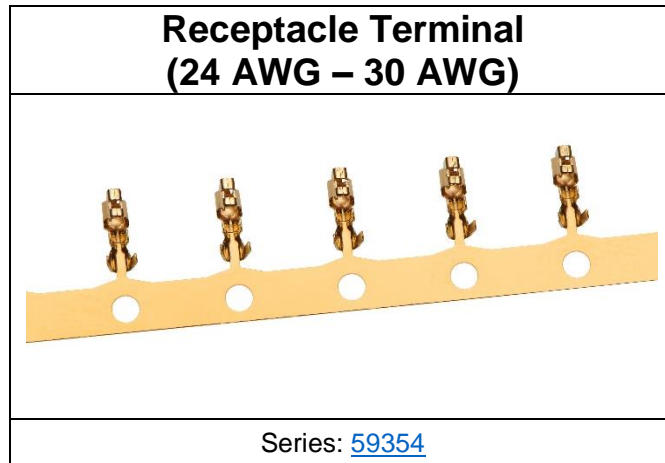

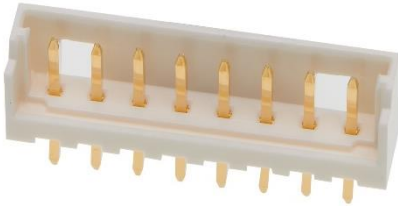


# Micro-Latch 2.0

## WIRE TO BOARD CONNECTOR SYSTEM (GOLD-PLATING)



Receptacle Housing	Plug Assembly Vertical
	
Series: <a href="#">51065</a>	Series: 502603

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**1.0 SCOPE**

This product specification covers the performance requirements for Micro-Latch 2.0 WIRE TO BOARD CONNECTOR GOLD PLATING TYPE series.

**2.0 PRODUCT DESCRIPTION**

**2.1 DESCRIPTION, SERIES NUMBER, AND LINKS**

DESCRIPTION	PART NUMBER	DRAWING NUMBER
Receptacle Terminal (24 AWG – 30 AWG)	<a href="#">593548081</a>	593540000-SD PSD 000
Receptacle Housing	<a href="#">51065**0*</a>	510650000-SD PSD 000
Plug Assembly Vertical	502603**70	5026030000-SD PSD 000

**2.2 DIMENSIONS, MATERIALS, PLATINGS**

See the appropriate sales drawings for the information on dimensions, materials, platings and markings.

**2.3 ENVIRONMENTAL CONFORMANCE**

To find product compliance information:

- a. [Go to molex.com](http://molex.com)
- b. Enter the part number in the search field.
- c. At the bottom of the page go to “Environmental” to see compliance status.

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**3.0 APPLICABLE DOCUMENTS AND SPECIFICATION**

**3.1 MOLEX DOCUMENTS**

[General Application Specification 2166940000-AS PS 000](#)  
 ATS – Application Tooling Specification\*

*\*Application Tooling Specification for terminals is not provided in this document. ATS for terminals can be available from respective terminal part number page in Molex.com*

**4.0 ELECTRICAL PERFORMANCE RATINGS**

**4.1 VOLTAGE**

250 V AC (rms) / DC

**4.2 RATED CURRENT AND APPLICABLE WIRES**

Wire Size	Rated Current (MAX.)	Insulation O.D. 593548081 : φ 0.85 ~ φ 1.40 mm
AWG #24	2.0 A	
AWG #26	2.0 A	
AWG #28	1.5 A	

**4.3 CURRENT DERATING**

AWG	2-circuits	8-circuits	15-circuits
	Current (A)	Current (A)	Current (A)
24	3.5	2.0	2.0
26	3.0	2.0	2.0
28	2.5	1.5	1.5

1. Values are for REFERENCE ONLY.
2. Current deratings are based on not exceeding 30 °C Temperature Rise
3. Temperature Rise is measured in barrel area of crimp terminal.
4. PCB trace design can greatly affect temperature rise results.
5. Data is for all circuits powered.

**4.4 TEMPERATURE**

Ambient Temperature Range\*1\*2\*3 : - 55 °C ~ + 105 °C  
 Not freeze in low temperature

NOTE:

- \*1. Non-operating connectors after reflow must follow the operating temperature range condition.
- \*2. This includes the terminal temperature rise generated by conducting electricity.
- \*3. Applicable wires must also meet the specified temperature range.

