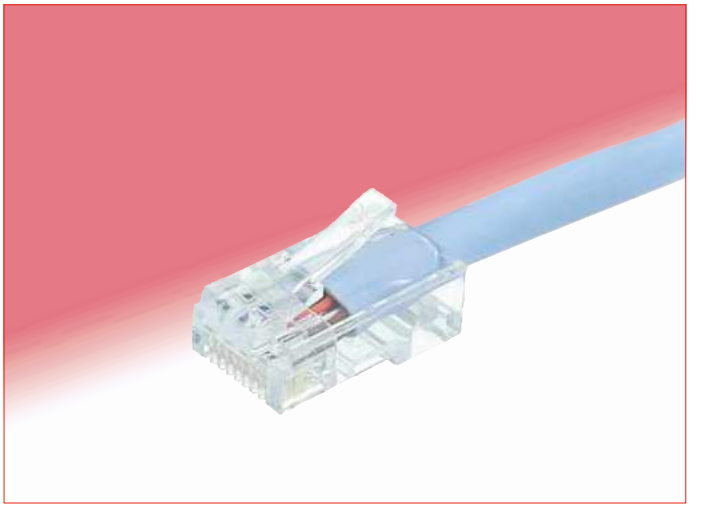
# Modular Plug Connectors Compliant to Enhanced Category 5 Standards

## TM21P Series (Shielded Type)



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



## ■Features

### 1. Supports High-Speed LAN Transmission

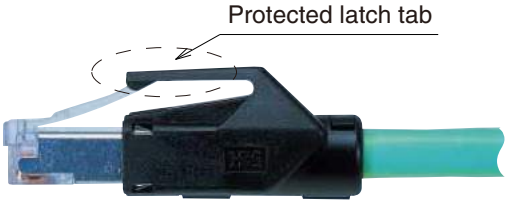
Conforms to requirements of TIA/EIA-568B data wiring standard, meeting transmission performance of Enhanced Category 5.
Supports Gigabit Ethernet (1000BASE-T) and Fast Ethernet (100BASE-TX) high-speed LAN transmission.

### 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.



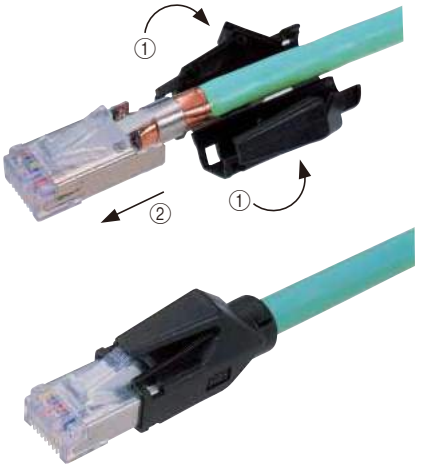

### 4. Termination of conductors

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

## ■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.

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## ■Product Specification

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

| 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/s², 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℃→+5℃ to +35℃→+85℃→+5℃ to +35℃<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℃ 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**
❶ ❷ ❶ ❸ ❹

| | |
|---|---|
| ❶ Series name | TM21P : Shielded |
| ❷ Cover Type | Blank : Protective latch cover<br>C : Short cover |
| ❸ Size | 8 : For 8 contacts |
| ❹ Inserted contacts | 8P : 8 |

