SPECIFICATION

宏致電子股份有限公司

桃園縣中壢市東園路13號

No.13, Dongyuan Rd., Jhongli City,

Taoyuan County 320, Taiwan (R.O.C.)

TEL: +886-3-463-2808
FAX: +886-3-463-1800

SPEC. NO.: PS-50294-XXXXX-XXX **REVISION:** J

PRODUCT NAME: 1.5 mm PITCH WTB CONNECTOR

PRODUCT NO: 50294-XXXXX, 91203-000XX

PREPARED:	CHECKED:	APPROVED:
SHI,YANAN	BRAVE	BRAVE
DATE: 2019.12.25	DATE: 2019.12.25	DATE: 2019.12.25

1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
O	ECN-0812210	NEW SPEC.	JASON	2008.11.15
A	ECN-0909184	UPDATED HOUSING AND TERMINAL P/N AND TEMP.RISE	JASON	2009.9.23
B	ECN-0910228	UPDATED TERMINAL P/N	JASON	2009.10.19
C	ECN-1003110	CANCEL WIRE CRIMPING STRENGTH	JASON	2010.3.12
D	ECN-1005167	REVISE SPEC	VIOLET	2010/05/07
E	ECN-1107033	FOR ADW1106050 MODIFY CURRENT	CHUNBO	2011/06/22
F	ECN-1401188	ADD WORKING VOLTAGE	XUFEI	2014/01/13
G	ECN-1608101	ADD AWG#24 CRIMPING CONDITION	LIYAQIN	2016/08/02
H	ECN-1808078	RENEWING ELECTROPLATING STANDARD	ZHANGHAO	2018/08/06
J	ECN-2001058	Update AWG#24 Current	SHI,YANAN	2019/12/25

2 SCOPE

This specification covers performance, tests and quality requirements for 1.5mm pitch wire-to-board connector. These connectors are used to computer or other application. (Lead free product)

ACES : P/N : 50294-XXXHXXX-XXX Wire Housing
P/N : 91203-000XX Crimping Terminal
Matting : P/N : 50292-XXXXX Wafer
P/N : 50289-XXXXX Wafer

3 APPLICABLE DOCUMENTS

EIA-364: ELECTRONICS INDUSTRIES ASSOCIATION

4 REQUIREMENTS

4.1 Design and Construction

4.1.1 Product shall be of design, construction and physical dimensions specified on applicable product drawing.
4.1.2 All materials conform to R.o.H.S. and the standard depends on TQ-WI-140101.

4.2 Materials and Finish

4.2.1 Crimping Terminal: High performance copper alloy (Phosphor Bronze)
Finish: (a) Area: Gold plated all over based on order information
(b) Under plate: Nickel-plated all over
4.2.2 Housing: Thermoplastic or Thermoplastic High Temp., UL94V-0

4.3 Ratings

4.3.1 Working voltage less than 36 volts (per pin)
4.3.2 Voltage Rating: 50 Volts AC (per pin)
4.3.3 Current Rating: AWG#24:4.0A (per pin)
AWG#26: 3.0A (per pin)
AWG#28: 2.5A (per pin)
AWG#30: 1.0A (per pin)
4.3.4 Operating Temperature : -40℃ to +85℃

5 Performance

5.1. Test Requirements and Procedures Summary

Item	Requirement	Standard
Examination of Product	Product shall meet requirements of applicable product drawing and specification.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Item	**Requirement**	**Standard**
Low Level Contact Resistance	20 m Ω Max.(initial) 40 m Ω Max. (After 30 times durability, mechanical and/ or environmental test)	Mate connectors, measure by dry circuit, 20mV Max., 10mA Max. (EIA-364-23)
Insulation Resistance	1000 M Ω Min.	Unmated connectors, apply 500 V DC between adjacent terminals. (EIA-364-21)
Dielectric Withstanding Voltage	No discharge, flashover or breakdown. Current leakage: 1 mA max.	500 VAC Min. at sea level for 1 minute. Test between adjacent contacts of unmated connectors. (EIA-364-20)
Temperature rise	30℃ Max. Change allowed	Mate connector: measure the temperature rise at rated current until temperature stable. The ambient condition is still air at 25℃ (EIA-364-70 METHOD 1,CONDITION 1)

