molex

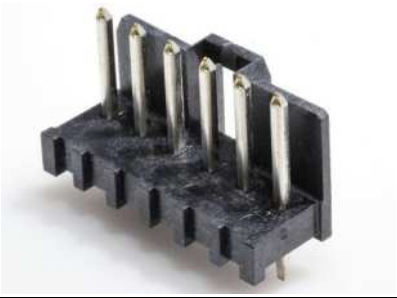
PRODUCT SPECIFICATION

KK PLUS 396

Wire-To-Board

CONNECTOR

Crimp Terminal	Receptacle Housing
	
Series: 45570	Series: 207458

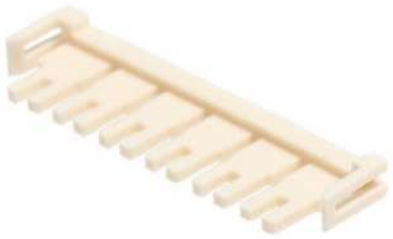
Unshrouded Header with Peg	Unshrouded Header Without Peg
	
Series: 207478	Series: 207478

KK PLUS 396 Connectors Web Page | TABLE OF CONTENTS

REVISION:	ECM INFORMATION:	TITLE:	SHEET No.
C3	EC No: 650168 DATE: 11/26/2020	PRODUCT SPECIFICATION FOR KK PLUS 396 WTB CONNECTOR	1 of 19

DOCUMENT NUMBER:	DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
2074580000-PS	PS	000	SMAHAJANSHET	NCSR	NCSR

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

Shrouded Header	TPA
	
Series: 207479	Series: 207459

KK PLUS 396 Connectors Web Page | TABLE OF CONTENTS

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

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
2.4	SAFETY AGENCY LISTINGS	4
3.0	APPLICABLE DOCUMENTS AND SPECIFICATION	5
3.1	MOLEX DOCUMENTS	5
3.2	INDUSTRY DOCUMENTS	5
4.0	ELECTRICAL PERFORMANCE RATINGS	6
4.1	VOLTAGE	6
4.2	CURRENT AND APPLICABLE WIRES	6
4.3	TEMPERATURE	7
4.4	DURABILITY	7
4.5	GLOW WIRE SERIES	7
5.0	QUALIFICATION	7
6.0	PERFORMANCE	8
6.1	ELECTRICAL PERFORMANCE	8
6.2	MECHANICAL PERFORMANCE	9
6.3	ENVIRONMENTAL PERFORMANCE	11
7.0	TEST SEQUENCE GROUPS	13
8.0	SOLDER INFORMATION	15
8.1	SOLDER PROCESS TEMPERATURES	15
8.2	REFLOW SOLDERING PROFILE	15
9.0	PACKAGING	16
10.0	CABLE TIE AND / OR TWIST TIE LOCATION	17
11.0	POLARIZATION AND KEYING OPTIONS	18

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

1.0 SCOPE

This Product Specification covers 3.96 mm centerline (pitch) connector series terminated with 18 to 20 AWG wire using Crimp technology with tin plating.

2.0 PRODUCT DESCRIPTION

2.1 DESCRIPTION, SERIES NUMBER, AND LINKS

DESCRIPTION	SERIES NUMBER
3.96mm Pitch MarKK Crimp Terminal	45570
KK PLUS 396 Receptacle Housing	207458
KK PLUS 396 Unshrouded Header with Peg	207478
KK PLUS 396 Unshrouded Header without Peg	207478
KK PLUS 396 shrouded Header	207479
KK PLUS 396 TPA	207459

2.2 DIMENSIONS, MATERIALS, PLATINGS

Refer to sales drawings 2074790000-SD, 2074781000-SD, 2074580000-SD, 2074590000-SD and SD-45570-001.

2.3 ENVIRONMENTAL CONFORMANCE

To find product compliance information:
a. Go to 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.

