

IEEE 802.3 10BASE2 Transceiver

Product Brief

FEATURES

- Supports the IEEE 802.3 standard for 10BASE2
- Designed to reduce external circuitry
- Integrates all transceiver functions except signal and power isolation
- Receiver detects collisions
- Externally selectable CD heartbeat operates with IEEE 802.3 compatible repeaters
- Integrated jabber timer function
- Squelch circuitry on all inputs for increased noise rejection
- Industry standard 9-volt supply
- CMOS technology
- Available in a 16-pin DIP

GENERAL DESCRIPTION

The NCR92C392 Transceiver is an IEEE 802.3 10BASE2 driver/receiver for thin coaxial cable. The NCR92C392 connects to coaxial cable on one side and the Manchester Encoder/Decoder (MENDEC) on the other. In 10BASE2 applications, the NCR92C392 is located on the adapter card or mother board and uses isolation transformers to interface to the MENDEC and the coaxial cable.

SYSTEM DESCRIPTION

The NCR92C392 is one of three functions that implements the complete IEEE 802.3 10BASE2 compatible system shown in Figure 2. The NCR92C392 performs the AUI-to-coax transceiver function. The Manchester encoder/decoder and the Ethernet controller are the two complementary functions used with the coax transceiver. The NCR92C391 provides the Manchester encoding/decoding functions. The NCR92C390 Controller handles the media access protocol and the buffer management tasks.

Figure 3 shows how integrated solutions can use the NCR92C901 Ethernet Controller in place of the NCR92C390 and NCR92C391. If a multimedia solution is desired, the NCR92C902 Controller can replace the NCR92C390 and NCR92C391, which adds twisted pair (10BASE-T) capability to the system.

Power isolation for the NCR92C392 is accomplished by using a DC-to-DC converter. The required isolation between the NCR92C392 and NCR92C391 is satisfied by using a set of transformers, which come in a standard DIP.

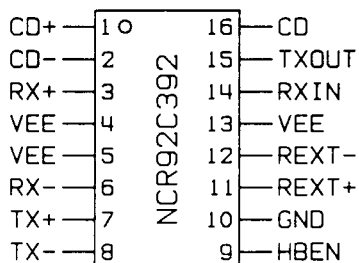


Figure 1 Pinout Diagram

Pinout Summary

Signal Name	Type	Pin No.	Pin Description
CD+	Output	1	Collision Output Plus
CD-	Output	2	Collision Output Minus
RX+	Output	3	Receive Output Plus
VEE	Power	4	Negative 9-Volt Supply
VEE	Power	5	Negative 9-Volt Supply
RX-	Output	6	Receive Output Minus
TX+	Input	7	Transmit Input Plus
TX-	Input	8	Transmit Input Minus
HBEN	Input	9	Heartbeat Enable
GND	Ground	10	System Ground (positive supply)
REXT+	Input	11	External Resistor Plus
REXT-	Input	12	External Resistor Minus
VEE	Power	13	Negative 9-Volt Supply
RXIN	Input	14	Receive Input
TXOUT	Output	15	Transmit Output
CD	Input	16	Collision Detect

