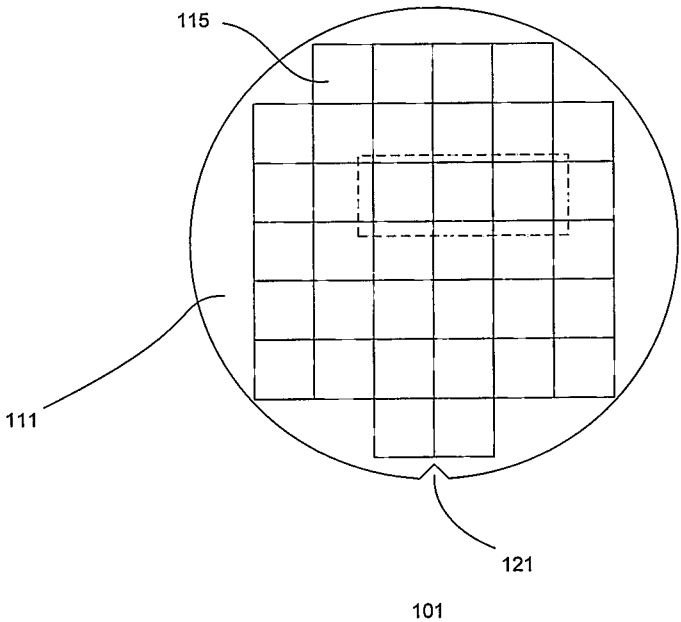


Fig. 1a

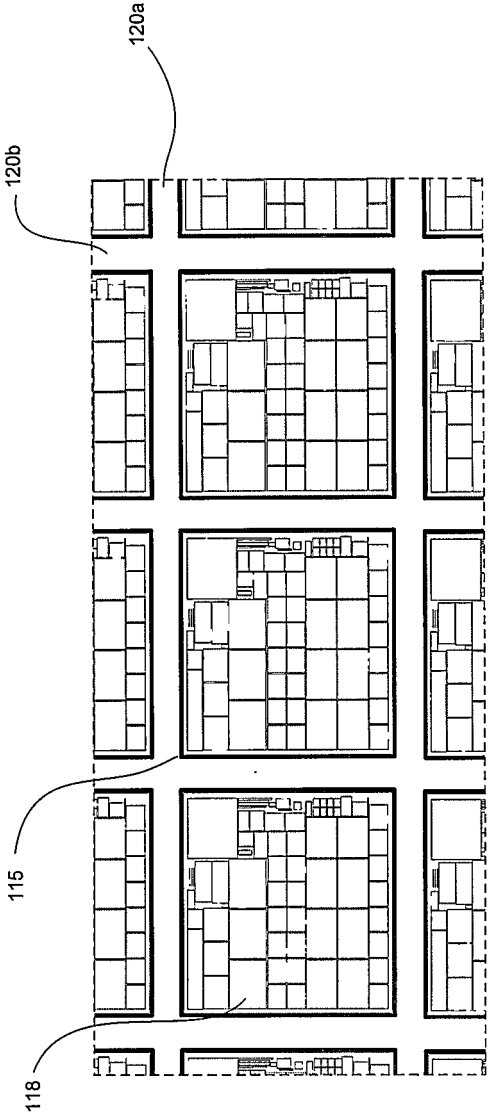


Fig. 1b

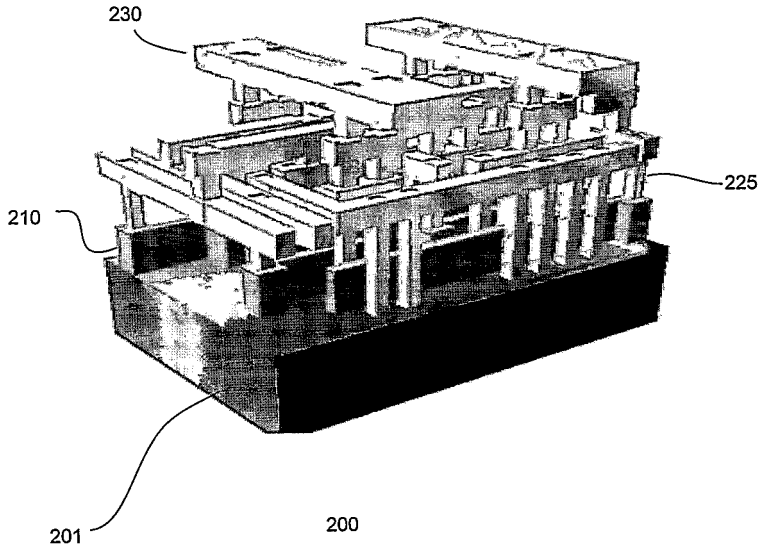


Fig. 2

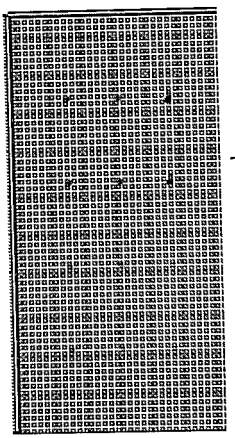


Fig. 3a

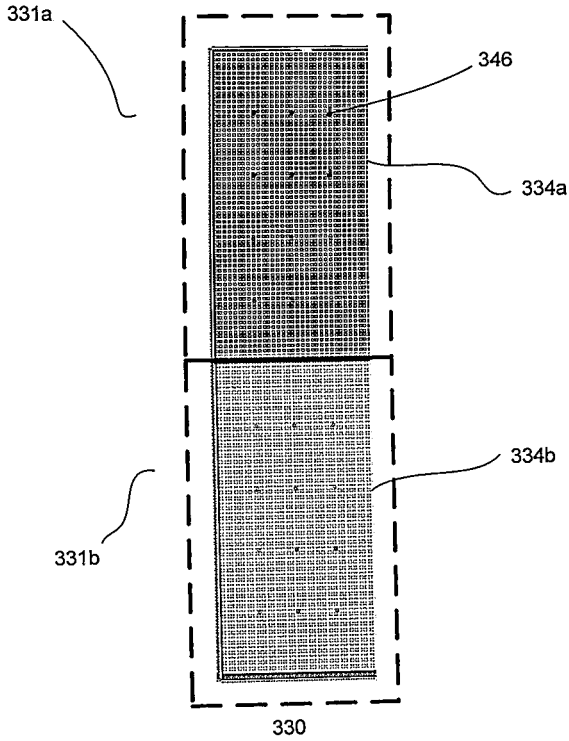


