

**IN THE UNITED STATES INTERNATIONAL TRADE COMMISSION  
WASHINGTON, DISTRICT OF COLUMBIA**

In The Matter of:

Investigation No. 337-TA-\_\_\_\_\_

CERTAIN SILICON MICROPHONE PACKAGES  
AND PRODUCTS CONTAINING THE SAME

**COMPLAINT OF KNOWLES ELECTRONICS LLC**  
**UNDER SECTION 337 OF THE TARIFF ACT OF 1930, AS AMENDED**

Complainant:

KNOWLES ELECTRONICS LLC  
1151 Maplewood Drive  
Itasca, Illinois 60143  
(630) 250 5930

Proposed Respondents:

ANALOG DEVICES INC.  
One Technology Way  
P. O. Box 9106  
Norwood, Massachusetts 02062-9106  
(781) 329-4700

Counsel For Complainant:

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**Table of Exhibits**

Exhibit A	Declaration of Ray Cabrera
Exhibit B	Article: SiSonic: the First Commercialized MEMS Microphone
Exhibit C	Claim Chart Showing Domestic Industry – Technical Prong
Exhibit D	Knowles Press Release, August 17, 2009
Exhibit E	U.S. Patent No. 6,781, 231
Exhibit F	Assignment of '231 Patent
Exhibit G	U.S. Patent No. 7,242,089
Exhibit H	Assignment of '089 Patent
Exhibit I	List of Licensees to the '231 and '089 Patents
Exhibit J	Declaration of Jeff Niew
Exhibit K	ADI Microphone Data Sheets
Exhibit L	Claim Charts Showing Infringement of U.S. Patents Nos. 6,781,231 and 7,242,089 by ADI Silicon Microphones
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**Table of Attachments (Provided on Compact Disc)**

Prosecution history of the '231 patent
Prosecution history of the '089 patent
References cited in prosecution of '231 patent
References cited in prosecution of '089 patent

## **I. Introduction**

1. This Complaint is filed by Complainant, KNOWLES ELECTRONICS LLC (“KNOWLES”), pursuant to Section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337).
2. This Complaint is based upon the unlawful importation into the United States, by the Proposed Respondents, of certain silicon microphones packages and products containing the same (the “Accused Products”).
3. KNOWLES has established a domestic industry (“Knowles Domestic Industry”) and has invested substantial capital, labor and resources in the research and development of acoustic technology and, in particular, of silicon microphones. KNOWLES’S product, developed as a result of its domestic investment, is the “SiSonic” silicon microphone. The SiSonic microphone is the standard for many of today’s cellular telephones. The SiSonic microphone, along with its associated proprietary technology, is one of KNOWLES’S most valuable assets.
4. As a further result of KNOWLES’S domestic research and development activities, KNOWLES developed and is the owner of the Invention claimed in U.S. Patent No. 6,781,231, which issued on August 24, 2004 and is entitled “Microelectromechanical System Package with Environmental and Interference Shield” (the “Knowles ‘231 Patent”). Knowles also developed and is the owner of the Invention claimed in U.S. Patent No. 7,242,089, which issued on July 10, 2007 and is entitled “Miniature Silicon Condenser Microphone” (the “Knowles ‘089 Patent”). The Inventions claimed in the Knowles ‘231 Patent and the Knowles ‘089 Patent (collectively the “Knowles Patents”) are embodied in the SiSonic microphone, specifically in the SiSonic Silicon Microphone Package. The establishment of a Knowles Domestic Industry in products embodying the claims of the ‘231 and ‘089 patents has previously been adjudicated and affirmed by the orders of this Commission in Investigation 337-TA-629.

