SPECIFICATION

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SPEC. NO.: PS-51451-XXXXX-XXX **REVISION:** E

PRODUCT NAME: 1.25mm Pitch WTB CONNECTOR

PRODUCT NO: 51451 51468 51465 51452 71206 Series

PREPARED:	CHECKED:	APPROVED:
Shi,SongTao	Xu,ZhiYong	Xu,ZhiYong
DATE: 2022/07/05	DATE: 2022/07/05	DATE: 2022/07/05

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1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
A	ECN-1910103	NEW SPEC	SHI,YANAN	2019/06/01
B	ECN-2004334	ADD 51468,51465,51452,71206 ADD GWIT&GWFI	SHI,YANAN	2019/12/23
C	ECN-004150	Change LLCR & Change Operating Temperature 規格& Change Crimping Terminal / Housing Retention Force(Cable Side)& Change Current &Add CRIMPING 規格	Lu,TaoTao	2021/6/29
D	ECN-006593	依 JST 規格變更 LLCR	Lu,TaoTao	2021/12/28
E	ECN-008703	Modify the CRIMPING CONDITION	Shi,SongTao	2022/07/05

2 SCOPE

This specification covers performance, tests and quality requirements for 1.25mm pitch SMT Wire to Board connector. Aces's P/N: 51451 51468 51465 51452 71206 Series

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 Contact: High performance copper alloy
Finish: Refer to the drawing.
4.2.2 Housing: Thermoplastic or Thermoplastic High Temp., UL94V-0
4.2.3 Nut or Ear: Copper Alloy,

4.3 Ratings

4.3.1 Working voltage less than 36 volts (per pin)
4.3.2 Voltage: 50 Volts AC (per pin)
4.3.3 Current:
(a) AWG # 26: 1.5 Amperes (per pin)
(b) AWG # 28: 1.5 Amperes (per pin)
(c) AWG # 30: 1.0 Amperes (per pin)

4.3.4 Operating Temperature : -40℃ to +105℃

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	30 m Ω Max.(initial)per contact 50 m Ω Max. (after tests)	Mate connectors, measure by dry circuit, 20mV Max., 100mA (DC) Max. (EIA-364-23)
Insulation Resistance	100 M Ω Min.	Unmated connectors, apply 250 V DC between adjacent terminals. (EIA-364-21)
Dielectric Withstanding Voltage	No discharge, flashover or breakdown. Current leakage: 1 mA max.	250 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)
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	Mating Force: See item 8 Unmating Force: See item 8	Operation Speed：25.4 ± 3 mm/minute.. Measure the force required to mate/unmate connector. (EIA-364-13)
Terminal / Housing Retention Force	2.0N MIN.	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the terminal assembled in the housing.

Item	Requirement	Standard
Fitting Nail /Housing Retention Force	3N MIN.	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the fitting nail assembled in the housing.
Crimping Terminal / Housing Retention Force (Cable Side)	5 N Min. per pin	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the terminal assembled in the housing.
Crimping Pull Out Force (Cable Side)	AWG #26: 20N Min. AWG #28: 10N Min. AWG #30: 7N Min.	Operation Speed： 25.4 ± 3 mm/minute. Fix the crimped terminal, apply axial pull out force on the wire.
Locking Force	2~3pin, 10N Min. 4~6pin, 12N Min. 7~9pin, 15N Min. 10~15pin, 20N Min.	While withdrawing plug & receptacle Without terminal at speed 25.4 ± 3 mm/minute
Vibration	1 μs 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 μs 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 (3 shocks). The electrical load condition shall be 100mA maximum for all contacts. (EIA-364-27, test condition A)

