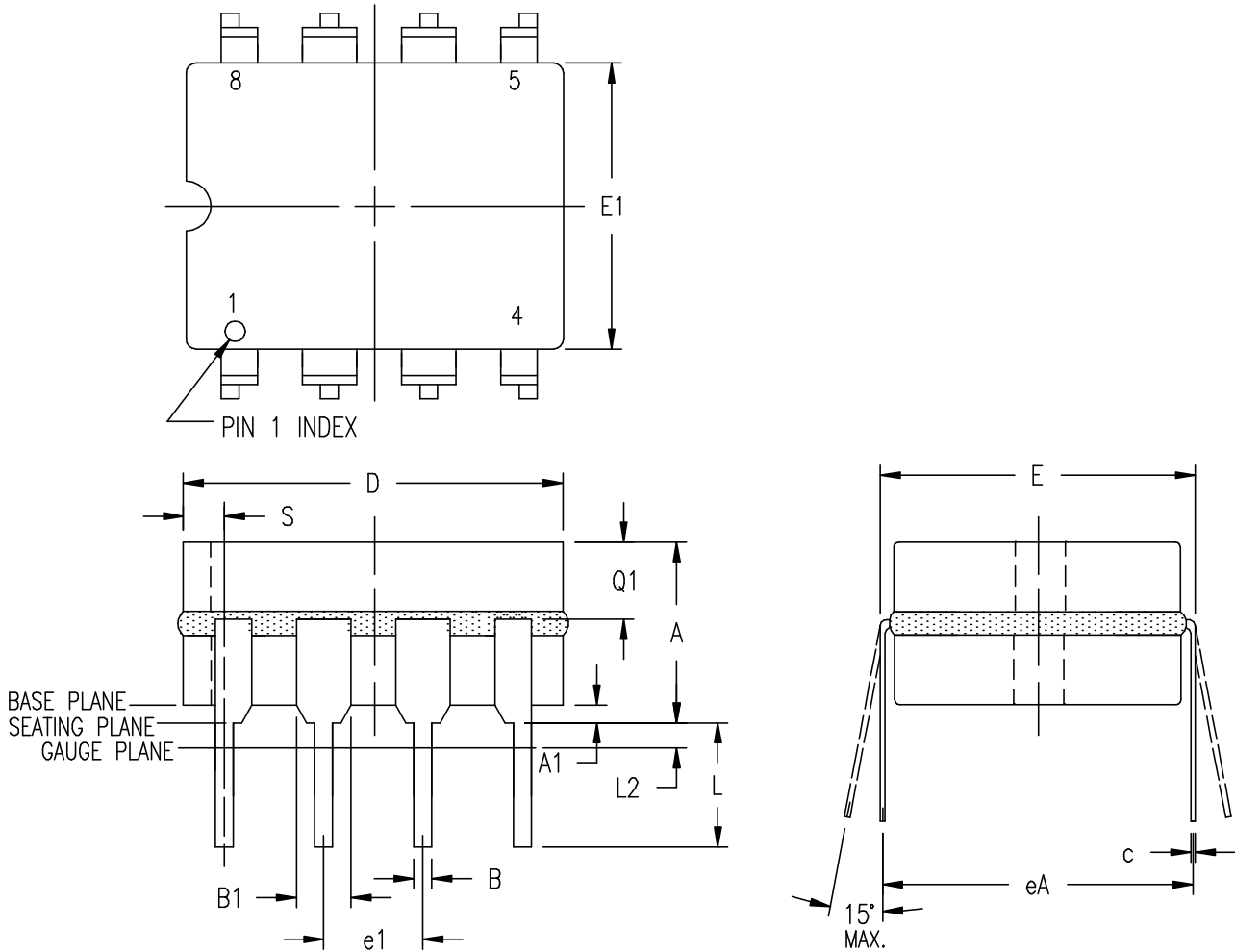


Ceramic DIP Package - DD8



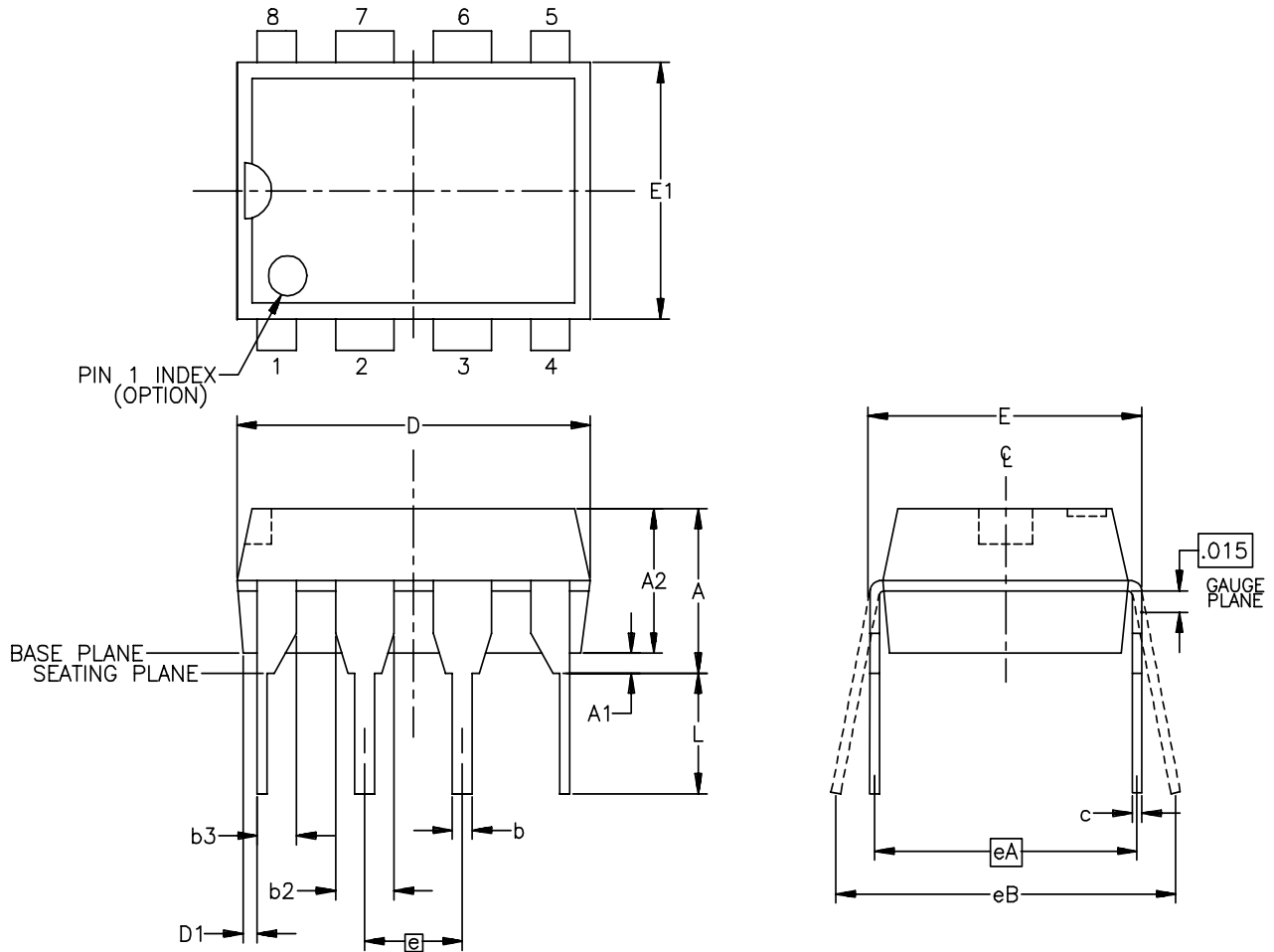
SYMBOL	INCHES	
	MIN.	MAX.
A	0.155	0.200
A1	0.020	0.050
B	0.014	0.020
B1	0.045	0.065
c	0.008	0.012
D	0.370	0.430
E	0.300	0.320
E1	0.280	0.310
e1	0.100 BSC	
eA	0.300 BSC	
L	0.125	0.150
L2	0	0.030
Q1	0.040	0.075

NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982.
2. LEAD FINISH: SOLDER DIPPED
3. CONFORMS TO JEDEC MO-001-AN EXCEPT BODY WIDTH.

8-PIN CERAMIC DIP (DD8)

Plastic DIP Package - PD8



SYMBOL	INCHES		NOTE
	MIN.	MAX.	
A	\approx	0.181	
A1	0.019	\approx	
A2	0.122	0.161	
b	0.014	0.022	
b2	0.045	\approx	
b3	\approx	0.045	
c	0.009	0.012	
D	0.355	0.382	
D1	0.005	\approx	
E	0.303	0.323	
E1	0.240	0.272	
e	0.100 BSC		
eA	0.300 BSC		
eB	\approx	0.430	
L	0.115	0.150	
N	8		

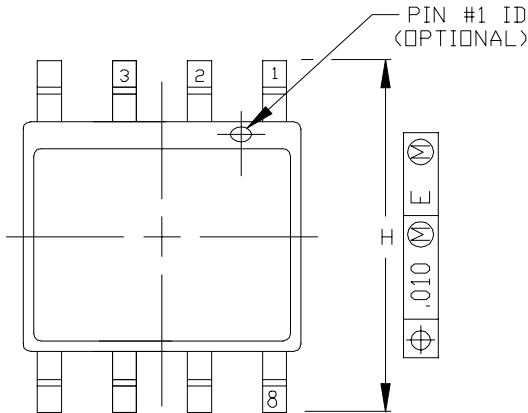
NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982.
2. DIMENSIONS "D" AND "E1" DO NOT INCLUDE MOLD PROTRUSIONS. ALLOWABLE MOLD PROTRUSION SHALL NOT EXCEED .010" PER SIDE.
3. LEAD FINISH: (85±5%)Sn-Pb SOLDER PLATE
4. CONFORMS TO JEDEC MS-001-BA

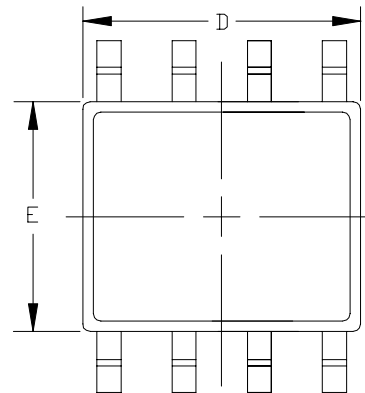
8-PIN PLASTIC DIP (PD8)

SOIC and TSOP Packages - S08, V08

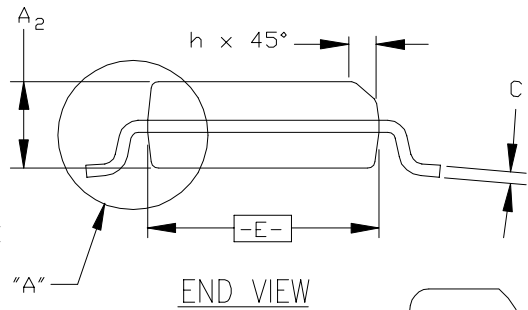
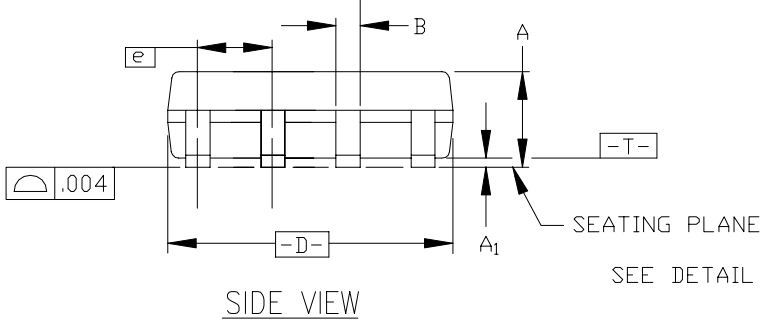
TOP VIEW



BOTTOM VIEW

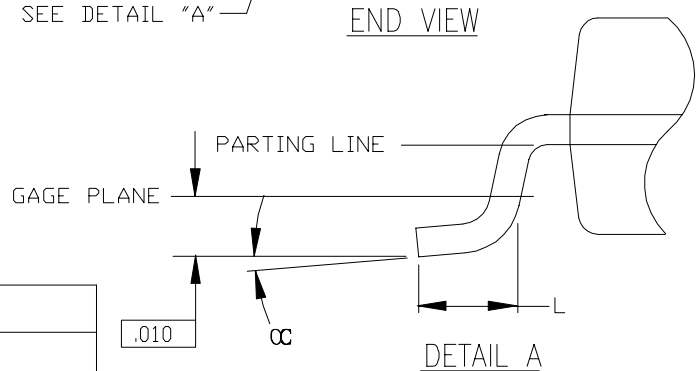


⊕ .010 (M) T E (M) D (S)



SIDE VIEW

END VIEW



DETAIL A

SYMBOL	S08			V08		
	INCHES			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	.059	.064	.068	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.047
A ₁	.004	.006	.0098	.002	.004	.006
A ₂	.055	.058	.061	.037	.039	.044
B	.013	.016	.020	.0138	$\cancel{\text{---}}$	.0192
C	.0075	.008	.0098	.0075	$\cancel{\text{---}}$	.0089
D	.189	.194	.196	.189	.194	.196
E	.150	.155	.157	.150	.155	.157
e	.050 BSC			.050 BSC		
H	.229	.236	.244	.230	.236	.244
h	.010	.013	.019	.010	.013	.019
L	.016	.025	.035	.016	.025	.035
∞	0°	5°	8°	0°	$\cancel{\text{---}}$	8°
REF.	JEDEC MS-012			$\cancel{\text{---}}$		

NOTES:

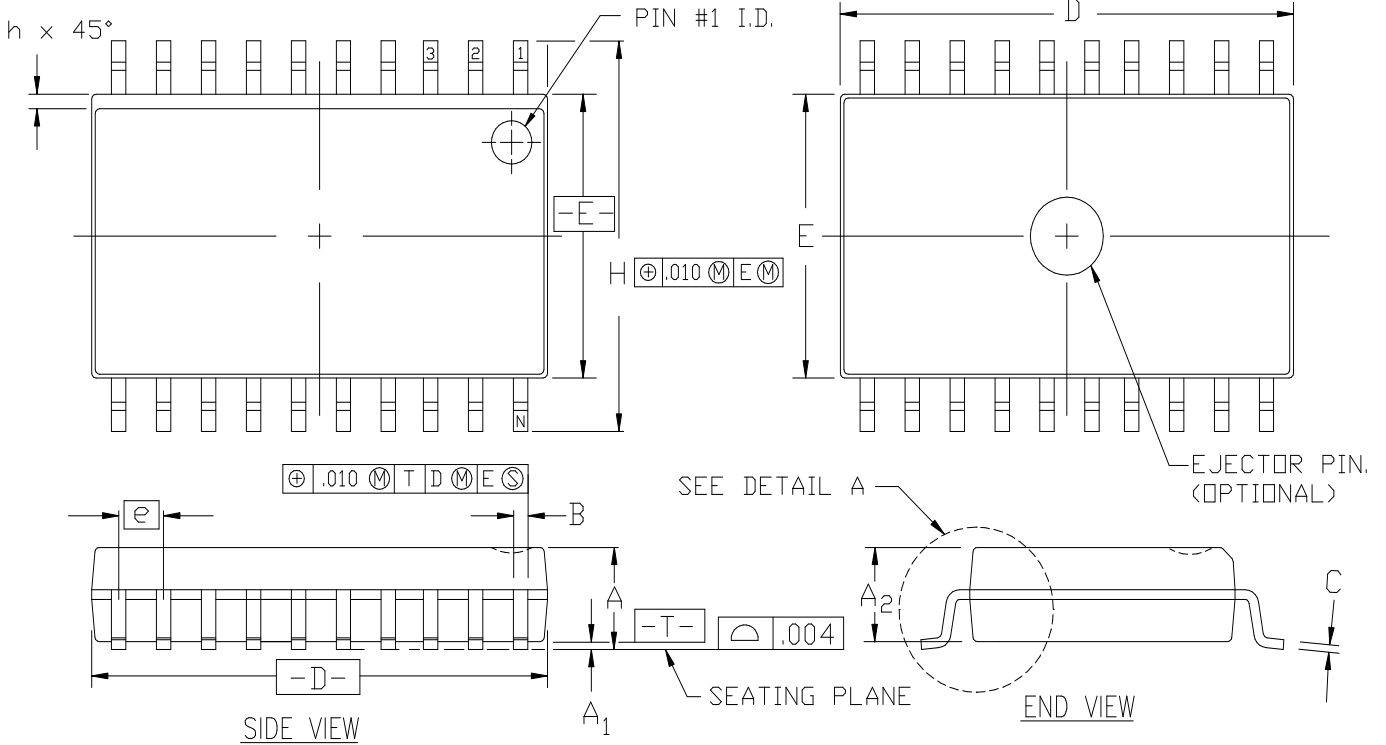
1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982.
2. DIMENSION 'D' DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION SHALL NOT EXCEED .006" PER SIDE.
3. DIMENSION 'E' DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION SHALL NOT EXCEED .010 INCH PER SIDE.
4. LEAD FINISH: SOLDER PLATE