### ●Plugs - Non-shielded

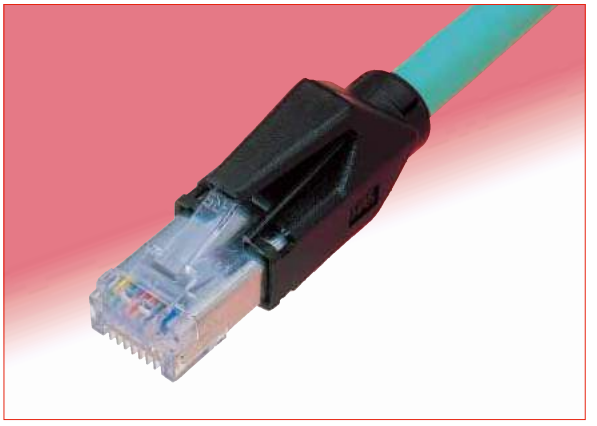
**TM22P - 8 8P**
❶ ❷ ❸

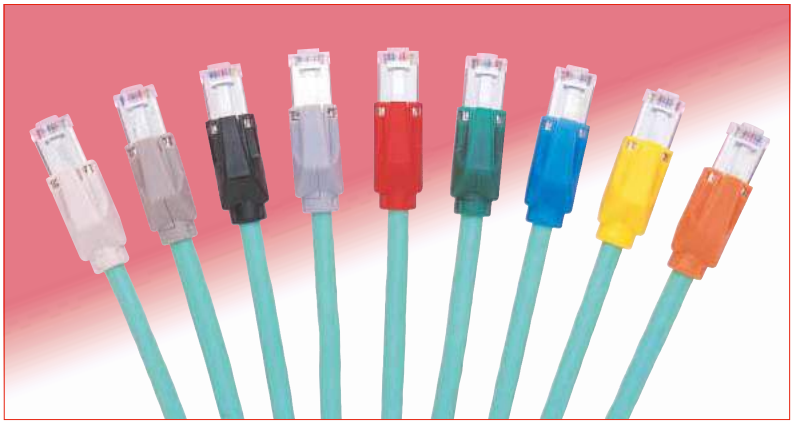
| | |
|---|---|
| ❶ Series name | TM22P : Non-shielded |
| ❷ Size | 8 : For 8 contacts |
| ❸ Inserted contacts | 8P: 8 |

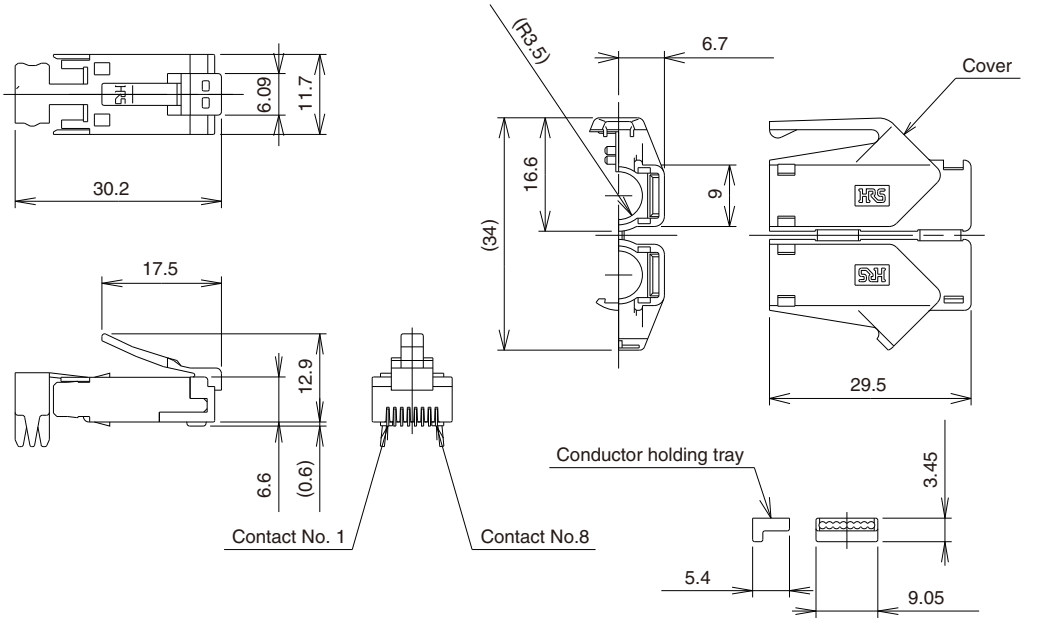
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# ■Plug Connectors

## ●Shielded

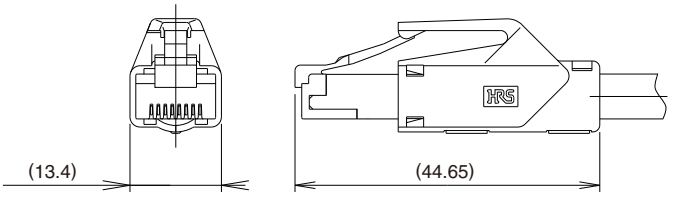




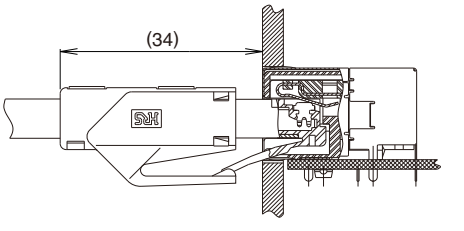



| Part No. | HRS No. | Cover Color | Remarks | RoHS |
|---|---|---|---|---|
| TM21P-88P | 222-2862-9 00 | Light beige | Plug unit and Cover | YES |
| TM21P-88P(11) | 222-2862-9 11 | Light beige | Cover | |
| TM21P-88P(12) | 222-2862-9 12 | Medium gray | Cover | |
| TM21P-88P(13) | 222-2862-9 13 | Black | 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)

