



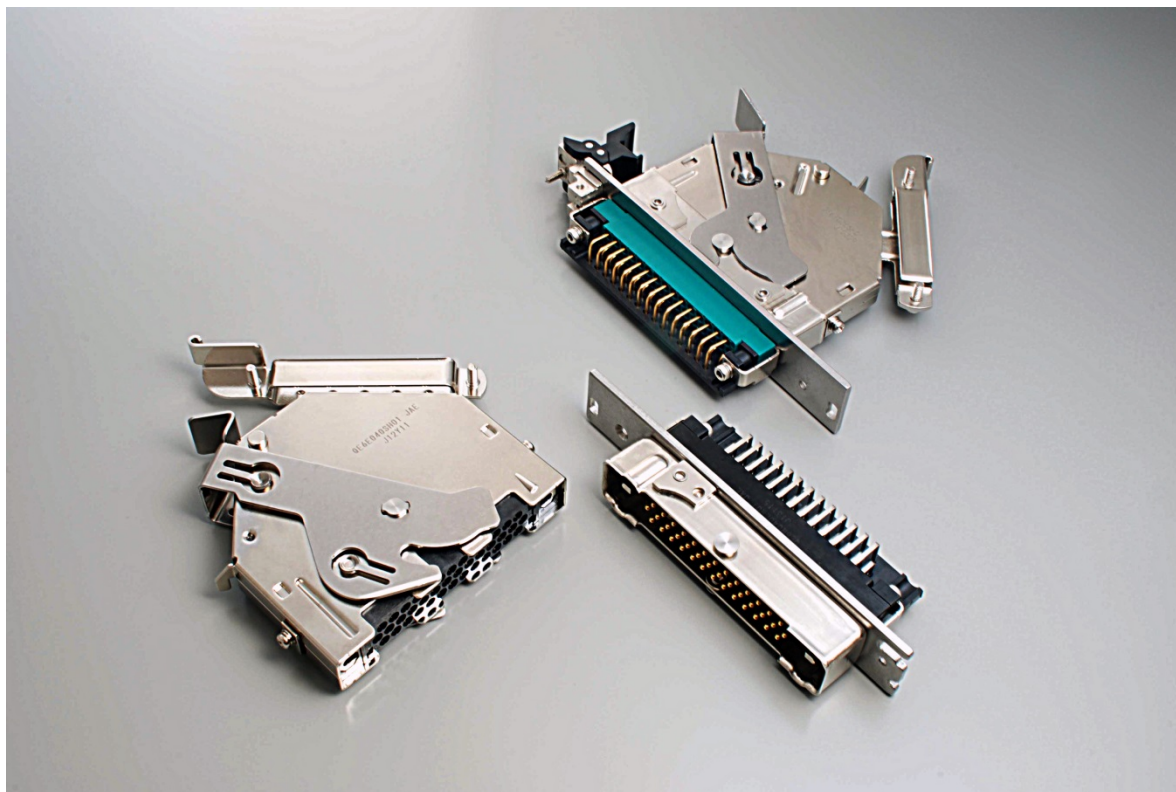
Panel-to-Wire / Board-to-Wire, Crimp and Solder Connection  
Lever Mating Type Rectangular Connector with EMI Countermeasure

CONNECTOR

MB-0281-3

January 2016

## QE6 Series



The JAE QE Series is a connector which has a long history of being utilized in railway equipment market. It has been redesigned as the QE6 Series rectangular connector. The QE6 Series is designed to have a smaller and slimmer form factor and a lever for easy mating.

- Metal outer shell offers a robust design.
- Two types of connections - wire crimp and board through-hole types.
- Same contacts used as our existing QE Series.
- Compatible with 3U4HP size cards for 19-inch sub-rack.
- Compact and robust design makes the connector ideal for use in a wide range of applications which require reliability and environmental resistance, such as railway-related equipment and other various electronics for industrial devices.
- Optimal for Ethernet transmission.

## Features

### ■Slimmer and smaller

50% less mounting space <sup>(Note 1)</sup> compared to the QE Series.

Note 1: Comparing QE6 Series 40-position connector to the QE Series 50-position connector

### ■Compatible with 19-inch sub-rack.

Dimensions and structure that can be mounted to a 3U4HP size card for 19-inch sub-rack (IEC60297-3-101) used for VME systems.

Compatible with front access plug-in module for rack.

### ■64 Key positions available.

Multiple key positions allow for the use of several connectors within the same device without mating errors.

### ■Common contacts with our QE series connector.

Ensure electrical and mechanical reliability through the use of common contacts with proven results. Crimp tool also in common with that used for the QE series.

### ■EMI controlled (40-position version)

Emission controlled design structure.

Forming a path between “electrical wire shield” to “equipment case” with incorporated GND bar. (Please refer to the EMI Characteristics section.)

### ■Optimal for Ethernet transmission

Satisfies ISO/IEC 11801 category 5 standard (general-purpose telecommunication cabling systems). (Please refer to the Ethernet Transmission Characteristics section.)

## General Specifications

Component	Specification and Performance		
Number of Contacts	19	30	40
Contact Resistance	5m Ω max.		
Dielectric Withstanding Voltage	A.C 1500 Vr.m.s. (for 1 minute)		
Rated Current	5A / Contact		
Maximum Current	19A	30A	40A
Insulation Resistance	5000M Ω min.		
Durability	500 times		
Operating Temperature	-55 Deg. C to +85 Deg. C		
Applicable Wire <sup>(Note)</sup>	Cross-sectional area of conductor: 0.2 mm <sup>2</sup> ~ 2mm <sup>2</sup> Wire outer diameter: Φ3.1 mm max.		

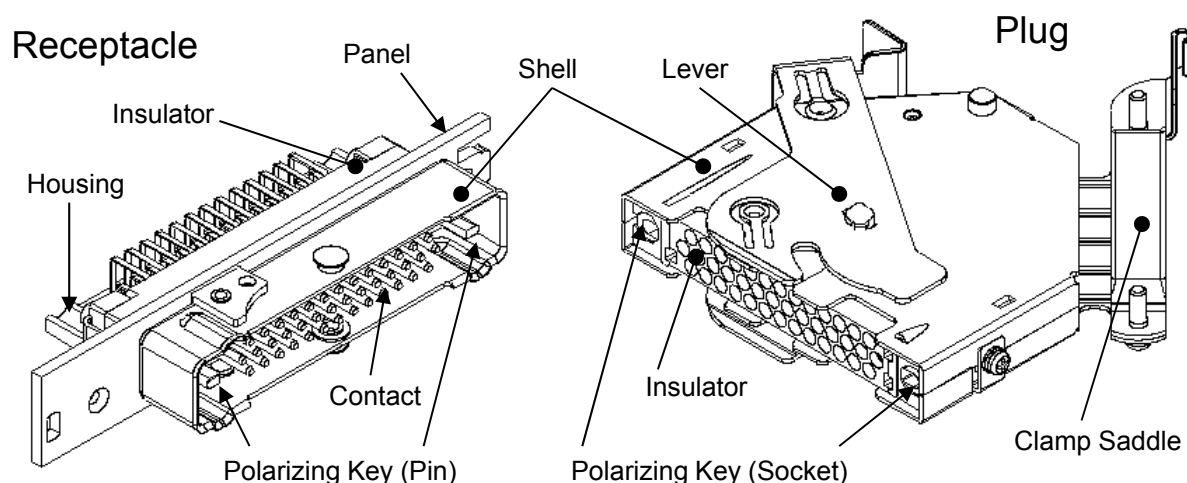
Note: Please refer to the Applicable Contact section on page 12 for more information on applicable wires.

