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-50429-XXXXX-XXX **REVISION:** F

PRODUCT NAME: 1.0 mm PITCH WIRE TO BOARD WAFER

PRODUCT NO: 50429、50430、50437、50485、50486、50494 、51443 SERIES

PREPARED:	CHECKED:	APPROVED:
Shi,SongTao	**Xu,ZhiYong**	**Xu,ZhiYong**
DATE: **2021.04.20**	DATE: **2021.04.20**	DATE: **2021.04.20**

1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
O	ECN-1009098	NEW SPEC FOR 50429，50430	YUXIANG	2010.07.03
A	ECN-1108448	ADD 50485，50486 SERIES	GAVIN	2011.08.24
B	ECN-1201132	ADD 50494SERIES	BRAVE	2012.01.11
C	ECN-1502035	ADD AWG#32 SPEC	COCOYU	2015.01.08
D	ECN-1808348	Change Salt Spray times	ZHOUQUAN	2018.08.17
E	ECN-1906570	ADD 51443 SERIES	SHI,YANAN	2019.06.28
F	ECN-003201	Adjust the Operating Temperature and Thermal Shock and Temperature life	Shi,SongTao	2021.04.20

2 Scope

This specification covers performance, tests and quality requirements for1.0mm Wire to Board wafer SMT T/H Type. These connectors are this Product SPEC.refer to Aces's P/N: 50429、50430、50437、50485、50486、50494、51443 series.

3 Applicable documents

EIA-364: ELECTRONICS INDUSTRIES ASSOCIATION

4 Requirements

4.1 Design and Construction

Product shall be of design, construction and physical dimensions specified on applicable product drawing.

4.2 Materials and Finish

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

4.3 Ratings

4.3.1 Voltage: 30 V AC ,DC
4.3.2 Current Rating: AWG#28-1.0A (Per Pin)
AWG#30-1.0A (Per Pin)
AWG#32-0.8A (Per Pin)
4.3.3 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	10 m Ω Max.(initial)per contact 20 m Ω Max. Change allowed	Mate connectors, measure by dry circuit, 20mV Max., 10mA Max. (EIA-364-23)
Insulation Resistance	100 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)
Terminal crimp Tensile strength	More than 1.3 Kgf More than 0.8 Kgf	When crimped AWG$28 size wire When crimped AWG$30 size wire
Mating / Un-mating Forces	See item 8	Operation Speed： 25.4 ± 3 mm/minute.. Measure the force required to mate/Un-mate connector. (EIA-364-13)

Contact Retention Force (Board Side)	0.3kg.f MIN.	Operation Speed： 25.4 ± 3 mm/minute. Measure the contact retention force with Tensile strength tester
Terminal / Housing Retention Force (Cable Side)	0.6kgf MIN.	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the terminal assembled in the housing.
Fitting Nail/Housing Retention Force	300g.f MIN.	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the Fitting Nail assembled in the housing
Locking Force	2kg.f 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 (18 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 9**(Lead Free)**	Pre Heat：150℃~180℃, 60~90sec. Heat：230℃ Min., 40sec Min. Peak Temp.：260℃Max, 10sec Max.

