



SPECIFICATION

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SPEC. NO.: PS-50228-XXXXX-XXX

REVISION: N

PRODUCT NAME: 1.00mm PITCH SMT WIRE TO BOARD CONNECTOR

PRODUCT NO: 50228 ,50233 ,50234, 50438 ,50439,50440,
51287,51290,87214-Wx,50211-T,87224-T,51438 Series

PREPARED: SHI,YANAN DATE: 2020/02/27	CHECKED: BRAVE DATE: 2020/02/27	APPROVED: BRAVE DATE: 2020/02/27
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Aces P/N: **50228 series**

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1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
O	ECN-0812248	NEW SPEC	JASON	2008/11/24
A	ECN-0909088	FOR ADW0909030 ADD HAND SOLDERING	JASON	2009/09/10
B	ECN-1101087	MODIFY TERMINAL RETENTION FORCE ADD 50438 / 50439 & 50440 SERIES.	HUANTY	2011/01/11
C	ECN-1304267	ADD 51239 SERIES.	CANDY	2013/4/26
D	ECN-1401156	ADD WORKING VOLTAGE	XUFEI	2014/01/09
E	ECN-1506113	ADD 51287 SERIES	XUBIN	2015/06/17
F	ECN-1508407	ADD 51290,50211,87214,87224SERIS Delete 50226,50229,50230,50232,51239	JUGG	2015/07/28
G	ECN-1510321	Update Group 5&6	JUGG	2015/10/22
H	ECN-1711105	Update Crimping Terminal / Housing Retention Force(Cable Side)	FUJIAN	2017/11/08
J	ECN-1805362	ADD 17pin mating/un-mating Forces	Huang,Shun Sen	2018/05/26
K	ECN-1807248	ADD 51438 SERIES	Leishan jun	2018/07/14
L	ECN-1808261	Update Salt Spray	SHIYANAN	2018/08/14
M	ECN-1906565	Update Crimping Data	SHIYANAN	2019/06/28
N	ECN-2002136	Update AWG#28 Current	SHI,YANAN	2020/02/27

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2 SCOPE

This specification covers performance, tests and quality requirements for 1.00mm pitch SMT Wire to Board connector. Aces's P/N: 50228 Series ; 50233 Series ; 50234 Series ; 50438 Series ; 50439 Series ; 50440 Series ; 51287 Series ; 51290 Series ; 87214-WX Series ; 50211-T Series ; 87224-T 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:
 - 4.3.3.1 Applicable wires: (a) **AWG # 28: 2.5 Amperes (per pin)**
(b) AWG # 30: 1 Amperes (per pin)
(c) AWG # 32: 1 Amperes (per pin)
(d) AWG # 34: 0.8 Amperes (per pin)
(e) AWG # 36: 0.5 Amperes (per pin)

- 4.3.4 Operating Temperature : -40°C to +85°C

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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	55 m Ω Max.(initial)per contact 20 m Ω Max. Change allowed	Mate connectors, measure by dry circuit, 20mV Max., 100mA 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.	250 VAC Min. at sea level for 1 minute. Test between adjacent contacts of unmated connectors. (EIA-364-20)
Temperature rise	30°C Max. Change allowed	Mate connector: measure the temperature rise at rated current until temperature stable. The ambient condition is still air at 25°C (EIA-364-70,METHOD1,CONDITION1)
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 \pm 3mm/min. (EIA-364-09)
Mating / Unmating Forces	Mating Force: See item 8 Unmating Force: See item 8	Operation Speed : 25.4 \pm 3 mm/minute.. Measure the force required to mate/unmate connector. (EIA-364-13)
Terminal / Housing Retention Force	0.4 kgf MIN.	Apply axial pull out force at the speed rate of 25.4 \pm 3 mm/minute. On the terminal assembled in the housing.

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Item	Requirement	Standard
Fitting Nail /Housing Retention Force	0.3kgf 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)	0.5 Kgf 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.
Vibration	1 μ s 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 μ s 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°C~180°C, 60~120sec. Heat : 230°C Min., 40sec Min. Peak Temp. : 260°C 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 +/-3 °C, 30 minutes +85 +/-2 °C, 30 minutes (EIA-364-32, test condition A)

