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# AT-MX10, AT-MX20 & AT-210, Micro Transceivers

**AT-MX10**, 10Base2 MAU transceiver
**AT-MX10S**, 10Base2 MAU, slim-line transceiver
**AT-MX20T**, 10T MAU transceiver
**AT-MX210T**, 10T MAU transceiver
**AT-MX210TS**, 10T MAU, slim-line transceiver



## KEY FEATURES

**IEEE 802.3 compliant and Ethernet Version 1.0 and 2.0 compatible**

**Direct Attachment Unit Interface (AUI) connection**

**Slim-line versions (AT-MX10S, AT-210TS) for improved mechanical fit for Macintosh, Sun SPARC stations and IBMRS/6000 workstations**

**Switch-selectable SQE test (all models) and LED (AT-MX10, AT-MX10S, AT-210T, AT-210TS)**

**Polarity detection and correction (AT-MX20T, AT-210T, AT-210TS) and LED (AT-210T, AT-210TS)**

**Link integrity test function and LED (AT-MX20T, AT-210T, AT-210TS)**

**5 year warranty**

These micro transceivers are 10Base2 and 10T compliant transceivers designed to reduce Ethernet cabling costs. Compact size allows these transceivers to connect directly to the workstation, bringing thin Ethernet or Unshielded Twisted Pair (UTP) wiring directly to the workstation. With UTP and inexpensive coax network media, distances up to 100 meters between workstations can be supported using UTP, and up to 185 meters using coax.

The 10Base2 compliant AT-MX10 and AT-MX10S transceivers use an industry-standard Ethernet transceiver chip that guarantees IEEE 802.3 compliance. The 10T compliant AT-MX20T, AT-210T and AT-210TS transceivers are also guaranteed compliant by the use of standard ICs.

On all models Signal Quality Error (SQE)/Heartbeat test can easily be enabled or disabled via an externally accessible switch. Additionally, all models have integral jabber lock-up prevention circuitry and a loopback function. This function emulates coaxial media where transmitted packets are looped back to the receive side. Local Area Network (LAN) controllers can use the loopback feature to determine if a Media Attachment Unit (MAU) is connected and operational.

The AT-MX20T, AT-210T and AT-210TS transceivers incorporate other functions that offer improved network reliability for workstations. The 10T link integrity test function provides a continuous test of the connection to the multiport repeater.

A test pulse is periodically transmitted and expected at the companion transceiver's receive side. If the pulse is not seen on the receive side, the transceiver is placed into link test fail mode. Normal operation of the transmit side is inhibited and the "Link" LED is turned off. Normal operation is resumed when the link is reestablished by the reception of a valid packet or two valid link pulses.

10T transceivers also address the polarity of the receive pair wiring. In less than one second, the UTP transceiver automatically "rolls" the wire pair and allows for the proper operation of the transceiver. Also, the "Polarity" indicator on the AT-210T and AT-210TS transceivers is not illuminated when the circuitry has transposed the receive pair.

SQE/Heartbeat test status is indicated by LEDs on the AT-MX10, AT-MX10S, AT-210T and AT-210TS transceivers. The AT-MX10 and AT-MX10S transceivers utilize a two-colored LED that indicates the presence of Data Terminal Equipment (DTE) power in addition to the SQE test. The AT-210T and AT-210TS both have a single LED that indicates the status of the SQE test switch.



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# AT-MX10, AT-MX20 & AT-210, Micro Transceivers

## STATUS INDICATORS

| | |
|---|---|
| AT-MX10/AT-MX10S: | |
| Power/HB | Two-color Heartbeat LED |
| | |
| AT-MX20T: | |
| Power | Power is present from the DTE |
| Transmit | Indicates packet is being transmitted to the media |
| Receive | Indicates packet is being received from the media |
| Link | Indicates a valid link exists |
| | |
| AT-210T/AT-210TS: | |
| Power | Power is present from the DTE |
| Link | Indicates a valid link exists |
| SQE Test | SQE/Heartbeat test enabled |
| Polarity | Automatic polarity reversal has not occurred |

