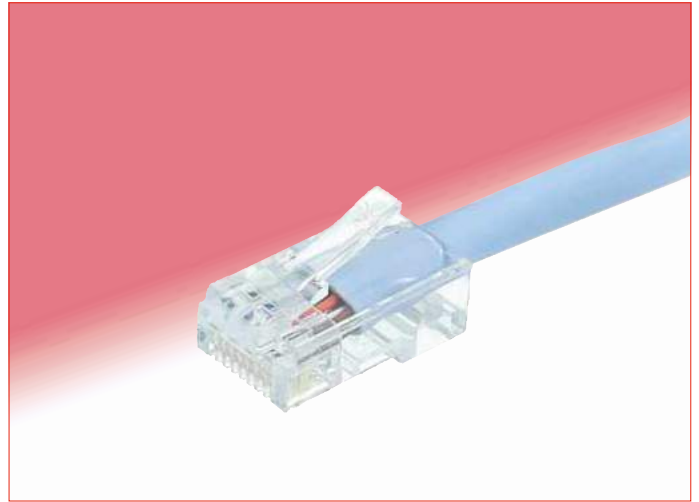


# Modular Plug Connectors Compliant to Enhanced Category 5 Standards

## 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.

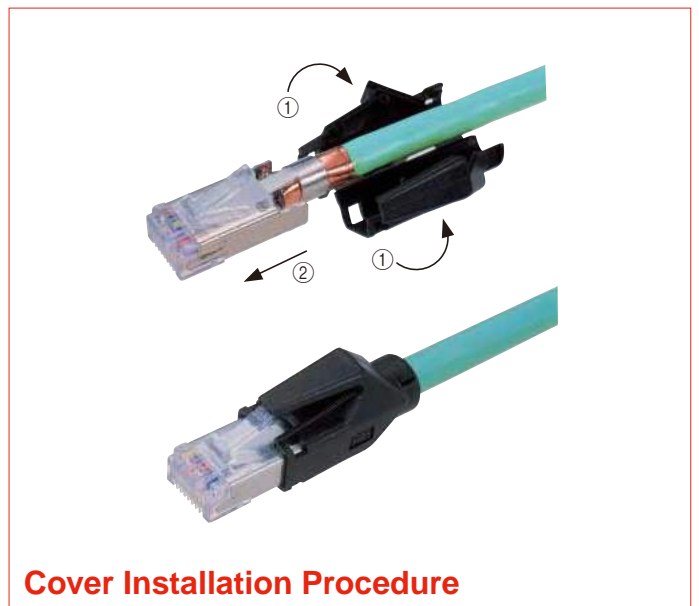
#### 5. Simplified termination (TM21\*P-88P)

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

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

### ■ Applications

Telecom Hubs, Routers, Bridges and ATM Transmission Equipment, Ethernet Switches and Networking Equipment, Test and Measurement Equipment and other equipment requiring this type of simple and reliable connection.



Cover Installation Procedure

## ■ Product Specification

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

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

Note : Includes temperature rise caused by current flow.

## ■ Materials / Finish

| Part                   | Material      | Finish                             | Remarks |
|------------------------|---------------|------------------------------------|---------|
| Insulator              | Polycarbonate | Color : Clear                      | UL94V-2 |
| Contacts               | Copper alloy  | Contact area : Gold plating 1.27μm | —       |
| 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.

## ■ Product Number Structure

Refer to the chart below when determining the product specifications from the product number.

Please select from the product numbers listed in this catalog when placing orders.

