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	核准 App.	审核 Chk.	制作 Pre.	Issued By:
By			郜军	
Date			2017.04.19	

***** Revised history *****

Edition	ECN NO.	Revised Page	Remark
X1	ECN1704040	None	Initial release

1. 概述 Scope:

1.1 说明 Content

此份产品规格书是针对由昆山嘉华电子有限公司设计和制和造的 **RF 1.0H 连接器**产品所定义的产品性能和测试方法。

适用产品料号：

Plug:7.040A0-000-1R0/7.041A*-***-1B0

Receptacle:7.032A*-000-1R0 / 7.039A*-000-1R0

This product specification defines the product performance and the test methods to ensure the performance of the **RF 1.0H CONNECTOR,** which is designed and manufactured by Kunshan Jiahua Electronics Co., Ltd.

Parts No.：

Plug:7.040A0-000-1R0/7.041A*-***-1B0

Receptacle:7.032A0-000-1R0 / 7.039A*-000-1R0

1.2 限制 Qualification

所有的测试和检验必须依照本文件中所要求的规格、方法进行。一旦产品的重要制程发生变更，必须立即进行品质验证和测试。

Tests and inspection shall be performed in accordance with the requirements, tests and methods contained herein. A re-qualification test shall be conducted immediately following all major process changes.

2. 参考文件 Referenced Documents:

EIA-364

MIL-STD-202F

MIL-P-81728A

MIL-T-10727B

JIS C 0040

JIS C 0041

若某些项目被发现本规格书中的内容与以上参考文件要求不一致时，一律依本规格书中的内容为测试依据。

In case of any contradiction between this document and referenced documents, this document will take precedence.

3. 规格要求 Requirements:

3.1 应用条件 Application Condition:

3.1.1 使用环境 Operating Environment:

温度: -40°C to +90°C,相对湿度:25%~85%,此条件下功能不可失效。

Temperature:-40°C to +90°C, Relative Humidity:25%~85%, Without loss of function.

3.1.2 储存环境 Storage Environment:

温度: -55°C to +100°C,相对湿度:95%或更低,此条件下功能不可失效。

Temperature:-55°C to +100°C, Relative Humidity: 95% or Less, Without loss of function.

3.1.3 额定值 Ratings:

A. 额定电压 Voltage Rating: 60VAC

B. 特性阻抗 Nominal characteristic impedance:50Ω

C. 频率范围 Frequency:DC0.1~6GHz

D. VSWR: Plug 1.3Max.(DC0.1~3GHz),1.5Max.(3~6GHz)

Receptacle 1.3Max.(DC0.1~3GHz),1.5Max.(3~6GHz)

3.2 绿色环保要求 Health, Safety and Environment

此产品中所有涉及环保有关的有害物质管控标准请参考嘉华系统文件:**JH-GP-213**

Hazardous substances (Environment related to be controlled substances) contained in this product should comply with the regulations specified by FAF's **JH-GP-213**.

3.3 测试说明 Test Description

此产品性能须满足本文件 4 节中的各项规格要求。除非有特别申明，所有的测试和量测必须在以下条件中进行:

The product is designed to meet the requirements specified in section 4. Unless otherwise specified, all tests and measurements are to be performed under the following conditions:

温度 Temperature: 15~35℃

相对湿度 Humidity: 45% ~ 75%

4.测试规范和方法 Test Requirements and Methods

Table I: 性能要求 Performance Requirements

4.1 外观 Appearance

项目 Items	规格要求 Requirements	测试方法 Test Methods
4.1 产品外观 Product Appearance	所有零件必须组装完好, 不能出现毛边, 变形, 刮伤, 以及任何外观破坏等异常; All components shall be properly assembled and free of burrs, warps, scratches, broken chips, and other abnormalities	依照相应的文件和规格书进行外观, 功能, 及尺寸的检验量测. Visual, functional, and dimensional inspection complies with applicable specification and document.
4.2 电气 性能 Electrical Performance :		
4.2.1 低功率接触阻抗 Low Level Contact Resistance	中心导体: 初态：20mΩ Max. 末态：40mΩ Max. 外导体: 初态：20mΩ Max. 末态：40mΩ Max. Inner contact: Initial: 20mΩ Max. After testing: 40mΩ Max. Ground contact:: Initial: 20mΩ Max. After testing: 40mΩ Max.	将板端产品焊接在测试板上并与线端配合起来，然后按照图 1 所示使用四线法测量接触阻抗，使用低功率条件需符合测试标准 MIL-STD-202G，Method 307。 测试电压：20mV Max . 测试电流：10mA Max. Solder the receptacle connector to the test board and mate the plug connector together，then，measure the contact resistance as shown in Fig-1 by the four terminal method.Apply the low level condition in accordance with MIL-STD-202G，Method 307. Open circuit voltage: 20mV Max . Circuit current: 10mA Max.

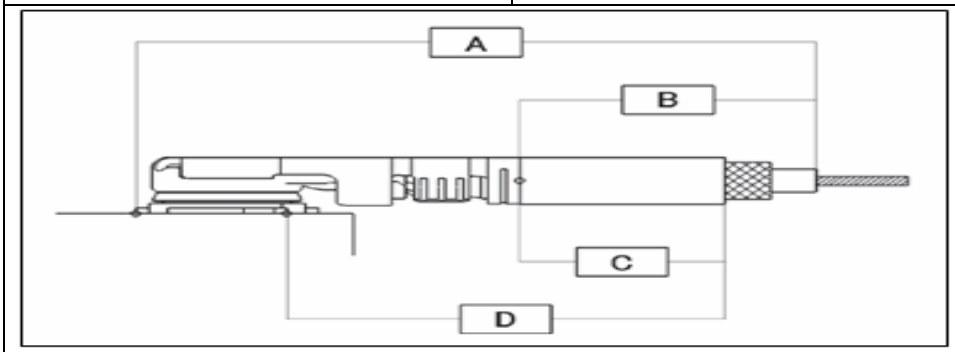
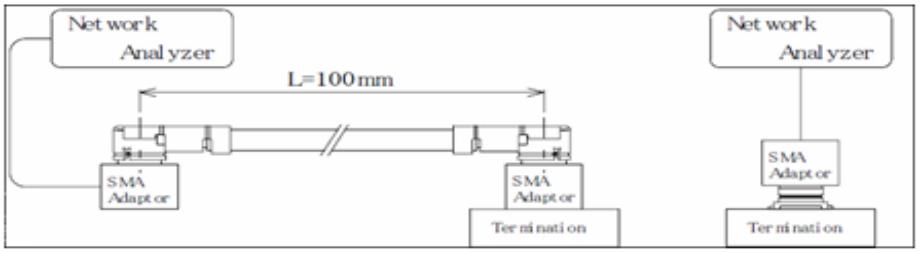
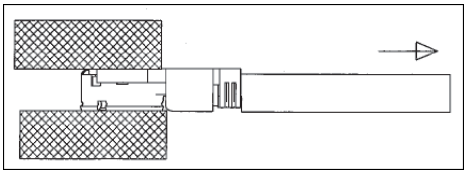
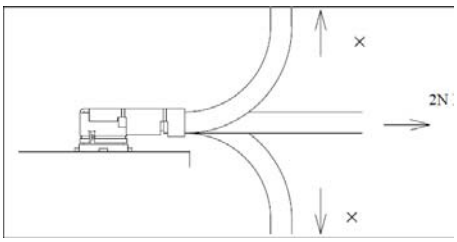


