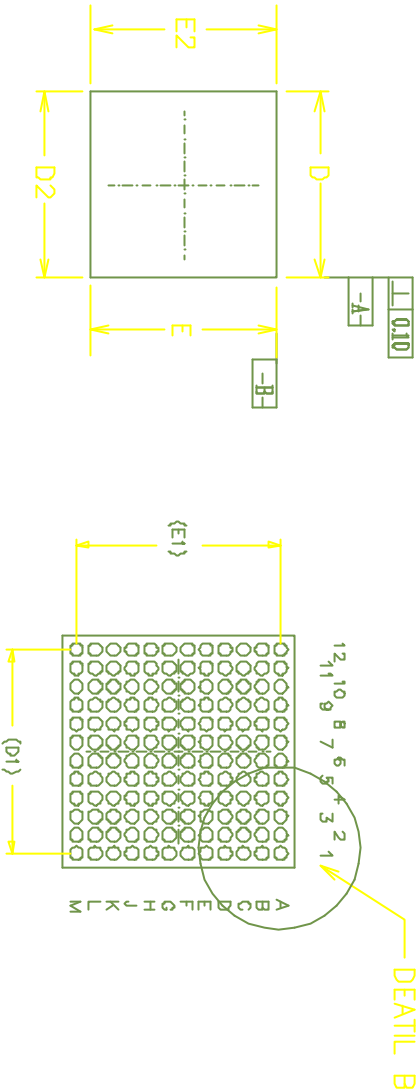
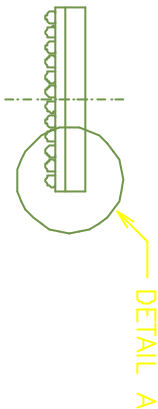


REVISIONS			
ECON	REV	DESCRIPTION	DATE
HK1473	A	Initial release	12/23/97
	B	Update "e"	1/21/98

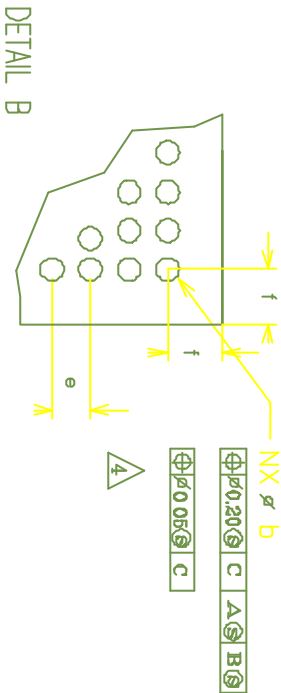


TOP VIEW

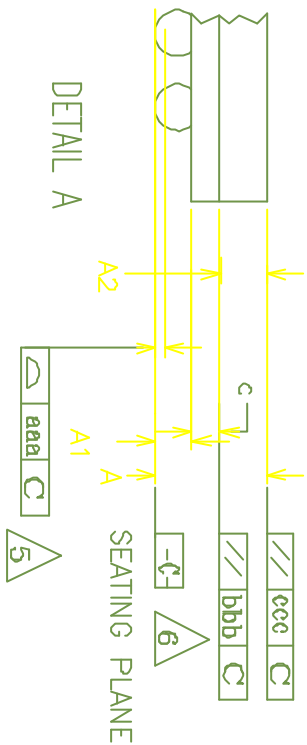
BOTTOM VIEW



SIDE VIEW



DETAIL B



DETAIL A

DIMENSIONAL REFERENCES			
REF.	MIN	NOM.	MAX.
A	1.35	1.45	1.55
A1	0.35	0.40	0.45
A2	0.65	0.70	0.75
D	12.80	13.00	13.20
D1	11.00 BSC.		
D2	12.80	13.00	13.20
E	12.80	13.00	13.20
E1	11.00 BSC.		
B2	12.80	13.00	13.20
b	0.45	0.50	0.55
c	0.35		
aaa	0.15		
bbb	0.20		
ccc	0.25		
e	0.9	1.00	1.10
f	0.9	1.00	1.10
M	12		
N	144		

NOTES.

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. "A" REPRESENTS THE BASIC SOLDER BALL GRID PITCH.
3. "W" REPRESENTS THE BASIC SOLDER BALL MATRIX SIZE.
4. AND SYMBOL "N" IS THE MAXIMUM ALLOWABLE NUMBER OF BALLS AFTER DEROPLANING
5. "V" IS MEASURABLE AT THE MAXIMUM SOLDER BALL DIAMETER PARALLEL TO PRIMARY DATUM [C].
6. DIMENSION "G" IS MEASURED PARALLEL TO PRIMARY DATUM [C].
7. PRIMARY DATUM [C] AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.
8. PACKAGE SURFACE SHALL BE WHITE FINISH CHANNELS 24 TO 27.
9. PACKAGE CENTERING TO SUBSTRATE SHALL BE 0.0760 MM MAXIMUM FOR BOTH X AND Y DIRECTION RESPECTIVELY
10. PACKAGE WARP SHALL BE 0.000MM MAXIMUM
11. SUBSTRATE MATERIAL BASE IS BT RESIN.
12. THE OVERALL PACKAGE THICKNESS "A" ALREADY CONSIDERS COLLAPSE BALLS

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 : ALLAN P. DATE : 12/2/97
APPROVED BY : MACS D. DATE : 12/2/97
DIMENSIONS IN MM PAGE 1 OF 1
DO NOT SCALE DRAWING CODE 13144_FMI



144 pin PBGA (13x13mm)
MARKETING OUTLING DRAWING

DWG NO.: DGM13144-FM1 REV. B