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1. Scope :

This product specification contains the test results that general performances of A1002 SERIES connector were examined.

2. Part name & part number :

Part name	Part number
Housing	A1002H A1002H-2 A1002HA A1002HB A1002HG
Terminal	A1002-T A1002A-T
Wafer	A1002WV-S/WR-S A1002WVA-S/WRA-S

3. Construction, dimensions, material & surface finish :

Construction and dimensions shall be in accordance with the referenced drawings.

Part name		Material	Surface finish
Housing		PBT	UL 94V-0
Terminal		Phosphor Bronze	Tin-plated/Gold-plated
Wafer (SMT)	Post	Phosphor Bronze	Tin-plated/Gold-plated
	Body	Nylon 6T/9T/LCP	UL 94V-0
	Tab	Phosphor Bronze	Tin-plated

4. Characteristics :

Current rating : 1A AC,DC

Voltage rating : 50V AC,DC

Temperature range : -40°C ~ 105°C

5. Conditions :

The conditions shall be in accordance with the referenced drawing of next page.

Number	Item	Requirement
(1)	Bend up	4° max.
	Bend down	4° max.
	Twisting	3° max.
	Rolling	8° max.
(2)	Bell mouth (flare)	0.2-0.5 mm
(3)	Cut-off tab length	0.2 mm max.
(4)	Extruded wire length	0-0.3 mm
(5)	Seam	Seam shall not be opened and no wire allowed out of crimping area
(8)	Wire strip length	1.2-1.7 mm ref.
	Lance height	0.3 mm ref.

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6. Mechanical test :

6.1 Crimp width、 crimp height & crimp strength

After crimping, the crimped areas [(6)、 (7)] should be as follows.

Wire Size (AWG)	Terminal Part Number	Conductor(mm)		Insulation(mm)		Crimp Strength (Kg)
		Crimp Width	Crimp Height	Crimp Width	Crimp Height	
#28	A1002-T	0.65±0.10	0.46-0.54	0.8 (max)	0.90(max)	1.0(min)
#30	A1002A-T		0.40-0.48		0.80(max)	0.5(min)
#32			0.36-0.44		0.70(max)	0.4(min)

Note : no distorted after terminal crimped.

6.2 Insertion force (I.F.) & withdrawal force (W.F.)

(1) Requirement : (Single Row)

Number of Circuits	At initial		At 50th
	I.F. (max)	W.F. (min)	W.F. (min)
single	1.00kg	0.10kg	0.05kg
2	1.20kg	0.15kg	0.10kg
3	1.50kg	0.20kg	0.15kg
4	2.00kg	0.30kg	0.25kg
5	2.50kg	0.40kg	0.35kg
6	3.00kg	0.50kg	0.45kg
7	3.50kg	0.70kg	0.60kg
8	4.00kg	0.80kg	0.70kg
9	4.50kg	0.90kg	0.80kg
10	5.00kg	1.00kg	0.90kg
11	5.50kg	1.05kg	1.00kg
12	6.00kg	1.10kg	1.05kg
13	6.50kg	1.15kg	1.10kg
14	7.00kg	1.20kg	1.15kg
15	7.50kg	1.30kg	1.20kg
16	8.00kg	1.40kg	1.30kg
17	8.50kg	1.50kg	1.40kg
18	9.00kg	1.60kg	1.50kg
19	9.50kg	1.70kg	1.60kg
20	10.00kg	1.80kg	1.70kg

(2) Requirement : (Dual Row)

Number of Circuits	At initial		At 50th
	I.F. (max)	W.F. (min)	W.F. (min)
2x10	5.00kg	1.00kg	0.80kg
2x15	8.00kg	2.00kg	1.80kg
2x20	10.00kg	3.00kg	2.80kg
2x25	12.00kg	4.00kg	3.80kg

(3) Test method : Housing with crimped terminal and wafer shall be mated and unmated

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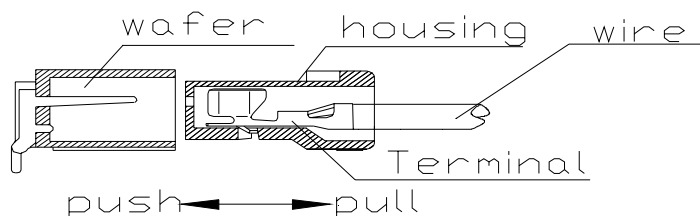
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on the same axis. Initial insertion and withdrawal forces and withdrawal forces at 30th shall be measured for single circuit and multi-circuits. For the measurement of single circuit, housing lock shall be removed.

Insertion and withdrawal speed : 20 ± 5 mm/minute.



