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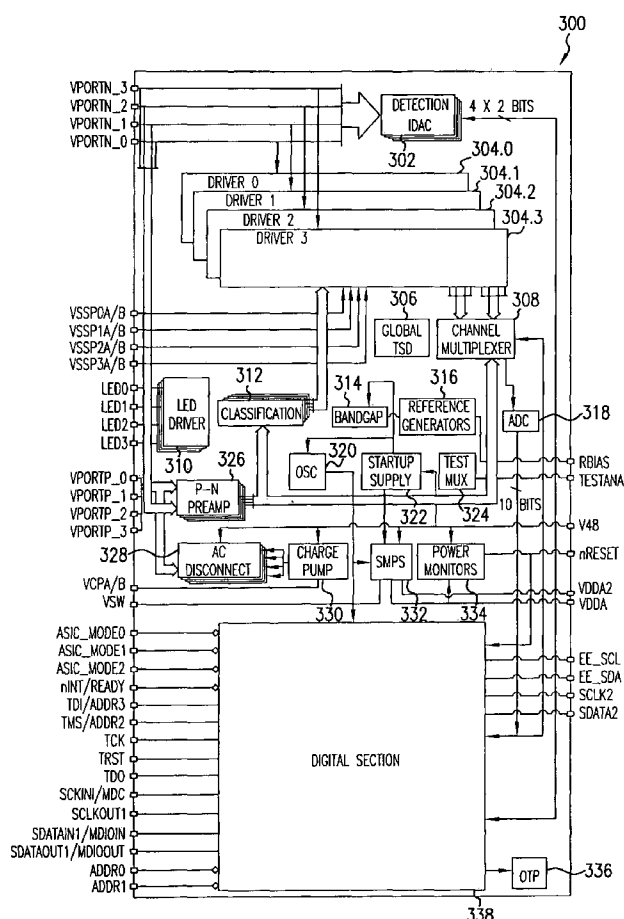
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(54) Title: POWER OVER ETHERNET CONTROLLER INTEGRATED CIRCUIT ARCHITECTURE



(57) Abstract: Power over Ethernet (PoE) communication systems provide power and data communications over the same communications link, where a power source device (PSE) provides DC power (for example, 48 volts DC) to a powered device (PD). The DC power is transmitted simultaneously over the same communications medium with the high speed data from one node to the other node. The PSE typically includes a controller that controls the DC power provided to the PD at the second node of the communications link. The PSE controller measures the voltage, current, and temperature of the outgoing and incoming DC supply lines to characterize the power requirements of the PD. In addition, the PSE controller may detect and validate a compatible PD, determine a power classification signature for the validated PD, supply power to the PD, monitor the power, and reduce or remove the power from the PD when the power is no longer requested or required. During detection, if the PSE finds the PD to be non-compatible, the PSE can prevent the application of power to that PD device, protecting the PD from possible damage.



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B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, INSPEC, IBM-TDB, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/099076 A1 (ELKAYAM SHIMON [IL] ET AL) 29 May 2003 (2003-05-29) paragraph [0080] - paragraph [0088]; figure 4	1-20
A	US 2004/201931 A1 (KORCHARZ DROR [IL] ET AL) 14 October 2004 (2004-10-14) paragraph [0063] paragraph [0090] - paragraph [0091] ----- -/--	1-17

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p> MEDELSON G: "All You Need To Know About Power over Ethernet (PoE) and the IEEE 802.3af Standard" INTERNET CITATION, [Online] June 2004 (2004-06), XP002372480 Retrieved from the Internet: URL: http://www.powerdsine.com/Documentation/WhitePapers/PoE_and_IEEE802_3 af.pdf> [retrieved on 2006-03-16] page 15, paragraph LINE DETECTION page 16, paragraph CLASSIFICATION ----- </p>	11-20

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003099076 A1	29-05-2003	US 2007121929 A1	31-05-2007
US 2004201931 A1	14-10-2004	NONE	