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ATTORNEYS FOR PLAINTIFF CONTINENTAL CIRCUITS, LLC

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF ARIZONA

CONTINENTAL CIRCUITS, LLC, Plaintiff, v. INTEL CORP.; IBIDEN U.S.A. CORP.; IBIDEN CO., LTD., Defendants.	CASE NO. CV-16-2026-PHX-DGC **AMENDED COMPLAINT FOR PATENT INFRINGEMENT** **JURY TRIAL DEMANDED**

Plaintiff Continental Circuits LLC files this Amended Complaint against Defendants Intel Corporation, Ibiden U.S.A. Corporation, and Ibiden Co., Ltd. (collectively, "Defendants") for patent infringement under 35 U.S.C. § 271 and alleges, based on its own personal knowledge with respect to its own actions and based upon information and belief with respect to all others' actions, as follows:

THE PARTIES

1. Plaintiff Continental Circuits LLC (hereinafter "Plaintiff" or "Continental Circuits") is a limited liability company organized and existing under the laws of the State of Arizona, with its principal place of business at 1 East Washington Street, Suite 590, Phoenix, Arizona 85004.

2. Defendant Intel Corporation (hereinafter "Intel") is a corporation organized and existing under the laws of the State of Delaware, with its principal place of business at 2200 Mission College Blvd., RNB-5-125, Santa Clara, California 95054. Intel has designated CT Corporation System, 3800 N. Central Avenue, Suite 460, Phoenix, Arizona 85012 as its agent for service of process.

3. Defendant Ibiden U.S.A. Corporation ("Ibiden USA") is a corporation organized and existing under the laws of the State of California, with its principal place of business at 3900 Freedom Circle, Suite 130, Santa Clara, California 95054. Ibiden USA has designated CT Corporation System, 3800 N. Central Avenue, Suite 460, Phoenix, Arizona 85012 as its agent for service of process.

4. Defendant Ibiden Corporation, Ltd., ("Ibiden Japan") is a corporation organized and existing under the laws of Japan, with its principal place of business at 2-1, Kanda-cho, Ogaki, Gifu 503-8604, Japan.

JURISDICTION AND VENUE

5. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq*. This Court has jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

6. This Court has personal jurisdiction over Intel. Intel has multiple facilities located in the State of Arizona, including facilities at 5000 West Chandler Boulevard, Chandler, Arizona 85226 and 4500 South Dobson Road, Chandler, Arizona 85248. Intel's main research and development facility for global packaging is located in Chandler, Arizona, where Intel employs over 1,000 packaging engineers.

7. In addition to Intel's global packaging hub being located in this District, Intel also imports finished products into the United States through Arizona. Intel enjoys the benefits of Foreign Trade Zone 75C, granted by the city of Phoenix, which include savings on duty rates of foreign-sourced items and streamlined customs procedures.

8. Intel conducts business and has committed acts of patent infringement and/or has induced acts of patent infringement by others in the District of Arizona and/or has contributed to patent infringement by others in the District of Arizona and elsewhere in the United States.

9. Ibiden USA is a wholly-owned subsidiary of Ibiden Japan (collectively, "Ibiden"). Ibiden has at least one facility in the State of Arizona at 2727 W. Frye Road, Suite 140, Chandler, Arizona 85224.

10. This Court has personal jurisdiction over Ibiden. Ibiden conducts business and has committed acts of patent infringement and/or has induced acts of patent infringement by others in the District of Arizona and/or has contributed to patent infringement by others in the District of Arizona and elsewhere in the United States. Ibiden has placed infringing products in the stream of commerce with the expectation that such infringing products would be made, used, sold, and/or offered for sale within the District of Arizona.

11. Venue is proper in this district pursuant to 28 U.S.C. § 1391(b), 1391(c) and 1400(b) because, among other things, each of Intel and Ibiden are subject to personal jurisdiction in the District of Arizona, has regularly conducted business in this judicial district, and certain of the acts complained of herein occurred in this judicial district.

PATENTS-IN-SUIT

12. On November 7, 2000, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,141,870 (the "'870 patent"), entitled "Method for Making Electrical Device" to Mr. Brian J. McDermott, et al.

13. On March 2, 2004, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,700,069 (the "'069 patent"), entitled "Circuit Board or Other

Multilayer Electrical Device Made by Forming Teeth to Join Layers" to Mr. Brian J. McDermott, et al.

14. On March 10, 2009, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,501,582 (the "'582 patent"), entitled "Electrical Device and Method for Making Same" to Mr. Brian J. McDermott, et al. A true and correct copy of the '582 patent is attached hereto as Exhibit A.

15. On October 2, 2012, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,278,560 (the "'560 patent"), entitled "Electrical Device with Teeth Joining Layers and Method for Making the Same" to Mr. Brian J. McDermott, et al. A true and correct copy of the '560 patent is attached hereto as Exhibit B.

16. On November 12, 2013, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,581,105 (the "'105 patent"), entitled "Electrical Device with Teeth Joining Layers and Method for Making the Same" to Mr. Brian J. McDermott, et al. A true and correct copy of the '105 patent is attached hereto as Exhibit C.

17. On June 21, 2016, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,374,912 (the "'912 patent"), entitled "Electrical Device with Teeth Joining Layers and Method for Making the Same" to Mr. Brian J. McDermott, et al. A true and correct copy of the '912 patent is attached hereto as Exhibit D.

18. The '870 patent, '069 patent, '582 patent, '560 patent,'105 patent, and '912 patent share a common specification.

19. Continental Circuits owns all rights, title, and interest in and to the '582 patent, the '560 patent, the '105 patent, and the '912 patent (the "patents-in-suit") and possesses all rights of recovery.

FACTUAL ALLEGATIONS

20. The patents-in-suit generally cover a multilayer electrical device, such as a circuit board, having a roughened surface structure for joining at least one of the layers, and methods of making the same.

21. The technology covered by the patents-in-suit is illustrated in Figure 1:

FIG. 1

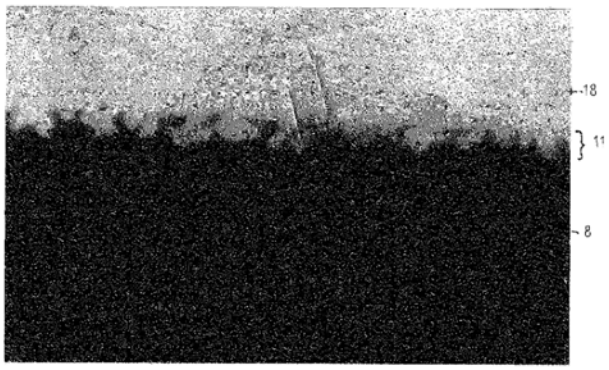


Fig. 1, ’560 patent.

22. Continental Circuits Inc. was formed in 1970 to manufacture printed circuit boards.

23. Continental Circuits Inc. manufactured printed circuit boards for large companies such as Intel, Motorola, and others.

24. In the 1996 to 1998 timeframe, representatives from Continental Circuits Inc. held multiple meetings with representatives of Intel to discuss, *inter alia*, design rules and manufacturing reliability of printed circuit boards.

25. Continental Circuits Inc.’s products were widely distributed in the printed circuit board market.

26. By 1997, Continental Circuits Inc. ranked in the top 10% of all United States printed circuit board suppliers.

27. Mr. Brian McDermott, Mr. Daniel McGowan, Mr. Ralph Leo Spotts, Jr., and Mr. Sid Tryzbiak, the co-inventors of the patents-in-suit, were employees of Continental Circuits Inc.

28. The co-inventors observed poor adhesion and delamination between the dielectric material and the conductive layer in multilayer electrical devices in the industry. To solve this problem, the co-inventors developed a novel surface roughening technique that offered stronger adhesion between these layers. This roughening technique produced a non-uniformly roughened surface, as shown in Figure 1.

