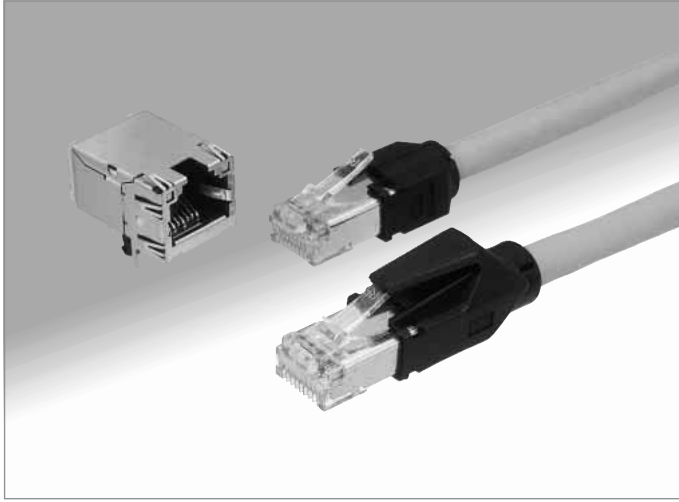
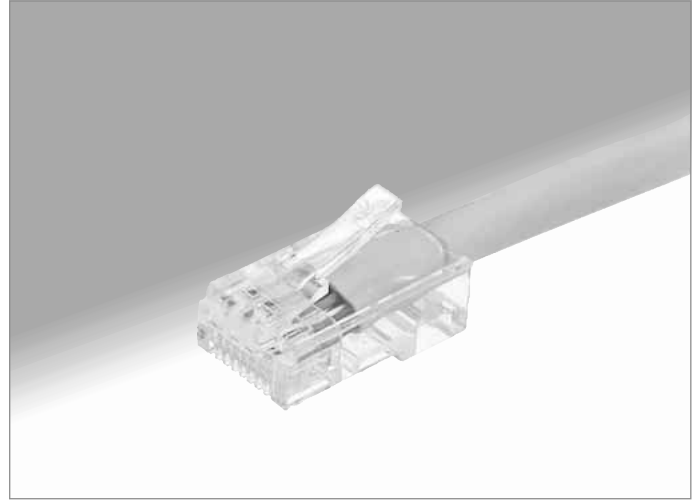


# Modular Plug Connectors Compliant to Enhanced Category 5 Standards

## TM21P Series (Shielded Type)



## TM22P-88P (Non-shielded Type)



### ■Features

#### 1. Supports High-Speed LAN Transmission

Conforms to requirements of TIA/EIA-568B data wiring standard, meeting transmission performance of Enhanced Category 5.

Supports Gigabit Ethernet (1000BASE-T) and Fast Ethernet (100BASE-TX) high-speed LAN transmission.

#### 2. EMI protection (TM21\*P-88P)

360° coverage of the engagement area with a metal shield assures protection against electromagnetic interference. When mated with corresponding connector the shield surfaces are securely connected to provide continuous circuit.

#### 3. Protected latch tab (TM21P-88P)

Flexible case extends over the release tab preventing the possibility of breaking-off during handling of the complete cable assembly.

