

Appeal decision

Appeal No. 2012-8250

USA

Appellant VISHAY SILICONIX INC.

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The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2008-519702, entitled "Complete Power Management System Implemented in a Single Surface Mount Package" [international publication on January 11, 2007 (International Publication No. WO2007/005864), national publication of the translated version (of PCT application) on December 11, 2008 (National Publication of International Patent Application No. 2008-545280)] has resulted in the following appeal decision.

Conclusion

The appeal of the case was groundless.

Reason

No 1. History of the procedures

The application was filed on June 30, 2006 as an international filing date (Priority Claim under the Paris Convention: July 1, 2005, US), and a decision for refusal was issued on December 21, 2011. An appeal against the examiner's decision of refusal was requested and procedures were amended on May 7, 2012.

No. 2. Examiner's decision

One of the reasons for refusal of the examiner's decision is acknowledged as follows:

"The applicant should not be granted a patent for the claimed inventions in the claims of this application under the provisions of Article 29(1)(iii) of the Patent Act for the reason that the claimed inventions have been deemed to be identical with the inventions described in the distributed publication listed below or made available to the public through electric telecommunication lines in Japan or other foreign countries prior to the filing of the application.

1. Japanese Unexamined Patent Application Publication No. 2004-228402"

No. 3. Decision to dismiss amendment dated May 7, 2012

[Conclusion of Decision to Dismiss Amendment]

The amendment dated May 7, 2012 (hereinafter referred to as the "Amendment") shall be dismissed.

[Reason]

1. Outline of the Amendment

The Amendment further amends the scope of claims amended on August 2, 2011.

As for claim 1,

the description,

"A device comprising:

a controller integrated circuit;

a power MOSFET coupled to the controller integrated circuit; and

a plurality of passive components comprising at least one inductor;

wherein the controller integrated circuit, the power MOSFET, and the plurality of passive components are functionally coupled to implement a complete power management system;

the controller integrated circuit, the power MOSFET, and the plurality of passive components are mounted to a metal leadframe, and

the controller integrated circuit, the power MOSFET, and the plurality of passive components are encapsulated in plastic to form a single package."

is replaced with

the description,

"A device comprising:

a controller integrated circuit;

a power MOSFET coupled to the controller integrated circuit; and

a plurality of surface mounted passive components comprising at least one inductor;

wherein the controller integrated circuit, the power MOSFET, and the plurality of surface mounted passive components are functionally coupled to implement a complete power management system;

the controller integrated circuit, the power MOSFET, and the plurality of surface mounted passive components are directly mounted to a metal leadframe, and

the controller integrated circuit, the power MOSFET, and the plurality of surface mounted passive components are encapsulated in plastic to form a single lead-free surface mount package."

The amendment of claim 1 limits a passive component to "a surface mounted passive component," and limits a package to "a lead-free surface mount package". The amendment of claim 1 obviously does not change the field of industrial application and the problem to be solved.

Therefore, at least the amendment of claim 1 falls under the purpose of restriction of the scope of claims in Article 17-2(4)(ii) of the Patent Act before revision by Act No. 55 of 2006, of which the provisions then in force shall remain applicable according to revision supplement Article 3(1) of Act No. 55 of 2006.

It will be examined whether the appellant should be granted a patent for invention described in claim 1 after the Amendment (hereinafter referred to as the "Amended Invention") independently at the time of patent application (whether it falls under the provisions of Article 126(5) of the Patent Act which is applied mutatis mutandis pursuant to the provisions of Article 17-2(5) of the Patent Act before provision by Act No. 55 of 2006, of which the provisions then in force shall remain applicable according to revision supplement Article 3(1) of Act No. 55 of 2006).

2. Cited publication

Japanese Unexamined Patent Application Publication No. 2004-228402 (hereinafter referred to as the "Cited Document") which is a publication cited for reasons for refusal of the examiner's decision and distributed before the priority date for the application, describes the following matters and drawings in relation to a semiconductor device.

a) "[Scope of Claims]"

[Claim 1]

A semiconductor device including: a die pad; a semiconductor chip adhered to and mounted on the principal face of the die pad; a plurality of leads one-end sides of which configure inner leads and the other-end sides of which configure outer leads; a plurality of passive components adhered to and mounted on the inner leads and electrically connected to the semiconductor chip; and a package housing the die pad, the semiconductor chip, the inner leads and the passive components, wherein the plurality of passive components is integrally configured.

[Claim 2]

The semiconductor device described in Claim 1 configured to include a pair of electrodes arranged on surfaces of the passive components facing the inner leads, to electrically connect the electrode pair with the inner leads by mounting the passive components on the inner leads for connection."

b) "[0001]

[Technical field of the invention]

The Invention relates to a semiconductor device, particularly a high-voltage control semiconductor device, including a semiconductor element and a plurality of passive components integrated with each other."

c) "[0018]

The semiconductor device of the Invention may include, as a semiconductor element, a power element and the power-element control semiconductor element. The semiconductor device is used as a high-voltage control power device. As the power element, a PwTr, a MOSFET, especially an IGBT, a thyristor, or a dedicated power element can be used.

