

# **Specification for**

## **Model : DQSL**

Revised : Apr. 09. 2012  
Original Release Date : July. 10. 2009

# **OPHIT**

## Revision History

| Version Number | Revision Date | Author  | Description of Changes       |
|----------------|---------------|---------|------------------------------|
| 1.0            | July 10, 2009 | J.H Lee | Initial Version              |
| 1.1            | Apr 09, 2012  | J.H Lee | Ordering Information Removed |
|                |               |         |                              |

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## 1. General Description

**DQSL** , dual link extension system, lets your Dual digital flat panel display signal extend up to 100 meters (330 feet) away from host by TMDS digital signal transmission.

- High speed and long distance transmission by LC type multimode fibers  
(Uses 2 strand multi mode LC fiber optic cable)
- Extends up to 100m
- It can support two mode for DDC
  - Real mode : Uses one CAT-5 cable for DDC
  - Emulation : Pseudo-DDC detection function for EDID information
- Self detecting function for EDID information
- It can support single link and dual link by selectable function switcher

## 2. General Specification

| Parameter                    | Symbol                                                                   |                               |
|------------------------------|--------------------------------------------------------------------------|-------------------------------|
|                              | Transmitter                                                              | Receiver                      |
| Optical Converter            | 850nm, 7ch Transmit OSA                                                  | 850nm, 7ch Receive OSA        |
| Input and Output Signal      | TMDS Signal(DVI 1.0 standard)                                            | TMDS Signal(DVI 1.0 standard) |
| Video Bandwidth              | 1.65Gbps / Channel                                                       |                               |
| Module Size                  | 134.9 x 25.0 x 81.7 mm (W x H x D)                                       |                               |
| Module Weight                | --                                                                       | --                            |
| Used electrical connector    | 24 PIN DVI-D Plug (Dual)                                                 |                               |
| Optical Connector            | 2 LC Connector                                                           | 2 LC Connector                |
| Recommended Fiber            | 50/125 $\mu$ m Multi-mode glass-fiber                                    |                               |
| Link Connector               | RJ-45 Jack                                                               |                               |
| Maximum Supported Resolution | -Single Link : WUXGA(1920x1200)60Hz<br>-Dual Link : WQXGA(2560x1600)60Hz |                               |

### 3. Absolute Maximum Ratings

| Parameter                    | Rating            |
|------------------------------|-------------------|
| Storage temperature          | -20°C ~ +70°C     |
| Operating temperature        | 0°C ~ +50°C       |
| Power Supply                 | -0.3 ~ 5.5 V      |
| Relative Humidity            | 10 ~ 80 %         |
| Lead-free solder temperature | 260°C, 10 seconds |

#### **NOTICE**

Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operations section for extended periods of time may affect reliability.

## 4. Electrical Specification

### 4.1 Electrical Specification

#### 4.1.1 Transmitter Module

|                       | Parameter                                 | Symbol | Min       | Typ  | Max       | Units | Condition |
|-----------------------|-------------------------------------------|--------|-----------|------|-----------|-------|-----------|
| P<br>O<br>W<br>E<br>R | Supply Voltage<br>(Option External Power) | Vcc    |           | +5.0 |           | V     |           |
|                       | Supply Current                            | Icc    |           | 380  |           | mA    | Dual      |
|                       |                                           |        |           | 280  |           |       | Single    |
|                       | Power Dissipation                         | Po     |           | 1.9  |           | W     | Dual      |
|                       |                                           |        |           | 1.4  |           |       | Single    |
| T<br>M<br>D<br>S      | Reference voltage for<br>graphic signal   | Vref   | +3.1      | +3.3 | +3.5      | V     |           |
|                       | Single-ended high<br>level input voltage  | VH     | Vref-0.01 |      | Vref+0.01 | V     |           |
|                       | Single-ended low level input<br>voltage   | VL     | Vref-0.6  |      | Vref-0.4  | V     |           |
|                       | Single-ended input<br>swing voltage       | Vswing | 0.4       |      | 0.6       | V     |           |
|                       | Single-ended standby<br>input voltage     |        | Vref-0.01 |      | Vref+0.01 | V     |           |
|                       | Data Output Load                          | RLD    |           | 50   |           | Ohms  |           |

Transmitter module of Model DQSL includes 2 channel VCSEL(Vertical Surface Emitting Laser Diode) with 850 nm invisible laser radiation.

