

## SPECIFICATION AND PERFORMANCE

<b>Series</b>	<b>115S</b>	<b>File</b>	<b>115S_spec_2</b>	<b>Date</b>	<b>2019/01/21</b>
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### Scope:

This specification covers the requirements for product performance, test methods and quality assurance provisions of below

SOCKET	
P/N	DESCRIPTION
115S-ACA0	Nano SIM Card Socket, Bar Push, 8u" Gold

Tray	
P/N	DESCRIPTION
115S-ACA1	Nano SIM Tray, PA46, White color, Reel
115S-ACA2	Nano SIM Tray, SUS316, Natural color, 18.10mm, Reel
115S-ACA3	Nano SIM Tray, SUS316, Natural color, 16.31mm, Reel

### Performance and Descriptions:

The product is designed to meet the electrical, mechanical and environmental performance requirements specification. Unless otherwise specified, all tests are performed at ambient environmental conditions.

### RoHS:

All material in according with the RoHS environment related substances list controlled.

MATERIALS		
NO.	PART NAME	DESCRIPTION
<b>Socket: 115S-ACA0</b>		
1	Insulator	LCP S475 +30%GF, UL94V-0, Black
2	Contact	Phosphor Bronze, NKT322-ESH. Contact area: Gold plated 8u", Solder area: Gold plated 3u"~5u", Under plated: Nickel plated 50u"~120u" over all
3	Shell	SUS301-H,0.1T, Tail area: 1u"~3u" Gold plated min., Under plated: 50u"~100u" Nickel plated min.
4	Lever	SUS301-H, 0.3T
5	CAM	SUS301-1/2H, 0.5T
6	Latch	SUS301-H, 0.25T
<b>Plastic Tray: 115S-ACA1</b>		
1	Housing	PA46_TW241F3 PA+15%GF, White color
2	Cover	SUS301-H, 0.1T
<b>Metal Tray: 115S-ACA2 &amp; 115S-ACA3</b>		
1	Body	SUS316, Natural color

<b>ELECTRICAL</b>		
<b>Item</b>	<b>Requirement</b>	<b>Test Condition</b>
Low Level Contact Resistance (Contact & Switch)	Contact resistance: 50mΩ max. ΔCR < 30mΩ after test. Switch resistance: 200mΩ max	Comply with EIA-364-23. Apply a closed-circuit current of 100 mA maximum at an open-circuit voltage of 20mV maximum on contact point and solder pad of PCB.
Insulation Resistance	(Initial) 1000 MΩ minimum. (Final) 500 MΩ minimum	Comply with EIA-364-21. Apply 200 VDC ±10VDC on the adjacent contacts for 1 minute ±5 seconds
Dielectric Withstanding Voltage	No shorting, breakdown, flashover or other damage.	Comply with EIA-364-20. Apply 500 VAC for one minute at sea level on unmated connectors, less than 1 mA leakage current.

<b>MECHANICAL</b>		
<b>Item</b>	<b>Requirement</b>	<b>Test Condition</b>
Tray Insertion Force	20N Max. (25mm/minute)	MIL-STD-1344, Method 2013.1 Applicable Nano SIM Card
Tray Extraction Force	4N min. after 200 cycles (with hands) 3N min. after 4400 cycles (with hands) No evidence of damage  The electrical performances should meet the spec. specified. (25mm/minute).	MIL-STD-1344, Method 2013.1 Applicable Nano SIM Card
Contact Normal Force	40gf Min./per Pin	0.10mm Gap to housing surface (work position) Speed of 25±3mm/minute
Durability (Mating/ Un-mating)	4N min after 200cycles (with hands) 3N min after 4400cycles (with hands) No evidence of damage  The electrical performances should meet the spec. specified	1. Push tray with card in connector and let the tray out with pushing Lever (with hands) for 4400 cycles 2. Mating and un-mating connector (with machine) for 200 cycles. 3. Applicable Nano SIM Card (5 pcs by maximum thickness size card (0.7mm) ) (5 pcs by minimum thickness size card(0.6mm)) for test. 4. Check point: after 200 cycles

