



# PRODUCT SPECIFICATION

## 1.0 SCOPE

This product specification covers the 0.50 mm (0.0197 inch) terminal system on a 2.0mm (0.0787 inch) centerline (pitch) single row and dual row Mini 50 unsealed wire to board connection system terminated with 0.35mm<sup>2</sup> to 0.13mm<sup>2</sup> wire using crimp technology.

Connectors in this specification are made from two resin materials – PBT & PA410 (Ecopaxx). Both will meet performance data unless specifically noted in the description or requirement columns.

## 2.0 PRODUCT DESCRIPTION

### 2.1 PRODUCT NAME AND SERIES NUMBERS

Product Name	Series
24 Way Right Angle Header Assembly	34826
20 Way Right Angle Header Assembly	34826
16 Way Right Angle Header Assembly	34826
12 Way Right Angle Header Assembly	34826
8 Way Right Angle Header Assembly	34793
4 Way Right Angle Header Assembly	34793
24 Way Vertical Header Assembly	34825
20 Way Vertical Header Assembly	34825
16 Way Vertical Header Assembly	34825
12 Way Vertical Header Assembly	34825
8 Way Vertical Header Assembly	34792
4 Way Vertical Header Assembly	34792
24 Way SMT Header Assembly	34897
20 Way SMT Header Assembly	34897
16 Way SMT Header Assembly	34897
12 Way SMT Header Assembly	34897
8 Way SMT Header Assembly	34912
4 Way SMT Header Assembly	34912
2 Way SMT Header Assembly	34912
2 Way Receptacle Connector Assembly	34791
4 Way Receptacle Connector Assembly	34791
8 Way Receptacle Connector Assembly	34791
12 Way Receptacle Connector Assembly	34824
16 Way Receptacle Connector Assembly	34824
20 Way Receptacle Connector Assembly	34824
24 Way Receptacle Connector Assembly	34824

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## 2.2 ASSOCIATED TERMINALS

Product Description	Vendor Part Number
Molex CTX 50 Small Grip Female Receptacle Terminal (.13mm <sup>2</sup> )	560023-0421
Molex CTX 50 Medium Grip Female Receptacle Terminal (.22mm <sup>2</sup> )	560023-0422
Molex CTX 50 Large Grip Female Receptacle Terminal (.35mm <sup>2</sup> )	560023-0448

## 2.3 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

Harness Housings: unfilled PBT – 2, 4, 8, 12, 16, 20, 24ckt connectors  
 25% glass fiber PA410 (Ecopaxx) – 16, 20, 24ckt connectors  
 Header Housing: 30% glass fiber SPS – 2, 4, 8, 12, 16, 20, 24ckt header housings  
 Pins: Copper alloy C26000  
 Tin Plating: Overall Tin with Nickel under-plate  
 CPA: 50% glass fiber PA66

## 2.4 SAFETY AGENCY APPROVALS

UL File Number	Not Applicable
CSA File Number	Not Applicable
TUV License number	Not Applicable

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## 3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

Description	Document Number
2, 4, 8 way single row receptacle assembly sales drawing (charted)	SD-34791-001
12, 16, 20, 24 way dual row receptacle assembly sales drawing (charted)	SD-34824-002
12, 16, 20, 24 way dual row receptacle assembly w/CPA sales drawing (charted)	SD-34824-003
4 & 8 way vertical header assembly sales drawing (charted)	SD-34792-001
12, 16, 20, 24 way vertical header assembly sales drawing (charted)	SD-34825-001
4 & 8 way right angle header assembly sales drawing (charted)	SD-34793-001
12, 16, 20, 24 way right angle header assembly sales drawing (charted)	SD-34826-001
2, 4, 8 way SMT header assembly sales drawing (charted)	SD-34912-001
12, 16, 20, 24 way SMT header assembly sales drawing (charted)	SD-34897-001
4 & 8 way harness sales drawing (charted)	DU5T-14489-CCA
12 way harness sales drawing (charted)	FU5T-14489-AA
Molex CTX 50 terminal sales drawing (charted)	SD-560023-002
Tray packaging specification (header only)	PK-31301-440
Tube packaging specification (header only)	PK-31301-688
Bulk packaging specification (receptacle assembly only)	PK-31301-538
Application specification	AS-34791-020

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## 4.0 RATINGS

### 4.1 VOLTAGE

500 VDC MAXIMUM; Per GMW3191, All measured isolation resistances shall be  $>100\text{M}\Omega$ .  
 14 VDC MAXIMUM; An initial leak current of  $\leq 10\mu\text{A}$  and a post endurance leak current of  $\leq 1\text{mA}$ .