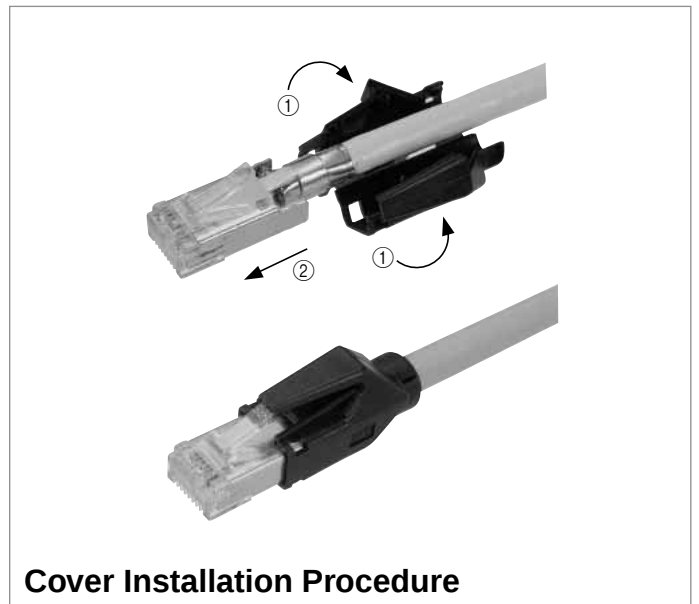
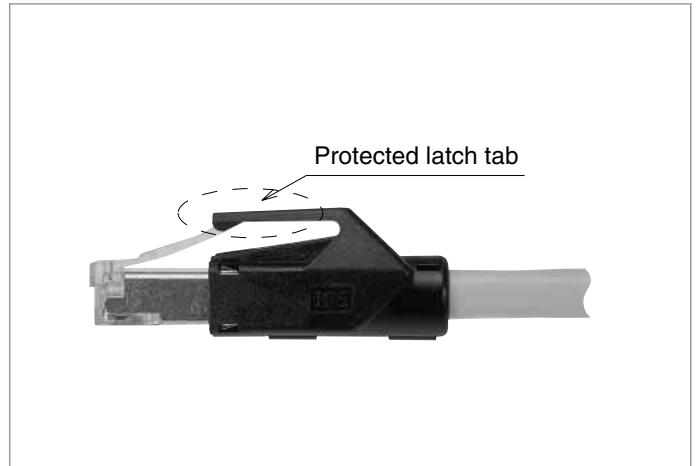
#### 4. Termination of conductors

Self located 24 AWG conductors (solid or stranded) are terminated against pre-inserted contacts using simple tooling.

#### 5. Simplified termination (TM21\*P-88P)

Removeable one piece cover allows easy access to the termination areas.

#### 6. Conforms to the ISO 8877 Standard (ISDN Interface Connector)



Cover Installation Procedure

Product Specification

|        |                         |                                                |
|--------|-------------------------|------------------------------------------------|
| Rating | Current rating 1A       | Operating temperature range-25℃ to +60℃ (Note) |
|        | Voltage rating 125 V AC |                                                |

| Item                                                 | Specification                                                                                                                                    | Conditions                                                                                           |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| 1. Insulation resistance                             | 100 M ohms min.                                                                                                                                  | 100 V DC                                                                                             |
| 2. Withstanding voltage (between adjacent contacts)  | No flashover or insulation breakdown                                                                                                             | 500 V AC / one minute                                                                                |
| 3. Withstanding voltage (between contact and shield) | No flashover or insulation breakdown                                                                                                             | 1500 V AC / one minute                                                                               |
| 4. Contact resistance                                | 230 m ohms max.                                                                                                                                  | 100mA DC                                                                                             |
| 5. Vibration                                         | No electrical discontinuity of 5 ms or more<br>Contact resistance: 250m ohms max.                                                                | Frequency: 10 to 55 Hz, single amplitude of 0.75 mm,<br>2 hours / 3 axis                             |
| 6. Shock                                             | No electrical discontinuity of 5 ms. min.<br>Contact resistance: 250m ohms max.                                                                  | Acceleration of 490 m/s², 11 ms duration,<br>sine half-wave waveform, 3 cycles in each of the 3 axis |
| 7. Durability (mating/un-mating)                     | Contact resistance: 250m ohms max.                                                                                                               | 200                                                                                                  |
| 8. Temperature cycle                                 | Contact resistance: 250 m ohms max.<br>Insulation resistance: 100 M ohms min.                                                                    | Temperature: -55℃→+5℃ to +35℃→+85℃→+5℃ to +35℃<br>Duration: 30→5→30→5(Minutes)<br>5 cycles           |
| 9. Humidity                                          | Contact resistance: 250 m ohms max.<br>Insulation resistance: 1 M ohms min. (High humidity)<br>Insulation resistance: 10 M ohms min. (Dry state) | 500 hours at temperature of 40℃ and humidity of 90% to 95%                                           |
| 10. Salt Spray                                       | Contact resistance: 250 m ohms max.                                                                                                              | Exposed to density 5% salt water for 48 hours                                                        |

Note :Includes temperature rise caused by current flow.

Materials

| Part                   | Material      | Finish                     | Remarks |
|------------------------|---------------|----------------------------|---------|
| Insulator              | Polycarbonate | Color: Clear               | UL94V-2 |
| Contacts               | Copper alloy  | Contact area: Gold plating | —       |
| Shield                 | Copper alloy  | Tin plating                | —       |
| Conductor holding tray | Polycarbonate | Color: Clear               | UL94V-2 |
| Cover                  | Polyamide     | Color: Light beige (Note)  | UL94V-2 |

Note :Cover available in various colors. Refer to page 3.

