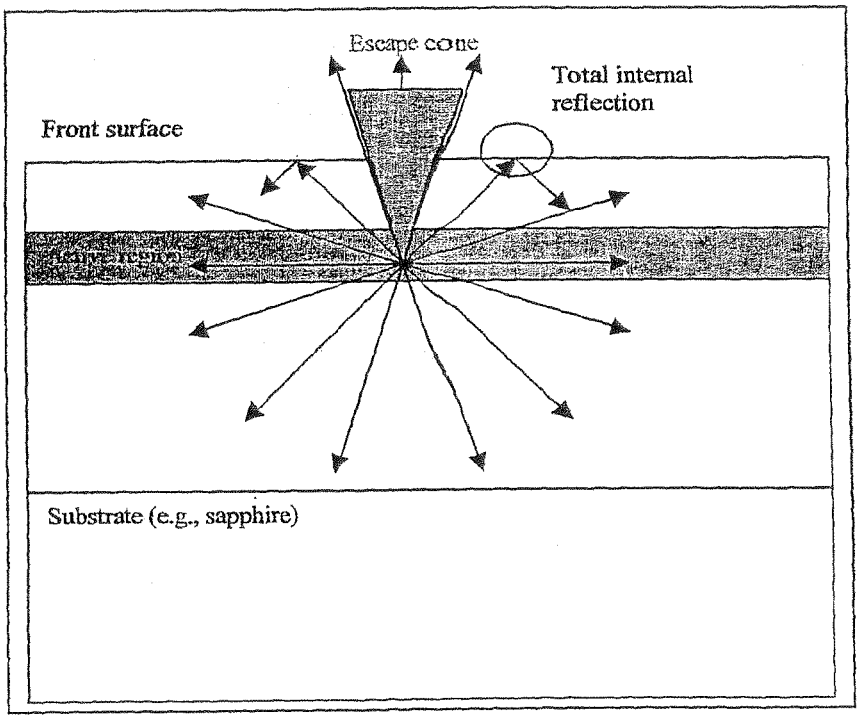

Escape cone
Total internal reflection
Front surface
Substrate (e.g., sapphire)

