Front Matter

EE, 20182327

Lee Jong Geon

Tilted deep trench isolation structure to maximize quantum efficiency of a CMOS image sensor at which corner of a chip

Jong Geon Leea, Dong Hyeon Leea, Jin Ha Lima, Hae Wook Hana,⁎

a Department of Electrical Engineering, Pohang University of Science and Technology, San 31 Hyoja Dong, Pohang, Kyungpook 790-784, Republic of Korea

A B S T R A C T

Maximize Quantum Efficiency (QE) in CMOS Image Sensor (CIS) at which side of an image sensor chip. We shifted Color Filter (CF) and Micro Lens (ML), also tilt Deep-Trench-Isolation (DTI). We increased QE 3.80 %p in red, 4.70 %p in green, 0.30 %p in blue, and 2.70 %p in white. Also we decreased crosstalk (X-talk) 0.05 %p in red, 0.20 %p in green, and 0.10 %p in blue.

[1] Teledyne DALSA Inc https://www.teledynedalsa.com/en/learn/knowledge-center/ccd-vs-cmos/ (accessed Jul 10, 2018).

[2] Alper, G. CCD vs. CMOS, sensitivity in low light improvements with industrial CMOS image sensors and cameras – Adimec https://www.adimec.com/ccd-vs-cmos-sensitivity-in-low-light-improvements-with-industrial-cmos-image-sensors-and-cameras/ (accessed Jul 10, 2018).

[3] Tu, C. N., Yeh, Y. L., Hsing-Chih, L. I. N., Huang, C. C., & Chen, S. S. (2017). U.S. Patent No. 9,818,779. Washington, DC: U.S. Patent and Trademark Office.

[4] Moon, C. R., Lee, D. H., & Cho, S. H. (2012). U.S. Patent No. 8,164,126. Washington, DC: U.S. Patent and Trademark Office.

[5] Agranov, G., Berezin, V., & Tsai, R. H. (2003). Crosstalk and microlens study in a color CMOS image sensor. IEEE Transactions on Electron Devices, 50(1), 4-11.

[6] CMOS sensor CRA https://www.dpreview.com/forums/thread/3819663 (accessed Jul 8, 2018).