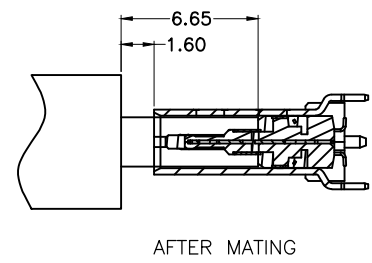


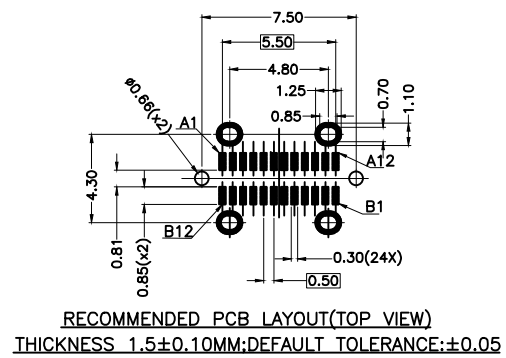
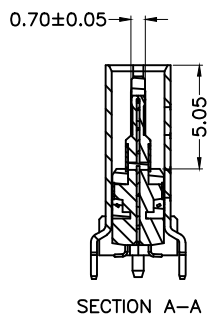
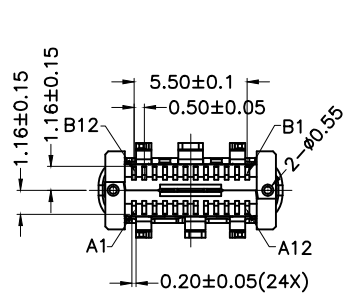
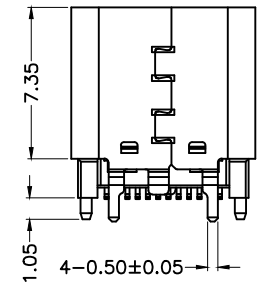
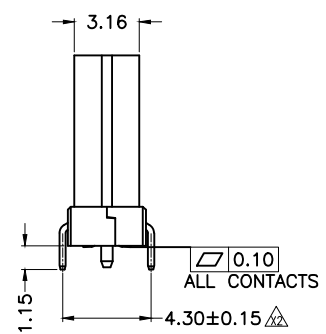
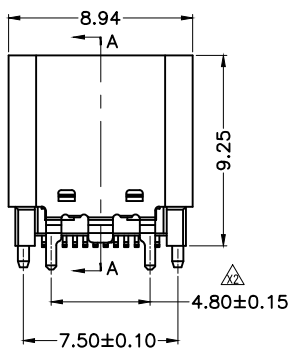
USB TYPE-C PIN ASSIGNMENTS

PIN NUMBER	SIGNAL NAME	PIN NUMBER	SIGNAL NAME
A1	GND	B12	GND
A2	SSTXp1	B11	SSRXp1
A3	SSTXn1	B10	SSRXn1
A4	Vbus	B9	Vbus
A5	CC1	B8	SBU2
A6	Dp1	B7	Dn2
A7	Dn1	B6	Dp2
A8	SBU1	B5	CC2
A9	Vbus	B4	Vbus
A10	SSRXn2	B3	SSTXn2
A11	SSRXp2	B2	SSTXp2
A12	GND	B1	GND



NOTE:

- MATERIAL SPECIFICATION:
  - HOUSING: HIGH TEMPERATURE RESISTANT PLASTIC(LCP),UL94 V-0.
  - CONTACTS: COPPER ALLOY(C18150)T=0.12mm
  - MID PLATE: STAINLESS STEEL(SUS301)T=0.15mm
  - EMI PLATE: STAINLESS STEEL(SUS301)T=0.10mm
  - SHELL: STAINLESS STEEL(SUS304)T=0.30mm
- PLATING SPECIFICATION:
  - CONTACTS:
    - Ni 50u" MIN. UNDER PLATED OVER ALL.
    - Au PLATED ON THE FUNCTIONAL AREA OF CONTACT. (GOLD PLATING THICKNESS FOLLOW THE P/N)
    - Sn PLATED ON THE SOLDER AREA OF CONTACT.
  - SHELL:
    - Ni 30u" MIN. UNDER PLATED OVER ALL.
  - MID PLATE:
    - CLEAR ONLY
  - EMI PLATE:
    - CLEAR ONLY
- MECHANICAL PERFORMANCE,
  - INSERTION FORCE: 5~20N.
  - REMOVAL FORCE: 8~20N,6~20N AFTER TEST;
  - DURABILITY: 10000 CYCLES.
- ELECTRICAL PERFORMANCE,
  - CURRENT RATING:5.0A  
VOLTAGE RATING:5.0V
  - LLCR:
    - VBUS & GND PINS AND OTHER PINS: 40mΩ/PIN MAX.
    - SHIELD: 50mΩ/MAX.
    - LLCR MAX. CHANGE OF ALL PINS: 10mΩ.
  - INSULATION RESISTANCE: 100MΩ MIN
  - DIELECTRIC WITHSTAND VOLTAGE,AC 100V FOR 1 MINUTE.
- ENVIRONMENTAL PERFORMANCE:
  - OPERATING TEMPERATURE: -25°C~+85°C.
- IR REFLOW:
  - THE PEAK TEMPERATURE ON THE BOARD SHALL BE MAINTAINED FOR 10 SECONDS AT 260°C.



Item	Title	Material	Dispose	Remark
1	Shell	Stainless Steel	Ni:30u" Min.	
2	GND Plate	Stainless Steel	Clear Only	
3	Mid Plate	Stainless Steel	Clear Only	
4	Top Contact	Copper Alloy	Mating Area: See P/N	
5	Bottom Contact	Copper Alloy	Solder Tails: Matt Tin	
6	Insulator	High Temperature Plastic	UL 94V-0	Black

HAOFU ELECTRONCS TECHNOLOGY CO.,LTD

PART NAME		USB 3.1 TYPE C FEMALE		DRAWING		Y,C,ZHANG		DWG.No.		SBICL	
PART NO.		TYPE-C 16P-LT-H9.25		CHECK		G.C.Chen		REV.		A1	
UNIT : mm	TOLERANCE OTHERWISE	UP TO 5	±0.2	ANGLE	APPROVAL	DATE		PAGE		1 OF 1	
		ABOVE 5~30	±0.3								
		ABOVE 30	±0.5	0°±3'	SCALE	2:1					

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## USB C-TYPE Connector

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### 1. SCOPE(适用范围)

#### 1.1. CONTENTS

This specification covers the performance, tests and quality requirements for the USB C-Type Connector used in mobile phone, etc.

#### 1.2. QUALIFICATION

When tests are performed on the subject product line, the procedures specified specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

### 2. APPLICABLE DOCUMENT(适用说明)

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

### 3. REQUIREMENTS(项目说明)

#### 3.1 DESIGN AND CONSTRUCTION

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

#### 3.2 MATERIALS(材质)

1.Housing: Refer To HOF Drawings 2.

Contact: Refer To HOF Drawings

3.Shell: Refer To HOF Drawings

#### 3.3 RATINGS(参数)

Current(额定电流): 5.0 A Max. for VBUS Pins, 1.25 A for VCONN Pin and GND Pins,  
0.25 A for all of other Pins.

Voltage(额定电压): 30 V AC/DC (RMS. max)

Storage Temperature & Relative humidity (存储温度及湿度): -20 °C to +60°C , 15%RH to 70%RH

Operating Temperature(工作温度): -30 °C to +85°C

#### 3.4 STANDARD ATMOSPHERIC CONDITION(标准大气状态)

Unless otherwise specified, the standard range of atmospheric condition for making measurements and tests are as follows:

