

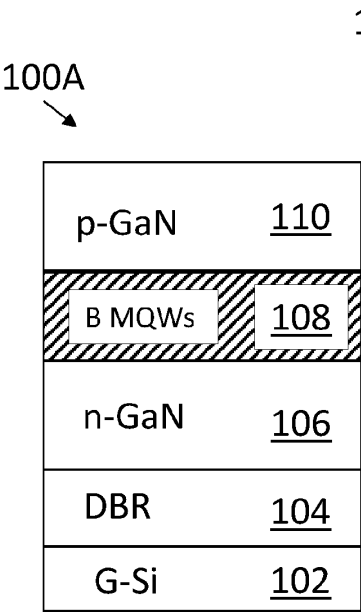


Figure 1A

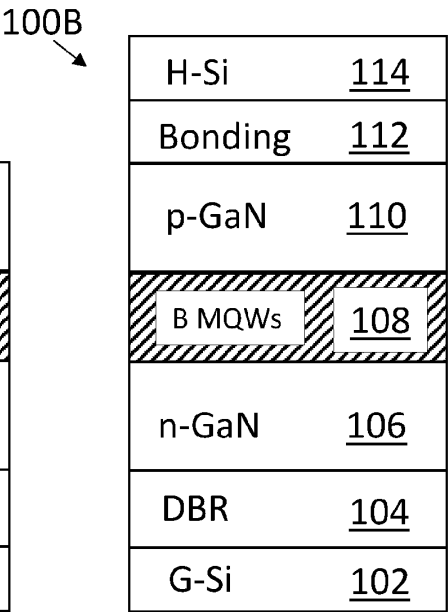


Figure 1B

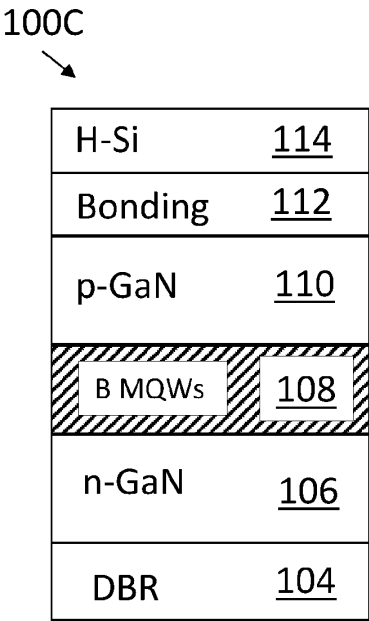


Figure 1C

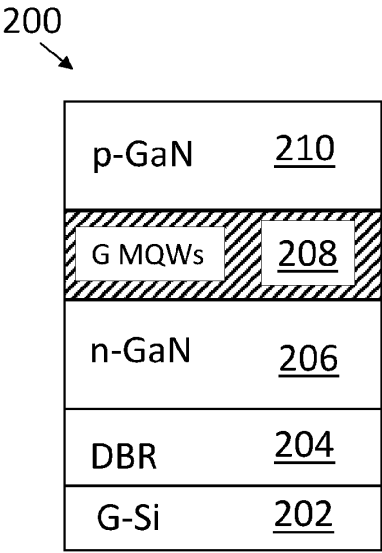


Figure 1D

300A

|         |            |
|---------|------------|
| H-Si    | <u>114</u> |
| Bonding | <u>112</u> |
| p-GaN   | <u>110</u> |
| B MQWs  | <u>108</u> |
| n-GaN   | <u>106</u> |
| DBR     | <u>104</u> |
| Bonding | <u>304</u> |
| ITO     | <u>302</u> |
| p-GaN   | <u>210</u> |
| G MQWs  | <u>208</u> |
| n-GaN   | <u>206</u> |
| DBR     | <u>204</u> |
| G-Si    | <u>202</u> |

Figure 1E

300B

|         |            |
|---------|------------|
| p-GaN   | <u>110</u> |
| B MQWs  | <u>108</u> |
| n-GaN   | <u>106</u> |
| DBR     | <u>104</u> |
| Bonding | <u>304</u> |
| ITO     | <u>302</u> |
| p-GaN   | <u>210</u> |
| G MQWs  | <u>208</u> |
| n-GaN   | <u>206</u> |
| DBR     | <u>204</u> |
| G-Si    | <u>202</u> |