### ● Plugs- Shielded

**TM21 C P - 8 8P**

① ② ③ ④

### ● Plugs - Non-shielded

**TM22P - 8 8P**

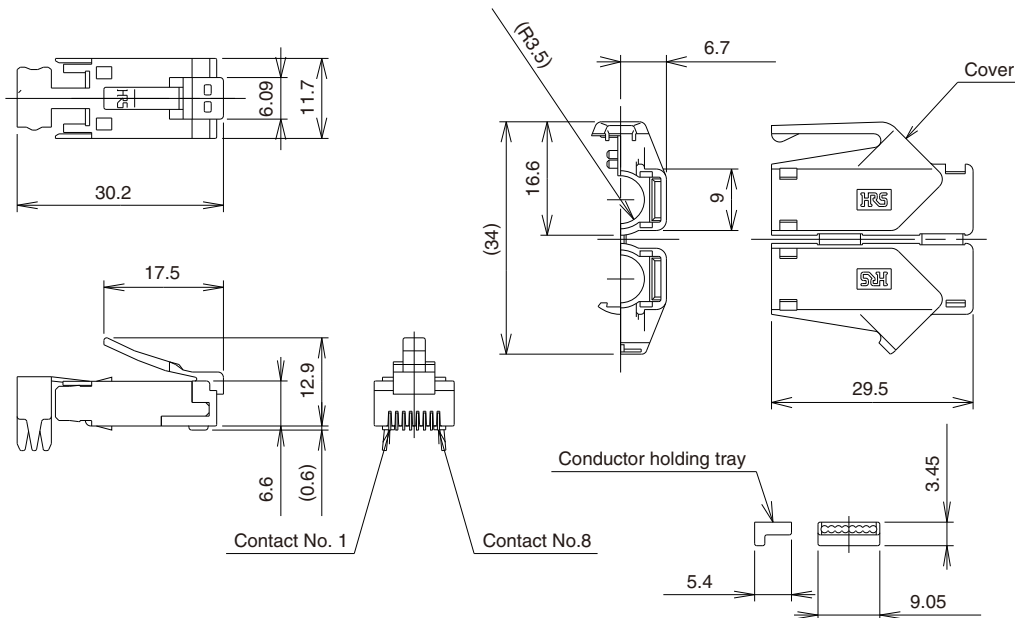
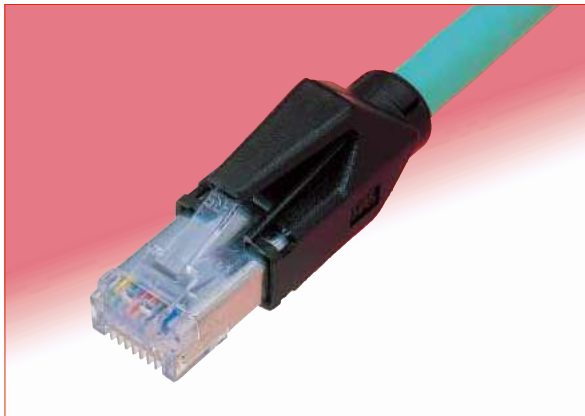
① ② ③

|                     |   |
|---------------------|---|
| 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  |

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

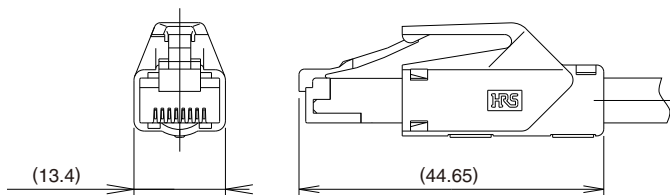
## ■ Plug Connectors

### ● Shielded

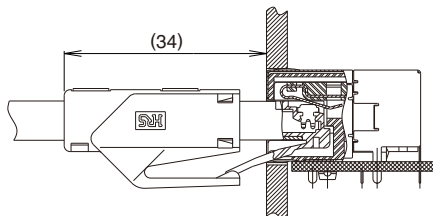


| Part No.      | HRS No.       | Cover Color        | Remarks             | RoHS |
|---------------|---------------|--------------------|---------------------|------|
| TM21P-88P     | 222-2862-9 00 | Light beige        | Plug unit and Cover | YES  |
| TM21P-88P(11) | 222-2862-9 11 | Light beige        | Cover               |      |
| TM21P-88P(12) | 222-2862-9 12 | Medium gray        | Cover               |      |
| TM21P-88P(13) | 222-2862-9 13 | Black              | Cover               |      |
| TM21P-88P(14) | 222-2862-9 14 | Natural light gray | Cover               |      |
| TM21P-88P(15) | 222-2862-9 15 | Red                | Cover               |      |
| TM21P-88P(16) | 222-2862-9 16 | Green              | Cover               |      |
| TM21P-88P(17) | 222-2862-9 17 | Blue               | Cover               |      |
| TM21P-88P(18) | 222-2862-9 18 | Yellow             | Cover               |      |
| TM21P-88P(19) | 222-2862-9 19 | Orange             | Cover               |      |