Fig. 3b

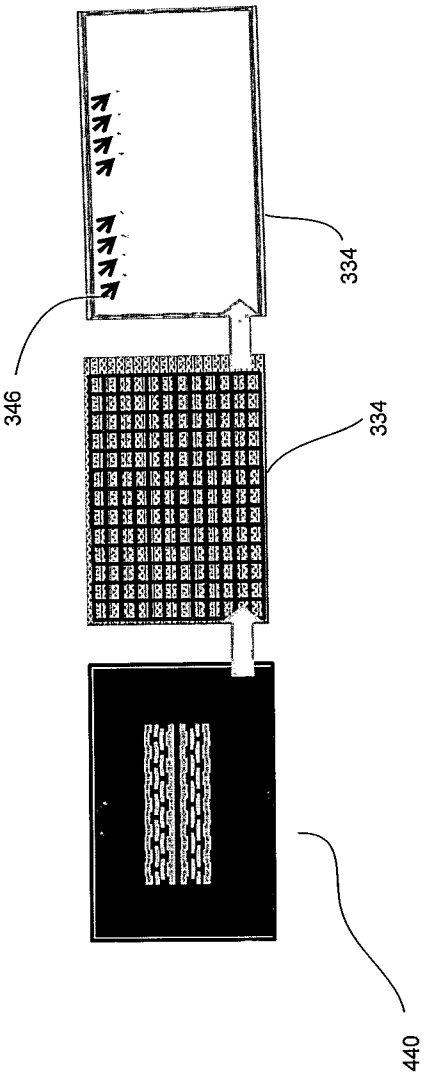


Fig. 4a

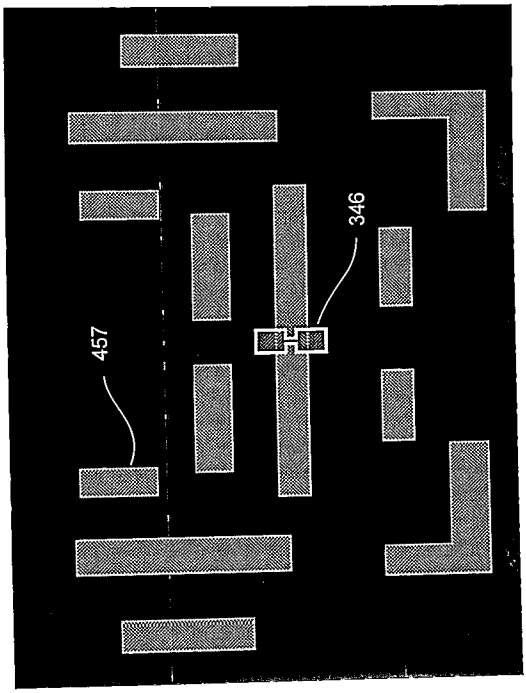


Fig. 4b

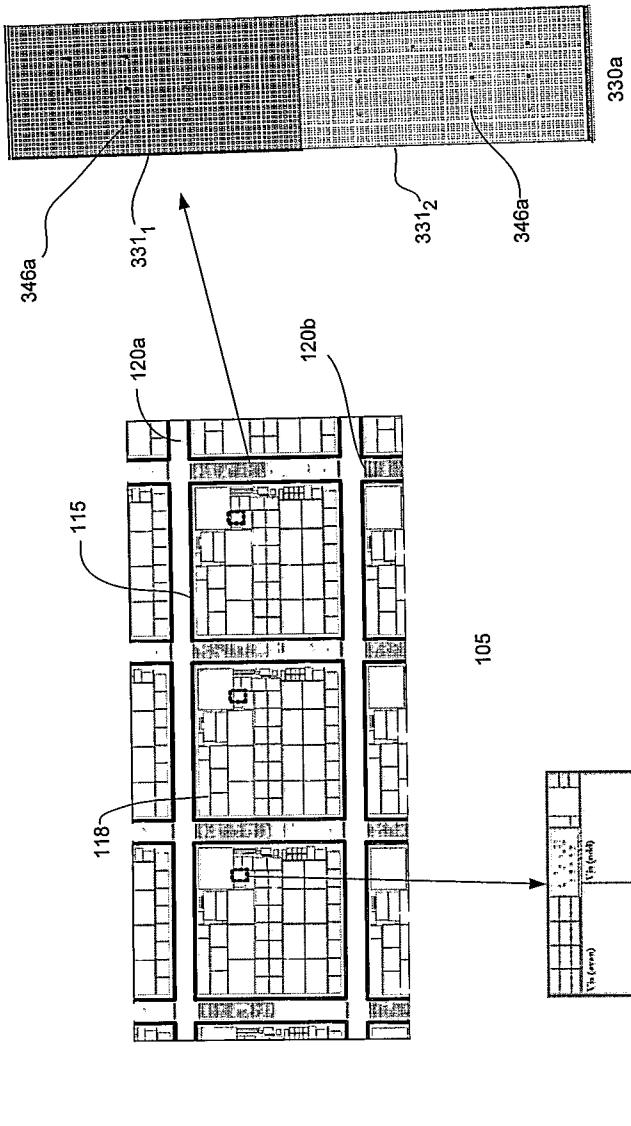

346a
331$_1$
331$_2$
346a
330a
120a
120b
115
118
105
332$_2$
346b
330b
332$_1$
346b