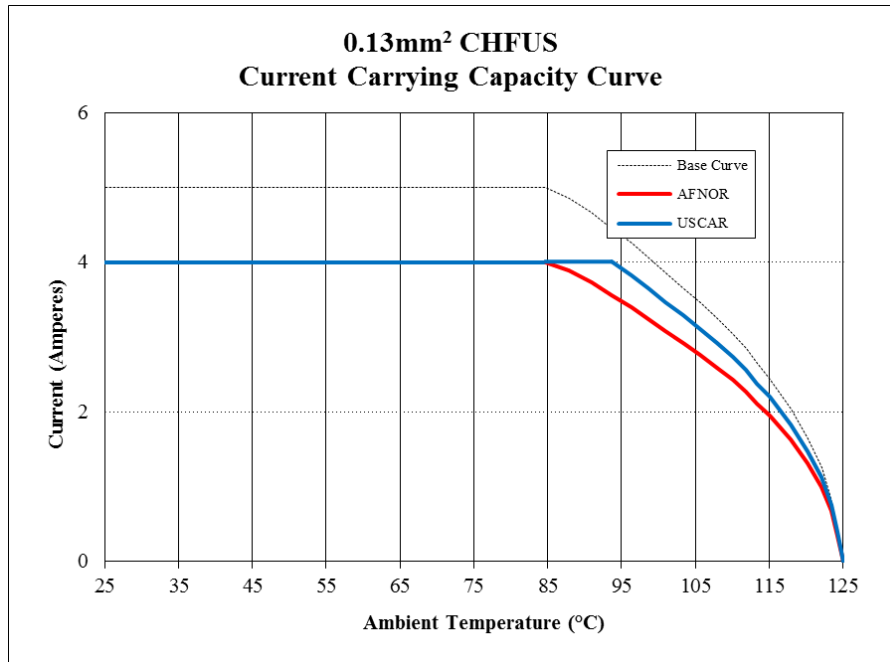
### 4.2 CURRENT AND APPLICABLE WIRES

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 temperature rise in the **terminal only, outside plastic.**

Wire section	Current	Wire range	Insulation Diameter
.35 mm <sup>2</sup>	see derating curve	1.4 mm MAX	(0.055 inch)
.22 mm <sup>2</sup>	see derating curve	1.2 mm MAX	(0.047 inch)
.13 mm <sup>2</sup>	see derating curve	1.05 mm MAX	(0.041 inch)

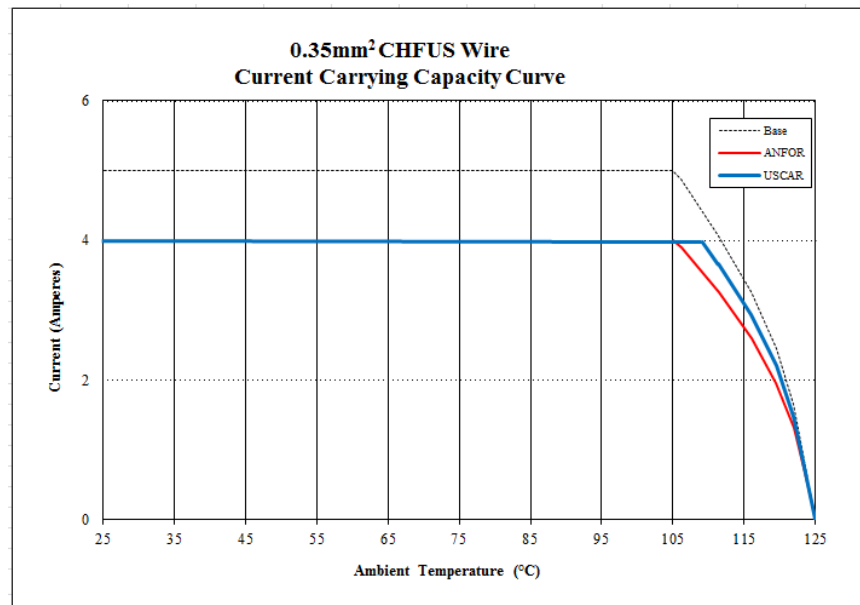
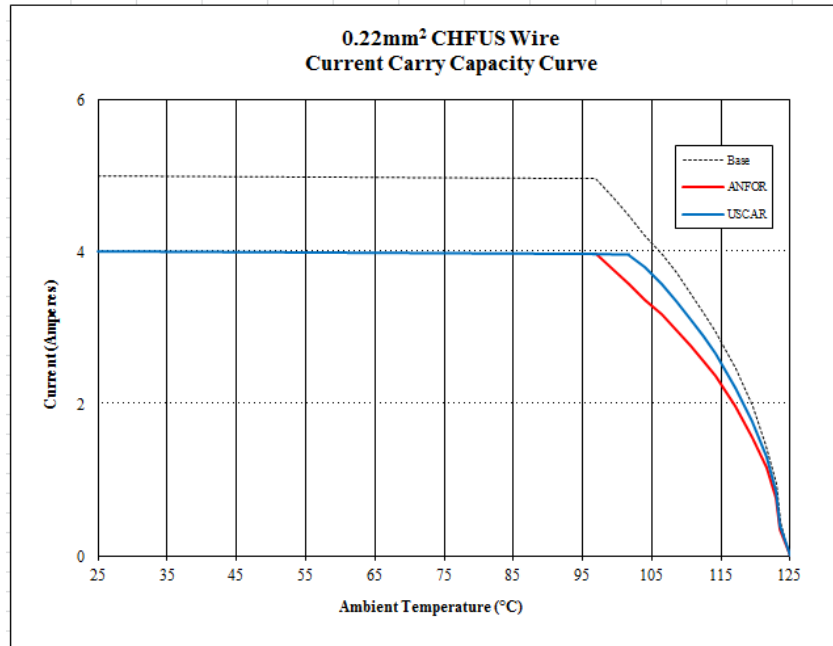
## Derating Curves