ENVIRONMENTAL

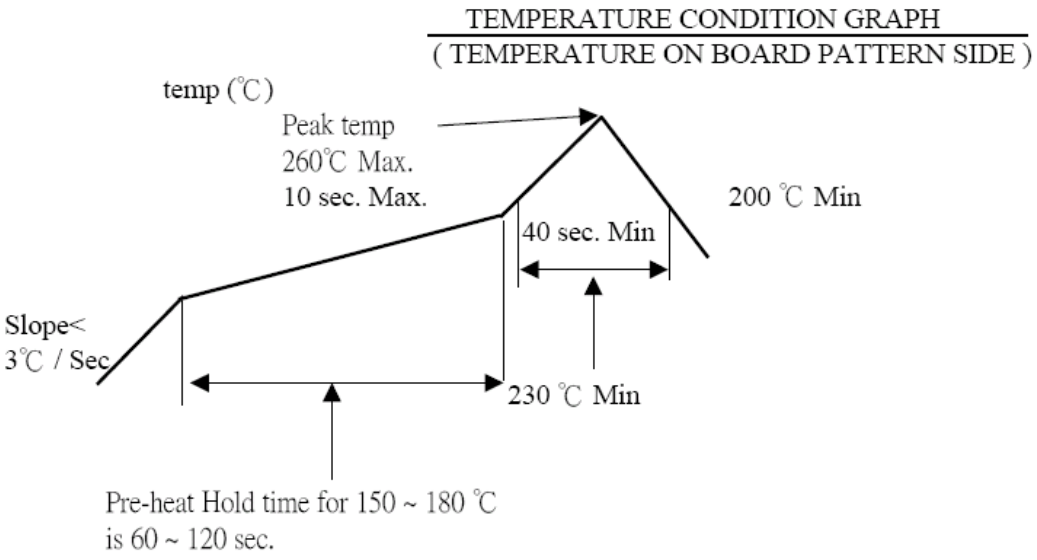
Item	Requirement	Standard
Resistance to **Reflow** Soldering Heat	See Product Qualification and Test Sequence Group 10 **(Lead Free)**	Pre Heat：150℃~180℃, 60~120sec. Heat：230℃ Min., 40sec Min. Peak Temp.：260℃Max, 10sec Max.

Thermal Shock	See Product Qualification and Test Sequence Group 4	Mate module and subject to follow condition for 25 cycles. 1 cycles: -40 +/-3 ℃, 30 minutes +105 +/-2 ℃, 30 minutes (EIA-364-32, test condition A)
Humidity	See Product Qualification and Test Sequence Group 5	Mated Connector 40+/-2℃, 90~95% RH, 240 hours. (EIA-364-31,Condition B, Method II)
Temperature life	See Product Qualification and Test Sequence Group 6	Mated connectors to temperature life at 105+/-2℃ for 250 hours. (EIA-364-17, Method A ,Test condition 3)
Salt Spray	See Product Qualification and Test Sequence Group 7	Subject mated/unmated connectors to 5% salt-solution concentration, 35℃ (I) Gold flash for 8 hours (II) Gold plating 3 u" for 48 hours. (III) Gold plating 5 u"(Min) for 96 hours. (EIA-364-26) (IV)PURE TIN for 48 hours
Solder ability	Solder able area shall have minimum of 90% 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)
Ammonia Gas (NH3)	Appearance: No damage 30 m Ω Max.(initial)per contact 50 m Ω Max. (after tests)	Subject mated connectors : Ammonia solution: 3% in weight Temperature :20+2°C Humidity condition :90 to 95% Duration:7 hours (The connector shall not be soldered.)
Hydrogen sulfide Gas (H2S)	Appearance: No damage 30 m Ω Max.(initial)per contact 50 m Ω Max. (after tests)	Subject mated connectors : Concentration: 3+/-1ppm Temperature: 40+/2℃ Relative humidity: 80+/-5% Duration: 96 hours
Hand Soldering Temperature Resistance	Appearance: No damage	T：350℃±10℃, 3sec at least.
GWIT	Temperature set to 750ºC(±10 ºC)	No ignition of the test specimem or Visible flames extinguish within 5s (IEC 60695-2-13)
GWFI	Temperature set to 850ºC(±10 ºC)	No ignition of the test specimem or Flames or glowing extinguish within 30s No ignition of the after removal of the glow-wire No ignition of the tissue paper (IEC 60695-2-12)