- Please refer to the following documents concerning specifications and handling instructions of the QE6 series connector.

Specifications -----19 and 30 positions: JACS-30181; 40 position: JACS-30290

Handling Instructions ---19 and 30 positions: JAHL-30181; 40 position: JAHL-30290

## Main Components



## Materials and Finishes

Components	Materials and Finishes
Insulator	Synthetic Resin
Shell, Clamp Saddle	Steel / Ni plating
Polarizing Key	Copper alloy / Ni plating
Lever, Panel	Stainless Steel
Housing	Synthetic Resin
Contact (Angle Through-hole)	19 and 30 positions: Copper alloy / Au plating over Ni 40 position: Copper alloy / Au plating over Ni (contact area), Sn plating (soldering area)
Contact (Crimp)	Copper alloy / Au plating over Ni

## Ordering Information

<p><b>QE6</b></p> <p>Series</p> <p><b>R</b></p> <p>Shape R: Receptacle E: Plug</p> <p><b>040</b></p> <p>No. of Contacts 019: 19 pos. 030: 30 pos. 040: 40 pos.</p>	<p><b>L</b></p> <p>Wire Pull Out Direction Plug      Receptacle (40 pos. only) H: Upward <sup>Note</sup>      H: for upward L: Downward      L: for downward                                  D: for both upward and downward</p> <p><b>H</b></p> <p>Note: Side No. 1 of insert array is defined upward. Please refer to Part Number List on page 4 and Combination List on pages 5 and 6.</p>	<p><b>01</b></p> <p>Modification Code</p> <p>Contact L: Angle Through-hole Pin (preassembled) P: Crimp Straight Pin (sold separately) or Straight Thorough-hole Pin (sold separately) S: Crimp Socket (sold separately)</p>	<p>Please refer to Part Number List on page 4.</p>
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Note: For more information on contact part numbers please refer to Applicable Contacts section on page 12.

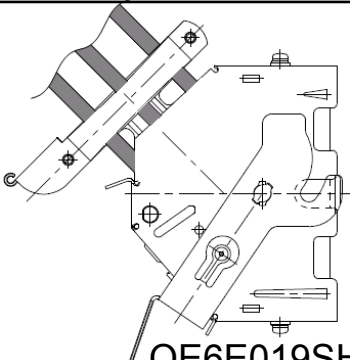
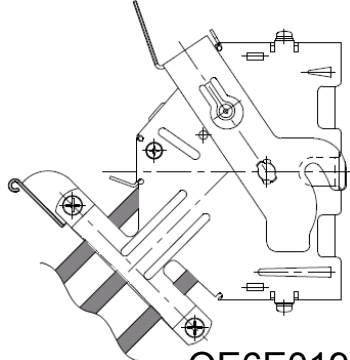
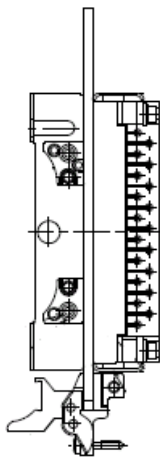
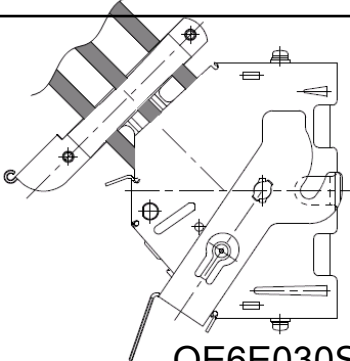
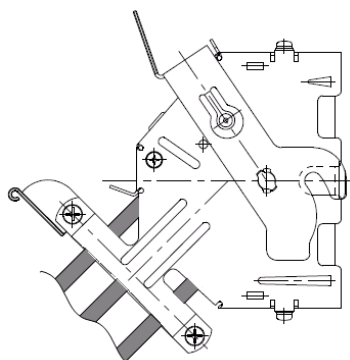
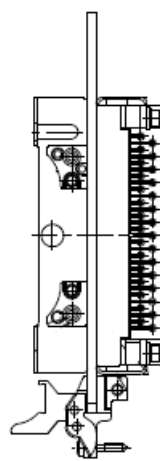
Part Number
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Number of Contacts	Connector	Part Number	Drawing Number	Applicable Contact Type Yes = available Blank = not available				Remarks
				Crimp Socket	Crimp Pin	Straight Through-hole Pin	Angle Through-hole Pin	
19	Receptacle	QE6R019L01	SJ111488				Yes	With eject bar
	Plug	QE6E019SH01	SJ111489	Yes				
		QE6E019SL01	SJ111490	Yes				
30	Receptacle	QE6R030L01	SJ111485				Yes	With eject bar
	Plug	QE6E030SH01	SJ111486	Yes				
		QE6E030SL01	SJ111487	Yes				
40	Receptacle	QE6R040LH01	SJ113433				Yes	
		QE6R040LL01	SJ113462				Yes	
		QE6R040PH01	SJ113434		Yes	Yes		Panel attachment type
		QE6R040PL01	SJ113463		Yes	Yes		
		QE6R040LD01	SJ114349				Yes	
		QE6R040PD01	SJ114987		Yes	Yes		Panel attachment type
	Plug	QE6E040SH01	SJ113435	Yes				EMI countermeasure enhanced type
		QE6E040SL01	SJ113464	Yes				
		QE6E040SH02	SJ114350	Yes				
		QE6E040SL02	SJ114351	Yes				