Ordering information

Plugs- Shielded

TM21 C P - 8 8P  
① ② ① ③ ④

|                     |                                                 |
|---------------------|-------------------------------------------------|
| ① Series name       | TM21P: Shielded                                 |
| ② Cover Type        | Blank: Protective latch cover<br>C: Short cover |
| ③ Size              | 8: For 8 contacts                               |
| ④ Inserted contacts | 8P: 8                                           |

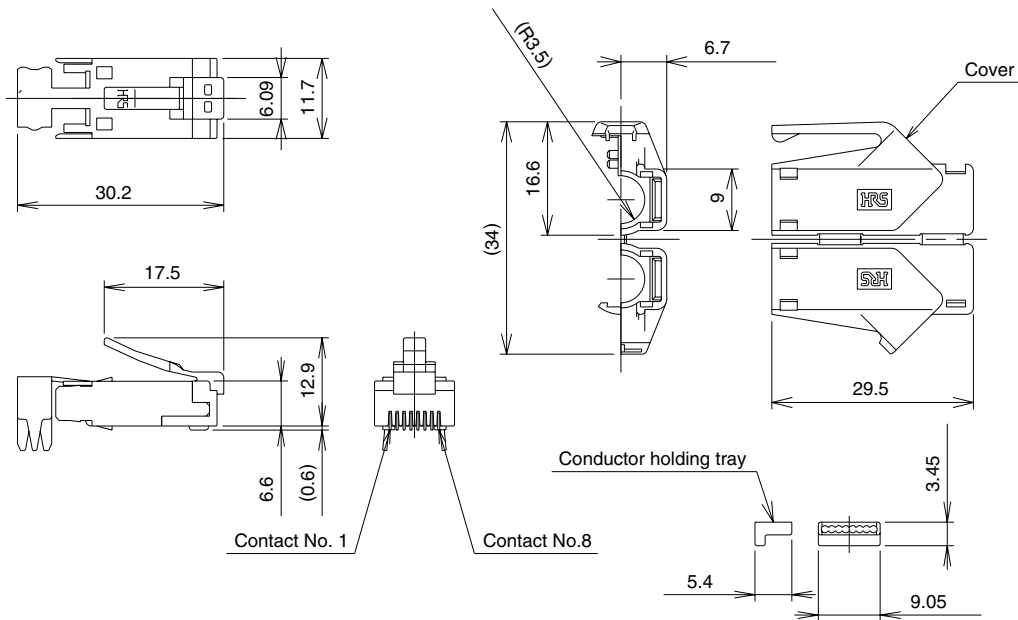
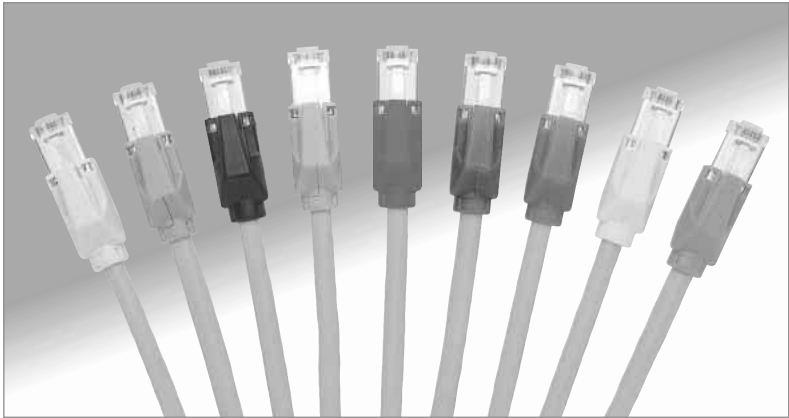
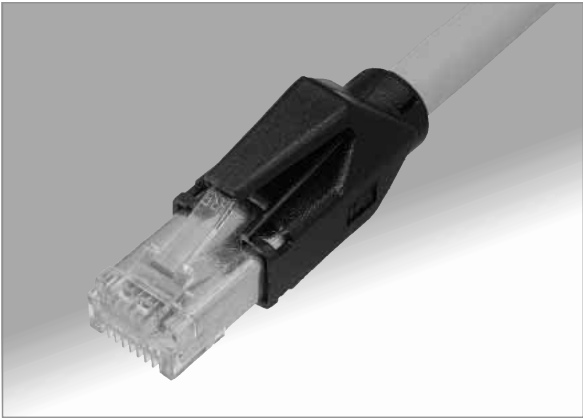
Plugs - Non-shielded