Figure 1F

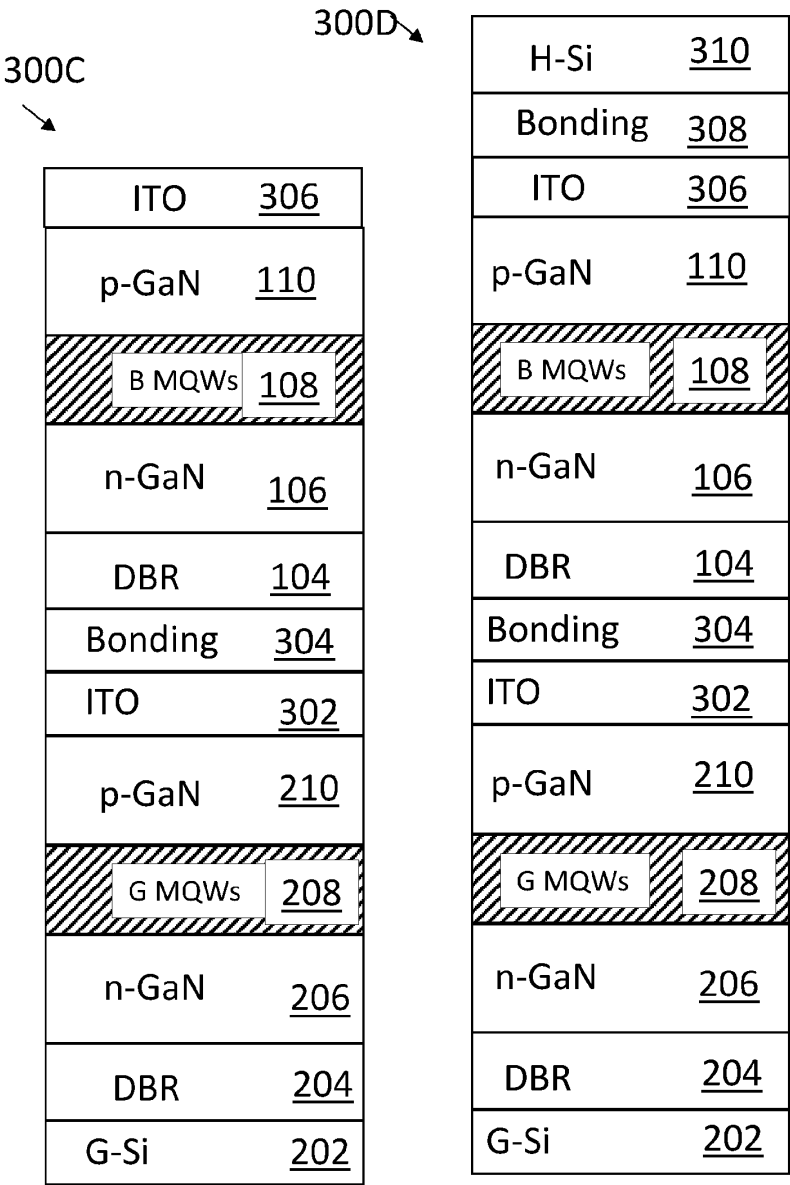
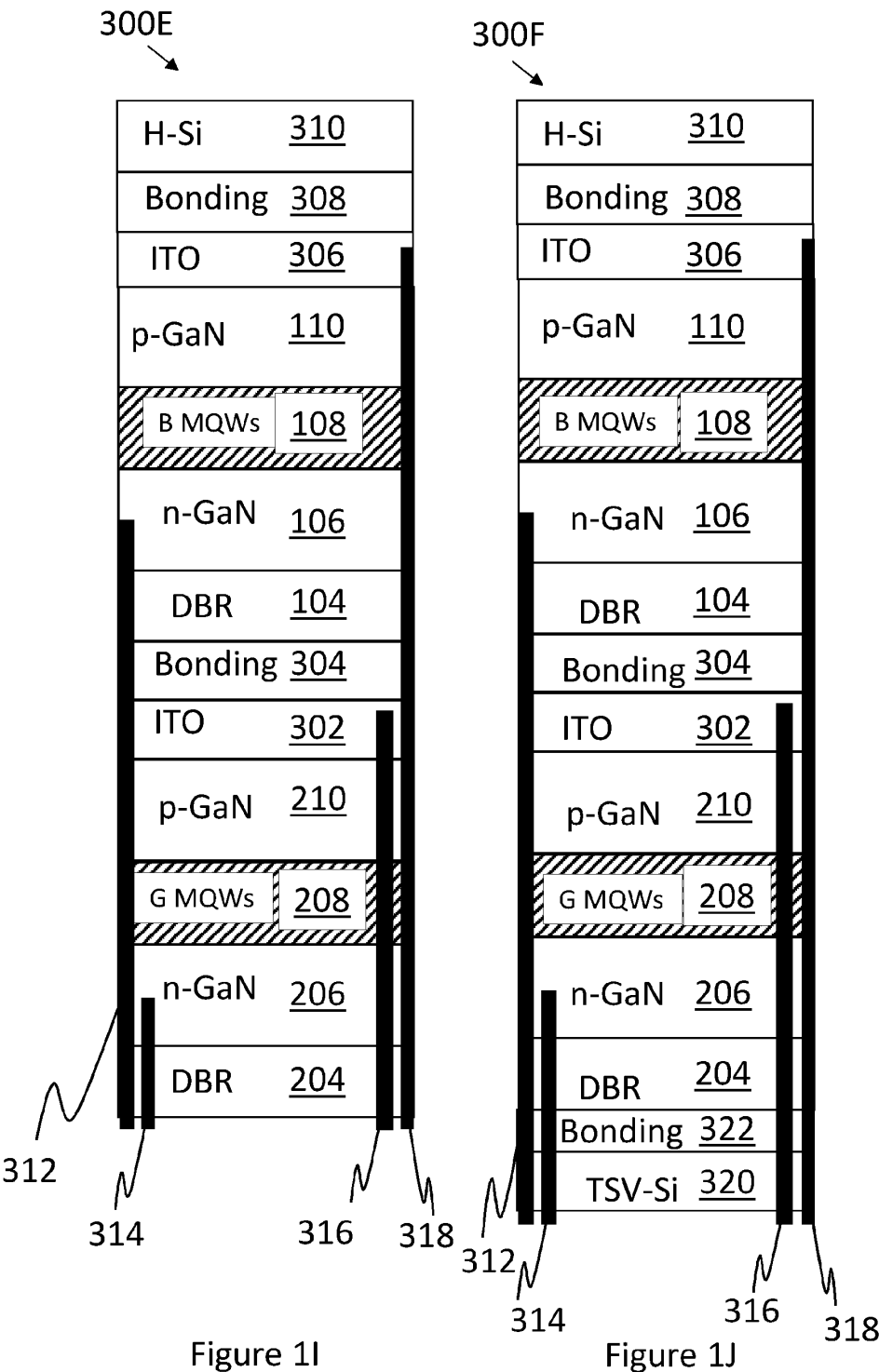
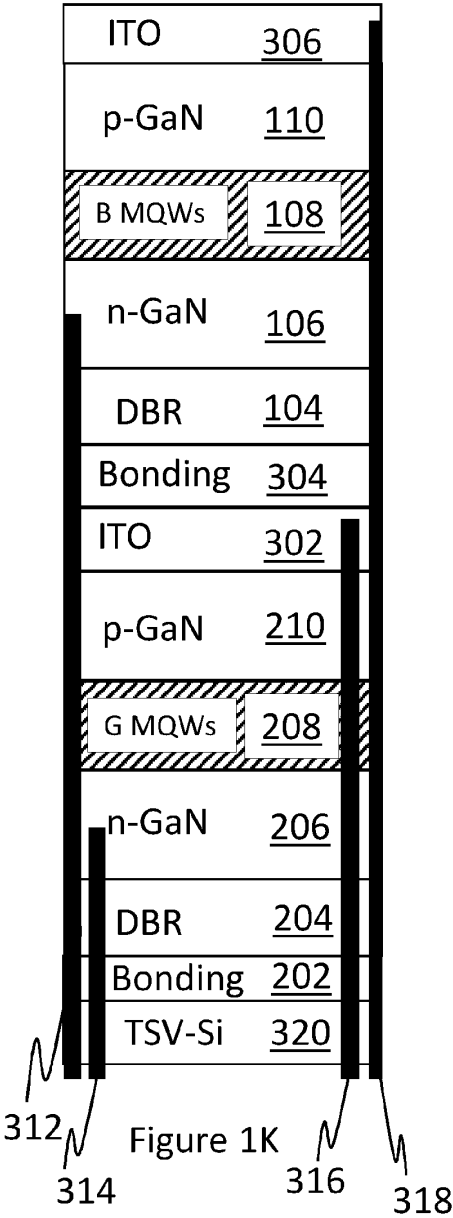


