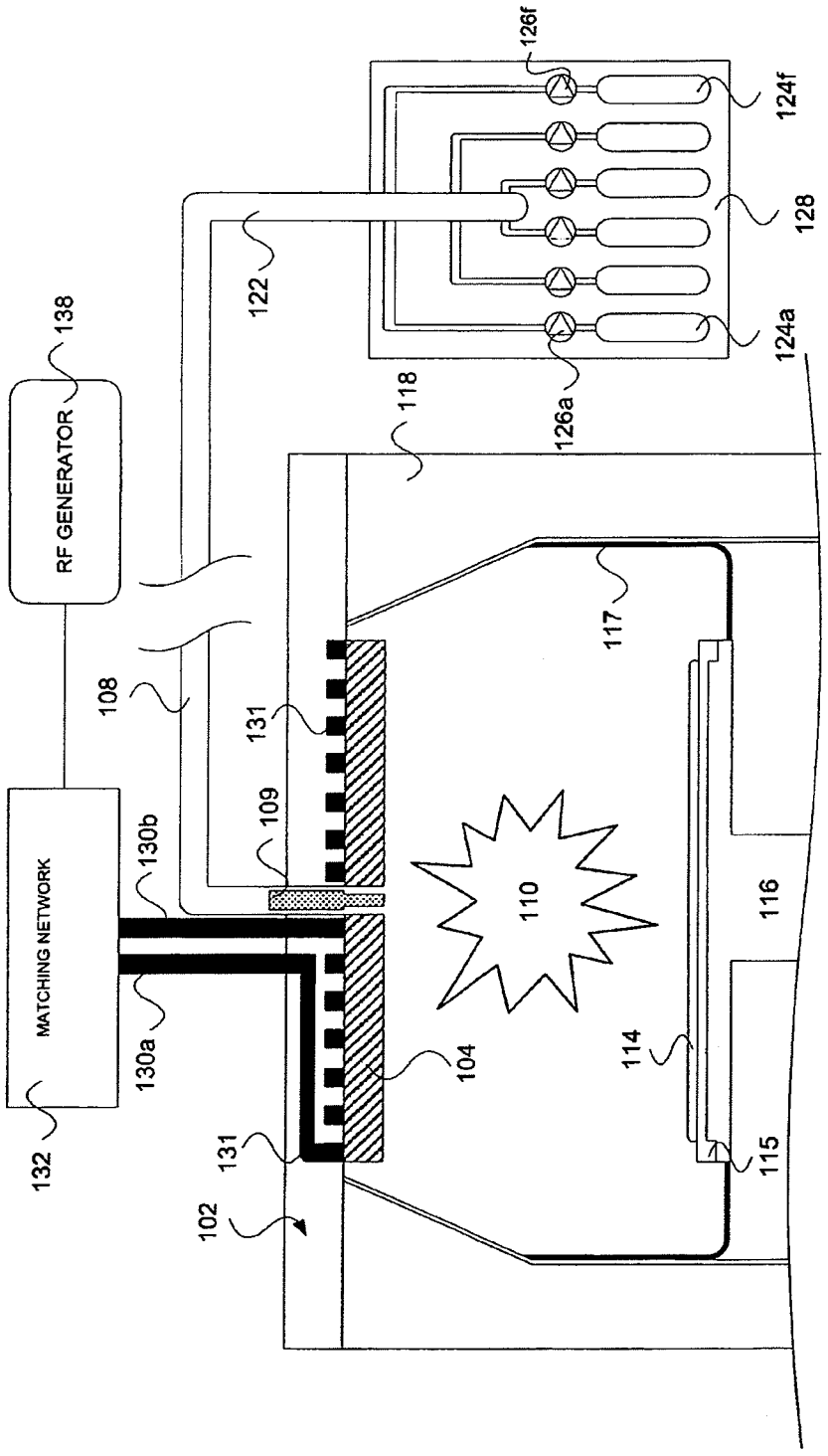

126f
124f
128
122
124a
126a
118
138
RF GENERATOR
MATCHING NETWORK
132
108
131
109
130b
130a
104
110
117
116
114
115
102

FIG. 1

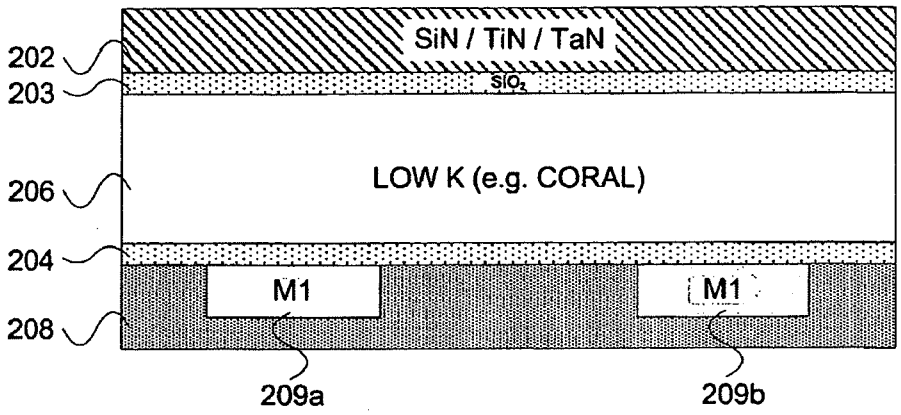

SiN / TiN / TaN
SiO_2
LOW K (e.g. CORAL)
M1
M1
202
203
206
204
208
209a
209b

FIG. 2A

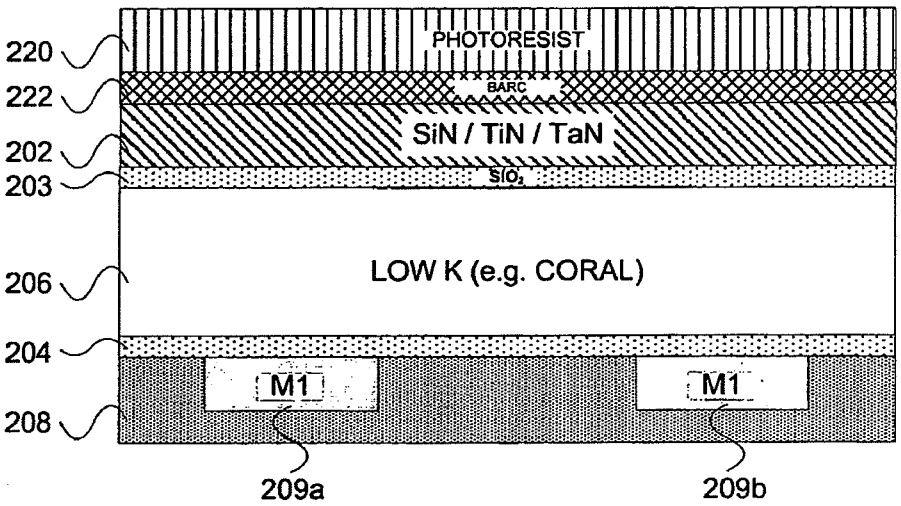

PHOTORESIST
BARC
SiN / TiN / TaN
SiO_2