5. One or more claims of the Knowles '231 Patent are infringed by the Accused Products, including silicon microphone packages of Respondent Analog Devices, Inc. ("ADI") bearing part or lot numbers 403 IP625 ("ADI Silicon Microphone Packages"), products containing the ADI Silicon Microphone Packages, and portable media player/recorders of non-Respondent Apple, Inc. ("Apple") offered for sale and sold under the iPod Nano ("Nano") model designation. ADI Silicon Microphone Packages have been imported and/or sold for importation by ADI in violation of Section 337(a)(1)(B) of the Tariff Act of 1930. Manufacturing of such products occurs predominantly outside the United States, and therefore, Accused Products have been and continue to be imported into the United States. Other products within which the ADI Silicon Microphone Packages may be imported include Laptops, Personal Digital Assistants, Mobile Phones, Hearing Aids, and similar Audio Devices.

6. One or more claims of the Knowles '089 Patent are infringed by the Accused Products, including the ADI Silicon Microphone Packages, and any products containing the ADI Silicon Microphone Packages such as the Apple Nano products. The ADI Silicon Microphone Packages have been imported and/or sold for importation by ADI in violation of Section 337(a)(1)(B) of the Tariff Act of 1930. Manufacturing of such devices occurs predominantly outside the United States, and therefore, Accused Products have been and continue to be imported into the United States. Other products within which the ADI Silicon Microphone Packages may be imported include Laptops, Personal Digital Assistants, Mobile Phones, Hearing Aids, and similar Audio Devices.

7. Accordingly, the Proposed Respondent ADI has engaged in unfair acts in violation of Section 337 of the Tariff Act of 1930, as amended, through the importation and sale for importation within the United States of the Accused Products.

8. Therefore, KNOWLES seeks an order (or orders), as provided by Section 337(d) of the Tariff Act of 1930, as amended, excluding the Accused Products of the proposed Respondent, including downstream products of the proposed Respondent, from entry into the United States.

9. KNOWLES further seeks a cease and desist order (or orders) pursuant to Section 337(f) of the Tariff Act of 1930, as amended, compelling the Proposed Respondent ADI to stop the promotion, marketing, advertising, demonstrating or warehousing of inventory of the Accused Products for distribution, sale and/or use within the United States.

10. Upon information and belief, at least some of the Accused Products will be imported into the United States within downstream products of the proposed Respondent, and as such, KNOWLES has a significant interest in excluding downstream products of the proposed respondent incorporating the Accused Products from importation into the United States.

11. Current alternatives to the Accused Products include products incorporating the SiSonic Microphone Package and alternative non-infringing microphone technology.

12. Upon information and belief, manufacturers will not be substantially burdened by the exclusion of the Accused Products due to the availability of non-infringing alternatives.

## **II. Complainant**

13. KNOWLES is a Limited Liability Company organized under the laws of the State of Delaware and having its principal offices in the city of Itasca, Illinois, employing approximately 198 persons in the United States, 4000 worldwide. *See* Exhibit A, Cabrera declaration.

14. KNOWLES is a provider of microphones to, *inter alia*, the cellular telephone industry. Knowles, which shipped its first MEMS Microphone in 2003, is currently ranked in

the top 5 Global Market Share Suppliers of MEMS for Consumer and Mobile Applications and is the world leader in MEMS-based silicon microphone manufacturing.

15. In connection with its research, development and manufacture of acoustic equipment, KNOWLES, with the Knowles '231 Patent, was awarded protection within the United States of a "Microelectromechanical System Package with Environmental and Interference Shield." Further, with the Knowles '089 Patent, Knowles was awarded protection within the United States of a "Miniature Silicon Condenser Microphone." The validity of claims 1 and 2 of the '231 patent and 1, 2, 9, 15, 17, 28 and 29 of the '089 patent have been adjudicated by this Commission and upheld in investigation 337-TA-629.

### **III. Proposed Respondents**

16. ADI is a Massachusetts Corporation with offices at One Technology Way, P. O. Box 9106, Norwood, Massachusetts.

17. Upon information and belief, ADI manufactures and imports into the United States and/or sells for importation into the United States a variety of silicon microphone packages that infringe the Knowles Patents.

18. Upon information and belief, ADI or one of its affiliates sells its silicon microphone packages to overseas manufacturers including Apple into downstream products such as Apple's iPod Nano product line. These products are assembled outside the United States and are subsequently imported into the United States to be sold to the public.