Note. Flowing Mixed Gas shell be conduct by customer request

6 INFRARED REFLOW CONDITION

6.1. Lead-free Process (2 cycles max)



7 PRODUCT QUALIFICATION AND TEST SEQUENCE

Test or Examination	Test Group													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Test Sequence													
Examination of Product		1、6	1、5	1、6	1、6	1、6		1、3	1、3		1、4	1、4	1	1
Low Level Contact Resistance		2、7	2、6	2、9	2、9	2、9	1、3		4		2、5	2、5		
Insulation Resistance				3、8	3、8	3、8								
Dielectric Withstanding Voltage				4、7	4、7	4、7								
Temperature rise	1													
Mating / Unmating Forces		3、5												
Durability		4												
Vibration			3											
Shock (Mechanical)			4											
Thermal Shock				5										
Humidity					5									
Temperature life						5								
Salt Spray							2							
Solder ability								2						
Resistance to Soldering Heat									2					
Terminal /Housing Retention Force										1				
Fitting Nail /Housing Retention Force										2				
Ammonia Gas(NH3)											3			
Hydrogen Sulfide Gas (H2S)												3		
GWIT													2	
GWFI														2
Sample Size	2	4	4	4	4	4	4	4	4	4	4	4	5	5

8 Insertion / Extraction Force

Units: N

Number of circuits	At initial		At 30th
	I.F.(MAX.)	W.F.(MIN.)	W.F.(MIN.)
2	17	0.5	0.5
3	18	1.0	1.0
4	19	1.5	1.5
5	20	2.0	2.0
6	21	2.5	2.5
7	22	3.0	3.0
8	23	3.5	3.5
9	24	4.0	4.0
10	25	4.5	4.5
11	26	5.0	5.0
12	27	5.5	5.5
13	28	6.0	6.0
14	29	6.5	6.5
15	30	7.0	7.0

9 Handing Precautions

9.1 Precautions for mating operation

(1) In the case of large circuit number， do not mate connector by pressing socket housing at only its both ends as indicated by arrows, because non-mating part may occur partly due to deflection of socket housing.
Be sure to make connector by pressing the whole of socket housing as shown in Fig.-2

When mating connector, align the edge of header with socket housing, and mate connector on the same axis as shown in Fig.-2

(2) There is a “clock” sound (you feel a click) when mating operation is properly completed. When there is no feeling of a click, there is a possibility that mating is not finished completely. Conduct mating operation again.
(The number of mating and unmating operation shall be decreased as much as possible.)

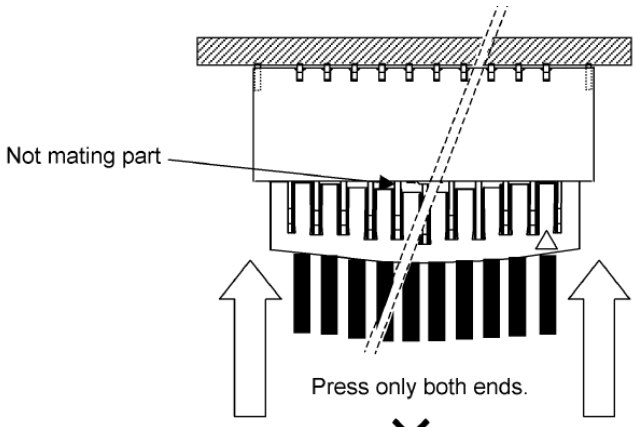


Fig.-1

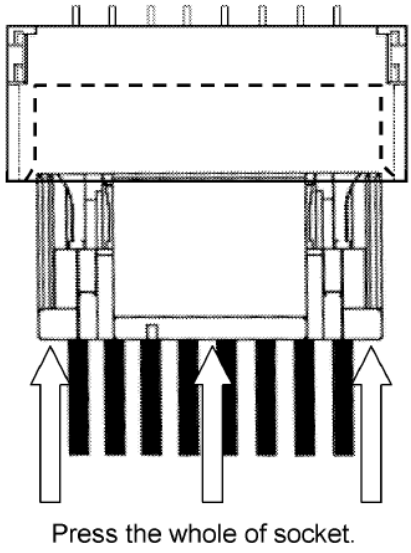


Fig.-2

9.2 Precautions for unmating operation

(1) Press a protrusion as shown in Fig.-3,hold wire in a bundle and unmate socket housing from header with releasing lock completely.
Do not unmate connector forcibly without releasing lock completely ,because such handling may cause deformation of lock part, and breakage of connector.

