

# Developing LSI for High Speed Next Generation Communication Interfaces

February 19 2010

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NEC Corp. announced today the development and successful demonstration of LSI technology for next-generation high-speed serial communication interfaces. This new technology allows inter-chip communication that is three times faster than modern communication interface standards, such as USB 3.0 and PCI Express 2.0, without using complicated transmission modes like multilevel transmission.

In recent years, due to the appearance of high-definition (HD) TV and 3D video content, the volume of data being processed for personal use has rapidly grown. This growth has resulted in greater demand for high speed transmission of data both between and within a wide variety of equipment. In order to provide for this demand, various types of sophisticated transmission schemes have been proposed to compensate for the large waveform distortion of input signals fed to the receiver, and to reach high-speed communications of more than 10 Gb/s to facilitate next-generation USB and PCI Express.

However, application of such transmission schemes is quite limited as their complexity is not compatible with widely-employed binary transmission schemes used in current USB and PCI Express.

NEC and NECEL's newly developed high-speed communication interface technology utilizing binary transmission schemes enable data rates of 16 Gb/s, which is approximately three times faster than existing communication interface standards, such as [USB](#) 3.0 and PCI Express 2.0.

Conventional equalizers correct the distortion of a receiver's input signal waveform by feeding back received data to the input signal waveform. However, as data rates grow higher, the time allowed for feedback operation becomes shorter, making the correction of distortion difficult.

In the newly developed technology, a feed-forward type waveform equalization is employed within the analog domain: the branched input signal is delayed by one data period and is then added to the original input signal waveform. This procedure greatly reduces the nearest-neighbor inter-bit interference in the signal waveform and thus successfully alleviates the issue of feedback-time constraint inherent in conventional equalizers.

NEC and NECEL presented the results of this research on February 9 at the IEEE International Solid State Circuits Conference (ISSCC 2010), held February 7 -11 in San Francisco, California, U.S.A.

Source: NEC

Citation: Developing LSI for High Speed Next Generation Communication Interfaces (2010, February 19) retrieved 25 April 2024 from <https://phys.org/news/2010-02-lsi-high-interfaces.html>

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