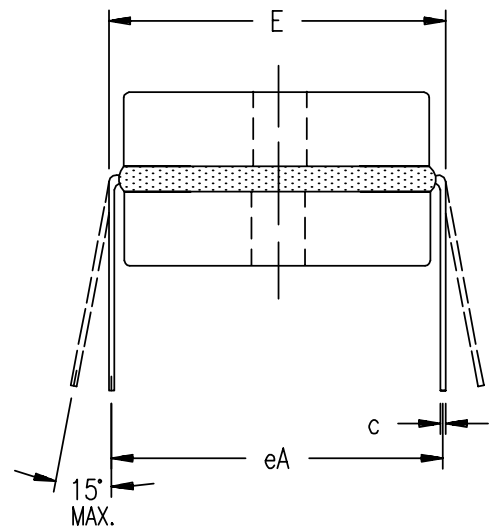
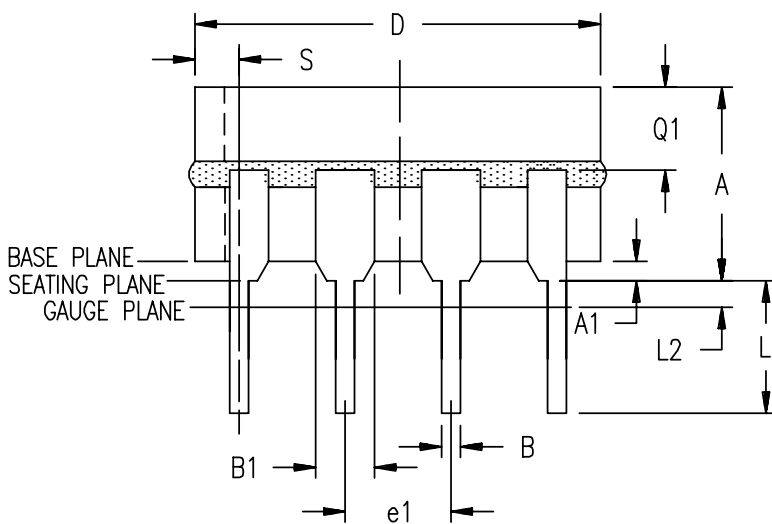
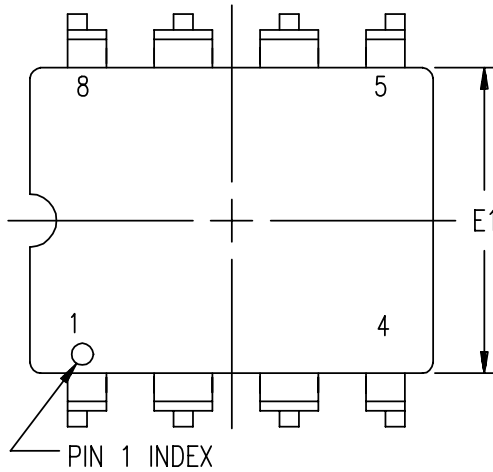


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### Ceramic DIP Package - DD8



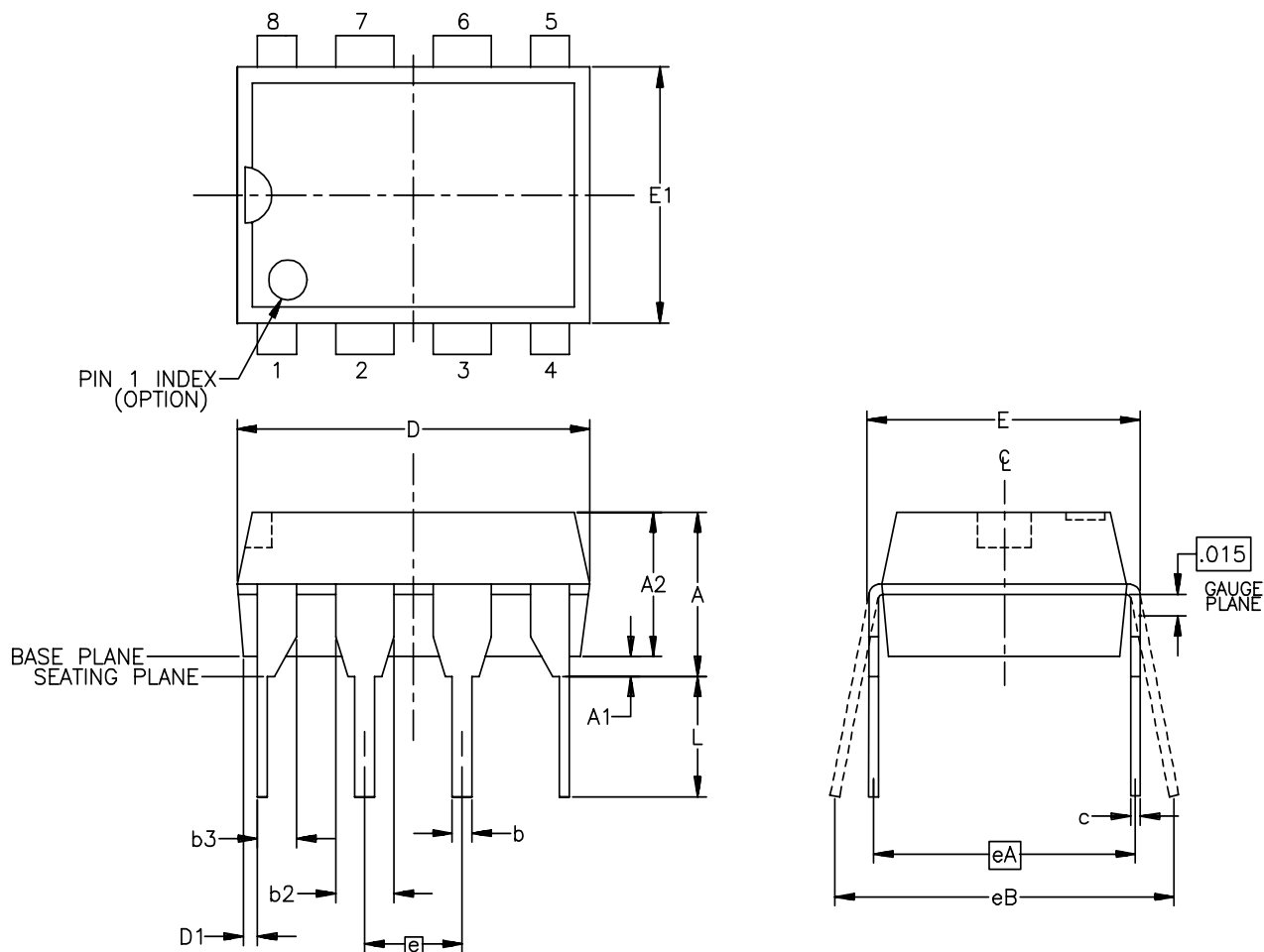
SYMBOL	INCHES	
	MIN.	MAX.
A	0.150	0.170
A1	0.020	0.050
B	0.015	0.020
B1	0.050	0.060
c	0.009	0.012
D	0.375	0.405
E	0.300	0.320
E1	0.280	0.300
e1	0.100 BSC	
eA	0.300 BSC	
L	0.125	0.150
L2	0	0.030
Q1	0.040	0.075

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



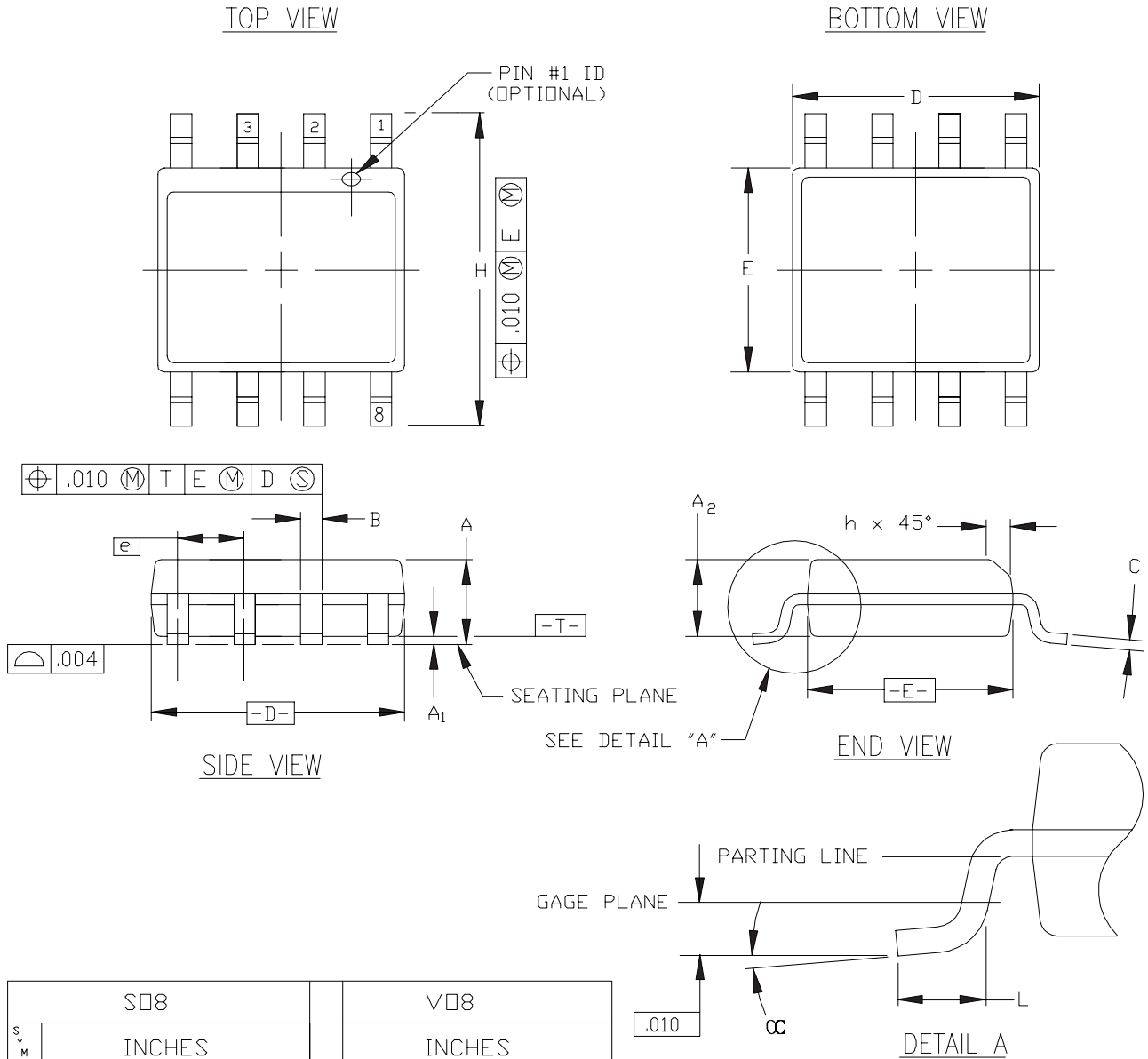
SYMBOL	INCHES		NOTE
	MIN.	MAX.	
A	$\approx$	0.181	
A1	0.019	$\approx$	
A2	0.122	0.161	
b	0.014	0.022	
b2	0.045	$\approx$	
b3	$\approx$	0.045	
c	0.009	0.012	
D	0.355	0.382	
D <sub>1</sub>	0.005	$\approx$	
E	0.303	0.323	
E <sub>1</sub>	0.240	0.272	
e	0.100 BSC		
e <sub>A</sub>	0.300 BSC		
e <sub>B</sub>	$\approx$	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 "E<sub>1</sub>" 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**



SYMBOL	S08			V08		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	.059	.064	.068	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.047
A <sub>1</sub>	.004	.006	.0098	.002	.004	.006
A <sub>2</sub>	.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
$\alpha$	0°	5°	8°	0°	$\cancel{\text{---}}$	8°
REF.	JEDEC MS-012			$\cancel{\text{---}}$		

NOTES:

