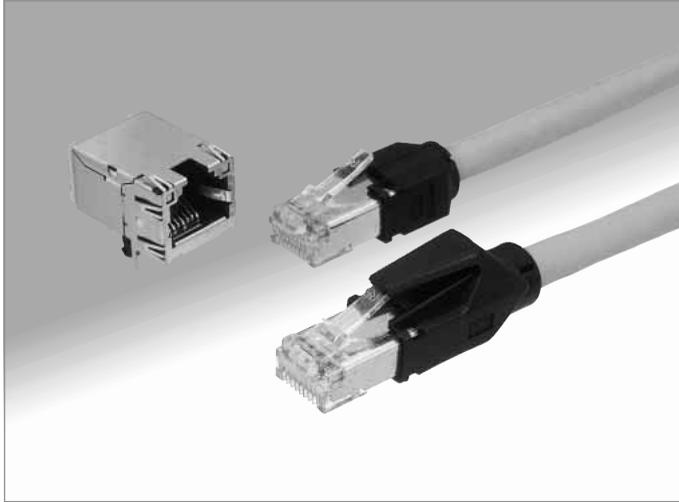
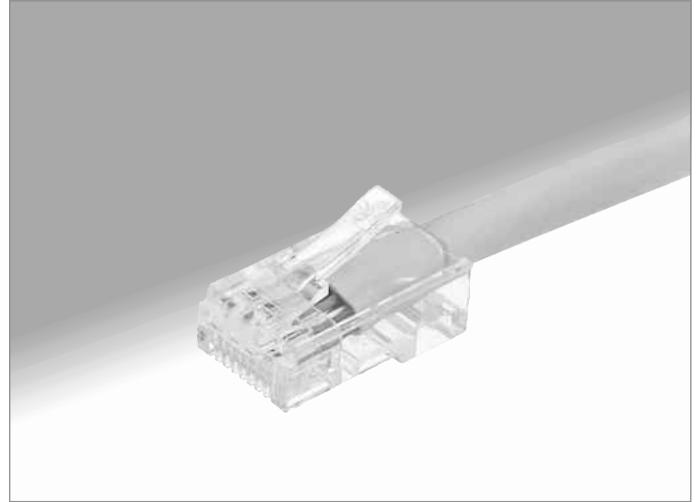


# Modular Plug Connectors Compliant to Enhanced Category 5 Standards

## 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.

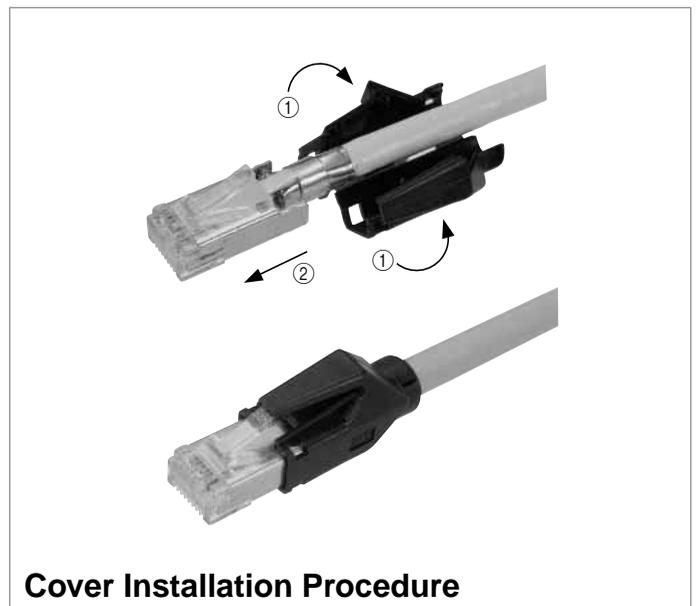
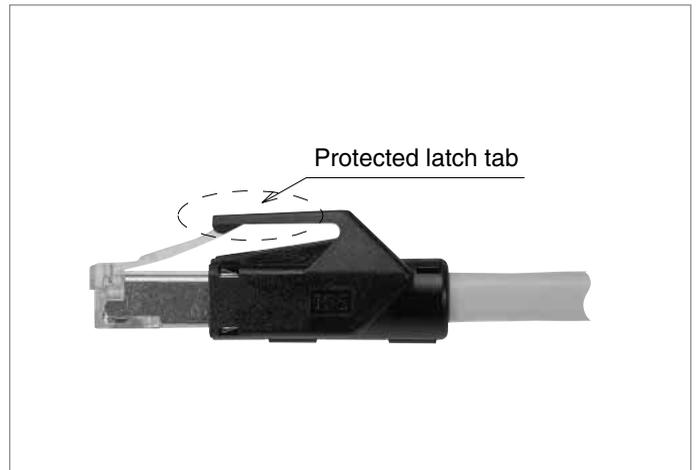
#### 4. Termination of conductors

