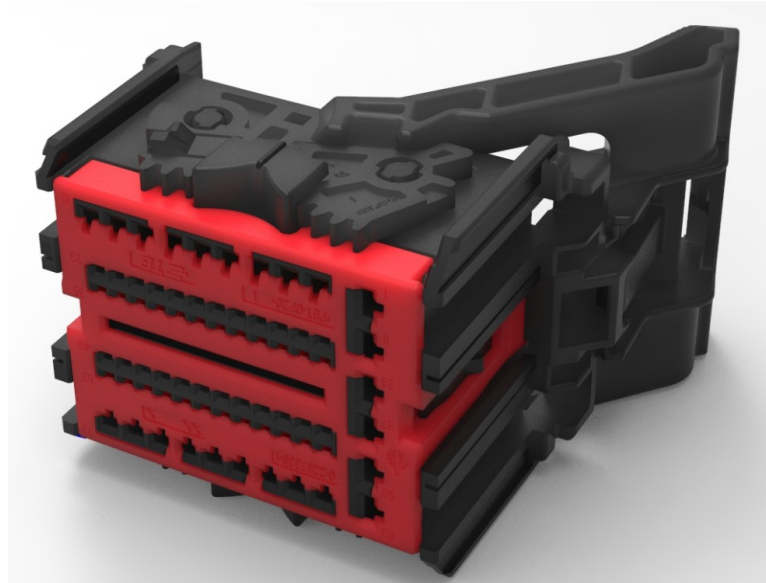
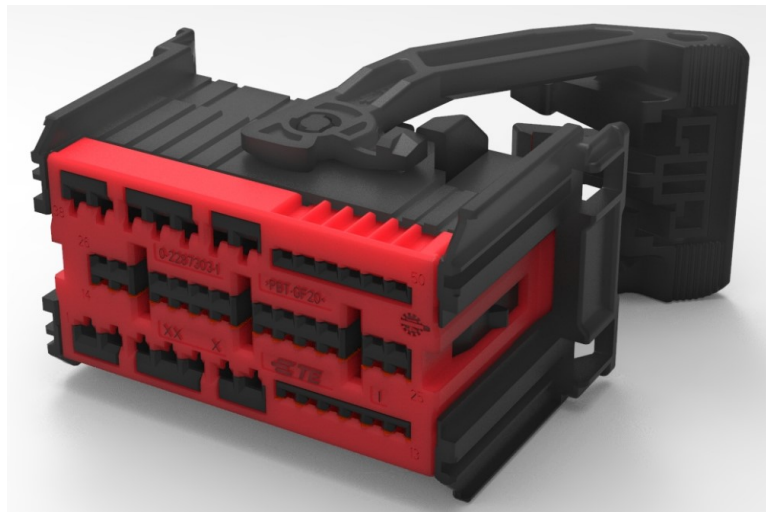


## PRODUCT SPECIFICATION FOR BCM CONNECTOR

### 72 WAY BCM CONNECTOR / 2287336



### 50 WAY BCM CONNECTOR / 2287277





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## 72 & 50 WAY BCM CONNECTOR

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### 1. PRODUCT OVERVIEW

1.1. OPERATING TEMPERATURE

1.2. VALID TE SPECIFICATIONS

1.3. SOCKET HOUSING

1.3.1. 72 WAY CONNECTOR

1.3.2. 50 WAY CONNECTOR

1.4. CONTACTS

1.4.1. 0.64 GENERATION Y – TE CONNECTIVITY

1.4.2. FCI MX150 OR YAZAKI 1.5

1.4.3. SUMITOMO 2.8

### 2. TEST REQUIREMENT

2.1. CONNECTOR – MECHANICAL TESTS / ENVIRONMENTAL TEST

### 3. REVISION RECORD

## 1. PRODUCT OVERVIEW.

Applicable product description part no's. are as follows:

| DESIGNATION                                            | PARTNUMBER                                                             |
|--------------------------------------------------------|------------------------------------------------------------------------|
| INTERFACE 72 WAY – NO HEADER TOOLED BY TE CONNECTIVITY | SEE INTERFACE SPEC. 114-94321                                          |
| PLUG ASSEMBLY 72 WAY UNSEALD HYBRID CONNECTOR          | SEE DRAWING 2287336<br>1-2287336-1 – CODING A / 1-2287336-2 – CODING B |
| COVER 90° FOR 72 WAY UNSEALED HYBRID CONNECTOR         | 1-2287341-2                                                            |
| INTERFACE 50 WAY - NO HEADER TOOLED BY TE CONNECTIVITY | SEE INTERFACE SPEC. 114-94317                                          |
| PLUG ASSEMBLY 50 WAY UNSEALD HYBRID CONNECTOR          | SEE DRAWING 2287277<br>0-2287277-1 – CODING A / 0-2287277-2 - CODING B |
| COVER 90° FOR 50 WAY UNSEALD HYBRID CONNECTOR          | 0-2287334-1                                                            |
| 0.64 GENERATION Y FEMALE TERMINAL                      | TE CONNECTIVITY - SEE 1.4 CONTACTS / PAGE 6                            |
| 1.5 UNSEALED FEMALE TERMINAL                           | FCI PART / YAZAKI PART – SEE 1.4 CONTACTS / PAGE 6                     |
| 2.8 UNSEALED FEMALE TERMINAL                           | SUMITOMO PART – SEE 1.4 CONTACTS / PAGE 6                              |

### 1.1. OPERATING TEMPERATURE

-40° to +100°C

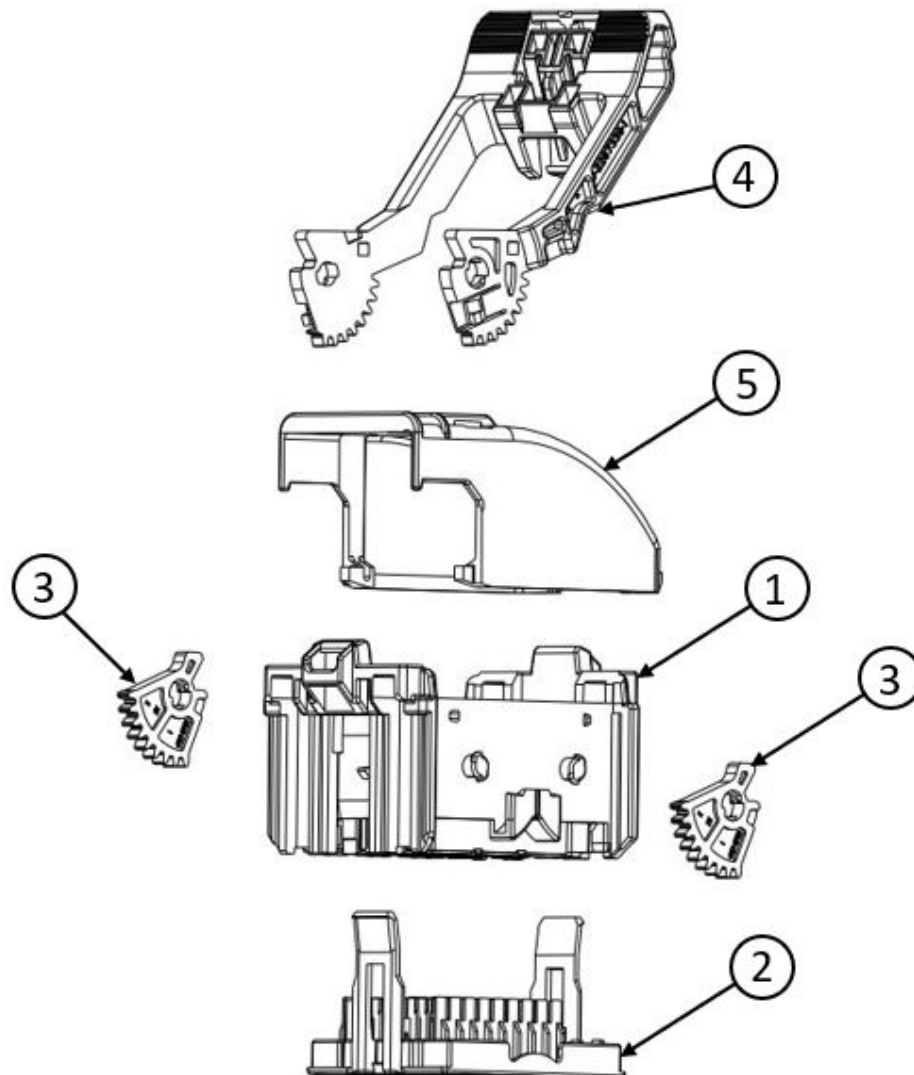
### 1.2. VALID TE SPECIFICATIONS

|           |                                                 |
|-----------|-------------------------------------------------|
| 114-94321 | INTERFACE DRAWING – 72 WAY HEADER SPECIFICATION |
| 114-94317 | INTERFACE DRAWING – 50 WAY HEADER SPECIFICATION |
| 114-94370 | APPLICATION SPEC. – 72 WAY BCM CONNECTOR        |
| 114-94371 | APPLICATION SPEC. – 50 WAY BCM CONNECTOR        |

