1.0 SCOPE

This Product Specification covers the 3.5 mm (0.138 inch) centerline (pitch) single row MX150 unsealed wire to wire connection system terminated with 14 to 22 AWG using crimp technology.

2.0 PRODUCT DESCRIPTION

PRODUCT NAME AND SERIES NUMBER(S)

Product name	Series
MX150 UNSEAL 2 CKT RECEPTACLE	34796
MX150 UNSEAL 3 CKT RECEPTACLE	34796
MX150 UNSEAL 4 CKT RECEPTACLE	34796
MX150 UNSEAL 2 CKT MALE GM CLIP	34797
MX150 UNSEAL 3 CKT MALE GM CLIP	34797
MX150 UNSEAL 4 CKT MALE GM CLIP	34797
MX150 UNSEAL 2 CKT MALE FORD CLIP	34797
MX150 UNSEAL 3 CKT MALE FORD CLIP	34797
MX150 UNSEAL 4 CKT MALE FORD CLIP	34797

ASSOCIATED TERMINALS

Product Description	Vendor Part Number
MX150 RECEPTACLE TIN 14/16AWG	330123021(2021)
MX150 RECEPTACLE TIN 18/20 AWG	330123022(2022)
MX150 RECEPTACLE TIN 22 AWG	330123023(2023)
MX150 BLADE TERMINAL TIN 22 AWG	33000-0003(1003)
MX150 BLADE TERMINAL TIN 16/18/20 AWG	33000-0002(1002)
MX150 BLADE TERMINAL TIN 14 AWG	33000-0001(1001)

2.1 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

Housings: 0% glass fiber PBT

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

Description	Document Number
Sales drawing of receptacle connector.	SD-34796-001
Sales drawing of blade connector	SD-34797-001
Application specification	AS-34796-001
Carton packaging specification	PK-31301-695
Transit requirements	PS-31301-865

4.0 RATINGS

4.1 VOLTAGE

500 VDC MAXIMUM; Per GMW3191, All measured isolation resistances shall be >100Mega Ohms,14 VDC MAXIMUM; Per NDS24012, An initial leak current of ⩽ 10μA and a post endurance leak current of ⩽ 1mA.

4.2 CURRENT AND APPLICABLE WIRES

Current is dependent on connector size, ambient temperature, blade size and related factors. Actual maximum current rating is application dependent and should be evaluated for each use.

The current listed below is expected to cause a 50°C average temperature rise in a fully populated 2 circuit connection system per RSA 36-05-019 Rev. G requirement.

AWG	Amps	Outside Insulation Diameter
14	22	2.34-2.69 mm (0.092-0.106 inch)
16	17	2.18-2.34 mm (0.086-0.092 inch)
18	15	1.91-2.06 mm (0.075-0.081 inch)
20	12.5	1.70-1.85 mm (0.067-0.073 inch)
22	10	1.50-1.65 mm (0.059-0.065 inch)

4.3 TEMPERATURE

Operating: - 40°c to + 105°c
No operating: - 40°c to + 105°c

4.4 FLAMMABILITY

Per GMW3191, the burn rate of the material test samples when tested shall be < 100 mm/min.