(2) Do not unmate socket housing from header from slanting condition as shown in Fig.-4, because socket housing may be deformed.
When socket housing is unmated with holding only several wires at the end of circuit, even if socket housing is extracted in a straight line against mating axis, such handling may cause the same condition as prying connector.

Be sure to hold wires in a bundle, and conduct unmating operation within 20 degress to each direction with releasing lock completely.

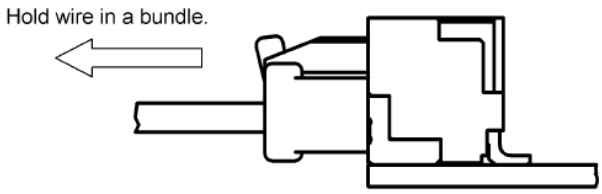


Fig.-3

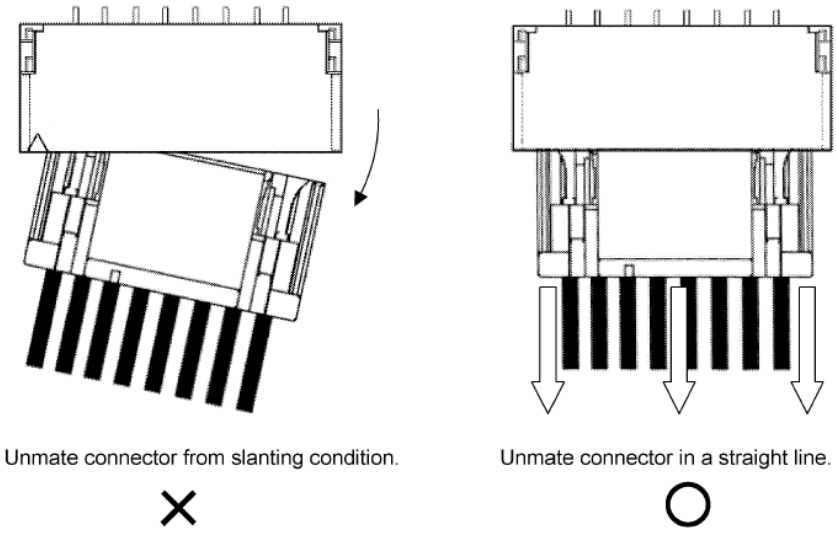
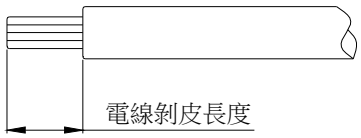


Fig.-4

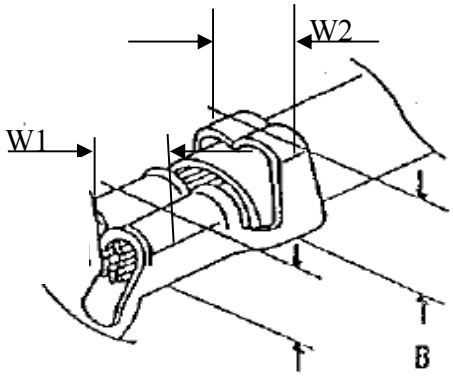
10 CRIMPING CONDITION

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
51452-Txxx	UL1061	26	1.00	0.52~0.56	1.05~1.10	0.85~0.90	0.95~1.00
51452-Txxx	UL1061 UL2941	28	0.90	0.46~0.50	1.12~1.18	0.83~0.90	0.90~0.98
51452-Txxx	UL1061	30	0.80	0.44~0.50	0.95~1.05	0.83~0.90	0.88~0.95