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**4.5 DURABILITY**

Plating Type	Number of Cycles
Gold Plated	30 cycles

**5.0 QUALIFICATION**

Sample selection is in accordance with EIA-364-1000.

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**6.0 PERFORMANCE**

**6.1 ELECTRICAL PERFORMANCE**

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
6.1.1	Contact Resistance	Mate connectors and measured by dry circuit, 20 mV MAX.,10 mA MAX. And subtract wire conductor resistance. Refer to section 8 Contact resistance measuring point. (JIS C5402-2-1)	20 milliohms MAX.	
6.1.2	Insulation Resistance	Mate connectors and apply 500 V DC between adjacent terminals or between terminal and ground. (JIS C5402-3-1 / MIL-STD-202 Method 302)	1000 Megohms MIN.	
6.1.3	Dielectric Strength	Mate connectors and apply 1000V AC (rms) for 1 minute between adjacent terminals or between terminal and ground. (JIS C5402-4-1/MIL-STD-202 Method 301)	No Damage on function	
6.1.4	Contact Resistance on crimped portion	Crimp the applicable wire to the terminal, measured by dry circuit, 20 mV MAX., 10 mA. MAX.	5 milliohms MAX.	
6.1.5	Temperature Rise	Mate connectors and all crimp terminals shall be connected in a direct series. The temperature rise shall be measured when maximum rated current is flowed and thermal equilibrium is reached. (UL498)	Temperature Rise	30 °C MAX.

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**6.2 MECHANICAL PERFORMANCE**

ITEM	DESCRIPTION	TEST CONDITION		REQUIREMENT
6.2.1	Insertion and Withdrawal Force	Insert and withdraw connectors at the speed rate of 25 ± 3 mm/minute. The data is measured when the housing lock is removed.		Refer to section 7
6.2.2	Crimping Pull out Force	Fix the crimped terminal to the jig, apply axial pull out force on the wire at the speed rate of 25 ± 3 mm/minute. (JIS C5402-16-4)	AWG #24	29.4 N {3.0 kgf} MIN
			AWG #26	19.6 N {2.0 kgf} MIN
			AWG #28	9.8 N {1.0 kgf} MIN
6.2.3	Crimp Terminal Insertion Force	Insert the crimped terminal into the housing.		9.8 N {1.0 kgf} MAX
6.2.4	Crimp Terminal Retention Force	Apply axial pull out force at the speed rate of 25 ± 3 mm/minute on the crimped terminal assembled in the plug housing.		9.8 N {1.0 kgf} MIN
6.2.5	Header Terminal Retention Force	Apply axial pull out force at the speed rate of 25 ± 3 mm/minute on the terminal assembled in the housing.		9.8 N {1.0 kgf} MIN.
6.2.6	Repeated Insertion / Withdrawal	Insert and withdraw connectors 30 cycles repeatedly by rate of less than 10 cycles per minute.		Contact Resistance 40 milliohms MAX.
6.2.7	Vibration	Mate connectors and conduct test subject to the following vibration conditions, for a period of 2 hours in each of 3 mutually perpendicular axes, passing DC 1 mA during the test. Cables should be fixed during the test. Amplitude : 1.5 mm P-P Frequency : 10~55~10 Hz in 1 minute. Duration : 2 hours in each X.Y.Z.axes. (JIS C 60068-2-6/MIL-STD-202 Method 201)		Appearance No Damage on function
				Contact Resistance 40 milliohms MAX.
				Discontinuity 1.0 microsecond MAX.

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**6.2 MECHANICAL PERFORMANCE CONTINUED**

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
6.2.8	Mechanical Shock	Mate connectors and subject to the following shock conditions. 3 shocks shall be applied 6 directions along 3 mutually perpendicular axes [ $\pm x$ , $\pm y$ , $\pm z$ , each], passing DC 1 mA current during the test. [Total of 18 shocks] Test pulse : Half Sine Peak value : 490 m/s <sup>2</sup> {50 G} Duration : 11 ms (JIS C60068-2-27/MIL-STD-202 Method 213)	Appearance	No Damage on function
			Contact Resistance	40 milliohms MAX.
			Discontinuity	1.0 microsecond MAX.

