

1 Rafey S. Balabanian*
rbalabanian@edelson.com
2 Stewart R. Pollock (SBN 301356)
spollock@edelson.com
3 EDELSON PC
123 Townsend Street,
4 San Francisco, California 94107
Tel: 415.212.9300
5 Fax: 415.373.9435

6 Benjamin S. Thomassen*
bthomassen@edelson.com
7 Amir C. Missaghi*
amissaghi@edelson.com
8 EDELSON PC
350 North LaSalle Street, 13th Floor
9 Chicago, Illinois 60654
Tel: 312.589.6370
10 Fax: 312.589.6378

11 * Admitted *pro hac vice*

12 *Attorneys for Plaintiffs and the Putative Classes*

13 **IN THE UNITED STATES DISTRICT COURT**
14 **FOR THE NORTHERN DISTRICT OF CALIFORNIA**
15 **SAN JOSE DIVISION**

16 TONY DICKEY, and PAUL PARMER,
individually and on behalf of all others
17 similarly situated,

18 *Plaintiffs,*

19 v.

20 ADVANCED MICRO DEVICES, INC., a
Delaware corporation,

21 *Defendant.*

Case No. 5:15-cv-04922-HSG

SECOND AMENDED COMPLAINT FOR:

1. **Violations of Cal. Civ. Code §§ 1750 *et seq.*;**
2. **Violations of Cal. Bus. & Prof. Code §§ 17200, *et seq.*;**
3. **Violations of Cal. Bus. & Prof. Code §§ 17500, *et seq.*;**
4. **Fraudulent Inducement;**
5. **Breach of Express Warranties; and**
6. **Negligent Misrepresentation.**

DEMAND FOR JURY TRIAL

CLASS ACTION

24
25
26
27
28

1 Plaintiffs Tony Dickey and Paul Parmer (“Plaintiffs”) bring this second amended class
 2 action complaint (“Complaint”) against Defendant Advanced Micro Devices, Inc., (“AMD” or
 3 “Defendant”) based on its deceptive marketing of certain of its central processing units (“CPUs”).
 4 Plaintiffs, for their Complaint, allege as follows upon personal knowledge as to themselves and
 5 their own acts and experiences, and, as to all other matters, upon information and belief, including
 6 investigation conducted by their attorneys.

7 NATURE OF THE ACTION

8 1. AMD is one of two major companies that design and produce CPUs for personal
 9 computers.

10 2. A CPU—a “central processing unit” or “processor”—is defined as “the logic
 11 circuitry that responds to and processes the basic instructions that drive a computer. . . . The basic
 12 elements of a processor [include]:

- 13 • The arithmetic logic unit (ALU), which carries out arithmetic and logic operations on the
 14 operands in instructions.
- 15 • The floating point unit (FPU), also known as a math coprocessor or numeric
 16 coprocessor, a specialized coprocessor that manipulates numbers more quickly than the
 17 basic microprocessor circuitry can.
- 18 • Register, which hold instructions and other data. Registers supply operands to the ALU
 19 and store the results of operations.
- 20 • L1 and L2 cache memory. Their inclusion in the CPU saves time compared to having to
 21 get data from random access memory (RAM).¹

22 3. Not long ago, CPUs contained only one main processor and were advertised—and
 23 compared against each other—in terms of their “clock” speeds. A CPU’s clock speed describes how
 24 fast it can perform calculations and is measured in units of Megahertz (“MHz”) and Gigahertz
 25 (“GHz”).

26 4. Recently, however, AMD—along with its main competitor, Intel—began selling and
 27 advertising “multi-core” CPUs (i.e., as opposed to CPUs with only a single processors, which—
 28 under today’s terminology—would be described as “single-core” CPUs).

¹ Definition of “Processor,” <http://whatis.techtarget.com/definition/processor> (last visited Nov. 21, 2016).

1 5. A multi-core CPU is defined as “an integrated circuit (IC) to which two or more
2 processors have been attached for enhanced performance, reduced power consumption, and more
3 efficient simultaneous processing of multiple tasks. . . . A dual core set-up is somewhat comparable
4 to having multiple, separate processors installed in the same computer, but because the two
5 processors are actually plugged into the same socket, the connection between them is faster.”²
6 Essentially, a computer with a multi-core CPU is the same as a computer with multiple, independent
7 processors running in parallel but, because the independent processors are joined on a single chip, a
8 multi-core CPU gains efficiencies.

9 6. Because multi-core CPUs join multiple processors (each of which have their own
10 ALU, FPU, registers, and LI and L2 cache memory—i.e., the “basic [processor] elements”
11 described above, ¶ 2) onto a single chip, each “core” in a multi-core CPU can perform one
12 calculation at a time separately from other cores. And because a multi-core CPU joins multiple
13 processors on to a single chip, the setup allows each core in a multi-core CPUs to multitask—i.e.,
14 independently handle calculations or processes—at full speed.

15 7. With the launch of its “Bulldozer” line of CPUs, AMD announced and promoted the
16 introduction of the “world’s first 8 core CPU.”³ AMD stated that, with eight cores, its Bulldozer
17 processors were the pinnacle of performance and that consumers could multitask greater than
18 before. Central to AMD’s marketing was its claim that the Bulldozer CPU had “8-cores.” AMD
19 includes the core-count in each of its Bulldozer processor’s model names and numbers (e.g., “AMD
20 FX 8-Core Black Edition”). It also includes the core-count on each of its Bulldozer processor’s
21 individual product webpage, which can be found at specific subdirectories on www.AMD.com.

22 8. In claiming that its Bulldozer CPU had “8-cores,” however, AMD overstated the
23 number of cores contained in the Bulldozer chips. In fact, the Bulldozer chips functionally have
24 only four cores—not eight, as advertised. Notably, AMD built the Bulldozer processors by stripping
25 away components from two cores (including, for example, each core’s own FPU) and combining

26 ² Definition of “multi-core processor.” <http://whatis.techtarget.com/definition/multi-core-processor> (last visited Nov. 21, 2016).

27 ³ See *infra* note 8.

1 what was left to make a single “module.” But by removing key elements of two cores to make one
2 module, the leftover “cores” no longer work independently and, by design, can no longer perform
3 true multitasking (and, thus, are not true cores). As a result, AMD’s Bulldozers suffer from material
4 performance degradation and cannot perform eight instructions simultaneously and independently
5 (i.e., as a truly 8-core processor would, by definition, be capable of doing). That is, while AMD
6 represents that the Bulldozers have “8” cores (i.e., eight countable cores), AMD designed the
7 processors to only have “4” (countable) cores.

8 9. Average consumers in the market for computer CPUs lack the requisite technical
9 expertise to understand the design of Defendant’s processors, and trust Defendant to convey
10 accurate specifications regarding its CPUs. Because AMD did not convey accurate specifications,
11 tens of thousands of consumers have been misled into buying Bulldozer CPUs that do not conform
12 to what AMD advertised, and cannot perform the way a true eight core CPU would (*i.e.*, perform
13 eight calculations simultaneously, without restriction).

14 10. Accordingly, this putative class action lawsuit seeks to prevent Defendant from
15 continuing to misrepresent the specifications of its Bulldozer-based CPUs, and actual damages for
16 those deceived into purchasing the products under false pretenses.

17 **PARTIES**

18 11. Plaintiff Tony Dickey is a natural person and citizen of the State of Alabama.

19 12. Plaintiff Paul Parmer is a natural person and citizen of the State of California.

20 13. Defendant Advanced Micro Devices, Inc., is a Delaware corporation with its
21 principal place of business located at One AMD Place, P.O. Box 3453, Sunnyvale, CA 94088.
22 AMD does business throughout the United States and the State of California, including in this
23 District.

24 **JURISDICTION AND VENUE**

25 14. The Court has jurisdiction over this action pursuant to 28 U.S.C. § 1332(d)(2),
26 because (i) at least one member of the Classes is a citizen of a different state than the Defendant, (ii)
27 the amount in controversy exceeds \$5,000,000, exclusive of interests and costs, and (iii) none of the
28

1 exceptions under that subsection apply to this action.

2 15. This Court has personal jurisdiction over Defendant because Defendant conducts
3 business in California, is headquartered in California, and because the events giving rise to this
4 lawsuit occurred, in substantial part, in California.

5 16. Venue is proper in the United States District Court for the Northern District of
6 California pursuant to 28 U.S.C. § 1391(b) because Defendant maintains its headquarters and
7 conducts significant business in this District.

8 INTRADISTRICT ASSIGNMENT

9 17. Pursuant to Civil Local Rule 3-2(e), this case shall be assigned to the San Jose
10 Division.

11 CHOICE OF LAW

12 18. California law governs the substantive legal issues in the instant matter. AMD's
13 "Terms of Use / Copyright" state that "[a]ny claim relating to the Materials shall be governed by the
14 internal substantive laws of the State of California, United States of America."⁴ Moreover, the
15 instruction manual that accompanies every AMD Bulldozer processor incorporates AMD's "Terms
16 of Use."⁵

17 19. AMD's conduct at issue herein also occurred in California. AMD is headquartered in
18 California, and the advertisements at issue here were, on information and belief, drafted in and
19 disseminated from California.⁶

20 FACTUAL BACKGROUND

21 I. An Introduction to AMD and CPU Core Technology

22 20. AMD was founded in 1969 in Sunnyvale, California and has grown into a global

23 ⁴ A true and accurate copy of AMD's "Terms of Use / Copyright" is attached hereto as
24 Exhibit B.

25 ⁵ A true and accurate copy of AMD's form "AMD Processor" document is attached hereto as
26 Exhibit C (stating that "[f] or more information please visit www.amd.com," and that consumers
27 should reference what is "set forth in AMD's Standard Term and Conditions of Sales ...").