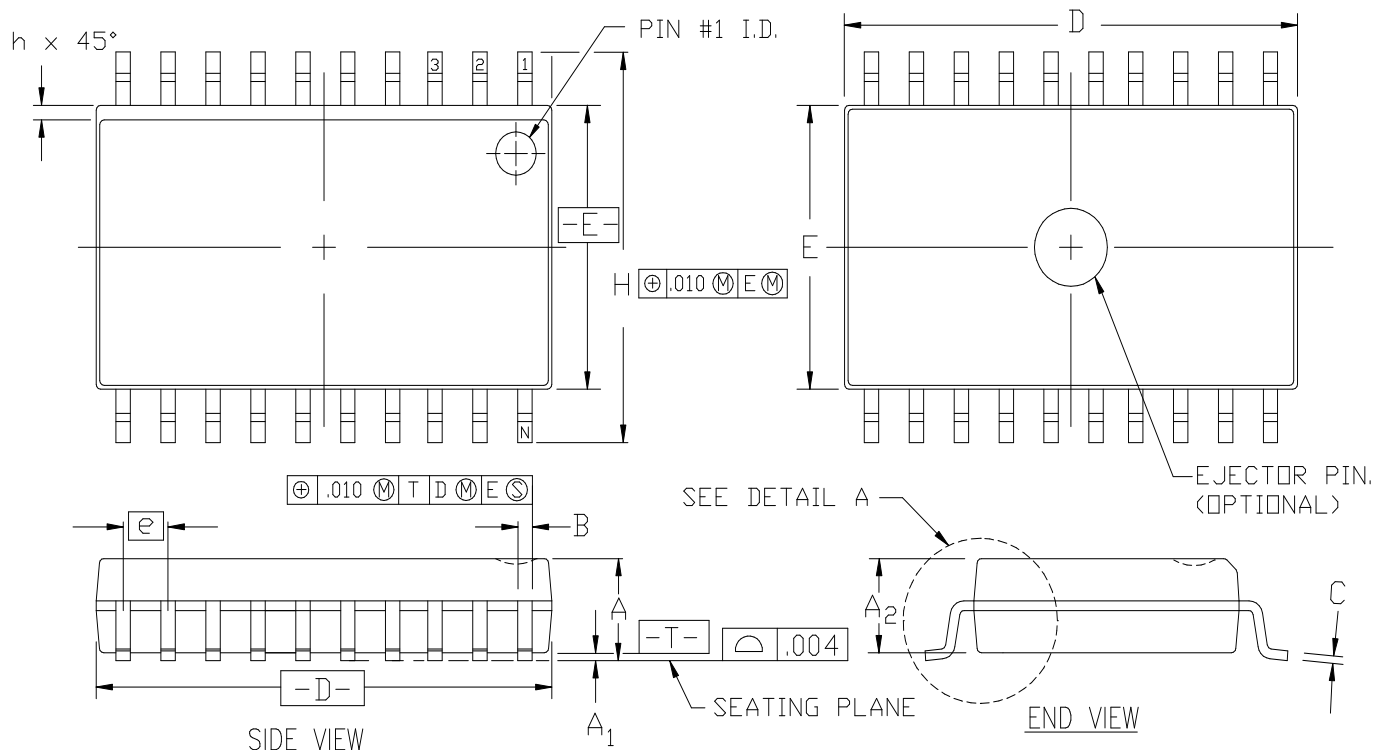
1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982.
2. DIMENSION 'D' DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION SHALL NOT EXCEED .006" PER SIDE.
3. DIMENSION 'E' DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION SHALL NOT EXCEED .010 INCH PER SIDE.
4. LEAD FINISH: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

8 LEAD SOIC/TSOP (S08, V08)

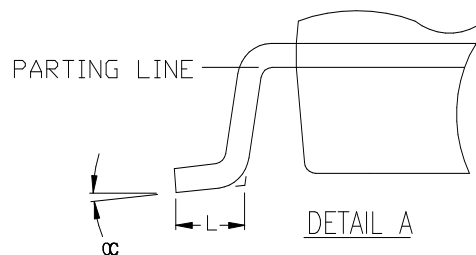
# SOIC Package - SO20

TOP VIEW

BOTTOM VIEW



SYMBOL	INCHES		
	MIN.	NOM.	MAX.
A	.097	.101	.104
A <sub>1</sub>	.005	.009	.0115
A <sub>2</sub>	.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
$\alpha$	0°	5°	8°

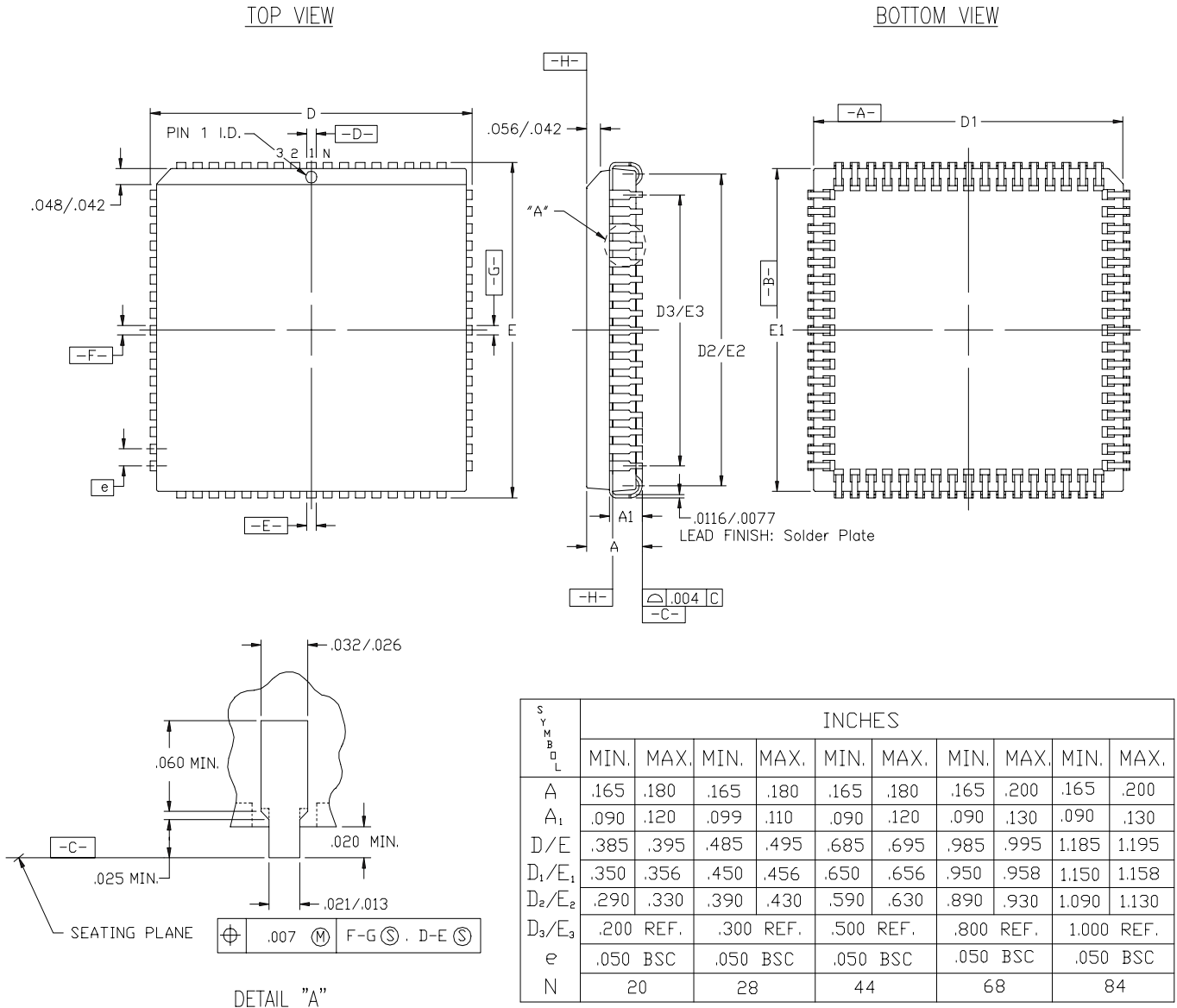


NOTES:

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

## 20 LEAD SOIC (SO20)

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

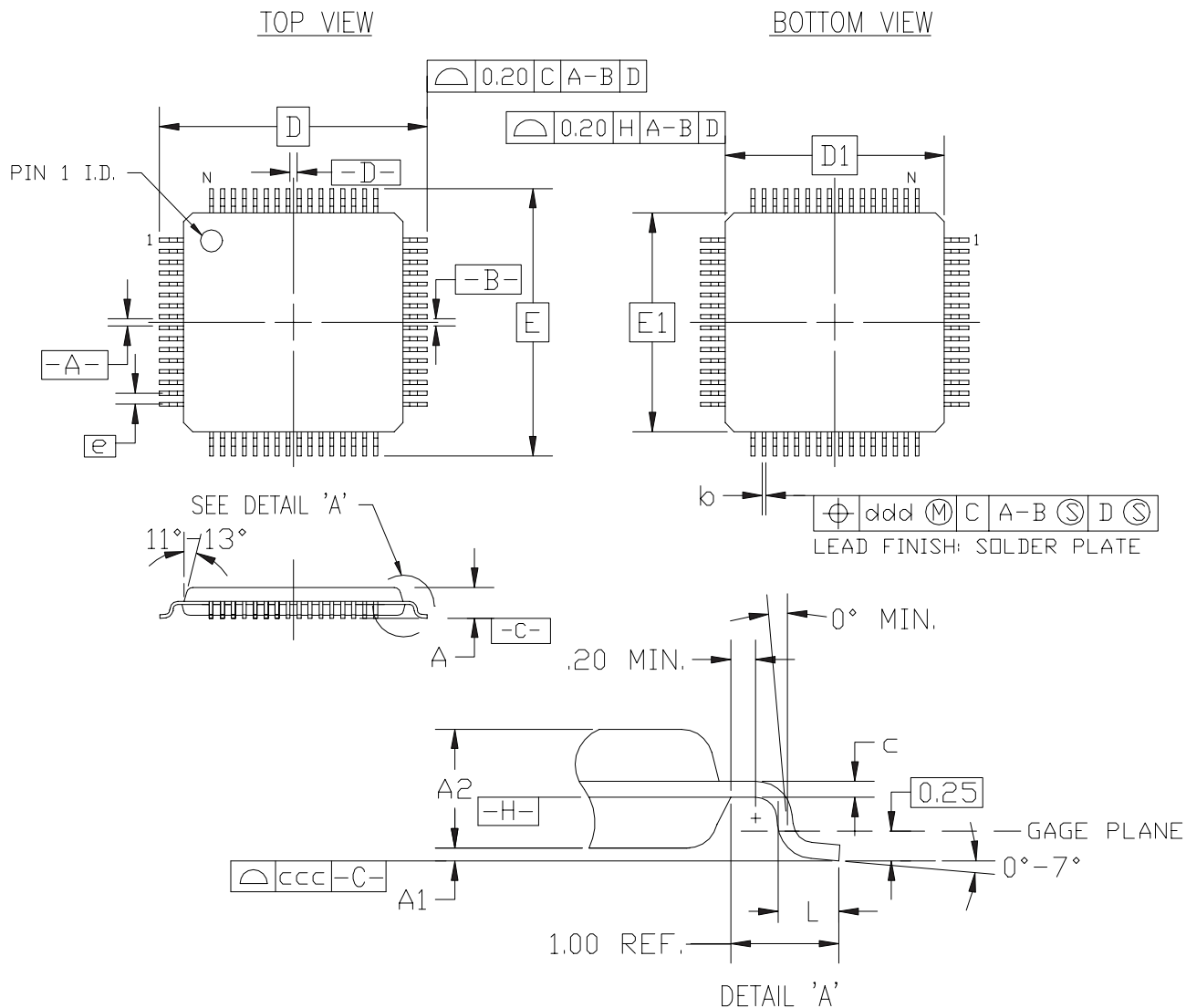


NOTES:

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)

## VQFP Packages - VQ44, VQ64, VQ100



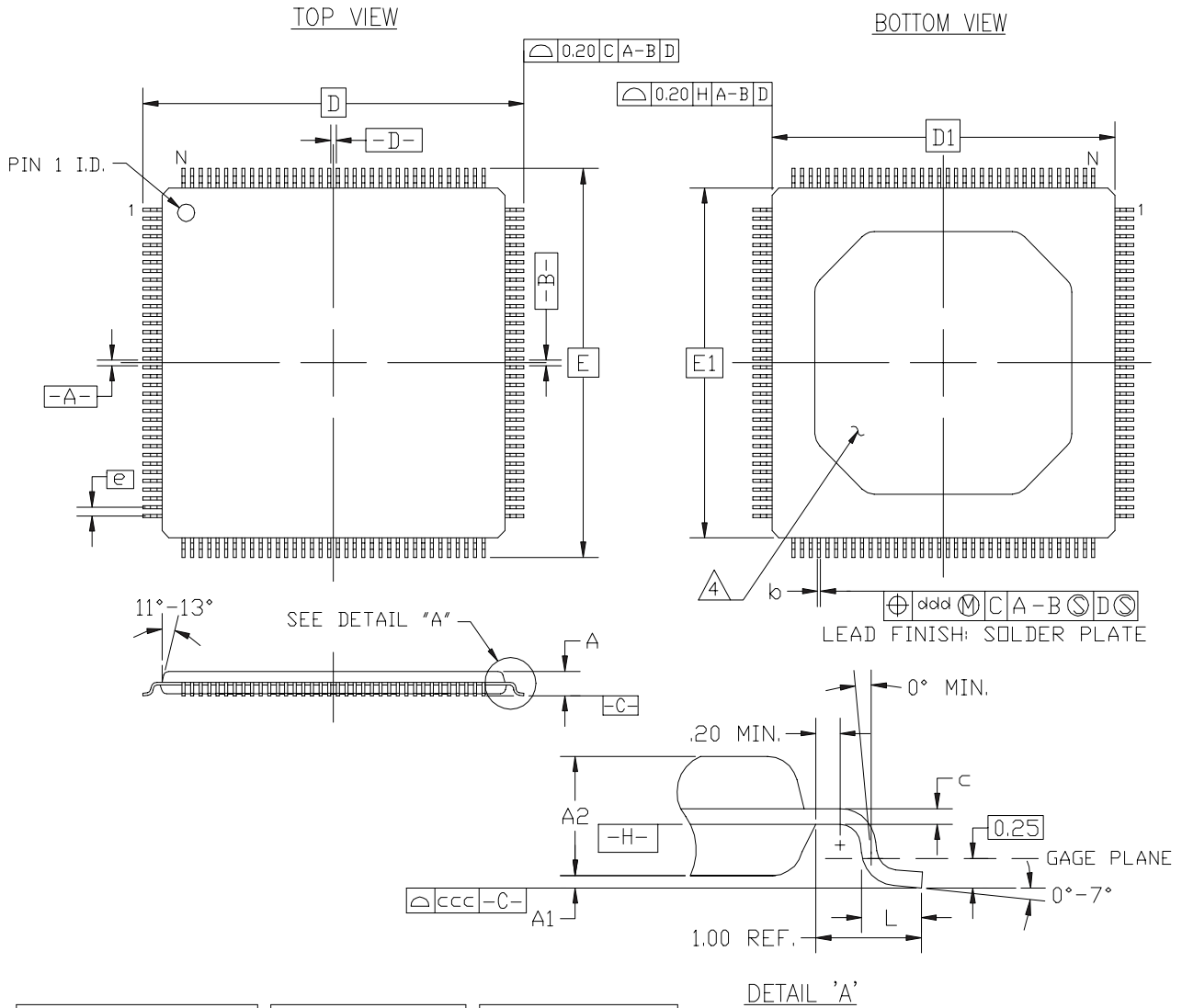
SYMBOL	VQ44			VQ64			VQ100		
	MILLIMETERS			MILLIMETERS			MILLIMETERS		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	1.20	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	1.20	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	1.20
A <sub>1</sub>	0.05	$\sqrt{\text{ }}$	0.15	0.05	0.10	0.15	0.05	0.10	0.15
A <sub>2</sub>	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 <sub>1</sub> /E <sub>1</sub>	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	$\sqrt{\text{ }}$	0.20	0.09	$\sqrt{\text{ }}$	0.20	0.09	$\sqrt{\text{ }}$	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	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	0.10	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	0.08	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	0.08
ddd	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	0.20	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	0.08	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	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 D<sub>1</sub> AND E<sub>1</sub> 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