Fig. 5

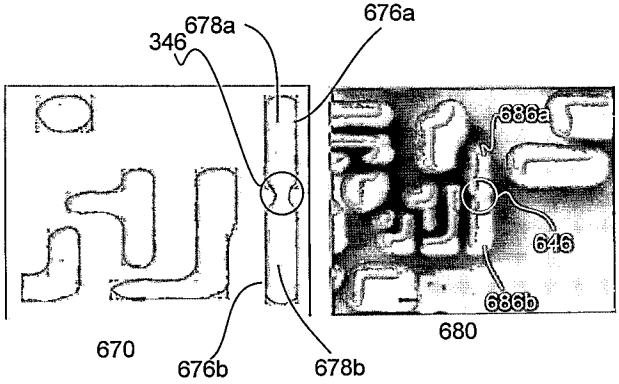

678a
346
676a
686a
646
686b
680
670
676b
678b

Fig. 6a

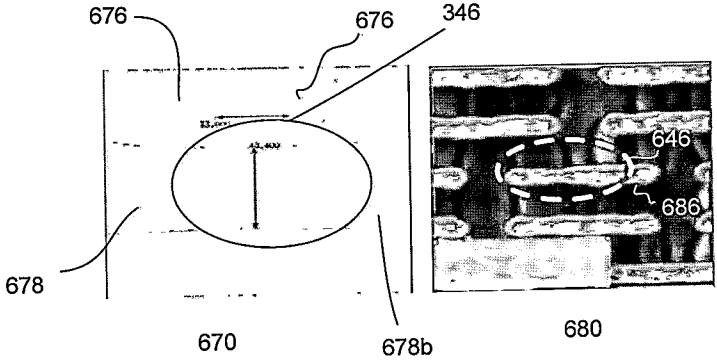

676
676
346
646
686
678
670
678b
680

Fig. 6b

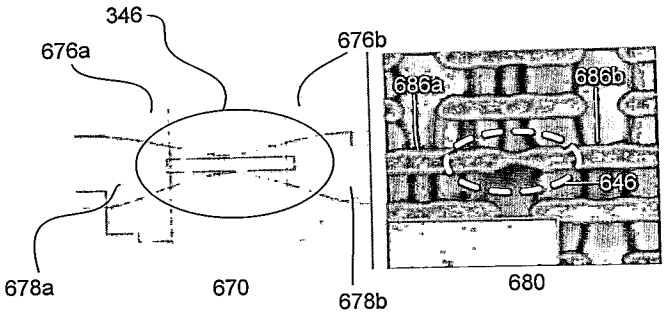

346
676a
676b
686a
686b
646
678a
670
678b
680

Fig. 6c

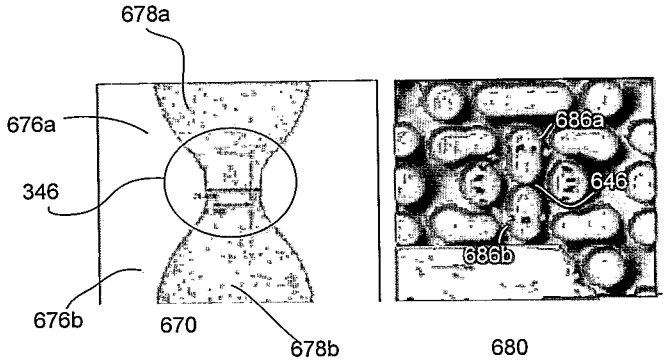

678a
676a
346
686a
646
686b
676b
670
678b
680

Fig. 6d

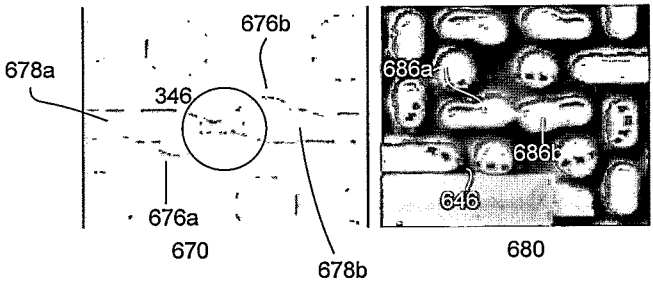

678a
676b
346
676a
670
678b
686a
686b