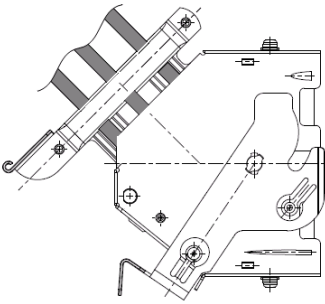
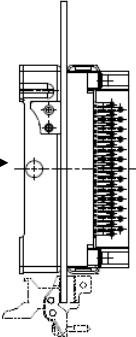
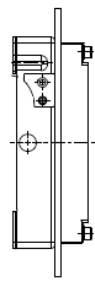
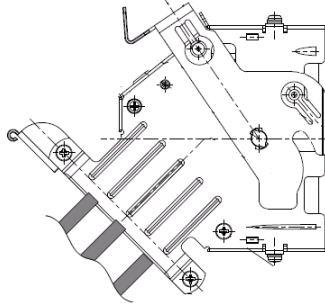
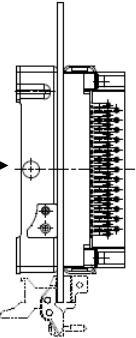
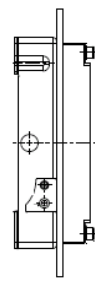
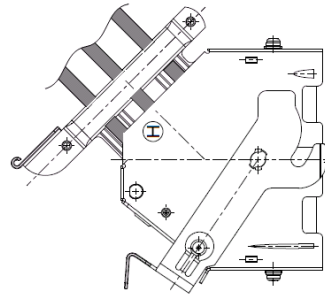
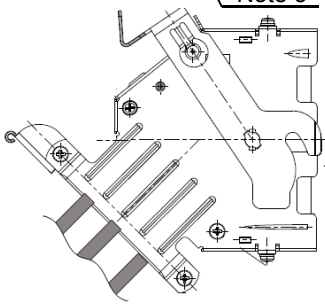
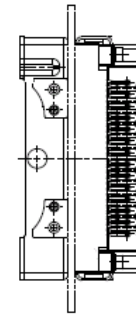
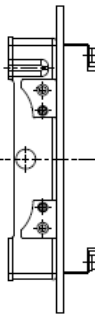
Note 1 : Contacts of the angled through-hole type come preassembled. Contacts of the other types are sold separately.

Note 2: Please refer to Combination List on pages 5 and 6 regarding plug and receptacle mating combinations.

Combinations
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Number of Contacts	Plug	Receptacle
19	 <p>QE6E019SH01</p> <p>Note 1</p>  <p>QE6E019SL01</p> <p>Note 1</p>	 <p>QE6R019L01</p> <p>Note 1: Plug is available in both wire pull out direction types "H" and "L".</p>
30	 <p>QE6E030SH01</p> <p>Note 2</p>  <p>QE6E030SL01</p> <p>Note 2</p>	 <p>QE6R030L01</p> <p>Note 2: Plug is available in both wire pull out direction types "H" and "L".</p>

Combinations
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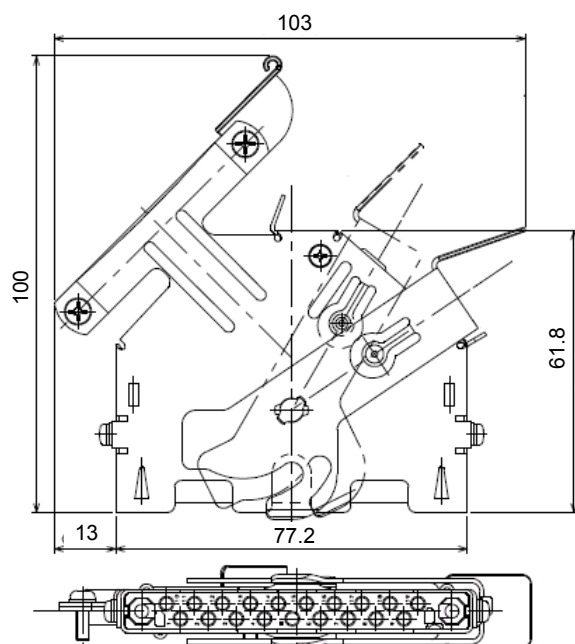
Number of Contacts	Plug	Receptacle
40 (EMI Control Type)	 <p><b>QE6E040SH01</b> Note 3</p>	 <p><b>QE6R040LH01</b> (Angled Through-hole Type)</p> <p>or</p>  <p><b>QE6R040PH01</b> (Panel Mount Type)</p> <p>Note 3: Mating plug is only available in wire pull out direction type "H".</p>
	 <p><b>QE6E040SL01</b> Note 4</p>	 <p><b>QE6R040LL01</b> (Angled Through-hole Type)</p> <p>or</p>  <p><b>QE6R040PL01</b> (Panel Mount Type)</p> <p>Note 4: Mating plug is only available in wire pull out direction type "L".</p>
40	 <p><b>QE6E040SH02</b> Note 5</p>  <p><b>QE6E040SL02</b> Note 5</p>	 <p><b>QE6R040LD01</b> (Angled Through-hole Type)</p> <p>or</p>  <p><b>QE6R040PD01</b> (Panel Mount Type)</p> <p>Note 5: Plug is available in both wire pull out direction types "H" and "L".</p>

## External Dimensions and Shape

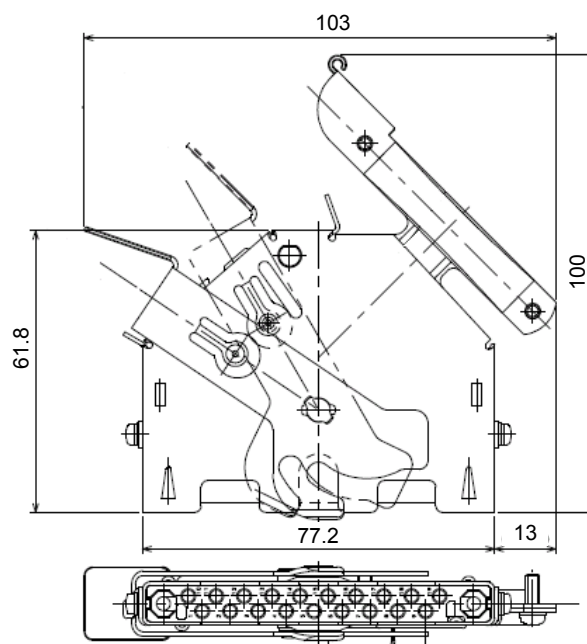
Note: Shape and dimensions of the drawings below are for reference only.  
For detailed product information please refer to our product drawings. (Unit: mm)

### ■ 19-position Plug

QE6E019SH01

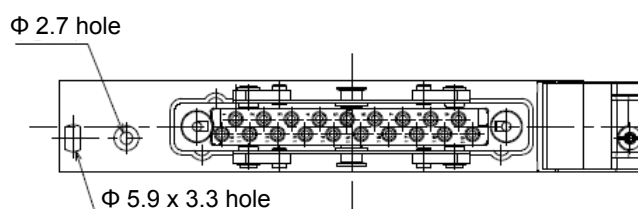
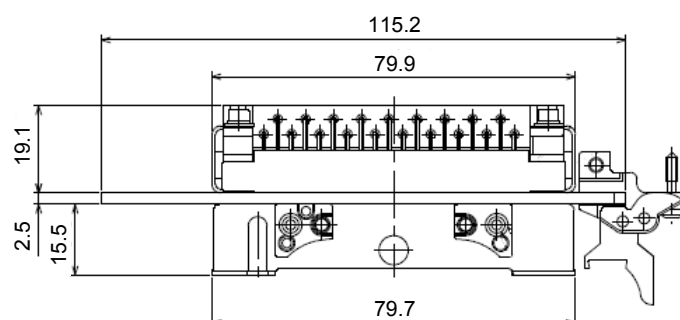