8 LEAD SOIC/TSOP (S08, V08)

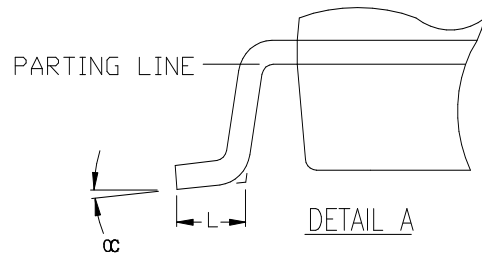
SOIC Package - SO20

TOP VIEW

BOTTOM VIEW



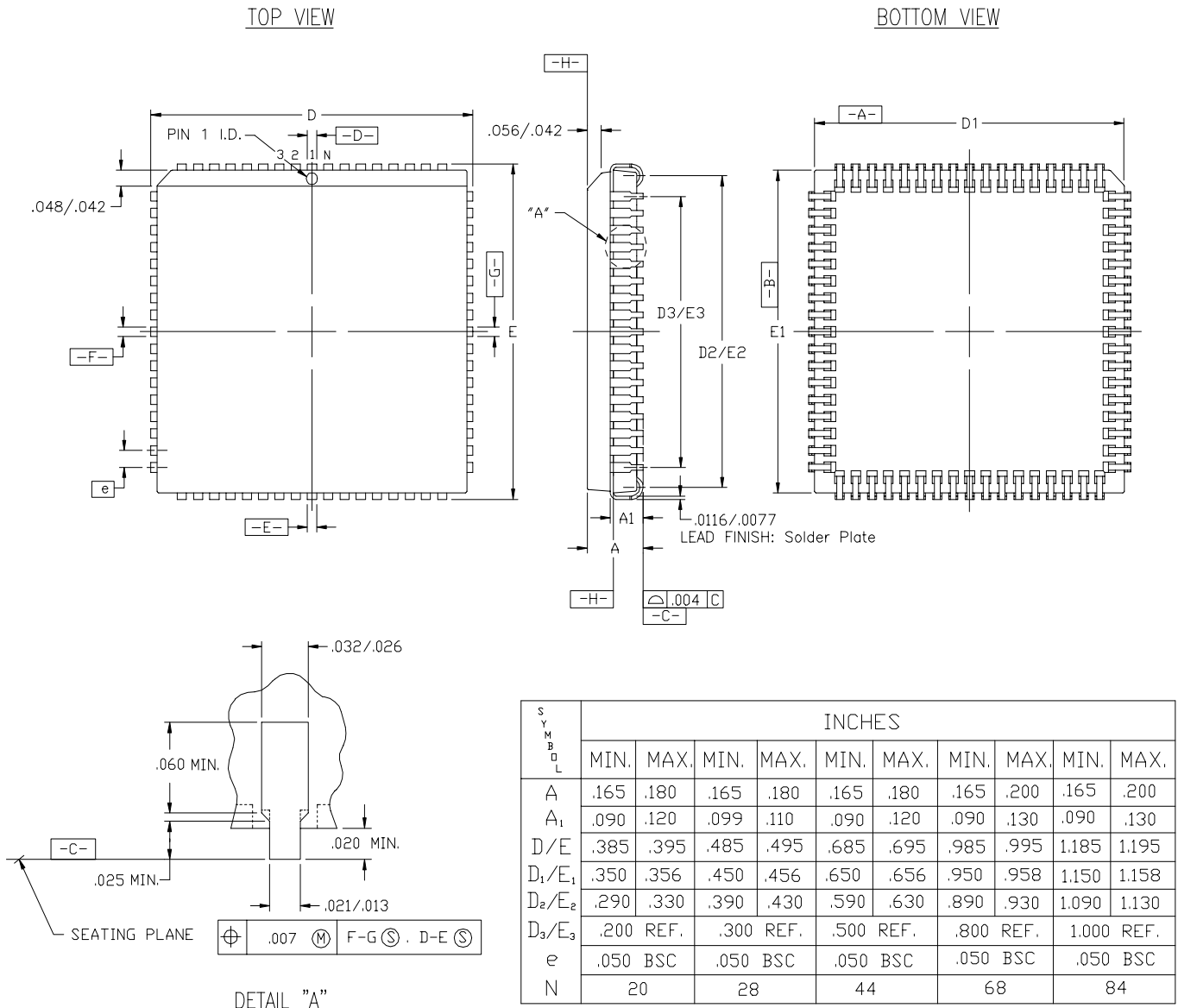
SYMBOL	INCHES		
	MIN.	NOM.	MAX.
A	.097	.101	.104
A ₁	.005	.009	.0115
A ₂	.090	.092	.094
B	.014	.016	.019
C	.0091	.010	.0125
D	.500	.505	.510
E	.292	.296	.299
e	.050 BSC		
H	.400	.406	.410
h	.010	--	.029
L	.024	.032	.040
α	0°	5°	8°



NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982.
2. DIMENSION "D" DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION SHALL NOT EXCEED .006" PER SIDE.
3. DIMENSION "E" DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION SHALL NOT EXCEED .010" PER SIDE.
4. LEAD FINISH: SOLDER PLATE
5. CONFORMS TO JEDEC MS-013-AC

PLCC Packages - PC20, PC28, PC44, PC68, PC84



NOTES:

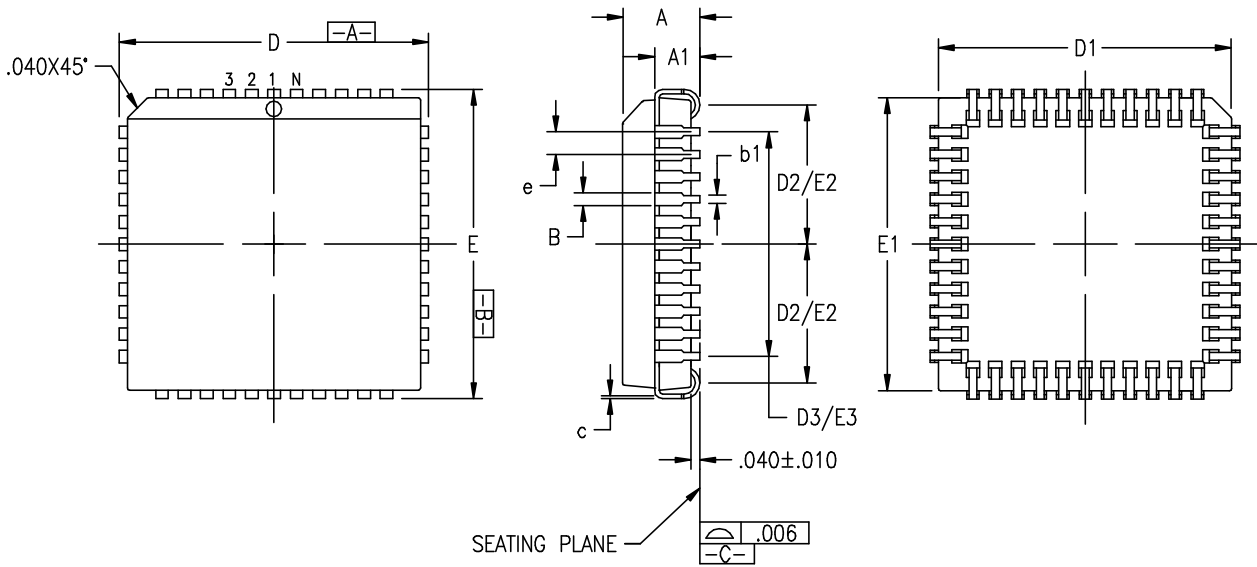
1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982.
2. DIMENSIONS 'D1' AND 'E1' DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED .010 PER SIDE.
3. 'N' IS NUMBER OF TERMINALS.
4. CONFORM TO JEDEC MO-047
5. TOP OF PACKAGE MAY BE SMALLER THAN BOTTOM BY .010".

20, 28, 44, 68 and 84-PIN PLCC (PC20 THRU PC84)

Ceramic Leaded Chip Carrier Package - CC44

TOP VIEW

BOTTOM VIEW



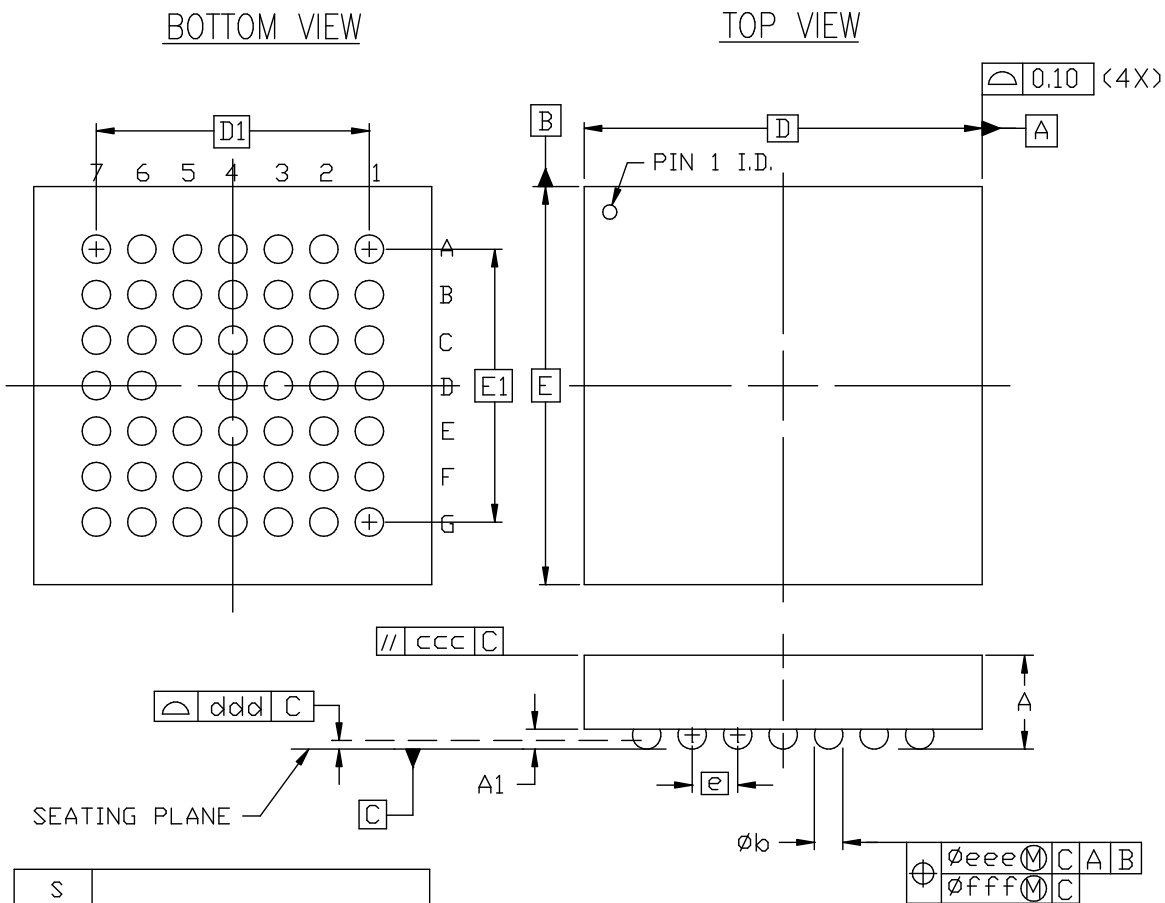
SYMBOL	INCHES		
	MIN	NOM	MAX
A	.155	.172	.190
A1	.090	---	.120
B	.026	.028	.032
b1	.017	.019	.022
c	.006	.007	.012
D/E	.685	.690	.695
D1/E1	.630	.650	.665
D2/E2	.290	.305	.320
D3/E3	.500 REF.		
e	.050 BSC		
N	44		

NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982.
2. LEAD WIDTH DIMENSION INCLUDE LEAD TRIM OFFSET and LEAD FINISH.
3. LEAD FINISH: HOT SOLDER DIP
4. UNDER BASE LEAD LOCATING POCKETS ARE OPTIONAL.
5. SYMBOL 'N' IS THE NUMBER OF TERMINALS.
6. THIS PACKAGE MEET DIMENSIONAL REQUIREMENTS OF JEDEC MO-087-AB

44 LEAD CERAMIC LEADED CHIP CARRIER (CC44)

Ball Chip Scale Package - CS48



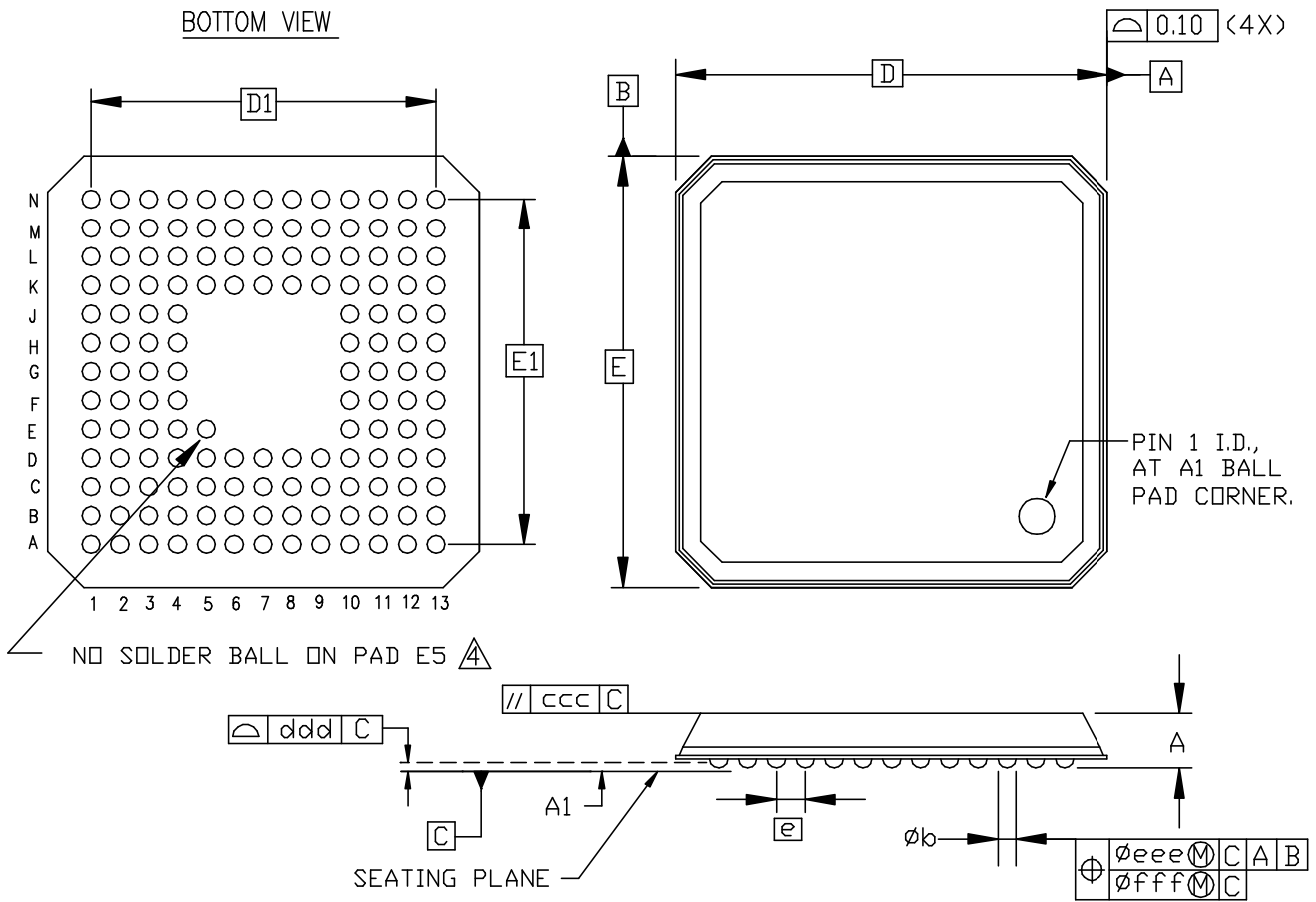
SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.30	\approx	1.80
A ₁	0.35	0.40	0.45
D/E	7.00 BSC		
D ₁ /E ₁	4.80 BSC		
e	0.80 BSC		
ϕb	0.45	0.50	0.55
ccc	\approx	\approx	0.10
ddd	\approx	\approx	0.10
eee	\approx	\approx	0.15
fff	\approx	\approx	0.08
M	7		

NOTES:

- 1. ALL DIMENSIONING AND TOLERANCING CONFORM TO ANSI Y14.5M-1994
- 2. SYMBOL "M" IS THE PIN MATRIX SIZE.

48-BALL CHIP SCALE BGA (CS48)

Ball Chip Scale Package - CS144



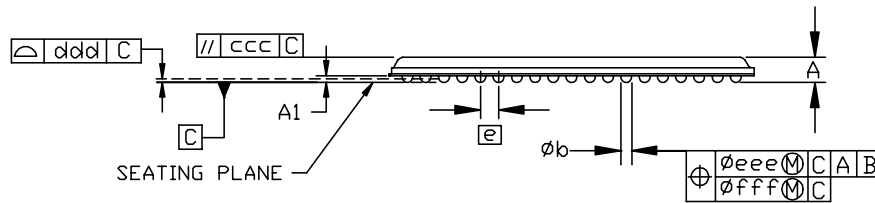
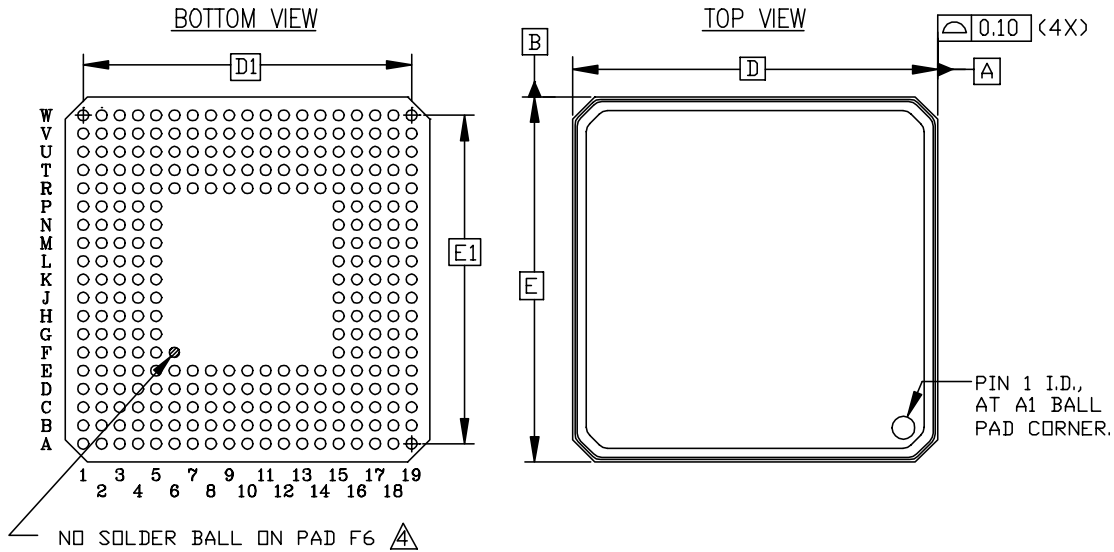
SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	$\cancel{\text{---}}$	$\cancel{\text{---}}$	1.20
A1	0.35	0.40	0.45
D/E	12.00 BSC		
D1/E1	9.60 BSC		
e	0.80 BSC		
ϕb	0.45	0.50	0.55
ccc	$\cancel{\text{---}}$	$\cancel{\text{---}}$	0.10
ddd	$\cancel{\text{---}}$	$\cancel{\text{---}}$	0.12
eee	$\cancel{\text{---}}$	$\cancel{\text{---}}$	0.15
fff	$\cancel{\text{---}}$	$\cancel{\text{---}}$	0.08
M	13		

NOTES:

1. ALL DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5M-1994
 2. SYMBOL "M" IS THE PIN MATRIX SIZE.
 3. CONFORMS TO JEDEC MO-205-BE (DEPOPULATED).
- \triangle PAD 'E5' IS FOR PAD 'A1' CORNER INDICATION.

