【請求項１】
　単結晶半導体からなる支持基板に多孔質半導体層を形成する工程と、
　前記支持基板上に前記多孔質半導体層を介して単結晶半導体層を形成する工程と、
　前記単結晶半導体層の表面に絶縁層を形成し、表示領域の絶縁層を残して周辺回路領域の絶縁層を除去し、半導体エピタキシャル成長により前記表示領域に多結晶半導体層を、前記周辺回路領域に単結晶半導体層を、それぞれ形成する工程と、
　前記表示領域の多結晶半導体層に表示素子部を、前記周辺回路領域の単結晶半導体層に周辺回路部を、それぞれ形成する工程と、
　前記支持基板を前記多孔質半導体層から分離する工程と、
　前記分離後の超薄型電気光学表示素子基板に支持体を貼り付ける工程と、
　前記支持体の貼り付け後、各超薄型電気光学表示装置に分割する工程と
を含む超薄型電気光学表示装置の製造方法。
[Claim 1]
A method of manufacturing an ultra-slim electrooptic display comprising:
a process of forming a porous semiconductor layer on a support substrate made of a single crystalline semiconductor,
a process of forming a single crystalline semiconductor layer on said support substrate via said porous semiconductor layer,
a process of forming an insulating layer on a surface of said single crystalline semiconductor layer and subsequently removing the insulating layer in the peripheral circuit region while leaving the insulating layer in the display region in order to form a polycrystalline semiconductor layer in said display region and a single crystalline semiconductor layer in said peripheral circuit region, respectively by semiconductor epitaxial growth,
a process of forming a display device unit in the polycrystalline semiconductor layer of said display region and a peripheral circuit unit in the single crystalline semiconductor layer of said peripheral circuit region, respectively,
a process of separating said support substrate from said porous semiconductor layer,
a process of bonding a support on the ultra-slim electrooptic display device substrate after said separation, and
a process of being divided into various ultra-slim electrooptic displays after bonding said support.

【請求項２】
　それぞれ単結晶半導体からなる種子基板および支持基板の両方に多孔質半導体層を形成する工程と、
　前記種子基板および支持基板の両方に、それぞれ前記多孔質半導体層を介して単結晶半導体層を形成する工程と、

前記種子基板および支持基板の少なくとも一方に、前記単結晶半導体層を介して絶縁層を形成する工程と、

前記種子基板および支持基板を前記絶縁層の形成面で貼り合わせる工程と、

前記種子基板を、同種子基板の多孔質半導体層から分離する工程と、

前記種子基板の分離により露出した前記単結晶半導体層の表面を少なくとも水素アニール処理によりエッチングして平坦化する工程と、

このエッチングした単結晶半導体層の表面に絶縁層を形成し、表示領域の絶縁層を残して周辺回路領域の絶縁層を除去し、半導体エピタキシャル成長により前記表示領域に多結晶半導体層を、前記周辺回路領域に単結晶半導体層をそれぞれ形成する工程と、

前記表示領域の多結晶半導体層に表示素子部を、前記周辺回路領域の単結晶半導体層に周辺回路部を、それぞれ形成する工程と、

前記支持基板を同支持基板の多孔質半導体層から分離する工程と、

前記分離後の超薄型電気光学表示素子基板に支持体を貼り付ける工程と、

前記支持体の貼り付け後、各超薄型電気光学表示装置に分割する工程と

を含む超薄型電気光学表示装置の製造方法。

[Claim 2]

A method of manufacturing an ultra-slim electrooptic display comprising:

a process of forming a porous semiconductor layer both on a seed substrate and support substrate, each made of a single crystalline semiconductor,

a process of forming a single crystalline semiconductor layer both on said seed substrate and support substrate, respectively via said porous semiconductor layer,

a process of forming an insulating layer via said single crystalline semiconductor layer on at least one of said seed substrate or support substrate,

a process of bonding said seed substrate and support substrate at the surface forming said insulating layer,

a process of separating said seed substrate from the porous semiconductor layer of the same seed substrate,

a process of flattening the surface of said single crystalline semiconductor layer which has been exposed by separating said seed substrate, by etching at least with a hydrogen annealing treatment,

a process of forming an insulating layer on the etched surface of the single crystalline semiconductor layer and [subsequently] removing the insulating layer in the peripheral circuit region while leaving the insulating layer in the display region in order to form a polycrystalline semiconductor layer in said display region and a single crystalline semiconductor layer in said peripheral circuit region, respectively by semiconductor epitaxial crystallization,

a process of forming a display device unit in the polycrystalline semiconductor layer of said display region and a peripheral circuit unit in the single crystalline semiconductor layer of said peripheral

circuit region, respectively,
a process of separating said support substrate from said porous semiconductor layer on the same support substrate,
a process of bonding a support on the ultra-slim electrooptic display device substrate after said separation, and
a process of being divided into various ultra-slim electrooptic displays after bonding said support.