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**TEMPERATURE**

Operating: - 40 C<sup>0</sup> to + 105 C<sup>0</sup>  
 Non-operating: - 40 C<sup>0</sup> to + 105 C<sup>0</sup>

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## 5.0 PERFORMANCE

### 5.1 ELECTRICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT										
1	Contact Resistance (Low Level)	Mate terminal: apply maximum voltage of 20 mV and a max current of 100 mA.	20 milliohms MAXIMUM										
2	Contact Resistance @ Rated Current (Voltage Drop)	Mate terminal: apply 3 A of current with a 0.35mm <sup>2</sup> wire	20 milliohms MAXIMUM										
3	Isolation Resistance	Apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	100 Meg ohms MINIMUM										
4	Dielectric Strength	Apply an AC rms voltage of 1000V at 60 Hz 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.										
5	Current Carrying Capability	Mate terminal: Determine the heating curve by measuring the temperature after 1008 cycles (45 minutes ON and 15 minutes OFF per cycle).	Temperature not to exceed 55° over ambient										
6	Connector - Connector Overcurrent Loading	Pass the following current for the specified time below through only one circuit that is arbitrarily selected: (20awg) <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Current (Amps)</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>11.0</td> <td>60 Minutes</td> </tr> <tr> <td>13.5</td> <td>200 Seconds</td> </tr> <tr> <td>15.0</td> <td>5 Seconds</td> </tr> <tr> <td>20.0</td> <td>1 Second</td> </tr> </tbody> </table>	Current (Amps)	Time	11.0	60 Minutes	13.5	200 Seconds	15.0	5 Seconds	20.0	1 Second	Housing shall not start burning
Current (Amps)	Time												
11.0	60 Minutes												
13.5	200 Seconds												
15.0	5 Seconds												
20.0	1 Second												
7	Leak Current	Apply 1000V AC with frequencies 50 to 60Hz, having wave-form close to a sinusoidal, between terminals and between housing and terminals. Conditioning consists of exposure to 60±5°C and 90-95% humidity for one hour in a thermo-static and humido-static tank.	Initial Leak Current 10 microAmp MAXIMUM										
			Post Conditioning 1 milliAmp MAXIMUM										

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## 5.2 MECHANICAL REQUIREMENTS

All testing performed to USCAR-2 Rev 5 and Rev 6 with similar test criteria in all cases

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	Connector Mate/ Unmate Forces	Mate and Unmate connector (male to female) at a rate of 50 ± 5 mm (2 ± ¼ inch) per minute.	<b>Mate Force - Unpopulated Connector:</b> 20 N MAX
			<b>Mate Force - Fully Populated Connector Assembly:</b> 1. Connector/Connector Mate Force (Primary Lock Engaged): 75 N MAX  2. Terminal Partially Installed: 7 N MIN
			<b>Unmate Force - Unpopulated Connector:</b> 1. Primary Lock Deflection: 5 N MAX 2. Primary Lock engaged a. (Non-Bridged): 110 N MIN b. (Bridged): PBT: 100 N MIN PA410: 110 N MIN
			<b>Unmate Force - Fully Populated Connector:</b> a. Primary Lock Disengaged: 75 N MAX b. Primary Lock Engaged With Wire Bundle Pull: 75 N MIN
2	Locking Device Strength (Primary Lock Engaged)	After the 11 <sup>th</sup> mating apply a force to the test sample with the locking device engaged and hold constant for 10+2 seconds.	100 N MIN
3	Primary Lock Disengage Force (CPA Disengaged)	Apply a force to push on the lock mechanism and attempt to unmate the connection	30 N MAX