(4) Test results : (Single Row)

Number of Circuits		At initial		AT 50th
		I.F. (Kg)	W.F. (Kg)	W.F. (Kg)
Single	Max.	0.54	0.51	0.45
	Min.	0.43	0.39	0.37
	Ave.	0.49	0.45	0.42
2	Max.	0.87	0.70	0.65
	Min.	0.79	0.55	0.51
	Ave.	0.83	0.62	0.56
3	Max.	1.08	0.89	0.82
	Min.	0.91	0.65	0.61
	Ave.	0.98	0.76	0.71
4	Max.	1.25	1.13	1.02
	Min.	1.02	0.72	0.64
	Ave.	1.09	0.95	0.87
5	Max.	1.41	1.42	1.35
	Min.	1.15	0.85	0.76
	Ave.	1.23	1.15	1.03
6	Max.	1.72	1.65	1.53
	Min.	1.27	0.96	0.85
	Ave.	1.41	1.31	1.26
7	Max.	1.95	1.84	1.72
	Min.	1.38	1.05	0.96
	Ave.	1.56	1.45	1.34
8	Max.	2.27	2.05	1.94
	Min.	1.69	1.31	1.24
	Ave.	1.83	1.67	1.54
9	Max.	2.59	2.24	2.21
	Min.	1.91	1.62	1.46
	Ave.	2.21	1.92	1.84

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10	Max.	2.85	2.43	2.31
	Min.	2.20	1.81	1.75
	Ave.	2.53	2.15	2.01
11	Max.	3.02	2.55	2.41
	Min.	2.39	1.87	1.75
	Ave.	2.68	2.23	2.16
12	Max.	3.27	2.63	2.53
	Min.	2.51	1.92	1.81
	Ave.	2.81	2.30	2.25
13	Max.	3.45	2.78	2.65
	Min.	2.75	1.99	1.85
	Ave.	2.99	2.37	2.31
14	Max.	3.61	2.83	2.79
	Min.	2.93	2.05	1.95
	Ave.	3.21	2.43	2.35
15	Max.	3.87	2.96	2.83
	Min.	3.15	2.12	2.01
	Ave.	3.39	2.51	2.48
16	Max.	4.01	3.08	2.98
	Min.	3.31	2.19	2.07
	Ave.	3.56	2.59	2.51
17	Max.	4.25	3.15	3.05
	Min.	3.52	2.25	3.04
	Ave.	3.72	2.66	2.61
18	Max.	4.51	3.24	3.12
	Min.	3.69	2.31	2.25
	Ave.	3.92	2.72	2.64
19	Max.	4.71	3.40	3.28
	Min.	3.82	2.36	2.31
	Ave.	4.05	2.81	2.69
20	Max.	4.83	3.54	3.42
	Min.	3.98	2.47	2.34
	Ave.	4.20	2.93	2.82

(5) Test results : (Dual row)

Number of Circuits		At initial		AT 50th
		I.F. (Kg)	W.F. (Kg)	W.F. (Kg)
2x10	Max.	2.81	2.01	1.95
	Min.	2.69	1.92	1.82
	Ave.	2.77	1.98	1.88
2x15	Max.	4.97	4.34	4.29
	Min.	4.52	3.43	3.38
	Ave.	4.82	3.93	3.87

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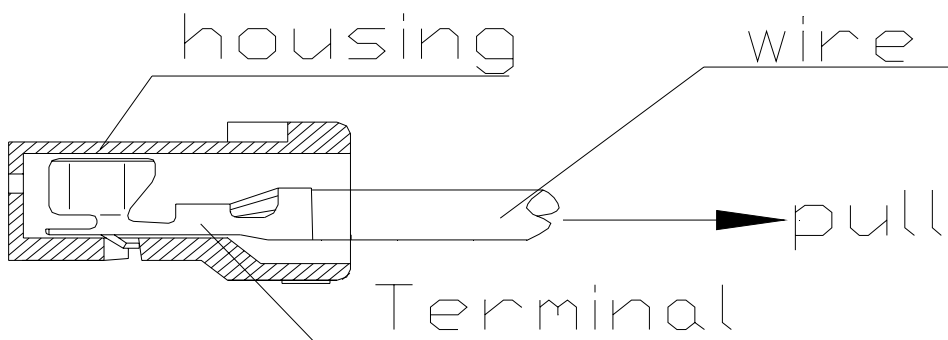
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2x20	Max.	7.35	6.21	6.15
	Min.	6.58	4.54	4.41
	Ave.	6.98	5.12	4.99
2x25	Max.	10.61	8.44	8.39
	Min.	9.57	7.55	7.51
	Ave.	10.18	8.06	7.99

6.3 Contact retention force

(1) Requirement : 0.5 Kg (min.)