Strip length



Note:

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

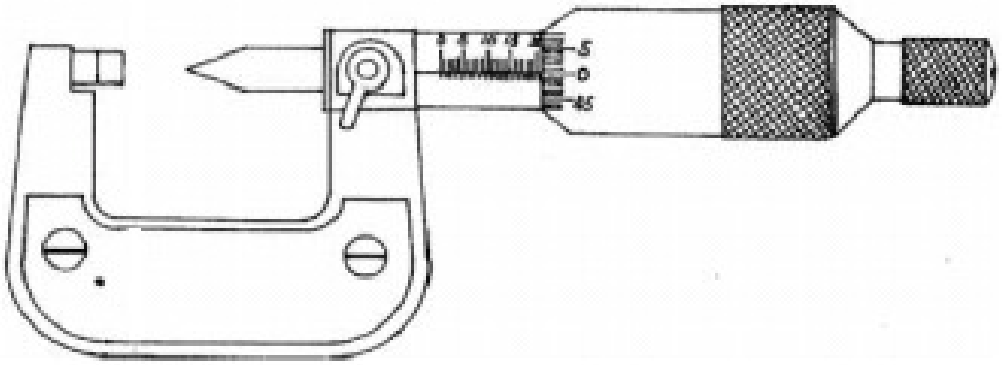
2、W2為電線外被部分鉚壓後之寬度(Insulation Crimping Width)：W2值如上表(參考值）

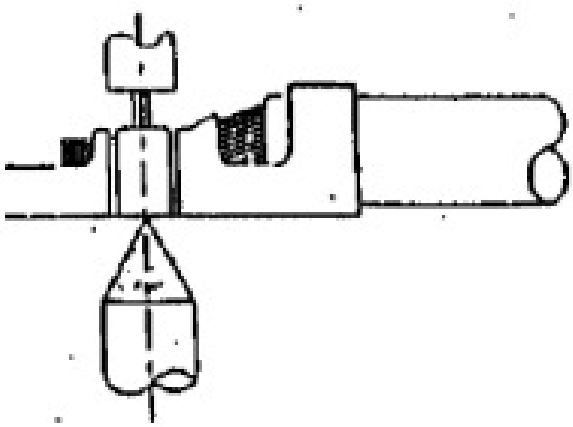
3、A為芯線導體鉚壓後之高度(Conductor Crimping height)：A值如上表(參考值）

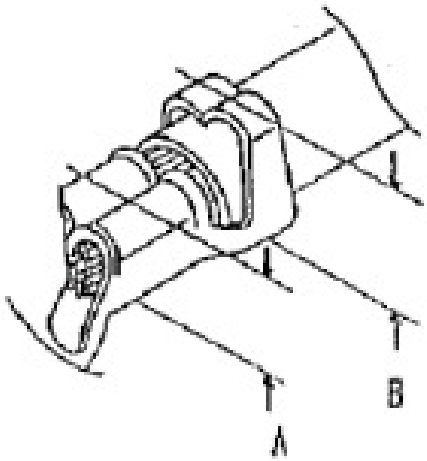
4、B為電線外被鉚壓後之高度(Insulation Crimping height)：B值如上表(參考值）

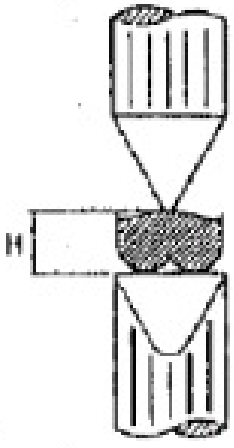
5、電線剝皮長度(Strip length)：0.7~1.0mm(參考值)

