WHAT IS CLAIMED IS:

[CLAIM 1]

A light emitting diode structure, comprising:

a substrate;

a chip disposed on the substrate;

transparent cup walls disposed on the substrate, wherein the transparent cup walls surround the chip;

a wavelength conversion layer covering the chip between the transparent cup walls; and

a reflective layer disposed on the wavelength conversion layer, wherein the reflective layer comprises a curved bottom surface protruding toward the chip, and

wherein the wavelength conversion layer fills a space defined by the substrate, the transparent cup walls and the reflective layer such that a bottom surface of the wavelength conversion layer directly contacts the substrate, a side surface of the wavelength conversion layer directly contacts the transparent cup walls, and a top surface of the wavelength conversion layer directly contacts the reflective layer.

[CLAIM 2]

The light emitting diode structure of claim 1, wherein a transmittance of the transparent cup walls is in a range of 20% to 100%.

[CLAIM 3]

The light emitting diode structure of claim 1, wherein an angle between an inner wall of the transparent cup walls and the substrate is in a range of 90° to 170°.

[CLAIM 4]

The light emitting diode structure of claim 1, wherein an outer wall of the transparent cup walls is substantially vertical to the substrate.

[CLAIM 5]

The light emitting diode structure of claim 1, wherein a thickness from the curved bottom surface of the reflective layer to a top surface of the reflective layer is in a range of 30 μm to 100 μm.

[CLAIM 6]

The light emitting diode structure of claim 1, wherein an edge thickness of the reflective layer approaches zero.

[CLAIM 7]

The light emitting diode structure of claim 1, ~~wherein the reflective layer contacts the transparent cup walls, and~~ wherein the wavelength conversion layer is free from being exposed to environment.

[CLAIM 8]

The light emitting diode structure of claim 1, wherein a reflectance of the reflective layer is in a range of 90% to 100%.

[CLAIM 9]

The light emitting diode structure of claim 1, wherein the reflective layer comprises a substantially flat top surface.

[CLAIM 10]

The light emitting diode structure of claim 1, wherein a beam angle of the light emitting diode structure is in a range of 95° to 175°.

[CLAIM 11]

A backlight module, comprising:

a light emitting diode structure, comprising:

a substrate;

a chip disposed on the substrate;

transparent cup walls disposed on the substrate, wherein the transparent cup walls surround the chip;

a wavelength conversion layer covering the chip between the transparent cup walls; and

a reflective layer disposed on the wavelength conversion layer, wherein the reflective layer comprises a curved bottom surface protruding toward the chip, and

wherein the wavelength conversion layer fills a space defined by the substrate, the transparent cup walls and the reflective layer such that a bottom surface of the wavelength conversion layer directly contacts the substrate, a side surface of the wavelength conversion layer directly contacts the transparent cup walls, and a top surface of the wavelength conversion layer directly contacts the reflective layer; and

an optical film disposed over the light emitting diode structure.

[CLAIM 12]

The backlight module of claim 11, further comprising a wire connecting the chip and the substrate.

[CLAIM 13]

The backlight module of claim 11, wherein an angle between an inner wall of the transparent cup walls and the substrate is in a range of 90° to 170°.

[CLAIM 14]

The backlight module of claim 11, wherein the wavelength conversion layer comprises a fluorescent material to emit a second light different from a first light emitted by the chip.

[CLAIM 15]

The backlight module of claim 11, wherein a central thickness from the curved bottom surface of the reflective layer to a top surface of the reflective layer is in a range of 30 μm to 100 μm.

[CLAIM 16]

The backlight module of claim 11, wherein a beam angle of the light emitting diode structure is in a range of 95° to 175°.

[CLAIM 17]

A method of forming a light emitting diode structure, comprising:

forming transparent cup walls on a substrate;

disposing a chip on the substrate, wherein the transparent cup walls surround the chip;

connecting a wire to the chip;

forming a wavelength conversion layer between the transparent cup walls, wherein the wavelength conversion layer covers the chip and comprises a central-recessed top surface, and

wherein the wavelength conversion layer fills a space defined by the substrate and the transparent cup walls such that a bottom surface of the wavelength conversion layer directly contacts the substrate, and a side surface of the wavelength conversion layer directly contacts the transparent cup walls; and

forming a reflective layer on the wavelength conversion layer and performing a baking process, wherein the central-recessed top surface of the wavelength conversion layer directly contacts the reflective layer.

[CLAIM 18]

The method of claim 17, wherein a difference between a central thickness of the wavelength conversion layer and an edge thickness of the wavelength conversion layer is larger than 30 μm.

[CLAIM 19]

The method of claim 17, wherein forming the wavelength conversion layer comprises dispensing a material of the wavelength conversion layer between the transparent cup walls.

[CLAIM 20]

The method of claim 17, wherein the baking process comprises a plurality of heating stages with gradient temperatures.