

**1 Features**

- a. WDM single mode fibers with SC/FC/ST connector
- b. Single +5V or +3.3V Power Supply
- c. Up to 1250Mbps with PECL/LVPECL signal for control
- d. Up to 100km with SM fiber

**2 Applications**

- Video monitor system
- Telephone system
- Data transmission system



**3 Absolute Maximum Ratings**

| Parameter                   | Symbol          | Min | Max             | Unit |
|-----------------------------|-----------------|-----|-----------------|------|
| Storage Temperature         | T <sub>s</sub>  | -40 | +85             | °C   |
| Operating Temperature       | T <sub>OP</sub> | -20 | +70             | °C   |
| Supply Voltage              | V <sub>CC</sub> | +3  | +6              | V    |
| Voltage on Any Pin          | V <sub>IN</sub> | 0   | V <sub>CC</sub> | V    |
| Soldering Temperature ,Time | -               |     | 260°C, 10 S     | °C,S |

**4 Recommended Operating Conditions**

| Parameter            | Symbol                           | Min. | Typ  | Max. | Unit |
|----------------------|----------------------------------|------|------|------|------|
| Ambient Temperature  | T <sub>AMB</sub>                 | -20  | -    | 70   | °C   |
| Power Supply Voltage | V <sub>CC</sub> -V <sub>EE</sub> | 5V   | 4.75 | 5    | V    |
|                      |                                  | 3.3V | 3    | 3.3  |      |

**5 Operating Conditions**

**5.1 Transmitter (T=25°C, V<sub>CC</sub>=4.75~5.25V (+5V))**

| Parameter         | Symbol          | Min.           | Typ  | Max. | Unit |     |
|-------------------|-----------------|----------------|------|------|------|-----|
| Center Wavelength | $\lambda_c$     | 1520           | 1550 | 1580 | nm   |     |
|                   |                 | 1280           | 1310 | 1340 |      |     |
|                   |                 | 1470           | 1490 | 1510 |      |     |
| Spectral width    | $\Delta\lambda$ | FP@RMS         | -    | 2    | 4    | nm  |
|                   |                 | DFB@-20dB FWHM | -    | -    | 1    |     |
| Output Power      | 3km             | TX1310nmFP     | -15  | -    | -3   | dBm |
|                   |                 | TX1550nmFP     | -15  | -    | -3   |     |
|                   | 20km            | TX1310nmFP     | -10  | -    | -0   |     |
|                   |                 | TX1550nmDFB    | -10  | -    | -0   |     |
|                   | 40km            | TX1310nmDFB    | -5   | -    | -0   |     |
|                   |                 | TX1550nmDFB    | -8   | -    | -0   |     |
|                   | 60km            | TX1490nmDFB    | -5   |      | 1    |     |
|                   |                 | TX1550nmDFB    | -5   |      | 1    |     |
| 80km              | TX1490nmDFB     | -3             |      | 2    |      |     |
|                   | TX1550nmDFB     | -3             |      | 2    |      |     |
| 100km             | TX1550nmDFB     | -0             |      | 4    |      |     |
|                   | TX1490nmDFB     | -0             |      | 4    |      |     |
| Extinction Ratio  | ER              | 9              |      | -    | dB   |     |

|                              |                       |       |     |       |    |
|------------------------------|-----------------------|-------|-----|-------|----|
| Supply Current               | I <sub>CC</sub> T     | -     |     | 150   | mA |
| Data Input Voltage - Low     | V <sub>IL-VCC</sub>   | -1.81 | -   | -1.48 | V  |
| Data Input Voltage - High    | V <sub>IH-VCC</sub>   | -1.16 | -   | -0.85 | V  |
| Rise/Fall Time (20%---80%)   | tr/tf                 |       | 150 | 260   | Ps |
| Total                        | Jitter                |       | 50  | 119   | ns |
| Input Differential Impedance | Z <sub>in</sub>       | 90    | 100 | 110   | Ω  |
| Eye Diagram                  | ITU-T G.957 Compliant |       |     |       |    |