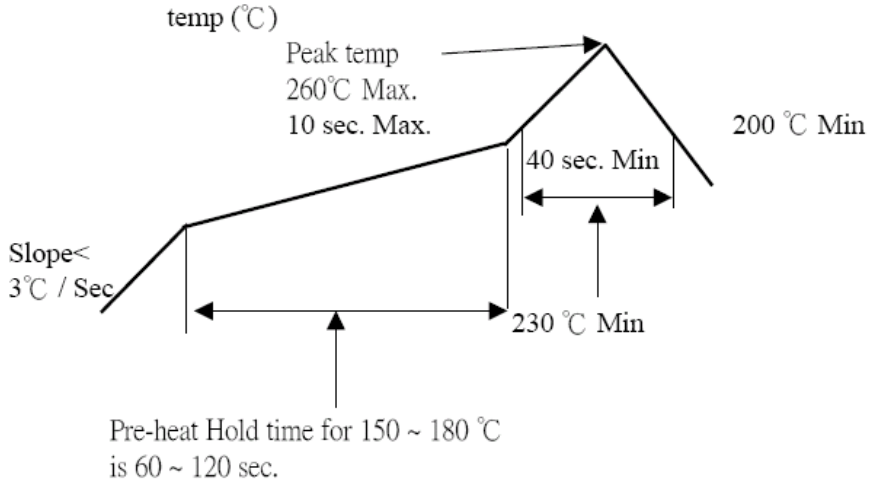
Thermal Shock	See Product Qualification and Test Sequence Group 4	Mate module and subject to follow condition for 5 cycles. 1 cycles: -40 +0/-3 ℃, 30 minutes +105 +3/-0 ℃, 30 minutes (EIA-364-32, test condition I)
Humidity	See Product Qualification and Test Sequence Group 4	Mated Connector 40℃, 90~95% 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 105±2℃ for 96 hours. (EIA-364-17, Test condition A)
Salt Spray (Only For Gold Plating)	See Product Qualification and Test Sequence Group 6	Subject mated/unmated connectors to 5% salt-solution concentration, 35℃ 1). Gold flash for 8 hours . 2). Gold plating 3 u" for 48 hours 3). Gold plating 5 u"(Min) for 96 hours (EIA-364-26)
Solder ability	Tin plating: Solder able area shall have minimum of 95% solder coverage. Gold plating: Solder able area shall have minimum of 75% 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.

6 Infrared reflow condition

6.1. Lead-free Process

TEMPERATURE CONDITION GRAPH
(TEMPERATURE ON BOARD PATTERN SIDE)



7 Product qualification and test sequence

Test or Examination	Test Group										
	1	2	3	4	5	6	7	8	9	10	11
	Test Sequence										
Examination of Product				1、7	1、6	1、4			1		
Low Level Contact Resistance		1、5	1、4	2、10	2、9	2、5			2		
Insulation Resistance				3、9	3、8						
Dielectric Withstanding Voltage				4、8	4、7						
Temperature rise	1										
Mating / Un-mating Forces		2、4									
Durability		3									
Terminal crimp Tensile strength										1	
Vibration			2								
Shock (Mechanical)			3								
Thermal Shock				5							

Humidity				6							
Temperature life					5						
Salt Spray(Only For Gold Plating)						3					
Solder ability							1				
Contact Retention Force (Board Side)								1			
Terminal/Housing Retention Force (Cable Side)								2			
Fitting Nail /Housing Retention Force								3			
Resistance to Soldering Heat									3		
Sample Size	2	4	4	4	4	4	2	5	4	5	

8 Mating / Unmating Forces

NO. OF Ckt.	At Initial		At 30th
	Mating(kgf max)	Un-mating(kgf min)	Un-mating(kgf min)
2	2.00	0.20	0.20
3	2.00	0.20	0.20
4	2.00	0.20	0.20
5	3.00	0.30	0.30
6	3.00	0.30	0.30
7	3.00	0.30	0.30
8	4.00	0.40	0.40
9	4.00	0.40	0.40
10	4.00	0.40	0.40
11	5.00	0.50	0.50
12	5.00	0.50	0.50
13	5.00	0.50	0.50
14	6.00	0.60	0.60
15	6.00	0.60	0.60
16	6.00	0.60	0.60
17	7.00	0.70	0.70

18	7.00	0.70	0.70
19	7.00	0.70	0.70
20	8.00	0.80	0.80

9 Applicable wires

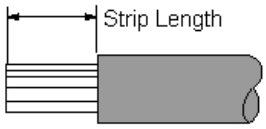
It will depend on selected terminals. Please refer to terminal specification to select wires. (Refer to sec 19.0)

10 Wire strip (Insulation)

Please be careful when cut wire insulation. If some stranded conductors were cut, the termination may not meet the specified pull force.