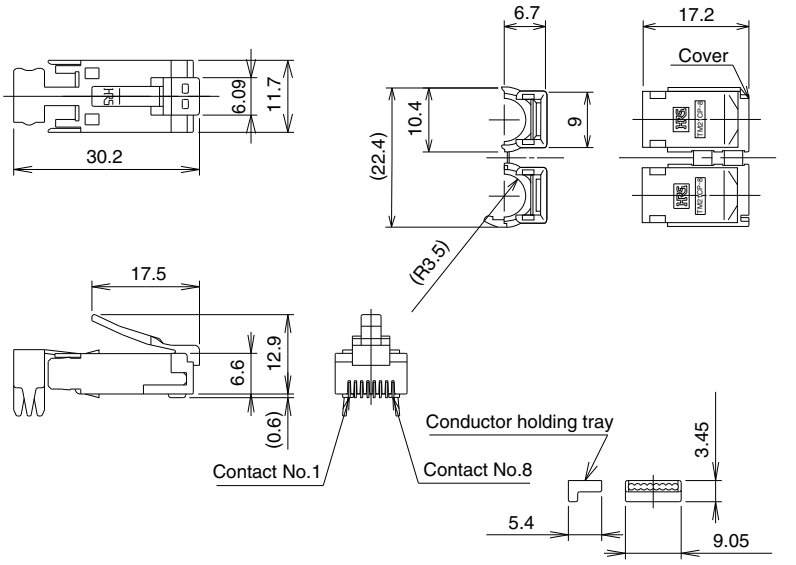



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# ■Plug Connectors

## ●Shielded-Short Cover

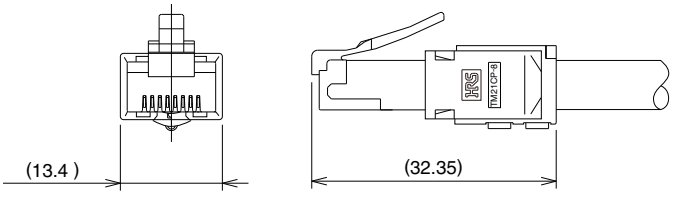




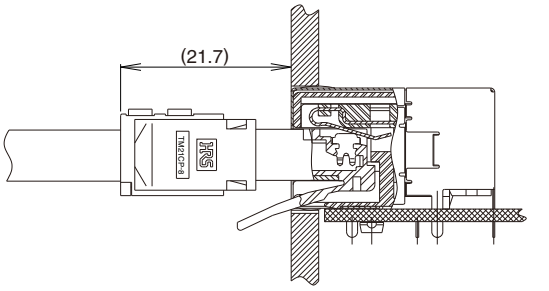

| Part No. | HRS No. | Cover color | RoHS |
|---|---|---|---|
| TM21CP-88P(03) | 222-2884-1 03 | Black | YES |

Note : For other colors contact Hirose sales representative.

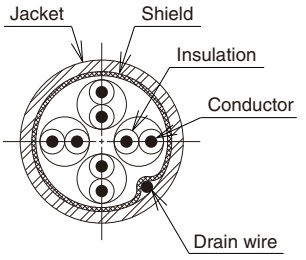
## ◆Cover installed




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




## ◆Applicable Shielded Cable Specifications

| Specifications | | |
|---|---|---|
|   | Conductor | Solid copper conductor : 0.5mm dia. |
| | | 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) |