[0019]

The semiconductor elements are die-bonded to a predetermined die pad, and connected electrically to inner leads of a leadframe by wire bonding, or the like. The semiconductor elements constitute a semiconductor device having a predetermined performance, in cooperation with the passive components mounted on the inner leads.

[0020]

As the passive components of the Invention, a capacitor, a resistor, a coil, or the like can be used."

d) "[0021]

The leadframe used in the Invention is formed by pressing or etching a thin copper plate, especially by pressing in order to reduce cost in mass production, preferably."

e) "[0022]

The semiconductor device of the Invention includes the semiconductor elements, passive components, and inner leads encapsulated in a package, and is configured to expose only an outer lead, to electrically connect the inside and outside of the semiconductor device. As the package, encapsulation resin can be used. Especially, the resin improved in insulating property, high-frequency characteristics, strength, adhesion, moisture resistance, and moldability, especially the resin improved in characteristics in a high temperature environment, is selected. Epoxy resin can be used, for example."

f) "[0023]

[Examples]

Example 1.

The following is an example of fabricating a power device by use of a semiconductor device of the Invention. Before resin molding, the power device 9 is formed by arranging and fixing semiconductor elements 1, 4 and passive components 70, 71, 72, 8 to a leadframe 2, as shown in FIG. 1. The leadframe 2 includes two die pads 10, 40, and inner leads 21-28, which are fixed to a frame 20 via an outer lead 29, or the like. The leadframe is formed of a thin copper plate."

Regarding the descriptions a-f and figures, it can be said that the following invention is described in the Cited Document (hereinafter referred to as the "Cited Invention").

"The semiconductor device fabricating a power device includes: a semiconductor element; a plurality of passive components; a leadframe having die pads and inner leads and formed of a thin copper plate; and a package housing the die pads, the semiconductor element, the inner leads, and the passive components,

wherein the semiconductor element constitutes the semiconductor device having a predetermined performance, in cooperation with the passive components, and includes a power element using a MOSFET and the power-element control semiconductor element,

a capacitor, a resistor, a coil, or the like is used for the passive component,

the semiconductor element is die-bonded to the die pad and the passive component is adhered to and mounted on the inner lead,

a pair of electrodes is arranged on a surface of the passive component facing the inner lead and is electrically connected to the inner lead by mounting the passive component on the inner lead for connection,

encapsulation resin is used as a package."

3. Comparison/judgment

The Amended Invention is compared with the Cited Invention.

"The power element using a MOSFET" and "the leadframe formed of a thin copper plate" in the Cited Invention correspond to "the power MOSFET" and "the metal leadframe" in the Amended Invention, respectively.

In terms of the technical common sense that a circuit for controlling a semiconductor element, such as a MOSFET, in a semiconductor device is composed of an integrated circuit (refer to paragraph [0003] in Japanese Unexamined Patent Application Publication No. 2004-140305, for example), it is obvious that the power-element control semiconductor element is composed of an integrated circuit, in the Cited Invention. It can be said that "the power element control semiconductor element" in the Cited Invention corresponds to "the controller integrated circuit" in the Amended Invention.

The Cited Invention includes a plurality of passive components, for which a coil is used. In the Cited Invention, the passive components are adhered to and mounted on the inner leads of the leadframe and a pair of electrodes is arranged on a surface of the passive component facing the inner lead. The electrode pair and the inner leads are electrically connected by mounting the passive components on the inner leads for connection. In terms of the fact that a surface mounted passive component such as a coil is well known (refer to paragraphs [0003], [0020], and FIG. 2 in Japanese Unexamined Patent Application Publication No. 2005-142280, for example), it is obvious that the passive component in the Cited Invention is a surface mounted passive component mounted on a surface of an inner lead. Thus, the Cited Invention meets the requirement in the Amended Invention "a plurality of surface mounted passive components comprising at least one inductor."

In the Cited Invention, the power element using the MOSFET and the power-element control semiconductor element constitute a semiconductor device having a predetermined performance, in cooperation with the passive components and a power device is fabricated by use of the semiconductor device. Thus, the

Cited Invention meets the requirement in the Amended Invention "the controller integrated circuit, the power MOSFET and the plurality of surface mounted passive components are functionally coupled to implement a complete power management system."

In the Cited Invention, the power element using the MOSFET and the power-element control semiconductor element are die-bonded to the die pad of the leadframe and the passive components are mounted on the surface of the inner leads of the leadframe. Thus, the Cited Invention meets the requirement in the Amended Invention "the controller integrated circuit, the power MOSFET and the plurality of surface mounted passive components are directly mounted to a metal leadframe."

