

color filter ($ACR \leq 5:1$). But if the QD area is reduced to 0.4, with the help of color filter, the ACR keeps larger than 5:1. However, if it is under full daylight, the QD area ratio needs to be further reduced to 0.1 in order to make the display to be adequately readable. The trade-off will be decreased optical efficiency. To address this issue, the AR coating can be optimized to reduce the surface reflectance to 0.2% so that the QD area ratio can be kept to 0.3 [18].

4. Conclusion

We have analyzed the ambient light excitation of QD-converted micro-LED displays and the calculated results agree well with the simulated ones based on LightTools. In order to improve the ambient contrast ratio, a top layer of color filter is employed to absorb the ambient light. Besides, by reducing the area ratio of QD to one subpixel to 0.1, the ambient contrast ratio can be improved to 5:1 under the full daylight, which is adequately readable.

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6. References

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