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4	Terminal Retention Force (in Housing-Dry as Molded)	Axial pullout force on the terminal in the housing at a rate of $50 \pm 5$ mm ( $2 \pm \frac{1}{4}$ inch) per minute.	ISL in Pre-Lock: PBT:10 N MIN PA410:20 N MIN
			After 3 insertions and 2 removals (Post 2 Cycles): 5 N MIN
5	Terminal Insertion Force (into Housing)	Apply an axial insertion force on the terminal at a rate of $50 \pm 5$ mm ( $2 \pm \frac{1}{4}$ inch) per minute.	5 N MAX
6	Forward Stop Force	Apply an axial insertion force on the terminal at a rate of $50 \pm 5$ mm ( $2 \pm \frac{1}{4}$ inch) per minute.	50 N MIN
7	Terminal - Engagement Force with ISL in Final-Lock	Apply an axial insertion force on the terminal at a rate of $50 \pm 10$ mm ( $2 \pm \frac{1}{4}$ inch) per minute.	30 N MIN
8	Connector Audible	The connector lock must provide audible feedback during connector mating by hand Ambient noise must be between 30 and 50 dB	36 dB MIN over Ambient
9	Terminal/Cavity Polarization 180° Misoriented	Connector and terminal must be polarized to prevent mating in improper direction.	10 N MIN
10	Independent Secondary Lock (ISL) Engage Force	The force to insert the ISL from the pre-lock position to the final-lock position at a rate of $50 \pm 5$ mm ( $2 \pm \frac{1}{4}$ inch) per minute.	ISL Insertion w/o terminals (pre to final lock): PBT: 5 N MIN PA410: 15 N MIN
			ISL Insertion with terminals (pre to final lock): 40 N MAX
			ISL Insertion with terminal partially installed: 40 N MIN
11	Independent Secondary Lock (ISL) Disengage Force	The force to completely disengage the ISL from final-lock position at a rate of $50 \pm 5$ mm ( $2 \pm \frac{1}{4}$ inch) per minute.	PBT: 60 N MAX PA410: 120 N MAX

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12	<b>Header Pin Retention Force (in Vertical, Right Angle, &amp; SMT Housing)</b>	Axial pushout force on the terminal in the housing at a rate of <b>50 ± 10 mm (2 ± ¼ inch)</b> per minute.	<b>15 N MIN</b>
13	<b>Insertion / Removal Feeling</b>	Insert and remove the terminal or the connector, while checking the correctness of the insertion/removal feeling	Connector shall be free of detrimental cracking, rust, play, flaw, deformation, and other defects. Terminal shall be free of catching and / or other abnormality.
14	<b>Connector Repetitive Mating/Unmating (Single Row connectors only)</b>	Mate and Unmate connector (male to female) at a rate of about <b>100mm/min</b>	<b>After 5 cycles</b> <ol style="list-style-type: none"> <li>Mating force <b>20 N MAX</b>(primary lock engaged)</li> <li>Unmating force <b>8 N MIN</b>(primary lock disengaged)</li> </ol> <b>After 50cycles</b> <ol style="list-style-type: none"> <li>Mating force <b>40 N MAX</b> (primary lock engaged)</li> <li>Unmating force <b>10 N MIN</b>(primary lock engaged)</li> <li><b>Voltage Drop</b> <b>30 milliohms MAXIMUM</b></li> </ol>
15	<b>Connector Polarization Feature Effectiveness (PBT connectors only)</b>	Connector must be polarized to prevent mating with similar connectors - <b>0° Misorientation for all possible header and receptacle configurations</b>	<p><b>240 N MIN</b> PolA_recp - PolB_hdr <b>12Ckt</b> PolB_recp - PolA_hdr <b>12Ckt</b></p> <p><b>220 N MIN</b> PolA_recp - PolB_hdr <b>4Ckt</b> PolB_recp - PolA_hdr <b>4Ckt</b> PolC_recp - PolD_hdr <b>4Ckt</b> PolD_recp - PolC_hdr <b>4Ckt</b> PolA_recp - PolB_hdr <b>8Ckt</b> PolB_recp - PolA_hdr <b>8Ckt</b></p> <p><b>200 N MIN</b> <b>16-20Ckt</b> PolA_recp - PolB_hdr</p> <p><b>190 N MIN</b> <b>16-20Ckt</b> PolB_recp - PolA_hdr</p>