DIMENSIONS	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 <sub>1</sub>	0.05	$\approx$	0.15	0.05	0.10	0.15	0.05	0.10	0.15
A <sub>2</sub>	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 <sub>1</sub> /E <sub>1</sub>	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		

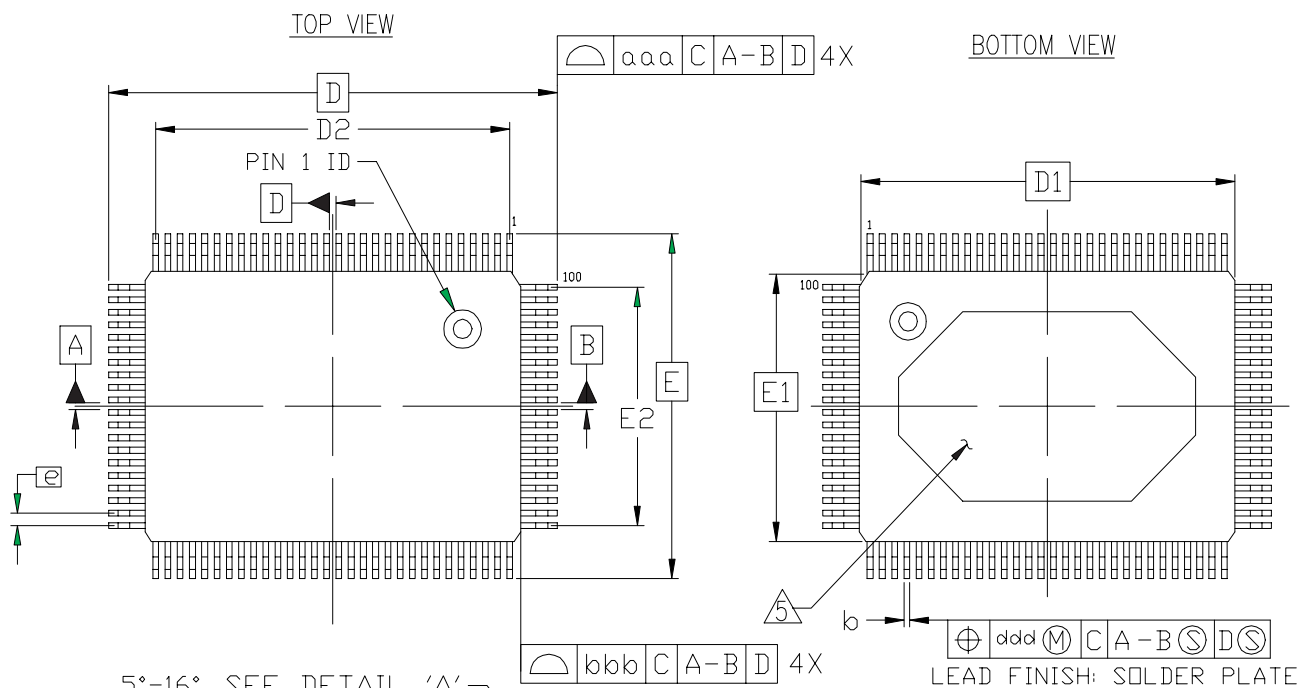
NOTE:

1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5-1982
  2. DIMENSION D<sub>1</sub> AND E<sub>1</sub> 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



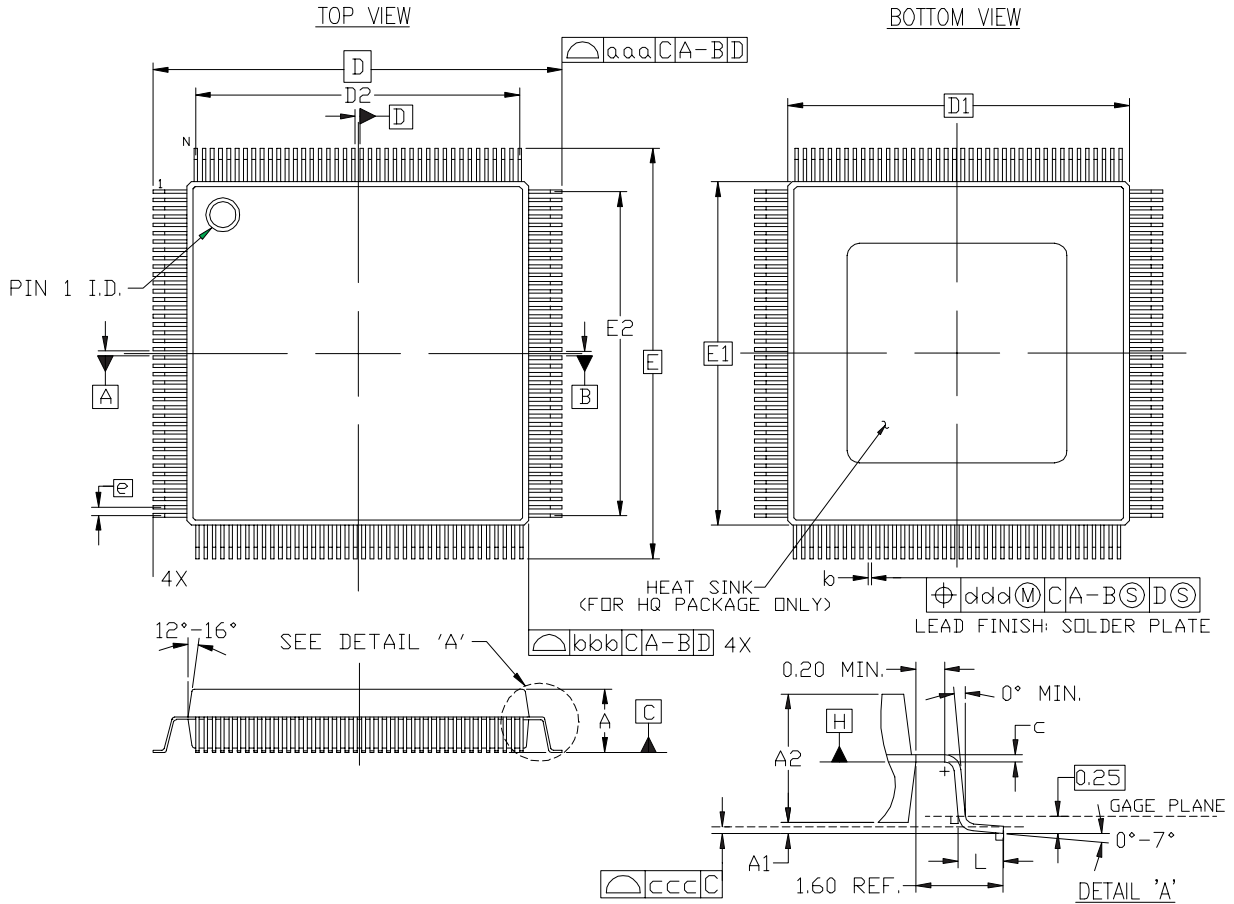
SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	$\neq$	$\neq$	3.40
A <sub>1</sub>	0.25	$\neq$	0.50
A <sub>2</sub>	2.50	2.70	2.90
D	23.20 BSC		
D <sub>1</sub>	20.00 BSC		
D <sub>2</sub>	18.85 REF.		
E	17.20 BSC		
E <sub>1</sub>	14.00 BSC		
E <sub>2</sub>	12.35 REF.		
L	0.73	0.88	1.03
e	0.65 BSC		
b	0.22	$\neq$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

### NOTES:

- ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1994.
  - DIMENSIONS 'D<sub>1</sub>' AND 'E<sub>1</sub>' DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION IS 0.25mm PER SIDE.
  - THE TOP OF PACKAGE MAY BE EQUAL TO OR SMALLER THAN THE BOTTOM OF PACKAGE BY 0.15 MILLIMETERS.
  - PACKAGE CONFORMS TO JEDEC OUTLINE MS-022-GC1
- 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**



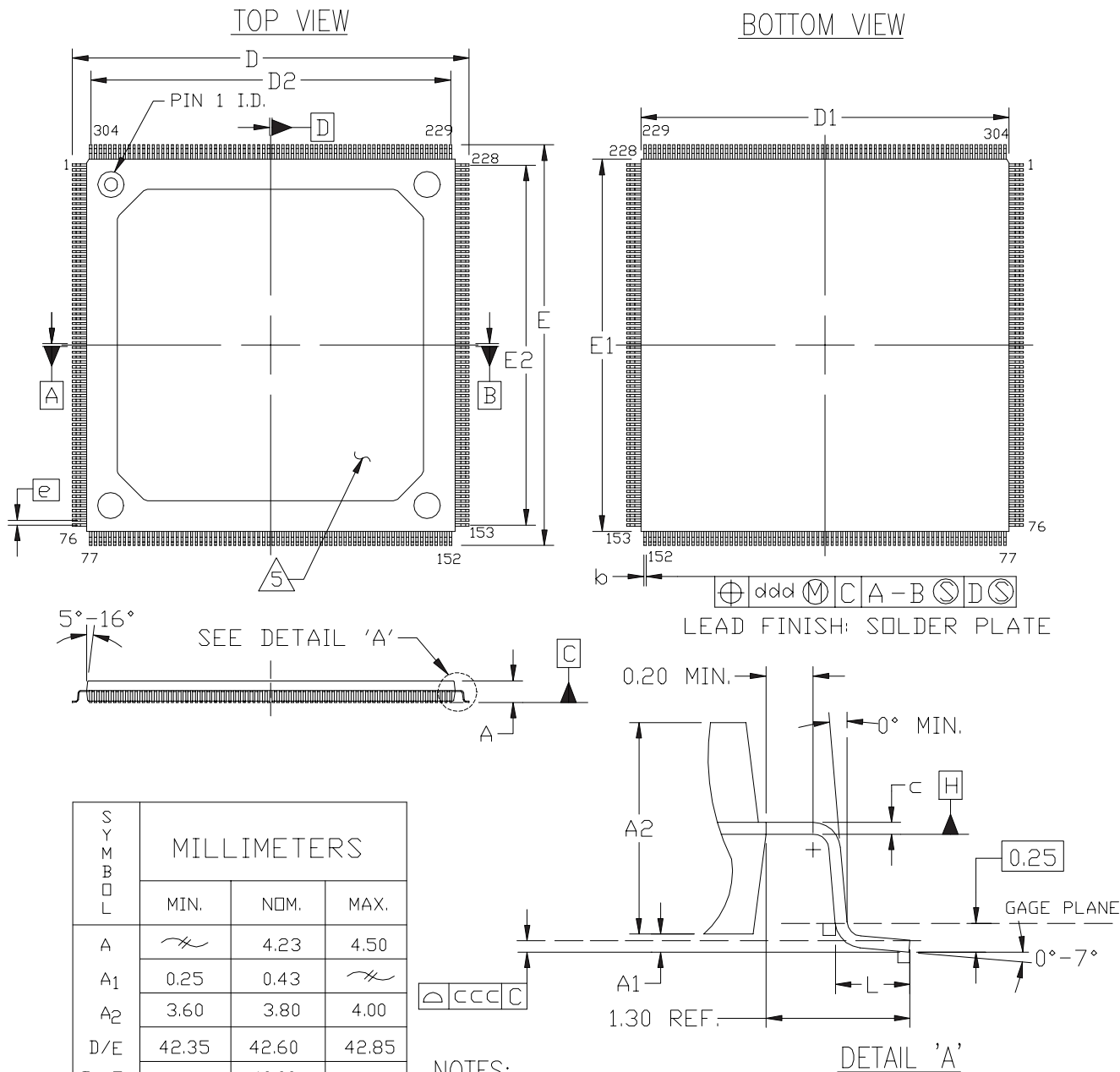
SYMBOL	PQ44			PQ/HQ160			PQ/HQ208			PQ/HQ240		
	MILLIMETERS			MILLIMETERS			MILLIMETERS			MILLIMETERS		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	$\nless$	2.15	2.35	$\nless$	3.70	4.10	$\nless$	3.70	4.10	$\nless$	3.78	4.10
A <sub>1</sub>	0.05	$\nless$	0.25	0.25	0.33	0.50	0.25	0.33	0.50	0.25	0.38	0.50
A <sub>2</sub>	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 <sub>1</sub> /E <sub>1</sub>	10.00 BSC			28.00 BSC			28.00 BSC			32.00 BSC		
D <sub>2</sub> /E <sub>2</sub>	8.00 REF.			25.35 REF.			25.50 REF.			29.50 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	$\nless$	0.45	0.22	$\nless$	0.40	0.17	0.22	0.27	0.17	$\nless$	0.27
c	0.13	$\nless$	0.23	0.13	$\nless$	0.23	0.09	$\nless$	0.20	0.09	$\nless$	0.20
aaa	$\nless$	$\nless$	0.25	$\nless$	$\nless$	0.25	$\nless$	$\nless$	0.25	$\nless$	$\nless$	0.25
bbb	$\nless$	$\nless$	0.20	$\nless$	$\nless$	0.20	$\nless$	$\nless$	0.20	$\nless$	$\nless$	0.20
ccc	$\nless$	$\nless$	0.10	$\nless$	$\nless$	0.10	$\nless$	$\nless$	0.08	$\nless$	$\nless$	0.08
ddd	$\nless$	$\nless$	0.20	$\nless$	$\nless$	0.13	$\nless$	$\nless$	0.08	$\nless$	$\nless$	0.08
N	44			160			208			240		
REF.	JEDEC MS-022-AB			JEDEC MS-022-DD1			JEDEC MD-143-FA-1			JEDEC MD-143-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