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**6.3 ENVIRONMENTAL PERFORMANCE**

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
6.3.1	Temperature Cycling	Mate connectors and subject to the following conditions for 5 cycles. Upon completion of the exposure period, the test specimens shall be left at ambient room temperature for 1 to 2 hours. After that, the measurements shall be performed. 5 cycles of : a) - 55 ± 3 °C 30 minutes b) + 105 ± 2 °C 30 minutes Shifting time : Within 5 minutes (JIS C60068-2-14)	Appearance	No Damage
			Contact Resistance	40 milliohms MAX
6.3.2	Heat Resistance	Mate connectors and expose to 105±2 °C for 96 hours. Upon completion of the exposure period, the test specimens shall be left at ambient room conditions for 1 to 2 hours. After that, the measurements shall be performed. (JIS C60068-2-2/MIL-STD-202 Method 108)	Appearance	No Damage on function
			Contact Resistance	40 milliohms MAX
6.3.3	Cold Resistance	Mate connectors and expose to -55 ± 3 °C for 96 hours. Upon completion of the exposure period, the test specimens shall be left at ambient room temperature for 1 to 2 hours. After that, the measurements shall be performed. (JIS C60068-2-1)	Appearance	No Damage on function
			Contact Resistance	40 milliohms MAX
6.3.4	Humidity	Mate connectors and expose to 60 ± 2 °C, relative humidity 90 to 95% for 96 hours. Upon completion of the exposure period, the test specimens shall be left at ambient room temperature for 1 to 2 hours. After that, the measurements shall be performed. (JIS C60068-2-78/MIL-STD-202 Method 103)	Appearance	No Damage on function
			Contact Resistance	40 milliohms MAX
			Dielectric Strength	Must meet 6.1.3
			Insulation Resistance	100 Megohms MIN.

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**6.3 ENVIRONMENTAL PERFORMANCE CONTINUED**

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
6.3.5	Salt Spray	Mate connectors and expose to the following salt mist conditions. Upon completion of the exposure period, salt deposits shall be removed by a gentle water wash or dip in running water. After that, the measurements shall be performed. NaCl solution Concentration : 5 ± 1% Spray time : 48 ± 4 hours Ambient temperature : 35 ± 2 °C (JIS 60068-2-11 / MIL-STD-202 Method 101)	Appearance	No Damage on function
			Contact Resistance	40 milliohms MAX
6.3.6	SO <sub>2</sub> Gas	Mated connectors and expose to the conditions of 50 ± 5 ppm SO <sub>2</sub> gas ambient temperature 40 ± 2 °C for 24 hours.	Appearance	No Damage on function
			Contact Resistance	40 milliohms MAX
6.3.7	Solderability	Dip terminal or pin into flux, and immerse the area up to 1.2 mm from the tip of terminal into molten solder pot at 245 ± 3 °C for 3 ± 0.5 sec	Solder Wetting	95% of immersed area must show no voids, pin holes
6.3.8	Resistance to Soldering Heat	<u>Soldering bath method</u> Dip terminal or pin into immerse the area up to 1.2 mm from the lowest surface of the product into solder molten at 260 ± 5 °C for 5 ± 0.5 sec.	Appearance	No Damage
		<u>Soldered by Manual Soldering iron</u> Use a soldering iron [370~400 °C for 5 seconds MAX.] , the product shall be heated up. However, do not apply excessive pressure to either the terminals or fitting nails.		

( ) : Reference Standard  
 { } : Reference Unit

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**7.0 INSERTION / WITHDRAWAL FORCE**

