



# PRODUCT SPECIFICATION

## 1.0 SCOPE

This Product Specification covers the performance requirements for Molex's 0.8 mm pitch Flat Pad I/O connector series with gold plating.

## 2.0 PRODUCT DESCRIPTION

### 2.1 PRODUCT NAME AND SERIES NUMBER (S)

SMT Receptacle Connector,	44828-****
Accessory Plug Modules,	45339-****, 45593-****
SMT Cradle Connector,	45560-****

### 2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

Please see the applicable Sales Drawings for information on dimensions, materials, platings and markings.

### 2.3 SAFETY AGENCY APPROVALS

UL File Number: E29179  
CSA File Number: LR19980

## 3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See applicable Sales Drawings and other sections of this specification for specific references to applicable documents and specifications.

## 4.0 RATINGS

### 4.1 VOLTAGE

30 Volts AC/DC maximum

### 4.2 CURRENT

1.5 Amps continuous;  
2.1 Amps pulsed, 33% duty cycle @ 50 Hz on alternating circuits.

### 4.3 TEMPERATURE / HUMIDITY

Operating: - 40°C to + 85°C  
Storage: - 40°C to + 85°C, 50% RH

REVISION: <b>C</b>	ECR/ECN INFORMATION: EC No: <b>UCP2010-0562</b> DATE: <b>2009/08/25</b>	TITLE: <b>PRODUCT SPECIFICATION 0.8mm Handylink™ Connector System</b>	SHEET No. <b>1 of 12</b>
DOCUMENT NUMBER: <b>PS-44828-001</b>	CREATED / REVISED BY: <b>MSIMMEL/DMORGAN</b>	CHECKED BY: <b>MIBARRA</b>	APPROVED BY: <b>SMILLER</b>



# PRODUCT SPECIFICATION

## 5.0 PERFORMANCE

### 5.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	<b>Contact Resistance (Low Level)</b>	Mate connectors: Using a maximum open circuit potential of <b>20 mV</b> and a current of <b>100 mA</b> , measure contact resistance. (Measurement locations and methods are shown in Section 7.1) [EIA 364-23]	<b>50 milliohms</b> MAXIMUM ( initial )
2	<b>Insulation Resistance</b>	Un-mate connectors: apply a voltage of <b>250 VDC</b> between adjacent terminals and between terminals to ground for 1 minute. [EIA 364-21]	<b>1000 Meg-ohms</b> MINIMUM
3	<b>Withstanding Voltage</b>	Un-mate connectors: apply a voltage of <b>300 volts AC</b> for <b>1</b> minute between adjacent terminals and between terminals to ground. [EIA 364-20]	No breakdown; current leakage < <b>5 mA</b>
4	<b>Temperature Rise (Current Cycling)</b>	Mate connectors: measure the temperature rise at the rated current after <b>96</b> hours. ( <b>45</b> minutes ON and <b>15</b> minutes OFF per hour). [EIA 364-55]	Temperature rise: <b>+30°C</b> MAXIMUM

### 5.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5	<b>Contact Normal Force</b>	Condition a plug terminal by displacing it fully in the mating direction (to the housing wall). Retract fully, then apply a displacement to within 0.55mm of the housing wall and measure the corresponding reaction force. [EIA 364-04]	<b>0.5 N</b> minimum.
6	<b>Connector Mate and Un-mate Forces</b>	Mate and un-mate connector (plug to receptacle) at a rate of <b>25 ± 6</b> mm per minute applying forces parallel to the central axis of symmetry (straight pull). [EIA 364-13]	<b>20 N</b> MAXIMUM mating force. <b>55 N</b> MAXIMUM, <b>7.5N</b> MINIMUM un-mating force.

REVISION: <b>C</b>	ECR/ECN INFORMATION: EC No: <b>UCP2010-0562</b> DATE: <b>2009/08/25</b>	TITLE: <b>PRODUCT SPECIFICATION</b> <b>0.8mm Handylink™</b> <b>Connector System</b>	SHEET No. <b>2 of 12</b>
DOCUMENT NUMBER: <b>PS-44828-001</b>	CREATED / REVISED BY: <b>MSIMMEL/DMORGAN</b>	CHECKED BY: <b>MIBARRA</b>	APPROVED BY: <b>SMILLER</b>



