



# PRODUCT SPECIFICATION

## 1.0 Applicable Connector: Applicable to DLK D-SUB Series connector.

(适用于德力康公司 D-SUB 系列连接器.)

Scope: This specification covers the requirements for product performance and test methods of DLK's D-SUB Series Connectors of the part numbers specified as bellow.

(覆盖范围: 此规格书内容含盖德力康公司 D-SUB 系列连接器产品性能及测试方法。)

## 2.0 Rating (要求) :

2.1 Rated Voltage : <36 V AC,DC (额定电压: <36V)

2.2 Rated Current:1.0 A (额定电流: 1.0A)

2.3 Electric Pressure: Keeping 60 second in AC 500V/1mA(耐压 500V AC 持续 60 秒)

2.4 Insulation Resistance: 1000 MΩ Min. in DC 500V(绝缘阻抗最小 1000 兆欧)

2.5 Contact Resistance: 30 mΩ Max. (接触阻抗最大 30 毫欧)

## 3.0 Test Condition (测试条件) :

All tests shall be performed as bellow conditions unless otherwise specified.

(所有的测试都在下列条件下完成, 除非另有说明.)

3.1 Temperature range : +15°C to 35°C. (温度: +15°C 至 35°C)

3.2 Humidity range: 25% to 85%. (湿度: 25% 至 85%)

3.3 Atmospheric Pressure : 860 to 1060 mber

(大气压力: 860 至 1060 兆帕)

## 4.0 Mechanical Characteristics (机械性能)

4.1 Insertion Force(for one pin): 240gf/Max.

4.2 Extraction Force(for one pin): 30gf/Min.

4.3 Stretching Force(from insulator to pin):1.0Kgf/Min

4.4 Insertion Force(mating connector):2.0 to 5.0Kgf;

4.5 Extraction Force(mating connector):1.0Kgf Min

## 5.0 Test Methods and Requirements (测试方法和要求) :

### 5.1 Examination of product (检查尺寸) :

Item (条目)	Test Description (测试内容)	Test Methods (测试方法)	Requirement (要求)
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5.1.1	Examination of product Outward Appearance Structure (产品外形/尺寸检查)	Shall be confirm with eyes in accordance with each drawing. Shall be confirmed by using proper measuring instruments. (依照图面要求对产品目视检查, 再用测量工具, 按图面要求测量尺寸)	Outward appearance shall be good without such injurious problem structure shall be meet the design and dimensional requirements of drawing (外观良好, 无任何有害问题; 结构符合图面设计要求。)
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## 5.2 Electrical performance (电气性能) :

Item (条目)	Test Description (测试内容)	Test Methods (测试方法)	Requirement (要求)
5.2.1	Contact Resistance (接触阻抗)	Mated connectors. Contact: measure by dry circuit, 20 mvolts maximum., 10mA  Shell: measured by open circuit, 5 Volts maximum, 100mA. (ANSI/EIA-364-06A-83) (配对的连接器, 端子在回路施加直流最大 20mV 10mA 的电流; 铁壳在回路施加直流最大 5V 100mA 的电流; 再测量相对应端子或铁壳的电阻值)	Excluding conductor resistance : 30 mΩ maximum. (接触阻抗最大不能超过 30 毫欧)
5.2.2	DIP 脚之间接触阻抗	左 Dip 脚与右 Dip 脚之间 及 左右 Dip 脚分别与外铁壳 的电阻值	
5.2.3	Insulation Resistance (绝缘阻抗)	Unmated connectors, applied DC 500 Volts for 1minute between adjacent terminal. (ANSI/EIA 364-21, Method 302) (未交配的连接器的, 在相邻的端子间施加 DC 500V 的电压测试 1 分钟; )	1000MΩ minimum (unmated) (最小为 1000 兆欧)
5.2.4	Dielectric Strength (耐电压)	Unmated connectors, applied AC 500 Volts and leak current 1mA for 1minute between adjacent terminal . (ANSI/EIA 364-20,Method 301) (未交配的连接器的, 在相邻的端子间施加 AC 500V 的电压与 1mA 漏电流测试 1 分钟;	No Breakdown (没有损坏)

