



SPECIFICATION

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SPEC. NO.: PS-91235-XXXXX-001 REVISION: E

PRODUCT NAME: 2.2mm PITCH WTB WAFER CONN.

PRODUCT NO: 91235-XXXXX-001 / 91235/92235 / 92237 / 92410 / 92239

PREPARED: Hsu Cheng Hsing DATE: 2018/10/17	CHECKED: Lee Kuang En DATE: 2018/10/17	APPROVED: Chen Chi Chang DATE: 2018/10/17
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1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
1	ECN-1409068	NEW SPEC	LERRY	14'/10/08
2	ECN-1411024	Re-define test sequence.in P9	LERRY	14'/11/25
O	ECN-1504012	Re-define test sequence.in P6	LERRY	15'/04/01
A	ECN-1507435	Merge SPEC(91235 series/92235series)	LERRY	15'/08/03
B	ECN-1605504	The new series (92237)	XUYNANG YANG	16'/05/30
C	ECN-1703135	新增 92237 獨立插入拔出力規格	Jay	17'/03/14
D	ECN-1806236	Added 92235-032 Plug and Pull Force SPEC.	CCHEN	18/06/15
E	ECN-1811330	Add CTS-17.01.03-A1-2016 SPEC.AND Increase P/N 92410(Housing)&92507(Terminal)FOR CTS	Bernie	18'/10/17



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2 SCOPE

This specification covers performance, tests and quality requirements for **2.2mm Pitch WTB Wafer Conn..**

3 APPLICABLE DOCUMENTS

3-1 EIA-364 ELECTRONICS INDUSTRIES ASSOCIATION

3-2 NDS05

3-3 CTS-17.01.03-A1-2016

3.3.1 QC/T 413—2002

3.3.2 QC/T 417.1—2001 (ISO 8092.2)

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 (**Brass**)
Finish: (a) Contact Area: **Tin plated.**
(b) Under plate: **Nickel-plated overall.**
- 4.2.2 Housing: Thermoplastic or Thermoplastic High Temp., UL94V-HB
- 4.2.3 Terminal: High performance copper alloy

4.3 Ratings

- 4.3.1 Voltage: **13±1 Volts DC (per pin)**
- 4.3.2 Current: **4 Amperes (per pin)**
- 4.3.3 Operating Temperature : **-40°C to +105°C**
- 4.3.4 Normal humidity:**60±15%**

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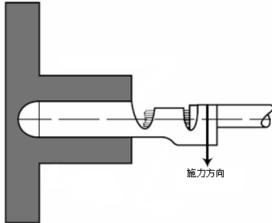
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5 Performance

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.
Hand feeling	There is no obvious blocking or such a touch.	Insert and drag the terminal + sheath and connector with the hand and check the tactile

ELECTRICAL

Item		Requirement	Standard										
Voltage Drop	Type	TH TH-NH	1.Energize the following circuits at the 15V voltages and 6A currents with the male and female connectors fitted. After the amount of voltage drop is stabled at a distance of 100mm away from the crimped section, measure the voltage drop. Subtracting the wire resistance of 100mm,determine the contact resistance. 2.Wire size[mm²]：0.3 ;Electric resistance[mΩ/m]：50.2 SEE Fig1、2 (NDS05-3.2.1, DATE:JUN.14.2008)										
	Initial value	10 or less											
	After the durability test	30 or less											
	Minute electric current circuit: Initial value and value after the durability test	30 or less											
	Unit m V/A												
The bending strength of terminal	After 15s,the terminal can't be torn apart		<p>This test is only applicable to the common terminal,Fix the end of the press,pressing the position up,as shown in figure 2,apply 15N force along the diagram and then release after 15s,the terminal were then rotated 180°and 90°respectively. Fig.3 (CTS-17.01.03-A1-6.3.4)</p> <div><p>图 2 端子弯曲强度测试</p><p>Fig.3</p><p>表 3 端子弯曲强度施加力</p><table><tr><th>端子材料厚度/mm</th><th>施力值/N</th></tr><tr><td>≤ 0.20</td><td>4</td></tr><tr><td>≤ 0.30</td><td>10</td></tr><tr><td>≤ 0.40</td><td>15</td></tr><tr><td>> 0.40</td><td>20</td></tr></table></div>	端子材料厚度/mm	施力值/N	≤ 0.20	4	≤ 0.30	10	≤ 0.40	15	> 0.40	20
端子材料厚度/mm	施力值/N												
≤ 0.20	4												
≤ 0.30	10												
≤ 0.40	15												
> 0.40	20												
Low voltage current tolerance	The initial: ≤5 mΩ Environmental resisance test period/later: <10 mΩ		Enter 10mA current at the opening of the maximum 20mV and calculate the contact resistance. (CTS-17.01.03-A1-6.4.2)										