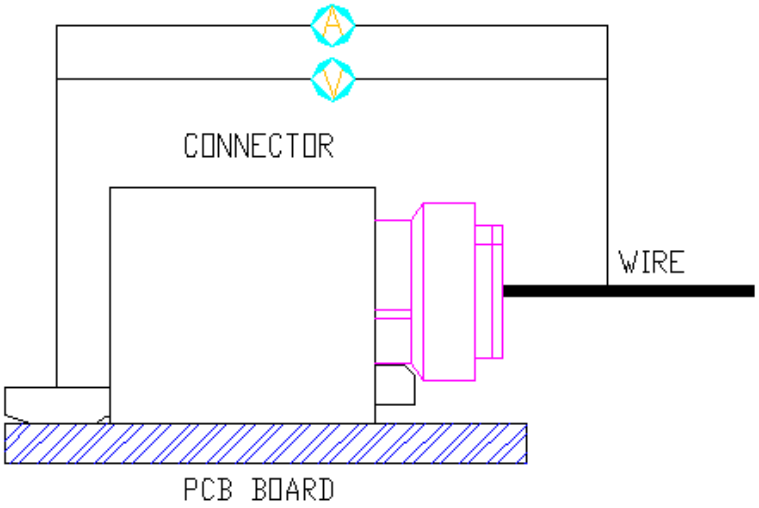
MECHANICAL		
Item	**Requirement**	**Standard**
Durability	30 cycles.	The sample should be mounted in the tester and fully mated and unmated the number of cycles specified at the rate of 25.4 ± 3mm/min. (EIA-364-09)
Mating / Unmating Forces	Please see item7	Operation Speed： 25.4 ± 3 mm/minute. Measure the force required to mate/Unmated connector. (EIA-364-13)

Crimping Terminal Pull Strength of the housing(Receptacle)(Board Side)	0.5kgf Min.	Operation Speed： 25.4 ± 3 mm/minute. Measure the Terminal retention force with Tensile strength tester.
Crimping Terminal V.S Housing Insertion Force(Cable Side)	0.5kgf Max	Operation Speed： 25.4 ± 3 mm/minute. Measure the Terminal Insertion force
Vibration	1 us Max.	The electrical load condition shall be 100 mA maximum for all contacts. Subject to a simple harmonic motion having amplitude of 0.76mm (1.52mm maximum total excursion) in frequency between the limits of 10 and 55 Hz. The entire frequency range, from 10 to 55 Hz and return to 10 Hz, shall be traversed in approximately 1 minute. This motion shall be applied for 2 hours in each of three mutually perpendicular directions. (EIA-364-28 Condition I)
Shock (Mechanical)	1 us Max.	Subject mated connectors to 50 G's (peak value) half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks). The electrical load condition shall be 100mA maximum for all contacts. (EIA-364-27, test condition A)

ENVIRONMENTAL		
Item	**Requirement**	**Standard**
Thermal Shock	See Product Qualification and Test Sequence Group 4	Mate module and subject to follow condition for 5 cycles. 1 cycles: -40 +0/-3 ℃, 30 minutes +85 +3/-0 ℃, 30 minutes (EIA-364-32, test condition A)
Humidity	See Product Qualification and Test Sequence Group 4	Mated Connector 40℃, 90~95% RH, 96 hours. (EIA-364-31,Condition A, Method II)

Temperature life	See Product Qualification and Test Sequence Group 5	Subject mated connectors to temperature life at 85℃ for 96 hours. (EIA-364-17, Test condition III Method A)
Salt Spray	See Product Qualification and Test Sequence Group 6	Subject mated/unmated connectors to 5% salt-solution concentration, 35℃, Under the condition that the electroplating layer on the metal surface is not destroyed (I)Gold flash for 8 hours (II)Gold plating 3 u" for 48 hours. (III) Gold plating 5 u" for 96 hours. (EIA-364-26,Test condition B)
Solder ability	Solder able area shall have minimum of 95% solder coverage.	Subject the test area of contacts into the flux for 5-10 sec. And then into solder bath, Temperature at 245 ±5℃, for 4-5 sec. (EIA-364-52)

Note. Flowing Mixed Gas shell be conduct by customer request.