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)



## ■ Product Specification

Rating	Current rating 1A	Operating temperature range -25°C to +60°C (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 Contact resistance: 250m ohms max.	Frequency: 10 to 55 Hz, single amplitude of 0.75 mm, 2 hours / 3 axis
6. Shock	No electrical discontinuity of 5 ms. min. Contact resistance: 250m ohms max.	Acceleration of 490 m/s <sup>2</sup> , 11 ms duration, 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. Insulation resistance: 100 M ohms min.	Temperature: -55°C → +5°C to +35°C → +85°C → +5°C to +35°C Duration: 30 → 5 → 30 → 5 (Minutes) 5 cycles
9. Humidity	Contact resistance: 250 m ohms max. Insulation resistance: 1 M ohms min. (High humidity) Insulation resistance: 10 M ohms min. (Dry state)	500 hours at temperature of 40°C 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 ③ ④

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

### ● Plugs - Non-shielded

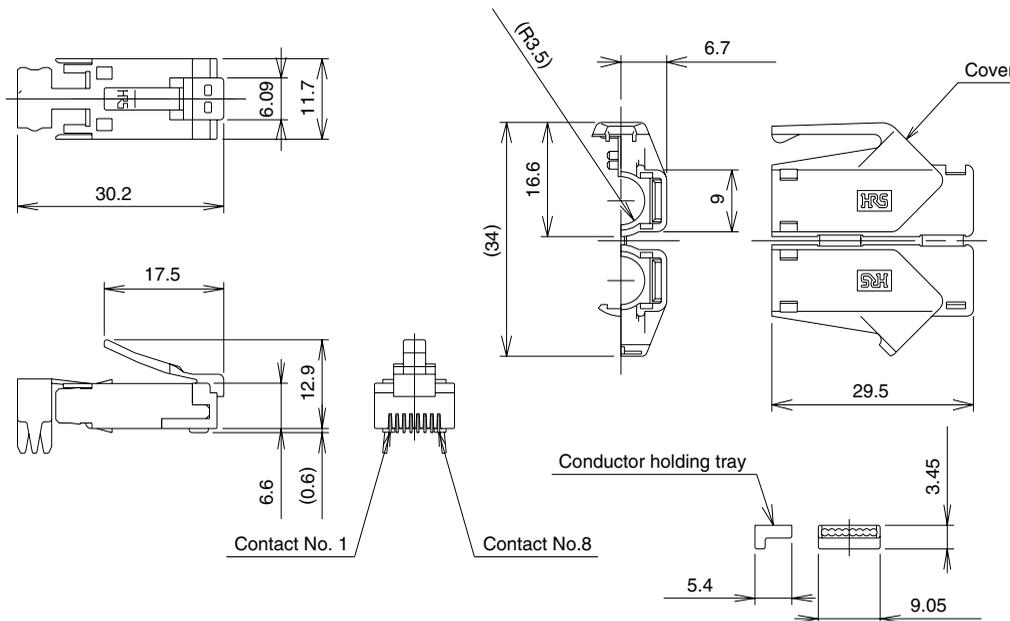
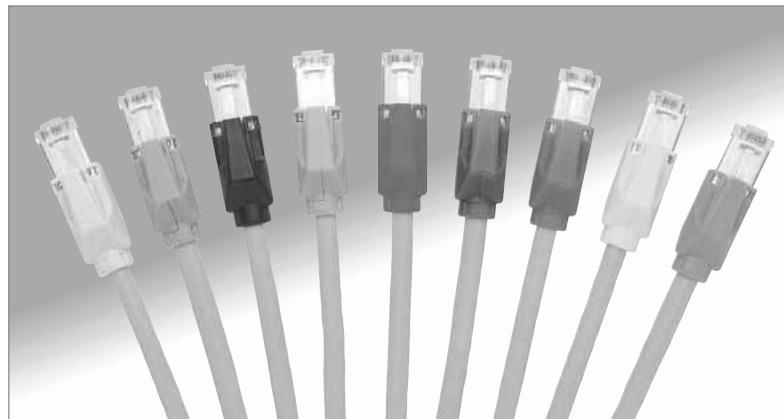
**TM22P - 8 8P**