28 ⁶ *Search | LinkedIn*, www.linkedin.com/vsearch/p?keywords=marketing&postalCode=94101&openAdvancedForm=true&locationType=I&countryCode=us&distance=100&f_CC=1497
(last visited Nov. 21, 2016) (showing 90 public profiles of AMD marketing employees within 100 miles of San Francisco, California).

1 semiconductor manufacturer with facilities around the world. Today, it is the second-largest
2 supplier of the CPUs found in personal computers and laptops (“PCs”), behind only Intel
3 Corporation (“Intel”).

4 21. Since its inception, AMD has battled with Intel over market share of the consumer
5 PC CPU market. Early on, personal computer CPUs were limited to performing only a single
6 calculation (*i.e.*, processing one instruction) at a time. As such, AMD and Intel focused their
7 advertisements on how fast their CPUs could perform a single calculation, in units of “clock” speed.
8 A CPU’s high Megahertz (MHz) and then Gigahertz (GHz) speeds were indicative of high
9 performance.

10 22. As advertised clock speeds began to plateau, CPU manufacturers began to increase
11 (and then advertise) the number of “cores” in their CPUs. AMD and Intel increased the core-count
12 of their CPUs by joining two or more CPUs into one physical processor (called a “die”). A core, as
13 it is understood and defined in the industry, is a processing unit that is capable of performing
14 calculations independent from other cores. A two-core CPU, then, can multitask—that is, perform
15 two calculations simultaneously and independently (just as two separate CPUs) at a certain clock
16 speed. For instance, a CPU advertised as being an “8-core 3.4 GHz CPU” is representing that it has
17 eight independent cores, each independently performing calculations at 3.4 gigahertz.

18 23. In line with the basic definitions of “processors” and “multi-core processors”
19 provided above, ¶¶ 2, 5, industry experts and consumers alike define a “core” as a processing unit
20 capable of performing a calculation independently. Industry texts use this definition, including
21 Georgia Tech’s College of Computing which states that for “typical off-the-shelf multiprocessor,”
22 which “[i]ncludes multi-core processors,” “each processor executes its own instructions and
23 operates on its own data.”⁷ Similarly, the textbook *Understanding Operating Systems* defines a
24 multicore processor as “a single chip (one piece of silicon) with two ‘processor cores’ in the same

25 ⁷ *Multiprocessors, Georgia Tech College of Computing*,
26 www.cc.gatech.edu/~milos/Teaching/CS6290F07/12_Multiprocessors.ppt (last visited Nov. 21,
27 2016).

1 amount of space. With this arrangement, two sets of calculations can take place at the same time.”⁸

2 Countless other texts repeat this definition—including, for example:

- 3 • Siebert, Eric, *VMware V13, Implementation and Administration*, 52 (“Simply put, a
4 multicore CPU combines multiple independent cores on a single physical CPU.”);
- 5 • Smith, Roderick W., *LPIC-2, Linux Professional Institute Certification STUDY
6 GUIDE*, (“Most modern computers have at least two CPU *cores*—CPU components
7 that act like independent CPUs. A *dual-core* CPU acts like two CPUs.”);
- 8 • Shen, Gang, Huange, Xiong, *Advanced Research on Computer Science and
9 Information Engineering*, Communications in Computer and Information Science, 49
10 (“In the structure of modern computer, CPU has multi-core. The CPU cache (multi-
11 level)—memory forms a leveled storing structure. Two CPU cores are integrated into
12 one chip. Every core is an independent computing unit which can perform computing
13 tasks and have independent registers. L1 Cache.”);
- 14 • Brenckmann, Ingo; Pöhling, Mathias, *The SAP HANA Project Guide*, Section 3.1.2
15 Multi-Core (“In the timeframe 2000-2004 chipmakers came to the conclusion that
16 they could actually pack more than one ‘core’ into one CPU. A core is an independent
17 processor inside a CPU.”); and
- 18 • Morley, Deborah; Parker, Charles S., *Understanding COMPUTERS Today and
19 Tomorrow*, 58 (“Most CPUs today are **multi-core CPUs**, that is, CPUs that contain
20 the processing components or *cores* of multiple independent processors on a single
21 CPU ... Multi-core CPUs allow computers to work simultaneously on more than one
22 task at a time, such as burning a DV while surfing the Web, as well as to work faster
23 within a single application if the software is designed to take advantage of multiple
24 cores.”).

24. Through its marketing, AMD consistently reinforced the common meaning (and,
with Intel) helped create the consumer expectation that a core is an independent processing unit. For
example, AMD uses the common definition of a core in its investor filings:

“ ... semiconductor companies are designing and developing multi-core [CPUs],
where multiple processor cores are placed on a single die or in a single processor.
Multi-core [CPUs] offer enhanced overall system performance and efficiency
because computing tasks can be spread across two or more processing cores, each
of which can execute a task [*i.e.*, a calculation] *at full speed.*”⁹

25. AMD used the same definition in 2007 when it stated that its then new “Dual-Core
processor puts the power of dual-core technology on the desktop. Dual-core processors contain *two*

⁸ McHoes, Ann McIver, Flynn, Ida M., *Understanding Operating Systems, 7th Edition, Ch. 6, Concurrent Processes*, 176, www.unf.edu/~sahuja/cop4640/ConcurrentProcesses.ppt (last visited Nov. 21, 2016).

⁹ *AMD 10-K*, 4, *supra* (emphasis added).

1 *processing cores, residing on one chip, that perform calculations on two streams of data ...*¹⁰ and
 2 that “[w]ith dual-core technology *there are two complete processor cores in one physical package*
 3 *... .*”¹¹

4 26. And, in 2010, AMD reinforced the consumer expectation that cores are processors
 5 independent from each other, stating that its CPUs are offered “[w]ith the power of four processor
 6 cores on a single chip, [and] deliver[] industry-leading multitasking performance.”¹² Even today,
 7 AMD defines a core as being “two or more processors on a single chip.”¹³

8 27. Similarly, Intel—AMD’s main competitor, and effectively the only other brand of
 9 CPUs cross-shopped by consumers—defines a core as being “a hardware term that describes the
 10 number of independent central processing units in a single computing component (die or chip).”¹⁴

11 28. This definition of “core” (i.e., as an independent processing unit) is also shared by
 12 consumers and computer enthusiasts. For example, companies and individuals have written and
 13 shared various “how to” articles describing how consumers can assign individual computer
 14 processes (such as an audio application, for example) to a single core on a multi-core CPU (which
 15 has the benefit of keeping every other core on that multi-core CPU unencumbered by that specific

16 ¹⁰ *Amazon.com: AMD Athlon 64 X2 Dual-Core 5600+ 2.8 GHz Processor, Socket AM2:*
 17 *Electronics*, http://www.amazon.com/gp/product/B000MNA082?ie=UTF8&ref_=de_a_smt&showDetailTechData=1#technical-data (last visited Nov. 21, 2016) (emphasis added).
 18 (describing dual-core AMD CPU released in 2007).

19 ¹¹ *AMD Athlon 64 X2 5200 Brisbane Dual-Core 2.7GHz Socket AM2 65W ADO5200DOBOX*
 20 *Processor - Newegg.com*, www.newegg.com/Product/Product.aspx?Item=N82E16819103210 (last
 21 visited Nov. 21, 2016) (emphasis added) (describing dual-core AMD CPU released in 2007).

22 ¹² *AMD Phenom II X4 970 Black Edition Deneb Quad-Core 3.5GHz Socket AM3 125W*
 23 *Desktop Processor HDZ970FBGMBOX - Newegg.com*,
 24 www.newegg.com/Product/Product.aspx?Item=N82E16819103894 (last visited Nov. 21, 2016)
 25 (describing four-core AMD CPU released in 2010).

26 ¹³ See e.g., *AMD Processors for Business*, www.amd.com/en-us/innovations/software-technologies/processors-for-business (last visited Oct. 26, 2015); *Multi-Core Processing with AMD*,
 27 <http://www.amd.com/en-us/innovations/software-technologies/processors-for-business/multicore>
 28 (last visited Nov. 21, 2016).

¹⁴ *ARK | Intel® Core™ i5-6600 Processor (6M Cache, up to 3.90 GHz)*, [ark.intel.com/
 products/88188/Intel-Core-i5-6600-Processor-6M-Cache-up-to-3_90-GHz](http://ark.intel.com/products/88188/Intel-Core-i5-6600-Processor-6M-Cache-up-to-3_90-GHz) (last visited Nov. 21,
 2016).

1 computer process and can result in net efficiencies).¹⁵ Such techniques would not be possible if
2 individual cores were not complete, independent processors.

3 29. Likewise, and as alleged more specifically below, this definition of “core” is also
4 shared by Plaintiffs Dickey and Parmer. In line with the industry standard definition (and common
5 usage) of the term discussed herein, both Plaintiffs understand that when a company advertises a
6 multi-core CPU, that company is promising that the advertised CPU will utilize a specific number
7 of independent processing units that—by virtue of their independence from the CPU’s other cores—
8 are each capable of independent operation at the CPU’s advertised clock speed (e.g., a 4.0 GHz “8-
9 core” CPU would utilize eight independent processing units that can each simultaneously process
10 tasks at speeds of 4.0 GHz.).

11 30. However, since launching its “Bulldozer” CPUs, AMD has deceived consumers by
12 advertising Bulldozers as having eight cores—two more than the competition—when they really
13 only have four complete cores.