### ◆ Cover installed



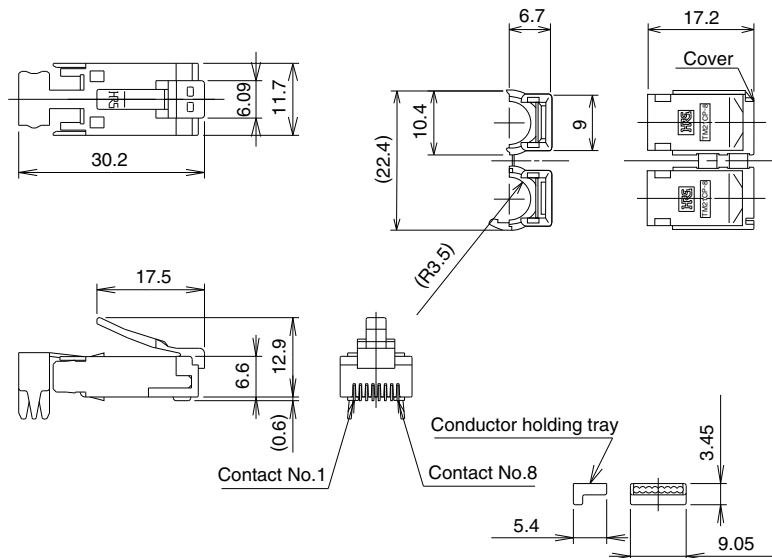
### ◆ Mated with corresponding receptacle (shown for reference only)



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## ■ Plug Connectors

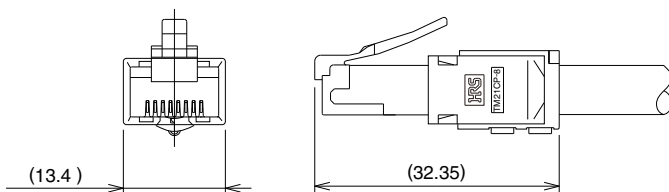
### ● Shielded-Short Cover



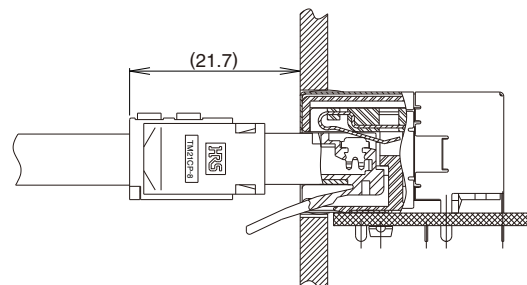
| Part No.       | HRS No.       | Cover color | RoHS |
|----------------|---------------|-------------|------|
| TM21CP-88P(03) | 222-2884-1 03 | Black       | YES  |

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 : 24 AWG (Dia. 0.2mm x 7 pcs) |
|                | Individual conductor insulation dia. | (0.9mm to 1.0mm)   |
|                | Drain wire                           | 26 AWG (tin coated)  |
|                | Overall jacket dia.                  | (dia. 6.6mm)   |

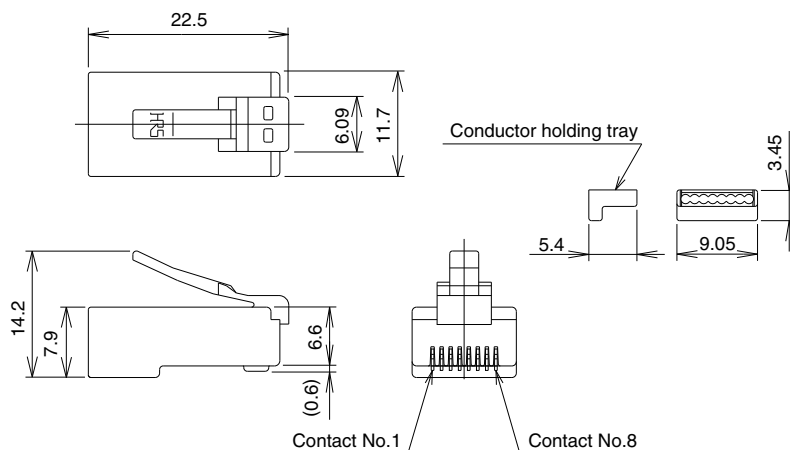
Note : For cable termination procedures refer to:

[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.

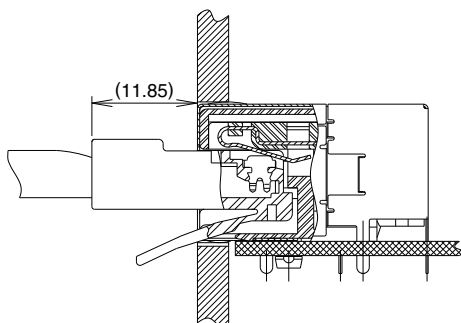
## ■ Plug Connectors

### ● Non-shielded



| Part No.  | HRS No.    | RoHS |
|-----------|------------|------|
| TM22P-88P | 222-2899-9 | YES  |

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



### ◆ Applicable Non-shielded Cable Specifications

| Specifications |                                      |  |
|----------------|--------------------------------------|--|
|                | Conductor                            | Solid copper conductor : 0.5mm dia.                        |
|                |                                      | Stranded copper conductor : 24 AWG<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.

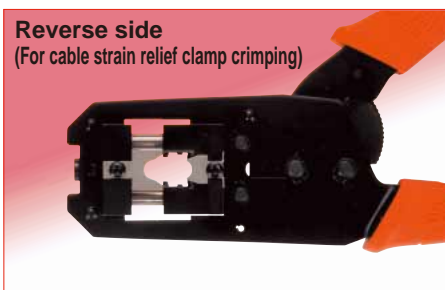
## ◆ Hand termination tools

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



| Part No.        | HRS No.    | Applicable connector    |
|-----------------|------------|-------------------------|
| HT603/TM21P-88P | 902-2532-0 | TM21P-88P<br>TM21CP-88P |

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



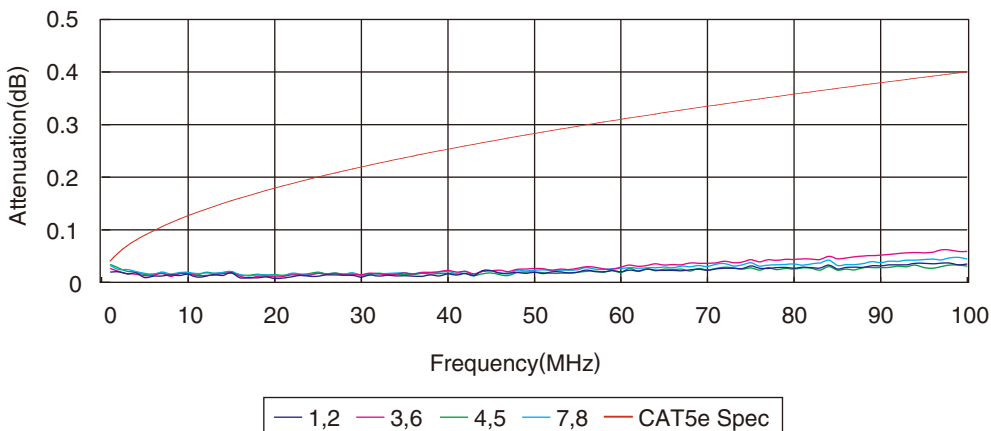
| Part No.           | HRS No.    | Applicable connector |
|--------------------|------------|----------------------|
| HT601-TM23/22P-88P | 902-2128-1 | TM22P-88P            |
|                    |            | TM23P-88P            |

