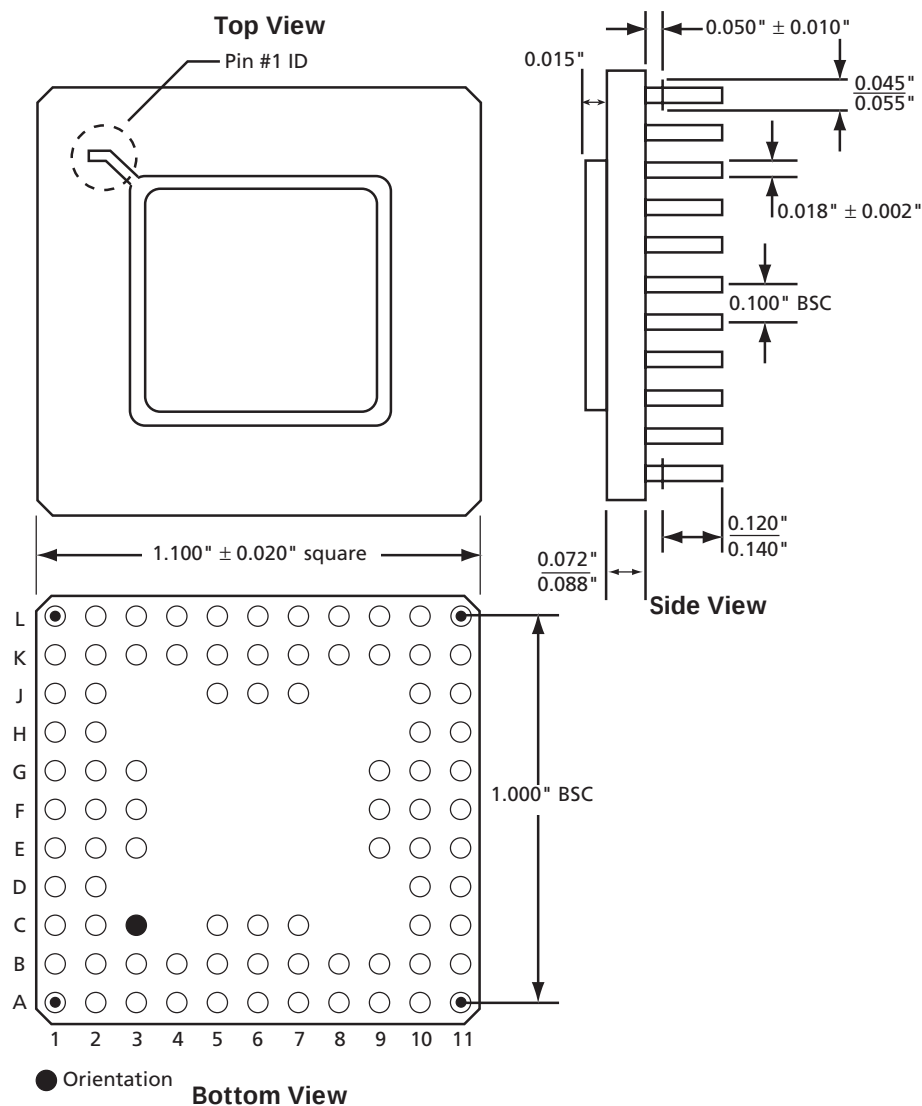


Package Mechanical Drawings

Ceramic Pin Grid Array

84-Pin CPGA



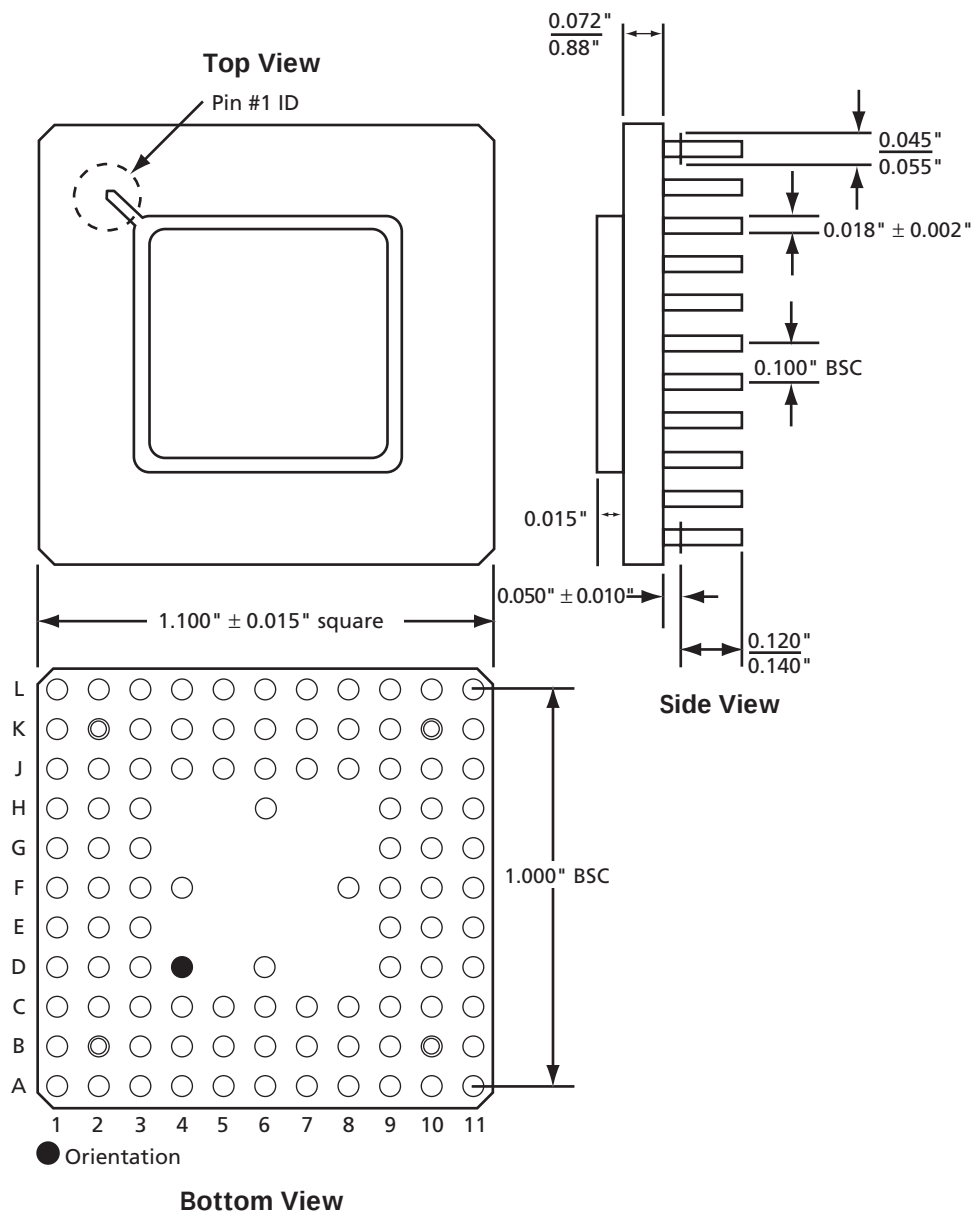
Note:

1. All dimensions are in inches unless otherwise stated.
2. BSC—Basic Spacing between Centers.

Supported Devices	
A1010B	A1020B

Ceramic Pin Grid Array

100-Pin CPGA



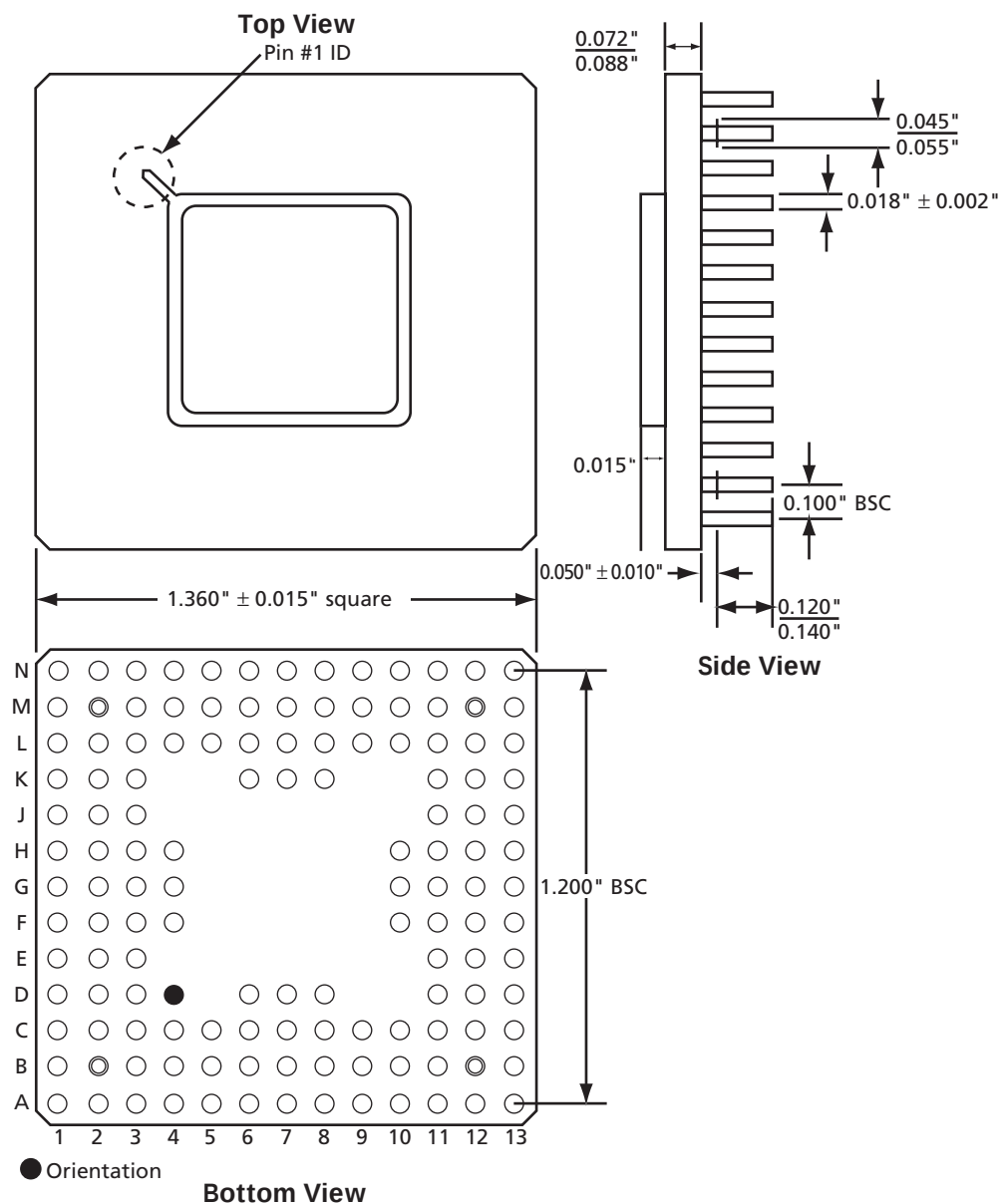
Note:

1. All dimensions are in inches unless otherwise stated.
2. BSC—Basic Spacing between Centers.

Supported Devices	
A1225XL	A1415A

Ceramic Pin Grid Array

132-Pin CPGA



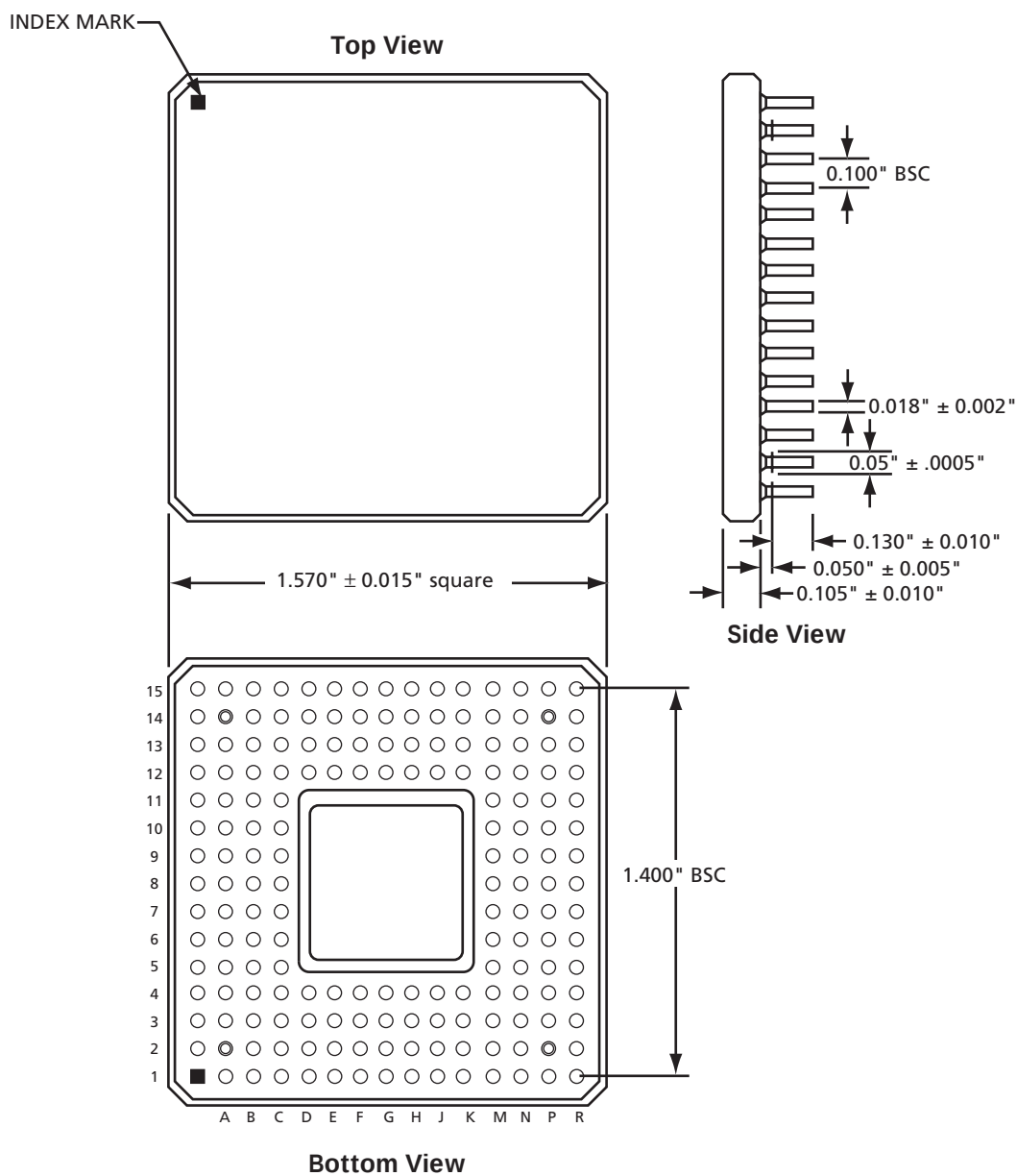
Note:

1. All dimensions are in inches unless otherwise stated.
2. BSC—Basic Spacing between Centers.

Supported Devices	
A1240A	A1240XL

Ceramic Pin Grid Array

175-Pin CPGA



Note:

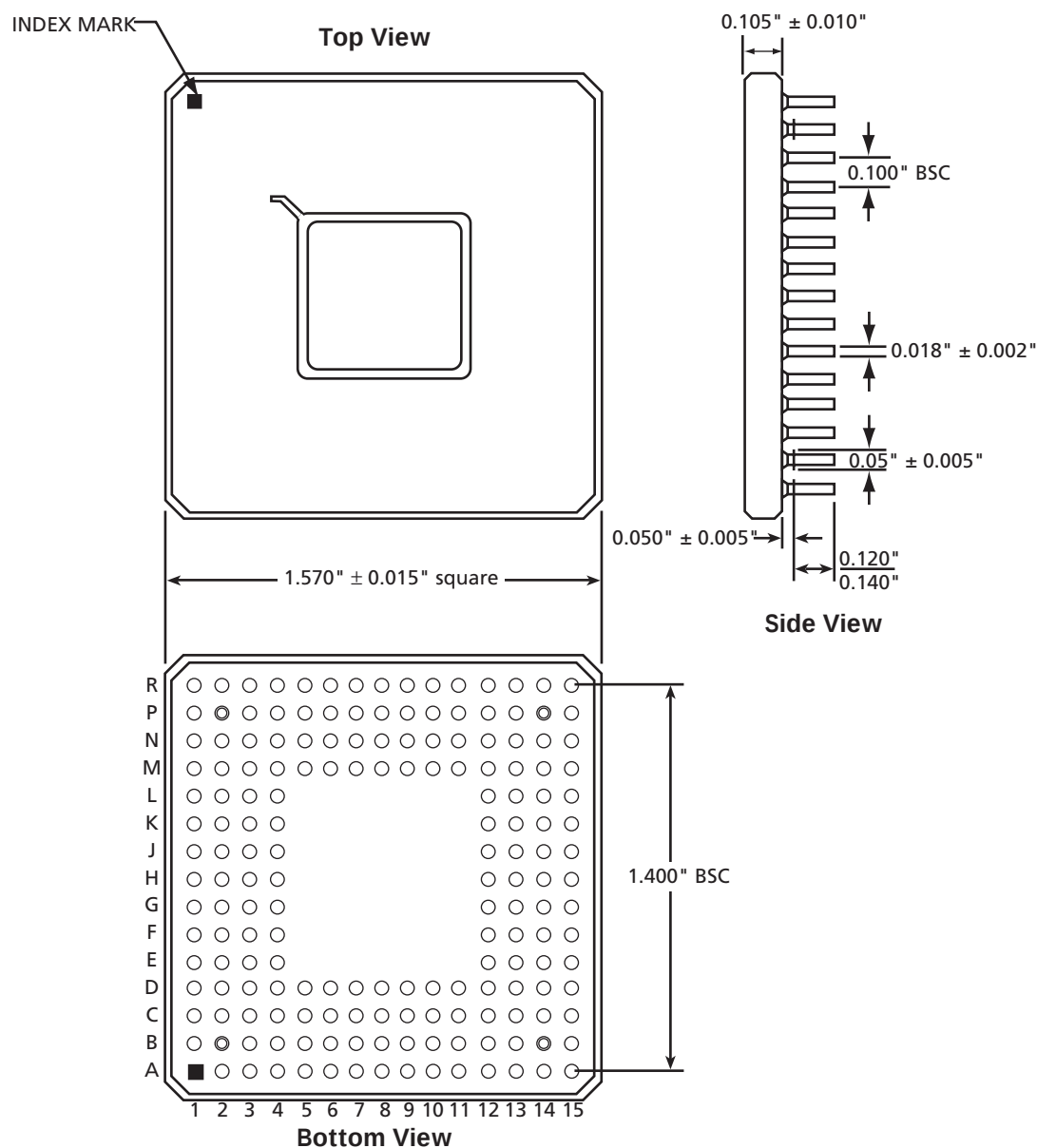
1. All dimensions are in inches unless otherwise stated.
2. BSC—Basic Spacing between Centers.