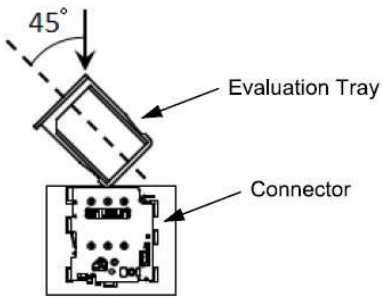
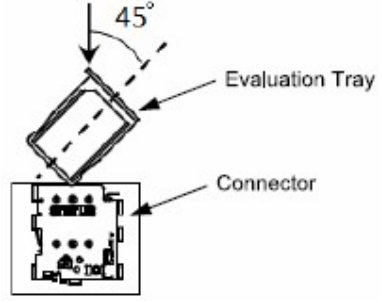


<p>Operating Random Vibration</p>	<p>Without mechanical damage and electrical discontinuity greater than 1 <math>\mu</math> sec (s) shall occur.</p> <p>The electrical performances should meet the spec. specified.</p>	<p>Comply with method EIA-364-46B.</p> <ol style="list-style-type: none"> <li>The power supply shall be capable of supplying 100mili-amperes DC. and open circuit voltage not to exceed 5.0 volts.</li> <li>Mated dummy card shall be subjected during test.</li> <li>Vibration Profile: As following</li> </ol> <table border="1" data-bbox="916 633 1445 797"> <thead> <tr> <th colspan="2">Operating Random Vibration</th> </tr> </thead> <tbody> <tr> <td colspan="2">3 axes, 30 minutes per axis, 1.67 Grms</td> </tr> <tr> <th>Frequency (Hz)</th> <th>A.S.D. (G<sup>2</sup>/Hz)</th> </tr> <tr> <td>10~200</td> <td>0.01</td> </tr> <tr> <td>200~500</td> <td>0.003</td> </tr> </tbody> </table>	Operating Random Vibration		3 axes, 30 minutes per axis, 1.67 Grms		Frequency (Hz)	A.S.D. (G <sup>2</sup> /Hz)	10~200	0.01	200~500	0.003				
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<p>Non-Operating Random Vibration</p>	<p>Without mechanical damage. The electrical performances should meet the spec. specified.</p>	<p>Vibration Profile: As following</p> <table border="1" data-bbox="916 925 1445 1115"> <thead> <tr> <th colspan="2">Non-operating Random Vibration</th> </tr> </thead> <tbody> <tr> <td colspan="2">3 axes, 10 minutes per axis, 6.06 Grms</td> </tr> <tr> <th>Frequency (Hz)</th> <th>A.S.D. (G<sup>2</sup>/Hz)</th> </tr> <tr> <td>20</td> <td>0.0098</td> </tr> <tr> <td>80</td> <td>0.04</td> </tr> <tr> <td>350</td> <td>0.04</td> </tr> <tr> <td>2000</td> <td>0.0069</td> </tr> </tbody> </table>	Non-operating Random Vibration		3 axes, 10 minutes per axis, 6.06 Grms		Frequency (Hz)	A.S.D. (G <sup>2</sup> /Hz)	20	0.0098	80	0.04	350	0.04	2000	0.0069
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<p>Operating Sine Vibration</p>	<p>Without mechanical damage and electrical discontinuity greater than 1 <math>\mu</math> sec (s) shall occur.</p> <p>The electrical performances should meet the spec. specified</p>	<p>Comply with method EIA-364-46B.</p> <ol style="list-style-type: none"> <li>The power supply shall be capable of supplying 100mili-amperes DC and open circuit voltage not to exceed 5 volts.</li> <li>Mated dummy card shall be subjected during test.</li> <li>Vibration Profile: As following</li> </ol> <table border="1" data-bbox="906 1339 1437 1529"> <thead> <tr> <th colspan="2">Non-operating Random Vibration</th> </tr> </thead> <tbody> <tr> <td colspan="2">3 axes, 10 minutes per axis, 6.06 Grms</td> </tr> <tr> <th>Frequency (Hz)</th> <th>A.S.D. (G<sup>2</sup>/Hz)</th> </tr> <tr> <td>20</td> <td>0.0098</td> </tr> <tr> <td>80</td> <td>0.04</td> </tr> <tr> <td>350</td> <td>0.04</td> </tr> <tr> <td>2000</td> <td>0.0069</td> </tr> </tbody> </table>	Non-operating Random Vibration		3 axes, 10 minutes per axis, 6.06 Grms		Frequency (Hz)	A.S.D. (G <sup>2</sup> /Hz)	20	0.0098	80	0.04	350	0.04	2000	0.0069
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<p>Operating Mechanical Shock</p>	<p>No electrical discontinuity greater than 1 <math>\mu</math> second shall occur.</p> <p>The electrical performances should meet the spec. specified</p>	<p>Comply with method EIA-364-46B.</p> <ol style="list-style-type: none"> <li>The power supply shall be capable of supplying 100mili-amperes DC and open circuit voltage not to exceed 5.0 volts.</li> <li>Mated dummy card shall be subjected during test.</li> <li>50G/11ms half-sine wave shock.</li> <li>3 shocks in each direction. Total of 6 directions.</li> <li>Total of 18 shocks.</li> </ol>														
<p>Non-Operating Mechanical Shock</p>	<p>There is no crack, deformation or other damage of connector.</p>	<ol style="list-style-type: none"> <li>Mated dummy card shall be subjected during test.</li> <li>500G/2ms half-sine wave shock.</li> </ol>														

