0.45
b1	0.29	0.35	0.41
c	0.11	-	0.23
c1	0.11	0.15	0.19

## 121-Ball csBGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
2. ALL DIMENSIONS ARE IN MILLIMETERS.

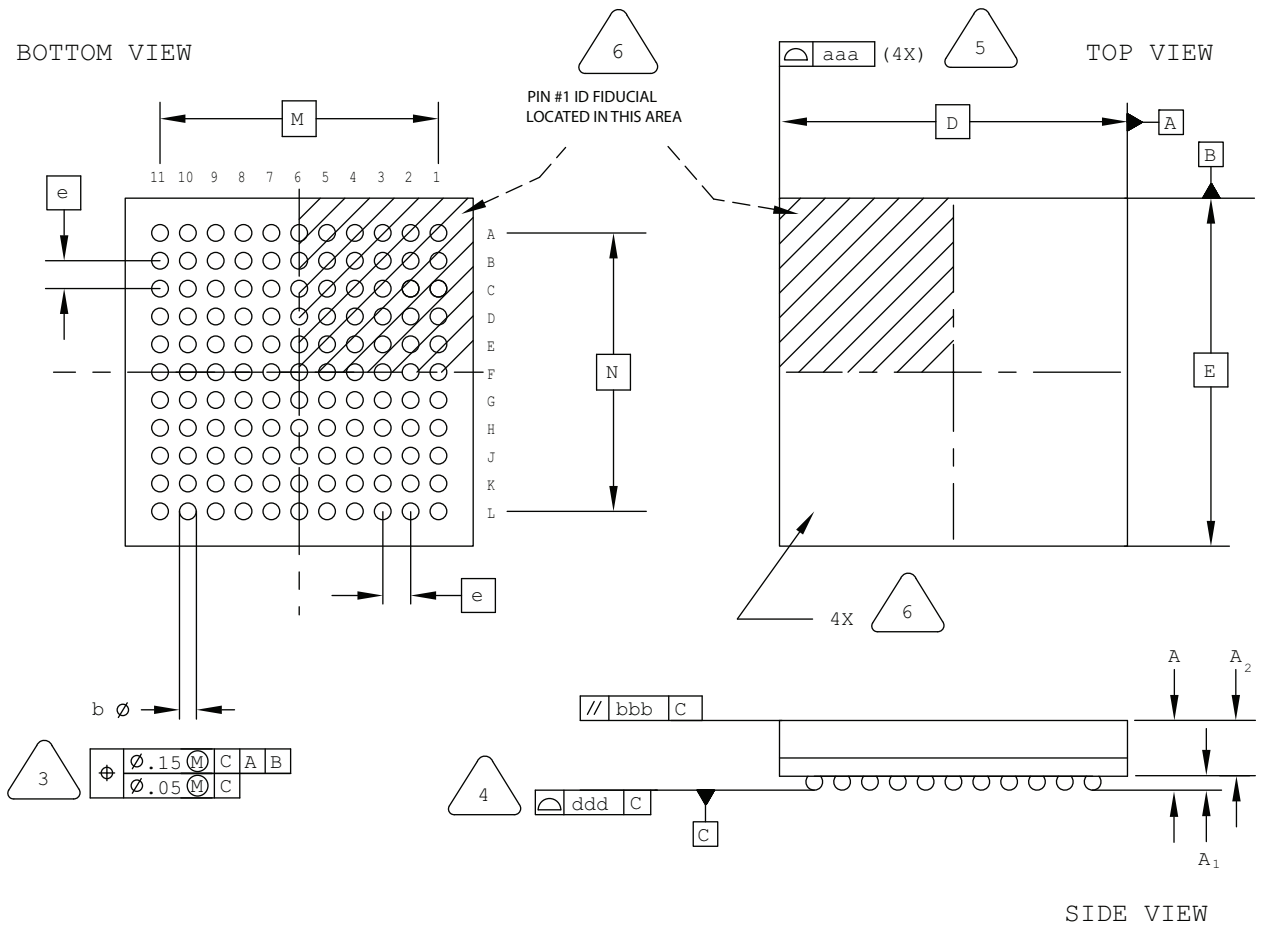
- 3 DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM [C]
- 4 PRIMARY DATUM [C] AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.
- 5 BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.
- 6 EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.00
A1	0.10	-	-
A2	-	-	0.90
D/E	6.00 BSC		
M/N	5.00 BSC		
b	0.20	0.25	0.30
e	0.50 BSC		
aaa	-	-	0.10
bbb	-	-	0.10
ddd	-	-	0.10



## 121-Ball ucBGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

- DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
- ALL DIMENSIONS ARE IN MILLIMETERS.

3. DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM [C]

4. PRIMARY DATUM [C] AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.

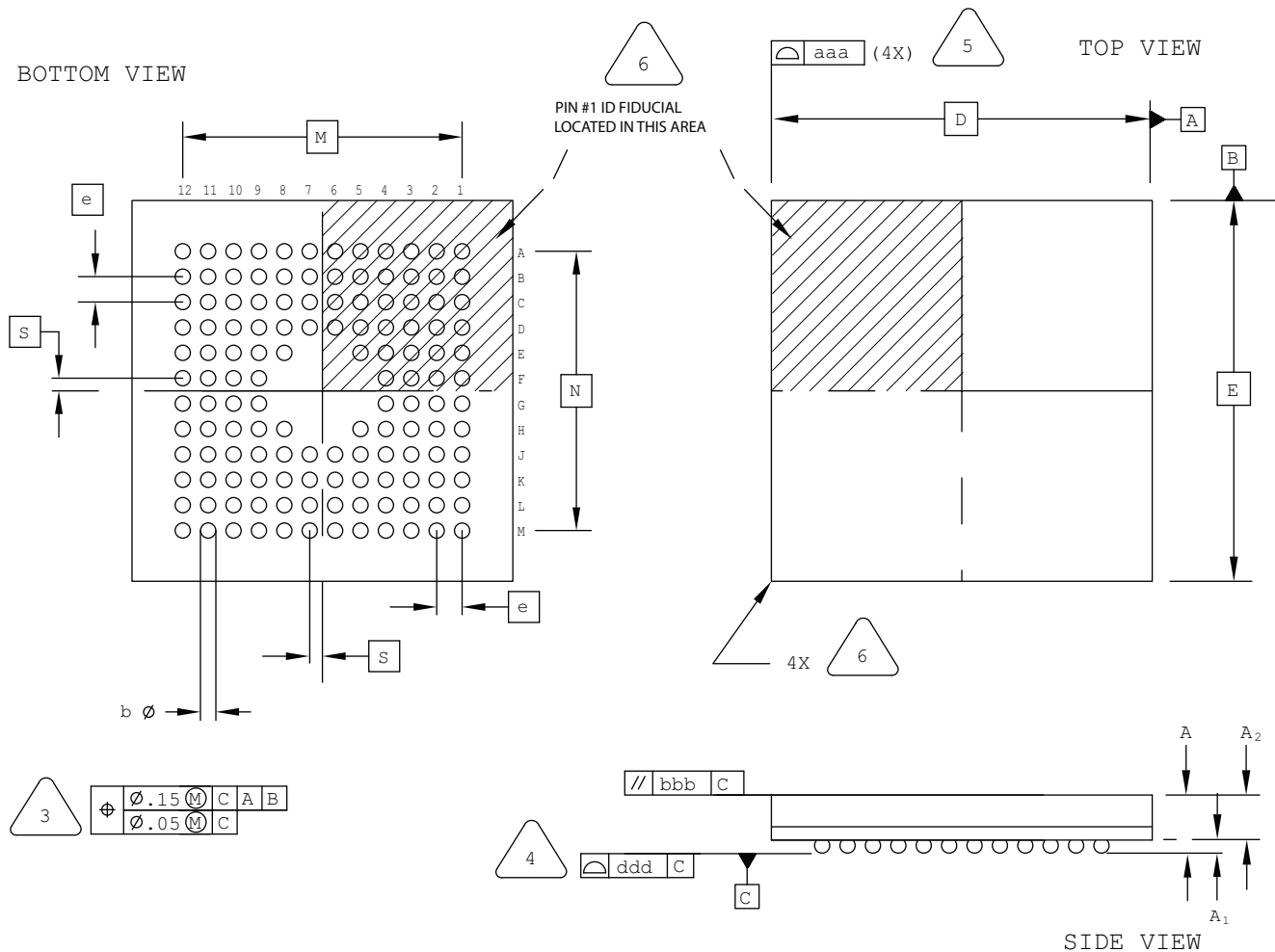
5. BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.

6. EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.00
A1	0.10	-	-
A2	-	-	0.90
D/E	5.00 BSC		
M/N	4.00 BSC		
b	0.20	0.25	0.30
e	0.40 BSC		
aaa	-	-	0.10
bbb	-	-	0.10
ddd	-	-	0.10

## 132-Ball ucBGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

- DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
- ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM **C**



PRIMARY DATUM **C** AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.

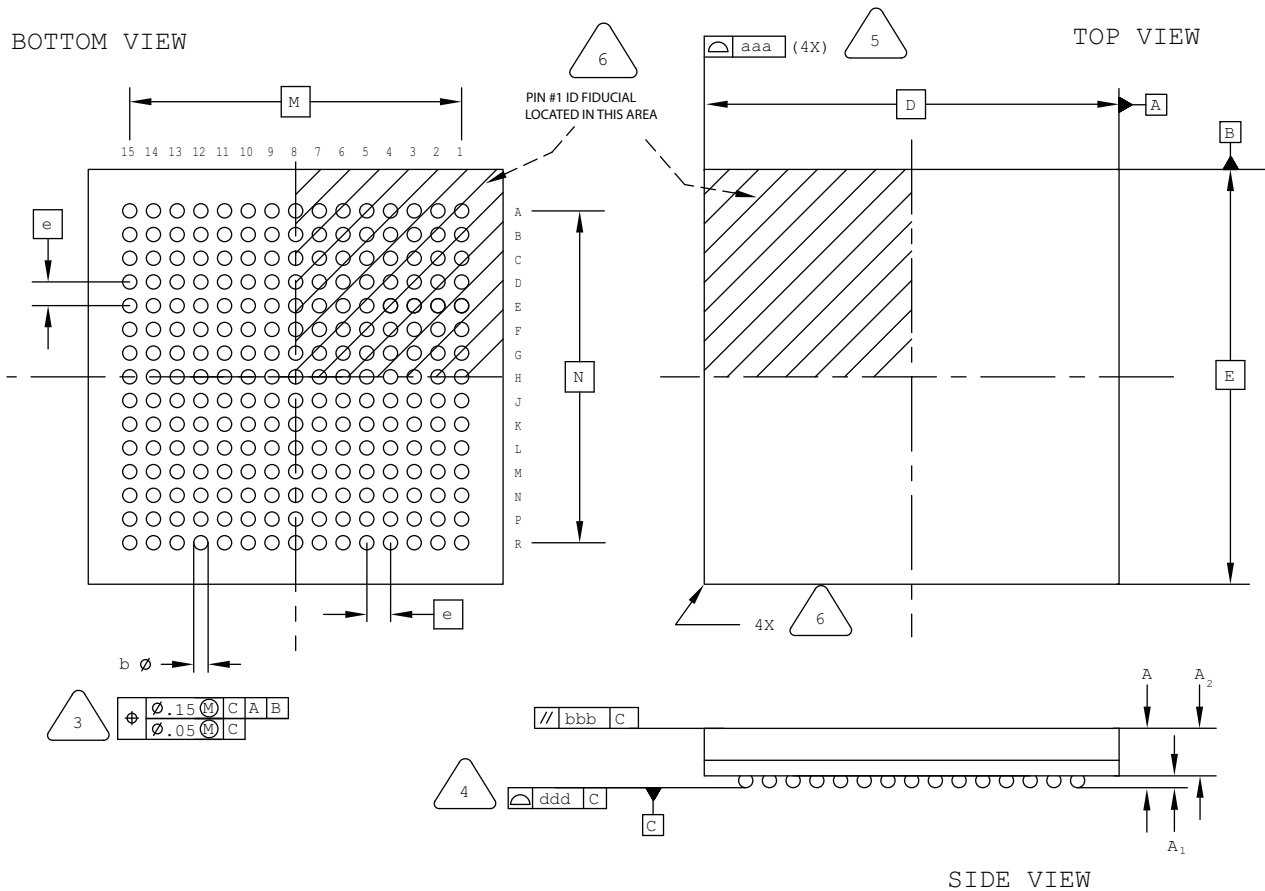


EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.00
A1	0.10	-	-
A2	-	-	0.90
D/E	6.00 BSC		
M/N	4.40 BSC		
S	0.20 BSC		
b	0.20	0.25	0.30
e	0.40 BSC		
aaa	-	-	0.10
bbb	-	-	0.10
ddd	-	-	0.08

## 225-Ball ucBGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

- DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
- ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM **C**



PRIMARY DATUM **C** AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.