TM22P - 8 8P  
① ② ③

|                     |                      |
|---------------------|----------------------|
| ① Series name       | TM22P : Non-shielded |
| ② Size              | 8 : For 8 contacts   |
| ③ Inserted contacts | 8P: 8                |

# Plug Connectors

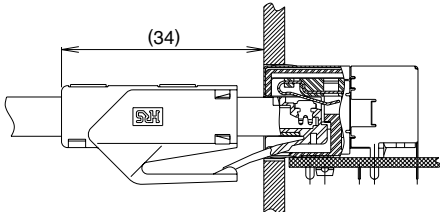
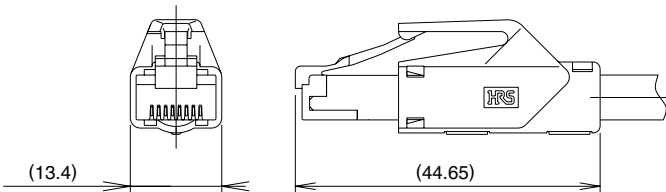
## Shielded



| Part Number   | CL No.        | Cover Color        |
|---------------|---------------|--------------------|
| TM21P-88P     | 222-2862-9    | Light beige        |
| TM21P-88P(02) | 222-2862-9-02 | Medium gray        |
| TM21P-88P(03) | 222-2862-9-03 | Black              |
| TM21P-88P(04) | 222-2862-9-04 | Natural light gray |
| TM21P-88P(05) | 222-2862-9-05 | Red                |
| TM21P-88P(06) | 222-2862-9-06 | Green              |
| TM21P-88P(07) | 222-2862-9-07 | Blue               |
| TM21P-88P(08) | 222-2862-9-08 | Yellow             |
| TM21P-88P(09) | 222-2862-9-09 | Orange             |

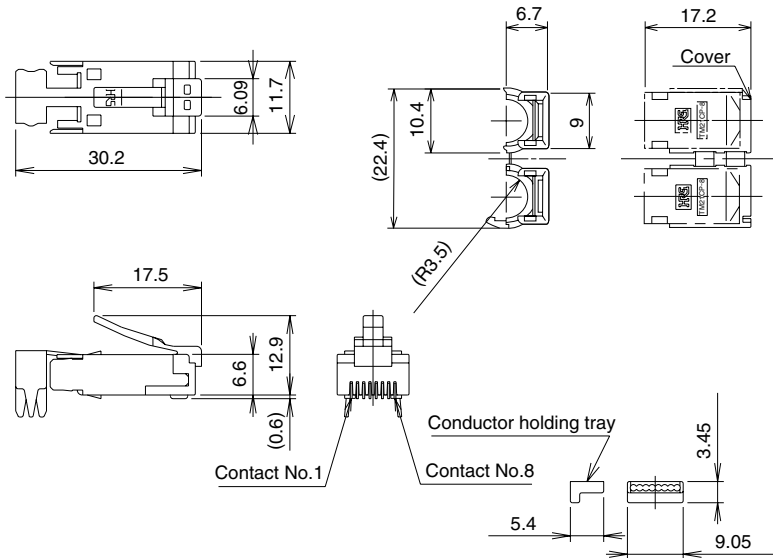
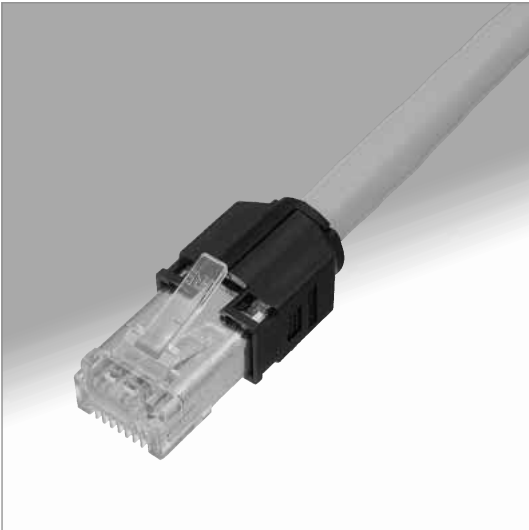
## Cover installed