*Do not view directly laser module of transmitter or the end of the other side of optical cable connected to transmitter with optical instrument.*

Transmitter module of DQSL is Class 1M Laser Product.

#### 4.1.2 Receiver Module

|                       | Parameter                               | Symbol  | Min  | Typ  | Max  | Units | Condition |
|-----------------------|-----------------------------------------|---------|------|------|------|-------|-----------|
| P<br>O<br>W<br>E<br>R | Supply Voltage<br>(External Power)      | Vcc     |      | +5.0 |      | V     |           |
|                       | Supply Current                          | Icc     |      | 250  |      | mA    |           |
|                       | Power Dissipation                       | Po      |      | 1.25 |      | W     |           |
| T<br>M<br>D<br>S      | Reference voltage for<br>graphic signal | Vref    | +3.1 | +3.3 | +3.5 | V     |           |
|                       | Single-ended output swing<br>voltage    | Voswing | 0.4  |      | 0.6  | V     | AC couple |
|                       | Data Input Load                         | RLD     |      | 50   |      | Ohms  |           |

## 4.2 Connector Pin Assignment

### 4.2.1 Transmitter

#### DVI Connector (Dual-mode)

| Pin | Signal Assignment       | Pin | Signal Assignment       | Pin | Signal Assignment       |
|-----|-------------------------|-----|-------------------------|-----|-------------------------|
| 1   | T.M.D.S. Data2-         | 9   | T.M.D.S. Data1-         | 17  | T.M.D.S. Data0-         |
| 2   | T.M.D.S. Data2+         | 10  | T.M.D.S. Data1+         | 18  | T.M.D.S. Data0+         |
| 3   | T.M.D.S. Data2/4 Shield | 11  | T.M.D.S. Data1/3 Shield | 19  | T.M.D.S. Data0/5 Shield |
| 4   | T.M.D.S. Data4-         | 12  | T.M.D.S. Data3-         | 20  | T.M.D.S. Data5-         |
| 5   | T.M.D.S. Data4+         | 13  | T.M.D.S. Data3+         | 21  | T.M.D.S. Data5+         |
| 6   | DDC Clock (SCL)         | 14  | +5V Power               | 22  | T.M.D.S Clock Shield    |
| 7   | DDC Data (SDA)          | 15  | Ground (for +5V)        | 23  | T.M.D.S Clock+          |
| 8   | No Connect              | 16  | Hot Plug Detect         | 24  | T.M.D.S Clock-          |

#### DVI Connector (Single-mode)

| Pin | Signal Assignment     | Pin | Signal Assignment     | Pin | Signal Assignment     |
|-----|-----------------------|-----|-----------------------|-----|-----------------------|
| 1   | T.M.D.S. Data2-       | 9   | T.M.D.S. Data1-       | 17  | T.M.D.S. Data0-       |
| 2   | T.M.D.S. Data2+       | 10  | T.M.D.S. Data1+       | 18  | T.M.D.S. Data0+       |
| 3   | T.M.D.S. Data2 Shield | 11  | T.M.D.S. Data1 Shield | 19  | T.M.D.S. Data0 Shield |
| 4   | No Connect            | 12  | No Connect            | 20  | No Connect            |
| 5   | No Connect            | 13  | No Connect            | 21  | No Connect            |
| 6   | DDC Clock (SCL)       | 14  | +5V Power             | 22  | T.M.D.S Clock Shield  |
| 7   | DDC Data (SDA)        | 15  | Ground (for +5V)      | 23  | T.M.D.S Clock+        |
| 8   | No Connect            | 16  | Hot Plug Detect       | 24  | T.M.D.S Clock-        |

#### RJ-45 Connector

| Pin | Signal Assignment | Pin | Signal Assignment |
|-----|-------------------|-----|-------------------|
| 1   | SCL               | 2   | GND               |
| 3   | SDA               | 4   | GND               |
| 5   | +5V Power         | 6   | GND               |
| 7   | +5V Power         | 8   | Hot Plug Detect   |