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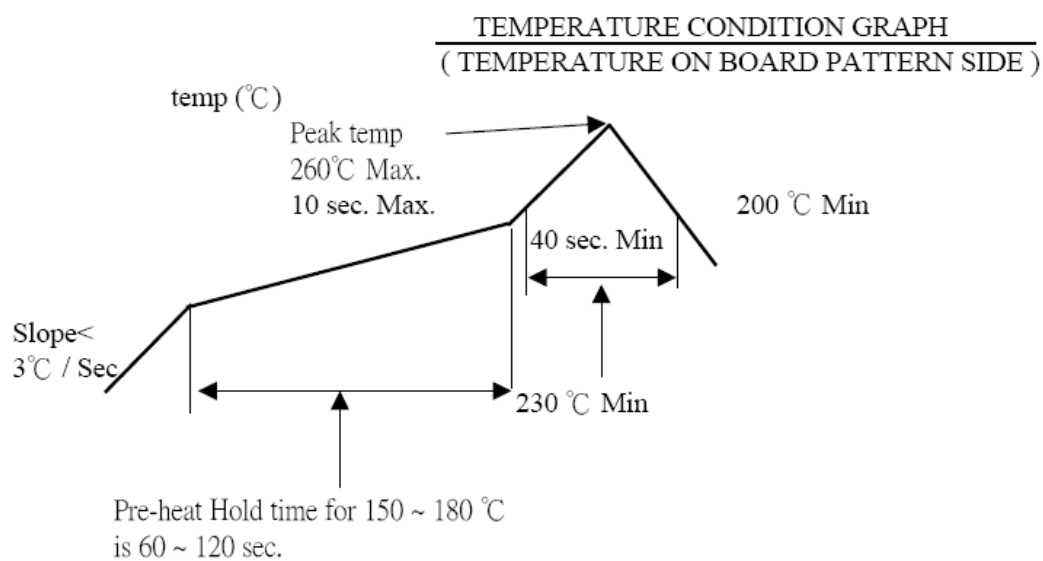
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Humidity	See Product Qualification and Test Sequence Group 4	Mated Connector 40°C, 90~95% RH, 96 hours. (EIA-364-31, Condition A, Method II)
Item	Requirement	Standard
Temperature life-Heat	See Product Qualification and Test Sequence Group 5	Subject mated connectors to temperature life at 85 +/-2°C for 96 hours. Measure Signal. (EIA-364-17, Test condition A)
Temperature life-Cold	See Product Qualification and Test Sequence Group 6	Subject mated connectors to temperature life at -40 +/-2°C for 96 hours. Measure Signal. (EIA-364-17, Test condition A)
Salt Spray (Only For Gold Plating)	See Product Qualification and Test Sequence Group 7	Subject mated/unmated connectors to 5% salt-solution concentration, 35°C (I) Gold flash for 8 hours (II) Gold plating 3 u" for 48 hours. (II) Gold plating 5 u"(Min) for 96 hours. (EIA-364-26)
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°C, for 4-5 sec. (EIA-364-52)
Hand Soldering Temperature Resistance	Appearance: No damage	T ≥ 350°C, 3sec at least.

Note. Flowing Mixed Gas shall be conducted by customer request.

6 INFRARED REFLOW CONDITION

6.1. Lead-free Process (2 cycles max)



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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、6	1、4			1	1
Low Level Contact Resistance		1、5	1、4	2、10	2、9	2、9	2、5			3	
Insulation Resistance				3、9	3、8	3、8					
Dielectric Withstanding Voltage				4、8	4、7	4、7					
Temperature rise	1										
Mating / Unmating Forces		2、4									
Durability		3									
Vibration			2								
Shock (Mechanical)			3								
Thermal Shock				5							
Humidity				6							
Temperature life-Heat					5						
Temperature life-Cold						5					
Salt Spray							3				
Solder ability								1			
Terminal / Housing Retention Force									1		
Fitting Nail /Housing Retention Force									2		
Resistance to Soldering Heat										2	
HandSoldering Temperature Resistance											2
Sample Size	2	4	4	4	4	4	4	4	2	4	4

