

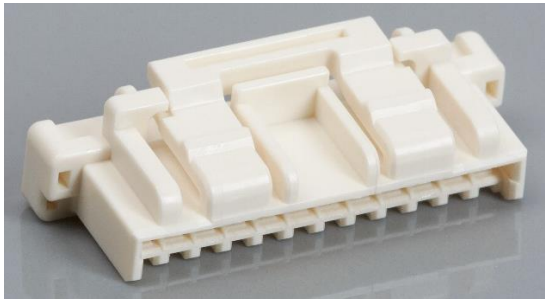



CLIK-Mate 1.5

WIRE TO BOARD CONNECTOR SYSTEM (SINGLE ROW GOLD-PLATING SMT)

Plug Terminal (24 AWG – 28 AWG)	Plug Terminal (26 AWG – 30 AWG)
	
Series: 213028	Series: 213029

Plug Housing	Vertical Receptacle Assembly
	
Series: 502578	Series: 213225

[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)


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REVISION DESCRIPTION	CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC						
CHANGE NO.	666482						
REVISED BY	MIKEDA01	DATE	2021/05/14	DOC TYPE	DOC TYPE DESCRIPTION	DOC PART	SERIES
REV APPR BY	KOMURAKAMI	DATE	2021/06/25	PS	PRODUCT SPECIFICATION WORD	000	502578
INITIAL RELEASE				CUSTOMER	DOCUMENT NUMBER	REVISION	SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL	5025781004-PS	B	1 OF 18
INITIAL APPR	AIDA	DATE	2020/08/07				

molex		PRODUCT SPECIFICATION					
<div><div>RA Receptacle Assembly</div><div></div><div>Series: 213226</div></div>							
CLIK-Mate W-t-B Connectors Web Page				TABLE OF CONTENT			
THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION							
REVISION DESCRIPTION		CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC					
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INITIAL RELEASE				CUSTOMER	DOCUMENT NUMBER	REVISION	SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL	5025781004-PS	B	2 OF 18
INITIAL APPR	AIDA	DATE	2020/08/07				

Table of Contents

ITEMS	PAGE
1.0 SCOPE.....	4
2.0 PRODUCT DESCRIPTION.....	4
2.1 DESCRIPTION, SERIES NUMBER, AND LINKS	4
2.2 DIMENSIONS, MATERIALS, PLATINGS	4
2.3 ENVIRONMENTAL CONFORMANCE	4
3.0 APPLICABLE DOCUMENTS AND SPECIFICATION.....	5
3.1 MOLEX DOCUMENTS	5
4.0 ELECTRICAL PERFORMANCE RATINGS.....	5
4.1 VOLTAGE	5
4.2 RATED CURRENT AND APPLICABLE WIRES	5
4.3 CURRENT DERATING	5
4.4 TEMPERATURE.....	6
4.5 DURABILITY	6
5.0 QUALIFICATION	6
6.0 PERFORMANCE	7
6.1 ELECTRICAL PERFORMANCE	7
6.2 MECHANICAL PERFORMANCE	8
6.3 ENVIRONMENTAL PERFORMANCE	10
7.0 INSERTION / WITHDRAWAL FORCE	12
8.0 SOLDER INFORMATION.....	13
8.1 SOLDER PROCESS TEMPERATURES	13
8.2 SOLDERING PROFILE	13
9.0 PACKAGING	14
10.0 CABLE TIE AND / OR TWIST TIE LOCATION	14
11.0 NOTES.....	15
12.0 INSTRUCTION UPON USAGE	16

[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)


THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC						
CHANGE NO.							
REVISOR	MIKEDA01	DATE	2021/05/14	DOC TYPE	DOC TYPE DESCRIPTION	DOC PART	SERIES
REV APPR BY	KOMURAKAMI	DATE	2021/06/25	PS	PRODUCT SPECIFICATION WORD	000	502578
INITIAL RELEASE				CUSTOMER	DOCUMENT NUMBER	REVISION	SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL	5025781004-PS	B	3 OF 18
INITIAL APPR	AIDA	DATE	2020/08/07				

1.0 SCOPE

This product specification covers the performance requirements for CLIK-Mate 1.5 WIRE TO BOARD CONNECTOR (SINGLE SMT GOLD PLATING TYPE) series.

