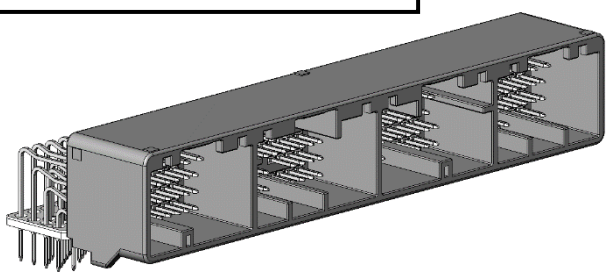
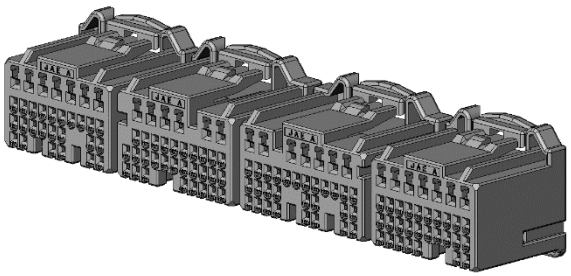
Board to Cable Connection
High Density Connector for Automotive

# MX31 Series

CONNECTOR
MB-0140-3
Feb.2024

**RoHS Compliant**





## Overview

High density and non-water proof type of MX31 series is developed to meet the demands for compact and lighter connectors with multi pin counts, due to increase of computerized control in automotives. Pitch of signal terminal is 2.2mm, and the pitch of power terminal is 3.2mm. Compact and 4row type and the variation of the number of terminal is from 70pos. to 135pos. (pin header) This connector meets with automotive specs.

## Application

Automotive ECU (Engine, transmission, etc)

## Features

・2.2mm terminal pitch for signal, 3.2mm terminal for power are 4 row type compact high density connector.
・Hybrid connector with terminals for both signal and power.
・Connector insertion force is under 70N and it enables easy mating work.
・Socket terminal is a newly developed terminal with countermeasure for fretting
・corrosion by slight conflicts.
・Pb-free mounting compatible by using heat resistant resin (SPS material)
・Plating type of terminal: Sn plating or Au plating

General Specifications

| | |
|---|---|
| Number of Contacts | 70, 98, 104, 135 (pin side) |
| Contact resistance | 8m ohm max. (initial) |
| Dielectric withstanding voltage | AC1000V per minute |
| Operating temperature | 40 ~ +85 ºC |
| Rated current | 2.2A for signal, 5.7A for power |
| Insulation resistance | 100M ohm min. |
| Mating cycle | 50cycles |
| Applicable wire | Please refer to next page. |
| Applicable board thickness | t1.6mm |

## Materials and Finishes

### ■ Socket connector

| Components | Materials / Finishes |
|---|---|
| Socket Housing | PBT |
| Retainer | 30% GF PBT |

### ■ Pin connector

| Components | Materials / Finishes |
|---|---|
| Pin insulator | 30% GF SPS |
| Locator | 30% GF PBT |
| Pin Contact | Brass / Sn plating or Au plating |

### ■ Socket contact

| Components | Materials / Finishes |
|---|---|
| Socket Contact | High conductivity material / Sn plating or Au plating |

## Applicable Wire

| Applicable wire (Unit:mm²) / Part Number | AVSS／CAVS／CAVUS | | | CPEX/ CHFUS | CHFUS | | | |
|---|---|---|---|---|---|---|---|---|
| | 0.3 to 0.5 | 0.3 to 0.85 | 0.85 to 1.25 | 0.22 | 0.35 to 0.5 | 0.35 to 0.75 | 0.75 to 1 | 1 to 1.5 |
| M31S07K4FA (Sn plating for signal) | * | | | | * | | | |
| M31S07K4QA (Au plating for signal) | * | | | | * | | | |
| M31S07K4FB (Sn plating for signal) | | | | * | | | | |
| M31S05K2FA (Sn plating for power) | | | *(1.25 only) | | | | | * |
| M31S05K3FA (Sn plating for power) | | | * | | | | * | |
| M31S05K4FA (Sn plating for power) | | * | | | | * | | |
| M31S05K4QA (Au plating for power) | | * | | | | * | | |