2.4 SAFETY AGENCY LISTINGS

UL File Number: E29179
CSA File Number: 80036057
IEC File Number: 61984:2008
CB File Number: US-37071-UL

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

3.0 APPLICABLE DOCUMENTS AND SPECIFICATION

3.1 MOLEX DOCUMENTS

KK PLUS 396 Connector System Test summary 2074580000-TS-000
KK PLUS 396 Connector System Application summary 2074580000-AS-000
Molex Quality Crimping Handbook Order No. 63800-0029
Molex Solderability Specification SMES-152
Molex Heat Resistance Specification AS-40000-5013
Molex Moisture Technical Advisory AS-45499-001
Molex Package Handling Specification 454990100-PK
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*

3.2 INDUSTRY DOCUMENTS

EIA-364-1000
UL-60950-1
IEC-60695-2-11
IEC-60335-1

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

4.0 ELECTRICAL PERFORMANCE RATINGS

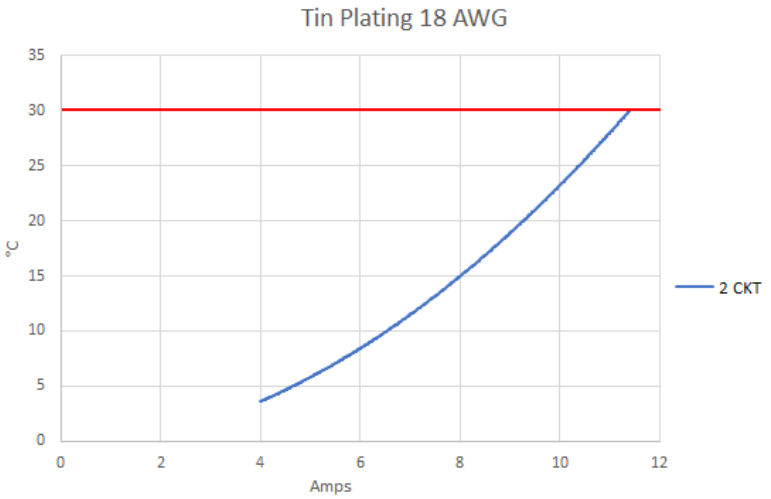
4.1 VOLTAGE

350 Volts AC/DC

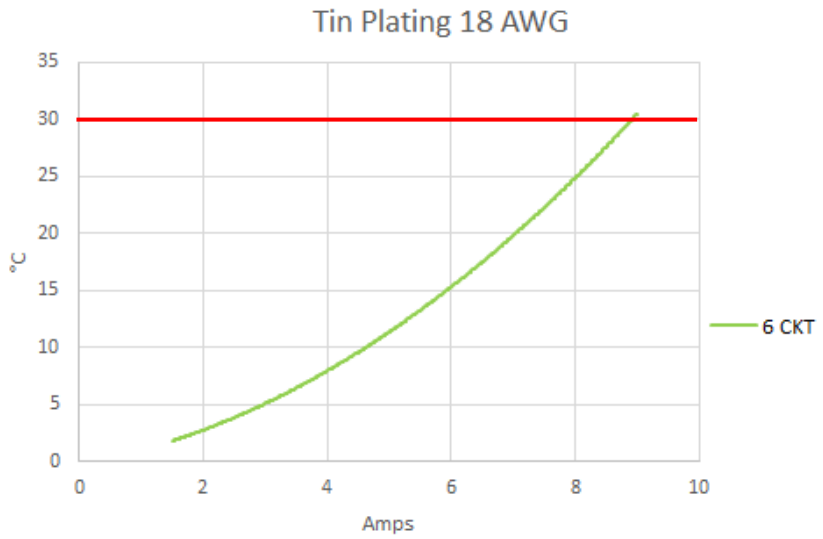
4.2 CURRENT AND APPLICABLE WIRES

Item	CIRCUIT	2	3	4	5	6
Rated current (Max.) and applicable wire	AWG. #18	11.0 A	10.5 A*	10.0 A*	9.5 A*	9.0 A
	AWG. #20	10.0 A	9.5 A*	9.0 A*	8.5 A*	8.0 A

*Estimated



Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.