Supported Device

A1440A

Ceramic Pin Grid Array

176-Pin CPGA



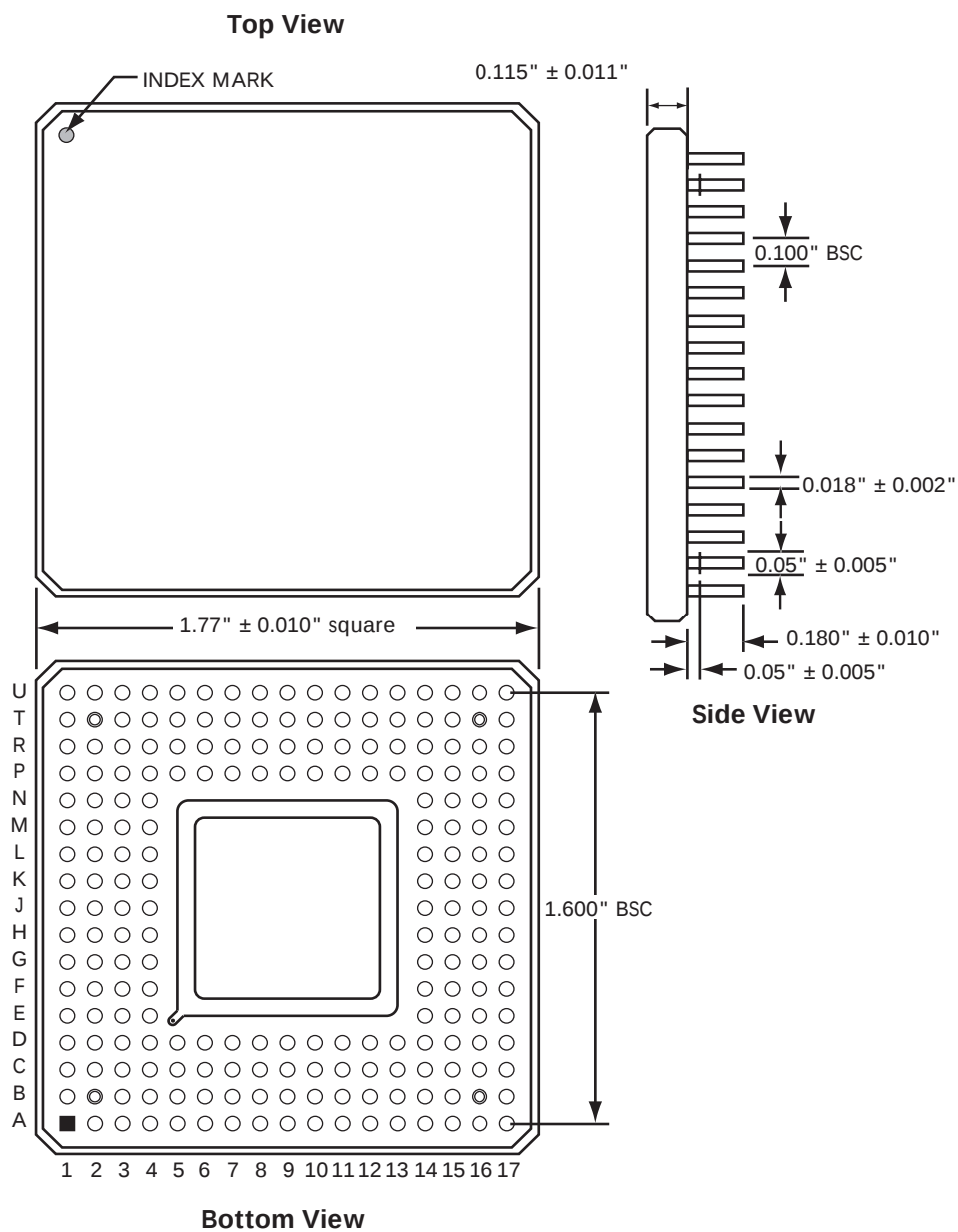
Note:

1. All dimensions are in inches unless otherwise stated.
2. BSC—Basic Spacing between Centers.

Supported Devices	
A1280A	A1280XL

Ceramic Pin Grid Array

207-Pin CPGA



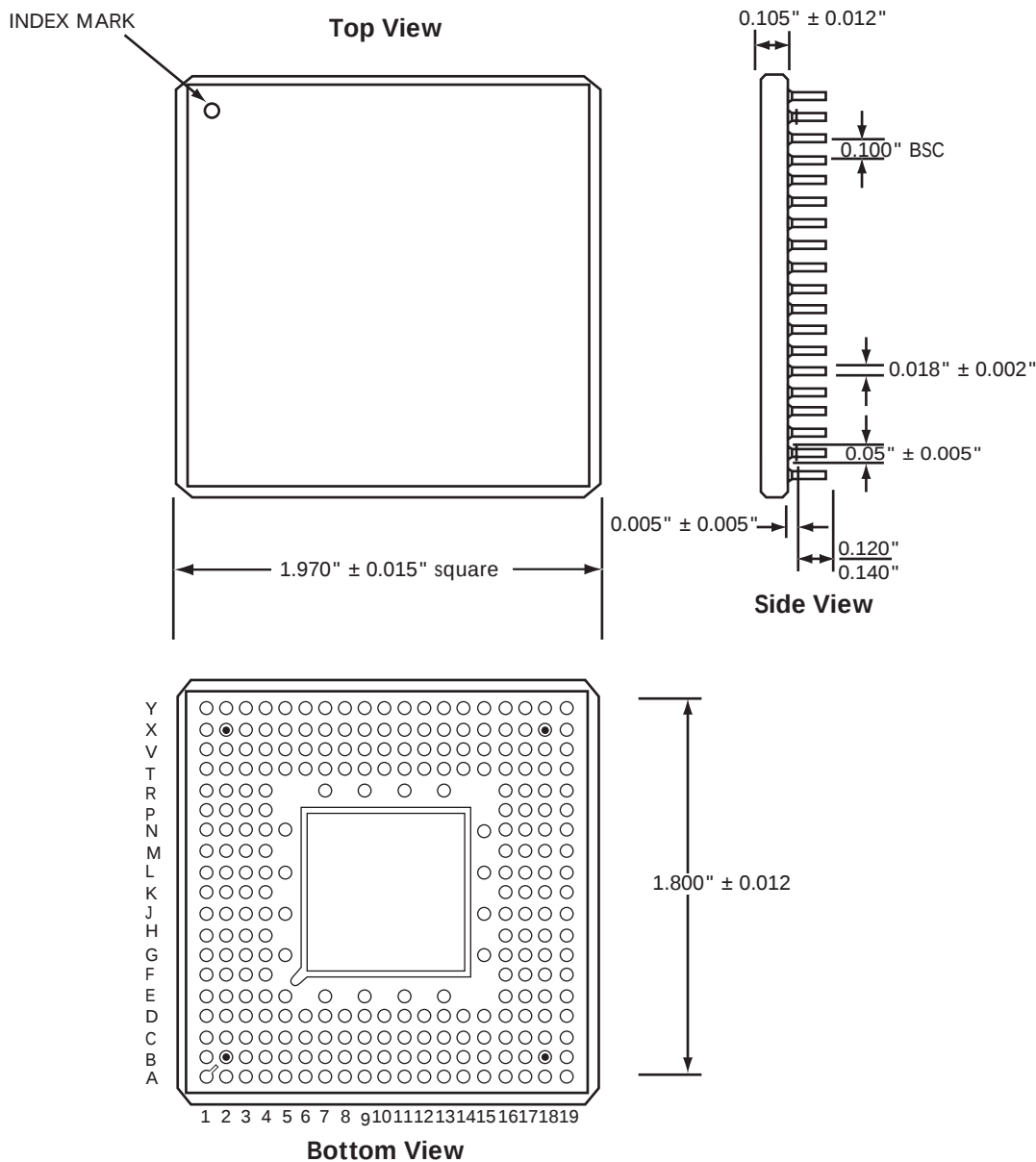
Note:

1. All dimensions are in inches unless otherwise stated.
2. BSC—Basic Spacing between Centers.

Supported Device
A1460A

Ceramic Pin Grid Array

257-Pin CPGA



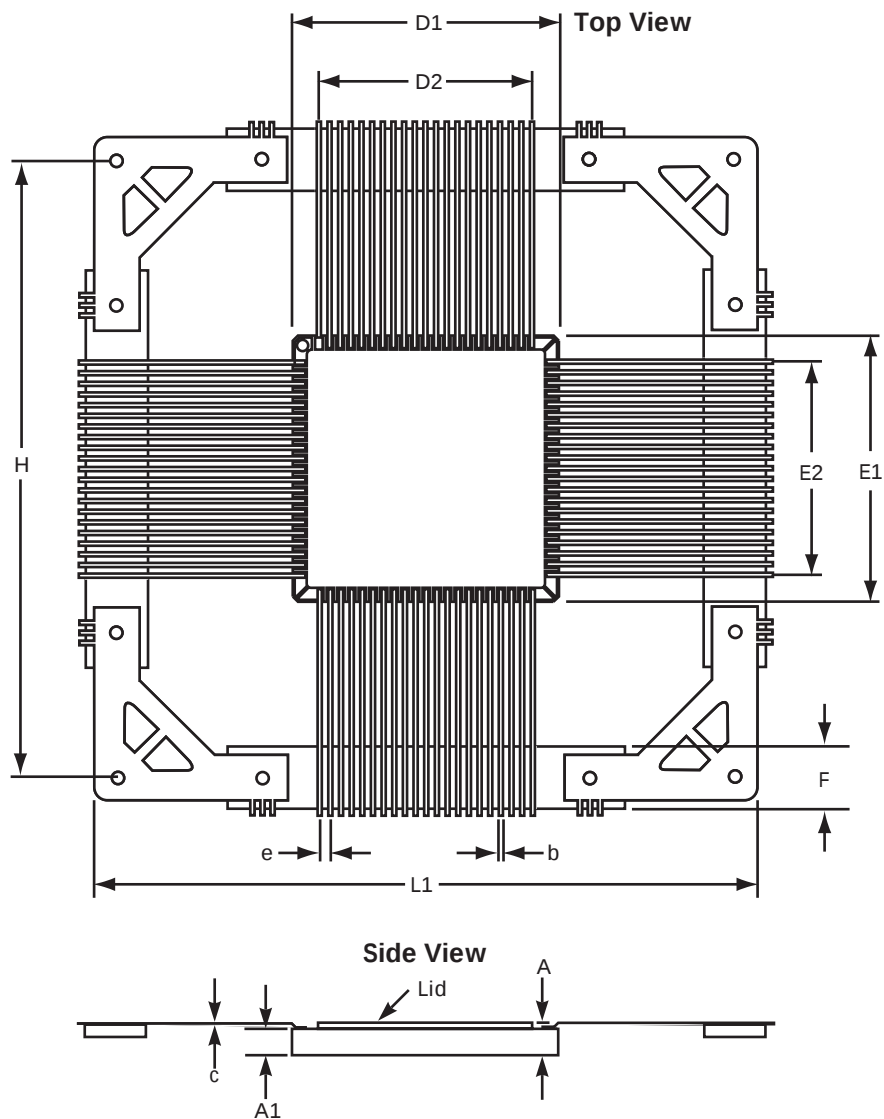
Note:

1. All dimensions are in inches unless otherwise stated.
2. BSC—Basic Spacing between Centers.

Supported Device
A14100A

Ceramic Quad Flat Pack

84-Pin CQFP



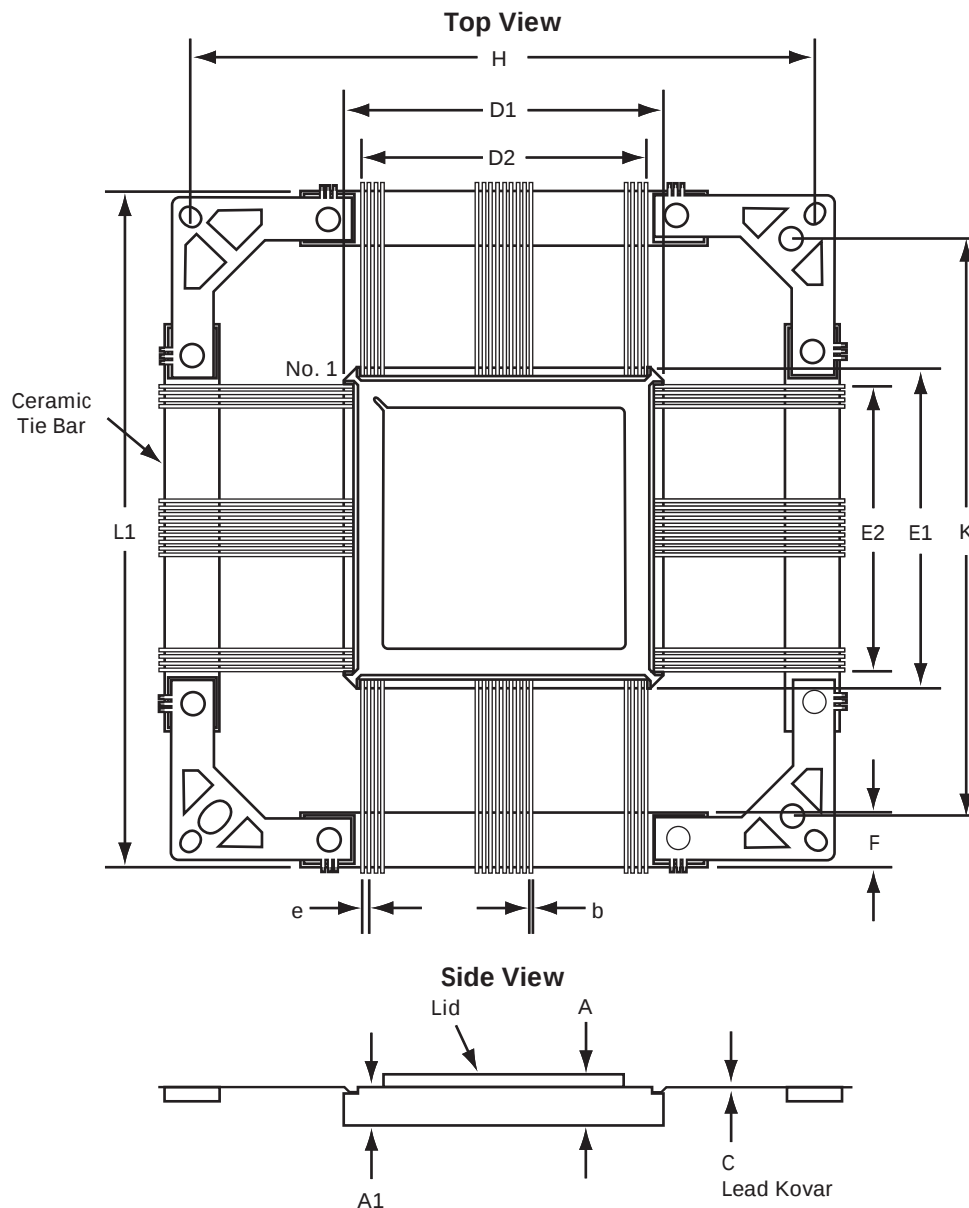
Note:

1. Dimensions are in inches. Please see the "[Ceramic Quad Flat Pack without Heat Sink Dimensions](#)" on page 15 for the dimensions.
2. Seal Ring and Lid are connected to Ground.
3. Lead material is Kovar with gold plate over nickel.
4. Packages are shipped unformed with the ceramic tie bar in a test carrier.

Supported Devices			
A1020B	A32100DX	RH1020	RT1020

Ceramic Quad Flat Pack

132-, 172-, 196-, 208-, 256- and 352-Pin CQFP—Cavity Up without Heat Sink



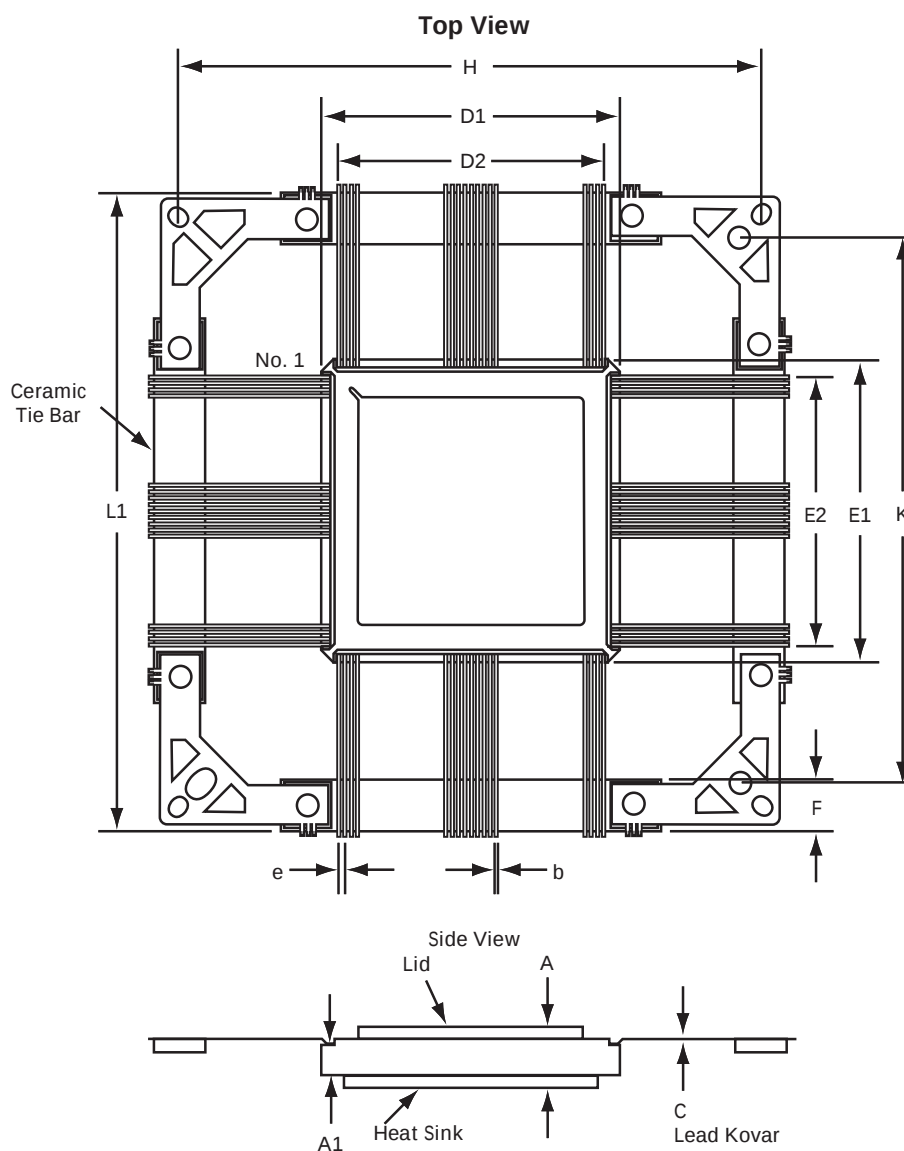
Note:

1. All dimensions are in inches except CQ208, CQ256 and CQ352 which are in millimeters. Please see the "[Ceramic Quad Flat Pack without Heat Sink Dimensions](#)" on page 15 for the dimensions.
2. Outside leadframe holes (from dimension H) are circular for the CQ208, CQ256 and CQ352.
3. Seal ring and lid are connected to Ground.
4. Packages are shipped unformed with the ceramic tie bar in a test carrier.