# PRODUCT SPECIFICATION

## 5.2 MECHANICAL REQUIREMENTS (continued)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
7	<b>Angular Connector Un-Mate Forces (Plug Only)</b>	Un-mate connector (plug from receptacle) by applying pulling forces away from the central axis of symmetry as follows: a) parallel to the plane of the PCB to which the receptacle connector is mounted; b) out of plane to the PCB to which the receptacle connector is mounted. See Section 7.3 for details about the test method.	<b>7.5 N MINIMUM</b> retention force at : a) 20 degrees off axis parallel to the PCB; b) 15 degrees off axis out of plane to the PCB.
8	<b>Terminal Retention Force (in Housing) (Plug Only)</b>	Apply an axial pullout force on the terminal in the housing with a slow steady manual pull until the terminal is removed from housing. Record peak force.	<b>2.5 N</b> MINIMUM retention force
9	<b>Durability</b>	Mate and un-mate connectors up to 15000 cycles at a maximum rate of <b>720</b> cycles per hour. Measure contact resistance. [EIA 364-09]	<b>10 milliohms</b> MAXIMUM (change from initial) <b>7.5 N</b> MINIMUM un-mating force (straight pull)
10	<b>Vibration (Random)</b>	Mate connectors and vibrate 15 minutes in each direction of each axis. [EIA 364-28, Cond. VII, C; IEC 68-2-36]	<b>10 milliohms</b> MAXIMUM (change from initial) Discontinuity < <b>1</b> microsecond
11	<b>Shock (Mechanical)</b>	Mate connectors and shock at <b>50 g's</b> with ½ sine wave (11 milliseconds) shocks in the ±X,±Y,±Z axes ( <b>18</b> shocks total). [EIA 364-27, Cond. A; IEC 68-2-27]	<b>10 milliohms</b> MAXIMUM (change from initial) Discontinuity < <b>1</b> microsecond

## 5.3 ENVIRONMENTAL REQUIREMENTS

12	<b>Thermal Shock</b>	Mate connectors; expose to <b>100</b> cycles of: <table border="1" style="display: inline-table; vertical-align: top;"> <thead> <tr> <th>Temperature °C</th> <th>Duration (Minutes)</th> </tr> </thead> <tbody> <tr> <td><b>-40 +0/-3</b></td> <td><b>30</b></td> </tr> <tr> <td><b>+25 ±10</b></td> <td><b>5</b> MAXIMUM</td> </tr> <tr> <td><b>+85 +3/-0</b></td> <td><b>30</b></td> </tr> <tr> <td><b>+25 ±10</b></td> <td><b>5</b> MAXIMUM</td> </tr> </tbody> </table> [EIA-364-32, Cond. I; IEC 68-2-14]	Temperature °C	Duration (Minutes)	<b>-40 +0/-3</b>	<b>30</b>	<b>+25 ±10</b>	<b>5</b> MAXIMUM	<b>+85 +3/-0</b>	<b>30</b>	<b>+25 ±10</b>	<b>5</b> MAXIMUM	<b>10 milliohms</b> MAXIMUM (change from initial) & Visual: No Damage
Temperature °C	Duration (Minutes)												
<b>-40 +0/-3</b>	<b>30</b>												
<b>+25 ±10</b>	<b>5</b> MAXIMUM												
<b>+85 +3/-0</b>	<b>30</b>												
<b>+25 ±10</b>	<b>5</b> MAXIMUM												
13	<b>Thermal Aging</b>	Using a Field Temperature of 85°C for a Field Life of 3 years test to [EIA364-17, Method A].	<b>10 milliohms</b> MAXIMUM (change from initial) & Visual: No Damage										

REVISION: <b>C</b>	ECR/ECN INFORMATION: EC No: <b>UCP2010-0562</b> DATE: <b>2009/08/25</b>	TITLE: <b>PRODUCT SPECIFICATION</b> <b>0.8mm Handylink™</b> <b>Connector System</b>	SHEET No. <b>3 of 12</b>
DOCUMENT NUMBER: <b>PS-44828-001</b>	CREATED / REVISED BY: <b>MSIMMEL/DMORGAN</b>	CHECKED BY: <b>MIBARRA</b>	APPROVED BY: <b>SMILLER</b>



# PRODUCT SPECIFICATION

## 5.3 ENVIRONMENTAL REQUIREMENTS (continued)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
14	Humidity (Cyclic)	Mate connectors, cycle as follows: 10 cycles at temperature $25 \pm 3^{\circ}\text{C}$ at $80 \pm 5\%$ relative humidity and $65 \pm 3^{\circ}\text{C}$ at $50 \pm 5\%$ relative humidity; dwell time of 1.0 hour; ramp time of 0.5 hours.  {Note: Remove surface moisture and air dry for 1 hour prior to measurements.} [EIA 364-31, Method III]	10 milliohms MAXIMUM (change from initial) & Dielectric Withstanding Voltage: No Breakdown at 250 VAC & Insulation Resistance: 1000 Megohms MINIMUM & Visual: No Damage
15	IR Reflow Solder Resistance	Subject connectors to Molex's Standard IR Profile for 245°C.	Visual: No Damage to insulator material
16	Salt Spray	Un-mated connectors: Duration: 48 hours exposure; Atmosphere: salt spray from a 5% solution, pH: 6.5 to 7.2, temperature: $35 +1/-2^{\circ}\text{C}$ Mate connectors and measure contact resistance. [EIA 364-TP26]	10 milliohms MAXIMUM (change from initial) & Visual: No Damage
17	Dust Exposure	Expose non-mated connectors to benign dust composition. Take LLCR measurements with the connectors mated. [EIA 364-91]	10 milliohms MAXIMUM (change from initial) & Visual: No Damage