11 Strip length

Strip length depends on wire barrel size. Please refer to terminal specification to cut correct strip length. (Refer to sec 18.0)



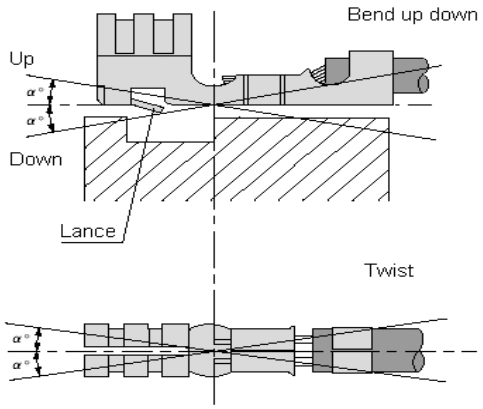
12 Bend and twist

12.1 BEND UP AND DOWN

Maximum bend up down angles please refer to terminal specification. If bend angles larger than specified, terminals will difficult insert to housing or retention force (terminal and housing) may not meet the specified. (Refer to sec 18.0)

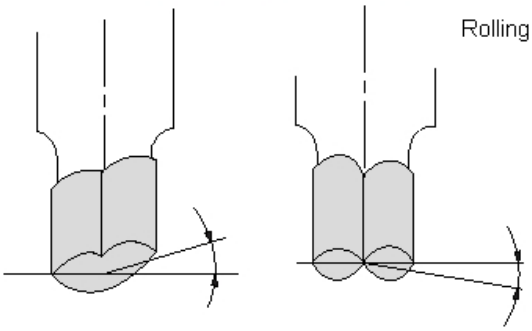
12.2 TWIST

Maximum twist angles please refer to terminal specification. If larger than specified, terminals will difficult insert to housing or retention force (terminal and housing) may not meet the specified.
(Refer to sec 18.0)



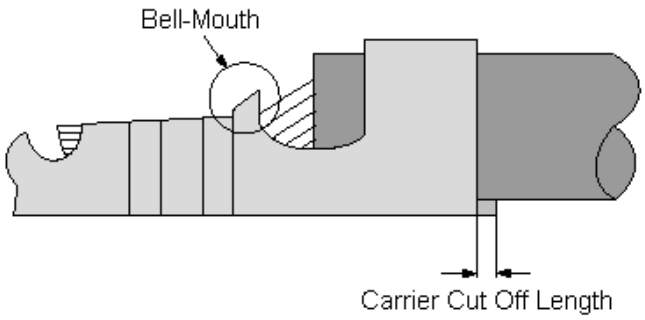
13 Rolling

Centerline of wire crimped should be near contact centerline. If twisted, the termination may not meet the specified pull force or non-stable. (Refer to sec 18.0)



14 Bell-mouth

Bell-mouth is needed, please be care. If no or undersized bell-mouth after crimped, it will cause some of stranded conductors broken and the termination may not meet the specified pull force. Recommended bell-mouth size approximate 2X material thickness. (Refer to sec 18.0)

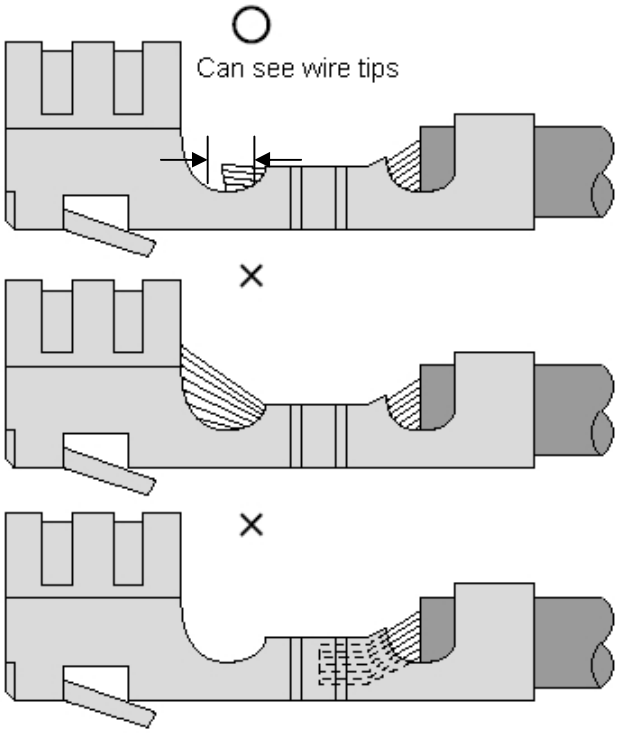


15 Carrier cut off length

It is possible cause performance lower if cut length is too long. Carrier cut length as above figure shown. Recommended cut off length approximate 1.5X material thickness maximum. (Refer to sec 18.0)