### **IV. Knowles's Products And The Technology-At-Issue and the Knowles Patents**

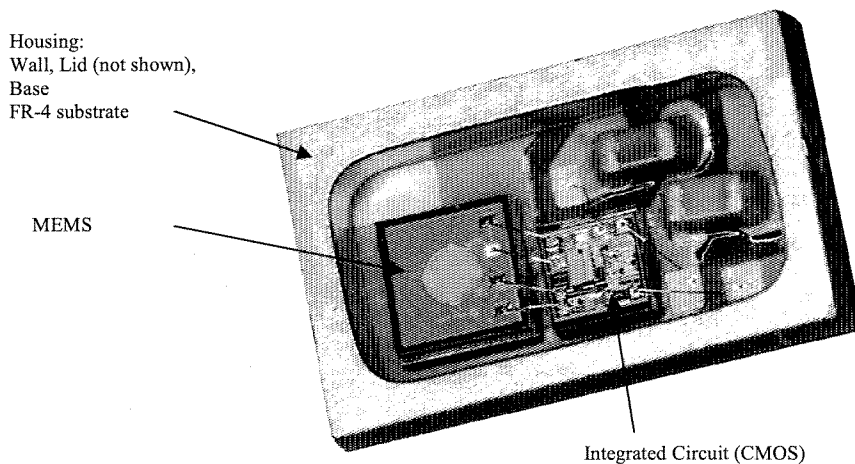
19. Knowles is a pioneer in the field of silicon microphones, also known as microelectromechanical system microphones ("MEMS"). Silicon microphones are a unique type of microphone using processes like silicon etching that are normally used to create microchips. The technology-at-issue relates to a unique and proprietary package for a silicon microphone that

consists of a microphone diaphragm made of silicon produced using the Microelectromechanical Systems (“MEMS”) process, a substrate, and a cover. KNOWLES began to research and develop its MEMS Silicon Microphone Technology in or around 1990, and, to date, has invested millions of dollars leading to its SiSonic Microphone Package. Exhibit A. The KNOWLES silicon microphone package, which is sold under the trade name “SiSonic,” was the first commercialized MEMS microphone package. Exhibit B.

20. One of the challenges KNOWLES faced in creating a commercially viable product was to create a MEMS microphone that matched the performance, reliability and pricing of traditional Electret Condenser Microphones (ECMs). KNOWLES met and surpassed this challenge and developed a surface mountable package that was less expensive to use than existing solutions.

21. KNOWLES developed a unique packaging for surrounding the microphone components. The packaging simultaneously provides protection from electromagnetic radiation, and allows certain components access to the surrounding environment. KNOWLES’S innovative packaging includes a base, a wall and a lid - all of which are made of a material which is conductive to shield against electromagnetic radiation - laminated together. *See Exhibit C.*

22. A SiSonic Microphone Package is depicted below in cutaway form.



23. The SiSonic Microphone Package can be picked up and placed, like other electronic components, without damaging the microphone's functions. As such, the manufacturing costs for MEMS microphone packages, and products utilizing the same, have been substantially reduced through KNOWLES'S innovations. KNOWLES'S MEMS Silicon Microphone Technology significantly improves manufacturability, environmental stability and reliability and significantly reduces the size of a microphone package.

24. In August, 2009, Knowles reached a major milestone in the history of MEMS technology with the shipment of its 1 Billionth SiSonic surface mount MEMS microphone. Today, with over 30 part models and multiple generations available, SiSonic is recognized as the preferred acoustic component in mobile phones, laptops, gaming systems, and headsets. Exhibit D, Knowles press release, August 17, 2009.

a. **Knowles's U.S. Patent No. 6,781,231**

25. From its research and development on MEMS microphones, including its MEMS Silicon Microphone Technology, KNOWLES obtained, on August 24, 2004, the duly, properly and legally issued U.S. Patent No. 6,781,231, entitled "Microelectromechanical System Package with Environmental and Interference Shield." KNOWLES obtained the Knowles '231 Patent as

assignee of Inventor and KNOWLES employee, Anthony D. Minervini. A copy of the Knowles '231 Patent is submitted with this Complaint as Exhibit E. A certified copy of the Knowles '231 Patent has been requested from the U.S. Patent and Trademark Office, and will be submitted to the Commission upon its receipt.