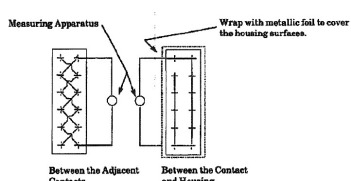
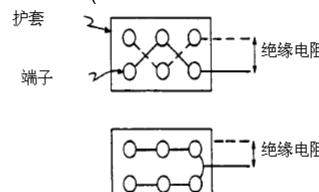
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Insulation Resistance	100 M Ω Min.(Init ial) 100 M Ω Min.(Final)	Measured by applying test potential between the adjacent contacts, and between the contacts and ground in the mated connectors. Fig.4 Condition DC 500 V. (CTS-17.01.03-A1-6.4.4) 																		
Dielectric Withstanding Voltage (Dielectric Strength)	No discharge, flashover or breakdown. Current leakage: 1 mA max.	Test between adjacent circuits of mated / unmated connectors. Fig.5 Apply 1000V AC of commercial frequency for 1 min. (CTS-17.01.03-A1-6.4.5)  图 9 绝缘电阻测试 Fig 5.																		
Temperature rise	30° C, max. under loaded specified current.	After having a half number of contacts series-wired (AVSS 0.5mm ²) , apply the specified current to the connector in the draft-free test chamber, and after reaching the established temperature, measure the temperature of the wire crimp of the contact. I _{max.} =8A (0.5mm ² wire) a: pass the I _{max.} through the connector b: Pass the I _{max.} *K _d through all theholes in the connector. (CTS-17.01.03-A1-6.4.3) K _d : <table><tr><th>孔位数</th><th>折减系数</th></tr><tr><td>1</td><td>1</td></tr><tr><td>2到3</td><td>0.75</td></tr><tr><td>4到5</td><td>0.6</td></tr><tr><td>6到8</td><td>0.55</td></tr><tr><td>9到12</td><td>0.5</td></tr><tr><td>13到20</td><td>0.4</td></tr><tr><td>21到30</td><td>0.3</td></tr><tr><td>>30</td><td>0.2</td></tr></table>	孔位数	折减系数	1	1	2到3	0.75	4到5	0.6	6到8	0.55	9到12	0.5	13到20	0.4	21到30	0.3	>30	0.2
孔位数	折减系数																			
1	1																			
2到3	0.75																			
4到5	0.6																			
6到8	0.55																			
9到12	0.5																			
13到20	0.4																			
21到30	0.3																			
>30	0.2																			
Over Current Loading	The appearance meets the sheath to change slightly	Take an embedded connector,wire selection max wire diameter,put the connector water dry in the no-wind condition,and input the corresponding current and length in the following table . (CTS-17.01.03-A1-6.5.1) Current load : <table><tr><th>線徑/mm2</th><th>电流 A</th><th>时间</th></tr><tr><td rowspan="4">0.5</td><td>16.5</td><td>60 min</td></tr><tr><td>20.5</td><td>200s</td></tr><tr><td>22.5</td><td>10s</td></tr><tr><td>30</td><td>1s</td></tr><tr><td>-</td><td>-</td><td>-</td></tr></table>	線徑/mm2	电流 A	时间	0.5	16.5	60 min	20.5	200s	22.5	10s	30	1s	-	-	-			
線徑/mm2	电流 A	时间																		
0.5	16.5	60 min																		
	20.5	200s																		
	22.5	10s																		
	30	1s																		
-	-	-																		



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Resistance to slow sliding	See Product Qualification and Test Sequence Group	At room temperature,the working terminal and the female terminal are listed in table : (CTS-17.01.03-A1-6.6.1)				
		滑动距离	滑动频率	滑动次数	开路电压	通电电流
		0.23mm	1~2 Hz	10,000次	最大20 mV	10 mA