LOW K (e.g. CORAL)
M1
M1
220
222
202
203
206
204
208
209a
209b

FIG. 2B

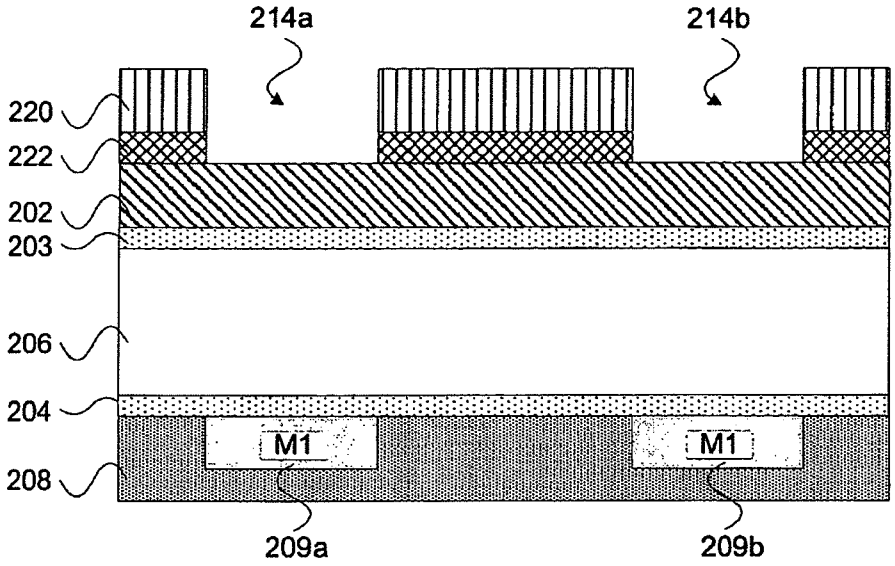

214a
214b
220
222
202
203
206
204
208
M1
M1
209a
209b

FIG. 2C

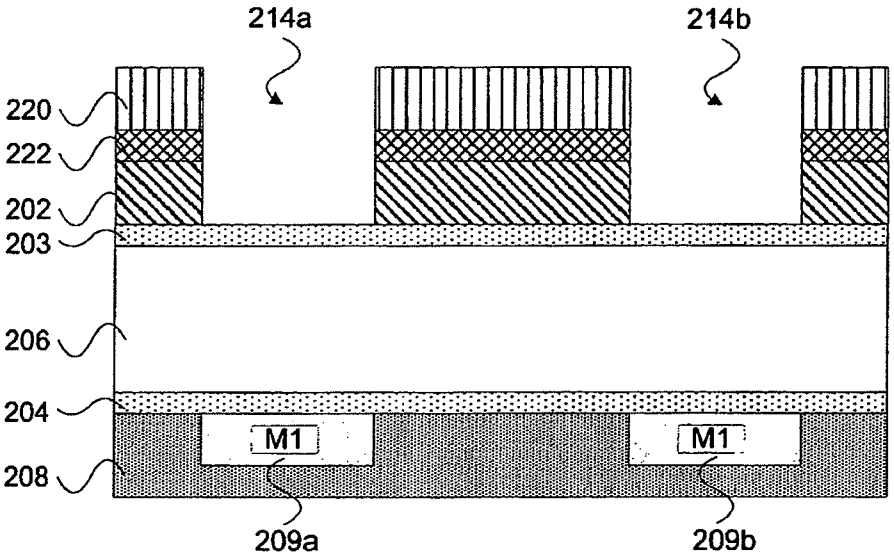

214a
214b
220
222
202
203
206
204
208
M1
M1
209a
209b

FIG. 2D

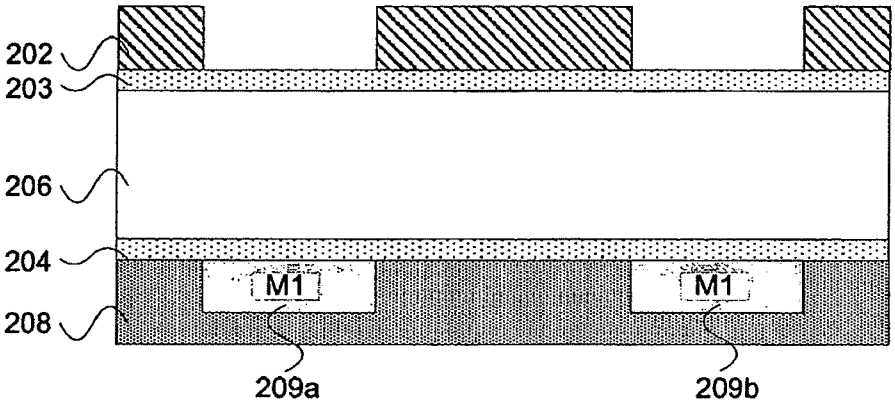

202
203
206
204
208
M1
M1
209a
209b

FIG. 2E

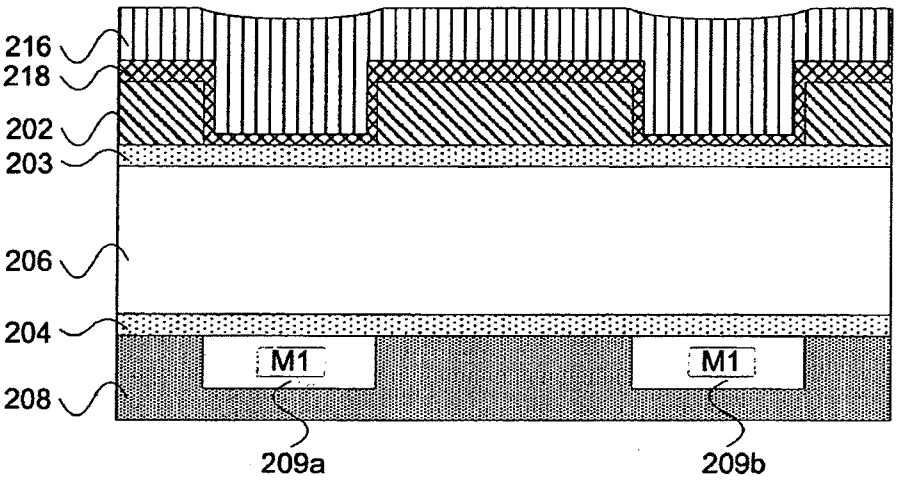