4.3 TEMPERATURE

Operating Temperature Range (includes T-Rise from applied current): - 40°C to + 105°C

Field Temperature and Field Life: 65°C for 10 years
(based EIA-364-1000, table 8)

Note: Temperature life test duration (section 6.3.1) is based on the assumption that the contact spends its entire life at the rated field maximum temperature (based on EIA-364-1000, table 8).

4.4 DURABILITY

Plating Type	Number of Cycles
Tin Plated	25

As tested in accordance with EIA-364-1000 test method (see sec 6.2.9 of this specification). Durability per EIA-364-09

4.5 GLOW WIRE SERIES

207458, 207459, 207478 and 207479

5.0 QUALIFICATION

Laboratory condition, sample selection and test sequences are in accordance with EIA-364-1000.

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

6.0 PERFORMANCE

6.1 ELECTRICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.1.1	Contact Resistance (Low Level)	Mate connectors: apply a maximum voltage of 20 mV and a current of 100 mA. EIA-364-23C	10 mΩ MAX [initial]
6.1.2	Insulation Resistance	Mate connectors: Apply a voltage of 500 VDC between adjacent terminals and between terminals to ground. EIA-364-21C	1000 Megohms MINIMUM
6.1.3	Dielectric Withstanding Voltage	Apply a voltage of 1700 VAC for 1 minute between adjacent terminals and between terminals to ground. EIA-364-20D	No breakdown; current leakage < 5 mA
6.1.4	Temperature Rise	Mate connectors: measure the temperature rise at the rated current. EIA-364-70B, Method 2	Temperature rise: +30°C MAXIMUM (above ambient)
6.1.5	Temperature Rise (18-day Stability)	Mate connectors: measure the temperature rise at the rated current after: 96 hours (Steady state) 240 hours (Current cycling) 45 minutes ON and 15 minutes OFF per hour 96 hours (Steady state) Steady state per EIA-364-70B, Method 2. Current cycling per EIA-364-55A, Test Condition A, Test Method 4.	Temperature rise: +30 °C MAXIMUM [over ambient]
6.1.6	Contact Resistance @ Rated Current	Mate connectors: apply a maximum voltage of 20 mV at rated current. Wire resistance shall be removed from the measured value.	10 milliohms MAXIMUM [initial]
6.1.7	Contact Resistance of Wire Termination (Low Level)	Terminate the applicable wire to the terminal and measure wire using a voltage of 20 mV and a current of 100 mA.	5 milliohms MAXIMUM [initial]

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

6.2 MECHANICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
6.2.1	Connector Mate and Unmate Forces (Latch deactivated)	Mate and unmate connector (male to female) at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute. EIA-364-13E	10.7 N MAX./ CIRCUIT Mate force & 3.4 N MIN./ CIRCUIT Unmate force	
6.2.2	Terminal Insertion Force (In Housing)	Insert the crimped terminal to housing at the speed rate of 25±6 mm (1 ± ¼ inch) per minute.	14.7 N MAXIMUM Insertion force	
6.2.3	Terminal Retention Force (In Housing)	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	35.6 N MINIMUM Retention force	
6.2.4	Wire Pullout Force (Axial)	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	AWG	MINIMUM pullout force
			18	89.0 N
			20	57.0 N
6.2.5	Housing Latch Mechanism Strength	Mate connectors apply axial pull out force at the speed rate of 13 mm (0.5 inch) per minute.	70.00 N MINIMUM	
6.2.6	Header Pin Retention (Header Housing)	Apply axial push force on the Header pin in the header housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	17.5 N MINIMUM	
6.2.7	TPA installation to housing	Install the TPA to the Housings at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	7.40 N MAXIMUM	
6.2.8	TPA Latch strength test	Apply an axial Pullout force at a rate of 13 mm (0.5 inch) per minute.	37.00 N MINIMUM	
6.2.9	Durability	Mate and unmate connectors up to 5 cycles (to meet application requirement of up to 25 cycles over the life of the connector) at a maximum rate of 10 cycles per minute prior to Environmental Tests. EIA-364-09C	10 mΩ MAXIMUM (change from initial)	