**5.2 Receiver (T=25°C, V<sub>cc</sub>=4.75~5.25V (+5V))**

| Parameter                     |         | Symbol                      | Min.  | Typ  | Max.  | Unit |
|-------------------------------|---------|-----------------------------|-------|------|-------|------|
| Wavelength Range              |         | λ <sub>c</sub>              | 1100  | 1550 | 1610  | nm   |
| Sensitivity                   | 20km    | P <sub>MIN</sub>            | -     | -    | -22   | dBm  |
|                               | 40/60km |                             | -     | -    | -24   |      |
|                               | 80km    |                             |       |      | -27   |      |
|                               | 100km   |                             |       |      | -29   |      |
| MAX. Input Power (Saturation) |         | P <sub>MAX</sub>            | -3    | -    | -     |      |
| Signal Detect Assert          |         | P <sub>A</sub>              | -     | -    | -24   |      |
| Signal Detect De-assert       |         | P <sub>D</sub>              | -45   | -    | -     |      |
| Signal Detect Hysteresis      |         | P <sub>PHYS</sub>           | 1     | -2   | 4     | dB   |
| Supply Current                |         | I <sub>CCR</sub>            | -     | -    | 120   | mA   |
| Data output Voltage - High    |         | V <sub>OH</sub>             | -1.16 | -    | -0.85 | V    |
| Data output Voltage - Low     |         | V <sub>OL</sub>             | -1.81 | -    | -1.48 |      |
| Signal Detect Voltage – High  |         | V <sub>SDHC</sub> (IF TTL)  | 2     | -    | -     |      |
| Signal Detect Voltage – Low   |         | V <sub>SDL</sub> (IF TTL)   | 0     | -    | 0.8   |      |
| Signal Detect Voltage – High  |         | V <sub>SDHC</sub> (IF PECL) | -1.1  | -    | -0.74 |      |
| Signal Detect Voltage – Low   |         | V <sub>SDL</sub> (IF PECL)  | -2.0  | -    | -1.58 |      |

Notes:

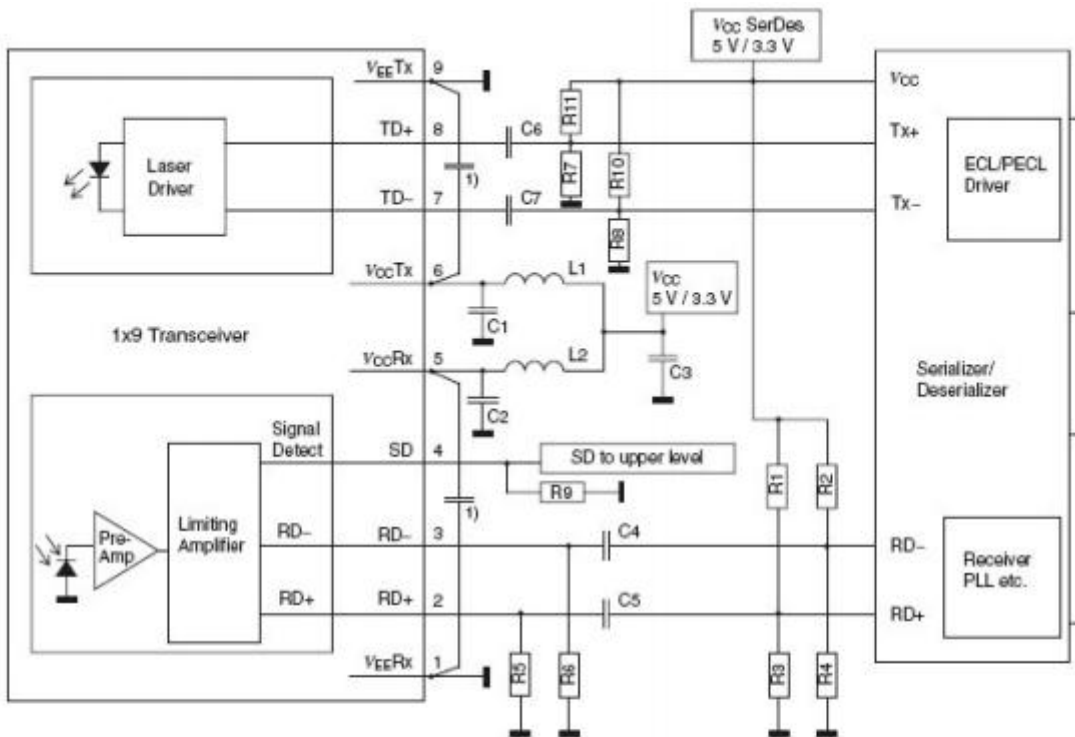
switch from a high state to a low state.

