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Title: Electrical device, useful e.g. as integrated circuit, semiconductor and transistor, comprises a current transport layer formed using a layer a topological material, and an electrode in electrical contact with the current transport layer

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Abstract: NOVELTY - Electrical device comprises: a current transport layer formed using a layer a topological material, which is a topological insulator (14), a quantum anomalous hall (QAH) insulator, a topological insulator variant, or a topological magnetic insulator comprising an anti-ferromagnetic insulator; and at least one electrode in electrical contact with the current transport layer. The topological insulator and QAH insulator both have an insulating energy band gap in the bulk and conducting edge or surface states. The topological insulator variant is formed from a topological insulator material.

USE - The electrical device is useful: as integrated circuit, semiconductor, and transistor; and in photodetectors, that are useful in thermal detection, high-speed optical communications, terahertz detection, imaging, remote sensing, surveillance and spectroscopy.

ADVANTAGE - The electrical device exhibits improved performance.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for an optical device, comprising an optical layer formed using the layer a topological material, and comprises one a light absorbing layer, a light emitting layer, a light transport layer, or a light modulation layer.

DESCRIPTION DRAWING(S) - The figure shows a prospective view a topological insulator transistor.

Topological insulator transistor (10)

Insulating substrate (12)

Layer topological insulator material (14)

Gate dielectric layer (15)

Gate electrode (16)

Drawing:

Derwent Class Code(s): L03 (Electro-(in)organic, chemical features electrical devices); T01 (Digital Computers); U11 (Semiconductor Materials and Processes)

Derwent Manual Code(s): L03-H03; L04-C11; L04-C12; L04-C16; L04-C18; L04-E01; L04-E03; L04-E05; L04-E05C; L04-F03; T01-J07B2; U11-C05B4

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