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

DESCRIPTION	PART NUMBER	DRAWING NUMBER
Plug Terminal (24 AWG – 28 AWG)	213028**00	2130280000-SD PSD 000
Plug Terminal (26 AWG – 30 AWG)	213029**00	2130290000-SD PSD 000
Plug Housing	502578****	5025780000-SD PSD 000
Embossed Tape Packaging of Vertical receptacle assembly (With Kapton Tape) (High barrier package including desiccant)	213225****	2132250000-SD PSD 000
Embossed Tape Packaging of Right Angle receptacle assembly (High barrier package including desiccant)	213226****	2132260000-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:

- [Go to molex.com](#)
- Enter the part number in the search field.
- At the bottom of the page go to "Environmental" to see compliance status.

[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)


THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC						
CHANGE NO.	666482						
REVISED BY	MIKEDA01	DATE	2021/05/14	DOC TYPE	DOC TYPE DESCRIPTION	DOC PART	SERIES
REV APPR BY	KOMURAKAMI	DATE	2021/06/25	PS	PRODUCT SPECIFICATION WORD	000	502578
INITIAL RELEASE				CUSTOMER	DOCUMENT NUMBER	REVISION	SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL	5025781004-PS	B	4 OF 18
INITIAL APPR	AIDA	DATE	2020/08/07				

3.0 APPLICABLE DOCUMENTS AND SPECIFICATION

3.1 MOLEX DOCUMENTS

[Clik-Mate 1.5 w-t-b Connector System Application summary AS-502578-001](#)

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

100 V AC (rms) / DC

4.2 RATED CURRENT AND APPLICABLE WIRES

Wire Size	Rated Current (MAX.)	Applicable wires 213028 series: AWG# 24, 26 213029 series: AWG# 26, 30 Insulation O.D. 213028 series: ϕ 0.78~ ϕ 1.28mm 213029 series: ϕ 0.7~ ϕ 1.02mm
AWG #24	2.0 A	
AWG #26	1.5 A	
AWG #28	1.0 A	

4.3 CURRENT DERATING

AWG	2-circuits	8-circuits	15-circuits
	Amps (A)	Amps (A)	Amps (A)
24	3.0	2.0	2.0
26	3.0	2.0	1.5
28	2.5	1.5	1.0

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.

[CLIK-Mate W-t-B Connectors Web Page](#)

[TABLE OF CONTENT](#)



THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC						
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INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER	REVISION SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL		5025781004-PS	B
INITIAL APPR	AIDA	DATE	2020/08/07				

4.4 TEMPERATURE

Ambient Temperature Range*1*2*3	:	- 40 °C ~ + 105 °C Not freeze to low temperature
<u>Recommended storage condition</u>		
Temperature	:	+5 °C ~ +35 °C
Humidity	:	60% RH MAX No Condensation permitted
Term of Storage	:	6 months after the product is stocked. (unopened package)
<u>Storage condition after opening*4 the Humidity Prevention package 213225/213226 series *4</u>		
Temperature	:	-5 °C ~ +35 °C
Humidity	:	70% RH MAX No Condensation permitted

NOTE:

- *1. Non-operating connectors after reflow must follow the operating temperature range condition.
- *2. Including terminal temperature rise.
- *3. Applicable wires must also meet the specified temperature range.
- *4. Refer to [11. NOTES] how product should treat after opening package.