216
218
202
203
206
204
208
M1
M1
209a
209b

FIG. 2F

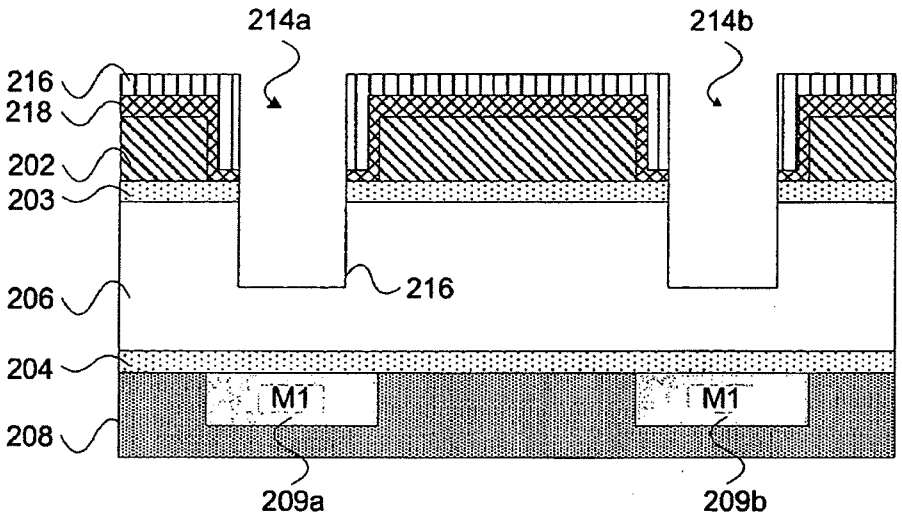

214a
214b
216
218
202
203
206
216
204
M1
M1
208
209a
209b

FIG. 2G

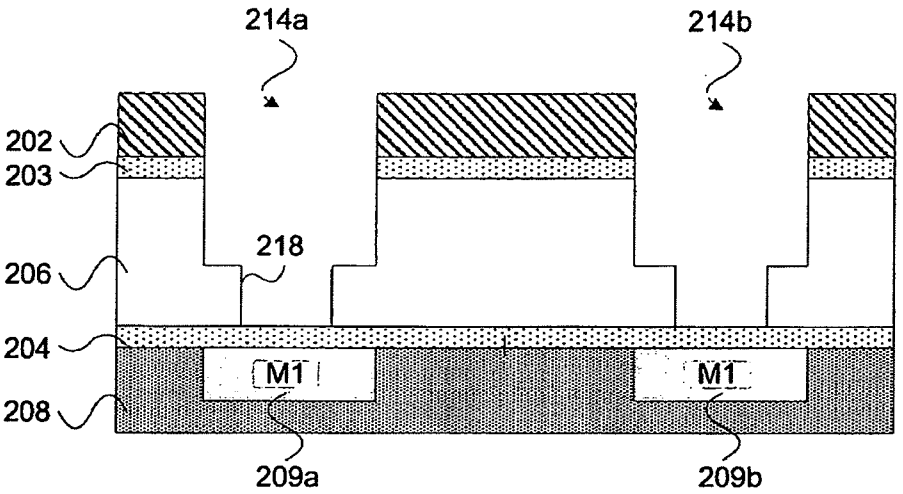

214a
214b
202
203
218
206
204
M1
M1
208
209a
209b

FIG. 2H

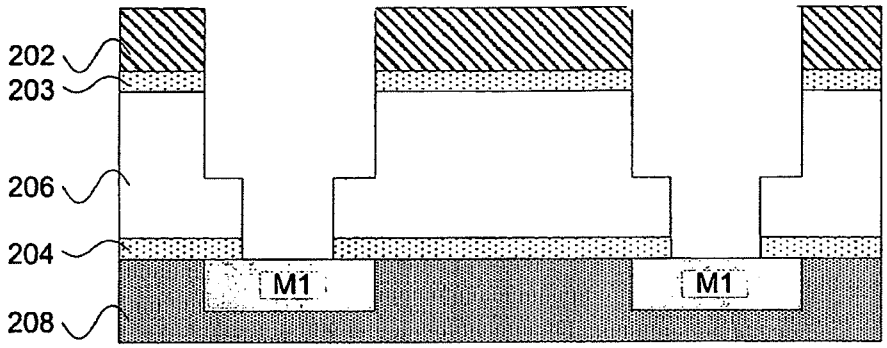


FIG. 2I

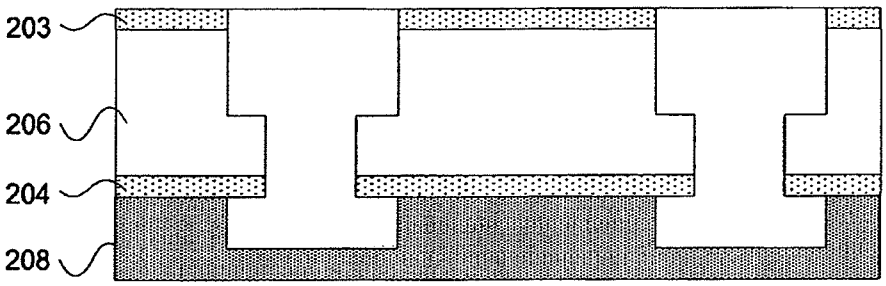


FIG. 2J

