

Claims

Claim 1

A plant cultivation LED light source, comprising:

a substrate;

5 at least one blue LED chip, provided on the substrate, for emitting blue light;

10 a red phosphor mixed resin which is provided so as to cover the blue LED chip and contains red phosphors being dispersed or settled down therein, each of the red phosphors emitting red light in response to excitation light emitted from the blue LED chip; and

 a silicone resin which is transparent and is provided so as to cover the red phosphor mixed resin.

15 Claim 2

 The plant cultivation LED light source as set forth in claim 1, wherein the substrate is made of ceramic or a film-like base material.

20 Claim 3

 The plant cultivation LED light source as set forth in claim 1 or 2, wherein each of the red phosphor mixed resin and the silicone resin has a dome shape.

Claim 4

The plant cultivation LED light source as set forth in claim 1, 2, or 3, wherein:

5 the blue LED chip emits light having a light emission peak at a wavelength in a range of 400 nm to 480 nm; and
each of the red phosphors emits light having a light emission peak at a wavelength in a range of 620 nm to 700 nm.

Claim 5

10 The plant cultivation LED light source as set forth in any one of claims 1 through 4, wherein:

15 a plurality of LED packages are provided on the substrate, each of the plurality of LED packages including the blue LED chip, the red phosphor mixed resin, and the silicone resin, the red phosphor mixed resin and the silicone resin being provided so as to cover the blue LED chip, and

20 as the plurality of LED packages, LED packages having different light amount ratios of blue region emission light to red region emission light are provided in combination.

Claims

Claim 1

A plant cultivation LED light source, comprising:

a substrate;

at least one blue LED chip, provided on the substrate, for emitting blue light having a light emission peak at a wavelength in a range of 400 nm to 480 nm;

a red phosphor mixed resin which is provided so as to cover the blue LED chip and contains red phosphors being dispersed or settled down therein, each of the red phosphors emitting, in response to excitation light emitted from the blue LED chip, red light having a light emission peak at a wavelength in a range of 620 nm to 700 nm;

a silicone resin which is transparent, has a dome shape, and is provided so as to cover the red phosphor mixed resin; and

a plurality of LED packages provided on a mounting substrate, each of the plurality of LED packages including (i) the at least one blue LED chip provided on the substrate, (ii) the red phosphor mixed resin, and (iii) the silicone resin, the red phosphor mixed resin and the silicone resin being provided so as to cover the at least one blue LED chip.

Claim 2

The plant cultivation LED light source as set forth in claim 1, wherein as the plurality of LED packages, LED packages have different light amount ratios of blue region emission light to red region emission light are provided in combination.

Claim 3

The plant cultivation LED light source as set forth in claim 1, wherein the substrate is made of ceramic or a film-like base material.

Claim 4

The plant cultivation LED light source as set forth in claim 1, wherein each of the red phosphor mixed resin and the silicone resin has a dome shape.

Claim 5

The plant cultivation LED light source as set forth in claim 1, wherein (i) the plurality of LED packages, each of which includes the blue LED chip, the red phosphor mixed resin, and the silicone resin, the red phosphor mixed resin and the silicone resin being provided so as to cover the blue LED chip and (ii) a plurality of LED packages for illumination are provided on the mounting substrate.