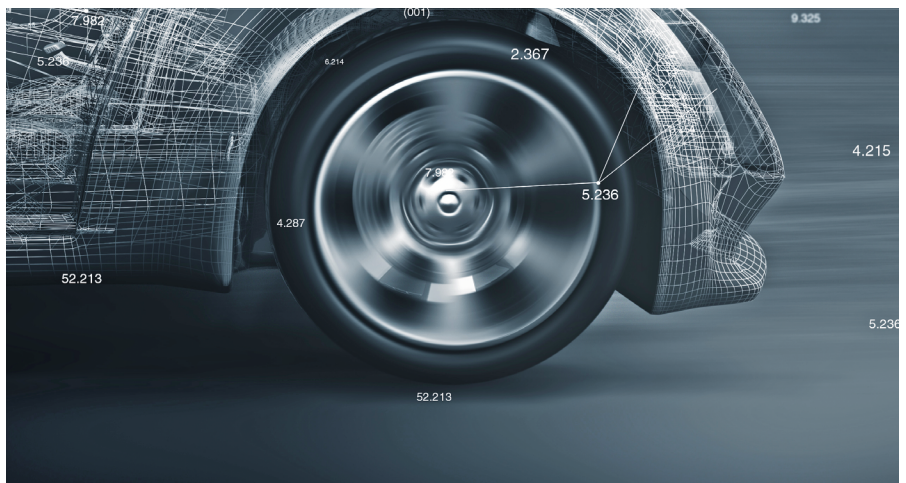
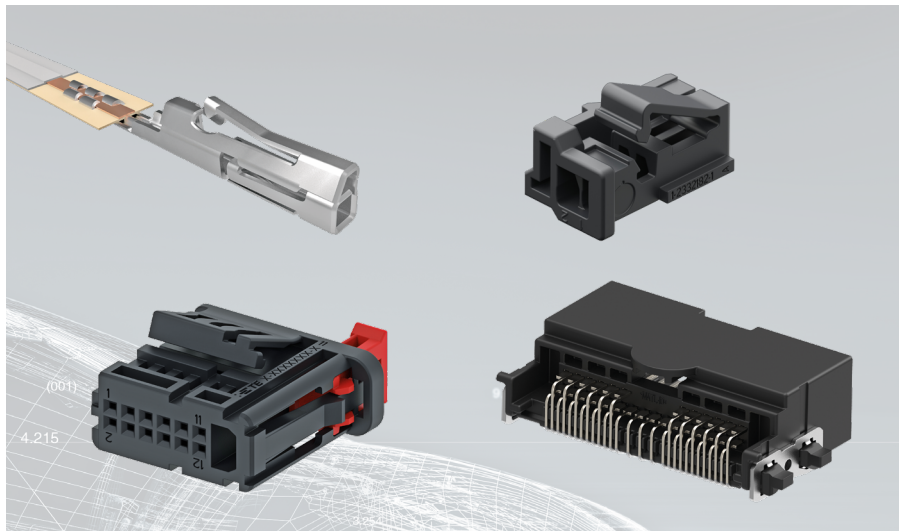
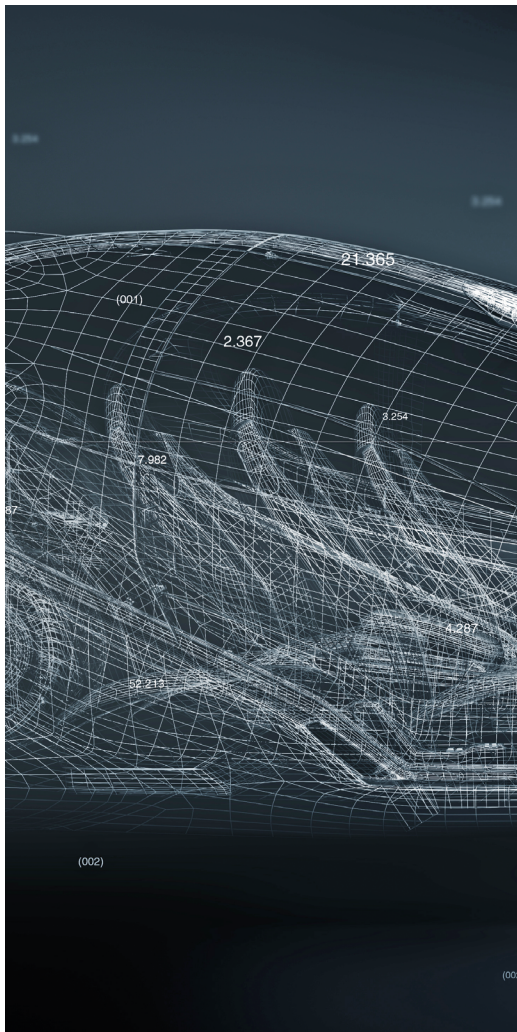


