課題番号　：　F-20-UT-0042
利用形態　：　機器利用
利用課題名（日本語）　：　ガリウム砒素融着 SOI 基板のレーザーダイシング
Program Title (English)　：　Laser dicing of GaAs bonded SOI substrate
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キーワード／Keyword　：　切削、レーザダイシング、シリコンフォトニクス、レーザ素子、光導波路

1. 概要（Summary）

There are three separate areas in the SOI substrate: the top area with Mach-Zehnder modulators (MZM) connected with distributed Bragg reflector (DBR) waveguides, the bottom left area with only MZM's and the bottom right area with DBR waveguides. The purpose of the laser dicing was to isolate the bottom right area with DBR waveguides so that they could be measured to obtain the DBR cut frequency.

2. 実験（Experimental）

【利用した主な装置】

ステルスダイサー（Stealth Dicing Machine Disco DFL-7340）

【実験方法】

The dicing is made in 3 steps (see Fig. 1). On the first step, the sample is introduced in the machine and its position is fixed. On the view screen we see the sample, define 2 points for tilt alignment, and select the point along which the laser cuts the sample in the horizontal direction. Once the laser dicing was done, the sample was removed from the machine and the cleaving was done manually, by pressing along the dicing line. The process was repeated for steps 2 and 3 (see Fig. 1).

3. 結果と考察（Results and Discussion）

On the first step, the cleaving line was slightly deviated from the laser line. The inverted tapers on some of the waveguides were removed. The measurements could still be done, although the transmission was smaller. The second step was done with no issues. On the third step, the dicing line was slightly deviated from the laser line, which caused no issue. The measurements showed a DBR cut frequency of 1.3 μm.

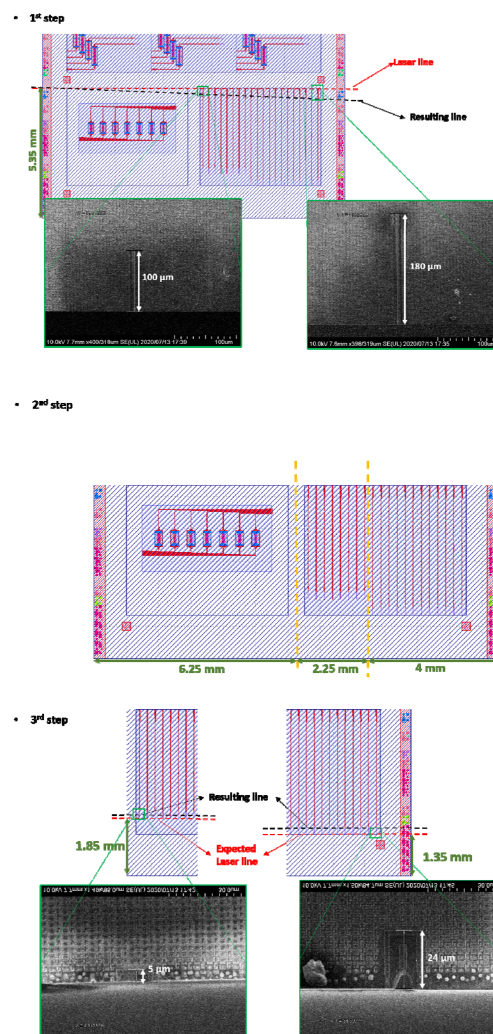

Figure 1 Experimental steps

5. 論文・学会発表（Publication/Presentation）

なし。

6. 関連特許（Patent）

なし。