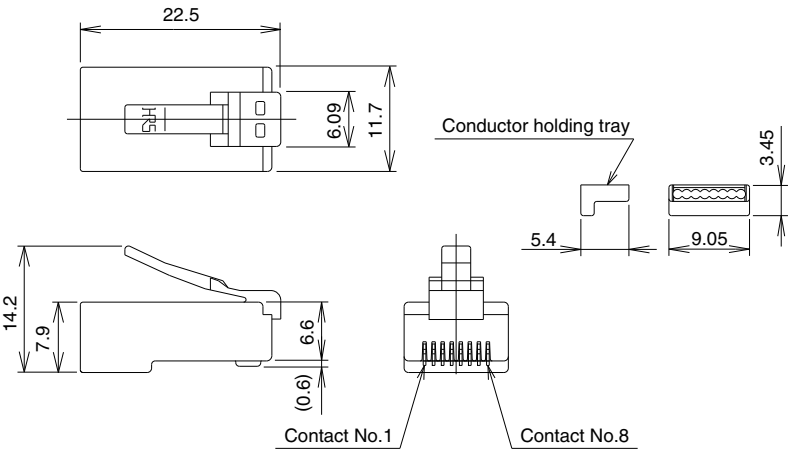
Note : For cable termination procedures refer to:
[TM21P-88P Cable Termination Procedure Manual] (ETA-E2349) and [TM21CP-88P Cable termination Procedure Manual] (ETA-E2353).
Some cables may not meet the required service ratings. Contact Hirose sales representative for specific cable applications recommendations.

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# ■Plug Connectors

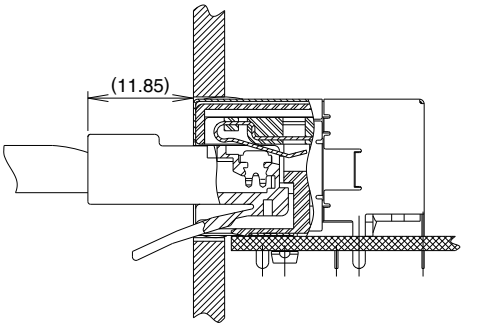
## ●Non-shielded



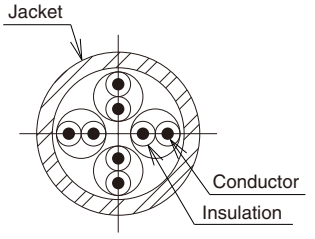



| Part No. | HRS No. | RoHS |
|---|---|---|
| TM22P-88P | 222-2899-9 | YES |

## ◆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 (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.

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# ◆Hand termination tools

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

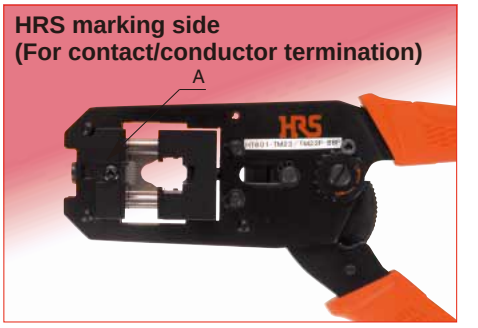


| Part No. | HRS No. | Applicable connector |
|---|---|---|
| HT603/TM21P-88P | 902-2532-0 | TM21P-88P<br>TM21CP-88P |

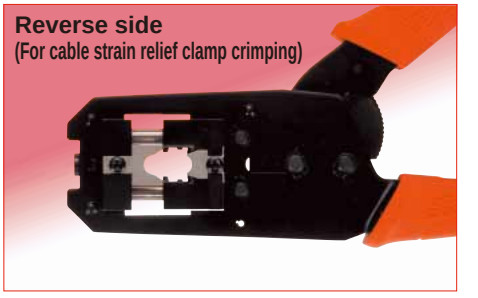
## ●For contact/conductor termination (Non-shielded connectors)



**HRS marking side**
**(For contact/conductor termination)**




**Reverse side**
(For cable strain relief clamp crimping)



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

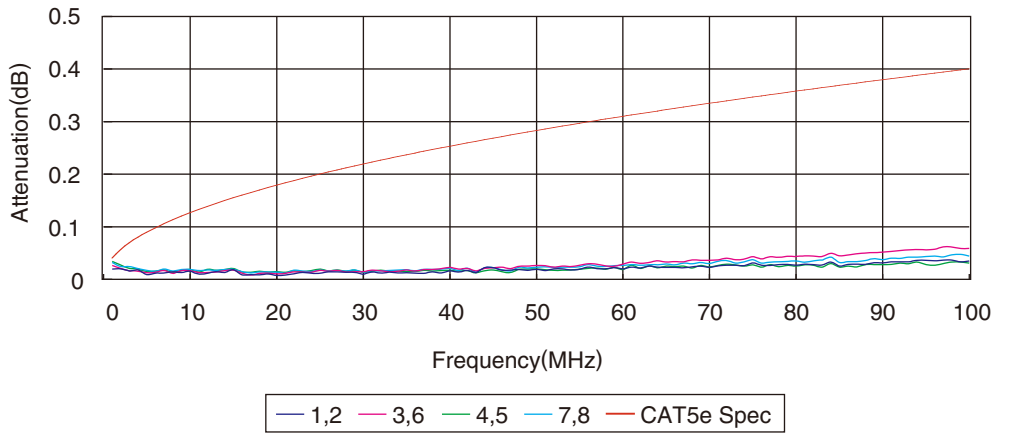
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# Technical Documentation