图 1

项目 Items	规格要求 Requirements	测试方法 Test Methods
4.2.2 绝缘阻抗 Insulation Resistance	初态：500MΩ Min. 末态：100MΩ Min. Initial: 500MΩ Min. After testing: 100MΩ Min.	配合好板端与线端产品，并在中心导体和外导体之间施加 DC100V 电压，需符合测试标准 MIL-STD-202G，Method 302。 Mate the plug and receptacle connector together,and then apply DC 100V between the inner contact and the ground contact in accordance with MIL-STD-202G，Method 302.
4.2.3 耐电压 Dielectric Withstanding Voltage	加电压期间漏电流不超过 0.5mA. 同时不能产生电弧以及而产生的短路和破坏产品的绝缘性能. No evidence of breakdown or flash burn. No burn caused by short circuit. No insulation destruction. Current leakage: 0.50 mA Max.	配合好板端与线端产品，并在中心导体和外导体之间施加 AC 200V 电压持续 1 分钟，需符合测试标准 MIL-STD-202G，Method 301。 Mate the plug and receptacle connector together,and then apply AC 200V between the inner contact and the ground contact for a minute in accordance with MIL-STD-202G，Method 301.
4.2.4 电压驻波比 VSWR	线端： 0.1~3GHz：1.3 Max. 3~6GHZ：1.5 Max. 板端： 0.1~3GHz：1.3 Max. 3~6GHZ：1.4 Max. Plug: 0.1~3GHz：1.3 Max. 3~6GHZ：1.5 Max. Receptacle： 0.1~3GHz：1.3 Max. 3~6GHZ：1.4 Max.	按照图 2 所示使用网络分析仪测量 VSWR。 周波数：100M~6GHz。 Measure the VSWR as shown in Fig-2 by the analyzer. Frequency: 100M~6GHz.
	 图 2	

4.3 机械 性能 Mechanical Performance :

项目 Items	规格要求 Requirements	测试方法 Test Methods
4.3.1 拔出力 Mating & Un-mating force	初态：4N Min. 插拔 30 次后：2N Min. Initial: 4N Min. After 30 cycles：2N Min.	将板端产品焊接在测试板上并与线端配合起来，以 25±3mm/min 的速度使用插拔力机平行于配合方向测量拔去力。 Solder the receptacle connector to the test board and mate the plug connector together，then，measure the un-mating force at speed of 25±3mm/min in parallel with the mating axis by the push-pull machine.
4.3.2 引张强度 Crimp strength	7N 以上。 7N Min.	通过引张试验机如图 3 所示以每分 25+/-3 毫米/分钟的速度拉线材部分. Pull the cable as shown in Fig-3 at a speed 25+/-3mm/min by the tensile strength machine.  图 3
4.3.3 耐插拔 Durability	接触阻抗满足 4.2.1 中心导体： 初态：20mΩ Max. 末态：40mΩ Max. 外导体： 初态：20mΩ Max. 末态：40mΩ Max. 外观无损伤 Contact resistance shall meet 4.2.1 Inner contact: Initial: 20mΩ Max. After testing: 40mΩ Max. Ground contact:: Initial: 20mΩ Max. After testing: 40mΩ Max. Appearance: no abnormality.	以 25±3mm/min 的速度使用插拔力机平行于配合方向插拔板线端连接器(板端焊接在测试板上)30 个循环。 Mate and un-mate the receptacle connector (soldered to the test board)and plug connector 30 cycles at speed of 25±3mm/minutes in parallel with the mating axis by the push-pull machine.