29. Jeff Long, a sales representative at Continental Circuits Inc. in the mid-1990s, learned of the technology covered by the patents-in-suit during his tenure working with the company.

30. Unbeknownst to Continental Circuits Inc., in approximately 1997, Mr. Long entered into a business arrangement with Ibiden while still employed by Continental Circuits Inc.

31. Continental Circuits Inc. terminated its relationship with Mr. Long in 1997.

32. Without permission from Continental Circuits Inc., Mr. Long shared the technology described in the patents-in-suit with Ibiden and began directing business away from Continental Circuits Inc. to Ibiden.

33. Ibiden's supplier relationship with Intel grew significantly in the late 1990s.

34. In early 2005, a representative of Continental Circuits contacted Mr. David Simon, Chief Legal Counsel for Intel, informing Mr. Simon of the '870 patent, the '069 patent, and the continuation application that led to the issuance of the '582, '560, '105, and '912 patents, enclosing a copy of the patents and application, and expressing an interest in licensing of the portfolio to Intel.

35. In early 2005, a representative of Continental Circuits contacted Mr. Asusushi Uchida, General Counsel for Ibiden Circuits of America, informing Mr. Uchida of the '870 patent, the '069 patent, and the continuation application that led to the issuance of the '582, '560,'105, and '912 patents, enclosing a copy of the patents and application, and expressing an interest in licensing of the portfolio to Ibiden.

36. On March 2, 2005, Ms. Martha Peralez, Outside Submissions Coordinator for Intel, responded to the letter of Paragraph 34, stating that "[a]n Intel attorney is reviewing the matter."

37. On April 21, 2005, Ms. Peralez sent an additional letter, stating that "Intel has determined not to pursue this matter."

38. The patents-in-suit have been publicly available from the United States Patent Office website since their respective dates of issuance.

39. Defendants are familiar with the United States patent system, having filed for and been granted U.S. patents of their own.

40. Defendants are familiar with the process of searching for and identifying issued U.S. patents.

41. In 2014, a conversation took place between a representative of Continental Circuits and a business development manager at Ibiden. In that conversation, it was confirmed that the technology claimed in the patents-in-suit is still in use at Ibiden today. When questioned further about specific processes claimed in the patents-in-suit, the Ibiden manager became evasive and ended the discussion.

42. Intel is one of the world's largest manufacturers of central processing units ("CPUs").

43. Intel buys package substrates for its products, including Intel's CPUs, chipsets, and wireless network adapters from package substrate suppliers.

44. Ibiden is Intel's largest package substrate supplier, and Ibiden's substrate packaging materials have been deemed essential to Intel's success. (*See* Exhibit E.)

45. Intel collaborates with its suppliers, including Ibiden, to develop specifications for the design of packaging to ultimately be used in Intel products, including specifications for delamination, signal integrity, thermal integrity, mechanical integrity, and overall package design.

46. If a particular package design is unsatisfactory, Intel will alter the specifications.

47. If a supplier fails to meet Intel's specifications, Intel will cease purchasing package substrates from that supplier.

48. Approximately ninety-percent of the interaction between Intel and its package substrate suppliers (*e.g.*, Ibiden) takes place in Phoenix, AZ.

49. Intel does not have any rights to the patents-in-suit.

50. Ibiden does not have any rights to the patents-in-suit.

51. Intel's Atom series of processors consists of at least the following products: Intel's Atom D2700, D2550, D2500, E3805, E3815, E3825, E3826, E3827, E3845, E680T, E680, E665CT, E665C, E660T, E660, E645CT, E645C, E640T, E640, E620T, E620, N2800, N2600, N570, N550, Z670, Z650, C2750, C2730, C2550, C2530, C2350, S1260, S1240, S1220, S1289, S1279, S1269, C2758, C2738, C2718, C2558, C2538, C2518, C2508, C2358, C2338, C2308, x7-Z8700, x7-Z8750, x5-Z8500, x5-Z8300, x5-Z8330, x5-E8000, x5-Z8350, x5-Z8550, x3-C3445, x3-C3405, x3-C3230RK, x3-C3200RK, x3-C3130, Z3795, Z3785, Z3775D, Z3775, Z3770D, Z3770, Z3745D, Z3745, Z3740D, Z3740, Z3736G, Z3736F, Z3735G, Z3735F, Z3735E, Z3735D, Z3580, Z3570, Z3560, Z3530, Z3590, Z3480, Z3460, Z2760, Z2580, Z2560, Z2520, Z2480, Z2460, and Z2420 processors, and any same or later generation Atom Processors (hereinafter Intel's "Atom series" of processors).

52. Intel's Atom series of processors meet or embody the limitations of at least one claim of the '582 patent.

53. Intel's Atom series of processors meet or embody the limitations of at least one claim of the '560 patent.

54. Intel's Atom series of processors meet or embody the limitations of at least one claim of the '105 patent.

55. Intel's Atom series of processors meet or embody the limitations of at least one claim of the '912 patent.

56. Intel's Core series of processors consists of at least the following products: Intel's Core i3-2100, i3-2100T, i3-2102, i3-2105, i3-2115C, i3-2120, i3-2120T, i3-2125, i3-2130, i3-2310E, i3-2310M, i3-2312M, i3-2328M, i3-2330E, i3-2330M, i3-2340UE, i3-2348M, i3-2350M, i3-2357M, i3-2365M, i3-2367M, i3-2370M, i3-2375M, i3-2377M, i3-3110M, i3-3115C, i3-3120M, i3-3120ME, i3-3130M, i3-3210, i3-3217U, i3-3217UE, i3-3220, i3-3220T, i3-3225, i3-3227U, i3-3229Y, i3-3240, i3-3240T, i3-3245, i3-3250, i3-3250T, i3-370M, i3-380M, i3-380UM, i3-390M, i3-4000M, i3-4005U, i3-4010U, i3-4010Y, i3-4012Y, i3-4020Y, i3-4025U, i3-4030U, i3-4030Y, i3-4100E, i3-4100M, i3-4100U, i3-4102E, i3-4110E, i3-4110M, i3-4112E, i3-4120U, i3-4130, i3-4130T, i3-4150, i3-4150T, i3-