Contact Resistance Measuring Point

6 PRODUCT QUALIFICATION AND TEST SEQUENCE

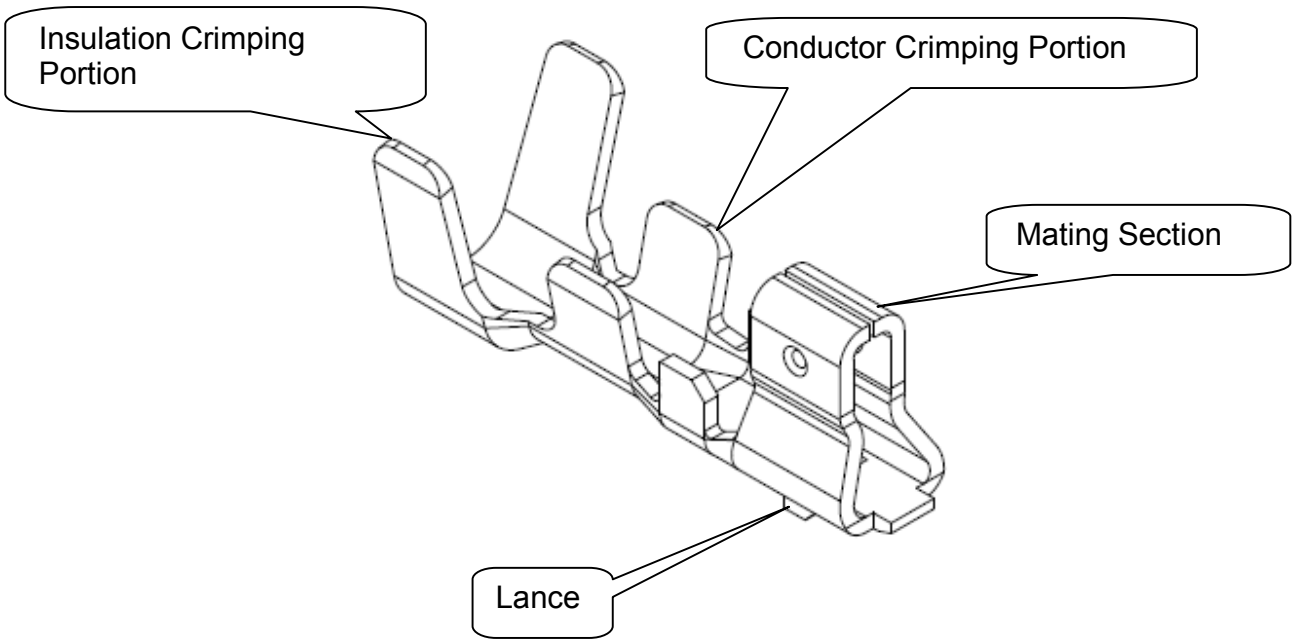
	Test Group								
	1	2	3	4	5	6	7	8	9
	Test Sequence								
Examination of Product				1、7	1、6	1、4			
Low Level Contact Resistance		1、5	1、4	2、10	2、9	2、5			
Insulation Resistance				3、9	3、8				
Dielectric Withstanding Voltage				4、8	4、7				
Temperature rise	1								
Mating / Unmating Forces		2、4							
Durability		3							
Vibration			2						
Shock (Mechanical)			3						
Thermal Shock				5					
Humidity				6					
Temperature life					5				
Salt Spray						3			
Crimping Terminal Pull Strength of the housing (Receptacle)(Board Side)							1		
Crimping Terminal V.S Housing Insertion Force(Cable Side)								1	
Solder ability									1
Sample Size	2	4	4	4	4	4	4	4	2

