



## Chromaticity-tunable Phosphor-in-glass for Long-lifetime High-power Warm w-LEDs

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Owing to the merits of high luminous efficiency, low power consumption, and good reliability, white light-emitting diodes (w-LEDs), made of InGaN blue-emitting chip and YAG: Ce<sup>3+</sup> yellow phosphor, have found widespread applications in the fields of lightings and displays. Despite these advantages, the current mainstream w-LED products suffer from tough issues of red deficiency and poor thermal stability in high-power condition. Aiming to solve these problems, we are engaged in developing chromaticity-tunable phosphor-in-glass (PiG) color converters by incorporating the commercial CASN:Eu<sup>2+</sup> or the synthesized Mn<sup>4+</sup> activated red phosphor (e.g., CaMg<sub>2</sub>Al<sub>16</sub>O<sub>27</sub>:Mn<sup>4+</sup> and BaMgAl<sub>10</sub>O<sub>17</sub>:Mn<sup>4+</sup>, Mg<sup>2+</sup>), accompanied with the YAG:Ce<sup>3+</sup> yellow phosphor, into low-melting inorganic glass matrix. Benefiting from supplement of the red-emissive component in electroluminescent spectrum, CRI and CCT of the fabricated w-LED are greatly improved. Thanks to the excellent thermal/chemical stability of inorganic glass, the long-term heat-radiation induced yellowing and aging of high-power w-LED using the conventional organic encapsulant can be well overcome.

### SHORT BIO:

Yuan-sheng Wang received his BS from University of Science and Technology of China (USTC), MS from Institute of Solid State Physics, Chinese Academy of Sciences (CAS), and Ph.D in Condensed Matter Physics from USTC (1989). He was appointed Professor of Chemistry in Fuzhou University, China in 1999. He has Joined Fujian Institute of Research on the Structure of Matter (FJIRSM), CAS since 2002, leading a group conducting researches on advanced optical materials. Since then, he has published over 180 papers in peer-reviewed academic journals, and received more than 7000 citations, with h-index of 50.