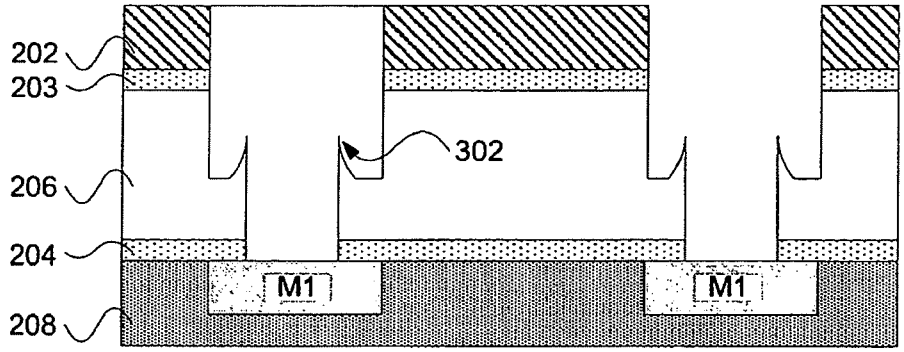


FIG. 3A

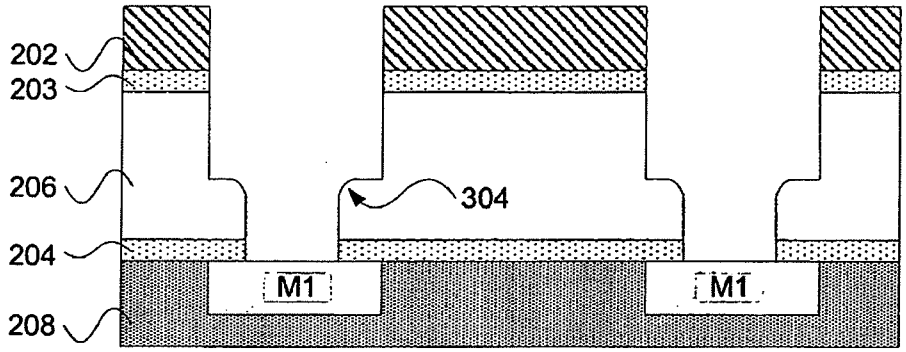


FIG. 3B

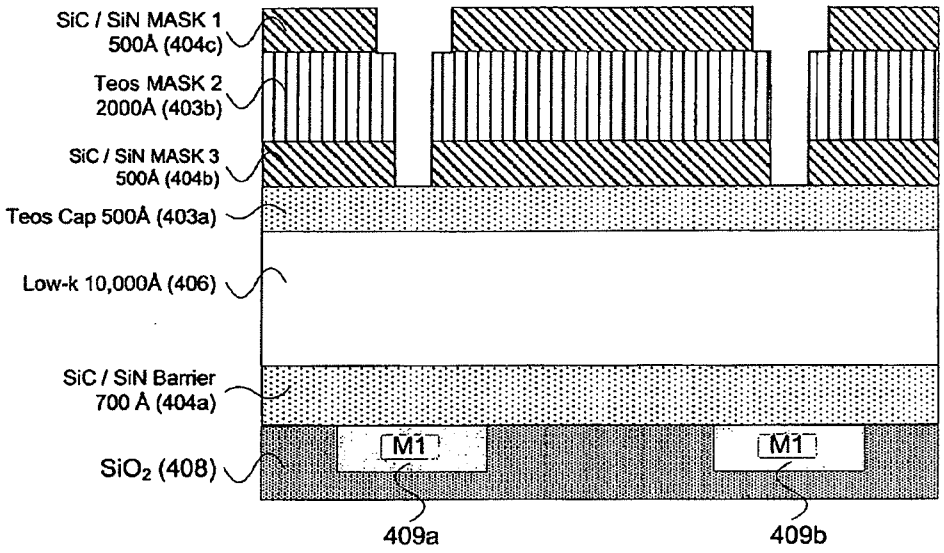

SiC / SiN MASK 1
500Å (404c)
Teos MASK 2
2000Å (403b)
SiC / SiN MASK 3
500Å (404b)
Teos Cap 500Å (403a)
Low-k 10,000Å (406)
SiC / SiN Barrier
700 Å (404a)
SiO2 (408)
M1
M1
409a
409b

FIG. 4A

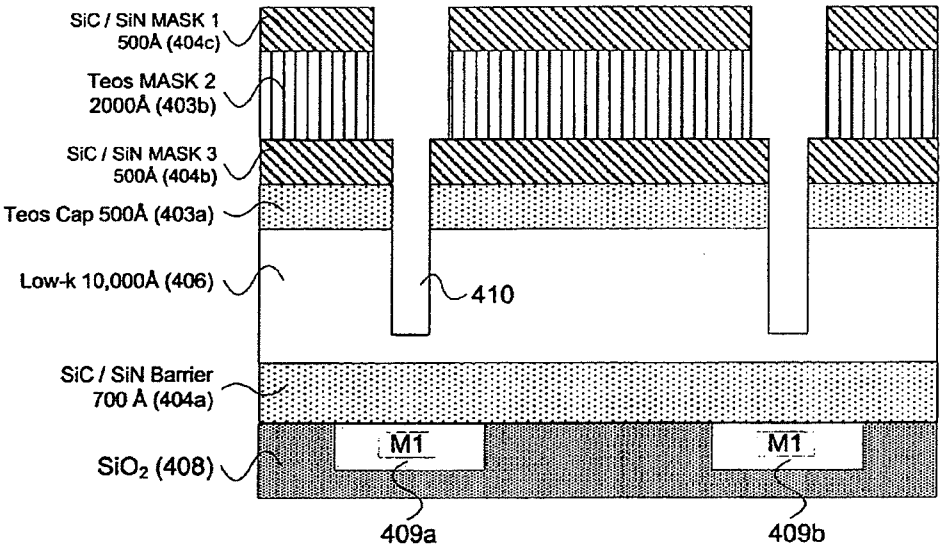