- 1) Value of output power and sensitivity can be customized according to the demand
- 2) An increase in optical power of data signal above the specified level will cause the Signal Detect to switch from a low state to a high state.
- 3) A decrease in optical power of data signal below the specified level will cause the Signal Detect to switch from a high state to a low state.

**6 Pin Assignment**

| Pin | Descriptions                    | Pin | Descriptions                     |
|-----|---------------------------------|-----|----------------------------------|
| 1   | Rx VEER :Receiver GND           | 6   | Tx VCCT : Transmitter VCC        |
| 2   | Rx Data + : Receiver Data Out + | 7   | Tx Data- :Transmitter Data Input |
| 3   | Rx Data- : Receiver Data Out -  | 8   | Tx Data+ :Transmitter Data Input |
| 4   | SD :Signal Detect Status Flag   | 9   | Tx VEET : Transmitter GND        |
| 5   | Rx VCCR: Receiver VCC           |     |                                  |

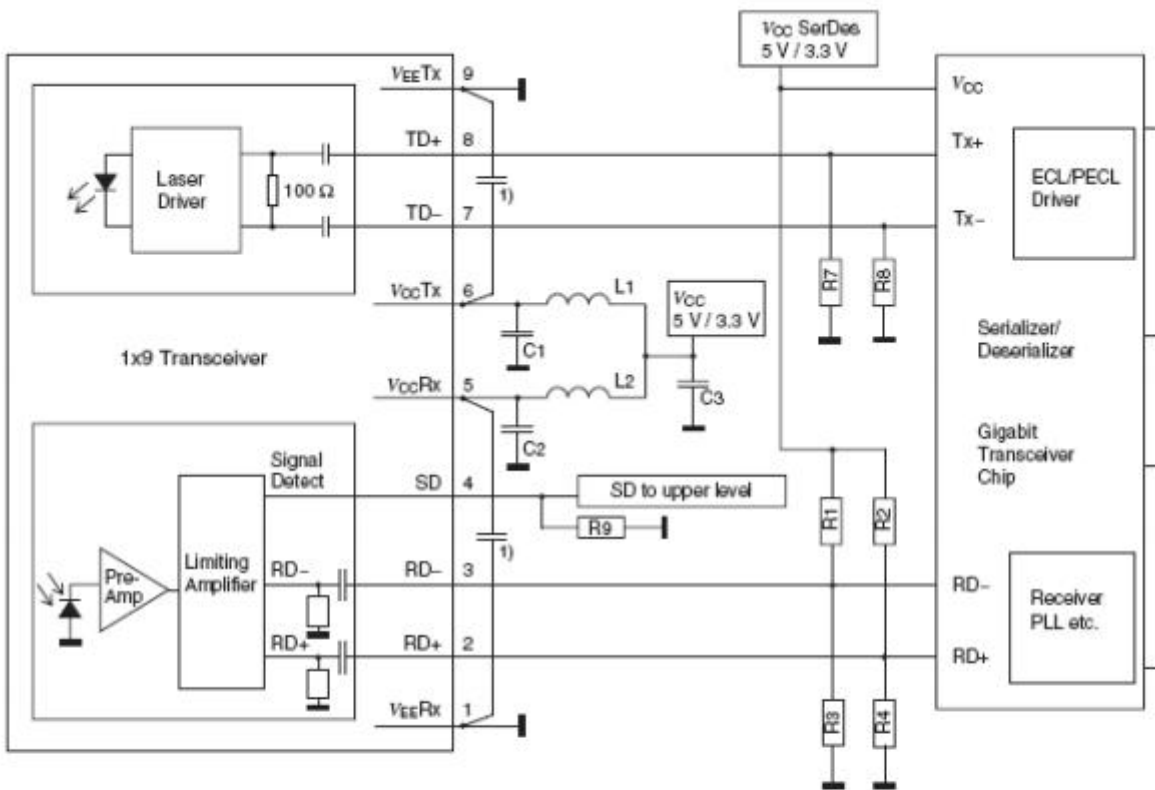
**7 Recommend Circuit**



- C1/2/3 = 4.7  $\mu$ F
- C4/5/6/7 = 100 nF
- L1/2 = 1  $\mu$ H
- R5/6 = 270  $\Omega$  (5 V)
- = 150  $\Omega$  (3.3 V)
- R7/8 = 127  $\Omega$  (5 V)
- = 82  $\Omega$  (3.3 V)
- (depends on SerDes chip used)
- R9 = 510  $\Omega$  (5 V)
- = 270  $\Omega$  (3.3 V)

- R10/11 = 82  $\Omega$  (5 V)
- = 127  $\Omega$  (3.3 V)
- (depends on SerDes chip used)
- Place R1/2/3/4 close to SerDes chip, depends on SerDes chip used.
- Place R5/6/7/8/10/11 close to 1x9 transceiver.

**DC Coupling inside**



- C1/2/3 = 4.7  $\mu$ F
- L1/2 = 1  $\mu$ H
- R1/2/3/4 = Depends on SerDes chip used
- R7/8 = Biasing (depends on SerDes chip)
- R9 = open (5 V/3.3 V TTL)
- = 510  $\Omega$  (5 V PECL)
- = 270  $\Omega$  (3.3 V PECL)

Place R1/2/3/4/7/8 close to SerDes chip.  
Place R5/6 close to 1x9 transceiver.