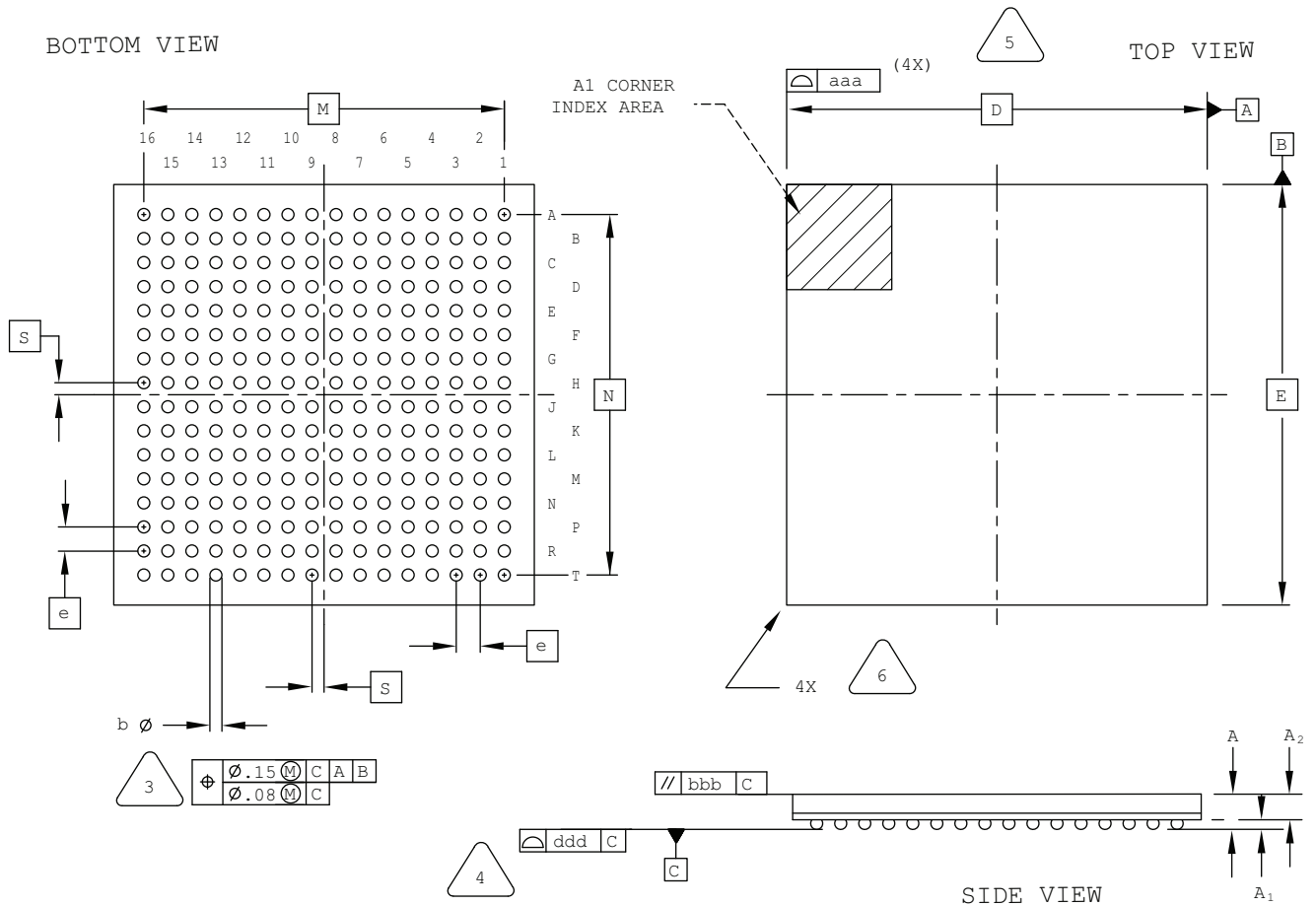


EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.00
A1	0.10	-	-
A2	-	-	0.90
D/E	7.00 BSC		
M/N	5.60 BSC		
b	0.20	0.25	0.30
e	0.40 BSC		
aaa	-	-	0.10
bbb	-	-	0.10
ddd	-	-	0.10

## 256-Ball caBGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
2. ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM [C]



PRIMARY DATUM [C] AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.



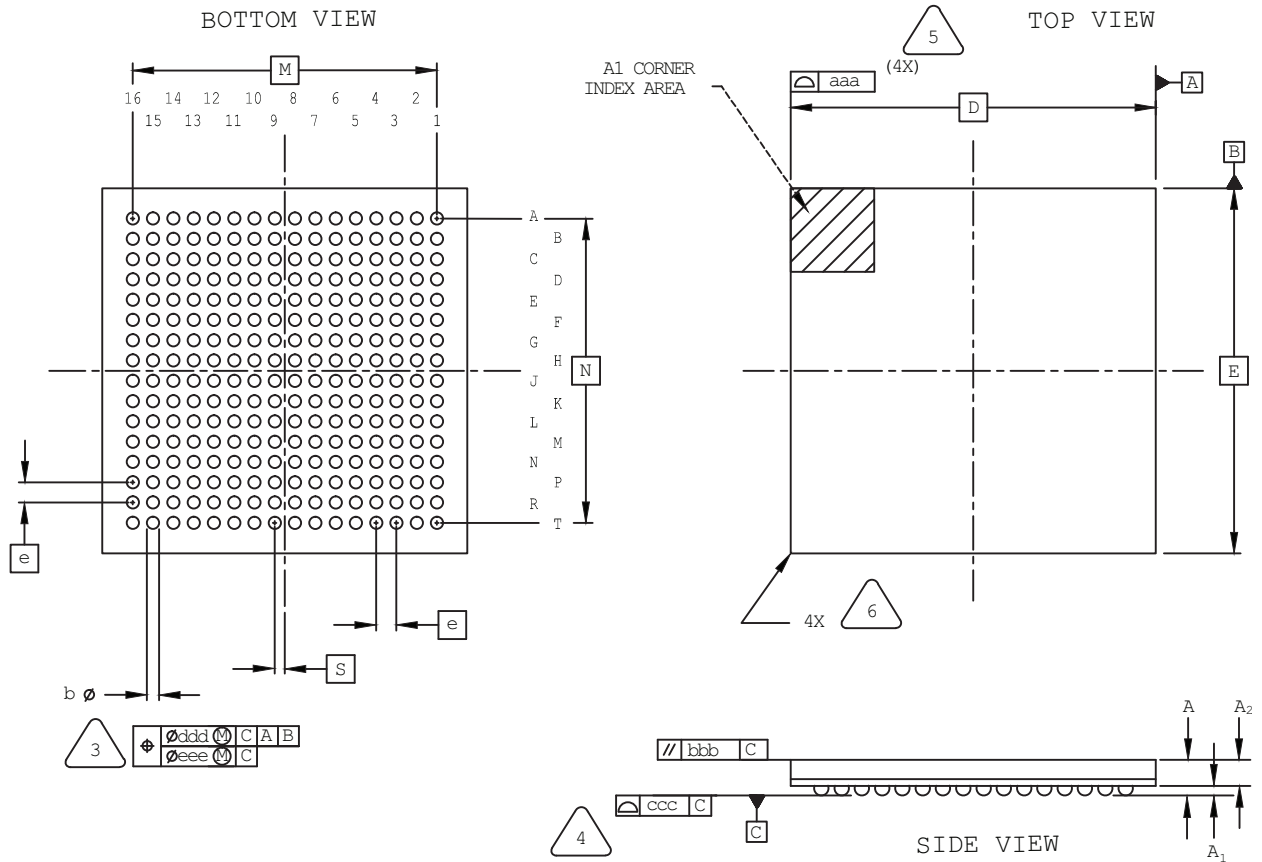
EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

7. REFERENCE JEDEC MO-275, VARIATION JJAB-2.

SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.70
A1	0.25	-	-
A2	0.65	-	-
D/E	14.0 BSC		
M/N	12.0 BSC		
S	0.40 BSC		
b	0.40	0.45	0.50
e	0.80 BSC		
aaa	-	-	0.15
bbb	-	-	0.20
ddd	-	-	0.20

## 256-Ball csfBGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
2. ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM [C].