No. of CKT	UNIT	Insertion (MAX.)			Withdrawal (MIN.)		
		1st	6th	30th	1st	6th	30th
2	N {kgf}	35.2 { 3.6 }	33.3 { 3.4 }	33.3 { 3.4 }	9.8 { 1.00 }	4.0 { 0.40 }	3.5 {0.35}
3	N {kgf}	43.1 { 4.4 }	40.1 { 4.1 }	40.1 { 4.1 }	11.8 { 1.20 }	4.9 { 0.50 }	4.5 { 0.45 }
4	N {kgf}	50.9 { 5.2 }	47.0 { 4.8 }	47.0 { 4.8 }	13.8 { 1.40 }	5.9 { 0.60 }	4.9 { 0.5 }
5	N {kgf}	58.8 { 6.0 }	53.9 { 5.5 }	53.9 { 5.5 }	14.7 { 1.50 }	6.4 { 0.65 }	5.4 { 0.55 }
6	N {kgf}	64.6 { 6.6 }	58.8 { 6.0 }	58.8 { 6.0 }	15.7 { 1.60 }	6.9 { 0.70 }	5.9 { 0.60 }
7	N {kgf}	70.5 { 7.2 }	63.7 { 6.5 }	63.7 { 6.5 }	16.7 { 1.70 }	7.4 { 0.75 }	6.4 { 0.65 }
8	N {kgf}	76.4 { 7.8 }	68.6 { 7.0 }	68.6 { 7.0 }	17.7 { 1.80 }	7.9 { 0.80 }	6.9 { 0.70 }
9	N {kgf}	82.3 { 8.4 }	73.5 { 7.5 }	73.5 { 7.5 }	18.7 { 1.90 }	8.4 { 0.85 }	7.4 { 0.75 }
10	N {kgf}	88.2 { 9.0 }	78.4 { 8.0 }	78.4 { 8.0 }	19.6 { 2.00 }	8.9 { 0.90 }	7.9 { 0.80 }
11	N {kgf}	94.0 { 9.6 }	83.3 { 8.5 }	83.5 { 8.5 }	20.6 { 2.10 }	9.4 { 0.95 }	8.4 { 0.85 }
12	N {kgf}	99.9 { 10.2 }	88.2 { 9.0 }	88.2 { 9.0 }	21.6 { 2.20 }	9.8 { 1.00 }	8.9 { 0.90 }
13	N {kgf}	105.8 { 10.8 }	93.1 { 9.5 }	93.1 { 9.5 }	22.6 { 2.30 }	10.3 { 1.05 }	9.4 { 0.95 }
14	N {kgf}	111.7 { 11.4 }	98.0 { 10.0 }	98.0 { 10.0 }	23.6 { 2.40 }	10.8 { 1.10 }	9.8 { 1.00 }
15	N {kgf}	117.6 { 12.0 }	102.9 { 10.5 }	102.9 { 10.5 }	24.5 { 2.50 }	11.3 { 1.15 }	10.3 { 1.05 }

{ } : Reference Unit

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**8.0 SOLDER INFORMATION**

**8.1 SOLDER PROCESS TEMPERATURES**

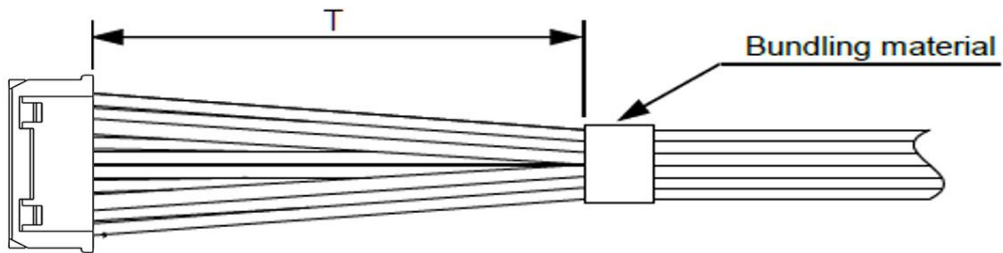
Wave Solder Temperature: 265 °C Maximum

**9.0 PACKAGING**

Parts shall be packaging to protect the parts from damage during standard shipping, storage, and handling. Refer Molex.com specific part number webpage to get the exact packaging document for that item.

**10.0 CABLE TIE AND / OR TWIST TIE LOCATION**

CKT Size	Dim T Min.
2-15 ckt	50 mm



The “T” dimension defines a “free” length of wire, or a length of wire that is not subject to significant bias by external factors such as a wire tie, wire twisting, or other means of bending or deforming of the wires that repositions them from their natural relaxed state or location where they enter the housing. Wires are to be dressed in such a manner to allow the terminals to float freely in the pocket. This dimension is general recommendation and may need to be adjusted for different wire gauges and wire type and insulation thickness and insulation material.

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INITIAL RELEASE				CUSTOMER	DOCUMENT NUMBER	REVISION	SHEET
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**11.0 NOTES**