4158U, i3-4160, i3-4160T, i3-4170, i3-4170T, i3-4330, i3-4330T, i3-4330TE, i3-4340, i3-4340TE, i3-4350, i3-4350T, i3-4360, i3-4360T, i3-4370, i3-4370T, i3-5005U, i3-5010U, i3-5015U, i3-5020U, i3-5157U, i3-560, i3-6098P, i3-6100, i3-6100E, i3-6100H, i3-6100T, i3-6100TE, i3-6100U, i3-6102E, i3-6167U, i3-6300, i3-6300T, i3-6320, i5-2300, i5-2310, i5-2320, i5-2380P, i5-2390T, i5-2400, i5-2400S, i5-2405S, i5-2410M, i5-2430M, i5-2435M, i5-2450M, i5-2450P, i5-2467M, i5-2500, i5-2500K, i5-2500S, i5-2500T, i5-2510E, i5-2515E, i5-2520M, i5-2537M, i5-2540M, i5-2550K, i5-2557M, i5-3210M (BGA), i5-3210M (rPGA), i5-3230M (BGA), i5-3230M (rPGA), i5-3317U, i5-3320M, i5-3330, i5-3330S, i5-3337U, i5-3339Y, i5-3340, i5-3340M, i5-3340S, i5-3350P, i5-3360M, i5-3380M, i5-3427U, i5-3437U, i5-3439Y, i5-3450, i5-3450S, i5-3470, i5-3470S, i5-3470T, i5-3475S, i5-3550, i5-3550S, i5-3570, i5-3570K, i5-3570S, i5-3570T, i5-3610ME, i5-4200H, i5-4200M, i5-4200U, i5-4200Y, i5-4202Y, i5-4210H, i5-4210M, i5-4210U, i5-4210Y, i5-4220Y, i5-4250U, i5-4258U, i5-4260U, i5-4278U, i5-4288U, i5-4300M, i5-4300U, i5-4300Y, i5-4302Y, i5-4308U, i5-4310M, i5-4310U, i5-4330M, i5-4340M, i5-4350U, i5-4360U, i5-4400E, i5-4402E, i5-4402EC, i5-4410E, i5-4422E, i5-4430, i5-4430S, i5-4440, i5-4440S, i5-4460, i5-4460S, i5-4460T, i5-4570, i5-4570R, i5-4570S, i5-4570T, i5-4570TE, i5-4590, i5-4590S, i5-4590T, i5-460M, i5-4670, i5-4670K, i5-4670R, i5-4670S, i5-4670T, i5-4690, i5-4690K, i5-4690S, i5-4690T, i5-470UM, i5-480M, i5-5200U, i5-5250U, i5-5257U, i5-5287U, i5-5300U, i5-5350H, i5-5350U, i5-5575R, i5-560M, i5-560UM, i5-5675C, i5-5675R, i5-580M, i5-6200U, i5-6260U, i5-6267U, i5-6287U, i5-6300HQ, i5-6300U, i5-6350HQ, i5-6360U, i5-6400, i5-6400T, i5-6402P, i5-6440EQ, i5-6440HQ, i5-6442EQ, i5-6500, i5-6500T, i5-6500TE, i5-6585R, i5-6600, i5-6600K, i5-6600T, i5-6685R, i5-760, i7-2600, i7-2600K, i7-2600S, i7-2610UE, i7-2617M, i7-2620M, i7-2629M, i7-2630QM, i7-2635QM, i7-2637M, i7-2640M, i7-2649M, i7-2655LE, i7-2657M, i7-2670QM, i7-2675QM, i7-2677M, i7-2700K, i7-2710QE, i7-2715QE, i7-2720QM, i7-2760QM, i7-2820QM, i7-2860QM, i7-2920XM, i7-2960XM, i7-3517U, i7-3517UE, i7-3520M, i7-3537U, i7-3540M, i7-3555LE, i7-3610QE, i7-3610QM, i7-3612QE, i7-3612QM (BGA), i7-3612QM (rPGA), i7-3615QE, i7-3615QM, i7-3630QM, i7-3632QM (BGA), i7-3632QM (rPGA), i7-3635QM,

i7-3667U, i7-3687U, i7-3689Y, i7-3720QM, i7-3740QM, i7-3770, i7-3770K, i7-3770S, i7-3770T, i7-3820, i7-3820QM, i7-3840QM, i7-3920XM, i7-3930K, i7-3940XM, i7-3960X, i7-3970X, i7-4500U, i7-4510U, i7-4550U, i7-4558U, i7-4578U, i7-4600M, i7-4600U, i7-4610M, i7-4610Y, i7-4650U, i7-4700EC, i7-4700EQ, i7-4700HQ, i7-4700MQ, i7-4702EC, i7-4702HQ, i7-4702MQ, i7-4710HQ, i7-4710MQ, i7-4712HQ, i7-4712MQ, i7-4720HQ, i7-4722HQ, i7-4750HQ, i7-4760HQ, i7-4765T, i7-4770, i7-4770HQ, i7-4770K, i7-4770R, i7-4770S, i7-4770T, i7-4770TE, i7-4771, i7-4785T, i7-4790, i7-4790K, i7-4790S, i7-4790T, i7-4800MQ, i7-4810MQ, i7-4820K, i7-4850HQ, i7-4860HQ, i7-4870HQ, i7-4900MQ, i7-4910MQ, i7-4930K, i7-4930MX, i7-4940MX, i7-4950HQ, i7-4960HQ, i7-4960X, i7-4980HQ, i7-5500U, i7-5550U, i7-5557U, i7-5600U, i7-5650U, i7-5700EQ, i7-5700HQ, i7-5750HQ, i7-5775C, i7-5775R, i7-5820K, i7-5850EQ, i7-5850HQ, i7-5930K, i7-5950HQ, i7-5960X, i7-640M, i7-6500U, i7-6560U, i7-6567U, i7-6600U, i7-660LM, i7-6650U, i7-6660U, i7-6700, i7-6700HQ, i7-6700K, i7-6700T, i7-6700TE, i7-6770HQ, i7-6785R, i7-6800K, i7-680UM, i7-6820EQ, i7-6820HK, i7-6820HQ, i7-6822EQ, i7-6850K, i7-6870HQ, i7-6900K, i7-6920HQ, i7-6950X, i7-6970HQ, i7-740QM, i7-840QM, i7-940XM, i7-970, i7-980, i7-990X, M-5Y10, M-5Y10a, M-5Y10c, M-5Y31, M-5Y51, M-5Y70, M-5Y71, m3-6Y30, m5-6Y54, m5-6Y57, and m7-6Y75 processors, and any same or later generation Core processors (hereinafter Intel's "Core series" of processors).

57. Intel's Core series of processors meet or embody the limitations of at least one claim of the '582 patent.

58. Intel's Core series of processors meet or embody the limitations of at least one claim of the '560 patent.

59. Intel's Core series of processors meet or embody the limitations of at least one claim of the '105 patent.

60. Intel's Core series of processors meet or embody the limitations of at least one claim of the '912 patent.

61. Intel's Pentium series of processors consists of at least the following products: Intel's Pentium N3540, N3530, N3520, N3510, N3700, N3710, G3470, G3460T, G3460,

G3450T, G3450, G3440T, G3440, G3430, G3420T, G3420, G3320TE, G3260T, G3260, G3258, G3250T, G3250, G3240T, G3240, G3220T, G3220, J2900, J2850, G2140, G2130, G2120T, G2120, G2100T, G2030T, G2030, G2020T, G2020, G2010, 3550M, 3556U, 3558U, 3560M, 3560Y, 3561Y, 3805U, 3825U, 2129Y, 2127U, 2117U, 2030M, 2020M, 1405 (v2), 1405, A1018, A1020, B980, B970, B960, B950, B940, B925C, B915C, 977, 967, 957, 987, 997, G870, G860T, G860, G850, G840, G645T, G645, G640T, G640, G632, G630T, G630, G622, G620T, G620, 4405U, 4405Y, G4400T, G4400TE, G4400, G4500, G4500T, G4520, J3710, D1507, D1508, D1509, D1517, D1519, E5700, E5800, E6800, G6951, G6960, P6100, P6200, P6300, and U5600 processors, and any same or later generation Pentium processors (hereinafter Intel's "Pentium series" of processors).

62. Intel's Pentium series of processors meet or embody the limitations of at least one claim of the '582 patent.

63. Intel's Pentium series of processors meet or embody the limitations of at least one claim of the '560 patent.

64. Intel's Pentium series of processors meet or embody the limitations of at least one claim of the '105 patent.

65. Intel's Pentium series of processors meet or embody the limitations of at least one claim of the '912 patent.

66. Intel's Celeron series of processors consists of at least the following products: Intel's Celeron N3000, N3050, N3150, N3010, N3160, N3060, 3765U, 3755U, 3215U, 3205U, 3955U, 3855U, N2940, N2930, N2920, N2910, N2840, N2830, N2820, N2815, N2810, N2808, N2807, N2806, N2805, 2981U, 2980U, 2970M, 2961Y, 2957U, 2955U, 2950M, 2002E, 2000E, J1900, J1850, J1800, J1750, G1850, G1840T, G1840, G1830, G1820TE, G1820T, G1820, G1630, G1620T, G1620, G1610T, G1610, 1047UE, 1037U, 1020M, 1020E, 1019Y, 1017U, 1007U, 1005M, 1000M, 927UE, 925, B840, B830, B820, B815, B810E, B810, B800, 887, 877, 867, 857, 847E, 847, 827E, 807UE, 807, B720, B710, 797, 787, 725C, G555, G550T, G550, G540T, G540, G530T, G530, G470, G465, G460, G440, G3902E, G3900E, G3900TE, G3920, G3900, G3900T, J3160, J3060, E3500, P4600,

T3500, U3600, and ULV 763 processors, and any same or later generation Celeron processors (hereinafter Intel's "Celeron series" of processors).