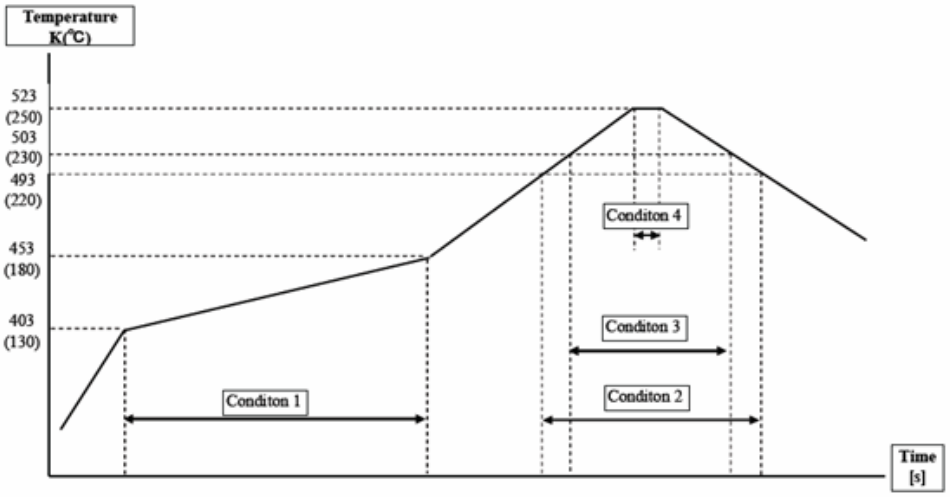
项目 Items	规格要求 Requirements	测试方法 Test Methods
4.3.4 线材保持力 Cable retention force	外观无损伤。 试验中无超过 1us 的电流瞬断。 Appearance: no abnormality. No electrical discontinuity grater than 1us occur.	施加力于线缆如图 4 所示方向。 试验期间工作电流 100mA DC 检查瞬间电流中断。 Apply force to the cable as shown in Fig-4. During the testing,run 100mA DC to check electrical discontinuity.  图 4
4.3.5 振动 Vibration	接触阻抗满足 4.2.1 中心导体： 初态：20mΩ Max. 末态：40mΩ Max. 外导体： 初态：20mΩ Max. 末态：40mΩ Max. 外观无损伤 试验中无超过 1us 的电流瞬断 Contact resistance shall meet 4.2.1 Inner contact: Initial: 20mΩ Max. After testing: 40mΩ Max. Ground contact:: Initial: 20mΩ Max. After testing: 40mΩ Max. Appearance: no abnormality. No electrical discontinuity grater than 1us occur.	嵌合状态下对产品施加振动，按照以下条件进行：试验期间工作电流 100mA DC 检查瞬间电流中断。 周波数：10Hz-100Hz-10Hz，约 20 分钟。 片幅度、加速度峰值：1.5mm 或 59m/s^2(6G) 方向、循环次数：3 个互相垂直的方向，每个方向 3 个循环 Apply the following vibration to the mating connector. During the testing, run 100mA DC to check electrical discontinuity. Frequency:10Hz-100Hz-10Hz, approx 20minutes. Half amplitude,Peak value of acceleration: 1.5mm or 59m/s2(6G). Directions,cycle: 3 mutually perpendicular direction,3 cycles for each direction.

项目 Items	规格要求 Requirements	测试方法 Test Methods
4.3.6 机械冲击 Mechanical shock	接触阻抗满足 4.2.1 中心导体： 初态：20mΩ Max. 末态：40mΩ Max. 外导体： 初态：20mΩ Max. 末态：40mΩ Max. 外观无损伤 试验中无超过 1us 的电流瞬断 Contact resistance shall meet 4.2.1 Inner contact: Initial: 20mΩ Max. After testing: 40mΩ Max. Ground contact:: Initial: 20mΩ Max. After testing: 40mΩ Max. Appearance: no abnormality. No electrical discontinuity grater than 1us occur.	嵌合状态下对产品施加冲击，要求符合 MIL-STD-202，Method 213 并按照以下条件进行，试验期间工作电流 100mA DC 检查瞬间电流中断。 加速度峰值：735m/s^2(75G) 标准持续时间：11ms 波形：半波正弦波 方向：6 个互相垂直的方向，每个方向 3 个循环 Apply the following vibration to the mating connector in accordance with MIL-STD-202,Method213,Condition B.During the testing, run 100mA DC to check electrical. Peak value of acceleration: 735m/s²(75); Standard Duration: 11msec; Wave form: Half sinusoidal; Direction: 6 mutually perpendicular directions,3 cycles in each direction;
4.4 环境 性能 Environmental Performance :		
4.4.1 耐湿性 Humidity	接触阻抗满足 4.2.1 中心导体： 初态：20mΩ Max. 末态：40mΩ Max. 外导体： 初态：20mΩ Max. 末态：40mΩ Max. 绝缘阻抗满足 4.4.2 初态：500MΩ Min. 末态：100MΩ Min .耐电压满足 4.2.3 外观无损伤 Contact resistance shall meet 4.2.1 Inner contact: Initial: 20mΩ Max. After testing: 40mΩ Max. Ground contact:: Initial: 20mΩ Max. After testing: 40mΩ Max. Insulation resistance shall meet 4.2.2 Initial: 500MΩ Min. After testing: 100MΩ Min. Delectric withstanding voltage shall meet 4.2.3. Appearance: no abnormality.	嵌合状态下对产品施加如以下所示环境条件，要求符合 MIL-STD-202G，Method 103，Condition B。 温度：40±2℃ (313±2K) 湿度：90~95%RH 持续时间：96 小时 Apply the following environment to the mating connector in accordance with MIL-STD-202G，Method 103，Condition B. Temperature: 40±2℃ (313±2K) Humidity: 90~95%RH Duration: 96 hours