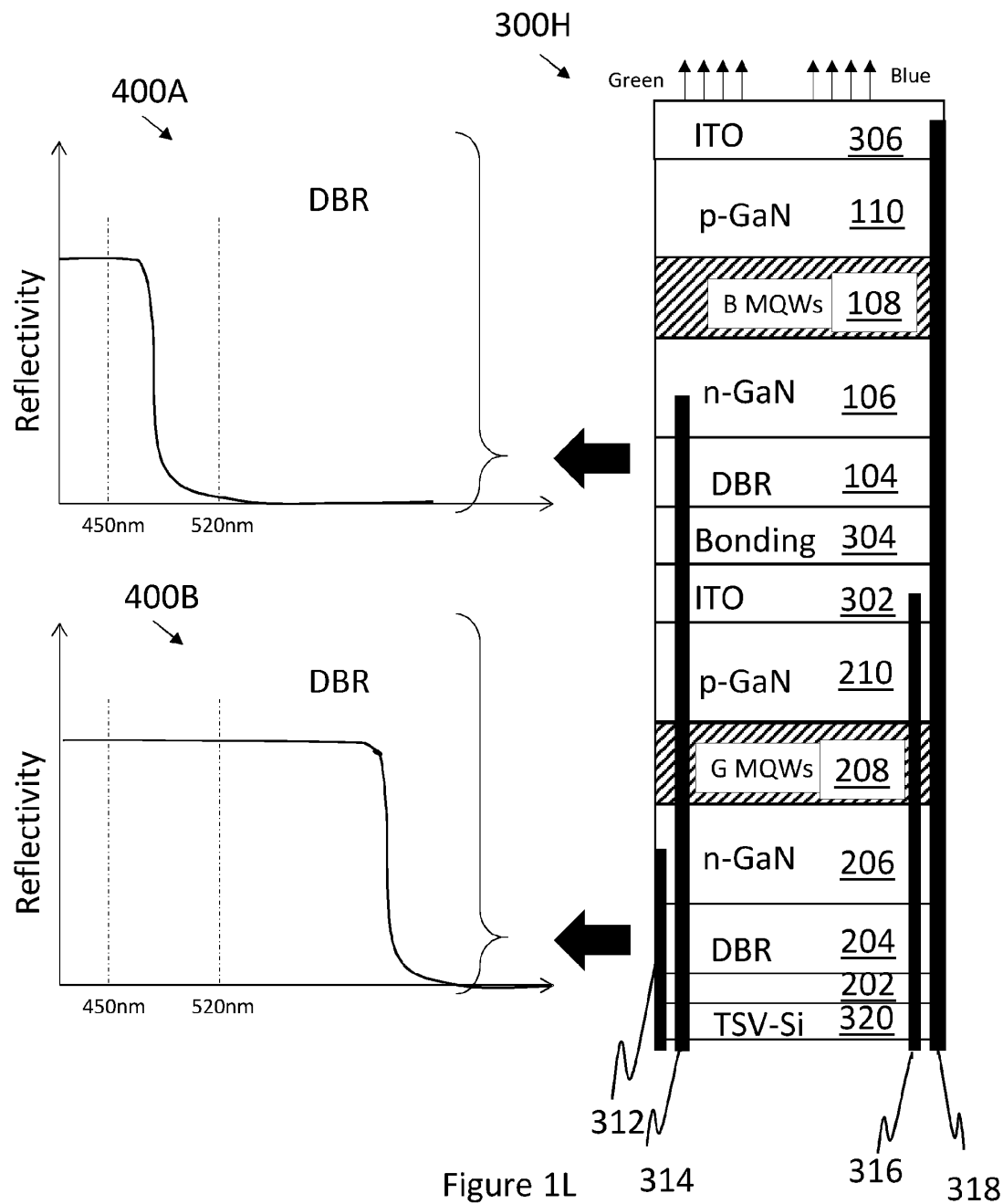
Figure 1G

Figure 1H



300G





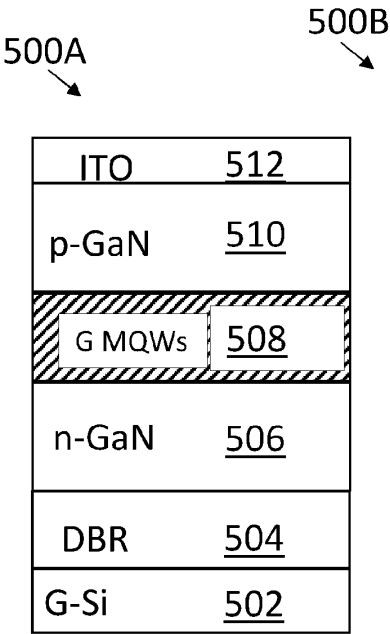


Figure 2A

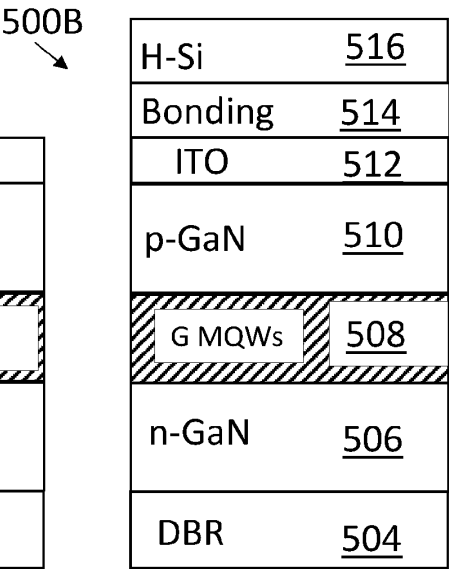


Figure 2B

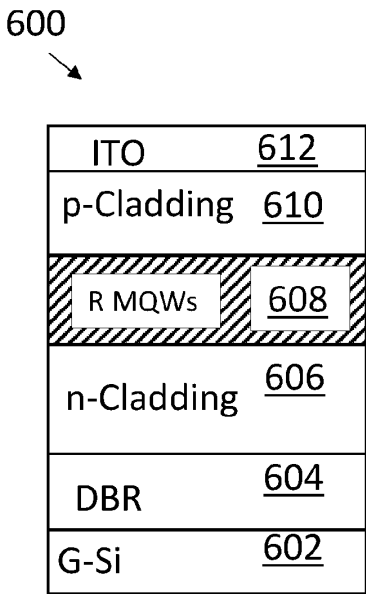


Figure 2C

700A

|            |            |
|------------|------------|
| H-Si       | <u>516</u> |
| Bonding    | <u>514</u> |
| ITO        | <u>512</u> |
| p-GaN      | <u>510</u> |
| G MQWs     | <u>508</u> |
| n-GaN      | <u>506</u> |
| DBR        | <u>504</u> |
| Bonding    | <u>702</u> |
| ITO        | <u>612</u> |
| p-Cladding | <u>610</u> |
| R MQWs     | <u>608</u> |
| n-Cladding | <u>606</u> |
| DBR        | <u>604</u> |
| G-Si       | <u>602</u> |

Figure 2D

700B

|            |            |
|------------|------------|
| ITO        | <u>512</u> |
| p-GaN      | <u>510</u> |
| G MQWs     | <u>508</u> |
| n-GaN      | <u>506</u> |
| DBR        | <u>504</u> |
| Bonding    | <u>702</u> |
| ITO        | <u>612</u> |
| p-Cladding | <u>610</u> |
| R MQWs     | <u>608</u> |
| n-Cladding | <u>606</u> |
| DBR        | <u>604</u> |
| G-Si       | <u>602</u> |