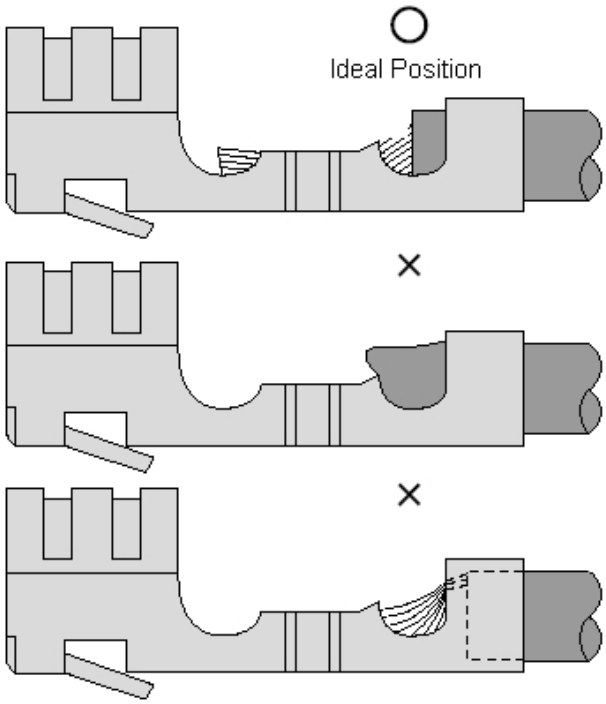
16 Stranded conductors inserted length

If stranded conductors are inserted too far into the crimp sections, this may cause some problems when terminal inserted into housing.
If stranded conductor's inserted length is too short, the termination may not meet the specified pull force because the metal-to-metal contact between the wire and the terminal is reduced. (Refer to sec 18.0)

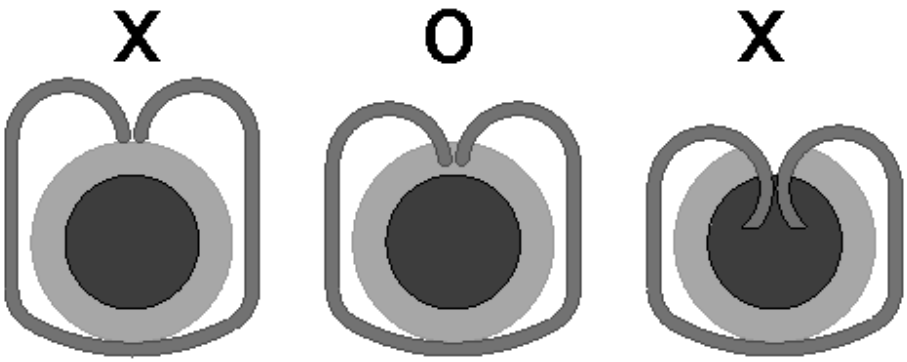


17 Insulation position

The ideal position of insulation tip is visible as following figure shown. If insulation were into crimp section, may cause unstable conduction. If too short, may not meet the specified pull force.



