



# PRODUCT SPECIFICATION



## MX150 16 WAY HYBRID CONNECTOR SYSTEM

REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: 114393 DATE: 3/10/2017	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>1 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>	CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>	APPROVED BY: <b>K. DEKOSKI</b>



# PRODUCT SPECIFICATION

## Table of Contents

1.0	Scope .....	3
2.0	Product Description.....	3
2.1.	Direct Connect (wire to board application).....	3
2.2.	Inline Applications (wire to wire application) .....	3
2.3.	Receptacle Assembly.....	4
2.4.	Blade Assembly .....	4
2.5.	Product Name and Series Numbers.....	5
3.0	Integral Components and Accessories.....	6
3.1.	Integral Components.....	6
3.1.1.	Receptacle Terminals.....	6
3.1.2.	Blade Terminals .....	7
3.1.3.	Applicable Wires .....	8
3.2.	Accessories .....	8
3.2.1.	Wire Harness Retention Clip – Recommended .....	8
3.2.2.	Backshell – Not Available .....	8
3.2.3.	Cavity Plugs .....	8
4.0	Applicable Documents and Specifications.....	9
5.0	Ratings .....	9
5.1.	Voltage – Operating .....	9
5.2.	Voltage – Isolation Resistance .....	9
5.3.	Current Rating.....	9
5.4.	Temperature .....	9
5.5.	Flammability.....	9
6.0	Performance .....	10
6.1.	Electrical .....	10
6.2.	Mechanical.....	11
6.3.	Environmental.....	12
6.4.	This Product Conforms to Din 40 050 1993 with the Following Conditions.....	13
7.0	Packaging.....	13
8.0	Gages and Fixtures.....	13
9.0	Other Information.....	13

REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: <b>114393</b> DATE: <b>3/10/2017</b>	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>2 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>	CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>	APPROVED BY: <b>K. DEKOSKI</b>