## 6.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage.

REVISION: <b>C</b>	ECR/ECN INFORMATION: EC No: <b>UCP2010-0562</b> DATE: <b>2009/08/25</b>	TITLE: <b>PRODUCT SPECIFICATION 0.8mm Handylink™ Connector System</b>	SHEET No. <b>4 of 12</b>
DOCUMENT NUMBER: <b>PS-44828-001</b>	CREATED / REVISED BY: <b>MSIMMEL/DMORGAN</b>	CHECKED BY: <b>MIBARRA</b>	APPROVED BY: <b>SMILLER</b>

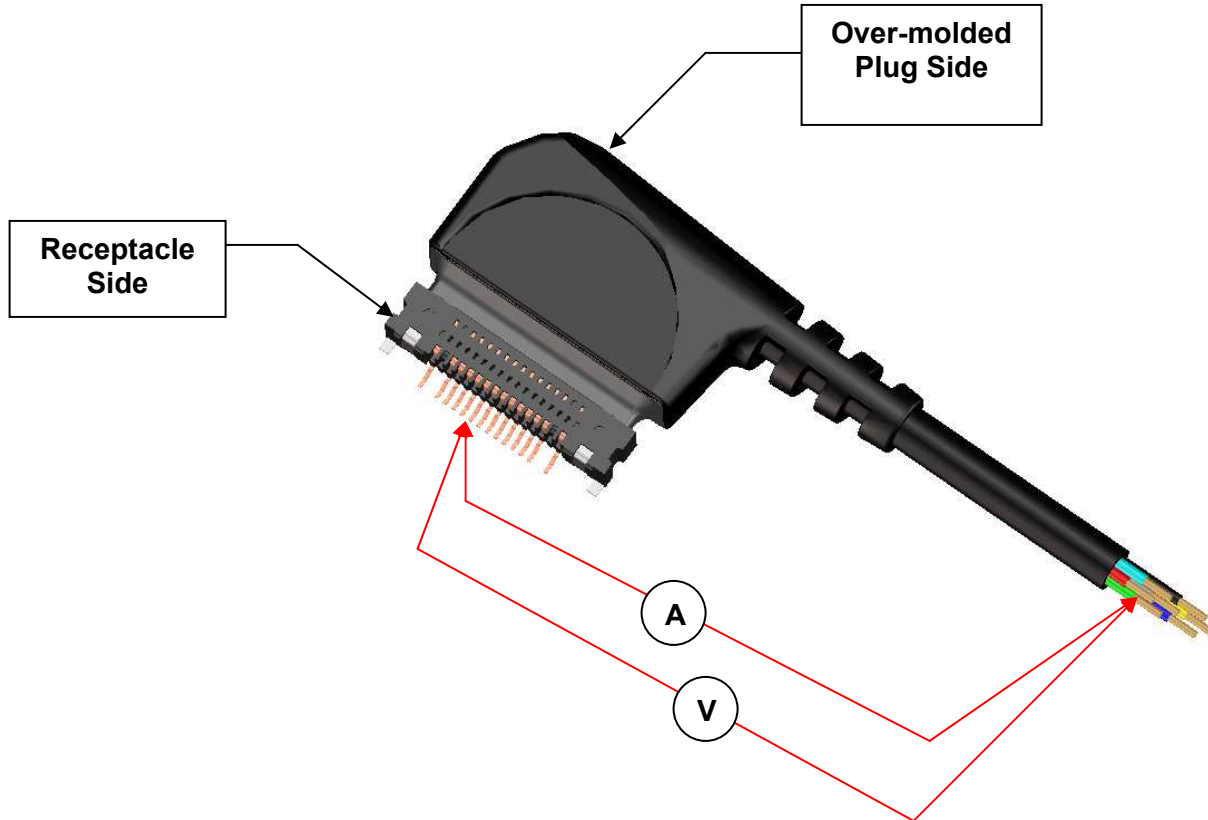


# PRODUCT SPECIFICATION

## 7.0 TEST GAGES, FIXTURES, AND SET-UP METHODS

### 7.1 CONTACT RESISTANCE PROBE POINTS

#### 7.1.1 RECEPTACLE (SERIES 44828) MATED TO OVERMOLDED PLUG (PLUG SERIES 45339)



Plug assembly and SMT receptacle shown mated.