## 5.3 Mechanical Performance (机械性能) :

Item (条目)	Test Description (测试内容)	Test Methods (测试方法)	Requirement (要求)
5.3.1	Connector Insertion Force (插入力)	Solder each of the plug and receptacle connector to the P.C.Board then do insertion/extraction along the axis 3 times at speed 25mm. After place each of the P.C.Board onto the push-on/pull-off machine to be measurement the insertion force. (ANSI/EIA-364-13) (将公、母座焊接在 PCB 板上, 再将 PCB 板置于插拔力实验机上, 然后以每分钟 25mm 的速度沿轴向插拔 3 之次后再测试其插入力。)	Insertion force: 2.0~5.0Kgf. 插入力: 2.0~5 .0Kgf.

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5.3.2	Connector Withdrawal Force (拔出力)	<p>Solder each of the plug and receptacle connector to the P.C.Board then do insertion/extraction along the axis 3 times at speed 25mm.</p> <p>After place each of the P.C.Board onto the push-on/pull-off machine to be measurement the insertion force.</p> <p>(ANSI/EIA-364-13)            (将公、母座焊接在 PCB 板上, 再将 PCB 板置于插拔力实验机上, 然后以每分钟 25mm 的速度沿轴向插拔 3 之次后再测试其拔出力。)</p>	<p>Withdrawal Force: 1.0Kgf Min.            拔出力: 1.0Kgf Min.</p>
5.3.3	Durability (寿命)	<p>Solder each of the plug and receptacle connector to the P.C. Board,then place each of the P.C. Board onto the push-on/pull-off machine,then do insertion / Withdrawal 500 cycles along the axis at speed of 100 ± 50 cycles per hours</p> <p>(ANSI/EIA 364-09)            (将公、母座焊接在 PCB 上, 再将 PCB 板置于耐插拔实验机上, 然后以每小时 100±50 次的速度沿轴向插拔 500 次)</p>	<p>1) Insertion force: 2.0~5.0Kgf .            插入力: 2.0~5.0Kgf .</p> <p>2) Withdrawal Force: 1.0Kgf Min.            拔出力: 1.0Kgf Min.</p>
5.3.4	Terminal strength (端子强度)	<p>Apply 5N gravity in the direction of the terminal of axis X,Y,Z for 10 seconds. After soldering and fixing the PC board properly, insert and withdraw 100 cycles. But the insertion force is 15N max.</p> <p>(在端子各方向加 5N 的重力 (X, Y, Z 方向), 时间 10 秒。焊接并固定好印刷线路板后, 插拔 100 次。但插力在 15N 以下)</p>	<p>There are no crack,no damage,electrical performance normal.            (端子无裂痕, 损伤等; 电气电能正常。)</p>