18 Standard insulation crimp



Not enough crimp

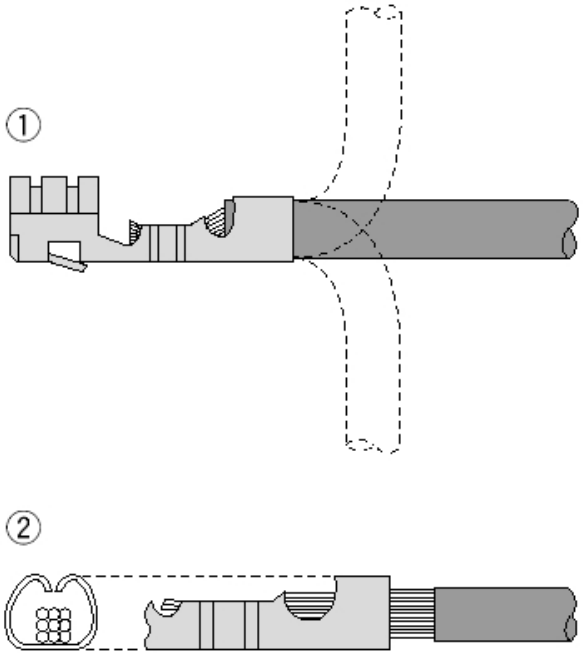
Crimp too much

19 Insulation crimp height

Insulation crimp height depends on wire diameter.

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

19.2 For longer strip length case, insulation crimp height as following figure 2 shown. The crimp height avoids stranded conductors be damaged.
(Refer to sec 19.0)

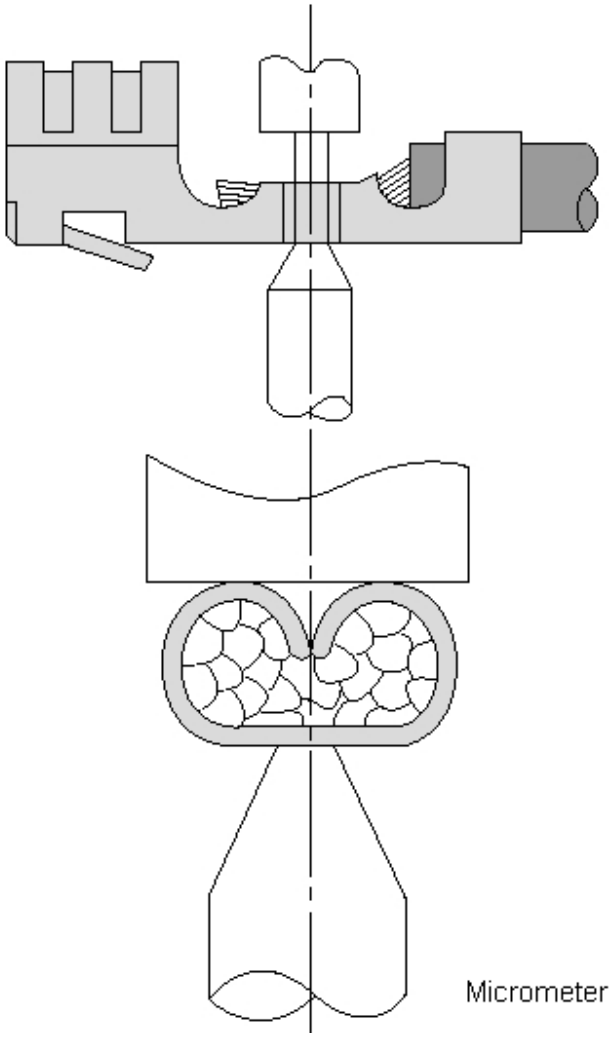


20 About crimp height (Conductors crimp section)

Crimp height is an important control dimension in the process. It depends on terminal types and applied wire sizes. Please refer to terminal specification for more detail. (Refer to sec 19.0)

21 Crimp height measurement

Please use micrometer to measure crimp height as following figure shown. And selected crimp section center to measure.

