

## Color Tunable Organic Light Emitting Diodes with DC and AC drive systems

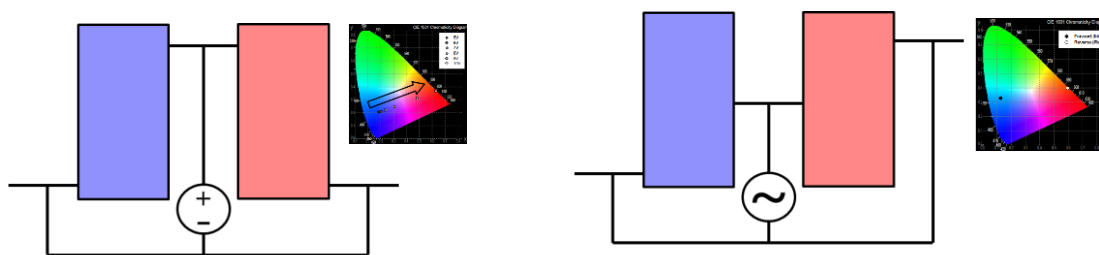
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The color tunable organic light emitting diodes (OLEDs) have been attracted lots of interests due to their unique features when they used as a lighting application. There have been some reports to realize such kind of application. In most case, researchers tried to use the different operating voltage behavior of the different colored emitters because they have different band gaps. However, the low efficiency of the blue material normally gives poor characteristics because low band gap materials could emit seriously during emitting of blue materials. Thus, we fabricated on the color tunable OLEDs by using vertically stacked AC structure.

Device with AC drive systems, in forward bias, only blue emission could be occurred and red emission could not observed. Otherwise, when negative bias was applied on two electrodes at both ends (reverse bias), there was red color without blue emission. The device characteristics in reverse bias were (at 1000 cd/m<sup>2</sup>) 5.2 and 5.2 V for the blue OLED and red OLED, respectively. Also, current efficiency and power efficiency at 1000 cd/m<sup>2</sup> 33.8 cd/A and 20.4 lm/W for the blue OLED and 20.8 cd/A and 12.6 lm/W for the red OLED, respectively. Fig. 1 (a) and (b) show color coordinates of each unit OLED. The CIE 1931 coordinates were (0.12, 0.31) for the blue OLED and (0.60, 0.40) for the red OLED. Maximum peaks in EL spectra were 470 nm and 596 nm for blue and red emission, respectively.



**Fig. 1. (a) Schematic diagram and CIE 1931 coordinates of Devices with DC drive system (b) Schematic diagram and CIE 1931 coordinates of Devices with AC drive system**

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