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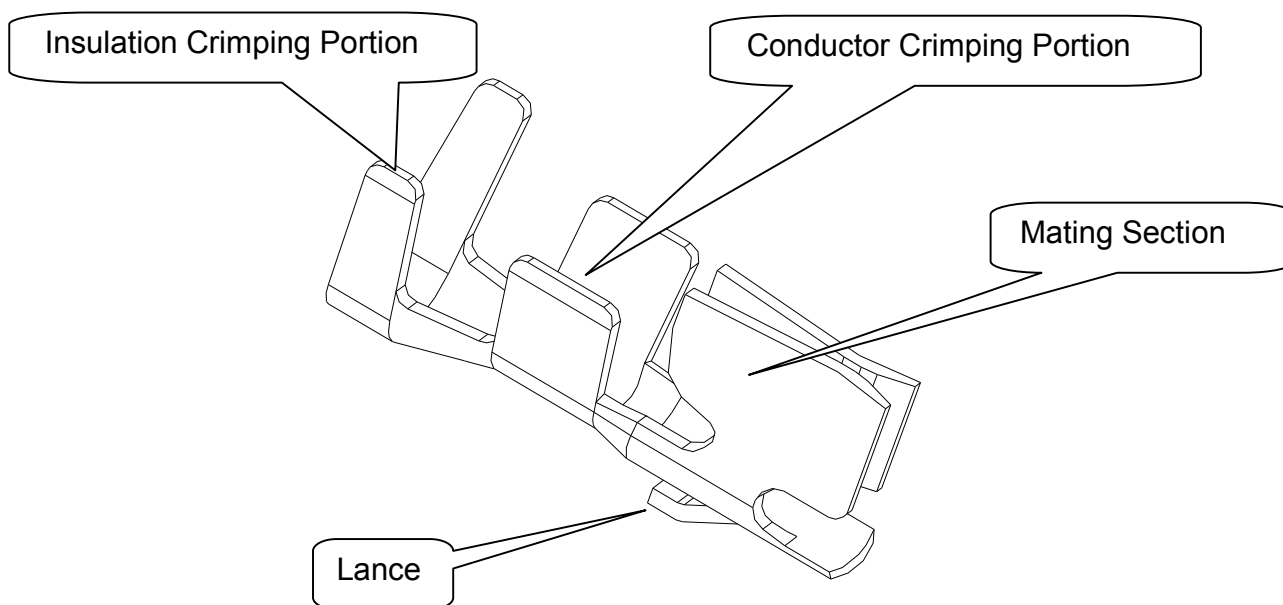
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8 Insertion / Extraction Force

Units: N

Number of circuits	At initial		At 30th
	I.F.(MAX.)	W.F.(MIN.)	W.F.(MIN.)
2	25	2	2
3	25	2	2
4	30	2	2
5	30	3	3
6	35	3	3
7	35	3	3
8	40	4	4
9	40	4	4
10	45	4	4
11	50	5	5
12	50	5	5
13	55	5	5
14	60	6	6
15	60	6	6
16	65	6	6
17	65	6	6
18	70	7	7
20	75	7	7
22	80	7	7
24	85	8	8
26	95	8	8

9 ANATOMY OF CRIMPING TERMINAL



The crimping contact drawing is for reference only. May Not be the same with this P/N

10 APPLICABLE WIRES: UL3302 , UL1571 AND UL10064 ETFE WIRE

AWG Size:AWG#28 Insulation OD: $\Phi 0.65\text{mm}$
 AWG Size:AWG#30 Insulation OD: $\Phi 0.70\text{mm}$
 AWG Size:AWG#32 Insulation OD: $\Phi 0.60\text{mm}$
 AWG Size:AWG#34 Insulation OD: $\Phi 0.31\sim 0.33\text{mm}$
 AWG Size:AWG#36 Insulation OD: $\Phi 0.25\text{mm}$

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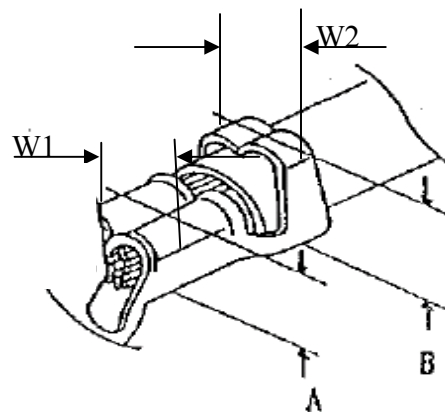
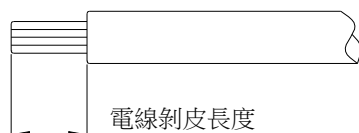
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11 CRIMPING CONDITION

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
87214-W	UL3302	28	0.65	0.80Max	1.05~1.15	0.55~0.65	0.80Max
87214-W	UL3302	30	0.70	0.75Max	1.10~1.20	0.50~0.60	0.80Max
87214-W	UL3302	32	0.60	0.60Max	1.00~1.10	0.50~0.60	0.80Max
50211-T	UL1571	34	0.31~0.33	0.35~0.42	0.74~0.76	0.70(參考值)	0.70~0.75
87224-T	UL10064	36	0.25	0.29~0.31	0.59~0.68	0.62~0.64	0.65~0.74

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)：1.3~1.6mm (參考值)