5.0 PERFORMANCE

5.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	**Contact Resistance (Low Level)**	Mate connectors: apply a maximum voltage of 20 mV and a current of 100 mA. (Measurement locations in Section 7.0)	8 milliohms MAXIMUM [initial]
2	**Contact Resistance @ Rated Current**	Mate connectors: apply a maximum voltage of 20 mV at rated current. (Measurement locations in Section 7.0)	8 milliohms MAXIMUM [initial]
3	**Insulation Resistance**	Unmate & unmount connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	100 Mega ohms MINIMUM
4	**Temperature Rise (via Current Cycling)**	Mate connectors: measure the temperature rise at the rated current after: 1008 hours Current Cycling (45 minutes ON and 15 minutes OFF per hour).	Temperature rise over Ambient: +50°C MAXIMUM
5	**Dielectric Strength**	Apply an AC 1000V for 60s across each adjacent cavity and between the terminals to ground.	No dielectric breakdown or flash-over shall occur between cavities or between the cavities and the outside of a connector at any time during the test.
6	**Connector Current Capability (Electrical)**	Mate connectors per durability; Expose to 1008 cycles of 45 minutes ON and 15 minutes.	Temperature rise over Ambient: +55°C MAXIMUM Voltage drop: 8 milliohms maximum
7	**Connector Current Capability (Mechanical)**	Mate connectors per durability; Expose to 1008 cycles of 45 minutes ON and 15 minutes.	Temperature rise over Ambient: +55°C MAXIMUM Terminal - Connector Extraction Force: 80N minimum

5.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	**Connector Mate/ Unmate Forces**	Mate and unmate connector (male to female) at a rate of 50 ± 6 mm (2 ± ¼ inches) per minute.	22 N MAXIMUM mate force
			110 N MINIMUM unmate force

2	**Terminal Retention Force (in Housing)**	Axial pullout force on the terminal in the housing at a rate of 50 ± 6 mm (1 ± ¼ inches) per minute.	TPA in open position 60 Newton MINIMUM	
			TPA in Final-Lock 80 Newton MINIMUM	
3	**Terminal Insertion Force (into Housing)**	Apply an axial insertion force on the terminal at a rate of 50 ± 6 mm (1 ± ¼ inches).	15 N MAXIMUM insertion force	
4	**Terminal Insertion Force (with TPA in final lock)**	Apply an axial insertion force on the terminal at a rate of 50 ± 6 mm (1 ± ¼ inches).	25 N MINIMUM insertion force	
5	**Connector Audible Feedback**	The connector lock must provide audible Feedback during connector mating at a rate of 50 ± 6 mm (2 ± ¼ inches) per minute.	7dB over Ambient Dry as molded	
			5dB over Ambient Post moisture conditioning	
6	**Polarization Feature Effectiveness**	Connector must be polarized to prevent mating with similar connectors - 0° Misorientation for all possible male and female configurations.	50 newton minimum (>=3 times of average mate force)	
7	**Terminal Position Assurance (TPA) Insertion Force (into housing)**	The hinged TPA is designed to resist seating during shipment and must be actuated by the operator in order to fully seat. The force to either insert the TPA from the opened (as shipped) position to the closed position or extract the TPA from closed to opened at a rate of 50 ± 6 mm (2 ± ¼ inch) per minute.	Female	Male
			TPA insertion w/o terminals: 5N minimum	TPA insertion w/o terminals: 5N minimum
			TPA fully engaged w/ terminals: 55N maximum	TPA insertion w/ terminals: 40N maximum
			TPA fully engaged w/ partially installed terminals: 100N minimum	TPA fully engaged w/ partially installed terminals: 100N minimum
8	**Terminal Position Assurance (TPA) Extraction Force (in housing)**	The force to completely extract the TPA from final position at a rate of 50 ± 6 mm (2 ± ¼ inch) per minute.	30 Newton MINIMUM	

9	**Pry Resistance I**	A pair of connectors shall have one of them secured and the other inserted. Under these conditions, they shall be pried axially, rectangularity, front and rear and right and left around the top with a force of 22 N After prying the connectors to two stages of fitting, pull them out. This is one cycle. Subject connectors to 10 cycles and Perform Contact Resistance @ Rated Current (Voltage Drop) and Connector Mate/Unmate Forces (with latch only)	While being tested, the connectors shall not have any problem in being made electrically alive Voltage Drop 30 milliohms MAXIMUM Mate 22 Newton MAXIMUM Unmate 110 Newton MINIMUM
10	**Pry Resistance II**	Pull the female connector wire at a 45° angle in the direction which minimizes the male and female terminal contact at a speed of 5mm/min to 100N. Then decrease the pulling load at the same speed to 0N (No Force)	There shall be no load interruptions in the waveform (NDS)
11	**Connector Drop Test**	System Assembly (Mated & Fully populated)–Subject the assembly to a fall of 1 meter on each face, except for electrical wire side, onto a concrete floor. Connector Assembly (Unmated & Fully Populated) - Subject the assembly to a fall of 1 meter on each face, except for electrical wire side, onto a concrete floor.	No damage or incipient rupture shall be observed.