646
680

Fig. 6e

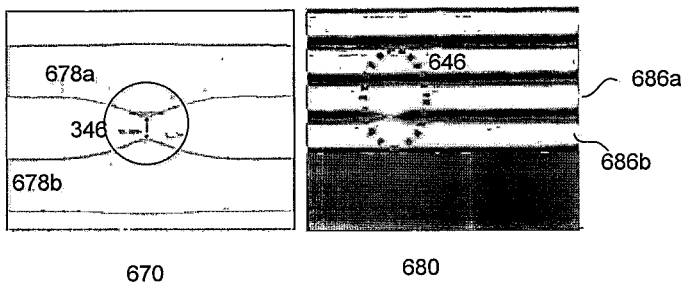

678a
346
678b
670
646
686a
686b
680

Fig. 6f

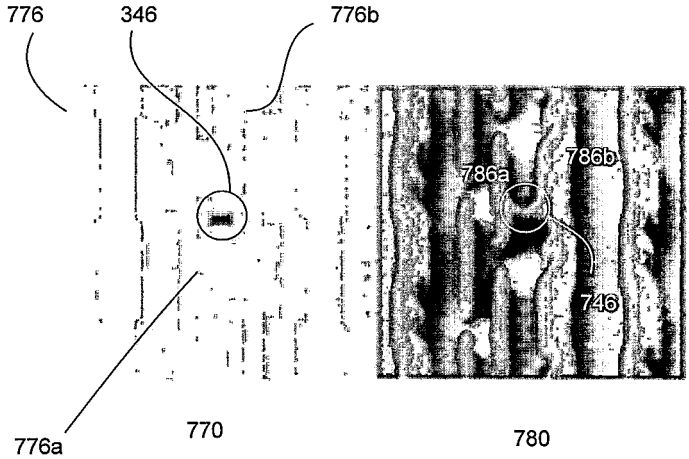


Fig. 7a

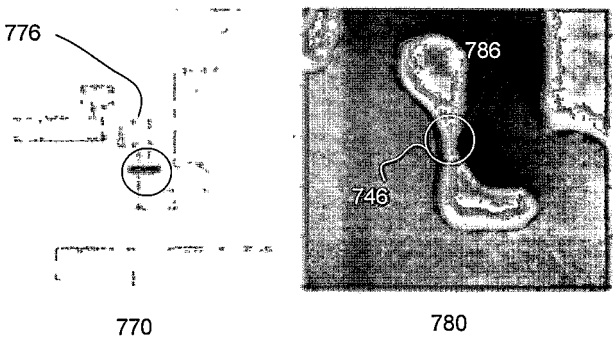


Fig. 7b

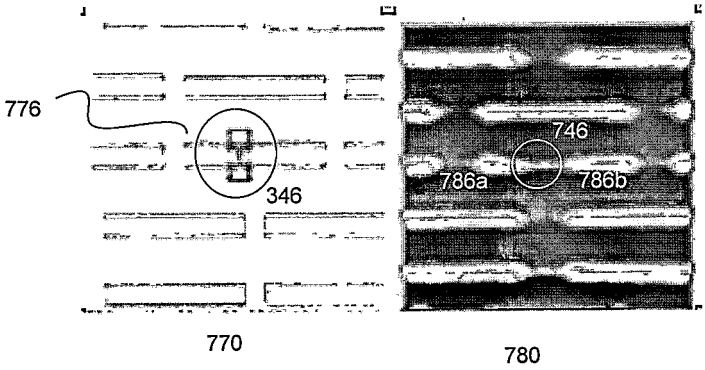


Fig. 7c

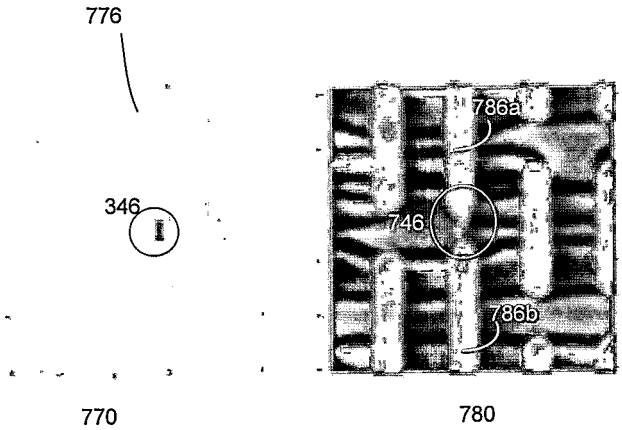


Fig. 7d

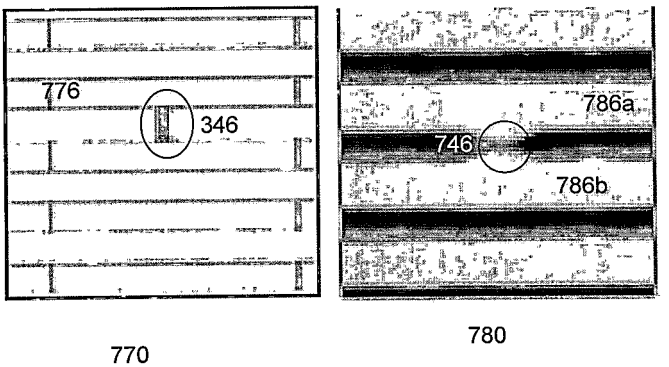


Fig. 7e

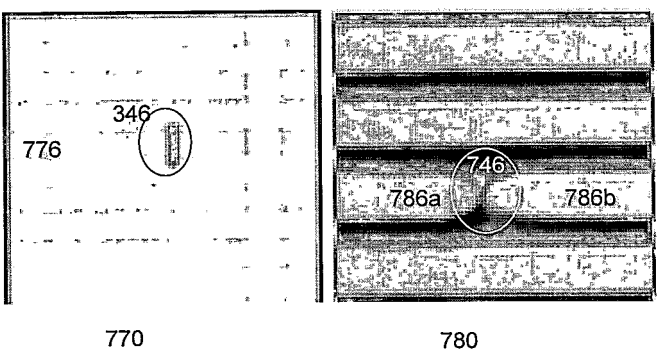


Fig. 7f

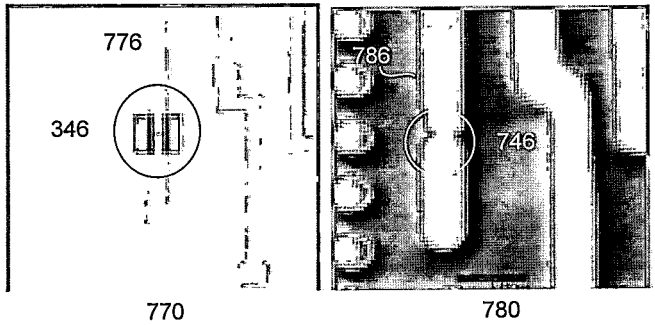


Fig. 7g

