

AVAGO TECHNOLOGIES, LTD.  
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Fort Collins, Colorado 80525

ATTORNEY DOCKET NO. 70030259-02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
Patent Application Transmittal Letter

COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria VA 22313-1450

Sir:

Transmitted herewith for filing under 37 CFR 1.53(b) is a(n):  Utility  Design  
 Original patent application,  
 Continuation-in-part

INVENTOR(S): Lee et al.

TITLE: SEMICONDUCTOR DEVICE WITH A LIGHT EMITTING SEMICONDUCTOR DIE

Enclosed are:

The Declaration and Power of Attorney  Signed  Unsigned or partially signed  
 10 sheets of drawings (one set)  Associate Power of Attorney  
 Form PTO-1449  Information Disclosure Statement and Form PTO-1449  
 Priority document(s)  Other: Other Fee: \$

CLAIMS AS FILED BY OTHER THAN A SMALL ENTITY				
(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) TOTALS
TOTAL CLAIMS	20 - 20	0	X \$ 50	\$ 0
INDEPENDENT CLAIMS	3 - 3	0	X \$200	\$ 0
ANY MULTIPLE DEPENDENT CLAIMS			\$360	\$ 0
TOTAL SHEETS OF SPEC AND DWGS	30 - 100	0	X \$250/50	\$ 0
BASIC FEE: Design (\$350.00); Utility (\$1000.00)				\$ 1,000
TOTAL FILING FEE				\$ 1,000
OTHER FEES				\$ 0
TOTAL CHARGES TO DEPOSIT ACCOUNT				\$ 1,000

Charge \$1,000 to Deposit Account 50-3718. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 50-3718 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 50-3718 under 37 CFR 1.16, 1.17, 1.19, 1.20 and 1.21. A duplicate copy of this sheet is enclosed.

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I hereby certify that this is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450.

Typed Name:

Signature: \_\_\_\_\_

Respectfully submitted,

Lee et al.

By /thomas h. ham/

Thomas H. Ham  
Attorney/Agent for Applicant(s)

Reg. No. 43,654

Date: August 14, 2007

Telephone No. (925) 249-1300

Rev 10/04 (TransNew)

**DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION** **ATTORNEY DOCKET NO. 70030259-02**

As a below named inventor, I hereby declare that:

My residence/correspondence post office address and citizenship are as stated below next to my name:

I believe I am the original, first and sole inventor (If only one name is listed below) or an original, first and joint inventor (If plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**SEMICONDUCTOR DEVICE WITH A LIGHT EMITTING SEMICONDUCTOR DIE**

the specification of which is attached hereto unless the following box is checked:

was filed on \_\_\_\_\_ as US Application Serial No. or PCT International Application Number \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment(s) referred to above. I acknowledge the duty to disclose all information which is material to patentability as defined in 37 CFR 1.56.

**Foreign Application(s) and/or Claim of Foreign Priority**

I hereby claim foreign priority benefits under Title 35, United States Code Section 119 of any foreign application(s) for patent or inventor(s) certificate listed below and have also identified below any foreign application for patent or inventor(s) certificate having a filing date before that of the application on which priority is claimed:

COUNTRY	APPLICATION NUMBER	DATE FILED	PRIORITY CLAIMED UNDER 35 U.S.C. 119
			YES: <input type="checkbox"/> NO: <input type="checkbox"/>
			YES: <input type="checkbox"/> NO: <input type="checkbox"/>

**Provisional Application**

I hereby claim the benefit under Title 35, United States Code Section 119(e) of any United States provisional application(s) listed below:

APPLICATION SERIAL NUMBER	FILING DATE

**U. S. Priority Claim:**

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NUMBER	FILING DATE	STATUS (patented/pending/abandoned)
10/608,605	06/27/2003	pending

**POWER OF ATTORNEY:**

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: PRACTITIONERS ASSOCIATED WITH CUSTOMER NUMBER 57299.