(2) Test method : Crimped terminal shall be mounted in a housing and pulled in an alignment. The load to pull the terminal out of the housing shall be measured.



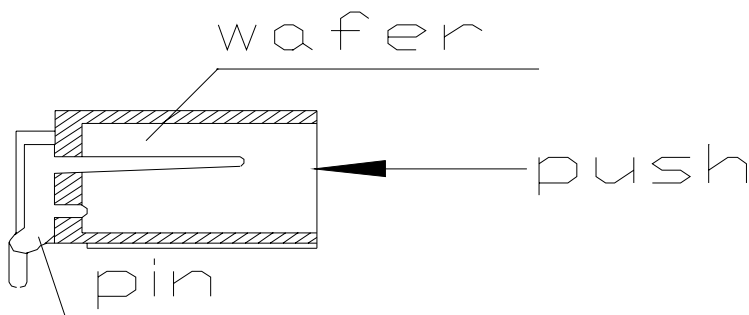
(3) Test results :

Max.	Min.	Ave.	N=10
1.23	1.06	1.15	

6.4 Post retention force

(1) Requirement : 0.3 Kg (min.)

(2) Test method : The end of a post shall be pushed in a perpendicular to wafer. The load to make the post start moving shall be measured.



(3) Test results :

Max.	Min.	Ave.	N=10
1.08	0.75	0.88	

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7. Electrical test :

7.1 Contact resistance

(1) Requirement : Initial : 20 mΩ (max.)

After environmental test : 30 m Ω (max.)

(2) Condition : Test current : 10 mA (DC)

Open voltage : 20mV (max.)

(3) Test result : See items 8.1 ~ 8.4

7.2 Insulation resistance

(1) Requirement : Initial : 100 MΩ (min.)

After humidity test : 50 MΩ (min.)

After thermal shock test : 50 MΩ (min.)

(2) Test method : DC 500V shall be applied between outer surface of housing and terminal and between adjacent terminals to measure insulation resistance.

(MIL-STD-202 , test method 302 , condition B)

(3) Test result : See items 8.1 & 8.3

7.3 Dielectric withstanding voltage

(1) Requirement : There shall be no breakdown nor flashover.

(2) Test method : Initially AC 500V (rms) and after humidity and thermal shock tests AC 250V (rms) shall be applied between outer surface of housing and terminal and between adjacent terminals for one minutes. (MIL-STD-202 , test method 301)

Test current : 1mA

(3) Test result : See items 8.1 & 8.3

8. Environment test :

8.1 Humidity

(1) Requirement : Contact resistance shall be 30 milliohms (max.) after the test. Insulation resistance shall be 250 megohms (min.) after the test. There shall be no breakdown nor flashover on dielectric withstanding voltage test.

(2) Test method : Mated connector shall be placed in a humidity chamber of the following conditions. After the test , contact resistance , insulation resistance and dielectric withstanding voltage shall be measured. (MIL-STD-202 , test method 103 , condition A)

Temperature : 40 ±2 °C

Humidity : 90% ~ 95% (RH)

Period : 240 hours continuously

(3) Test results :

Test item	Initial (mΩ)			After test (mΩ)		
Contact resistance	Max.	Min.	Ave.	Max.	Min	Ave
	4.56	2.21	3.61	4.67	2.34	3.75

N=30

Test item	Housing-Terminal (MΩ)		Terminal-Terminal (MΩ)	
Insulation resistance	Initial	After test	Initial	After test
	100 min.	50 min.	100 min.	50 min.

N=20

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Test item	Housing-Terminal (MΩ)		Terminal-Terminal (MΩ)	
D.W.V.	Initial	After test	Initial	After test
	Good	Good	Good	Good

N=20

(D.W.V. : Dielectric withstanding voltage)

8.2 Salt spray

(1) Requirement : Contact resistance shall be 30 milliohms (max.) after the test.

(2) Test method : Mated connector shall be subjected to salt spray test of the following conditions. After the test, specimen shall be washed with running water and dried naturally before the measurement of contact resistance.

Temperature : 40 ±2 °C

Humidity : 90% ~ 95% (RH)

Period :8 or 16 or 24 or 32 or 48 hours

(3) Test result :

Test item	Initial (mΩ)			After test (mΩ)		
Contact resistance	Max.	Min.	Ave.	Max.	Min.	Ave.
	4.46	2.17	3.75	4.59	2.23	3.89

N=30

8.3 Thermal shock

(1) Requirement : Contact resistance shall be 30 milliohms (max.) after the test. Insulation resistance shall be 250 megohms (min.) after the test. There shall be no breakdown nor flashover on dielectric withstanding voltage test.