4.5 DURABILITY

Plating Type	Number of Cycles
Gold Plated	30 cycles

5.0 QUALIFICATION

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

[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)


THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC						
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REV APPR BY	KOMURAKAMI	DATE	2021/06/25	PS	PRODUCT SPECIFICATION WORD	000	502578
INITIAL RELEASE				CUSTOMER	DOCUMENT NUMBER	REVISION	SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL	5025781004-PS	B	6 OF 18
INITIAL APPR	AIDA	DATE	2020/08/07				

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. (JIS C5402-2-1)	20 milliohms MAX.	
6.1.2	Insulation Resistance	Mate connectors and apply 250 V DC between adjacent terminal or ground. (JIS C5402-3-1 / MIL-STD-202 Method 302)	500 Megohms MIN.	
6.1.3	Dielectric Strength	Mate connectors, apply 500V AC (rms) for 1 minute between adjacent terminal or ground. Trip current 2 mA. (JIS C5402-4-1/MIL-STD-202 Method 301)	No Breakdown	
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 the terminal reaches thermal equilibrium allowable current. (UL498)	Temperature Rise	30 °C MAX.

[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)


THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC						
CHANGE NO.	666482						
REVISED BY	MIKEDA01	DATE	2021/05/14	DOC TYPE	DOC TYPE DESCRIPTION	DOC PART	SERIES
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INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER	REVISION SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL		5025781004-PS	B
INITIAL APPR	AIDA	DATE	2020/08/07				

6.2 MECHANICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION		REQUIREMENT
6.2.1	Insertion and Withdrawal Force	Insert and withdraw connectors with hand.		Refer to section 7
6.2.2	Crimping Pull out Force	Fix the crimped terminal, 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 rec housing.		2.94 N {0.3 kgf} MIN
6.2.6	Housing Lock Strength (Positive Lock)	Mate connectors and apply axial pull out force at the speed rate of 25 ± 3 mm/minute.		29.4 N {3.0 kgf} MIN

[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)


THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC						
CHANGE NO.	666482						
REVISED BY	MIKEDA01	DATE	2021/05/14	DOC TYPE	DOC TYPE DESCRIPTION	DOC PART	SERIES
REV APPR BY	KOMURAKAMI	DATE	2021/06/25	PS	PRODUCT SPECIFICATION WORD	000	502578
INITIAL RELEASE				CUSTOMER	DOCUMENT NUMBER	REVISION	SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL	5025781004-PS	B	8 OF 18
INITIAL APPR	AIDA	DATE	2020/08/07				

6.2 MECHANICAL PERFORMANCE CONTINUED

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
6.2.7	Repeated Insertion / Withdrawal	When mated up to 30 cycles repeatedly by the rate of 10 cycles per minute with hand.	Contact Resistance	40 milliohms MAX.
6.2.8	Vibration	Mate connectors and subject to the following vibration conditions, for a period of 2 hours in each of 3 mutually perpendicular axes, passing DC 1mA during the test. (Fix the cable at test.) Amplitude : 1.52 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.
6.2.9	Mechanical Shock	Mate connectors and subject to the following shock conditions. 3 shocks shall be applied along 3 mutually perpendicular axes, passing DC 1 mA current during the test. (Total of 18 shocks) Test pulse : Half Sine Peak value : 490 m/s ² {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.

[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)


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REVISION DESCRIPTION	CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC						
CHANGE NO.	666482						
REVISED BY	MIKEDA01	DATE	2021/05/14	DOC TYPE	DOC TYPE DESCRIPTION	DOC PART	SERIES
REV APPR BY	KOMURAKAMI	DATE	2021/06/25	PS	PRODUCT SPECIFICATION WORD	000	502578
INITIAL RELEASE				CUSTOMER	DOCUMENT NUMBER	REVISION	SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL	5025781004-PS	B	9 OF 18
INITIAL APPR	AIDA	DATE	2020/08/07				

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 conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. 5 cycles of : a) $-40 \pm 3^{\circ}\text{C}$ 30 minutes b) $+105 \pm 2^{\circ}\text{C}$ 30 minutes (JIS C60068-2-14)	Appearance	No Damage on function
			Contact Resistance	40 milliohms MAX
6.3.2	Heat Resistance	Mate connectors and expose to $105 \pm 2^{\circ}\text{C}$ for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 hour, after which the specified 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 $-40 \pm 3^{\circ}\text{C}$ for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified 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 $60 \pm 2^{\circ}\text{C}$, relative humidity 90 to 95% for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 hours, after which the specified measurements shall be performed. (JIS C60068-2-78/MIL-STD-202 Method 103)	Appearance	No Damage on function
			Contact Resistance	40 milliohms MAX
			Insulation Resistance	Must meet 6.1.2
			Dielectric Strength	Must meet 6.1.3