Figure 2E

800

|         |            |
|---------|------------|
| H-Si    | <u>814</u> |
| Bonding | <u>812</u> |
| p-GaN   | <u>810</u> |
| B MQWs  | <u>808</u> |
| n-GaN   | <u>806</u> |
| DBR     | <u>804</u> |
| G-Si    | <u>802</u> |

Figure 2F

700C

|            |            |
|------------|------------|
| H-Si       | <u>814</u> |
| Bonding    | <u>812</u> |
| p-GaN      | <u>810</u> |
| B MQWs     | <u>808</u> |
| n-GaN      | <u>806</u> |
| DBR        | <u>804</u> |
| Bonding    | <u>704</u> |
| ITO        | <u>512</u> |
| p-GaN      | <u>510</u> |
| G MQWs     | <u>508</u> |
| n-GaN      | <u>506</u> |
| DBR        | <u>504</u> |
| Bonding    | <u>702</u> |
| ITO        | <u>612</u> |
| p-Cladding | <u>610</u> |
| R MQWs     | <u>608</u> |
| n-Cladding | <u>606</u> |
| DBR        | <u>604</u> |
| G-Si       | <u>602</u> |

Figure 2G

700D

|            |            |
|------------|------------|
| ITO        | <u>706</u> |
| p-GaN      | <u>810</u> |
| B MQWs     | <u>808</u> |
| n-GaN      | <u>806</u> |
| DBR        | <u>804</u> |
| Bonding    | <u>704</u> |
| ITO        | <u>512</u> |
| p-GaN      | <u>510</u> |
| G MQWs     | <u>508</u> |
| n-GaN      | <u>506</u> |
| DBR        | <u>504</u> |
| Bonding    | <u>702</u> |
| ITO        | <u>612</u> |
| p-Cladding | <u>610</u> |
| R MQWs     | <u>608</u> |
| n-Cladding | <u>606</u> |
| DBR        | <u>604</u> |
| G-Si       | <u>602</u> |

Figure 2H

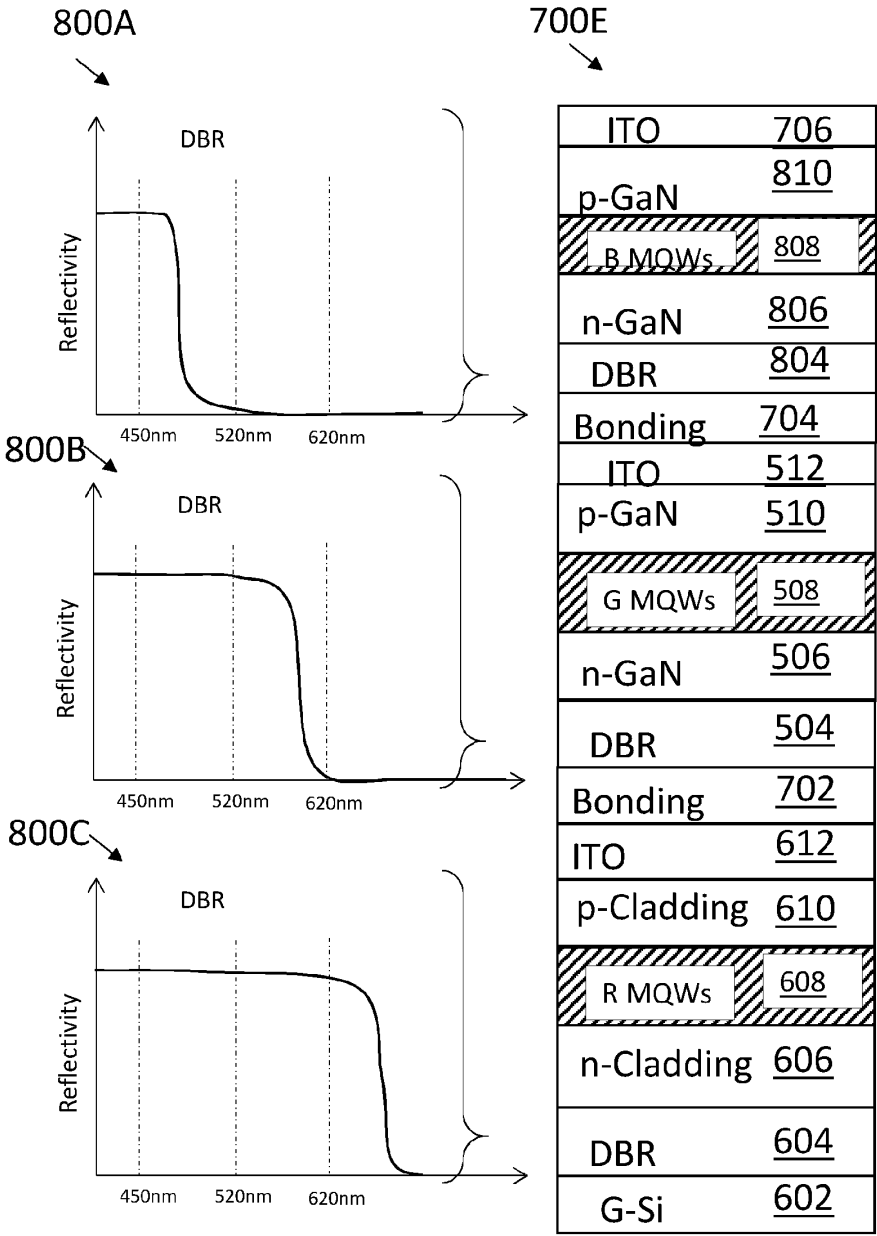
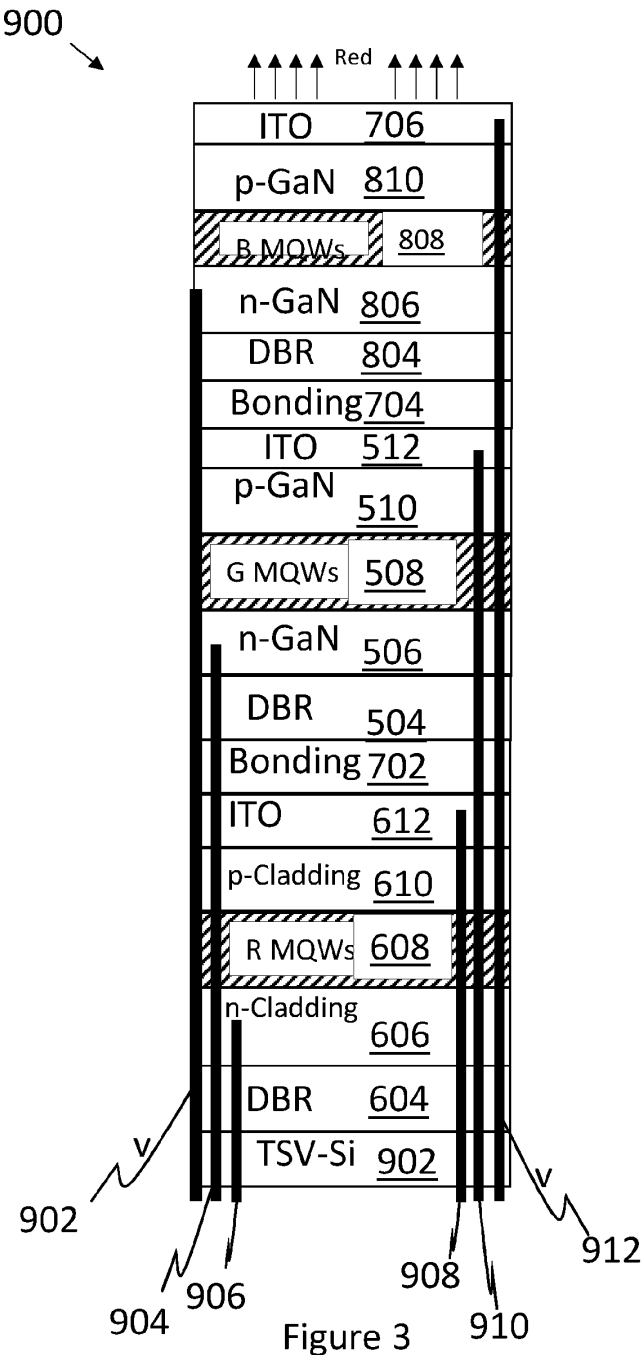