除非有其他要求，否则测试的标准环境参数参照如下：

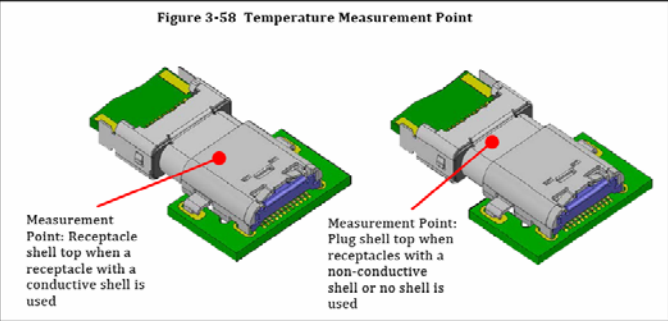
Ambient temperature(常温): 15°C to 35°C

Relative humidity(相对湿度): 25%RH to 85%RH

Air pressure(大气压): 86kPa to 106kPa

## USB C-TYPE Connector

## 3.5 TEST REQUIREMENTS AND PROCEDURES SUMMARY

TEST ITEM (FREQUENCY)	REQUIREMENTS	PROCEDURE
Appearance 外观	No defects such as cracks, scratches or blemishes. 产品不可有缺陷，例如：破裂，刮伤，脏污。	
<b>A. ELECTRICAL REQUIREMENT (电气测试)</b>		
<b>Test shall be performed in mated condition with mating applicable modules. (产品在配对的条件下测试)</b>		
A1 Low Level Contact Resistance 接触电阻	40 milliohms Max. 40 毫欧最大	Connect with applicable modules, then contact resistance shall be measured between each coupled terminals.(See Figure 1) Measure at 20 mV Max, 100mA. (EIA-364-23B)  在连接器对插的情况下，针对公母连接器相互连接的每一对端子进行测试。(测试方法：可见图表 1) 测试条件：20 毫伏最大，100 毫安。 (具体的可参照：EIA-364-23B)
A2 Insulation Resistance 绝缘阻抗	Between conductors: 100 Megaohms Min. 导体相互间：100MΩ Min.	Unmated /mated connectors, Apply 100VDC between adjacent terminals.(EIA-364-21)  在公母座不接触或接触的情况下，在相邻的端子间施加电压 100VDC。(具体的可参照：EIA-364-21)
A3 Dielectric Strength 介电强度	Between conductors: Without damages such as arc or breakdown etc. 导体相互间：产品无损坏现象，例如：电弧，击穿等等。	Unmated /mated connectors, Apply 100VAC(RMS) between adjacent terminals.(EIA-364-20)  在公母座不接触或接触的情况下，在相邻的端子间施加电压 100VAC/1 分钟。(具体的可参照：EIA-364-20)
A4 Temperature Rising 温升测试	The temperature rise shall not exceed 30 °C at any point on the USB Type-C mated plug and receptacle under test. 温升测试点如下图所示，温升值不可超过 30°C  	Contact series-wired, apply test current of loaded rating current to the circuit, and measure the temperature rising by probing on soldered areas of contacts, after the temperature becomes stabilized deduct ambient temperature from the measured value. (5.0 A for VBUS Pins, 1.25 A for VCONN Pin and GND Pins, 0.25 A for all of other Pins.) (EIA-364-70, method 2)  在公母座对插接触的情况下(需焊线)，通额定电流，同时测量其焊接区和接触区的温度变化，当温度变化稳定时，用其值减去当时的环境温度(环境温度需控制在 25±3°C)，所得到数据即为温升值。 (电源 Pin 加载 5A，Vconn & GND pin 加载 1.25A，其它 Pins 上加载 0.25A.) (具体的可参照：EIA-364-70，方法 2)
<b>B. MECHANICAL REQUIREMENT (机械测试)</b>		
<b>Test shall be performed in mated condition with mating applicable modules. (产品在配对的条件下测试)</b>		