# MINIATURIZED CONNECTOR SOLUTIONS

Based on PicoMQS, NanoMQS,  
and Generation 50 Connector Systems



## Miniaturized Connector Solutions

Based on PicoMQS, NanoMQS, and Generation 50 Connector Systems

The automotive industry innovation roadmap is often characterized by the acronym **ACES**, meaning **Auto-mated, Connected, Electrified and Smart**.

Each area of innovation is driving an increasing number of electronic components within the vehicle. However, as the size of cars is not increasing, and, at the same time, automotive manufacturers are under pressure to reduce their vehicle fuel consumption, CO<sub>2</sub> emissions, component footprint and packaging space. Component miniaturization is therefore a key enabler of automotive innovation, particularly in relation to connector technology that transports electrical power, signaling and data to these new electronic devices.

### Miniaturized Connector Requirements

The challenge, facing automotive manufacturers, is not just about the reduction of component footprint and packaging space it is also about achieving the necessary robustness and packaging, reliability when deployed in harsh high-vibration, high-temperature automotive environments.

Automotive engineers also need connector component suppliers to offer extensive portfolios that address the geometric and robustness challenges as well as the varying levels of complexity presented by applications around the vehicle.

### TE Connectivity Miniaturized Connector Solutions

Based on our PicoMQS, NanoMQS and Generation 50 connector portfolios, TE Connectivity offers a comprehensive range of miniaturized connector solutions for applications throughout the vehicle.

Supporting a pin-pitch of 1.27 mm up to 1.8 mm and based on locking lance and clean body terminals, our connector systems offer both 1 and 2 row options, that can be hand-mated up to 28 positions (NanoMQS and Gen50).

Our portfolio offers outstanding savings in packaging weight (up to 78% reduction) while ensuring the highest levels of automotive reliability and robustness. For example, compared to a standard connector with a 2.54 mm pin-pitch, NanoMQS offers an almost 50% reduction in PCB footprint while our surface-mounted Generation 50 connectors offer superior PCB retention forces of 80N.

In addition, options for click-audible connector position assurance (CPA), PCB mounting clips and anti-scooping features all contribute to the LV214 and USCAR compliant automotive levels of robustness.