14 **II. AMD Falsely Advertises Its Bulldozer Chips As Having Eight “Cores.”**

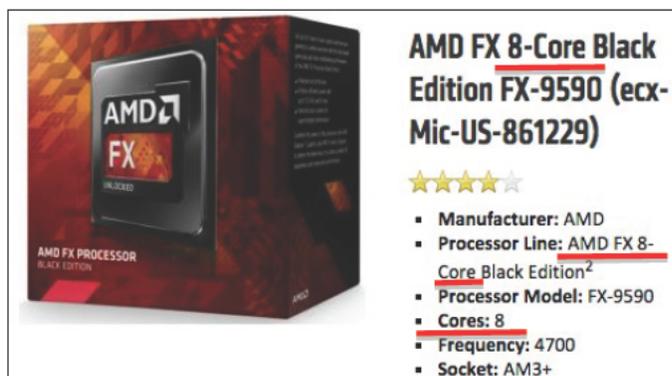
15 31. With its Bulldozer product line, AMD aimed to further convince consumers that a
16 high core-count in a CPU is equal to high performance, emphasizing that it offers more cores than
17 the competition. A close inspection of the Bulldozer’s CPU architecture and technical literature,
18 however, reveals that AMD uniformly overstated the number of cores in its processors.

19 *A. AMD advertises its Bulldozer CPUs as having eight “cores.”*

20 32. Since launching the Bulldozer CPUs, AMD’s marketing online and on-packaging
21 has centered on their number of purported cores in each Bulldozer CPU. For example, on its
22 website www.amd.com, AMD advertises the following for its Bulldozer chips:

23
24
25
26 ¹⁵ See e.g., *Assign a Program or Process to a Specific CPU running on Windows 7*,
27 <https://technet.microsoft.com/en-us/library/ee851672.aspx> (last visited Nov. 21, 2016); *How To*
28 *Force Windows Applications to Use a Specific CPU*, <http://www.howtogeek.com/121775/how-to-force-windows-applications-to-use-a-specific-cpu/> (last visited Nov. 21, 2016).

Take your PC's megatasking abilities to extreme levels with the first native 8-core desktop processor built with dynamic, tuneable performance to handle multiple intensive apps without breaking a sweat.



(**Figure 1**) (emphasis added.)¹⁶

(**Figure 2**) (emphasis added.)¹⁷

33. AMD makes similar representations at online retailers' webpages for the Bulldozer processors. For example, AMD caused the NewEgg.com and Amazon.com product page descriptions to prominently include the number of cores in the title for the Bulldozer processors:

AMD FX-9590 Vishera 8-Core 4.7GHz Socket AM3+ 220W FD9590FHHKWOF Desktop Processor - Black Edition

(**Figure 3**, AMD's Newegg.com page) (emphasis added.)¹⁸

Amd FD9590FHHKWOF Fx-9590 Oem Fx-series 8-core Black Edition by AMD

(**Figure 4**, AMD's Amazon.com page) (emphasis added.)¹⁹

34. Beyond webpage titles, AMD provides the same online retailers descriptive marketing copy for its Bulldozer processors. For instance, AMD repeatedly emphasizes that the Bulldozer processors have eight cores:

¹⁶ *AMD FX Processors*, <http://web.archive.org/web/20151029022341/http://www.amd.com/en-us/products/processors/desktop/fx> (last visited Nov. 21, 2016).

¹⁷ *AMD FX 8-Core Black Edition FX-9590| Processors* |, <http://shop.amd.com/en-us/components/processors/ecxMicUS861229> (last visited Nov. 21, 2015).

¹⁸ *AMD FX-9590 Vishera 8-Core 4.7GHz Socket AM3+ 220W FD9590FHHKWOF Desktop Processor - Black Edition - Newegg.com*, www.newegg.com/Product/Product.aspx?Item=N82E16819113347 (last visited Nov. 21, 2016).

¹⁹ *Amazon.com: AMD Athlon 64 X2 Dual-Core 5600+ 2.8 GHz Processor, Socket AM2: Electronics, infra.*

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

Features



Overclock and keep cool with up to eight cores and 5 GHz of the most advanced technology you can buy.¹The AMD FX-series processor unleashes up to 5 GHz of performance and contains up to eight powerful cores, so you can game, overclock and get the max out of your experience.

- Control up to eight cores and 5 GHz of relentless power

AMD FX 8-Core Processors

- The industry's first and only native 8-core desktop processor for unmatched multitasking and pure core performance with "Bulldozer" architecture.

Product Brief



This is FXing Serious.

We call it the new AMD FX 8-Core Processor Black Edition and it's unlocked for your overclocking pleasure. Experience unmatched multitasking and pure core performance with the industry's first 32nm 8-core desktop processor. Get the speed you crave with AMD Turbo CORE Technology to push your core frequencies to the limit when you need it most.

Maximum Performance

- The industry's only 8-core desktop processor

Core Name	Vishera
# of Cores	<u>8-Core</u>

Innovative Architecture

- The industry's first and only native 8-core desktop processor for unmatched multitasking and pure core performance with "Bulldozer" architecture

(Figure 5, showing AMD's representations on Newegg.com) (emphasis added.)²⁰

35. AMD similarly ensured that its marketing at brick-and-mortar stores emphasized the Bulldozers' core-count. For example, AMD prominently displays that the FX-9590 Bulldozer CPU has "8 cores" on the product's packaging, including on two different product seals that must be broken before consumers can access the processor (*i.e.*, consumers must view the representation before using the product). See Figures 6–8.

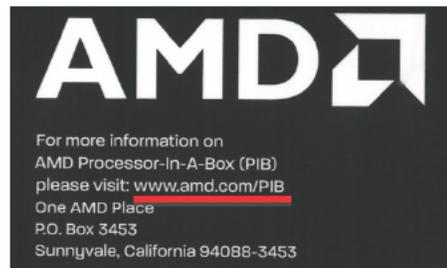
Plus:

- ▲ Control up to 8 cores and 5 GHz of relentless power
- ▲ Dominate your games with unlocked, maximum performance
- ▲ Combine it with an AMD Radeon™ R9 series graphics card for the ultimate gaming experience

(Figure 6, showing the FX-9590 Bulldozer's retail packaging) (emphasis added.)²¹

²⁰ AMD FX-9590 Vishera 8-Core 4.7GHz Socket AM3+ 220W FD9590FHHKWOF Desktop Processor - Black Edition - Newegg.com, *supra*.

²¹ Figures 6 and 7 are excerpts taken from AMD's FX9590 Bulldozer processor's packaging, a true and accurate reproduction of which is attached hereto as Exhibit D.



7 (Figure 7, showing product seal and incorporation of www.amd.com) (emphasis added.)

8



15 (Figure 8, showing secondary product seal and incorporation of www.amd.com) (emphasis added.)²²

16 36. And as noted above, even the full product names for AMD’s Bulldozer CPUs state

17 that each has 8 cores (e.g., “AMD FX 8-Core Black Edition”).

18 37. Taken together, AMD’s marketing and advertisements for the Bulldozer

19 processors—including those appearing on every processor’s packaging—make clear that the

20 Bulldozer CPUs have “8-cores.” However, as explained below, AMD has overstated the number of

21 cores within its Bulldozer processors.

22 *B. AMD’s Bulldozer CPUs Do Not Have Eight Cores.*

23 38. Despite Defendant’s claims, AMD’s Bulldozer CPUs do not have eight cores.

24 Instead, AMD designed its Bulldozers around four component-sharing “modules” rather than eight

25 independent cores. A technical inspection of the Bulldozer processors and review of trade

26 publications demonstrate that each of the 8 “cores” in a Bulldozer CPU lacks key processor

27 ²² Figure 8 is an excerpt taken from AMD’s FX9590 Bulldozer processor’s secondary

28 packaging, a true and accurate reproduction of which is attached hereto as Exhibit E.

1 elements. At best, then, each of the 8 “cores” in a Bulldozer CPU is a sub-processor that *cannot*, by
2 design and definition, operate and simultaneously multitask as actual cores.

3 39. The foundation of every AMD Bulldozer processor is AMD’s “module” technology
4 that contains two sub-processing units.²³ In its marketing, AMD represents that each module
5 contains two cores, but that is not the case because a Bulldozer module begins as a single core, to
6 which AMD adds some—but not all—of the components from another core. As described above, a
7 core is a processing unit (i.e., a processor with its own ALU, FPU, registers, and L1 and L2 cache
8 memory) that is independent from other processing units on the same physical chip or die. AMD’s
9 decision to provide each module with only *some* (but not all) of the components of two cores means
10 a module contains only one complete core, not two as advertised. While two complete cores can
11 simultaneously process two instructions independently from each other, AMD’s Bulldozer modules
12 cannot.

13 40. A visual comparison of a module to a core reveals that a module does not contain
14 two cores. Figure 9 shows a pre-Bulldozer AMD CPU design. There, a single core has a dedicated
15 (not shared) floating-point unit (“FPU”)²⁴ along with L1 and L2 cache. Similarly, Figure 10 shows
16 a current Intel design where a single core has a dedicated (not shared) FPU and L1 and L2 cache.²⁵

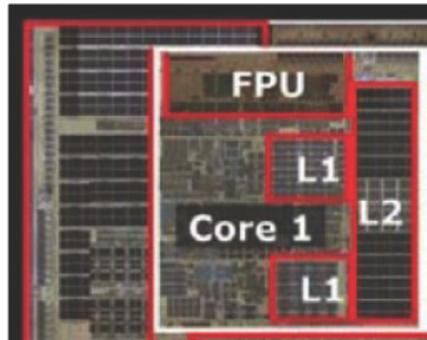
17 ²³ AMD subsequently released “Piledriver” and “Steamroller” processors that contain and
18 were built using Bulldozer module technology.

19 ²⁴ A floating point unit is a sub processor purpose-built to perform calculations related to
20 “floating points,” or non-integer number (*i.e.*, numbers with decimal places). L2 cache is a bank of
21 computer memory that serves as a repository for a processing unit.