144-BALL CHIP SCALE BGA (CS144)

Chip Scale Package - CS280



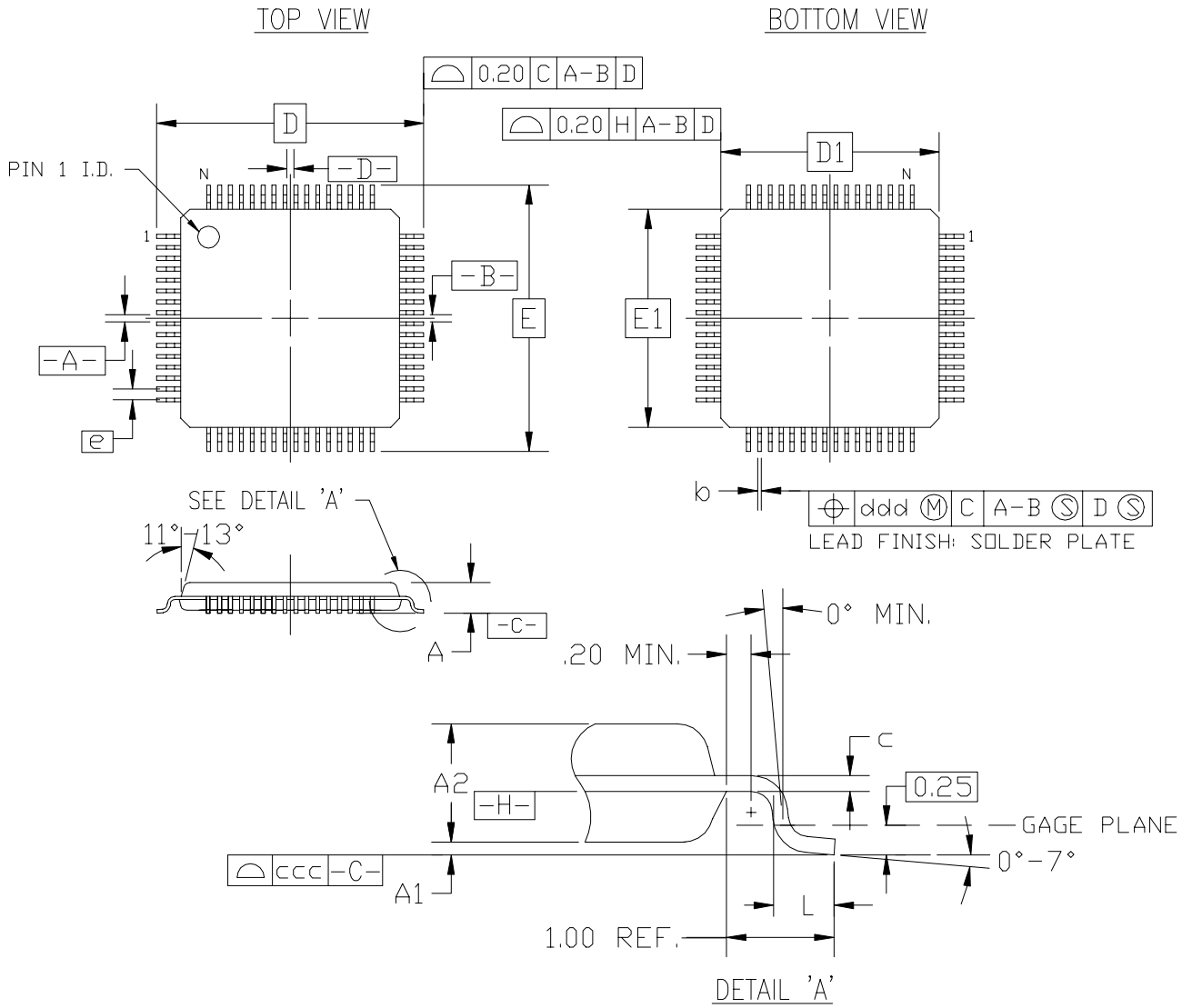
SYMBOL	MILLIMETERS		
	MIN.	NDM.	MAX.
A	---	---	1.20
A ₁	0.35	0.40	0.45
D/E	16.00 BSC		
D ₁ /E ₁	14.40 BSC		
e	0.80 BSC		
ϕb	0.45	0.50	0.55
ccc	---	---	0.10
ddd	---	---	0.12
eee	---	---	0.15
fff	---	---	0.08
M	19		

NOTES:

1. ALL DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5M-1994
2. SYMBOL "M" IS THE PIN MATRIX SIZE.
3. CONFORMS TO JEDEC MO-205-AH (DEPOPULATED).
4. \triangle PAD 'F6' IS FOR PAD 'A1' CORNER INDICATION.

280-BALL CHIP SCALE BGA (CS280)

VQFP Packages - VQ44, VQ64, VQ100

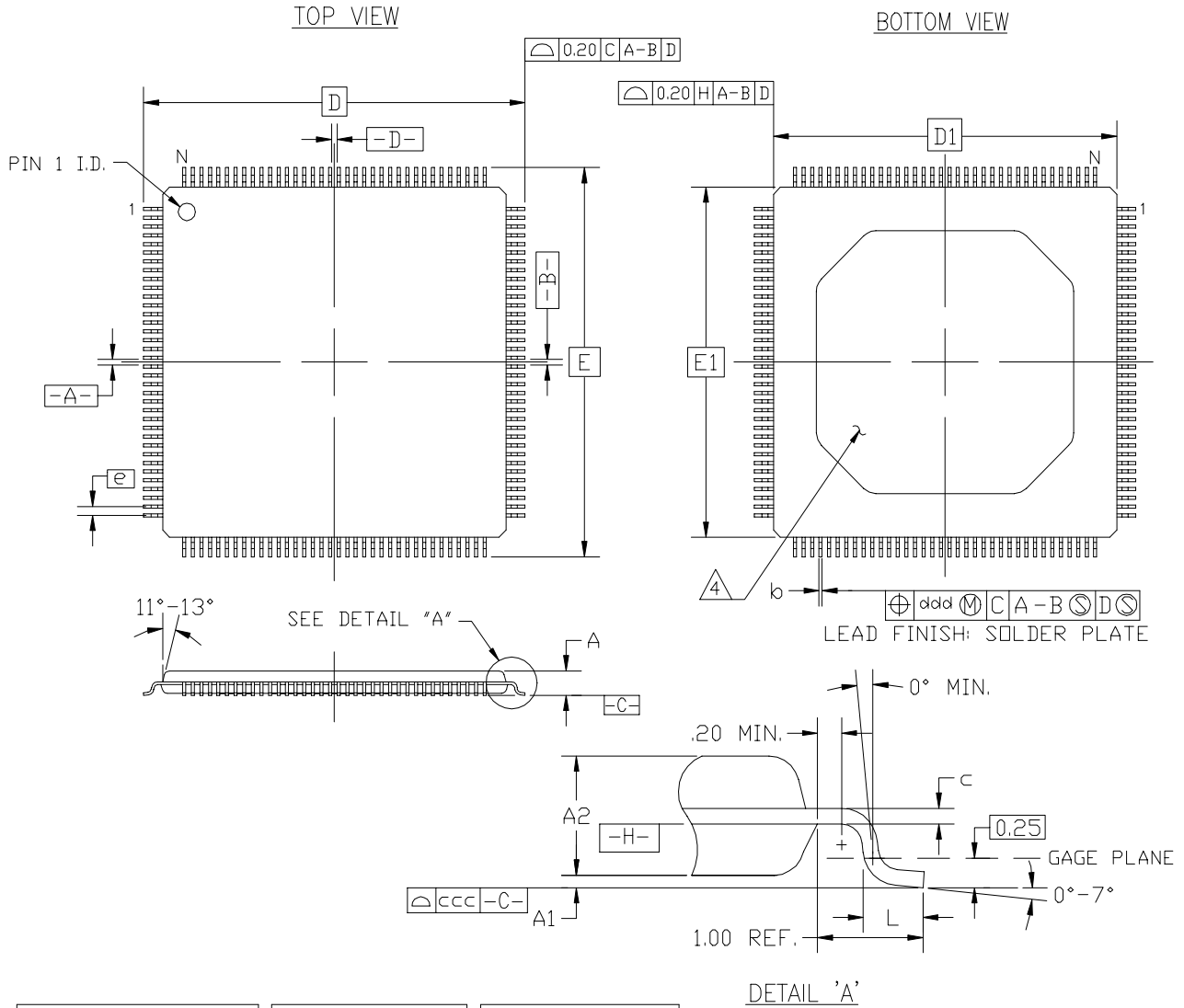


DIMENSION	VQ44			VQ64			VQ100		
	MILLIMETERS			MILLIMETERS			MILLIMETERS		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	\approx	\approx	1.20	\approx	\approx	1.20	\approx	\approx	1.20
A ₁	0.05	\approx	0.15	0.05	0.10	0.15	0.05	0.10	0.15
A ₂	0.95	1.00	1.05	0.95	1.00	1.05	0.95	1.00	1.05
D/E	12.00 BSC.			12.00 BSC.			16.00 BSC.		
D ₁ /E ₁	10.00 BSC.			10.00 BSC.			14.00 BSC.		
b	0.30	0.37	0.45	0.17	0.22	0.27	0.17	0.22	0.27
c	0.09	\approx	0.20	0.09	\approx	0.20	0.09	\approx	0.20
e	0.80 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
ccc	\approx	\approx	0.10	\approx	\approx	0.08	\approx	\approx	0.08
ddd	\approx	\approx	0.20	\approx	\approx	0.08	\approx	\approx	0.08
N	44			64			100		
REF.	JEDEC MS-026-ACB			JEDEC MS-026-ACD			JEDEC MS-026-AED		

- NOTES:
1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982.
 2. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION SHALL NOT EXCEED 0.25mm PER SIDE.
 3. THE TOP OF PACKAGE MAY BE SMALLER THAN THE BOTTOM OF PACKAGE BY 0.15mm.

44, 64, 100-PIN PLASTIC VERY THIN QFP (VQ44, VQ64, VQ100)

TQFP/HTQFP Packages - TQ100, TQ144, TQ176, HT100, HT144, HT176

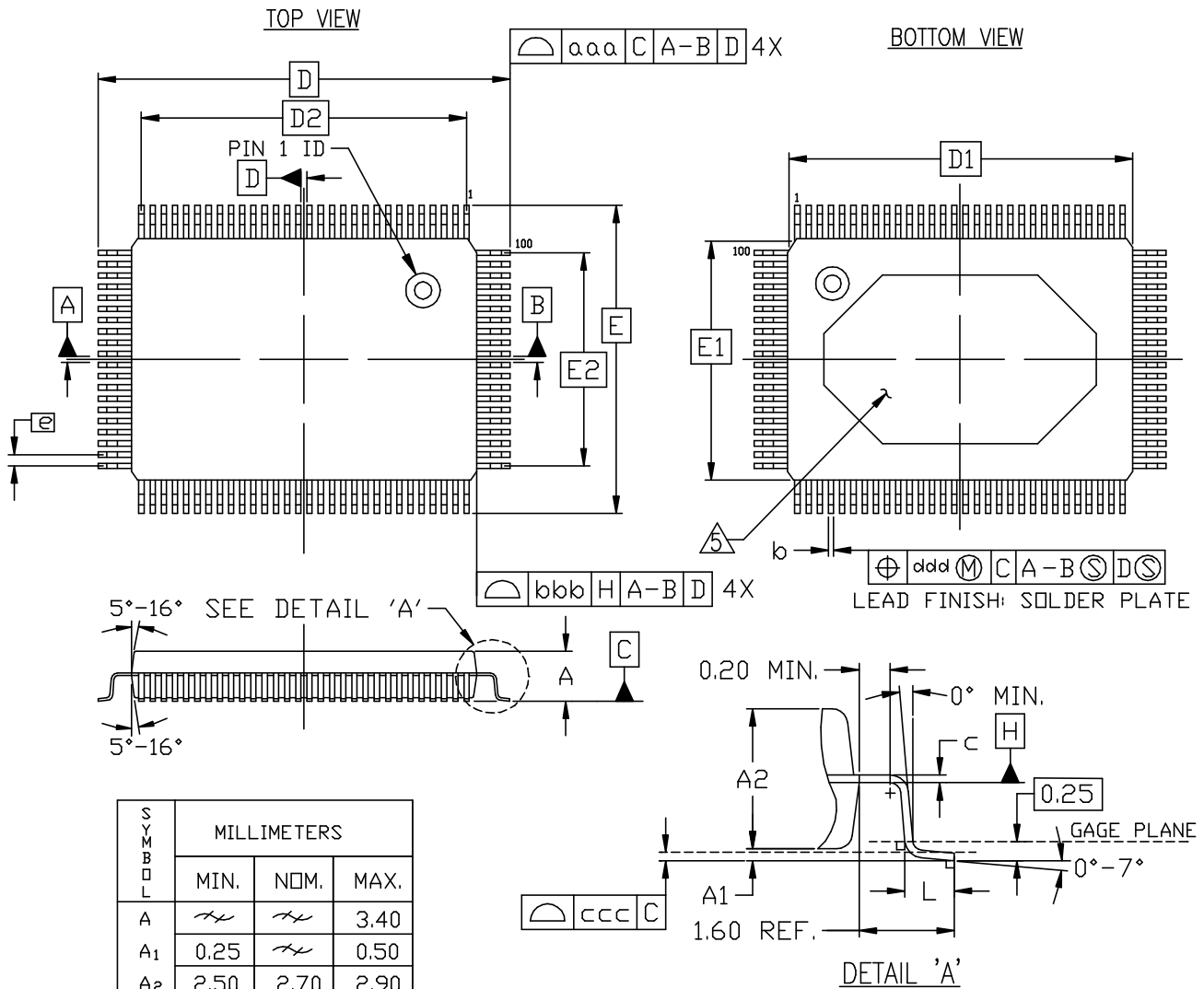


SYMBOL	TQ/HT100			TQ/HT144			TQ/HT176		
	MILLIMETERS			MILLIMETERS			MILLIMETERS		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	\approx	\approx	1.60	\approx	\approx	1.60	\approx	\approx	1.60
A ₁	0.05	\approx	0.15	0.05	0.10	0.15	0.05	0.10	0.15
A ₂	1.35	1.40	1.45	1.35	1.40	1.45	1.35	1.40	1.45
D/E	16.00 BSC			22.00 BSC			26.00 BSC		
D ₁ /E ₁	14.00 BSC			20.00 BSC			24.00 BSC		
L	0.45	0.60	0.75	0.45	0.60	0.75	0.45	0.60	0.75
e	0.50 BSC			0.50 BSC			0.50 BSC		
b	0.17	0.22	0.27	0.17	0.22	0.27	0.17	0.22	0.27
c	0.09	\approx	0.20	0.09	\approx	0.20	0.09	\approx	0.20
ccc	\approx	\approx	0.08	\approx	\approx	0.08	\approx	\approx	0.08
ddd	\approx	\approx	0.08	\approx	\approx	0.08	\approx	\approx	0.08
N	100			144			176		
REF.	JEDEC MS-026-BED			JEDEC MS-026-BFB			JEDEC MS-026-BGA		

- NOTE:
1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5-1982
 2. DIMENSION D₁ AND E₁ DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION SHALL NOT EXCEED 0.25mm PER SIDE.
 3. PACKAGE TOP DIMENSION MAY BE SMALLER THAN THE BOTTOM DIMENSION BY 0.15mm.
- ⚠ THE SAME PACKAGE DIMENSIONS APPLY FOR THERMALLY ENHANCED PRODUCTS. HEAT SINK IS ADDED. THE PACKAGE CODE IS "HT".

100, 144, 176-PIN TQFP/HEAT SINK TQFP (TQ/HT100, 144, 176)

PQ/HQFP Packages - PQ100, HQ100



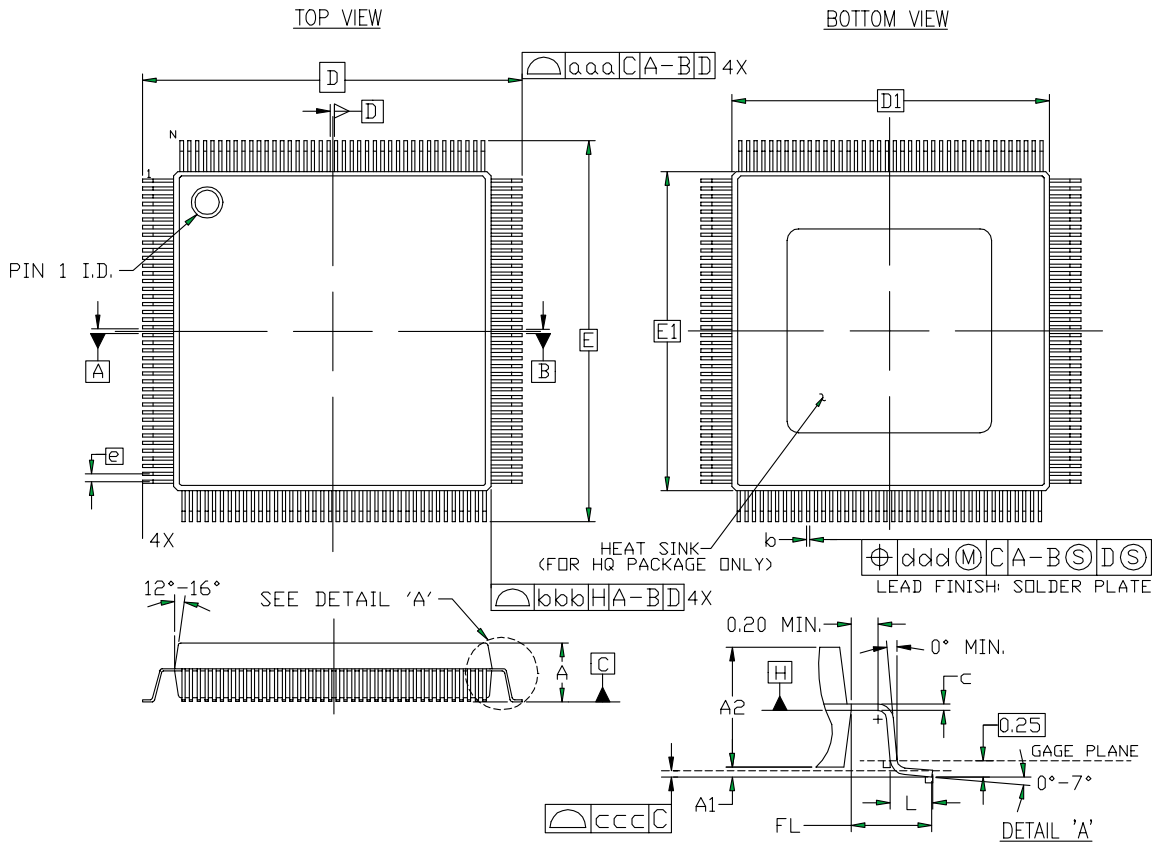
SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	$\cancel{\text{---}}$	$\cancel{\text{---}}$	3.40
A ₁	0.25	$\cancel{\text{---}}$	0.50
A ₂	2.50	2.70	2.90
D	23.20 BSC		
D ₁	20.00 BSC		
D ₂	18.85 REF.		
E	17.20 BSC		
E ₁	14.00 BSC		
E ₂	12.35 REF.		
L	0.73	0.88	1.03
e	0.65 BSC		
b	0.22	$\cancel{\text{---}}$	0.40
c	0.13	$\cancel{\text{---}}$	0.23
aaa	$\cancel{\text{---}}$	$\cancel{\text{---}}$	0.25
bbb	$\cancel{\text{---}}$	$\cancel{\text{---}}$	0.20
ccc	$\cancel{\text{---}}$	$\cancel{\text{---}}$	0.10
ddd	$\cancel{\text{---}}$	$\cancel{\text{---}}$	0.13

NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1994.
 2. DIMENSIONS 'D1' AND 'E1' DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION IS 0.25mm PER SIDE.
 3. THE TOP OF PACKAGE MAY BE EQUAL TO OR SMALLER THAN THE BOTTOM OF PACKAGE BY 0.15 MILLIMETERS.
 4. PACKAGE CONFORMS TO JEDEC OUTLINE MS-022-GC1
5. THE SAME PACKAGE DIMENSIONS APPLY FOR THERMALLY ENHANCED PRODUCTS. HEAT SINK IS ADDED. THE PACKAGE CODE IS 'HQ'.