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

6.2 MECHANICAL PERFORMANCE (CONTD.)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.2.10	Vibration (Random) Test group 3, EIA-364-1000	Mate connectors and vibrate per EIA 364-28, test condition VII. Letter D. (Acceleration 3.1 g)	10 mΩ MAXIMUM (change from initial) & Discontinuity < 1 microsecond
6.2.11	Shock (Mechanical) Test group 3, EIA-364-1000	Mate connectors and shock at 50 g's with ½ sine wave (11 milliseconds) shocks in the ±X, ±Y, ±Z axes (18 shocks total). EIA-364-27, Test Condition A	10 mΩ MAXIMUM (change from initial]) & Discontinuity < 1 microsecond

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

6.3 ENVIRONMENTAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.1	Temperature Life EIA-364-1000 Test Group 1	Mate connectors; expose to: 228 hours at 105 ± 2°C. with the field temperature of 65 °C and field life of 10 years EIA-364-17, Method A	10 mΩ MAXIMUM (change from initial) & Visual: No Damage
6.3.2	Thermal shock EIA-364-1000 Test Group 2	Mate connectors; expose to 5 cycles of: Temperature °C — Duration (Minutes) -40 +0/-3 — 30 +25 ±10 — 5 MAXIMUM +105 +3/-0 — 30 +25 ±10 — 5 MAXIMUM EIA-364-32E Test condition I	10 mΩ MAXIMUM (change from initial) & Visual: No Damage
6.3.3	Cyclic Temperature & Humidity EIA-364-1000 Test Group 2	Mate connectors: cycle per EIA-364-31: 24 cycles at temperature 25 ± 3°C at 80 ± 5% relative humidity and 65 ± 3°C at 50 ± 5% relative humidity; dwell time of 1.0 hour; ramp time of 0.5 hours.	10 mΩ MAXIMUM (change from initial) & Dielectric Withstanding Voltage: No Breakdown at 500 VAC & Insulation Resistance: 1000 Megohms MINIMUM & Visual: No Damage
6.3.4	Solderability	Per SMES-152	Solder coverage: 95% MINIMUM
6.3.5	Resistance to Soldering Heat (Wave solder)	Dip connector terminal tails into solder molten; Soldering Time: 5±0.5 sec. Solder Temperature: 260±5℃	Visual: No damage in appearance of the connector
6.3.6	Resistance to Soldering Heat (Reflow solder)	See table – Section 8	Visual: No damage in appearance of the connector
6.3.7	Thermal Cycling with lubrication (NYOGEL 760G) EIA-364-1000 Test Group 5	Cycle the connector between 15°C ± 3°C and 85°C ± 3°C. Humidity is not controlled. EIA-364-1000, Table 5	10 mΩ MAXIMUM (change from initial) & Visual: No Damage

