

# USB3.0



# Product Specification



## 1. Scope / 概論

A leading professional solutions provider of waterproof connectors (overmolded with cable, receptacle, field installable) in the industry, Amphenol LTW always fulfills any requirements with high functionality and reliability products; even it is a very special requirement. And it is highly recommended to be applied to harsh environment.

Amphenol LTW (ALTW) 是防水連接器計設及生產的領導者,主要包含線端,板端及現場組裝式連接器以滿足各種使用求及特殊要求,產品具有高效能及高可靠性,非常適合在各種惡劣的環境條件下提供安裝及使用。

This product specification sheet describes the product application in the markets such as Renewable Energy, Industrial Automation, LED Lighting, Marine, Broadband Wireless Access, Smart Grid, Heavy Equipment, Medical, Electrical Vehicle....etc.

本規範主要描述了 Amphenol LTW(ALTW)產品的應用要求。本產品廣泛應用於可再生能源,工業自動化,LED,船舶,寬帶無線接入,智能電網,建築機械/重型車輛,醫療設備等,電動車行業....

## 2. Applicable Documents / 參考文件

### 2.1 Industry Document / 業界標準

Amphenol LTW (ALTW) 設計及生產的產品符合各項世界標準,包括 IEC, EIA, MIL, NMEA....

## 3. Specification / 規格

### 3.1 Material / 材質

Parts / 零件	Material / 材質
Connector / 連接器	Thermoplastic / 熱塑性塑膠
Pin / 端子	Copper Alloy / 銅合金
Nut / 螺帽	Thermoplastic / 熱塑性塑膠
Clamp Ring / 夾環	Thermoplastic / 熱塑性塑膠
O-Ring / O 型環	
Gasket / 墊圈	Rubber / 橡膠
Seal / 密封圈	
Shield/Shell / 屏蔽	Metal / 金屬

3.2 Rating / 操作評級

<p>Voltage 電壓</p>	<p>5V</p>
<p>Current 電流</p>	<p>1A</p>
<p>Operating Temperature 操作溫度</p>	<p>Overmolded With Cable / Receptacle With Cable(ABS) / Receptacle(ABS): -20°C~80°C (攝氏-20 度~80 度) Receptacle: -40°C~105°C (攝氏-40 度~105 度) Field Installable : -20°C~80°C (攝氏-20 度~80 度)</p>
<p>IP 防水等級</p>	<p>Overmolded With Cable : IP67 (Mated, 1M /30min) Receptacle / Receptacle With Wires : IP67 (Unmated) Field Installable : IP67 (Mated)</p>

## 4. Test Requirement/測試要求

### 4.1 Appearance/外觀

Item / 項目	Test Condition / 測試條件	Requirement / 條件需求
Examination of product 外觀檢查	IEC 60512, Test 1a Visual inspection No physical damage 檢查外觀是否有損壞	No defect would impair normal operation 沒有缺陷會影響正常操作

### 4.2 Electrical/電氣

Item / 項目	Test Condition / 測試條件	Requirement / 條件需求
Dielectric Withstanding Voltage 耐電壓試驗	EIA 364-20 Supply AC 500 voltage for 1 minute, 給予固定 AC 500V，測試 1 分鐘	the current leakage should be less than 5mA 漏電流需低於 5mA
Contact Resistance 接觸阻抗	EIA 364-06 Both ends of the contact resistance measurement of male and female specimens (excluding lineresistance) 量測公母試件兩端之接觸阻抗(不含線阻)	<ul style="list-style-type: none"> <li>• Less than 30mΩ..</li> <li>• 30mΩ 以下</li> </ul>
Insulation Resistance 絕緣阻抗	EIA 364-21 Supply DC 500 voltage±10% for 1 minutes, the Insulation 給予固定 DC500V±10%，測試一分鐘	<ul style="list-style-type: none"> <li>• 100MΩ min.</li> <li>• 100MΩ 最小</li> </ul>

