

課題番号 : F-15-TU-0099
利用形態 : 機器利用
利用課題名(日本語) : Micron pattern devices for THz image system
Program Title (English) : Micron pattern devices for THz image system
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1. 概要(Summary)

THz wave has unique applications since its fingerprint characteristics on many chemicals, leading to the active researches on the THz spectroscopy and THz image. We propose to use the micron pattern devices or metamaterial devices for various THz applications such as remote sensing, nondestructive inspection and so on. We have designed micron pattern devices working on THz frequency range. To fabricate the micron devices, we used the facility of μ SIC (Micro System Integration Center) at Tohoku University.

2. 実験(Experimental)

【利用した主な装置】

両面アライナ、スピコータ、オーブン、現像機、乾燥機、ステッパ、EB 描画装置、レーザ描画装置、芝浦スパッタ装置、電子ビーム蒸着装置、ダイサ、Tenchor 段差計、デジタル顕微鏡、熱電子 SEM.

【実験方法】

We mainly use the photolithography technique to fabricate the micron devices. A polymer substrate is employed to accommodate the micron devices. Due to the minimum size of the device around 5 μ m, lift-off is planned for the patterning. We began with a handle wafer and finally the polymer substrate will be released to obtain the designed device. The device is under developing.

3. 結果と考察(Results and Discussion)

By several try and error tests, we have obtained the inter-process results of the device before releasing from the handle wafer. The micron array

has a process yield close to 100 % until the above step.

4. その他・特記事項(Others)

Thanks to Prof. H. Ito of RIKEN/Tohoku Univ. and Prof. M. Kumano of Tohoku Univ. for fruitful discussions.

5. 論文・学会発表(Publication/Presentation)

(1) Z. Han, S. Ohno, Y. Tokizane, K. Nawata, M. Koyama, T. Notake, Y. Takida, S. Hayashi, and H. Minamide, "Metamaterials to improve terahertz-wave real-time imaging system," The 76th JSAP Autumn Meeting 2015, 15p-2E-11, Nagoya Congress Center, Japan (Sep. 15, 2015). (oral)

(2) Z. Han, S. Ohno, Y. Tokizane, K. Nawata, M. Koyama, T. Notake, Y. Takida, S. Hayashi, and H. Minamide, "Metamaterials to improve terahertz-wave real-time imaging system," シンポジウム:テラヘルツ科学の最先端 II, P-20, 作並温泉岩松旅館(2015年11月19日). (poster)

6. 関連特許(Patent)

なし