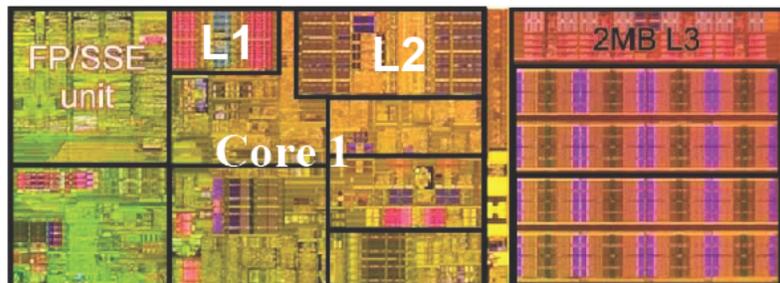
22 ²⁵ In addition to its multi-core processors, Intel offers a “Hyper-Threading” feature on its
23 CPUs. Hyper-Threading is a technology used by Intel to create virtual cores. Specifically, engineers
24 found that by adding additional components to a CPU, it may be possible to cause one core to
25 process two instructions rather than one. By including Hyper-Threading, Intel increased
26 performance of a single core. However, Hyper-Threading does not offer the same performance as
27 two “physical” (*i.e.*, actual) cores.

28 Importantly, Intel does not market its CPUs with Hyper-Threading as having more cores
than a chip without Hyper-Threading. That is, Intel does not count Hyper-Threading’s virtual cores
as additional “physical cores.” For example, Intel advertises its Hyper-Thread enabled Core i5 chips
as having “2 cores” but being capable of executing “4 threads,” what it defines as “a software term
for the basic ordered sequence of instructions that can be passed through or processed by a single
CPU core.” See *ARK | Intel® Core™ i5-5250U Processor (3M Cache, up to 2.70 GHz)*,
http://ark.intel.com/products/84984/Intel-Core-i5-5250U-Processor-3M-Cache-up-to-2_70-GHz
(last visited Nov. 21, 2016).

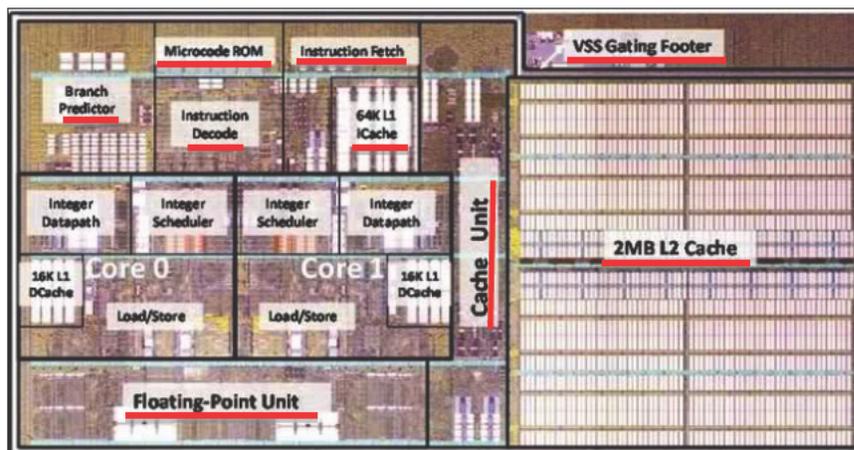
1 With these designs, each core can process an instruction independently from other cores because it
 2 has its own dedicated cache and FPU, among other components (e.g., ALU and registers). These
 3 complete processing units fit into the definition of a core. And, an 8-core CPU built with these
 4 designs will have eight copies of the cores shown above on one physical processor or die and, thus,
 5 would contain eight FPUs and eight sets of L1 and L2 cache.



6
7
8
9
10
11 (Figure 9, showing AMD's Phenom II core with a separate and dedicated (non-
 12 shared) floating-point unit and L2 cache, among other components.)



13
14
15
16
17 (Figure 10, showing Intel's Westmere core with a separate floating-point unit and
 18 L2 cache, among other components)

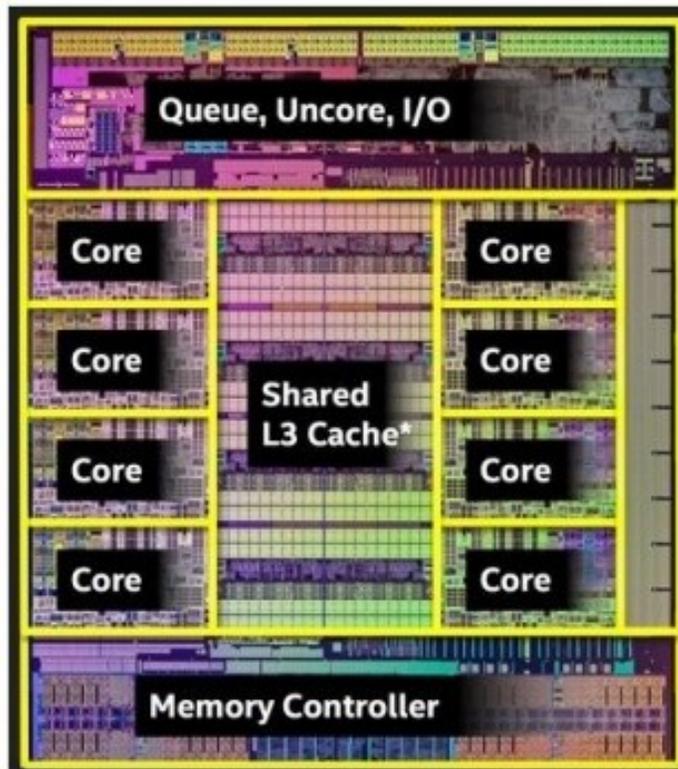


19
20
21
22
23
24
25 (Figure 11, showing a Bulldozer module with two module processing units marked as
 26 "Core 0" and "Core 1" and sharing a single floating point unit and L2 cache)
 27 (emphasis added, showing shared components.)²⁶

28 ²⁶ Intel & AMD, *Architectural Discussion, How Far Ahead Is Intel? - CPUs, Motherboards, and Memory - Linus Tech Tips*, <http://linustechtips.com/main/topic/48571-intel-amd-architectural->

1 41. But as Figure 11 reveals, AMD designed its module processing units to share
 2 common components. As such, AMD’s advertised “cores” are not independent from each other and,
 3 by definition, are not actual cores. For instance, AMD’s Bulldozer module processing units share a
 4 single FPU. If one module processing unit performs a floating point calculation, the other must wait
 5 until that resource is free for its own floating point calculation, creating a bottleneck. The same is
 6 true for the L2 cache, and other shared sub-components. A Bulldozer CPU advertised as having
 7 “eight cores,” then, has eight module sub-processing units but only four FPUs, four sets of L2
 8 cache, and four sets of other important core components. As such, the “eight core” AMD Bulldozer
 9 CPU does not have eight cores under the industry standard and commonly accepted definition.

10 42. Looking at entire processors, it becomes evident that the Bulldozers do not have “8-
 11 cores.” Figure 12, on the following page, shows an Intel processor with eight true cores. There,
 12 eight cores are identified and they all effectively follow the Intel core design in Figure 10.

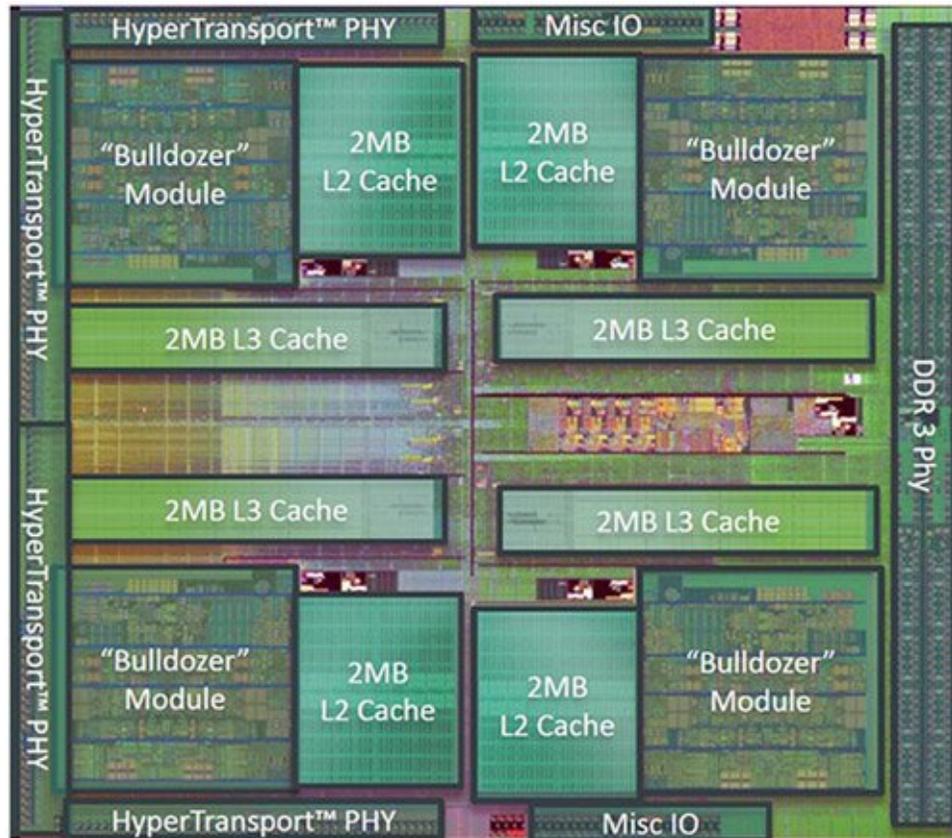


13
14
15
16
17
18
19
20
21
22
23
24
25 (Figure 12, showing an Intel Core i7-5960X eight core processor.)²⁷

26 discussion-how-far-ahead-is-intel/ (last visited Nov. 21, 2016).

27 ²⁷ Intel releases its 8-core Haswell-E Extreme edition processors – Tech2 ,
 28 <http://tech.firstpost.com/news-analysis/intel-releases-8-core-haswell-e-extreme-edition-processors-231793.html> (last visited Nov. 21, 2016).

1 43. In contrast, Figure 13 shows an FX-8150 8-Core Bulldozer processor. There, only
2 four modules are countable and they follow the design pattern identified in Figure 11.