项目 Items	规格要求 Requirements	测试方法 Test Methods
4.4.2 热冲击 Thermal shock	接触阻抗满足 4.2.1 中心导体： 初态：20mΩ Max. 末态：40mΩ Max. 外导体： 初态：20mΩ Max. 末态：40mΩ Max. 绝缘阻抗满足 4.2.2 初态：500MΩ Min. 末态：100MΩ Min. 耐电压满足 4.2.3 外观无损伤 Contact resistance shall meet 4.2.1 Inner contact: Initial: 20mΩ Max. After testing: 40mΩ Max. Ground contact:: Initial: 20mΩ Max. After testing: 40mΩ Max. Insulation resistance shall meet 4.2.2 Initial: 500MΩ Min. After testing: 100MΩ Min. Delectric withstanding voltage shall meet 4.2.3 Appearance: no abnormality.	嵌合状态下对产品施加如以下环境条件，要求符合 MIL-STD-202G，Method 107G，Condition A。 温度：218K(-55℃) 30 分钟<=>358K(85℃) 30 分钟 移动时间：5 分钟以下 循环次数：5 个循环 Apply the following environment to the mating connector in accordance with MIL-STD-202G，Method 107G，Condition A. Temperature: 218K(-55℃) 30 Min<=> 358K(85℃) 30 Min. Transition time: 5 Min Max. No. of cycles: 5 cycles
4.4.3 高温寿命 High temperature life	接触阻抗满足 4.2.1 中心导体： 初态：20mΩ Max. 末态：40mΩ Max. 外导体： 初态：20mΩ Max. 末态：40mΩ Max. 外观无损伤 Contact resistance shall meet 4.2.1 Inner contact: Initial: 20mΩ Max. After testing: 40mΩ Max. Ground contact:: Initial: 20mΩ Max. After testing: 40mΩ Max. Appearance: no abnormality	嵌合状态下对产品施加如以下环境条件。 温度：90±2℃ (363±2K) 持续时间：96 小时 Apply the following environment to the mating connector. Temperature: 90±2℃ (363K±2K) Duration: 96 hours.

项目 Items	规格要求 Requirements	测试方法 Test Methods
4.4.4 *硫化氢测试 H_2S Gas	接触阻抗满足 4.2.1 中心导体： 初态：20mΩ Max. 末态：40mΩ Max. 外导体： 初态：20mΩ Max. 末态：40mΩ Max. 端子接触区外观无损伤 Contact resistance shall meet 4.2.1 Inner contact: Initial: 20mΩ Max. After testing: 40mΩ Max. Ground contact:: Initial: 20mΩ Max. After testing: 40mΩ Max. Appearance: no abnormality in contact Area of contacts;	嵌合状态下对产品施加如以下环境条件。 温度：40±2℃ (313±2K) 湿度：80±5%RH 气体浓度：H_2S 3±1ppm 持续时间：96 小时 Apply the following environment to the mating connector. Temperature: 40±2℃ (313K±2K) Relative Humidity: 80±5%RH Gas: H_2S 3±1ppm Duration: 96 hours.
4.4.5 盐雾测试 Salt Spray Test	接触阻抗满足 4.2.1 中心导体： 初态：20mΩ Max. 末态：40mΩ Max. 外导体： 初态：20mΩ Max. 末态：40mΩ Max. 外观无损伤 Contact resistance shall meet 4.2.1 Inner contact: Initial: 20mΩ Max. After testing: 40mΩ Max. Ground contact:: Initial: 20mΩ Max. After testing: 40mΩ Max. Appearance: no abnormality.	嵌合状态下对产品施加如以下环境条件，需符合 MIL-STD-202G，Method 101E，Condition B。 温度：35±2℃ (308±2K) 盐水浓度：5±1%(重量比) 持续时间：48 小时 Apply the following environment to the mating connector in accordance with MIL-STD-202G，Method 101E，Condition B. Temperature: 35±2℃ (308±2K) Salt water density: 5±1%(by weight) Duration: 48 hours
4.4.6 可焊性 Solder ability	板端：焊锡表面浸渍超过 95%并且空洞不能大于 5%。 Receptacle:More than 95% of the dipped surface becomes wet and the pinhole that should not gather at one point is less than 5%.	将端子的焊接点沉入 245±5℃ (518±5K)的焊液中 5±0.5 秒，需符合 MIL-STD-202F，Method 208E。 Dip the soldering point of the contacts in the solder bath at 518±5K(245±5℃) for 5±0.5 seconds after immersing the tine in the flux of RMA type for 5 to 10 seconds in accordance with MIL-STD-202F，Method 208E.

