



## SPECIFICATION

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SPEC. NO.: PS-92207-xxxxx-xxx REVISION: A

PRODUCT NAME: 2.54mm WTB WAFER CONN. T/H D/R R/A TYPE

PRODUCT NO: 92207, 92208

PREPARED:  <b>LIANG JU</b>  DATE: <b>2018/10/31</b>	CHECKED:  <b>WARLES</b>  DATE: <b>2018/10/31</b>	APPROVED:  <b>WARLES</b>  DATE: <b>2018/10/31</b>
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### 1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
O	ECN-1410429	Release	SNOW	2014/10/31
A	ECN-1810427	Modify insertion force	LIANG JU	2018/10/31

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## 2 SCOPE

This specification covers performance, tests and quality requirements for **2.54mm WTB Wafer Conn. T/H D/R R/A Type**. These connectors are **used to Body Control Module**.

## 3 APPLICABLE DOCUMENTS

EIA-364: ELECTRONICS INDUSTRIES ASSOCIATION  
USCAR-2 REV\_5: SPECIFICATION FOR AUTOMOTIVE ELECTRICAL CONN. SYSTEM  
GMW 3191 (Dec 2007): GM WORLDWILD ENGINEERING STANDARDS  
GMW 3172 (July2010): GM WORLDWILD ENGINEERING STANDARDS  
IEC 60068-2-52-1996: ENVIRONMENT TESTING

## 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: **Refer to the drawing**.
- 4.2.2 Housing: Thermoplastic or Thermoplastic High Temp., UL94 HB

### 4.3 Ratings

- 4.3.1 Voltage: **14 Volts AC (per pin)**
- 4.3.2 Current: **5 Amperes (per pin)**
- 4.3.3 Operating Temperature : **-40°C to +85°C**

**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.
<b>ELECTRICAL</b>		
Item	Requirement	Standard
Voltage Drop	50mΩ Max.	Mated connectors, measure by dry circuit. Testing Voltage: 14V. Testing Current: 5A. (USCAR-2_rev-5)
Isolation Resistance	100 M Ω Min.	Unmated connectors, apply 500 V DC between adjacent terminals.  (USCAR-2_rev-5)
Isolation Resistance	100 M Ω Min.	Test samples: Mating connector pairs filled with terminals attached to 300 mm of the largest wire size to be validated Step: 1. Wrap metal foil around the exterior of the connector without contacting any terminals or wires 2. applying 500 VDC between all adjacent pairs of terminals, and record the resistance after 15 s of stabilized readings. 3. Attach all the terminated wire leads to the positive lead of a Mega-Ohmmeter, and attach the negative lead of the Mega-Ohmmeter to the metal foil. Measure the isolation resistance between the terminals and the metal foil and record the resistance after 15 s of stabilized readings.  (GME3191_29OC03)
Dielectric Resistance	No discharge, flashover or breakdown.	Step: 1. Wrap metal foil around the exterior of the connector without contacting any terminals or wires. 2. Separate wires under test with sufficient distance as to have



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		<p>no influence on isolation resistance between any <b>two wire pairs</b>. Using <b>1600 VDC</b> Min. at sea level for <b>1</b> minute and record any current leakage.</p> <p>3. Attach all the terminated wire leads to the positive lead of the hi-pot tester. Attach the negative lead of the hi-pot tester to the metal foil</p> <p>Using <b>1600 VDC</b> Min. at sea level for <b>1</b> minute and record any current leakage between <b>the terminals and the metal foil</b> (GMW 3191_Dec 2007)</p>
Dry Circuit Resistance	<b>20 m Ω</b> Max.	<p>Measure and record the resistance across <b>150mm</b> of the conductor to be used for the test (Conductor length: <b>75</b> mm per side)</p> <p>Mating precise depth: least <b>1</b> mm (USCAR-2_rev-5)</p>

### MECHANICAL

Item	Requirement	Standard
Connector and/or Terminal Cycling	<b>10</b> cycles.	None (USCAR-2_rev-5)
Header Pin Retention Force	<b>15N (1.5Kg)</b> Min.	<p>Step:</p> <ol style="list-style-type: none"> <li><b>95~98%</b> Relative Humidity at <b>40°C</b> for <b>6</b> hours</li> <li>Measure the contact retention force with tester.</li> </ol> <p>(USCAR-2_Rev.5)</p>
Terminal to Terminal Engage/Disengage Force	<b>1<sup>st</sup> Engage Force:</b> <b>1<sup>st</sup> and 10<sup>th</sup> Disengage Force:</b>	<p>1. Operation Speed : <b>50</b> mm/minute..</p> <p>Measure the force required to mate/unmate connector. (USCAR-2_Rev.5)</p>
Terminal Push-out Force	<b>15 N</b> Min.	<p>Step:</p> <ol style="list-style-type: none"> <li>Operation Speed : <b>50</b> mm/minute and record the peak force required to displace the terminal a distance of <b>0.20</b> mm.</li> <li>Using new test samples as needed, reverse force direction.</li> <li>Repeat step1 to step 2 (GMW 3191_DEC2007)</li> </ol>