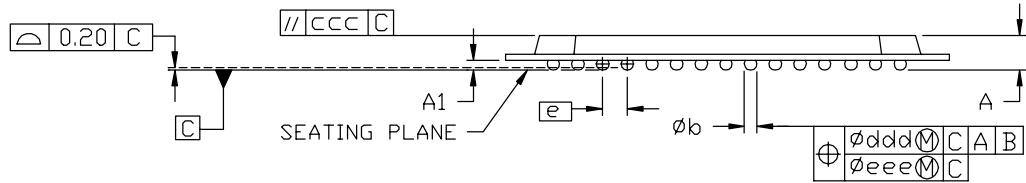
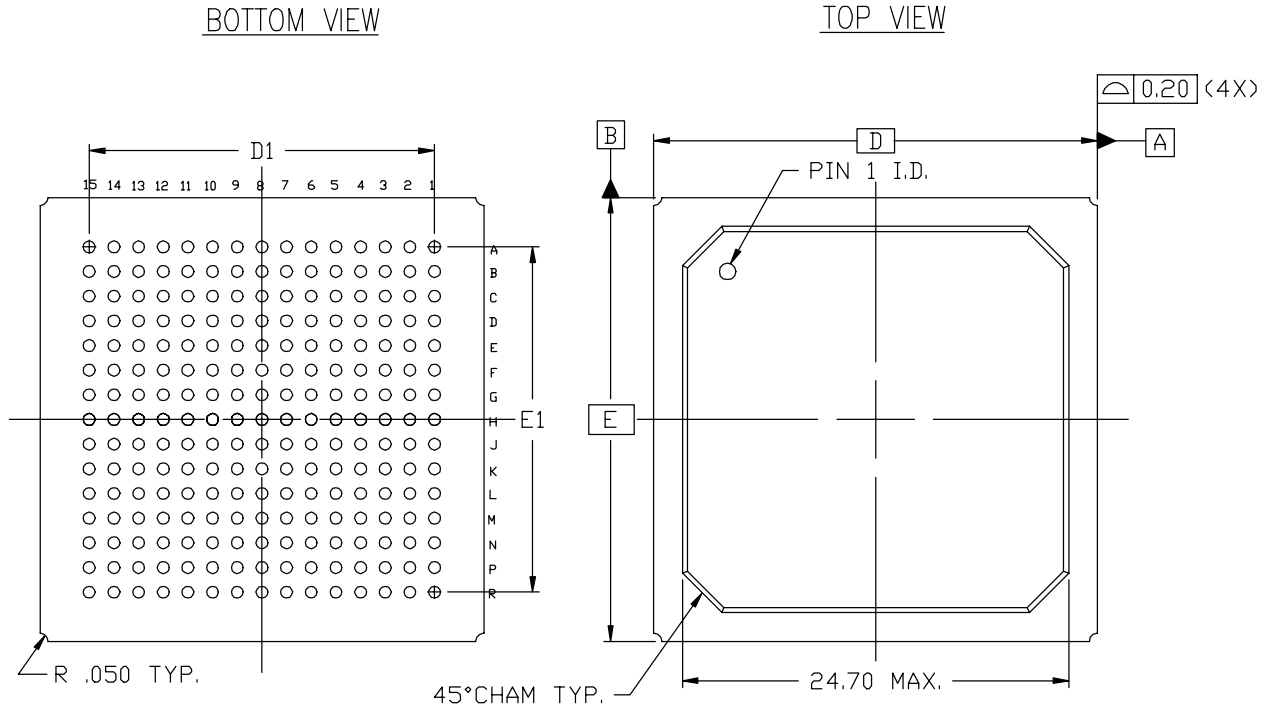
SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	$\varnothing$	4.23	4.50
A1	0.25	0.43	$\varnothing$
A2	3.60	3.80	4.00
D/E	42.35	42.60	42.85
D1/E1	39.90	40.00	40.10
D2/E2	37.50 REF.		
L	0.45	0.60	0.75
e	0.50 BSC.		
b	0.17	$\varnothing$	0.27
b1	$\varnothing$	0.20	$\varnothing$
C	0.09	$\varnothing$	0.20
ccc	0.08		
ddd	0.07		

**NOTES:**

- ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1994
  - DIMENSIONS 'D1' AND 'E1' DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION SHALL NOT EXCEED 0.25mm PER SIDE.
  - PACKAGE TOP DIMENSIONS MAY BE SMALLER THAN BOTTOM DIMENSIONS BY 0.15mm.
  - CONFORMS TO JEDEC OUTLINE MO-143-JA
- △ THE SAME PACKAGE DIMENSIONS APPLY FOR THERMALLY ENHANCED PRODUCTS. HEAT SINK IS ADDED. THE PACKAGE CODE IS 'HQ'.

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

BGA Packages - BG225



SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	<i>h</i>	2.15	3.50
A <sub>1</sub>	0.50	0.60	0.70
D/E	27.00 BSC		
D <sub>1</sub> /E <sub>1</sub>	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)

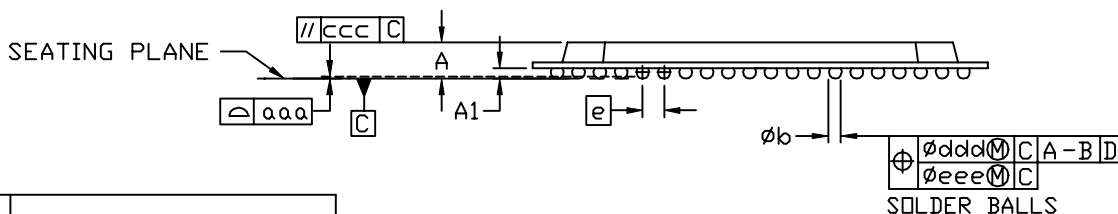
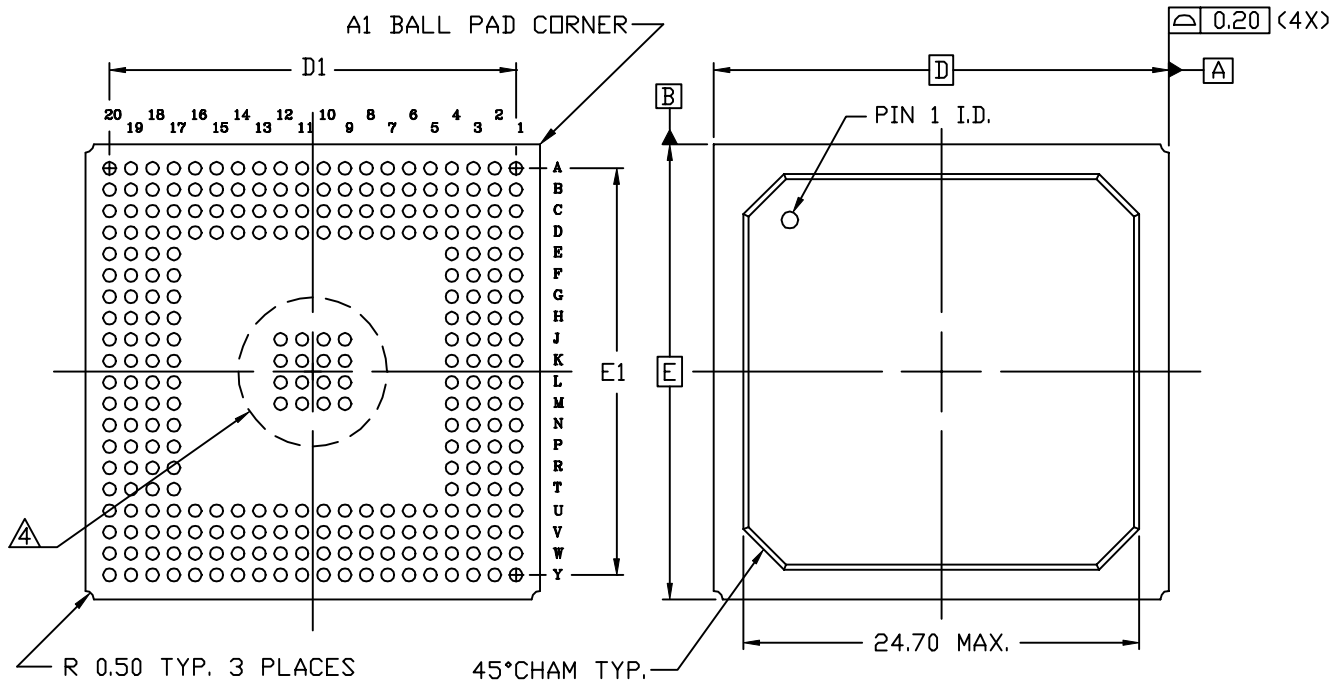
225-BALL PLASTIC BGA (BG225)

# BGA Packages - BG256

## BG256

BOTTOM VIEW

TOP VIEW

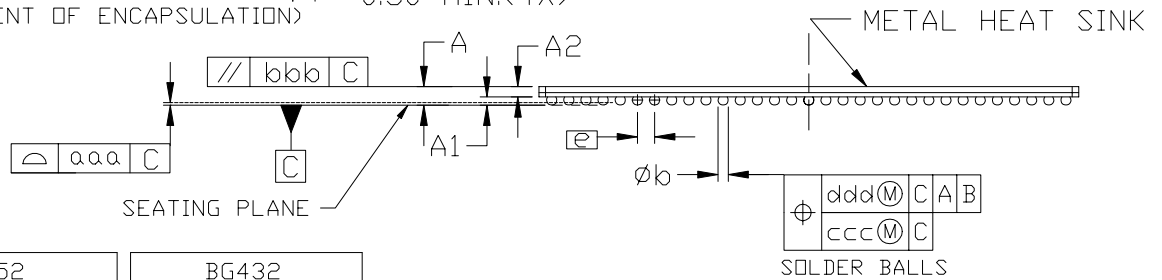
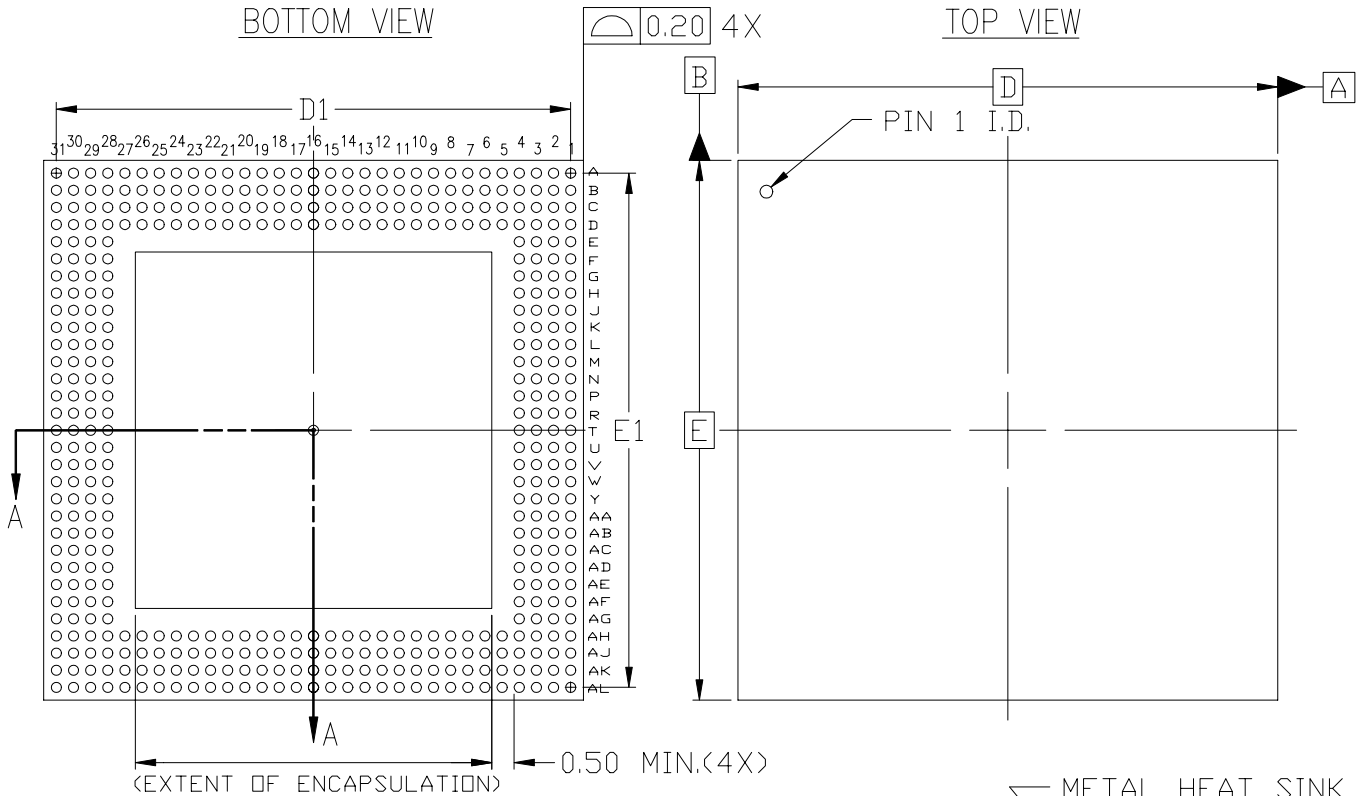


SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	<i>xx</i>	2.33	3.50
A <sub>1</sub>	0.50	0.60	0.70
D/E	27.00 BSC		
D <sub>1</sub> /E <sub>1</sub>	24.14 REF		
e	1.27 BSC		
phi b	0.60	0.75	0.90
aaa	<i>xx</i>	<i>xx</i>	0.20
ccc	<i>xx</i>	<i>xx</i>	0.35
ddd	<i>xx</i>	<i>xx</i>	0.30
eee	<i>xx</i>	<i>xx</i>	0.15
M	20		

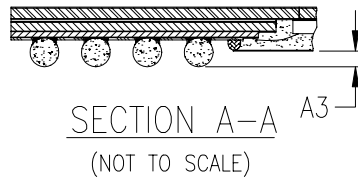
**NOTES:**

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
- ⚠** 16 EXTRA BALLS (GROUNDED) – APPLICABLE TO DEVICES WITH 28K GATES OR MORE.