<p><b>Send Correspondence to :</b></p> <p><b>Customer Number</b> <span style="border: 1px solid black; padding: 2px;">57299</span></p> <p><b>AVAGO TECHNOLOGIES, LTD.</b> 4380 Ziegler Road Fort Collins, CO 80525</p>	<p><b>Direct Telephone Calls To:</b></p> <p><b>Thomas H. Ham</b> (925) 249-1300</p> <p style="text-align: center;"><b>OR</b></p> <p><b>Scott Weitzel</b> (970) 288-0747</p>
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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*[Signature]*  
 Inventor's Signature

*August 10, 2007*  
 Date

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Citizenship:

Inventor's Signature

Date

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Date

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Correspondence Post Office Address:

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Date

**DECLARATION AND POWER OF ATTORNEY  
FOR PATENT APPLICATION (Continued)**

**ATTORNEY DOCKET NO. 70030259-02**

**Full Name of # 2 Joint Inventor: Kee Yean Ng**  
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Date

**Full Name of # 4 Joint Inventor: Cheng Why Tan**  
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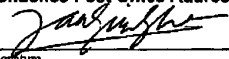
**Citizenship: Malaysia**

\_\_\_\_\_  
Inventor's Signature

\_\_\_\_\_  
Date

**Full Name of # 5 Joint Inventor: Gin Ghee Tan**  
**Residence: Penang, Malaysia**  
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**Citizenship: Malaysia**

  
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Inventor's Signature

8/12/2007  
Date

**Full Name of # Joint Inventor:**  
**Residence:**  
**Correspondence Post Office Address:**

**Citizenship:**

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Inventor's Signature

\_\_\_\_\_  
Date

**Full Name of # Joint Inventor:**  
**Residence:**  
**Correspondence Post Office Address:**

**Citizenship:**

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Inventor's Signature

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Date

**Full Name of # Joint Inventor:**  
**Residence:**  
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**Citizenship:**

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Inventor's Signature

\_\_\_\_\_  
Date

**Full Name of # Joint Inventor:**  
**Residence:**  
**Correspondence Post Office Address:**

**Citizenship:**

\_\_\_\_\_  
Inventor's Signature

\_\_\_\_\_  
Date

SEMICONDUCTOR DEVICE WITH A LIGHT EMITTING  
SEMICONDUCTOR DIE

RELATED APPLICATION

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**[0001]** This application is a continuation-in-part of U.S. Patent Application Serial No. 10/608,605, filed June 27, 2003, which is related to U.S. Patent Application Serial No. 10/608,606, filed June 27, 2003. Both disclosures are specifically incorporated herein by reference.

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BACKGROUND OF THE INVENTION

**[0002]** Many types of conventional semiconductor device are composed of a semiconductor die mounted in a packaging device. One type of packaging device widely used in the industry includes a metal lead frame. A metallization layer of aluminum located on the bottom surface of the semiconductor die is bonded to a conductive surface that forms part of the lead frame to attach and electrically connect the die to the lead frame. Additionally, electrical connections are made between bonding pads on the top surface of the die and other leads of the lead frame to provide additional electrical connections to the die. The lead frame and semiconductor die are then encapsulated to complete the semiconductor device. The packaging device protects the semiconductor die and provides electrical and mechanical connections to the die that are compatible with conventional printed circuit board assembly processes.

**[0003]** In such conventional semiconductor devices, the bottom surface of the die is typically bonded to the conductive surface of the lead frame using a silver epoxy adhesive that cures at a relatively low temperature, typically about 120 °C. The curing temperature of the silver epoxy adhesive is compatible with the other materials of the packaging device.

**[0004]** The volume of the packaging device used in such conventional semiconductor devices, i.e., the lead frame and the encapsulant, is typically many times that of the semiconductor die. This makes such conventional semiconductor devices unsuitable for use in applications in which a high packing density is

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