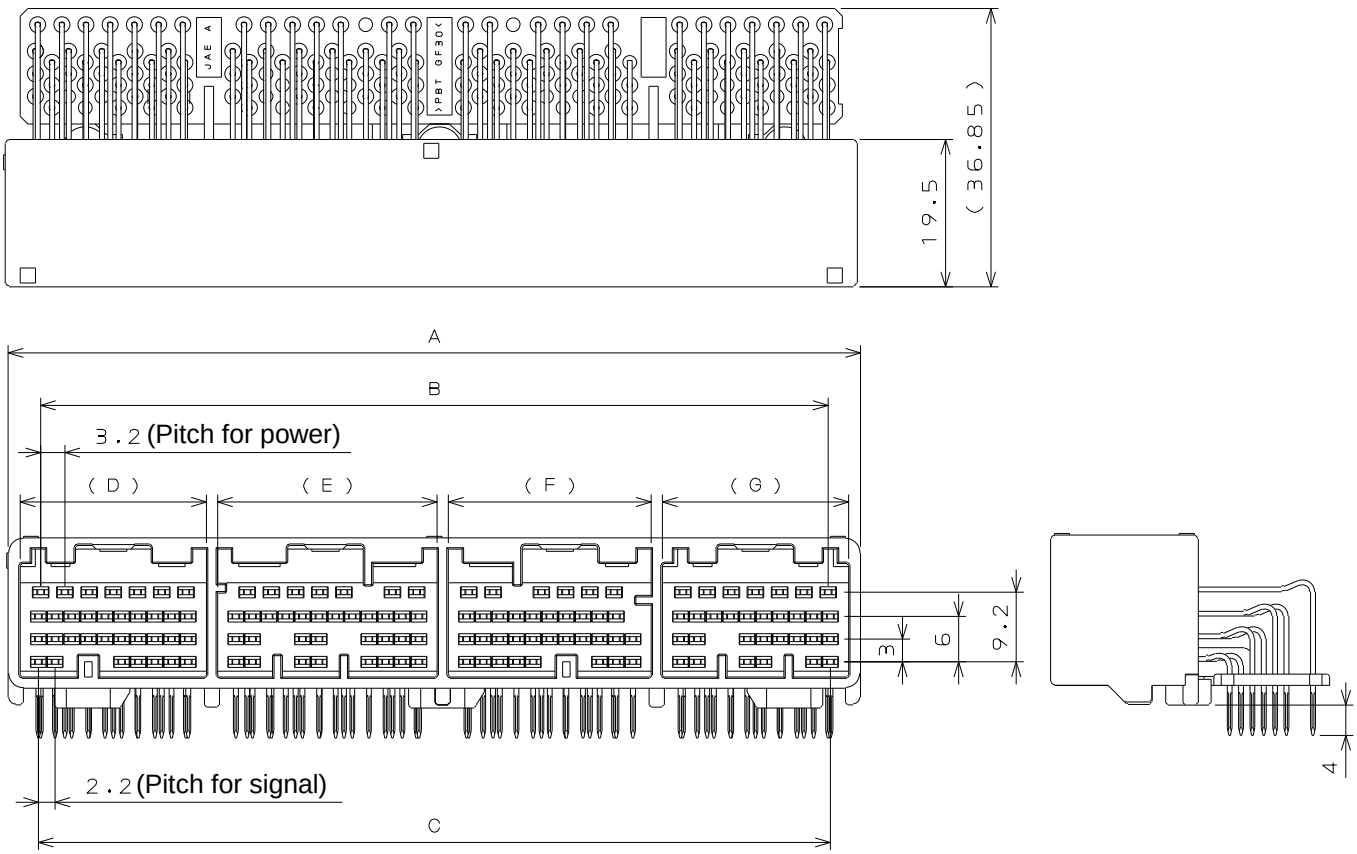
## Applicable Tool

| Contact Part number | Extraction tool | Semi-automatic crimping applicator | Automatic crimping applicator |
|---|---|---|---|
| M31S07K4FA, 4QA | ET-MX31B-1 | 3502-MX31A-2 | 3502-MX31A-3B |
| M31S07K4FB | | | |
| M31S05K4FA, 4QA | ET-MX31A-1 | 3502-MX31B-2 | 3502-MX31B-3B |
| M31S05K2FA | | | |
| M31S05K3FA | | | |

Note: Every contact uses different crimping die.
However crimping die for 4FA and 4QA is common.