[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)


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REVISION DESCRIPTION	CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC						
CHANGE NO.	666482						
REVISED BY	MIKEDA01	DATE	2021/05/14	DOC TYPE	DOC TYPE DESCRIPTION	DOC PART	SERIES
REV APPR BY	KOMURAKAMI	DATE	2021/06/25	PS	PRODUCT SPECIFICATION WORD	000	502578
INITIAL RELEASE				CUSTOMER	DOCUMENT NUMBER	REVISION	SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL	5025781004-PS	B	10 OF 18
INITIAL APPR	AIDA	DATE	2020/08/07				

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 wash or dip in running water, after which the specified measurements shall be performed. NaCl solution Concentration : $5 \pm 1\%$ Spray time : 48 ± 4 hours Ambient temperature : 35 ± 2 °C (JIS 60068-2-11 / MIL-STD-202 Method 101)	Appearance	No Damage
			Contact Resistance	40 milliohms MAX
6.3.6	SO ₂ Gas	Mated connectors and expose to the conditions of 50 ± 5 ppm SO ₂ gas ambient temperature 40 ± 2 °C for 24 hours.	Appearance	No Damage on function
			Contact Resistance	40 milliohms MAX
6.3.7	NH ₃ Gas	Mated connectors and expose to the conditions of NH ₃ gas evaporating from 28% NH ₃ solution for 40 minutes.	Appearance	without damage such as cracks or other breaks
			Contact Resistance	40 milliohms MAX
6.3.8	Solderability	Dip soldertails into the molten solder [held at 245 ± 5 °C] up to 0.5 mm from the bottom of the housing for 3 ± 0.5 seconds.	Solder Wetting	95% of immersed area must show no voids, pin holes
6.3.9	Resistance to Soldering Heat	<u>IR Reflow soldering method</u> Reference reflow condition at section 8	Appearance	No Damage
		<u>Soldering iron method</u> 0.2 mm from terminal tip Solder Temperature : 350 ± 5 °C Soldering Time : 5 seconds MAX		

() : Reference Standard

{ } : Reference Unit

[CLIK-Mate W-t-B Connectors Web Page](#)[TABLE OF CONTENT](#)

THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

REVISION DESCRIPTION	CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC						
CHANGE NO.	666482						
REVISED BY	MIKEDA01	DATE	2021/05/14	DOC TYPE	DOC TYPE DESCRIPTION	DOC PART	SERIES
REV APPR BY	KOMURAKAMI	DATE	2021/06/25	PS	PRODUCT SPECIFICATION WORD	000	502578
INITIAL RELEASE				CUSTOMER	DOCUMENT NUMBER	REVISION	SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL	5025781004-PS	B	11 OF 18
INITIAL APPR	AIDA	DATE	2020/08/07				