16 **(Figure 13, showing an “8-core” AMD Bulldozer processor.)**²⁸

17 44. In fact, when not marketing to consumers, AMD acknowledges that a module is not
18 equal to two cores. In 2013, AMD released a technical video of one of its engineers describing the
19 Bulldozer design.²⁹ In the video, the engineer states that AMD’s modules have “additional sharing”
20 when compared to existing cores and that *modules*, rather than module processing units, have
21 “everything necessary to schedule a code on these processors.”³⁰ That is, an “8 core” Bulldozer
22 CPU with four modules really only has four actual cores.

23 ²⁸ AMD FX-8150 8-Core CPU Review: Bulldozer Is Here - Page 2 | HotHardware,
24 <http://hothardware.com/reviews/amd-fx8150-8core-processor-review-bulldozer-has-landed?page=2>
(last visited Nov. 21, 2016).

25 ²⁹ AMD, “*Bulldozer*” Processor Topology, May 28, 2013, www.youtube.com/watch?v=4EAuVsXWQ0s (last visited Nov. 21, 2016).

26 ³⁰ *Id.*

1 C. *Misrepresenting a CPU's Core-count is Material.*

2 45. As the AMD engineer put it: Bulldozer module processing units share more
3 resources than a core. In practice, AMD's choice to design the Bulldozer module processor units to
4 share components creates a performance bottleneck compared to CPUs with actual cores.

5 46. When it was released in 2011, AMD advertised its 3.3 GHz FX-8150 Bulldozer
6 processor³¹ as being the "first-ever eight-core desktop processor" for consumers.³² Intel's
7 competing chip at the time was its four core Intel Core i7-2600K running at 3.3 GHz.³³ As these
8 specifications suggest, the competing chips operate at the same clock speeds, but AMD seemingly
9 bests Intel on core-count. As such, consumers in the market for CPUs would identify the AMD chip
10 as the better offering because it offers double the number of cores at the same speeds—therefore it
11 would be expected that AMD's CPU would be twice as fast as Intel's. But as described above, the
12 Bulldozer does not contain eight cores and its performance is less than it would be for a true eight-
13 core CPU.

14 47. For instance, Figure 14 is a chart from a representative technical review of a
15 Bulldozer processor compared against an Intel processor (lower is better). There, the "8-core" FX-
16 8150 Bulldozer processor is 96% slower than the 4-core (with Hyper-Threading) Intel Core i7-
17 2600K.³⁴ In fact, the reviewer discovered that the new "8-core" Bulldozer chip was often *slower*
18 than AMD's older 6-core processor.³⁵

19
20 * * *

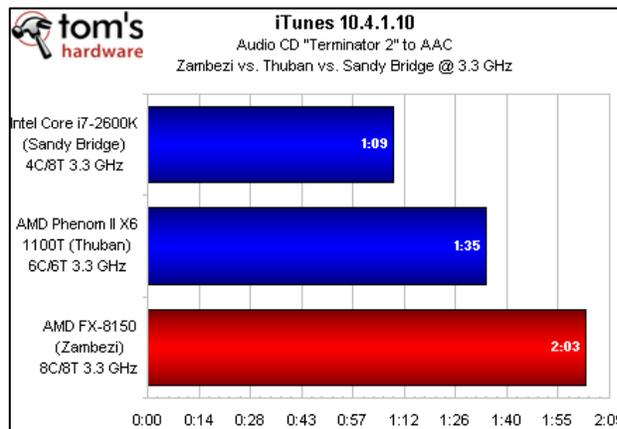
21
22
23 ³¹ *The Bulldozer Review: AMD FX-8150 Tested - Print View, supra.*

24 ³² AMD, *Unlock Your Record Setting AMD FX Series Processor Today*, (10/12/2011)
25 <http://www.amd.com/en-us/press-releases/Pages/unlock-your-record-setting-2011oct12.aspx> (last
26 visited Nov. 21, 2016).

27 ³³ *The Sandy Bridge Review: Intel Core i7-2600K, i5-2500K and Core i3-2100 Tested*,
28 [http://www.anandtech.com/show/4083/the-sandy-bridge-review-intel-core-i7-2600k-i5-2500k-core-
i3-2100-tested](http://www.anandtech.com/show/4083/the-sandy-bridge-review-intel-core-i7-2600k-i5-2500k-core-i3-2100-tested) (last visited Nov. 21, 2016).

³⁴ *Id.*

³⁵ *Id.*



(Figure 14, showing AMD’s Bulldozer “AMD FX-8150,” taking 2:03 minutes to complete a task, markedly slower than Intel’s “Core i7” at 1:09 minutes and AMD’s pre-Bulldozer chip, the “Phenom II” at 1:35 minutes.)³⁶

48. The reason AMD’s “8-core” Bulldozer was slower than Intel’s 4-core CPU and its own 6-core CPU is that it does not have “8-cores,” but only eight module processing units with shared components. And even if they were privy to the Bulldozer technical design documentation, average consumers in the market for a CPU lack the requisite technical expertise to understand the underlying design of the Bulldozer processors. Instead, average consumers trust AMD to convey accurate specifications in its marketing.

49. And although AMD knew that average consumers were unable to discern the falsehood of its representations at the time of sale, AMD misled consumers who desired a processor with eight cores by advertising inflated core-counts of its Bulldozer CPUs. As a result, tens of thousands of consumers have been deceived by AMD’s marketing and purchased Bulldozer processors believing AMD’s representations about its core-count to be true.

III. Plaintiff Dickey’s Experience With His FX-9590 Processor.

50. On March 10, 2015, Plaintiff Dickey navigated to AMD.com’s product webpage for the FX-9590 Bulldozer chip (located at <http://products.amd.com/en-us/search/CPU/AMD-FX->

³⁶ *Per-Core Performance - AMD Bulldozer Review: FX-8150 Gets Tested*, <http://www.tomshardware.com/reviews/fx-8150-zambezi-bulldozer-990fx,3043-6.html> (last visited Nov. 21, 2016); *see also The Bulldozer Review: AMD FX-8150 Tested - Print View*, <http://www.anandtech.com/print/4955/the-bulldozer-review-amd-fx8150-tested> (last visited Nov. 21, 2016) (stating that in some instances, “Bulldozer simply does not perform,” and even in other cases, “the improvement over the previous generation [AMD six-core CPU] simply isn’t enough to justify an upgrade.”)

1 Series/AMD-FX-8-Core-Black-Edition/FX-9590/98). On AMD’s website, Plaintiff Dickey saw
2 representations identical to those in Figures 1 and 2. Specifically, Plaintiff Dickey saw
3 representations that the FX-9590 Bulldozer chip was “the first native 8-core desktop processor” and
4 had “8-core[s].”

5 51. Plaintiff Dickey then navigated to www.Newegg.com where he saw AMD’s
6 representations claiming that the Bulldozer processor had “8 cores.” The representations he saw
7 were created by AMD and provided by it to Newegg.com. Specifically, Plaintiff Dickey saw
8 representations on Newegg.com that the FX-9590 Bulldozer was the “first native 8-core desktop
9 processor” and “the industry’s first and only native 8-core desktop processor for unmatched
10 multitasking and pure core performance with ‘Bulldozer’ architecture,” identical to the
11 representations in Figures 3 and 5. These also matched the representations AMD made on its own
12 website.

13 52. After viewing and relying upon these representations, on March 10, 2015, Plaintiff
14 Dickey purchased two FX-9590 Bulldozer processors on Newegg.com for \$299.99. Plaintiff Dickey
15 then read the representations that AMD created for the processors’ packaging when he received the
16 FX-9590 processors in the mail but prior to opening and using the product. Specifically, Plaintiff
17 Dickey read AMD’s representations that the FX-9590 Bulldozer was an “8-core” processor, as
18 shown in Figures 6–8.

19 53. Plaintiff Dickey then began using the AMD FX-9590 Bulldozer processors.
20 However, as described above, the FX-9590 Bulldozer processors Plaintiff Dickey purchased did not
21 have eight cores each. Instead, they each only contained four Bulldozer “modules,” which at best
22 could constitute four cores. As a result, Plaintiff Dickey’s AMD FX-9590 Bulldozer processors did
23 not perform as well as a CPU with the same clock speed but with eight true cores.

24 54. Plaintiff Dickey purchased the FX-9590 Black Edition 8-Core Bulldozer processor
25 specifically because AMD advertised it as having 8 cores. Relying on those advertisements, and
26 based on his own understanding of the term “core,” Plaintiff Dickey believed that the FX-9590
27 Black Edition 8-Core Bulldozer processor would contain 8 cores, such that each “core” would be
28

1 independent from all the others (i.e., it would not share resources with the other cores) and would be
2 capable of performing independent calculations at full speed.

3 55. Had Dickey known that each of the advertised “cores” in the FX-9590 Black Edition
4 8-Core Bulldozer processor shared processing resources (e.g., the FPU and cache)—and, thus, was
5 not independent or, by design, capable of performing at full speed—he would not have purchased it
6 in the first place (or, at the least, would have paid less for it).

7 56. Accordingly, Plaintiff Dickey has suffered damages as the result of AMD’s
8 misrepresentations in the form of money paid to purchase the FX-9590 Bulldozer processors.

9 57. Plaintiff Dickey is likely to consider purchasing AMD’s processors in the future and
10 requires an injunction requiring AMD to truthfully advertise its processor specifications going
11 forward. Defendant AMD is one of only two major companies that provide processors for consumer
12 personal computers.³⁷ As such, Plaintiff Dickey will be exposed to AMD’s deceptive marketing in
13 the future and is effectively left with no other option but to purchase products from AMD or Intel.
14 Plaintiff Dickey would consider purchasing AMD’s Bulldozer chips in the future if they were
15 accurately advertised and priced commensurately with their true value. Moreover, an injunction
16 requiring AMD to stop falsely marketing its CPUs will have an effect on the market for CPUs,
17 leading to fewer misleading advertisements.