### 1.3 SOCKET HOUSING

#### 1.3.1 72 WAY CONNECTOR

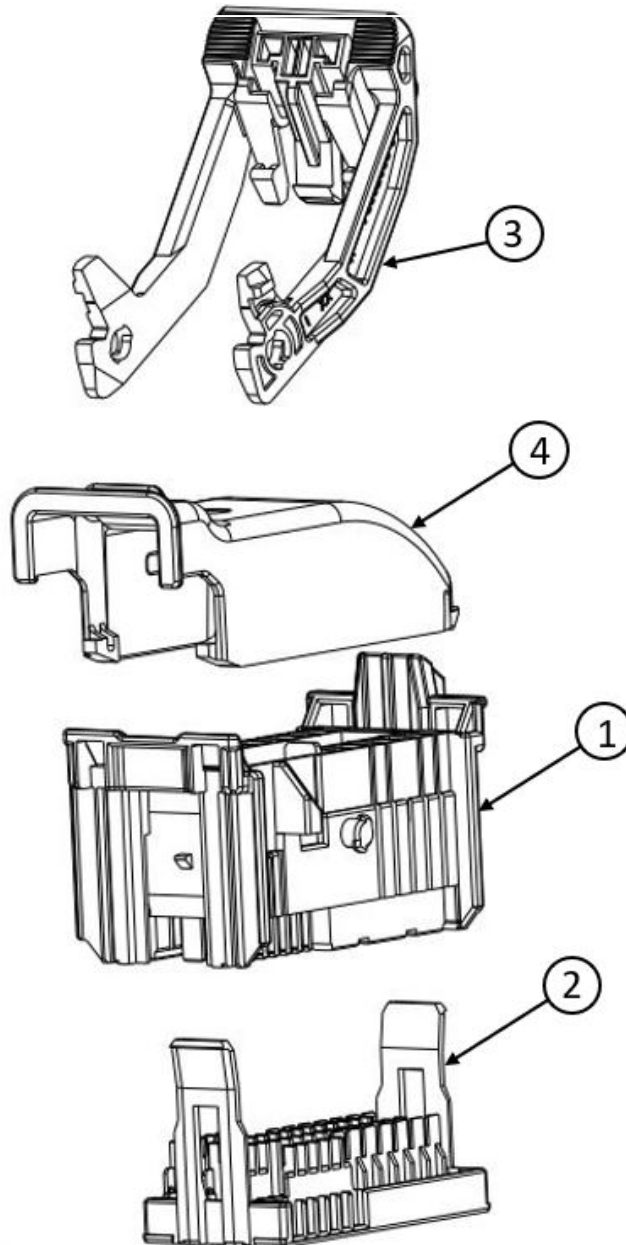
##### **ASSEMBLY OVERVIEW** COVER IS A SEPARATE SALEABLE PART



|   |                                     |
|---|-------------------------------------|
| 1 | 72 WAY BCM CONNECTOR FEMALE HOUSING |
| 2 | 72 WAY BCM CONNECTOR TPA            |
| 3 | 72 WAY BCM CONNECTOR PINION GEAR    |
| 4 | 72 WAY BCM CONNECTOR LEVER          |
| 5 | 72 WAY BCM CONNECTOR COVER          |

### 1.3.2 50 WAY CONNECTOR

#### ASSEMBLY OVERVIEW COVER IS A SEPARATE SALEABLE PART



|   |                                     |
|---|-------------------------------------|
| 1 | 50 WAY BCM CONNECTOR FEMALE HOUSING |
| 2 | 50 WAY BCM CONNECTOR TPA            |
| 3 | 50 WAY BCM CONNECTOR LEVER          |
| 4 | 50 WAY BCM CONNECTOR COVER          |