26. The Knowles '231 Patent is the product of U.S. Patent Application No. 10/238,256, filed September 10, 2002. The prosecution history and cited references of the Knowles '231 Patent are submitted as on the Attachment Compact Disc provided with this Complaint. KNOWLES has formally requested certified copies of the prosecution history of the Knowles '231 Patent, and will submit a certified copy of the prosecution history and three copies thereof as such copies become available.

27. Generally speaking, the Knowles '231 Patent is directed to a package in acoustic systems for enclosing a surface mountable MEMS microphone. The package generally includes a substrate having a surface for supporting a MEMS microphone and a cover, within which the MEMS microphone – and related equipment – are disposed, an acoustic port for allowing the acoustic signal to reach the microphone, and protection from an interference signal.

28. Anthony D. Minervini, the Inventor of the Knowles '231 Patent, assigned all rights, title, and interest in the Knowles '231 Patent to KNOWLES. A copy of the Assignment document for the Knowles '231 Patent is submitted with this Complaint as Exhibit F. A certified copy of the same has been requested from the U.S. Patent and Trademark Office and will be provided to the Commission upon receipt.

29. There are no foreign applications for any patent claiming priority to the application leading to the Knowles '231 Patent. Nevertheless, application PCT W02005/036698

assigned to Knowles was directed to the same invention described in the Knowles '231 Patent, but the application was knowingly allowed to expire.

**b. Knowles's U.S. Patent No. 7,242,089**

30. Further from its research and development on MEMS microphones, including its MEMS Silicon Microphone Technology, KNOWLES obtained, on July 10, 2007, the duly, properly and legally issued U.S. Patent No. 7,242,089 entitled "Miniature Silicon Condenser Microphone." KNOWLES obtained the Knowles '089 Patent as assignee of Inventor and KNOWLES employee, Anthony D. Minervini. A copy of the Knowles '089 Patent is submitted with this Complaint as Exhibit G. A certified copy of the Knowles '089 Patent has been requested from the U.S. Patent and Trademark Office, and will be submitted to the Commission upon its receipt.

31. The Knowles '089 Patent is the product of U.S. Patent Application No. 11/112,043, filed April 22, 2005. The Knowles '089 claims priority to U.S. Provisional Application No. 60/253,543, filed November 28, 2000, and is a division of U.S. Patent Application No. 09/886,854, filed June 21, 2001, now U.S. Patent No. 7,166,910. The afore-discussed U.S. Patent Applications and U.S. Patents are commonly assigned to KNOWLES.

32. The prosecution history and cited references of the Knowles '089 Patent are submitted as on the Attachment Compact Disc provided with this Complaint. KNOWLES has formally requested certified copies of the prosecution history of the Knowles '089 Patent, and will submit a certified copy of the prosecution history and three copies thereof as such copies become available.

33. Generally speaking, the Knowles '089 Patent is directed to a surface mountable microphone package. The microphone package generally includes a chamber, a surface

mountable transducer unit mounted on one of the members forming the chamber, a volume defined by the transducer and one of the members, an aperture for allowing an acoustic signal to reach the transducer, and terminal pads coupled to a patterned conductive layer coupled to the transducer.

34. Anthony D. Minervini, the Inventor of the Knowles '089 Patent, assigned all rights, title, and interest in the Knowles '089 Patent to KNOWLES. A copy of the Assignment document for the Knowles '089 Patent is submitted with this Complaint as Exhibit H. A certified copy of the same has been requested from the U.S. Patent and Trademark Office and will be provided to the Commission upon receipt.