## Outer Dimensions

### ■Pin Connector

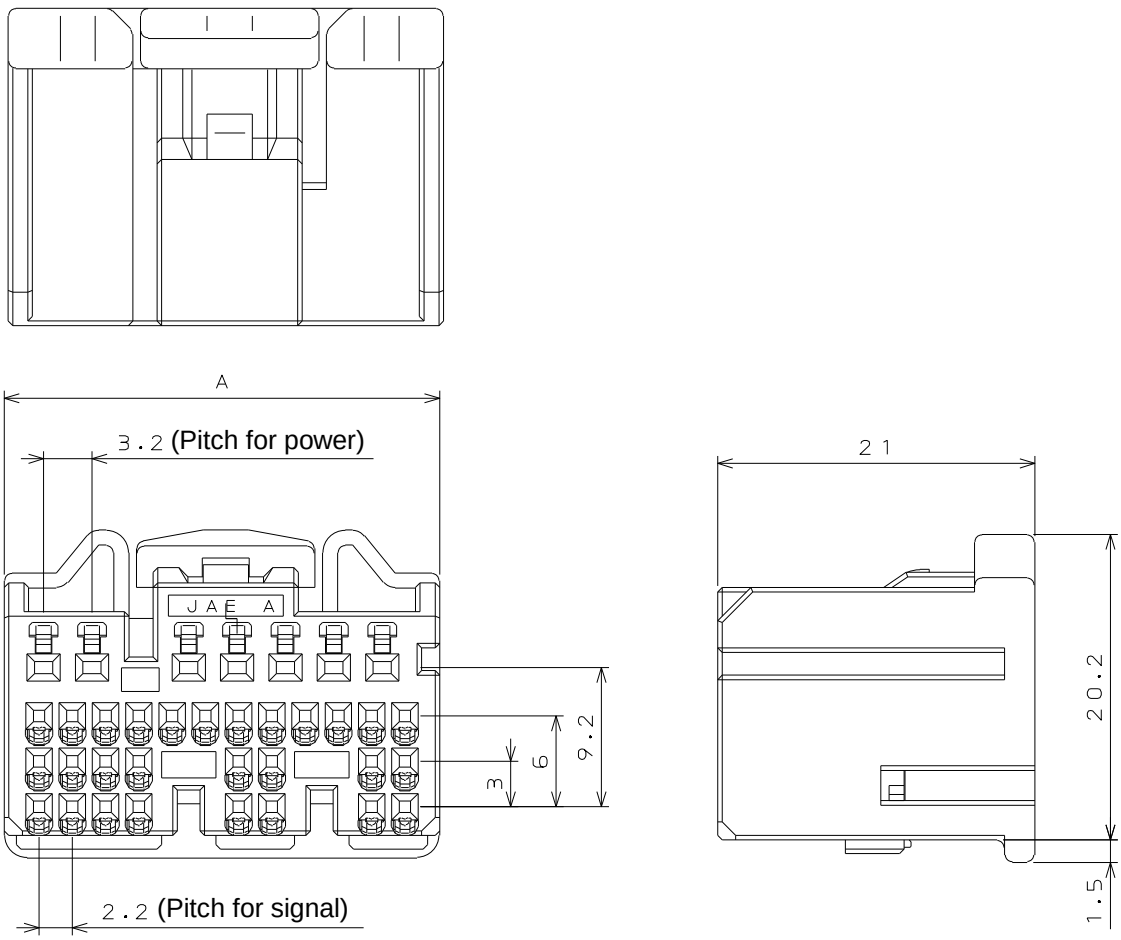



| Key Position | No. of contacts | Part Number | Dimensions | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | A | B | C | (D) | (E) | (F) | (G) |
| Standard | 70 | MX31070NFC | 60.5 | 48.5 | 52.5 | - | 29.0 | 26.8 | - |
| | 98 | MX31135NFA | 112.7 | 104.1 | 104.7 | 24.6 | 29.0 | 26.8 | 24.6 |
| | 104 | MX31104NFA | 86.6 | 75.8 | 78.6 | 24.6 | 29.0 | 26.8 | - |
| | 135 | MX31135NQA | 112.7 | 104.1 | 104.7 | 24.6 | 29.0 | 26.8 | 24.6 |
| Sub (Compatible to mis-mating) | 70 | MX31070NFD | 60.5 | 48.5 | 52.5 | - | 29.0 | 26.8 | - |
| | 135 | MX31135NQB | 112.7 | 104.1 | 104.7 | 24.6 | 29.0 | 26.8 | 24.6 |