## Mated with corresponding receptacle (shown for reference only)



## ■Plug Connectors

### ●Shielded-Short Cover

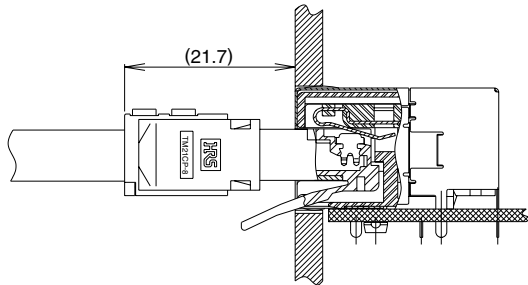
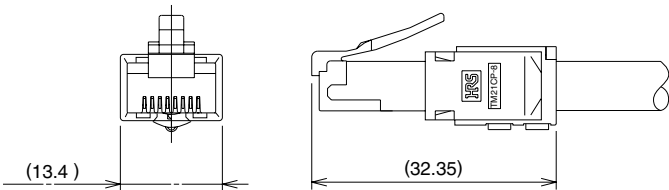


| Part Number    | CL No.        | Cover color |
|----------------|---------------|-------------|
| TM21CP-88P(03) | 222-2884-1-03 | Black       |

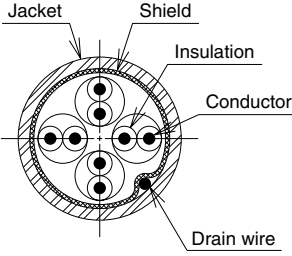
Note: For other colors contact Hirose sales representative.

### ■Cover installed

### ■Mated with corresponding receptacle (shown for reference only)



## ■Applicable Shielded Cable Specifications

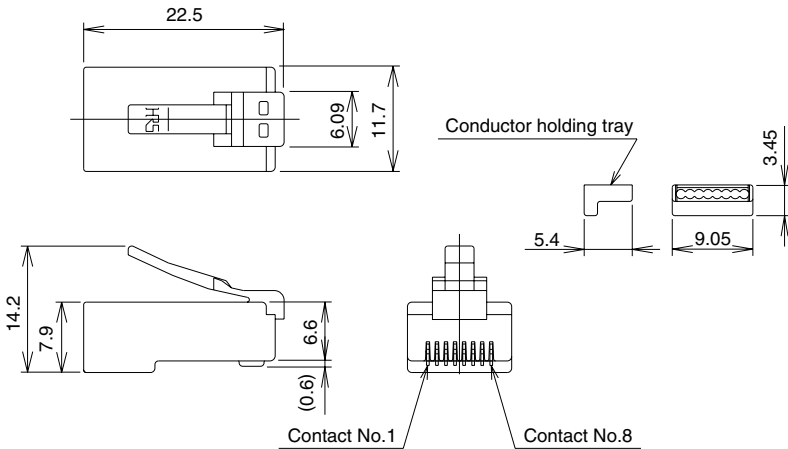
| Specifications                                                                      |                                      |                                                                                              |
|-------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------|
|  | Conductor                            | Solid copper conductor: 0.5mm dia.<br>Stranded copper conductor: AWG#24 (Dia. 0.2mm x 7 pcs) |
|                                                                                     | Individual conductor insulation dia. | (0.9mm to 1.0mm)                                                                             |
|                                                                                     | Drain wire                           | AWG#26 (tin coated)                                                                          |
|                                                                                     | Overall jacket dia.                  | (dia. 6.6mm)                                                                                 |

Note: For cable termination procedures refer to:  
[TM21P-88P Cable Termination Procedure Manual] (ETA-E2349) and [TM21CP-88P Cable termination Procedure Manual] (ETA-E2353).  
Some cables may not meet the required service ratings. Contact Hirose sales representative for specific cable applications recommendations.