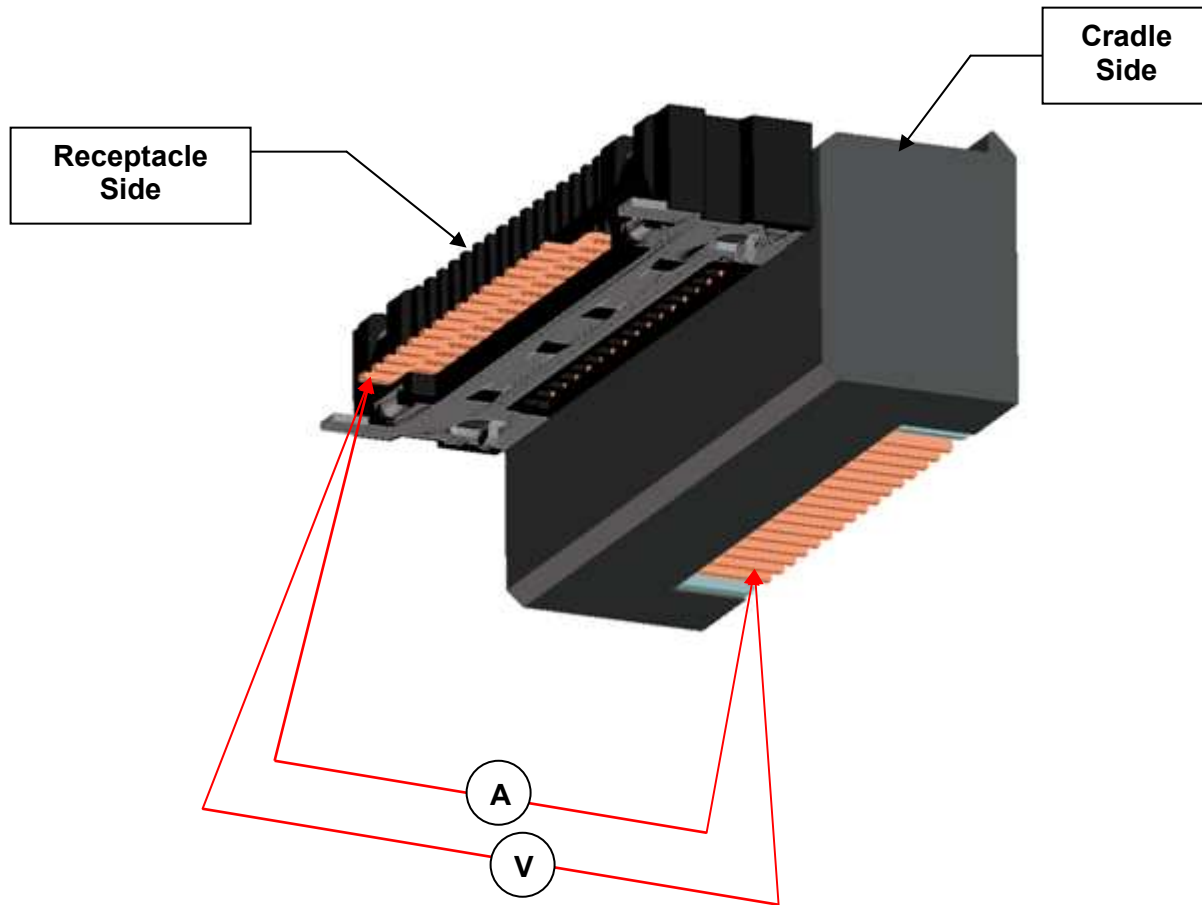
Four point probe method: 20mV, 100mA max.  
Wire and terminal bulk resistances must be subtracted from the result to obtain the contact resistance values.

REVISION: <b>C</b>	ECR/ECN INFORMATION: EC No: <b>UCP2010-0562</b> DATE: <b>2009/08/25</b>	TITLE: <b>PRODUCT SPECIFICATION 0.8mm Handylink™ Connector System</b>	SHEET No. <b>5 of 12</b>
DOCUMENT NUMBER: <b>PS-44828-001</b>	CREATED / REVISED BY: <b>MSIMMEL/DMORGAN</b>	CHECKED BY: <b>MIBARRA</b>	APPROVED BY: <b>SMILLER</b>



# PRODUCT SPECIFICATION

## 7.1.2 RECEPTACLE (SERIES 44828) MATED TO CRADLE (SERIES 45560)



Receptacle and cradle shown mated.

Four point probe method: 20mV, 100mA max.  
Terminal bulk resistances must be subtracted from the result to obtain the contact resistance values.

REVISION: <b>C</b>	ECR/ECN INFORMATION: EC No: <b>UCP2010-0562</b> DATE: <b>2009/08/25</b>	TITLE: <b>PRODUCT SPECIFICATION 0.8mm Handylink™ Connector System</b>	SHEET No. <b>6 of 12</b>
DOCUMENT NUMBER: <b>PS-44828-001</b>	CREATED / REVISED BY: <b>MSIMMEL/DMORGAN</b>	CHECKED BY: <b>MIBARRA</b>	APPROVED BY: <b>SMILLER</b>