**AC Coupling inside**

**8 Ordering Information**

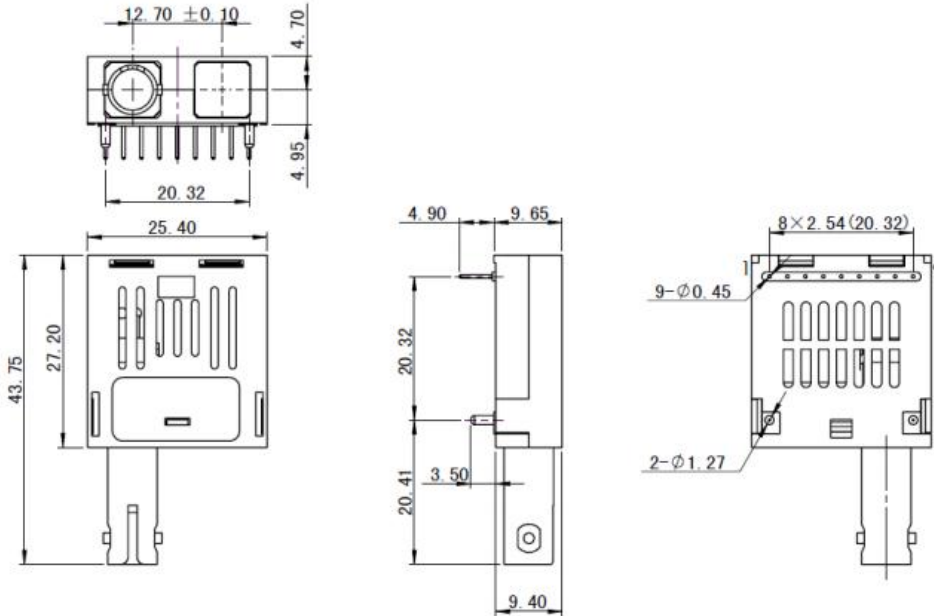
8.1 Example

STR 3 X 24 -F 1 5 SC-20

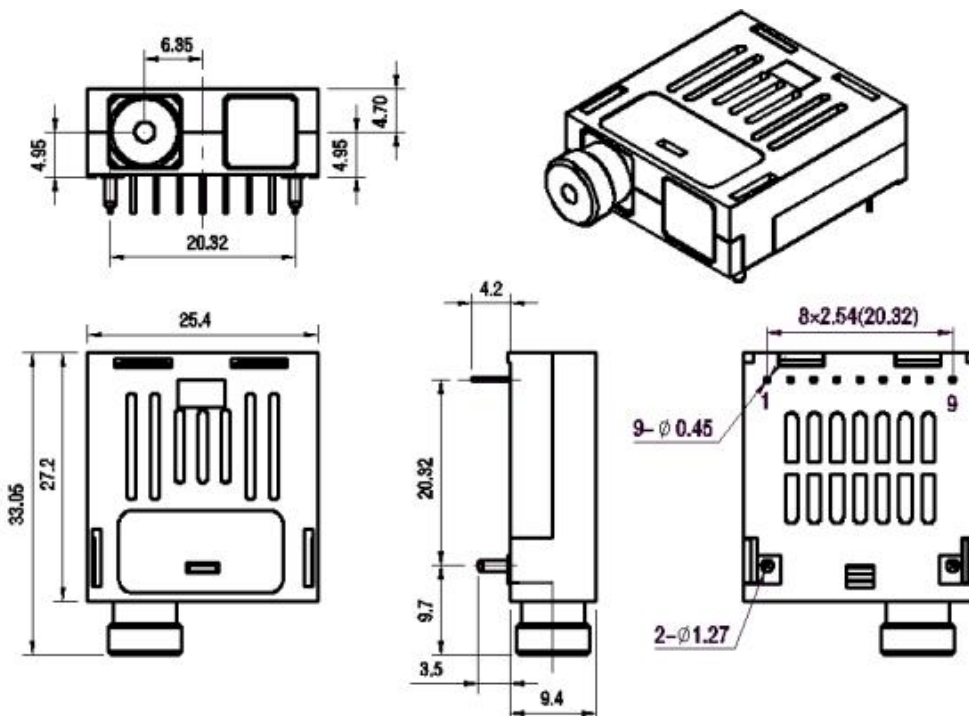
| Sign | Mean             | Description                              |           |               |          |         |           |
|------|------------------|--|-----------|---------------|----------|---------|-----------|
| STR  | Module type      | STR= Single fiber transceiver receptacle |           |               |          |         |           |
| 3    | Center wave TX   | 3=1310nm                                 |           | 4=1490nm      | 5=1550nm |         |           |
| x    | Center wave RX   | 3=1310nm                                 | 5=1550nm  | X=1100~1610nm |          |         |           |
| 01   | Transmitter Rate | 01=52M                                   | 02=84m    | 03=155M       | 24=1.25G |         | 48=2.5G   |
| F    | Laser type       | F=FP                                     |           | D=DFB         |          | C=CWDM  | V=VCSEL   |
| 1    | Operating T      | 1=0~+70°C                                |           | 2=-40~+85°C   |          |         |           |