## ◆ Technical Documentation

### ● CAT5e Transmission Characteristics Data

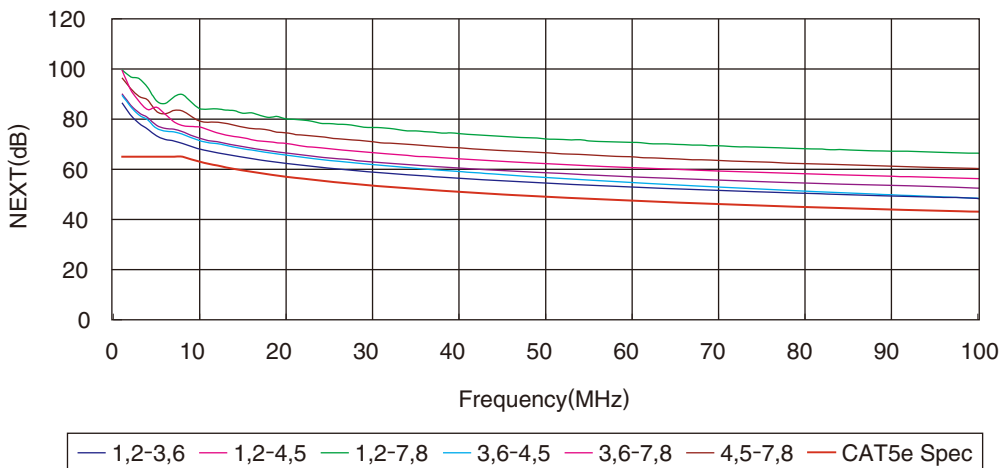
These are the representative values of the various transmission characteristics data for connector assemblies TM21P-88P and TM21R-5C-88-LP when fully mated.

#### • Signal Attenuation

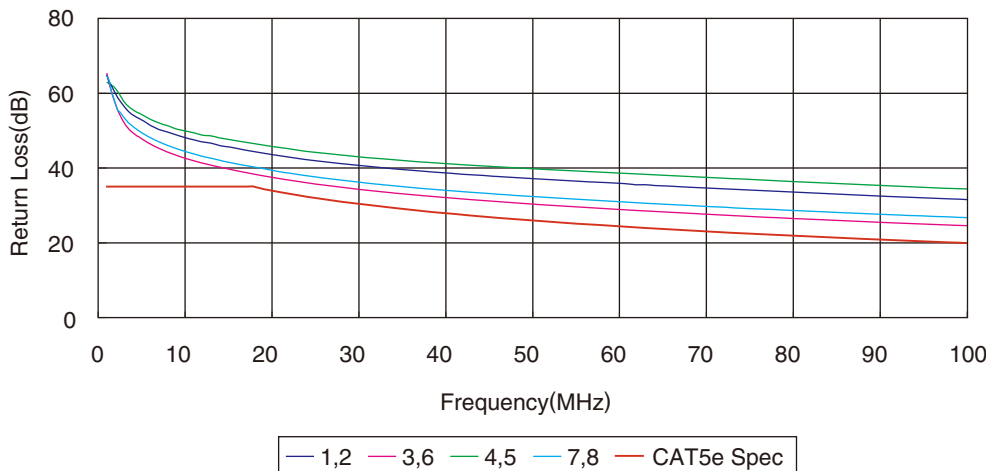


(Each two numbers are for the pair of individual contact position.)

