Description

ESD protection component and component comprising an ESD protection component and an LED

An ESD protection component is specified. Furthermore, a component which comprises an LED and an ESD protection component is specified.

The document DE 10 2008 024 481 A1 discloses an electrical component arrangement which has a semiconductor component and a varistor element for protecting the semiconductor component from electrostatic discharges.

A problem to be solved consists in specifying an ESD protection component with improved properties. A further problem consists in specifying a component comprising an LED and an improved ESD protection component.

An ESD protection component is specified. Preferably, the ESD protection component comprises a ceramic material.

"ESD" in the text below stands for "electrostatic discharge". This means that the ESD protection component is preferably designed to protect other components, for example semiconductor components, from overvoltages. The ESD protection component can also be used for protecting other components from overcurrent. For example, the ESD protection component is designed for protecting an LED. "LED" in the text which follows stands for "light-emitting diode".

According to a first aspect, there is provided an ESD protection component, comprising a basic body with a lower side, wherein the basic body comprises a ceramic material, and at least one floating inner electrode, wherein the floating inner electrode is not electrically connected to the outside, wherein a distance

between the lower side and the floating inner electrode is two to 100 ceramic grains and wherein the basic body is formed symmetrically with respect to a plane which runs parallel to the lower side and central through the basic body.

According to a second aspect, there is provided an ESD protection component, comprising a basic body with a lower side, a first floating inner electrode and, adjacent to this, a second floating inner electrode, wherein the first floating inner electrode and the second floating inner electrode are not electrically connected to the outside, wherein the distance between the first floating inner electrode and the second floating inner electrode is greater than the distance between the first floating inner electrode and the lower side of the basic body, and wherein a contact connection is arranged on the lower side of the basic body.

The ESD protection component is preferably in the form of an ultrathin protection component. Preferably, the ESD protection component has a height of between 50 μm

Patent claims

1. An ESD protection component ~~(3)~~, comprising a basic body ~~(21)~~ with a lower side ~~(12)~~, wherein the basic body ~~(21)~~ comprises a ceramic material, and at least one floating inner electrode ~~(4a)~~, wherein the floating inner electrode is not electrically connected to the outside, wherein a distance ~~(16)~~ between the lower side ~~(12)~~ and the floating inner electrode ~~(4a)~~ is two to 100 ceramic grains and wherein the basic body is formed symmetrically with respect to a plane which runs parallel to the lower side and central through the basic body.

2. The ESD protection component according to claim 1, in which the distance ~~(16)~~ is two ceramic grains.

3. The ESD protection component according to either of claims 1 and 2, comprising a BGA or LGA termination ~~(22)~~.

~~4. An ESD protection component (3), comprising a ceramic material and a BGA or LGA termination (22).~~

~~5. The ESD protection component according to claim 4, having at least one floating inner electrode (4a).~~

~~6. The ESD protection component according to claim 5, having a basic body (21) with a lower side (12), wherein a distance (16) between the lower side (12) and the floating inner electrode (4a) is two to 100 ceramic grains.~~

~~7~~4. The ESD protection component according to one of the preceding claims, comprising a second floating inner electrode ~~(4b)~~, wherein a distance between the first floating inner electrode ~~(4a)~~ and the second floating inner electrode ~~(4b)~~ is greater than the distance ~~(16)~~ between the first floating inner electrode ~~(4a)~~ and the lower side ~~(12)~~ of the basic body ~~(21)~~.

~~8~~5. The ESD protection component according to one of the preceding claims, having a contact connection for electrically contact-connecting the basic body ~~(21)~~, wherein the contact connection is arranged on the lower side ~~(12)~~ of the basic body ~~(21)~~.

~~9. The ESD protection component according to one of the preceding claims, wherein the basic body (21) is formed symmetrically with respect to a plane which runs parallel to the lower side (12) of the basic body (21).~~

~~10~~6. An ESD protection component, comprising a basic body ~~(21)~~ with a lower side ~~(12)~~, a first floating inner electrode ~~(4a)~~ and, adjacent to this, a second floating inner electrode ~~(4b)~~, wherein the first floating inner electrode and the second floating inner electrode are not electrically connected to the outside, wherein the distance between the first floating inner electrode ~~(4a)~~ and the second floating inner electrode ~~(4b)~~ is greater than the distance ~~(16)~~ between the first floating inner electrode ~~(4a)~~ and the lower side ~~(12)~~ of the basic body ~~(21)~~, and wherein a contact connection is arranged on the lower side ~~(12)~~ of the basic body ~~(21)~~.

~~11~~7. The ESD protection component according to one of the preceding claims, in which the ceramic material comprises a ZnO-Bi-Sb material or ZnO-Pr material or consists of a ZnO-Bi-Sb material or ZnO-Pr material.

~~12~~8. A component ~~(20)~~ comprising a carrier ~~(1)~~, on which an LED ~~(2)~~ and an ESD protection component ~~(3)~~ are arranged, wherein the ESD protection component ~~(3)~~ is designed according to one of claims 1 to ~~11~~7.

~~13~~9. The component according to claim ~~12~~8,

in which the carrier ~~(1)~~ comprises a ceramic material or an organic material or consists of a ceramic material or an organic material.

~~14~~10. The component according to either of claims ~~12 —~~8 and ~~13~~9, in which the carrier ~~(1)~~ has at least one thermal via, which runs perpendicular to a surface and improves the thermal conductivity of the LED ~~(2)~~ to a housing.

~~15~~11. The component according to one of claims ~~12 —~~8 to ~~14~~10, in which the carrier ~~(1)~~ comprises a metal, wherein the metal is coated with an electrically insulating layer ~~(13)~~.