18 **IV. Plaintiff Parmer’s Experience With His FX 8350 Black Edition 8-Core Processor.**

19 58. On or around June 2015, Plaintiff Parmer purchased an FX 8350 Black Edition 8-
20 Core Bulldozer processor for \$189.99 from Amazon.com.

21 59. Before purchasing the product, Plaintiff Parmer recognized that the name of the
22 product identified that it had “8-Cores.”

23 60. In addition, and also before deciding to make his purchase, Plaintiff Parmer visited
24 AMD.com and the FX 8350 AMD product webpage, located at [http://shop.amd.com/en-](http://shop.amd.com/en-us/components/processors/FD8350FRHKBOX)
25 [us/components/processors/FD8350FRHKBOX](http://shop.amd.com/en-us/components/processors/FD8350FRHKBOX), and viewed representations substantially similar to

26 ³⁷ Kay, Roger, *Intel v. AMD: The Juggernaut Vs. The Squid*, Forbes.com (Nov. 25, 2014),
27 <http://www.forbes.com/sites/rogerkay/2014/11/25/intel-and-amd-the-juggernaut-vs-the-squid/> (last
28 visited Nov. 21, 2016).

1 those identified in Exhibit F. Specifically, Plaintiff Parmer saw and relied upon the representations
2 on AMD.com that the FX-8350 Black Edition 8-Core Bulldozer was the “first native 8-core desktop
3 processor” and “the industry’s first and only native 8-core desktop processor for unmatched
4 multitasking and pure core performance with ‘Bulldozer’ architecture.” *See* Exhibit F.

5 61. Plaintiff Parmer then began using the FX 8350 Black Edition 8-Core Bulldozer
6 processor. However, as described above, the FX 8350 Black Edition 8-Core Bulldozer processor
7 Plaintiff Parmer purchased did not have 8 independent cores. Instead, it only contained four
8 Bulldozer “modules,” which at best could constitute four cores. As a result, Plaintiff Parmer’s FX
9 8350 Black Edition 8-Core Bulldozer processor did not perform as well as a CPU with the same
10 clock speed but with eight true cores.

11 62. Plaintiff Parmer purchased the FX 8350 Black Edition 8-Core Bulldozer processor
12 specifically because AMD advertised it as having 8-cores. Relying on those advertisements, and
13 based on his own understanding of the term “core,” Plaintiff Parmer believed that the FX 8350
14 Black Edition 8-Core Bulldozer processor would contain 8 cores, such that each “core” would be
15 independent from all the others (i.e., it would not share resources with the other cores) and would be
16 capable of performing independent calculations at full speed.

17 63. Had Parmer known that each of the advertised “cores” in the FX 8350 Black Edition
18 8-Core Bulldozer processor shared processing resources (e.g., the FPU and cache)—and, thus, was
19 not independent or capable of performing at full speed—he would not have purchased it in the first
20 place (or, at least, would have paid less for it).

21 64. Accordingly, Plaintiff Parmer has suffered damages as the result of AMD’s
22 misrepresentations in the form of money paid to purchase the FX 8350 Black Edition 8-Core
23 Bulldozer.

24 65. Plaintiff Parmer is likely to consider purchasing AMD’s processors in the future and
25 requires an injunction requiring AMD to truthfully advertise its processor specifications going
26 forward. Defendant AMD is one of only two major companies that provide processors for consumer
27
28

1 personal computers.³⁸ As such, Plaintiff Parmer will be exposed to AMD's deceptive marketing in
 2 the future and is effectively left with no other option but to purchase products from AMD or Intel.
 3 Plaintiff Parmer would consider purchasing AMD's Bulldozer chips in the future if they were
 4 accurately advertised and priced commensurately with their true value. Moreover, an injunction
 5 requiring AMD to stop falsely marketing its CPUs will have an effect on the market for CPUs,
 6 leading to fewer misleading advertisements.

7 CLASS ALLEGATIONS

8 66. Plaintiffs Dickey and Parmer bring this action pursuant to Federal Rule of Civil
 9 Procedure 23(b)(2) and Rule 23(b)(3) on behalf of themselves and a national Class of similarly
 10 situated individuals (the "**Nationwide Class**") defined as follows:

11 All individuals in the United States that purchased an AMD Bulldozer processor after
 12 viewing and relying upon the description provided on that processor's respective
 AMD webpage, including:

- 13 a. **Model No. FX-8120** (<http://products.amd.com/en-us/search/CPU/AMD-FX-Series/AMD-FX-8-Core-Black-Edition/FX-8120/85>)
- 14 b. **Model No. FX-8150** (<http://products.amd.com/en-us/search/CPU/AMD-FX-Series/AMD-FX-8-Core-Black-Edition/FX-8150/84>)
- 15 c. **Model No. FX-8320** (<http://products.amd.com/en-us/search/CPU/AMD-FX-Series/AMD-FX-8-Core-Black-Edition/FX-8320/93>)
- 16 d. **Model No. FX-8350** (<http://products.amd.com/en-us/search/CPU/AMD-FX-Series/AMD-FX-8-Core-Black-Edition/FX-8350/92>)
- 17 e. **Model No. FX-8370** (<http://products.amd.com/en-us/search/CPU/AMD-FX-Series/AMD-FX-8-Core-Black-Edition/FX-8370/100>)
- 18 f. **Model No. FX-9370** (<http://products.amd.com/en-us/search/CPU/AMD-FX-Series/AMD-FX-8-Core-Black-Edition/FX-9370/99>)
- 19 g. **Model No. FX-9590** (<http://products.amd.com/en-us/search/CPU/AMD-FX-Series/AMD-FX-8-Core-Black-Edition/FX-9590/98>).³⁹

27 ³⁸ *id.*

28 ³⁹ True and accurate copies of the online advertising and on-box representations for the FX-

1 67. Plaintiff Parmer brings this action pursuant to Federal Rule of Civil Procedure
2 23(b)(2) and Rule 23(b)(3) on behalf of himself and a statewide Class of similarly situated
3 individuals (the “**California Class**”) defined as follows:

4 All California residents that purchased any of the following AMD Bulldozer
5 processors: FX-8120, FX-8150, FX-8320, FX-8350, FX-8370, FX-9370, and FX-
6 9590.

7 68. The following people are excluded from the Classes: (1) any Judge or Magistrate
8 presiding over this action and members of their families; (2) Defendant, Defendant’s subsidiaries,
9 parents, successors, predecessors, and any entity in which the Defendant or its parents have a
10 controlling interest and its current or former employees, officers and directors; (3) persons who
11 properly execute and file a timely request for exclusion from the Classes; (4) persons whose claims
12 in this matter have been finally adjudicated on the merits or otherwise released; (5) Plaintiffs’
13 counsel and Defendant’s counsel; and (6) the legal representatives, successors, and assigns of any
14 such excluded persons.

15 69. **Numerosity:** The exact number of members of the Classes is unknown and is not
16 available to Plaintiffs at this time, but individual joinder in this case is impracticable. The Classes
17 likely consists of tens of thousands of individuals. Members of the Classes can be easily identified

18 8120, FX-8150, FX-8320, FX-8350, FX-8370, FX-9370, and FX-9590 Bulldozer processors
19 (“Bulldozer Processors”) are attached hereto as Exhibit G, emphasis showing substantially similar
20 representations and specifications. As the representations in Exhibit G show, AMD built all of the
21 Bulldozer Processors around the same “Bulldozer Microarchitecture,” meaning the processors only
22 differ with regards to price, clock speed (GHz), and other non-material or not-at-issue features. *See*
23 *also AMD FX-Series microprocessor family*, [http://www.cpu-world.com/CPUs/Bulldozer/TYPE-](http://www.cpu-world.com/CPUs/Bulldozer/TYPE-FX-Series.html)
24 [FX-Series.html](http://www.cpu-world.com/CPUs/Bulldozer/TYPE-FX-Series.html) (last visited Nov. 21, 2016).

25 In addition, and as shown in Exhibit G, the Bulldozer Processors were marketed in the same
26 way. Marketing for each contains the core-count within the product name, product description,
27 product details, and on the box. Moreover, AMD overstated the core-count for each processor in the
28 same way: AMD counted each module as two cores even though a Bulldozer module processing
unit is not equal to a core. And, in one of its Form 10-Ks, AMD states the following about its FX
processors: “Our CPUs for desktop PC platforms also consist of the following: AMD FX processors
based on the ‘Bulldozer’ and ‘Piledriver’ x86 multi-core architecture” *Advanced Micro Devices*
- SEC Filing,

<http://ir.amd.com/mobile.view?c=74093&v=202&d=3&id=aHR0cDovL2FwaS50ZW5rd2l6YXJkLmNvbS9maWxpbnmcueG1sP2lwYWdlPTg3NDQwODgmRFNFUT0xJINFUT04JINRREVTQz1TRUNUSU9OX1BBR0UmZXhwPSZzdWJzaWQ9NTc%3D> (last visited Nov. 21, 2016).

1 through Defendant's or its agents' records.

2 70. **Commonality and Predominance:** There are many questions of law and fact
3 common to the claims of Plaintiffs and the other members of the Classes, and those questions
4 predominate over any questions that may affect individual members of the Classes. Common
5 questions for the Classes include but are not limited to the following:

- 6 a) Whether Defendant intentionally misrepresented the core-count of its
7 Bulldozer Processors;
- 8 b) Whether Defendant's conduct described herein was willful;
- 9 c) Whether Defendant's conduct described herein constitutes a violation of
10 California's Consumers Legal Remedies Act (Cal. Civ. Code. §§ 1750, *et*
11 *seq.*);
- 12 d) Whether Defendant's conduct described herein constitutes a violation of the
13 Unfair Competition Law (Cal. Bus. & Prof. Code §§ 17200, *et seq.*);
- 14 e) Whether Defendant's conduct described herein constitutes a violation of the
15 False Advertising Law (Cal. Bus. & Prof. Code §§ 17500, *et seq.*);
- 16 f) Whether Defendant's conduct described herein constitutes fraud in the
17 inducement;
- 18 g) Whether Defendant's conduct described herein constitutes a breach of
19 express warranty; and
- 20 h) Whether Defendant's conduct described herein constitutes negligent
21 misrepresentation.