## AUI INTERFACE

| Transmitter: | Typical | Range |
|---|---|---|
| Threshold Voltage | -200mv | -175 to -225mv |
| SQE Test Delay | 800ns | 600 to 1600ns |
| Duration | 1000ns | 500 to 1500ns |
| Collision Indication Delay | 200ns | 900ns |
| Assert Delay | 200ns | 900ns |
| Jabber Setup | 45ms | 20 to 100ms |
| Recovery | 450ms | 250 to 750ms |
| | | |
| Receiver: | | |
| Start-Up Delay | 500ns | |
| Steady State Delay | 100ns | 200ns |
| Signal Amplitude | ±800mv | ±550 to ±1200mv |
| Loopback | | |
| Steady State Delay | 100ns | |
| Start-Up Delay | 100ns | 500ns |

## COAXIAL INTERFACE

| | |
|---|---|
| Input Impedance | > 100K Ω |
| Coaxial Tap Capacitance | < 6 pf |

| Input/Output Voltage: | Typical | Range |
|---|---|---|
| DC Offset | -0.1v | -0.5 to 0v |
| AC Offset | 1.86Vp-p | 1.2 to 2.4Vp-p |
| Transmit Rise/Fall Time | 25ns | ±5ns |

## TWISTED PAIR CONNECTOR (RJ-45)

| Pin No. | Function |
|---|---|
| 1 | +TD |
| 2 | -TD |
| 3 | +RD |
| 4 | Not Used |
| 5 | Not Used |
| 6 | -RD |
| 7 | Not Used |
| 8 | Not Used |

## TWISTED PAIR INTERFACE

| Transmitter: | Typical | Range |
|---|---|---|
| Peak Differential | | |
| Signal Amplitude | 2.5v | 2.2 to 2.8v |
| Transmitter Jitter | ±1.5ns | ±2ns |
| Harmonics Content | 27dB Down | |
| Common Mode Output Voltage | | |
| Start-Up Delay | 100ns | 200ns |
| Steady State Delay | 100ns | 200ns |
| Silence Voltage | ±50mv | |
| Duration | 16ms | 8 to 130ms |
| Link Test Pulse | 100ns | 80 to 130ns |
| Output Impedance | 100 Ω | 95 to 105 Ω |
| | | |
| Receiver: | | |
| Receiver Threshold | -400mv | -350 to -450mv |
| Input Impedance | 100 Ω | 95 to 105 Ω |
| Differential Noise Rejection | 300mv | |

## POWER CHARACTERISTICS

| | |
|---|---|
| Isolation: | |
| Breakdown Voltage | |
| AT-MX10/AT-MX10S | 500v rms 50/60Hz for 1 min |
| AT-MX20T/AT-210T/AT-210TS | 1500v rms 50/60 Hz for 1 min |

| Supply: | Typical | Range |
|---|---|---|
| Voltage | 12v | 11.4 to 12.6v |
| Current | 300mA | 500mA |

## ENVIRONMENTAL SPECIFICATIONS

| | |
|---|---|
| Operating Temp | 0°C to 50°C |
| Storage Temp. | -20°C to 60°C |
| Relative Humidity | 5% to 80% noncondensing |

## PHYSICAL CHARACTERISTICS

| | |
|---|---|
| Dimensions: | |
| Standard | 6.4cm x 4.6cm x 2.0cm (2.5" x 1.8" x 0.8") |
| Slim-line | 6.9cm x 4.3cm x 2.5cm (2.7" x 1.7" x 1.0") |
| | |
| Weight: | |
| Standard | 70g (2.4oz) |
| Slim-line | 73g (2.5oz) |

## ELECTRICAL/MECHANICAL APPROVALS

| | |
|---|---|
| EMI | FCC Class A, TUV, Vfg-B |
| Safety | UL, CSA, TUV-GS |

## ORDERING INFORMATION

**AT-MX10-05**
10Base2 MAU transceiver

**AT-MX10S-05**
10Base2 MAU Slim-Line transceiver

**AT-MX20T-05**
10T MAU transceiver

**AT-210T-05**
10T MAU transceiver

**AT-210TS-05**
10T MAU Slim-Line transceiver

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