Figure 2I



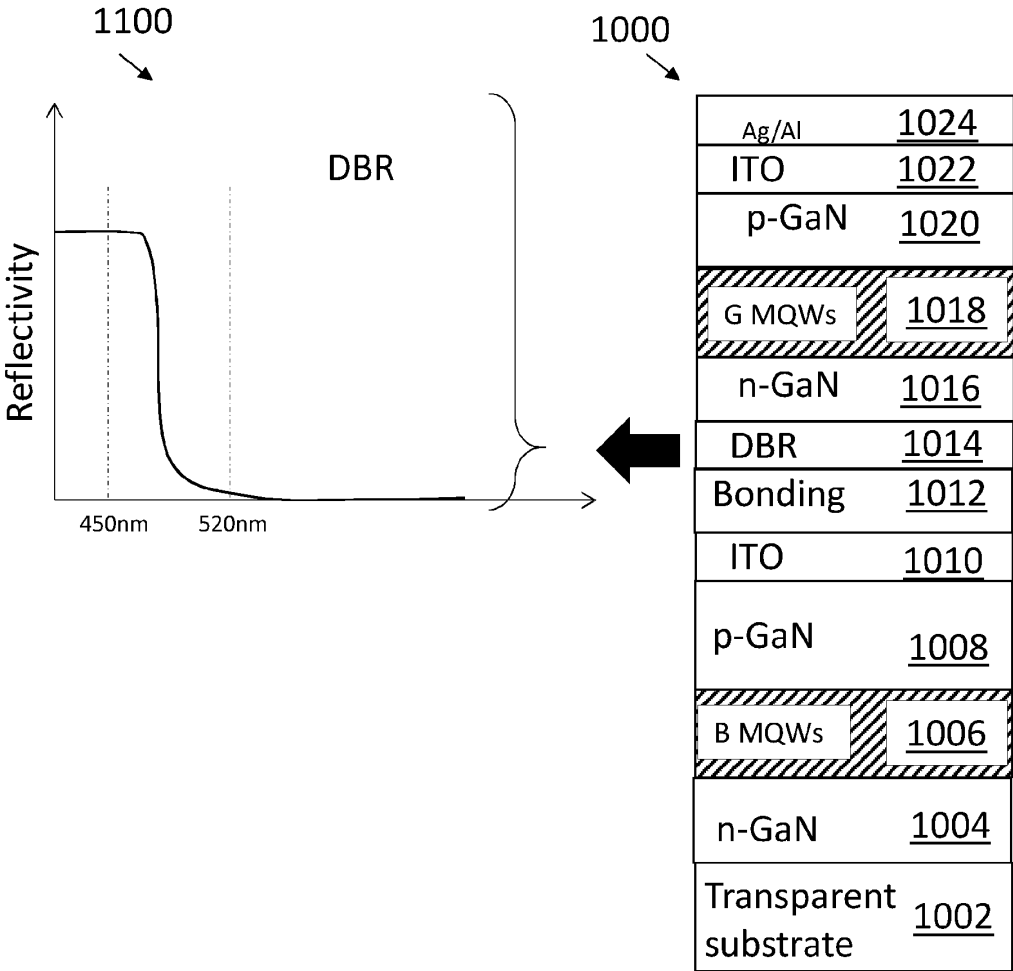


Figure 4A

13/19

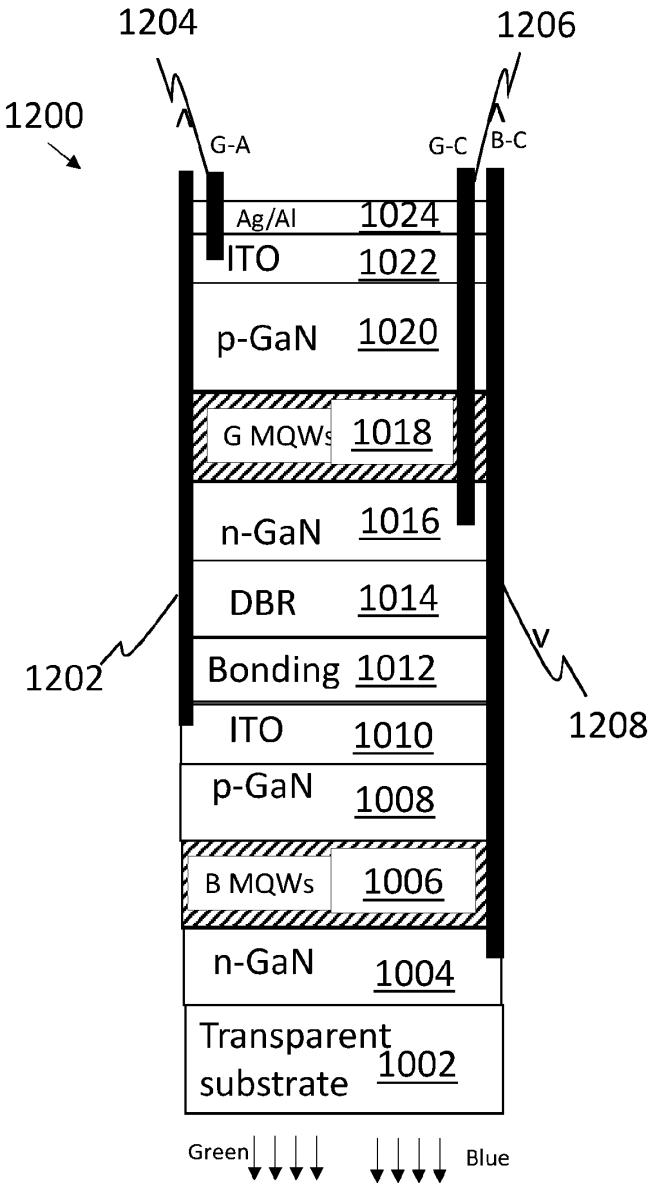


Figure 4B

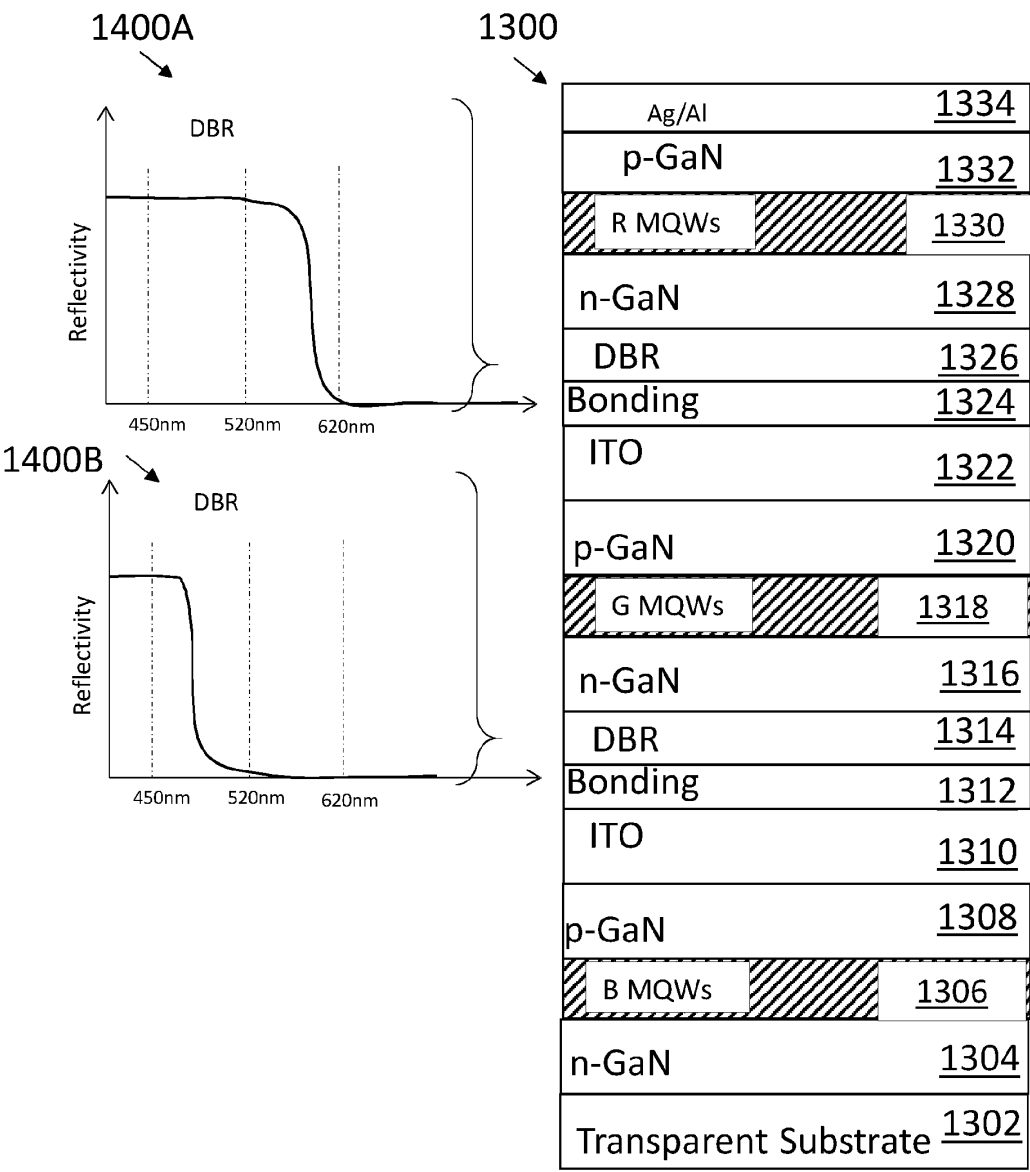