7 Mating / Unmating Forces:

Unit: Kgf

NO. OF Ckt.	At initial		At 30th
	Mating Force. (Max)	Unmating Force (Min)	Unmating Force (Min)
2	2.5	1.0	0.6
3	3.0	1.0	0.6
4	3.5	1.2	0.7
5	4.0	1.2	0.7
6	4.5	1.3	0.8
7	5.0	1.3	0.8
8	5.5	1.4	0.9
9	5.5	1.4	0.9
10	6.0	1.5	1.0
11	6.0	1.5	1.0
12	6.5	1.5	1.0
13	6.5	1.5	1.0
14	7.0	1.5	1.0
15	7.0	1.5	1.0

8 ANATOMY OF CRIMPING TERMINAL



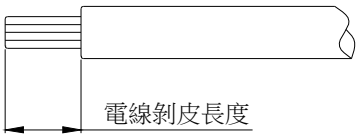
9 APPLICABLE WIRES:

AWG Size: AWG#24~#30
Insulation OD: Φ0.70~1.10mm

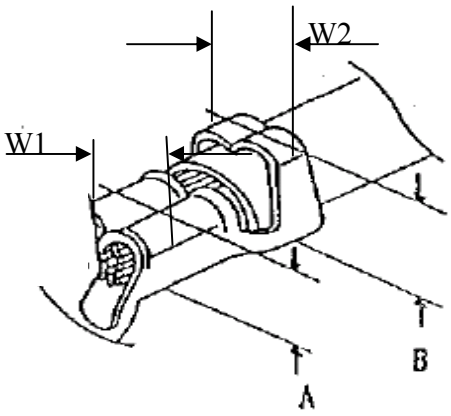
10 CRIMPING CONDITION

鉚線條件表 CRIMPING CONDITION

Part Number	Wire Specification			Crimp Height (mm)		Crimp Width (mm)	
	UL Style (REF.)	AWG Size	Insulation OD(mm)	Conductor A	Insulation B	Conductor W1	Insulation W2
91203-00001	UL10368	24	1.10	0.52~0.58	1.57~1.63	0.90(Ref.)	1.05 max.
	UL1061	26	1.00	0.52~0.58	1.47~1.53	0.80(Ref.)	1.05 max.
	UL1061	28	0.90	0.52~0.58	1.37~1.43	0.70(Ref.)	1.05 max.
	UL1571	30	0.70	0.52~0.58	1.25~1.31	0.60(Ref.)	1.05 max.



Strip length



Note:

1、W1為芯線導體鉚壓後之寬度(Conductor Crimping Width)：W1值如上表

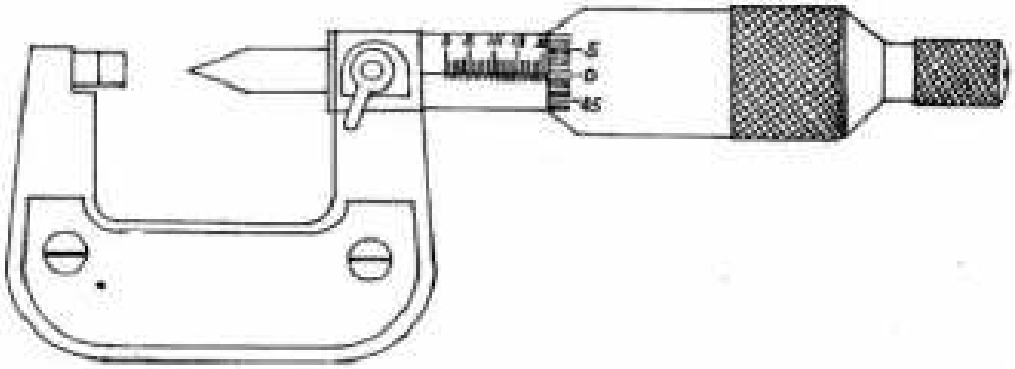
2、W2為電線外被部分鉚壓後之寬度(Insulation Crimping Width)：W2值如上表