Supported Devices					
CQ132	CQ172	CQ196	CQ208	CQ256	CQ352
A1425A	A1280A	A1460A	A42MX36	A14100A	AX2000
RT1425A	RH1280	RT1460A	A54SX16	A54SX16	APA1000
	RT1280A		A54SX32	A54SX32A	RTAX1000S
			A54SX32A	A54SX72A	RTAX2000S
			A54SX72A	RT54SX32S	
			APA1000	RT14100A	
			RT54SX32S		

Ceramic Quad Flat Pack

208- and 256-Pin CQFP—Cavity Up with Heat Sink



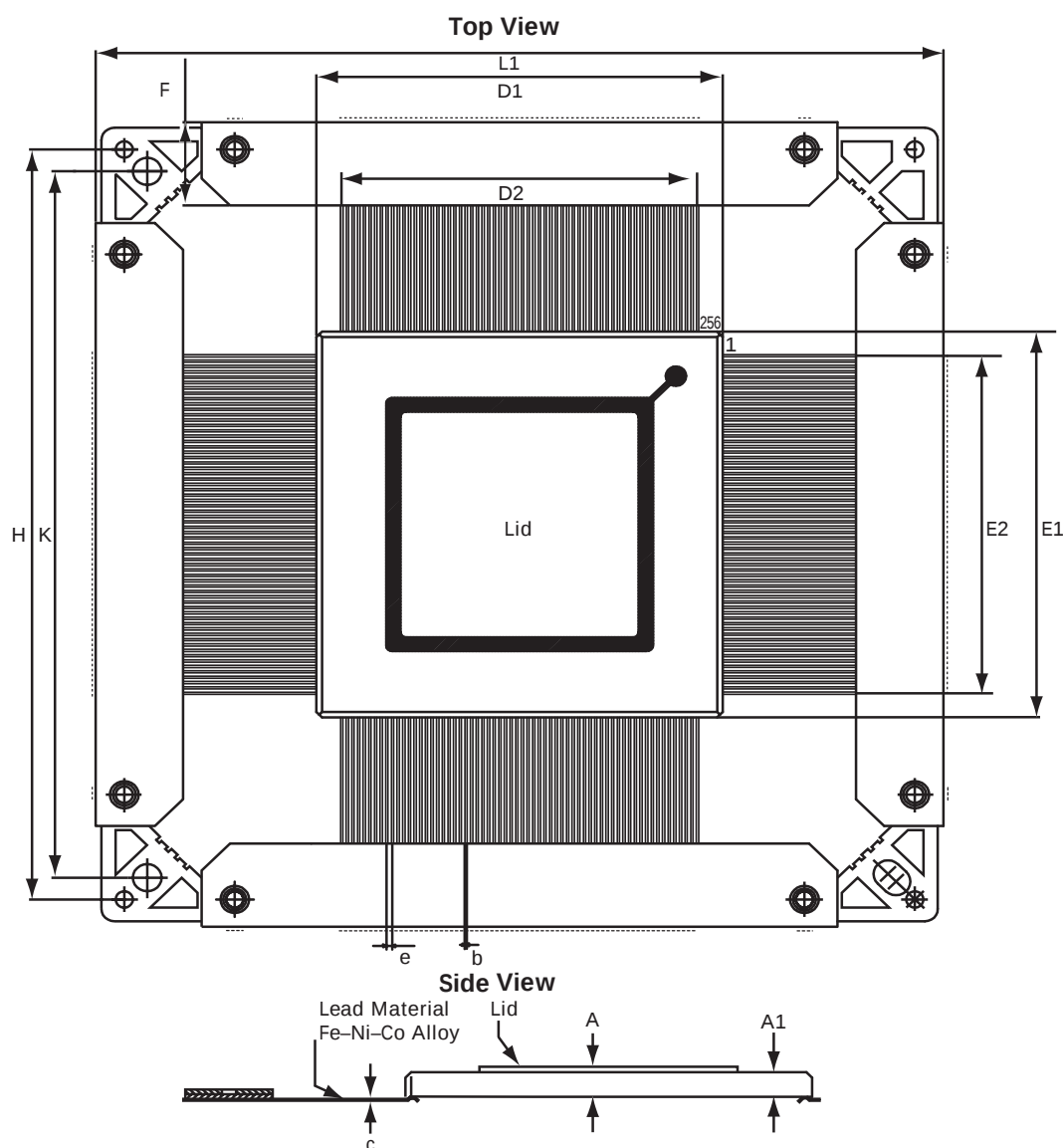
Note:

1. All dimensions are in inches except CQ208, CQ256 and CQ352 which are in millimeters. Please see the ["Ceramic Quad Flat Pack without Heat Sink Dimensions"](#) on page 15 for the dimensions.
2. Outside leadframe holes (from dimension H) are circular for the CQ208, CQ256 and CQ352.
3. Seal ring and lid are connected to Ground.
4. Lead material is Kovar with minimum 60 microinches gold over nickel.
5. Packages are shipped unformed with the ceramic tie bar.

Supported Devices	
CQ208	CQ256
A32200DX RT54SX72S	A54SX16 A54SX32 RT54SX72S

Ceramic Quad Flat Pack

256-Pin CQFP — Cavity Down without Heat Sink



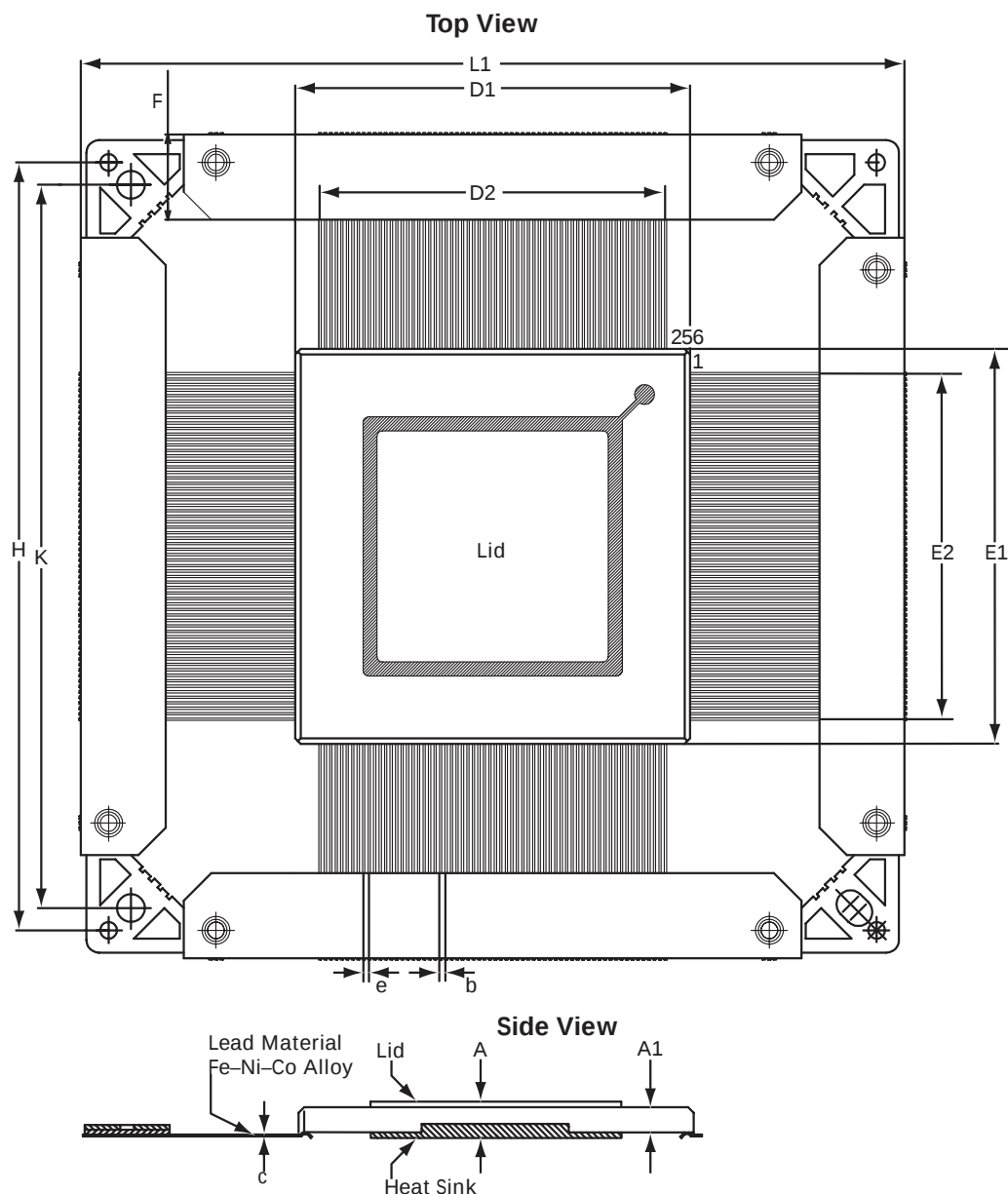
Note:

1. Dimensions are in millimeters. Please see the "[Ceramic Quad Flat Pack with Heat Sink Dimensions](#)" on page 16 for the dimensions.
2. Seal Ring and Lid are connected to Ground.
3. Lead material is Kovar with gold plate over nickel.
4. Packages are shipped unformed with the ceramic tie bar.
5. Package is cavity down, with the lid facing the bottom of the package. However the leads can be formed on either side if the application requires the lid to be facing the top.

Supported Device
A42MX36

Ceramic Quad Flat Pack

256-Pin CQFP — Cavity Down with Heat Sink



Note:

1. Packages are shipped unformed with the ceramic tie bar in a test carrier.
2. Dimensions are in millimeters. Please see the "[Ceramic Quad Flat Pack with Heat Sink Dimensions](#)" on page 16 for the dimensions.

Supported Device
A32200DX

Ceramic Quad Flat Pack without Heat Sink Dimensions

Jedec Equiv	CQ84			CQ132 MO-113 VAR AC			CQ172 MO-113 VAR AE			CQ196 MO-113 VAR AB		
Symbol	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.070	0.090	0.100	0.094	0.105	0.116	0.094	0.105	0.116	0.094	0.105	0.116
A1	0.060	0.075	0.080	0.080	0.090	0.100	0.080	0.090	0.100	0.080	0.090	0.100
b	0.008	0.010	0.012	0.007	0.008	0.010	0.007	0.008	0.010	0.007	0.008	0.010
c	0.004	0.006	0.008	0.004	0.006	0.008	0.004	0.006	0.008	0.004	0.006	0.008
D1/E1	0.640	0.650	0.660	0.940	0.950	0.960	1.168	1.180	1.192	1.336	1.350	1.364
D2/E2	0.500 BSC			0.800 BSC			1.050 BSC			1.200 BSC		
e	0.025 BSC			0.025 BSC			0.025 BSC			0.025 BSC		
F	0.130	0.140	0.150	0.325	0.350	0.375	0.175	0.200	0.225	0.175	0.200	0.225
H	1.460 BSC			2.320 BSC			2.320 BSC			2.320 BSC		
K	—			2.140 BSC			2.140 BSC			2.140 BSC		
L1	1.595	1.600	1.615	2.485	2.500	2.505	2.485	2.495	2.505	2.485	2.495	2.505
Jedec Equiv	CQ208			CQ256 MO-134 VAR AB			CQ352 MO-134 VAR AE					
Symbol	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.			
A	2.30	2.80	3.30	2.30	2.80	3.30	2.43	2.66	2.89			
A1	2.00	2.30	2.80	2.00	2.30	2.80	2.05	2.28	2.51			
b	0.17	0.20	0.22	0.18	0.20	0.22	0.18	0.20	0.22			
c	0.11	0.15	0.18	0.11	0.15	0.18	0.11	0.15	0.18			
D1/E1	28.96	29.21	29.46	35.64	36.00	36.64	47.75	48.00	48.25			
D2/E2	25.5 BSC			31.5 BSC			43.51 BSC					
e	0.50 BSC			0.50 BSC			0.50 BSC					
F	7.05	7.75	8.45	7.05	7.75	8.45		5.00				
H	70.00 BSC			70.00 BSC			70.00 BSC					
K	65.90 BSC			65.90 BSC			65.90 BSC					
L1	74.60	75.00	75.40	74.60	75.00	75.40	74.60	75.00	75.40			

Note:

1. All dimensions are in inches except CQ208, CQ256 and CQ352 which are in millimeters.
2. BSC equals Basic Spacing between Centers. This is a theoretical true position dimension and so has no tolerance.

Ceramic Quad Flat Pack with Heat Sink Dimensions

Jedec Quiv	CQ208			CQ256 MO-134 VAR AB		
Symbol	Min.	Nom.	Max.	Min.	Nom.	Max.
A	2.79	3.30	3.90	2.79	3.30	3.90
A1	2.00	2.30	2.80	2.00	2.30	2.80
b	0.18	0.20	0.22	0.18	0.20	0.22
c	0.11	0.15	0.17	0.11	0.15	0.18
D1/E1	28.96	29.21	29.46	35.64	36.00	36.66
D2/E2	25.5 BSC			31.5 BSC		
e	0.50 BSC			0.50 BSC		
F	7.05	7.75	8.45	7.05	7.75	8.45
H	70.00 BSC			70.00 BSC		
K	65.90 BSC			65.90 BSC		
L1	74.60	75.00	75.40	74.60	75.00	75.40

Note:

1. All dimensions are in inches except CQ208, CQ256 and CQ352 which is in millimeters.
2. BSC equals Basic Spacing between Centers. This is a theoretical true position dimension and so has no tolerance.

The dimensions above are for reference only. For more accurate dimensions, use the dimensions in the SMD drawings for a specified device.

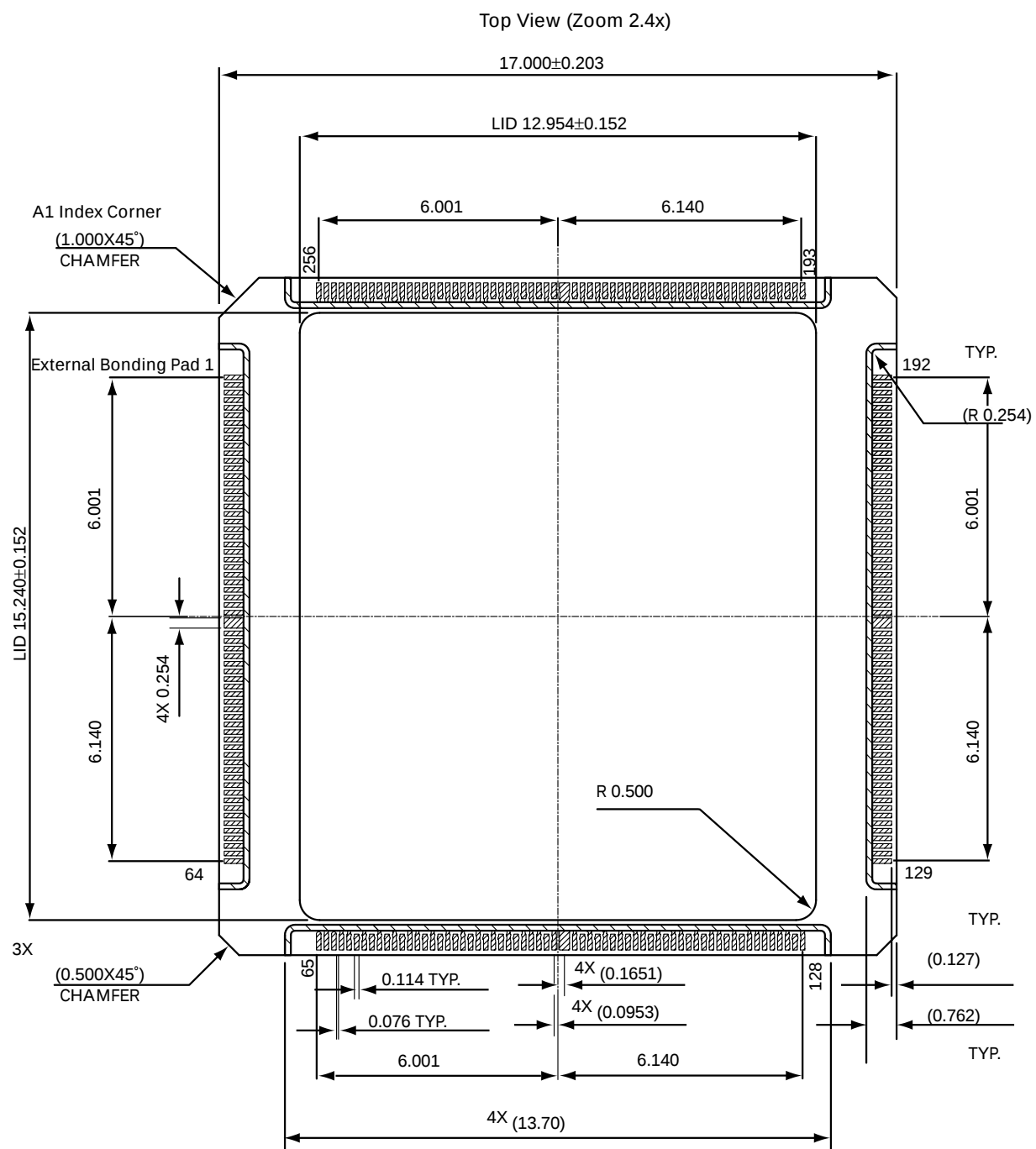
For heat sink information, refer to Actel's *Hermetic Package Mechanical (Cavity, weight, Lid size and Heat Sink size) Configuration* document located at:

<http://www.actel.com/documents/HermeticPckg.pdf>

256-Pin CCLG

RT54SX32S

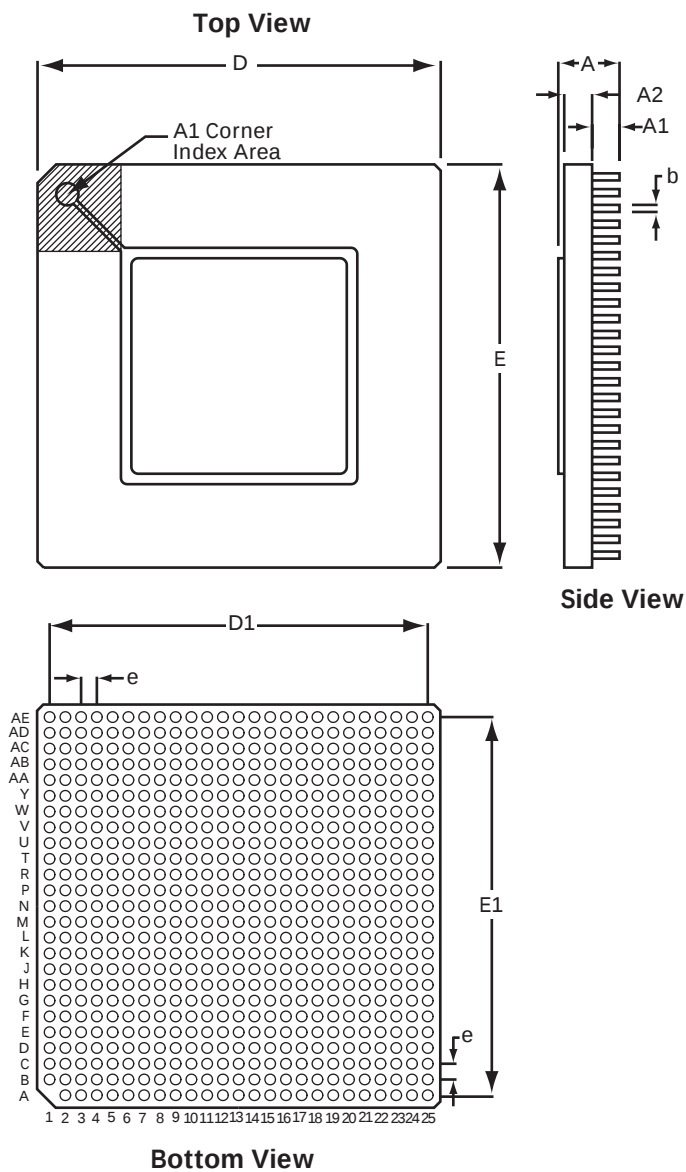
Ceramic Chip Carrier Land Grid Substrate Dimensions



CC256			
Symbol	Min.	Nom.	Max.
A	1.83	1.85	1.87
A1	1.25	1.40	1.55
D/E	16.79	17.00	17.21
D1/E1	15.00		
D2/E2	13.15	13.40	13.65
D3/E3	11.99	12.14	13.65
b	0.55	0.60	0.65
d	0.45	0.50	0.55
e	1.00 BSC		
e1	0.19 BSC		

Ceramic Column Grid Array

624-Pin CCGA



Supported Devices

AX2000

RTAX1000S

RTAX2000S

RT54SX72S

Ceramic Column Grid Array Dimensions

Jedec Equiv	CG624 MO-158 VAR BE-01		
Dimension	Min.	Nom.	Max.
A	4.51	4.94	5.37
A1	2.01	2.21	2.41
A2	2.02	2.25	2.78
b	0.45	0.55	0.65
D/E	32.30	32.50	32.70
D1/E1	30.48 BSC		
e	1.27 BSC		

Note: All dimensions are in millimeters.