BGA Packages - BG352, BG432



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

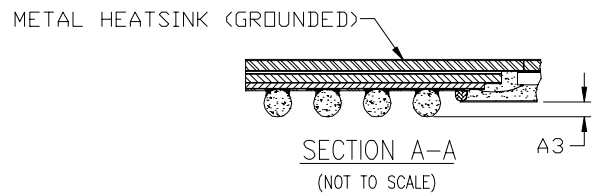
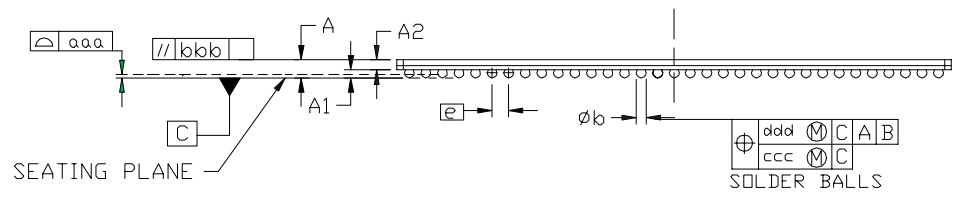
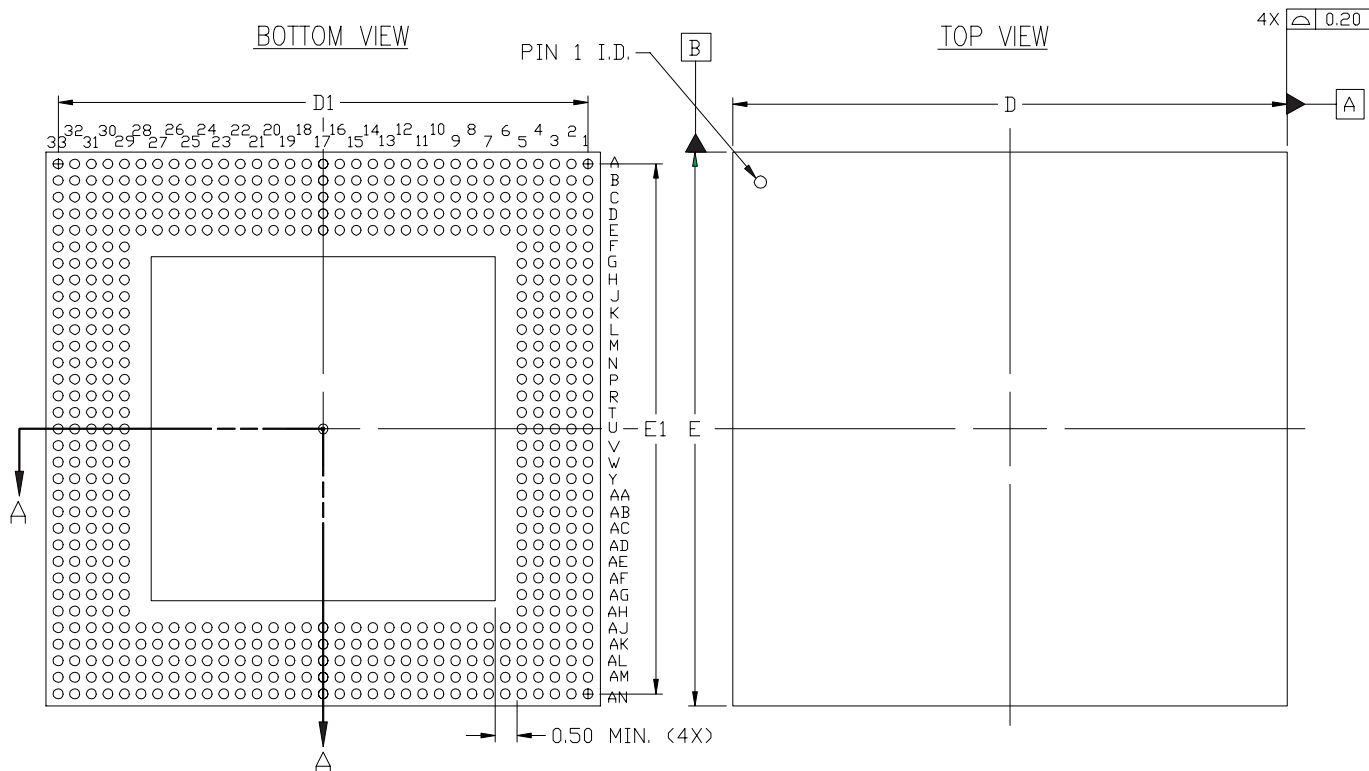


NOTES:

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	
A <sub>1</sub>	0.50	0.60	0.70	
A <sub>2</sub>	0.60	<i>∅</i>	1.00	
A <sub>3</sub>	0.20	<i>∅</i>	<i>∅</i>	
D/E	42.50 BSC			
D <sub>1</sub> /E <sub>1</sub>	40.64 REF.			
e	1.27 BSC			
φ <sub>b</sub>	0.60	0.75	0.90	
aaa	<i>∅</i>	<i>∅</i>	0.20	
ccc	<i>∅</i>	<i>∅</i>	0.15	
bbb	<i>∅</i>	<i>∅</i>	0.25	
ddd	<i>∅</i>	<i>∅</i>	0.30	
M	33			2

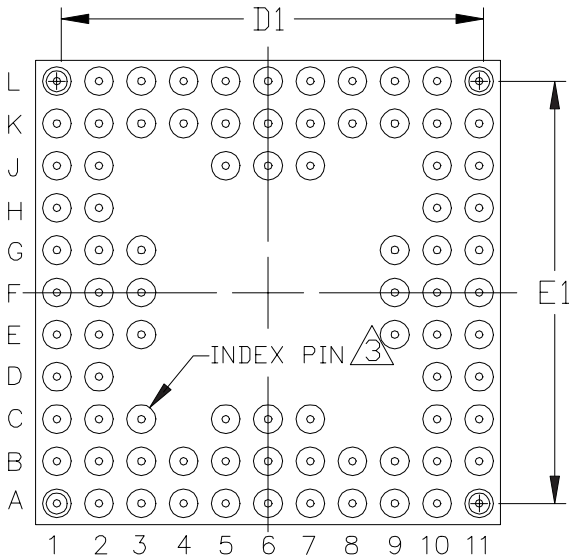
### NOTES:

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)

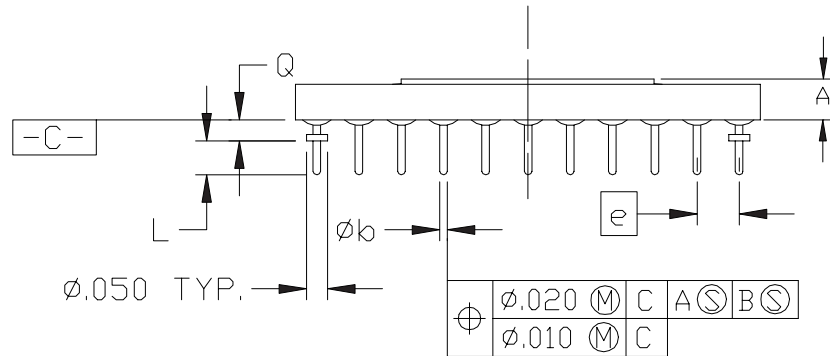
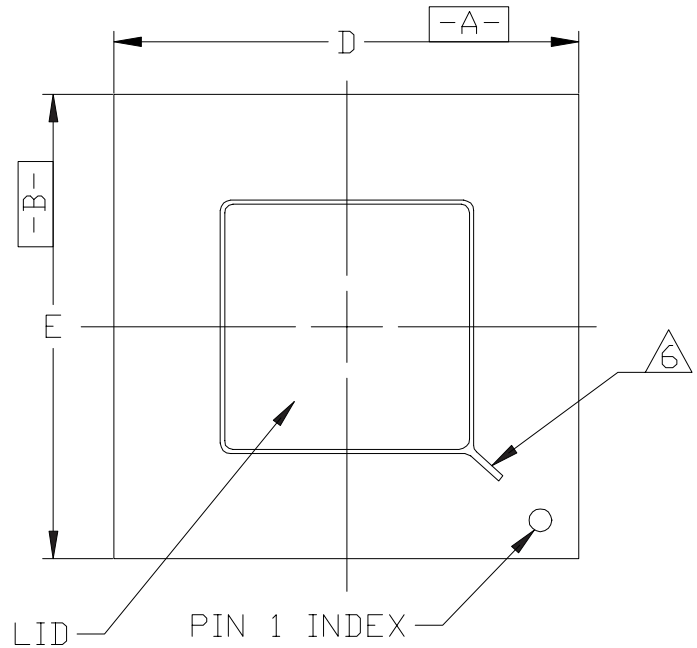
## 560 BALL PLASTIC BGA (BG560)

Ceramic PGA Packages - PG68, PG84

BOTTOM VIEW



TOP VIEW



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

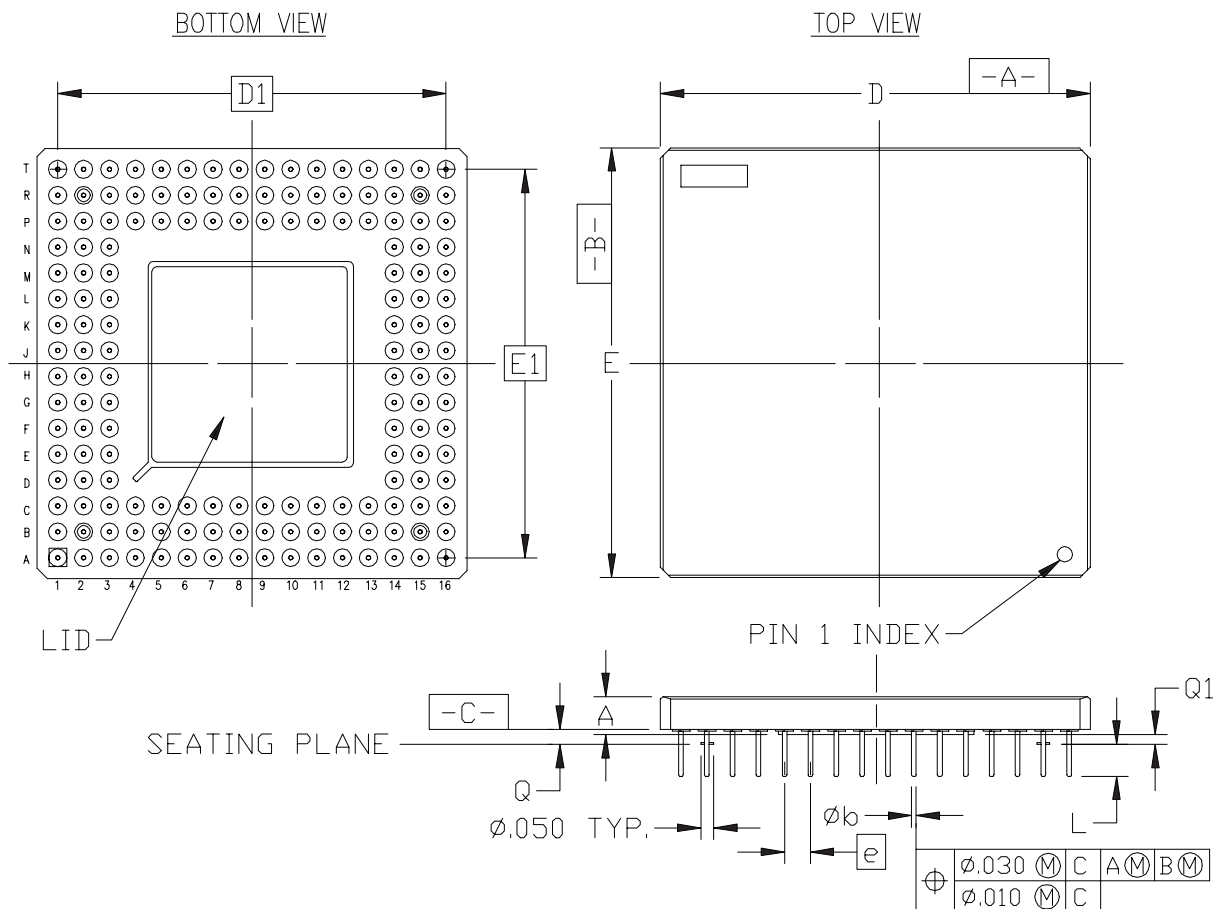
NOTES:

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 MICROINCHES MIN.)  
 - MILITARY (50 MICROINCHES MIN.)
6. THIS FEATURE IS OPTIONAL, MAYBE AT DIFFERENT LOCATION.

