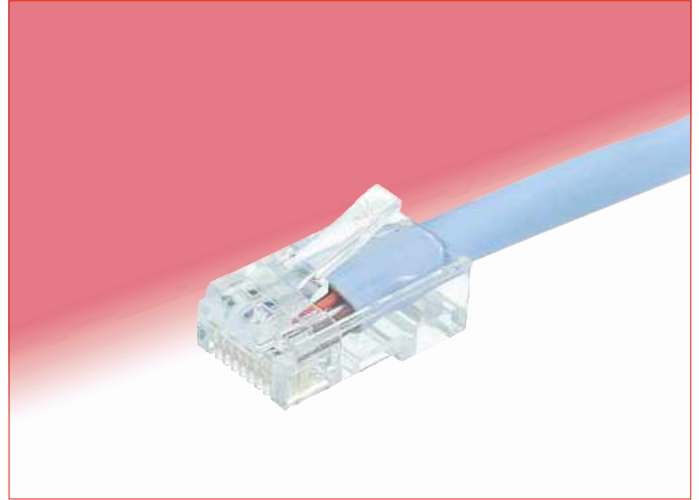


# Modular Plug Connectors Compliant to Enhanced Category 5 Standards

## 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.

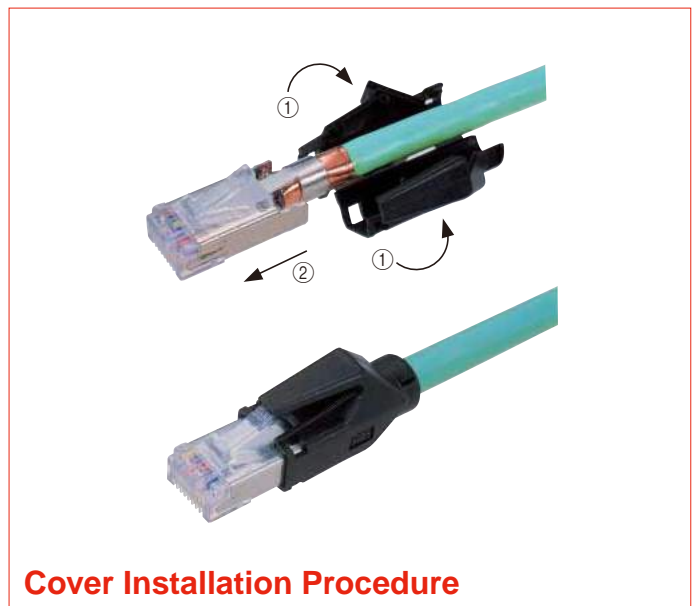
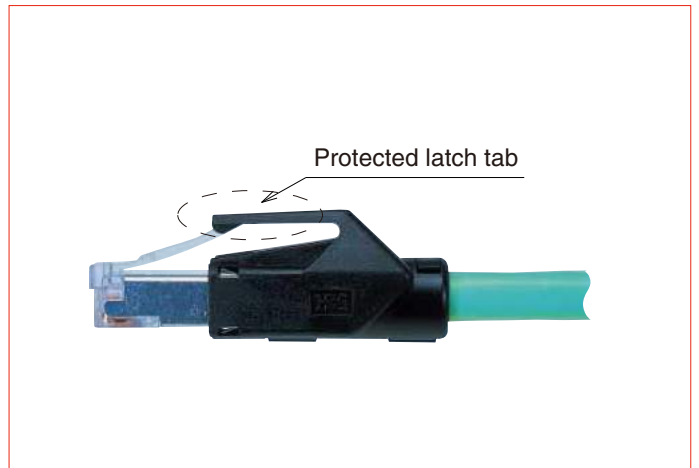
#### 5. Simplified termination (TM21\*P-88P)

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.