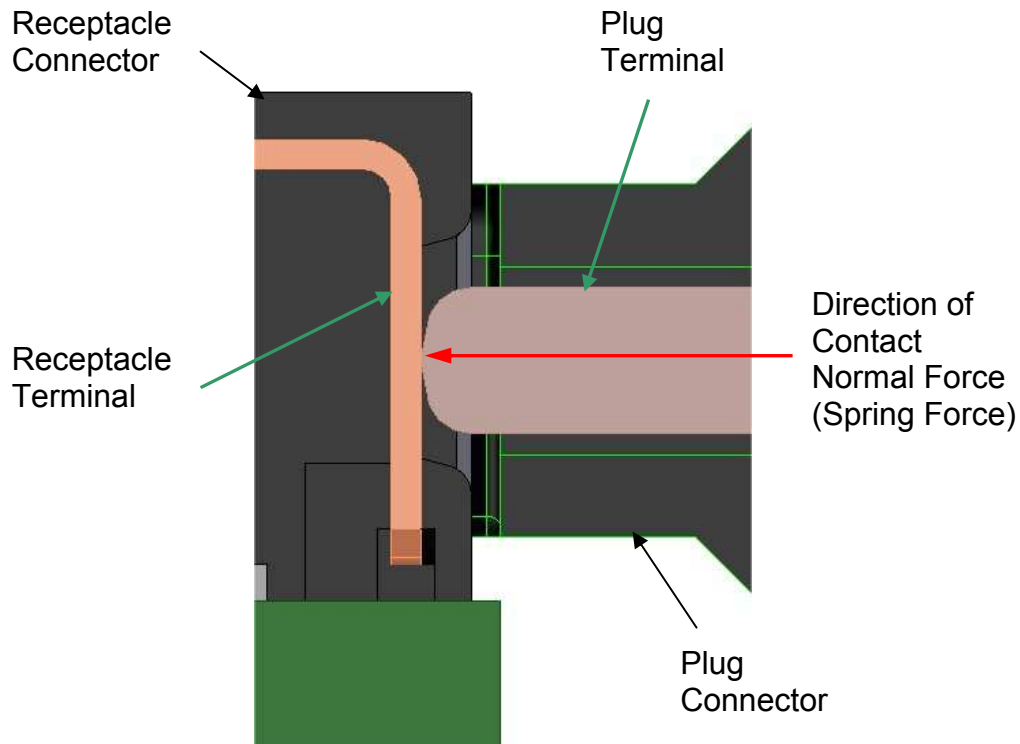


# PRODUCT SPECIFICATION

## 7.2 DEFINITION OF MECHANICAL FORCES (SECTION 5.2, Items 5, 6, 7 AND 8)

### Section 5.2, Item 5: Contact Normal Force

Normal force is defined as the force generated by the plug terminal's spring force on the mating surface of the receptacle connector.



REVISION: <b>C</b>	ECR/ECN INFORMATION: EC No: <b>UCP2010-0562</b> DATE: <b>2009/08/25</b>	TITLE: <b>PRODUCT SPECIFICATION 0.8mm Handylink™ Connector System</b>	SHEET No. <b>7 of 12</b>
DOCUMENT NUMBER: <b>PS-44828-001</b>	CREATED / REVISED BY: <b>MSIMMEL/DMORGAN</b>	CHECKED BY: <b>MIBARRA</b>	APPROVED BY: <b>SMILLER</b>



# PRODUCT SPECIFICATION

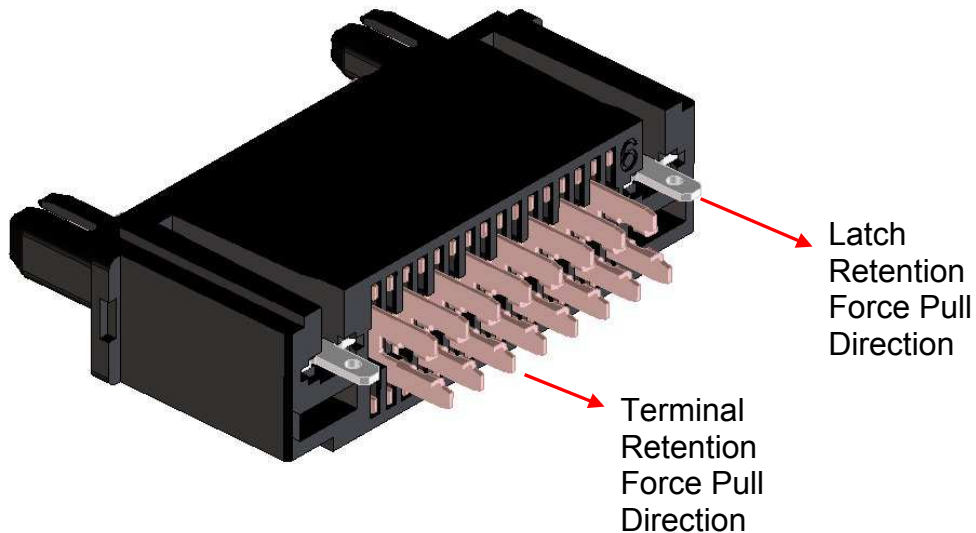
## Section 5.2, Item 6 and 7: Connector Mate and Un-Mate Forces

Connector mate and un-mate forces are defined as the force required to fully engage and disengage the plug connector with the receptacle. The receptacle is rigidly mounted to a PCB and the forces are applied using a strain gauge tester along the principal axis of symmetry of the connectors, perpendicular to the mating (front) face of the receptacle connector.

