AMD

AMD's Am79C901 HomePNA-Compliant Device with Motorola's MC68360, MPC860, MPC850, and MPC8260

Application Note

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The following application note describes how to interface AMD's Am79C901 HomePHY™ 1/10 Mbps home networking PHY to the SCCs, FECs, and FCCs on Motorola's integrated communication microprocessors. **The user should make every effort to verify this design in the lab before releasing it.** *For more information or assistance, please contact the AMD Field Applications Engineer at your nearest AMD sales office.*

Supporting the Home Phoneline Networking Alliance (HomePNA) specification for data networking at speeds up to 1 Mbps over existing residential phone wiring with a Motorola QUICC™, PowerQUICC™, and PowerQUICC II™ integrated communication microprocessors is simple when you use AMD's Am79C901 HomePHY device.

All of the Motorola integrated communication controllers that support Ethernet or Fast Ethernet require a separate PHY (transceiver). AMD's HomePHY device is a HomePNA-compliant PHY that connects easily and without any glue logic to all of the Ethernet and Fast Ethernet ports on the Motorola communication microprocessors.

AMD's HomePHY device and all of the Ethernet-enabled serial communication controllers (SCCs) of the QUICC/PowerQUICC/PowerQUICC II, the Fast Ethernet controllers (FECs) of the MPC860T/DT, and the fast communication controllers (FCCs) of the PowerQUICC II support the 7-wire, SIA interface (also called serial mode or General Purpose Serial Interface (GPSI) mode).

The remainder of this application note describes how to connect the 7-wire, SIA interface of the HomePHY device with Motorola's Ethernet-enabled SCCs, FECs, and FCCs.

Because every SCC has different pin names, the actual SCC pin names in Figure 1 have been omitted. Please refer to Table 1 for proper corresponding SCC pin names.

The interface between the SCC and the HomePHY transceiver has seven pins. Below is a description of these pins and their respective connections:

1. Receive Clock – Receive Clock (RXCLK) comes from the HomePHY device and goes into the SCC (RCLK) and may either be the CLK1, CLK2, CLK3, CLK4, CLK5, CLK6, CLK7, or CLK8 pin on the SCC.

Table 1. HomePHY Pin Connections to Various SCC pins

Am79C901	SCC Pins			
Pins	SCC1	SCC2	SCC3	SCC4
TXDAT	TXD1	TXD2	TXD3	TXD4
TXEN	RTS1	RTS2	RTS3	RTS4
TXCLK	CLKa	CLKa	CLKb	CLKb
RXDAT	RXD1	RXD2	RXD3	RXD4
RXCRS	CD1	CD2	CD3	CD4
RXCLK	CLKa	CLKa	CLKb	CLKb
CLS	CTS1	CTS2	CTS3	CTS4

Note: *CLKa = CLK1, CLK2, CLK3 or CLK4*

CLKb = CLK5, CLK6, CLK7 or CLK8

2. Transmit Clock – Transmit Clock (TXCLK) comes from the HomePHY device and goes into the SCC (TCLK) and may either be the CLK, CLK1, CLK2, CLK3, CLK4, CLK5, CLK6, CLK7, or CLK8 pin on the SCC. However, TCLK and RCLK cannot be connected to the same CLK because the Ethernet transceiver supplies a separate clock signal between the transmitter and receiver.

3. Receive Data – RXDAT of the HomePHY transceiver connects directly to the RXDAT pin of the SCC.

4. Transmit Data – TXDAT of the HomePHY transceiver connects directly to the TXD pin of the SCC.

5. Transmit Enable – The SCC's $\overline{RTS}$ changes to TENA when it is configured to Ethernet mode. TENA connects to the HomePHY device's TXEN pin. This signal allows the SCC to signal the HomePHY device when there is valid data on TXD.

6. Receive Enable – The SCC's $\overline{CD}$ changes to RENA when it is configured to Ethernet Mode. RENA connects to the HomePHY device's CRS pin. This signal allows the HomePHY device to signal the SCC when

data has been received.

7. Collision – The SCC's $\overline{\text{CTS}}$ changes to CLSN when it is configured to Ethernet mode. CLSN connects to the HomePHY device's CLS pin. This signal indicates the detection of a collision condition.

Note: This application note is based on engineering information from AMD's and Motorola's data sheets. Limited validation has been done to test this specific application.

Refer to the AMD HomePHY data sheet (PID#22304), the Motorola QUICC/PowerQUICC/PowerQUICC II data sheets, and the Motorola MPC860T Fast Ethernet Controller supplement for additional information.
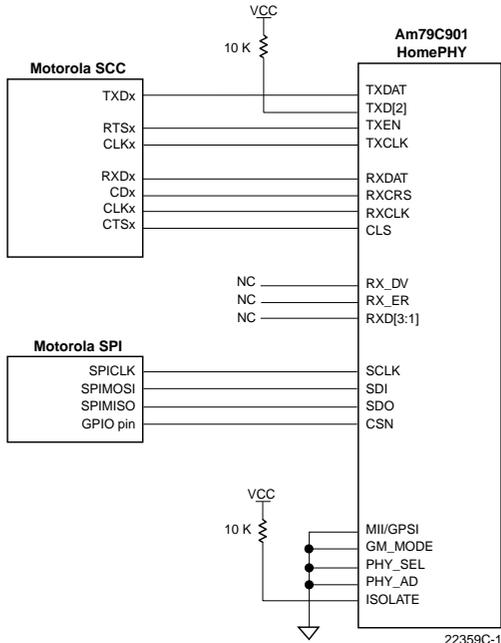
Note: NC = No Connect

Figure 1.   7-Wire Interface Between SCC and HomePHY Devices