| 5    | Voltage          | 3=3.3V DC                                |           | 5=5V DC       |          |         |           |
| SC   | Connector        | SC=SC/UPC                                | SA=SC/APC | FC=FC         | ST=ST    |         |           |
| 20   | Distance         | 022=220M                                 |           | 055=550M      |          | 5=5KM   | 10=10KM   |
|      |                  | 20=20KM                                  |           | 40=40KM       |          | 80=80KM | 100=100KM |

| Part No.      | Wavelength      | Connector | Temp.     | TX Power (dBm) | RX Sens (Max.) (dBm) | Distance |
|---------------|-----------------|-----------|-----------|----------------|----------------------|----------|
| DTR3x24-F*-20 | Tx1310FP/Rx xx  | SC/FC/ST  | -20 to 70 | -10 to-0       | -23                  | 20km     |
| DTR5x24-D*-20 | Tx1550DFB/Rx xx | SC/FC/ST  | -20 to 70 | -10 to-0       | -23                  | 20km     |
| DTR4x24-F*-60 | Tx1490FP/Rx xx  | SC/FC/ST  | -20 to 70 | -5 to1         | -24                  | 40km     |
| DTR5x24-F*-60 | Tx1550FP/Rx xx  | SC/FC/ST  | -20 to 70 | -5 to1         | -24                  | 60km     |