Supported Devices				
PLCC 44	PLCC 68	PLCC 84		
A1010B	A1010B	A10V20B	A1020B	A3265A
A1020B	A1020B	A1225XLV	A1225A	A54SX08
A40MX02	A10V10B	A1280XLV	A1240A	A32100DX
A40MX04	A10V20B	A2140XLV	A1280A	A32140DX
	A40MX02	A14V15A	A1225XL	A40MX04
	A40MX04	A14V25A	A1240XL	A42MX09
		A14V40A	A1280XL	A42MX16
		A3265DXV	A1415A	A42MX24
		A32100DXV	A1425A	
		A32140DXV	A1440A	

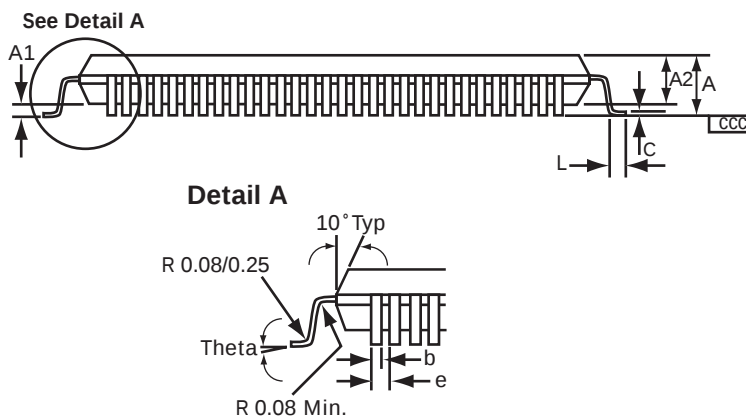
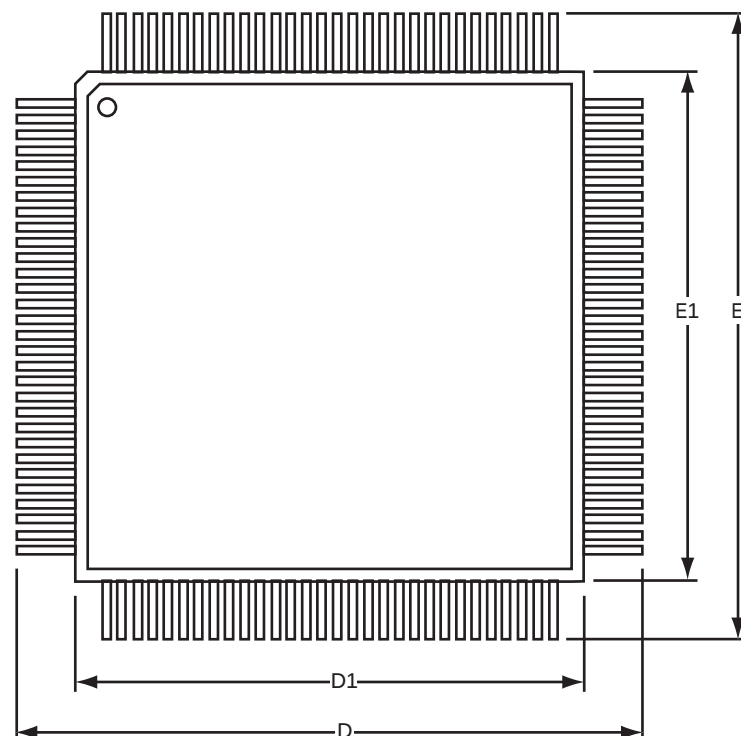
Plastic Leaded Chip Carrier Dimensions

Jedec Equiv	PLCC 44 MS-018 VAR AC			PLCC 68 MS-018 VAR AE			PLCC 84 MS-018 VAR AF		
Dimension	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.165	0.172	0.180	0.165	0.172	0.180	0.165	0.172	0.180
A1	0.090	0.105	0.120	0.090	0.105	0.120	0.090	0.105	0.120
B	0.013	–	0.021	0.013	–	0.021	0.013	–	0.021
B2	0.026	–	0.032	0.026	–	0.032	0.026	–	0.032
D/E	0.685	0.690	0.695	0.985	0.990	0.995	1.185	1.190	1.195
D1/E1	0.650	0.653	0.656	0.950	0.954	0.958	1.150	1.154	1.158
D2/E2	0.590	0.610	0.630	0.890	0.910	0.930	1.090	1.110	1.130
e1	0.050 BSC			0.050 BSC			0.050 BSC		

Note:

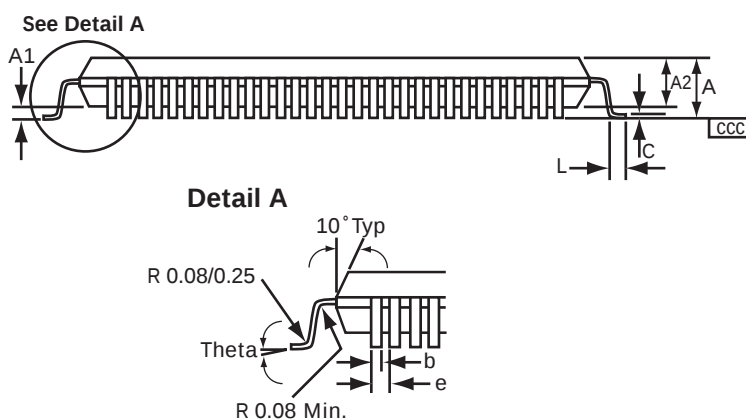
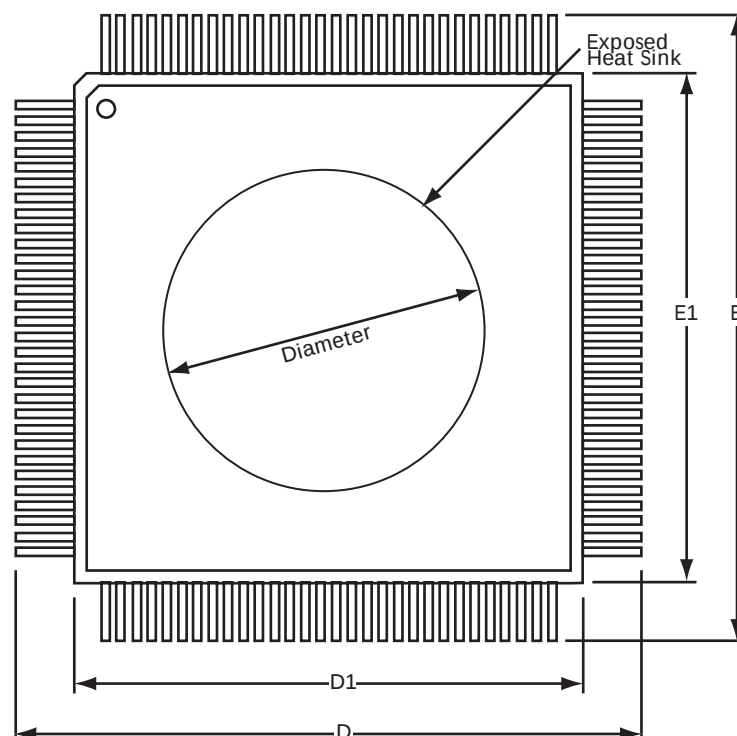
1. All dimensions are in inches.
2. BSC—Basic Spacing between Centers.

Plastic Quad Flat Pack (PQFP, TQFP, VQFP)



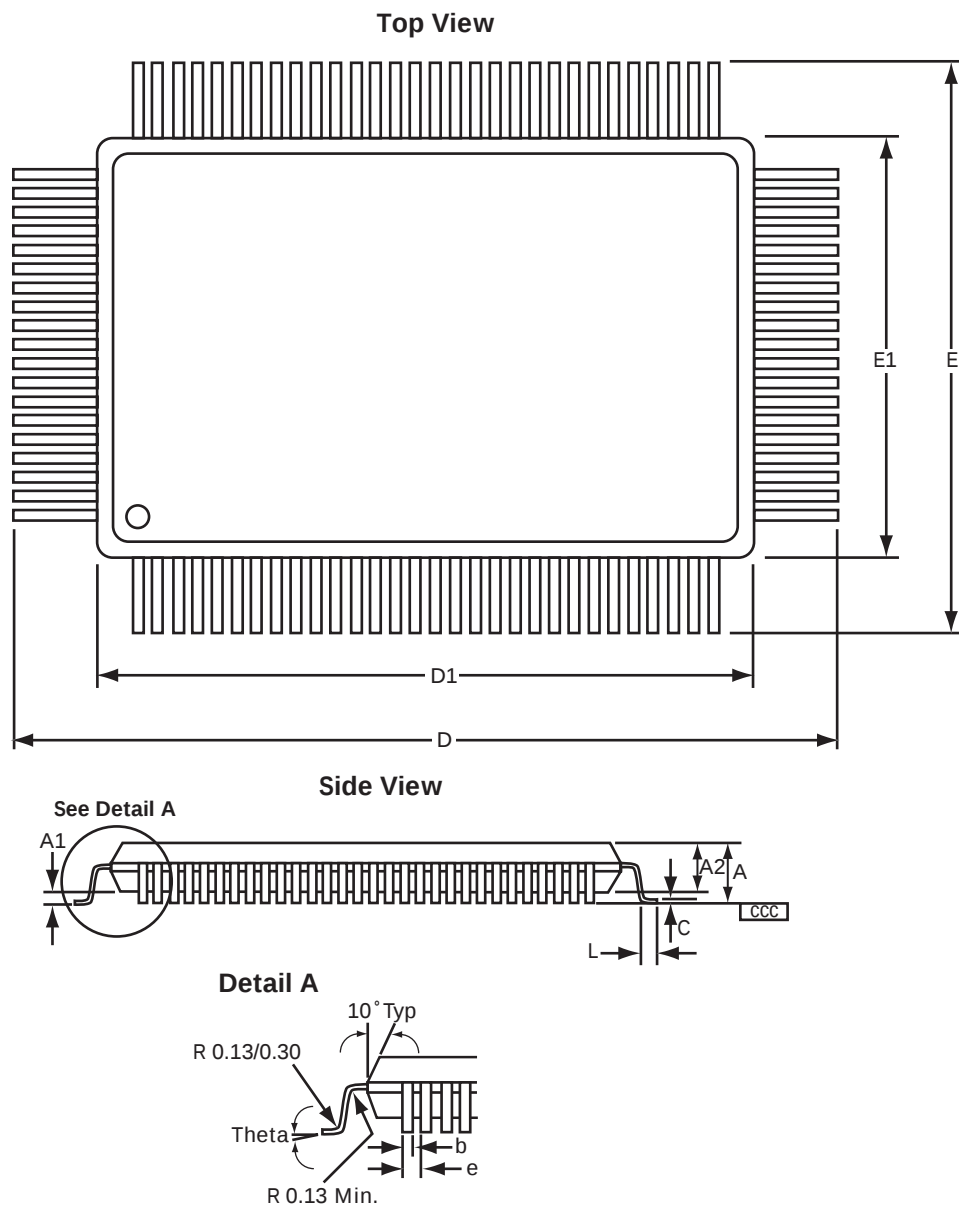
Note: Dimensions are in millimeters. Please see the "Plastic Quad Flat Pack (PQFP) Dimensions" on page 28, "Plastic Quad Flat Pack (TQFP) Dimensions" on page 30, and "Plastic Quad Flat Pack (VQFP) Dimensions" on page 30 for the dimensions.

Plastic Quad Flat Pack (RQFP)



Note: Dimensions are in millimeters. Please see the "Plastic Quad Flat Pack (RQFP/PQFP) Dimensions" on page 28 for the dimensions.

Plastic Quad Flat Pack Rectangular Package (PQ100)



Note: Dimensions are in millimeters. Please see the "Plastic Quad Flat Pack (PQFP) Dimensions" on page 28 for the dimensions.

Supported Devices								
RQFP 208	PQFP 100	PQFP 144	PQFP 160	PQFP 208			RQFP 240	PQFP 240
A14V100A	A1010B	A1240A	A14V25A	A1280XL	A54SX32A	APA1000	A32200DX	A42MX36
A14100A	A1020B	A1240XL	A1425A	A32100DX	A54SX72A	A1460A	A32300DX	
A32200DX	A1225A		A14V40A	A32140DX	AX250	A14V60A	A32200DXV	
A32300DX	A1225XL		A1440A	A32200DX	AX500		A32300DXV	
A32300DXV	A1240XL		A14V60A	A32200DXV	A500K050			
	A1415A		A1460A	A42MX16	A500K130			
	A1425A		A1280A	A42MX24	A500K180			
	A3265DX		A1280XL	A42MX36	A500K270			
	A40MX02		A3265DX	A54SX08	APA075			
	A40MX04		A32100DX	A54SX16	APA150			
	A42MX09		A32140DX	A54SX16P	APA300			
	A42MX16		A42MX09	A54SX32	APA450			
			A42MX16	A54SX08A	APA600			
			A42MX24	A54SX16A	APA750			

Plastic Quad Flat Pack (PQFP) Dimensions

Jedec Equiv	PQFP 100 MS-022 VAR GC-1			PQFP 144 MS-022 VAR DC-1			PQFP 160 MS-022 VAR DD-1		
Dimension	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
A			3.40			4.10			4.10
A1	0.25		0.5	0.25		0.50	0.25	0.33	0.50
A2	2.50	2.70	2.9	3.20	3.40	3.60	3.20	3.40	3.60
b	0.22		0.40	0.22		0.40	0.22		0.40
c	0.11		0.23	0.11		0.23	0.11		0.23
D	23.20 BSC			31.20 BSC			31.20 BSC		
D1	20.00 BSC			28.00 BSC			28.00 BSC		
E	17.20 BSC			31.20 BSC			31.20 BSC		
E1	14.00 BSC			28.00 BSC			28.00 BSC		
e	0.65 BSC			0.65 BSC			0.65 BSC		
L	0.73	0.88	1.03	0.73	0.88	1.03	0.73	0.88	1.03
ccc	0.10			0.10			0.10		
Theta	0		7 deg	0		7 deg	0		7 deg

Plastic Quad Flat Pack (RQFP/PQFP) Dimensions

Jedec Equiv	RQFP 208/PQFP 208 MS-029 VAR FA-1			RQFP 240/PQFP 240 MS-029 VAR GA		
Dimension	Min.	Nom.	Max.	Min.	Nom.	Max.
A			4.10			4.10
A1	0.25		0.50	0.25		0.50
A2	3.20	3.40	3.60	3.20	3.40	3.60
b	0.17		0.27	0.17		0.27
c	0.09		0.20	0.09		0.20
D/E	30.60 BSC			34.60 BSC		
D1/E1	28.00 BSC			32.10 BSC		
e	0.50 BSC			0.50 BSC		
L	0.45	0.60	0.75	0.50	0.60	0.75
ccc	0.10			0.10		
Theta	0	3.50	8 deg	0	3.50	8 deg
Diameter	19.82	20.32	20.82	23.63	24.13	24.63

Note:

1. All dimensions are in millimeters.
2. BSC—Basic Spacing between Centers.

Supported Devices						
TQFP 64	TQFP 100	TQ 144	TQFP 176		VQFP 80	VQFP 100
eX64	APA075	A54SX08	A1240A	A42MX09	A1010B	A1225XL
eX128	APA150	A54SX16P	A1440A	A42MX16	A10V10B	A1415A
	A54SX08A	A54SX32	A1460A	A42MX24	A1020B	A1425A
	A54SX16A	A54SX08A	A14V40A	A54SX08	A10V20B	A1440A
	A54SX32A	A54SX16A	A14V60A	A54SX16	A40MX02	A14V15A
	eX64	A54SX32A	A1240XL	A54SX16P	A40MX04	A14V25A
	eX128	APA075	A1280XL	A54SX32		A14V40A
	eX256		A1280XLV	A54SX32A		A42MX09
			A1240XLV			A42MX16
			A3265DX			A54SX16
			A32140DX			A54SX16P
			A3265DXV			A54SX08
			A32140DXV			

Plastic Quad Flat Pack (TQFP) Dimensions

JEDEC Equivalent	TQFP 64 MS-026 VAR BCD			TQFP 100 MS-026 VAR BED			TQFP 144 MS-026 VAR BFB			TQFP 176 MS-026 VAR BCA		
Dimension	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
A			1.60			1.60			1.60			1.60
A1	0.05		0.15	0.05		0.15	0.05		0.15	0.05		0.15
A2	1.35	1.40	1.45	1.35	1.40	1.45	1.35	1.40	1.45	1.35	1.40	1.45
b	0.17	0.22	0.27	0.17	0.22	0.27	0.17	0.22	0.27	0.17	0.22	0.27
c	0.09		0.20	0.09		0.20	0.09		0.20	0.09		0.20
D/E	12.00 BSC			16.00 BSC			22.00 BSC			26.00 BSC		
D1/E1	10.00 BSC			14.00 BSC			20.00 BSC			24.00 BSC		
e	0.50 BSC			0.50 BSC			0.50 BSC			0.50 BSC		
L	0.45	0.60	0.75	0.45	0.60	0.75	0.45	0.60	0.75	0.45	0.60	0.75
ccc	0.08			0.08			0.08			0.08		
Theta	0	3.50 deg	7 deg	0	3.50 deg	7 deg	0	3.50 deg	7 deg	0	3.50 deg	7 deg

Note:

1. All dimensions are in millimeters.
2. BSC—Basic Spacing between Centers.

Plastic Quad Flat Pack (VQFP) Dimensions

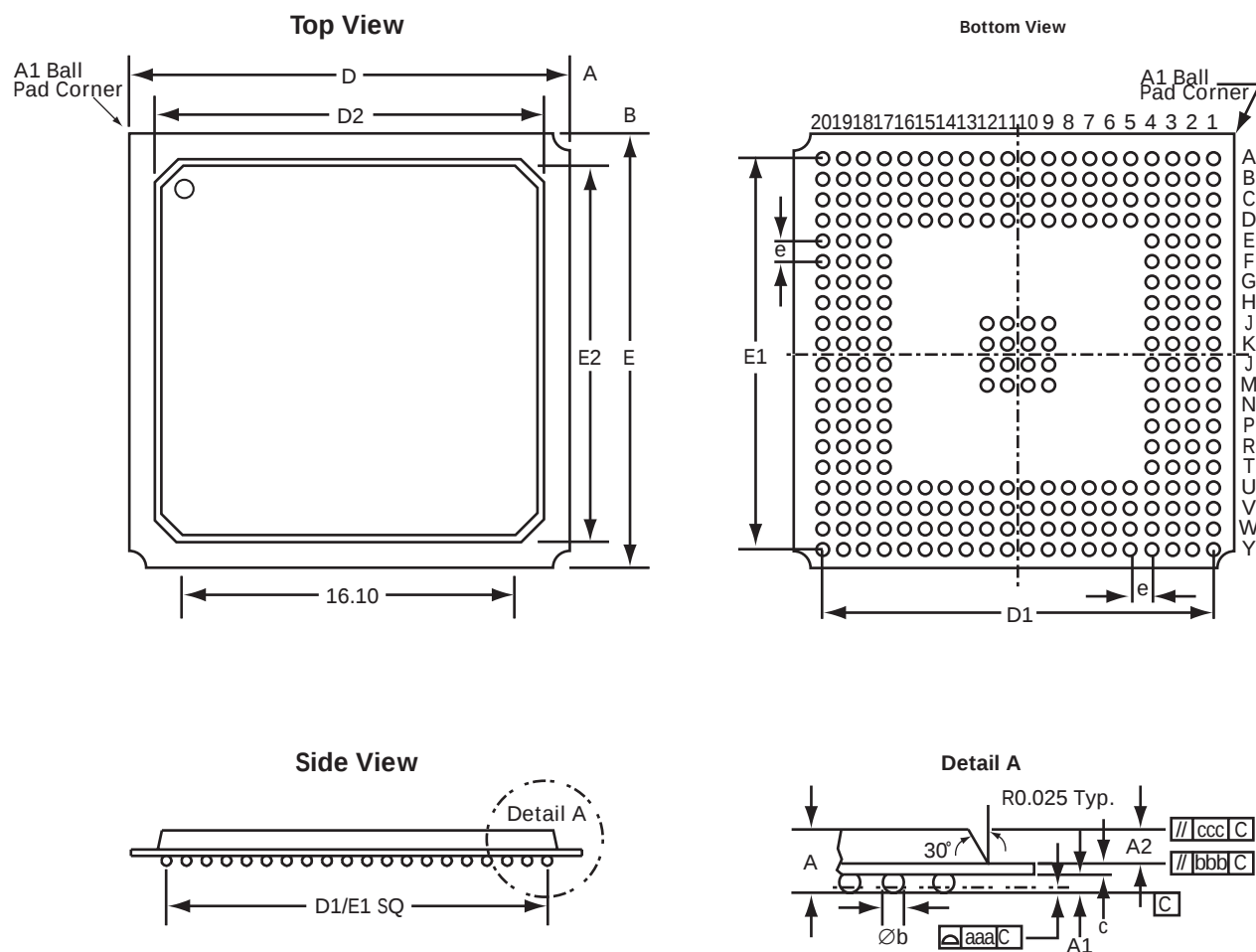
Jedec Equivalent	VQFP 80 MS-026 VAR AEC			VQFP 100 MS-036 VAR AED		
Dimension	Min.	Nom.	Max.	Min.	Nom.	Max.
A			1.20			1.20
A1	0.05		0.15	0.05		0.15
A2	0.95	1.00	1.05	0.95	1.00	1.05
b	0.22	0.32	0.38	0.17	0.22	0.27
c	0.09		0.20	0.09		0.20
D/E	16.00 BSC			16.00 BSC		
D1/E1	14.00 BSC			14.00 BSC		
e	0.65 BSC			0.50 BSC		
L	0.45	0.60	0.75	0.45	0.60	0.75
ccc	0.10			0.08		
Theta	0	3.50 deg	7 deg	0	3.50 deg	7 deg

Note:

1. All dimensions are in millimeters.
2. BSC—Basic Spacing between Centers.

Plastic Ball Grid Array

272-Pin PBGA



Supported Devices

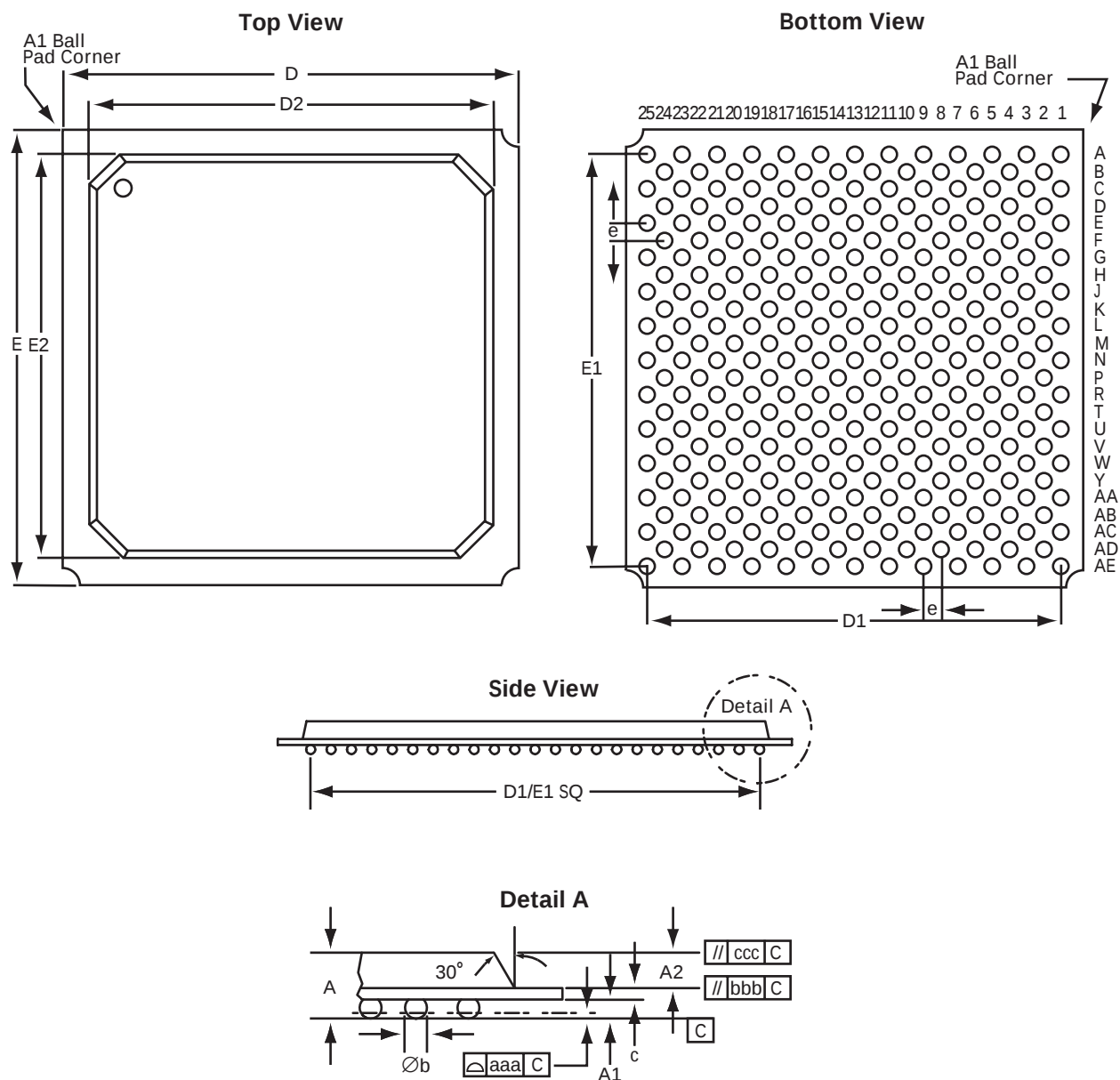
A42MX36

A500K050

A500K130

Plastic Ball Grid Array

313-Pin PBGA

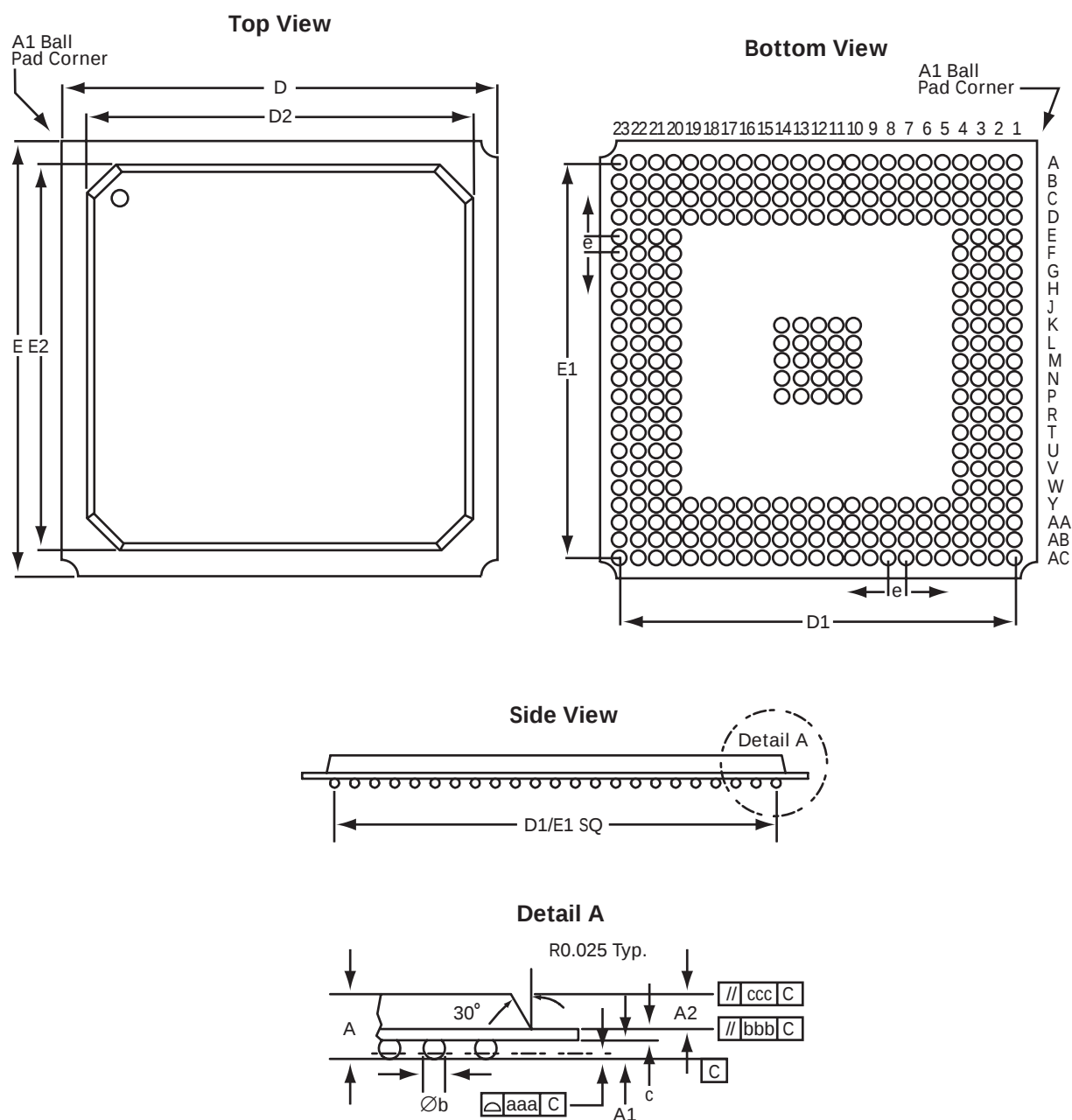


Note: Dimensions are in millimeters. Please see the "Plastic Ball Grid Array Dimensions" on page 36 for the dimensions.

Supported Devices		
A54SX32	A14100A	A14V100A

Plastic Ball Grid Array

329-Pin PBGA

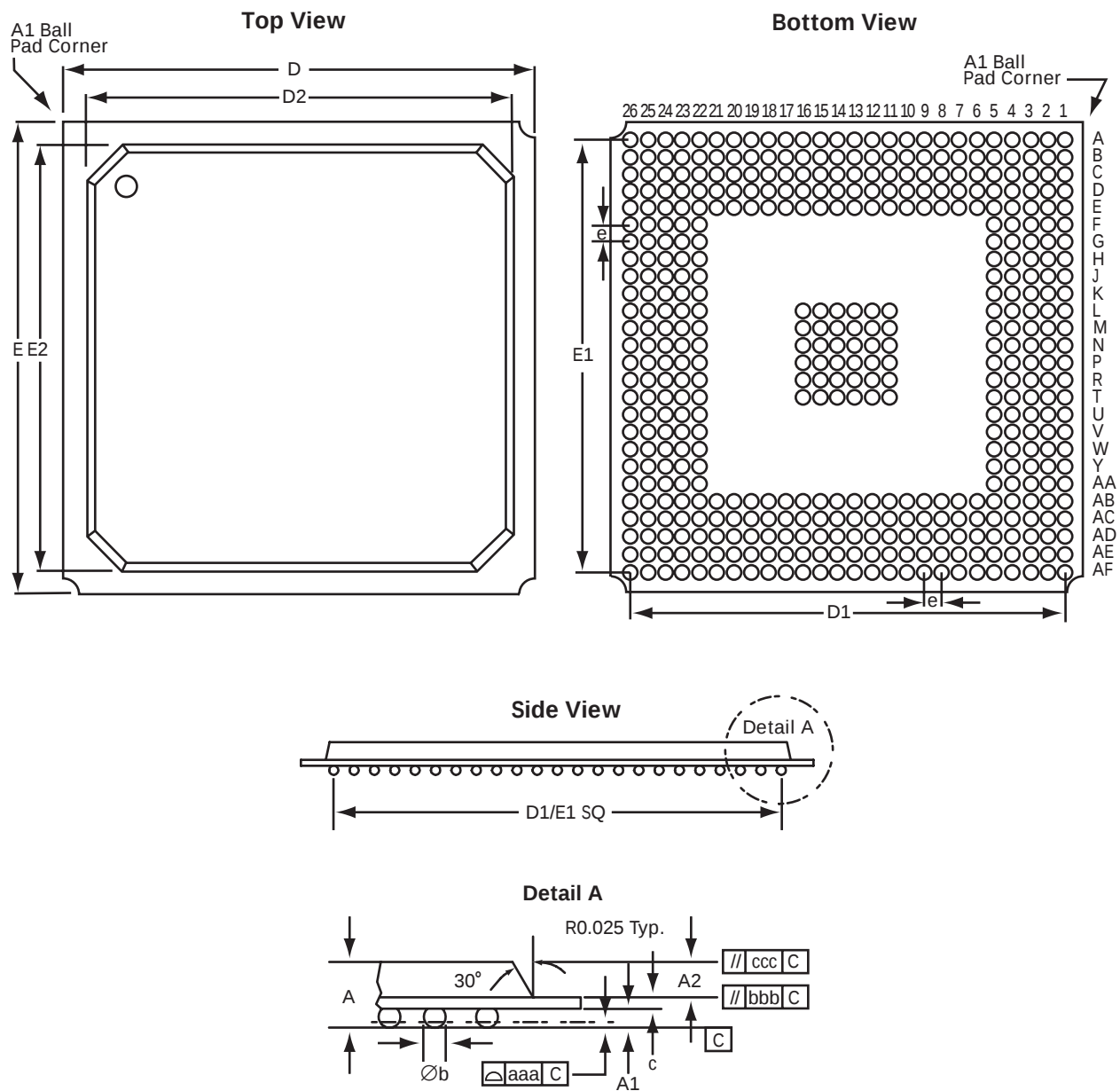


Note: Dimensions are in millimeters. Please see the "Plastic Ball Grid Array Dimensions" on page 36 for the dimensions.

Supported Devices	
A54SX32	A53SX32A

Plastic Ball Grid Array

456-Pin PBGA

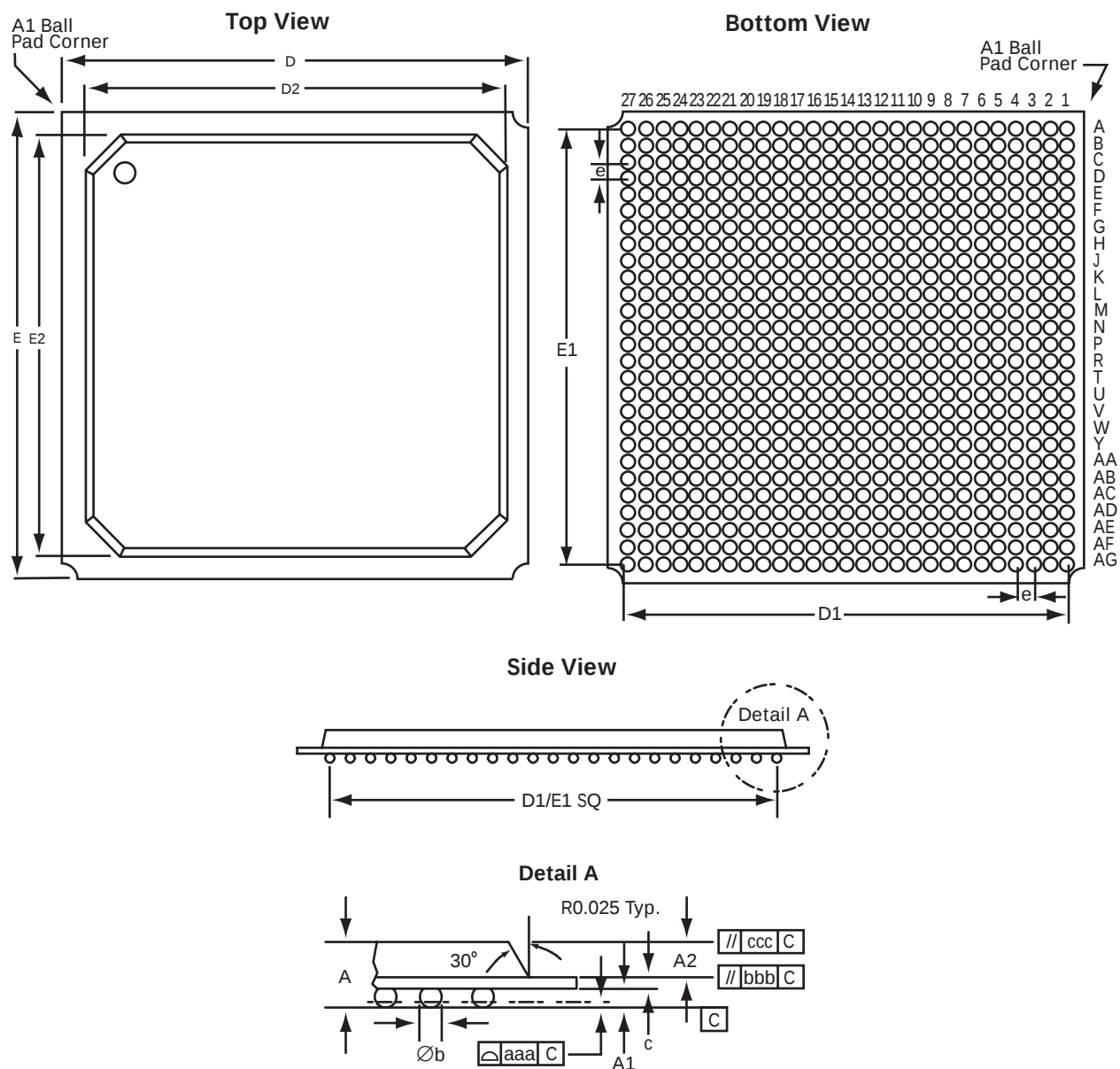


Note: Dimensions are in millimeters. Please see the "Plastic Ball Grid Array Dimensions" on page 36 for the dimensions.