## USB C-TYPE Connector

B1	Insertion Force 插入力	5~20N 5~20 牛顿	Measure force necessary to mate connector assemblies at maximum rate of 12.5 mm(0.492)/min.( EIA-364-13)  测量插入力需配对的连接器完全插入， 最大测试速度：12.5 毫米/分钟 (具体的可参照：见 EIA-364-13)
B2	Extraction Force 拔出力	8~20N(1~32cycle) 6~20N(33~10000cycle)  8~20 牛顿(1~32 次插拔) 6~20 牛顿(1001~10000 次插拔)	Measure force necessary to mate connector assemblies at maximum rate of 12.5 mm(0.492)/min. (EIA-364-13)  测量拔出力须配对的连接器完全脱离 最大测试速度：12.5 毫米/分钟(具体的可参照： EIA-364-13)
B3	Durability 耐久性	Insertion Force: 5~20N Extraction Force: 8~20N(1~32cycle) 6~20N(33~10000cycle) LLCR: 50 milliohms Max. Appearance: No physical damage to any part of the connector  插入力：5~20 牛顿 拔出力：8~20 牛顿(1~32 次插拔，做完 32 次插拔之后， 插拔力变化不能超过 33%) 6~20 牛顿(33~10000 次插拔) 接触阻抗：50 毫欧最大(完成测试后) 外观：连接器上不可有任何零件的破坏	The durability rating shall be 10,000 cycles minimum for the USB Type-C connector family. The durability test shall be done at a maximum rate of 500+/-50 cycles per hour. (EIA-364-09)  耐久性测试最少：10,000 次插拔 耐久性测试的最大速度为：500+/-50 次插拔循环/小时 (具体的可参照：EIA-364-09)
B4	4-Axis Continuity Test 四轴测试	Passing parts shall not exhibit any discontinuities or shorting to the shell greater than 1 $\mu$ s duration in any of the four orientations.  每个轴向在测试的过程中出现信号瞬断或短路的情况不可超过 1 微秒	The continuity across each contact shall be measured throughout the application of the tensile force. Each non-ground contact shall also be tested to confirm that it does not short to the shell during the stresses. The PCB shall then be rotated 90 degrees such that the cable is still inserted horizontally and the 8 N tensile force shall be applied again in the downward direction and continuity measured as before. This test is repeated for 180 degree and 270 degree rotations. (See Figure 2)  在公母座对插的情况下(母座焊接在PCB板上，公头做成Cable线)，母座PCB在0°时，公头Cable尾端上吊重8牛顿，至少保持停留测试10s；母座PCB旋转到90°时，公头在不受外力的情况下旋转到90°，然后在Cable尾端上吊重8牛顿，至少保持停留测试10s，180°，270°方向同上测试方式测试。(可见图表2)

## USB C-TYPE Connector

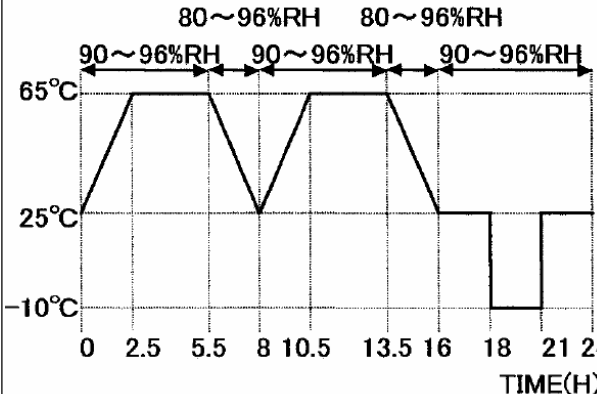
B5	<b>Wrenching Strength</b> 扭力强度	0~50N: No plug damage.  0~50牛顿: 公头不能有损坏	The wrenching strength test shall be performed using virgin parts. Perpendicular forces (Fp) are applied to a plug when inserted at a distance (L) of 15 mm from the edge of the receptacle. These forces shall be applied in all four directions (i.e., left, right, up, and down).  连接器配对的, 从距离母座边缘15mm处, 施加垂直的力于公头Cable上, 这个力需施加于产品的四个方向上(上、下、左、右)
B6	<b>Vibration</b> 振动测试	No discontinuities of 1μs or longer duration LLCR: 50 milliohms Max.  不能超过一微秒的断电 接触阻抗: 50毫欧最大(完成测试后)	Mated connectors are subjected to 5.35Ggrms, 15 minutes in each of 3 mutually perpendicular planes. 100mA Max. Applied. (EIA-364-28)