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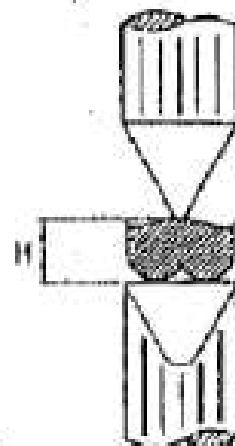
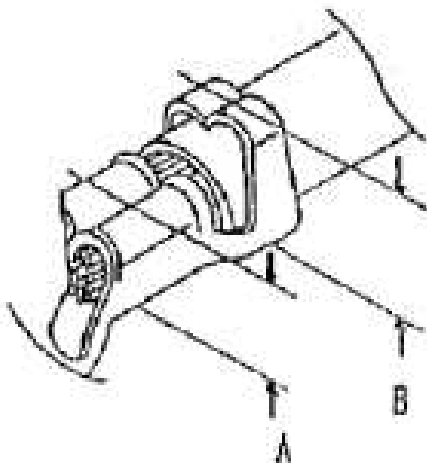
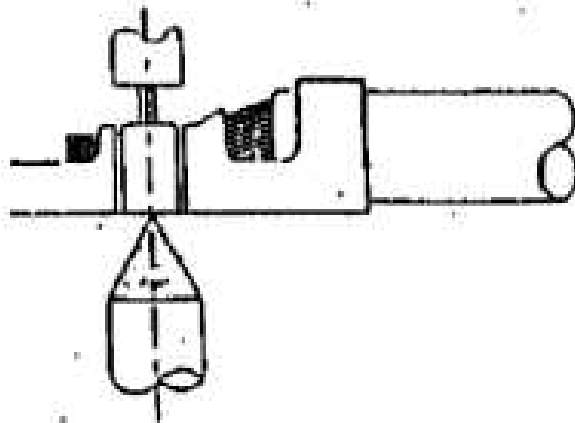
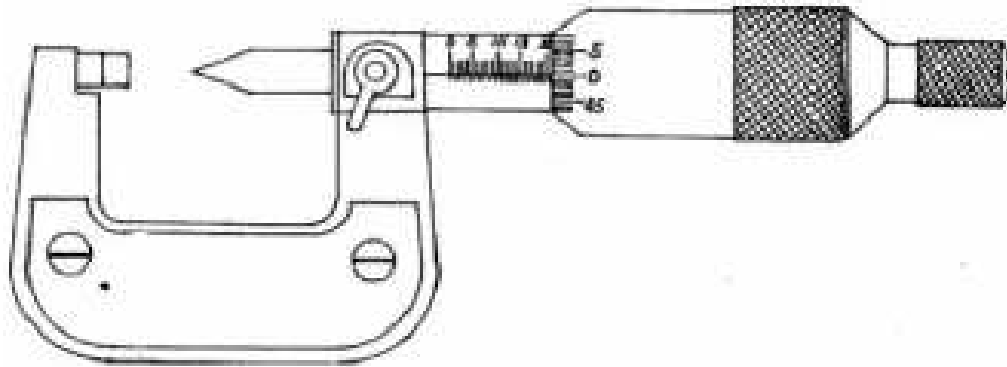
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12 CRIMPING HEIGHT MEASUREMENT



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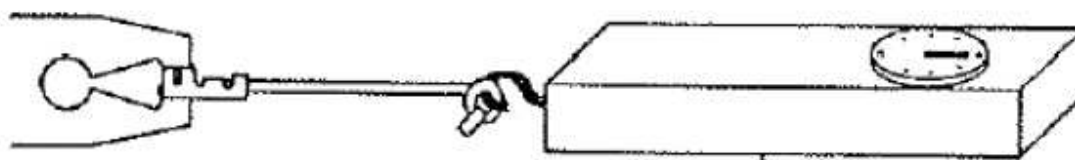
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13 PULL FORCE OF CRIMPING SECTION MEASUREMENT

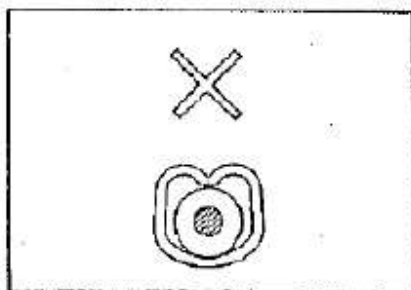


Before test samples, please measure crimp height and do not crimp insulation.