## 1.4 CONTACTS

### 1.4.1 0.64 GENERATION Y – TE CONNECTIVITY



|                  |                            |
|------------------|----------------------------|
| WIRE SIZE RANGE  | 0.35 – 0.75mm <sup>2</sup> |
| PART NO.         | SEE TABLE ON PAGE 7        |
| SURFACE FINISH   | TINNED                     |
| MAX. TEMPERATURE | +100°C                     |

### 1.4.2 FCI MX150 / YAZAKI 1.5



|                  |                            |
|------------------|----------------------------|
| WIRE SIZE RANGE  | 0.35 – 1.50mm <sup>2</sup> |
| PART NO.         | SEE TABLE ON PAGE 7        |
| SURFACE FINISH   | TINNED / SILVER / GOLD     |
| MAX. TEMPERATURE | +125°C                     |

### 1.4.3 SUMITOMO 2.8



|                  |                           |
|------------------|---------------------------|
| WIRE SIZE RANGE  | 0.35 – 3.0mm <sup>2</sup> |
| PART NO.         | SEE TABLE ON PAGE 7       |
| SURFACE FINISH   | TINNED                    |
| MAX. TEMPERATURE | +125°C                    |

### 0.64 GENERATION

| PART-NO     | WIRE SIZE RANGE          | SURFACE FINISH |
|-------------|--------------------------|----------------|
| 1-1456841-1 | 0.35-0.50mm <sup>2</sup> | Sn             |
| 1-1456841-2 | 0.75mm <sup>2</sup>      | Sn             |
| 1-2098753-5 | 0.35-0.50mm <sup>2</sup> | Sn             |
| 1-2098753-6 | 0.75mm <sup>2</sup>      | Sn             |
| 2098762-1   | 0.35-0.50mm <sup>2</sup> | Sn             |
| 2098762-2   | 0.75mm <sup>2</sup>      | Sn             |

### FCI MX150

| PART-NO    | WIRE SIZE RANGE          | SURFACE FINISH |
|------------|--------------------------|----------------|
| 33012-2023 | 0.35-0.50mm <sup>2</sup> | Sn             |
| 33012-3023 | 0.35-0.50mm <sup>2</sup> | Sn             |
| 33012-2022 | 0.75-1.0mm <sup>2</sup>  | Sn             |
| 33012-3022 | 0.75-1.0mm <sup>2</sup>  | Sn             |
| 33012-2021 | 1.5-2.0mm <sup>2</sup>   | Sn             |
| 33012-3021 | 1.5-2.0mm <sup>2</sup>   | Sn             |
| 33001-2023 | 0.35-0.50mm <sup>2</sup> | Au             |
| 33001-3023 | 0.35-0.50mm <sup>2</sup> | Au             |
| 33001-2022 | 0.75-1.0mm <sup>2</sup>  | Au             |
| 33001-3022 | 0.75-1.0mm <sup>2</sup>  | Au             |
| 33001-2021 | 1.5-2.0mm <sup>2</sup>   | Au             |
| 33001-3021 | 1.5-2.0mm <sup>2</sup>   | Au             |
| 33001-4023 | 0.35-0.50mm <sup>2</sup> | Ag             |
| 33001-5023 | 0.35-0.50mm <sup>2</sup> | Ag             |
| 33001-4022 | 0.75-1.0mm <sup>2</sup>  | Ag             |
| 33001-5022 | 0.75-1.0mm <sup>2</sup>  | Ag             |
| 33001-4021 | 1.5-2.0mm <sup>2</sup>   | Ag             |
| 33001-5021 | 1.5-2.0mm <sup>2</sup>   | Ag             |

### YAZAKI 1.5

| PART-NO      | WIRE SIZE RANGE          | SURFACE FINISH |
|--------------|--------------------------|----------------|
| 7116-6315-02 | 0.35-0.50mm <sup>2</sup> | Sn             |
| 7116-6316-02 | 0.75-1.0mm <sup>2</sup>  | Sn             |
| 7116-6317-02 | 1.5mm <sup>2</sup>       | Sn             |

### SUMITOMO 2.8

| PART-NO   | WIRE SIZE RANGE        | SURFACE FINISH |
|-----------|------------------------|----------------|
| 8240-0477 | 0.35mm <sup>2</sup>    | Sn             |
| 8240-0423 | 0.5-1.0mm <sup>2</sup> | Sn             |
| 8240-0424 | 1.5-2.5mm <sup>2</sup> | Sn             |
| 8240-0425 | 3.0mm <sup>2</sup>     | Sn             |