【請求項３】
　単結晶半導体からなる支持基板の表面に絶縁層を形成し、表示領域の絶縁層を残して周辺回路領域の絶縁層を除去し、半導体エピタキシャル成長により前記表示領域に多結晶半導体層を、前記周辺回路領域に単結晶半導体層を、それぞれ形成する工程と、
　前記表示領域の多結晶半導体層に表示素子部を、前記周辺回路領域の単結晶半導体層に周辺回路部を、それぞれ形成する工程と、
　前記支持基板の所定深さにイオン注入層を形成する工程と、
　剥離用アニール処理を行う工程と、
　前記支持基板を前記イオン注入層の歪部から分離する工程と、
　前記分離後の超薄型電気光学表示素子基板に支持体を貼り付ける工程と、
　前記支持体の貼り付け後、各超薄型電気光学表示装置に分割する工程と
を含む超薄型電気光学表示装置の製造方法。
[Claim 3]
A method of manufacturing an ultra-slim electrooptic display comprising:
a process of forming an insulating layer on the surface of a support substrate made of a single crystalline semiconductor and subsequently removing the insulating layer in the peripheral circuit region while leaving the insulating layer in the display region in order to form a polycrystalline semiconductor layer in said display region and a single crystalline semiconductor layer in said peripheral circuit region, respectively by semiconductor epitaxial crystallization,
a process of forming a display device unit in the polycrystalline semiconductor layer of said display region and a peripheral circuit unit in the single crystalline semiconductor layer of said peripheral circuit region, respectively,
a process of forming an ion injection layer at a specified depth in said support substrate,
a process of performing a separation type annealing treatment,
a process of separating said support substrate from the strained section of said ion injection layer,
a process of bonding a support on the ultra-slim electrooptic display device substrate after said separation, and
a process of being divided into various ultra-slim electrooptic displays after bonding said support.

【請求項４】
　単結晶半導体からなる種子基板にイオン注入層を形成する工程と、
　単結晶半導体からなる支持基板に絶縁層を形成する工程と、
　前記種子基板のイオン注入層と前記支持基板の絶縁層とを貼り合わせ、熱処理により前記イオン注入層と絶縁層とを共有結合させて単結晶半導体層を形成する工程と、剥離用アニール処理を行い、前記種子基板を同種子基板のイオン注入層の歪部から分離する工程と、
　少なくとも水素アニール処理により前記単結晶半導体層の表面をエッチングして平坦化する工程と、
　このエッチングした単結晶半導体層の表面に絶縁層を形成し、表示領域の絶縁層を残して周辺回路領域の絶縁層を除去し、半導体エピタキシャル成長により前記表示領域に多結晶半導体層を、前記周辺回路領域に単結晶半導体層を、それぞれ形成する工程と、
　前記表示領域の多結晶半導体層に表示素子部を、前記周辺回路領域の単結晶半導体層に周辺回路部を、それぞれ形成する工程と、
　前記支持基板の所定深さにイオン注入層を形成する工程と、
　剥離用アニール処理を行う工程と、
　前記支持基板を前記イオン注入層の歪部から分離する工程と、
　前記分離後の超薄型電気光学表示素子基板に支持体を貼り付ける工程と、
　前記支持体の貼り付け後、各超薄型電気光学表示装置に分割する工程と
を含む超薄型電気光学表示装置の製造方法。
[Claim 4]
A method of manufacturing an ultra-slim electrooptic display comprising:
a process of forming an ion injection layer on a seed substrate made of a single crystalline semiconductor,
a process of forming an insulating layer on a support substrate made of a single crystalline semiconductor,
a process of forming a single crystalline semiconductor layer by bonding an ion injection layer of said seed substrate on the insulating layer of said support substrate, and subsequently by forming a covalent bonding between said ion injection layer and the insulating layer with a heat treatment,
a process of separating said seed substrate from the strained section of the ion injection layer of the same seed substrate by performing a separation type annealing treatment,
a process of flattening by etching the surface of said single crystalline semiconductor layer at least with a hydrogen annealing treatment,
a process of forming an insulating layer on the etched surface of the single crystalline semiconductor layer and subsequently removing the insulating layer in the peripheral circuit region while leaving the insulating layer in the display region in order to form a polycrystalline semiconductor layer in said display region and a single crystalline semiconductor layer in said peripheral circuit region,

