ANALOGIX
SEMICONDUCTOR

FEATURES AND BENEFITS

- IEEE802.3-compliant 10Base-T, 100Base-TX and 100Base-FX Ethernet PHY
- IEEE 802.3u auto negotiation support with extension for long-range operation
- Proprietary Long Range extension supporting 10 Mbps at 1000m over Cat5 cable (10/100BASE-LR™) for all ports
- IEEE 802.3u compliant Auto Negotiation support for automatic selection of speed, duplex, etc.
- DSP based transmit pre-emphasis, adaptive receive equalization, Baseline Wander Correction and cross-talk cancellation
- Half duplex and full duplex support for all patterns. Manual and automatic crossover for MDI and MDIX.Automatic reversed polarity detection/correction

- Proprietary cable diagnostic test: detection of disconnect or short when link is down detecting disconnect or short location
- Jumbo frame (up to 20K bytes) support with up to ±100ppm clock frequency difference
- Programmable interrupts. Integrated programmable status LED drivers and LED stretch
- IEEE 1149.1 Standard Test Access Port (JTAG) for boundary scan test.
- I/O voltage 3.3V, Core voltage 1.8V
- Low power consumption, maximum power consumption: 300mW/port
- BGA/QFP package

APPLICATIONS

### "The Last Mile" Ethernet Broadband Access

In the past few years, "The Last Mile" broadband access mainly based on: Ethernet, ADSL and Cable Modem, and ADSL is the mainstream in the application. But with the boom of video business such as IPTV, game online etc., people are eager for higher bandwidth, exchangeable network structure and lower cost solutions. As everybody knows, Ethernet access has many advantages with high bandwidth, high dependability, easy maintenance, low cost, and extensive application, making it people's first choice. But in the past 20 years, the 100-meter transmission limit through copper cables has always been the bottleneck for Ethernet application. It causes equipments spreading around and complicated. If the transmitting distance can be extended, it undoubtedly gives a big chance to the Ethernet. Based on the advanced techniques in high-speed mixed signal circuit design, Analogix semiconductor introduces the ANX58xx family LRE PHYs and provides a physical layer Mixed-Signal solution to "The Last Mile" access. It breaks the traditional restriction and makes the transmitting distance reach up to 1000 meters. LRE devices are fully compatible with standard IEEE 802.3. When used on both ends of a connection, LRE dramatically increase the standard's reach on CAT 3, CAT 5, and city telephone cable to make Ethernet a reality for broadband access deployment.

Network Surveillance

With the characteristics of long-range and high-bandwidth, the ANX58xx LRE PHYs are perfect solutions for the new developing network surveillance equipments with high performance/cost ratio. It also can be widely used in the fields of security monitoring systems, traffic control systems and fire prevention systems etc.

Long-Range Industry Ethernet Bus

Industrial Ethernet is an extension from computer digital communications technology to industrial automatization field. Maximum advantages of industrial networks comprised by industrial Ethernet is that it can make commercial networks of factory, manufacture networks of workshop, and equipment networks as an expedite clarity networks, and forms an integer combining with electrics commercial, logistics supply link and ERP etc. However, Industrial Ethernet has not been widely used in the field of the lower layer of industrial process control, that is in the field of the equipment layer, whereas the main reason is that the transmission distance of the traditional Industrial Ethernet made of copper media can not reach more than 100 meters, but if people use the multiple-chip cable for long distance, the transmission cost must be very high. ANX58xx make the transmission distance extending from 100 meters to 1000 meters, so that it can provide the enterprise an actual solution in building a "top-to-bottom" network.
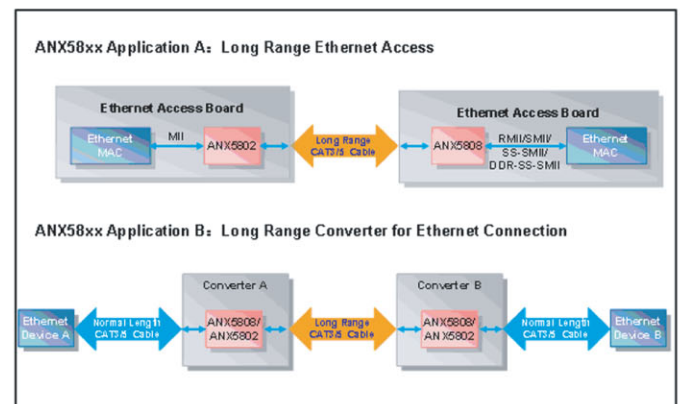
LRE Easily Provide Ethernet A Long-Range Solution