11 CRIMPING HEIGHT MEASUREMENT



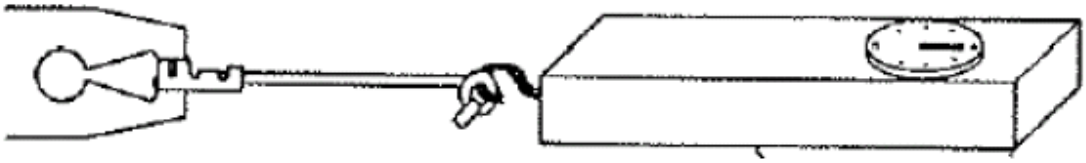






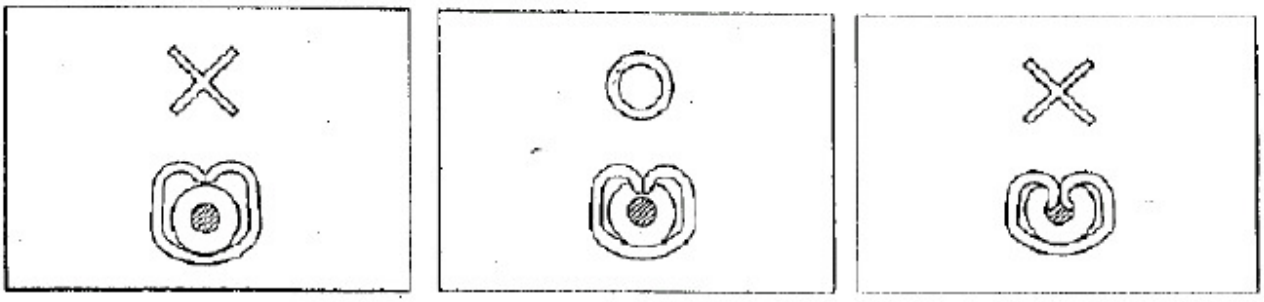
12 PULL FORCE OF CRIMPING SECTION MEASUREMENT

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



Pull Force of Crimp Section Measurement

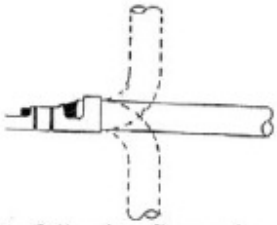
13 STANDARD INSULATION CRIMPING