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	$\cancel{.145}$	$\cancel{.145}$	.145	$\cancel{.145}$	$\cancel{.145}$	.145	$\cancel{.145}$	$\cancel{.145}$	.145
D/E	1.340	1.360	1.380	1.440	1.460	1.480	1.640	1.660	1.680
D <sub>1</sub> /E <sub>1</sub>	1.200 BSC			1.300 BSC			1.500 BSC		
L	.120	.130	.140	.120	.130	.140	.120	.130	.140
Q	.045	$\cancel{.045}$	.060	.045	$\cancel{.045}$	.060	.045	$\cancel{.045}$	.060
Q <sub>1</sub>	.025	$\cancel{.025}$	$\cancel{.025}$	.025	$\cancel{.025}$	$\cancel{.025}$	.025	$\cancel{.025}$	$\cancel{.025}$
e	.100 BSC			.100 BSC			.100 BSC		
$\phi_b$	.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:

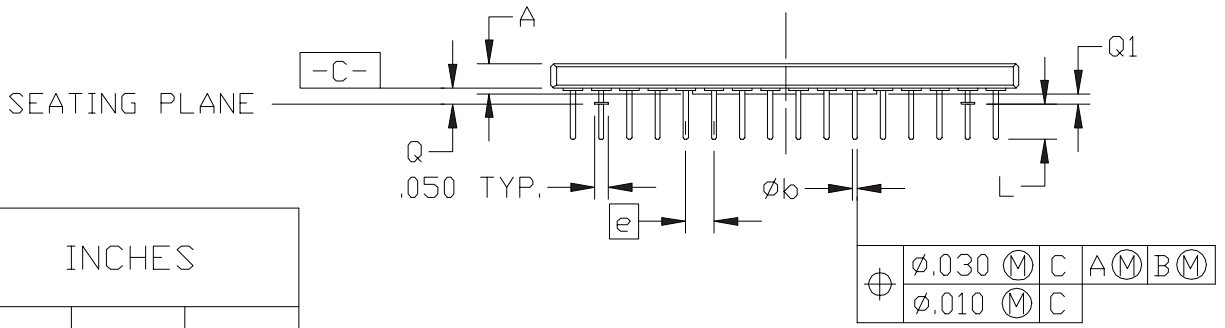
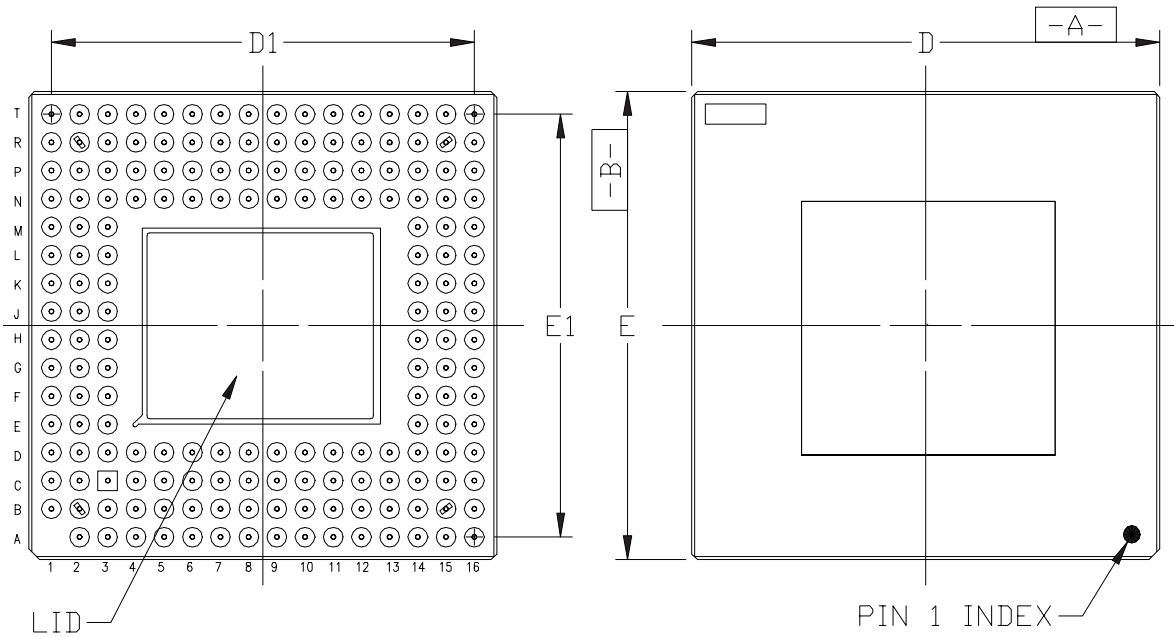
1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982
2. SYMBOL 'M' IS THE PIN MATRIX SIZE.
3. LEAD FINISH: GOLD PLATED
  - COMMERCIAL (35 MICROINCHES MIN.)
  - MILITARY (50 MICROINCHES MIN.)

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 <sub>1</sub> /E <sub>1</sub>	1.500 BSC		
L	.120	.130	.140
Q	.045	<i>∅</i>	.060
Q <sub>1</sub>	.025	<i>∅</i>	<i>∅</i>
e	.100 BSC		
φ <sub>b</sub>	.016	.018	.020
M	16		

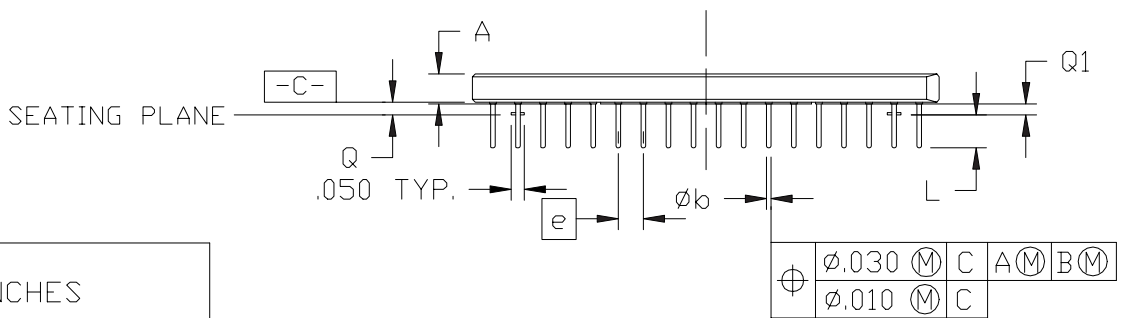
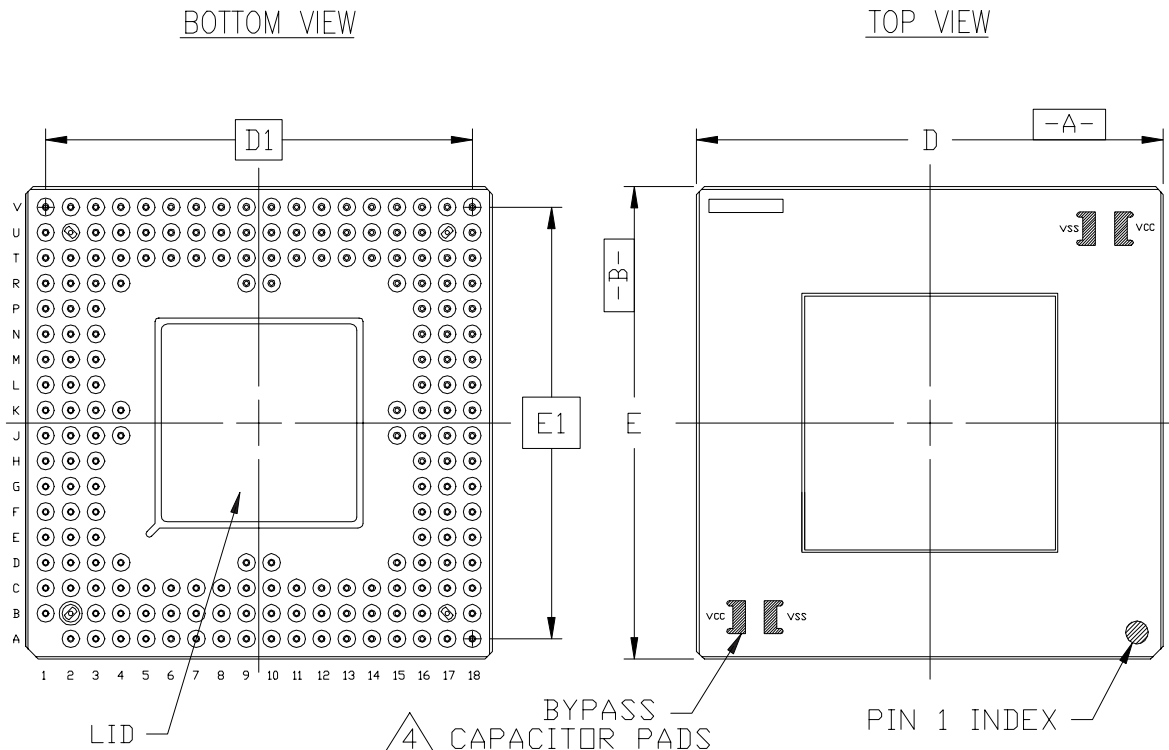
⊕	∅.030 (M)	C	A (M)	B (M)
⊕	∅.010 (M)	C		

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 <sub>1</sub> /E <sub>1</sub>	1.700 BSC		
L	.120	.130	.140
Q	.045	$\approx$	.060
Q <sub>1</sub>	.025	$\approx$	$\approx$
e	.100 BSC		
phi <sub>b</sub>	.016	.018	.020
M	18		

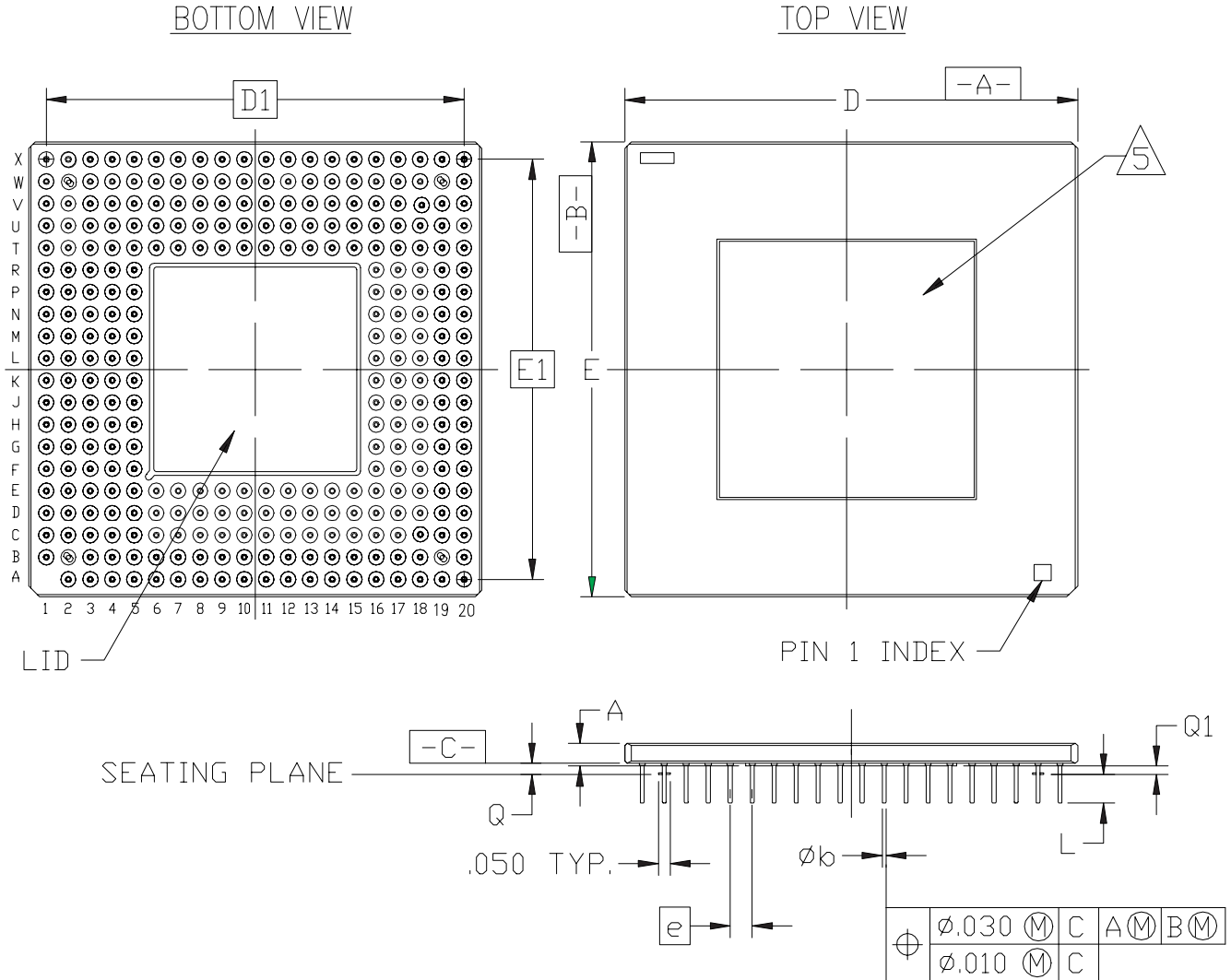
phi	phi .030 (M)	C	A (M)	B (M)
	phi .010 (M)	C		

