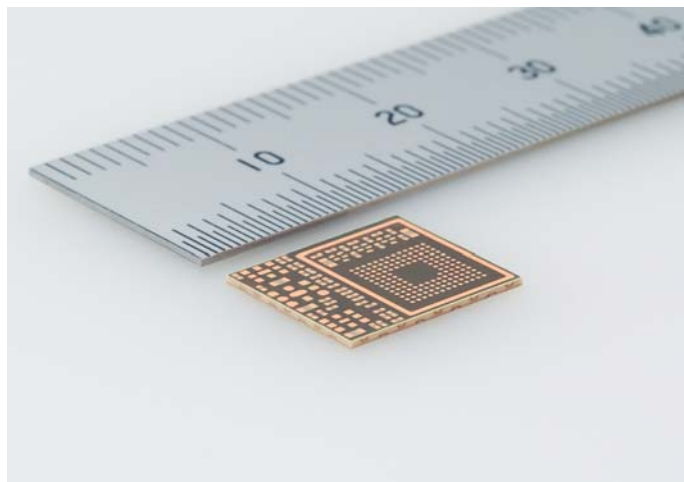


For immediate release

## Taiyo Yuden Announces the World's First Practicable Circuit Board Embedding of Gallium Arsenide Semiconductors

*Further Application of the Embedded-parts Multilayer Wiring Substrate "EOMIN<sup>®</sup>" in Communication Modules*



TOKYO, September 8, 2011 — TAIYO YUDEN CO., LTD. today announced the commercial release of an embedded-parts multilayer wiring substrate "EOMIN<sup>®</sup> (Embedded Organic Module Involved Nanotechnology)" with a built-in gallium arsenide (below, GaAs) antenna switch, which was achieved with a new technology, established for the first time in the world, to embed GaAs semiconductors inside circuit boards.

This product is a high frequency circuit board package for mounting in mobile devices such as smart phones and tablet PCs equipped with communication functions. Integration of a GaAs antenna switch, which has been difficult up to now, has been successfully realized due to the high durability possessed by the copper core embedded-parts multilayer wiring substrate "EOMIN<sup>®</sup>" and miniaturization of the via hole etc., which has thus extended its use into the field of communications modules.

Taiyo Yuden, responding to the demands of the market, is expanding the various applications of the embedded-parts multilayer wiring substrate "EOMIN<sup>®</sup>" and will pursue the continued miniaturization and low profiling of devices through the dense packaging made possible using built-in parts.

### Technology Background

In order to achieve high quality telephone calls and high speed radio communications, mobile devices like smart phones and tablet PCs equipped with communication functions, are becoming increasingly multiband to accommodate multiple frequency bands. A GaAs antenna switch, with its superior high frequency characteristics, has been incorporated in to the high frequency circuits of such mobile devices so that the multiple frequency bands can be used efficiently.

When miniaturizing high frequency circuits, embedding the GaAs antenna switch as a bare chip is extremely effective due to its tiny form. However, with a conventional circuit board that has embedded-parts, because it was difficult to protect the relatively weak GaAs antenna switch from external shock and to properly bond the minute electrode of the bare chip, embedding was not possible.

Taiyo Yuden consequently recognized that the embedded-parts multilayer wiring substrate “EOMIN<sup>®</sup>” that adopts a copper core and has high rigidity was most appropriate for embedding a GaAs antenna switch as a bare chip. By miniaturizing the via hole and copper wiring to about a half of that used conventionally, the design of the “EOMIN<sup>®</sup>” advanced dramatically in both the high mounting precision of parts being integrated and the reliability of the copper plate junction.

Using these innovative techniques, the world’s first GaAs antenna switch built into the circuit board in the form of a bare chip, which was previously considered difficult, has been made possible, along with the increasingly smaller size, lower profile and dense packaging of modules.

This commercial release was with the cooperation of “Panasonic Mobile Communications Co., Ltd.” in an attempt to optimize high frequency circuits and so on. Currently, our products have been installed in some models of “Panasonic Mobile Communications Co., Ltd.” mobile phones.

**This product will be exhibited from October 4 in the Taiyo Yuden booth at the “CEATEC JAPAN 2011” to be held at the Makuhari Messe (Mihama-ku, Chiba City, Chiba prefecture).**

\* “EOMIN” is a registered trademark or trademark of TAIYO YUDEN CO., LTD. used both for Japan and other countries.

#### ■ Applications

Wiring substrate for the high frequency circuits mounted in mobile devices such as smart phones and tablet PCs equipped with communication functions.

#### EOMIN<sup>®</sup> Features

- Low noise

An improvement in tolerance to noise due to the shielding effect from the copper core

- Highly heat radiation

The high thermal conductivity of the copper core effectively dissipates heat coming from IC chips, etc.

- Stiffness

Constructed with a built-in copper core, the rigidity of the module itself is increased

- High reliability

Jointed with embedded-parts by electrolytic copper plating

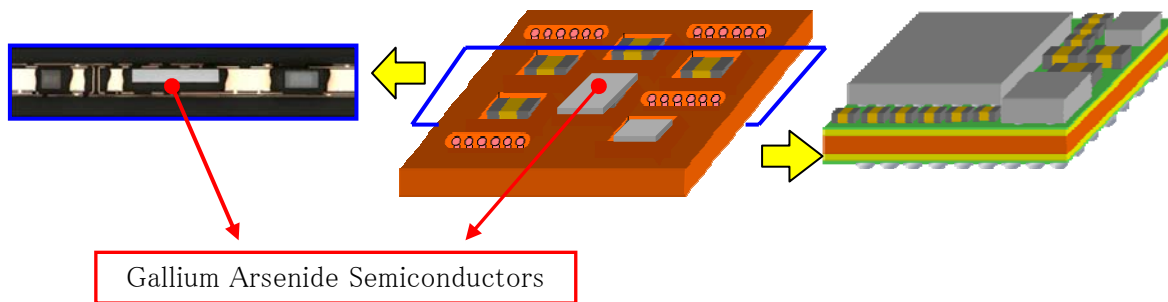


Figure 1. EOMIN<sup>®</sup> Exterior View (Left: cross section, Center: copper core and embedded parts, through holes, Right: module)