The Cited Invention includes a package for housing the power element using the MOSFET, the power-element control semiconductor element, and the passive components and uses encapsulation resin as the package. Thus, the Cited Invention meets the requirement in the Amended Invention "the controller integrated circuit, the power MOSFET and the plurality of surface mounted passive components are encapsulated in plastic to form a single package."

For the reasons stated above, the Amended Invention and the Cited Invention are common, according to the description in the Amended Invention, in the point of "A device comprising:

- a controller integrated circuit;
- a power MOSFET coupled to the controller integrated circuit;
- a plurality of surface mounted passive components comprising at least one inductor;

- wherein the controller integrated circuit, the power MOSFET, and the plurality of surface mounted passive components are functionally coupled to implement a complete power management system;

- the controller integrated circuit, the power MOSFET, and the plurality of surface mounted passive components are directly mounted to a metal leadframe, and

- the controller integrated circuit, the power MOSFET, and the plurality of surface mounted passive components are encapsulated in plastic to form a single package," while differing in the following points.

[The different feature]

The package in the Amended Invention is a lead-free surface mount package,

whereas, the package in the Cited Invention is unclear whether it is a lead-free surface mount package.

The above-mentioned different feature will be examined.

It is well known that in a semiconductor device, a package is surface mounted by use of lead-free solder, as described in, for example, Japanese Unexamined Patent Application Publication No. 2000-223638 (This document is cited in Reconsideration report, refer to paragraphs [0014]-[0015]), which is a publication distributed before the priority date of the Invention.

Therefore, in the Cited Invention, a person skilled in the art could easily achieve a configuration relating to the different features by referring the well-known arts.

Effects obtained by the Amended Invention could also be easily predicted by a person skilled in the art from the Cited Invention and the well-known arts and cannot be remarkable.

Therefore, the Amended Invention could be easily made by a person skilled in the art based on the Cited Invention and the well-known arts, and appellant should not be granted a patent for it independently at the time of patent application under the provisions of Article 29(2) of the Patent Act.

The appellant alleges in the response letter submitted on January 28, 2013 that "using lead is indispensable for the Invention described in the publication 1, and thus we consider that a person skilled in the art cannot be triggered to find the Invention without lead from the description in publication 1, even if it is described in publication 3". However, no mention of using lead is made in the publication 1 (Cited Document). Therefore, the allegation of the appellant that "using lead is indispensable for the Invention described in the publication 1" is inappropriate.

The appellant presents a draft amendment in the response letter submitted on January 28, 2013. The Invention described in Claim 1 in the draft amendment is one obtained by adding a limitation that "a part of the metal leadframe is exposed on a back side of the package," which is described in Claim 2, to Claim 1 in Scope of Claims amended on May 7, 2012. However, the point of the limitation is the well-known arts, as described in a notice of reasons for refusal submitted on February 1, 2011. Thus, appellant still should not be granted a patent for the Invention in this

draft amendment in accordance with the provisions of Article 29(2) of the Patent Act.

4. Conclusion

As described above, the amendment violates the provisions of Article 126(5) of the Patent Act which is applied mutatis mutandis pursuant to the provisions of Article 17-2(5) of the Patent Act before revision by Act No. 55 of 2006, of which the provisions then in force shall remain applicable according to revision supplement Article 3(1) of Act No. 55 of 2006. Therefore, it shall be dismissed under the provisions of Article 53(1) of the Patent Act applied mutatis mutandis by replacing certain terms pursuant to Article 159(1) of the Patent Act.

No. 4. The Invention

As the amendment was dismissed as above, the Invention relating to Claim 1 of this application is specified by matters described in Claim 1 of the scope of claims amended on August 2, 2011 (hereinafter referred to as the "Invention." Refer to "1. Outline of the Amendment" of "No. 3").

No. 5. Cited Publication

Publications cited in reasons for refusal of the examiner's decision and described matters in the publications are as described in "2. Cited publication" of "No. 3".

No. 6. Comparison/judgment

The Invention is one which excludes the limitation described in "1. Outline of the Amendment" of "No. 3" from the Amended Invention.

A part of the limitation is the different feature between the Amended Invention and the Cited Invention as described in "3. Comparison/judgment" of "No. 3".

As the Invention is one which excludes the limitation that is the different feature between the Amended Invention and the Cited invention from the Amended Invention, there is no difference between the Invention and the Cited Invention. Therefore, the Invention is identical to the invention described in the Cited Document.

No. 7. Conclusion

As described above, the Invention of the case is identical to the invention described in the Cited Document, and appellant should not be granted a patent for it under the provisions of Article 29(1)(iii) of the Patent Act. This application should be rejected

without examining inventions relating to other claims of the application.

Therefore, the examiner's decision is reasonable, and the appeal decision shall be made as described in the conclusion.

March 12, 2013

Chief administrative judge: SENBA, Takayuki

Administrative judge: SUGIURA, Takayuki

Administrative judge: OZEKI, Mineo