respectively by semiconductor epitaxial crystallization,
a process of forming a display device unit in the polycrystalline semiconductor layer of said display region and a peripheral circuit unit in the single crystalline semiconductor layer of said peripheral circuit region, respectively,
a process of forming an ion injection layer at a specified depth in said support substrate,
a process of performing a separation type annealing treatment,
a process of separating said support substrate at the strained section of said ion injection layer,
a process of bonding a support on the ultra-slim electrooptic display device substrate after said separation, and
a process of being divided into various ultra-slim electrooptic displays after bonding said support.

【請求項５】
　単結晶半導体からなる種子基板にイオン注入層を形成する工程と、
　単結晶半導体からなる支持基板に多孔質半導体層を形成する工程と、
　前記支持基板上に、前記多孔質半導体層を介して単結晶半導体層を形成する工程と、
　前記単結晶半導体層上に、絶縁層を形成する工程と、
　前記種子基板のイオン注入層と前記支持基板の絶縁層とを貼り合わせ、熱処理により前記種子基板のイオン注入層と前記支持基板の絶縁層とを共有結合させて単結晶半導体層を形成する工程と、
　剥離用アニール処理を行い、前記種子基板を前記イオン注入層の歪部から分離する工程と、
　少なくとも水素アニール処理により前記単結晶半導体層の表面をエッチングして平坦化する工程と、
　このエッチングした単結晶半導体層の表面に絶縁層を形成し、表示領域の絶縁層を残して周辺回路領域の絶縁層を除去し、半導体エピタキシャル成長により前記表示領域に多結晶半導体層を、前記周辺回路領域に単結晶半導体層を、それぞれ形成する工程と、
　前記表示領域の多結晶半導体層に表示素子部を、前記周辺回路領域の単結晶半導体層に周辺回路部を、それぞれ形成する工程と、
　前記支持基板を前記多孔質半導体層から分離する工程と、
　前記分離後の超薄型電気光学表示素子基板に支持体を貼り付ける工程と、
　前記支持体の貼り付け後、各超薄型電気光学表示装置に分割する工程と
を含む超薄型電気光学表示装置の製造方法。
[Claim 5]
A method of manufacturing an ultra-slim electrooptic display comprising:
a process of forming an ion injection layer on a seed substrate made of a single crystalline semiconductor,

a process of forming a porous semiconductor layer on a support substrate made of a single crystalline semiconductor,

a process of forming a single crystalline semiconductor layer via said porous semiconductor layer on said support substrate,

a process of forming an insulating layer on said single crystalline semiconductor layer,

a process of forming a single crystalline semiconductor layer by bonding the ion injection layer of said seed substrate with the insulating layer of said support substrate, and subsequently by forming a covalent bonding between said ion injection layer and the insulating layer using a heat treatment,

a process of separating said seed substrate at the strained section of the ion injection layer of the same seed substrate by performing a separation type annealing treatment,

a process of flattening by etching the surface of said single crystalline semiconductor layer at least using a hydrogen annealing treatment,

a process of forming an insulating layer on the etched surface of the single crystalline semiconductor layer and subsequently removing the insulating layer in the peripheral circuit region while leaving the insulating layer in the display region in order to form a polycrystalline semiconductor layer of said display region and a single crystalline semiconductor layer in said peripheral circuit region, respectively by semiconductor epitaxial crystallization,

a process of forming a display device unit in the polycrystalline semiconductor layer of said display region and a peripheral circuit unit in the single crystalline semiconductor layer of said peripheral circuit region, respectively,

a process of separating said support substrate from said porous semiconductor layer,

a process of bonding a support on the ultra-slim electrooptic display device substrate after said separation, and

a process of being divided into various ultra-slim electrooptic displays after bonding said support.