## ■ 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. Contact resistance : 250mΩ max.	Frequency : 10 to 55Hz, single amplitude of 0.75mm, 5 min/cycle, 10 times for 3 directions
6. Shock	No electrical discontinuity of 5 μsec min. Contact resistance : 250mΩ 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 : 250mΩ max.	200
8. Temperature cycle	Contact resistance : 250mΩ max. Insulation resistance : 100MΩ 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 : 250mΩ max. Insulation resistance : 1MΩ min. (High humidity) 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**

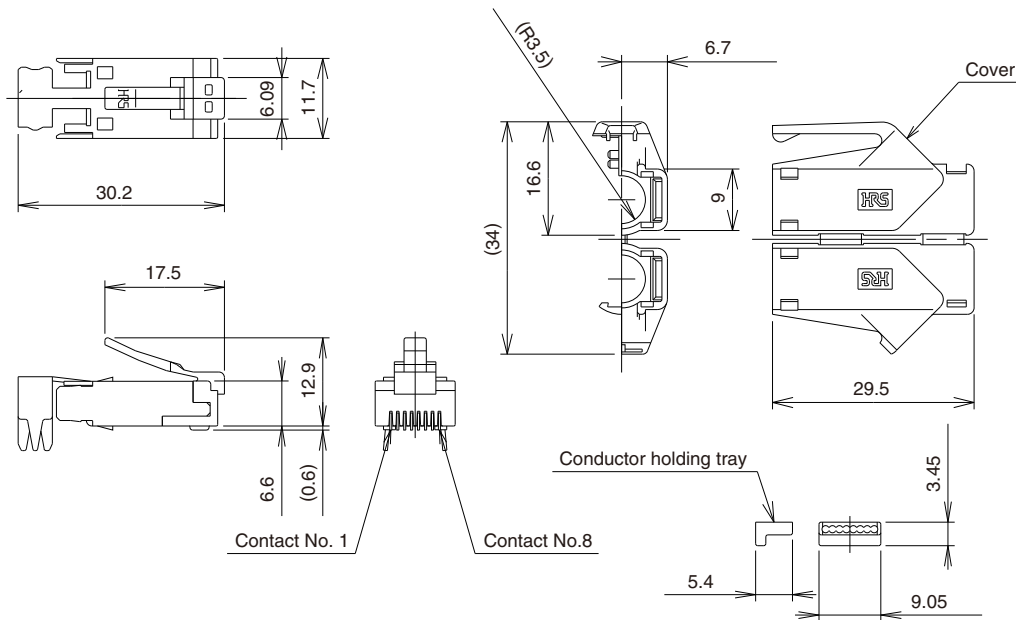
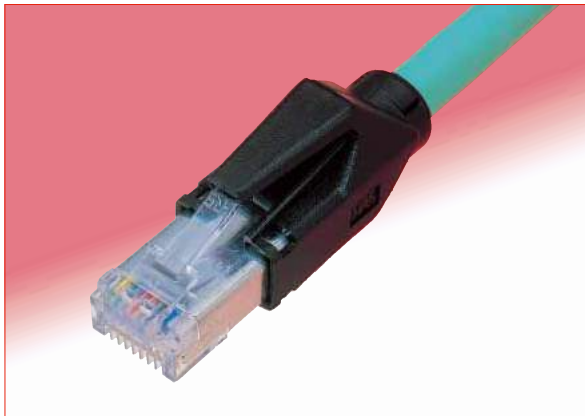
① ② ③

① Series name	TM21P : Shielded
② Cover Type	Blank : Protective latch cover 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