项目 Items	规格要求 Requirements	测试方法 Test Methods
4.4.7 耐焊接热 Soldering heat resistance	板端：产品无异常，无损坏。 Receptacle: Abnormality adversely affecting the performance should not occur.	回流焊温度曲线：参照图 5. 回流焊接次数：2 次 钢网尺寸：参照图 6 Reflow temperature profile: Fig-5 The number of reflow is 2 times. Metal mask size: Fig-6



	Temperature	Time(s)
Conditon 1	130~180℃ 403~453K	120Max
Conditon 2	220℃ 493K	60Max
Conditon 3	230℃ 503K	50Max
Conditon 4	250℃ 523K	10

图 5

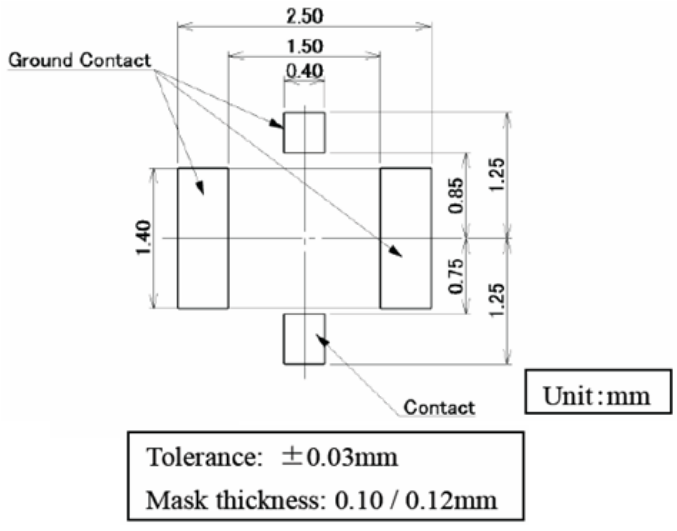


图 6

5.产品测试顺序 Test Sequence

Test of Examination	测试群组 Test Group													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
产品外观 Visual Examination	1	1	1	1,5	1,5	1,5	1,5	1,9	1,9	1,5	1,5	1,3	1,3	1,3
低功率接触阻抗 Contact Resistance				2,4	2,4	2,4	2,4	2,6	2,6	2,4	2,4	2,4		
绝缘阻抗 Insulation resistance								3,7	3,7					
耐电压 voltage								4,8	4,8					
驻波比 V.S.W.R	2													
拔出力 Unmating force		2												
引张强度 Crimp strength			2											
耐久性 Durability				3										
保持力 Cable retention force					3									
振动 Vibration						3								
机械冲击 Mechanical shock							3							
耐湿性 Humidity								5						
热冲击 Thermal Shock									5					
温度寿命 Temperature life										3				
*硫化氢测试 H2S Gas											3			
盐雾测试 Salt Spray Test												3		
可焊性 Solder ability													2	
耐焊接热 Soldering heat resistance														2
样品数	5	5	5	5	5	5	5	5	5	5	5	5	5	5