## 2. TEST REQUIREMENTS

|                                                                     | Test Description                                                                         | Requirement                            | Procedure                                                                  |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------------|
|                                                                     | Examination of Product                                                                   | Meets requirements of product drawing. | Visual, dimensional and functional per Applicable quality inspection plan. |
| 2.1. CONNECTOR – MECHANICAL TESTS                                   |                                                                                          |                                        |                                                                            |
| TERMINAL- CONNECTOR INSERTION/RETENTION FORCE FOR SIGNAL TERMINALS. |                                                                                          |                                        |                                                                            |
| 1                                                                   | Terminal Insertion Force<br>0.64 GENY                                                    | Max. 30 N                              | V= 50 mm/min.<br><br>Qualification acc. To SAE/USCAR-2;<br>Rev. 6 §5.4.1   |
|                                                                     | Terminal Push Through Force<br>0.64 GENY                                                 | Max. 50N or Cable buckles              |                                                                            |
|                                                                     | Terminal Extraction Force<br>0.64 GENY (Primary lock only)                               | Min. 30 N                              |                                                                            |
|                                                                     | Terminal Extraction Force<br>0.64 GENY (Primary and Secondary locks After Moisture)      | Min. 60 N                              |                                                                            |
|                                                                     | Terminal Extraction Force<br>0.64 GENY (Primary and Secondary locks Temp/Humidity)       | Min. 50 N                              |                                                                            |
| TERMINAL- CONNECTOR INSERTION/RETENTION FORCE FOR POWER TERMINALS.  |                                                                                          |                                        |                                                                            |
| 2                                                                   | Terminal Insertion Force<br>1.5 FCI/YAZAKI                                               | Max. 30 N                              | V= 50 mm/min.<br><br>Qualification acc. To SAE/USCAR-2;<br>Rev. 6 §5.4.1   |
|                                                                     | Terminal Push Through Force<br>1.5 FCI/YAZAKI                                            | Max. 50N or Cable buckles              |                                                                            |
|                                                                     | Terminal Extraction Force<br>1.5 FCI/YAZAKI (Primary lock only)                          | Min. 45 N                              |                                                                            |
|                                                                     | Terminal Extraction Force<br>1.5 FCI/YAZAKI (Primary and Secondary locks After Moisture) | Min. 70 N                              |                                                                            |
|                                                                     | Terminal Extraction Force<br>1.5 FCI/YAZAKI (Primary and Secondary locks Temp/Humidity)  | Min. 50 N                              |                                                                            |
| TERMINAL- CONNECTOR INSERTION/RETENTION FORCE FOR POWER TERMINALS.  |                                                                                          |                                        |                                                                            |
| 3                                                                   | Terminal Insertion Force<br>2.8 SUMITOMO                                                 | Max. 30 N                              | V= 50 mm/min.<br><br>Qualification acc. To SAE/USCAR-2;<br>Rev. 6 §5.4.1   |
|                                                                     | Terminal Push Through Force<br>2.8 SUMITOMO                                              | Max. 50N or Cable buckles              |                                                                            |
|                                                                     | Terminal Extraction Force<br>2.8 SUMITOMO (Primary lock only)                            | Min. 60 N                              |                                                                            |