Figure 5A

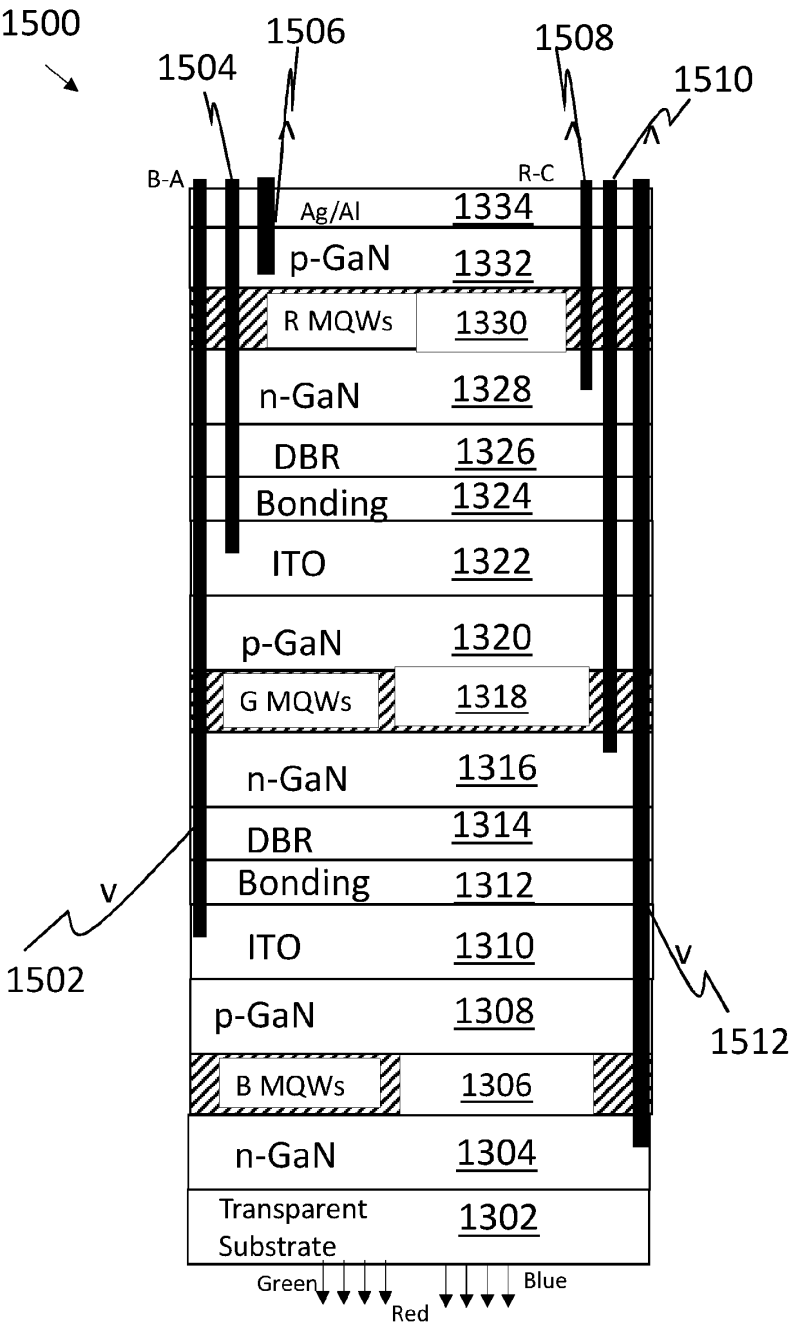


Figure 5B

1600A

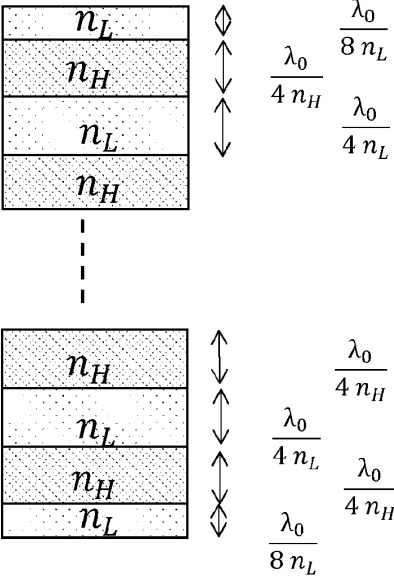


Figure 6A

1600B

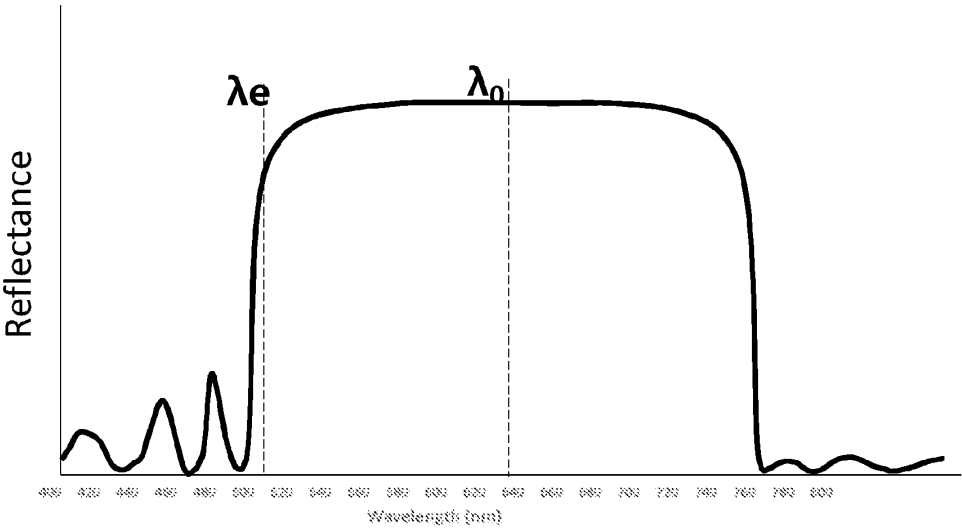