SiC / SiN MASK 1
500Å (404c)
Teos MASK 2
2000Å (403b)
SiC / SiN MASK 3
500Å (404b)
Teos Cap 500Å (403a)
Low-k 10,000Å (406)
410
SiC / SiN Barrier
700 Å (404a)
SiO2 (408)
M1
M1
409a
409b

FIG. 4B

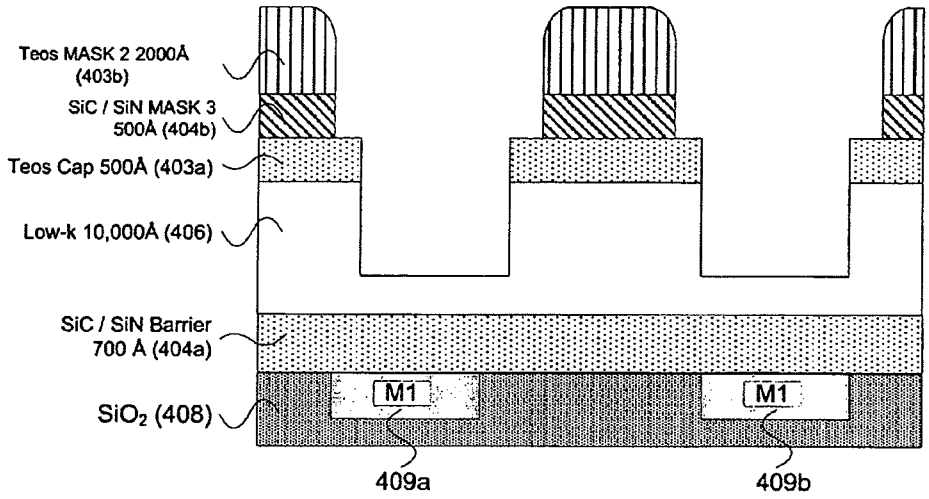

Teos MASK 2 2000Å
(403b)
SiC / SiN MASK 3
500Å (404b)
Teos Cap 500Å (403a)
Low-k 10,000Å (406)
SiC / SiN Barrier
700 Å (404a)
SiO2 (408)
M1
M1
409a
409b