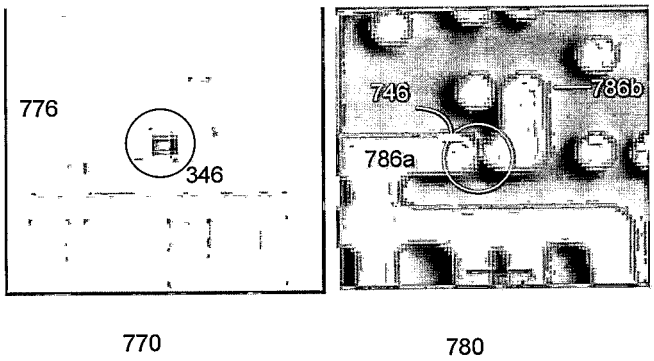


Fig. 7h

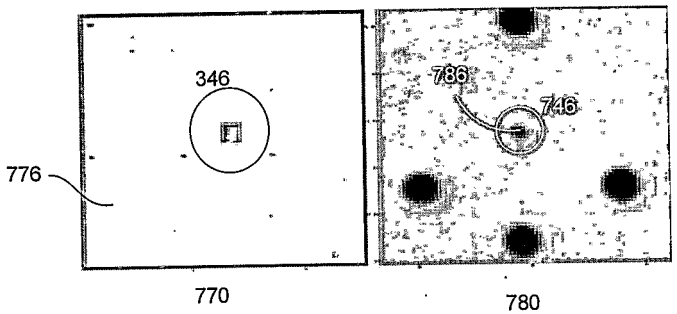


Fig. 7i

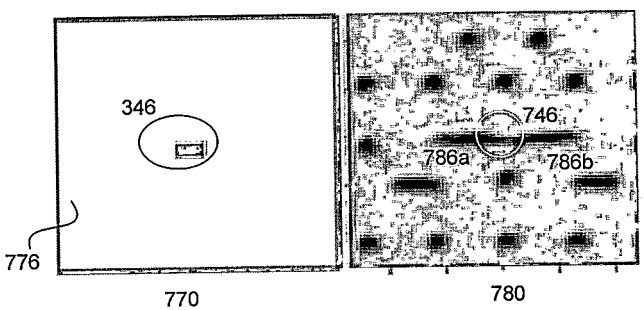


Fig. 7j

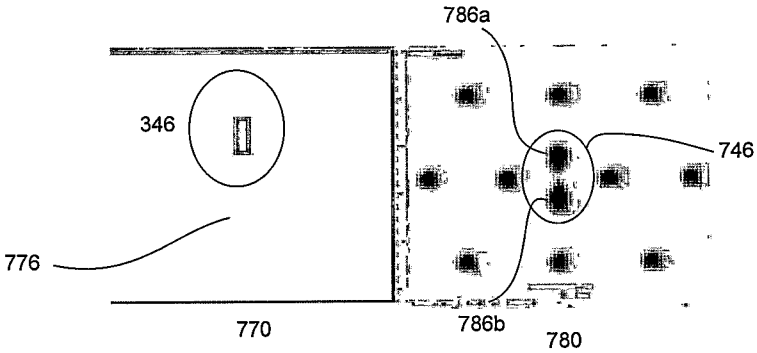


Fig. 7k

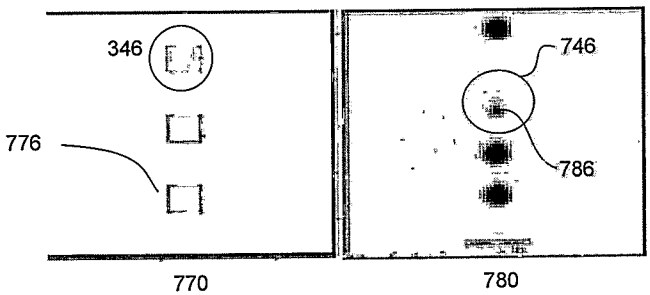


Fig. 7l

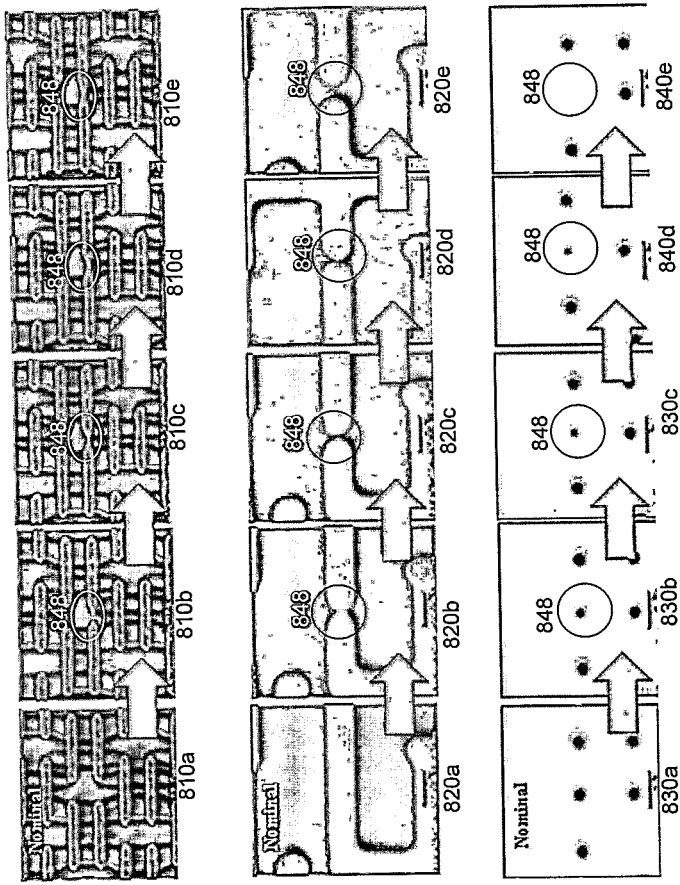
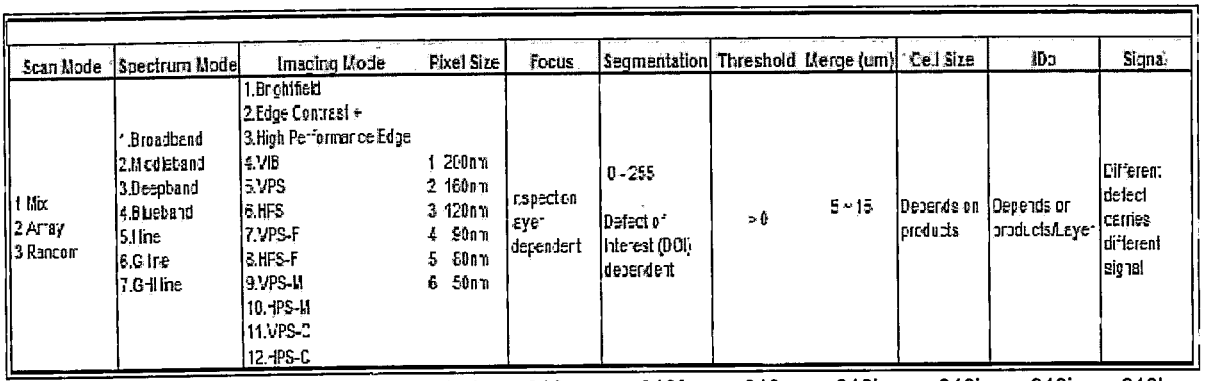

810
Nominal
848
810a
810b
810c
810d
810e
820
Nominal
848
820a
820b
820c
820d
820e
830
Nominal
848
830a
830b
830c
840d
840e