100-PIN PQFP (PQ100)
 100-PIN HEAT SINK PQFP (HQ100)

PQ/HQFP Packages - PQ44, PQ160, PQ208, PQ240, HQ160, HQ208, HQ240



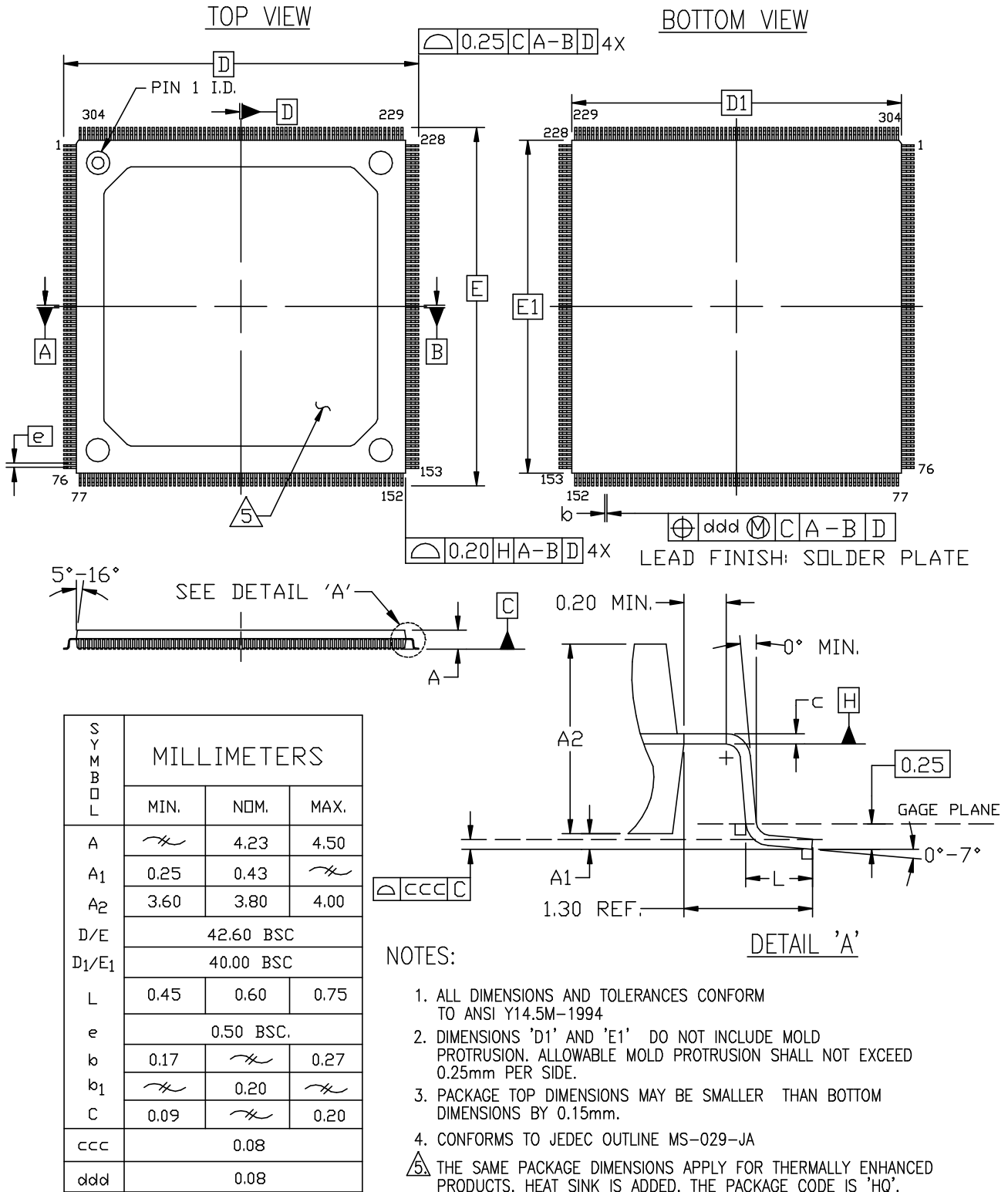
SYMBOL	PQ44			PQ/HQ160			PQ/HQ208			PQ/HQ240		
	MILLIMETERS			MILLIMETERS			MILLIMETERS			MILLIMETERS		
A	\approx	2.15	2.35	\approx	3.70	4.10	\approx	3.70	4.10	\approx	3.78	4.10
A ₁	0.05	\approx	0.25	0.25	0.33	0.50	0.25	0.33	0.50	0.25	0.38	0.50
A ₂	1.95	2.00	2.10	3.20	3.40	3.60	3.20	3.40	3.60	3.20	3.40	3.60
D/E	13.20 BSC			31.20 BSC			30.60 BSC			34.60 BSC		
D ₁ /E ₁	10.00 BSC			28.00 BSC			28.00 BSC			32.00 BSC		
FL	1.60 REF.			1.60 REF.			1.30 REF.			1.30 REF.		
L	0.73	0.88	1.03	0.73	0.88	1.03	0.50	0.60	0.75	0.50	0.60	0.75
e	0.80 BSC.			0.65 BSC.			0.50 BSC.			0.50 BSC.		
b	0.30	\approx	0.45	0.22	\approx	0.40	0.17	0.22	0.27	0.17	\approx	0.27
c	0.13	\approx	0.23	0.13	\approx	0.23	0.09	\approx	0.20	0.09	\approx	0.20
aaa	\approx	\approx	0.25	\approx	\approx	0.25	\approx	\approx	0.25	\approx	\approx	0.25
bbb	\approx	\approx	0.20	\approx	\approx	0.20	\approx	\approx	0.20	\approx	\approx	0.20
ccc	\approx	\approx	0.10	\approx	\approx	0.10	\approx	\approx	0.08	\approx	\approx	0.08
ddd	\approx	\approx	0.20	\approx	\approx	0.13	\approx	\approx	0.08	\approx	\approx	0.08
N	44			160			208			240		
REF.	JEDEC MS-022-AB			JEDEC MS-022-DD1			JEDEC MS-029-FA-1			JEDEC MS-029-GA		

NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1994.
2. DIMENSIONS D₁ AND E₁ DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION SHALL NOT EXCEED 0.25mm PER SIDE.
3. PACKAGE TOP DIMENSIONS MAY BE SMALLER THAN THE BOTTOM DIMENSIONS BY 0.20mm.
4. THE SAME PACKAGE DIMENSIONS APPLY FOR THERMALLY ENHANCED PRODUCTS. HEAT SINK IS ADDED. THE PACKAGE CODE IS "HQ".

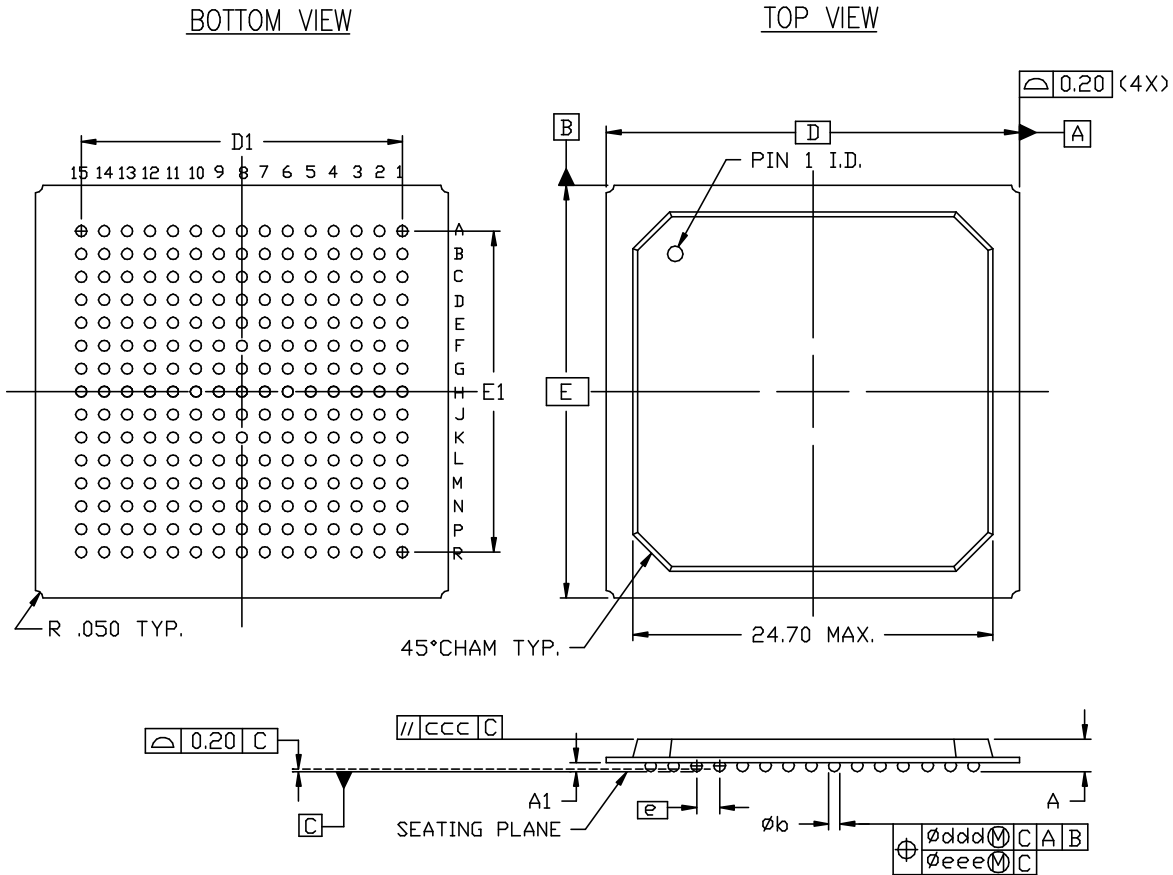
44, 160, 208, 240-PIN PQFP/HEAT SINK PQFP (PQ44, PQ/HQ160, 208, 240)

PQ/HQFP Packages - PQ304, HQ304



304-PIN PQFP (PQ304)
304-PIN HEAT SINK PQFP (HQ304)

BGA Packages - BG225



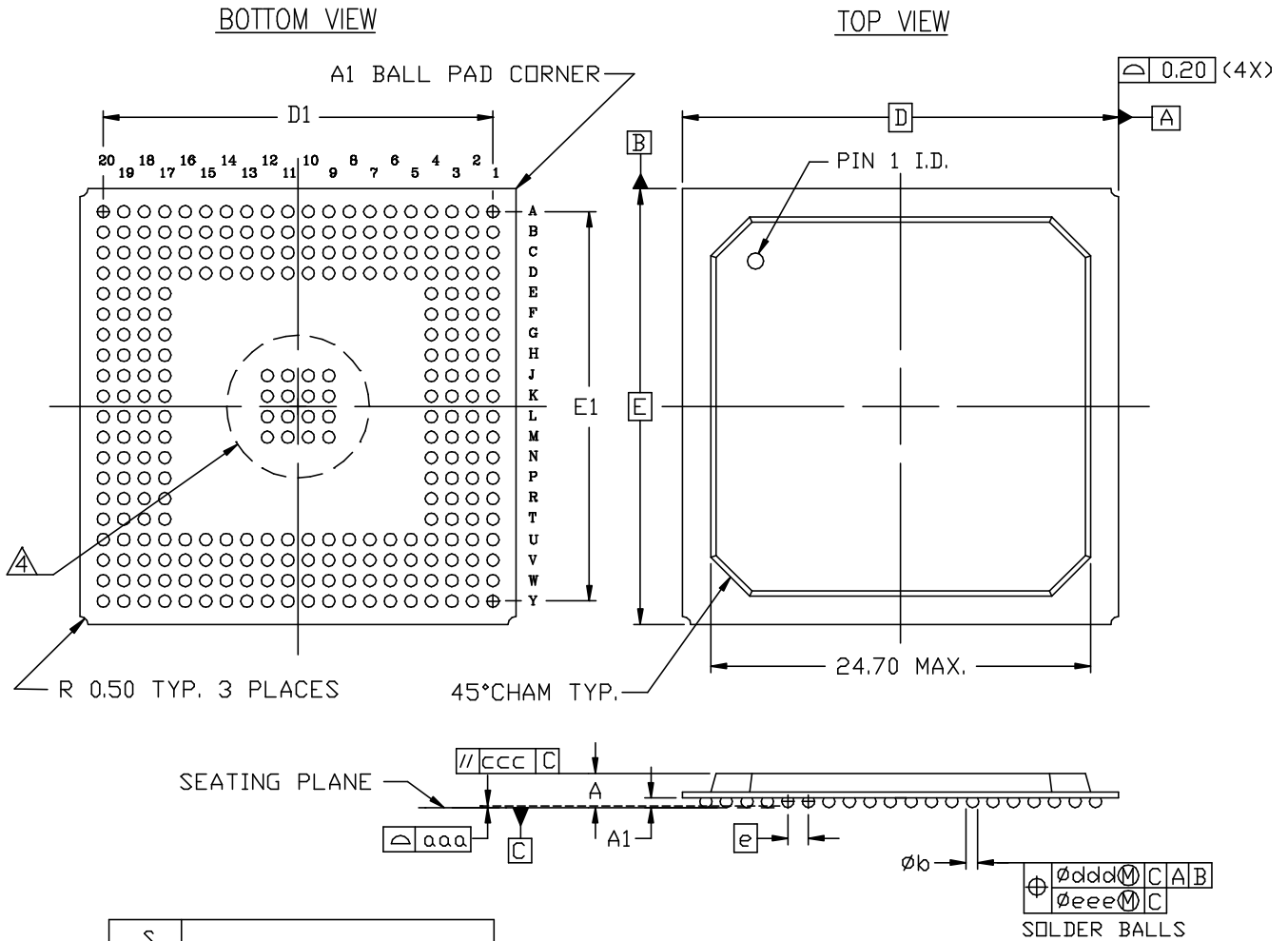
SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	<i>h</i>	2.15	2.55
A ₁	0.50	0.60	0.70
D/E	27.00 BSC		
D ₁ /E ₁	21.00 REF.		
e	1.50 BSC		
øb	0.60	0.75	0.90
ccc	<i>h</i>	<i>h</i>	0.35
ddd	<i>h</i>	<i>h</i>	0.30
eee	<i>h</i>	<i>h</i>	0.15
M	15		

NOTES:

1. ALL DIMENSIONING AND TOLERANCING CONFORM TO ANSI Y14.5M-1994
2. SYMBOL "M" IS THE PIN MATRIX SIZE.
3. CONFORMS TO JEDEC MO-151-CAL (DEPOPULATED)

225-BALL PLASTIC BGA (BG225)

BGA Packages - BG256

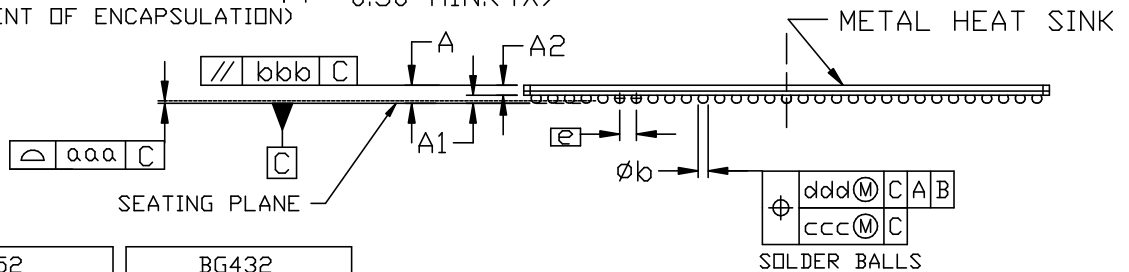
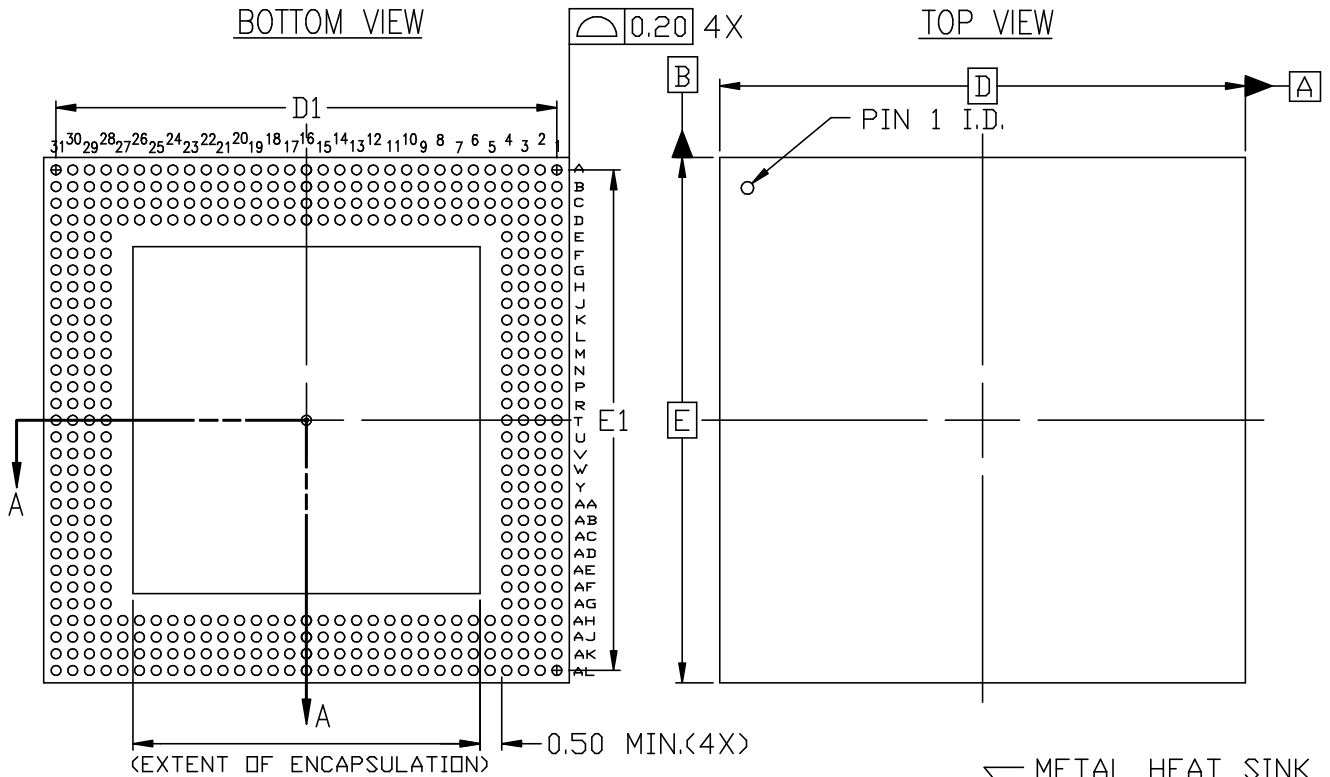


SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	---	2.30	2.55
A ₁	0.50	0.60	0.70
D/E	27.00 BSC		
D ₁ /E ₁	24.14 REF		
e	1.27 BSC		
øb	0.60	0.75	0.90
aaa	---	---	0.20
ccc	---	---	0.35
ddd	---	---	0.30
eee	---	---	0.15
M	20		

- NOTES:
1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1994
 2. SYMBOL 'M' IS THE BALL MATRIX SIZE.
 3. CONFORMS TO JEDEC MO-151-BAL-2
- \triangle 16 EXTRA BALLS (GROUNDED) – APPLICABLE TO DEVICES WITH 28K LOGIC GATES OR MORE.