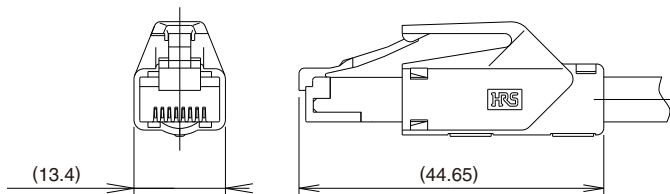
## ■ Plug Connectors

### ● Shielded

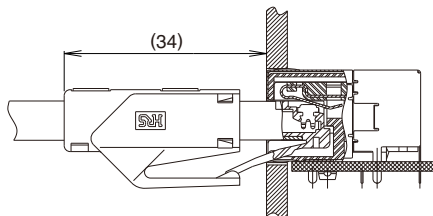


Part No.	HRS No.	Cover Color	Remarks	RoHS
TM21P-88P	222-2862-9 00	Light beige	Plug unit and Cover	YES
TM21P-88P(11)	222-2862-9 11	Light beige	Cover	
TM21P-88P(12)	222-2862-9 12	Medium gray	Cover	
TM21P-88P(13)	222-2862-9 13	Black	Cover	
TM21P-88P(14)	222-2862-9 14	Natural light gray	Cover	
TM21P-88P(15)	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



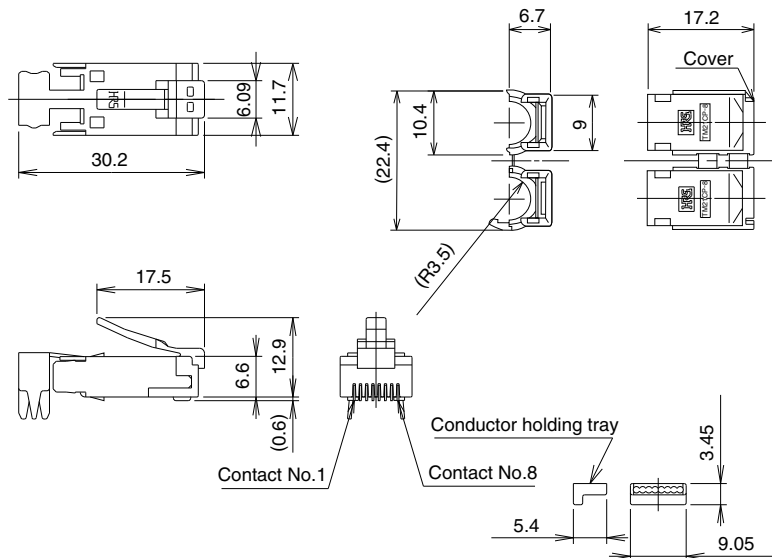
### ◆ Mated with corresponding receptacle (shown for reference only)



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## ■ Plug Connectors

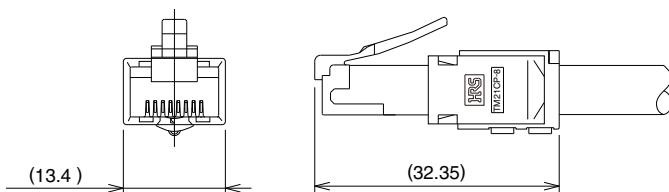
### ● Shielded-Short Cover



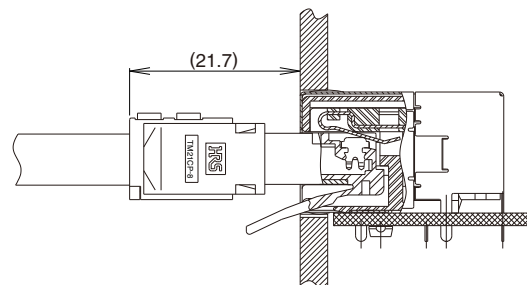
Part No.	HRS No.	Cover color	RoHS
TM21CP-88P(03)	222-2884-1 03	Black	YES

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. 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)