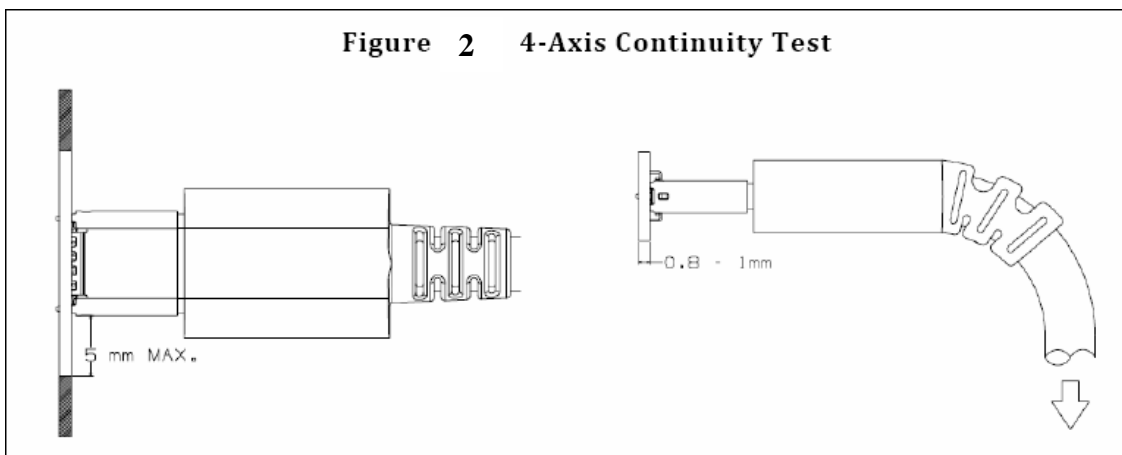
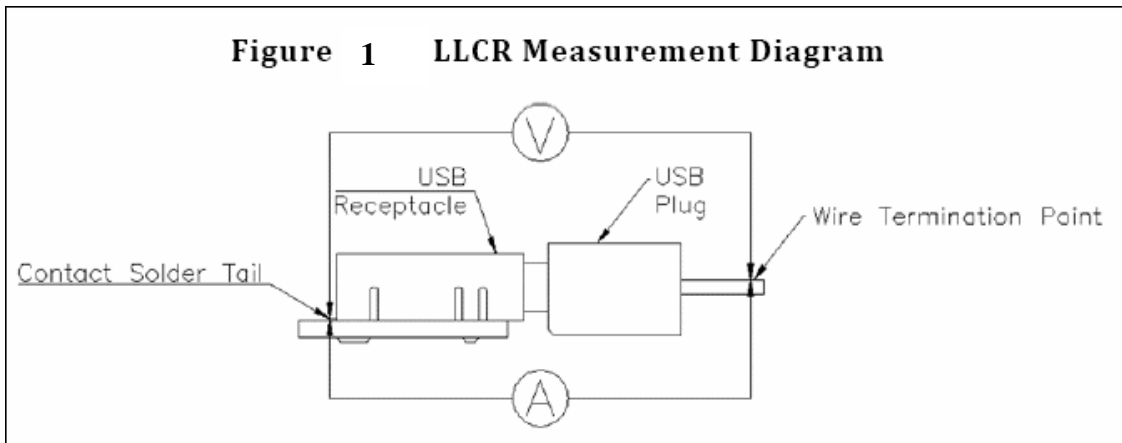
### C. ENVIRONMENTAL REQUIREMENT (环境测试)

Test shall be performed in mated condition with mating applicable modules. (产品在配对的条件下测试)

TEST ITEM (FREQUENCY)	REQUIREMENTS	PROCEDURE
C1 <b>Mixed flowing gas</b> 混合气体	LLCR: 50 milliohms Max.  接触阻抗: 50 毫欧最大(完成测试后)	7days (EIA-364-65, class IIA)  放置在混合气体的环境中测试7天。 然后将样品放置于标准环境下1小时, 然后测量样品的接触电阻。(具体的可参照: EIA-364-65, class IIA)
C2 <b>Temperature life</b> 高温老化	LLCR: 50 milliohms Max.  接触阻抗: 50 毫欧最大(完成测试后)	After exposing to a temperature of 105°C+/-2°C for 120h, the specimen shall be subjected to standard atmospheric conditions for 1h, then measurement shall be made. For other procedures. (EIA-364-17B)  测试条件: 样品放置在温度 105+/-2°C 的环境中 120 小时, 然后将样品放置于标准环境下 1 小时, 然后测量样品的接触电阻。(具体的可参照: EIA-364-17B)
C3 <b>Salt Spray</b> 盐雾测试	Appearance: No damage.  外观: 不可有明显氧化, 腐蚀等现象.	The connector shall be subjected to a fine mist solution at a temperature of 35+/-2°C for 48h continuously. Salt solution concentration is 5+/-1% by weight. Then it shall be subjected to standard atmospheric conditions for 1h, and so measurement shall be made. For other procedure. (EIA-364-26B)  将样品放置于盐雾测试箱中, 其测试条件: 测试温度: 35+/-2°C 盐水浓度: 5+/-1% 测试时间: 48 小时 测试完成后检查样品的外观。 (具体的可参照: EIA-364-26B)