Fig. 8



Scan Mode	Spectrum Mode	Imaging Mode	Pixel Size	Focus	Segmentation	Threshold	Merge (um)	Cell Size	IDo	Signal
1 Mix 2 Array 3 Random	1.Broadband 2.Midband 3.Deepband 4.Blueband 5.I line 6.G line 7.GHI line	1.Brightfield 2.Edge Contrast + 3.High Performance Edge 4.VIB 5.VPS 6.HFS 7.VPS-F 8.HFS-F 9.VPS-M 10.HPS-M 11.VPS-C 12.HPS-C	1 200nm 2 160nm 3 120nm 4 90nm 5 80nm 6 50nm	Inspection eye dependent	0 - 255 Defect of Interest (DOI) dependent	> 0	5 ~ 15	Depends on products	Depends on products/Eye	Different defect carries different signal
910a	910b	910c	910d	910e	910f	910g	910h	910i	910j	910k

900

Fig. 9a

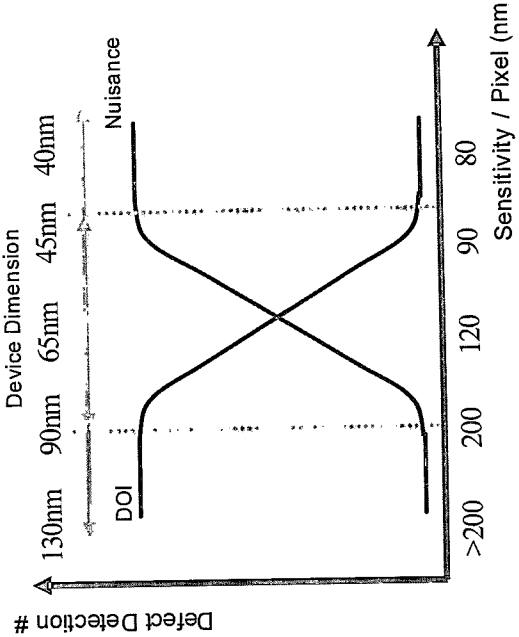

Defect Detection #
Device Dimension
130nm
90nm
65nm
45nm
40nm
DOI
Nuisance
>200
200
120
90
80
Sensitivity / Pixel (nm
905

Fig. 9b

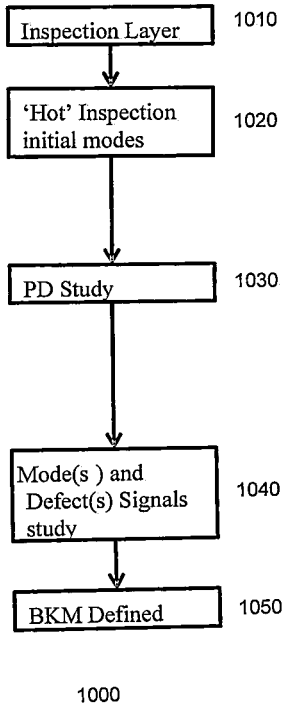

Inspection Layer
1010
'Hot' Inspection initial modes
1020
PD Study
1030
Mode(s) and Defect(s) Signals study
1040
BKM Defined
1050
1000

Fig. 10a

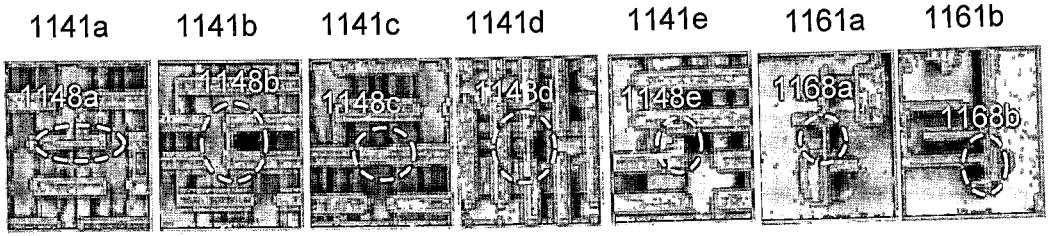
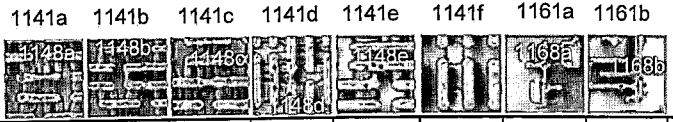

1141a
1141b
1141c
1141d
1141e
1161a
1161b
1148a
1148b
1148c
1148d
1148e
1168a
1168b

Fig. 10b



Spectral Mode		Focus (um)	Pixel Size (um)	SRAM BK I	SRAM BG I	SRAM BG M	SRAM BG Subtle T2T	SRAM BG Lateral MM	SRAM Nuisance	LOG BG II	LOG BG VI	Ave
G Line	BF	0.00	0.09	1.1	1.11	2.6	2.17	0.9	1.00	1.33	1.45	1.40
GHI-Line	ECP	-0.15	0.09	4.02	3.07	2.55	2.41	2.5	1.71	3.11	2.75	2.92
GHI-Line	VIB	-0.20	0.09	1.82	2.61	2.11	2.1	1.33	1.4	1.63	2	1.94
GHI-Line	BF	-0.10	0.09	3.14	3.09	2.5	2.33	1.83	1.17	3	3.1	2.71
I-Line	BF	-0.10	0.09	3.05	2.76	1.81	1.6	2.33	1.4	2	1.67	2.17
Middleband_DUV	BF	-0.10	0.09	1.51	1.74	1.88	1.38	2.5	2.33	2.33	2.11	1.92
Deepband_DUV	VIB	-0.20	0.09	0.89	1.19	2	1.86	1.7	1.75	1.17	1.5	1.49
Deepband_DUV	BF	-0.10	0.09	1	1.15	2.19	2	1.86	1.6	2	2.16	1.77
Blueband_DUV	ECP	-0.15	0.09	1.06	1.93	2.1	1.63	1.91	1.43	2.5	3	2.02
Blueband_DUV	VIB	-0.20	0.09	1.12	1.26	2.23	1.43	2.11	2.29	1.78	2.7	1.80
Blueband_DUV	BF	-0.10	0.09	1.49	1.56	2.3	2.13	2.25	2	2.5	2.25	2.07
Broadband_DUV	ECP	-0.15	0.09	3.9	3.8	2.82	2.7	2.67	1.33	3.37	3.5	3.25
Broadband_DUV	VIB	-0.20	0.09	1.75	2.05	2.13	1.5	1.86	1.86	2.43	2.2	1.99
Broadband_DUV	BF	-0.10	0.09	2.16	2.77	2.2	2.17	2.67	2.2	2.67	3	2.52