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			<p><b>115 N MIN</b> PolA_rec - PolC_hdr 12Ckt PolA_rec - PolC_hdr 12Ckt</p> <p><b>110 N MIN</b> PolA_rec - PolC_hdr 4Ckt PolA_rec - PolD_hdr 4Ckt PolC_rec - PolB_hdr 4Ckt</p> <p><b>100 N MIN</b> PolC_rec - PolA_hdr 4Ckt PolD_rec - PolB_hdr 4Ckt PolB_rec - PolC_hdr 12Ckt</p> <p><b>95 N MIN</b> PolA_rec - PolC_hdr 8Ckt PolA_rec - PolB_hdr 2Ckt PolB_rec - PolA_hdr 2Ckt PolB_rec - PolD_hdr 2Ckt PolC_rec - PolA_hdr 2Ckt PolC_rec - PolD_hdr 2Ckt PolD_rec - PolB_hdr 2Ckt PolD_rec - PolC_hdr 2Ckt</p> <p><b>90 N MIN</b> PolB_rec - PolD_hdr 4Ckt PolB_rec - PolC_hdr 8Ckt</p> <p><b>80 N MIN</b> PolB_rec - PolC_hdr 4Ckt PolD_rec - PolA_hdr 4Ckt PolA_rec - PolC_hdr 2Ckt</p> <p><b>35 N MIN</b> PolA_rec - PolD_hdr 2Ckt PolB_rec - PolC_hdr 2Ckt PolC_rec - PolB_hdr 2Ckt PolD_rec - PolA_hdr 2Ckt</p>
16	<p><b>Connector Polarization Feature Effectiveness (PA410 connectors)</b></p>	<p>Connector must be polarized to prevent mating with similar connectors - <b>0° Misorientation for all possible header and receptacle configurations</b></p>	<p><b>295 N MIN</b> PolA rec - PolB Hdr, 20ckt</p> <p><b>180 N MIN</b> PolB rec - PolA Hdr, 20ckt</p> <p><b>160 N MIN</b> PolB rec - PolC Hdr, 20ckt</p> <p><b>150 N MIN</b> PolA rec - PolC Hdr, 20ckt</p>

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			<p><b>130 N MIN</b> PoIC recp – PoB Hdr, <b>20ckt</b></p> <p><b>115 N MIN</b> PoIC recp – PoA Hdr, <b>20ckt</b></p>
17	Pry Resistance	<p>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 78N After prying the connectors to two stages of fitting, pull them out. This is one cycle.</p> <p>Subject connectors to 10 cycles and Perform <b>Contact Resistance @ Rated Current (Voltage Drop)</b> and <b>Connector Mate/Unmate Forces</b> (Primary Lock Engaged), the mate/unmate speed shall be about 100 mm/min.</p>	<p>While being tested, the connectors shall not have any problem in being made electrically alive</p> <p><b>Voltage Drop</b> <b>30 milliohms MAX</b></p> <p><b>Mate:</b> <b>20 N MAX</b></p> <p><b>Unmate:</b> Primary Lock Engaged <b>20 N MIN</b></p>
18	Pry Resistance II	<p>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)</p>	<p>The waveform slope remained positive when increasing load during pulling and negative when decreasing load</p>
19	Connector Drop Test	<p><b>System Assembly (Mated &amp; Fully populated)</b> – Subject the assembly to a fall of 1 meter on each face, except for electrical wire side, onto a concrete floor</p>	<p>No damage or incipient rupture shall be observed.</p>
		<p><b>Connector Assembly (Unmated &amp; Fully Populated)</b> - Subject the assembly to a fall of 1 meter on each face, except for electrical wire side, onto a concrete floor</p>	<p>No damage or incipient rupture shall be observed.</p>
20	Connector Position Assurance (CPA) Engage Force	<p>Axial push force on the CPA in the housing at a rate of <b>50 ± 10 mm (2 ± ¼ inch)</b> per minute.</p>	<p><b>Pre-staged to Final Lock With mated connector</b> <b>22 N MAX</b></p> <p><b>With unmated connector</b> PBT: <b>40 N MINIMUM</b> PA410: <b>60 N MINIMUM</b></p>
21	Connector Position Assurance (CPA) Disengage Force	<p>Axial pull force on the CPA in the housing at a rate of <b>50 ± 10 mm (2 ± ¼ inch)</b> per minute.</p>	<p><b>Final Lock to Pre-staged</b> <b>10 N MIN</b> <b>50 N MAX</b></p>
22	Connector Position Assurance (CPA) Removal Force	<p>Axial pull force on the CPA in the housing at a rate of <b>50 ± 10 mm (2 ± ¼ inch)</b> per minute.</p>	<p><b>Removal from Pre-staged on Un-mated Connector</b> <b>60 N MIN</b></p>