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

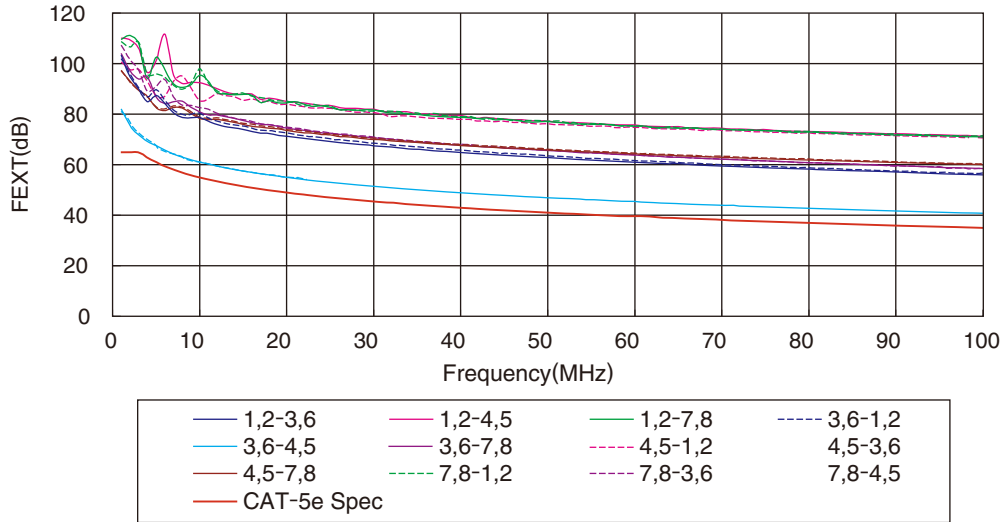


#### • Return Loss



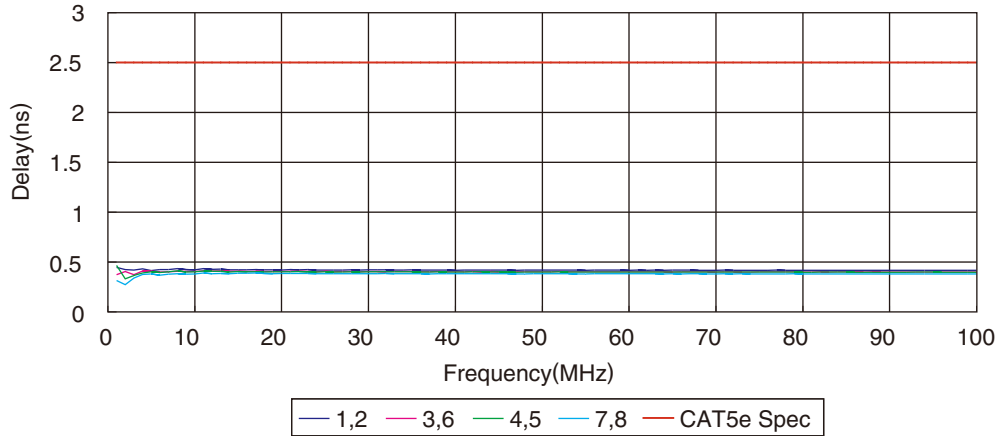
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• Far-End Crosstalk Attenuation (FEXT)

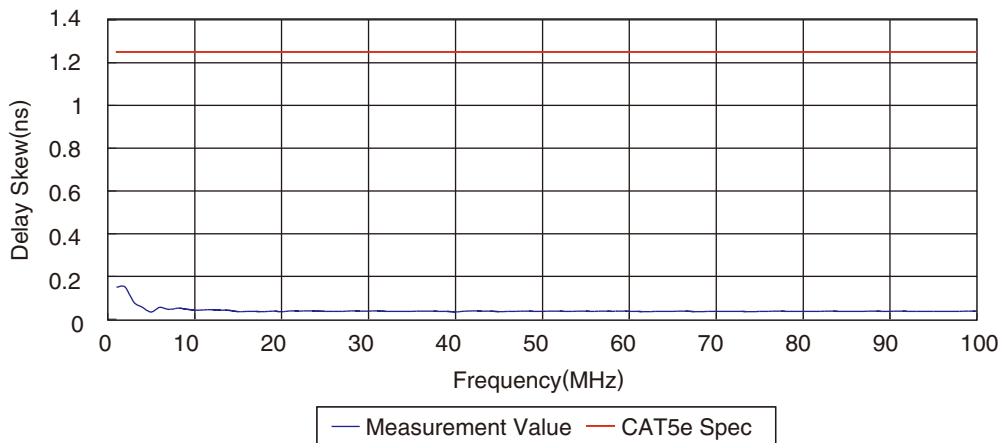


(Each two numbers are for pair of individual contact position.)

• Propagation Delay



• Propagation Delay skew



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