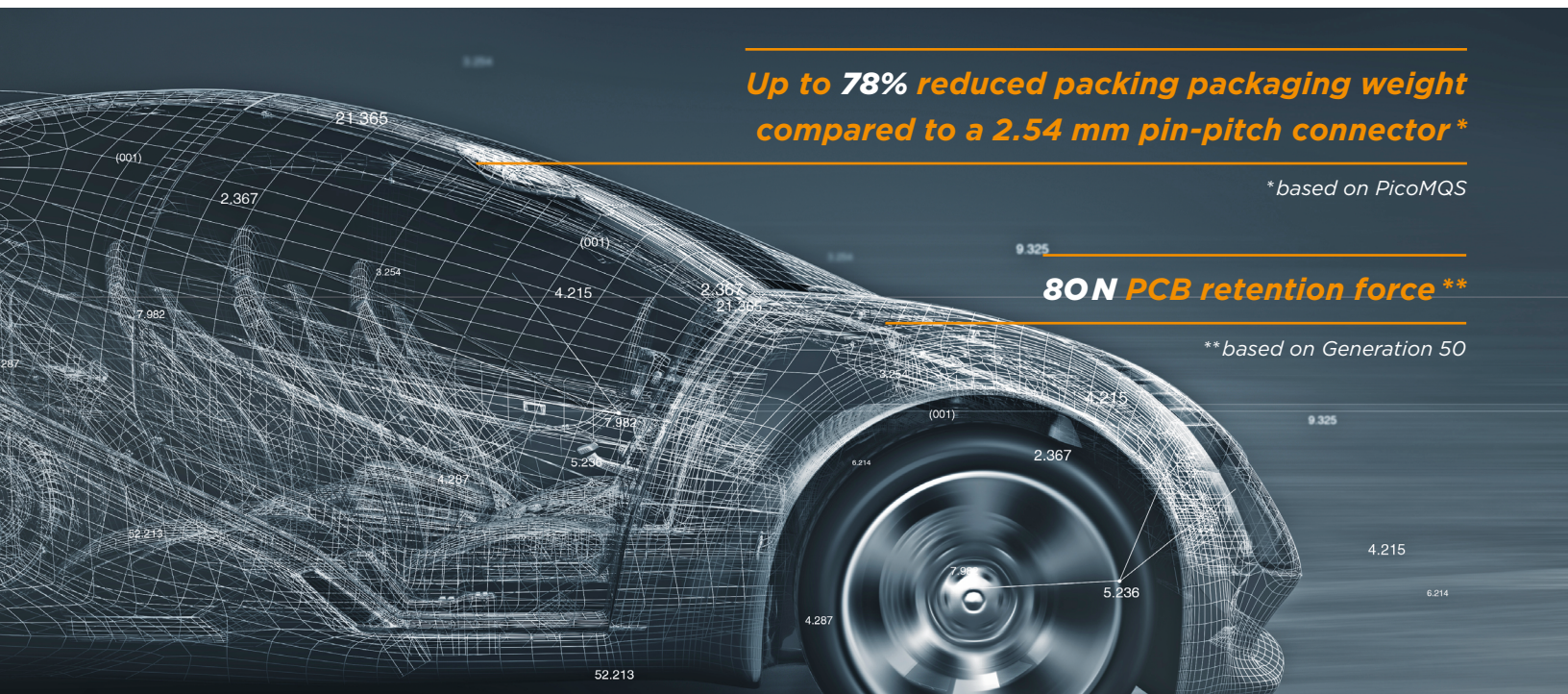
The availability of through-hole technology (THT) and surface-mounted technology (SMT) headers, hybrid connectors, supporting different terminal sizes, and solutions for flat flexible cables (FFC) provide additional flexibility for innovative miniaturized connectivity solutions.

**Up to 78% reduced packing packaging weight compared to a 2.54 mm pin-pitch connector\***

*\*based on PicoMQS*

**80N PCB retention force\*\***

*\*\*based on Generation 50*



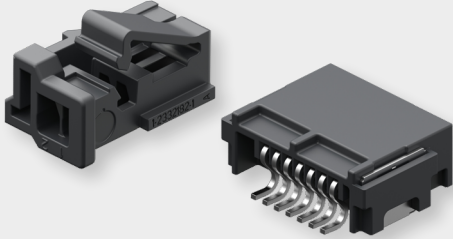
## Miniaturized Connector Solutions

Based on PicoMQS, NanoMQS, and Generation 50 Connector Systems

### PicoMQS Connector System

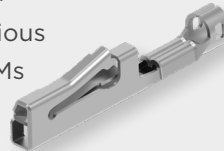
#### Dimensions

- 1.27 mm pin-to-pin pitch
- 0.22 mm<sup>2</sup> FLU & FLR wire range
- Mating for 0.5 x 0.4 blade size
- 0.014 to 0.42 mm<sup>2</sup> foil cross section



#### Performance

- Current capacity: 4A (90°C) / 1A FFC
- Max. Temperature 130°C (Sn) / 105°C FFC
- SG2 vibration grade, unsealed (Sn)
- LV214 European automotive standard compliant
- Present in various European OEMs



#### Position Assurance

- Locking Lance design
- Primary and secondary contact locking
- Click-audible connector position assurance (CPA) possible

#### Applications

- Blackbox applications (headlamps and steering wheel controls)
- Battery management