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

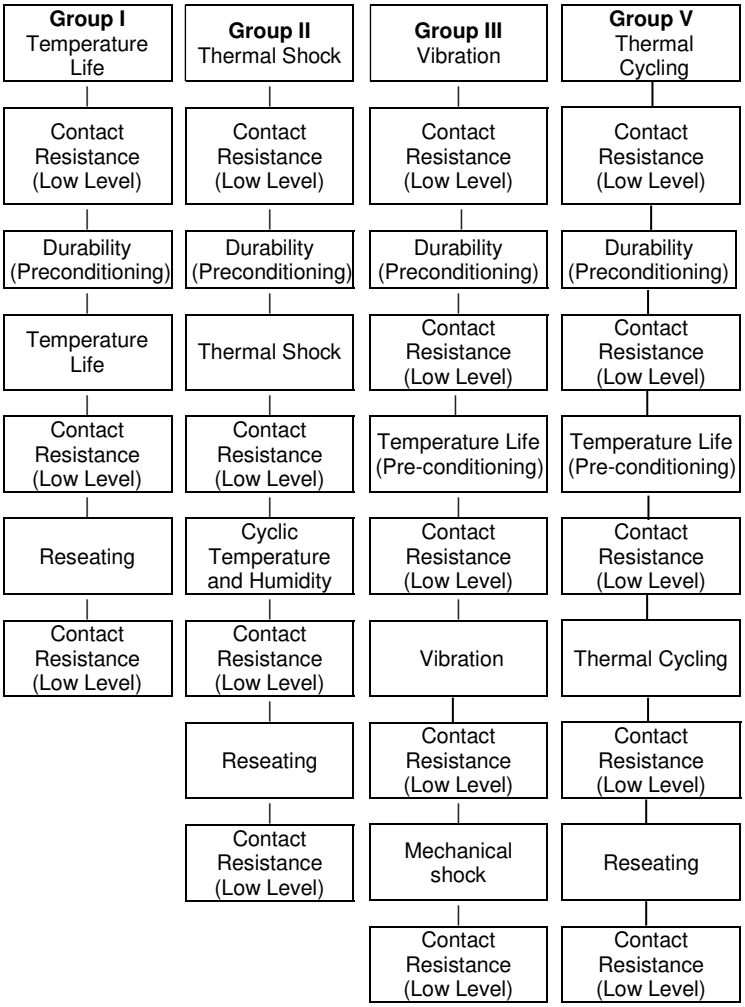
6.3 ENVIRONMENTAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.8	Humidity (Steady State)	Mate connectors: expose to a temperature of 40 ± 2°C with a relative humidity of 90-95% for 96 hours. Note: Remove surface moisture and air dry for 1 hour prior to measurements.	10 milliohms MAXIMUM (change from initial) & Dielectric Withstanding Voltage: No Breakdown at 500 VAC & Insulation Resistance: 1000 Megohms MINIMUM & Visual: No Damage
6.3.9	Salt Spray	Mate connectors: Duration: 48 hours exposure; Atmosphere: salt spray from a 5% solution; Temperature: 35 +1/-2°C	10 milliohms MAXIMUM (change from initial) & Visual: No Damage
6.3.10	Cold Resistance	Mate connectors: Duration: 96 hours; Temperature: -40 ± 3°C	10 milliohms MAXIMUM (change from initial) & Visual: No Damage

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

7.0 TEST SEQUENCE GROUPS

Reliability Test Sequences per EIA-364-1000



Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

Temperature Rise

T-Rise Profiling

Steady State Temperature Rise

Individual Tests

- Connector Mate / Un-mate Force
- Crimp Terminal Insertion force
- Crimp Terminal Retention force
- Wire Pullout force (Axial)
- Housing Latch Mechanism Strength
- Header Pin Retention
- TPA Installation to Housing
- TPA Latch Strength Test

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

8.0 SOLDER INFORMATION

Per SMES-152 and AS-40000-5013
*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.