256-BALL PLASTIC BGA (BG256)

BGA Packages - BG352, BG432



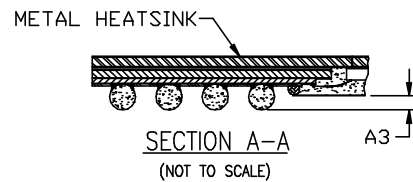
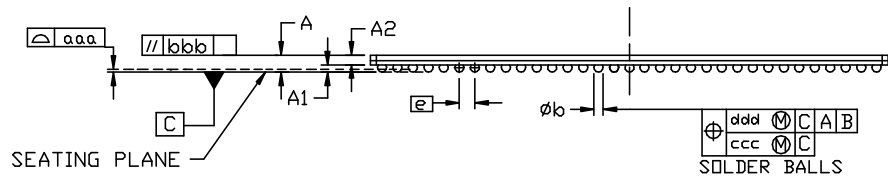
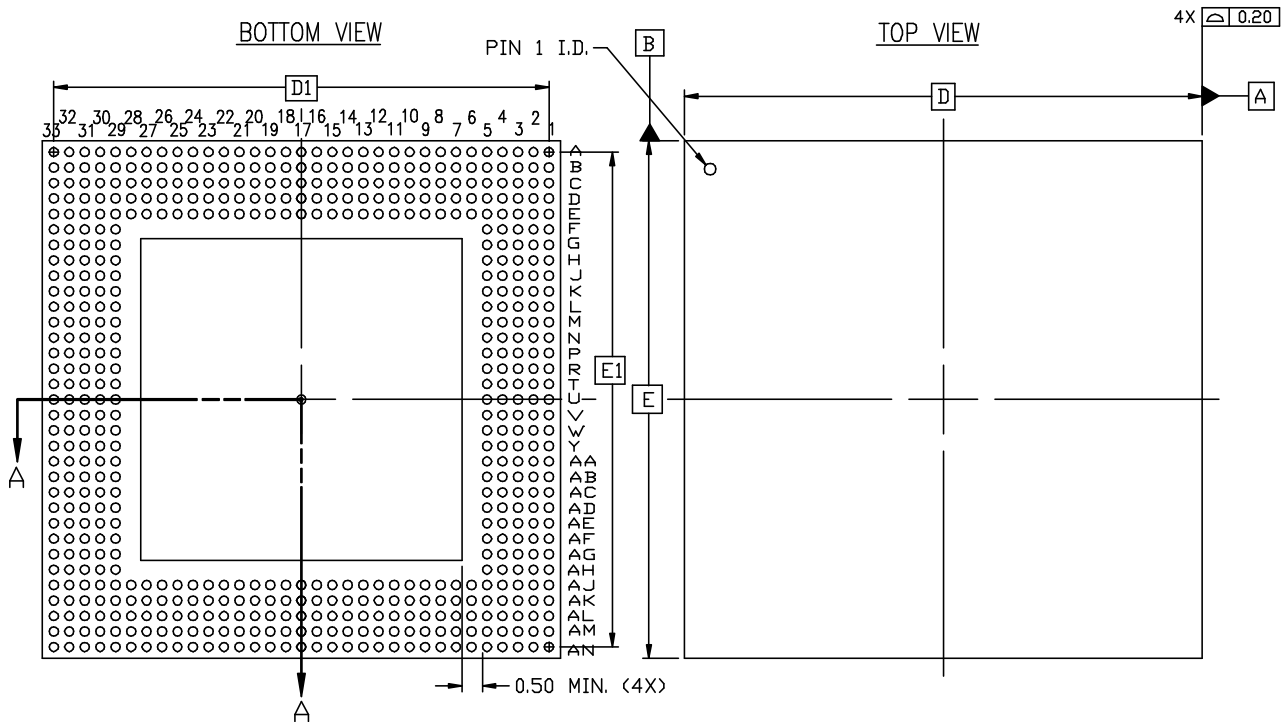
SYMBOL	BG352			BG432		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	1.10	1.40	1.70	1.10	1.40	1.70
A ₁	0.50	0.60	0.70	0.50	0.60	0.70
A ₂	0.60	<i>HL</i>	1.00	0.60	<i>HL</i>	1.00
A ₃	0.20	<i>HL</i>	<i>HL</i>	0.20	<i>HL</i>	<i>HL</i>
D/E	35.00 BSC			40.00 BSC		
D ₁ /E ₁	31.75 REF.			38.10 REF.		
e	1.27 BSC			1.27 BSC		
øb	0.60	0.75	0.90	0.60	0.75	0.90
aaa	<i>HL</i>	<i>HL</i>	0.20	<i>HL</i>	<i>HL</i>	0.20
bbb	<i>HL</i>	<i>HL</i>	0.25	<i>HL</i>	<i>HL</i>	0.25
ccc	<i>HL</i>	<i>HL</i>	0.15	<i>HL</i>	<i>HL</i>	0.15
ddd	<i>HL</i>	<i>HL</i>	0.30	<i>HL</i>	<i>HL</i>	0.30
M	26			31		
REF.	JEDEC MO-192-BAR-2			JEDEC MO-192-BAU-1		

NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1994
2. SYMBOL "M" IS THE PIN MATRIX SIZE.
3. CONFORMS TO JEDEC MO-192 (DEPOPULATED)
4. 31X31 MATRIX SIZE IS SHOWN FOR ILLUSTRATION ONLY.
5. BOTH PACKAGES HAVE 4 ROWS OF PINS ON EACH SIDE.
6. CONTACT XILINX FOR CLARIFICATION.

352, 432-BALL PLASTIC BGA (BG352, BG432)
CAVITY DOWN

BGA Packages - BG560



SYMBOL	MILLIMETERS			NOTE
	MIN.	NOM.	MAX.	
A	1.10	1.38	1.70	2
A ₁	0.50	0.60	0.70	
A ₂	0.60	<i>xx</i>	1.00	
A ₃	0.20	<i>xx</i>	<i>xx</i>	
D/E	42.50 BSC			
D ₁ /E ₁	40.64 REF.			
e	1.27 BSC			
φb	0.60	0.75	0.90	
aaa	<i>xx</i>	<i>xx</i>	0.20	
ccc	<i>xx</i>	<i>xx</i>	0.15	
bbb	<i>xx</i>	<i>xx</i>	0.25	
ddd	<i>xx</i>	<i>xx</i>	0.30	
M	33			

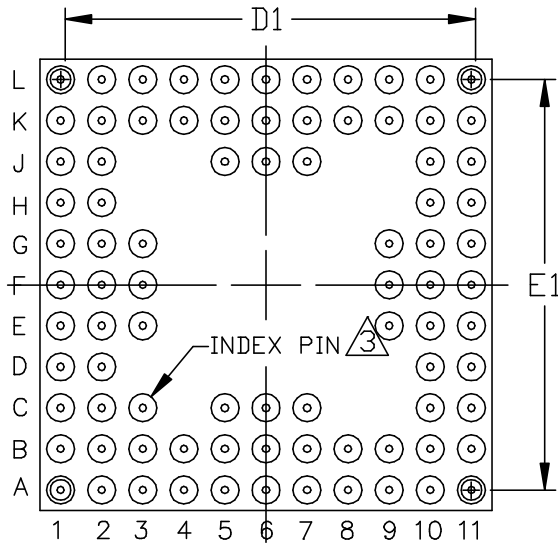
NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1994
2. SYMBOL 'M' IS THE PIN MATRIX SIZE.
3. CONFORMS TO JEDEC MO-192-BAV-1 (DEPOPULATED)

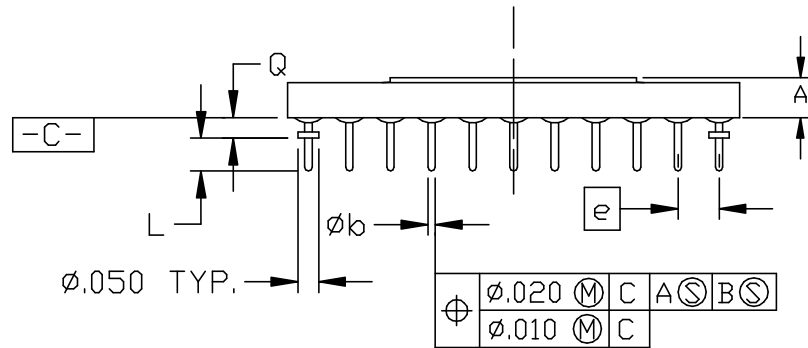
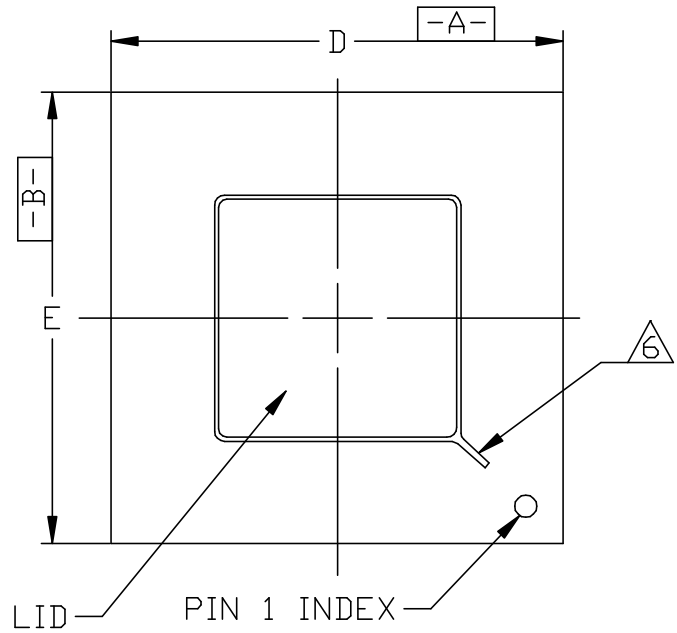
560-BALL PLASTIC BGA (BG560)

Ceramic PGA Packages - PG68, PG84

BOTTOM VIEW



TOP VIEW



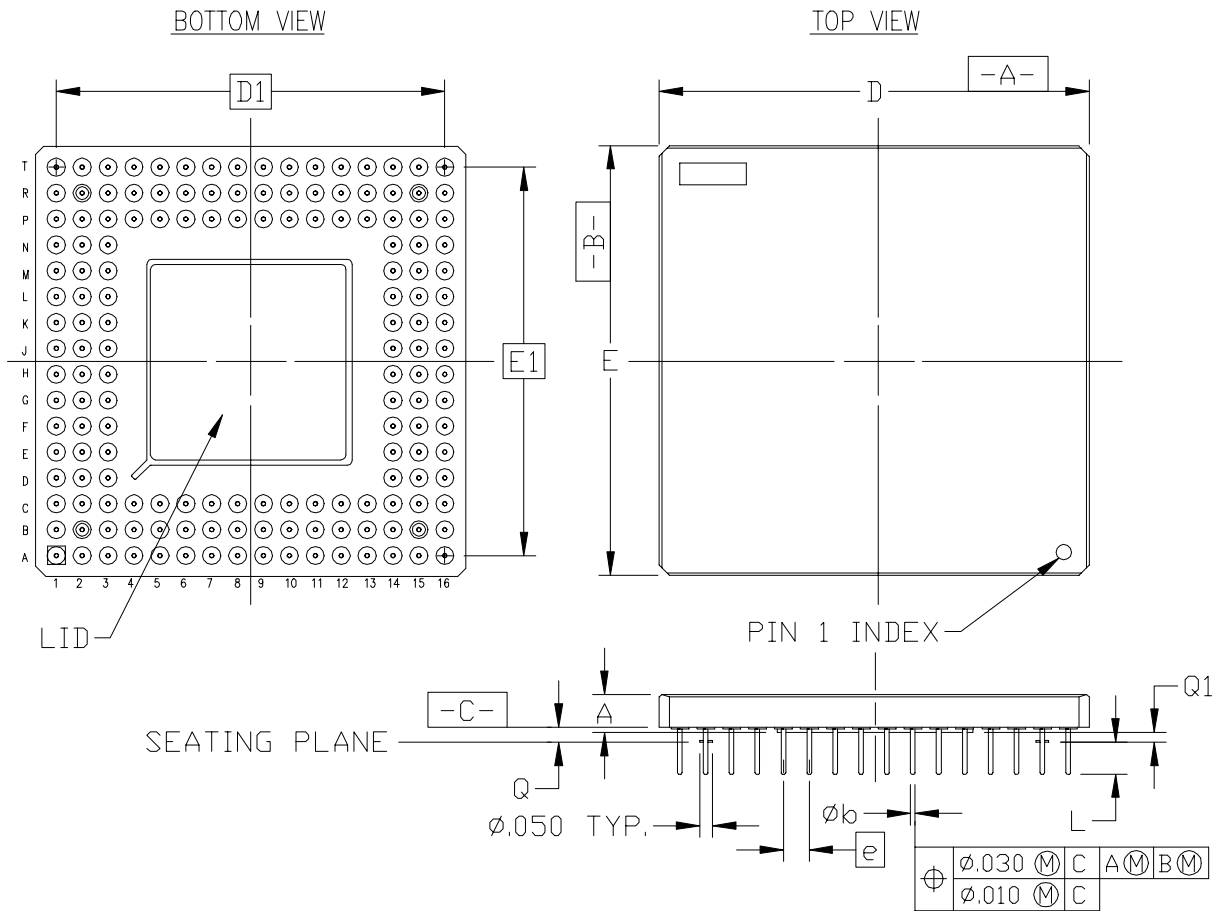
PG68 OR PG84			
SYMBOL	INCHES		
	MIN.	NOM.	MAX.
A	<i>∅</i>	<i>∅</i>	.145
D/E	1.090	1.100	1.115
D ₁ /E ₁	1.000 REF.		
L	.120	.130	.140
Q	.045	<i>∅</i>	.060
e	.100 BSC		
øb	.016	.018	.020
M	11		
REF.	JEDEC MO-66 AC		

NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982
2. SYMBOL 'M' IS THE PIN MATRIX SIZE.
3. PIN C3 MAY OR MAY NOT BE ELECTRICALLY CONNECTED.
4. PG68 DOES NOT HAVE THIRD ROW ON EACH SIDE EXCEPT THE INDEX PIN.
5. LEAD FINISH: GOLD PLATED
 - COMMERCIAL (35 MICRO INCHES MIN.)
 - MILITARY (50 MICRO INCHES MIN.)
6. THIS FEATURE IS OPTIONAL, MAY BE AT DIFFERENT LOCATION.
7. PG68 DOES NOT HAVE THE 4 CORNER PINS.

68, 84-PIN CERAMIC PGA (PG68, PG84)

Ceramic PGA Packages - PG120, PG132, PG156



SYMBOL	PG120			PG132			PG156		
	INCHES			INCHES			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	<i>HL</i>	<i>HL</i>	.145	<i>HL</i>	<i>HL</i>	.145	<i>HL</i>	<i>HL</i>	.145
D/E	1.340	1.360	1.380	1.440	1.460	1.480	1.640	1.660	1.680
D ₁ /E ₁	1.200 BSC			1.300 BSC			1.500 BSC		
L	.120	.130	.140	.120	.130	.140	.120	.130	.140
Q	.045	<i>HL</i>	.060	.045	<i>HL</i>	.060	.045	<i>HL</i>	.060
Q ₁	.025	<i>HL</i>	<i>HL</i>	.025	<i>HL</i>	<i>HL</i>	.025	<i>HL</i>	<i>HL</i>
e	.100 BSC			.100 BSC			.100 BSC		
ϕ b	.016	.018	.020	.016	.018	.020	.016	.018	.020
M	13			14			16		
REF.	JEDEC MO-067-AE			JEDEC MO-067-AF			JEDEC MO-067-AH		

NOTES:

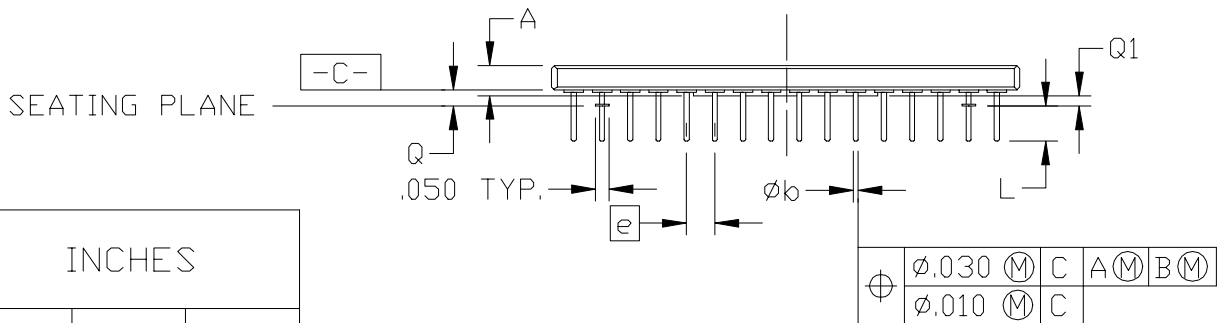
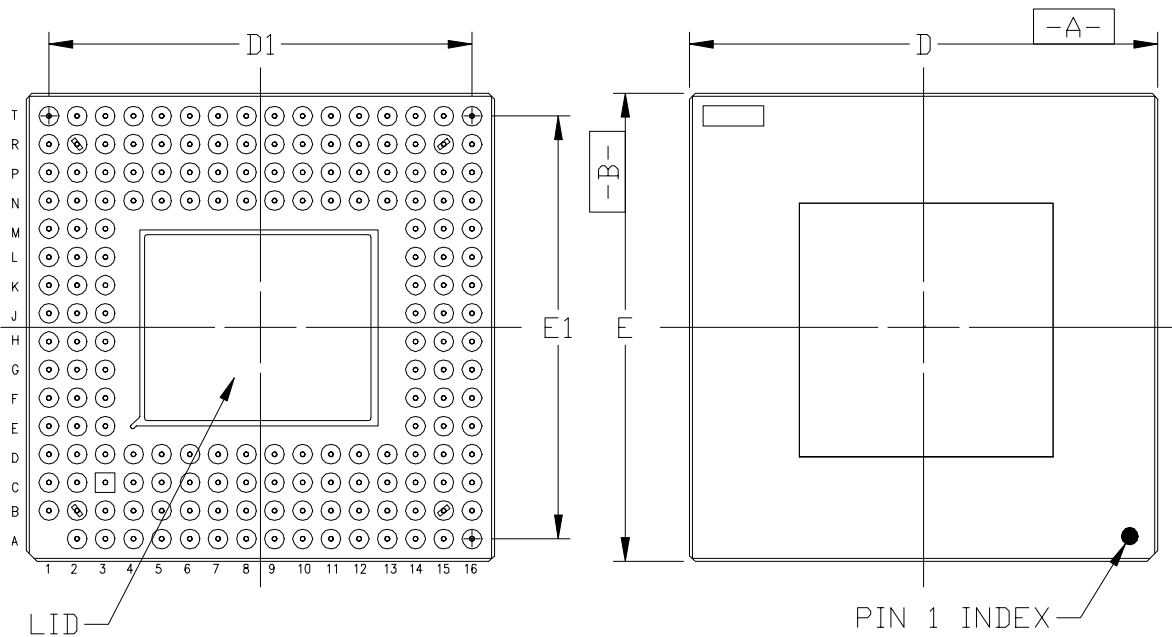
1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982
2. SYMBOL 'M' IS THE PIN MATRIX SIZE.
3. LEAD FINISH: GOLD PLATED
 - COMMERCIAL (35 MICROINCHES MIN.)
 - MILITARY (50 MICROINCHES MIN.)