QE6E019SL01



### ■ 19-position Angled Through-hole Type Receptacle

QE6R019L01

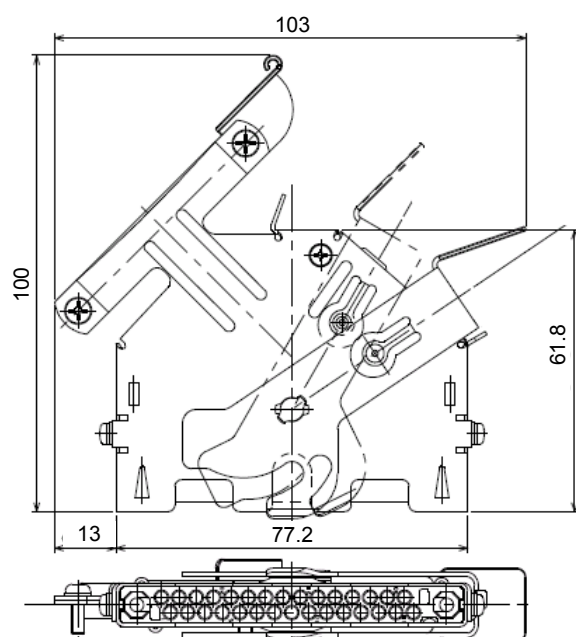


## External Dimensions and Shape

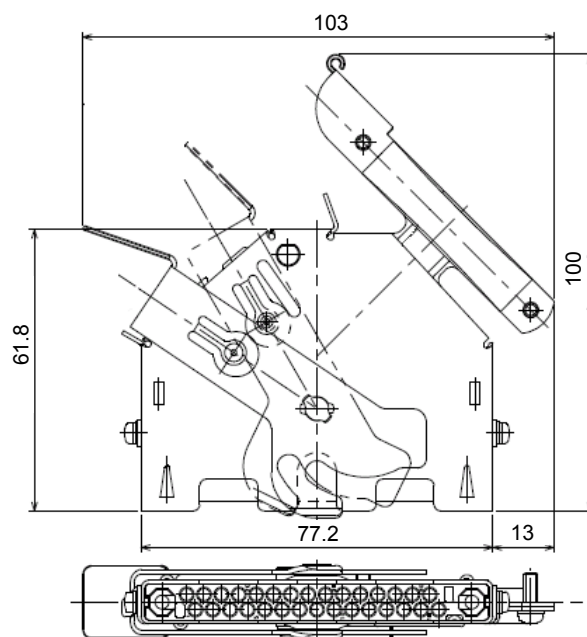
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For detailed product information please refer to our product drawings. (Unit: mm)

### ■30-position Plug

QE6E030SH01

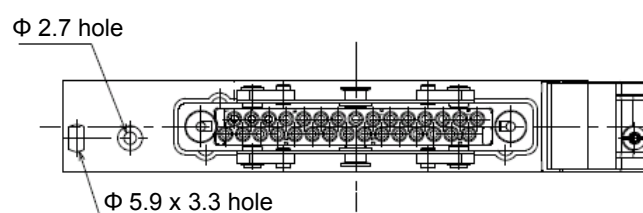
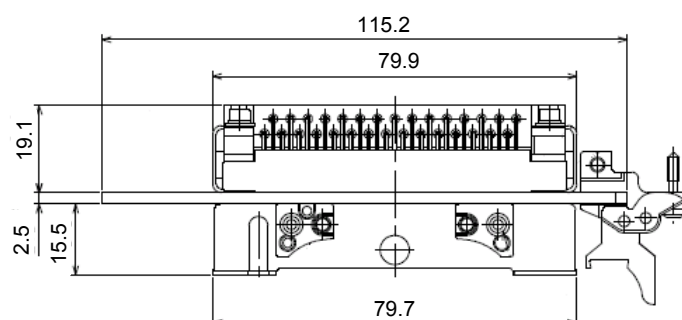


QE6E030SL01



### ■30-position Angled Through-hole Type Receptacle

QE6R030L01

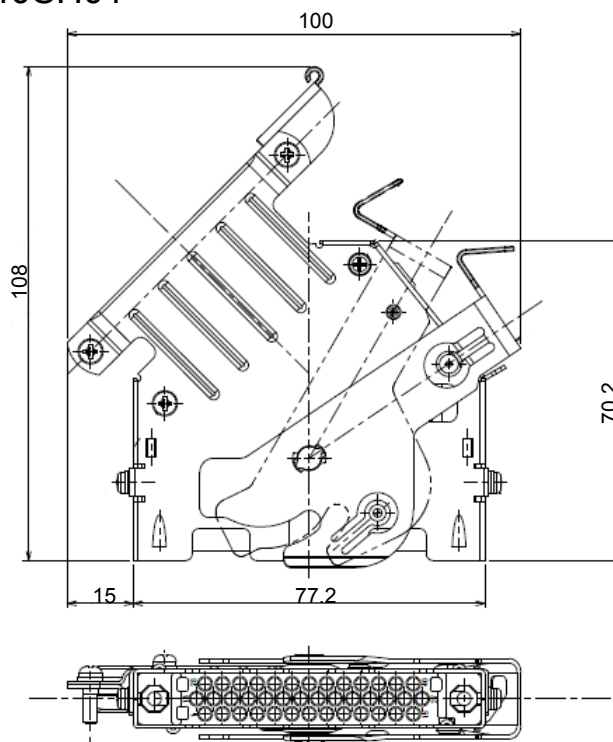




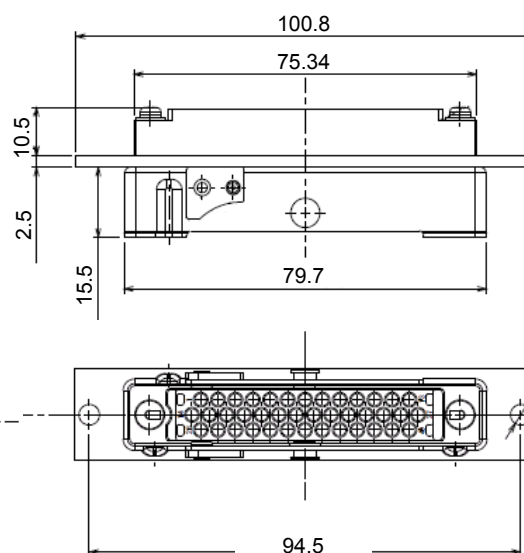
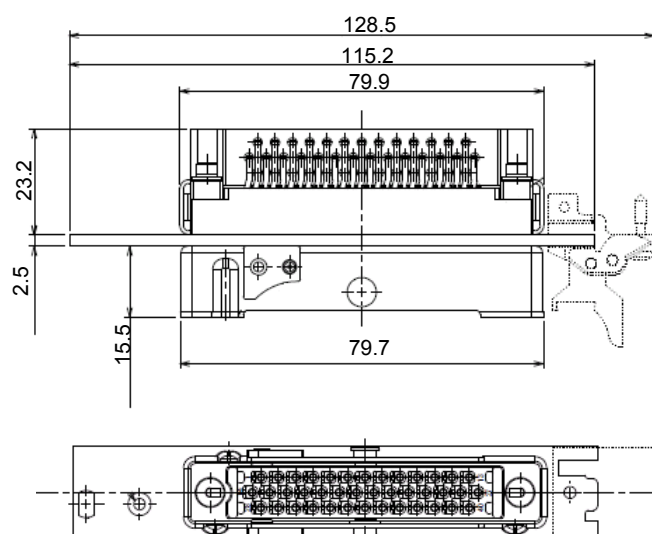
## External Dimensions and Shape