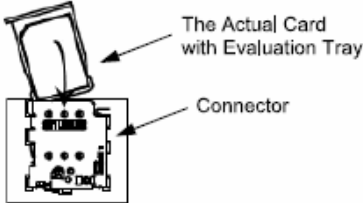
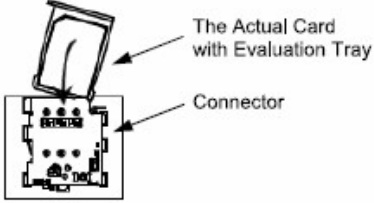
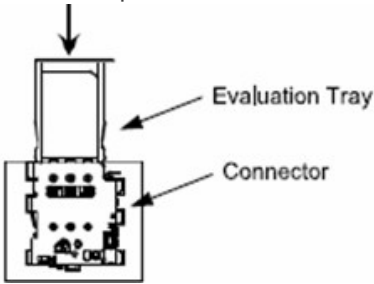
		3. 3 shocks in each direction. Total of 6 directions. 4. Total of 18 shocks.
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ENVIRONMENTAL		
Item	Requirement	Test Condition
Operating Heat Resistance	No evidence of damage The electrical performances should meet the spec. specified	1. Operating test current: 0.2A 2. Mated dummy card shall be subjected during test. 3. Temperature: 70±3°C 4. Duration time: 240 hours. It shall be maintained at standard atmospheric condition for 30 min after measurement shall be made.
Operating Cold Resistance	No evidence of damage The electrical performances should meet the spec. specified.	1. Operating test current: 0.2A 2. Mated dummy card shall be subjected during test. 3. Temperature: -20±3°C 4. Duration time: 240 hours. It shall be maintained at standard atmospheric condition for 30 min after measurement shall be made.
Non-Operating Heat Resistance	No evidence of damage The electrical performances should meet the spec. specified	1. Mated dummy card shall be subjected during test. 2. Temperature: 85±3°C 3. Duration time: 240 hours. It shall be maintained at standard atmospheric condition for 30 min after measurement shall be made.
Non-Operating Cold Resistance	No evidence of damage The electrical performances should meet the spec. specified.	1. Mated dummy card shall be subjected during test. 2. Temperature: -40±3°C 3. Duration time: 240 hours. It shall be maintained at standard atmospheric condition for 30 min after measurement shall be made
Non-Operating Thermal Shock	No evidence of damage The electrical performances should meet the spec. specified.	Subject mated connector to 32 cycles between -40 ± 3°C/ 30 minutes and +85 ± 3°C/ 30 minutes  MIL-STD-202, Method 107
Operating Temperature	No evidence of damage The electrical performances	1. Operating test current: 0.2A 2. Mated dummy card shall be subjected during test.