## 5.4 Environmental Performance (环境性能):

Item (条目)	Test Description (测试内容)	Test Methods (测试方法)	Requirement (要求)																			
5.4.1	Salt Spray (盐水喷雾)	<p>Salt density:5% Temperature: 35± 2℃            盐水浓度: 5% 温度: 35± 2℃            After keeping in above surrounding for 48 hours            EIA-364-26</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>膜厚類型</th> <th>測試時間</th> <th>判定</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">USB / DVI&amp;D-SUB / DP CONN / HDMI / AC SOCKET</td> </tr> <tr> <td>鍍錫部位</td> <td>24H</td> <td rowspan="6" style="text-align: center;">無氧化, 銹蝕 (端子焊脚鍍錫處不作要求)</td> </tr> <tr> <td>鍍錫之焊錫部位</td> <td>24H</td> </tr> <tr> <td>金屬件與非金屬/折彎處/切口</td> <td>24H</td> </tr> <tr> <td>外部連接 port</td> <td>48H</td> </tr> <tr> <td>接觸端鍍金(包含 15u"與 15u"以上)</td> <td>48H</td> </tr> <tr> <td>接觸端鍍金(包含 15u"以下上)</td> <td>48H</td> </tr> </tbody> </table>	膜厚類型	測試時間	判定	USB / DVI&D-SUB / DP CONN / HDMI / AC SOCKET			鍍錫部位	24H	無氧化, 銹蝕 (端子焊脚鍍錫處不作要求)	鍍錫之焊錫部位	24H	金屬件與非金屬/折彎處/切口	24H	外部連接 port	48H	接觸端鍍金(包含 15u"與 15u"以上)	48H	接觸端鍍金(包含 15u"以下上)	48H	
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5.4.2	Withstand humidity (恒温恒湿)	<p>Solder each of the plug and receptacle connector to the P.C.Board ,then mate them together and exposed at temperature of <math>40^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> and humidity of 90-95% for a period of 96 hours. after removal from chamber, socket shall be returned at room condition for a period of 2 hours. the socket shall be capable of.</p> <p>(ANSI/EIA-364-31) (将公母座连接器各自焊接于 PCB 板上后将其对插再暴露在温度为 <math>40^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> ,湿度为 90-95%的恒温恒湿槽中放置 96 小时进行测试,完成测试后将插座取回在常温常湿下放置 2 小时后测定。)</p>	<p>1) Appearance: no damage (外观无损害)</p> <p>2) Contact resistance: 30 mΩ Max. (接触阻抗最大 30 毫欧)</p> <p>3) Insulation resistance: 1000 megaohms minimum. (绝缘阻抗最小 1000 兆欧)</p> <p>4) dielectric withstanding Voltage: AC 500V No Breakdown. (耐电压 AC 500V 测试无损坏。)</p>
5.4.3	Withstand heat (耐热)	<p>The connector shall be exposed in a hot chamber at temperature of <math>70 \pm 2^{\circ}\text{C}</math> for a period of 96 hours ,shall then be returned at room conditions for 2 hours. the socket shall be capable of satisfactory performance.</p> <p>(ANSI/EIA-364-17) (将连接器暴露在温度为 <math>70 \pm 2^{\circ}\text{C}</math> 的恒温恒湿槽中放置 96 小时后,再在室温下自然干燥 2 小时后,绝缘部分应无变形、裂痕、金属部分无变色。)</p>	<p>Appearance: no obvious damage on appearance and configuration (外观和构造无损坏)</p>
5.4.4	Withstand cold (耐寒)	<p>The connector shall be exposed in a cold chamber at temperature of <math>-40^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> for a period of 96hours, shall then be returned at room conditions for 2 hours, the socket shall be capable of satisfactory performance.</p> <p>(ANSI/EIA-364-17) (将连接器暴露在温度为 <math>-40 \pm 2^{\circ}\text{C}</math> 的恒温恒湿槽中放置 96 小时后,再在室温下自然干燥 2 小时后,绝缘部分应无变形、裂痕、金属部分无变色。)</p>	<p>Appearance: no obvious damage on appearance and configuration (外观和构造无损坏)</p>
5.4.5	Composite temperature/humidity cyclic (高低温循环)	<p>The socket shall be subjected to the condition described below, for a total of 5 cycles, first step <math>-25^{\circ}\text{C} \pm 2^{\circ}\text{C}/0.5\text{h}</math>, second step: <math>85^{\circ}\text{C} \pm 2^{\circ}\text{C}/0.5\text{h}</math> ,shall then be returned at room condition for a period of 2 hours .</p> <p>(ANSI/EIA-364-17) (在下列条件下持续进行 5 次循环测试,第一步: <math>-25^{\circ}\text{C} \pm 2^{\circ}\text{C}/0.5\text{h}</math>, 第二步: <math>85^{\circ}\text{C} \pm 2^{\circ}\text{C}/0.5\text{h}</math>, 常温常湿中放置 2 小时后测定。)</p>	<p>1) Appearance: no damage (外观无损害)</p> <p>2) Contact resistance: 30 mΩ Max. (接触阻抗最大 30 毫欧)</p> <p>3) Insulation resistance: 1000 megaohms minimum. (绝缘阻抗最小 1000 兆欧)</p> <p>4) dielectric withstanding Voltage: AC 500V No Breakdown. (耐电压 AC 500V 测试无损坏。)</p>
5.4.6	Solderability (可焊性)	<p>Immerse the solder pin of the connector in the solder bath at <math>235^{\circ}\text{C} \pm 5^{\circ}\text{C}</math> for <math>2.5 \pm 0.5</math> seconds.</p> <p>After dipped the pin in the flux for 5 seconds.</p> <p>(ANSI/EIA-364-52) (将端子脚浸入助焊剂中 5 秒,然后将端子脚浸入 <math>235^{\circ}\text{C} \pm 5^{\circ}\text{C}</math> 的锡炉中 <math>2.5 \pm 0.5</math> 秒。)</p>	<p>Solder wetting:90% of immersed area must show no voids, Pin holes. (粘锡面积: 锡附着的面积应超过浸入表面积 的 90%以上)</p>
5.4.7	Resistance to soldering heat (耐焊接热)	<p>Place the connector on the P.C.Board,then immerse the solder pin up to the surface of the board in the solder bath at <math>260^{\circ}\text{C} + 2^{\circ}\text{C}</math> for <math>10 \pm 0.5</math> seconds. (ANSI/EIA-364-52) (将连接器置于 PCB 上,然后将露出 PCB 板表面的 Pin 脚部分浸入 <math>260 + 2^{\circ}\text{C}</math> 的锡炉中 <math>10 \pm 0.5</math> 秒)</p>	<p>1) Without deformation of case or excessive lossen.(塑胶不得有明显变形或损坏)</p> <p>2) Electrical characteristics shall be satisfied.(电气特性必须符合规格)</p>