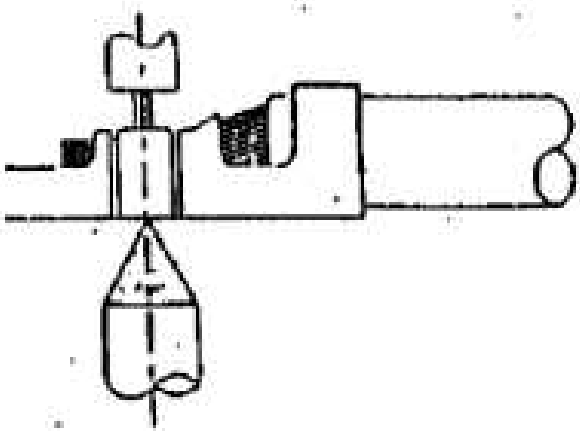
3、A為芯線導體鉚壓後之高度(Conductor Crimping height)：A值如上表(參考值）

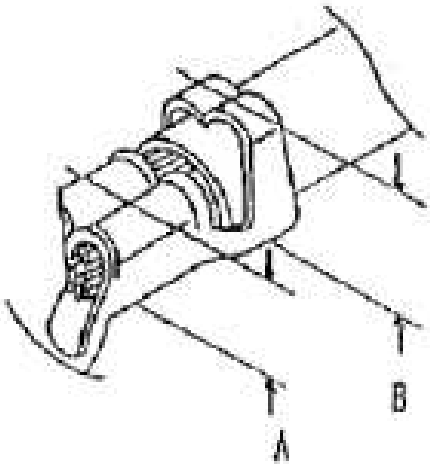
4、B為電線外被鉚壓後之高度(Insulation Crimping height)：B值如上表(參考值）

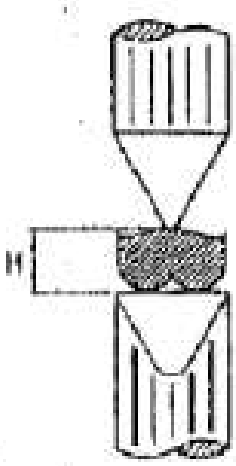
5、電線剝皮長度(Strip length)：1.2~1.6mm(參考值)