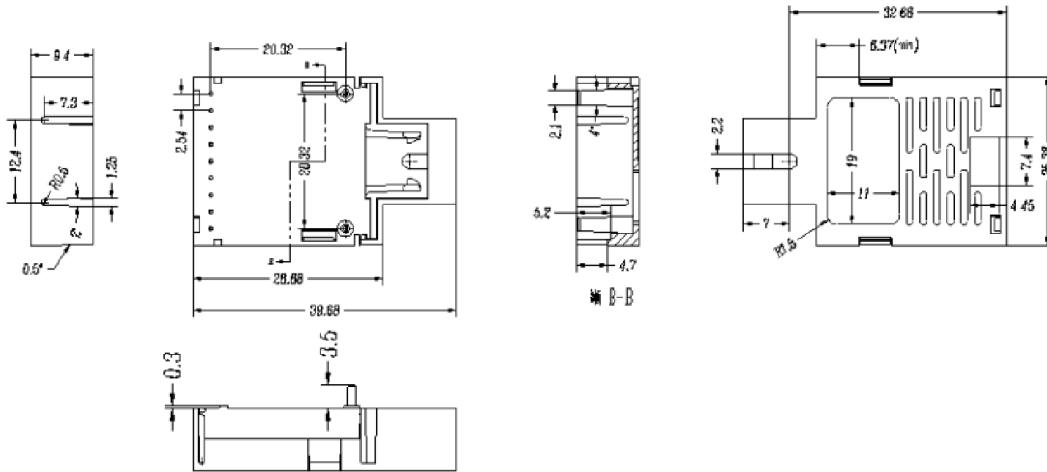
8.2.1 ST receptacle



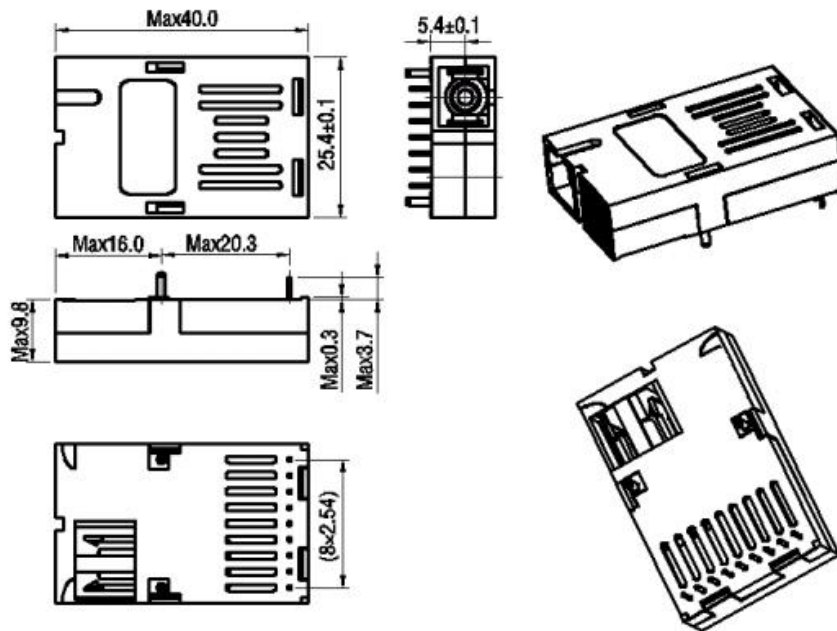
8.2.2 FC receptacle



8.2.3 .1 SC middle receptacle



8.2.3 .2SC side receptacle



|           |  |
|-----------|--|
| REV:      | A  |
| DATE:     | August 30, 2012  |
| Write by: | HDV photoelectron technology LTD                               |
| Contact:  | Room703,Nanshan district science college town, Shenzhen, China |
| WEB:      | Http://www.hdv-tech.com  |