PRIMARY DATUM [C] AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.

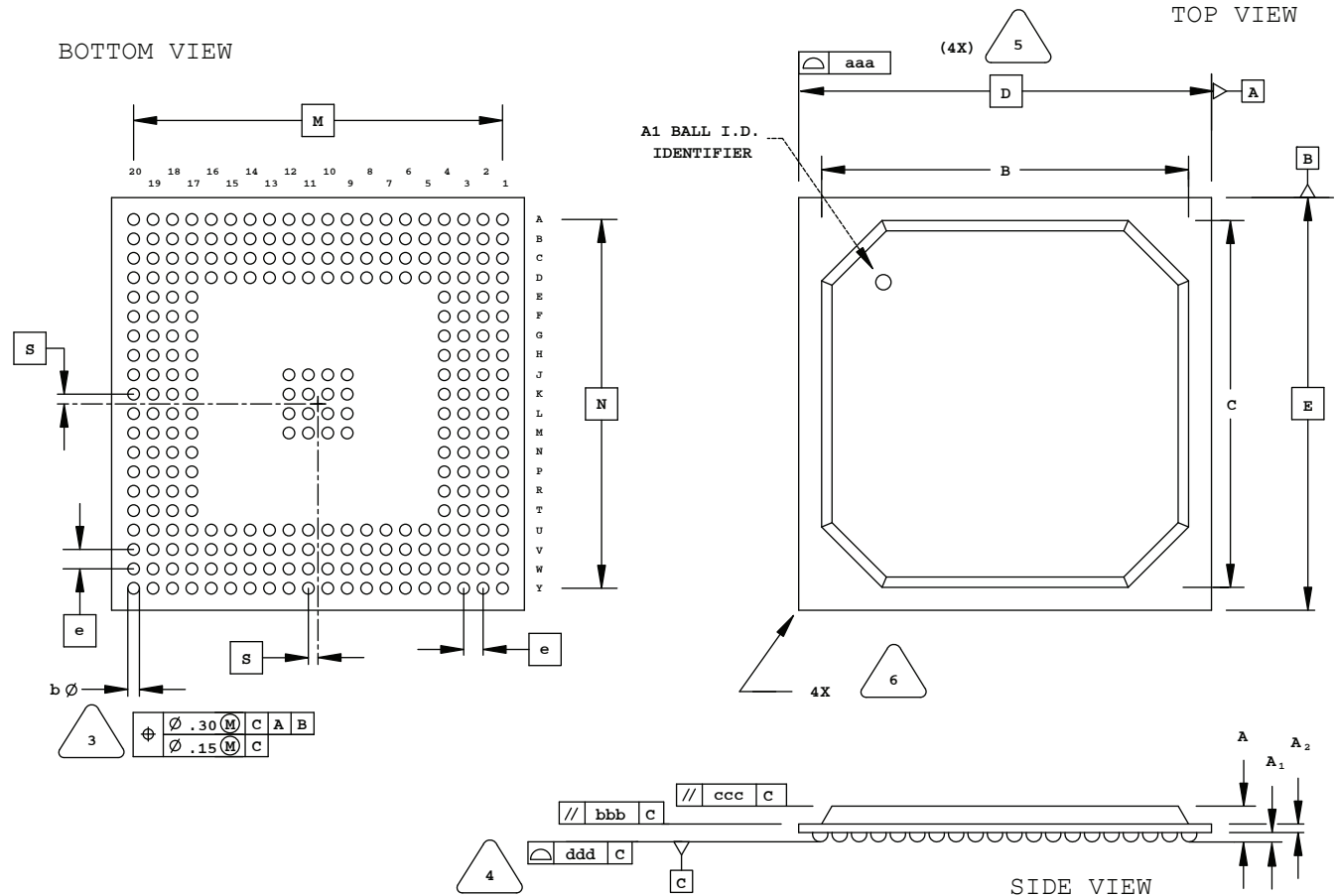


EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.00
A1	0.15	0.24	-
A2	-	0.66	-
D/E	9.00 BSC		
M/N	7.50 BSC		
S	0.25 BSC		
b	0.25	0.30	0.35
e	0.50 BSC		
aaa	0.10		
bbb	0.10		
ccc	0.08		
ddd	0.15		
eee	0.05		

## 272-Ball BGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
2. ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM **C**



PRIMARY DATUM **C** AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.