1120$_1$

1120$_N$

1120$_2$

1120$_4$

1120$_{12}$

1140a ---------- 1140f 1160a 1160b

1120 1140 1160 1180

1100

Fig. 11

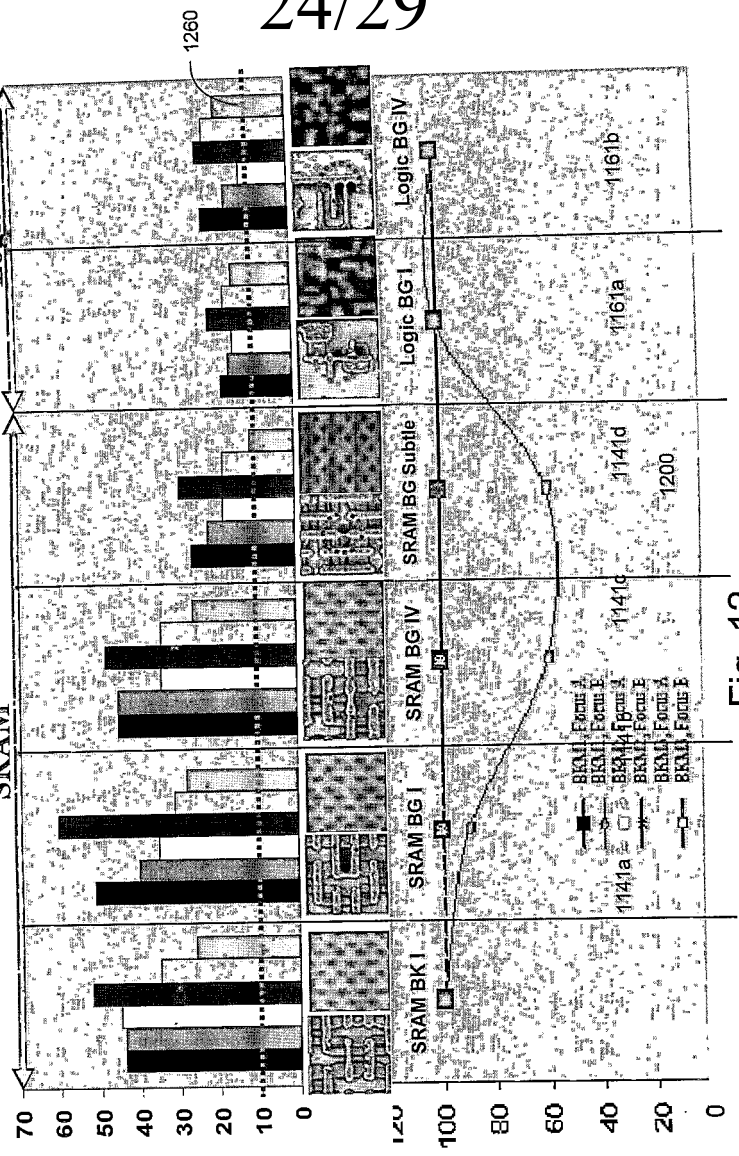
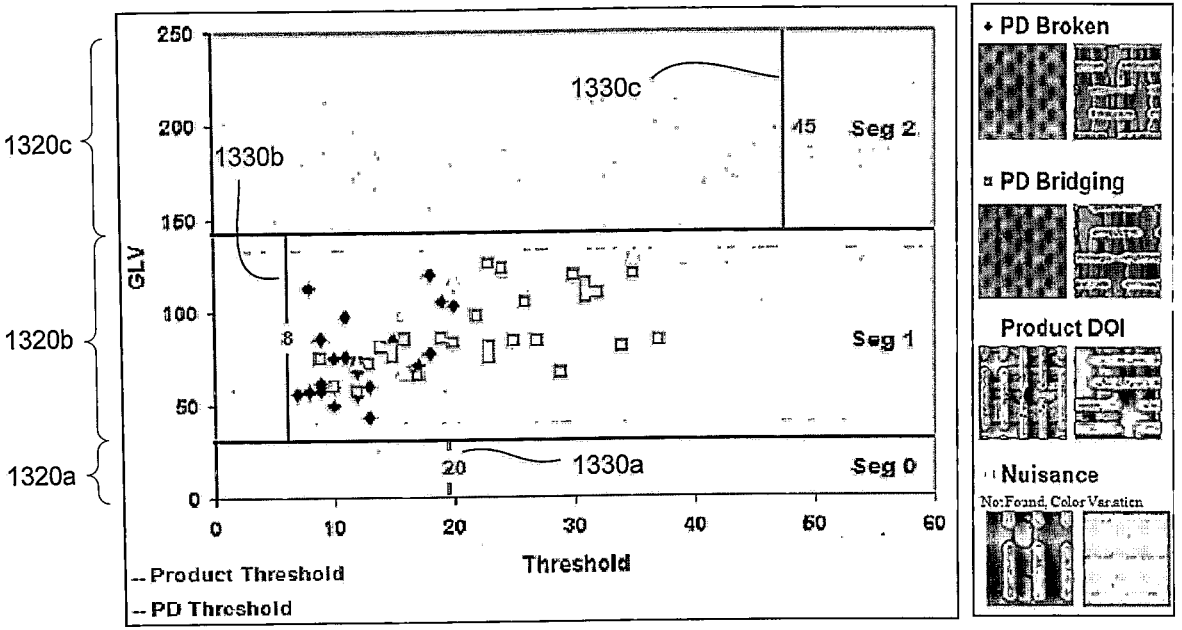
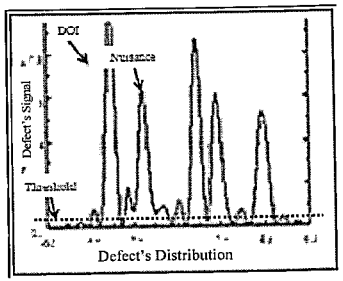