① ② ③

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

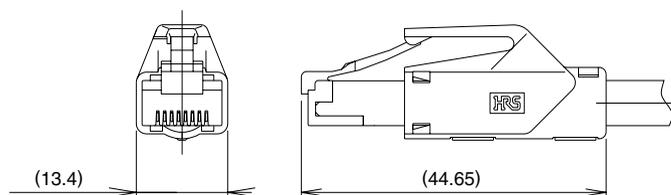
## ■ Plug Connectors

### ● Shielded

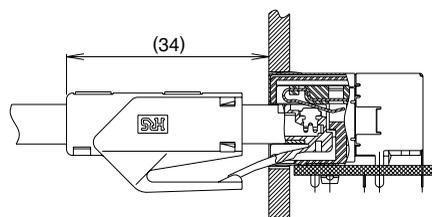


Part Number	CL No.	Cover Color
TM21P-88P	222-2862-9	Light beige
TM21P-88P(02)	222-2862-9-02	Medium gray
TM21P-88P(03)	222-2862-9-03	Black
TM21P-88P(04)	222-2862-9-04	Natural light gray
TM21P-88P(05)	222-2862-9-05	Red
TM21P-88P(06)	222-2862-9-06	Green
TM21P-88P(07)	222-2862-9-07	Blue
TM21P-88P(08)	222-2862-9-08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

### ■ Cover installed

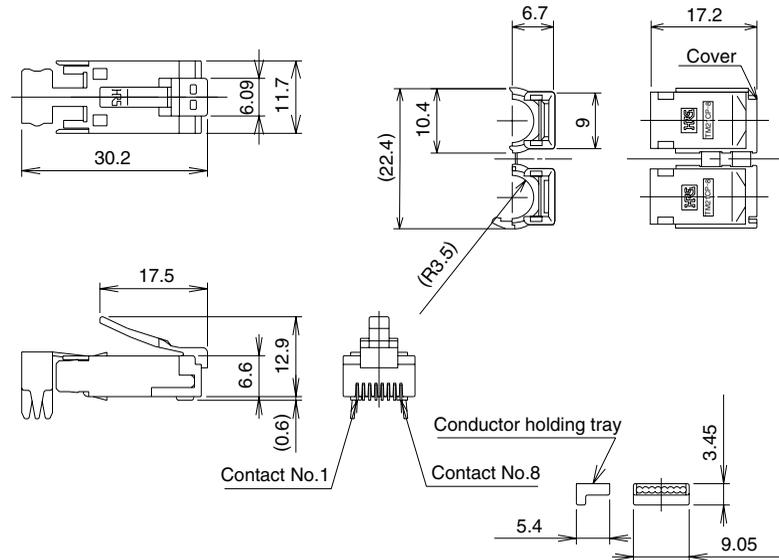
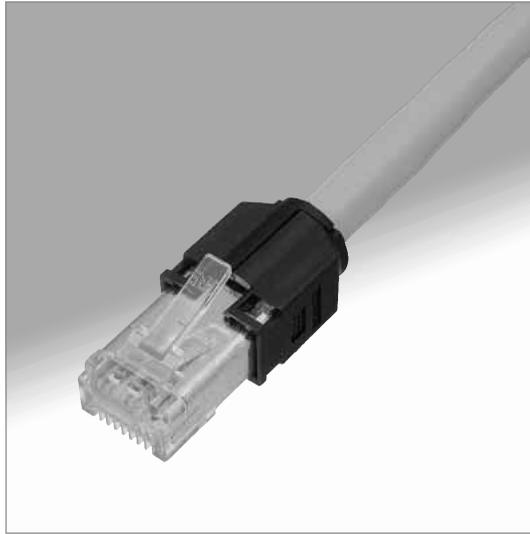