67. Intel's Celeron series of processors meet or embody the limitations of at least one claim of the '582 patent.

68. Intel's Celeron series of processors meet or embody the limitations of at least one claim of the '560 patent.

69. Intel's Celeron series of processors meet or embody the limitations of at least one claim of the '105 patent.

70. Intel's Celeron series of processors meet or embody the limitations of at least one claim of the '912 patent.

71. Intel's Xeon series of processors consists of at least the following products: Intel's Xeon Phi 3120A, 3120P, 5110P, 5120D, 7120A, 7120D, 7120P, and 7120X coprocessors, and any same or later generation Xeon Phi coprocessors, and Intel's Xeon D-1518, D-1520, D-1521, D-1527, D-1528, D-1529, D-1531, D-1537, D-1539, D-1540, D-1541, D-1548, D-1557, D-1559, D-1567, D-1571, D-1577, E3-1105C, E3-1105C (v2), E3-1125C, E3-1125C (v2), E3-1220, E3-1220 (v2), E3-1220 (v3), E3-1220 (v5), E3-1220L, E3-1220L (v2), E3-1220L (v3), E3-1225, E3-1225 (v2), E3-1225 (v3), E3-1225 (v5), E3-1226 (v3), E3-1230, E3-1230 (v2), E3-1230 (v3), E3-1230 (v5), E3-1230L (v3), E3-1231 (v3), E3-1235, E3-1235L (v5), E3-1240, E3-1240 (v2), E3-1240 (v3), E3-1240 (v5), E3-1240L (v3), E3-1240L (v5), E3-1241 (v3), E3-1245, E3-1245 (v2), E3-1245 (v3), E3-1245 (v5), E3-1246 (v3), E3-1258L (v4), E3-1260L, E3-1260L (v5), E3-1265L (v2), E3-1265L (v3), E3-1265L (v4), E3-1268L (v3), E3-1268L (v5), E3-1270, E3-1270 (v2), E3-1270 (v3), E3-1270 (v5), E3-1271 (v3), E3-1275, E3-1275 (v2), E3-1275 (v3), E3-1275 (v5), E3-1275L (v3), E3-1276 (v3), E3-1278L (v4), E3-1280, E3-1280 (v2), E3-1280 (v3), E3-1280 (v5), E3-1281 (v3), E3-1285 (v3), E3-1285 (v4), E3-1285L (v3), E3-1286 (v3), E3-1286L (v3), E3-1290, E3-1290 (v2), E3-1505L (v5), E3-1505M (v5), E3-1515M (v5), E3-1535M (v5), E3-1545M (v5), E3-1558L (v5), E3-1565L (v5), E3-1575M (v5), E3-1578L (v5), E3-1585 (v5), E3-1585L (v5), E5-1428L, E5-1428L (v2), E5-1428L (v3), E5-1620, E5-1620 (v2), E5-

1620 (v3), E5-1630 (v3), E5-1650, E5-1650 (v2), E5-1650 (v3), E5-1660, E5-1660 (v2), E5-1660 (v3), E5-1680 (v3), E5-2403, E5-2403 (v2), E5-2407, E5-2407 (v2), E5-2408L (v3), E5-2418L, E5-2418L (v2), E5-2418L (v3), E5-2420, E5-2420 (v2), E5-2428L, E5-2428L (v2), E5-2428L (v3), E5-2430, E5-2430 (v2), E5-2430L, E5-2430L (v2), E5-2438L (v3), E5-2440, E5-2440 (v2), E5-2448L, E5-2448L (v2), E5-2450, E5-2450 (v2), E5-2450L, E5-2450L (v2), E5-2470, E5-2470 (v2), E5-2603, E5-2603 (v2), E5-2603 (v3), E5-2603 (v4), E5-2608L (v3), E5-2608L (v4), E5-2609, E5-2609 (v2), E5-2609 (v3), E5-2609 (v4), E5-2618L (v2), E5-2618L (v3), E5-2618L (v4), E5-2620, E5-2620 (v2), E5-2620 (v3), E5-2620 (v4), E5-2623 (v3), E5-2623 (v4), E5-2628L (v2), E5-2628L (v3), E5-2628L (v4), E5-2630, E5-2630 (v2), E5-2630 (v3), E5-2630 (v4), E5-2630L, E5-2630L (v2), E5-2630L (v3), E5-2630L (v4), E5-2637, E5-2637 (v2), E5-2637 (v3), E5-2637 (v4), E5-2640, E5-2640 (v2), E5-2640 (v3), E5-2640 (v4), E5-2643, E5-2643 (v2), E5-2643 (v3), E5-2643 (v4), E5-2648L, E5-2648L (v2), E5-2648L (v3), E5-2648L (v4), E5-2650, E5-2650 (v2), E5-2650 (v3), E5-2650 (v4), E5-2650L, E5-2650L (v2), E5-2650L (v3), E5-2650L (v4), E5-2658, E5-2658 (v2), E5-2658 (v3), E5-2658 (v4), E5-2658A (v3), E5-2660, E5-2660 (v2), E5-2660 (v3), E5-2660 (v4), E5-2665, E5-2667, E5-2667 (v2), E5-2667 (v3), E5-2667 (v4), E5-2670, E5-2670 (v2), E5-2670 (v3), E5-2680, E5-2680 (v2), E5-2680 (v3), E5-2680 (v4), E5-2683 (v3), E5-2683 (v4), E5-2687W, E5-2687W (v2), E5-2687W (v3), E5-2687W (v4), E5-2690, E5-2690 (v2), E5-2690 (v3), E5-2690 (v4), E5-2695 (v2), E5-2695 (v3), E5-2695 (v4), E5-2697 (v2), E5-2697 (v3), E5-2697 (v4), E5-2697A (v4), E5-2698 (v3), E5-2698 (v4), E5-2699 (v3), E5-2699 (v4), E5-4603, E5-4603 (v2), E5-4607, E5-4607 (v2), E5-4610, E5-4610 (v2), E5-4610 (v3), E5-4617, E5-4620, E5-4620 (v2), E5-4620 (v3), E5-4624L (v2), E5-4627 (v2), E5-4627 (v3), E5-4640, E5-4640 (v2), E5-4640 (v3), E5-4648 (v3), E5-4650, E5-4650 (v2), E5-4650 (v3), E5-4650L, E5-4655 (v3), E5-4657L (v2), E5-4660 (v3), E5-4667 (v3), E5-4669 (v3), E5603, E5606, E5607, E5649, E7-2803, E7-2820, E7-2830, E7-2850, E7-2850 (v2), E7-2860, E7-2870, E7-2870 (v2), E7-2880 (v2), E7-2890 (v2), E7-4807, E7-4809 (v2), E7-4809 (v3), E7-4809 (v4), E7-4820, E7-4820 (v2), E7-4820 (v3), E7-4820 (v4), E7-4830, E7-4830 (v2), E7-4830 (v3), E7-4830 (v4), E7-4850, E7-4850 (v2), E7-4850

(v3), E7-4850 (v4), E7-4860, E7-4860 (v2), E7-4870, E7-4870 (v2), E7-4880 (v2), E7-4890 (v2), E7-8830, E7-8837, E7-8850, E7-8850 (v2), E7-8857 (v2), E7-8860, E7-8860 (v3), E7-8860 (v4), E7-8867 (v3), E7-8867 (v4), E7-8867L, E7-8870, E7-8870 (v2), E7-8870 (v3), E7-8870 (v4), E7-8880 (v2), E7-8880 (v3), E7-8880 (v4), E7-8880L (v2), E7-8880L (v3), E7-8890 (v2), E7-8890 (v3), E7-8890 (v4), E7-8891 (v2), E7-8891 (v3), E7-8891 (v4), E7-8893 (v2), E7-8893 (v3), E7-8893 (v4), W3670, W3690, X5647, X5672, X5675, X5687, and X5690 processors, and any same or later generation Xeon processors (hereinafter Intel's "Xeon series" of processors).