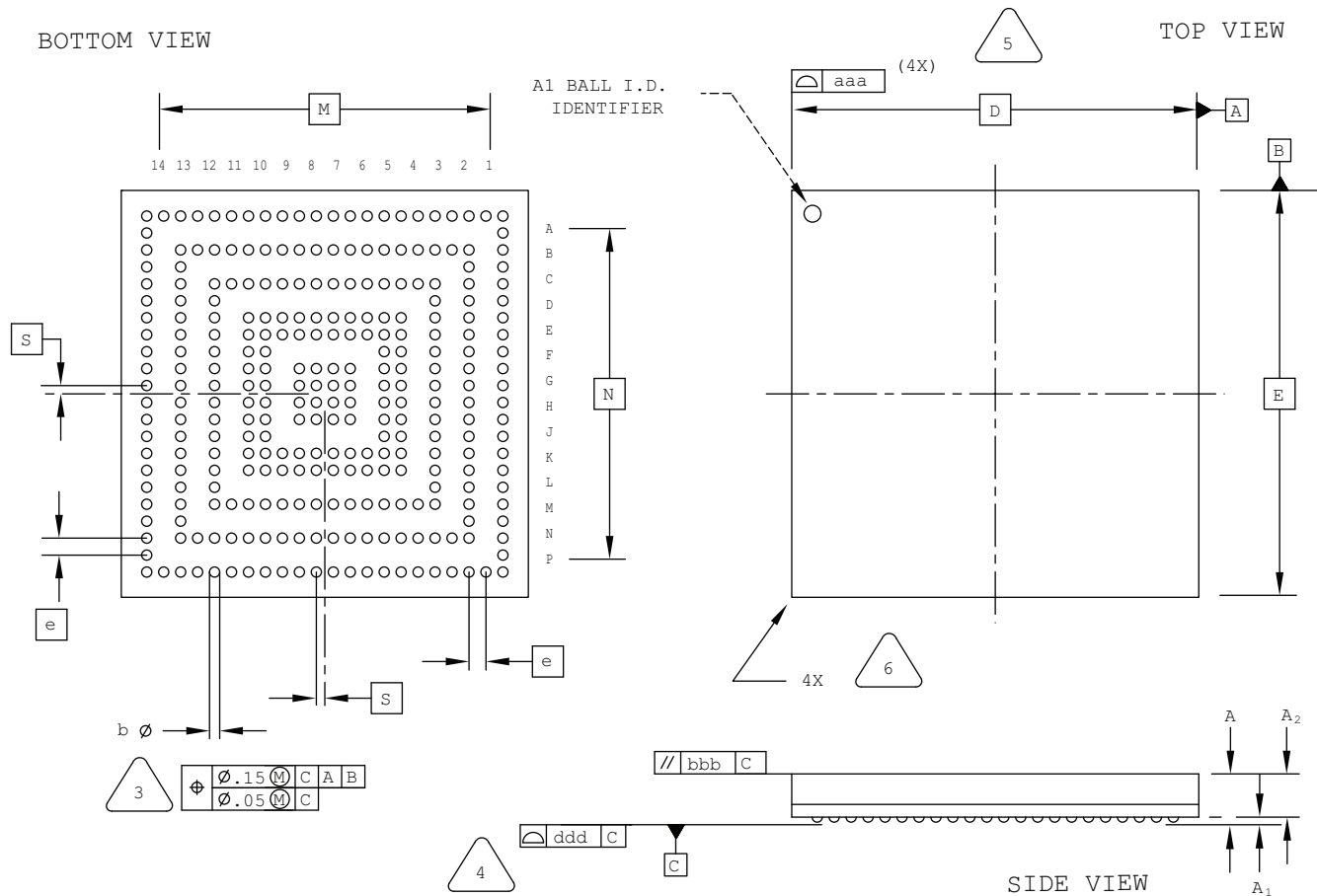


EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	1.90	2.25	2.80
A1	0.50	0.65	0.80
A2	0.28	0.54	0.80
B/C	23.80	24.30	24.80
D/E	27.00 BSC		
M/N	24.13 BSC		
S	0.635 BSC		
b	0.60	0.75	0.90
e	1.27 BSC		
aaa	-	-	0.20
bbb	-	-	0.25
ccc	-	-	0.35
ddd	-	-	0.20


## 284-Ball csBGA Package


### Dimensions in Millimeters




NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES  
PER ANSI Y14.5M.
2. ALL DIMENSIONS ARE IN MILLIMETERS.


 DIMENSION "b" IS MEASURED AT THE  
 MAXIMUM SOLDER BALL DIAMETER,  
 PARALLEL TO PRIMARY DATUM C


 PRIMARY DATUM C AND SEATING  
 PLANE ARE DEFINED BY THE SPHERICAL  
 CROWNS OF THE SOLDER BALLS.

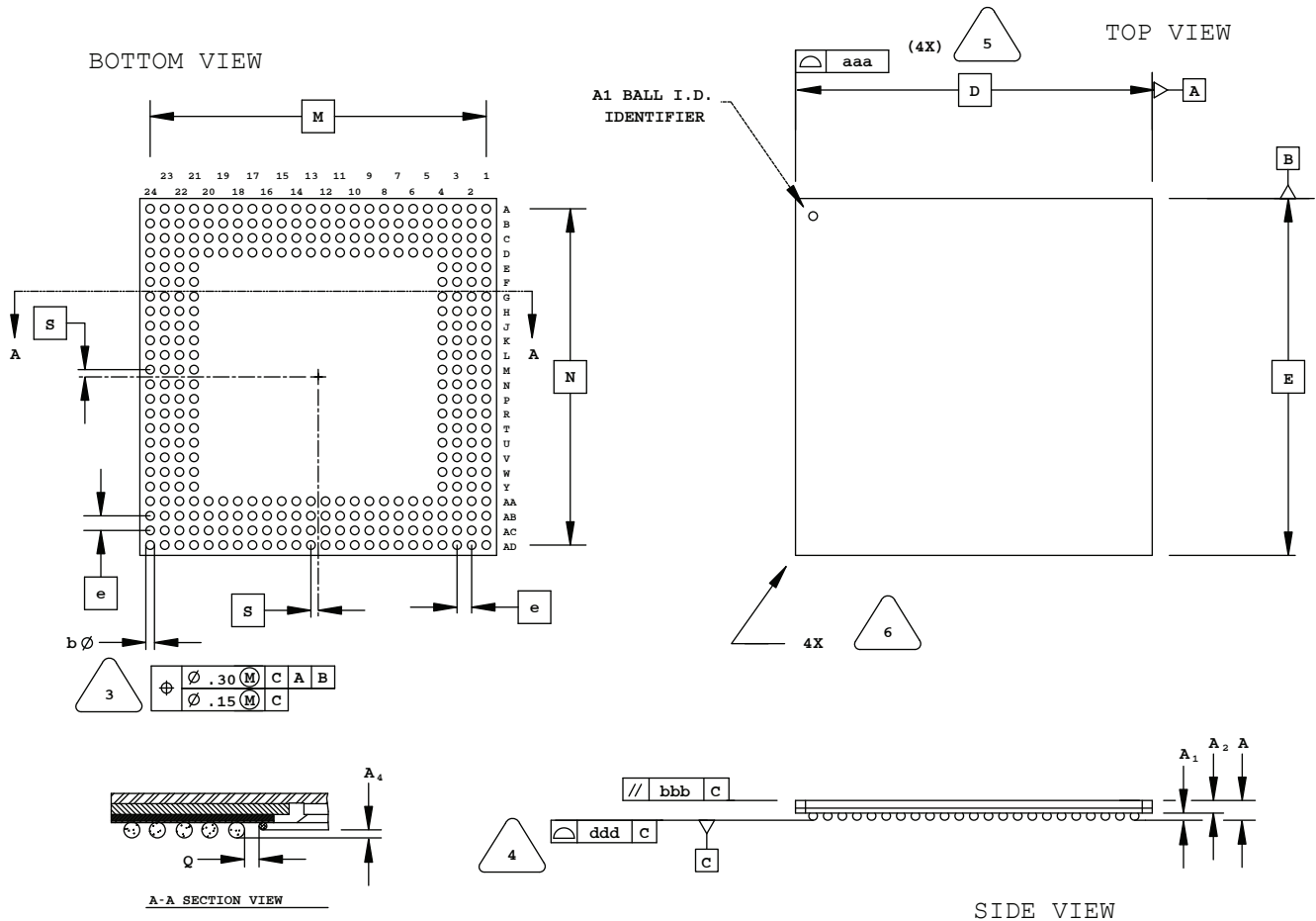

 BILATERAL TOLERANCE ZONE IS APPLIED  
 TO EACH SIDE OF THE PACKAGE BODY.

6 EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	–	–	1.00
A1	0.15	–	–
A2	–	–	0.85
D/E	12.00 BSC		
M/N	10.50 BSC		
S	0.25 BSC		
b	0.25	0.31	0.37
e	0.50 BSC		
aaa	–	–	0.10
bbb	–	–	0.10
ddd	–	–	0.08

## 320-Ball SBGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
2. ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM **C**



PRIMARY DATUM **C** AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.