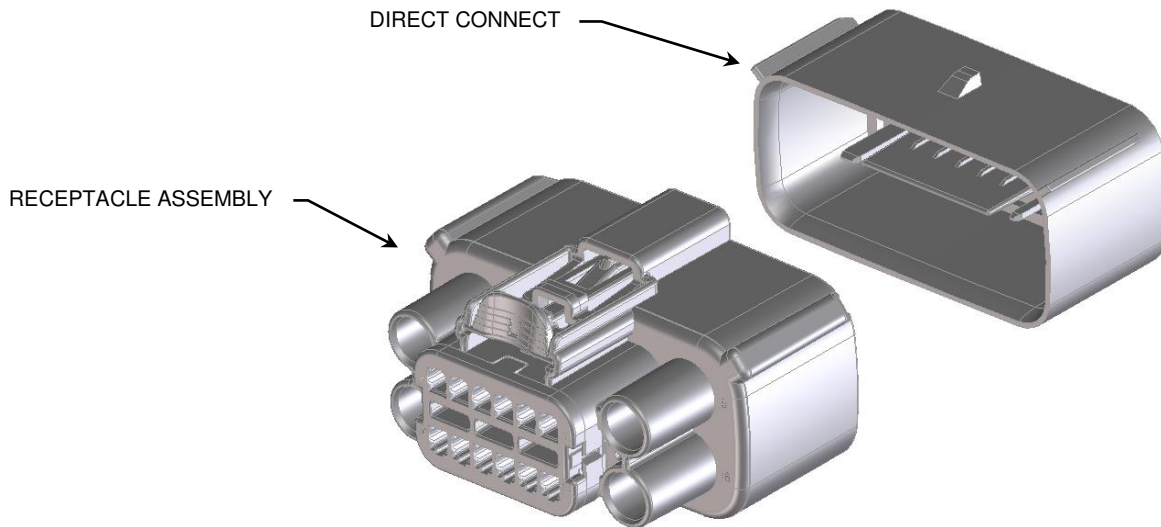
# PRODUCT SPECIFICATION

## 1.0 SCOPE

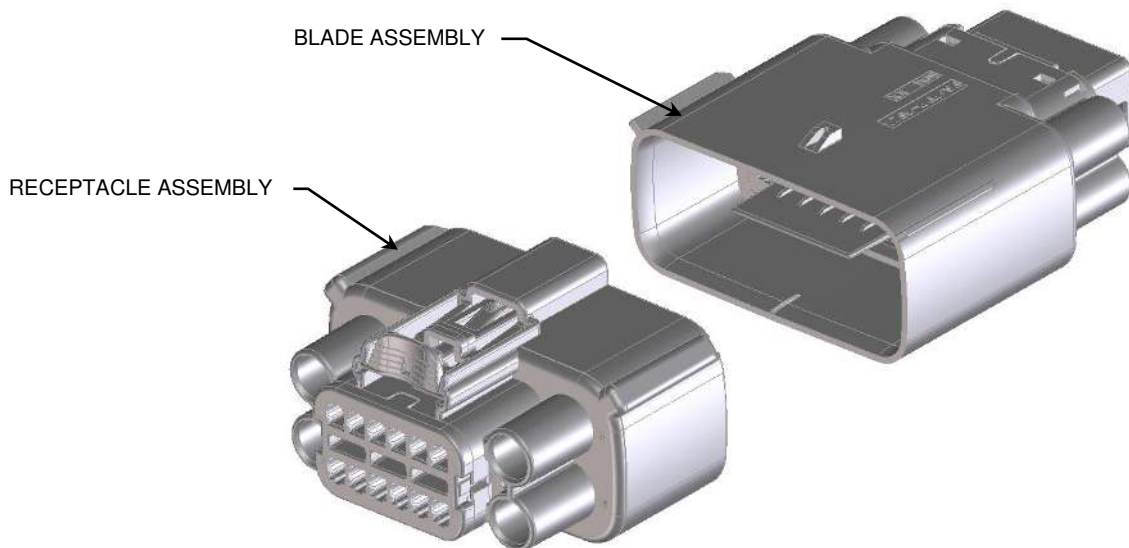
This product specification covers the 3.50 mm (0.138 inch) centerline (pitch) 16 way hybrid MX150 sealed product line with an in-line connection system terminated with wires using crimp technology.