(See Section 7.3, below, for a description of how un-mating forces are measured at angles that are off-axis)

## Section 5.2, Item 8: Terminal Retention Force in Housing

Terminal retention force is defined as the forces required to dislodge the plug or receptacle terminal from the respective plastic housing. The contact terminals used in the Handylink™ receptacle connector are encased in plastic during the manufacturing process and cannot be removed from the housing. The contact terminals and spring latches are press-fitted into recesses in the plastic housing during the manufacturing process. The retention force is defined as the axial force necessary to remove the terminals or latches in the opposite direction to that used during assembly, as illustrated below.



REVISION: <b>C</b>	ECR/ECN INFORMATION: EC No: <b>UCP2010-0562</b> DATE: <b>2009/08/25</b>	TITLE: <b>PRODUCT SPECIFICATION</b> <b>0.8mm Handylink™</b> <b>Connector System</b>	SHEET No. <b>8 of 12</b>
DOCUMENT NUMBER: <b>PS-44828-001</b>	CREATED / REVISED BY: <b>MSIMMEL/DMORGAN</b>	CHECKED BY: <b>MIBARRA</b>	APPROVED BY: <b>SMILLER</b>



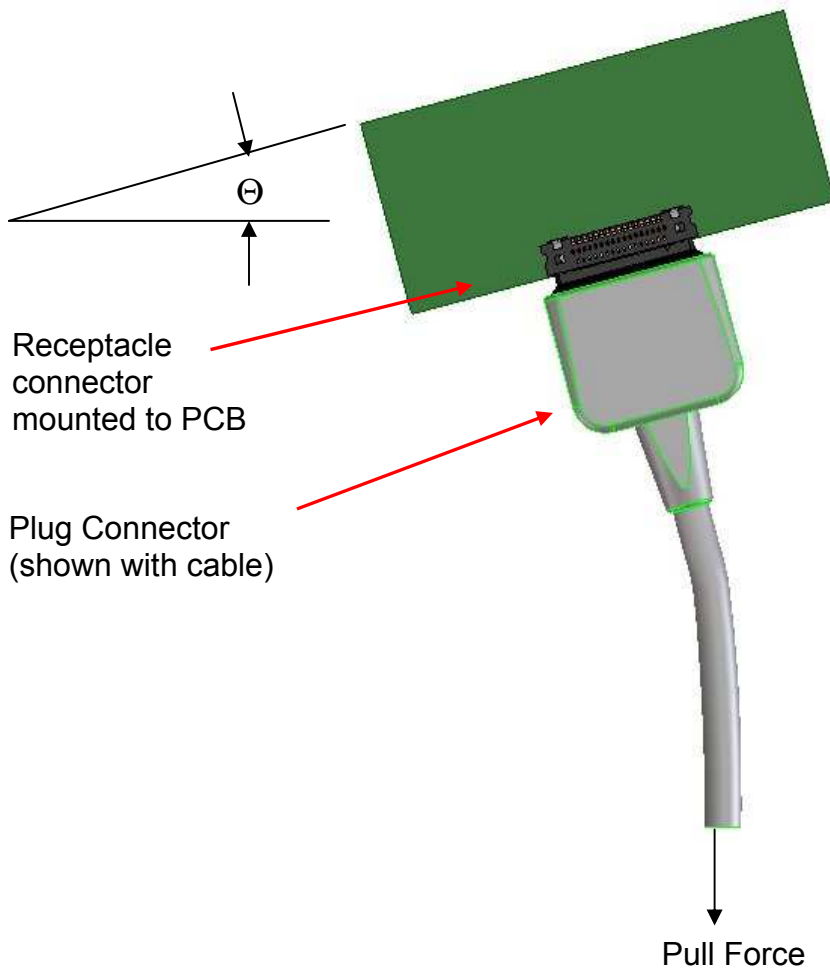


# PRODUCT SPECIFICATION

## 7.3 ANGULAR PULL FORCE TEST METHOD

A 16 circuit receptacle connector is soldered to a board and fixed to an angle measurement gauge that is mounted vertically. The force necessary to cause the plug connector latches to disengage is recorded at various angles and the results charted on a polar plot (see the diagrams on the pages that follow).