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<p>Conn.-Conn. Mating/Unmating Force(Connectors with Mechanical Assist)</p>	<ol style="list-style-type: none"> <li>1. Force to engage to pre-lock position: <b>8PIN&amp;12PIN -- 75N MAX</b> <b>14PIN -- 100N MAX</b></li> <li>2. Force to release latch from pre-stage position: <b>5N Min.</b></li> <li>3. Lever actuation/removal force: <b>60N Min.</b></li> </ol>	<ol style="list-style-type: none"> <li>A. Force to engage to pre-lock position:             <ol style="list-style-type: none"> <li>1. Using the force tester, engage each connector fully to its pre-lock position</li> <li>2. Reverse the direction and measure the force required to un-seat the connector from the pre-lock position.</li> </ol> </li> <li>B. Force to release latch from pre-stage position:             <ol style="list-style-type: none"> <li>1. Using the unmated lever connector, place lever or slide in its shipping (open) position.</li> <li>2. Using the force tester, gradually apply a force of <b>50N</b> in a direction so as to move the lever toward the lock position.</li> </ol> </li> <li>C. Lever actuation/removal force:             <ol style="list-style-type: none"> <li>1. With the connector in its pre-stage condition, measure the force required to fully actuate and close the lever. Force shall be applied perpendicular with the contact surface of the lever or slide as nearly as possible.</li> <li>2. For designs with a secondary release mechanism, without disabling or releasing this feature, gradually apply a force of <b>60N</b> to the lever in the release direction.</li> <li>3. Disable or release any existing release mechanism (if applicable) and record the force required to move the lever from the locked position to the open position.</li> </ol> </li> </ol> <p>(USCAR-2 Rev.5)</p>
<p>Locked Connector Disengagement Force (Only housing)</p>	<p><b>100 N min</b></p>	<p>Operation Speed : <b>50±10 mm/minute..</b> Measure the force required to mate/unmate connector. (GMW 3191_DEC2007)</p>



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<p>Unlocked Conn. Disengagement Force (With all terminals and wires)</p>	<p>120 N Max.</p>	<p>Step:            1. Mount the mated connector housings in the fixture with the locking feature disengaged.            2. Pull the mated connectors apart at a rate of 50±10 mm/min.            3. Record the force            4. Mount 5 of the mated connector housings in the fixture with the locking feature engaged.            Measure the force required to disengage the primary locking feature and Record the force (GMW 3191_DEC2007)</p>
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### ENVIRONMENTAL

Item	Requirement	Standard
<p>Temperature Humidity Cycling</p>	<p>See Product Qualification and Test Sequence Group 7</p>	<p>Temperature and Humidity curve shown in Figure 6-1            10 times            (GMW 3191_Dec 2007)</p>
<p>Temperature Humidity Cycling</p>	<p>See Product Qualification and Test Sequence Group 8</p>	<p>Mate module and subject to follow condition for 40 cycles.            1 cycle:            Temperature and Humidity curve shown in Figure 6-2            (USCAR-2_Rev.5)</p>
<p>Thermal Shock</p>	<p>See Product Qualification and Test Sequence Group 9</p>	<p>Mate module and subject to follow condition for 99 cycles            1 cycle:            -40 °C, 30 minutes            +85 °C, 30 minutes            Transition one chamber from the coldest to the hottest extreme in less than: 30 sec            (USCAR-2_Rev.5)</p>
<p>High Temperature Exposure</p>	<p>See Product Qualification and Test Sequence Group 10</p>	<p>Temperature: +85 °C for 1008 hrs            (USCAR-2_Rev.5)</p>
<p>Salt Mist</p>	<p>See Product Qualification and Test Sequence Group 11</p>	<p>Subject mated/unmated connectors to 5% salt-solution concentration, for 3 cycles            1 cycle:            2hrs salt spray period at</p>