		<p>3. Temperature: 60±2°C 4. Humidity: 95%RH 5. Duration time: 240 hours.</p>
Non-Operating Temperature And Humidity	No evidence of damage The electrical performances should meet the spec. specified.	<p>1. Temperature: 70±2°C 2. Humidity: 90%RH 3. Duration time: 240 hours.</p>
H <sub>2</sub> S Corrosion Resistance	Electrical performance specified in table 1 shall be satisfied. No harmful deformation, cracking and chip etc., on function.	<p>MIL-STD-202, Method 1010 Temperature: 40±2°C  Gas concentration: 3±1ppm Humidity: 75% to 80% RH Duration: 24H</p>
Salt Spray	No mechanical damage; No harmful corrosion occurs on contact.	<p>Temperature: 35±2°C NaCl: 5% Duration: 48H After test wash parts and return</p>
Tray Push In Strength (Tray Left Oblique)	<p>As show below, No problem to connector performance</p> 	The evaluation tray is left oblique by 45 degree and the load of 2kg is added in 20 seconds by 10pcs
Tray Push In Strength (Tray Right Oblique)	<p>As show below, No problem to connector performance</p> 	The evaluation tray is right oblique by 45 degree and the load of 2kg is added in 20 seconds by 10pcs.



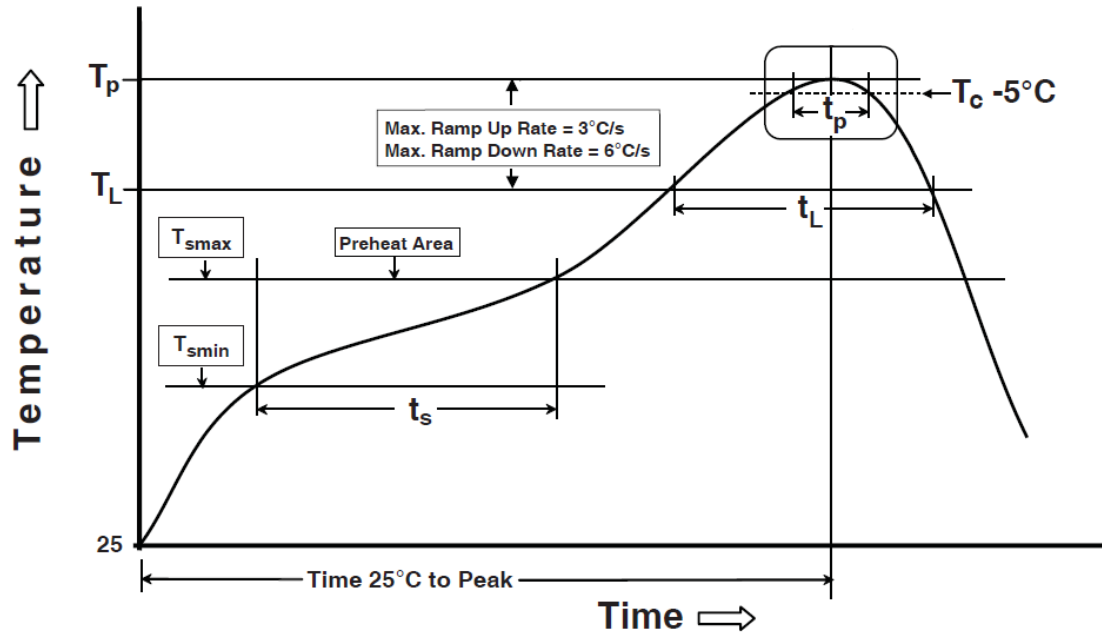
<p>Left Oblique Insertion Resistance</p>	<p>As show below, No problem to connector performance</p> 	<p>The actual card with evaluation Tray is inserted by left oblique, and ejected (pushing Eject Bar). It is Repeated 100 cycles.</p>
<p>Right Oblique Insertion Resistance</p>	<p>As show below, No problem to connector performance</p> 	<p>The actual card with evaluation Tray is inserted by right oblique, and ejected (pushing Eject Bar). It is Repeated 100 cycles</p>
<p>Tray Reversed Insertion Resistance</p>	<p>As show below, No problem to connector performance</p> 	<p>The evaluation tray is reversed and the load of 2kg is added in 20 seconds (50cycle)</p>
<p>Cutting-SIM Card Test</p>	<p>No evidence of damage The electrical performances should meet the spec. specified</p>	<p>5pcs Micro SIM cut into Nano SIM (Micro SIM type thickness: 0.84mm) Test method: 1,000 cycles as defined to insert cutting-SIM card into the connector, and remove the cutting-SIM card.</p>
<p>Misuse test For SIM Card Connector</p>	<p>Testing orientation of object: Normal/ Reverse/ Bottom-up Sample quantity: 5(straight) + 5(left slant) + 5(right slant) + 5(upper slant) + 5(lower slant) No problem to connector performance</p>	<p>Insert the maximum size micro SD conn card along straight/left slant/right slant/upper slant/lower slant deflection, and then remove Micro SD tray. Perform this action for 10 times for each sample. Totally for 5 samples for each side</p>