### ■ Mated with corresponding receptacle (shown for reference only)



## ■ Plug Connectors

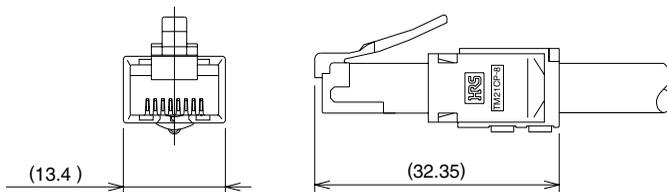
### ● Shielded-Short Cover



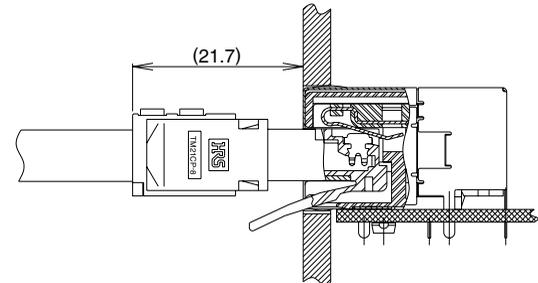
Part Number	CL No.	Cover color
TM21CP-88P(03)	222-2884-1-03	Black

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. 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)

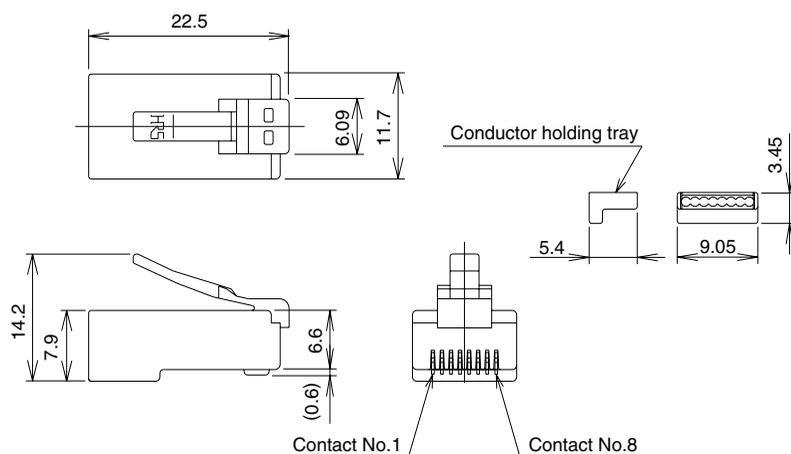
Note: For cable termination procedures refer to:

[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.

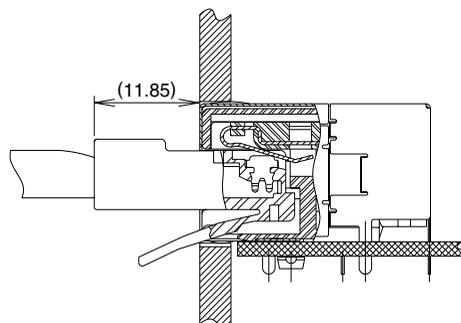
## ■ Plug Connectors

### ● 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 (Dia. 0.2mm x 7 pcs)
	Individual conductor insulation dia.	(0.9mm to 1.0mm)
	Overall jacket dia.	(dia. 5.4mm to 5.7mm)

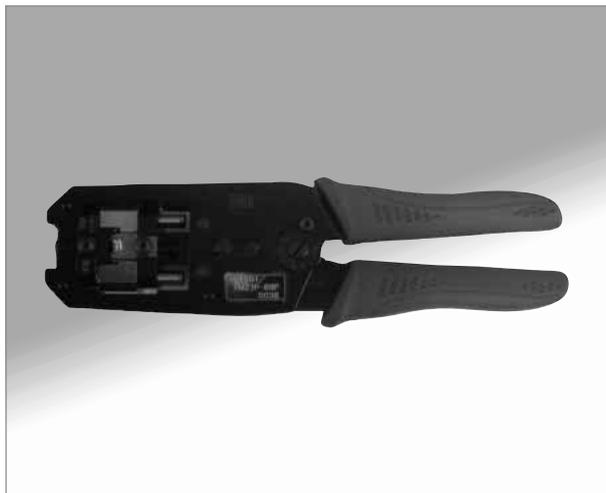
Note: For cable termination procedures refer to:

[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.