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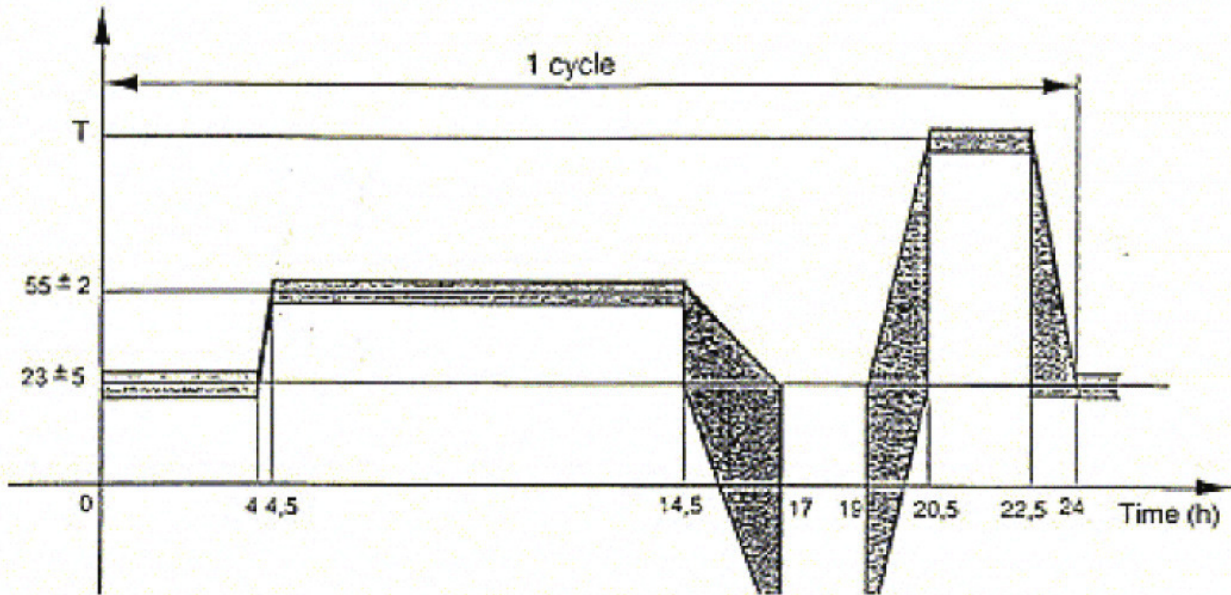
		temperature <b>15~35°C</b> then humidity storage <b>22hrs</b> for <b>40±2°C</b> and <b>95 +2/-3%</b>  (IEC 60068-2-52-1996)
Solder ability	Solder able area shall have minimum of <b>95%</b> solder coverage.	And then into solder bath, Temperature at <b>245 ±5°C</b> , for <b>4-5</b> sec. (EIA-364-52)
Hand Soldering Temperature Resistance	Appearance: No damage	$T \geq 350^{\circ}\text{C}$ , 3sec at least.