#### 4.2.2 Receiver

##### DVI Connector (Dual-mode)

| Pin | Signal Assignment        | Pin | Signal Assignment        | Pin | Signal Assignment        |
|-----|--------------------------|-----|--------------------------|-----|--------------------------|
| 1   | T.M.D.S. Data 2-         | 9   | T.M.D.S. Data 1-         | 17  | T.M.D.S. Data 0-         |
| 2   | T.M.D.S. Data 2+         | 10  | T.M.D.S. Data 1+         | 18  | T.M.D.S. Data 0+         |
| 3   | T.M.D.S. Data 2/4 Shield | 11  | T.M.D.S. Data 1/3 Shield | 19  | T.M.D.S. Data 0/5 Shield |
| 4   | T.M.D.S. Data 4-         | 12  | T.M.D.S. Data 3-         | 20  | T.M.D.S. Data 5-         |
| 5   | T.M.D.S. Data 4+         | 13  | T.M.D.S. Data 3+         | 21  | T.M.D.S. Data 5+         |
| 6   | DDC Clock (SCL)          | 14  | Out +5V Power            | 22  | T.M.D.S Clock Shield     |
| 7   | DDC Data (SDA)           | 15  | Ground (for out +5V)     | 23  | T.M.D.S Clock+           |
| 8   | No Connect               | 16  | Hot Plug Detect          | 24  | T.M.D.S Clock-           |

##### DVI Connector (Single-mode)

| Pin | Signal Assignment     | Pin | Signal Assignment     | Pin | Signal Assignment     |