35. As stated above, the Knowles '089 Patent claims priority to U.S. Patent Application No. 09/886,854, filed June 21, 2001, now U.S. Patent No. 7,166,910. PCT Publication No. W002/45463 designated for Japan and the European Patent Office, was filed October 22, 2001 claiming priority to U.S. Patent Application No. 09/886,854. The European (EP20070002957) and Japanese applications are currently pending. In Singapore, Application No. 96969, filed October 22, 2001 claiming priority to PCT Publication No. WO02/45463, was granted on November 20, 2005.

**b. Licensees**

36. The parties licensing the Knowles '231 and '089 Patents are given in Exhibit I.

**VI. The Domestic Industry**

37. A Domestic Industry, under Section 337(a)(3) exists in the articles protected by the '231 and '089 patents.

38. A Domestic Industry under Subparts (A), (B) and (C) ("the economic prong") Section 337(a)(3) exists by virtue of KNOWLES'S activities within the United States, including

KNOWLES'S manufacture, research and development, repair and service of its MEMS Silicon Microphone Technology and its SiSonic Microphone Package.

39. The existence of the economic prong of a domestic industry with respect to both of the '231 and '089 patents was adjudicated and affirmed in investigation 337-TA-629.

40. KNOWLES'S domestic activities include its significant investment in plant and equipment, significant investment in labor and capital and substantial investment in the exploitation of its intellectual property portfolio. Exhibit A. KNOWLES'S domestic facility includes salaried research and design employees, salaried administrative employees, multi-million dollar manufacturing equipment for a small scale production line and other assets allowing for the research, development, production and sales of acoustic equipment. *Id.* A substantial portion of the Knowles Domestic Industry is specifically dedicated to its SiSonic Microphone Package. KNOWLES has justified its substantial domestic investment through the anticipated commercial profits of the exploitation and/or sale of its SiSonic Microphone Package. *Id.*

41. KNOWLES domestically practices at least one claim of the Knowles '231 Patent and the Knowles '089 Patent. *See* Exhibit C.

42. The construction of Knowles's SiSonic microphone packages is substantially the same as during investigation 337-TA-629, when the same products were adjudicated by this Commission to practice at least one claim of both the '231 and '089 patents. Exhibit J, Niew Declaration.

## **VII. Unfair Acts Of The Proposed Respondents – Patent Infringement**

43. One or more claims of the Knowles Patents are infringed by ADI Silicon Microphone Packages and products containing the same.

44. An exemplary ADI Silicon Microphone Package is depicted below:

## ADI Silicon Microphone: Exterior

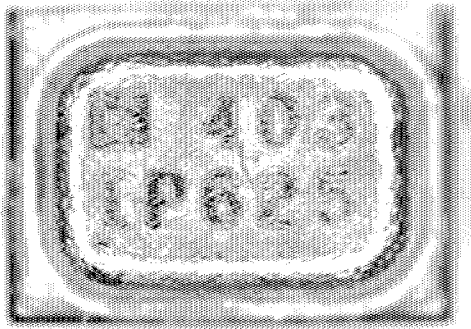
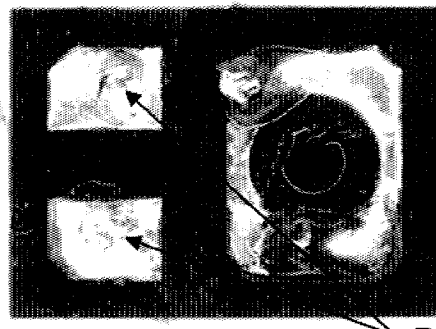


Fig. 1



Bond pads

Fig. 2

## ADI Silicon Microphone: Interior

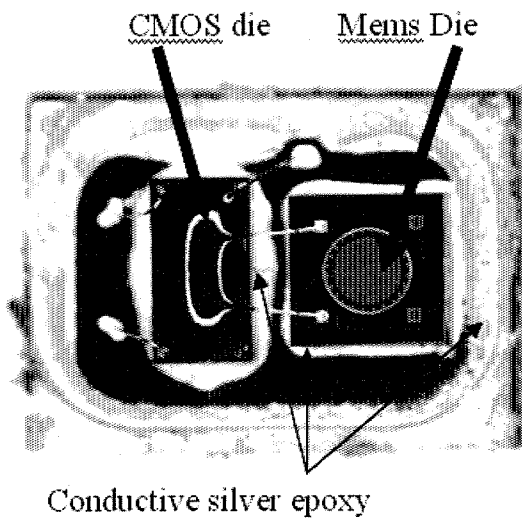


Fig. 5

Tin plated conductive metal lid (inside view)