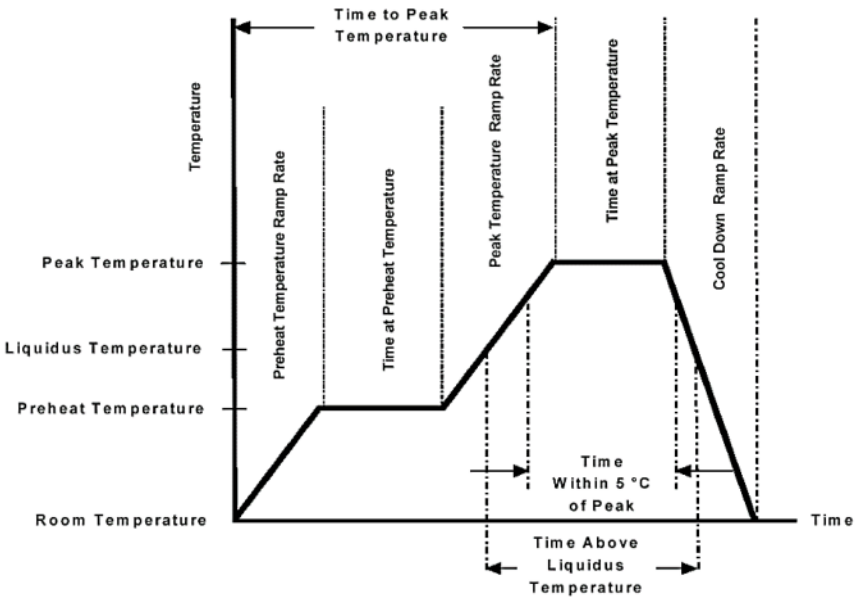
8.1 SOLDER PROCESS TEMPERATURES *

Wave Solder Temperature: 260°C Maximum
Reflow Solder Temperature: 260°C Maximum

Molex Solderability Specification SMES-152
(Click Here)

8.2 REFLOW SOLDERING PROFILE *

Molex Connector Heat Resistance Specification AS-40000-5013
(Click Here)



Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

Description	Requirement
Average Ramp Rate	3°C/sec Max
Preheat Temperature	150°C Min to 200°C Max
Preheat Time	60 to 180 sec
Ramp to Peak	3°C/sec Max
Time over Liquidus (217°C)	60 to 150 sec
Peak Temperature	260 +0/-5°C
Time within 5°C of Peak	20 to 40 sec
Ramp - Cool Down	6°C/sec Max
Time 25°C to Peak	8 min Max

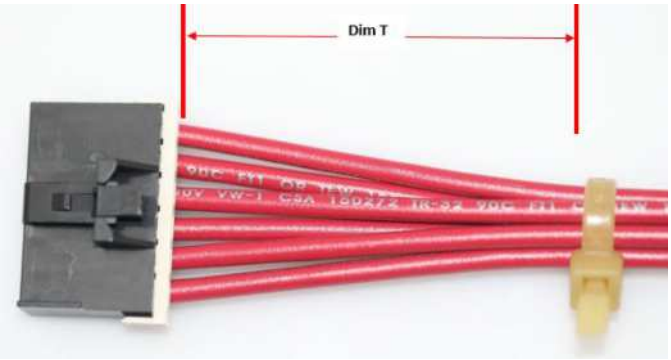
9.0 PACKAGING

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.

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

10.0 CABLE TIE AND / OR TWIST TIE LOCATION

CKT Size	Dim T Min.
2	16.50mm
3	21.00mm
4	27.50mm
5	34.00mm
6	38.50mm

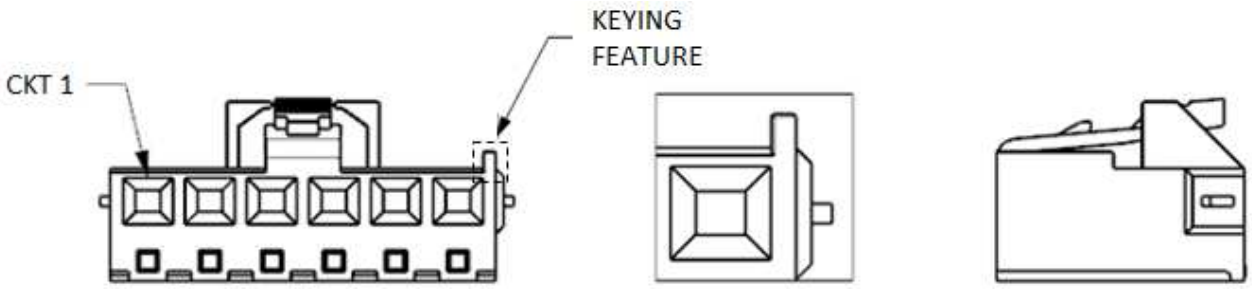


The “T” dimension defines a “free” length of wire, or a length of wire that is not subject to significant bias by external factors such as a wire tie, wire twisting, or other means of bending or deforming of the wires that repositions them from their natural relaxed state or location where they enter 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.