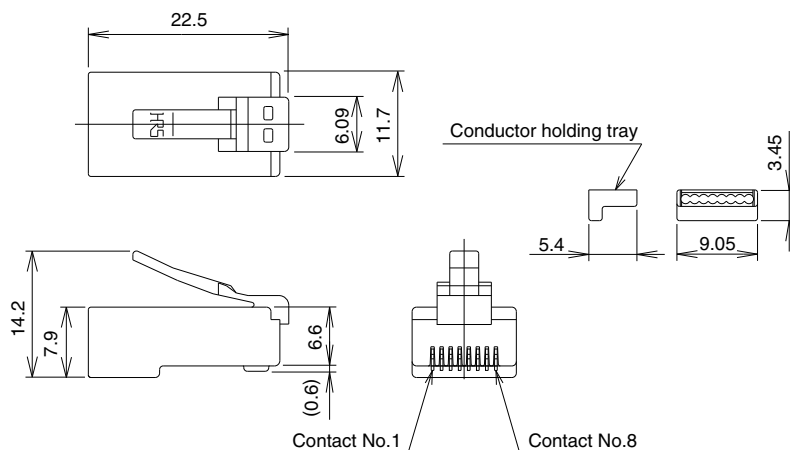
Note : For cable termination procedures refer to:

[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.

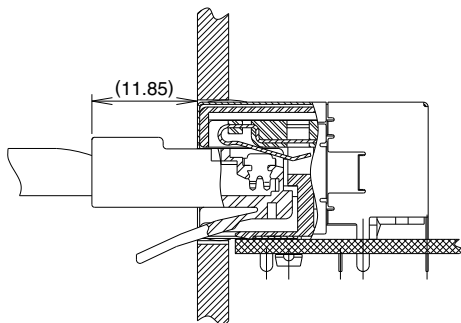
## ■ Plug Connectors

### ● 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 (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.

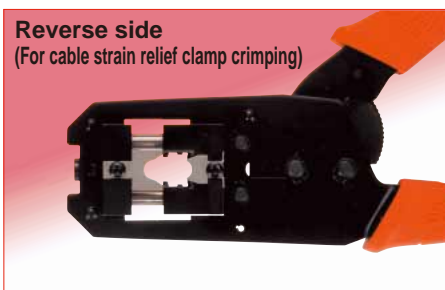
## ◆ Hand termination tools

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



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

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



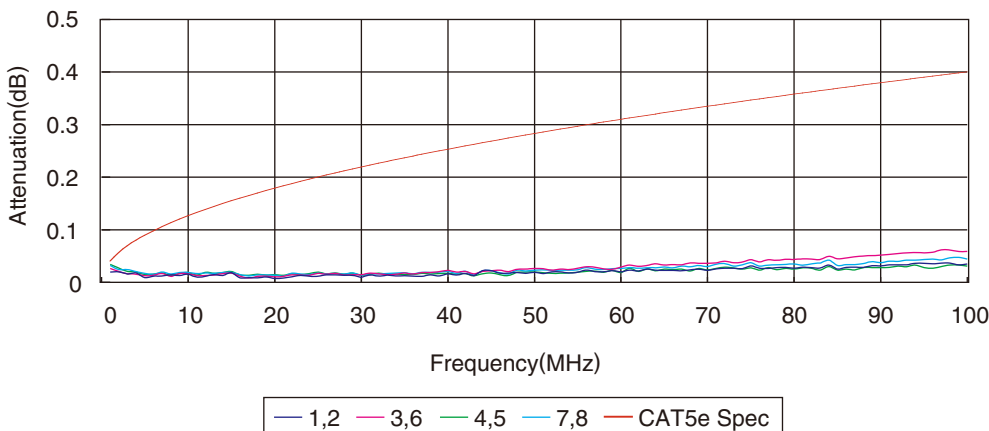
Part No.	HRS No.	Applicable connector
HT601-TM23/22P-88P	902-2128-1	TM22P-88P
		TM23P-88P