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

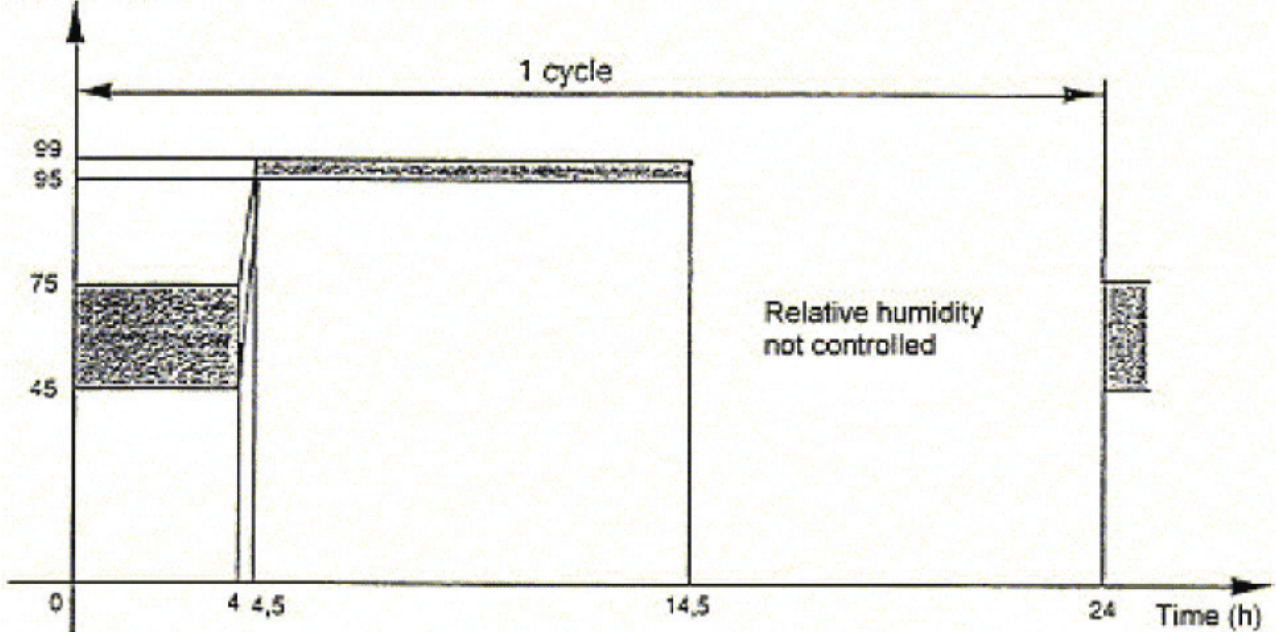
**6 Figure**

6-1 Temperature Humidity Cycling from GMW 3191\_Dec 2007

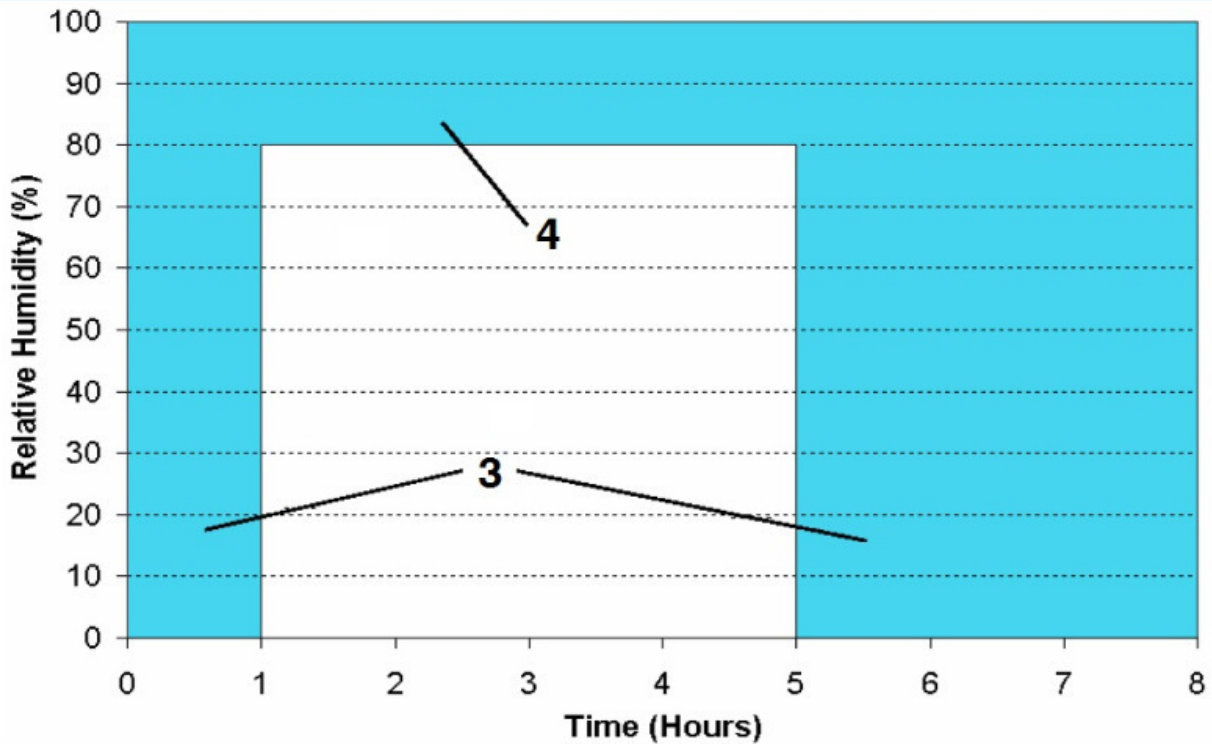
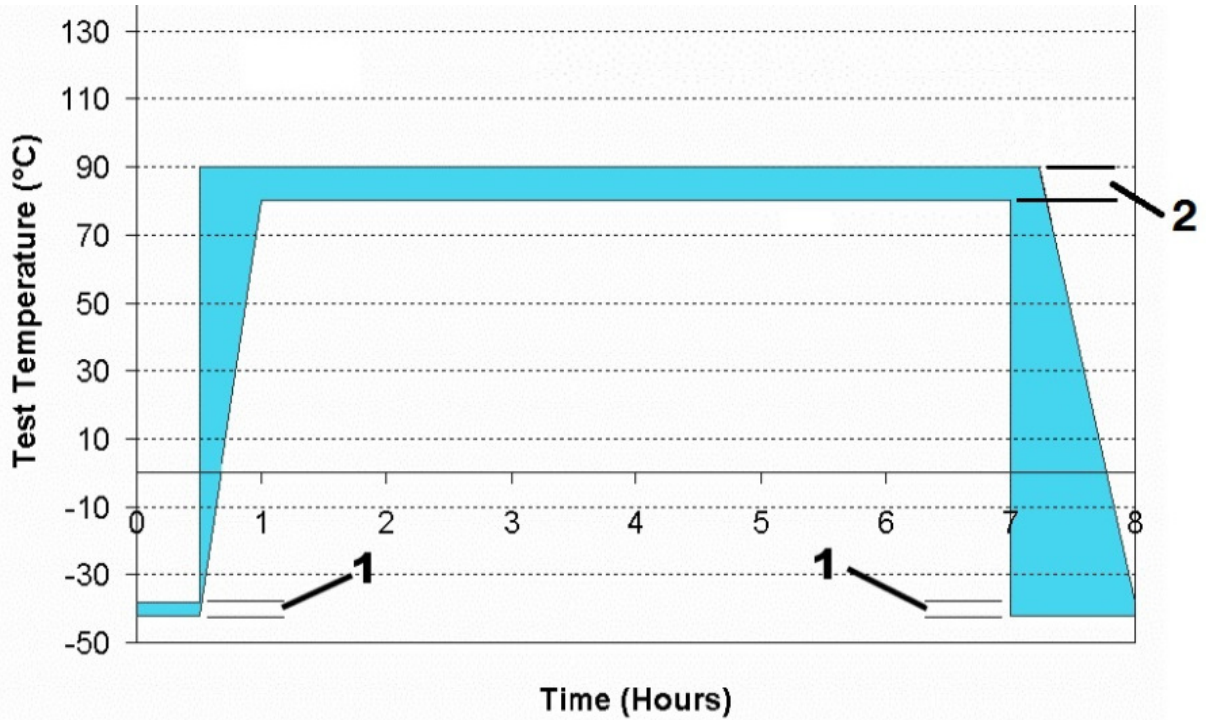
Temperature (°C)