## ●CAT5e Transmission Characteristics Data

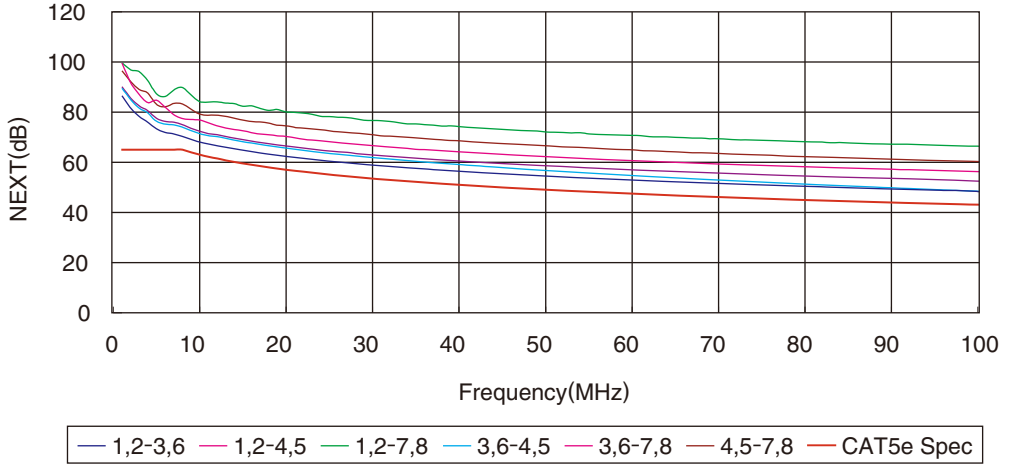
These are the representative values of the various transmission characteristics data for connector assemblies TM21P-88P and TM21R-5C-88-LP when fully mated.

### • Signal Attenuation

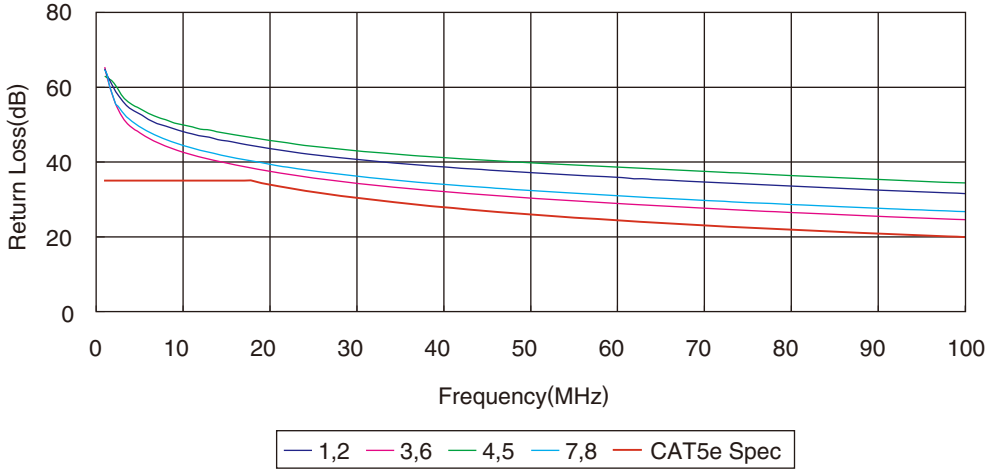



(Each two numbers are for the pair of individual contact position.)