7.0 INSERTION / WITHDRAWAL FORCE

No. of CKT	UNIT	Insertion (MAX)			Withdrawal (MIN)		
		1st	6th	30th	1st	6th	30th
2	N {kgf}	6.5 { 0.66 }	7.0 { 0.72 }	11.0 { 1.12 }	0.4 { 0.04 }	0.4 { 0.04 }	0.4 { 0.04 }
3	N {kgf}	9.7 { 0.99 }	10.5 { 1.07 }	15.1 { 1.54 }	0.6 { 0.06 }	0.6 { 0.06 }	0.6 { 0.06 }
4	N {kgf}	12.9 { 1.32 }	14.0 { 1.43 }	18.3 { 1.87 }	0.8 { 0.08 }	0.8 { 0.08 }	0.8 { 0.08 }
5	N {kgf}	16.2 { 1.65 }	17.5 { 1.79 }	21.8 { 2.22 }	1.0 { 0.10 }	1.0 { 0.10 }	1.0 { 0.10 }
6	N {kgf}	19.4 { 1.98 }	21.5 { 2.20 }	24.8 { 2.53 }	1.2 { 0.12 }	1.2 { 0.12 }	1.2 { 0.12 }
7	N {kgf}	22.6 { 2.31 }	24.5 { 2.50 }	28.6 { 2.92 }	1.4 { 0.14 }	1.4 { 0.14 }	1.4 { 0.14 }
8	N {kgf}	25.9 { 2.64 }	28.0 { 2.86 }	32.3 { 3.30 }	1.6 { 0.16 }	1.6 { 0.16 }	1.6 { 0.16 }
9	N {kgf}	29.1 { 2.97 }	31.5 { 3.22 }	35.9 { 3.66 }	1.8 { 0.18 }	1.8 { 0.18 }	1.8 { 0.18 }
10	N {kgf}	32.3 { 3.30 }	35.4 { 3.61 }	39.4 { 4.02 }	2.0 { 0.20 }	2.0 { 0.20 }	2.0 { 0.20 }
11	N {kgf}	35.6 { 3.63 }	38.9 { 3.97 }	42.9 { 4.38 }	2.2 { 0.22 }	2.2 { 0.22 }	2.2 { 0.22 }
12	N {kgf}	38.8 { 3.96 }	42.5 { 4.33 }	46.3 { 4.72 }	2.4 { 0.24 }	2.4 { 0.24 }	2.4 { 0.24 }
13	N {kgf}	42.0 { 4.29 }	46.4 { 4.73 }	49.6 { 5.06 }	2.5 { 0.26 }	2.5 { 0.26 }	2.5 { 0.26 }
14	N {kgf}	45.3 { 4.62 }	49.6 { 5.06 }	52.8 { 5.39 }	2.7 { 0.28 }	2.7 { 0.28 }	2.7 { 0.28 }
15	N {kgf}	48.5 { 4.95 }	53.1 { 5.42 }	56.6 { 5.78 }	2.9 { 0.30 }	2.9 { 0.30 }	2.9 { 0.30 }

※ Released lock, and measure.

{ } : Reference Unit

[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)


THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

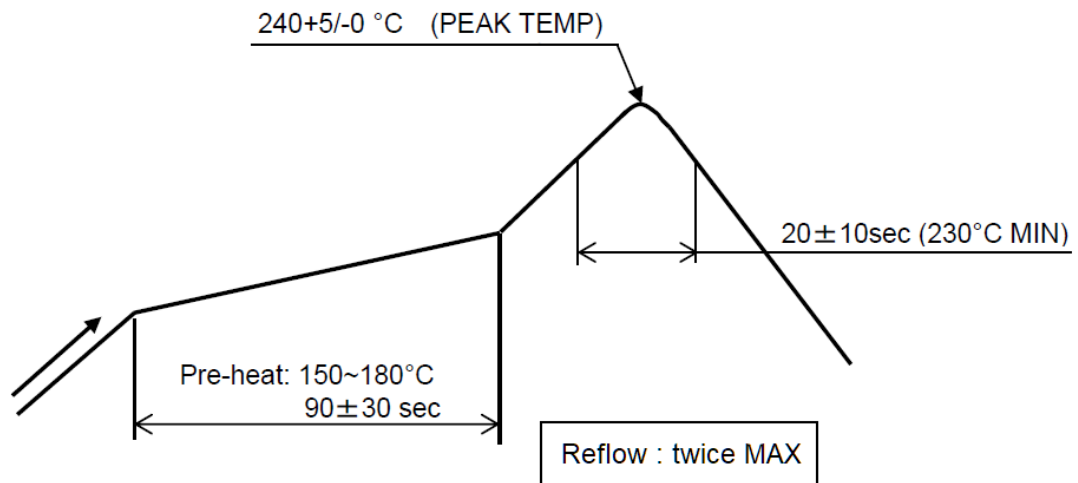
REVISION DESCRIPTION		CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC							
CHANGE NO.								666482	
REVISED BY	MIKEDA01	DATE	2021/05/14	DOC TYPE	DOC TYPE DESCRIPTION		DOC PART	SERIES	
REV APPR BY	KOMURAKAMI	DATE	2021/06/25	PS	PRODUCT SPECIFICATION WORD		000	502578	
INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER		REVISION	SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL		5025781004-PS		B	12 OF 18
INITIAL APPR	AIDA	DATE	2020/08/07						

8.0 SOLDER INFORMATION

These specifications establish standard solderability test methods used to evaluate a products ability to accept molten solder. Solder Process Temperatures and Reflow Solder Profiles will vary based on application, equipment, solder paste, PCB thickness, etc.