Note: Shape and dimensions of the drawings below are for reference only.  
For detailed product information please refer to our product drawings. . (Unit: mm)

### ■40-position plug (EMI Controlled Type) QE6E040SH01



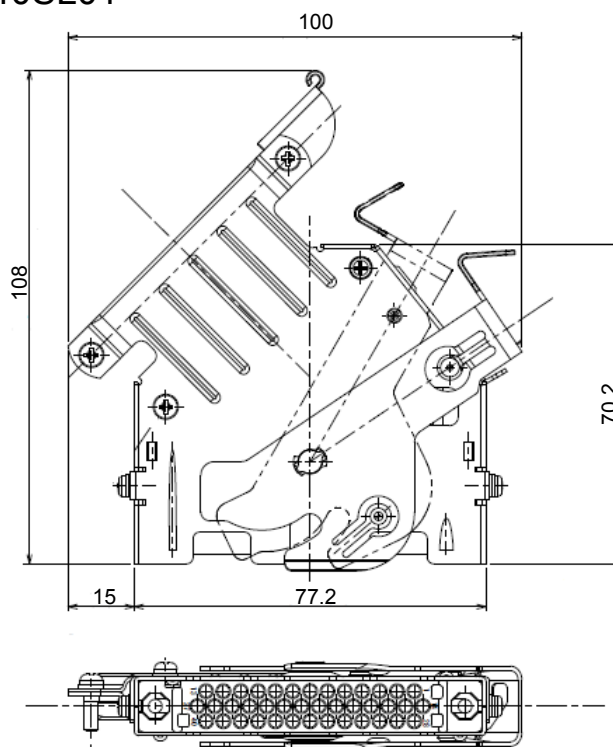
### ■40-position receptacle (QE6E040SH01 Mating Connector) Angled Through-hole Type QE6R040LH01      Panel Mount Type QE6R040PH01



## External Dimensions and Shape

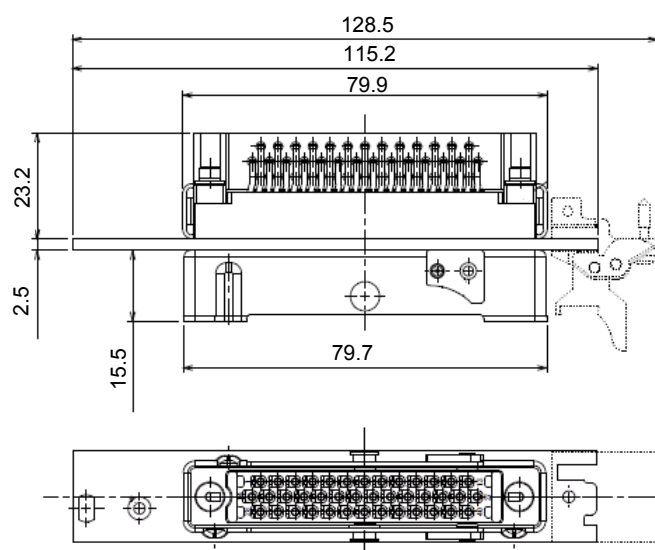
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For detailed product information please refer to our product drawings. (Unit: mm)