72. Intel's Xeon series of processors meet or embody the limitations of at least one claim of the '582 patent.

73. Intel's Xeon series of processors meet or embody the limitations of at least one claim of the '560 patent.

74. Intel's Xeon series of processors meet or embody the limitations of at least one claim of the '105 patent.

75. Intel's Xeon series of processors meet or embody the limitations of at least one claim of the '912 patent.

76. Intel's Itanium series of processors consists of at least the following products: Intel's Itanium 9560, 9550, 9540, and 9520 processors, and any same or later generation Itanium processors (hereinafter Intel's "Itanium series" of processors).

77. Intel's Itanium series of processors meet or embody the limitations of at least one claim of the '582 patent.

78. Intel's Itanium series of processors meet or embody the limitations of at least one claim of the '560 patent.

79. Intel's Itanium series of processors meet or embody the limitations of at least one claim of the '105 patent.

80. Intel's Itanium series of processors meet or embody the limitations of at least one claim of the '912 patent.

81. Intel's Quark series of processors consists of at least the following products: Intel's Quark Soc X1000, SoC X1001, SoC X1010, SoC X1011, SoC X1020, SoC X1020D, SoC X1021, SoC X1021D, Microcontroller D1000, Microcontroller D2000, and SE C1000 Microcontroller processors, and any same or later generation Quark processors (hereinafter Intel's "Quark series" of processors).

82. Intel's Quark series of processors meet or embody the limitations of at least one claim of the '582 patent.

83. Intel's Quark series of processors meet or embody the limitations of at least one claim of the '560 patent.

84. Intel's Quark series of processors meet or embody the limitations of at least one claim of the '105 patent.

85. Intel's Quark series of processors meet or embody the limitations of at least one claim of the '912 patent.

86. Intel's chipsets consist of at least the following products: Intel's Z170, Z97, Z87, Z77, Z75, Z68, X99, X38, Q170, Q150, Q87, Q85, Q77, Q75, Q67, Q65, P67, H170, H110, H97, H87, H81, H77, H67, H61, B150, B85, B75, B65, SM35, QM87, HM87, HM86, UM77, UM67, QS77, QS67, QM170, QM77, QM67, HM170, HM77, HM76, HM75, HM70, HM67, HM65, CM236, C612, C608, C606, C604, C602J, C602, C236, C232, C226, C224, C222, C216, C206, C204, C202 chipsets, and any same or later generation chipsets (hereinafter Intel's "Chipsets").

87. Intel's Chipsets meet or embody the limitations of at least one claim of the '582 patent.

88. Intel's Chipsets meet or embody the limitations of at least one claim of the '560 patent.

89. Intel's Chipsets meet or embody the limitations of at least one claim of the '105 patent.

90. Intel's Chipsets meet or embody the limitations of at least one claim of the '912 patent.

91. Intel's wireless network adapters consist of at least the following products: Intel's W13100, AC 7265, N 7265 (Dual Band), N 7265, AC 7260, N 7260 (Dual Band), N 7260, AC 3160, AC 3165, AC 3168, N 2200 (Single Band), N 2230 (Single Band), N 1030 (Single Band), N 1000 (Single Band), N 100 (Single Band), N 105 (Single Band), N 130 (Single Band), N 135 (Single Band), N 6300 (Dual Band), N 6200 (Dual Band), N 6205 (Dual Band), N 6230 (Dual Band), N 6235 (Dual Band), AC 8260, AC 8265, AC 18260, AC 17265, W11000, N + WiMAX 6250 (Dual Band), and N + WiMAX 6150 (Single Band) wireless network adapters, and any same or later generation Intel wireless network adapters (hereinafter Intel's "Wireless Network Adapters").

92. Intel's Wireless Network Adapters meet or embody the limitations of at least one claim of the '582 patent.

93. Intel's Wireless Network Adapters meet or embody the limitations of at least one claim of the '560 patent.

94. Intel's Wireless Network Adapters meet or embody the limitations of at least one claim of the '105 patent.

95. Intel's Wireless Network Adapters meet or embody the limitations of at least one claim of the '912 patent.

96. Ibiden makes printed circuit boards, such as those which can be found in Intel's Atom series, Core series, Pentium series, Celeron series, Xeon series, Itanium series, and Quark series processors, Chipsets, and Wireless Network Adapters (hereinafter Ibiden's "Package Substrates").

97. Ibiden's Package Substrates meet or embody the limitations of at least one claim of the '582 patent.

98. Ibiden's Package Substrates meet or embody the limitations of at least one claim of the '560 patent.

99. Ibiden's Package Substrates meet or embody the limitations of at least one claim of the '105 patent.

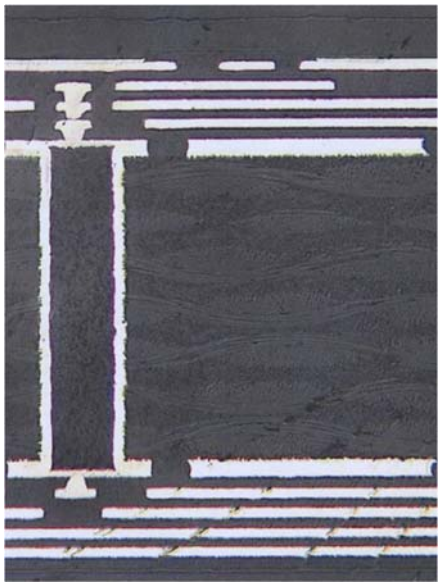
100. Ibiden's Package Substrates meet or embody the limitations of at least one claim of the '912 patent.

101. Intel makes, uses, offers to sell, sells, and/or imports the Atom series, Core series, Pentium series, Celeron series, Xeon series, Itanium series, and Quark series processors, Chipsets, Wireless Network Adapters, and Ibiden's Package Substrates within the United States.

102. Ibiden offers to sell and sells its Package Substrates within the United States, such as those which can be found in Intel's Atom series, Core series, Pentium series, Celeron series, Xeon series, Itanium series, and Quark series processors, Chipsets, and Wireless Network Adapters.