## 2.0 PRODUCT DESCRIPTION

### 2.1. DIRECT CONNECT (WIRE TO BOARD APPLICATION)



### 2.2. INLINE APPLICATIONS (WIRE TO WIRE APPLICATION)

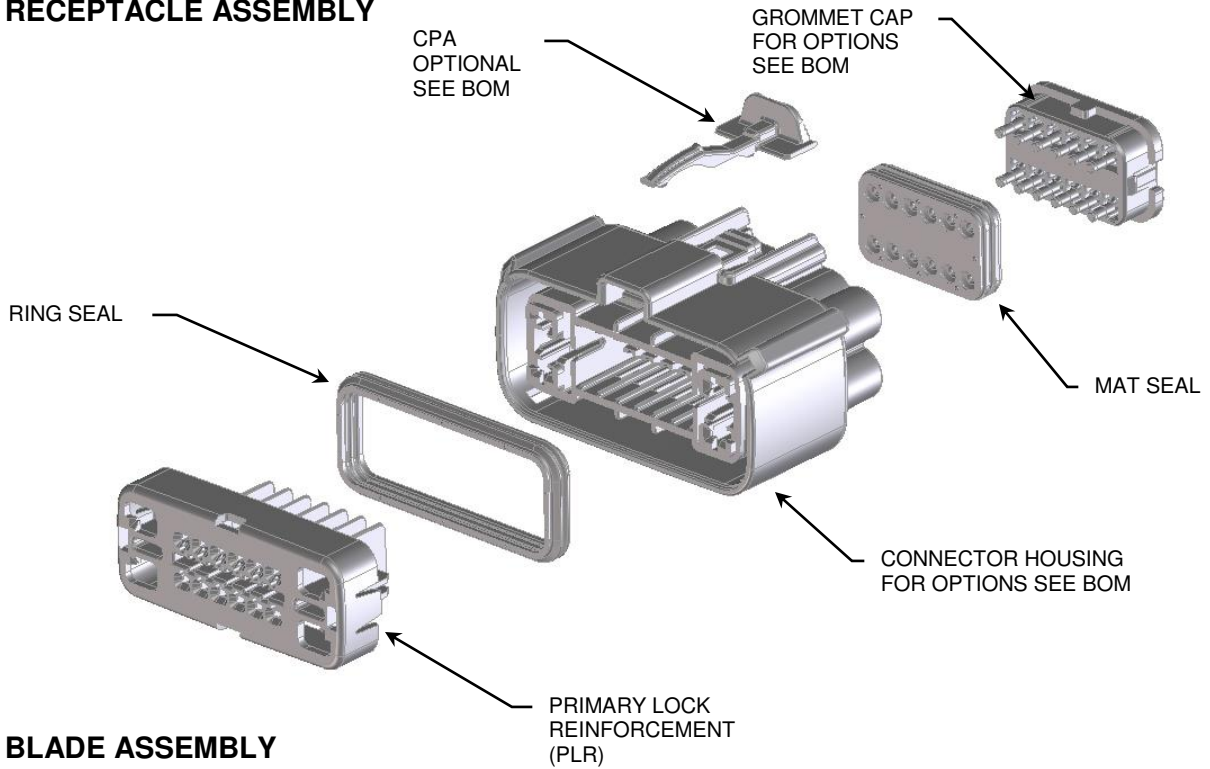


REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: 114393 DATE: 3/10/2017	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>3 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>	CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>	APPROVED BY: <b>K. DEKOSKI</b>

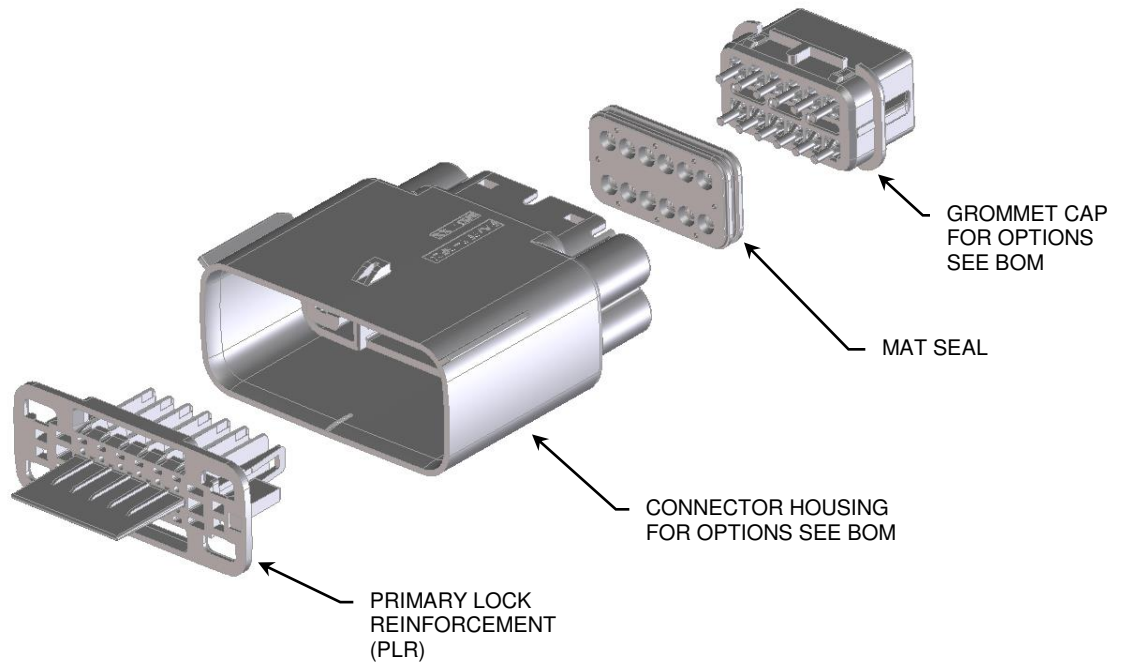


# PRODUCT SPECIFICATION

## 2.3. RECEPTACLE ASSEMBLY



## 2.4. BLADE ASSEMBLY



REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: 114393 DATE: 3/10/2017	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>4 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>	CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>	APPROVED BY: <b>K. DEKOSKI</b>



# PRODUCT SPECIFICATION

## 2.5. PRODUCT NAME AND SERIES NUMBERS

Refer to listed document number for part availability, dimensions, material, marking information, packaging information, interface definition, and configuration options etc.

