Claims

1. A method of fabricating semiconductor devices, the method comprising:
providing a continuous device layer on a substrate, the continuous device layer comprising a semiconductor material;
applying a patterning structure to the continuous device layer so that a first portion of the continuous device layer is masked and a second portion of the continuous device layer is unmasked;
depositing a conductive material on the unmasked second portion of the continuous device layer to form a plurality of conductive substrates on the continuous device layer, each conductive substrate being in electrical contact with a respective portion of the continuous device layer;
applying a temporary supporting carrier to the conductive substrates with a low-melting point adhesive or a solvent-soluble adhesive;
affixing a mounting tape to the device layer;
removing the temporary supporting carrier and adhesive so that the temporary supporting carrier and adhesive are not present in the fabricated semiconductor device;
removing the patterning structure after depositing the conductive material; and
stretching the mounting tape after removing the temporary substrate and after removing the patterning structure so that the continuous device layer is separated into a plurality of semiconductor devices, wherein the separation is substantially within the first portion of the continuous device layer.

2. A method according to claim 1,
wherein the device layer comprises a plurality of islands of multilayer epitaxial regions, and wherein respective conductive substrates are formed on respective islands.

3. A method according to claim 2, further comprising,

prior to depositing the conductive material, selectively removing portions of a multilayer epitaxial region to form the islands.

4. A method according to claim 1,

wherein applying a patterning structure to the device layer comprises depositing a photoresist layer and irradiating portions of the photoresist layer to form a plurality of sidewalls of the patterning structure, the sidewalls being disposed within trenches between the islands.

5. A method according to claim 1,

further comprising removing the substrate to expose a surface of the device layer.

6. A method according to claim 5,

further comprising applying a metal contact layer to the exposed surface of the device layer, the metal contact layer comprising a plurality of metal contact elements in register with the plurality of conductive substrates.

7. A method according to claim 1,

wherein the device layer is an LED layer comprising at least one multilayer epitaxial region, the or each multilayer epitaxial region comprising a p-type layer, an n-type layer and an active layer disposed between the p-type and n-type layers.

8. A method according to claim 7,

wherein the semiconductor devices are vertical LEDs.

9. A method according to claim 1,

wherein the separating is without dicing or scribing of the conductive material.

10. A method according to claim 2, wherein the islands have angled sidewalls.

11. A method according to claim 1,

wherein the temporary supporting layer is soluble.