|-----|-----------------------|-----|-----------------------|-----|-----------------------|
| 1   | T.M.D.S. Data2-       | 9   | T.M.D.S. Data1-       | 17  | T.M.D.S. Data0-       |
| 2   | T.M.D.S. Data2+       | 10  | T.M.D.S. Data1+       | 18  | T.M.D.S. Data0+       |
| 3   | T.M.D.S. Data2 Shield | 11  | T.M.D.S. Data1 Shield | 19  | T.M.D.S. Data0 Shield |
| 4   | No Connect            | 12  | No Connect            | 20  | No Connect            |
| 5   | No Connect            | 13  | No Connect            | 21  | No Connect            |
| 6   | DDC Clock (SCL)       | 14  | Out +5V Power         | 22  | T.M.D.S Clock Shield  |
| 7   | DDC Data (SDA)        | 15  | Ground (for +5V)      | 23  | T.M.D.S Clock+        |
| 8   | No Connect            | 16  | Hot Plug Detect       | 24  | T.M.D.S Clock-        |

##### RJ-45 Connector

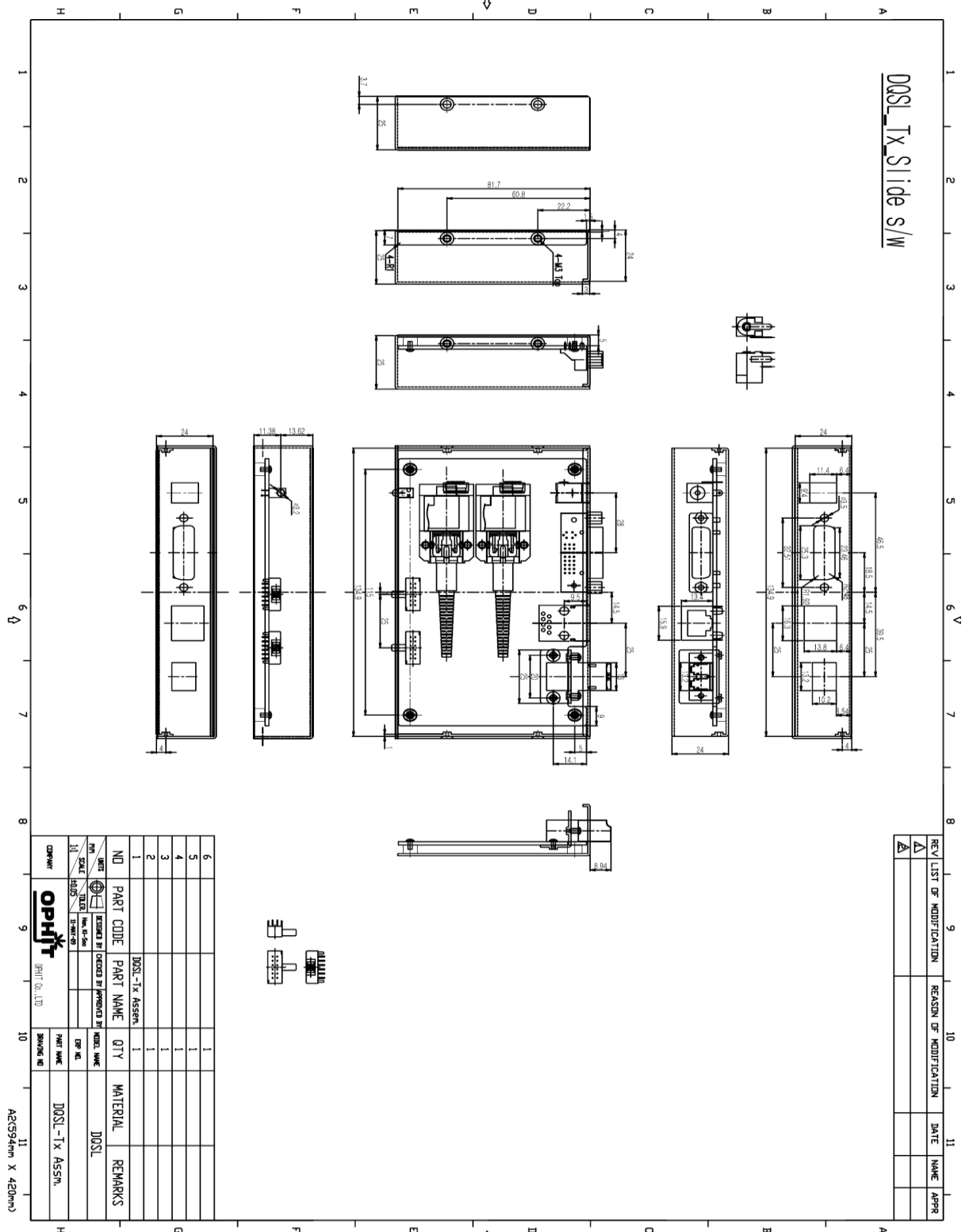
| Pin | Signal Assignment | Pin | Signal Assignment |
|-----|-------------------|-----|-------------------|
| 1   | SCL               | 2   | GND               |
| 3   | SDA               | 4   | GND               |
| 5   | +5V Power         | 6   | GND               |
| 7   | +5V Power         | 8   | Hot Plug Detect   |



