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Fei Shan, Sung-Jin Kim

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# **TiO<sub>x</sub>-based thin-film transistors prepared by femtosecond laser pre-annealing**

**Fei Shan and Sung-Jin Kim\***

*College of Electrical and Computer Engineering, Chungbuk National University,  
Cheongju 28644, Korea*

**Abstract**—We report on thin-film transistors (TFTs) based on titanium oxide (TiO<sub>x</sub>) prepared using femtosecond laser pre-annealing for electrical application of *n*-type channel oxide transparent TFTs. Amorphous TFTs using TiO<sub>x</sub> semiconductors as an active layer have a low-temperature process and show remarkable electrical performance. And the femtosecond laser pre-annealing process has greater flexibility and development space for semiconductor production activity, with a fast preparation method. TFTs with a TiO<sub>x</sub> semiconductor pre-annealed via femtosecond laser at 3 W have a pinhole-free and smooth surface without crystal grains.

**Keywords:** TiO<sub>x</sub>, Thin-film transistor, Femtosecond laser, Pre-annealing, ALD

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\*Corresponding Author: [ksj@cbnu.ac.kr](mailto:ksj@cbnu.ac.kr)

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