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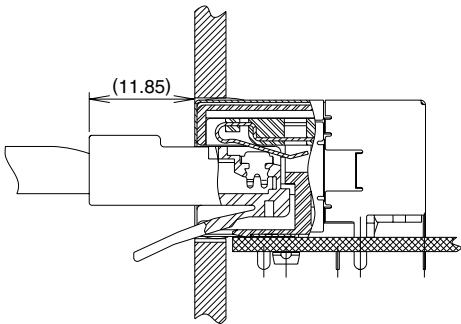
■ Plug Connectors

● Non-shielded

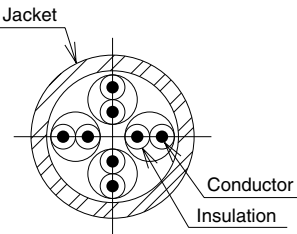


|             |            |
|-------------|------------|
| Part Number | CL No.     |
| TM22P-88P   | 222-2899-9 |

■ Mated with corresponding receptacle (shown for reference only)



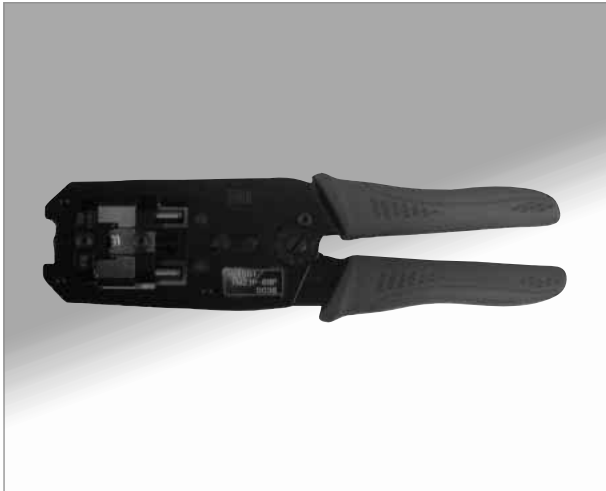
■ Applicable Non-shielded Cable Specifications

| Specifications                                                                      |                                      |                                                           |
|-------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------|
|  | Conductor                            | Solid copper conductor: 0.5mm dia.                        |
|                                                                                     |                                      | Stranded copper conductor: AWG#24<br>(Dia. 0.2mm x 7 pcs) |
|                                                                                     | Individual conductor insulation dia. | (0.9mm to 1.0mm)                                          |
|                                                                                     | Overall jacket dia.                  | (dia. 5.4mm to 5.7mm)                                     |

Note: For cable termination procedures refer to:  
[TM22P-88P Cable Termination Procedure Manual] (ETA-E2381).  
Some cables may not meet the required service ratings. Contact Hirose sales representative for specific cable applications recommendations.

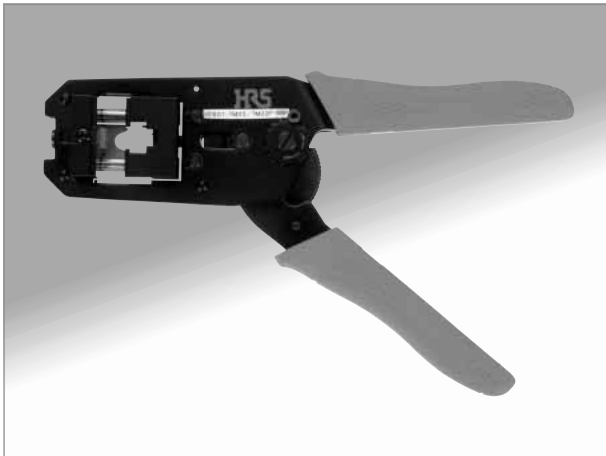
■Hand termination tools

●For contact/conductor termination (For cable and shield crimping)

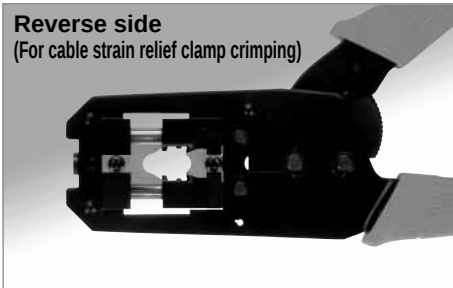
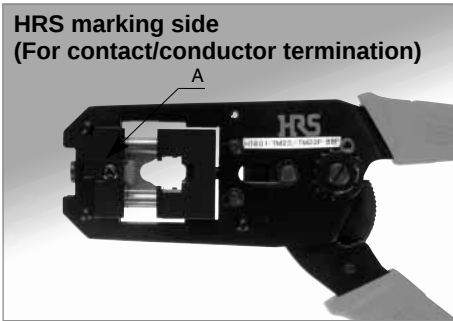


| Part Number       | CL No.     | Applicable connector    |
|-------------------|------------|-------------------------|
| HT601 / TM21P-88P | 902-2133-1 | TM21P-88P<br>TM21CP-88P |