8.1 SOLDER PROCESS TEMPERATURES

Reflow Solder Temperature: 245°C Maximum

8.2 SOLDERING PROFILE

TEMPERATURE CONDITION GRAPH
(SOLDER JOINT PART)

NOTE : Please check the mount condition (reflow soldering condition) by your own devices beforehand, because the condition changes by the soldering devices, p.c. boards, and so on. Although tail of terminal and nail may discolor, a solderability does not have a problem.

[CLIK-Mate W-t-B Connectors Web Page](#)

[TABLE OF CONTENT](#)



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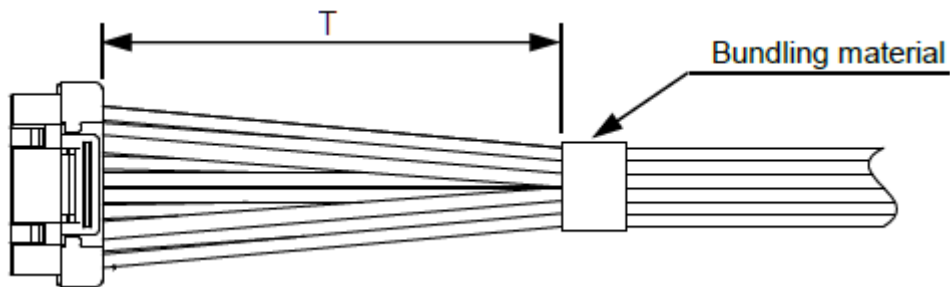
REVISION DESCRIPTION	CLIK-MATE 1.5 SINGLE ROW SMT TYPE GOLD PLATING SMART SPEC						
CHANGE NO.	666482						
REVISED BY	MIKEDA01	DATE	2021/05/14	DOC TYPE	DOC TYPE DESCRIPTION	DOC PART	SERIES
REV APPR BY	KOMURAKAMI	DATE	2021/06/25	PS	PRODUCT SPECIFICATION WORD	000	502578
INITIAL RELEASE				CUSTOMER		DOCUMENT NUMBER	REVISION
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL		5025781004-PS	B
INITIAL APPR	AIDA	DATE	2020/08/07				
							SHEET
							13 OF 18

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	35 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.

[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)


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INITIAL RELEASE				CUSTOMER	DOCUMENT NUMBER	REVISION	SHEET
INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL	5025781004-PS	B	14 OF 18
INITIAL APPR	AIDA	DATE	2020/08/07				

11.0 NOTES

1. There is no influence in the product performance though the black spot or bubble etc. might be confirmed to the plastic part of this product and the shade might be different (discoloration by secular distortion etc.).
2. The wound of friction might adhere to externals because the tin plating is used for the tail and nail. But there is no influence in the product performance.
3. A few scratches may be confirmed to the surface of the housing and the plating of this product, however, there is no problem in the product performance.
4. ELV and RoHS Compliant.
5. Discoloration of the plastic part of this product can result from exposure to ultraviolet light. There is no problem in the product performance.
6. Please use it after confirming externals and soldering when the storage condition of packing goods is over recommended storage condition.
7. Please store the products under recommended storage condition. Please use it promptly after opening a packing. Please put unused products back in the high barrier bag (this high barrier bag is made of material with much lower permeability) with desiccant enclosed and store with condition preventing from hygroscopicity (for ex. folding an opening of the bag once or twice and sealing with tape etc.) to maintain the effect of prevention of hygroscopicity.
The recommendation is within at 48 hours after opening a packing.
8. Because of property of HS'G resin, blister might be generated during reflow heating by hygroscopicity. When the storage condition after opening the humidity prevention package of product is over recommended storage condition, baking is recommended with below condition.
Baking condition : put in 50°C temperature chamber for 10 hours.
9. In the case of changing our recommended board pattern size and designing, please consult in advance because it may cause a mounting issues and soldering defect and more.
10. Description of size of thickness of recommended metal mask and the aperture ratio. The metal mask of thickness of t=0.1mm and the aperture ratio of 100% is used in our evaluation. In the case of metal mask of more than that solder volume used in our evaluation, please consult in advance because it may cause a flux wicking and more defect.