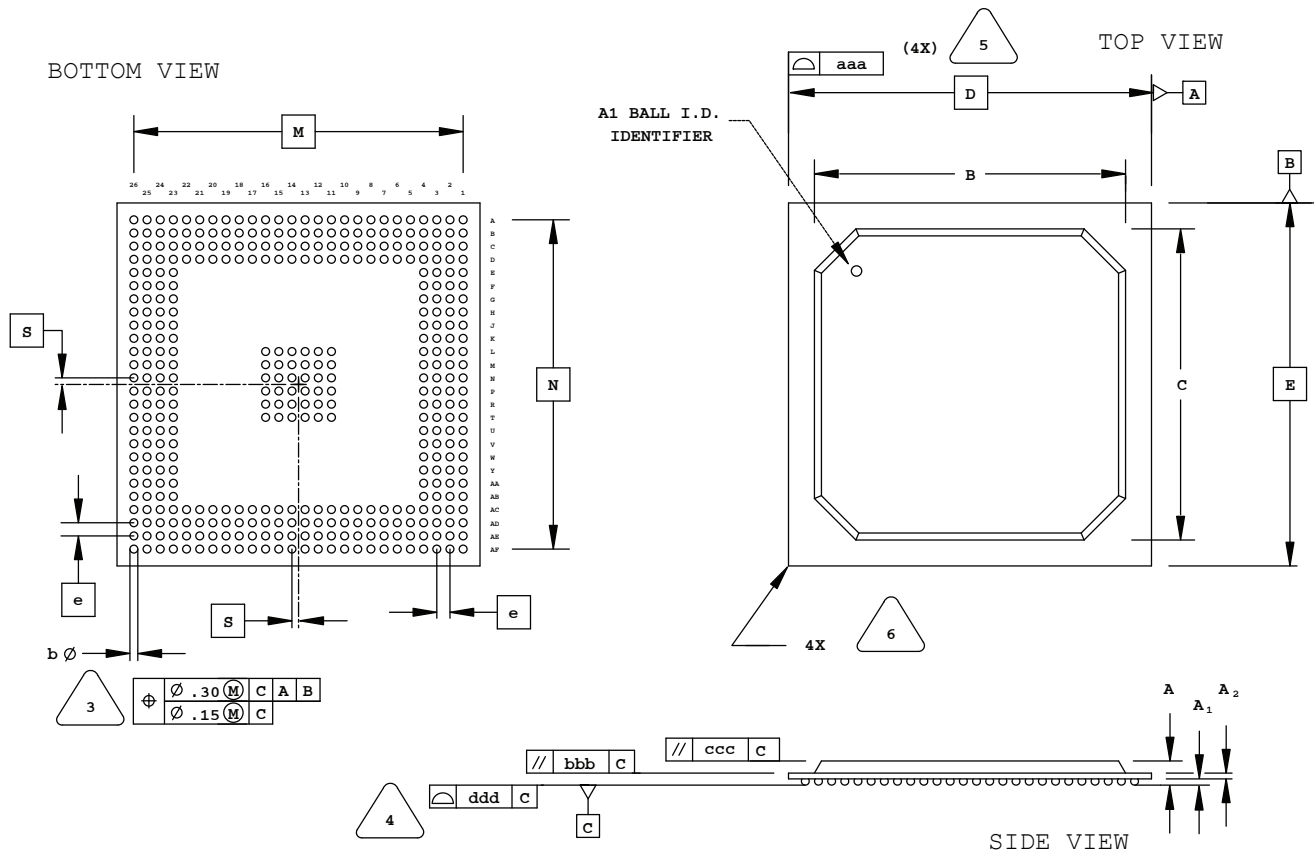
EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.70
A1	0.50	0.65	0.80
A2	0.80	0.90	1.00
D/E	31.00 BSC		
M/N	29.21 BSC		
S	0.635 BSC		
b	0.60	0.75	0.90
e	1.27 BSC		
Q	0.25	-	-
A4	0.10	-	-
aaa	-	-	0.20
bbb	-	-	0.25
ddd	-	-	0.20



## 388-Ball BGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

- DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
- ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM **C**



PRIMARY DATUM **C** AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.

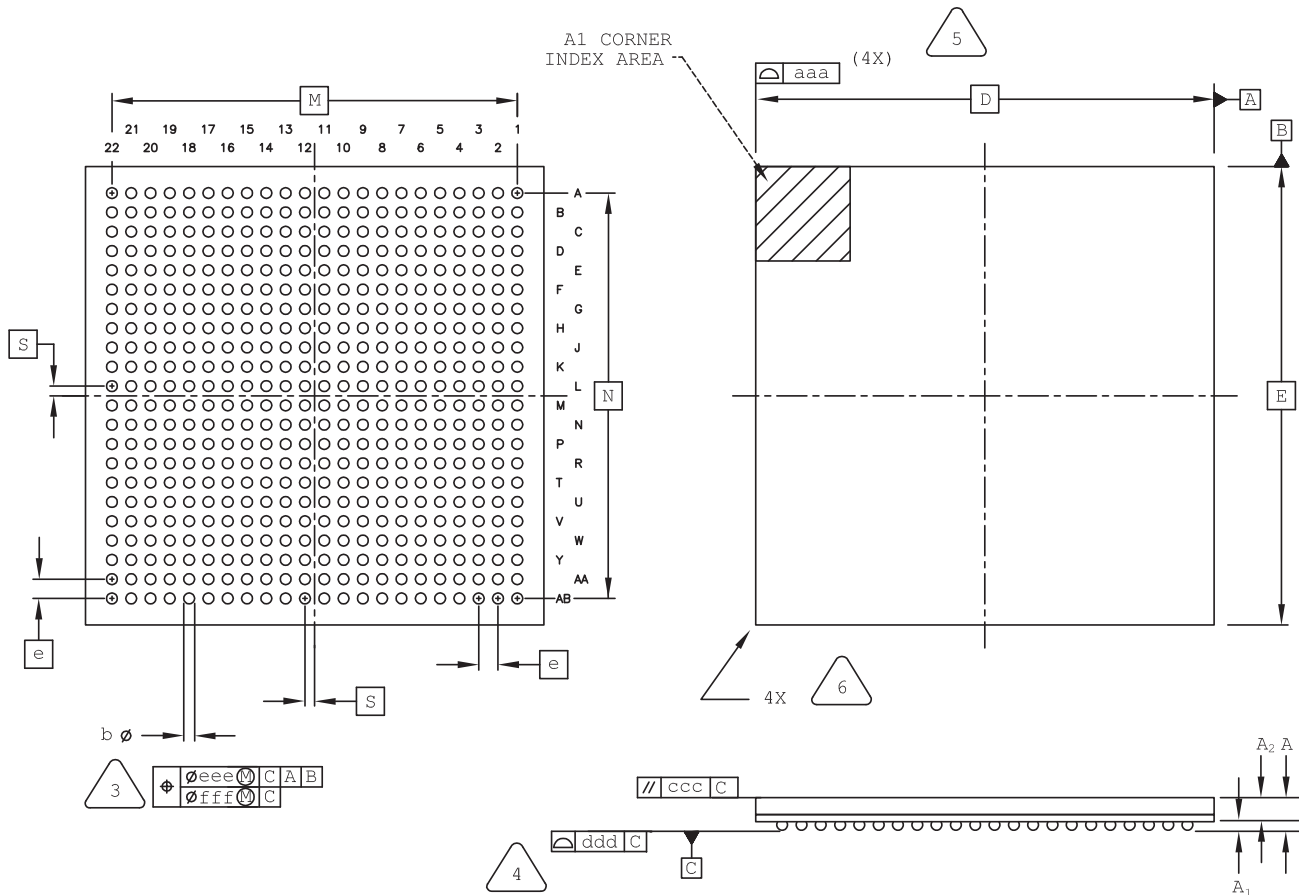


EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	1.90	2.80	3.25
A1	0.50	0.65	0.80
A2	0.28	0.54	0.80
B/C	29.80	31.80	33.80
D/E	35.00 BSC		
M/N	31.75 BSC		
S	0.635 BSC		
b	0.60	0.75	0.90
e	1.27 BSC		
aaa	-	-	0.20
bbb	-	-	0.25
ccc	-	-	0.35
ddd	-	-	0.20

## 484-Ball caBGA Package (19x19 mm Body)

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.