5.3 ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	**Durability**	Mate connectors up to 11 cycles prior to environmental tests.	8 milliohms MAXIMUM
2	**Thermal Shock (Electrical)**	Mate connectors per durability; expose to 1000 cycles of: Temperature ℃ — Duration (Minutes) -40 +0/-3 — 30 +105 +3/-0 — 30 Perform Contact Resistance (Low Level)	Dry Circuit Resistance 8 milliohms MAXIMUM & Discontinuity < 1 microsecond
3	**Thermal Shock (Physical)**	Mate connectors per durability; expose to 300 cycles of: Temperature ℃ — Duration (Minutes) -40 +0/-3 — 30 +105 +3/-0 — 30 Apply a voltage of 500 VDC per Isolation Resistance	100 Mega ohms MINIMUM

		Apply an AC rms voltage of 1000V at 60Hz per Dielectric Strength	No dielectric breakdown or flash-over shall occur between cavities or between the cavities and the outside of a connector at any time during the test.
4	**Random Vibration / Mechanical Shock (Not Coupled to Engine - Electrical)**	Mate connectors per durability. Perform Contact Resistance (Low Level) Connector assembly shall be subject to the following vibration profile: Mechanical Shock: Acceleration: 25 G Nominal Shock Duration: 15ms Nominal Shock Shape: Half Sine Number of shocks per axis: 792 Random Vibration with Thermal Cycling Temperature Range: -40/+105℃ Test Duration: 24h for each X,Y,Z axis of the parts RMS Acceleration = 20.9m/s^2 Perform Contact Resistance (Low Level) Perform Contact Resistance @ Rated Current (Voltage Drop)	Dry Circuit Resistance 8 milliohms MAXIMUM No instantaneous disconnection of 7 Ω or more for 1 µs Max No instantaneous disconnection of 7 Ω or more for 1 µs Max Dry Circuit Resistance 8 milliohms MAXIMUM Voltage Drop 8 milliohms MAXIMUM
5	**Temperature/ Humidity Cycling (Electrical)**	Mate connectors per durability. Subject connector system to 320 cycles of: 60% RH 4hours @ 23℃, 97% RH 10 hours @ ℃,2 hour @ -40℃, 2 hours @ 105℃ Perform Contact Resistance (Low Level) Perform Contact Resistance @ Rated Current (Voltage Drop)	Dry Circuit Resistance 8 milliohms MAXIMUM Voltage Drop 8 milliohms MAXIMUM
6	**Temperature/ Humidity Cycling (Physical)**	Mate connectors per durability. Subject connector system to 320 cycles of: 60% RH 4hours @ 23 ℃; 97% RH 10 hours @ 55 ℃, 2 hour @ -40 ℃; 2 hours @ 105℃. Apply a voltage of 500 VDC per Isolation Resistance	100 Mega ohms MINIMUM
		Apply an AC rms voltage of 1000V at 60 Hz per Dielectric Strength.	No dielectric breakdown or flash-over shall occur between cavities or between the cavities and the outside of a connector at any time during the test.
7	**High Temperature Exposure (Electrical)**	Mate connectors per durability. Subject connector system to 105 ℃ for 1008 hours. Perform Contact Resistance (Low Level) Perform Contact Resistance @ Rated Current (Voltage Drop)	Dry Circuit Resistance 8 milliohms MAXIMUM Voltage Drop 8 milliohms MAXIMUM