Supported Devices		
A500K130	APA150	APA600
A500K180	APA300	APA750
A500K270	APA450	APA1000

Plastic Ball Grid Array

729-Pin PBGA



Note: Dimensions are in millimeters. Please see the "Plastic Ball Grid Array Dimensions" on page 36 for the dimensions.

Supported Device

AX1000

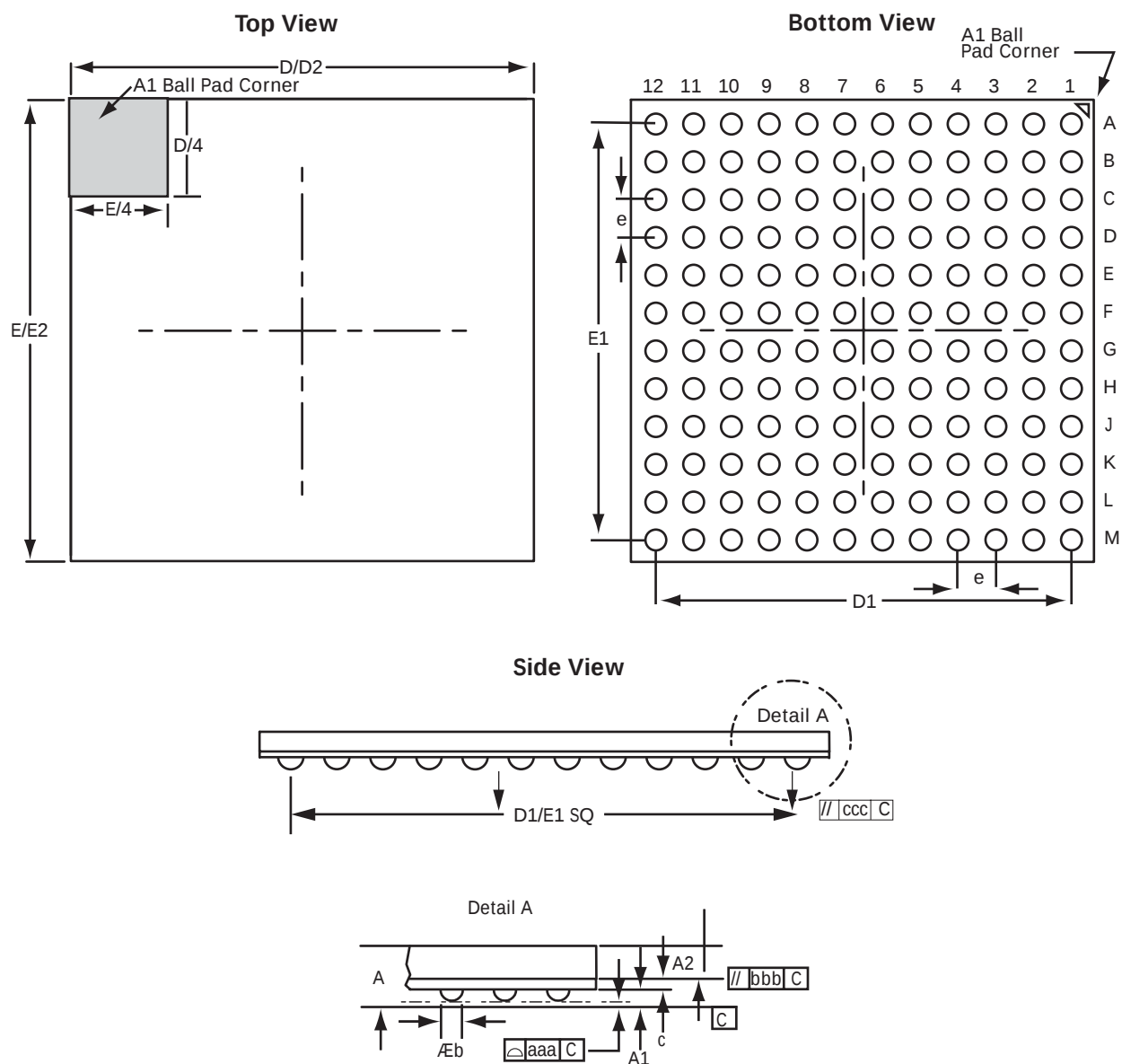
Plastic Ball Grid Array Dimensions

JEDEC Equivalent	PBGA272 MS-034 VAR BAL-2			PBGA313 MS-034			PBGA329 MS-034 VAR BAN-2			PBGA456 MS-034 VAR BAR-2		
Dimension	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
A	2.18	2.33	2.50	2.12	2.33	2.52	2.17	2.33	2.70	2.12	2.33	2.54
A1	0.50	0.60	0.70	0.50	0.60	0.70	0.50	0.60	0.70	0.50	0.60	0.70
A2	1.15	1.17	1.19	1.12	1.17	1.22	1.10	1.20	1.30	1.12	1.17	1.19
aaa	0.20			0.20			0.20			0.20		
b	0.60	0.75	0.90	0.60	0.76	0.90	0.60	0.76	0.90	0.60	0.76	0.90
bbb	0.25			0.25			0.25			0.25		
c	0.53	0.56	0.61	0.53	0.56	0.61	0.53	0.60	0.70	0.51	0.56	0.61
ccc	0.35			0.35			0.35			0.35		
D	26.80	27.00	27.20	34.80	35.00	35.20	30.80	31.00	31.20	34.80	35.00	35.20
D1	24.13 BSC			30.48 BSC			27.94 BSC			31.75 BSC		
D2	23.90	24.00	24.10	29.50	30.00	30.70	27.90	28.00	28.10	29.80	30.00	30.20
E	26.80	27.00	27.20	34.80	35.00	35.20	30.80	31.00	31.20	34.80	35.00	35.20
E1	24.13 BSC			30.48 BSC			27.94 BSC			31.75 BSC		
E2	23.90	24.00	24.10	29.50	30.00	30.70	27.90	28.00	28.10	29.80	30.00	30.20
e	1.27 typ.			1.27 typ.			1.27 typ.			1.27 typ.		

JEDEC Equivalent	PBGA729 MS-034 VAR BAR-1		
Dimensions	Min.	Nom.	Max.
A	2.12	2.33	2.54
A1	0.50	0.60	0.70
A2	1.12	1.17	1.19
aaa	0.20		
b	0.60	0.76	0.90
bbb	0.25		
c	0.50	0.56	0.62
ccc	0.35		
D	34.80	35.00	35.20
D1	33.02 BSC		
D2	29.95	30.00	30.70
E	34.80	35.00	35.20
E1	33.02 BSC		
E2	29.95	30.00	30.70
e	1.27 typ.		

Fine Pitch Plastic Ball Grid Array

144-Pin FG

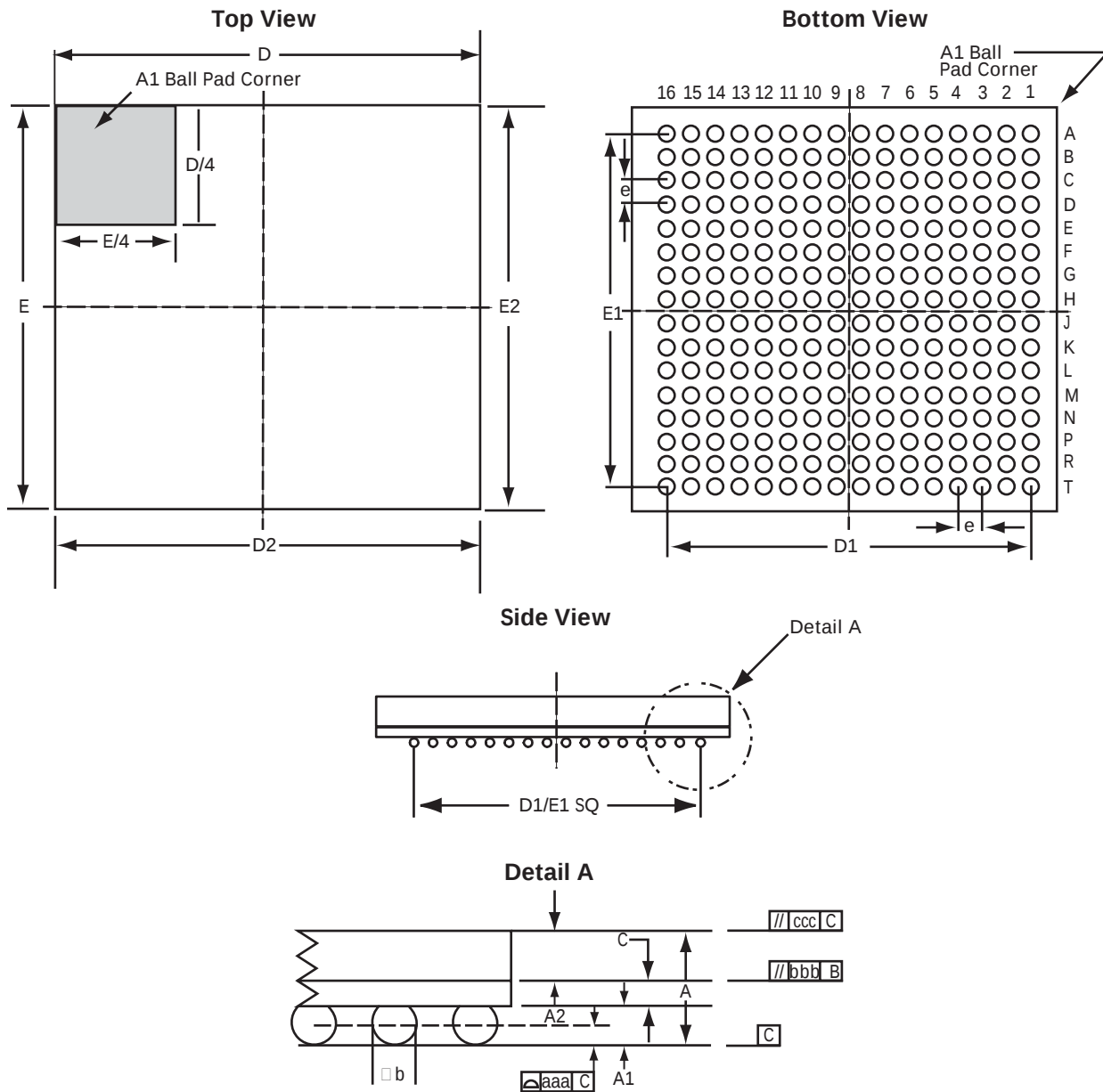


Note: Dimensions are in millimeters. Please see the "Fine Pitch Plastic Ball Grid Array Dimensions" on page 46 for the dimensions.

Supported Devices			
A54SX08	A500K050 A500K130	APA075 APA150 APA300 APA450	A54SX08A A54SX16A A54SX32A

Fine Pitch Plastic Ball Grid Array

256-Pin FG

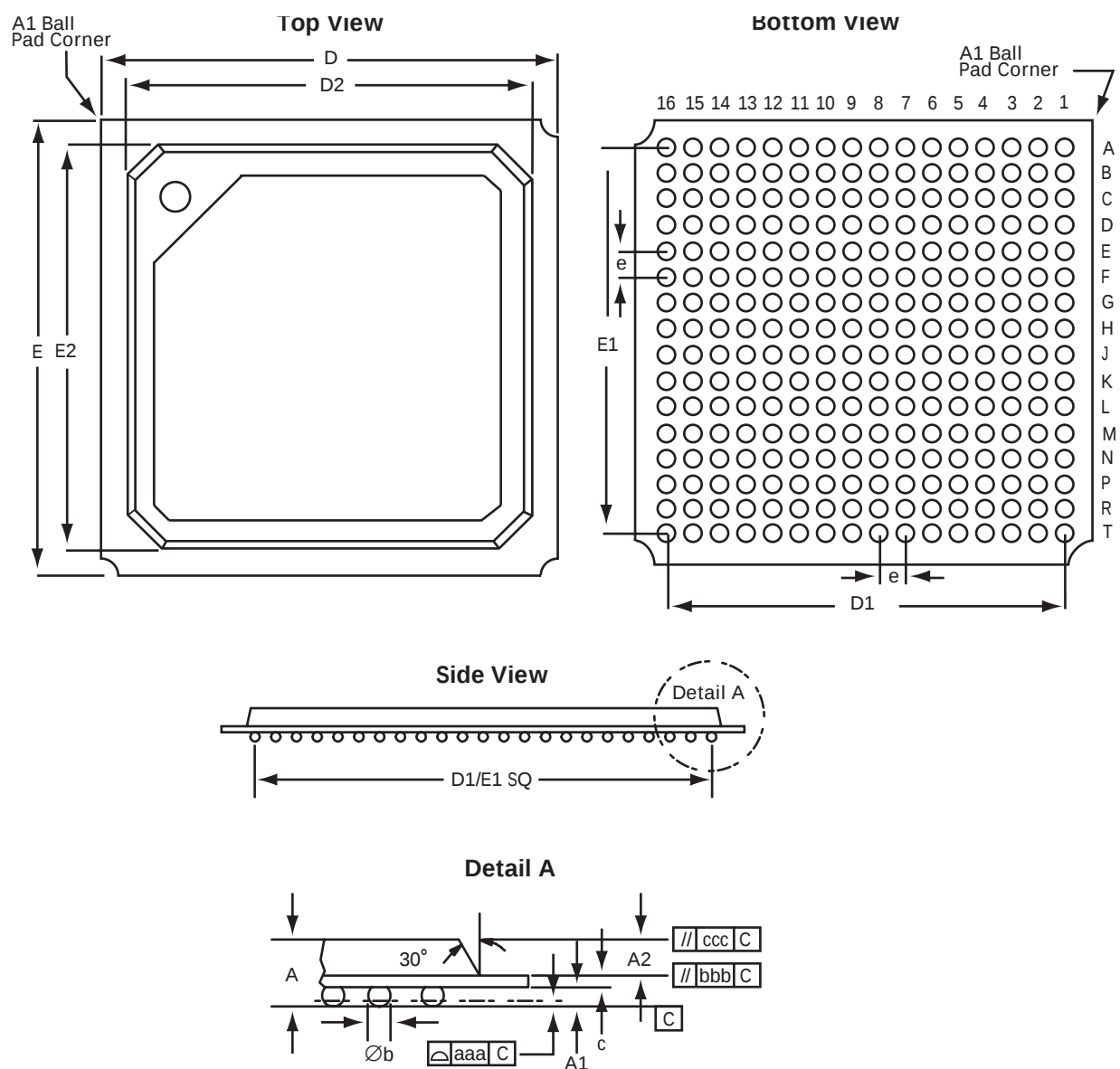


Note: Dimensions are in millimeters. Please see the "Fine Pitch Plastic Ball Grid Array Dimensions" on page 46 for the dimensions.

Supported Devices			
A500K130	APA150	A54SX16A	AX125
A500K180	APA300		AX250
A500K270	APA450		
	APA600		

Fine Pitch Plastic Ball Grid Array

256-Pin FG



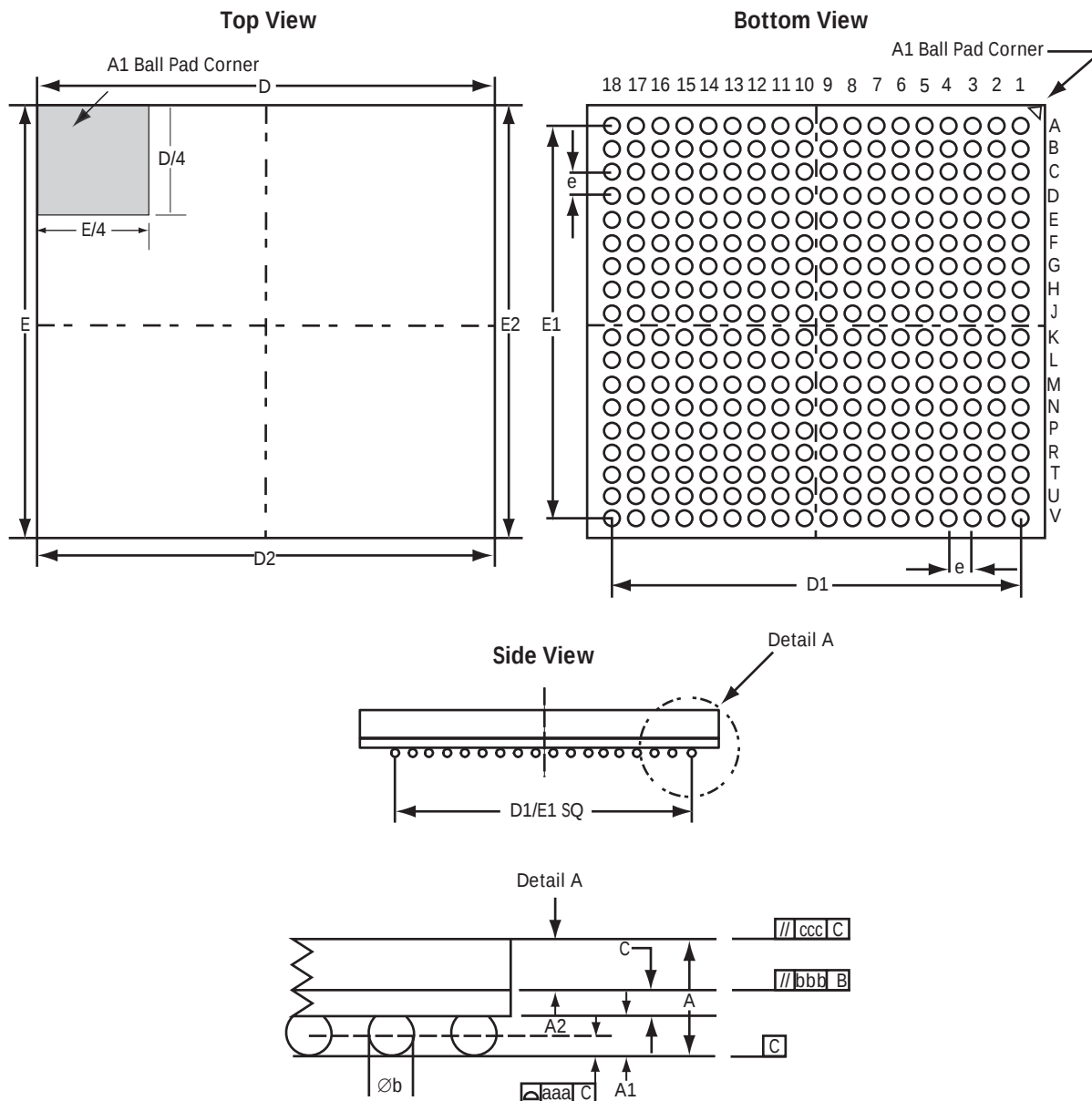
Note:

1. Dimensions are in millimeters. Please see the "Fine Pitch Plastic Ball Grid Array Dimensions" on page 46 for the dimensions.