MECHANICAL

Terminal holding force (Female Conn.)	(initial) 40N Min. (Completely locked) 100 Min. <table> <tr> <th>類型(W*T) (代號)</th><th>初次鎖止狀態</th><th>完全鎖止狀態</th></tr> <tr> <td>0.64*0.64 {025}</td><td rowspan="2">≥40</td><td rowspan="2">≥100 *</td></tr> <tr> <td>1.0*0.64 {025}</td></tr> </table> *(如果電線附件的抗拉強度小於100N,則以電線附件的抗拉強度為準)	類型(W*T) (代號)	初次鎖止狀態	完全鎖止狀態	0.64*0.64 {025}	≥40	≥100 *	1.0*0.64 {025}	Will be a better terminal and wire crimping chimeric within the sheath,and then in the shaft up to 50mm/min speed drawing of the wire,try point distance terminal pressure parte of 100mm,measuuring terminal load from the sheath when pulled of . (CTS-17.01.03-A1-6.3.6)
類型(W*T) (代號)	初次鎖止狀態	完全鎖止狀態							
0.64*0.64 {025}	≥40	≥100 *							
1.0*0.64 {025}									
Mating Force	91235/92235/92239 SERIES 70N Max(40Pin below) 78N Max.(40pin) 92235 90N MAX(32PIN) 92237 65N MAX(12PIN) 85N MAX(20PIN) 95N MAX(24PIN)	Measure the force required to mate connector with locking latch by operating at 50 mm a minute. (CTS-17.01.03-A1-6.3.10)							
Unmating Force	91235/92235/92239 SERIES 70N Max(40Pin below) 78N Max.(40pin) 92235 90N MAX(32PIN) 92237 65N MAX(12PIN) 85N MAX(20PIN) 95N MAX(24PIN)	Measure the force required to unmate connector without locking latch set in effect, by operating at 50 mm a minute. (CTS-17.01.03-A1-6.3.11)							
Strength of lock	100N Min .	A pair interlocking connectors is required to pull a solid measurement from the other end at a speed of 50mm/min when the end is fixed and the device is in the junction. According to the connector lock structure, in the axial direction and relative to the surface of the five direction tilt 45°the easiest way to make the direction of unlocked device. Fig 6. (CTS-17.01.03-A1-6.3.12) meets the (NDS05-3.2.8, DATE:JUN.14.2008)							

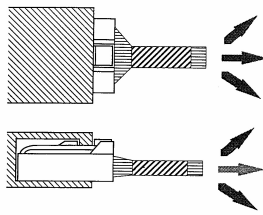
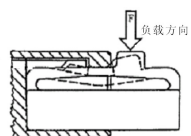
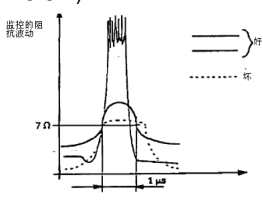
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		 <p>Fig 6.</p>									
Unlock the force	20N Max	<p>In a embedded with terminal connector,according to the connector after the insert lock structure,at the most easy to lock in tectonic unlock on the connector load,measure the lock or unlock the required load moment, Fig 7. (CTS-17.01.03-A1-6.3.13)</p>  <p>Fig 7.</p>									
Durability	Termination Resistance (Low Level)(Final) 0.5mm ² 10mΩ max.	Mate and unmate connectors for 50 Cycles. (CTS-17.01.03-A1-6.6.2)									
Terminal holding force (Female Conn.)	<p>(initial) 40N Min. (Completely locked) 100 Min.</p> <table border="1"> <thead> <tr> <th>類型(W*T) (代號)</th> <th>初次鎖止狀態</th> <th>完全鎖止狀態</th> </tr> </thead> <tbody> <tr> <td>0.64*0.64 (025)</td> <td>≥40</td> <td>≥100 *</td> </tr> <tr> <td>1.0*0.64 (025)</td> <td></td> <td></td> </tr> </tbody> </table> <p>*(如果電線附件的抗拉強度小於100N,則以電線附件的抗拉強度為準)</p>	類型(W*T) (代號)	初次鎖止狀態	完全鎖止狀態	0.64*0.64 (025)	≥40	≥100 *	1.0*0.64 (025)			<p>Will be a better terminal and wire crimping chimeric within the sheath,and then in the shaft up to 50mm/min speed drawing of the wire,try point distance terminal pressure parte of 100mm,measuuring terminal load from the sheath when pulled of .(CTS-17.01.03-A1-6.3.6)</p>
類型(W*T) (代號)	初次鎖止狀態	完全鎖止狀態									
0.64*0.64 (025)	≥40	≥100 *									
1.0*0.64 (025)											
Mechanical shock	<p>Transient breaking time≤1ms See Product Qualification and Test Sequence Group G</p>	<p>Take a pair of connectors with full terminals,and select the maximum diameter of the terminal adaptor.All hole series,and install it on the impact test bench,up/down,left/right before/back with six direction 980m/s² acceleration ,Three times in each direction,10ms at a time , Fig 8. (CTS-17.01.03-A1-6.6.4)</p>  <p>图 11 振動試驗中的阻抗</p> <p>Fig 8.</p>									
Vibration	<p>Transient breaking time≤1ms See Product Qualification and Test Sequence Group F/4</p>	<p>Connector, and give vibration after 12V,1A(for plated gold:below 20mV,10mA) is energized.,Vibration Accelation / frequency as shown in Fig.4 and up/down,left/right before/back with six direction for 6 hours respectively. Fig 9.(CTS-17.01.03-A1-6.6.3)</p>									