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## 5.3 ENVIROMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT						
1	Durability	Mate connectors up to <b>10</b> cycles prior to environmental tests.	<b>10</b> milliohms MAX						
2	Thermal Shock (Electrical)	Mate connectors per durability; expose to <b>300</b> cycles of: <table border="0"> <tr> <td><u>Temperature C°</u></td> <td><u>Duration (Minutes)</u></td> </tr> <tr> <td><b>-40 +0/-3</b></td> <td><b>30</b></td> </tr> <tr> <td><b>+105 +3/-0</b></td> <td><b>30</b></td> </tr> </table> Perform <b>Contact Resistance (Low Level)</b>	<u>Temperature C°</u>	<u>Duration (Minutes)</u>	<b>-40 +0/-3</b>	<b>30</b>	<b>+105 +3/-0</b>	<b>30</b>	<b>Dry Circuit Resistance:</b> <b>20</b> milliohms MAX & Discontinuity < <b>1</b> microsecond
<u>Temperature C°</u>	<u>Duration (Minutes)</u>								
<b>-40 +0/-3</b>	<b>30</b>								
<b>+105 +3/-0</b>	<b>30</b>								
3	Thermal Shock (Physical)	Mate connectors per durability; expose to <b>300</b> cycles of: <table border="0"> <tr> <td><u>Temperature C°</u></td> <td><u>Duration (Minutes)</u></td> </tr> <tr> <td><b>-40 +0/-3</b></td> <td><b>30</b></td> </tr> <tr> <td><b>+105 +3/-0</b></td> <td><b>30</b></td> </tr> </table> Apply a voltage of <b>500</b> VDC per Isolation Resistance	<u>Temperature C°</u>	<u>Duration (Minutes)</u>	<b>-40 +0/-3</b>	<b>30</b>	<b>+105 +3/-0</b>	<b>30</b>	<b>100</b> Meg ohms MIN  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.
		<u>Temperature C°</u>	<u>Duration (Minutes)</u>						
<b>-40 +0/-3</b>	<b>30</b>								
<b>+105 +3/-0</b>	<b>30</b>								
Apply an AC rms voltage of 1000V at 60 Hz per Dielectric Strength									
4	Thermal Shock (Mechanical)	Mate connectors per durability; expose to <b>1000</b> cycles of: <table border="0"> <tr> <td><u>Temperature C°</u></td> <td><u>Duration (Minutes)</u></td> </tr> <tr> <td><b>-40 +0/-3</b></td> <td><b>30</b></td> </tr> <tr> <td><b>+105 +3/-0</b></td> <td><b>30</b></td> </tr> </table> Unmate connector per Connector Mate/Unmate Forces	<u>Temperature C°</u>	<u>Duration (Minutes)</u>	<b>-40 +0/-3</b>	<b>30</b>	<b>+105 +3/-0</b>	<b>30</b>	<b>Unmate w/latch:</b> <b>100</b> N MIN w/o terminals  (4CKT – 24CKT)  <b>ISL in Final-Lock:</b> <b>30</b> N MIN
		<u>Temperature C°</u>	<u>Duration (Minutes)</u>						
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<b>-40 +0/-3</b>	<b>30</b>								
<b>+105 +3/-0</b>	<b>30</b>								
5	Temperature/Humidity Cycling (Electrical)	Mate connectors per durability. Subject connector system to <b>10</b> cycles of: <b>60%</b> RH <b>4</b> hours @ <b>23</b> C°; <b>97%</b> RH <b>10</b> hours @ <b>55</b> C°, <b>2</b> hour @ <b>-40</b> C°; <b>2</b> hours @ <b>105</b> C° Perform <b>Contact Resistance (Low Level)</b> Perform <b>Contact Resistance @ Rated Current (Voltage Drop)</b>	<b>Dry Circuit Resistance:</b> <b>20</b> milliohms MAX  <b>Voltage Drop</b> <b>20</b> milliohms MAX						

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DOCUMENT NUMBER: <b>PS-34791-020</b>	CREATED / REVISED BY: <b>TREVOR MACHUGA</b>	CHECKED BY: <b>YULIN LI/SHANKS WU</b>	APPROVED BY: <b>JEREMY DUNAJ</b>