Figure 6B

1700A

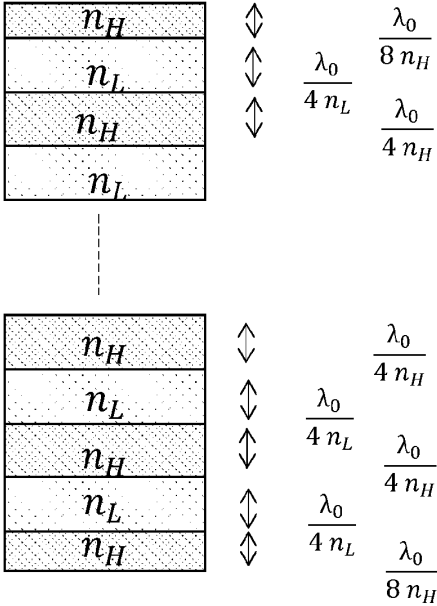


Figure 7A

1700B

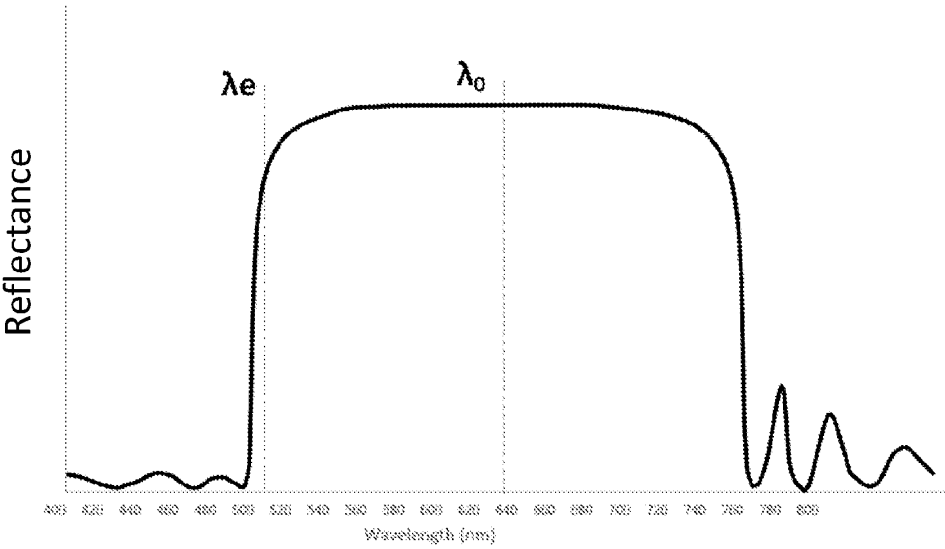


Figure 7B

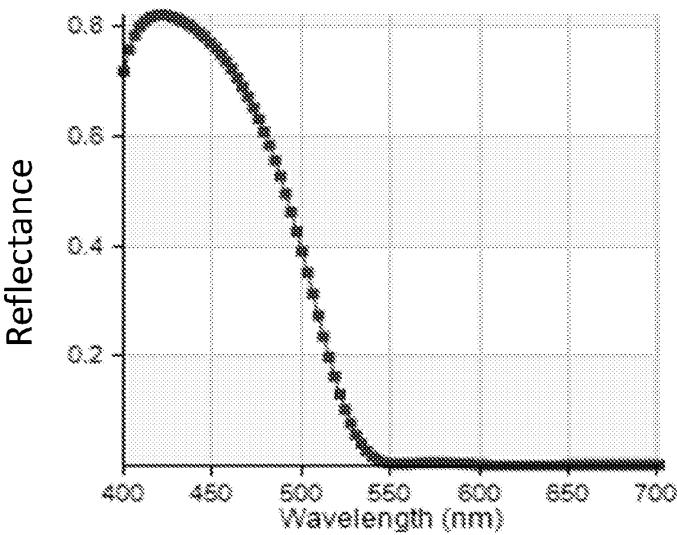
