

Title (en)

INSULATED-GATE ELECTRON FIELD EMISSION DEVICES AND THEIR FABRICATION PROCESSES

Title (de)

ELEKTRONENFELDEMISSIONSVORRICHTUNG MIT ISOLIERTEM GATE UND VERFAHREN ZUR HERSTELLUNG

Title (fr)

COMPOSANTS D'EMISSION DE CHAMP D'ELECTRONS A GRILLE ISOLEE ET LEURS PROCEDES DE FABRICATION

Publication

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Application

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Abstract (en)

[origin: WO0108192A1] A lateral-emitter field emission device has a gate (30) that is separated by an insulating layer (40) from a vacuum- or gas-filled environment containing other elements of the device. For example, the gate may be disposed external to a microchamber (110). The insulating layer is disposed such that there is no vacuum- or gas-filled path to the gate for electrons that are emitted from a lateral emitter. The insulating layer disposed between the emitter and the gate preferably comprises a material having a dielectric constant greater than one. The insulating layer also preferably has a low secondary electron yield over the device's operative range of electron energies. For display applications, the insulating layer is preferably transparent. Emitted electrons are confined to the microchamber containing their emitter. Thus, the gate current component of the emitter current consists of displacement current only, and direct electron current from the emitter to the gate is prevented. An array of the devices comprises an array of microchamber, so that electron current from each emitter can reach only the anode in the same microchamber, even for diode devices lacking a gate electrode. A fabrication process is specially adapted for fabricating the device and arrays of such devices, including formation in situ of a vacuum microchamber.

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