120, 132, 156-PIN CERAMIC PGA (PG120, PG132, PG156)

Ceramic PGA Packages - PG175

BOTTOM VIEW

TOP VIEW



SYMBOL	INCHES		
	MIN.	NOM.	MAX.
A	<i>∅</i>	<i>∅</i>	.145
D/E	1.640	1.660	1.680
D ₁ /E ₁	1.500 BSC		
L	.120	.130	.140
Q	.045	<i>∅</i>	.060
Q ₁	.025	<i>∅</i>	<i>∅</i>
e	.100 BSC		
φ _b	.016	.018	.020
M	16		

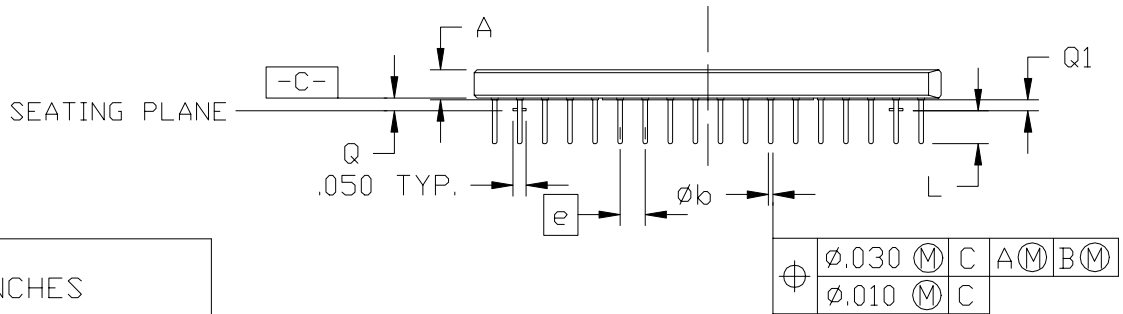
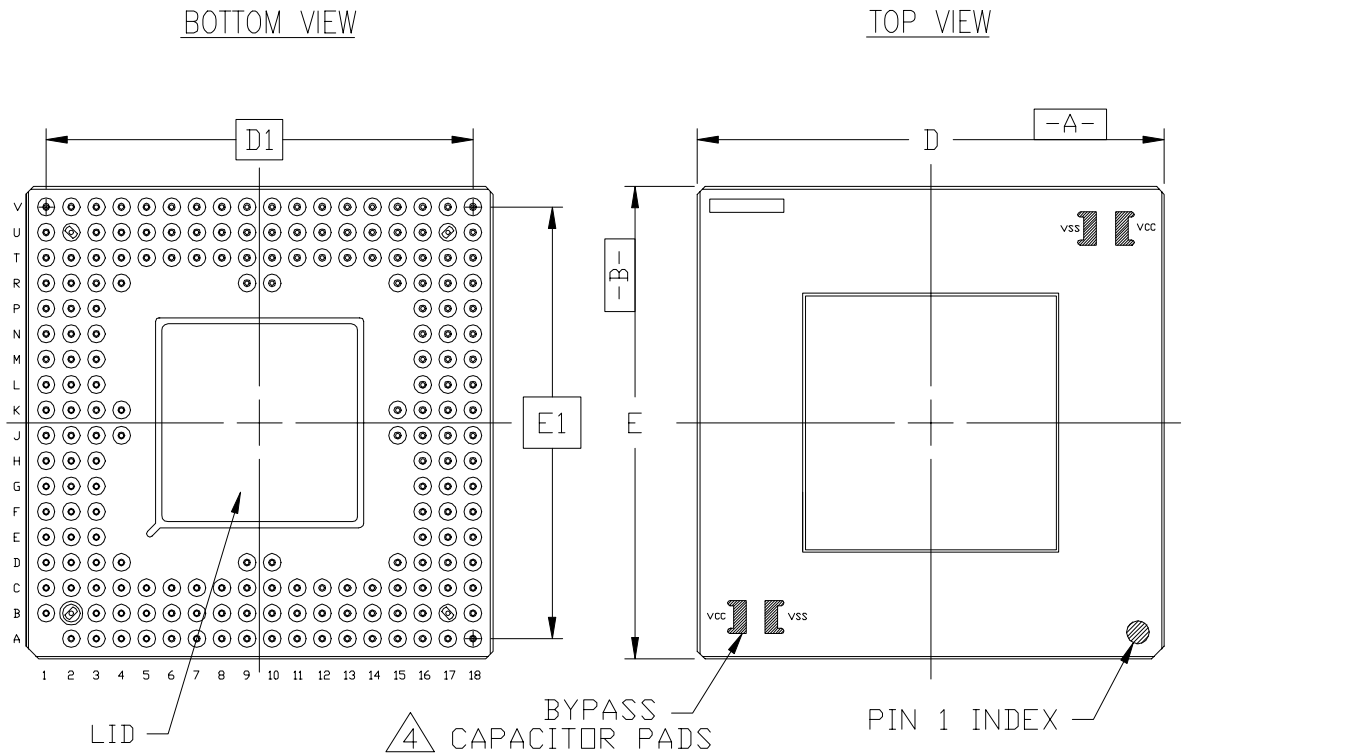
∅	∅.030 (M)	C	A (M)	B (M)
∅	∅.010 (M)	C		

NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982
2. SYMBOL 'M' IS THE PIN MATRIX SIZE.
3. CONFORMS TO JEDEC MO-067-AH
4. LEAD FINISH: GOLD PLATED
 - COMMERCIAL (35 MICROINCHES MIN.)
 - MILITARY (50 MICROINCHES MIN.)

175-PIN CERAMIC PGA (PG175)

Ceramic PGA Packages - PG191



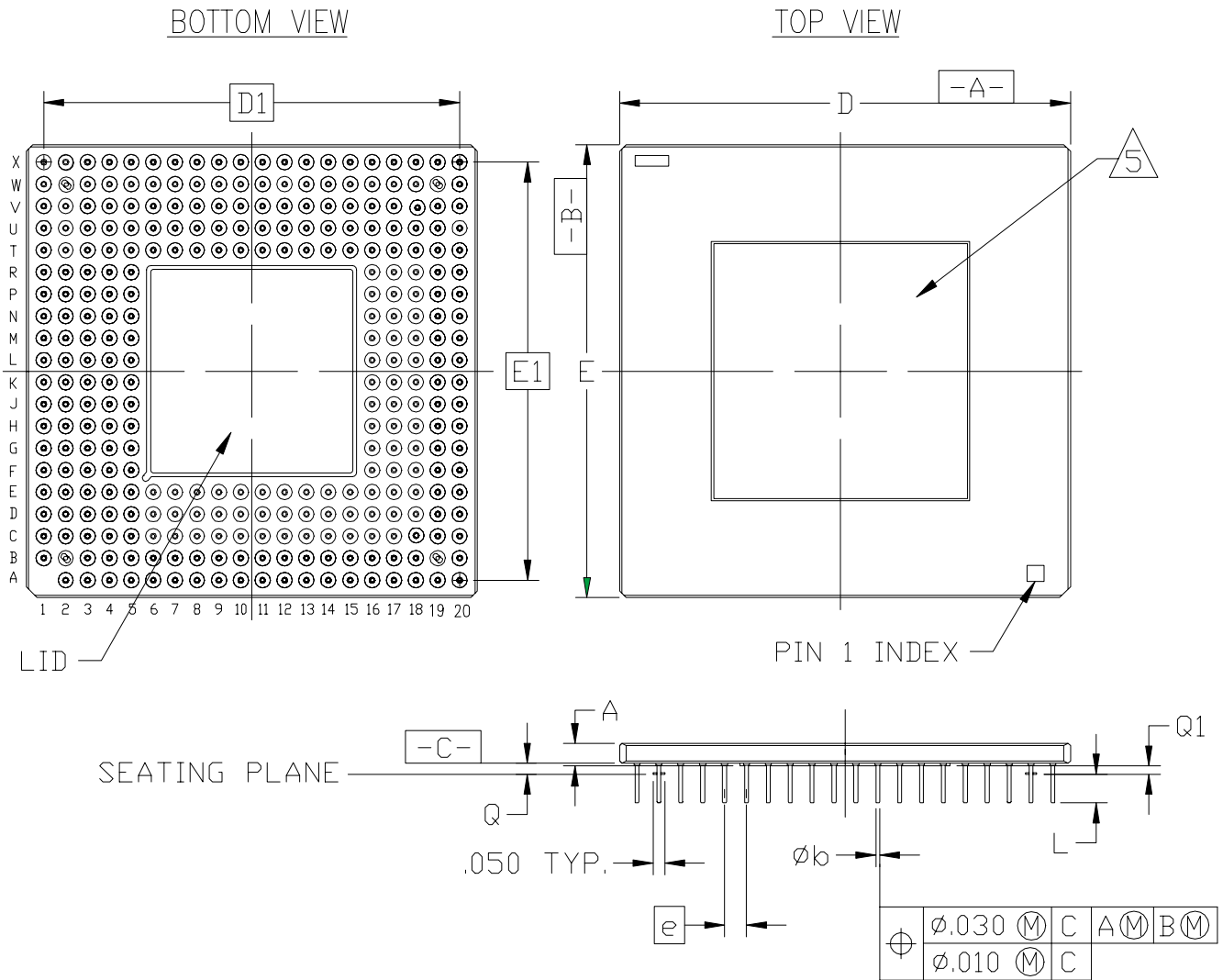
SYMBOL	INCHES		
	MIN.	NOM.	MAX.
A	\approx	.115	.145
D/E	1.840	1.860	1.880
D ₁ /E ₁	1.700 BSC		
L	.120	.130	.140
Q	.045	\approx	.060
Q ₁	.025	\approx	\approx
e	.100 BSC		
phi_b	.016	.018	.020
M	18		

NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982.
2. SYMBOL 'M' IS THE PIN MATRIX SIZE.
3. CONFORMS TO JEDEC MO-067-AK
4. BYPASS CAPACITOR PADS – GOLD PLATED. MAY OR MAY NOT BE PRESENT ON ALL PACKAGES.
5. LEAD FINISH: GOLD PLATED
 - COMMERCIAL (35 MICROINCHES MIN.)
 - MILITARY (50 MICROINCHES MIN.)

191-PIN CERAMIC PGA (PG191)

Ceramic PGA Packages - PG223, PG299



		PG223			PG299		
SYMBOL	INCHES			INCHES			
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	
A	<i>∅</i>	.115	.145	<i>∅</i>	<i>∅</i>	.145	
D/E	1.840	1.860	1.880	2.040	2.060	2.080	
D ₁ /E ₁	1.700 BSC			1.900 BSC			
L	.120	.130	.140	.120	.130	.140	
Q	.045	<i>∅</i>	.060	.045	<i>∅</i>	.060	
Q ₁	.025	<i>∅</i>	<i>∅</i>	.025	<i>∅</i>	<i>∅</i>	
e	.100 BSC			.100 BSC			
∅ _b	.016	.018	.020	.016	.018	.020	
M	18			20			
REF.	JEDEC MO-067-AK			JEDEC MO-067-AM			

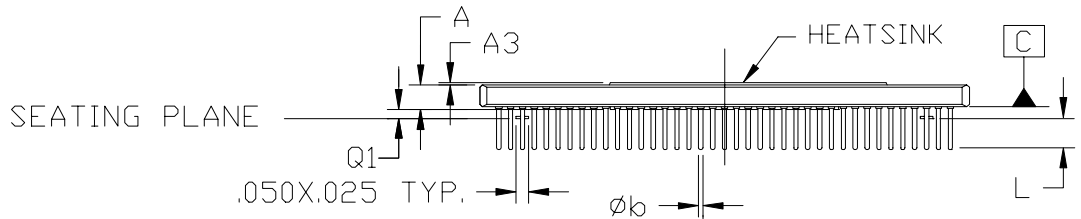
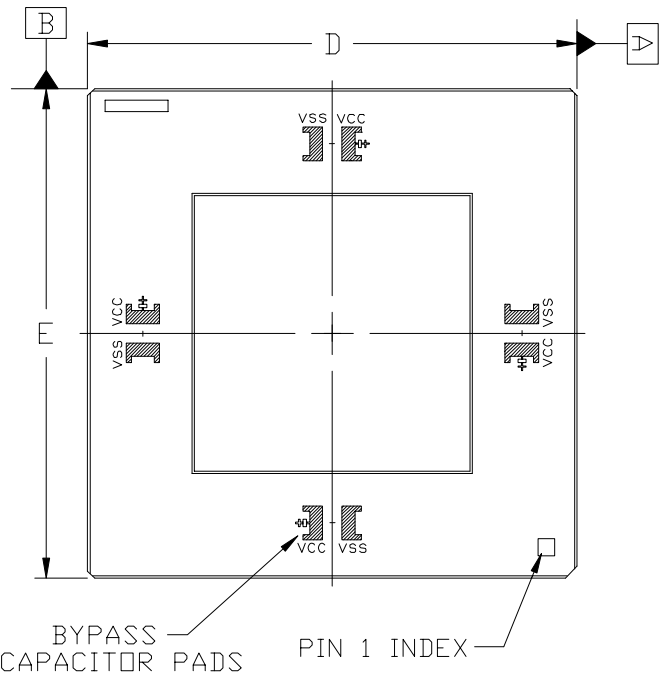
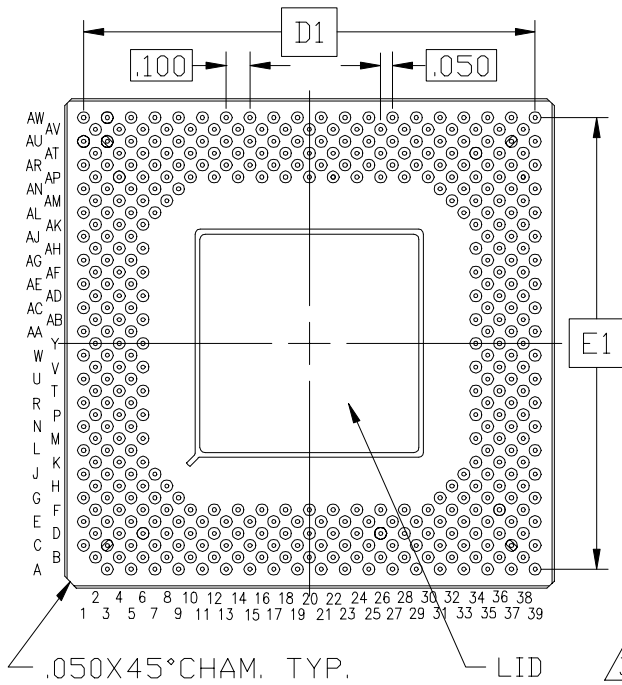
NOTES:

- ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982
- SYMBOL 'M' IS THE PIN MATRIX SIZE.
- FOR PG223, ONLY 4 ROWS OF PINS ON EACH SIDE.
- LEAD FINISH: GOLD PLATED
 - COMMERCIAL (35 MICROINCHES MIN.)
 - MILITARY (50 MICROINCHES MIN.)
- OPTION - HEAT SINK MAY BE ADDED FOR HIGH POWER DEVICES BUT DIMENSION 'A' REMAINS .145" MAX.
- PG299 20X20 MATRIX SHOWN FOR ILLUSTRATION ONLY.
- CONTACT XILINX FOR CLARIFICATION.

Ceramic PGA Packages - PG411

BOTTOM VIEW

TOP VIEW



SYMBOL	INCHES		
	MIN.	NOM.	MAX.
A	\approx	\approx	.165
A3	.015	.020	.025
D/E	2.040	2.060	2.080
D1/E1	1.900 BSC		
L	.110	\approx	.150
Q1	.015	\approx	.045
M1	39		
ϕ_b	.016	.018	.020

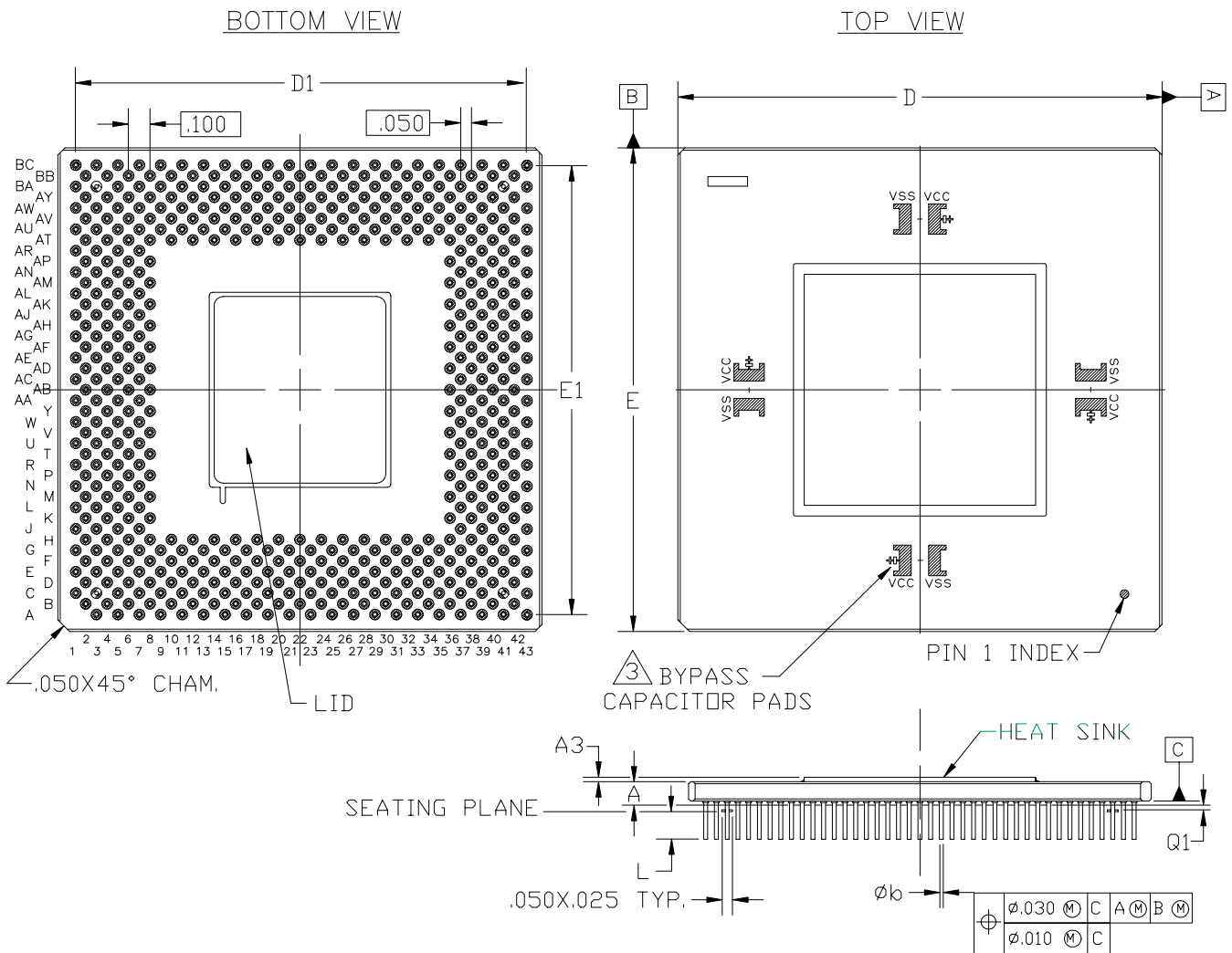
ϕ	ϕ .030 (M)	C	A (M)	B (M)
	ϕ .010 (M)	C		

NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1994
2. SYMBOL 'M' IS THE PIN MATRIX SIZE.
3. BYPASS CAPACITOR PADS - GOLD PLATED MAY OR MAY NOT BE PRESENT ON ALL PACKAGES.
4. CONFORMS TO JEDEC MO-128- AM.
5. LEAD FINISH: GOLD PLATED
 - COMMERCIAL (35 MICROINCHES MIN.)
 - MILITARY (50 MICROINCHES MIN.)