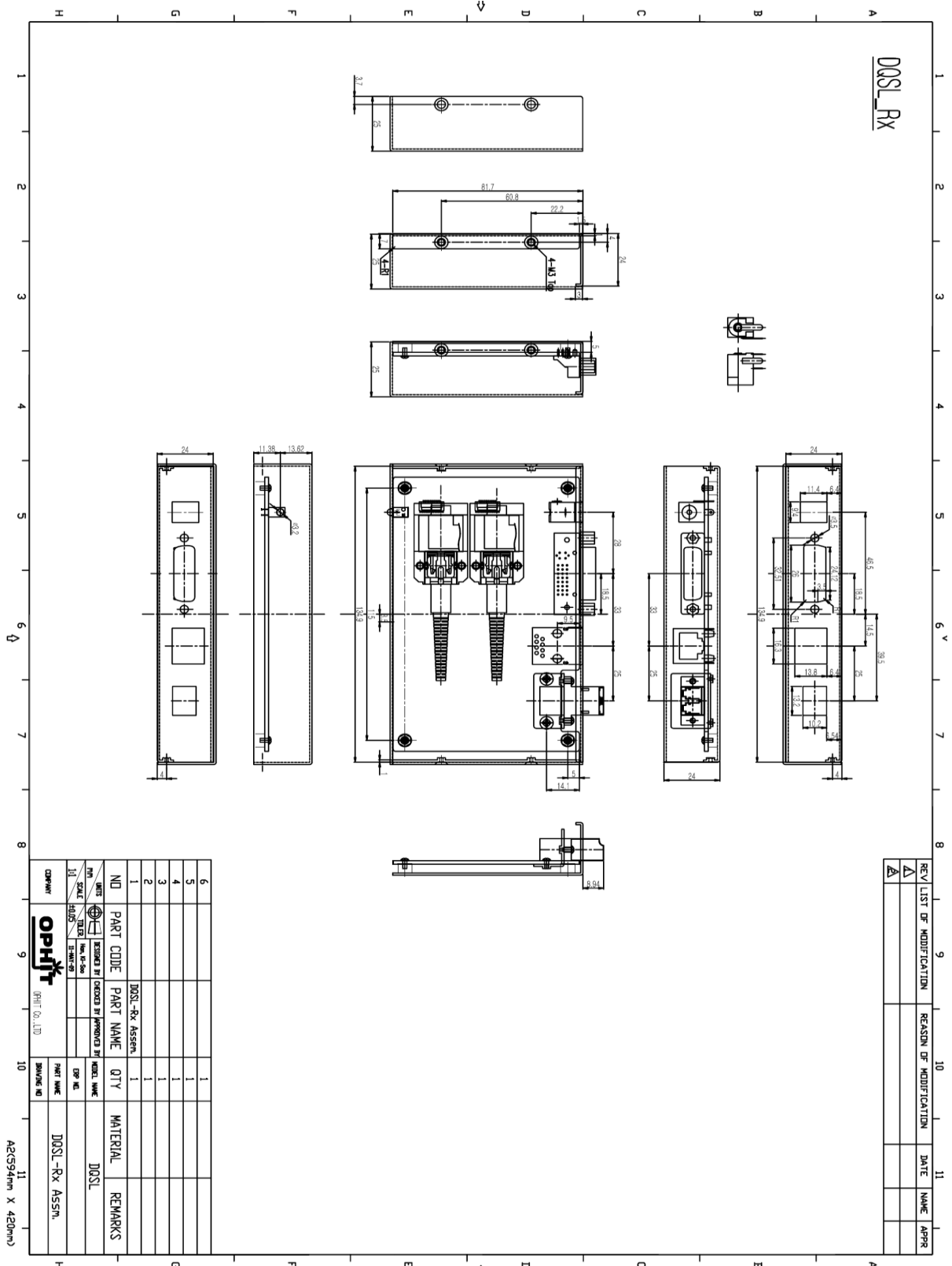
## 5. Mechanical Specification

### 5.1 Case Dimension

#### 5.1.1 Transmitter

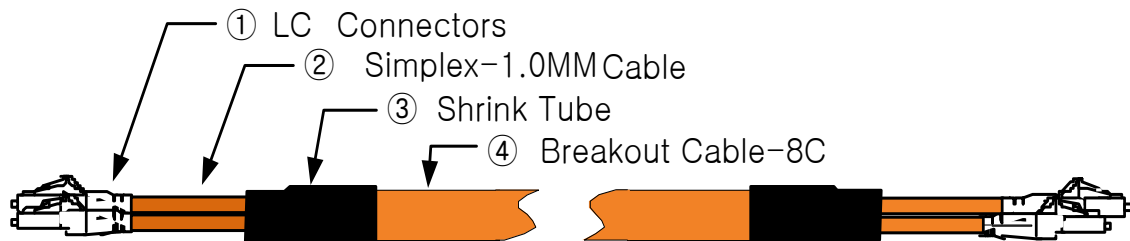


### 5.1.2 Receiver

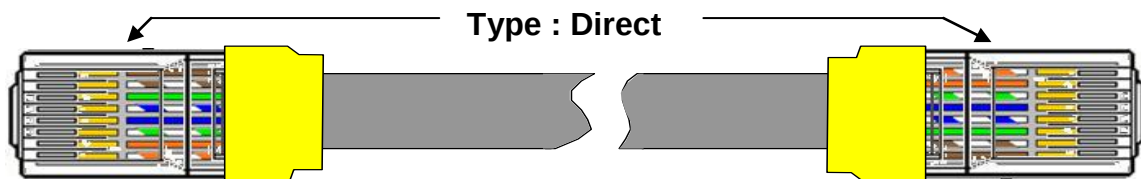


## 5.2 Cable Information

### ▪ Optical Fiber Cable



### ▪ UTP Cable Cat. 5 (RJ-45 Jack)



## 6. RoHS

### Certificate of Conformance RoHS

Dear Customer,

On January 27, 2003, the European Parliament and the Administrative Council adopted Directive 2002/95/EC (RoHS) that concerns the "Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment".

The parts currently delivered by **OPHIT CO., LTD.** are already free of lead (Pb), mercury (Hg), cadmium (Cd), hexavalent chromium ( $\text{Cr}^{6+}$ ), polybrominated biphenyl (PBB) and polybrominated diphenyl (PBDE).

This Certification of Conformance is to certify that the products listed below comply with RoHS Directive mentioned above:

- DQSL

If you have any further questions regarding the RoHS compliance of parts delivered by **OPHIT CO., LTD.**, please do not hesitate to contact us at [support@ophit.com](mailto:support@ophit.com).

Best regards,

JONG-KOOK MOON/CEO

OPHIT CO., LTD.