Relative Humidity (%)



6-2 Temperature Humidity Cycling from USCAR-2 Rev.5





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## 7 PRODUCT QUALIFICATION AND TEST SEQUENCE

Test or Examination	1	2	3	4	5	6	7	8	9
Examination of Product							1,5	1,8	1,7
Voltage Drop								6	6
Isolation Resistance (USCAR-2_rev-5)								7	
Isolation Resistance (GMW 3191_Dec 2007)									
Dielectric Withstanding Voltage (GMW 3191_Dec 2007)									
Dry Circuit Resistance (USCAR-2_rev-5)							2,4	3,5	3,5
Header pin retention (USCAR-2_rev-5)	1								
Terminal to Terminal Engage/Disengage Force (USCAR-2_rev-5)		1,3							
Terminal Push-out Force (GMW 3191_Dec 2007)			1						
Conn.-Conn. Mating/Unmating Force(Connectors with Mechanical Assist) (USCAR-2_rev-5)				1					
Connector and/or Terminal Cycling (USCAR-2_rev-5)		2						2	2
Locked Conn. Disengagement Force (GMW 3191_Dec 2007)					1				
Unlocked Conn. Disengagement Force (GMW 3191_Dec 2007)						1			
Temperature / Humidity Cycling (GMW 3191_Dec 2007)							3		
Temperature / Humidity Cycling (USCAR-2_rev-5)								4	
Thermal Shock (USCAR-2_rev-5)									4
Sample Size	4	10	4	10	10	10	10	10	10



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Test or Examination	10	11	12	13	14	15	16	17	18
	Examination of Product	1,7	1,3						
Voltage Drop	6								
Isolation Resistance (USCAR-2_rev-5)					1				
Isolation Resistance (GMW 3191_Dec 2007)						1			
Dielectric Withstanding Voltage (GMW 3191_Dec 2007)							1		
Dry Circuit Resistance (USCAR-2_rev-5)	3,5							1	
Connector and/or Terminal Cycling (USCAR-2_rev-5)	2								2
High Temperature Exposure (USCAR-2_rev-5)	4								
Salt Mist (IEC 60068-2-52-1996)		2							
Solder ability			1						
Hand Soldering Temperature Resistance				1					
Sample Size	10	4	4	4	3	3	3	20	4