### 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-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	$\cancel{\text{---}}$	.115	.145	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.145	
D/E	1.840	1.860	1.880	2.040	2.060	2.080	
D1/E1	1.700 BSC			1.900 BSC			
L	.120	.130	.140	.120	.130	.140	
Q	.045	$\cancel{\text{---}}$	.060	.045	$\cancel{\text{---}}$	.060	
Q1	.025	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.025	$\cancel{\text{---}}$	$\cancel{\text{---}}$	
e	.100 BSC			.100 BSC			
$\phi b$	.016	.018	.020	.016	.018	.020	
M	18			20			
REF.	JEDEC MO-067-AK			JEDEC MO-067-AM			

NOTES:

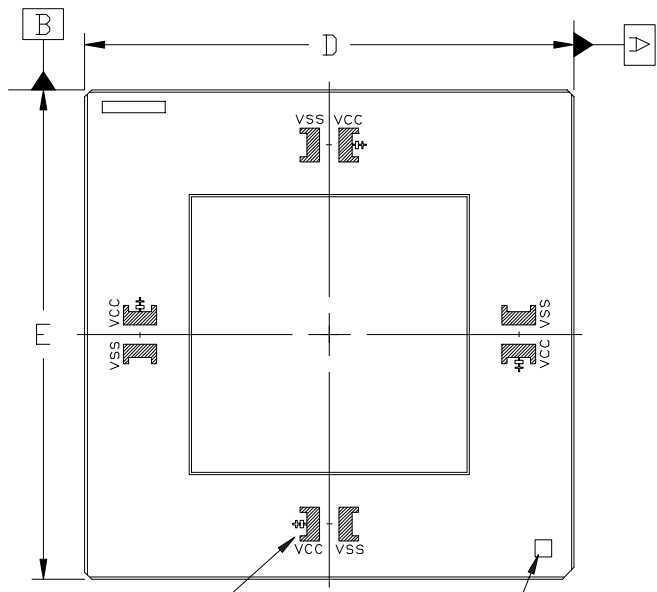
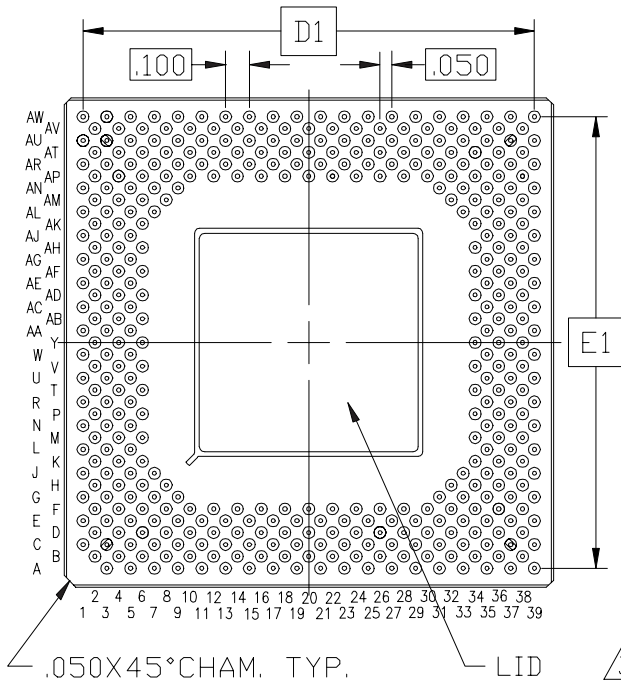
- ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982
- SYMBOL 'M' IS THE PIN MATRIX SIZE.
- FOR PG223, ONLY 4 ROWS OF PINS ON EACH SIDE.
- LEAD FINISH: GOLD PLATED
  - COMMERCIAL (35 MICROINCHES MIN.)
  - MILITARY (50 MICROINCHES MIN.)
- $\triangle 5$  OPTION - HEAT SINK MAY BE ADDED FOR HIGH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

223, 299-PIN CERAMIC PGA (PG223, PG299)

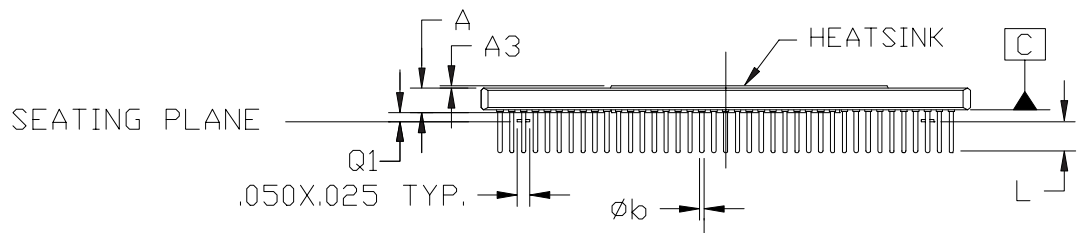
# Ceramic PGA Packages - PG411

BOTTOM VIEW

TOP VIEW



3 BYPASS CAPACITOR PADS PIN 1 INDEX



SYMBOL	INCHES		
	MIN.	NOM.	MAX.
A	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.165
A3	.015	.020	.025
D/E	2.040	2.060	2.080
D <sub>1</sub> /E <sub>1</sub>	1.900 BSC		
L	.110	$\cancel{\text{---}}$	.150
Q <sub>1</sub>	.015	$\cancel{\text{---}}$	.045
M <sub>1</sub>	39		
phi_b	.016	.018	.020

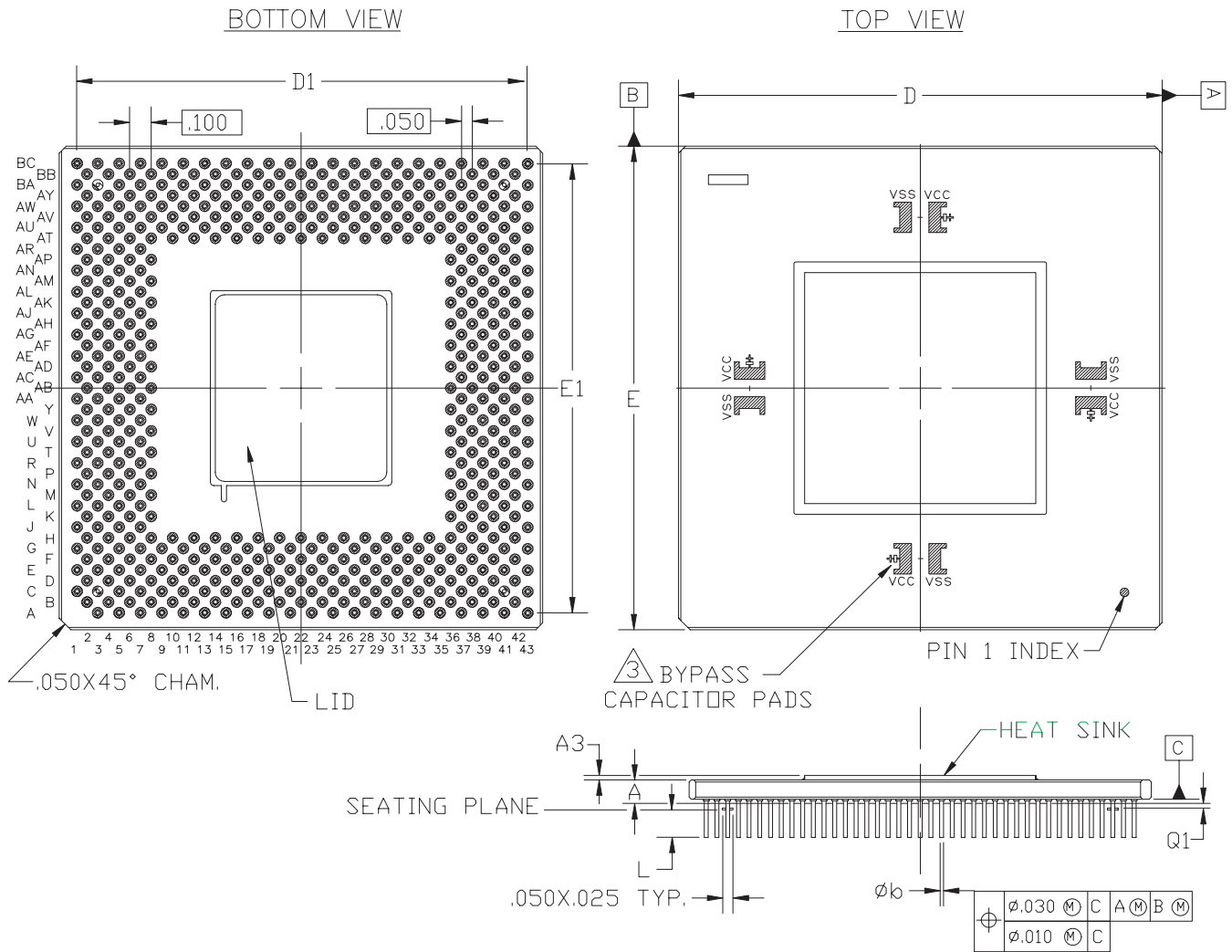
phi	phi .030 (M)	C	A (M)	B (M)
	phi .010 (M)	C		

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



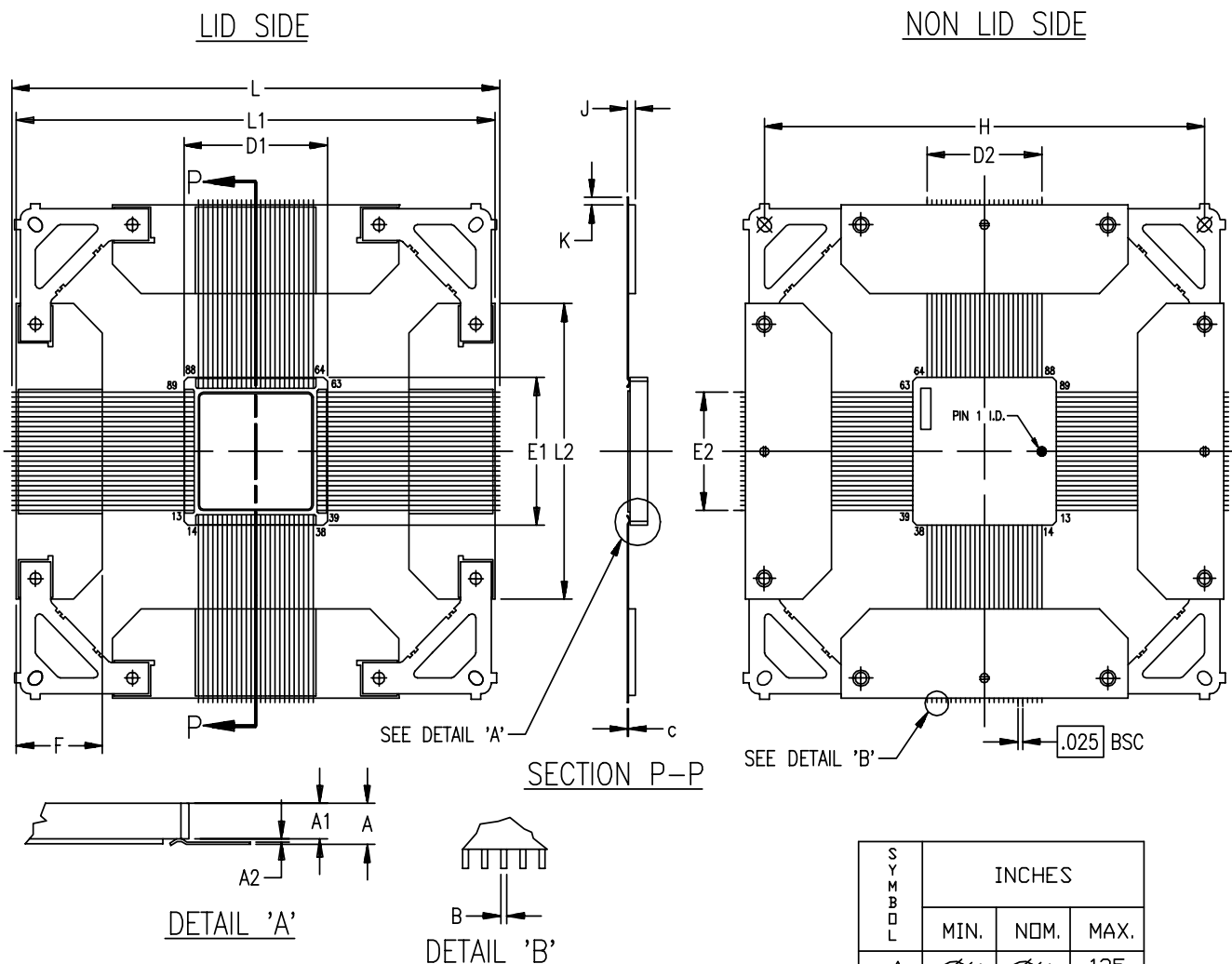
SYMBOL	PG475			PG559		
	INCHES			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.165	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.165
A3	.015	.020	.025	.015	.020	.025
D/E	2.140	2.160	2.180	2.240	2.260	2.280
D <sub>1</sub> /E <sub>1</sub>	2.000 BSC			2.100 BSC		
L	.110	$\cancel{\text{---}}$	.150	.110	$\cancel{\text{---}}$	.150
Q <sub>1</sub>	.015	$\cancel{\text{---}}$	.045	.015	$\cancel{\text{---}}$	.045
M	41			43		
phi <sub>b</sub>	.016	.018	.020	.016	.018	.020
REF.	JEDEC MO-128-AN			$\cancel{\text{---}}$		

