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Title:Noncontact detection of the location of buried conductive grids with pulsed THz wave

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Abstract:In this article, a new method for precisely measuring the location of buried conductive grid based on time-domain pulsed terahertz (THz) reflectometry is presented. The location of the buried conductive grid is determined by the time difference of reflected THz pulses between the front surface and the buried conductive grid. Since the wavelength of THz wave is usually larger than the roughness of unpolished optical surface and the period of conductive grid, the proposed method is insensitive to the surface condition. Furthermore, this is a non-contact and real-time measurement technique. The experimental result indicates that the accuracy of the measurement is at least on the order of 10 μm . Such kind of technique will be very helpful for enhancing the quality and reduce the cost of fabricating electro-optic windows with embedded conductive grids and/or wires. It can also be beneficial for some other applications. For example, since there are often embedded conductive wires in explosive devices, it can be used to detect the explosive devices because the proposed method can remotely determine the dimensions and locations of conductive wires embedded in dielectric enclosures. \copyright 2012 Wiley Periodicals, Inc.

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