



PRODUCT SPECIFICATION

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			APPROVED	CHECKED	WRITTEN
			BY	BY	BY
			<i>Jack Yin</i>	<i>Lailin</i>	<i>Diankui Wan</i>
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**1.SCOPE:**

This specification covers the requirements for product performance of 3.50 mm pitch wire to board connector series.

**2.PART NAME & PART NUMBERS**

Part name	Part number	Part name	Part number
Housing	A3501HE	TPA	A3501SA
Terminal	A3501-T-E(-L)	Wafer	A3501WVE A3501WRE

**3. CONSTRUCTION. DIMENSIONS . MATERIAL & SURFACE FINISH**

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

Material and surface finish shall be as specified below.

Part name		Material	Surface finish
Housing/TPA		Nylon 66	UL94V-0
Terminal		High conductive cooper alloy	Tin over Nickel/Gold over Nickel
Wafer	Post	Brass	Tin over Nickel/Gold over Nickel
	Body	Nylon 66/LCP	UL94V-0

**4. RATINGS & APPLICABLE WIRES**

Current rating: 14A AC,DC (Max.)

Voltage rating: 600V AC,DC

Temperature range: -40°C ~ 105°C

**Wire to Board Current Rating (Amp Max.)**

(As tested with Tin plated terminals)

Connector fully loaded with all circuits powered

AWG Wire Size	Single row						
	2	3	4	5	6	7	8
#16	14.00	12.80	12.10	11.50	11.30	11.10	11.00
#18	12.60	11.60	10.90	10.40	9.90	9.50	9.20
#20	11.50	10.50	9.80	9.20	8.80	8.40	8.10
#22	9.00	8.80	8.60	8.10	7.60	7.30	7.00
AWG Wire Size	Dual row						
	2x2	2x3	2x4	2x5	2x6	2x7	2x8
#16	12.00	11.10	11.00	10.50	10.30	10.00	10.00
#18	10.90	9.90	9.20	8.60	8.20	7.80	7.50
#20	9.80	8.80	8.10	7.50	7.00	6.70	6.30
#22	8.00	7.60	6.90	6.40	5.90	5.50	5.00

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### Wire to Board Current Rating (Amp Max.)

(As tested with Gold plated terminals)

Connector fully loaded with all circuits powered

AWG Wire Size	Single row						
	2	3	4	5	6	7	8
#16	12.00	11.10	11.00	10.50	10.30	10.00	10.00
#18	11.00	10.10	9.50	9.00	8.60	8.20	7.90
#20	10.00	9.10	8.40	7.90	7.50	7.20	6.90
#22	8.00	7.70	7.40	6.90	6.50	6.10	6.00
AWG Wire Size	Dual row						
	2x2	2x3	2x4	2x5	2x6	2x7	2x8
#16	11.00	10.00	9.20	8.50	8.00	7.70	7.00
#18	9.50	8.60	7.90	7.40	7.00	6.60	6.30
#20	8.40	7.50	6.90	6.40	6.00	5.60	5.30
#22	7.00	6.60	6.00	5.70	5.40	5.20	5.00

## 5. PERFORMANCE

### 6.1 ELECTRICAL PERFORMANCE

Test Description		Procedure	Requirement
5-1-1	Contact Resistance	Mate connectors, measure by dry circuit, 20mV Max. 10mA. (Based upon JIS C5402 5.4)	15mΩ Max.
5-1-2	Insulation Resistance	Mate connectors, apply 500V DC between adjacent terminal or ground. (Based upon JIS C5402 5.2/MIL-STD-202 Method 302 Cond. B)	1000MΩ Min.
5-1-3	Dielectric Withstanding Voltage	Mate connectors, apply 1500V AC (rms) for 1 minute between adjacent terminal or ground. (Based upon JIS C5402 5.1/MIL-STD-202 Method 301)	No Breakdown

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**6.2 MECHANICAL PERFORMANCE**