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6	Temperature/ Humidity Cycling (Physical)	Mate connectors per durability. Subject connector system to <b>10</b> cycles of: <b>60% RH 4 hours @ 23 C°; 97% RH 10 hours @ 55 C°, 2 hour @ -40 C°; 2 hours @ 105 C°</b> Apply a voltage of <b>500VDC</b> per Isolation Resistance	<b>100 Meg ohms MIN</b>
		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	Temperature/ Humidity Cycling (Mechanical)	Mate connectors per durability. Subject connector system to <b>10</b> cycles of: <b>60% RH 4 hours @ 23 C°; 97% RH 10 hours @ 55 C°, 2 hour @ -40 C°; 2 hours @ 105 C°</b> Unmate connector per Connector Mate/Unmate Forces (Connector Holding)	<b>Unmate w/latch:</b> <b>100 N MIN w/o terminals</b>  (4CKT – 24CKT)
		Mate connectors per durability. Subject connector system to <b>10</b> cycles of: <b>60% RH 4 hours @ 23 C°; 97% RH 10 hours @ 55 C°, 2 hour @ -40 C°; 2 hours @ 105 C°</b> Extract terminal from housing per Terminal Retention Force (in Housing)	<b>ISL in Final-Lock:</b> <b>30 N MIN</b>
8	High Temperature Exposure (Electrical)	Mate connectors per durability. Subject connector system to <b>105 C°</b> for <b>1008</b> hours. Perform <b>Contact Resistance (Low Level)</b> Perform <b>Contact Resistance @ Rated Current (Voltage Drop)</b>	<b>Dry Circuit Resistance:</b> <b>20 milliohms MAX</b>  <b>Voltage Drop:</b> <b>20 milliohms MAX</b>
9	High Temperature Exposure (Physical)	Mate connectors per durability. Subject connector system to <b>105 C°</b> for <b>1008</b> hours. Apply a voltage of <b>500DC</b> per Isolation Resistance post 1008 hours	<b>100 Meg ohms MIN</b>
		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.

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10	High Temperature Exposure (Mechanical)	Mate connectors per durability. Subject connector system to <b>105 C°</b> for <b>1008</b> hours. Apply a force to wire bundle and pull on wire bundle in the following directions: <b>Straight, +45° Vertical, -45° Vertical, +45° Horizontal, &amp; -45° Horizontal</b>	No breakage or electrical discontinuities at <b>60N or less</b>  (4CKT – 24CKT)																		
		Mate connectors per durability. Subject connector system to <b>105 C°</b> for <b>1008</b> hours. Extract terminal from housing per Terminal Retention Force (in Housing)	ISL in Final-Lock <b>30 N MIN</b>																		
10b	High Temperature Exposure (Mechanical) GM	Subject connector system to <b>105 C°</b> for <b>1008</b> hours. Extract Terminal from housing post test..	ISL in Final-Lock <b>40 N MIN</b>																		
11	Chemical Resistance (Electrical)  (PBT connectors only)	Perform <b>Contact Resistance (Low Level)</b> .  Expose connectors to the following fluids for the specified duration of soak and dry time:	No deformation or cracks shall be observed in connector  <b>Delta Dry Circuit Resistance:</b> <b>20 milliohms MAX</b>  <b>Voltage Drop:</b> <b>20 milliohms MAX</b>																		
		<table border="1"> <thead> <tr> <th>Resistance To Fluids:</th> <th>Time / Temp. in Fluid</th> <th>Time / Temp. Drying</th> </tr> </thead> <tbody> <tr> <td><b>Automatic Transmission Oil:</b></td> <td>15 Seconds @ 23°C</td> <td>24 Hours @ 105°C</td> </tr> <tr> <td><b>Zinc Chloride:</b></td> <td>15 Seconds @ 23°C</td> <td>24 Hours @ 23°C</td> </tr> <tr> <td><b>Fuel:</b></td> <td>7 Days @ 23°C</td> <td>7 Days @ 23°C</td> </tr> <tr> <td><b>Engine Coolant:</b></td> <td>5 Minutes @ 23°C</td> <td>48 Hours @ 50°C</td> </tr> <tr> <td><b>Windshield Washer Fluid:</b></td> <td>5 Minutes @ 23°C</td> <td>48 Hours @ 50°C</td> </tr> </tbody> </table>		Resistance To Fluids:	Time / Temp. in Fluid	Time / Temp. Drying	<b>Automatic Transmission Oil:</b>	15 Seconds @ 23°C	24 Hours @ 105°C	<b>Zinc Chloride:</b>	15 Seconds @ 23°C	24 Hours @ 23°C	<b>Fuel:</b>	7 Days @ 23°C	7 Days @ 23°C	<b>Engine Coolant:</b>	5 Minutes @ 23°C	48 Hours @ 50°C	<b>Windshield Washer Fluid:</b>	5 Minutes @ 23°C	48 Hours @ 50°C
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Perform <b>Contact Resistance (Low Level)</b> and <b>Contact Resistance @ Rated Current (Voltage Drop)</b> .																					