Product Name	Document Number	Series
16 Way Hybrid Female Assembly	SD-33476-161/181*	33476*
16 Way Hybrid Female Assembly	<a href="#">SD-34985-8001</a> – Assembly Drawing <a href="#">SD-34985-8002</a> – Bill of Materials	34985
16 Way Hybrid Male Assembly	<a href="#">SD-34986-8001</a> – Assembly Drawing <a href="#">SD-34986-8002</a> – Bill of Materials	34986

\*Obsolete – new series is 34985

REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: <b>114393</b> DATE: <b>3/10/2017</b>	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>5 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>	CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>	APPROVED BY: <b>K. DEKOSKI</b>



# PRODUCT SPECIFICATION

## 3.0 INTEGRAL COMPONENTS AND ACCESSORIES

Integral components and accessories are sold separately.

### 3.1. INTEGRAL COMPONENTS

#### 3.1.1. Receptacle Terminals

For crimping information see the Receptacle Terminal Application Specification listed in section [4.0](#). Molex recommends reverse reeling direction for terminal reel order.

Terminal Information	Manufacturer	Terminal Description	Sealing	Document Number	Revision
MX150 Receptacle Terminal	Molex	High Performance, Sn, M3 Grip Code	Mat Seal	<a href="#">SD-33012-002</a>	C1
		High Performance, Sn, 22 Grip Code			
		High Performance, Sn, 18 Grip Code			
		High Performance, Sn, 14 Grip Code			
		High Performance, Au*, M3 Grip Code			
		High Performance, Au*, 22 Grip Code			
		High Performance, Au*, 18 Grip Code			
		High Performance, Au*, 14 Grip Code			
TYCO 2.8mm Receptacle Terminal	Terminals: TYCO Cable Seal: Yazaki	Sn, 22 awg	Cable Seal p/n: 7158-3111-60	<a href="#">TE Connectivity</a> Drawing C-1326032  Cable Seal Ford Drawing: 97BG-10C930-EA	
		Sn, 20 awg	Cable Seal p/n: 7158-3111-60		
		Sn, 18 awg	Cable Seal p/n: 7158-3112-70		
		Sn, 16 awg	Cable Seal p/n: 7158-3112-70		
		Sn, 14 awg	Cable Seal p/n: 7158-3113-40		
		Sn, 12 awg	Cable Seal p/n: 7158-3110-40		

\*Shorting bar applications

REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: <b>114393</b> DATE: <b>3/10/2017</b>	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>6 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>	CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>	APPROVED BY: <b>K. DEKOSKI</b>



# PRODUCT SPECIFICATION

## 3.1.2. Blade Terminals

For crimping information see the Blade Terminal Application Specification listed in section [4.0](#). Molex recommends reverse reeling direction for terminal reel order.

Terminal Information	Manufacturer	Terminal Description	Sealing	Document Number	Revision
MX150 Blade Terminal	Molex	High Performance, Sn, M3 Grip Code	Mat Seal	<a href="#">SD-33000-001</a>	D1
		High Performance, Sn, 22 Grip Code			
		High Performance, Sn, 18 Grip Code			
		High Performance, Sn, 14 Grip Code			
		Shorting Bar Blade, High Performance, Au*, 18 Grip Code		<a href="#">SD-31296-001</a>	H
TYCO 2.8mm Blade Terminal	Terminals: TYCO Cable Seal: Yazaki	Sn, 22 awg	Cable Seal p/n: 7158-3111-60	<a href="#">TE Connectivity</a> Drawing C-1326031  <b>Cable Seal Ford Drawing:</b> 97BG-10C930-EA	
		Sn, 20 awg	Cable Seal p/n: 7158-3111-60		
		Sn, 18 awg	Cable Seal p/n: 7158-3112-70		
		Sn, 16 awg	Cable Seal p/n: 7158-3112-70		
		Sn, 14 awg	Cable Seal p/n: 7158-3113-40		
		Sn, 12 awg	Cable Seal p/n: 7158-3110-40		

\*Shorting bar applications

REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: <b>114393</b> DATE: <b>3/10/2017</b>	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>7 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>	CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>	APPROVED BY: <b>K. DEKOSKI</b>



# PRODUCT SPECIFICATION

### 3.1.3. Applicable Wires

#### 3.1.3.1. Wire Size

See Section [6.0](#) for temperature range and recommended wire type within this system.

