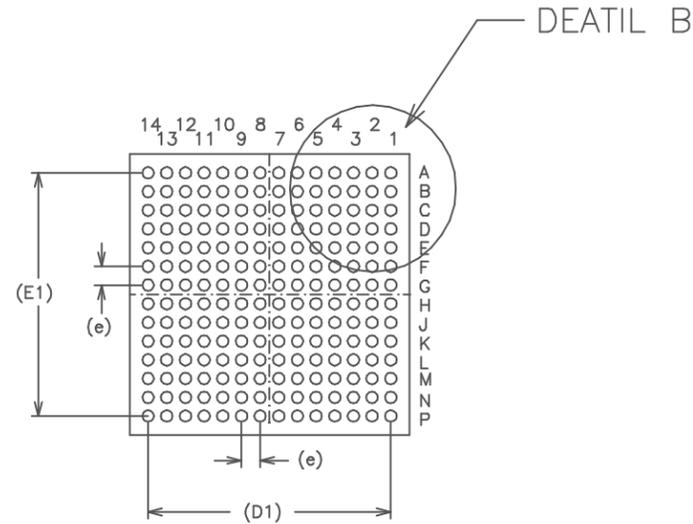
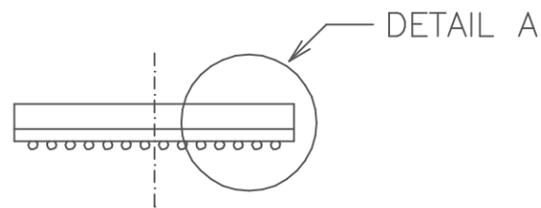


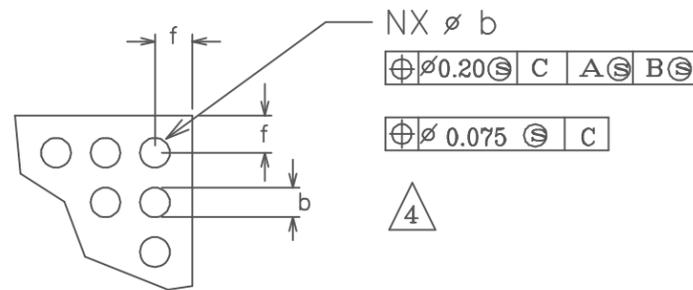
TOP VIEW



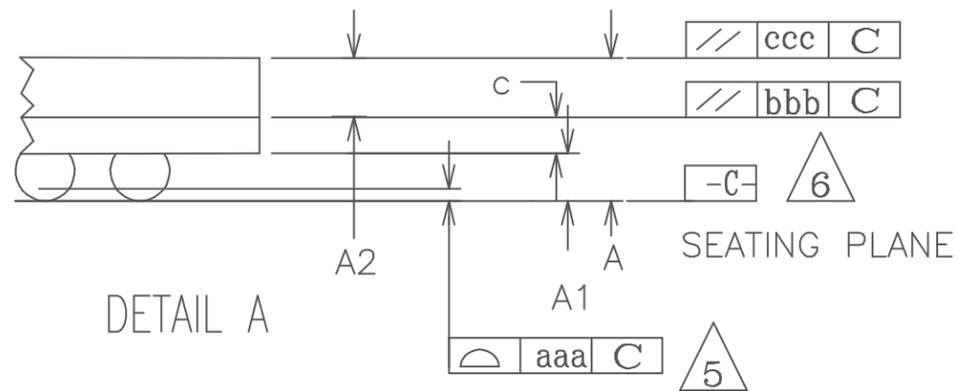
BOTTOM VIEW



SIDE VIEW



DETAIL B



DETAIL A

REVISIONS				
ECN	REV	DESCRIPTION	DATE	APPROVED
	A	Initial Release	12/1/98	

DIMENSIONAL REFERENCES			
REF.	MIN.	NOM.	MAX.
A	1.20	1.35	1.45
A1	0.20	0.30	0.35
A2	0.65	0.70	0.75
D	11.80	12.00	12.20
D1	10.40 BSC.		
D2	11.80	12.00	12.20
E	11.80	12.00	12.20
E1	10.40 BSC		
E2	11.80	12.00	12.20
b	0.40	0.45	0.55
c		0.35	
aaa			0.15
bbb			0.20
ccc			0.25
e	0.70	0.80	0.90
f	0.70	0.80	0.90
M	14		
N	196		

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS.
 - 'e' REPRESENTS THE BASIC SOLDER BALL GRID PITCH.
 - 'M' REPRESENTS THE BASIC SOLDER BALL MATRIX SIZE. AND SYMBOL 'N' IS THE NUMBER OF BALLS AFTER DEPOPULATING.
- ⚠ 'b' IS MEASURABLE AT THE MAXIMUM SOLDER BALL DIAMETER AFTER REFLOW PARALLEL TO PRIMARY DATUM -C-.
- ⚠ DIMENSION 'aaa' IS MEASURED PARALLEL TO PRIMARY DATUM -C-.
- ⚠ PRIMARY DATUM -C- AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.
- PACKAGE SURFACE SHALL BE MATTE FINISH CHARMILLES 24 TO 27.
 - PACKAGE CENTERING TO SUBSTRATE SHALL BE 0.0760 MM MAXIMUM FOR BOTH X AND Y DIRECTION RESPECTIVELY.
 - PACKAGE WARP SHALL BE 0.050MM MAXIMUM.
 - SUBSTRATE MATERIAL BASE IS BT RESIN.
 - THE OVERALL PACKAGE THICKNESS "A" ALREADY CONSIDERS COLLAPSE BALLS



196 fpBGA (12x12mm)
 MARKETING OUTLINE DRAWING
 Ball Size : 0.4mm (before reflow)

THIS DOCUMENT CONTAINS INFORMATION PROPRIETARY TO ASAT LIMITED AND REPRODUCTION DISCLOSURE OR USE OF THIS DOCUMENT IS EXPRESSLY PROHIBITED EXCEPT OTHERWISE AGREED UPON IN WRITING.

DRAWN BY : C.K LO DATE : 12/3/98
 APPROVED BY : TIM L DATE : 12/3/98
 DIMENSIONS IN MM PAGE 1 OF 1
 DO NOT SCALE DRAWING CODE: fpBGA-1212-0196-01

DWG NO.: DGM-fpBGA-1212-0196-01 REV. A