● Advanced ANALOG+DSP Architecture

When signals transmit after the long-range (above 200m) line attenuation, traditional Ethernet transceiver won't be able to work normally. The extended reach of LRE is achieved through the use of advanced analog and digital signal processing (DSP) techniques and features two unique architectural elements: PAM4 transmit encoding and enhanced analog/DSP receiver functions. Standard Ethernet devices use Manchester encoding for 10 Mbps and MLT-3 encoding for 100 Mbps, date rates. LRE supports these standard modes and adds PAM4 encoding for long-range capabilities. PAM4 reduces fundamental frequencies and boosts pulse widths, thereby lessening the effects of "noises" that normally hinder longer-distance transmission. Additionally, LRE transmitters also employ pre-emphasis to reduce to compensate for attenuation over long transmission links.

● Extended Auto-Negotiation for Long-Range Modes

To easily support extended distances, LRE devices incorporate a superset of the IEEE 802.3u standard Ethernet auto-negotiation protocol. Two link partners that can both support Long Range capabilities will automatically turn on PAM4 encoding and other DSP elements through the protocol.

● Proprietary Cable Diagnostic Testing and Reporting

When users' cable breaks down, traditional Ethernet transceiver unable to work normally, or help user diagnose the reason. But Analogix ANX58xx LRE PHYs provide proprietary cable diagnostic test: detection of disconnect or short when link is down including disconnect or short location. So that it can report the position and reasons of trouble to the users.

LRE Network Diagram

ANX58xx Family LRE PHY can be designed into:

- Ethernet switches
- Family multimedia gateway
- 10/100M NIC
- Net surveillance equipment
- Industry Ethernet equipment

ANX58xx Family PHYs

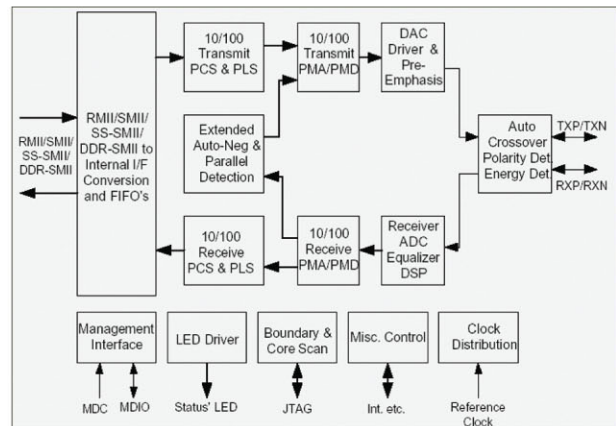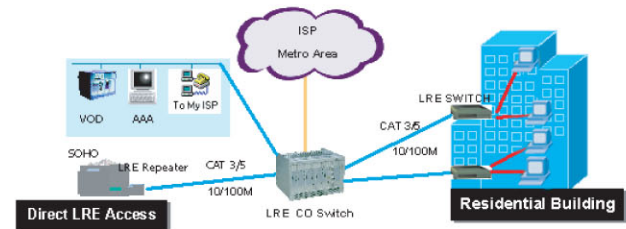| P/N	Function	Supply Voltage	Package
ANX5808	8-ports LRE PHY/4 Converters	Core: 1.8V I/O: 3.3V	BGA
ANX5802	1-port LRE PHY/1 Converter	Core: 1.8V I/O: 3.3V	BGA/QFP

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CONTACT ANALOGIX

For more information on the ANX58xx, please contact Analogix or visit the web at www.analogix.com