#### 3.1.3.2. ISO Wire

Per the listed wire specifications where the insulation diameter is within 1.20mm to 3.00mm

- GMW15626 February 2008
  - o FLR2X-A
- ES-AU5T-1A348-AA Rev D
  - o 3TAD

#### 3.1.3.3. SAE Wire

Per the listed wire specifications where the insulation diameter is within 1.50mm to 3.30mm.

- ESB-ML123-A 2003
- SAE J1128 DEC 2005
  - o TXL

#### 3.1.3.4. Terminal Service Tool

See the Connector Application Specification listed in section [4.0](#).

## 3.2. ACCESSORIES

### 3.2.1. Wire Harness Retention Clip – Recommended

For further information contact your sales engineer.

### 3.2.2. Backshell – Not Available

### 3.2.3. Cavity Plugs

\*Seal plugs are not to be used to replace shorting bar terminals.

Information	Description	Document Number
MX150 <b>Blade</b> cavity Plug, Natural	34345-0001	<a href="#">SD-34345-001</a>
<b>MX150 Receptacle cavity Plug, Dark Grey</b>	<b>34345-4001</b>	<a href="#">SD-34345-001</a>
Yazaki 2.8 Cavity Seal Plug	Seal Plug p/n: 7158-3114-90	<a href="#">Yazaki</a> Drawing: 7158-3114-90

REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: <b>114393</b> DATE: <b>3/10/2017</b>	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>8 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>	CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>	APPROVED BY: <b>K. DEKOSKI</b>





# PRODUCT SPECIFICATION

## 4.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

Document Title	Document Number
UL File Number	Not Applicable
CSA File Number	Not Applicable
TUV License number	Not Applicable
IMDS Report	Available upon request
Environmental Compliance	Available on molex.com
Connector Application Specification	<a href="#">AS-33472-100</a>
Cavity Plug Information	<a href="#">SD-34345-001</a>
MX150 Terminal Product Specification	<a href="#">PS-33012-002</a>
MX150 Receptacle Terminal Application Specification	<a href="#">AS-33012-002</a>
MX150 Blade Terminal Application Specification	<a href="#">AS-33000-001</a>
TYCO 2.8mm Receptacle Terminal Application Specification	<a href="#">TE Connectivity</a> Document 114-13013
TYCO 2.8mm Blade Terminal Application Specification	
Connector Test Summary	TBD
PLR Transit Related Product Specification	<a href="#">PS-34646-001</a>
MX150 CPA Installation Guide	<a href="#">AS-33611-001</a>

## 5.0 RATINGS

### 5.1. VOLTAGE – OPERATING

Operating Voltage: 14 Volts DC Maximum

### 5.2. VOLTAGE – ISOLATION RESISTANCE

100MΩ Minimum when 500 Volts DC between adjacent terminals and terminals to ground

### 5.3. CURRENT RATING

See the Terminal Product Specification listed in section [4.0](#).

### 5.4. TEMPERATURE

Non-operating: - 40 C° to + 125 C°

Operating: - 40 C° to + 125 C°

### 5.5. FLAMMABILITY

The burn rate of the plastic material when tested to ISO 3795 shall not exceed 100 mm/min.

REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: <b>114393</b> DATE: <b>3/10/2017</b>	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>9 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>	CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>	APPROVED BY: <b>K. DEKOSKI</b>



# PRODUCT SPECIFICATION

## 6.0 PERFORMANCE

Operating Conditions	Terminal Size	Wire Range	Series	Recommended Wire Type*	Recommended Terminal Plating Type
Temperature Class III Vibration Class I	1.5mm	1.20 – 2.69 mm	34985/34986	FLR2X	Sn*
		1.40 – 2.69 mm	ALL		
	2.8mm	1.50 – 3.30 mm			

\*Must be compliant to the wire specification listed in section [3.1.3](#)

\*\*Au for shorting bar applications

## 6.1. ELECTRICAL

ITEM	FUNCTION	DESCRIPTION	REQUIREMENT
1	<b>Contact Resistance (Low Level)</b>	Mate connectors: limiting the open circuit voltage of <b>20 mV</b> and a maximum current of <b>100 mA</b> .	<b>10 milliohms MAXIMUM</b>
2	<b>Contact Resistance @ Rated Current (Voltage Drop)</b>	Mate connectors: apply a <b>5 ampere/ 1.0 mm<sup>2</sup></b> current	<b>10 milliohms MAXIMUM</b>
3	<b>Isolation Resistance</b>	Apply a voltage of <b>500 VDC</b> between adjacent terminals and between terminals to ground.	<b>20 Meg ohms MINIMUM</b>
4	<b>Temperature Rise (via Current Cycling)</b>	Mate terminals: measure the temperature rise at the rated current after: <b>1008</b> hours of bench top testing ( <b>45</b> minutes ON and <b>15</b> minutes OFF per hour).	Temperature rise over Ambient: <b>+55 C° MAXIMUM</b>

REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: <b>114393</b> DATE: <b>3/10/2017</b>	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>10 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>		CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>
		APPROVED BY: <b>K. DEKOSKI</b>	



# PRODUCT SPECIFICATION

## 6.2. MECHANICAL

ITEM	FUNCTION	DESCRIPTION	REQUIREMENT
5	Connector Mate/ Unmate Forces	Mate and unmate connector (male to female).	75 Newtons MAXIMUM
			Unmate 110 Newtons MINIMUM
6	Terminal Retention Force (in Housing)	Axial pullout force on the terminal in the housing.	90 Newtons MINIMUM
7	Terminal Insertion Force (into Housing)	Apply an axial insertion force on the terminal.	30 Newtons MAXIMUM
8	Connector Audible Feedback	The connector lock must provide audible feedback during connector mating.	7dB over Ambient (C scale)
9	Polarization Feature Effectiveness	Connector must be polarized to prevent mating with similar connectors or incorrect orientation	145 Newtons MINIMUM
10	Terminal Position Assurance (TPA) Insertion Force (into housing)	The force to insert the TPA from the preload (as shipped) position to the final position.	60 Newtons MAXIMUM
11	Terminal Position Assurance (TPA) Extraction Force (in housing)	The force to extract the TPA from the final position to the preload position (as shipped).	60 Newtons MAXIMUM
12	Connector Position Assurance (CPA) Insertion Force (into housing)	The force to insert the CPA from the preload (as shipped) position.	40 Newtons MINIMUM (unmated)
			22 Newtons MAXIMUM (fully mated)
13	Connector Position Assurance (CPA) Disengage Force (in housing)	The force to disengage the CPA from the final position to the preload (as shipped) position.	3 Newtons MINIMUM
			40 Newtons MAXIMUM
14	Connector Position Assurance (CPA) Extraction Force (in housing)	The force to remove the CPA from the preload (as shipped) position until fully detached.	30 Newtons MINIMUM

REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: 114393 DATE: 3/10/2017	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>11 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>	CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>	APPROVED BY: <b>K. DEKOSKI</b>



# PRODUCT SPECIFICATION

15	<b>Locator Clip Insertion Force (in housing)</b>	The force to insert the locator clip to the final position.	<b>60 Newtons MAXIMUM</b>
16	<b>Locator Clip Extraction Force (in housing)</b>	The force to extract the locator clip from the final position to out.	<b>110 Newtons MINIMUM</b>