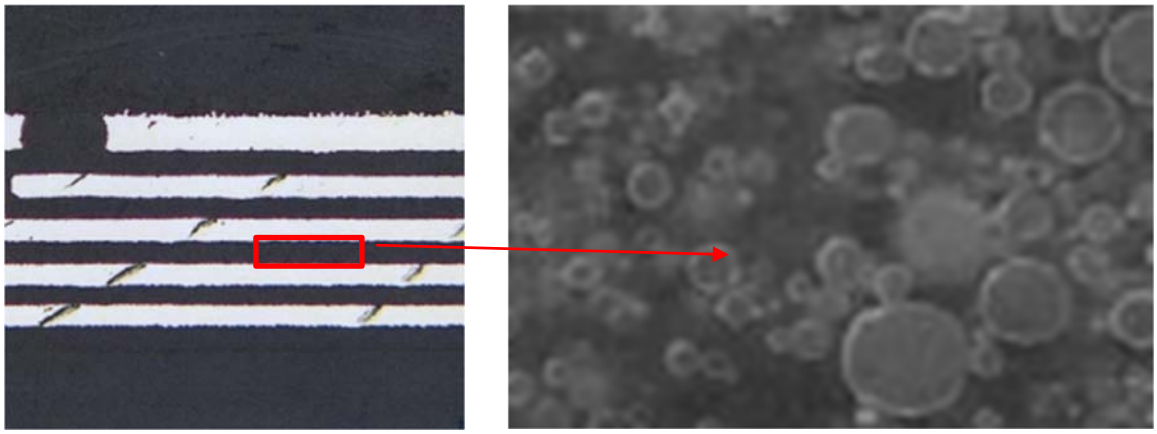
103. Defendants have committed and continue to commit acts of infringement under 35 U.S.C. § 271 with (i) any version of the Atom series of processors; (ii) any version of the Core series of processors; (iii) any version of the Pentium series of processors; (iv) any version of the Celeron series of processors; (v) any version of the Xeon series of processors; (vi) any version of the Itanium series of processors; (vii) any version of the Quark series of processors; (viii) any processors manufactured in a manner similar to those named in (i)–(vii); (ix) any Intel Chipsets; (x) any Intel Wireless Network Adapters; and (ix) any Package Substrates manufactured by Ibiden for Intel or others (collectively referred to as the "Accused Instrumentalities").

104. The Accused Instrumentalities comprise an article of manufacture, a multilayer electrical device, a product, and/or a circuit board. *See, e.g.*:



Cross-section view of Intel Core series processor at 100x magnification.

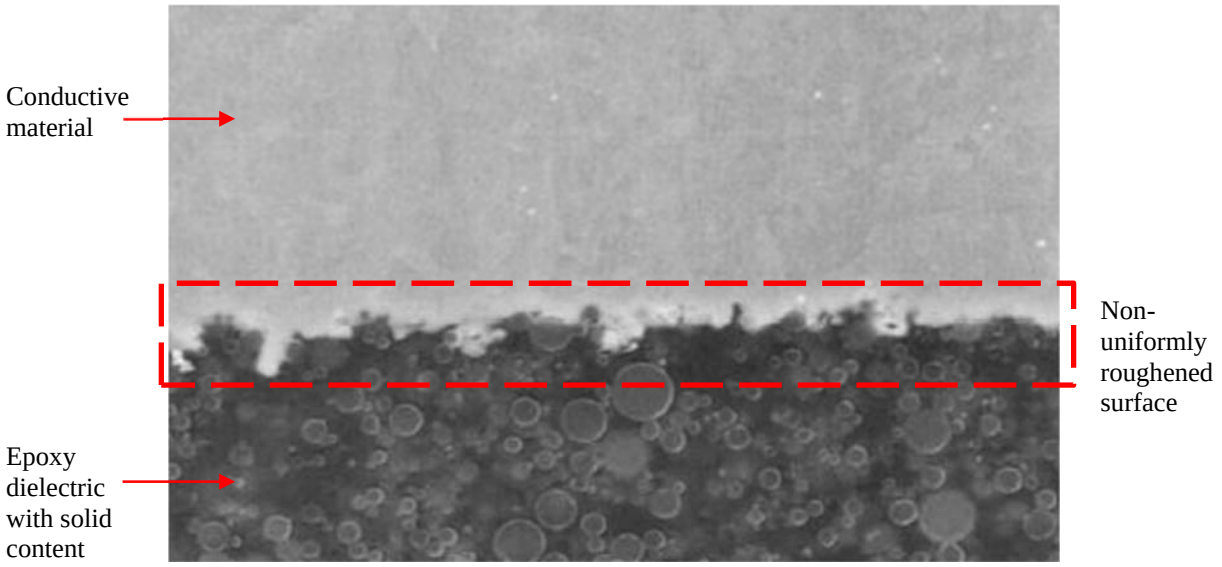
105. The Accused Instrumentalities comprise an epoxy dielectric material ("the Epoxy") delivered with solid content ("Solid Content"). *See, e.g.*:



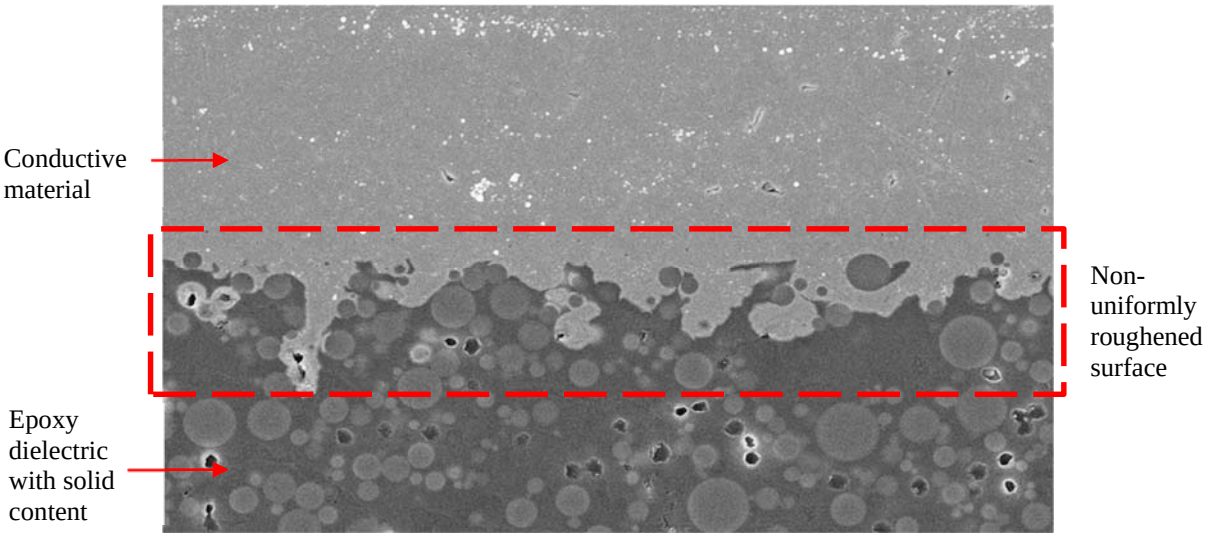
Cross-section view of Intel Core series processor at 200x (left) and >2000x (right) magnification.

106. The Accused Instrumentalities comprise the Epoxy having been etched ("the Etching").

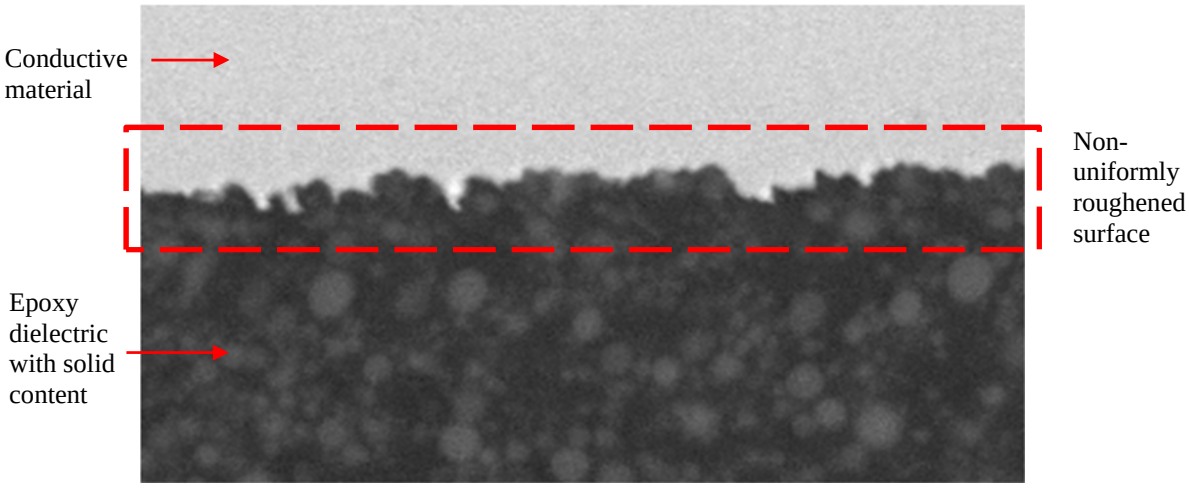
107. The Accused Instrumentalities comprise the Epoxy having a non-uniformly roughened surface ("Roughened Surface") of cavities ("the Cavities"). *See, e.g.*:



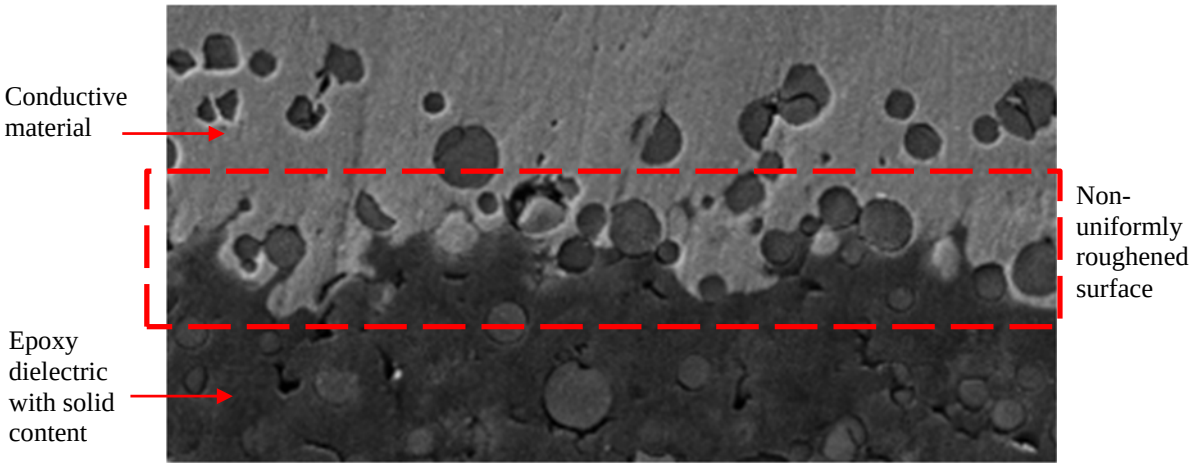
Cross-section of Intel Core series processor at > 2000x magnification.



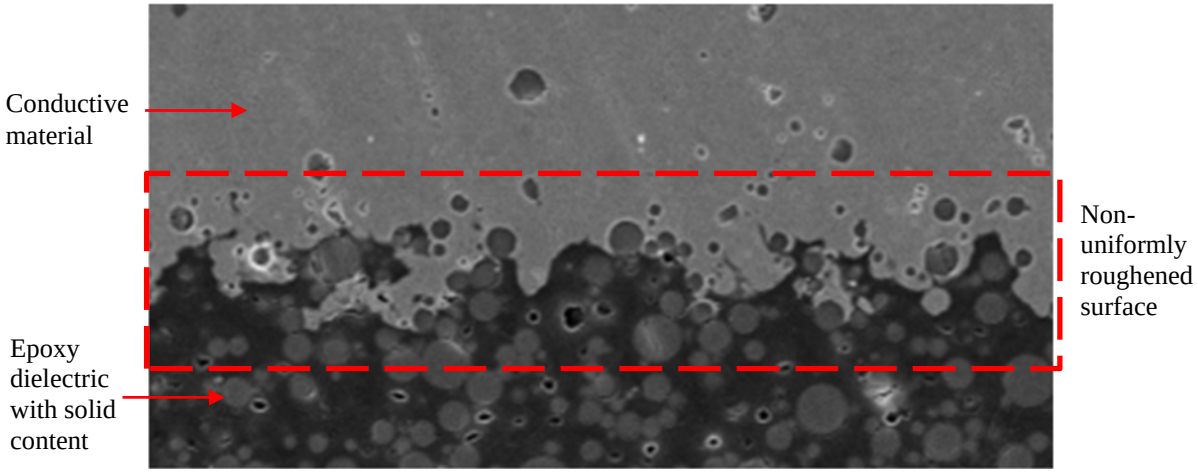
Cross-section of Intel Atom series processor at >2000x magnification.



Cross-section of Intel Pentium series processor at 1500x magnification.



Cross-section of Intel Celeron series processor at >2000x magnification.



Cross-section of Intel Xeon series processor at >2000x magnification.

108. The images in Paragraph 102 are representative of the cross-sections of a substrate layer within each of the Accused Instrumentalities.

109. There is no material difference in the substrate layers between any versions of the Accused Instrumentalities.

110. The Roughened Surface is formed by the Etching.

111. The Etching uses non-homogeneity with the Solid Content to bring about formation of the Roughened Surface.

112. The Accused Instrumentalities comprise a conductive material.

113. The Accused Instrumentalities comprise a conductive material in the Cavities.

114. The Etching includes a first etching and a second etching.

115. The Accused Instrumentalities constitute or contain products made by the processes claimed in at least one claim of each of the patents-in-suit.

116. The Accused Instrumentalities and/or the portions of the Accused Instrumentalities made by the processes claimed in the patents-in-suit are not materially changed by subsequent processes, and do not become a trivial and nonessential component of another product.

117. The Accused Instrumentalities remain essential to the operation and functionality of any product into which they are incorporated.

118. In committing the above described acts of infringement under 35 U.S.C. § 271, Defendants acted despite an objectively high likelihood that their actions constituted infringement of at least one valid patent owned by Plaintiff, and Defendants knew or should have known that their actions constituted an unjustifiably high risk of infringement of a valid and enforceable patent.

119. Questions of fact common to Defendants exist and will arise in this action.

COUNT ONE: PATENT INFRINGEMENT BY INTEL

120. Plaintiff incorporates by reference the preceding paragraphs as if fully set forth herein.

121. Intel has infringed and continues to infringe the patents-in-suit.

122. The Accused Instrumentalities meet claims of the patents-in-suit, including, by way of example and not limitation, claim 14 of the ’560 patent.

123. Intel makes, uses, offers to sell, sells and/or imports the Accused Instrumentalities within the United States or into the United States without authority from Plaintiff.

124. Intel therefore infringes the patents-in-suit under 35 U.S.C. § 271(a).

125. The Accused Instrumentalities which Intel imports, offers to sell, sells, and/or uses within the United States or into the United States without authority constitute products made by a process claimed in the patents-in-suit, which products are not materially changed

by a subsequent process and do not become a trivial and nonessential component of another product.

126. Intel therefore infringes the patents-in-suit under 35 U.S.C. § 271(g).

127. Intel has actual knowledge of the patents-in-suit.

128. Intel indirectly infringes the patents-in-suit by inducing infringement by others, such as its suppliers, by, for example, providing design and technical specifications for substrate packages to its suppliers, including Ibiden, and requiring its suppliers to meet those specifications. Such design and technical specifications include benchmarks directly related to the invention claimed in the patents-in-suit, including signal integrity, thermal integrity, mechanical integrity, and delamination. Intel also actively markets to, encourages use by, and instructs consumers, businesses, distributors, resellers, computer equipment manufacturers, and sales representatives, to use, promote, market, distribute, and/or sell the Accused Instrumentalities.

129. Intel took the above actions intending to cause infringing acts by others.

130. Intel was aware of the patents-in-suit and knew that the others' actions, if taken, would constitute infringement of the patents-in-suit. Alternatively, Intel believed there was a high probability that others would infringe the patents-in-suit but remained willfully blind to the infringing nature of others' actions.