|                                                                                   |                                                                                           |           |                                                                                                                |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------|
|                                                                                   | Terminal Extraction Force<br>2.8 SUMITOMO (Primary and<br>Secondary locks After Moisture) | Min. 90 N |                                                                                                                |
|                                                                                   | Terminal Extraction Force<br>2.8 SUMITOMO (Primary and<br>Secondary locks Temp/Humidity)  | Min. 50 N |                                                                                                                |
| CONNECTOR - CONNECTOR MATING / UNMATING FORCE (CONNECTORS WITH MECHANICAL ASSIST) |                                                                                           |           |                                                                                                                |
| 4                                                                                 | Connector-Connector Mating<br>Force (Mechanical assist, Pre-lock)                         | Max. 75N  | V= 50 mm/min<br><br>Fully populated with terminals.<br><br>Qualification acc. To SAE/USCAR-2;<br>Rev. 6 §5.4.3 |
|                                                                                   | Connector-Connector Unmating<br>Force (Mechanical assist,<br>Locked position)             | Max. 75N  |                                                                                                                |
|                                                                                   | Connector-Connector Unmating<br>Force (Mechanical assist,<br>Release the assist feature)  | Min. 60N  |                                                                                                                |
| MISCELLANEOUS COMPONENTS ENGAGE/DISENGAGE (TPA)                                   |                                                                                           |           |                                                                                                                |
| 5                                                                                 | TPA Preset to Lock Force (w/terminals<br>installed in all available cavities)             | Max. 60N  | V= 50 mm/min<br><br>Qualification acc. To SAE/USCAR-2;<br>Rev. 6 §5.4.5                                        |
|                                                                                   | TPA Preset to Lock Force (w/o<br>terminals)                                               | Min. 15N  | See TE Spec. 114-94370 / 114-94371                                                                             |
|                                                                                   | TPA Lock to Preset Force (w/terminals<br>installed in all available cavities)             | Max. 60N  |                                                                                                                |
|                                                                                   | TPA Lock to Preset Force                                                                  | Min. 18N  |                                                                                                                |
|                                                                                   | TPA Complete Removal from Pre-stage<br>on Unmated Connector                               | Min. 25N  |                                                                                                                |
| MISCELLANEOUS COMPONENTS ENGAGE/DISENGAGE (WIRE DRESS COVER)                      |                                                                                           |           |                                                                                                                |
| 6                                                                                 | Wire Dress Cover Engage                                                                   | Max. 60N  | V= 50 mm/min<br><br>Qualification acc. To SAE/USCAR-2;<br>Rev. 6 §5.4.5                                        |
|                                                                                   | Wire Dress Cover Disengage                                                                | Min. 110N |                                                                                                                |
| POLARIZATION FEATURE EFFECTIVENESS                                                |                                                                                           |           |                                                                                                                |
| 7                                                                                 | Polarization Feature Force, Correct<br>Orientation but with wrong code                    | F >150N   | V= 50 mm/min<br><br>No electrical contact.<br>Qualification acc. To SAE/USCAR-2;<br>Rev. 6 §5.4.4              |

|                                     |                                                                     |                                                                                                                                                                |                                                                                                    |
|-------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
|                                     | Polarization Feature Force, Incorrect Orientation                   |                                                                                                                                                                |                                                                                                    |
| <b>CAVITY DAMAGE SUSCEPTIBILITY</b> |                                                                     |                                                                                                                                                                |                                                                                                    |
| 8                                   | Cavity Damage force fully applied to TPA                            | <p>Signal terminal:<br/>0.64 GEN Y = Min. 60N</p> <p>Power terminal:<br/>1.5 FCI/YAZAKI =<br/>Min. 80N<br/>2.8 SUMITOMO =Min. 80N</p>                          | <p>V= 50 mm/min</p> <p>Qualification acc. To SAE/USCAR-2;<br/>Rev. 6 §5.4.9</p>                    |
|                                     | Extraction Force with Primary and Secondary Locks (Before Moisture) | <p>Signal terminal:<br/>0.64-1.2 GEN Y =<br/>Min. 60N</p> <p>Power terminal:<br/>1.5-1.8 FCI/YAZAKI/FCI =<br/>Min. 70N<br/>2.8-3.0 SUMITOMO =<br/>Min. 90N</p> |                                                                                                    |
| <b>CONNECTOR DROP TEST</b>          |                                                                     |                                                                                                                                                                |                                                                                                    |
| 9                                   | Connector Drop Test                                                 | No Cracks Occur                                                                                                                                                | <p>Distance Minimum 1meter height</p> <p>Qualification acc. To SAE/USCAR-2;<br/>Rev. 6; §5.4.8</p> |
| <b>DRY CIRCUIT RESISTANCE</b>       |                                                                     |                                                                                                                                                                |                                                                                                    |
| 10                                  | Dry Circuit Resistance                                              | <p>Signal terminal:<br/>0.64 GEN Y =<br/>20 mOhms Max (Tin)</p> <p>Power terminal:<br/>1.5 FCI/YAZAKI =<br/>10 mOhms<br/>2.8 SUMITOMO =<br/>5 mOhms Max</p>    | <p>Qualification acc. To SAE/USCAR-2;<br/>Rev. 6; §5.3.1</p>                                       |
| <b>VIBRATION</b>                    |                                                                     |                                                                                                                                                                |                                                                                                    |
| 11                                  | Vibration (W/Circuit Continuity Monitoring)                         | Connector Conditioning & No loss of electrical continuity (and any instance of resistor current dropping below 95 mA), for more than 1 microsecond             | <p>Qualification acc. To SAE/USCAR-2;<br/>Rev. 6; §5.4.6</p> <p>V1 Tested</p>                      |
| <b>THERMAL SHOCK</b>                |                                                                     |                                                                                                                                                                |                                                                                                    |
| 12                                  | Thermal Shock (w/Circuit Continuity Monitoring)                     | Connector Conditioning & No loss of electrical continuity (and any instance of resistor current dropping below 95 mA), for                                     | <p>Qualification acc. To SAE/USCAR-2;<br/>Rev. 6; §5.6.1</p>                                       |