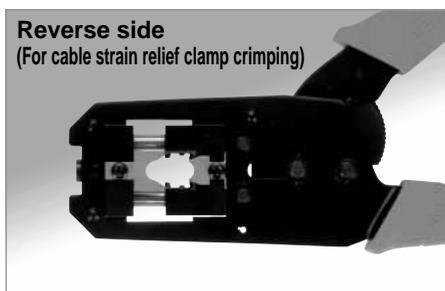
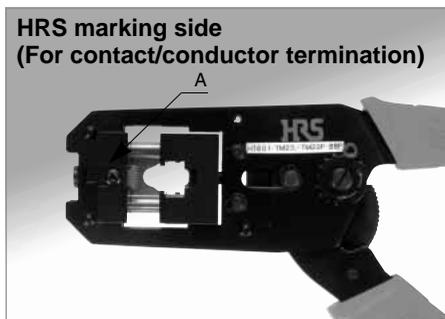
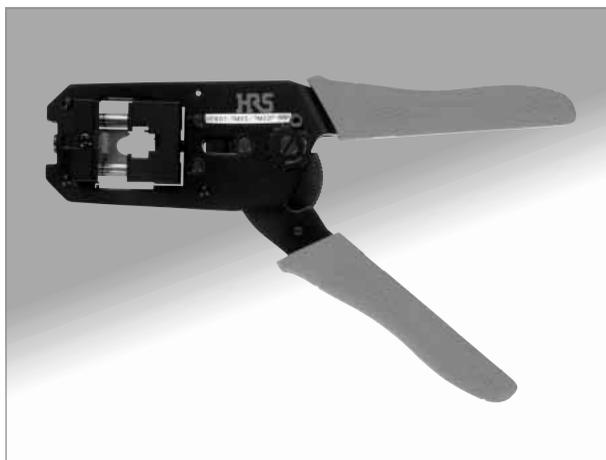
## ■ Hand termination tools

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



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

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



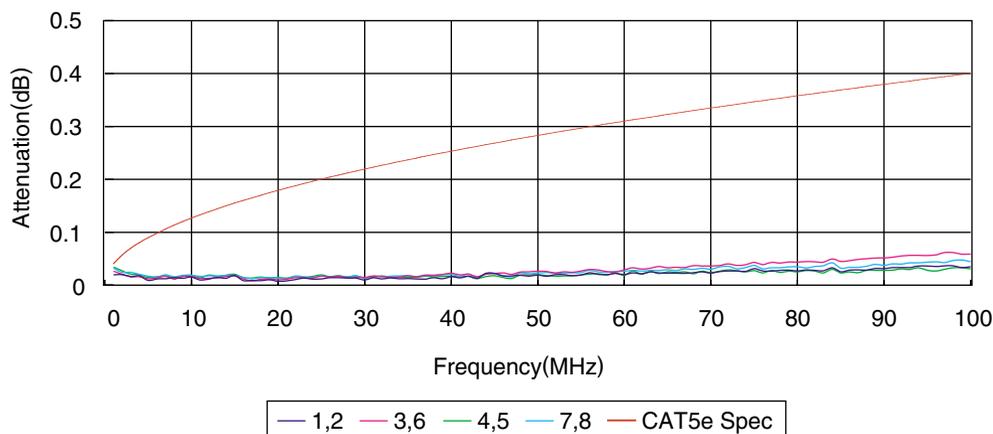
Part Number	CL No.	Applicable connector
HT601-TM23/22P-88P	CL902-2128-1	TM22P-88P
		TM23P-88P