1. There is no influence in the product performance in the case that the black spot or bubble might be appeared on the plastic part of this product and the color shade might be different (including discoloration by aging etc.).
2. A few scratches may be seen on the surface of the housing and the plating of this product, however, there is no issue in the product performance.
3. Discoloration of the plastic part of this product can be appeared by the exposure to ultraviolet light, however, there is no issue in the product performance.
4. When this product is used at a place where exposure to water could be expected, please provide the appropriate care to avoid damage from water. There is a possibility of causing insulated malfunction between the circuits by condensation and water leakage.
5. Please do not conduct any washing process on the connectors because it may damage the functionality.
6. Please avoid the situation which the contact area of connector always moves around. For example, the contact area is experiencing a constant movement by the sympathetic vibration of wires and PCB, rotating construction of devices, and action of moveable area. This may cause a defect in the conductivity due to the contact area being worn down. Therefore, please fix wires and PCB on the chassis and reduce sympathetic vibration.
7. Please do not apply extra pressure on the connectors. For example, do not carry around the substrate which has mated hanging connector on board. There is a case where it causes the damage of connector.
8. After mating the connectors, please do not apply pressure on the connectors in either the pitch direction, the span direction or rotational direction. It may cause damage to the connectors and may crack the soldering.
9. Please ensure to prevent from applying any external forces or shock to the connector when connector or the cable assembly in process or cable assembly is under being packaged, or under transportation. This may cause deformation and damage to the connectors and may cause a defect in product performance.
10. When using this product, please ensure to follow within its rated current per circuit. Please ensure not to apply the sum of the rated current separated in several circuits to exceed the maximum allowable current.
11. This product is not designed for the mating and un-mating of the connectors under the condition of an active electrical circuit. It may cause a risk of electric spark and the defect in product performance. Please do not conduct the hot plug and hot unplug.
12. The applicable wire for this connector, in principle, is tin-plated copper stranded wire. Please contact molex in advance when using other kind of wires.
13. Please ensure to keep enough clearance between the connectors and chassis of your application in order not to apply pressure on the connectors.
14. Please tie the cable at least 50 mm away from the edge of the connector housing and ensure that the forces on all of the wires are applied evenly.

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CHANGE NO.	666482								
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15. When extracting a crimp terminal from the housing by using a jig, it may deform the housing lance, and it causes to reduce the terminal retention force enormously after re-inserting the terminal. Therefore, please ensure to use a new housing after repairing the crimp terminals.
16. When positioning cable assembly and cable assembly after mating connectors in the device, it should not have a constant stress or a pulling force applied on it. This phenomenon may damage the contact area, crimping area, or terminal lock area, and it causes the defect in conductivity. Therefore, when designing the wire positioning in the device, please ensure that there is enough wire length not to stress on the connector.
17. Please do not deliberately deform the movable portion (the lock area and lance of plug housing) and terminals. It would lead to product failure.
18. Please ensure to solder all the terminal tails and fitting nails on the PCB. When you leave any soldering area open, it may cause the short circuit between pins, terminal buckling or connector's coming off the PCB.
19. Please evaluate the connector of your mounter in advance. When the mounter applies the extra pressure on the connector, it may cause the deformation or damage of connector.
20. Please do not touch the terminals before or after mounted the connectors onto the PCB.
21. Please do not stack the PCB directly after mounted the connectors on it.
22. Please conduct it under the condition of the specifications when repairing by hand soldering iron after mounting. In the case of practicing beyond the condition, the backlash, the change in the contact gap, the deformation of the mold and the melting, etc. may cause damage.
23. When conducting manual repairs using a soldering iron, please do not use more solder and flux than needed. This may cause solder wicking and flux wicking issues, and it will eventually cause a contact defect and functional issues.
24. Please do not use the connectors alone to provide mechanical support for the PCB. Please ensure that there is a fixed structure on the phone chassis or other component support for the PCB.
25. In the case of changing our recommended board pattern size and designing, please consult in advance because it may cause a fatal defect.
26. It is necessary to consult separately when mount product on a special PCB or FPC.

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- 27. Load the connector into the PCB straight down. Do not tilt or squeeze the connector in wrong directions.
  - ※ When touching the connector, be sure not to touch the contacts.
  - ※ Load the solder tails straightly into the PCB.
  - ※ Do not apply force in such directions that would damage the solder tails.
  - ※ In case you push the solder tails in such directions, the pin deformations and pin fallout would occur and damage the connector.
  
- 28. Please do the mating as much as possible to along to mating axis. At this time, positioning each side of external faces of receptacle housing and plug and push to mating until both connectors strikes each other (complete mating position). In the case of diagonal mating, touch with external faces with receptacle housing and plug under the angle of 10 ° lightly and push to mating in order to avoid the connector break.
  
- 29. The housing material of this product is made from a high heat resistant polyamide. The soldering condition and the water absorption properties of the housing material may cause blistering on the housing surface. Because this blister is not caused by property change, it does not damage the product's features.

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