



Reference Study: OPD Materials_ 1a+1b

Green-light-selective organic photodiodes for full-color imaging

GAE HWANG LEE, XAVIER BULLIARD, SUNGYOUNG YUN,
DONG-SEOK LEEM, KYUNG-BAE PARK, KWANG-HEE LEE,
CHUL-JOON HEO, IN-SUN JUNG, JUNG-HWA KIM, YEONG SUK
CHOI, SEON-JEONG LIM, AND YONG WAN JIN,

Samsung Advanced Institute of Technology (SAIT), Samsung Electronics, Co., Ltd., 130 Samsung-ro,
Yeongtong-gu, Suwon-si, Gyeonggi-do 443-803, South Korea

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Abstract

- In summary, a high-performing green-selective OPD that reached an EQE over 70% at an operating voltage of 3 V, while the dark current was only 6 e/s/m².
- In addition, an important OPD device specification such as a high thermal stability was also confirmed. This level of performance is in many aspects comparable to that obtained with a Si photodiode.
- Considering the dual function of the active organic layer as filter and absorber, simplifying the lensing process, it therefore appears that organic photodiode could be integrated in the next generation of image sensors, as an alternative to conventional Si-photodiode image sensor.

Materials & Devices

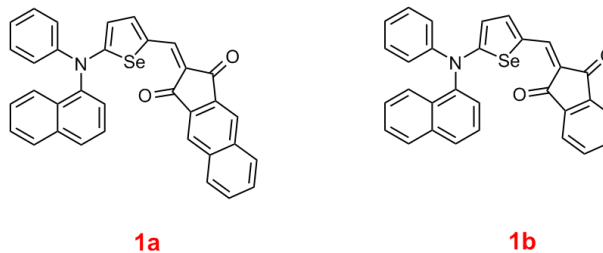


Table 2. Numerical properties of inverted-structure green-light-selective OPDs with the BHJs (1a or 1b:C60 = volume ratio 1:1, total thickness 85 nm).

OPDs (1:1, 85 nm)	J_d [nA/cm ²]		EQE_{max} [%]		η_A [%]	IQE_{max} [%]		η_{cs} [%]		η_{cc} [%]		λ_{max} [nm]	FWHM [nm]
	@3V		@0V	@3V		@0V	@3V	@0V	@3V	@0V	@3V		
1a:C60	11.1	21.1	51.8	61.9	34.1	83.6	51.4	99.1	66.4	84.4	560	97	
1b:C60	62.2	24.0	46.7	56.0	42.8	83.4	60.2	99.6	71.1	84.4	540	102	

*Table2 reference: *Optics Express* Vol. 27, Issue 18, pp. 25410-25419 (2019)

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Head office : 2F, No. 21, R&D Road II, Science-Based Industrial Park, Hsin-Chu 30076, Taiwan, R.O.C., TEL : +886-3-666-3188, FAX : +886-3-666-9288.

Taipei office : 9F., No.3, Park St., Nangang Dist., Taipei City 11503, Taiwan, R.O.C., TEL : +886-2-2655-8658, FAX : +886-2-2655-8699.

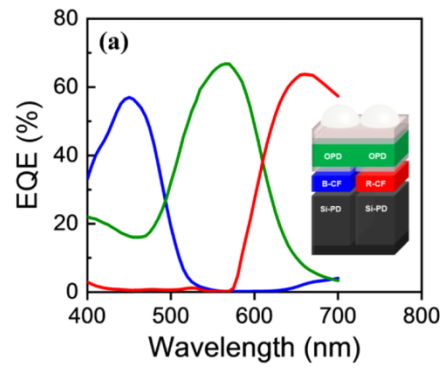
新竹總公司 : 30076 新竹科學工業園區研發二路 21 號 2 樓, TEL : 03-666-3188, FAX : 03-666-9288.

台北分公司 : 11503 台北市南港區園區街 3 號 9 樓 B2, TEL : 02-2655-8658, FAX : 02-2655-8699.

E-mail : sales@lumtec.biz ; Web : <http://www.lumtec.com.tw>



Luminescence Technology Corp.



*Figure reference: *Optics Express* Vol. 27, Issue 18, pp. 25410-25419 (2019)

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Taipei office : 9F., No.3, Park St., Nangang Dist., Taipei City 11503, Taiwan, R.O.C., TEL : +886-2-2655-8658, FAX : +886-2-2655-8699.

新竹總公司 : 30076 新竹科學工業園區研發二路 21 號 2 樓, TEL : 03-666-3188, FAX : 03-666-9288.

台北分公司 : 11503 台北市南港區園區街 3 號 9 樓 B2, TEL : 02-2655-8658, FAX : 02-2655-8699.

E-mail : sales@lumtec.biz ; Web : <http://www.lumtec.com.tw>