FIG. 4C

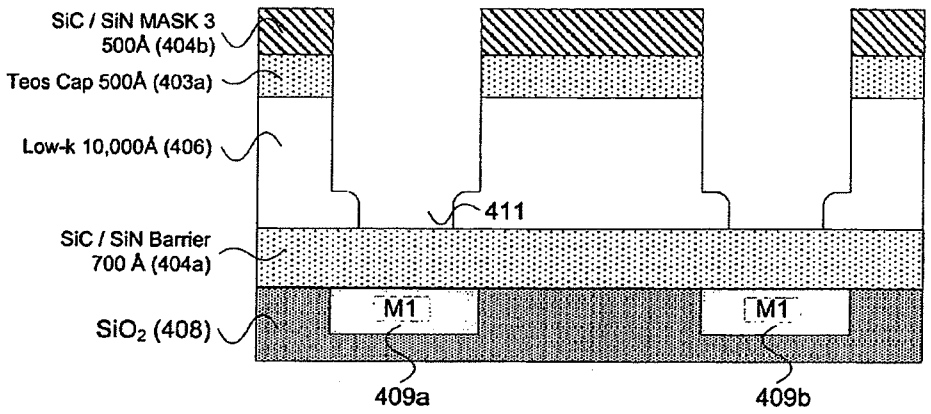

SiC / SiN MASK 3
500Å (404b)
Teos Cap 500Å (403a)
Low-k 10,000Å (406)
411
SiC / SiN Barrier
700 Å (404a)
SiO2 (408)
M1
M1
409a
409b

FIG. 4D

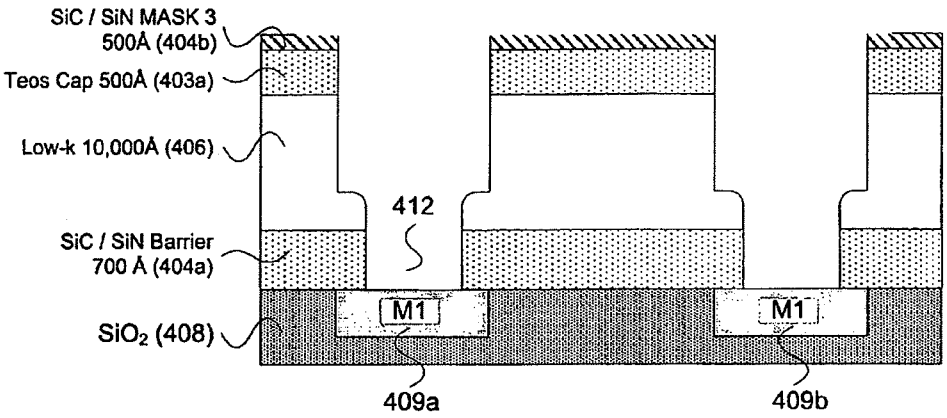

SiC / SiN MASK 3
500Å (404b)
Teos Cap 500Å (403a)
Low-k 10,000Å (406)
412
SiC / SiN Barrier
700 Å (404a)
SiO2 (408)
M1
M1
409a
409b

FIG. 4E

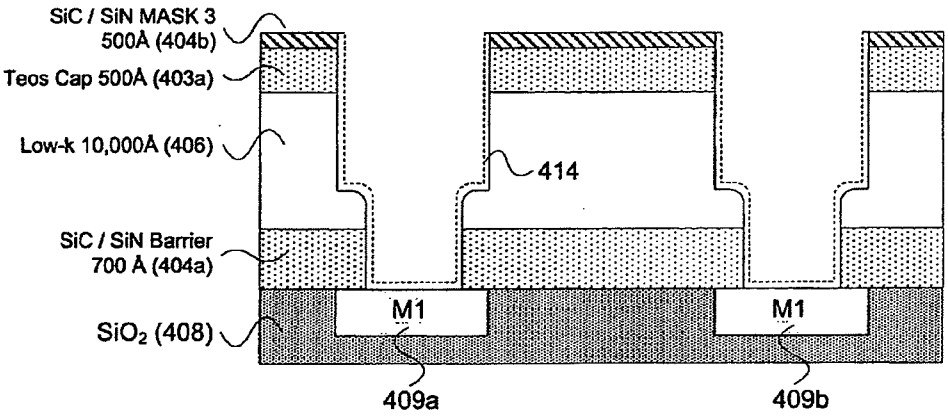

SiC / SiN MASK 3
500Å (404b)
Teos Cap 500Å (403a)
Low-k 10,000Å (406)
414
SiC / SiN Barrier
700 Å (404a)
SiO2 (408)
M1
M1
409a
409b

FIG. 4F

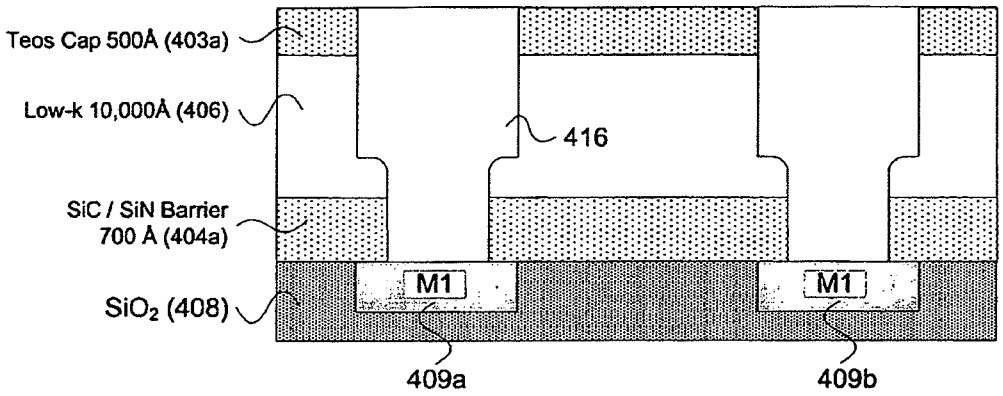

Teos Cap 500Å (403a)
Low-k 10,000Å (406)
SiC / SiN Barrier
700 Å (404a)
SiO2 (408)
416
M1
M1
409a
409b

