

# TTC-1T13

## 1 × 9 Fiber Optic Transceiver for 100BASE-SX

### FEATURES:

- High quality VCSEL transmitter at 850 nm wavelength
- 50% energy saving over LED transmitters
- Low dispersion secures better optical signal after long distance transmission
- Link distance up to 300m with 62.5/125 um and 50/125 um optical fibers.
- Compatible with 10BASE-FL
- Capability of auto-negotiating with 10BASE-FL, 100BASE-SX and 1000BASE-SX
- Satisfy TIA 100BASE-SX-SP-4360A specification
- Meet IEC 825-1 Eye Safety Standard
- Industrial standard 1X9 package footprint
- Duplex ST\* ports



### TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS

| PARAMETERS                               | SYMBOL     | MIN    | TYP   | MAX    | UNIT     |
|------------------------------------------|------------|--------|-------|--------|----------|
| Supply Current                           | $I_{CC}$   |        | 35    | 45     | mA       |
| Power Dissipation                        | $P_{DISS}$ |        | 0.175 |        | W        |
| Supply Voltage                           | $V_{CC}$   | 4.75   |       | 5.25   | V        |
| Wavelength                               | $\lambda$  | 830    | 850   | 860    | nm       |
| Output Optical Power                     | $P_O$      | -17    |       | -12    | dBm      |
| Data Input Voltage - Low <sup>(1)</sup>  | $V_{IL}$   | -1.810 |       | -1.475 | $V_{CC}$ |
| Data Input Voltage - High <sup>(1)</sup> | $V_{IH}$   | -1.165 |       | -0.880 | $V_{CC}$ |
| Output Extinction Ratio <sup>(2)</sup>   |            | 10     |       |        | dB       |
| Optical Rise Time                        | $t_r$      |        | 1.3   | 2.2    | ns       |
| Optical Fall Time                        | $t_f$      |        | 1.3   | 2.2    | ns       |
| Duty Cycle Distortion                    | DCD        |        |       | 0.6    | ns p-p   |
| Systematic Jitter                        | SJ         |        |       | 0.60   | ns p-p   |
| Random Jitter                            | RJ         |        | 0.20  | 0.69   | ns p-p   |

(1) Voltage levels listed are compatible with 100K Series PECL logic levels. The parts are compatible with 10K and 10KH Series logic when driven with differential signals.

(2) This Optical Extinction Ratio is expressed in decibels (dB) by the relationship  $10 \cdot \log(P_{high\ avg}/P_{low\ avg})$ .

### RECEIVER ELECTRO-OPTICAL CHARACTERISTICS

| PARAMETERS                                | SYMBOL     | MIN    | TYP   | MAX    | UNIT     |
|-------------------------------------------|------------|--------|-------|--------|----------|
| Supply Current                            | $I_{CC}$   |        | 55    |        | mA       |
| Power Dissipation                         | $P_{DISS}$ |        | 0.275 |        | W        |
| Supply Voltage                            | $V_{CC}$   | 4.75   |       | 5.25   | V        |
| Data Output Voltage - Low <sup>(1)</sup>  | $V_{OL}$   | -1.810 |       | -1.475 | $V_{CC}$ |
| Data Output Voltage - High <sup>(1)</sup> | $V_{OH}$   | -1.165 |       | -0.880 | $V_{CC}$ |
| Signal Detect Output Voltage - Low        | $V_{IL}$   | -1.810 |       | -1.475 | $V_{CC}$ |
| Signal Detect Output Voltage - High       | $V_{IH}$   | -1.165 |       | -0.880 | $V_{CC}$ |
| Rise Time                                 | $t_r$      |        | 1.3   | 2.2    | ns       |
| Fall Time                                 | $t_f$      |        | 1.3   | 2.2    | ns       |
| Duty Cycle Distortion                     | DCD        |        |       | 0.4    | ns p-p   |
| Systematic Jitter                         | SJ         |        |       | 1.00   | ns p-p   |
| Random Jitter                             | RJ         |        | 0.2   | 2.14   | ns p-p   |