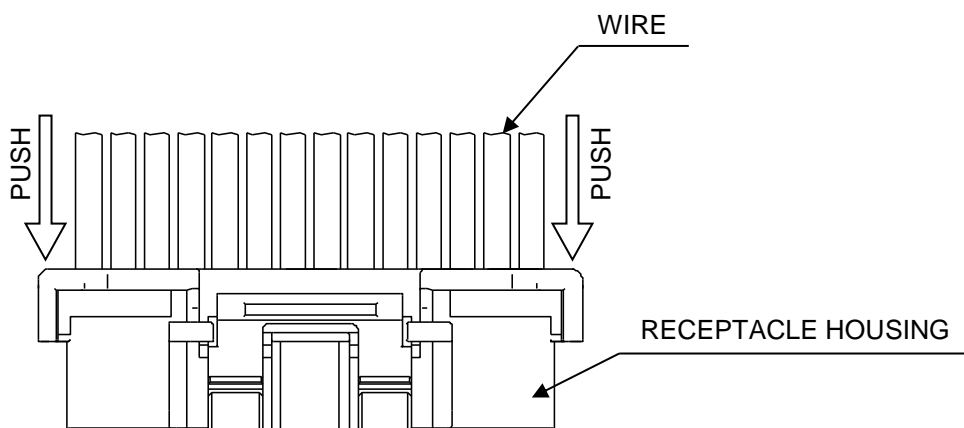
[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)


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INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL		5025781004-PS	B 15 OF 18
INITIAL APPR	AIDA	DATE	2020/08/07				

12.0 INSTRUCTION UPON USAGE

1. Please refer to the manual for the detailed handling of the connector. (AS-502578-001)
 - a. Please push the part directed by FIG.1 at the time of mate. It may damage, when electric wires or lock part of the receptacle housing are pushed.


FIG.1

- b. When unmated connectors, positive locks shall be released. Please grip all the wire together, push "lock release bar" with "lock protection wall" to release the lock, then pull out slowly.
2. Mounting performance of coplanarity shall not contain the influence of the warpage of the mounting board.
3. The coplanarity assurance of this product is a guarantee alone before mounting, and the coplanarity during and after the empty reflow is not guaranteed.
4. 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 a damage.
5. In the case of changing our recommended board pattern size and designing, please consult in advance because it may cause a fatal defect.
6. Strand, etc. may be generated on the terminal plating part according to the reflow condition, however, there is no influence in the product performance.
7. Discoloration may be generated in the resin part according to the reflow condition, however, there is no influence in the product performance.
8. Soldering wicking: "This connector assumes the mounting by an IR reflow. In the case of mounting by the N₂ reflow, there is a risk of the soldering wicking. The separate evaluation is necessary for mounting by the N₂ reflow."
9. Color fall may be generated according to the reflow condition, please consult in advance.

[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)


THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

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INITIAL APPR	AIDA	DATE	2020/08/07				
							16 OF 18