## ■ Technical Documentation

### ● CAT5e Transmission Characteristics Data

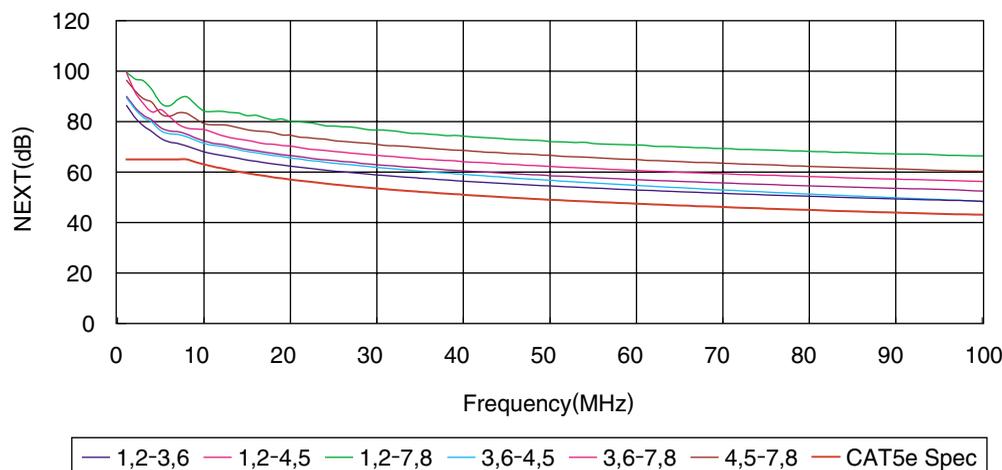
These are the representative values of the various transmission characteristics data for connector assemblies TM21P-88P and TM21R-5C-88-LP when fully mated.

#### • Signal Attenuation

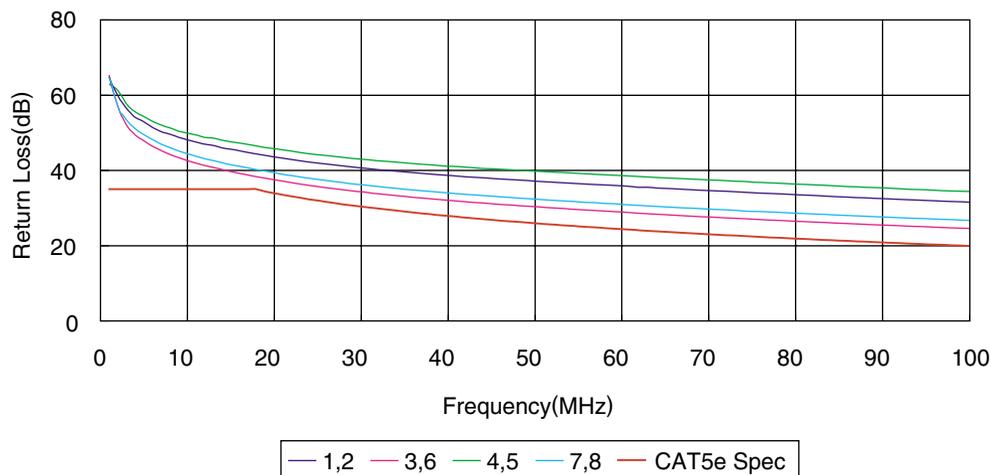


(Each two numbers are for the pair of individual contact position.)