Note)
- Product with 98pos. type is the same as 135pos. type without the one lowest pin terminal row.
- NF* -> All Sn plating type
  NQ*-> Sn plating and Au plating mixture type.

## Outer Dimensions

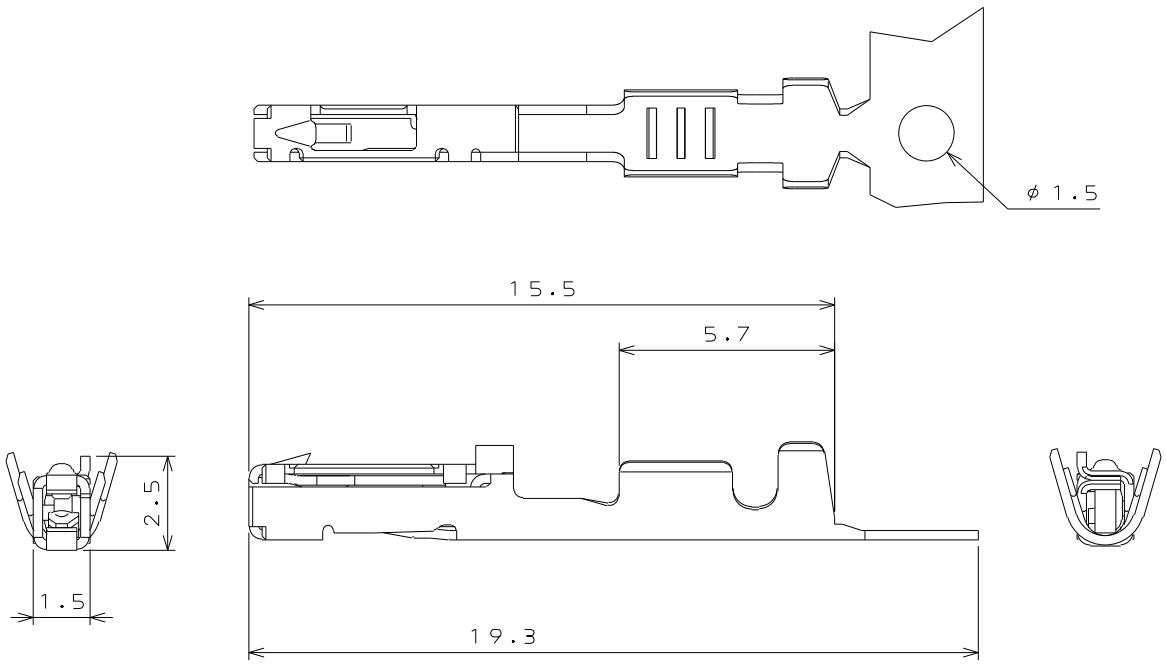
### ■Socket Connector



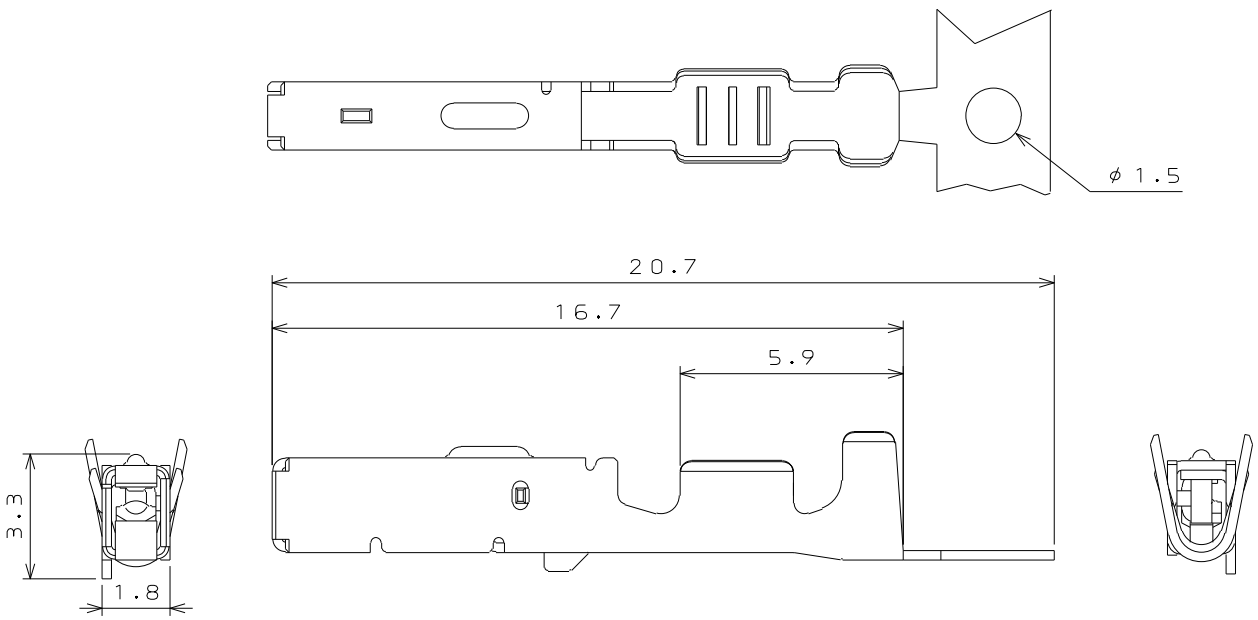

| Key position | No. of contacts | Part Number | Dimensions |
|---|---|---|---|
| | | | A |
| Normal | 31 | MX31031SGA | 24.4 |
| | 34 | MX31034SGA | 24.4 |
| | 35 | MX31035SGA | 28.8 |
| | 35 | MX31035SGB | 26.6 |
| Sub (Compatible to mis-mating) | 31 | MX31031SGB | 24.4 |
| | 34 | MX31034SGB | 24.4 |
| | 35 | MX31035SGC | 28.8 |
| | 35 | MX31035SGD | 26.6 |

# ■Socket Contact

## 1. M31S07K4FA, 4QA, 4FB




## 2. M31S05K2FA, 3FA, 4FA, 4QA



## Part Numbers and Product Drawings

| No. of Contacts | Socket P/ N | SJ Drawing |
|---|---|---|
| 31 | MX31031SGA | SJ037337 |
| 34 | MX31034SGA | SJ037335 |
| 35 | MX31035SGA | SJ037331 |
| 35 | MX31035SGB | SJ037332 |
| 31 | MX31031SGB | SJ037338 |
| 34 | MX31034SGB | SJ037336 |
| 35 | MX31035SGC | SJ037333 |