11 CRIMPING HEIGHT MEASUREMENT

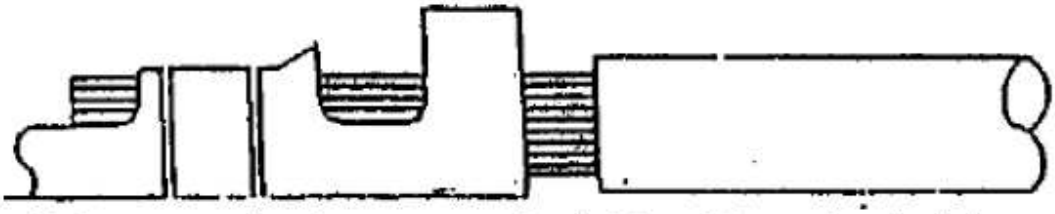




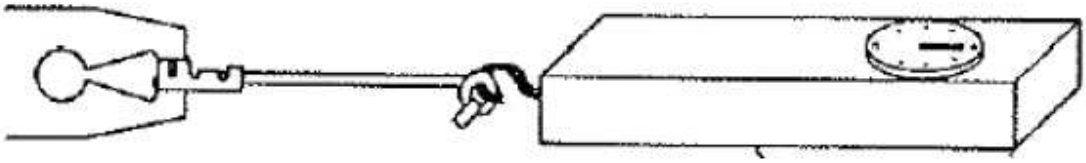




12 PULL FORCE OF CRIMPING SECTION MEASUREMENT

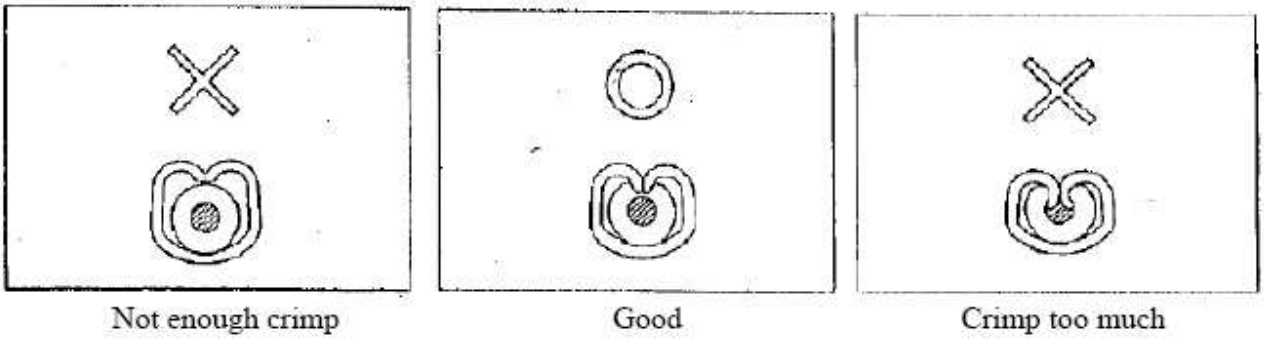


Before test samples, please measure crimp height and do not crimp insulation.