●For contact/conductor termination (Non-shielded connectors)



| Part Number        | CL No.       | Applicable connector |
|--------------------|--------------|----------------------|
| HT601-TM23/22P-88P | CL902-2128-1 | TM22P-88P            |
|                    |              | TM23P-88P            |

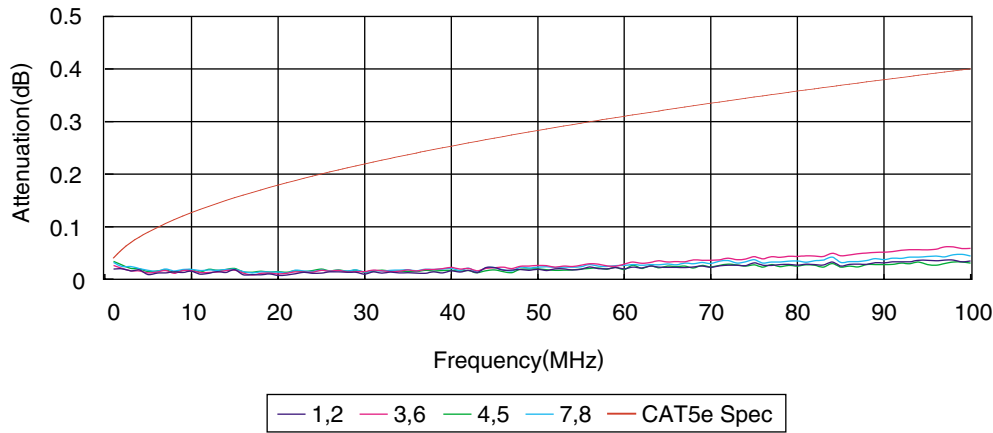


## ■ Technical Documentation

### ● CAT5e Transmission Characteristics Data

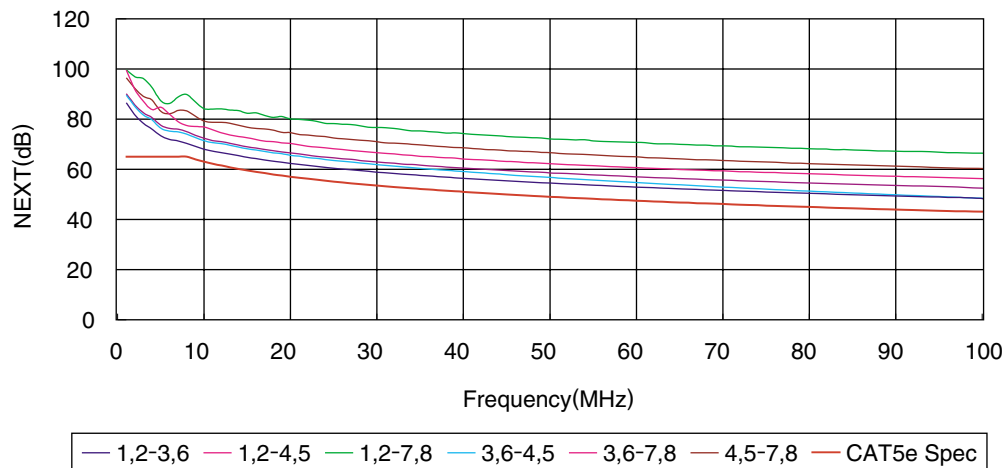
These are the representative values of the various transmission characteristics data for connector assemblies TM21P-88P and TM21R-5C-88-LP when fully mated.