|                                                              |                                                                                                    |                                                                                                                                                                                   |                                                      |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
|                                                              |                                                                                                    | more than 1 microsecond                                                                                                                                                           |                                                      |
| <b>TEMPERATURE / HUMIDITY CYCLING</b>                        |                                                                                                    |                                                                                                                                                                                   |                                                      |
| <b>13</b>                                                    | Temperature Humidity                                                                               | Connector Conditioning Only                                                                                                                                                       | Connector Conditioning Only                          |
| <b>HIGH TEMPERATURE EXPOSURE</b>                             |                                                                                                    |                                                                                                                                                                                   |                                                      |
| <b>14</b>                                                    | High Temperature Exposure                                                                          | Connector Conditioning Only                                                                                                                                                       | Connector Conditioning Only                          |
| <b>DRY CIRCUIT RESISTANCE</b>                                |                                                                                                    |                                                                                                                                                                                   |                                                      |
| <b>13</b>                                                    | Dry Circuit Resistance                                                                             | <p>Signal terminal:<br/>0.64 GEN Y =<br/>20 mOhms Max (Tin)</p> <p>Power terminal:<br/>1.5 FCI/YAZAKI =<br/>10 mOhms Max<br/>2.8 SUMITOMO =<br/>5 mOhms Max</p>                   | Qualification acc. To SAE/USCAR-2;<br>Rev. 6; §5.3.1 |
| <b>VOLTAGE DROP</b>                                          |                                                                                                    |                                                                                                                                                                                   |                                                      |
| <b>14</b>                                                    | Voltage Drop                                                                                       | <p>Signal terminal:<br/>0.64 GEN Y =<br/>20 mOhms Max (Tin)</p> <p>Power terminal:<br/>1.5 FCI/YAZAKI =<br/>20 mOhms Max<br/>2.8 SUMITOMO =<br/>5 mOhms Max</p>                   | Qualification acc. To SAE/USCAR-2;<br>Rev. 6; §5.3.2 |
| <b>TEMPERATURE / HUMIDITY CYCLING (ISOLATION RESISTANCE)</b> |                                                                                                    |                                                                                                                                                                                   |                                                      |
| <b>15</b>                                                    | Temperature Humidity (Isolation Resistance)                                                        | Resistance between every combination of two adjacent terminals must exceed 100 Mohm at 500 VDC (Includes terminals that may be separated by one or more vacant terminal cavities) | Qualification acc. To SAE/USCAR-2;<br>Rev. 6; §5.5.1 |
| <b>TEMPERATURE / HUMIDITY CYCLING (EXTRACTION FORCE)</b>     |                                                                                                    |                                                                                                                                                                                   |                                                      |
| <b>16</b>                                                    | Terminal to Connector Extraction Force with Primary and Secondary Locks after Temperature Humidity | Min. 50 N                                                                                                                                                                         | Qualification acc. To SAE/USCAR-2;<br>Rev. 6; §5.4.1 |

### 3. REVISION RECORD

| <u>LTR</u> | <u>REVISION RECORD</u>        | <u>DWN</u>   | <u>APP</u>  | <u>DATE</u> |
|------------|-------------------------------|--------------|-------------|-------------|
| A          | Initial Release               | Sathya Raj N | Parusuram T | 18022020    |
| B          | Product-Specification updated | Georg Puckel | Konrad Roth | 11042022    |
|            |                               |              |             |             |
|            |                               |              |             |             |