**Table II: Products qualification test sequence**

Test Description	Test Group and Sequence																			
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U
1. Visual inspection	1,15	1,9	1,9	1,9	1,9	1,9	1,9	1,9	1,9	1,9	1,9	1,9	1,9	1,9	1,9	1,3	1,3	1,3	1,3	1,3
2. Low level contact resistance	2,9	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6					
3. Insulation Resistance	3,10	3,7	3,7	3,7	3,7	3,7	3,7	3,7	3,7	3,7	3,7	3,7	3,7	3,7	3,7					
4. Dielectric Withstanding Voltage	4,11	4,8	4,8	4,8	4,8	4,8	4,8	4,8	4,8	4,8	4,8	4,8	4,8	4,8	4,8					
5. Tray Insertion Force	5,12																			
6. Tray Extraction Force	6,13																			
7. Contact Normal Force	7,4																			
8. Durability	8																			
9. Operating Random Vibration		5																		
10. Non-operating Random Vibration			5																	
11. Operating Sine Vibration				5																
12. Operating Mechanical Shock					5															
13. Non-operating Mechanical Shock						5														
14. Operating Heat Resistance							5													
15. Operating Cold Resistance								5												
16. Non-operating Heat Resistance									5											
17. Non-operating Cold Resistance										5										
18. Non-operating Thermal Shock											5									
19. Operating Temperature and Humidity												5								
20. Non-operating Temperature and Humidity													5							
21. H2S Corrosion Resistance														5						
22. Salt Spray															5					
23. Tray Push in Strength (tray Left Oblique)																2				
24. Tray Push in Strength (tray Right Oblique)																	2			
25. Left Oblique Insertion Resistance																		2		
26. Right Oblique Insertion Resistance																			2	
27. Tray Reversed Insertion Resistance																				2
Sample size	10	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4



## Reflow Profile



Preheating temperature: 150 ~ 200°C, 60~120 seconds  
 Liquidus temperature ( $T_L$ ): 217°C, 60~150 seconds  
 Peak temperature: 260°C  
 Time within 5 °C of peak temperature ( $T_c$ ): 255°C, 30seconds