22 71. **Typicality:** Plaintiffs' claims are typical of the claims of the other members of the
23 Classes. Plaintiffs and the Classes sustained damages as a result of Defendant's uniform wrongful
24 conduct during transactions with Plaintiffs and the Classes.

25 72. **Adequate Representation:** Plaintiffs have and will continue to fairly and adequately
26 represent and protect the interests of the Classes, and he has retained counsel competent and
27 experienced in complex litigation and class actions. Plaintiffs have no interests antagonistic to those
28

1 of the Classes, and Defendant has no defenses unique to Plaintiffs. Plaintiffs and their counsel are
2 committed to vigorously prosecuting this action on behalf of the members of the Classes, and they
3 have the resources to do so. Neither Plaintiffs nor their counsel has any interest adverse to those of
4 the other members of the Classes.

5 73. **Policies Generally Applicable to the Classes:** This class action is appropriate for
6 certification because Defendant has acted or refused to act on grounds generally applicable to the
7 Classes, thereby requiring the Court’s imposition of uniform relief to ensure compatible standards
8 of conduct toward the members of the Classes and making final injunctive relief appropriate with
9 respect to each of the Classes. Defendant’s policies challenged herein apply and affect the members
10 of the Classes uniformly and Plaintiffs’ challenge of these policies hinges on Defendant’s conduct
11 with respect to the Classes, not on facts or law applicable only to Plaintiffs.

12 74. **Superiority:** This class action is also appropriate for certification because class
13 proceedings are superior to all other available methods for the fair and efficient adjudication of this
14 controversy and joinder of all members of the Classes is impracticable. The damages suffered by
15 the individual members of the Classes will likely be small relative to the burden and expense of
16 individual prosecution of the complex litigation necessitated by Defendant’s wrongful conduct.
17 Thus, it would be virtually impossible for the individual members of the Classes to obtain effective
18 relief from Defendant’s misconduct. Even if members of the Classes could sustain such individual
19 litigation, it would not be preferable to a class action because individual litigation would increase
20 the delay and expense to all parties due to the complex legal and factual controversies presented in
21 this Complaint. By contrast, a class action presents far fewer management difficulties and provides
22 the benefits of single adjudication, economy of scale, and comprehensive supervision by a single
23 court. Economies of time, effort, and expense will be fostered and uniformity of decisions will be
24 ensured.

25 75. Plaintiffs reserve the right to revise the foregoing “Class Allegations” and “Class
26 Definition” based on facts learned through additional investigation and in discovery.
27
28

FIRST CAUSE OF ACTION
Violation of the Consumers Legal Remedies Act
Cal. Civ. Code §§ 1750, *et seq.*
(On Behalf of Plaintiffs and the Classes)

1
2
3 76. Plaintiffs incorporate by reference the foregoing allegations as if fully set forth
4 herein.

5 77. The Consumers Legal Remedies Act (“CLRA”) applies to Defendant’s actions and
6 conduct as described herein because it extends to transactions that are intended to result, or which
7 have resulted, in the sale of goods or services to consumers.

8 78. Defendant is a “person” as defined by Cal. Civ. Code § 1761(c).

9 79. Plaintiffs and each member of the Classes are “consumers” as defined by Cal. Civ.
10 Code § 1761(a).

11 80. Defendant’s Bulldozer Processors are “goods” within the meaning of Cal. Civ. Code
12 § 1761(a).

13 81. As described herein, Defendant has engaged in deceptive practices, unlawful
14 methods of competition, and/or unfair acts as defined by Cal. Civ. Code §§ 1750 *et seq.*, to the
15 detriment of Plaintiffs and the Classes.

16 82. Defendant, acting with knowledge, intentionally and unlawfully brought harm upon
17 Plaintiffs and the Classes by representing that the Bulldozer Processors had “8-cores” when in fact
18 Defendant’s representations were false because the Bulldozer Processors have only four complete
19 cores.

20 83. Specifically, Defendant violated Cal. Civ. Code § 1750 in at least the following
21 respects:

- 22 a. In violation of § 1770(5), by representing that the Bulldozer Processors had
23 characteristics, ingredients, uses, benefits, or quantities which they did not
24 have;
- 25 b. In violation of § 1770(7), by representing that the Bulldozer Processors were
26 of a particular standard, quality, or grade of which they are not; and
- 27 c. In violation of § 1770(9), by advertising the Bulldozer Processors with the
28

1 intent not to sell its goods as advertised.

2 84. Defendant's unfair or deceptive acts or practices were capable of deceiving a
3 substantial portion of the purchasing public.

4 85. Defendant knew that it was unable or unwilling to manufacture, distribute, and sell
5 processors with the advertised specifications at the time that it made representations claiming that
6 the Bulldozer Processors had twice the number of cores that they actually had. Specifically,
7 Defendant possessed technical materials and documentation and would have known that the
8 Bulldozer modules were not equivalent to two cores as advertised.

9 86. Once Defendant made specific public representations regarding the specifications of
10 the Bulldozer Processors, Defendant was under a duty to Plaintiffs and the Classes to disclose its
11 inability or unwillingness to manufacture, distribute, and sell processors as advertised because:

- 12 a. Defendant was in a superior position to know the true state of facts about the
13 specifications of the Bulldozer Processors;
- 14 b. Plaintiffs and the Classes could not reasonably have been expected to learn or
15 discover that Defendant did not design the Bulldozer Processors with the
16 advertised specifications;
- 17 c. Defendant knew that Plaintiffs and the members of the Classes could not
18 reasonably have been expected to learn or discover that the Bulldozer
19 Processors did not contain the core-count advertised; and
- 20 d. Defendant knew, and in fact intended, that Plaintiffs and the members of the
21 Classes would rely on Defendant's representations regarding the processors'
22 core-count in choosing whether or not to purchase the Bulldozer Processors.

23 87. In failing to disclose its inability or unwillingness to design, manufacture, and sell
24 processors with the advertised specifications, Defendant has knowingly and intentionally concealed
25 material facts and breached its duty not to do so.

26 88. The facts concealed or not disclosed by Defendant to Plaintiffs and the Classes,
27 including that the Bulldozer Processors did not have any many cores as advertised, are material in
28

1 that a reasonable consumer would have considered them to be important in deciding whether or not
2 to purchase the Bulldozer Processors.

3 89. Plaintiffs and the Classes reasonably expect their processors to have the
4 specifications equal to what Defendant advertised based upon Defendant's representations found
5 online, the processors' packaging, and in the processors' names. Plaintiffs' and members of the
6 Class's expectations were reasonable under the circumstances.

7 90. The core-count of the Bulldozer Processors are and were material selling points of
8 Defendant's processors, and primary reasons to purchase the products.

9 91. Plaintiffs and members of the Classes relied on the representations made by
10 Defendant about the core-count of the Bulldozer Processors when purchasing the products.

11 92. Defendant's false representations about the core-count of the Bulldozer Processors
12 were acts likely to mislead Plaintiffs and the members of the Classes acting reasonably under the
13 circumstances.

14 93. Through the misrepresentations and omissions detailed herein, Defendant wrongfully
15 induced Plaintiffs and the other members of the Classes to purchase the Bulldozer Processors when
16 they otherwise would not have purchased the processors or would have only agreed to purchase
17 them at a lower price.

18 94. As a direct and proximate result of Defendant's violation of Cal. Civ. Code §§ 1750,
19 *et seq.*, Plaintiffs and each member of the Classes have suffered harm in the form of paying monies
20 to Defendant without receiving the entire benefit of his or her bargain.

21 95. Plaintiffs and the members of the Classes are likely to purchase processors with
22 AMD technology in the future and require an injunction requiring AMD to truthfully advertise its
23 processors' specifications. Specifically, because AMD and its competitor Intel manufacture and
24 distribute effectively all consumer CPUs, Plaintiffs and members of the Classes will be exposed to
25 AMD's deceptive marketing in the future and are effectively left with no other option but to
26 purchase products from AMD or Intel.

27 96. Under Cal. Civ. Code § 1780(a) and (b), Plaintiffs, individually and on behalf of the
28

1 Classes, seek an injunction requiring Defendant to cease and desist the illegal conduct alleged in
2 this Complaint, and all other appropriate remedies for its violations of the CLRA. For the sake of
3 clarity, Plaintiffs explicitly disclaims any claim for damages under the CLRA at this time.

4 **SECOND CAUSE OF ACTION**
5 **Violations of California’s Unfair Competition Law**
6 **Cal. Bus. & Prof. Code §§ 17200, *et seq.***
7 **(On Behalf of Plaintiffs and the Classes)**

8 97. Plaintiffs incorporate by reference the foregoing allegations as if fully set forth
9 herein.

10 98. California’s Unfair Competition Law (“UCL”), Cal Bus. & Prof. Code §§ 17200, *et*
11 *seq.*, protects both consumers and competitors by promoting fair competition in commercial
12 markets for goods and services.

13 99. The UCL prohibits any unlawful, unfair, or fraudulent business act or practice,
14 including the employment of any deception, fraud, false pretense, false promise, misrepresentation,
15 or the concealment, suppression, or omission of any material fact. A business practice need only
16 meet one of the three criteria to be considered unfair competition.

17 100. The specifications of a consumer product is a material term of any transaction
18 because it directly affects a consumer’s choice of, or conduct regarding, whether to purchase a
19 product. Any deception or fraud related to the specifications of a product is materially misleading.

20 101. As described herein, Defendant has engaged in deceptive business practices, as
21 defined by the UCL, by misrepresenting the core-count of its Bulldozer Processors.