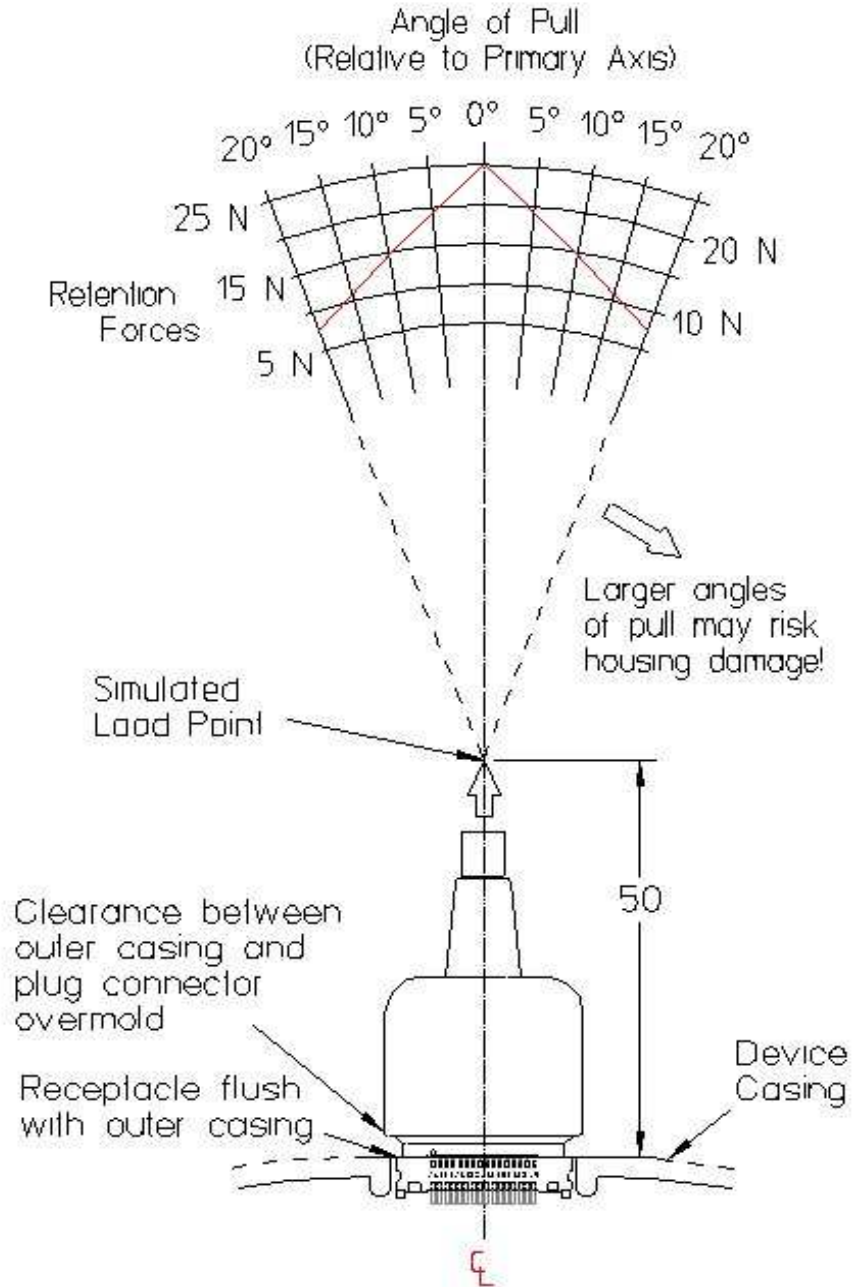
Units: Newtons, mm, degrees



REVISION: <b>C</b>	ECR/ECN INFORMATION: EC No: <b>UCP2010-0562</b> DATE: <b>2009/08/25</b>	TITLE: <b>PRODUCT SPECIFICATION 0.8mm Handylink™ Connector System</b>	SHEET No. <b>9 of 12</b>
DOCUMENT NUMBER: <b>PS-44828-001</b>	CREATED / REVISED BY: <b>MSIMMEL/DMORGAN</b>	CHECKED BY: <b>MIBARRA</b>	APPROVED BY: <b>SMILLER</b>