## 6.3. ENVIRONMENTAL

ITEM	FUNCTION	DESCRIPTION	REQUIREMENT						
16	<b>Field Correlated Life Test (FCLT)</b>	Mate connectors up to <b>1</b> cycle and expose to environment per SAE/USCAR-20.	<b>20 milliohms MAXIMUM</b>						
17	<b>Durability</b>	Mate connectors up to <b>10</b> cycles prior to environmental tests.	<b>10 milliohms MAXIMUM &amp; Discontinuity &lt; 1 microsecond</b>						
18	<b>Thermal Shock (Electrical)</b>	Mate connectors per durability; expose to <b>100</b> cycles of: <table border="1" style="margin-left: 20px;"> <tr> <td><u>Temperature C°</u></td> <td><u>Duration (Minutes)</u></td> </tr> <tr> <td>-40 +0/-3</td> <td>30</td> </tr> <tr> <td>+125 +3/-0</td> <td>30</td> </tr> </table>	<u>Temperature C°</u>	<u>Duration (Minutes)</u>	-40 +0/-3	30	+125 +3/-0	30	<b>10 milliohms MAXIMUM &amp; Discontinuity &lt; 1 microsecond</b>
<u>Temperature C°</u>	<u>Duration (Minutes)</u>								
-40 +0/-3	30								
+125 +3/-0	30								
19	<b>High Temperature Exposure (Sealing)</b>	Mate connectors per durability and expose to <b>1008</b> hours at <b>125 ± 2°C</b>	<b>28 kPa for 15 seconds MINIMUM pressure/vacuum &amp; Submersion for 30 minutes &amp; Isolation Resistance of 20 Meg ohms @ 500 VDC MINIMUM</b>						
20	<b>Temperature/ Humidity (Sealing)</b>	Mate connectors per durability and expose connector system to forty <b>8-hour</b> cycles of combined heating and humidity exposure <b>-40 °C</b> and <b>125 °C</b> at <b>0% to 90% RH</b>	<b>28 kPa for 15 seconds MINIMUM pressure/vacuum &amp; Submersion for 30 minutes &amp; Isolation Resistance of 20 Meg ohms @ 500 VDC MINIMUM</b>						
21	<b>Fluid Resistance (Sealing)</b>	Submerge connector assemblies in the following fluids: gasoline, *diesel fuel, engine oil, ethanol, power steering fluid, automatic transmission fluid, engine coolant, and brake fluid.	<b>Submersion for 30 minutes &amp; Isolation Resistance of 20 Meg ohms @ 500 VDC MINIMUM</b>						
22	<b>Vibration/ Mechanical Shock (Electrical)</b>	Mate connectors per durability. Connector assembly shall be vibrated for ( <b>8</b> hours / axes @ <b>1.81 Grms</b> , <b>10</b> shocks @ <b>35 Gs</b> / axes) Not Coupled to Engine.	<b>10 milliohms MAXIMUM &amp; Discontinuity &lt; 1 microsecond</b>						

REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: <b>114393</b> DATE: <b>3/10/2017</b>	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>12 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>	CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>	APPROVED BY: <b>K. DEKOSKI</b>



# PRODUCT SPECIFICATION

\*Silicone seals swell in the presence of diesel fuel. This condition may cause excessive connector mate/unmate forces.

## 6.4. THIS PRODUCT CONFORMS TO DIN 40 050 1993 WITH THE FOLLOWING CONDITIONS.

- Meets IP6K7

## 7.0 PACKAGING

- Molex packaging drawing numbers are located on the Assembly Drawing listed in section 0.
- Parts should be packaged to protect against damage during handling, transit, and storage.

## 8.0 GAGES AND FIXTURES

All applicable gages and fixtures are referenced in the appropriate control plans.

## 9.0 OTHER INFORMATION

To add new knock out patterns contact your sales engineer.

MOLEX REPRESENTS AND WARRANTS TO BUYER FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF DELIVERY OF THE PRODUCTS TO BUYER THAT

- 1) THE PRODUCTS SHALL CONFORM TO THE MOLEX SPECIFICATIONS FOR THE PRODUCTS IN FORCE AT THE DATE OF DELIVERY OF THE PRODUCTS TO BUYER, AND
- 2) THE PRODUCTS SHALL BE OF FREE FROM MATERIAL DEFECTS IN MATERIALS AND MANUFACTURING.

EXCEPT AS EXPRESSLY PROVIDED ABOVE, MOLEX MAKES NO WARRANTY, EXPRESS OR IMPLIED, REGARDING THE PRODUCTS. ALL IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED. IN ADDITION, MOLEX EXPRESSLY DISCLAIMS ANY WARRANTY OBLIGATIONS IN THOSE INSTANCES WHERE THE FAILURES RESULTED FROM THE MODIFICATION OF THE PRODUCTS BY BUYER OR ITS CUSTOMERS, IMPROPER HANDLING, USE OR INSTALLATION OF THE PRODUCTS BY BUYER OR ITS CUSTOMERS, OR ANY OTHER CAUSE BEYOND THE CONTROL OF MOLEX.

REVISION: <b>F3</b>	ECR/ECN INFORMATION: EC No: <b>114393</b> DATE: <b>3/10/2017</b>	TITLE: <b>MX150 16 WAY HYBRID CONNECTOR SYSTEM</b>	SHEET No. <b>13 of 13</b>
DOCUMENT NUMBER: <b>PS-33476-000</b>	CREATED / REVISED BY: <b>M. KOWALSKY</b>	CHECKED BY: <b>M. VANSLAMBROUCK</b>	APPROVED BY: <b>K. DEKOSKI</b>