Title (en)

ELEMENT

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Application

EP 84303057 A 19840508

Priority

- GB 8312720 A 19830509
- GB 8332733 A 19831208

Abstract (en)

[origin: EP0125859A1] An element for use as a thermionic cathode and/or a light emitting device comprising a semiconductor substrate (1) having a recess (3) therein with a bridge structure extending across the recess and comprising a metal layer (9) on a support layer (5). The bridge structure may be in the form of a narrow linear strip or alternatively it may comprise a broad band of support material with a metal layer in the form of a sinuous strip (21) or (91) supported thereon. The element may be enclosed in an envelope and in a preferred construction the metal layer is only about 5 microns wide but the support layer is mechanically stable up to about 1100 K. Preferably the semiconductor substrate is silicon and the support material is silicon dioxide or silicon nitride (15). In one construction the element can be used as a thermionic cathode (25) and the element may form part of a thermionic cathode assembly forming part of a display device with a phosphor screen, a grid assembly (27) between the cathode assembly (25) and the screen and an anode for accelerating electrons from the cathode to the screen. Preferably, therefore, cathode ray deflection means are also provided. The elements may be closely packed in matrix form to provide a cathode assembly on a single wafer of semiconductor material (45) to form part of a display device with a screen, accelerating anode, grid assembly 43, etc. The matrix of elements may he addressed by a digital logic circuit and suitable drive circuits and the grid (49) may be provided with an even potential over its surface so that light produced by electrons impinging upon the screen (41) will be produced in a matrix of pixels corresponding to the addressed elements, The intensity of each pixel may be controlled by adjusting the current supplied to the relevant cathode element or by adjusting the potential difference between the grid (49) and cathode assembly (39). As an alternative, the matrix may he addressed by applying equal current flow to each element in a row of the matrix in which case each grid element in a corresponding row of the grid would be addressed separately. Alternatively, equal current may be supplied to each cathode element and the grid assembly may be in the form of a matrix of elements to each of which is applied an independent bias potential. It is envisaged that the or each element instead of providing a thermionic cathode may each provide a light emitting device and the elements can again be provided in the form of a matrix and the amount of light emitting from each element would be controlled by the current passed to each element. In some simple cathode structures, the support layer may be etched away so that the bridge across the recess in the substrate is formed just of a metal layer.

IPC 1-7

H01J 1/14; H01J 29/04; H01K 7/00; H01K 1/02

IPC 8 full level

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CPC (source: EP)

H01J 1/15 (2013.01); **H01J 17/49** (2013.01); H01J 2201/2878 (2013.01)

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