### ■40-position Plug (EMI Controlled Type) QE6E040SL01

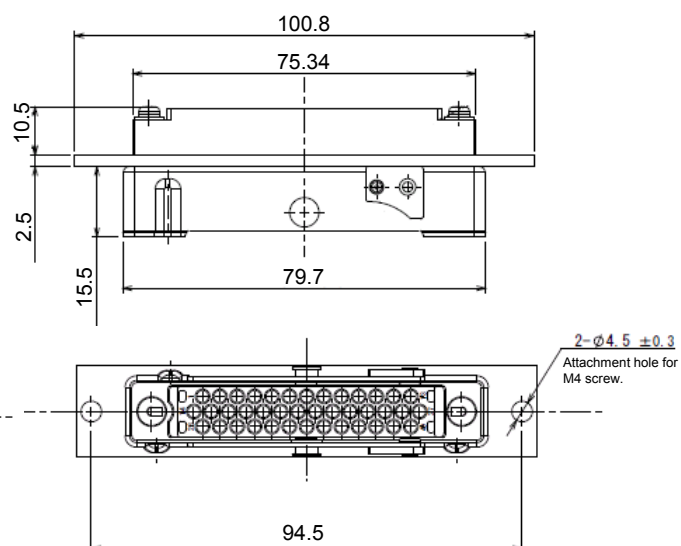


### ■40-position Receptacle (QE6E040SL01 Mating Connector)

#### Angle Through-hole Type QE6R040LL01



#### Panel Mount Type QE6R040PL01

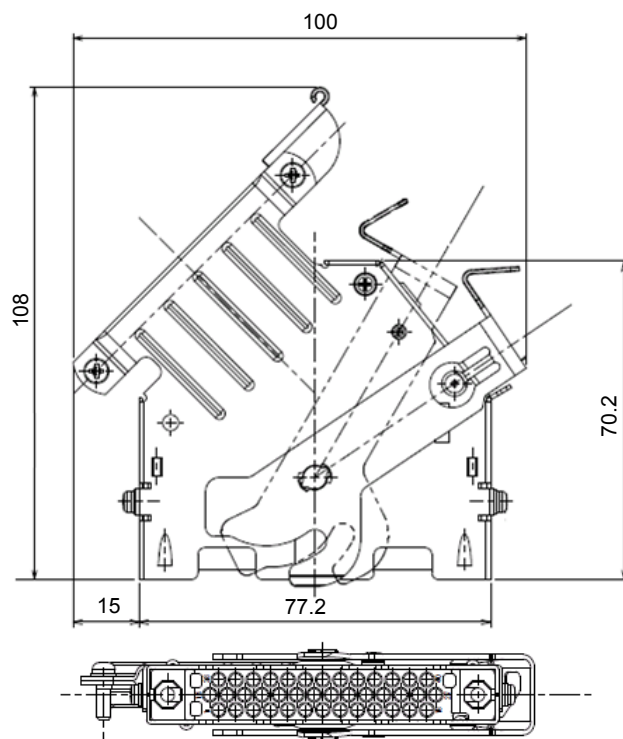


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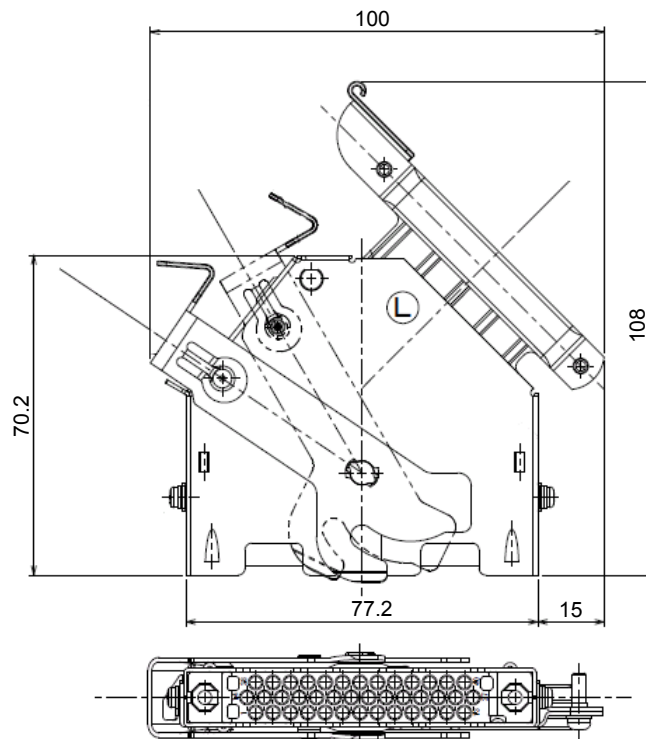
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For detailed product information please refer to our product drawings. (Unit: mm)

### ■40-position Plug

QE6E040SH02

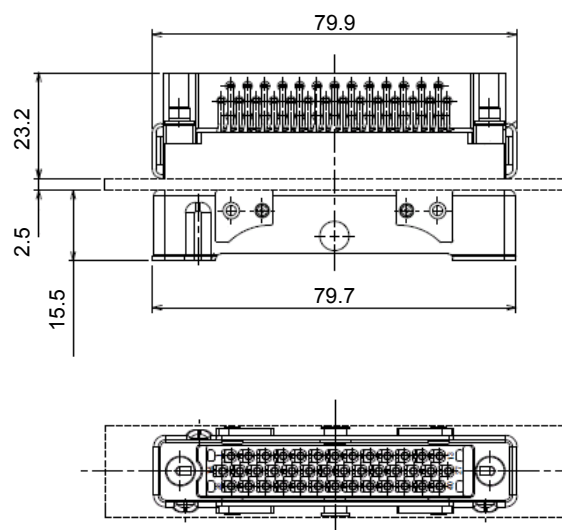


QE6E040SL02

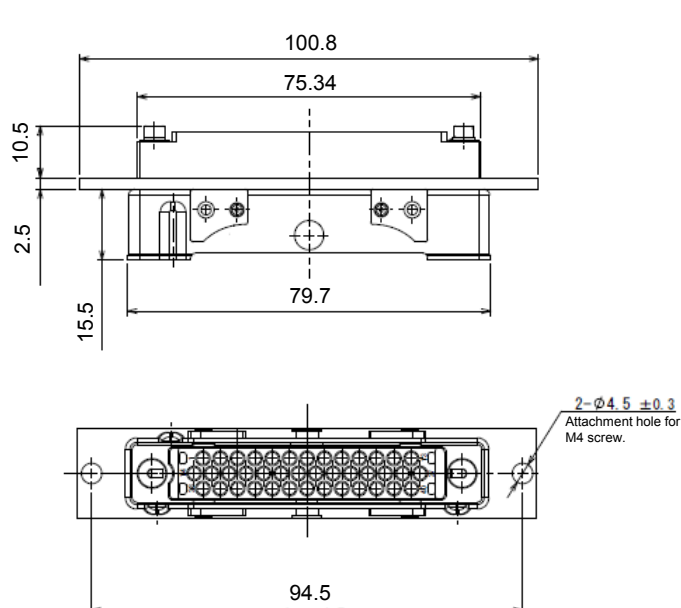


### ■40-position Receptacle (QE6E040S\*02 Mating Connector)

Angle Through-hole Type  
QE6R040LD01



Panel Mount Type  
QE6R040PD01



## Applicable Contacts

### Crimp Contact

Contact Size	Part Number		Plating Specification	Applicable Wire Size (conductor cross-sectional area)	Applicable Wire Outer Diameter
	Pin Contact	Socket Contact			
16-14	031-50793	031-50794	A	AWG#14 to #16 (2mm <sup>2</sup> to 1.25mm <sup>2</sup> )	2.4 dia. max.
	031-50793-002	031-50794-002	B		
16-16	031-50565	031-50675	A	AWG#16 to #20 (1.3mm <sup>2</sup> to 0.5mm <sup>2</sup> )	2.4 dia. max.
	031-50565-002	031-50675-002	B		
16-20A	031-50566	031-50676	A	AWG#20 to #24 (0.5mm <sup>2</sup> to 0.2mm <sup>2</sup> )	2.6 dia. max.
	031-50566-002	031-50676-002	B		
16-20	031-50567	031-50677	A	AWG#20 to #24 (0.5mm <sup>2</sup> to 0.2mm <sup>2</sup> )	1.6 dia. max.
	031-50567-002	031-50677-002	B		

### Through-hole Pin Contact

Part Number	Plating Specification	Soldering Lead Area Length (mm)
031-55414	A	14
031-55415	B	14
031-55417	A	24

#### \* Plating Specification

A--- Au Plating Thickness: 0.75μm

B--- Au Plating Thickness: 0.3μm

## Tools and Others

Air Pressure Crimp Machine		Manual Crimp Tool		Contact Insertion Tool	Contact Insertion Confirmation Tool	Contact Extraction Tool
Manual Valve	With Foot Valve (Check Valve)	Main Body	Locator			
CBT-520	CBT-530	M22520/1-01	JP-QE-16-16	JIT-Q*-16	JG-QE-2	JET-16

Note: Please contact us concerning RoHS compliance information for tools and other.