| 35 | MX31035SGD | SJ037334 |

| Key position | No. of Contacts | Pin header P/N | SJ Drawing |
|---|---|---|---|
| Standard | 70 | MX31070NFC | SJ100553 |
| | 98 | MX31135NFA | SJ100814 |
| | 104 | MX31104NFA | SJ038843 |
| | 135 | MX31135NQA | SJ037329 |
| Sub (Compatible to mis-mating) | 70 | MX31070NFD | SJ101333 |
| | 135 | MX31135NQB | SJ037330 |

| Socket contact P/ N | SJ Drawing |
|---|---|
| M31S07K4FA (Sn plating terminal for signal) | SJ037461 |
| M31S07K4QA (Au plating terminal for signal) | SJ037462 |
| M31S07K4FB (Sn plating terminal for signal) | SJ038294 |
| M31S05K2FA (Sn plating terminal for power) | SJ038295 |
| M31S05K3FA (Sn plating terminal for power) | SJ037463 |
| M31S05K4FA (Sn plating terminal for power) | SJ037464 |
| M31S05K4QA (Au plating terminal for power) | SJ037465 |

## Technical Documents

| Specification | Handling Instructions |
|---|---|
| JACS-1726 | JAHL-1726 |

**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**

* The specifications in this brochure are subject to change without notice. Please contact JAE for information.