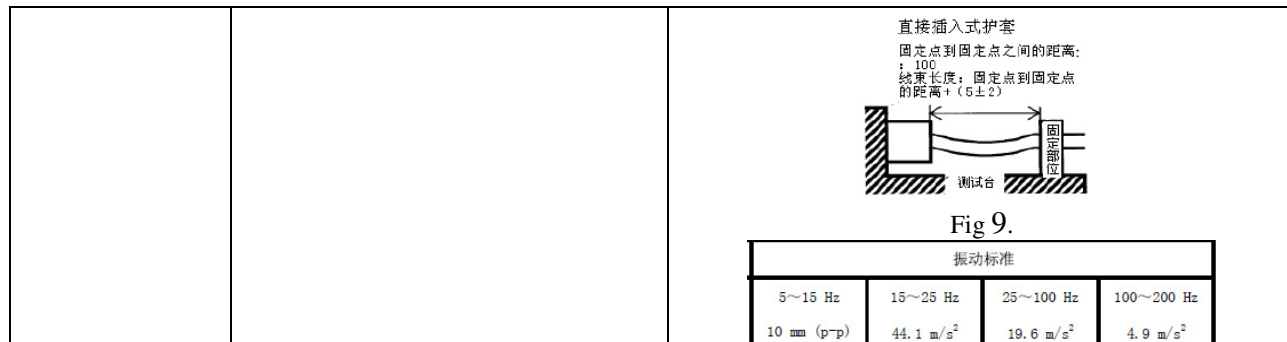
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Terminal / Housing
Retention Force
(Wafer Conn.)

19.6N Min.

Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the terminal assembled in the housing.

ENVIRONMENTAL

Item	Requirement	Standard				
Resistance to Wave Soldering Heat(Female Conn.)	See Product Qualification and Test	Solder Temp. : 265±5℃, 10±0.5sec.				
Humidity	See Product Qualification and Test Sequence Group 5	Mated Connector 40℃, 90~95% RH,96 hours. (EIA-364-31,Condition A, Method II)				
Solder ability	Solderable area shall have solder coverage of 95% minimum.	After immersing a soldering area of the cap assembly posts in flux (rosineous methanol solution) for 5 to 10 seconds, immerse it in a soldering bath of 230° C±5° C (tin 60% lead 40%) for 3±0. 5 seconds,and then inspect the connector by using approx. X10 magnifying glass.				
Low Temperature test	See Product Qualification and Test Sequence Group 7	Subject mated connectors to temperature life at -40℃ for 96 hours. Measure Signal.(EIA-364-59)				
Heat resistance	See Product Qualification and Test Sequence Group F/8	Take a pair of connectors with built-in terminals,the maximum diameter of the terminal fitting.Put it in the 100±3℃ high temperature box in the test 120h,in type waterproof connector,strapping all wires,to make it to 30°,The tilt of the tilt is tilted to the waterproof bolt,plus 30N negative.After the test is completed,the connector is removed and adjusted to room temperature.(CTS-17.01.03-A1-6.7.1)				
Thermal Shock	See Product Qualification and Test Sequence Group D	Take a pair of connectors with built-in terminals to insert,and the wire is selected with the most flattering diameter of the terminal tongue,As shown in figure in the cold strike type of connector try humming gartic street test are shown in table ,300 repeat cycle. During the test,check the teansient condition of the current,and the impedance fluctuation of the connector should not exceed 7Ω,After the test is completed,the connector will be removed and the connector will be left after 2h , Fig 10.(CTS-17.01.03-A1-6.7.3) <table><tr><td>高温/℃ (high temperature/℃)</td><td>低温/℃ (low temperature/℃)</td></tr><tr><td>70</td><td>-40</td></tr></table>	高温/℃ (high temperature/℃)	低温/℃ (low temperature/℃)	70	-40
高温/℃ (high temperature/℃)	低温/℃ (low temperature/℃)					
70	-40					