### NanoMQS Connector System

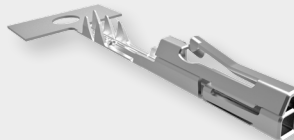
#### Dimensions

- 1.8 mm pin-to-pin
- 0.13 mm<sup>2</sup> to 0.35 mm<sup>2</sup> wire range
- Mating for 0.5 mm x 0.4 mm blade size



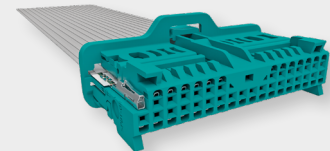
#### Performance

- Current capacity: 6A (90°C)
- Max. temperature 170°C (Ag)
- SG4 vibration Grade (Ag)
- European automotive standard compliant (LV 214)
- USCAR validation in process



#### Position Assurance

- Locking lance design
- Primary and secondary contact locking
- Click-audible connector position assurance (CPA)
- Click-audible mating



### Generation 50 Connector System

#### Dimensions

- 1.8 mm pin-to-pin
- 0.13 mm<sup>2</sup> to 0.35 mm<sup>2</sup> wire range
- Mating for 0.5 mm x 0.4 mm blade size

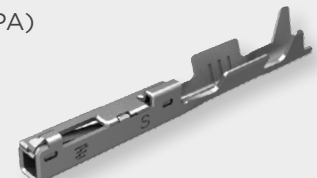


#### Performance

- Current capacity: 3A (90°C)
- Temperature range: -40°C to 105°C
- Vibration grade class V1
- Sealing class S1
- PCB retention force: 80N in perpendicular direction to mating
- USCAR-2, USCAR-25, GMW3191 compliant

#### Position Assurance

- Locking lance and clean body design
- Primary and secondary contact locking
- Click-audible mating
- Connector position assurance (CPA)



## Miniaturized Connector Solutions

Based on PicoMQS, NanoMQS, and Generation 50 Connector Systems

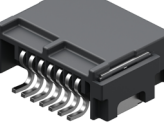
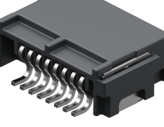
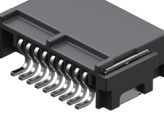
### PicoMQS Connector System Housing Portfolio

1.27 mm pin pitch /  
1 row

|                                                                                     | Positions | TE PN       |
|-------------------------------------------------------------------------------------|-----------|-------------|
|    | 2         | 1-2332182-1 |
|    | 3         | 1-2332183-1 |
|    | 4         | 1-2332184-1 |
|   | 5         | 1-2301920-1 |
|  | 6         | 1-2332186-1 |
|  | 7         | 1-2301968-1 |
|  | 8         | 1-2301969-1 |
|  | 9         | 1-2332189-1 |
|  | 10        | 1-2332190-1 |

### PicoMQS Connector System Header Portfolio

90° SMD

|                                                                                      | Positions | TE PN       |
|--------------------------------------------------------------------------------------|-----------|-------------|
|    | 2         | 2339202-2   |
|    | 3         | 2339203-3   |
|    | 4         | 2339204-4   |
|   | 5         | 2323101-5   |
|  | 6         | 2339206-6   |
|  | 7         | 2323102-7   |
|  | 8         | 2323103-8   |
|  | 9         | 2339209-9   |
|  | 10        | 1-2339210-0 |

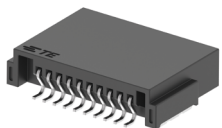
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## Miniaturized Connector Solutions

Based on PicoMQS, NanoMQS, and Generation 50 Connector Systems

### NanoMQS Connector System Header Portfolio

#### 90° Headers 1 row

| <br> | Number of Positions | TE PN      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------|
|                                                                                                                                                                        | 2                   | 2315401 *) |
|                                                                                                                                                                        | 3                   | 2315403 *) |
|                                                                                                                                                                        | 4                   | 2315405    |
|                                                                                                                                                                        | 5                   | 2315407    |
|                                                                                                                                                                        | 6                   | 2311714    |
|                                                                                                                                                                        | 7                   | 2315409    |
|                                                                                                                                                                        | 8                   | 2315411    |
|                                                                                                                                                                        | 9                   | 2315413 *) |
|                                                                                                                                                                        | 10                  | 2315415    |
|                                                                                                                                                                        | 11                  | 2315417 *) |