## ◆ Technical Documentation

### ● CAT5e Transmission Characteristics Data

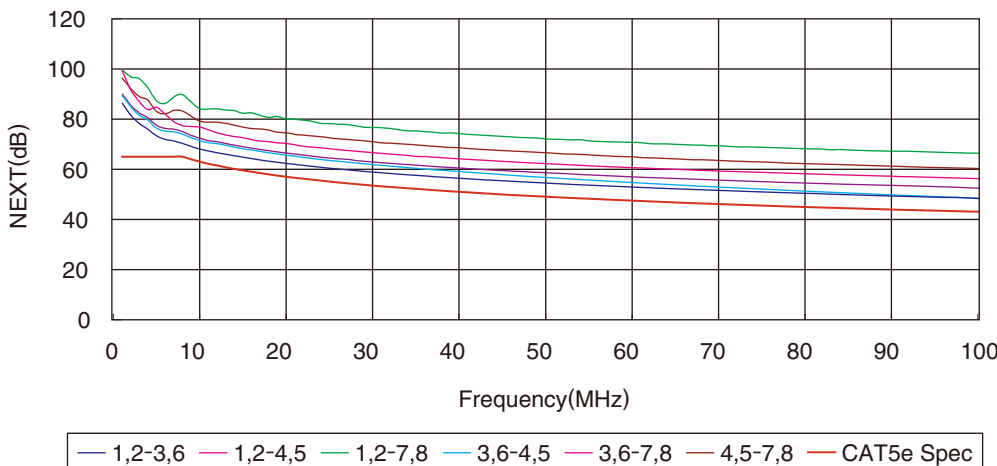
These are the representative values of the various transmission characteristics data for connector assemblies TM21P-88P and TM21R-5C-88-LP when fully mated.

#### • Signal Attenuation

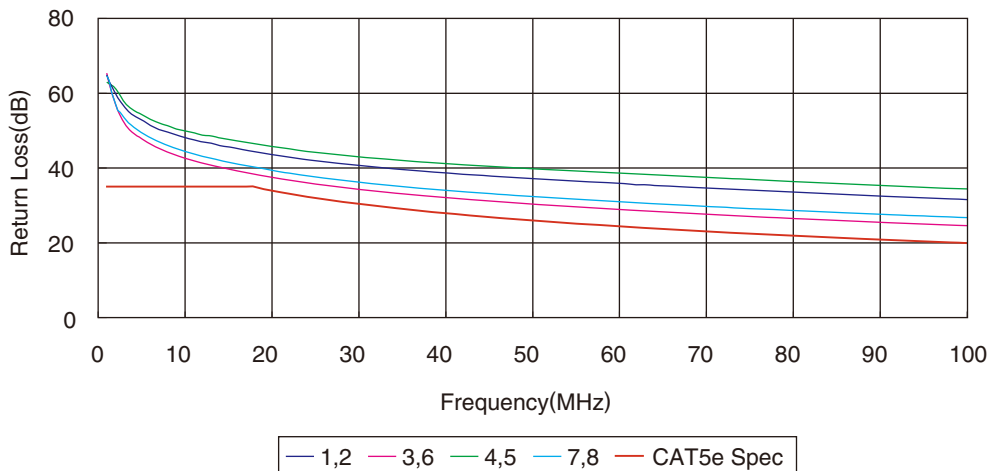


(Each two numbers are for the pair of individual contact position.)