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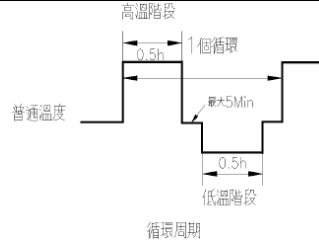
		 <p>高溫階段 普通溫度 低溫階段 0.5h 1個循環 最大5Min 0.5h 循環周期</p> <p>Fig 10.</p>
Thermal Shock (2)	See Product Qualification and Test Sequence Group 5	<p>Mate module and subject to follow Condition for 5 cycles.</p> <p>1 cycles:</p> <p>-40 +0/-3°C,30 minutes</p> <p>+105 +3/-0°C,30 minutes</p> <p>(EIA-364-32,test condition I)</p>
Resistance to Solder Heat	No Physical damage shall occur. Tab retention force 9.8N min.	<p>Dip between 3 mm and top of solder tab of cap housing assembly into solder bath (tin 60%,lead40%) at 250° C±5° C for 5±0.5 seconds and lock into appearance and meas tab retention force as bellow.Measurements of tab retention for cut tab at bending area after dipped and measure the force of tab to move when pushing toward the direction by arrow mark.</p>

Fig 1

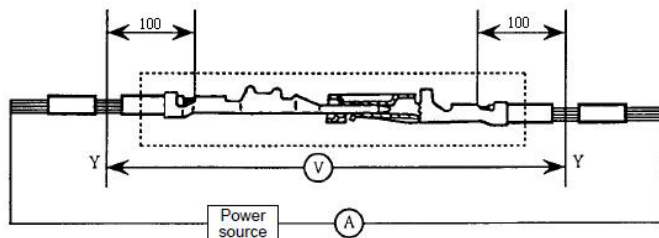
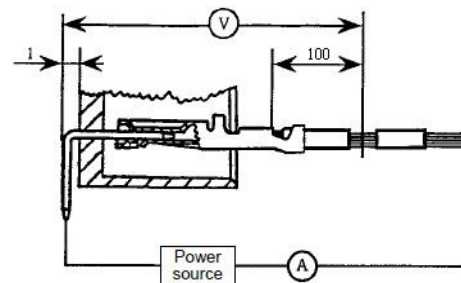


Fig 2





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6 PRODUCT QUALIFICATION AND TEST SEQUENCE

Test or Examination	Test Group															
	b	c	A	C	D	F	G	1	2	3	4	5	6	7	8	9
Examination of Product	1	1	1,5	1,4	1,10	1,5	1,3					1、7		1、6	1、6	
Hand feeling	6				8											
Voltage Drop									1、5		1、3	2、10		2、9	2、9	
The bending strength of terminal	8															
Insulation Resistance												3、9		3、8	3、8	
Over Current Loading			3													
Resistance to slow sliding				2												
Dielectric Withstanding Voltage												4、8		4、7	4、7	
Temperature rise	4							1								
Low voltage current tolerance	3		2,4	3	3,5,7	2										
Mating / Unmating Forces	2,5				2				2、4							
Strength of lock		3								1						
Terminal / Housing Retention Force													1			
Durability					4				3							
Terminal holding force	7				9											
Vibration						4					2					
Mechanical shock							2									
Thermal Shock					6											
Thermal Shock(2)												5				
Unlock the force		2														
Humidity												6				
Solder ability																1
Low Temperature test														5		
Heat resistance						3									5	
Sample Size	3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	5