22 102. Defendant’s representations were, in fact, false. Defendant’s processors do not
23 actually contain the advertised core-count. In particular, Defendant’s Bulldozer Processors contain
24 four “modules” (*i.e.*, four complete cores) which are materially distinct from “8-cores” that are
25 advertised.

26 103. Defendant has violated the fraudulent prong of the UCL by knowingly making false
27 representations to consumers—including Plaintiffs and the Class—regarding the number of cores in
28 its Bulldozer Processors. These representations were made in an effort to convince consumers to
purchase the Bulldozer Processors.

1 111. California’s False and Misleading Advertising Law (“FAL”) prohibits corporations
2 from intentionally disseminating advertisements for products or services that are “unfair, deceptive,
3 untrue, or misleading.” Cal. Bus. & Prof. Code §17500.

4 112. As depicted in Figures 1–8 and detailed throughout this Complaint, Defendant has
5 disseminated unfair, deceptive, untrue, and misleading advertisements that overstate the core-count
6 of its Bulldozer Processors. As detailed in Section II above, these advertisements are false and
7 misleading and were designed to convince consumers to purchase the processors. In short,
8 Defendant’s advertisements are false because they advertise specifications that Defendant knew the
9 processors did not have (*i.e.*, AMD knew a Bulldozer module is not equal to two complete cores).

10 113. A reasonable person is likely to be deceived by Defendant’s advertisements.

11 114. Defendant knew or should have known when creating and disseminating these
12 advertisements that they contained materially false and misleading information. As the developers,
13 engineers, testers, and distributors of the Bulldozer Processors, Defendant is intimately familiar
14 with the processors’ specifications. Thus, it is reasonable to infer that Defendant is (and was) aware
15 of the fact that the Bulldozer Processors did not have any many cores as advertised.

16 115. Defendant’s conduct directly and proximately caused Plaintiffs and the Classes
17 actual monetary damages in the form of the price paid for the Bulldozer Processors—typically
18 between \$150 and \$300—or, at least, the difference between what they paid for the processors and
19 their actual value.

20 116. Plaintiffs seek an order (1) requiring Defendant to cease the false advertising
21 practices described herein; (2) requiring Defendant to restore to members of the Classes any money
22 acquired by means of false advertising (restitution); and, (3) awarding reasonable costs and
23 attorneys’ fees pursuant to Cal. Code Civ. Proc. § 1021.5.

24 **FOURTH CAUSE OF ACTION**
25 **Fraud in the Inducement**
26 **(On Behalf of Plaintiffs and the Classes)**

27 117. Plaintiffs incorporate by reference the foregoing allegations as if fully stated herein.

28 118. As described with particularity herein, Defendant has designed, overseen, and

1 disseminated false and misleading advertisements for its Bulldozer Processors. This conduct
2 includes, but is not limited to, Defendant promoting and advertising that the Bulldozer Processors
3 have “8-cores” when Defendant knew or should have known that the processors only have four
4 complete cores.

5 119. By committing the acts alleged in this Complaint, Defendant has designed and
6 disseminated untrue and misleading statements through fraudulent advertising in order to sell or
7 induce members of the public to purchase its Bulldozer Processors.

8 120. The number of cores within a CPU is a material term of any transaction for a
9 processor because it directly affects a consumer’s choice of, or conduct regarding, whether to
10 purchase a particular CPU. Any deception of fraud related to the core-count for a processor is
11 materially misleading.

12 121. Misrepresentations regarding a processor’s core-count specifications are likely to
13 mislead a reasonable consumer who is acting reasonably under the circumstances.

14 122. Defendant knew or should have known of the falsity of the representations it made
15 regarding the core-count of its Bulldozer Processors.

16 123. Defendant intended that the deceptive and fraudulent misrepresentations it made
17 would induce consumers to rely upon them and act by purchasing its Bulldozer Processors.

18 124. Defendant received money as a result of Plaintiffs and members of the Classes
19 monies purchasing a product that did not meet the advertised specifications. Accordingly, Plaintiffs
20 and the members of the Classes have suffered injury in fact and lost money in justifiable reliance on
21 Defendant’s misrepresentations of material fact.

22 125. In deceiving Plaintiffs and the Classes by misrepresenting the actual core-count
23 specifications of the Bulldozer Processors, and inducing Plaintiffs and the Classes to proffer
24 payment based on those misrepresentations, Defendant has engaged in and has, and/or continues to
25 have, direct knowledge of fraudulent practices designed to mislead and deceive consumers.

26 126. Plaintiffs and the Classes have suffered harm as a proximate result of Defendant’s
27 violations of law and wrongful conduct.
28

1 127. Plaintiffs, on behalf of themselves and the Classes, seek damages from Defendant's
2 unlawful conduct.

3 **FIFTH CAUSE OF ACTION**
4 **Breach of Express Warranties**
5 **(On Behalf of Plaintiffs and the Classes)**

6 128. Plaintiffs incorporate by reference the foregoing allegations as if fully set forth
7 herein.

8 129. Pursuant to California Commercial Code § 2313, Defendant's sale of its Bulldozer
9 Processors included express warranties created by Defendant's affirmations of fact, made through
10 the marketing materials and advertisements displayed on retailers' websites, on the processors'
11 packaging, and in the processors' product description.

12 130. Defendant's express warranties included affirmations of fact and promises that the
13 Bulldozer Processors would conform to the core-count specifications represented on retailers'
14 websites, on the processors' packaging, in the processors' product description, and in the Bulldozer
15 Processors' names and model numbers.

16 131. Specifically, Defendant's statements included affirmations of fact and promises that
17 the Bulldozer Processors have "8-cores." As such, Defendant expressly warranted that the
18 Bulldozer Processors would conform to such specifications.

19 132. Defendant, under the California Commercial Code, was obligated to deliver the
20 Bulldozer Processors as advertised, promised, and/or described.

21 133. Defendant breached its express warranties because the processors did not conform to
22 the core-count specifications advertised on retailers' websites, on the processors' packaging, in the
23 processors' product description.

24 134. Defendant's failure to provide Plaintiffs and the members of the Classes with
25 processors that conform to advertised core-count specifications constitutes a breach of the express
26 warranty to include such core-count specifications with the Bulldozer Processors.

27 135. Plaintiffs and the members of the Classes relied on Defendant's affirmations,
28 promises, and descriptions when they purchased the Bulldozer Processors. But for Defendant's

1 affirmations and promises, Plaintiffs and the Classes would not have purchased the Bulldozer
2 Processors, or would have only agreed to purchase them at a lower price. As such, Defendant's
3 breach of express warranties injured Plaintiffs and the Classes because they purchased a product of
4 diminished value—processors that do not have the core-count specifications as described by
5 Defendant's affirmations and promises.

6 136. Because the processors that Plaintiffs and the members of the Classes received did
7 not have the core-count specifications as expressly warranted and represented by Defendant,
8 Plaintiffs and the members of the Classes have been damaged insofar as they did not receive the
9 benefit of their bargain.

10 137. By serving this Complaint, Plaintiffs and the Classes hereby give Defendant notice
11 that it has breached the express warranties described above. Plaintiffs and the members of the
12 Classes request maximum damages as provided by the California Commercial Code.

13 **SIXTH CAUSE OF ACTION**
14 **Negligent Misrepresentation**
15 **(On Behalf of Plaintiffs and the Classes)**

16 138. Plaintiffs incorporate by reference the foregoing allegations.

17 139. Through its marketing materials, Defendant represented to Plaintiffs and the
18 members of the Classes that the Bulldozer Processors have "8-cores."

19 140. Plaintiffs and the members of the Classes were exposed to representations made by
20 Defendant regarding the Bulldozer Processors having eight cores. Those representations were
21 repeated on and through various websites, including amd.com, Newegg.com, and Amazon.com, on
22 the Bulldozer's packaging, and in the Bulldozer Processors' names and model numbers.

23 141. Those representations were false, and at the time such false statements were made,
24 Defendant knew or should have known of their falsity or, at the very least, Defendant acted with
25 negligence and carelessness in ascertaining the truth of the statements. Defendant knew or should
26 have known that they were unwilling or unable to include the qualities and specifications
27 represented in its marketing materials (online and on-box). Defendant did not have any reasonable
28 ground for believing its statements to be true.

1 C. Awarding damages, including statutory and punitive damages where applicable, to
2 Plaintiffs and the Classes in an amount to be determined at trial;

3 D. Awarding Plaintiffs and the Classes their reasonable litigation expenses and
4 attorneys' fees;

5 E. Awarding Plaintiffs and the Classes pre- and post-judgment interest, to the extent
6 allowable;

7 F. Awarding such other injunctive and declaratory relief as is necessary to protect the
8 interests of Plaintiffs and the Classes; and

9 G. Awarding such other and further relief as the Court deems reasonable and just.

10 **DEMAND FOR JURY TRIAL**

11 Plaintiffs demand a trial by jury for all issues so triable.

12 Respectfully submitted,

13 Dated: November 21, 2016

TONY DICKEY and PAUL PARMER, individually
and on behalf of all others similarly situated,

14 By: /s/ Benjamin S. Thomassen
15 One of Plaintiffs' Attorneys

16 Rafey S. Balabanian*
17 rbalabanian@edelson.com
18 Stewart R. Pollock (SBN 301356)
19 spollock@edelson.com
20 EDELSON PC
21 123 Townsend Street,
22 San Francisco, California 94107
23 Tel: 415.212.9300
24 Fax: 415.373.9435

25 Benjamin S. Thomassen*
26 bthomassen@edelson.com
27 Amir C. Missaghi*
28 amissaghi@edelson.com
EDELSON PC
350 North LaSalle Street, 13th Floor
Chicago, Illinois 60654
Tel: 312.589.6370
Fax: 312.589.6378

* Admitted *pro hac vice*

Attorneys for Plaintiffs and the Putative Classes