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US009529769B2

(12) **United States Patent**  
**Chu**

(10) **Patent No.:** **US 9,529,769 B2**  
(45) **Date of Patent:** **\*Dec. 27, 2016**

(54) **COMPUTER SYSTEM INCLUDING CPU OR PERIPHERAL BRIDGE DIRECTLY CONNECTED TO A LOW VOLTAGE DIFFERENTIAL SIGNAL CHANNEL THAT COMMUNICATES SERIAL BITS OF A PERIPHERAL COMPONENT INTERCONNECT BUS TRANSACTION IN OPPOSITE DIRECTIONS**

(58) **Field of Classification Search**  
USPC ..... 710/305-317, 104-110, 62-64, 72-74  
See application file for complete search history.

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(57) **ABSTRACT**

A computer system has a computer with an integrated central processing unit and graphics subsystem in a single chip. The graphics subsystem directly couples to a unidirectional differential signal channel to output digital video data. A connector is configurable for external peripheral communication. A first Low Voltage Differential Signal (LVDS) channel directly couples to the connector. The first LVDS channel has two unidirectional, differential signal pairs transmitting data in opposite directions to convey Universal Serial Bus (USB) protocol data for external peripheral communication. The unidirectional different signal channel conveys Transition Minimized Differential Signaling (TMDS) signals as digital video data.

**22 Claims, 35 Drawing Sheets**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **15/055,436**

(22) Filed: **Feb. 26, 2016**

(65) **Prior Publication Data**

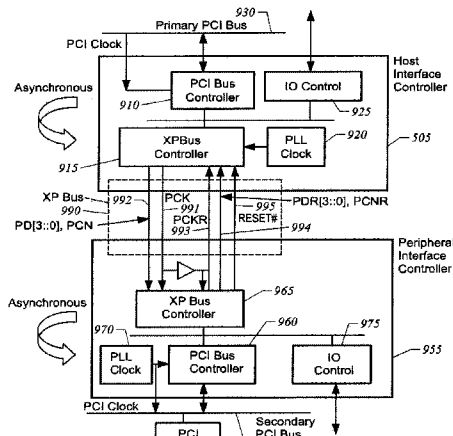
US 2016/0179744 A1 Jun. 23, 2016

**Related U.S. Application Data**

(63) Continuation of application No. 14/511,093, filed on Oct. 9, 2014, which is a continuation of application (Continued)

(51) **Int. Cl.**  
**G06F 13/00** (2006.01)  
**G06F 13/42** (2006.01)  
(Continued)

(52) **U.S. Cl.**  
CPC ..... **G06F 13/4282** (2013.01); **G06F 1/08** (2013.01); **G06F 1/12** (2013.01); **G06F 1/1632** (2013.01);  
(Continued)



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No. 14/209,922, filed on Mar. 13, 2014, which is a continuation of application No. 13/744,287, filed on Jan. 17, 2013, now Pat. No. 8,756,359, which is a continuation of application No. 13/649,084, filed on Oct. 10, 2012, now Pat. No. 8,977,797, which is a continuation of application No. 13/560,924, filed on Jul. 27, 2012, now Pat. No. 8,626,977, which is a continuation of application No. 13/087,912, filed on Apr. 15, 2011, now Pat. No. 8,234,436, which is a continuation of application No. 12/504,534, filed on Jul. 16, 2009, now Pat. No. 8,041,873, which is a continuation of application No. 12/077,503, filed on Mar. 18, 2008, now Pat. No. 7,676,624, which is a continuation of application No. 11/166,656, filed on Jun. 24, 2005, now Pat. No. 7,376,779, which is a continuation of application No. 11/097,694, filed on Mar. 31, 2005, now Pat. No. 7,363,415.

## (51) Int. Cl.

**G06F 13/40** (2006.01)  
**G06F 1/16** (2006.01)  
**G06F 1/12** (2006.01)  
**G06F 13/38** (2006.01)  
**G06F 1/08** (2006.01)  
**G06F 13/10** (2006.01)  
**G06F 13/20** (2006.01)

## (52) U.S. Cl.

CPC ..... **G06F 13/102** (2013.01); **G06F 13/20** (2013.01); **G06F 13/385** (2013.01); **G06F 13/409** (2013.01); **G06F 13/4027** (2013.01); **G06F 13/4068** (2013.01); **G06F 13/42** (2013.01); **G06F 13/4221** (2013.01)

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