

課題番号 : F-15-NM-0100  
 利用形態 : 技術代行  
 利用課題名 (日本語) : パリレン HT ライナーのスルーシリコンビアの検査  
 Program Title (English) : Inspection of a Through-Si-Via with Parylene-HT Liner  
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## 1. 概要 (Summary)

Three-dimensional stacking technology has been developed for high-integration, high-speed and high performance electric devices. The through silicon via (TSV) approach realizes 3D integration by heterogeneous integration of multiple tiers of active components in vertically direct. In this research, a high-aspect ratio (AR) parylene-HT liner TSV for low-temperature compatible 3D integration will be inspected by FIB milling to confirm the formation of the TSV structure (Fig.1).

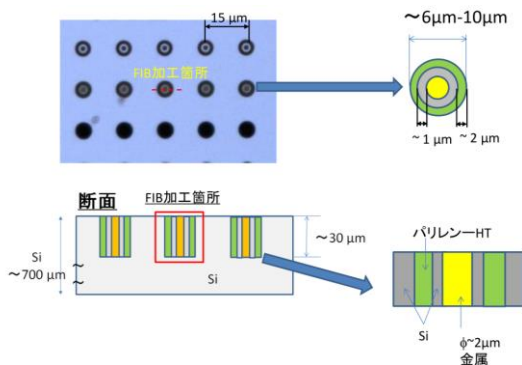


Fig.1. Form TSVs and expected cross-section view.

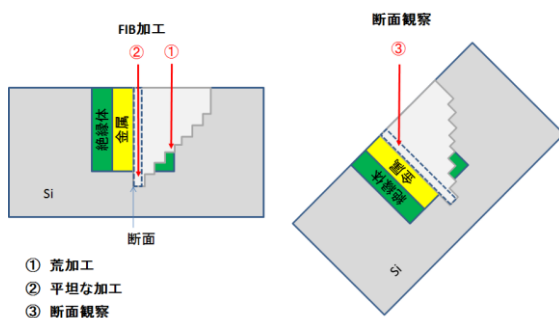


Fig. 2. FIB milling and observation procedure.

## 2. 実験 (Experimental)

【利用した主な装置】 FIB-SEM Dual Beam System

【実験方法】 High-aspect ratio (AR) parylene-HT liner TSVs were fabricated through Si etching, parylene liner deposition, and metal filling

processes. The sample after that was FIB milled and inspected by a FIB-SEM double beam system (XVision200DB, Hitachi, Ltd.) to confirm the formation of bumps. The experimental procedure is illustrated in Fig. 2.

## 3. 結果と考察 (Results and Discussion)

The observation results are shown in Fig. 3. Since SEM is also equipped, real-time imaging at high resolution of a specimen is permitted during the FIB milling process. As a result, high-precision processing was implemented and the formation of bumps was confirmed.

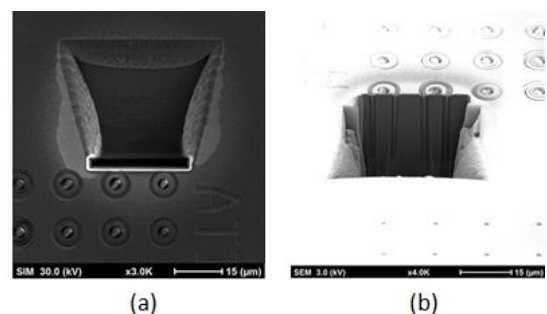


Fig. 3 TSV structure confirmed by FIB milling. (a), (b) are the top- and bird's eye-view of bump position after FIB milling process, respectively.

## 4. その他・特記事項 (Others)

なし

## 5. 論文・学会発表 (Publication/Presentation)

(1) B. T. Tung, et.al, IEEE Transactions on Components, Packaging and Manufacturing Technology, 2016 (Accepted).

(2) B. T. Tung, et.al, International conference on 3D Systems Integration Conference (3DIC), 2015, pp. 160-163.

## 6. 関連特許 (Patent)

なし