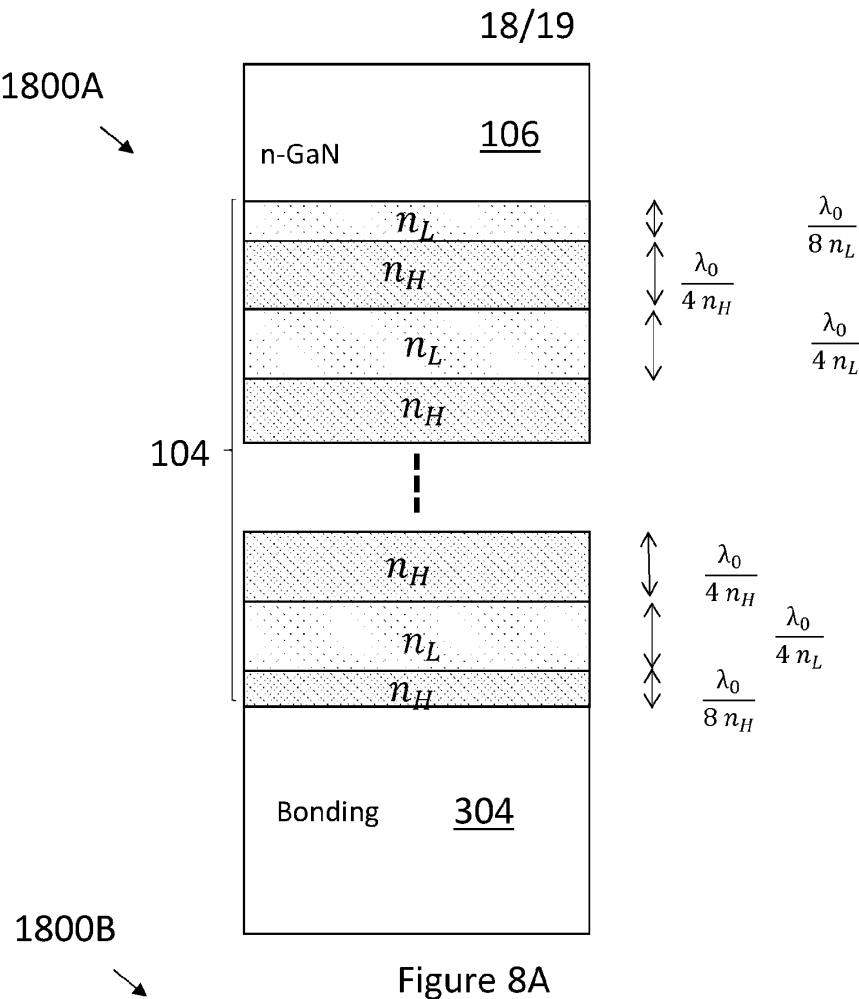
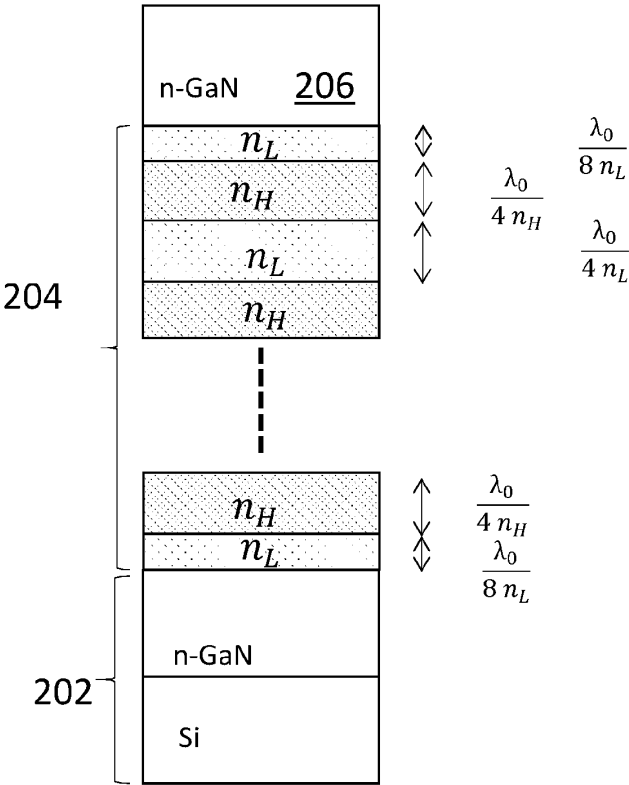


Figure 8B

1900A



1900B



Figure 9A

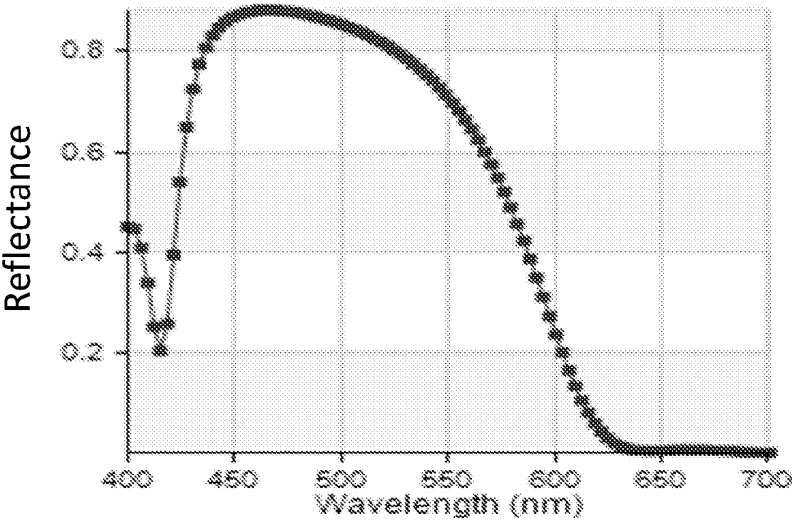


Figure 9B