2. ALL DIMENSIONS ARE IN MILLIMETERS.

3. DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM [C]

4. PRIMARY DATUM [C] AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.

5. BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.

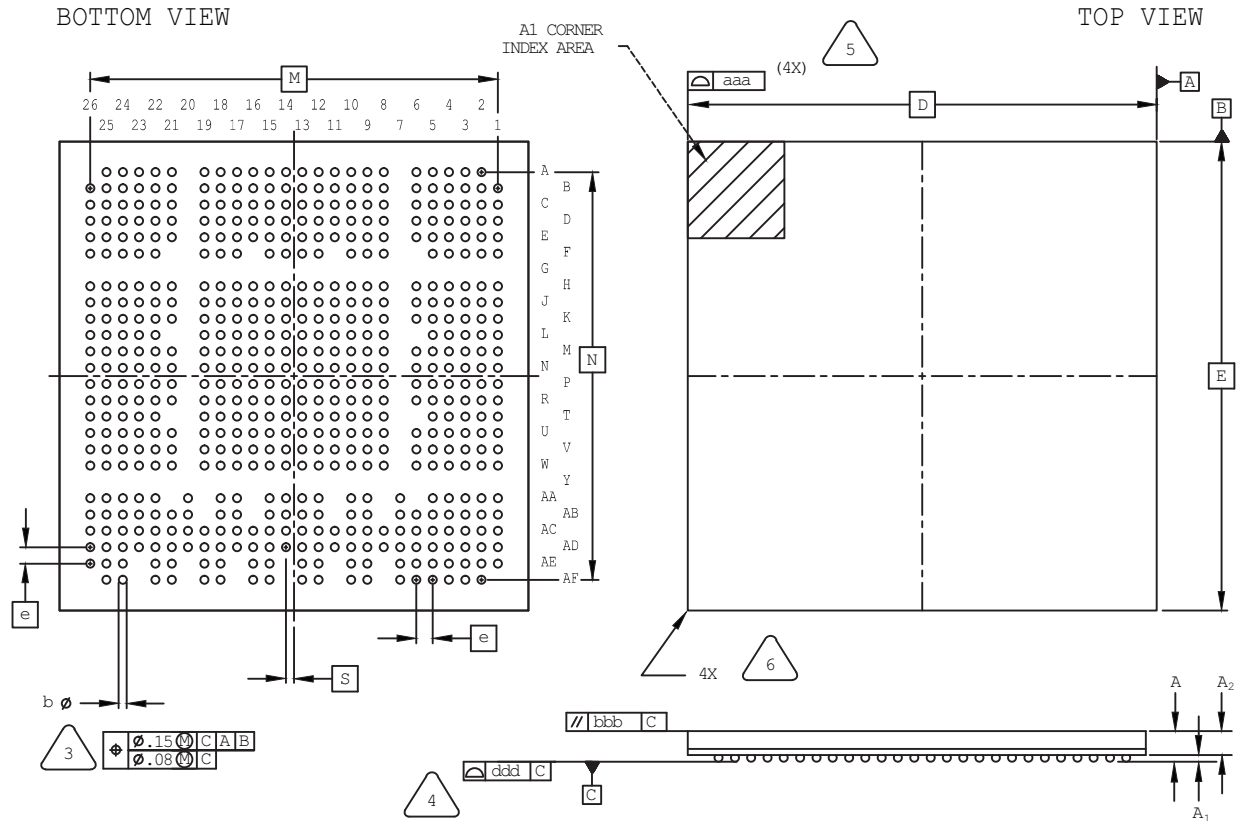
6. EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

7. JEDEC REFERENCE: MO-275A

SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.70
A1	0.25	-	-
A2	0.65	-	-
D/E	19.0 BSC		
M/N	16.8 BSC		
S	0.40 BSC		
b	0.40	0.45	0.50
e	0.80 BSC		
aaa	-	-	0.15
ccc	-	-	0.20
ddd	-	-	0.20
eee	-	-	0.15
fff	-	-	0.08

# 554-Ball caBGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

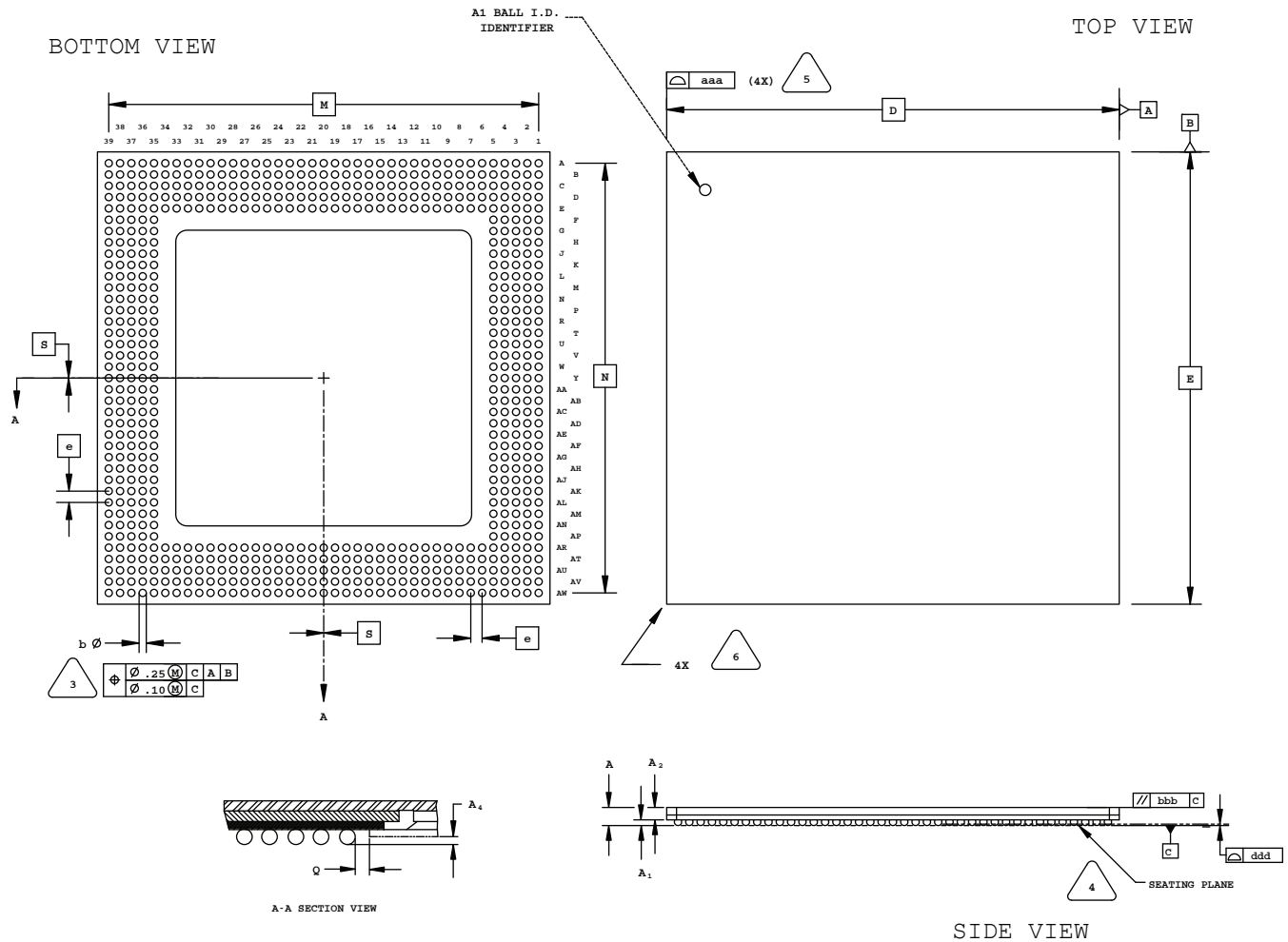
- DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
- ALL DIMENSIONS ARE IN MILLIMETERS.

- DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM [C]
- PRIMARY DATUM [C] AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.
- BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.
- EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.76
A1	0.25	0.30	0.35
A2	0.80	-	-
D/E	23.0 BSC		
M/N	20.0 BSC		
S	0.40 BSC		
b	0.35	0.40	0.45
e	0.80 BSC		
aaa	-	-	0.15
bbb	-	-	0.20
ddd	-	-	0.12

# 680-Ball fpSBGA Package

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

- DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
- ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM **C**



PRIMARY DATUM **C** AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.

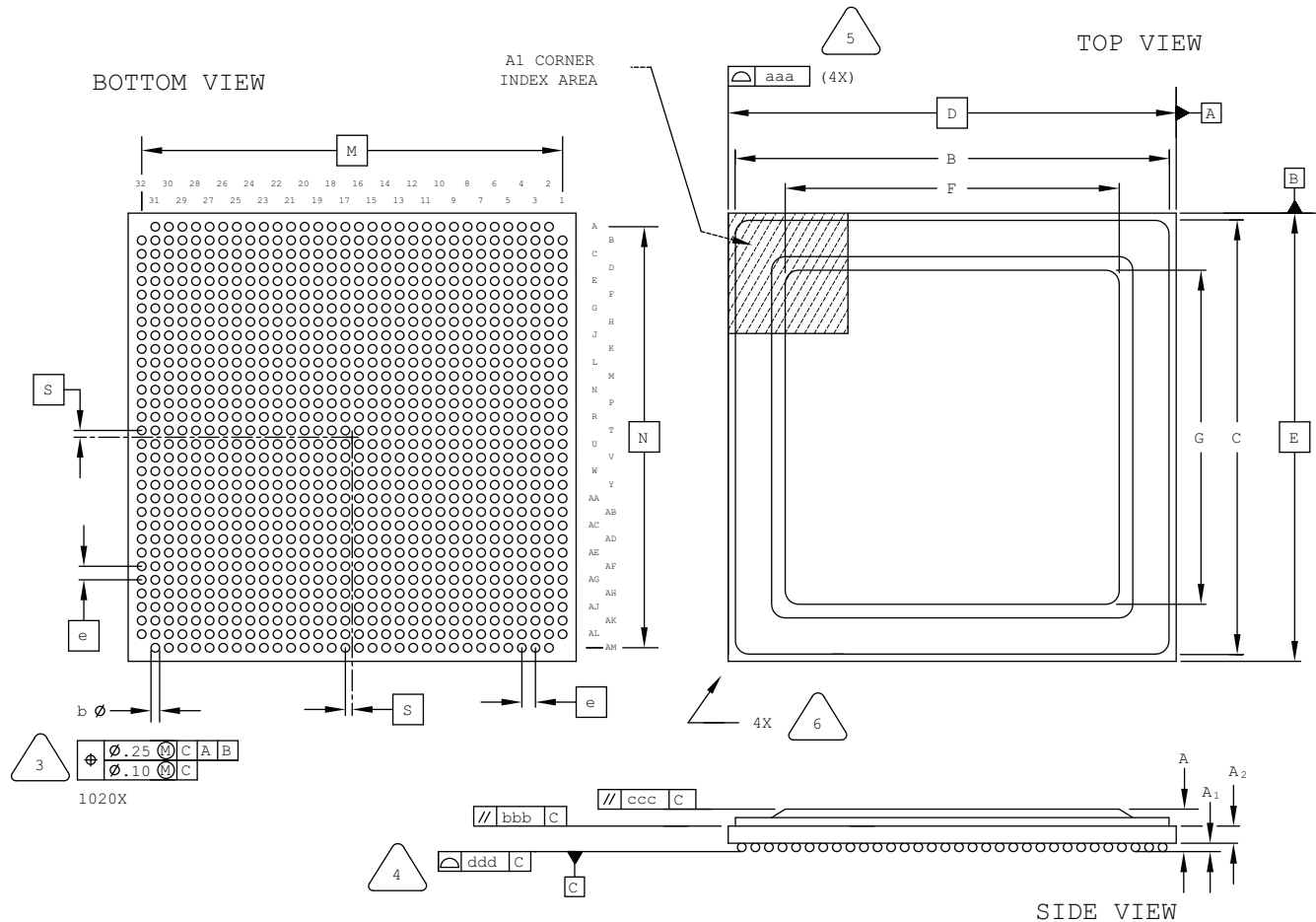


EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.70
A1	0.45	0.53	0.60
A2	0.90	0.98	1.05
D/E	40.00 BSC		
M/N	38.00 BSC		
S	0.00 BSC		
b	0.50	0.65	0.80
e	1.00 BSC		
Q	0.25	-	-
A4	0.10	-	-
aaa	-	-	0.20
bbb	-	-	0.25
ddd	-	-	0.20

# 1020-Ball Organic fcBGA Package Rev. 2

Dimensions in Millimeters



NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
2. ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM [C]



PRIMARY DATUM [C] AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.



EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

SYMBOL	MIN.	NOM.	MAX.
A	2.55	2.90	3.25
A1	0.40	0.50	0.60
A2	1.20 REF		
B/C	32.40	32.60	32.80
D/E	33.00 BSC		
F/G	24.50	24.60	24.70
M/N	31.00 BSC		
S	0.50 BSC		
b	0.50	0.60	0.70
e	1.00 BSC		
aaa	-	-	0.20
bbb	-	-	0.25
ccc	-	-	0.35
ddd	-	-	0.20