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5.4.8	Vibration (振动)	<p>Solder each of plug and receptacle connector to the P.C.Board,then mate them together.place the mated connector firmly on the vibrator and apply the following condition shall be done.</p> <p>Amplitude:1.52 mm P-P or 147m/s2 {15G} Vibration frequency:10Hz-55Hz-10Hz/minute. Direction:along three mutually perpendicular direction. Sweep time:two hours along each direction,a total six hours.</p> <p>Electrical load: DC100ma current shall be flowed during the test. (ANSI/EIA-364-28) (将公母座各自焊接于 PCB 板上, 然后将其对插再固定于振动机上, 并施加下列条件) 振幅: 1.52mm; 振动频率: 一分钟内变换 10Hz-55Hz-10Hz; 方向: 沿著三个互相垂直的方向; 时间: 每个方向两小时, 共 6 小时; 电力负载: 施加 DC 100mA 电流测试。</p>	<p>1) No electrical discontinuity greater than 1 microsecond shall occur. (电气上不能有超过 1 微秒断讯的情形发生。)</p> <p>2) Lossen,crack and breakage of the plastic part and other detrimental damage shall not be observed. (塑胶件不能有松脱破损或其它不利的损坏。)</p> <p>3) Contact resistance: 30 mΩ Max. (接触阻抗最大 30 毫欧)</p>
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## 6.0 Test Sequence (测试顺序) :

Test Group (群组测试)		Sample Groups (群组样品)									
Test Item (项目)	Test Description (测试种类)	A	B	C	D	E	F	G	H	I	J
5.1.1	Examination of product(尺寸/外形检查)	1,9	1,9	1,5	1,7	1,3	1,3	1,9	1,3	1,3	1,5
5.2.1	Contact Resistance(接触阻抗)	3,7	2,6	2,4				2,6			2,4
5.2.2	Insulation Resistance(绝缘阻抗)		3,7		2,5			3,7			
5.2.3	Dielectric Withstanding Voltage(耐电压)		4,8		3,6			4,8			
5.3.1	Connector Insertion Force(插入力)	2,6									
5.3.2	Connector Withdrawal Force(拔出力)	4,8									
5.3.3	Durability(寿命)	5									
5.3.4	Terminal strength(端子强度)		5								
5.4.1	Salt Spray(盐水喷雾)			3							
5.4.2	Withstand humidity(恒温恒湿)				4						
5.4.3	Withstand heat(耐热)					2					
5.4.4	Withstand cold(耐寒)						2				
5.4.5	Composite temperature/humidity cyclic (高低温循环)							5			
5.4.6	Solderability(可焊性)								2		
5.4.7	Resistance to soldering heat(耐焊接热)									2	
5.4.8	Vibration(振动)										3
Number of Test Samples (Minimum)最小试样数量		5	5	5	5	5	5	5	5	5	5

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