411-PIN CERAMIC PGA (PG411)

Ceramic PGA Packages - PG475, PG559



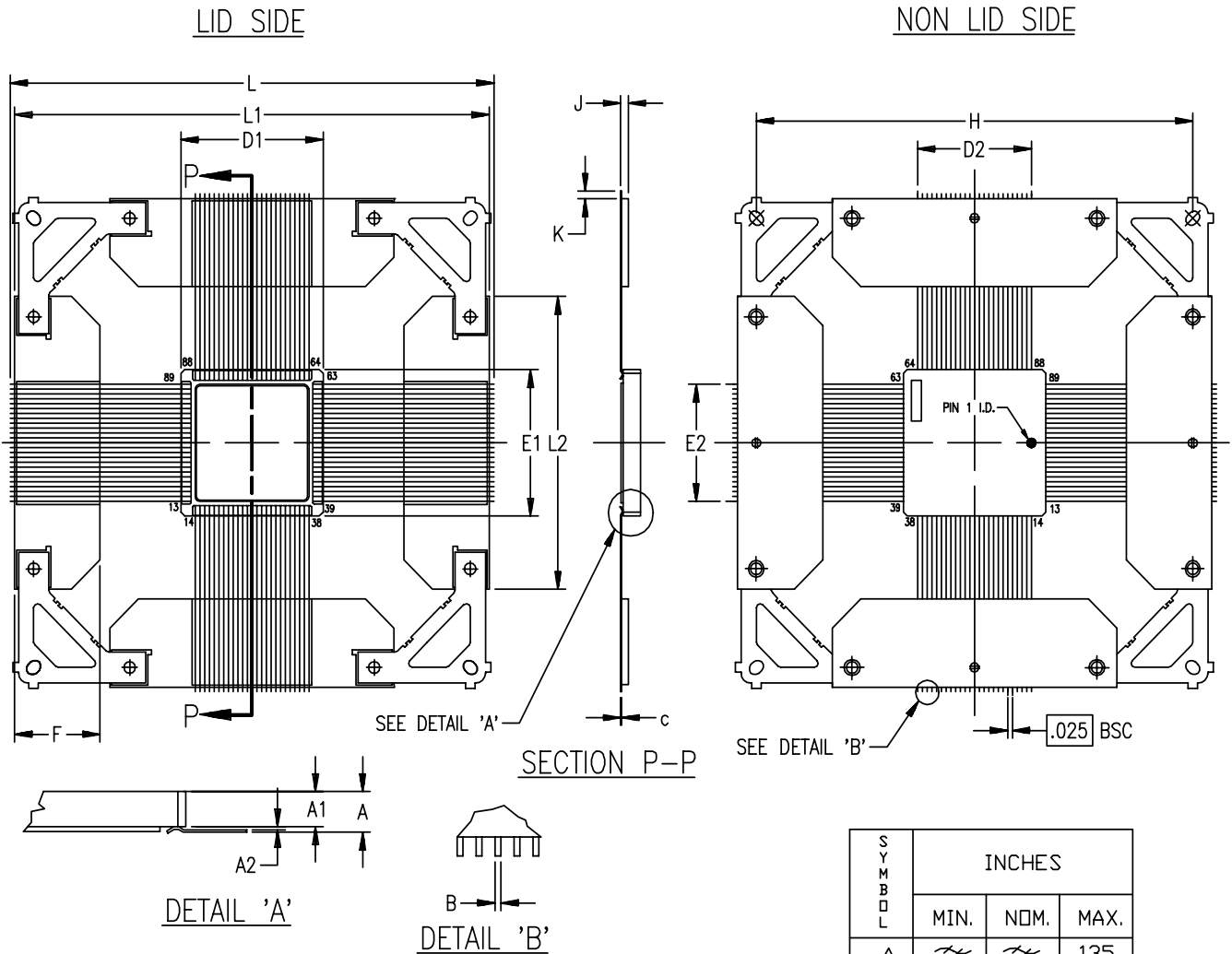
SYMBOL	PG475			PG559		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	<i>h</i>	<i>h</i>	.165	<i>h</i>	<i>h</i>	.165
A3	.015	.020	.025	.015	.020	.025
D/E	2.140	2.160	2.180	2.240	2.260	2.280
D ₁ /E ₁	2.000 BSC			2.100 BSC		
L	.110	<i>h</i>	.150	.110	<i>h</i>	.150
Q ₁	.015	<i>h</i>	.045	.015	<i>h</i>	.045
M	41			43		
φ _b	.016	.018	.020	.016	.018	.020
REF.	JEDEC MO-128-AN			<i>h</i>		

NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1994.
2. SYMBOL "M" IS THE PIN MATRIX SIZE.
3. BYPASS CAPACITOR PADS – GOLD PLATED MAY OR MAY NOT BE PRESENT ON ALL PACKAGES.
4. LEAD FINISH: GOLD PLATED
 – COMMERCIAL (35 MICROINCHES MIN.)
 – MILITARY (50 MICROINCHES MIN.)
5. 43 X 43 MATRIX SHOWN FOR ILLUSTRATION.
6. PG475 – 7 ROWS OF PINS ON EACH SIDE.
 PG559 – 8 ROWS OF PINS ON EACH SIDE.
7. CONTACT XILINX FOR CLARIFICATION.

475, 559-PIN CERAMIC PGA (PG475, PG559)

Ceramic Brazed QFP Packages - CB100 (XC3000 Version)



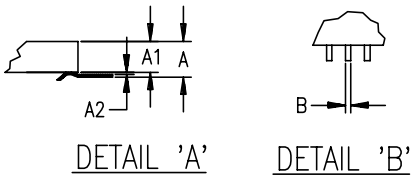
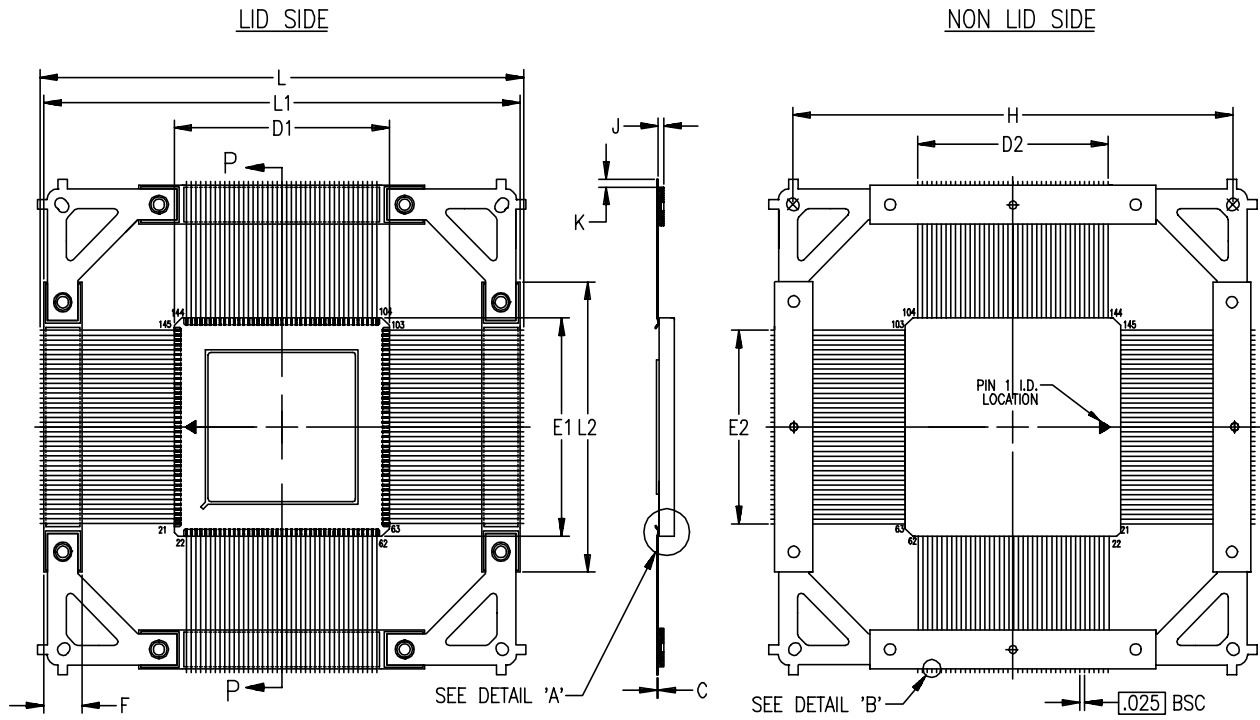
NOTES:

1. ALL DIMENSIONING AND TOLERANCING CONFORM TO ANSI Y14.5M-1982
2. SYMBOL "N" IS THE NUMBER OF TERMINALS.
3. PACKAGES ARE SHIPPED UNFORMED.
4. LEAD FINISH: GOLD (50 MICROINCHES MINIMUM) OVER NICKEL PER MIL-I-38535

SYMBOL	INCHES		
	MIN.	NOM.	MAX.
A	<i>h</i>	<i>h</i>	.135
A1	<i>h</i>	<i>h</i>	.115
A2	<i>h</i>	<i>h</i>	.020
B	.006	.008	.012
C	.005	.006	.009
D1/E1	.740	.750	.765
D2/E2	.600 BSC		
F	.425	.450	.475
H	2.300 BSC		
J	.030	.035	.040
K	<i>h</i>	<i>h</i>	.020
L	<i>h</i>	<i>h</i>	2.580
L1	2.490	2.500	2.510
L2	1.480	1.500	1.520
N	100		

100-PIN CERAMIC BRAZED CQFP (CB100)
(XC3000 VERSION)

Ceramic Brazed Packages - CB164 (XC3000)



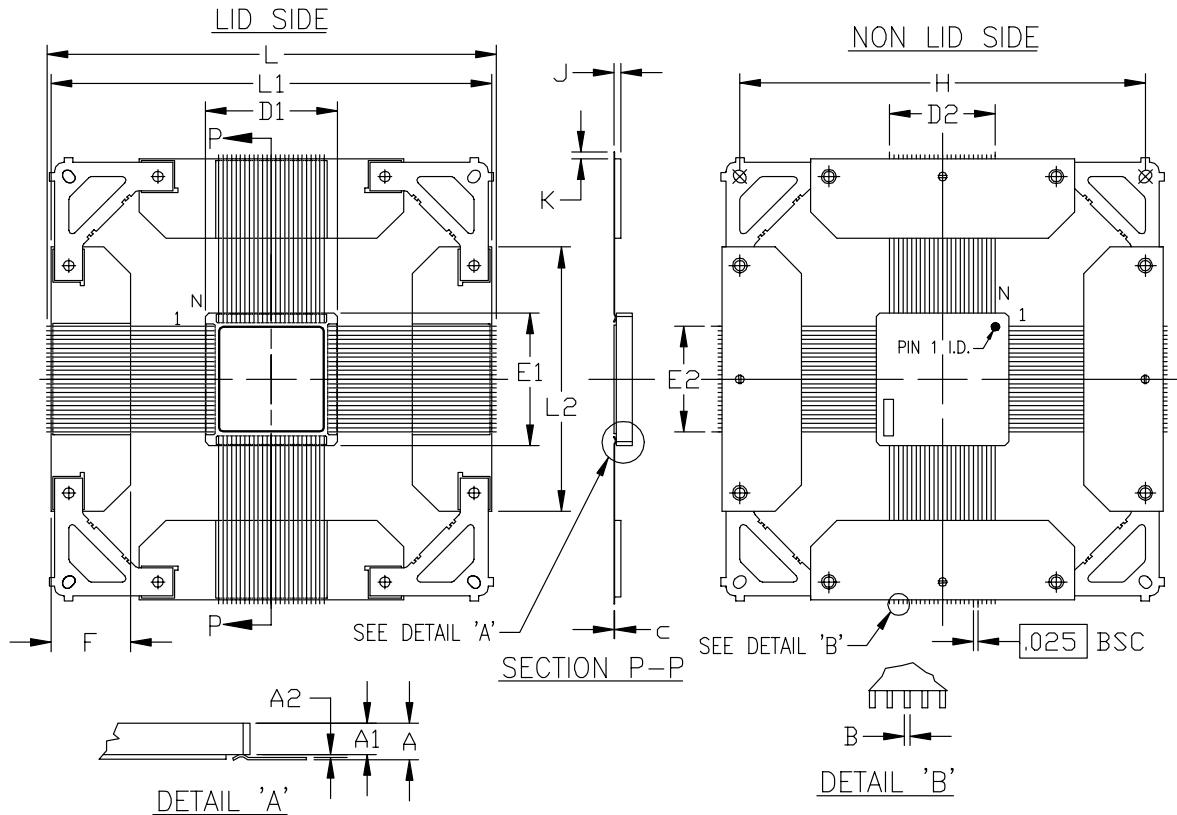
NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982
2. SYMBOL "N" IS THE NUMBER OF TERMINALS.
3. PACKAGES ARE SHIPPED UNFORMED.
4. LEAD FINISH: GOLD (50 MICROINCHES MINIMUM) OVER NICKEL PER MIL-I-38535

SYMBOL	INCHES		
	MIN.	NOM.	MAX.
A	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	.130
A1	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	.110
A2	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	.020
B	.007	$\sqrt{\text{ }}$	.012
C	.005	.006	.009
D1/E1	1.120	1.130	1.145
D2/E2	1.000 BSC		
F	.175	.200	.225
H	2.300 BSC		
J	.030	.035	.040
K	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	.020
L	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	2.580
L1	2.485	2.500	2.505
L2	1.480	1.500	1.520
N	164		

164-PIN CERAMIC BRAZED CQFP (CB164)
(XC3000 VERSION)

Ceramic Brazed QFP Packages - CB100, CB164, CB196 (XC4000 Version)



SYMBOL	CB100			CB164			CB196		
	INCHES			INCHES			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.135	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.130	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.130
A1	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.115	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.110	.081	.090	.105
A2	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.020	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.020	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.020
B	.006	.008	.012	.006	.008	.012	.006	.008	.012
C	.005	.006	.009	.005	.006	.009	.005	.006	.009
D1/E1	.740	.750	.765	1.120	1.130	1.145	1.336	1.350	1.364
D2/E2	.600 BSC			1.000 BSC			1.200 BSC		
F	.425	.450	.475	.175	.200	.225	.175	.200	.225
H	2.300 BSC			2.300 BSC			2.300 BSC		
J	.030	.035	.040	.030	.035	.040	.030	.035	.040
K	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.020	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.020	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.020
L	$\cancel{\text{---}}$	$\cancel{\text{---}}$	2.580	$\cancel{\text{---}}$	$\cancel{\text{---}}$	2.580	2.500	$\cancel{\text{---}}$	2.580
L1	2.490	2.500	2.510	2.485	2.500	2.505	2.470	2.500	2.530
L2	1.480	1.500	1.520	1.480	1.500	1.520	1.700	1.720	1.740
N	100			164			196		

NOTE:

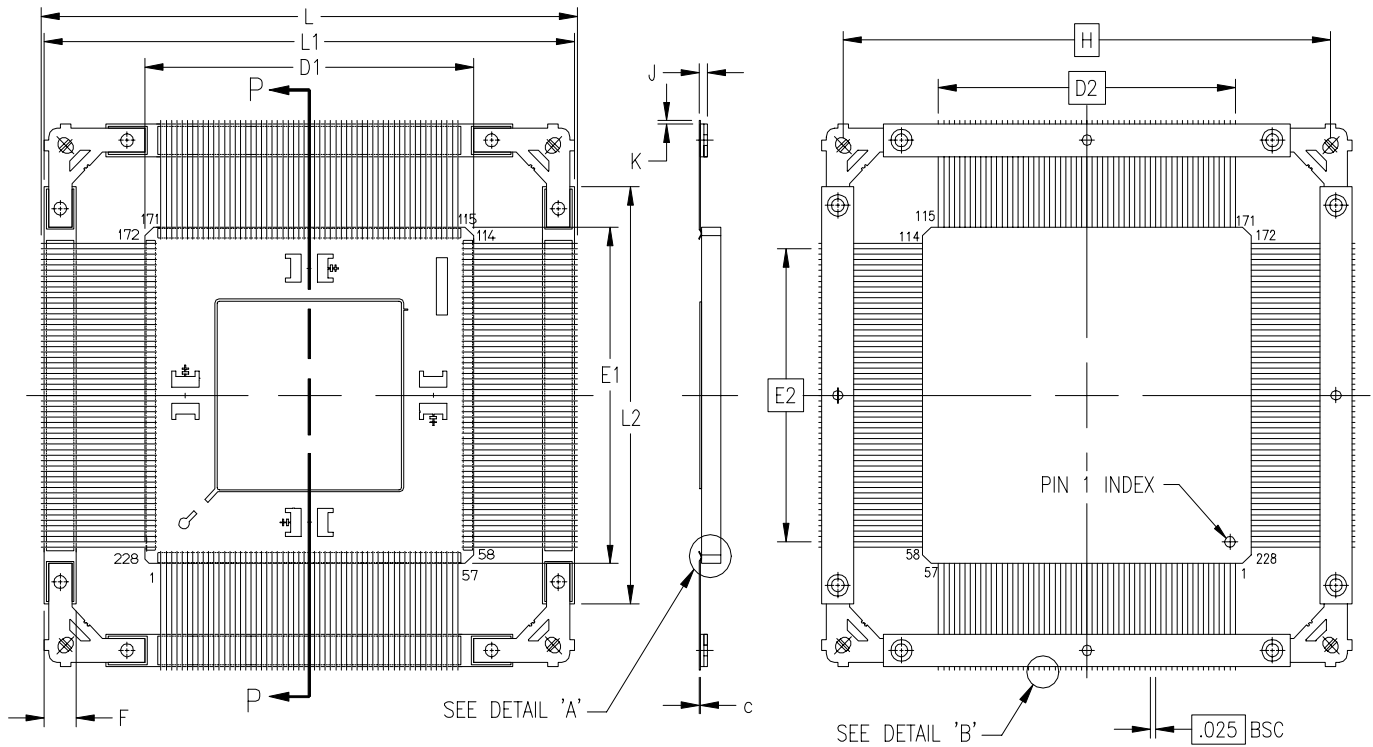
1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982
2. SYMBOL 'N' IS THE NUMBER OF TERMINALS.
3. PACKAGES ARE SHIPPED UNFORMED.
4. LEAD FINISH: GOLD (50 MICROINCHES MINIMUM)
OVER NICKEL PER MIL-I-38535

100, 164, 196-PIN CERAMIC BRAZED CQFP (CB100, 164, 196)

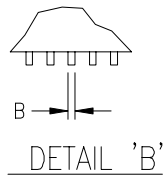
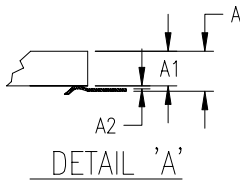
Ceramic Brazed QFP Packages - CB228