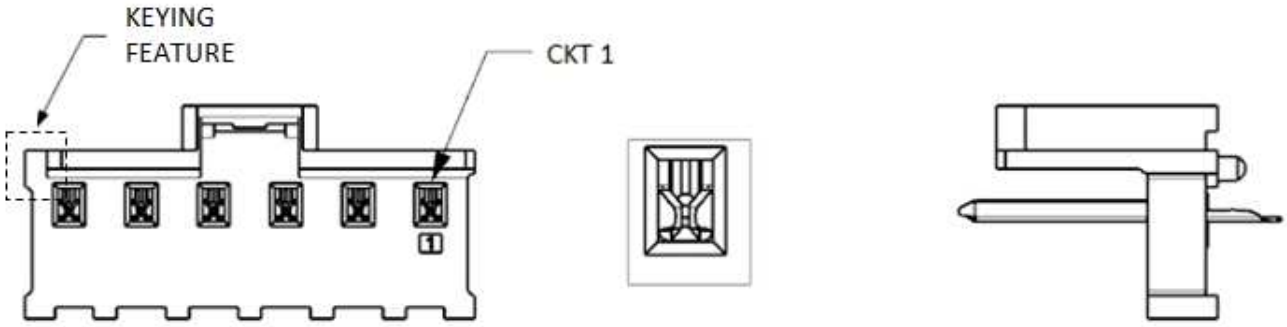
Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

11.0 POLARIZATION AND KEYING OPTIONS

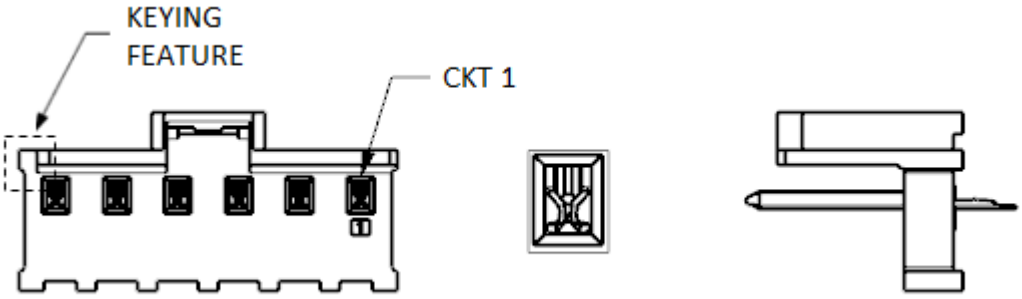
11.1 Receptacle Housing (Series: 207458)



11.2 Unshrouded Header With Peg (Series: 207478)

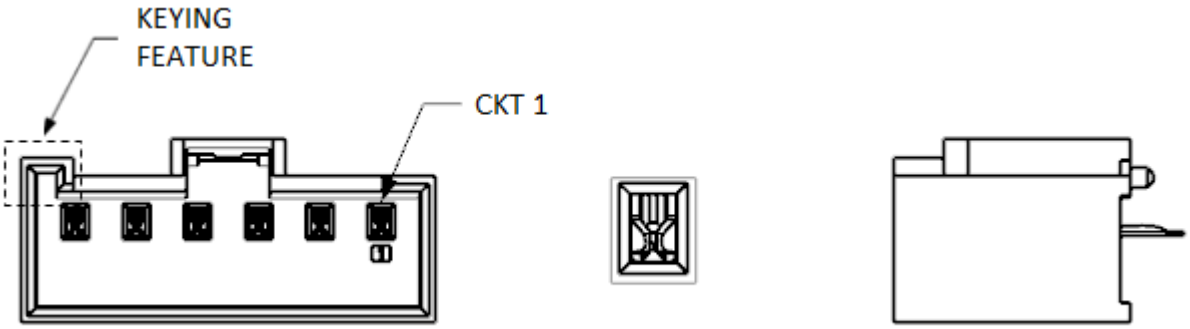


11.3 Unshrouded Header Without Peg (Series: 207478)



Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

11.4 Shrouded Header (Series: 207479)



KK PLUS 396 Connectors Web Page | TABLE OF CONTENTS

Molex is a registered trademark of Molex, LLC in the Unites States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.