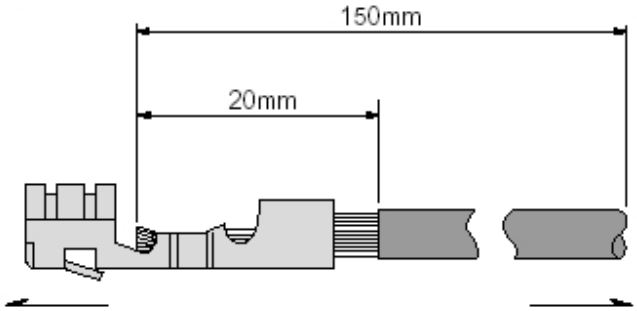


22 About pull force of crimp section

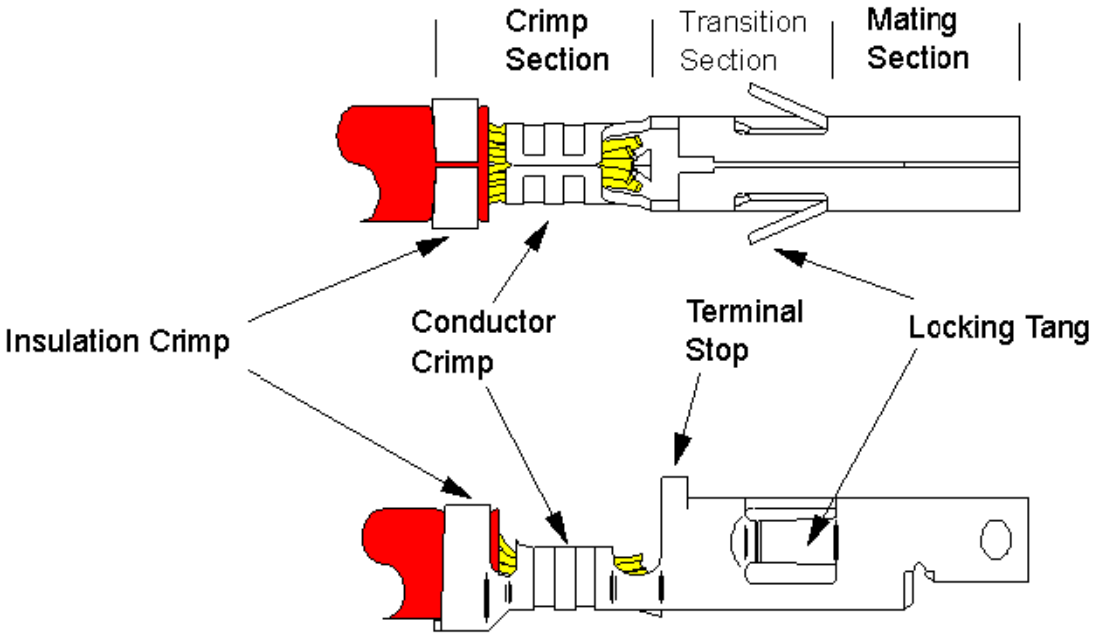
Pull force is another important control point. It should larger than specified minimum pull force. (Refer to sec 19.0)

23 Pull force of crimp section measurement

Make some test samples as following figure shown. Use a typical tensile test machine or pull gage to pull cable at a speed 25mm/min. And read the force when cable withdrew from crimp section or braked.
Before test samples, please measure crimp height and do not crimp insulation.



24 Anatomy of a terminal



25 Table of strip length, bend, twist, rolling angles, cut off, and extrude length

Product Description	Product No.	Strip length (mm)	Max. Bend		Max. Twist	Max. Rolling	Bell-Mouth (mm)	Cut Off (mm)	Extrude length (mm)
			Up	Down					
1.0 MM PITCH WTB Terminal	50430-Txxx	1.35~1.60	6°	6°	5°	7°	0.1 ~ 0.3	0.0 ~ 0.3	0.05 ~ 0.20

26 Table of applicable wires, crimp height, and pull force

Product Description	Product No.	Wire		Crimp Height (mm)		Crimp Width (mm)	
		AWG Size	Insulation D (mm)	Conductor	Insulation	Conductor	Insulation
1.0 MM PITCH WTB Terminal	50430-Txxx	#28	0.80	0.55~0.62	1.0~1.2	0.65 Max.	0.75 Max
		#30	0.70	0.50~0.57	1.0~1.2	0.65 Max.	0.75 Max
		#32	0.41	0.35~0.45	0.8~0.9	0.7 Max	0.75 Max