Supported Devices	
A54SX32A	A54SX72A

Fine Pitch Plastic Ball Grid Array

324-Pin FG



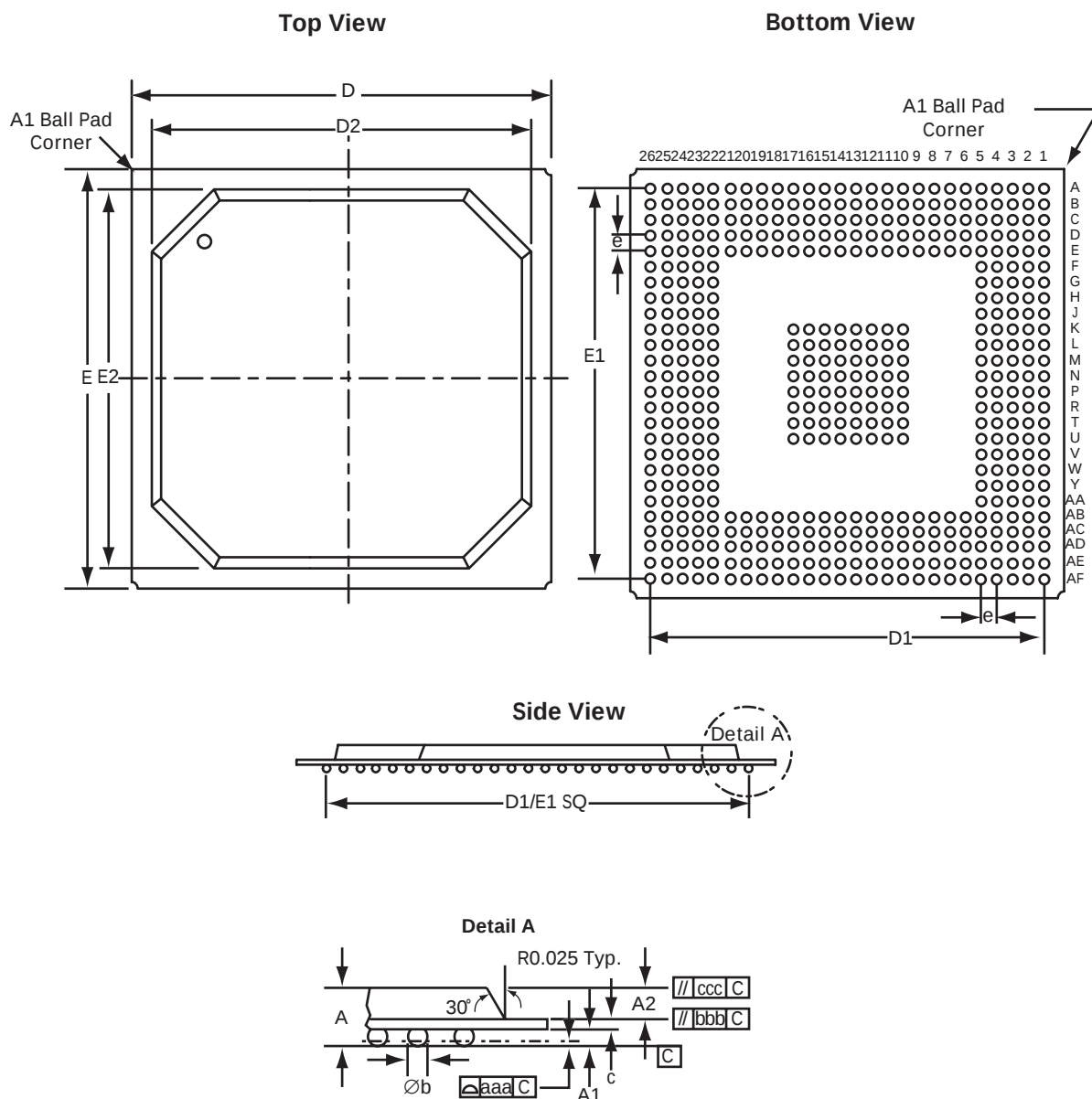
Note: Dimensions are in millimeters. Please see the "Fine Pitch Plastic Ball Grid Array Dimensions" on page 46 for the dimensions.

Supported Device

AX125

Fine Pitch Plastic Ball Grid Array

484-Pin FG

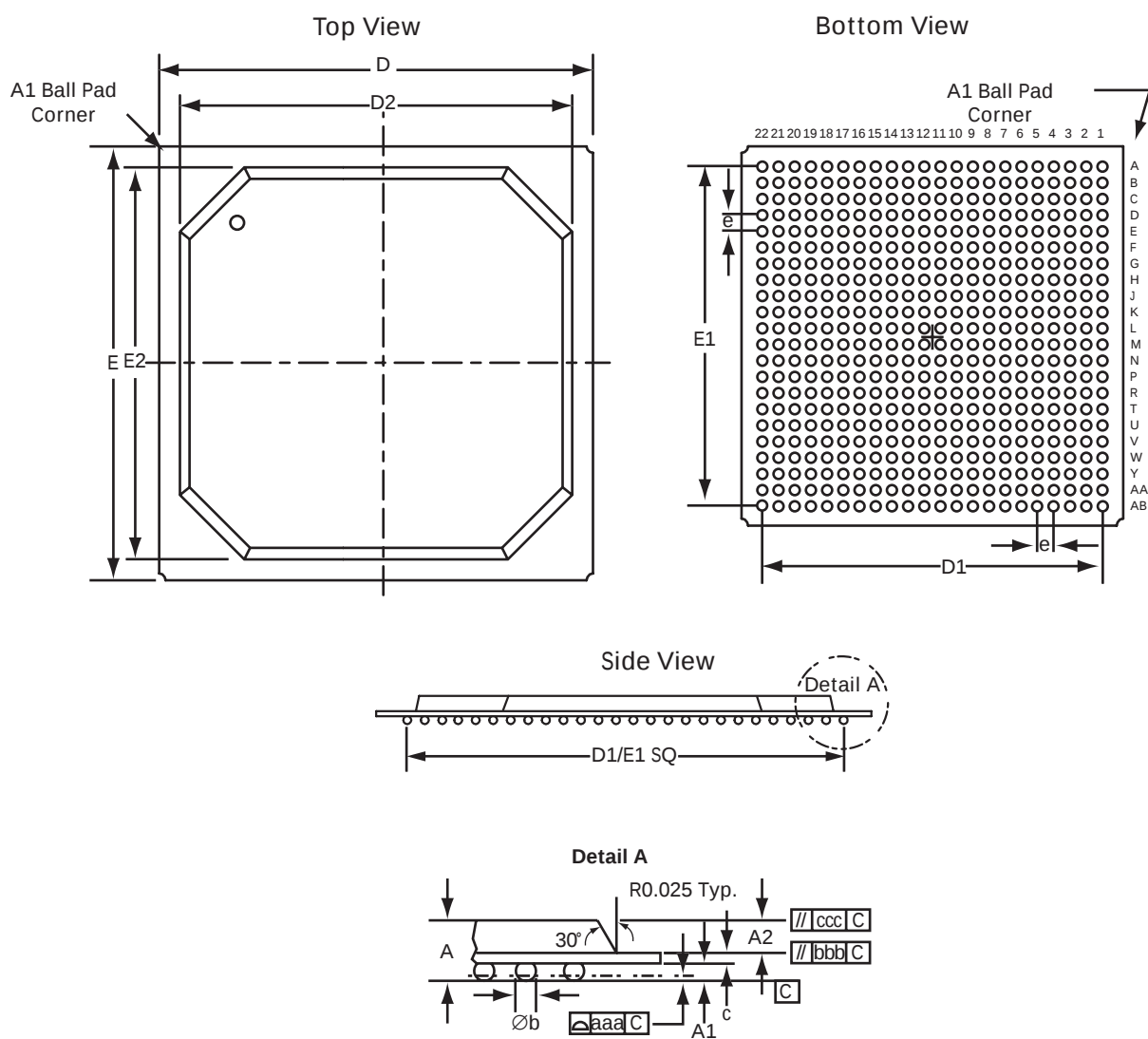


Note: Dimensions are in millimeters. Please see the "Fine Pitch Plastic Ball Grid Array Dimensions" on page 46 for the dimensions.

Supported Devices
A54SX32A
A54SX72A

Fine Pitch Plastic Ball Grid Array

484-Pin FG—Fully Populated

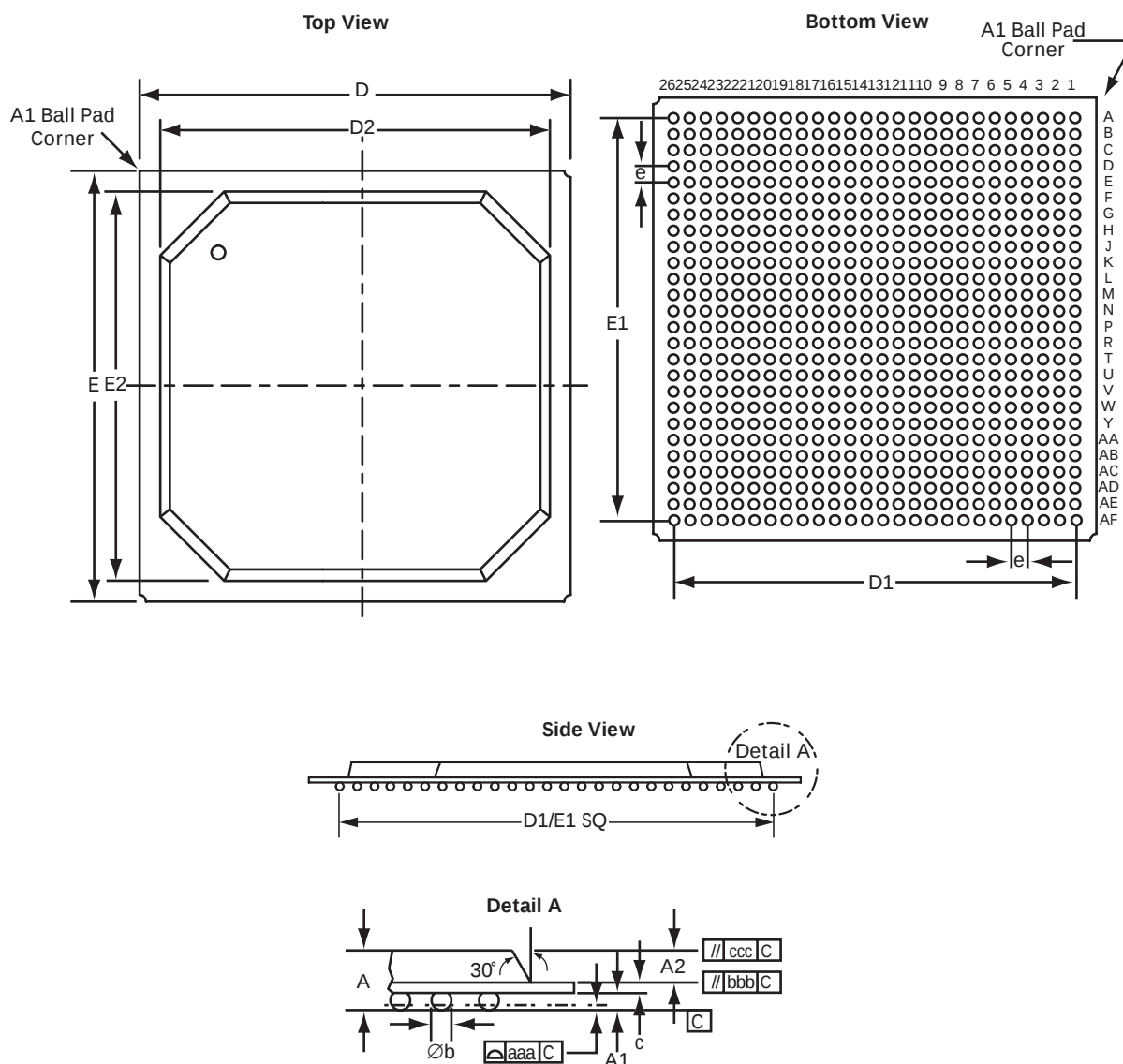


Note: Dimensions are in millimeters. Please see the "Fine Pitch Plastic Ball Grid Array Dimensions" on page 46 for the dimensions.

Supported Devices	
APA450	AX250
APA600	AX500
	AX1000

Fine Pitch Plastic Ball Grid Array

676-Pin FG

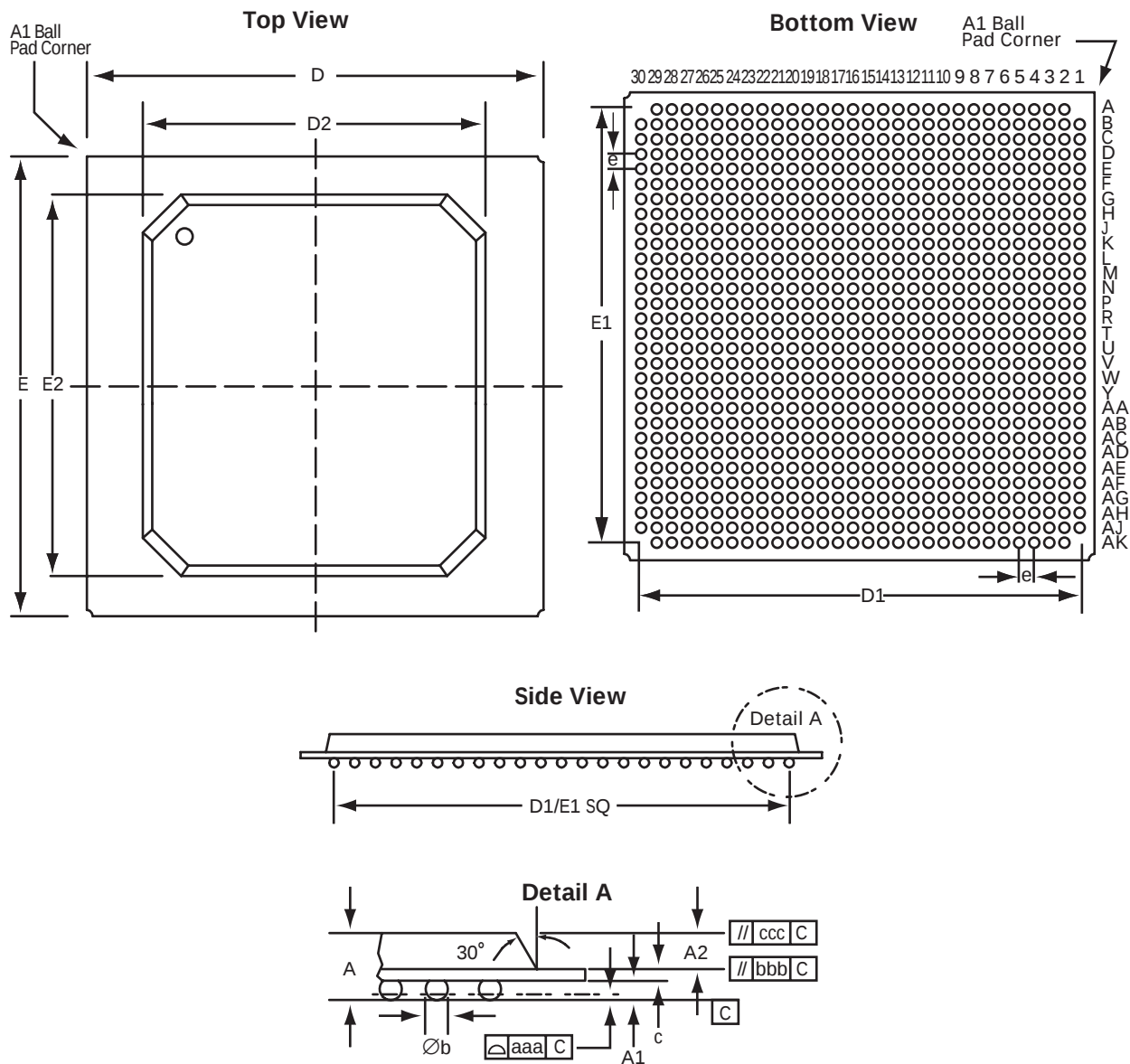


Note: Dimensions are in millimeters. Please see the "Fine Pitch Plastic Ball Grid Array Dimensions" on page 46 for the dimensions.

Supported Devices		
A500K270	APA600	AX500
	APA750	AX1000

Fine Pitch Plastic Ball Grid Array

896-Pin FG

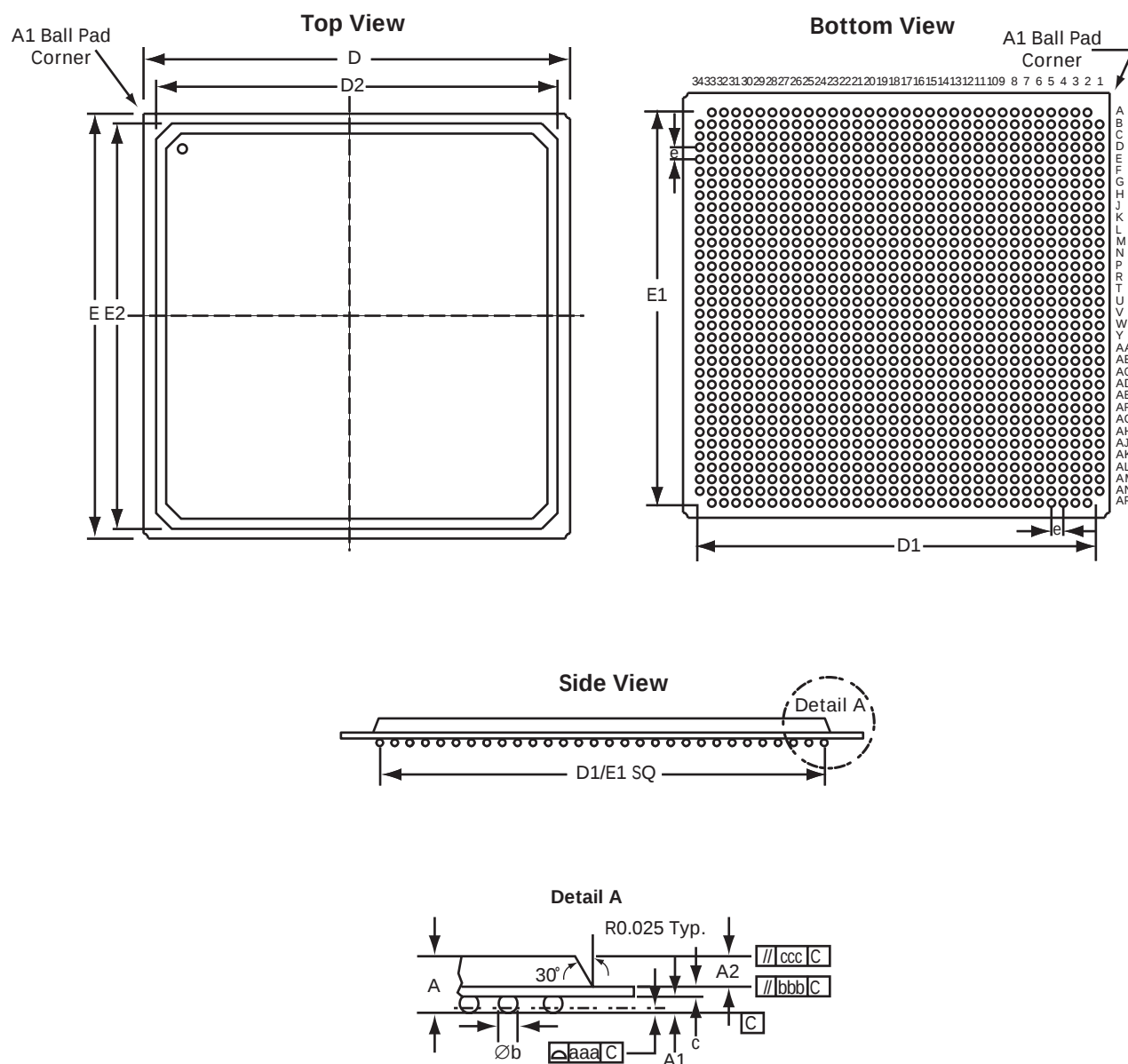


Note: Dimensions are in millimeters. Please see the "Fine Pitch Plastic Ball Grid Array Dimensions" on page 46 for the dimensions.