Test Description		Procedure	Requirement	
5-2-1	Insertion & Withdrawal Force	Insert and withdraw connectors at the speed rate of $25 \pm 3$ mm/minute.	Insertion Force(per circuit), Tin-plated:4.5N Max. 15u"&30u"Gold-plated:2.8N Max.  Withdrawal Force(per circuit), Tin-plated:4.0N Max. 15u"&30u"Gold-plated:2.3N Max.	
5-2-2	Crimping Pull Out Force	Fix the crimped terminal, apply axial pull out force on the wire at the speed rate of $25 \pm 3$ mm/minute. (Based upon JIS C5402 6.8)	AWG #16	69.4N/7.0kgf Min.
			AWG #18	69.4N/7.0kgf Min.
			AWG #20	57.9N/5.9kgf Min.
			AWG #22	35.6N/3.6kgf Min.
5-2-3	Terminal/Housing Retention Force	Apply axial pull out force at the speed rate of $25 \pm 3$ mm/minute on the terminal assembled in the housing	2.76kgf Min.	
5-2-4	Header Terminal Retention Force	Apply axial push force at the speed rate of $25 \pm 3$ mm/minute	5.0kgf Min.(Mating side) 1.0kgf Min.(PCB side)	
5-2-5	Housing Lock Strength ( Positive Lock )	Mate connectors and apply axial pull out force at the speed rate of $25 \pm 3$ mm/minute.	With TPA	9.0kgf Min.
			Without TPA	6.0kgf Min.
5-2-6	Durability	When mated up to 30 cycles repeatedly by the rate of 10 cycles per minute	Contact Resistance	20mΩ Max.
5-2-7	Vibration	Amplitude: 1.52mm P-P Sweep time: 10-55-10 Hz in 1 minute Duration: 2 hours in each X.Y.Z. axes (Based upon JIS C 60068-2-6/MIL-STD-202 Method 201)	Appearance	No Damage
			Contact Resistance	20mΩ Max.
			Discontinuity	1μsec. Max.

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**6.3 ENVIRONMENTAL PERFORMANCE AND OTHERS**

Test Description		Procedure		Requirement
5-3-1	Temperature Rise	Carrying rated current load. (Based upon UL 498)	Temperature Rise	30°C Max.
5-3-2	Heat Resistance	105 ± 2°C, 96 hours (Based upon JIS C0021/MIL-STD-202 Method 108A Cond. A)	Appearance	No Damage
			Contact Resistance	20mΩ Max.
5-3-3	Humidity	Temperature: 40 ± 2°C Relative Humidity: 90 ~ 95% Duration: 96 hours (Based upon JIS C0022/MIL-STD-202 Method 103B Cond. B)	Appearance	No Damage
			Contact Resistance	20mΩ Max.
			Insulation Resistance	500MΩ Min.
			Dielectric Withstanding Voltage	Must meet 5-1-3
5-3-4	Temperature Cycling	25 cycles of: a) - 55°C 30 minutes b) +105°C 30 minutes (Based upon JIS C60068-2-14)	Appearance	No Damage
			Contact Resistance	20mΩ Max.
5-3-5	Salt Spray	24 hours exposure to a salt spray from the 5 % solution at 35 ± 2°C. (Based upon JIS C0023/MIL-STD-202 Method 101D Cond. B)	Appearance	No Damage
			Contact Resistance	20mΩ Max.
5-3-6	Solderability	Soldering Time: 3~5 sec. Solder Temperature: 240 ± 5°C	Solder Wetting	95% of immersed area must show no voids, pin holes
5-3-7	Resistance to Soldering Heat	<u>Normal materials</u> Soldering Time: 3~5 sec. Solder Temperature: 250 ± 5°C <u>High temperature resistant materials</u> Soldering Time: 3~5 sec. Solder Temperature: 260 ± 5°C	Appearance	No Damage