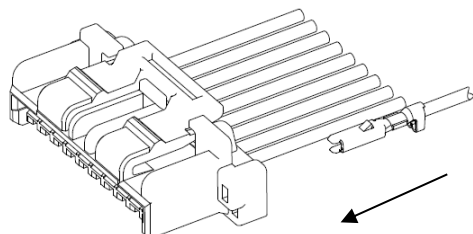
10. Please investigate the mounting condition (reflow soldering condition) on your own devices beforehand. The mounting conditions may change due to the soldering temperature, soldering paste, air reflow machine, Nitrogen reflow machine, and the type of printed circuit board. The different mounting conditions may have an influence on the product's performance.
11. The product performance was tested using rigid printed circuit board. In case the product needs to be reflowed onto flexible circuit board, please conduct a reflow test on the flexible circuit board in advance.
12. If you leave any soldering area on this product open, there may be the possibility of a missing terminal short circuiting between pins, terminal buckling or the potential for the connector to come off of the printed circuit board. Therefore, please solder all of the terminals and fitting nails on the printed circuit board.
13. Please do not use the connector in a condition where the wire, the printed circuit board, or the contact area is experiencing a sympathetic vibration of wires and printed circuit board, and constant movement of devices. This may cause a defect in the contact due to the contact area being worn down. Therefore, please fix wires and printed circuit board on the chassis, and reduces sympathetic vibration.
14. Please do not touch the terminals and fitting nails before or after reflowing the connector onto the printed circuit board.
15. Please do not do work that the load hangs in the connector like the carrying of the substrate etc. with the connector engages. There is a case where it causes the connector damage etc.
16. Please do not stack the printed circuit board directly after mounted the connector on it.
17. 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.
18. If there is accidental contact with the connector while it is going through the reflow machine, there may be deformation or damage caused to the connector. Please check to prevent this.
19. Please do not use the connector alone to provide mechanical support for the printed circuit board (PCB). Please ensure that there is a fixed structure on the phone chassis or other component support for the PCB.
20. After mated the connector, please do not allow the printed circuit boards to apply pressure on the connector in either the pitch direction or the span direction. It may cause damage to the connector and may crack the soldering.
21. Please try to prevent any external forces or shock from being applied to the connector while the cable assembly is in process, when it is being packaged, or while it is in transportation. This may cause deformation and damage to the connector and cause a defect in the product's performance.
22. The cable assembly should not have a constant stress or pulling force applied on it when it is in the mated condition. This phenomenon may damage the contact area or wiring area (crimping). Therefore, when designing the wire positioning, please ensure that there is enough length of wire to avoid stress on the connector.

[CLIK-Mate W-t-B Connectors Web Page](#)
[TABLE OF CONTENT](#)

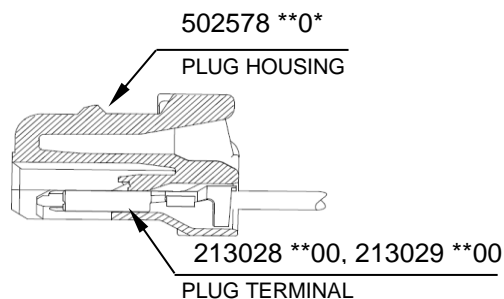

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INITIAL DRWN	MIKEDA01	DATE	2020/06/25	GENERAL		5025781004-PS	B
INITIAL APPR	AIDA	DATE	2020/08/07				
							17 OF 18

23. The applicable wire for this connector, in principle, is tin-plated copper stranded wire. Please consult us and evaluate it in advance when using other wires.
24. When inserting the terminal (213028 **00, 213029 **00) into the receptacle housing (502578 ****), please ensure that the terminal is inserted completely and touches the end of the receptacle housing. Please insert the terminal in the correct direction as showing in figure 2. Also, please pull the wire lightly after inserting the terminal to ensure that the terminal is fully inserted and can not be pulled out.



<Fig.2 Terminal insertion direction>



<Fig.3 Terminal inserted statement>

25. When extracting a crimp terminal from the housing using a jig, it may deform the housing lance and therefore reduce the terminal retention force after re-inserting of the terminal. Therefore, please ensure to use a new housing after repairing the crimp terminals.
26. When using this product, please ensure that the specification for rated current per circuit is followed. Do not allow the sum of the current used on several circuits to exceed the maximum allowable current.
27. This product is not designed for the mating and unmating of the connectors to be performed under the condition of an active electrical circuit. It may cause a spark and product defect if the connectors are mated and unmated in this way.

[CLIK-Mate W-t-B Connectors Web Page](#)

[TABLE OF CONTENT](#)



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INITIAL APPR	AIDA	DATE	2020/08/07				
							SHEET
							18 OF 18