FIG. 4G

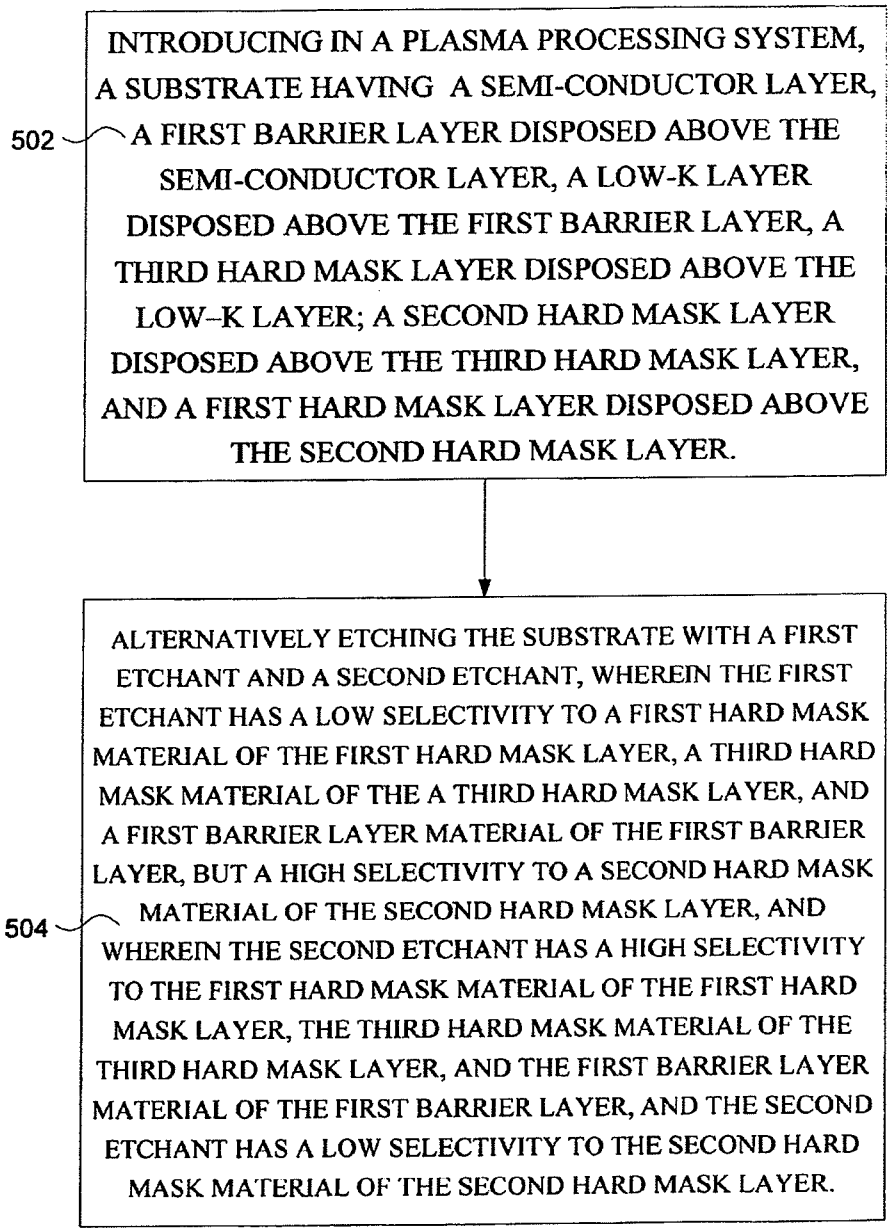

INTRODUCING IN A PLASMA PROCESSING SYSTEM, A SUBSTRATE HAVING A SEMI-CONDUCTOR LAYER, A FIRST BARRIER LAYER DISPOSED ABOVE THE SEMI-CONDUCTOR LAYER, A LOW-K LAYER DISPOSED ABOVE THE FIRST BARRIER LAYER, A THIRD HARD MASK LAYER DISPOSED ABOVE THE LOW-K LAYER; A SECOND HARD MASK LAYER DISPOSED ABOVE THE THIRD HARD MASK LAYER, AND A FIRST HARD MASK LAYER DISPOSED ABOVE THE SECOND HARD MASK LAYER.
502
ALTERNATIVELY ETCHING THE SUBSTRATE WITH A FIRST ETCHANT AND A SECOND ETCHANT, WHEREIN THE FIRST ETCHANT HAS A LOW SELECTIVITY TO A FIRST HARD MASK MATERIAL OF THE FIRST HARD MASK LAYER, A THIRD HARD MASK MATERIAL OF THE A THIRD HARD MASK LAYER, AND A FIRST BARRIER LAYER MATERIAL OF THE FIRST BARRIER LAYER, BUT A HIGH SELECTIVITY TO A SECOND HARD MASK MATERIAL OF THE SECOND HARD MASK LAYER, AND WHEREIN THE SECOND ETCHANT HAS A HIGH SELECTIVITY TO THE FIRST HARD MASK MATERIAL OF THE FIRST HARD MASK LAYER, THE THIRD HARD MASK MATERIAL OF THE THIRD HARD MASK LAYER, AND THE FIRST BARRIER LAYER MATERIAL OF THE FIRST BARRIER LAYER, AND THE SECOND ETCHANT HAS A LOW SELECTIVITY TO THE SECOND HARD MASK MATERIAL OF THE SECOND HARD MASK LAYER.
504