LID SIDE

NON LID SIDE



SECTION P-P



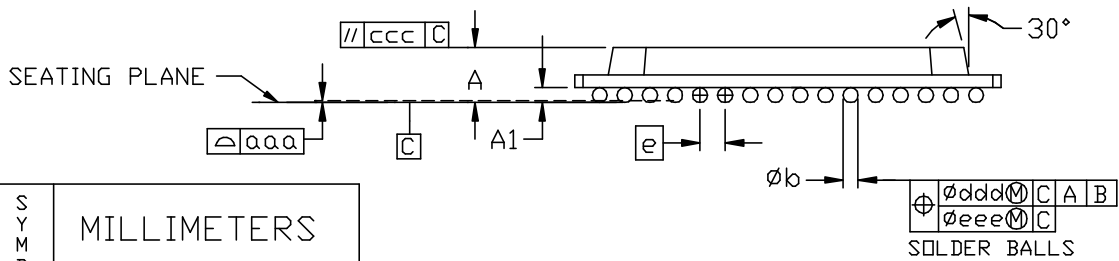
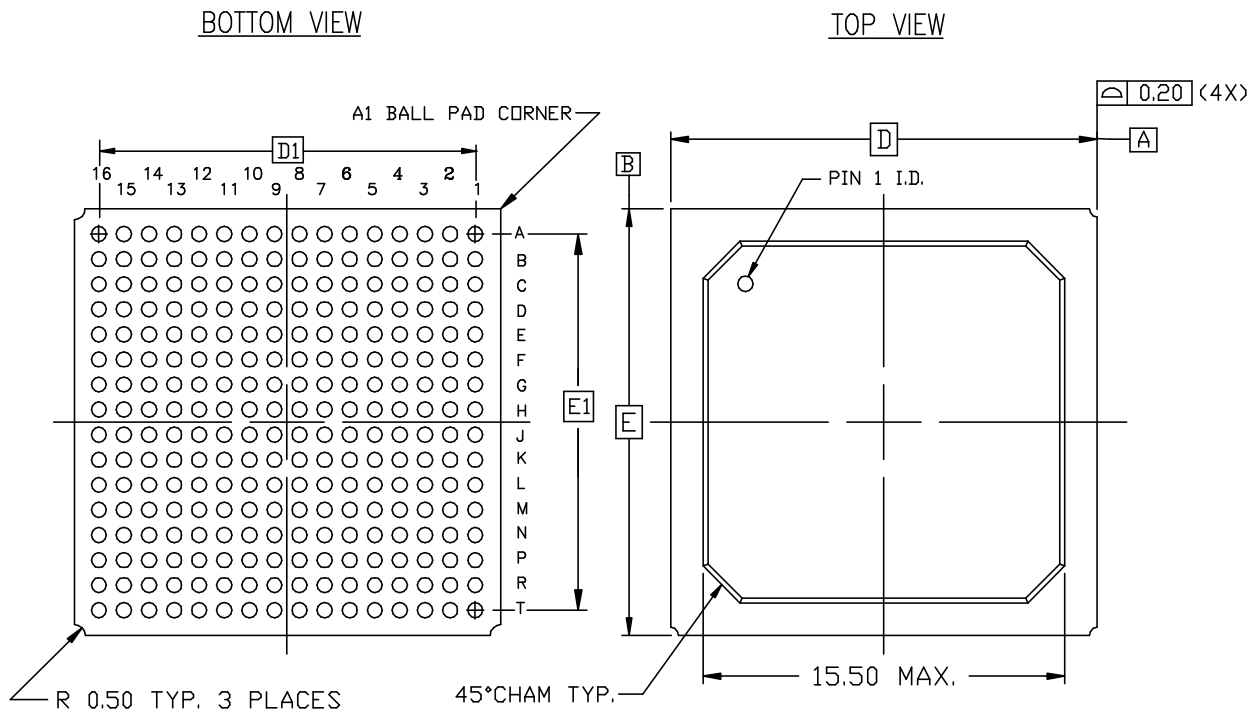
NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982
2. SYMBOL 'N' IS THE NUMBER OF TERMINALS.
3. PACKAGES ARE SHIPPED UNFORMED.
4. LEAD FINISH: GOLD (50 MICROINCHES MINIMUM) OVER NICKEL PER MIL-I-38535

SYMBOL	INCHES		
	MIN.	NOM.	MAX.
A	<i>h</i>	<i>h</i>	.130
A1	<i>h</i>	<i>h</i>	.110
A2	<i>h</i>	<i>h</i>	.020
B	.006	.008	.012
C	.005	.006	.009
D1/E1	1.534	1.550	1.570
D2/E2	1.400 BSC		
F	.125	.150	.175
H	2.300 BSC		
J	.030	.035	.040
K	<i>h</i>	<i>h</i>	.020
L	<i>h</i>	<i>h</i>	2.580
L1	2.480	2.500	2.530
L2	1.900	1.920	1.940
N	228		

228-PIN CERAMIC BRAZED CQFP (CB228)

Ball Fine Pitch Packages - FG256



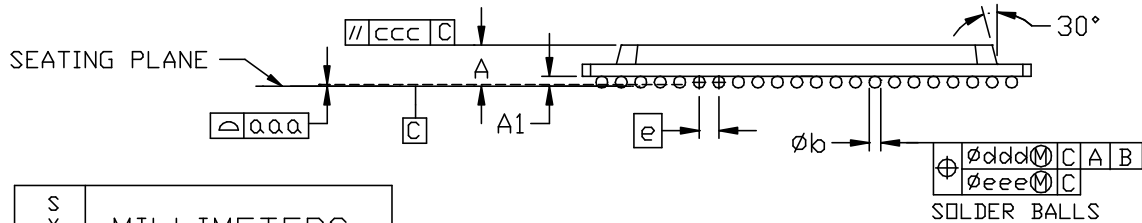
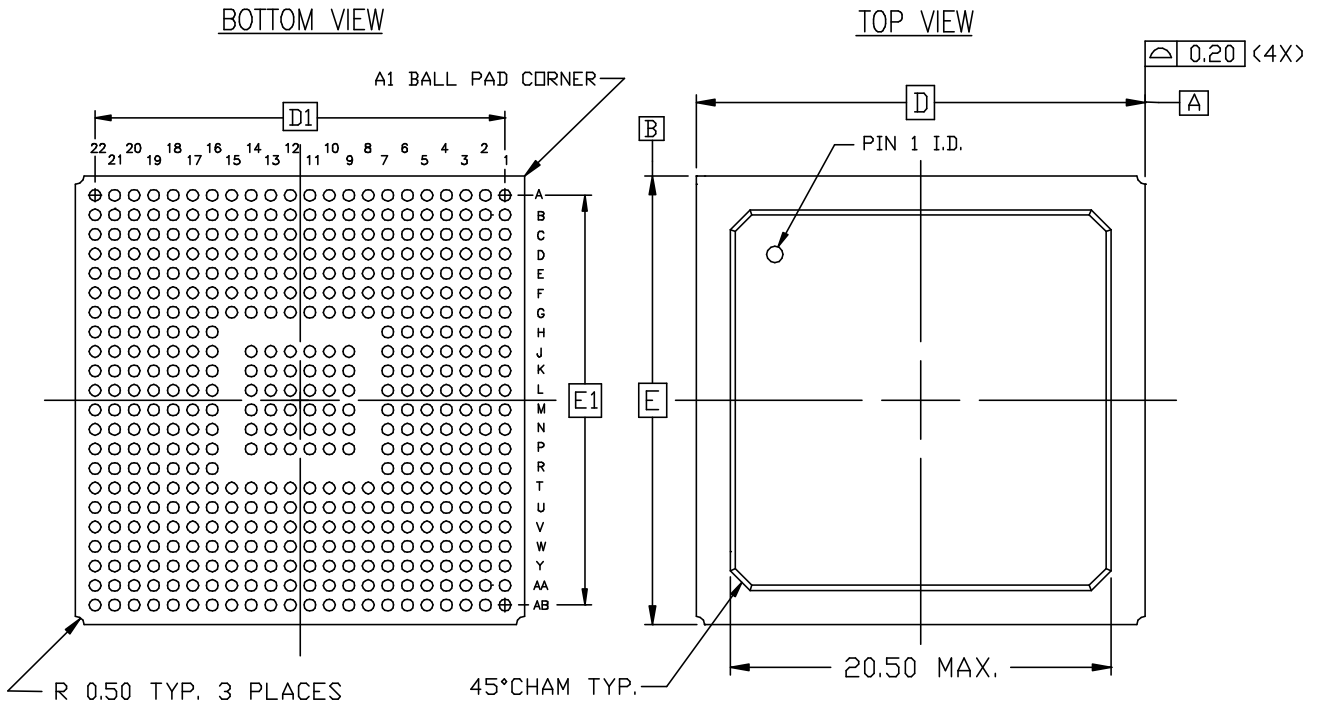
SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	\approx	1.73	2.00
A ₁	0.40	0.50	0.60
D/E	17.00 BSC		
D ₁ /E ₁	15.00 REF		
e	1.00 BSC		
ϕb	0.50	0.60	0.70
aaa	\approx	\approx	0.20
ccc	\approx	\approx	0.35
ddd	\approx	\approx	0.30
eee	\approx	\approx	0.10
M	16		

NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1994
2. SYMBOL 'M' IS THE BALL MATRIX SIZE.
3. CONFORMS TO JEDEC MO-151 AAF-1.

256-BALL FINE PITCH BGA (FG256)

Ball Fine Pitch Packages - FG456



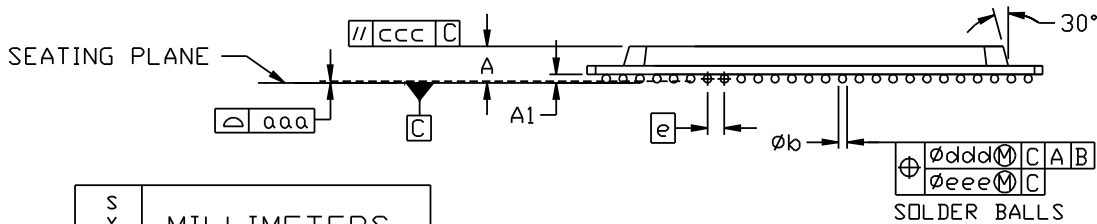
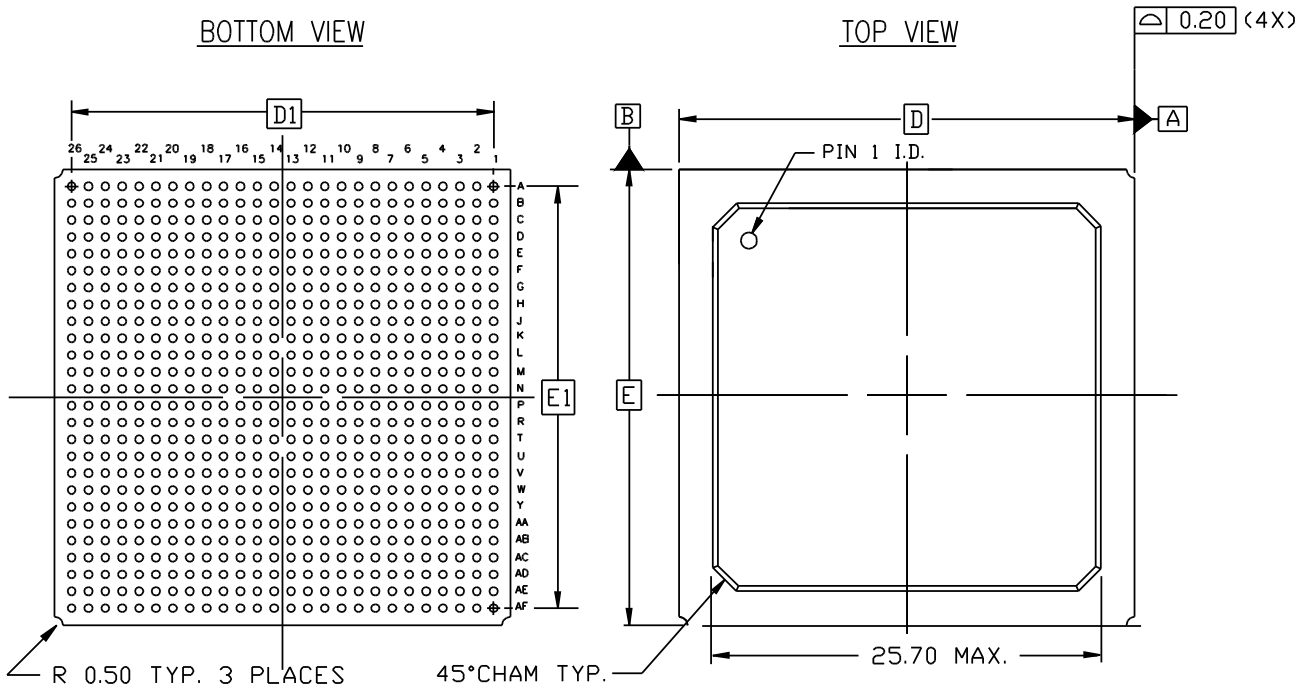
SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	$\cancel{\text{---}}$	2.20	2.60
A ₁	0.40	0.50	0.60
D/E	23.00 BSC		
D ₁ /E ₁	21.00 REF		
e	1.00 BSC		
øb	0.50	0.60	0.70
aaa	$\cancel{\text{---}}$	$\cancel{\text{---}}$	0.20
ccc	$\cancel{\text{---}}$	$\cancel{\text{---}}$	0.35
ddd	$\cancel{\text{---}}$	$\cancel{\text{---}}$	0.30
eee	$\cancel{\text{---}}$	$\cancel{\text{---}}$	0.10
M	22		

NOTES:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1994
2. SYMBOL 'M' IS THE BALL MATRIX SIZE.
3. CONFORMS TO JEDEC MO-151 AAJ-1 (DEPOPULATED)

456-BALL FINE PITCH BGA (FG456)

Ball Fine Pitch Packages - FG676



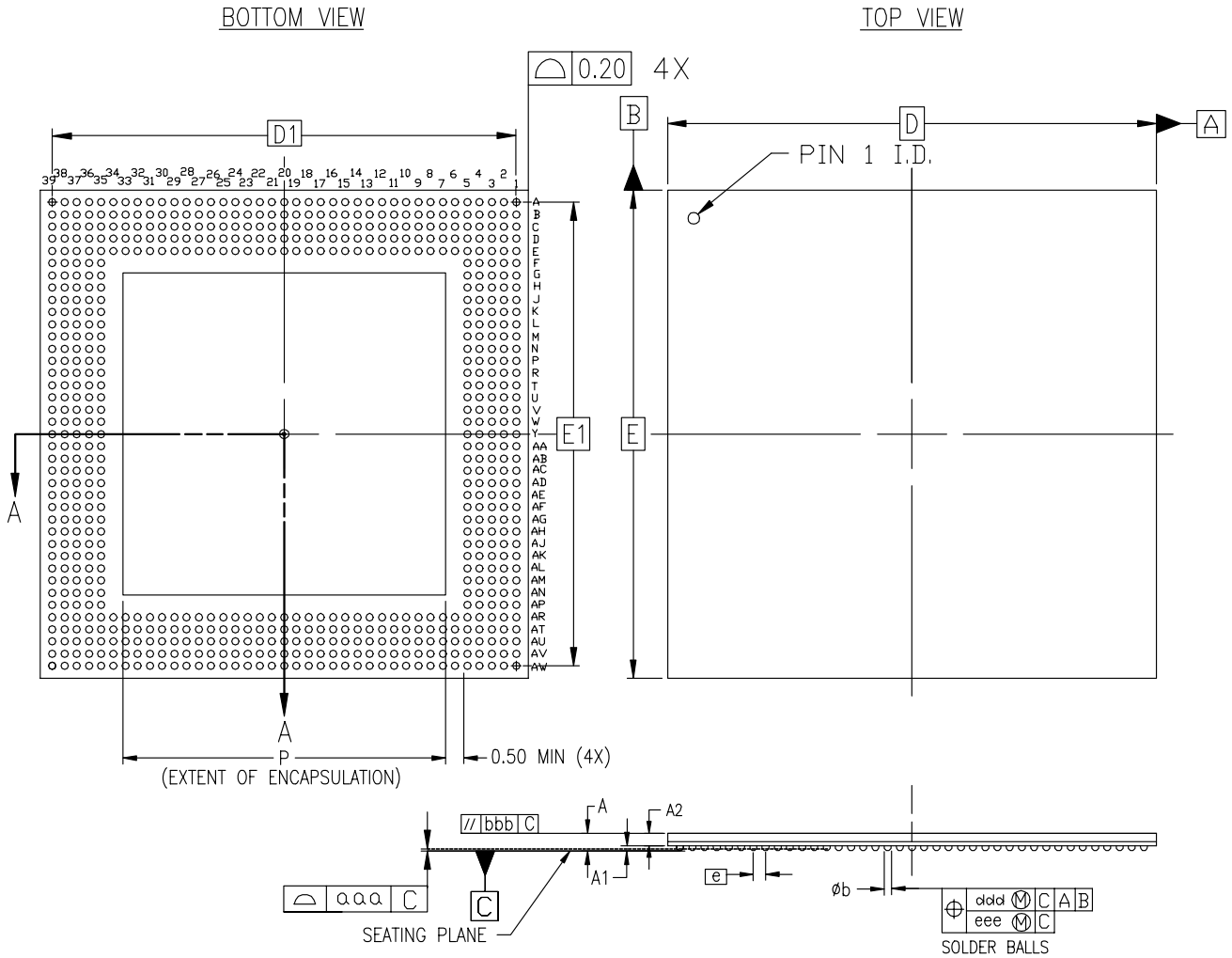
SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	<i>h</i>	2.25	2.60
A ₁	0.40	0.50	0.60
D/E	27.00 BSC		
D ₁ /E ₁	25.00 REF		
e	1.00 BSC		
φ _b	0.50	0.60	0.70
aaa	<i>h</i>	<i>h</i>	0.20
ccc	<i>h</i>	<i>h</i>	0.35
ddd	<i>h</i>	<i>h</i>	0.30
eee	<i>h</i>	<i>h</i>	0.10
M	26		

NOTES:

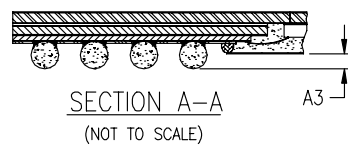
1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1994
2. SYMBOL 'M' IS THE BALL MATRIX SIZE.
3. CONFORMS TO JEDEC MO-151-AAL-1.

676-PIN FINE PITCH BGA (FG676)

Ball Fine Pitch Packages - FG680



SYMBOL	MILLIMETERS			NOTE
	MIN.	NOM.	MAX.	
A	$\sqrt{\text{---}}$	1.60	1.90	3
A ₁	0.40	0.50	0.60	
A ₂	$\sqrt{\text{---}}$	$\sqrt{\text{---}}$	1.00	
A ₃	0.20	$\sqrt{\text{---}}$	$\sqrt{\text{---}}$	
D/E	40.00 BASIC			
D ₁ /E ₁	38.00 REF			
e	1.00 BASIC			
øb	0.50	0.60	0.70	
aaa	$\sqrt{\text{---}}$	$\sqrt{\text{---}}$	0.20	
bbb	$\sqrt{\text{---}}$	$\sqrt{\text{---}}$	0.25	
ddd	$\sqrt{\text{---}}$	$\sqrt{\text{---}}$	0.25	
eee	$\sqrt{\text{---}}$	$\sqrt{\text{---}}$	0.10	
M		39		



NOTES:

1. ALL DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5M-1994
2. SYMBOL "M" IS THE PIN MATRIX SIZE.
3. CONFORMS TO JEDEC MO-192-AAU-1 (DEPOPULATED) EXCEPT FOR PACKAGE THICKNESS.

680-BALL FINE PITCH BGA (FG680)