#### • Signal Attenuation

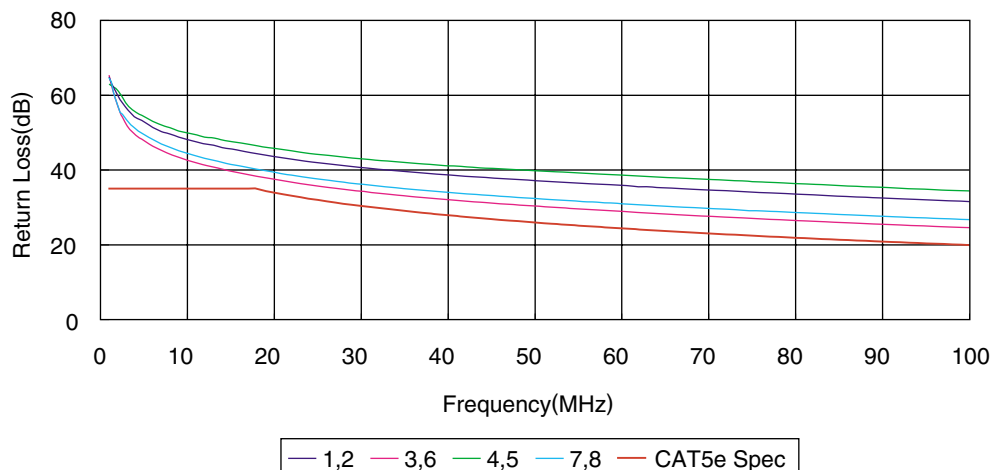


(Each two numbers are for the pair of individual contact position.)

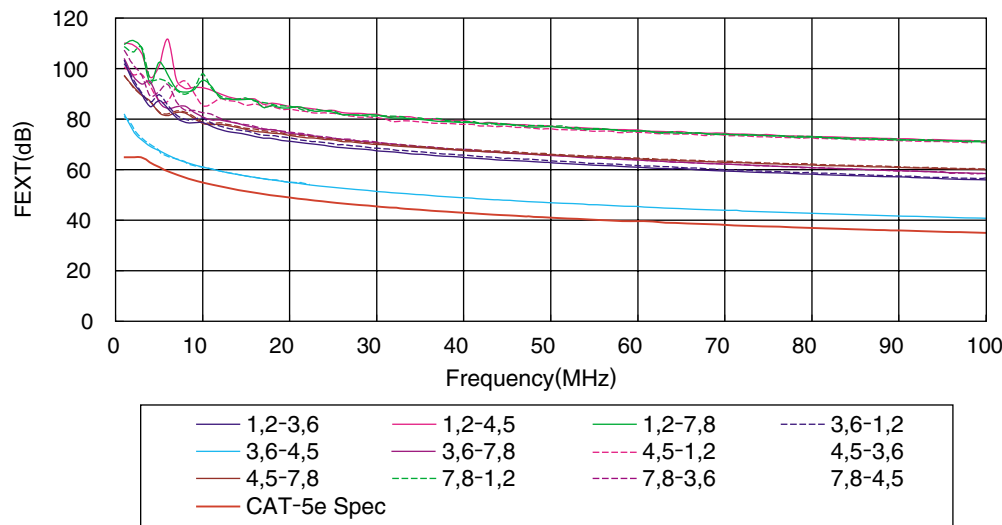
#### • Near-End Crosstalk Attenuation (NEXT)



#### • Return Loss

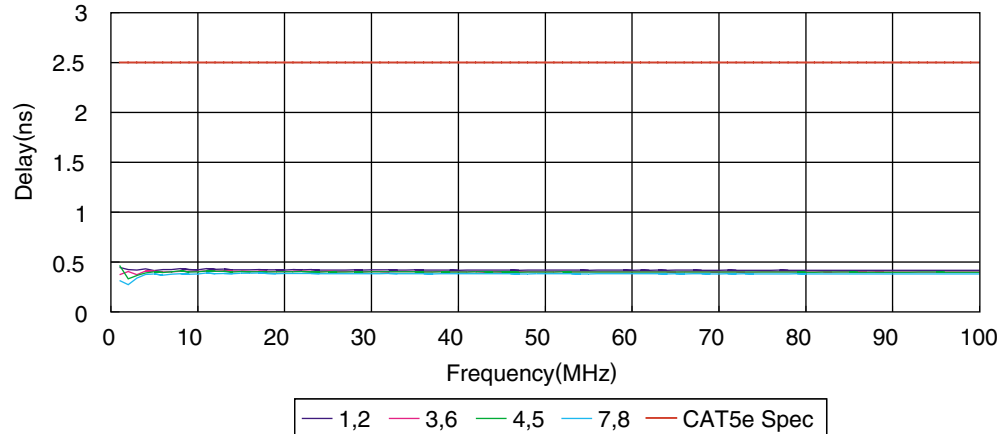


• Far-End Crosstalk Attenuation (FEXT)



(Each two numbers are for pair of individual contact position.)

• Propagation Delay



• Propagation Delay skew