## Accessories

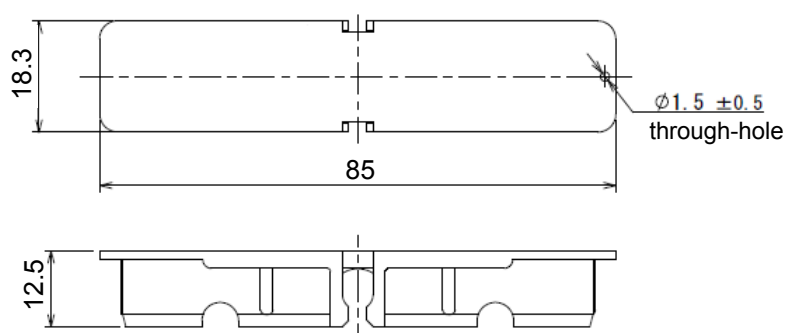
Note: Shape and dimensions of the drawings below are for reference only.  
For detailed product information please refer to our product drawings. (Unit: mm)

### ■Dust Cap for 40 position Receptacle

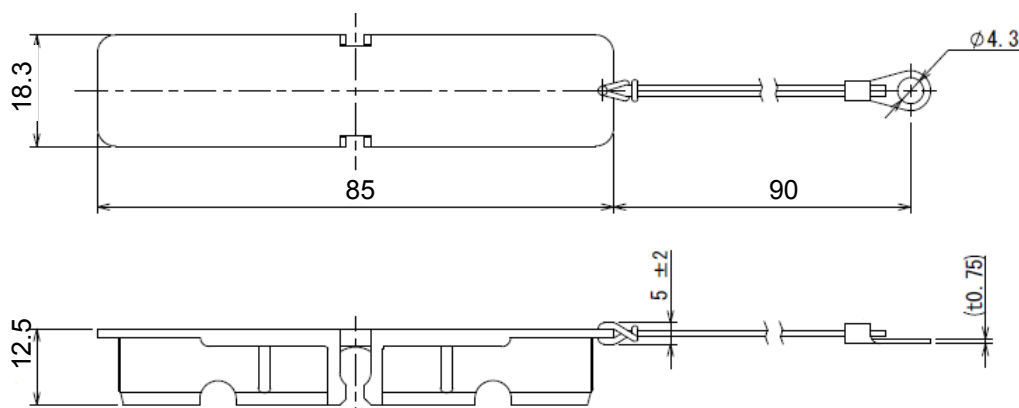
Synthetic resin dust cap for 40 position receptacle (QE6R040\*\*\*\*).

Protects mating area and blocks dust and foreign materials.

QE6-40-DC (without tether, Product Drawing No. SJ114596)



QE6-40-DC-J1 (with tether, Product Drawing No. SJ114597)



## EMI Characteristics

The QE6 Series connector satisfies the electromagnetic radiation standard, IEC 62236-3-2. (electromagnetic compatibility for railway applications).

Evaluation Conditions:

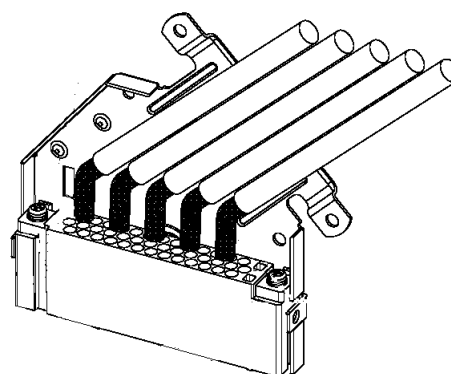
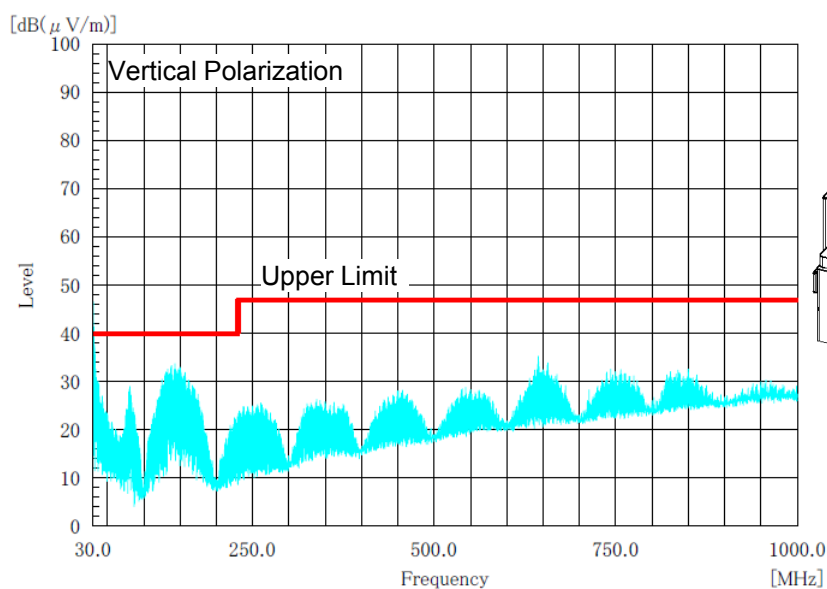
IEC 62236-3-2: Railway applications - Electromagnetic compatibility -  
Part 3-2: Rolling stock Apparatus Table 6 Enclosure Port

Samples:

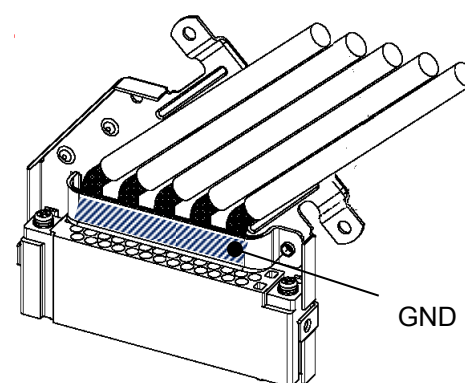
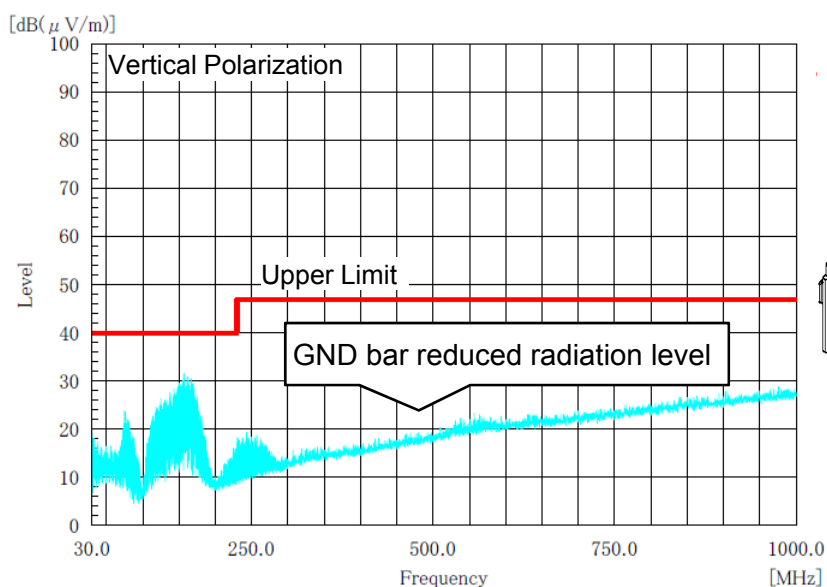
Receptacle	QE6R040LH01
Plug	QE6E040SH01