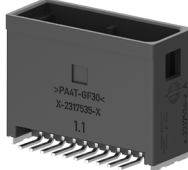
#### 180° Headers 1 row

| <br> | Number of Positions | TE PN      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------|
|                                                                                                                                                                          | 2                   | 2314389 *) |
|                                                                                                                                                                          | 3                   | 2314501 *) |
|                                                                                                                                                                          | 4                   | 2314503    |
|                                                                                                                                                                          | 5                   | 2314505    |
|                                                                                                                                                                          | 6                   | 2314507    |
|                                                                                                                                                                          | 7                   | 2314509 *) |
|                                                                                                                                                                          | 8                   | 2311396    |
|                                                                                                                                                                          | 9                   | 2314511 *) |
|                                                                                                                                                                          | 10                  | 2314513    |
|                                                                                                                                                                          | 11                  | 2314515 *) |

#### 90° Headers 2 row

| <br> | Number of Positions | TE PN      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------|
|                                                                                                                                                                            | 4                   | tbd *)     |
|                                                                                                                                                                            | 6                   | 2317501 *) |
|                                                                                                                                                                            | 8                   | 2317503 *) |
|                                                                                                                                                                            | 10                  | 2317505 *) |
|                                                                                                                                                                            | 12                  | 2317507    |
|                                                                                                                                                                            | 14                  | 2317509    |
|                                                                                                                                                                            | 16                  | 2317511    |
|                                                                                                                                                                            | 18                  | 2317513 *) |
|                                                                                                                                                                            | 20                  | 2317515    |
|                                                                                                                                                                            | 22                  | 2317517 *) |

#### 180° Headers 2 row

| <br> | Number of Positions | TE PN      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------|
|                                                                                                                                                                              | 4                   | tbd *)     |
|                                                                                                                                                                              | 6                   | 2317521 *) |
|                                                                                                                                                                              | 8                   | 2317523    |
|                                                                                                                                                                              | 10                  | 2317525    |
|                                                                                                                                                                              | 12                  | 2317527    |
|                                                                                                                                                                              | 14                  | 2317529 *) |
|                                                                                                                                                                              | 16                  | 2317531    |
|                                                                                                                                                                              | 18                  | 2317533 *) |
|                                                                                                                                                                              | 20                  | 2317535 *) |
|                                                                                                                                                                              | 22                  | 2317537    |

\*) Please contact your account manager / customer service center for information on availability.

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## Miniaturized Connector Solutions

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### NanoMQS Connector System Plug Portfolio (Side Latch)

#### 1 row without CPA

|                                                                                   | Number of Positions | TE PN   |
|-----------------------------------------------------------------------------------|---------------------|---------|
|  | 2                   | 2282150 |
|                                                                                   | 3                   | 2282151 |
|                                                                                   | 4                   | 2282152 |
|                                                                                   | 5                   | 2282153 |
|                                                                                   | 6                   | 2282154 |
|                                                                                   | 7                   | 2282155 |
|                                                                                   | 8                   | 2282267 |
|  | 9                   | 2282156 |
|                                                                                   | 10                  | 2282268 |
|                                                                                   | 11                  | 2282157 |

#### 1 row with CPA

|                                                                                     | Number of Positions | TE PN      |
|-------------------------------------------------------------------------------------|---------------------|------------|
|  | 2                   | 2333102    |
|                                                                                     | 3                   | 2333103    |
|                                                                                     | 4                   | 2333104    |
|                                                                                     | 5                   | 2333105    |
|                                                                                     | 6                   | 2309873    |
|  | 7                   | 2333107 *) |
|                                                                                     | 8                   | 2333108    |
|                                                                                     | 9                   | 2333109 *) |