|                                    |           |      |      |         |    |
|------------------------------------|-----------|------|------|---------|----|
| Sensitivity                        |           | -30  | -27  | dBm     |    |
| Input power                        | $P_{in}$  |      | 0    | dBm     |    |
| Power level (avg.) Detect Assert   | $P_A$     |      | -33  | dBm     |    |
| Power level (avg.) Detect Deassert | $P_D$     | -45  |      | dBm     |    |
| Level detect hysteresis            | $P_A-P_D$ | 1.75 | 2.25 | 2.75    | dB |
| Signal Detect Assert Time          |           |      | 100  | $\mu s$ |    |
| Signal Detect Deassert Time        |           |      | 350  | $\mu s$ |    |

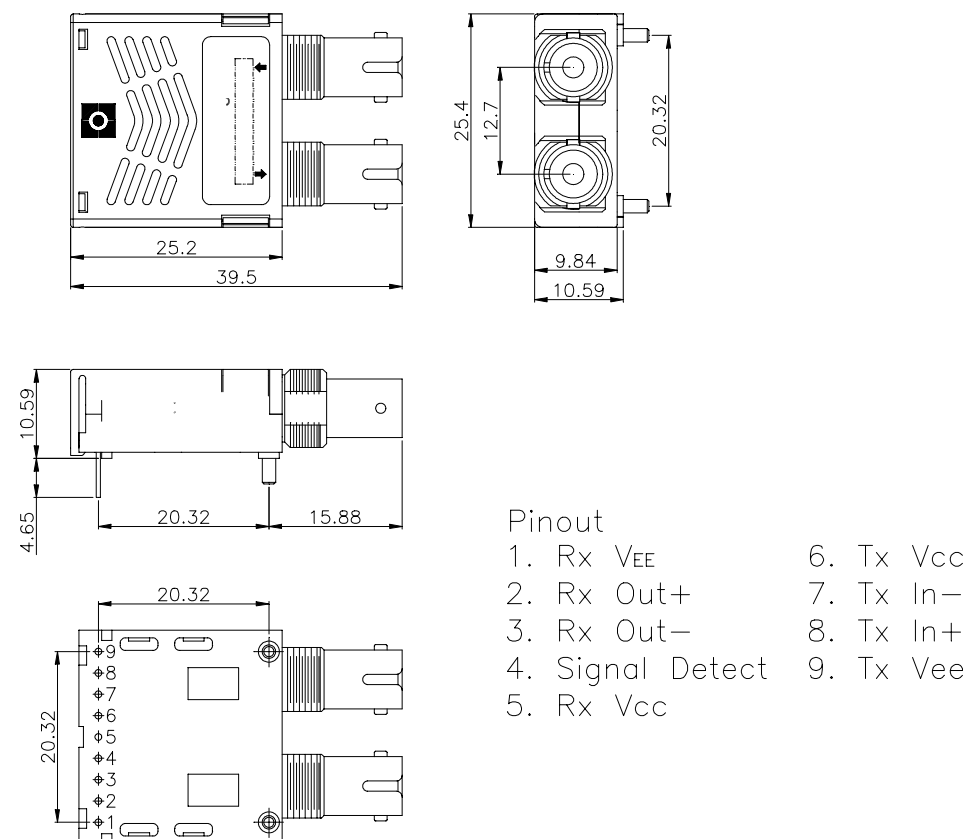
(1) Voltage levels listed are compatible with 100K Series PECL logic levels. The parts are compatible with 10K and 10KH Series logic when driven with differential signals.

### ABSOLUTE MAXIMUM RATINGS:

| PARAMETERS            | SYMBOL   | MIN  | MAX    | UNIT            |
|-----------------------|----------|------|--------|-----------------|
| Storage Temperature   | $T_S$    | -40  | 100    | $^{\circ}C$     |
| Lead Soldering Limits |          |      | 260/10 | $^{\circ}C/sec$ |
| Operating Temperature | $T_A$    | 0    | 70     | $^{\circ}C$     |
| Supply Voltage        | $V_{CC}$ | -0.5 | 7      | V               |

### OUTLINE and PINOUT

Unit:mm



\* ST is registered trademark of AT&T.