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

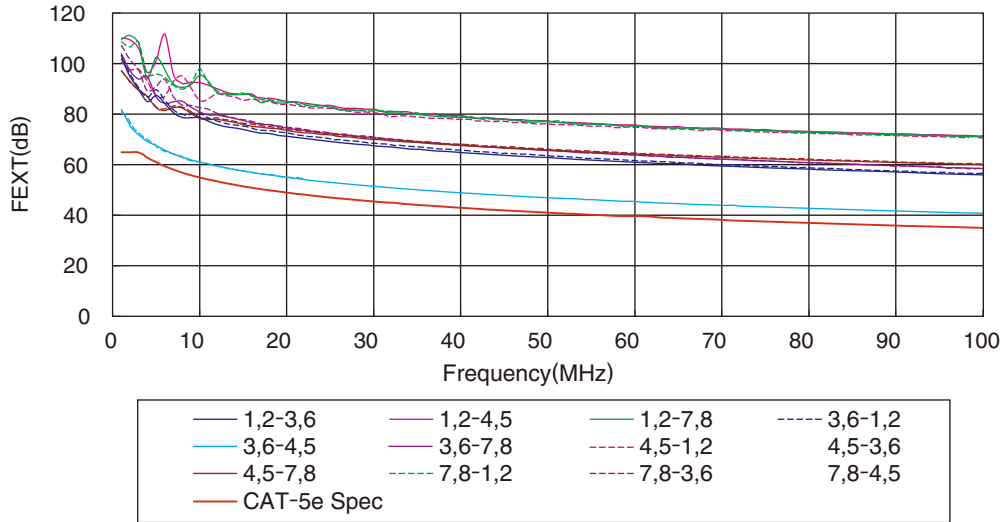


#### • Return Loss



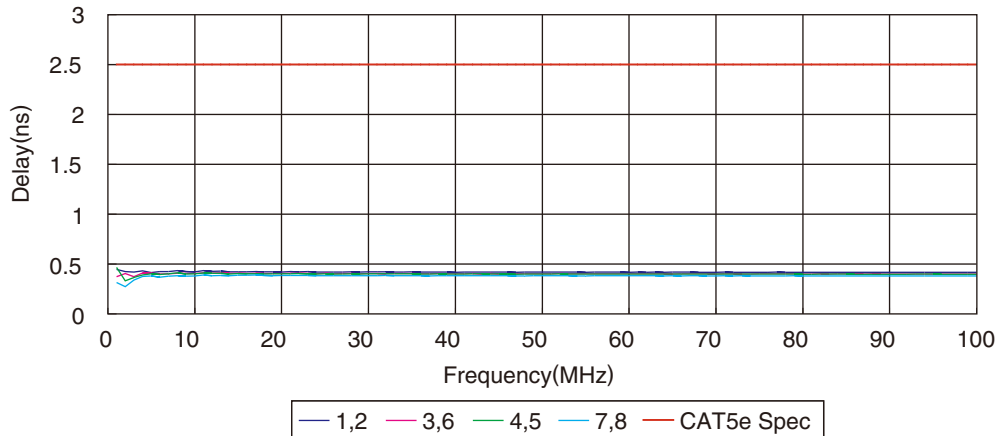
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• Far-End Crosstalk Attenuation (FEXT)

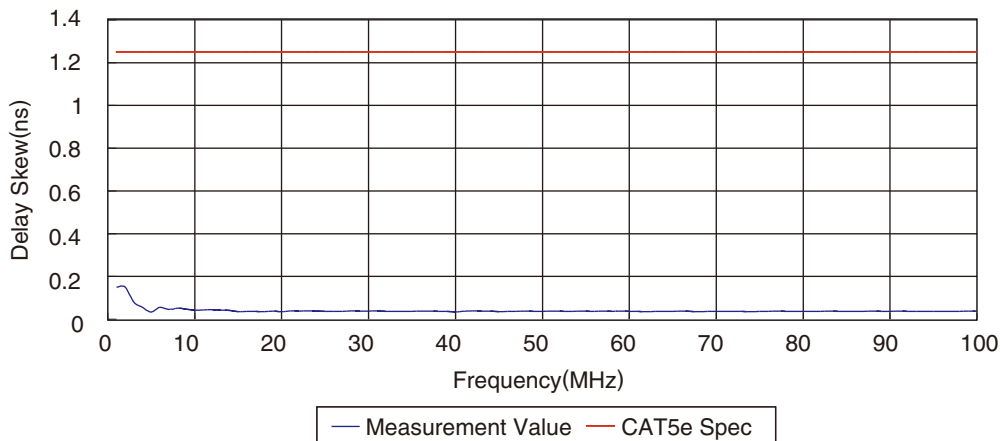


(Each two numbers are for pair of individual contact position.)

• Propagation Delay



• Propagation Delay skew



**HIROSE ELECTRIC CO.,LTD.**

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