USB C-TYPE Connector

<p>C4</p>	<p>Thermal Shock 热冲击</p>	<p>LLCR: 10 mΩ Max change for post test Dielectric Strength: No breakdown Insulation resistance: 100 MΩ Min. Appearance: No damage.</p> <p>接触阻抗: 测试完成后变化量最大 10 毫欧 介电强度: 不可击穿 绝缘阻抗: 最小 100 兆欧姆 外观: 无明显损伤</p>	<p>The connector shall be subjected to 10 successive change of temperature cycles each as shown in the table below. Then it shall be subjected to standard atmospheric conditions for 1h, then measurement shall be made. For other procedures. (EIA-364-32C) -55+0/-3°C: 30min. 25+10/-5°C: 5min. Max. 85+3/-0°C: 30min. 25+10/-5°C: 5min. Max.</p> <p>样品需做 10 个连续的高低温交变循环测试, 每次的循环测试条件相同见以下: 测试条件及步骤: 1. -55+0/-3°C: 30 分钟 2. 25+10/-5°C: 最多 5 分钟 3. 85+3/-0°C: 30 分钟 4. 25+10/-5°C: 最多 5 分钟 完成 10 次循环测试后将样品放置于标准环境下 1 小时. 然后再做相关的量测. (具体的可参照: EIA-364-32C)</p>
<p>C5</p>	<p>Humidity 恒温恒湿</p>	<p>LLCR: 10 mΩ Max change for post test Dielectric Strength: No breakdown Insulation resistance: 100 MΩ Min. Appearance: No damage.</p> <p>接触阻抗: 测试完成后变化量最大 10 毫欧 介电强度: 不可击穿 绝缘阻抗: 最小 100 兆欧姆 外观: 无损伤</p>	<p>Following cyclic test shall be for 7cycles in mating condition. The connector housing shall be subjected to ambient temperature fo 1h or 2h, after which measurement shall be made. (EIA-364-31B.)</p> <p>*Temperature reduced from 25°C to -10°C within 30min. *Humidity uncontrolled at a temperature less then 25°C.</p>  <p>在公母座样品对插的情况下参照下图测试 7 个循环. 完成后将样品放置于空气中 1 至 2 小时, 然后检测样品的接触电阻及外观. *温度从 25°C 降低至 -10°C 时需控制在 30 分钟以内. *当温度低于 25°C 时湿度可以不控制. (具体的可参照: EIA-364-31B)</p>
<p>C6</p>	<p>Solderability 可焊性</p>	<p>Solder tails shall pass 95% Min coverage</p> <p>粘锡面积最小 95%</p>	<p>Solder temperature: 245±5°C Duration: 5±0.5sec. (EIA-364-52)</p> <p>焊接温度: 245±5°C 持续时间: 5±0.5 秒. (具体可参见 EIA-364-52)</p>

**USB C-TYPE Connector****3.6 ATTACHMENT****3.7 TEST SEQUENCE**

## USB C-TYPE Connector

Test group		A	B	C	D	E	F	G	H	I	
Group sample size		5	5	5	5	5	5	5	5	5	
1	Appearance (外观)						4				
2	A1: LLCR (低阶接触阻抗)	1,4	1,4,6	1,4,6	1,4,6,8	2,7	1,3				
3	A2: Insulation Resistance (绝缘阻抗)					9					
4	A3: Dielectric Strength (介电强度)					1,8					
5	A4: Temperature Rising (温升测试)								1		
6	B1: Insertion Force (插入力)					3					
7	B2: Extraction Force (拔出力)					4,6					
8	B3: Durability (耐久性)	2	2	2	2	5					
9	B4: 4-Axis Continuity Test (四轴测试)							1			
10	B5: Wrenching Strength (扭力强度)									1	
11	B6: Vibration (振动测试)			5							
12	B7: Physical Shock (物理冲击)										
13	C1: Mixed flowing gas (混合气体)				5						
14	C2: Temperature life (高温老化)	3		3	3						
15	C3: Salt Spray (盐雾测试)						2				
16	C4: Thermal Shock (热冲击)		3		7						
17	C5: Humidity (恒温恒湿)		5								