<table>
<tr><td rowspan="2">8</td><td rowspan="2">High Temperature Exposure (Physical)</td><td>Mate connectors per durability. Subject connector system to 105 ℃ for 1008 hours.
Apply a voltage of 500 VDC per Isolation Resistance post 1008 hours</td><td>100 Mega ohms MINIMUM</td></tr>
<tr><td>Apply an AC rms voltage of 1000V at 60 Hz per Dielectric Strength</td><td>No dielectric breakdown or flash-over shall occur between cavities or between the cavities and the outside of a connector at any time during the test.</td></tr>
<tr><td>9</td><td>High Temperature Exposure (Mechanical)</td><td>Mate connectors per durability. Subject connector system to 105 ℃ for 1008 hours.
Extract terminal from housing per Terminal Retention Force (in Housing)</td><td>TPA in Final-Lock
70 Newton MINIMUM</td></tr>
<tr><td>10</td><td>Low Temperature Exposure (Electrical)</td><td>Mate connectors per durability. Subject connector system to -40 ℃ for 120 hours.
Perform Contact Resistance (Low Level)
Perform Contact Resistance @ Rated Current (Voltage Drop)</td><td><u>Dry Circuit Resistance</u>
8 milliohms MAXIMUM
<u>Voltage Drop</u>
8 milliohms MAXIMUM</td></tr>
<tr><td>11</td><td>Chemical Resistance (Electrical)</td><td>Perform Contact Resistance (Low Level).
Expose connectors to the following fluids for the specified duration of soak and dry time:
<table>
<tr><td>Resistance To Fluids:</td><td>Time / Temp. in Fluid</td><td>Time / Temp. Drying</td></tr>
<tr><td>Automatic Transmission Oil:</td><td>15 Seconds @ 23°C</td><td>24 Hours @ 105°C</td></tr>
<tr><td>Zinc Chloride:</td><td>15 Seconds @ 23°C</td><td>24 Hours @ 23°C</td></tr>
<tr><td>Fuel:</td><td>7 Days @ 23°C</td><td>7 Days @ 23°C</td></tr>
<tr><td>Engine Coolant:</td><td>5 Minutes @ 23°C</td><td>48 Hours @ 50°C</td></tr>
<tr><td>Windshield Washer Fluid:</td><td>5 Minutes @ 23°C</td><td>48 Hours @ 50°C</td></tr>
<tr><td>Cold Cleaning Agent:</td><td>spray 1 second per connector side</td><td>48 Hours @ 50°C</td></tr>
</table></td><td>No deformation or cracks shall be observed in connector

Delta Dry Circuit Resistance
8 milliohms MAXIMUM

<u>Voltage Drop</u>
8 milliohms MAXIMUM</td></tr>
<tr><td>12</td><td>Corrosion Resistance (Electrical)</td><td>Mate connectors per durability. Subject connector system to corrosion condition.
Dry circuit resistance and voltage drop.</td><td><u>Dry Circuit</u>
8 milliohms MAXIMUM

<u>Voltage Drop</u>
8 milliohms MAXIMUM</td></tr>
</table>

13	**Corrosion Resistance (Physical)**	Mate connectors per durability. Subject connector system to corrosion condition. Isolation resistance dielectric strength and hinge cycling test.	Isolation resistance 100mega ohms minimum Dielectric strength No dielectric breakdown or flash-over shall occur between cavities or between the cavities and the outside of a connector at any time during the test. Hinge cycling 5cycles minimum

6.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage. In the event that the part is found damage during transit, refer to Molex specification PS-31301-865, Available at www.molex.com. <http:// www.molex.com >

7.0 GAGES AND FIXTURES

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

8.0 OTHER INFORMATION

Products conform to the following environmental ratings:

Temperature: 105℃
Vibration: On-Body
Sealing: Un-Sealed
To ensure compliance with our product validation, it is imperative that our product meet the print dimensions. Any non-conformance with the true position of the mating interface will create performance failures that include: increased mate/unmate forces and electrical discontinuities.