131. Intel therefore infringes the patents-in-suit under 35 U.S.C. § 271(b).

132. Intel indirectly infringes the patents-in-suit by contributing to infringement by others, such as package substrate suppliers, product assemblers, resellers including computer equipment manufacturers, and end-user customers by providing, offering to sell, and/or selling within the United States the Accused Instrumentalities, including the package substrates supplied by Ibiden. These Accused Instrumentalities constitute a material part of the inventions claimed in the patents-in-suit, and are used to practice one or more processes/methods covered by the claims of the patents-in-suit. Not only do the Accused Instrumentalities constitute a material part of the invention, but the Accused Instrumentalities are manufactured in a manner which fundamentally encompasses the entire invention.

133. In the above offerings to sell and/or selling, Intel has known the package substrates to be especially made or especially adapted for use in an infringement of the patents-in-suit and are not a staple article or commodity of commerce suitable for substantial non-infringing use. The only practical use of the Accused Instrumentalities constitutes infringement of the patents-in-suit. Alternatively, Intel believed that there was a high probability that others would infringe the patents-in-suit but remained willfully blind to the infringing nature of others' actions.

134. Intel therefore infringes the patents-in-suit under 35 U.S.C. § 271(c).

135. Intel has committed and continues to commit acts of infringement under 35 U.S.C. § 271. In committing these acts of infringement, Intel's behavior has been egregious.

136. Intel's infringement of the patents-in-suit has been and continues to be willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, and/or flagrant.

137. Intel's acts of infringement have caused damage to Plaintiff. Plaintiff is entitled to recover from Intel the damages sustained by Plaintiff as a result of Intel's wrongful acts in an amount subject to proof at trial. In addition, the infringing acts and practices of Intel have caused, are causing, and unless such acts and practices are enjoined by the Court, will continue to cause immediate and irreparable harm to Plaintiff for which there is no adequate remedy at law, and for which Plaintiff is entitled to injunctive relief under 35 U.S.C. § 283.

138. To the extent Intel releases any new version of the Accused Instrumentalities, such instrumentalities will meet the claims of the patents-in-suit and infringe the patents-in-suit under 35 U.S.C. §§ 271(a)–(c) and (g) in ways analogous to Intel's current infringement described above.

COUNT TWO: PATENT INFRINGEMENT BY IBIDEN

139. Plaintiff incorporates by reference the preceding paragraphs as if fully set forth herein.

140. Ibiden has infringed and continues to infringe the patents-in-suit.

141. The Accused Instrumentalities meet claims of the patents-in-suit, including, by way of example and not limitation, claim 14 of the ’560 patent.

142. Ibiden offers to sell and sells the Accused Instrumentalities within the United States without authority from Plaintiff.

143. Ibiden therefore infringes the patents-in-suit under 35 U.S.C. § 271(a).

144. The Ibiden Package Substrates which Ibiden offers to sell and sells within the United States without authority constitute products made by a process claimed in the patents-in-suit, which products are not materially changed by a subsequent process and do not become a trivial and nonessential component of another product.

145. Ibiden therefore infringes the patents-in-suit under 35 U.S.C. § 271(g).

146. Ibiden has actual knowledge of the patents-in-suit.

147. Ibiden indirectly infringes the patents-in-suit by inducing infringement by others, such as Intel and other companies supplied by Ibiden, by, for example, collaborating on design and technical specifications for the Accused Instrumentalities, and by providing technical instruction for use of package substrates in the assembly and manufacture of the Accused Instrumentalities.

148. Ibiden took the above actions intending to cause infringing acts by others.

149. Ibiden was aware of the patents-in-suit and knew that the others’ actions, if taken, would constitute infringement of the patents-in-suit. Alternatively, Ibiden believed there was a high probability that others would infringe the patents-in-suit but remained willfully blind to the infringing nature of others’ actions.

150. Ibiden therefore infringes the patents-in-suit under 35 U.S.C. § 271(b).

151. Ibiden indirectly infringes the patents-in-suit by contributing to infringement by others, such as Intel and other companies supplied by Ibiden by offering to sell and/or selling within the United States products that contain components that constitute a material part of the inventions claimed in the patents-in-suit. Such components are, for example, package substrates used in the manufacturing of the Accused Instrumentalities. The only substantial use is to be incorporated into the Accused Instrumentalities. Not only do the

Accused Instrumentalities constitute a material part of the invention, but the Accused Instrumentalities are manufactured in a manner which fundamentally encompasses the entire invention.

152. In the above offering to sell and/or selling, Ibiden has known these components to be especially made or especially adapted for use in an infringement of the patents-in-suit and that these components are not a staple article or commodity of commerce suitable for substantial non-infringing use. The only practical use of the Accused Instrumentalities constitutes infringement of the patents-in-suit. Alternatively, Ibiden believed there was a high probability that others would infringe the patents-in-suit but remained willfully blind to the infringing nature of others' actions. Ibiden therefore infringes the patents-in-suit under 35 U.S.C. § 271(c).

153. Ibiden has committed and continues to commit acts of infringement under 35 U.S.C. § 271. In committing these acts of infringement, Ibiden's behavior has been egregious.

154. Ibiden's infringement of the patents-in-suit has been and continues to be willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, and/or flagrant.

155. Ibiden's acts of infringement have caused damage to Plaintiff. Plaintiff is entitled to recover from Ibiden the damages sustained by Plaintiff as a result of Ibiden's wrongful acts in an amount subject to proof at trial. In addition, the infringing acts and practices of Ibiden have caused, are causing, and unless such acts and practices are enjoined by the Court, will continue to cause immediate and irreparable harm to Plaintiff for which there is no adequate remedy at law, and for which Plaintiff is entitled to injunctive relief under 35 U.S.C. § 283.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Plaintiff hereby demands a jury for all issues so triable.

PRAYER FOR RELIEF

1. A judgment that Defendants have directly infringed the patents-in-suit;

2. A judgment that Defendants have induced infringement of the patents-in-suit;

3. A judgment that Defendants have contributorily infringed the patents-in-suit;

4. A preliminary and permanent injunction preventing Defendants and their officers, directors, agents, servants, employees, attorneys, licensees, successors, and assigns, and those in active concert or participation with any of them, from directly infringing, contributorily infringing, and/or inducing infringement of the patents-in-suit;

5. A judgment that Defendants' infringement of the patents-in-suit has been willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, and/or flagrant;

6. A ruling that this case is exceptional under 35 U.S.C. § 285, and a judgment awarding to Plaintiff its attorneys' fees incurred in prosecuting this action;

7. A judgment and order requiring Defendants to pay Plaintiff damages under 35 U.S.C. § 284, including supplemental damages for any continuing post-verdict infringement up until entry of the final judgment, with an accounting, as needed, and enhanced damages as provided by 35 U.S.C. § 284;

8. A judgment and order requiring Defendants to pay Plaintiff the costs of this action (including all disbursements);

9. A judgment and order requiring Defendants to pay Plaintiff pre-judgment and post-judgment interest on the damages award;

10. In the event a permanent injunction preventing future acts of infringement is not granted, a judgment and order awarding Plaintiff a compulsory ongoing licensing fee; and

11. Such other and further relief as the Court may deem just a proper.

DATED this 26th day of January, 2017.

CALDWELL CASSADY CURRY P.C

By */s/ Bradley W. Caldwell (pro hac vice)*

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CERTIFICATE OF SERVICE

The undersigned certifies that all counsel of record who have consented to electronic service are being served with a copy of the foregoing document via the Court's CM/ECF system on this 26th day of January, 2017.

/s/ Bradley W. Caldwell (pro hac vice)
Bradley W. Caldwell