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# PRODUCT SPECIFICATION

<p>12</p>	<p><b>Chemical Resistance (Mechanical)</b>  (PBT connectors only)</p>	<p>Expose connectors to the following fluids for the specified duration of soak and dry time:</p> <table border="1"> <thead> <tr> <th>Resistance To Fluids:</th> <th>Time / Temp. in Fluid</th> <th>Time / Temp. Drying</th> </tr> </thead> <tbody> <tr> <td><b>Automatic Transmission Oil:</b></td> <td>15 Seconds @ 23°C</td> <td>24 Hours @ 105°C</td> </tr> <tr> <td><b>Zinc Chloride:</b></td> <td>15 Seconds @ 23°C</td> <td>24 Hours @ 23°C</td> </tr> <tr> <td><b>Fuel:</b></td> <td>7 Days @ 23°C</td> <td>7 Days @ 23°C</td> </tr> <tr> <td><b>Engine Coolant:</b></td> <td>5 Minutes @ 23°C</td> <td>48 Hours @ 50°C</td> </tr> <tr> <td><b>Windshield Washer Fluid:</b></td> <td>5 Minutes @ 23°C</td> <td>48 Hours @ 50°C</td> </tr> </tbody> </table> <p>Un-mate connector per Connector Mate/ Un-mate Forces. (Hand Evaluation) Extract terminal from housing per Terminal Retention Force (in Housing)</p>	Resistance To Fluids:	Time / Temp. in Fluid	Time / Temp. Drying	<b>Automatic Transmission Oil:</b>	15 Seconds @ 23°C	24 Hours @ 105°C	<b>Zinc Chloride:</b>	15 Seconds @ 23°C	24 Hours @ 23°C	<b>Fuel:</b>	7 Days @ 23°C	7 Days @ 23°C	<b>Engine Coolant:</b>	5 Minutes @ 23°C	48 Hours @ 50°C	<b>Windshield Washer Fluid:</b>	5 Minutes @ 23°C	48 Hours @ 50°C	<p>No deformation or cracks shall be observed in connector</p> <p>Unmate w/latch (hand evaluation) shall show no signs of functional degradation.</p> <p>ISL in Final-Lock <b>30 N MIN</b></p>
Resistance To Fluids:	Time / Temp. in Fluid	Time / Temp. Drying																			
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# PRODUCT SPECIFICATION

14	<b>Solderability</b>	Steam-age samples for 8 hours (Category 3), set at ambient for at least one hour, and its pins were dipped in ROL0 flux and lead-free solder per <b>SMES-152</b> (Paragraph 5.3.4 Dip Coated) with an agitation of 10mm forward and backward. The solder temperature was <b>255°C</b> per Molex BP5155. Criteria: SMES-152 Rev E Paragraph 5.4.1.	Solder coverage: <b>95% MIN</b> (per <b>SMES-152</b> )
15	<b>IR Process Soldering</b>	Molex IR Profile: <b>ES-40000-5013</b> Maximum Temperature: <b>260°C</b>	Dimensional: Conformance to Sales Drawing requirements & Visual: No Damage

## 6.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage. There is a very low probability that a CPA will seat during transit. If this occurs, please scrap that specific connector and Molex will replace it.

## 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 (as specified to USCAR):

**Temperature:** 105°C

**Vibration:** On-Body (not coupled to engine)

**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 PCB pins or mating interface will create performance failures that include; PCB installation, increased mate/unmate forces and electrical discontinuities.

## 9.0 LV-214 TESTING USING PBT CONNECTORS ONLY:

The Mini50 product has been tested to following LV 214 test (*according to the March 2010 revision*):

- PG 6, 7, 8, 14, 18A, 19, 21, 28

TEMPERATURE:

Operating: -40°C to +125°C

Non-Operating: -40°C to +125°C

Specific test results may include deviations, and are available upon request.

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## 10.0 REVISION HISTORY

REVISION	MODIFICATION	SHEET	DATE
H	Added a blanket statement under Section 5.2 MECHANICAL REQUIREMENTS  Added uniformed connector mate force requirement  Added uniformed connector un-mate force (primary lock disengaged) requirement  Added bridged and non-bridged connector un-mate force (primary lock engaged) requirement  Added CPA requirement	7, 11	07/16/2018
J	Added Ecopaxx Test Data & information	1-3, 7-18	8/14/2018

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