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)



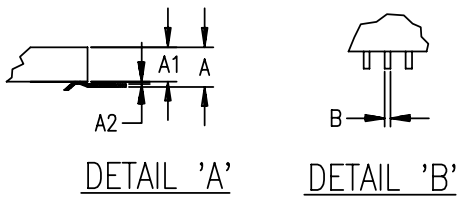
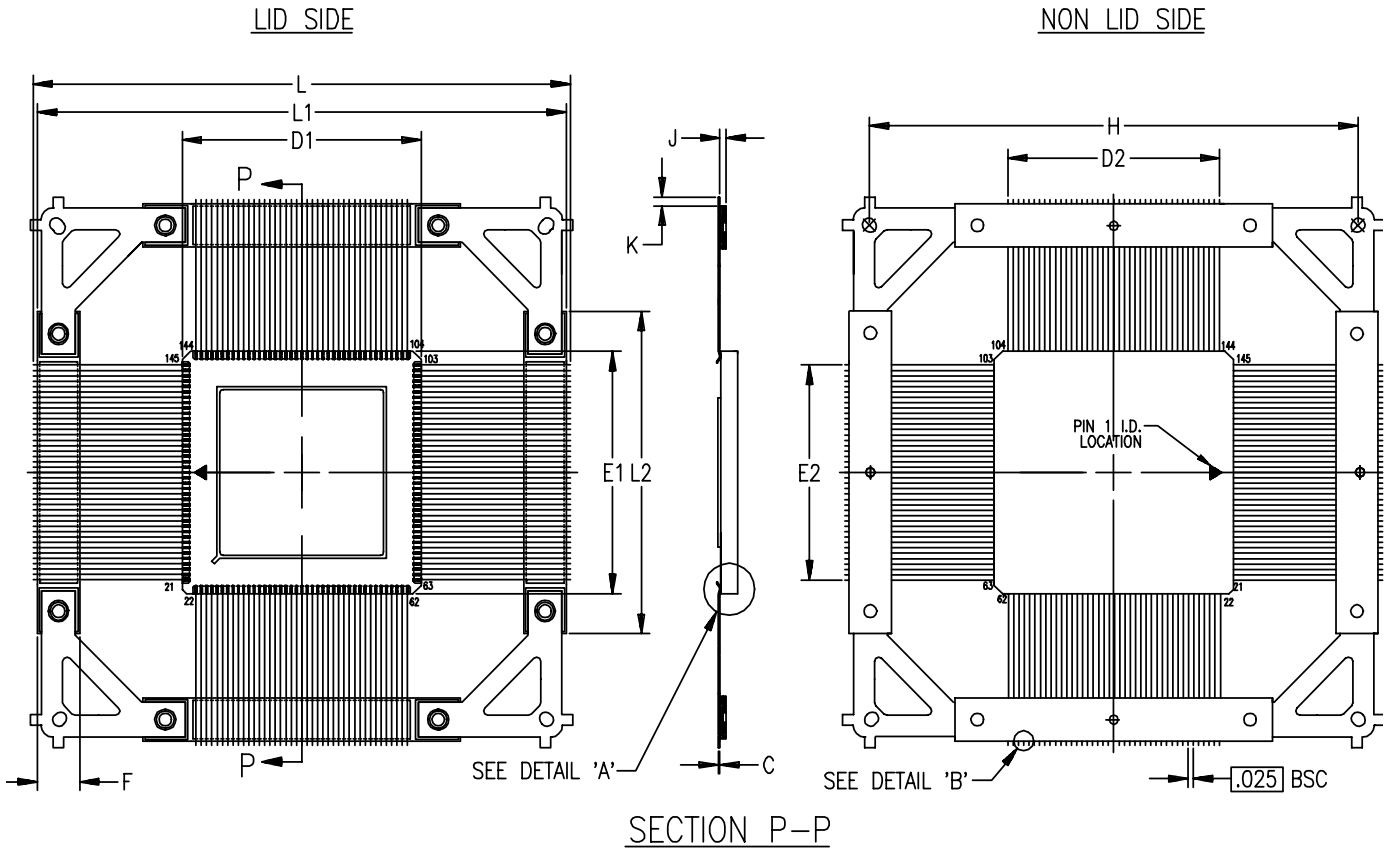
### NOTES:

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 MICRINCHES MINIMUM) OVER NICKEL PER MIL-I-38535

SYMBOL	INCHES		
	MIN.	NOM.	MAX.
A	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.135
A1	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.115
A2	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.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	$\cancel{\text{---}}$	$\cancel{\text{---}}$	.020
L	$\cancel{\text{---}}$	$\cancel{\text{---}}$	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



NOTES:

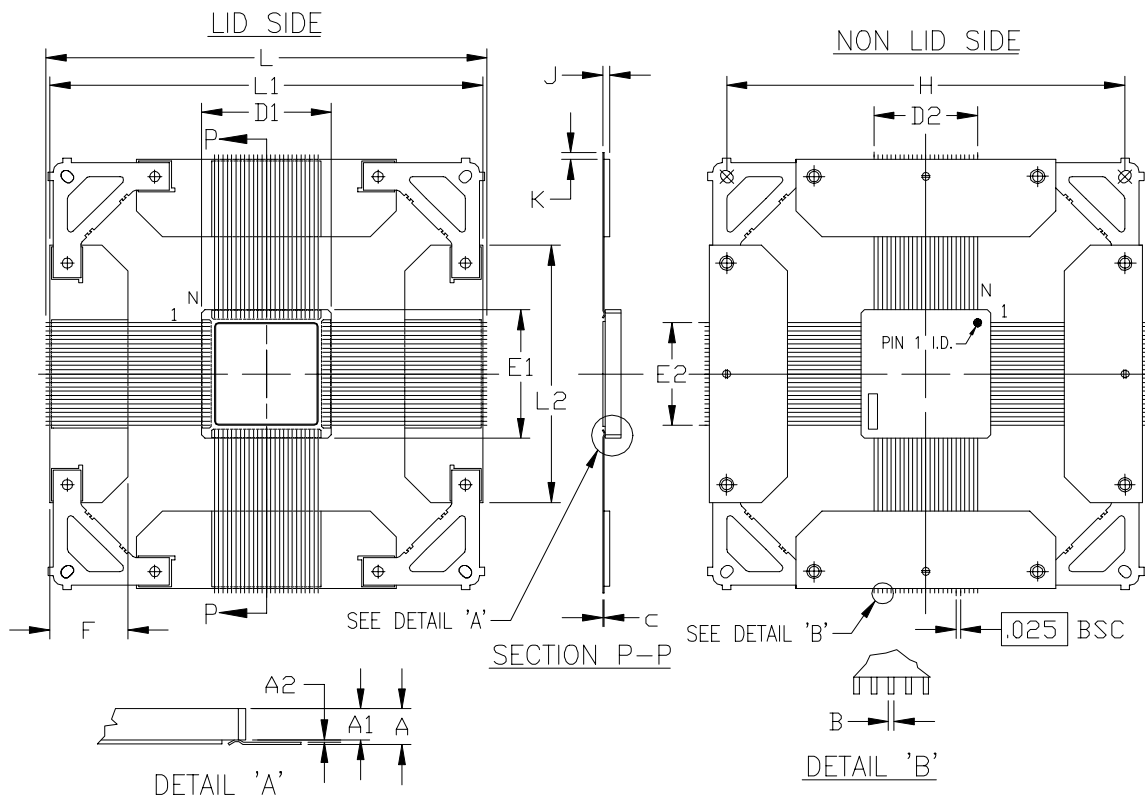
1. ALL DIMENSIONS AND TOLERANCES CONFORM TO ANSI Y14.5M-1982
2. SYMBOL "N" IS THE NUMBER OF TERMINALS.
3. PACKAGES ARE SHIPPED UNFORMED.
4. LEAD FINISH: GOLD (50 MICROINCHES MINIMUM) OVER NICKEL PER MIL-I-38535

SYMBOL	INCHES		
	MIN.	NOM.	MAX.
A	$\cancel{.130}$	$\cancel{.130}$	.130
A1	$\cancel{.110}$	$\cancel{.110}$	.110
A2	$\cancel{.020}$	$\cancel{.020}$	.020
B	.007	$\cancel{.012}$	.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	$\cancel{.020}$	$\cancel{.020}$	.020
L	$\cancel{2.580}$	$\cancel{2.580}$	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)



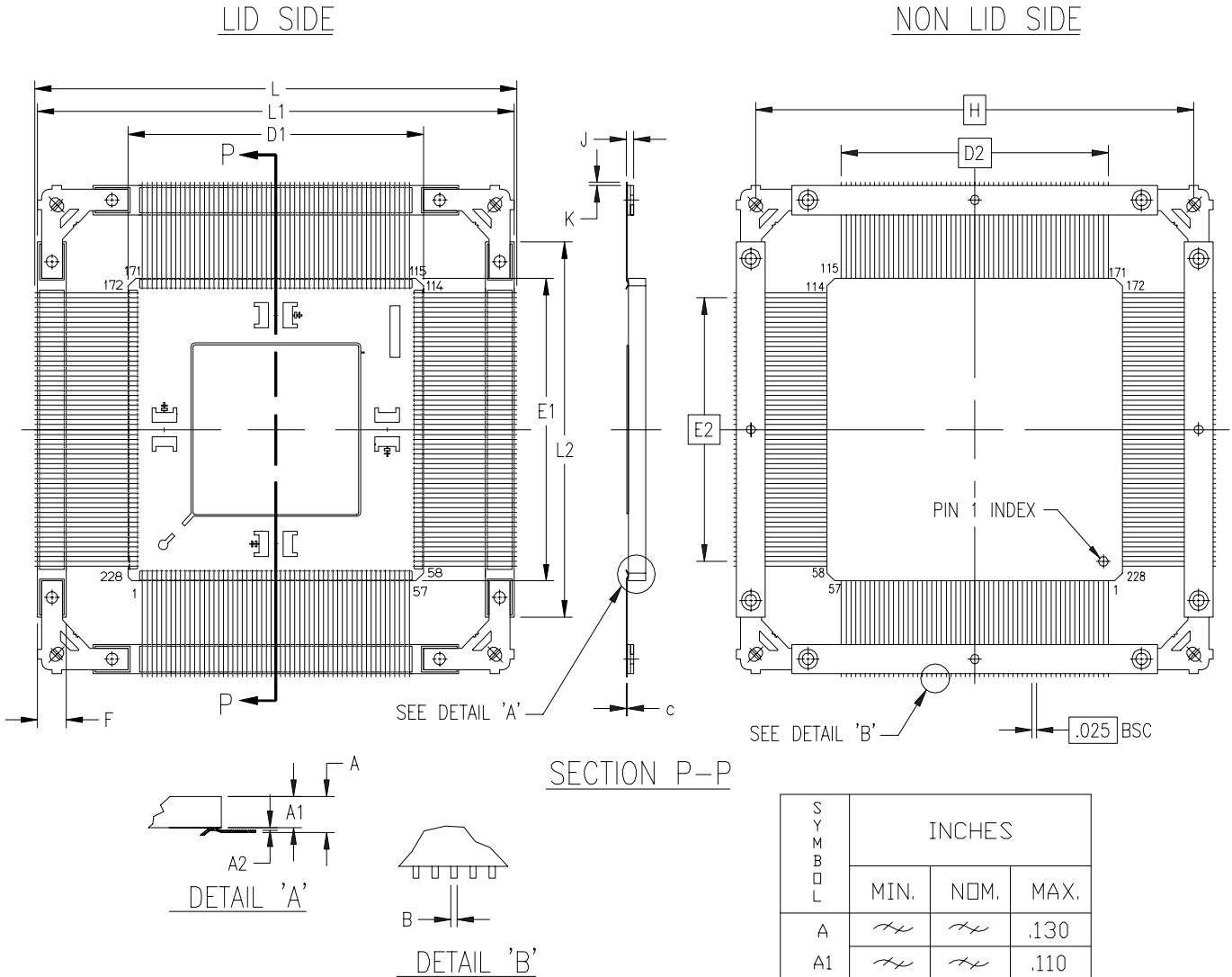
SYMBOL	CB100			CB164			CB196		
	INCHES			INCHES			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	$\frac{H}{H}$	$\frac{H}{H}$	.135	$\frac{H}{H}$	$\frac{H}{H}$	.130	$\frac{H}{H}$	$\frac{H}{H}$	.130
A1	$\frac{H}{H}$	$\frac{H}{H}$	.115	$\frac{H}{H}$	$\frac{H}{H}$	.110	.081	.090	.105
A2	$\frac{H}{H}$	$\frac{H}{H}$	.020	$\frac{H}{H}$	$\frac{H}{H}$	.020	$\frac{H}{H}$	$\frac{H}{H}$	.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	1.130	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	$\frac{H}{H}$	$\frac{H}{H}$	.020	$\frac{H}{H}$	$\frac{H}{H}$	.020	$\frac{H}{H}$	$\frac{H}{H}$	.020
L	$\frac{H}{H}$	$\frac{H}{H}$	2.580	$\frac{H}{H}$	$\frac{H}{H}$	2.580	2.500	$\frac{H}{H}$	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 MICRINCHES MINIMUM)  
OVER NICKEL PER MIL-I-38535

100, 164, 196-PIN CERAMIC BRAZED CQFP (CB100, 164, 196)  
(XC4000 VERSION)

Ceramic Brazed QFP Packages - CB228



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	.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	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	.020
L	$\sqrt{\text{ }}$	$\sqrt{\text{ }}$	2.580
L1	2.480	2.500	2.530
L2	1.900	1.920	1.940
N	228		

228-PIN CERAMIC BRAZED CQFP (CB228)