Not enough crimp | Good | Crimp too much

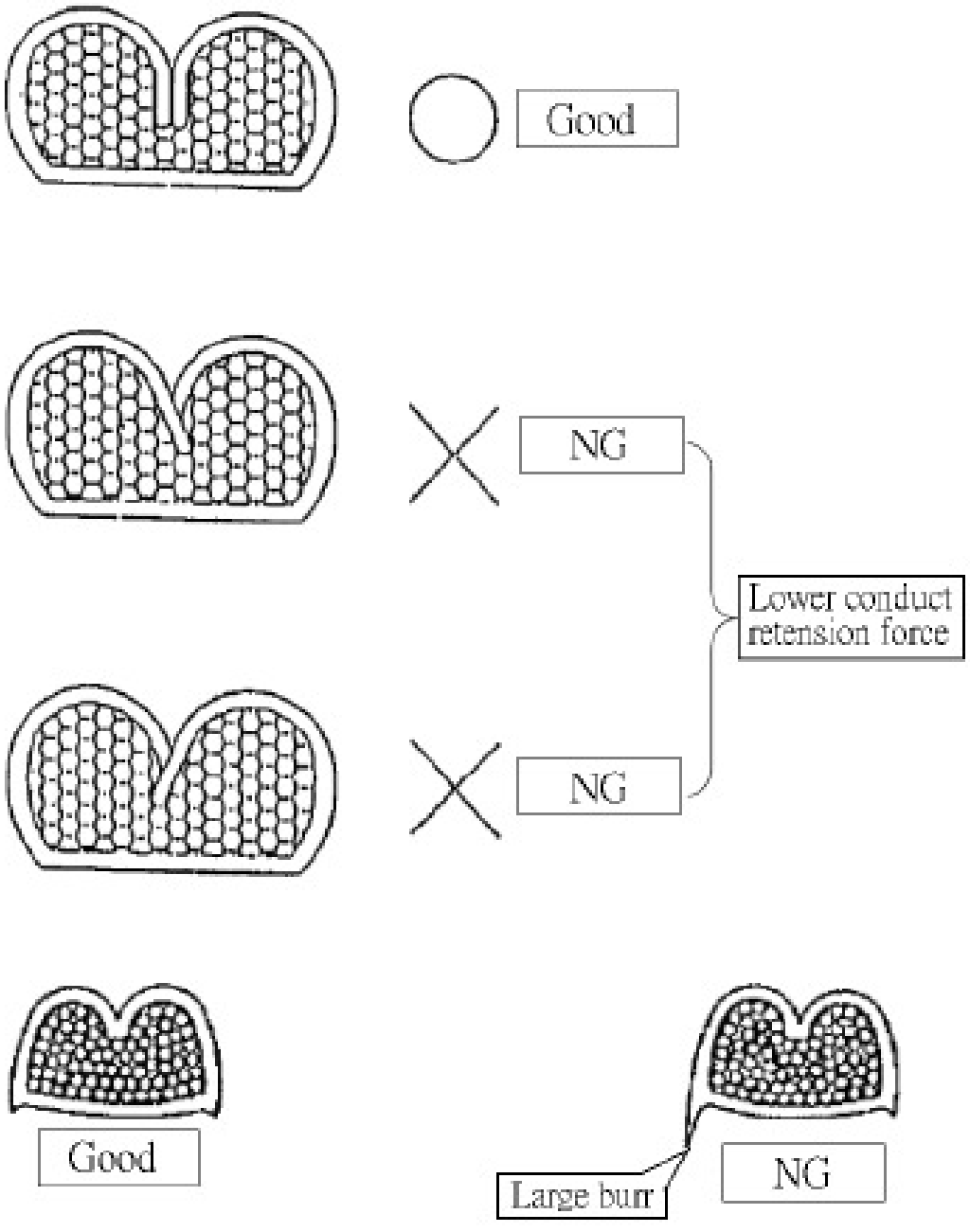
Good | NG

Insulation Crimp Condition

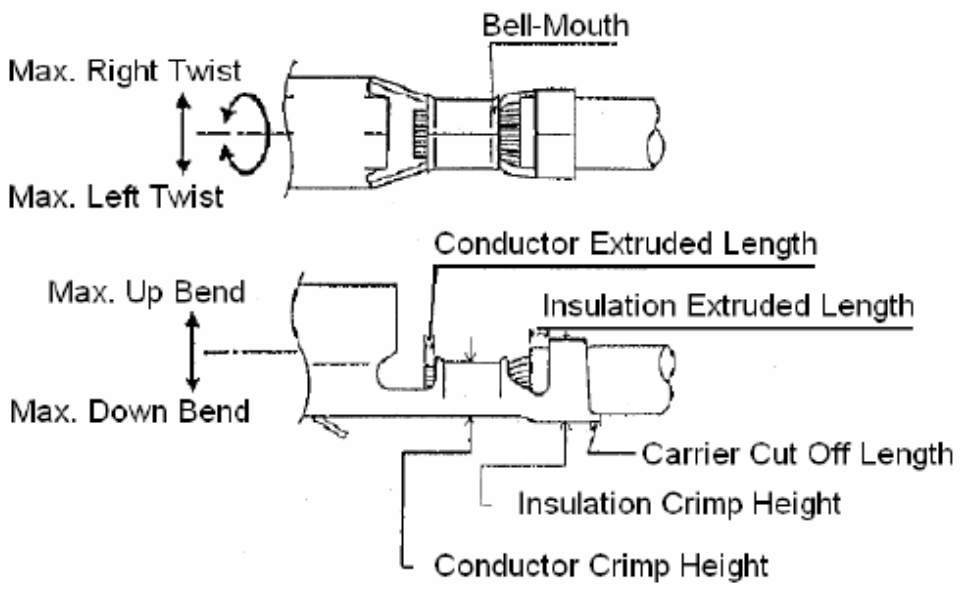


As following figure shown.
It is no problem if wire bent up down 90 degrees 1 cycle and insulation position still in ideal position.

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	0.05~0.2mm