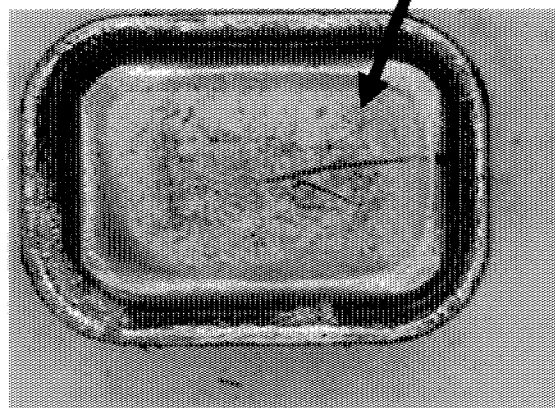


Fig. 6

45. Other ADI silicon microphone models are depicted on ADI's website and include model designations ADMP 401 and ADMP 421, as shown in Exhibit K.

46. The ADI Silicon Microphone Packages infringe the Knowles '231 Patent and the Knowles '089 Patent. Claim Charts applying exemplary claims of the Knowles '231 Patent and the Knowles '089 Patent to a representative ADI Silicon Microphone Package are submitted with this Complaint as Exhibit L.

47. The packaging as depicted above consists of a substrate member, which supports a surface mountable MEMS microphone, bonded to a metal cover member with conductive epoxy. The substrate member is formed of a fiberglass reinforced epoxy composite with embedded copper layers. The cover is formed of a stainless steel with tin plating and is attached with silver-loaded epoxy to the substrate. The electrically conductive cover inherently protects from interference signals. While the sides of the ADI Silicon Microphone are bonded to the substrate, the center portion of the cover is spaced away. Exhibit M, Cech Declaration.

48. The above-described and depicted ADI silicon microphone was found in an Apple iPod Nano brand media player/recorder purchased from Apple's online store at [www.apple.com](http://www.apple.com) and shipped to a U.S. address, showing that such devices integrate the infringing ADI silicon microphones and are intended for importation into the United States. Exhibit M, Cech declaration; Exhibit J, Niew declaration.

49. The iPod Nano referenced above notes that it is "assembled in China" and is therefore necessarily imported into the United States for sale. Exhibit J, Niew declaration.

50. Importation, sale, offers for sale and use of ADI Silicon Microphones in or into the United States constitutes patent infringement and violation of section 337.

#### **IX. Other Proceedings.**

51. KNOWLES filed a Complaint on November 14, 2006 in the Northern District of Illinois alleging non-respondent American Audio Components, Inc., General MEMS Corporation, and their subsidiaries, divisions, and affiliates violated trade secrets related silicon

microphones. That action, case number 06-cv-6213, was settled and was dismissed on January 7, 2008.

52. KNOWLES filed a Complaint on December 13, 2006 in the Eastern District of Texas alleging non-respondent, AKUSTICA INC., infringed the Knowles '231 Patent. That action, case number 06-cv-527, was settled and, on June 13, 2007, KNOWLES filed to dismiss the action under Rule 41(a)(1)(i) of the Federal Rules of Civil Procedure.

53. The Commission instituted investigation 337-TA-629 against Memstech Technology Berhad ("Memstech") on January 4, 2008. On August 19, 2009, the Commission issued an opinion and limited exclusion order finding that Knowles's patents were valid and infringed and excluding infringing Memstech articles from importation into the U.S.