SRAM
Logic
1260
Signal
70
60
50
40
30
20
10
0
Capacitance (%)
120
100
80
60
40
20
0
SRAM BK I
SRAM BG I
SRAM BG IV
SRAM BG Subtle
Logic BG I
Logic BG IV
1141a
1141b
1141c
1141d
1161a
1161b
1200
BK1 Focus A
BK1 Focus B

Fig. 12


1320c
1320b
1320a
250
200
150
100
50
0
GLV
1330c
1330b
15
Seg 2
8
Seg 1
20
1330a
Seg 0
0
10
20
30
40
50
60
Threshold
-- Product Threshold
-- PD Threshold
PD Broken
PD Bridging
Product DOI
Nuisance
No:Found, Color Variation

1300

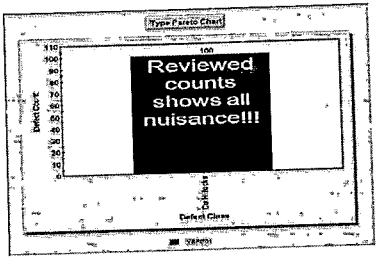
Fig. 13



1410

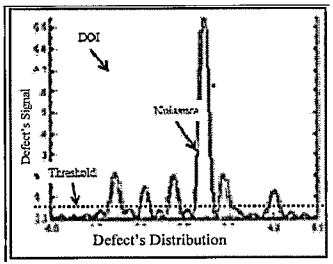


1430

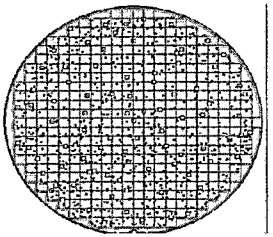


1440

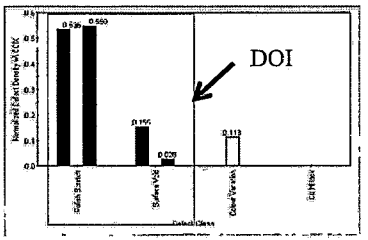
Fig. 14a



1415



1435



1445

1405

Fig. 14b

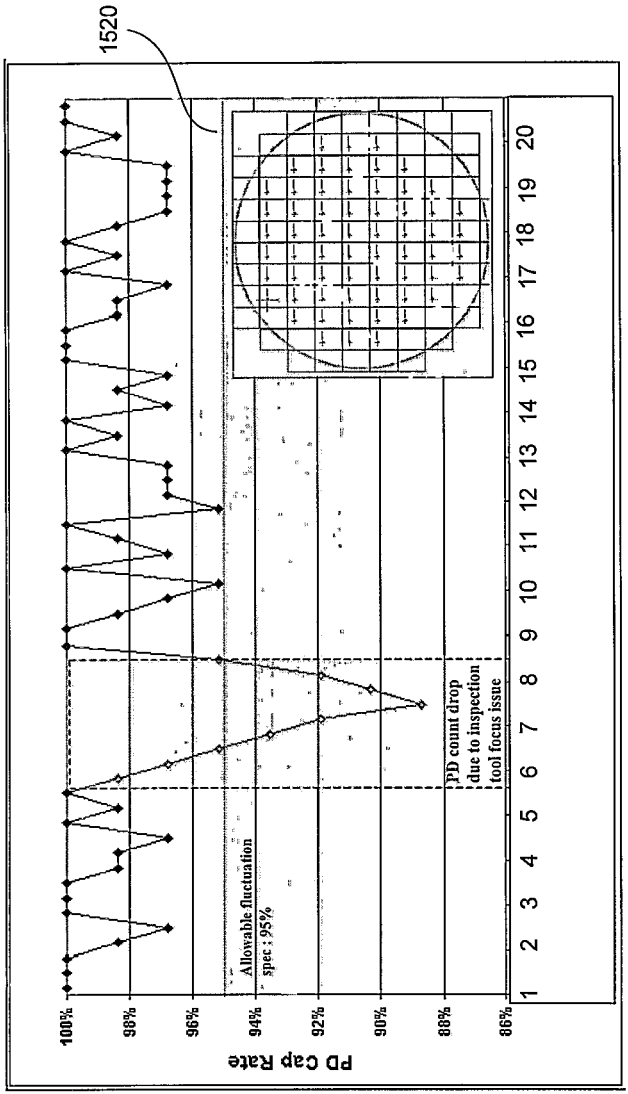

1520
PD Cap Rate
100%
98%
96%
94%
92%
90%
88%
86%
Allowable fluctuation
spec : 95%
PD count drop
due to inspection
tool focus issue
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
1500

Fig. 15

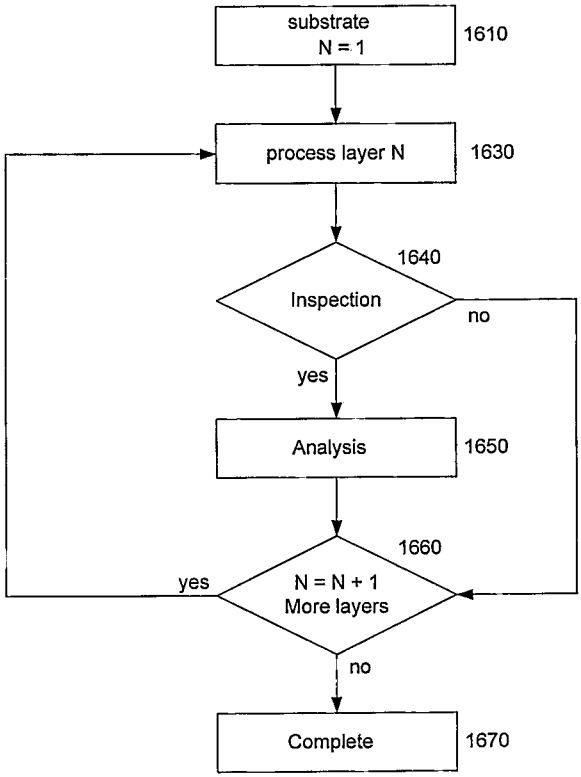

substrate
N = 1
1610
process layer N
1630
1640
Inspection
no
yes
Analysis
1650
1660
yes
N = N + 1
More layers
no
Complete
1670
1600

Fig. 16