# PRODUCT SPECIFICATION

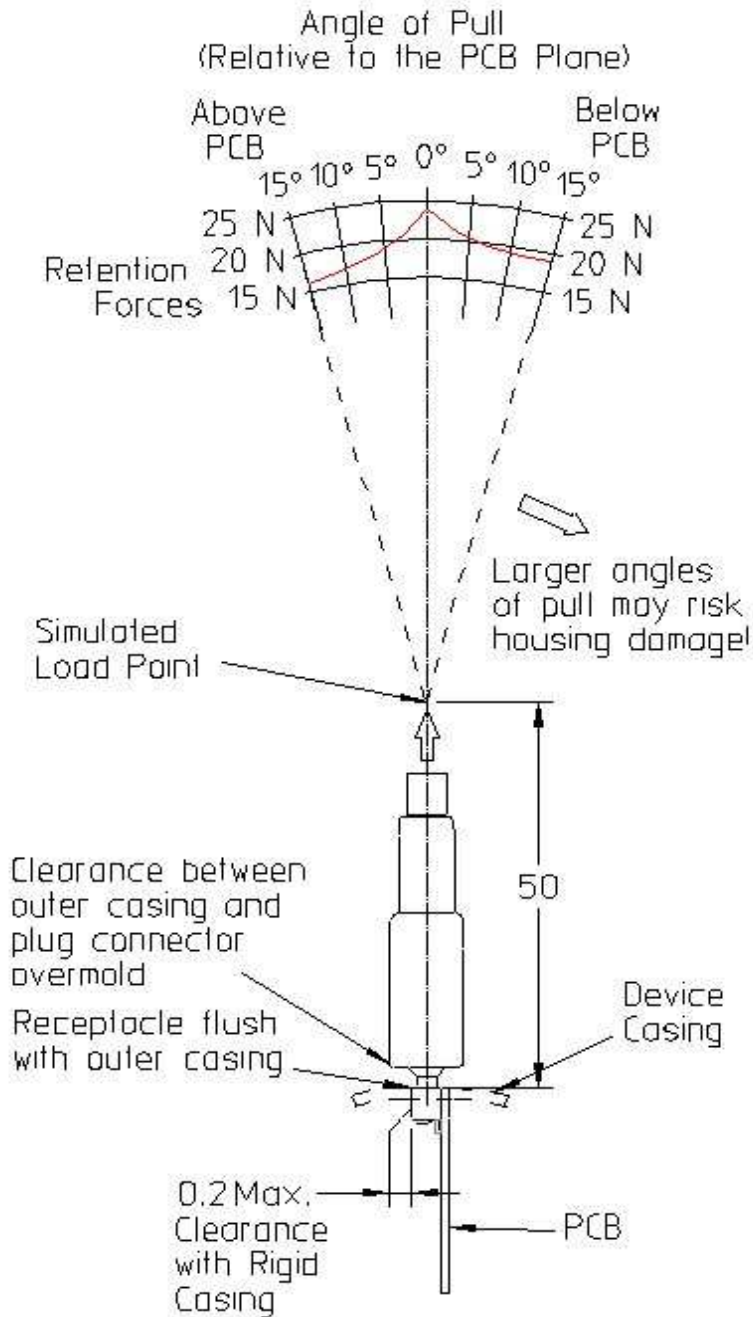


Note: Polar chart at the top of the diagram shows typical initial values. The actual change in retention force values from the axial (0 degree) pull may vary due to differences in the fit of the overmolded plug connector with the device casing, and the stiffness of both the cable and the overmolded strain relief. For further information, please see the application specification, AS-44828-001.

REVISION: <b>C</b>	ECR/ECN INFORMATION: EC No: <b>UCP2010-0562</b> DATE: <b>2009/08/25</b>	TITLE: <b>PRODUCT SPECIFICATION 0.8mm Handylink™ Connector System</b>	SHEET No. <b>10 of 12</b>
DOCUMENT NUMBER: <b>PS-44828-001</b>	CREATED / REVISED BY: <b>MSIMMEL/DMORGAN</b>	CHECKED BY: <b>MIBARRA</b>	APPROVED BY: <b>SMILLER</b>



# PRODUCT SPECIFICATION



Note: Polar chart at the top of the diagram shows typical initial values. The actual change in retention force values from the axial (0 degree) pull may vary due to differences in the fit of the overmolded plug connector with the device casing, and the stiffness of both the cable and the overmolded strain relief. For further information, please see the application specification, AS-44828-001.

REVISION: <b>C</b>	ECR/ECN INFORMATION: EC No: <b>UCP2010-0562</b> DATE: <b>2009/08/25</b>	TITLE: <b>PRODUCT SPECIFICATION</b> <b>0.8mm Handylink™</b> <b>Connector System</b>	SHEET No. <b>11 of 12</b>
DOCUMENT NUMBER: <b>PS-44828-001</b>	CREATED / REVISED BY: <b>MSIMMEL/DMORGAN</b>	CHECKED BY: <b>MIBARRA</b>	APPROVED BY: <b>SMILLER</b>



# PRODUCT SPECIFICATION

## 8.0 TEST PLAN

8.1 TESTING PER EIA-1000.01A, GROUPS 1, 2, 3, 5, 6, AND 7.

8.2 SALT SPARY TEST PER EIA-364-TP26, IEC 68-2-11.

REVISION: <b>C</b>	ECR/ECN INFORMATION: EC No: <b>UCP2010-0562</b> DATE: <b>2009/08/25</b>	TITLE: <b>PRODUCT SPECIFICATION 0.8mm Handylink™ Connector System</b>	SHEET No. <b>12 of 12</b>
DOCUMENT NUMBER: <b>PS-44828-001</b>	CREATED / REVISED BY: <b>MSIMMEL/DMORGAN</b>	CHECKED BY: <b>MIBARRA</b>	APPROVED BY: <b>SMILLER</b>