Supported Devices	
APA750	AX1000
APA1000	AX2000

Fine Pitch Plastic Ball Grid Array

1152-Pin FG



Note: Dimensions are in millimeters. Please see the "Fine Pitch Plastic Ball Grid Array Dimensions" on page 46 for the dimensions.

Supported Devices	
APA1000	AX2000

Fine Pitch Plastic Ball Grid Array Dimensions

	FBGA 144 MO-192 VAR AAD1			FBGA 256 (page 38) MO-192 VAR AAF1			FBGA 256 (page 39) MS-034 VAR AAF-1			FBGA 324 MS-034 VAR AAG-1			FBGA 484 (page 42) MS-034 VAR AAL-1		
Dimension	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.35	1.45	1.55	1.35	1.60	1.70	1.55	1.76	1.97	1.48	1.63	1.78	2.02	2.23	2.44
A1	0.35	0.40	0.45	0.25	0.40	—	0.30	0.40	0.50	0.33	0.38	0.43	0.40	0.50	0.60
A2	0.65	0.70	0.75	0.65	0.70	0.75	0.75	0.80	0.85	0.65	0.70	0.75	1.12	1.17	1.22
aaa	0.12			0.12			0.20			0.20			0.20		
b	0.45	0.50	0.55	0.45	0.50	0.55	0.40	0.50	0.60	0.49	0.54	0.59	0.50	0.63	0.70
bbb	0.25			0.25			0.25			0.25			0.25		
c	—	0.35	—	0.25	0.50	1.10	0.50	0.56	0.62	0.50	0.55	0.60	0.50	0.56	0.62
ccc	0.35			0.35			0.35			0.35			0.35		
D	12.80	13.00	13.20	16.80	17.00	17.20	16.80	17.00	17.20	18.80	19.00	19.20	26.80	27.00	27.20
D1	11.00 BSC			15.00 BSC			15.00 BSC			17.00 BSC			21.00 BSC		
D2	12.80	13.00	13.20	16.80	17.00	17.20	14.80	15.00	15.20	18.80	19.00	19.20	19.45	19.50	20.20
E	12.80	13.00	13.20	16.80	17.00	17.20	16.80	17.00	17.20	18.80	19.00	19.20	26.80	27.00	27.20
E1	11.00 BSC			15.00 BSC			15.00 BSC			17.00 BSC			21.00 BSC		
E2	12.80	13.00	13.20	16.80	17.00	17.20		15.00	15.70	18.80	19.00	19.20	19.45	19.50	20.20
e	1.00 typ.			1.00 typ.			1.00 typ.			1.00 typ.			1.00 typ.		

Note:

1. All dimensions are in millimeters.
2. BSC—Basic Spacing between Centers.

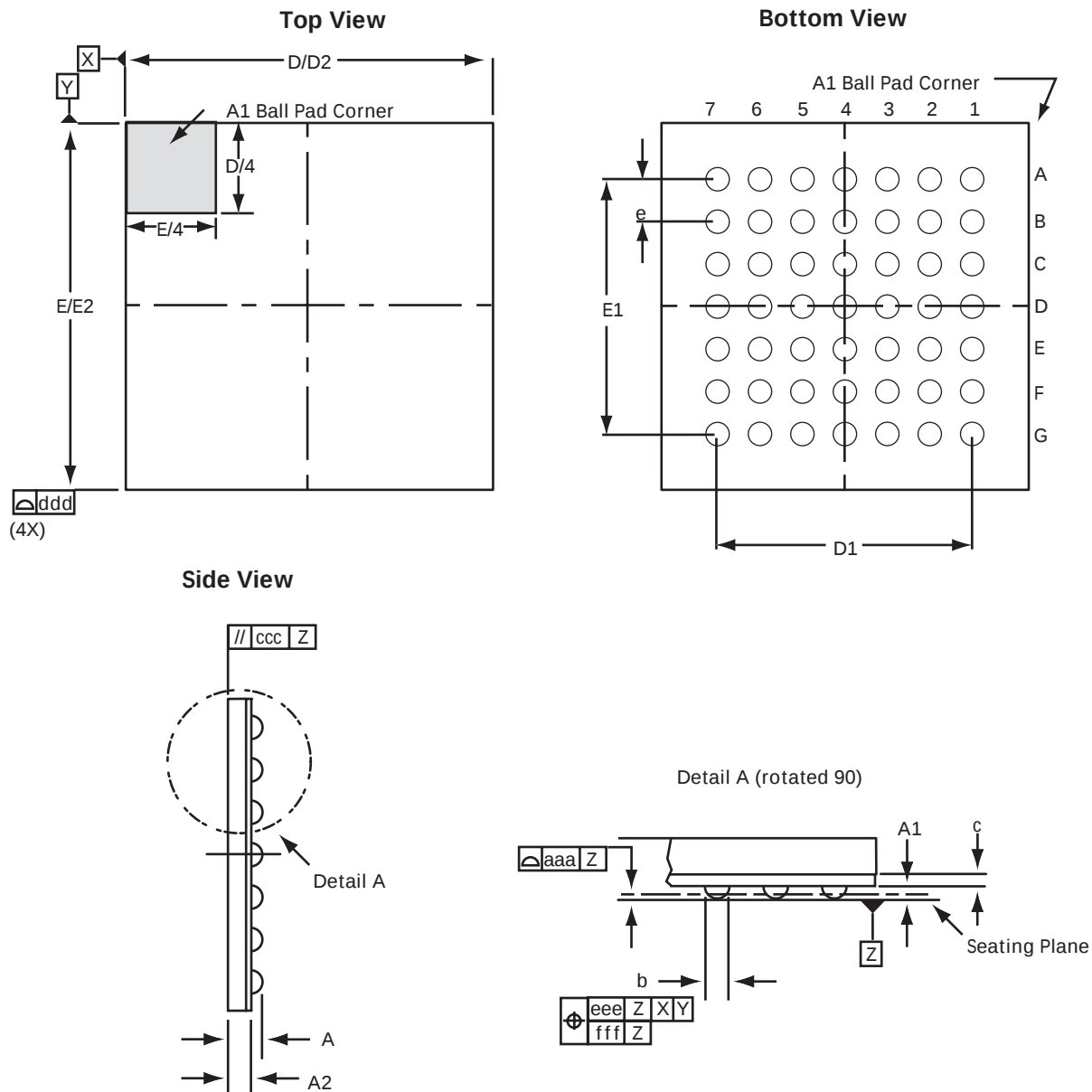
	FBGA 484 (page 42) (23x23 Fully Populated) MS-034 VAR AAJ-1			FBGA 676 MS-034 VAR AAL-1			FBGA 896 MS-034 VAR AAN-1			FBGA 1152 MS-034 VAR AAR-1		
Dimension	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
A	2.02	2.23	2.44	2.02	2.23	2.44	2.02	2.23	2.44	2.02	2.23	2.44
A1	0.40	0.50	0.60	0.40	0.50	0.60	0.40	0.50	0.60	0.40	0.50	0.60
A2	1.12	1.17	1.22	1.12	1.17	1.22	1.12	1.17	1.22	1.12	1.17	1.22
aaa	0.20			0.20			0.20			0.20		
b	0.50	0.63	0.70	0.50	0.63	0.70	0.50	0.63	0.70	0.50	0.63	0.70
bbb	0.25			0.25			0.25			0.25		
c	0.50	0.56	0.62	0.50	0.56	0.62	0.50	0.56	0.62	0.50	0.56	0.62
ccc	0.35			0.35			0.35			0.35		
D	22.95	23.00	23.05	26.80	27.00	27.20	30.80	31.00	31.20	34.80	35.00	35.20
D1	21.00 BSC			25.00 BSC			29.00 BSC			33.00 BSC		
D2	19.45	19.50	20.20	23.05	24.00	24.70	25.95	26.00	26.70	33.65	33.70	34.20
E	22.95	23.00	23.05	26.80	27.00	27.20	30.80	31.00	31.20	34.80	35.00	35.20
E1	21.00 BSC			25.00 BSC			29.00 BSC			33.00 BSC		
E2	19.45	19.50	20.20	23.05	24.00	24.07	25.95	26.00	26.70	33.65	33.70	34.20
e	1.00 typ.			1.00 typ.			1.00 typ.			1.00 typ.		

Note:

1. All dimensions are in millimeters.
2. BSC—Basic Spacing between Centers.

Chip Scale Package

49-Pin CSP

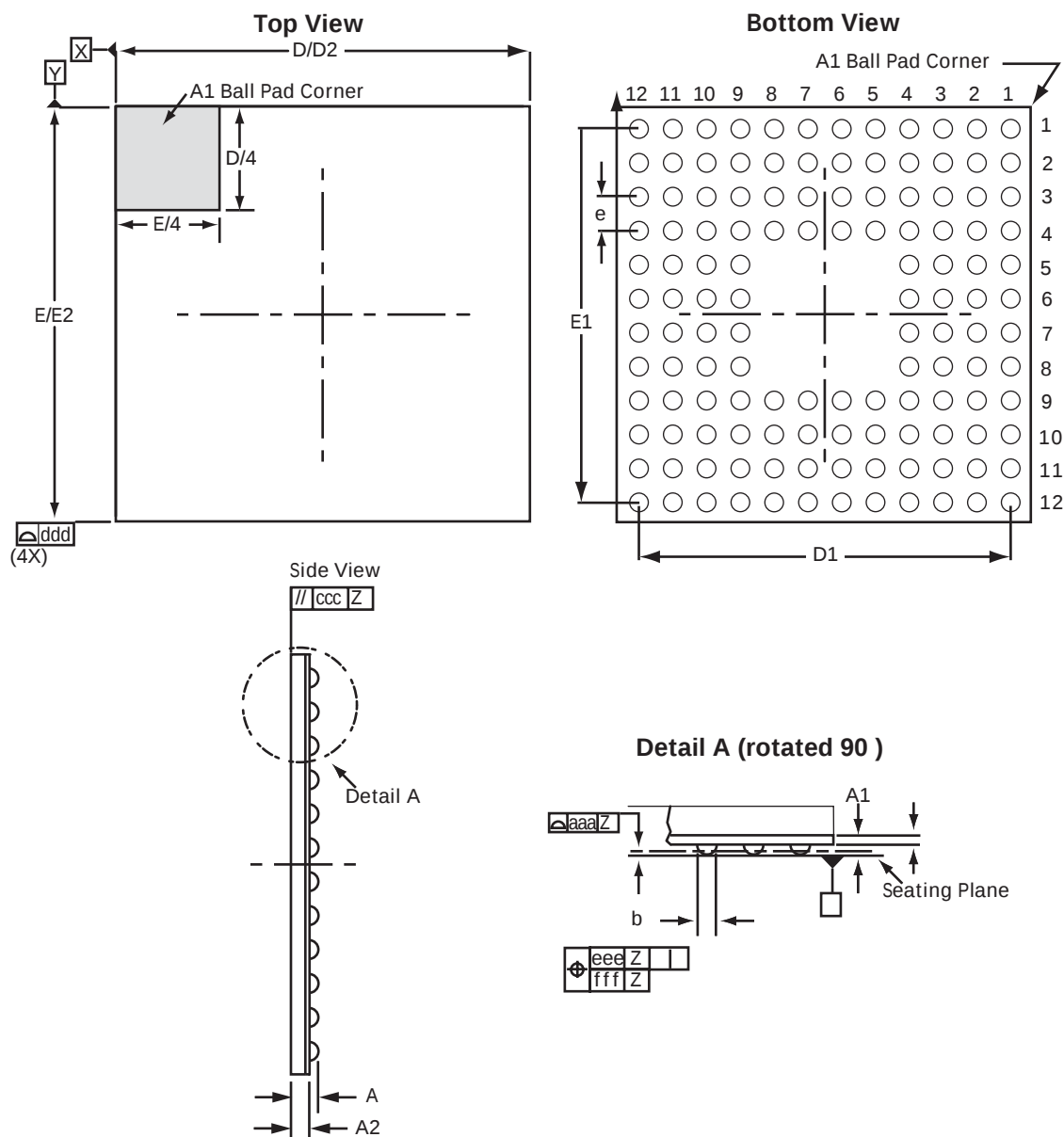


Note: Dimensions are in millimeters. Please see the "Chip Scale Package Dimensions" on page 51 for the dimensions.

Supported Devices	
eX64	eX128

Chip Scale Package

128-Pin CSP

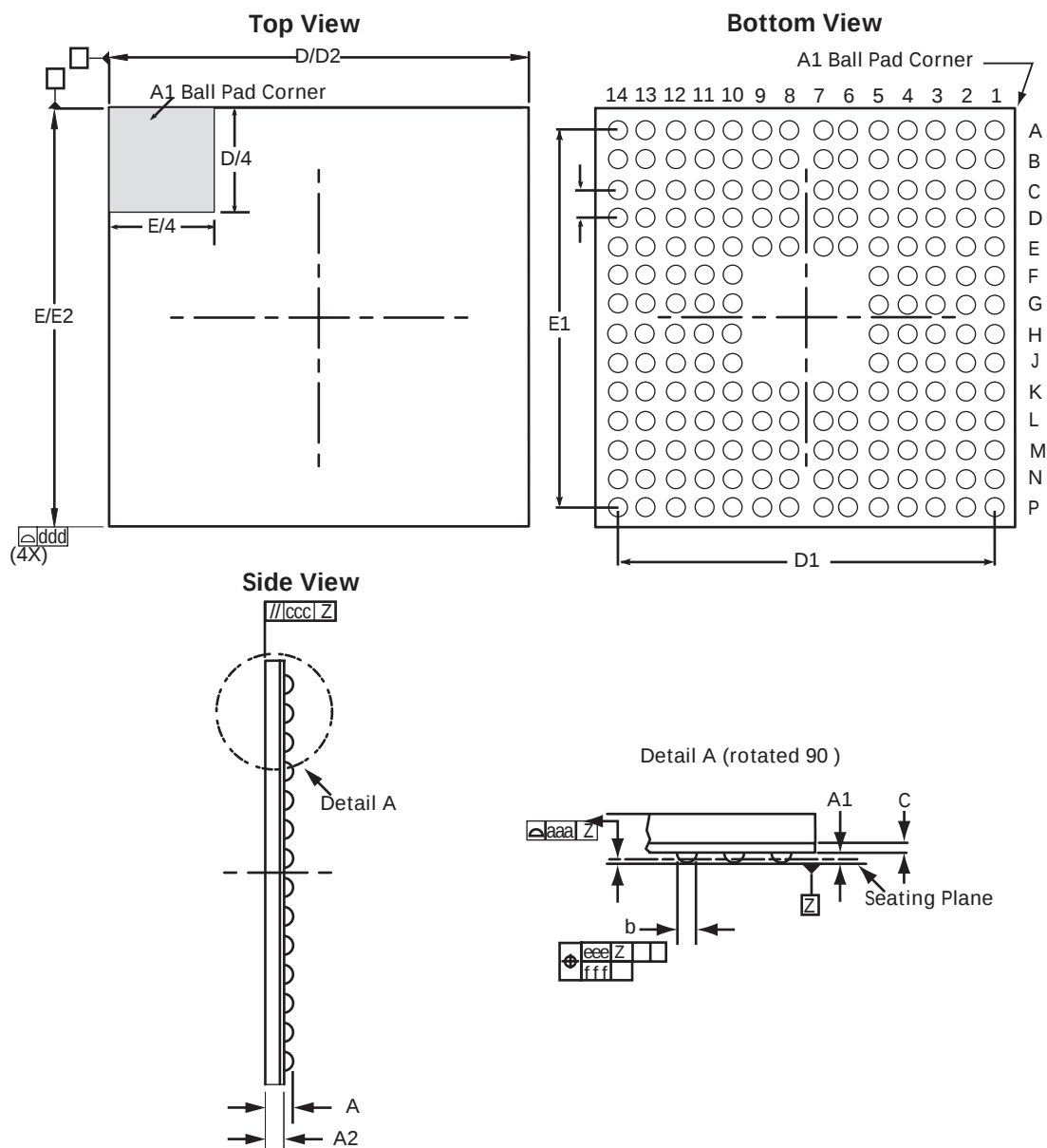


Note: Dimensions are in millimeters. Please see the "Chip Scale Package Dimensions" on page 51 for the dimensions.

Supported Devices		
eX64	eX128	eX256

Chip Scale Package

180-Pin CSP



Note: Dimensions are in millimeters. Please see the "Chip Scale Package Dimensions" on page 51 for these dimensions.

Supported Devices	
eX256	AX125

Chip Scale Package Dimensions

JEDEC Equivalent	CS49 MO-205			CS128 MO-205, Variation BD			CS180 MO-205, Variation BF		
Dimension	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
A			1.50			1.50			1.50
A1	0.25			0.25			0.25		
A2	0.85			0.85			0.85		
aaa	0.12			0.12			0.12		
b	0.45	0.50	0.55	0.45	0.50	0.55	0.45	0.50	0.55
c		0.36			0.36			0.36	
ccc	0.10			0.10			0.10		
ddd	0.10			0.10			0.10		
D/E		7.00			11.00			13.00	
D1/E1		4.80			8.80			10.40	
e	0.8 typ.			0.8 typ.			0.8 typ.		
eee	0.15			0.15			0.15		
fff	0.08			0.08			0.08		

Note: All dimensions are in millimeters.

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<http://www.actel.com>

Actel Corporation

2061 Stierlin Court
Mountain View, CA
94043-4655 USA

Phone 650.318.4200
Fax 650.318.4600

Actel Europe Ltd.

Dunlop House, Riverside Way
Camberley, Surrey GU15 3YL
United Kingdom

Phone +44 (0) 1276 401 450
Fax +44 (0) 1276 401 490

Actel Japan

EXOS Ebisu Bldg. 4F
1-24-14 Ebisu Shibuya-ku
Tokyo 150 Japan

Phone +81.03.3445.7671
Fax +81.03.3445.7668

Actel Hong Kong

39th Floor, One Pacific Place
88 Queensway, Admiralty
Hong Kong

Phone 852.227.35712
Fax 852.227.35999