Figure 1

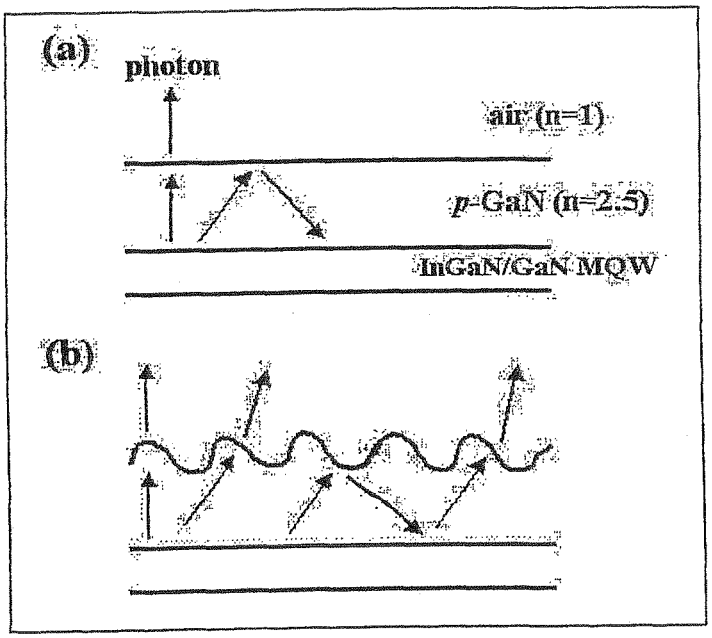


Figure 2

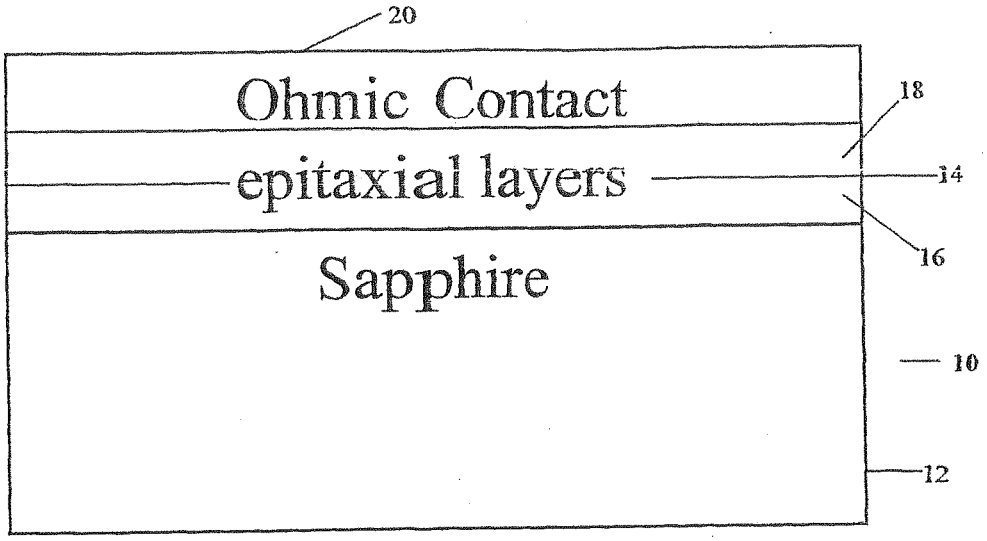


Figure 3

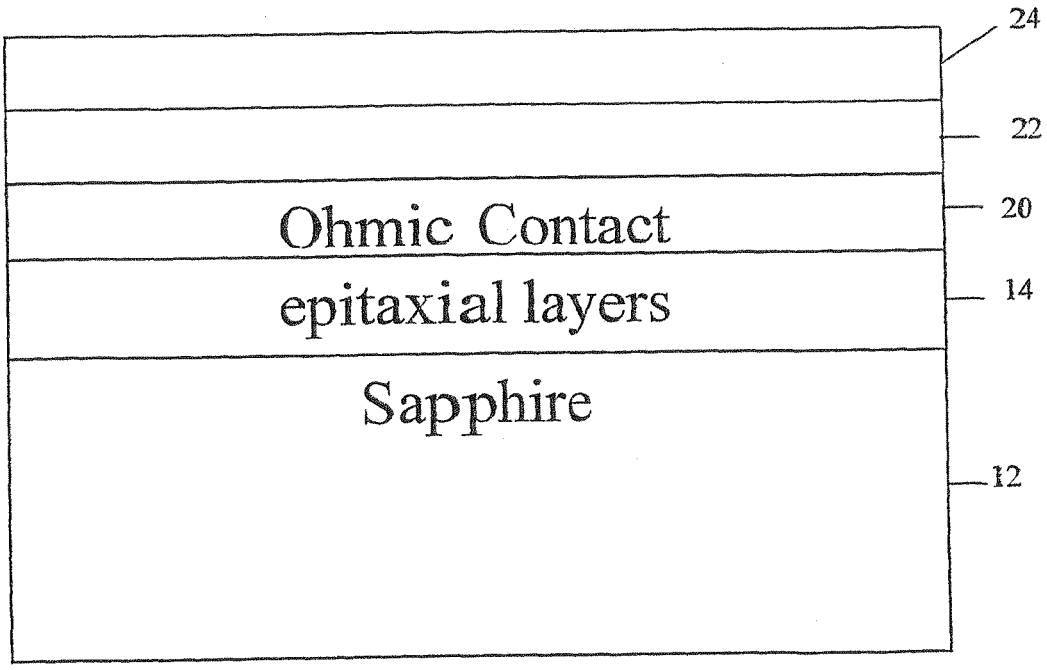


Figure 4

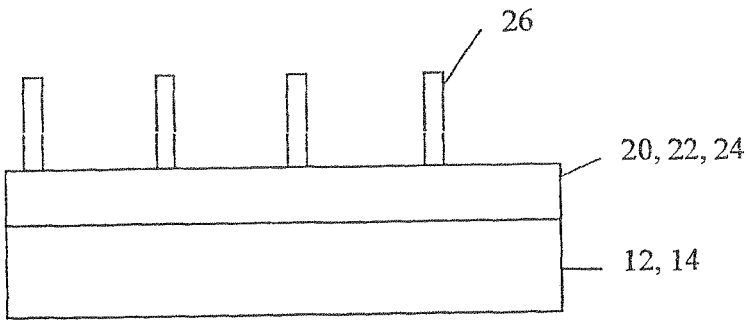


Figure 5

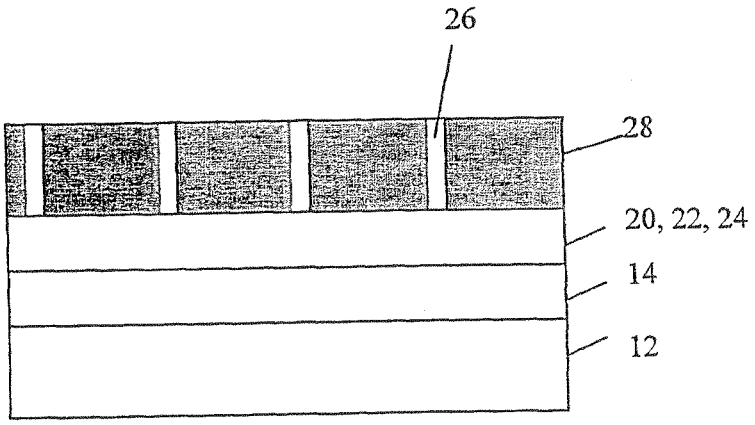


Figure 6

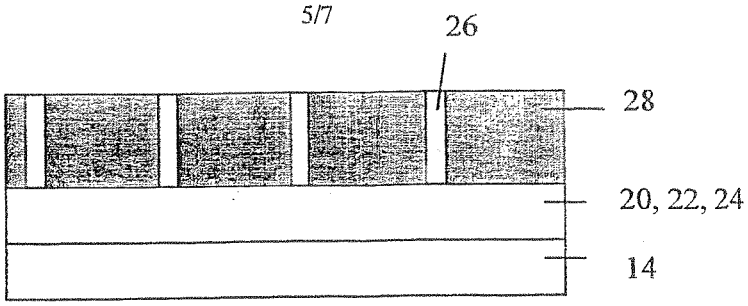


Figure 7