(2) Test method : Mated connector shall be subjected to thermal shock test of the following conditions. After the test , contact resistance , insulation resistance and dielectric withstanding voltage shall be measured.

1 cycle consists of :

-55 °C for 30 minutes

+85 °C for 30 minutes

Times of cycles : 25 cycles

(3) Test results :

Test item	Initial (mΩ)			After test (mΩ)		
Contact resistance	Max.	Min.	Ave.	Max.	Min.	Ave.
	4.48	2.28	3.7	4.62	2.31	3.84

N=20

Test item	Housing-Terminal (MΩ)		Terminal-Terminal (MΩ)	
Insulation resistance	Initial	After test	Initial	After test
	100 min.	50 min.	100 min.	50 min.

Test item	Housing-Terminal (MΩ)		Terminal-Terminal (MΩ)	
D.W.V.	Initial	After test	Initial	After test
	Good	Good	Good	Good

N=20

(D.W.V. : Dielectric withstanding voltage)

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8.4 Vibration

(1) Requirements : Contact resistance shall be 30 milliohms (max.) after the test. There shall be no current discontinuity longer than 1 microsecond during the test.

(2) Test method : Mated connector shall be mounted on a PCB and subjected to a vibration test of the following conditions. During the test , current continuity shall be checked. After the test , contact resistance shall be measured.

(MIL-STD-202 , test method 201)

Frequency : 10~55~10 Hz/min.

Amplitude : 1.5 mm

Direction : 1. Axis of up and down

2. Axis of right and left

3. Axis of front and back

(3) Test result :

Test item	Initial (mΩ)			After test (mΩ)		
	Max.	Min.	Ave.	Max.	Min	Ave.
Contact resistance	4.98	2.37	3.28	4.83	2.45	3.25

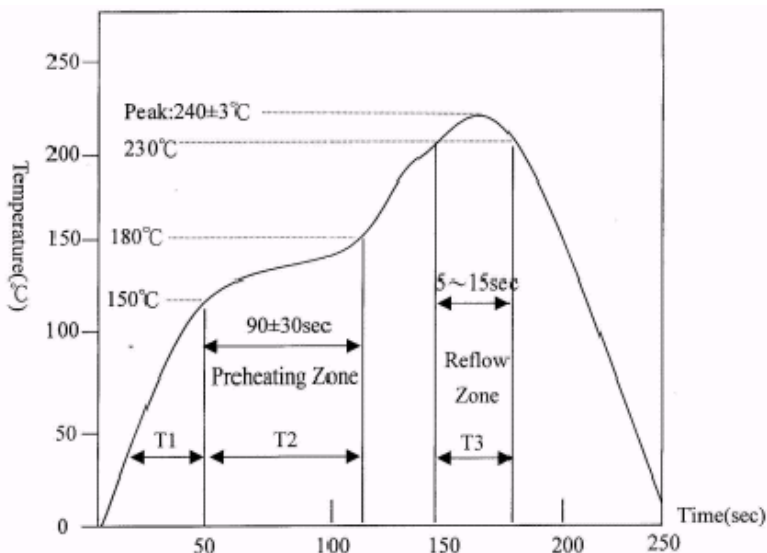
N=30

Current discontinuity : There shall be no current discontinuity longer than 1 microsecond during the test.

8.5 Solderability

(1) Requirements : Solder-dipping section shall be covered by solder entirely.

INFRARED REFLOW CONDITION



RAMP UP Preheat RAMP ramp down
2°C~3°C/Sec 90Sec ± 30Sec 30sec. 4°C~7°C/Sec

T1:	temperature ramp up rate:	2°C~3°C/ sec
T2:	preheat: 150°C ~ 180°C	60~120sec
T3:	time Over 230°C:	5~15sec
	ramp down rate during cooling:	4°C~7°C/sec
	peak temperature :	240°CMax

(2) Test result : Good.



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8.6 Resistance to soldering heat

Nomal materials

(1) Requirements : There shall be no deformation nor damage which may affect the performance.

(2) Test method : Specimen shall be mounted on a PCB (inserted only) and subjected to resistance to soldering heat test of the following conditions.

Solder temperature : 250 ± 5 °C

Immersion period : 3-5 seconds

(3) Test result : Good.

High temperature resistant materials

(4) Requirements : There shall be no deformation nor damage which may affect the performance.

(5) Test method : Specimen shall be mounted on a PCB (inserted only) and subjected to resistance to soldering heat test of the following conditions.

Solder temperature : 260 ± 5 °C

Immersion period : 3-5 seconds

(6) Test result : Good.