Applied Signal:

Data Rate	100Mbps
Data Series	PRBS 2 <sup>7</sup> -1 (pseudo random bit sequence 7)



without GND bar



with GND bar

## Ethernet Transmission Characteristics

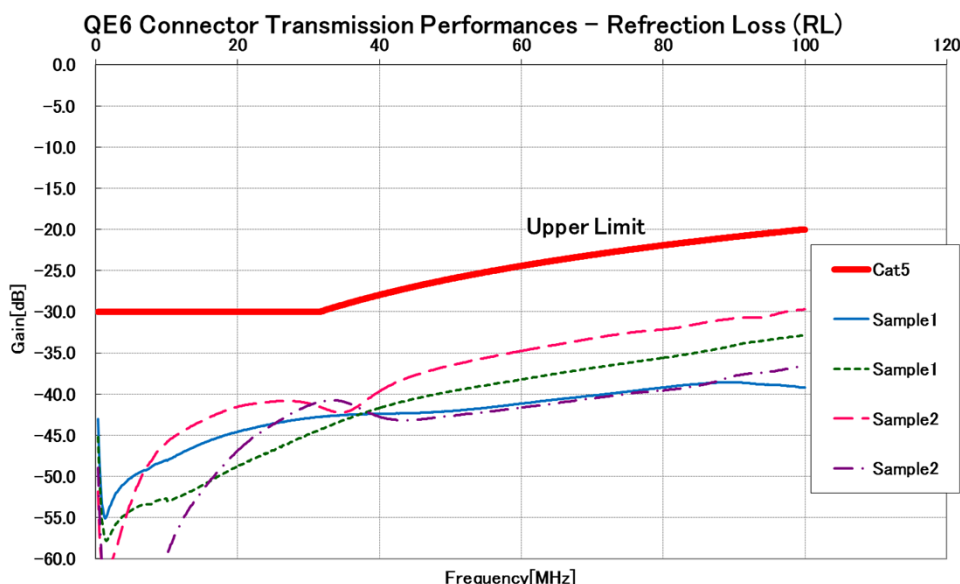
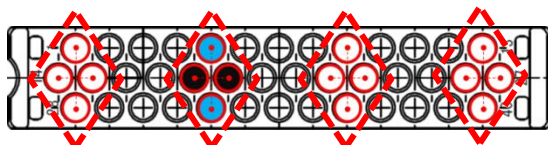
Satisfies ISO/IEC 11801 standard category 5 (general-purpose telecommunication cabling systems). Supports 100BASE-TX and 1000BASE-T Ethernet transmission, using appropriate cables and mounting methods.

### Evaluation Condition

ISO/IEC 11801 (2002): Information Technology -- Generic Cabling for Customer Premises  
10.2.4.3 Connecting hardware for use in distributors and consolidation Cat.5

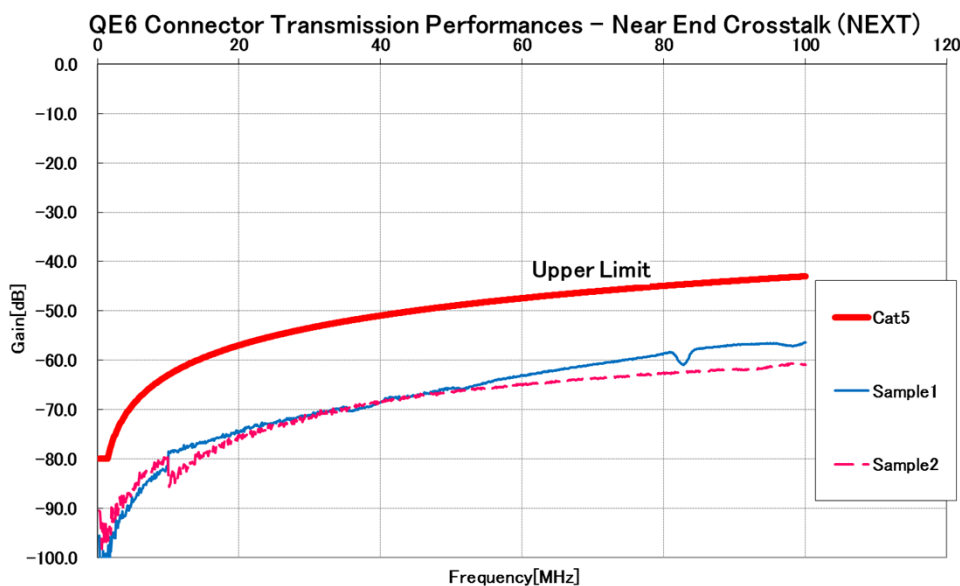
(JISX5150: 2004 Information technology - Generic cabling for customer premises  
---10.2.4.3 distributing board and connection device used at bifurcation point)

### Pin Assignment Evaluation



#### Graph legend sample

Sample 1:  
Receptacle QE6R040PH01  
Plug QE6E040SH01  
Sample 2:  
Receptacle QE6R040LH01  
Plug QE6E040SH01



#### Graph legend sample

Sample 1:  
Receptacle QE6R040PH01  
Plug QE6E040SH01  
Sample 2:  
Receptacle QE6R040LH01  
Plug QE6E040SH01

Note: Transmission Characteristics vary by wire specifications and connection types.  
Please contact us for details.

**Notice:**

1. The values specified in this brochure are only for reference. The products and their specifications are subject to change without notice. Contact our sales staff for further information before considering or ordering any of our products. For purchase, a product specification must be agreed upon.

2. Users are requested to provide protection circuits and redundancy circuits to ensure safety of the equipment, and sufficiently review the suitability of JAE's products to the equipment.

3. The products presented in this brochure are designed for the uses recommended below. We strongly suggest you contact our sales staff when considering use of any of the products in any other way than the recommended applications or for a specific use that requires an extremely high reliability.

(1) Applications that require consultation:

(i) Please contact us if you are considering use involving a quality assurance program that you specify or that is peculiar to the industry, such as:

Automotive electrical components, train control, telecommunications devices (mainline), traffic light control, electric power, combustion control, fire prevention or security systems, disaster prevention equipment, etc.

(ii) We may separately give you our support with a quality assurance program that you specify, when you think of a use such as :

Aviation or space equipment, submarine repeaters, nuclear power control systems, medical equipment for life support, etc.

(2) Recommended applications include:

Computers, office appliances, telecommunications devices (terminals, mobile units), measuring equipment, audiovisual equipment, home electric appliances, factory automation equipment, etc.

**Japan Aviation Electronics Industry, Limited**

Product Marketing Division

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