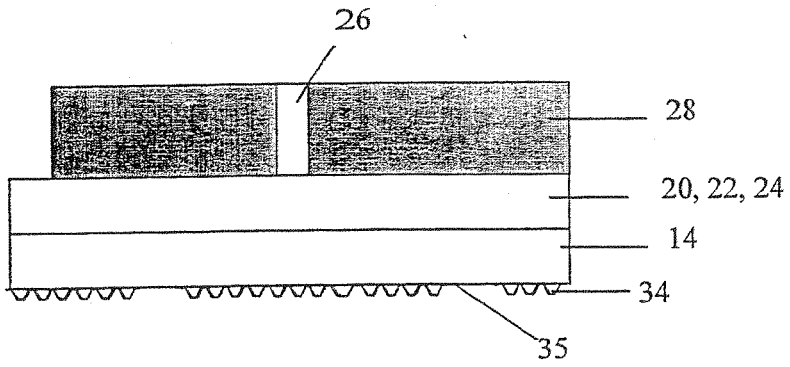


Figure 8

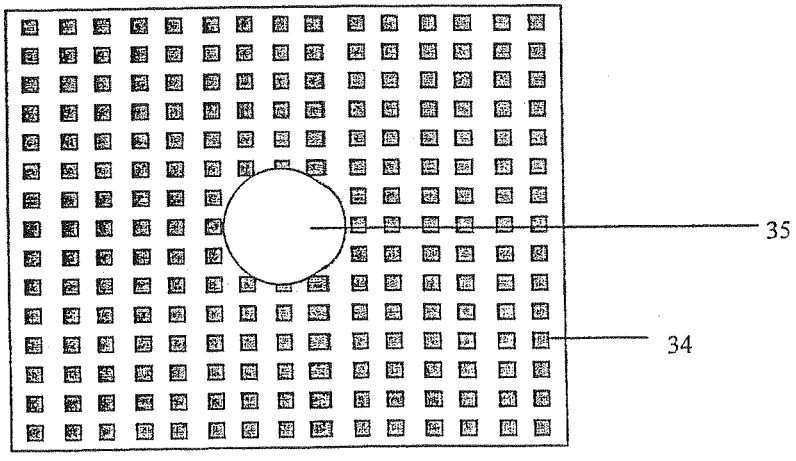


Figure 9

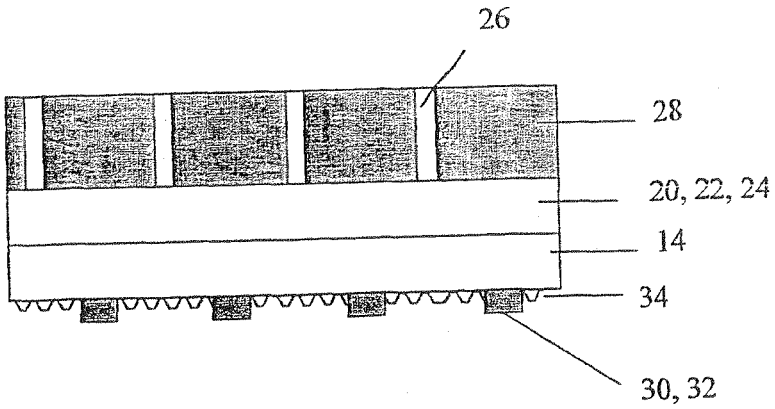


Figure 10

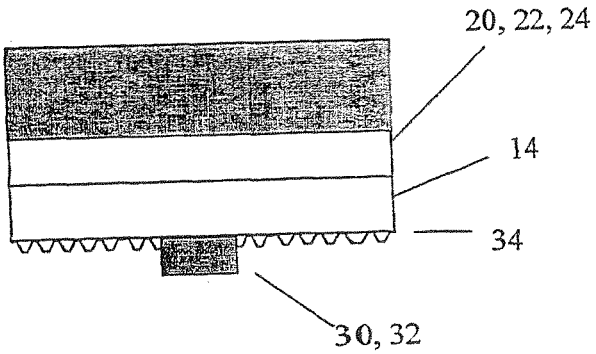


Figure 11

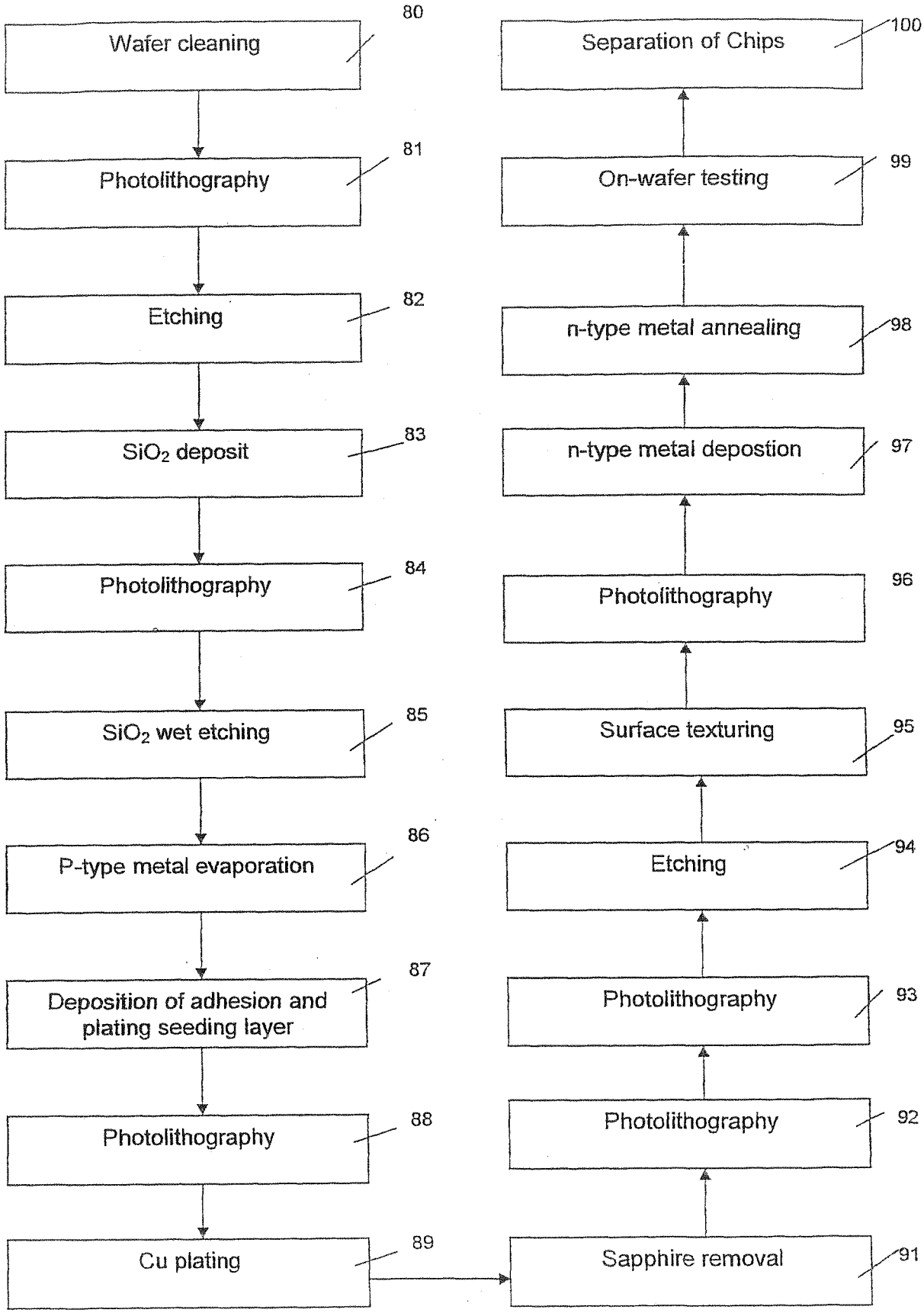

Wafer cleaning
80
Photolithography
81
Etching
82
SiO_2 deposit
83
Photolithography
84
SiO_2 wet etching
85
P-type metal evaporation
86
Deposition of adhesion and plating seeding layer
87
Photolithography
88
Cu plating
89
Sapphire removal
91
Photolithography
92
Photolithography
93
Etching
94
Surface texturing
95
Photolithography
96
n-type metal depostion
97
n-type metal annealing
98
On-wafer testing
99
Separation of Chips
100

Figure 12