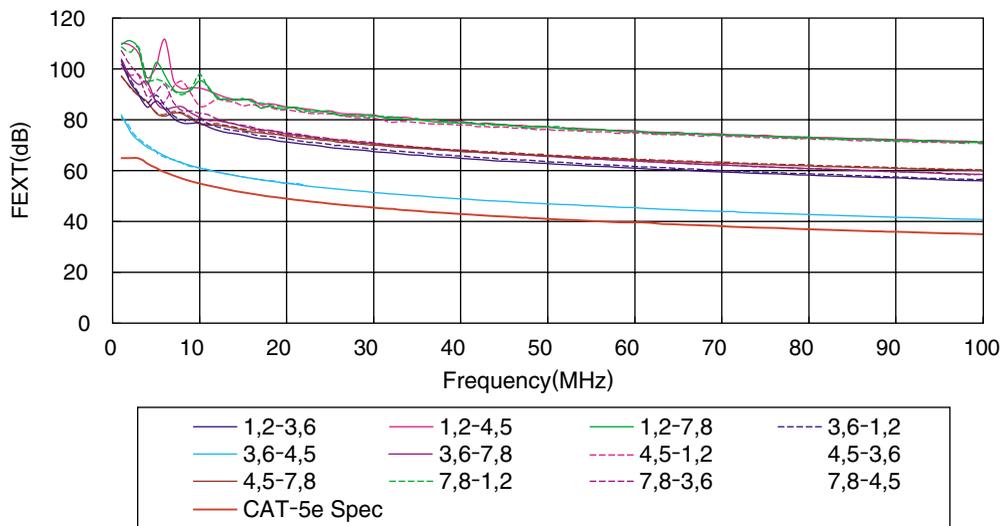
#### • Near-End Crosstalk Attenuation (NEXT)



#### • Return Loss

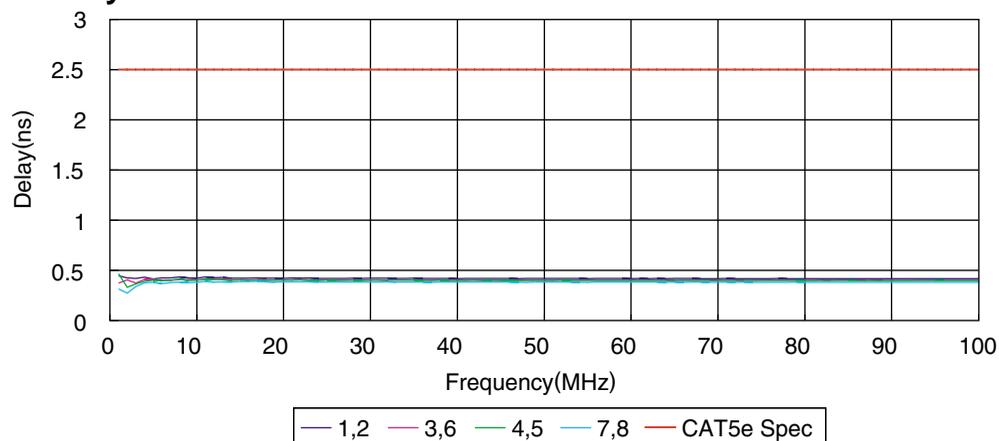


• **Far-End Crosstalk Attenuation (FEXT)**

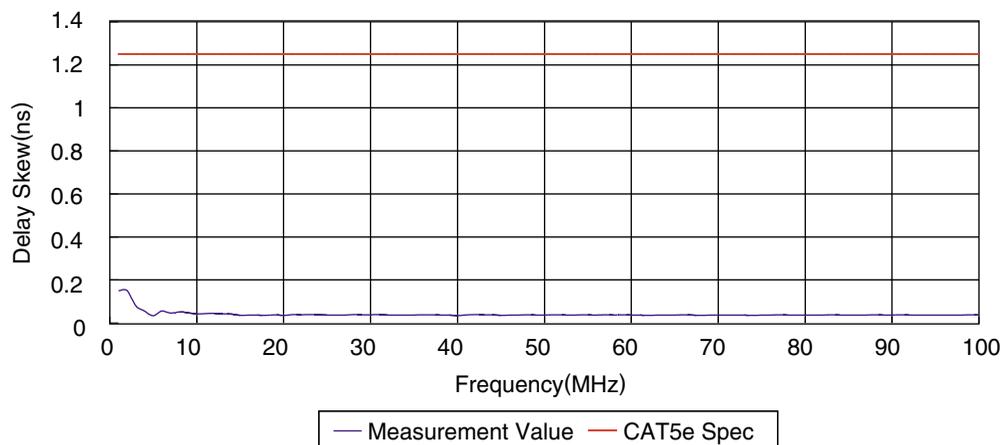


(Each two numbers are for pair of individual contact position.)

• **Propagation Delay**



• **Propagation Delay skew**



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