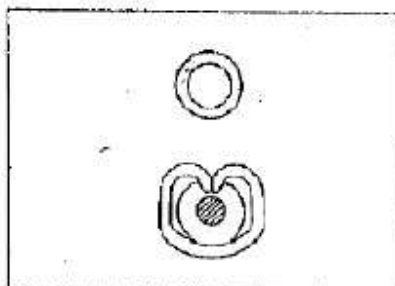


Pull Force of Crimp Section Measurement

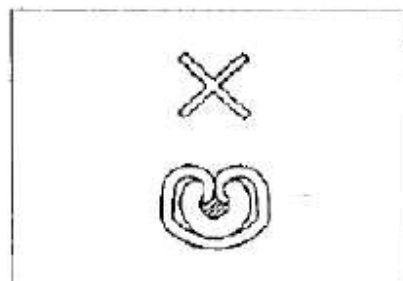
14 STANDARD INSULATION CRIMPING



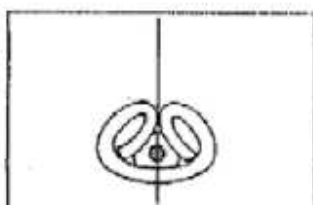
Not enough crimp



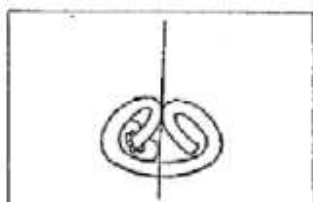
Good



Crimp too much

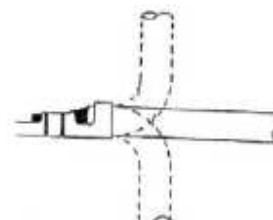


Good



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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.

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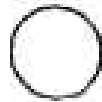
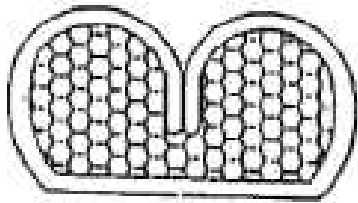
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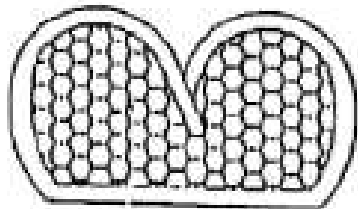
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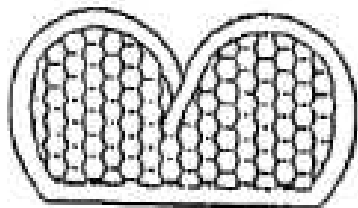
15 CONDUCTORS CRIMPING CONDITION



Good

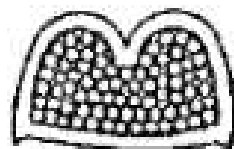


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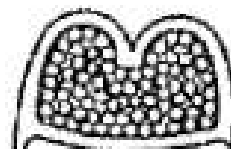


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Lower conduct
retension force



Good



Large burr

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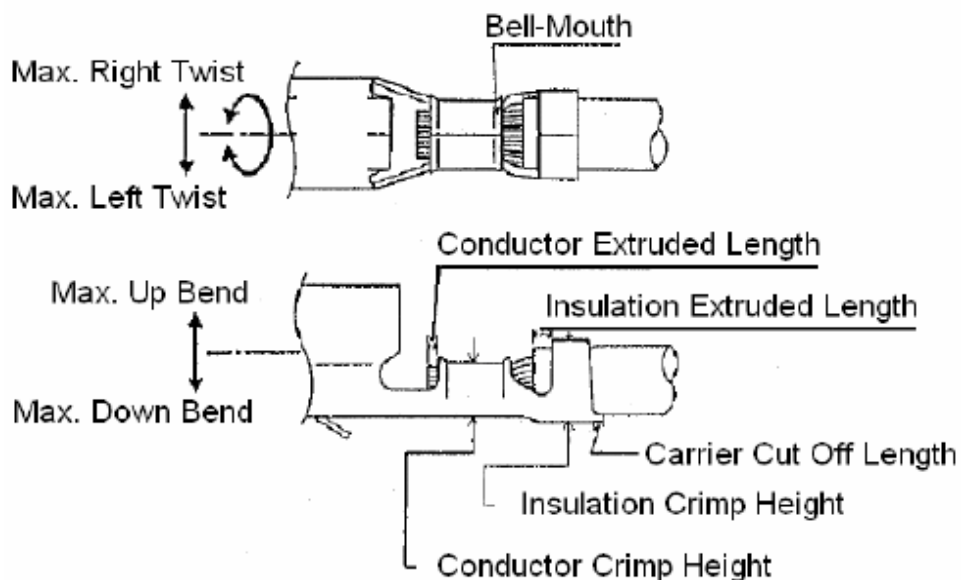
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16 CRIMPING REQUIREMENT



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