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

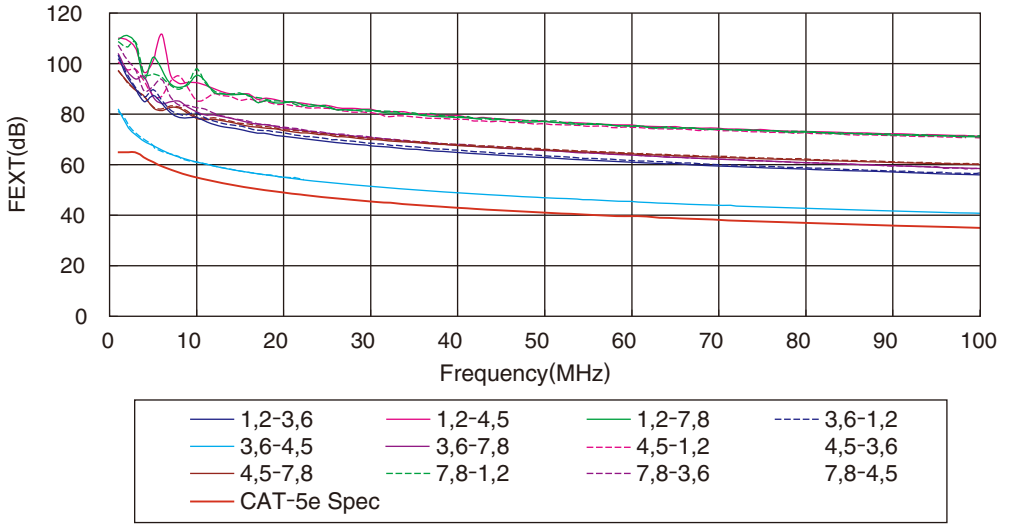



### • Return Loss



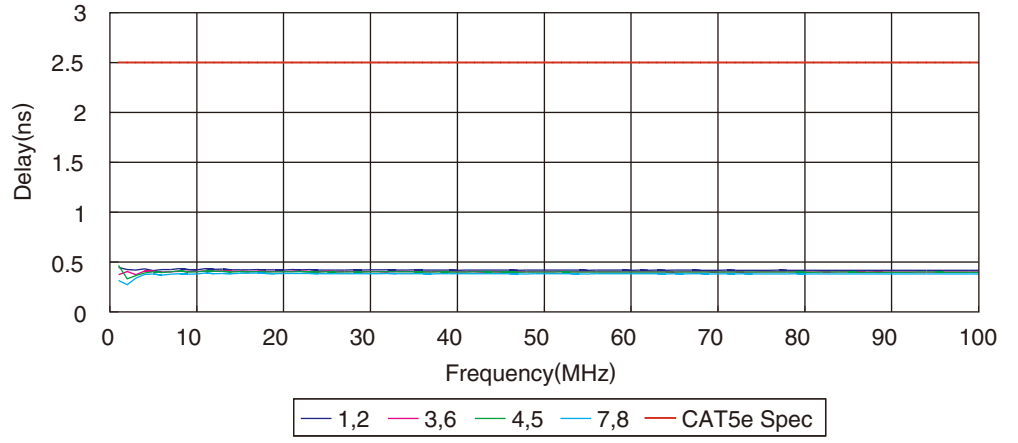

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## • Far-End Crosstalk Attenuation (FEXT)

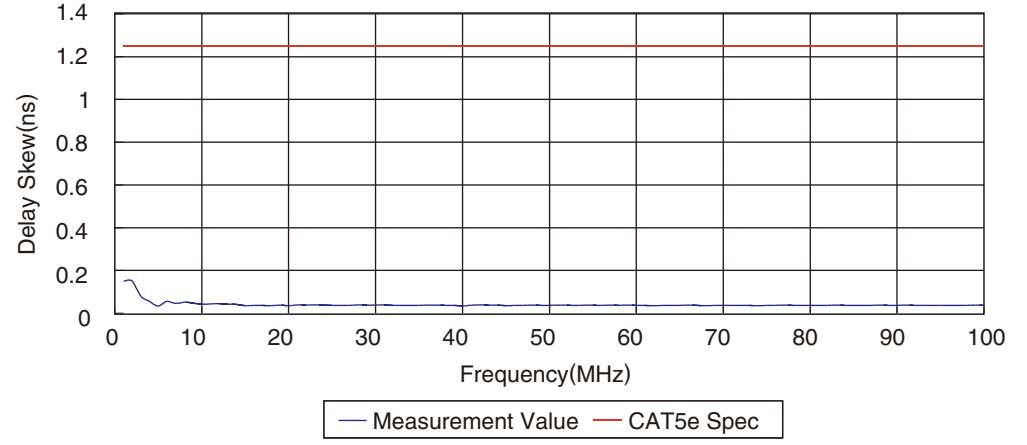



(Each two numbers are for pair of individual contact position.)

## • Propagation Delay




## • Propagation Delay skew




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The contents of this catalog are current as of date of 02/2022. Contents are subject to change without notice for the purpose of improvements.