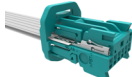
#### 2 row without CPA

|                                                                                    | Number of Positions | TE PN   |
|------------------------------------------------------------------------------------|---------------------|---------|
|  | 4                   | 2320004 |
|                                                                                    | 6                   | 2302501 |
|                                                                                    | 8                   | 2320008 |
|                                                                                    | 10                  | 2302475 |
|                                                                                    | 12                  | 2312212 |
|                                                                                    | 14                  | 2320014 |
|  | 16                  | 2320016 |
|                                                                                    | 18                  | 2312218 |
|                                                                                    | 20                  | 2320020 |

#### 2 row with CPA

|                                                                                      | Number of Positions | TE PN   |
|--------------------------------------------------------------------------------------|---------------------|---------|
|  | 4                   | 2345104 |
|                                                                                      | 6                   | 2312106 |
|                                                                                      | 8                   | 2312108 |
|                                                                                      | 10                  | 2312110 |
|                                                                                      | 12                  | 2312112 |
|                                                                                      | 14                  | 2312114 |
|  | 16                  | 2312116 |
|                                                                                      | 18                  | 2312118 |
|                                                                                      | 20                  | 2312120 |

### NanoMQS Connector System FFC/FPC Portfolio

|                                                                                     | Description                 | TE PN       |
|-------------------------------------------------------------------------------------|-----------------------------|-------------|
|  | FFC/FPC Receptacle Terminal | 1-2291853-1 |
|  | 8pos Plug                   | 2303089     |

|                                                                                      | Description | TE PN   |
|--------------------------------------------------------------------------------------|-------------|---------|
|  | 20pos Plug  | 2365086 |
|  | 32pos Plug  | 2303088 |

\*) Please contact your account manager / customer service center for information on availability.

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## Miniaturized Connector Solutions

Based on PicoMQS, NanoMQS, and Generation 50 Connector Systems

### Generation 50 Connector System Header and Plug Portfolio

| Headers                                                                             | Number of Positions | TE PN      | Plugs                                                                                | Number of Positions | TE PN                            |
|-------------------------------------------------------------------------------------|---------------------|------------|--------------------------------------------------------------------------------------|---------------------|----------------------------------|
|    | 2                   | 2291330 *) |    | 2                   | 2291329                          |
|    | 4                   | 2272400 *) |    | 4                   | 2272399                          |
|    | 6                   | 2272406    |    | 6                   | 2272405<br>2272405-5 (CPA)       |
|    | 8                   | 2272919 *) |    | 8                   | 2272918 *)<br>2272918-5 (CPA) *) |
|  | 12                  | 2288750 *) |  | 12                  | 2288749 *)<br>2288749-5 (CPA) *) |
|  | 16                  | 2272388 *) |  | 16                  | 2272387 *)<br>2272387-5 (CPA) *) |
|  | 16<br>(hybrid)      | 2203881    |  | 16<br>(hybrid)      | 2334712<br>2334712-5 (CPA)       |
|  | 20                  | 2272897    |  | 20                  | 2334713<br>2334713-5 (CPA)       |
|  | 24                  | 2291989 *) |  | 24                  | 2291988 *)<br>2291988-5 (CPA) *) |
|  | 28                  | 2272394 *) |  | 28                  | 2272393 *)<br>2272393-5 (CPA) *) |

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## Miniaturized Connector Solutions

Based on PicoMQS, NanoMQS, and Generation 50 Connector Systems

### Features and Benefits

#### Miniaturization Innovation

- 1.27 mm up to 1.8 mm pin spacing
- Wire size range: 0.13 mm<sup>2</sup> to 0.35 mm<sup>2</sup> thin wall
- SMT (Surface Mount Technology) headers available
- Hybrid configurations with 1.2 mm available (Generation 50)
- Automotive grade FFC connectors (NanoMQS)

#### Automotive Grade Robustness

- Robust anti-scooping features
- Header to PCB mounting clips
- USCAR-2, LV214, GMW3191 compliant
- Primary and secondary locking system
- Kojiri connector design
- Loud click-audible mating (NanoMQS)
- SG2 vibration grade

#### Design Flexibility

- Clean body/ locking lance terminals
- THT/ SMT headers
- FFC products
- CPA option
- Interchangeability of terminals
- Wide range of circuit counts
- S-bended pins header design to allow optical inspection instead of X-ray (PicoMQS)

**FOR FURTHER INFORMATION  
PLEASE CONTACT US**

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