54. On October 6, 2009, Knowles filed a Complaint in the Northern District of Illinois alleging that respondent ADI infringed the '231 and '089 patents. That action has been assigned case number 09-cv-6238 and is currently pending.

55. On the following day, October 7, 2009, ADI has requested the U.S. Patent and Trademark office re-examine the '231 patent. That request is pending, but has not been granted at the time of this filing. The request has been assigned reexam control number 95/000,509.

56. On November 4, 2009, ADI requested the U.S. Patent and Trademark office re-examine the '089 patent. That request is pending but has not been granted at the time of this filing. The request has been assigned reexam control number 95/000,515.

57. On October 29, 2009, Wolfson Microelectronics Plc requested reexamination of the '231 patent. That request has been assigned control number 95/001,251. On November 3, 2009, the USPTO notified counsel for Wolfson that its request regarding the '231 patent was deficient and would not be afforded a filing date until deficiencies were cured.

58. On October 29, 2009, Wolfson Microelectronics Plc requested reexamination of the '089 patent. That request is pending but has not been granted at the time of this filing. That request has been assigned control number 95/000,513.

**X. Harmonized Tariff Schedule Numbers**

59. Knowles states on information and belief that the HTSUS numbers that the accused products may be imported under include:

- a. 8518.10.0000,
- b. 8518.10.4000 or
- c. 8518.10.8030.

60. Knowles has no direct information regarding the HTSUS Numbers under which any of the Accused Products are imported.

**XI. Requests For Relief**

61. Wherefore, pursuant to ITC Rule 210.12 (a)(10), KNOWLES respectfully requests that the Commission:

- A. Institute an immediate investigation pursuant to Section 337 of the Tariff Act of 1930, as amended, into the Proposed Respondent's unfair acts and methods of competition in the importation into the United States, and the sale for importation into the United States, of the Accused Products that infringe the Knowles Patents;
- B. Set a target date of no more than twelve months;
- C. Schedule and conduct a hearing pursuant to Section 337(c) for purposes of receiving evidence and hearing argument concerning whether there has been a violation of Section 337, and following the hearing, to determine that there has been a violation of Section 337;

- D. Issue a permanent exclusion order pursuant to Section 337(d), excluding from entry into the United States the Accused Products that infringe the Knowles Patents;
- E. Issue an order or orders pursuant to Section 337(f) to cease and desist unfair acts and methods of competition, including assembly, testing, marketing, distributing, offering for sale, selling, or otherwise transferring in the United States the Accused Products that infringe the Knowles Patents; and
- F. Grant such other and further relief as the Commission finds appropriate and just under the law, based upon the facts complained of herein and determined in the investigation.

Dated: November 12, 2009

Respectfully submitted,

Counsel for Complainant

KNOWLES ELECTRONICS, LLC

By: /s/Timothy Sendek  
One Of Their Attorneys

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Steven McMahon Zeller  
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**Verification Of Complaint**

I, Austin Victor, declare, in accordance with 19 C.F.R. § 210.4 and 210.12(a), under penalty of perjury, that the following statements are true:

I am the Intellectual Property Counsel of Knowles Electronics, LLC ("Knowles"), and am duly authorized to sign this Complaint on behalf of Knowles;

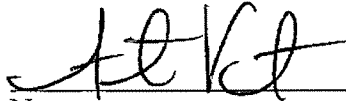
I have read the foregoing Complaint and am aware of its contents;

To the best of my knowledge, information, and belief based on reasonable inquiry, the foregoing Complaint is well-founded in fact, and is warranted by existing law or by a non-frivolous argument for the extension, modification or reversal of existing law or the establishment of new law;

The allegations and other factual contentions have evidentiary support or are likely to have evidentiary support after a reasonable opportunity for further investigation or discovery; and

The foregoing Complaint is not being filed for an improper purpose, such as to harass or to cause unnecessary delay or needless increase in the cost of litigation.

Executed on this 9<sup>th</sup> Day of November, 2009.



Name

Intellectual Property Counsel

Title

CHICAGO2773842.5  
IDVTKS - 092771/0020