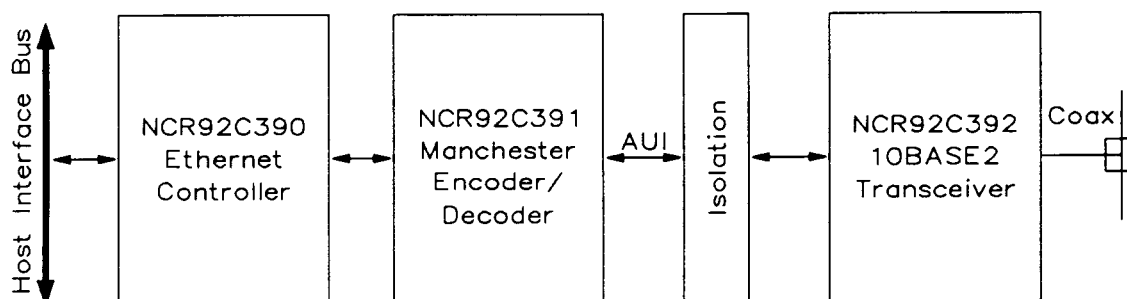


Figure 2 System Block Diagram – Discreet Solution

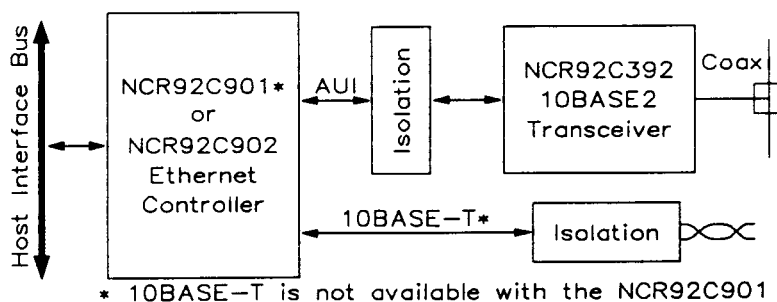


Figure 3 System Block Diagram – Integrated Solutions

FUNCTIONAL DESCRIPTION

The NCR92C392 consists of a receiver, transmitter, a collision detector, and a jabber timer. The transmitter translates the differential Manchester encoded data into a single output for transmission to the coax. During transmission, a jabber timer ensures that the NCR92C392 transmitter does not send a packet longer than the maximum length. Collision detection circuitry monitors the signals on the coax to determine if a collision occurs and signals the MENDEC if one does occur. The receiver brings data off the coax when there is no collision and converts it to differential signals for the MENDEC. Figure 4 shows the primary logic.

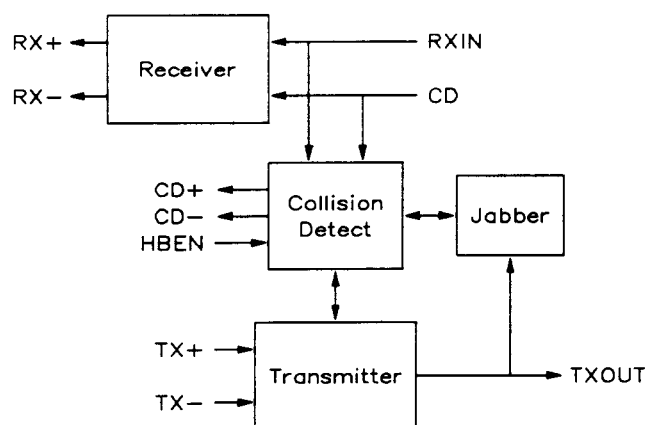


Figure 4 Chip Block Diagram

TRANSMITTER

The NCR92C392 transmitter translates differential data from the MENDEC (AUI) to data that can be transmitted on a 50 Ω coaxial cable. The transmitter receives its data from a differential input and sends it out over an open-collector current driver. The differential input common-mode voltage is established by the NCR92C392 and does not require any alteration by external circuitry. The standard AUI transformer for the TX+/- input pair is the only component required between the MENDEC and AUI. Controlled rise and fall times minimize jitter.

RECEIVER

The receiver translates data from the coax cable into differential signals compatible with the MENDEC. At the beginning of a packet, the receiver turns on to receive the data. Squelch circuitry is used to prevent noise from generating false starts. The receiver also has a quick shutdown system to reject dribble bits at the end of the packet.

COLLISION

The collision circuitry monitors the media and determines if a collision has occurred. When a collision occurs, it activates the collision differential detect signals. The collision detection circuitry includes a 10 MHz oscillator, a comparator, a heartbeat generator, and a differential driver. The oscillator generates the signal for the collision and heartbeat functions. It is also used as the timer for all jabber functions. This oscillator does not require any external components. The comparator monitors the media to detect when to enable the CD+/- outputs. At the end of every transmission, the heartbeat generator creates a collision for a short time to ensure that the collision circuitry is functioning. This function can be disabled with the HBEN input to allow operation with repeaters. The collision differential driver transfers the 10 MHz signal to the CD+/- pair in the event of collision, jabber, or heartbeat conditions.

JABBER

The jabber circuitry is a protective device required by IEEE 802.3 to insure that the node will not continuously transmit if it should be damaged. The jabber timer does this by ensuring that the transmissions do not exceed the maximum allowable length. If the timer expires (20 ms), a fault occurs and the CD+/- outputs indicate a collision for the remainder of the transmission.

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