FIG. 5A

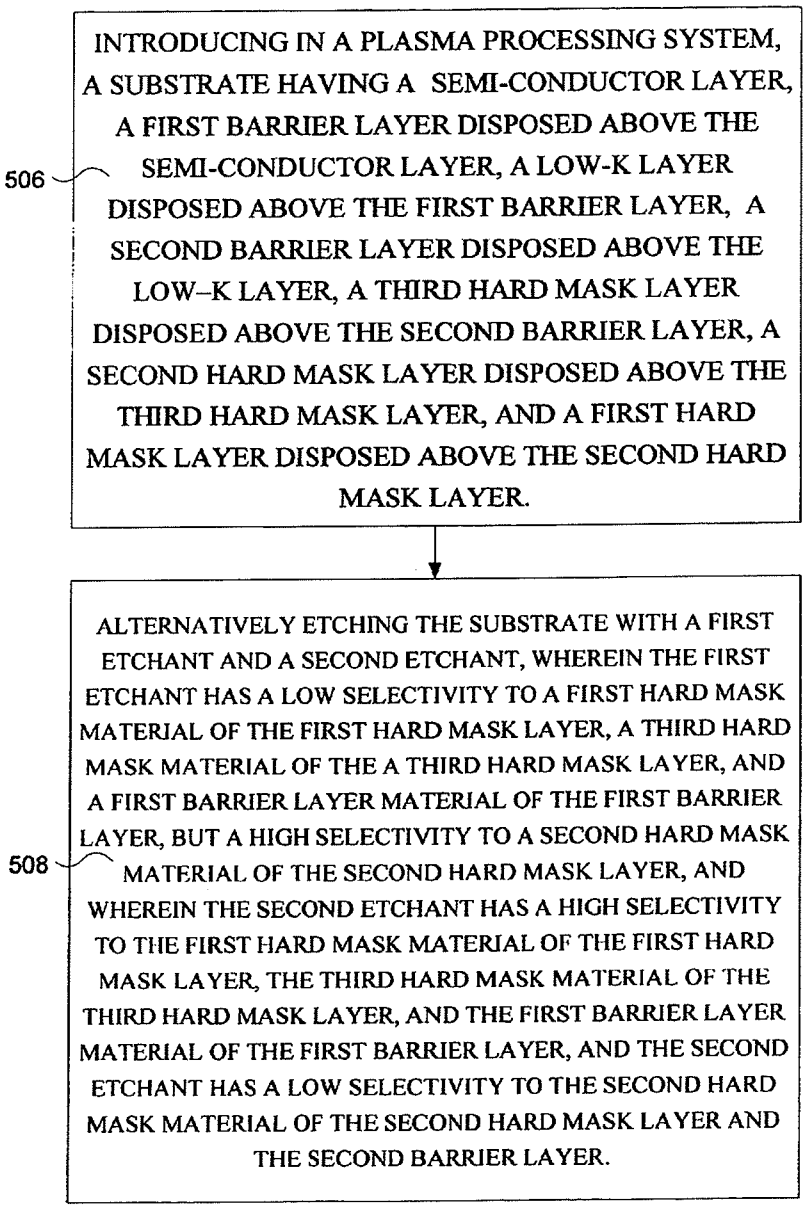

INTRODUCING IN A PLASMA PROCESSING SYSTEM, A SUBSTRATE HAVING A SEMI-CONDUCTOR LAYER, A FIRST BARRIER LAYER DISPOSED ABOVE THE SEMI-CONDUCTOR LAYER, A LOW-K LAYER DISPOSED ABOVE THE FIRST BARRIER LAYER, A SECOND BARRIER LAYER DISPOSED ABOVE THE LOW–K LAYER, A THIRD HARD MASK LAYER DISPOSED ABOVE THE SECOND BARRIER LAYER, A SECOND HARD MASK LAYER DISPOSED ABOVE THE THIRD HARD MASK LAYER, AND A FIRST HARD MASK LAYER DISPOSED ABOVE THE SECOND HARD MASK LAYER.
506
ALTERNATIVELY ETCHING THE SUBSTRATE WITH A FIRST ETCHANT AND A SECOND ETCHANT, WHEREIN THE FIRST ETCHANT HAS A LOW SELECTIVITY TO A FIRST HARD MASK MATERIAL OF THE FIRST HARD MASK LAYER, A THIRD HARD MASK MATERIAL OF THE A THIRD HARD MASK LAYER, AND A FIRST BARRIER LAYER MATERIAL OF THE FIRST BARRIER LAYER, BUT A HIGH SELECTIVITY TO A SECOND HARD MASK MATERIAL OF THE SECOND HARD MASK LAYER, AND WHEREIN THE SECOND ETCHANT HAS A HIGH SELECTIVITY TO THE FIRST HARD MASK MATERIAL OF THE FIRST HARD MASK LAYER, THE THIRD HARD MASK MATERIAL OF THE THIRD HARD MASK LAYER, AND THE FIRST BARRIER LAYER MATERIAL OF THE FIRST BARRIER LAYER, AND THE SECOND ETCHANT HAS A LOW SELECTIVITY TO THE SECOND HARD MASK MATERIAL OF THE SECOND HARD MASK LAYER AND THE SECOND BARRIER LAYER.
508

FIG. 5B