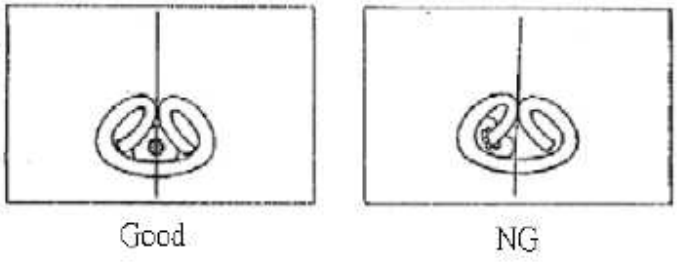


Pull Force of Crimp Section Measurement

13 STANDARD INSULATION CRIMPING

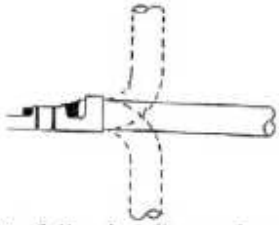


Not enough crimp | Good | Crimp too much



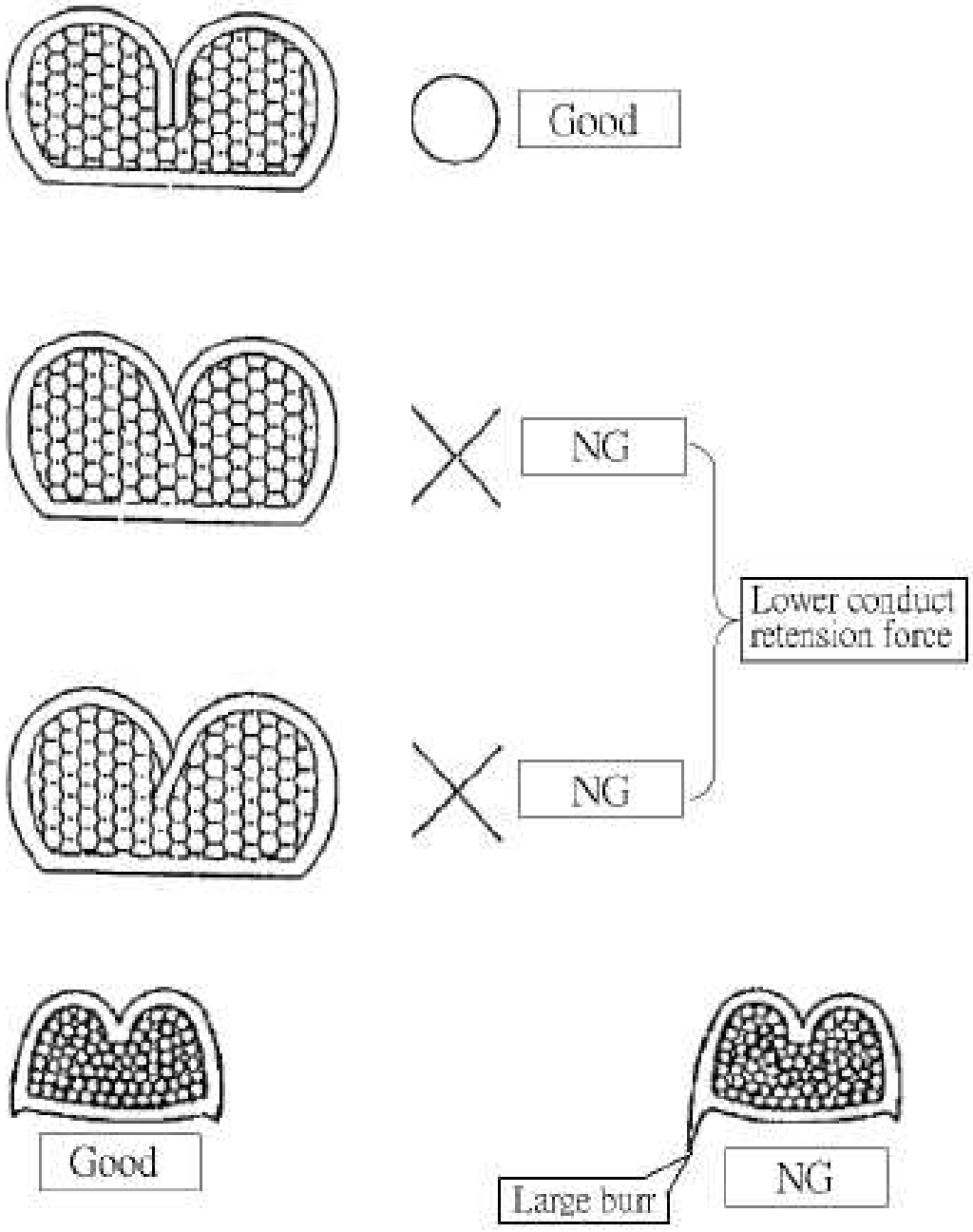
Good | NG

Insulation Crimp Condition

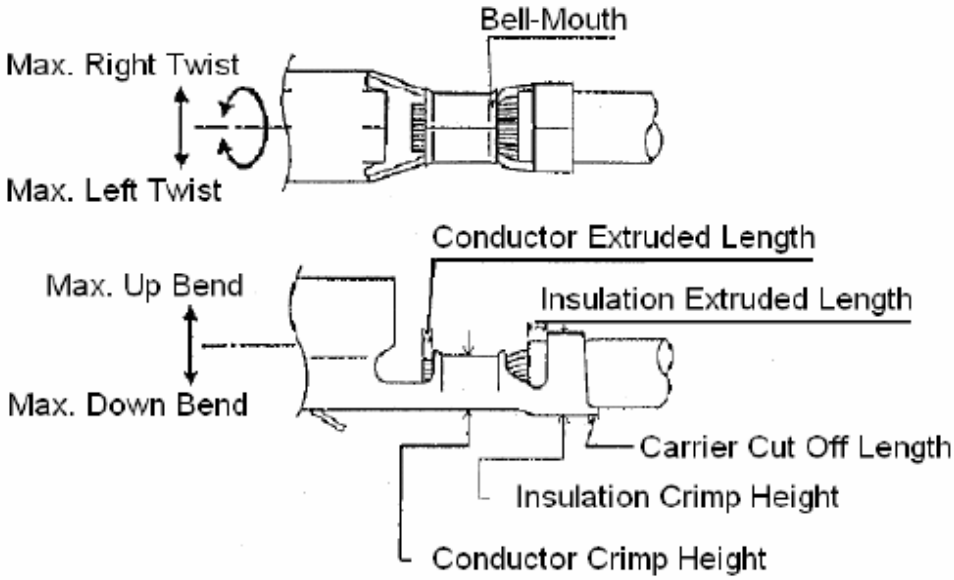


As following figure shown. It is no problem if wire bent up down 90 degrees 1 cycle and insulation position still in ideal position.

14 CONDUCTORS CRIMPING CONDITION



15 CRIMPING REQUIREMENT



Item	Range(Ref.)
Max. Up Bend	6°
Max. Down Bend	6°
Max. Left Twist	5°
Max. Right Twist	5°
Bell-Mouth Length	0.1~0.3mm
Carrier Cut Off Length	0~0.2mm
Conductor Extruded Length	0.1~0.3mm