## 4.3 Mechanical/機械

Item / 項目	Test Condition / 測試條件	Requirement / 條件需求
Durability 耐久性	EIA 364-09 1500 cycles 1500次循環	<ul style="list-style-type: none"> <li>No physical damage</li> <li>Contact Resistance 30mΩ max.</li> <li>waterproof test requested</li> <li>無物理損害</li> <li>接觸電阻 30mΩ 以下</li> <li>符合防水需求</li> </ul>
Vibration 震動試驗	EIA 364-28 Frequency range 10~55Hz, with oscillation amplitude of 1.52mm, one axial testing time 2 hours, 3 axial max 頻率範圍 10~55Hz，振幅為 1.52mm，一軸向測試時間 2 小時，最多可測到 3 軸向	<ul style="list-style-type: none"> <li>No physical damages</li> <li>electrical discontinuity more than 1μs, no damage in appearance of the product.</li> <li>無物理損害</li> <li>測試中電氣訊斷不超過 1 μ second</li> </ul>

## 4.4 Environmental/環境

Item / 項目	Test Condition / 測試條件	Requirement / 條件需求
Waterproof Test 防水測試	IEC 60529, IPX7 Should be immersed in water at depth of at least 1 m for 30 minutes. 浸入深度至少 1 米的水中 30 分鐘。	<ul style="list-style-type: none"> <li>• No physical damages</li> <li>• Visual inspection inside no water</li> <li>• Insulation resistance: &gt;1000MΩ</li> <li>• 無物理損壞</li> <li>• 目視內部無水侵入</li> <li>• 絕緣電阻：&gt;100MΩ</li> </ul>
Thermal Shock 冷熱衝擊試驗	EIA 364-32 For 5 cycles at least under -20°C ~ +80°C、-20°C ~ +105°C (Nylon+GF) 最少 5 cycles at -20°C / +80°C、-20°C ~ +105°C (Nylon+GF)	<ul style="list-style-type: none"> <li>• no impact on the product function and appearance.</li> <li>• 測試後不影響產品功能性及外觀</li> </ul>
Cyclic Humidity 恆溫恆濕試驗	EIA-364-31b For 4 cycles at least under -20°C / +80°C、-20°C / +105°C(Nylon+GF) humidity 80~98% and 24 hours for 1 cycle., 4 cycles at -20°C / +80°C、-20°C / +105°C (Nylon+GF) 濕度 80~98%，24 小時為 1 循環	<ul style="list-style-type: none"> <li>• no impact on the product function and appearance.</li> <li>• 測試後不影響產品功能性及外觀</li> </ul>

5. Product Qualification Test Sequence/測試群組及順序

	Test or Examination	Test Group				
		A	B	C	D	E
Examination of product	Visual Examination	1,9	1,7	1,5	1,9	1,9
Electrical 電氣	Contact Resistance	2,6		2,4		
	insulation Resistance	3,7	2,6		2,7	2,7
	Dielectric Withstanding Voltage	4,8	3,5		3,8	3,8
Mechanical 機械	Durability			3		
	Vibration Test	5				
Environmental 環境	Rapid change of temperature		4		5	
	Cyclic Humidity					5
	Waterproof Test				4,6	4,6

6. Others/其他

6.1 Torque/扭力

Panel Nut / 鎖板 (板端)	11.5~14 kgf.cm
Mating Nut (Overmolded With Cable/Field Installable) / 對插 (線端/組裝式)	3~3.5 kgf.cm
Clamp Ring / 接管 (組裝式)	6~8 kgf.cm
Sealing Nut / 尾蓋 (組裝式)	8~15 kgf.cm



7. Quality Assurance Provisions/品質保證

Unless otherwise specified, in the contract or purchase order, we will be responsible for the quality of the part as it is delivered to client. We will be responsible for having controlled processes to ensure product is in total compliance with this specification. Failing lots shall be subject to return or other corrective action.

除非在合同或採購訂單中另有規定者外，我們將對交付給客戶的部件質量負責。我們將負責控制流程，以確保產品完全符合規格。未通過的批次應退回或採取其他糾正措施。

Re-qualification Testing : 重新資格測試

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

如果對產品或製造過程產生顯著影響的形狀，配合或功能的變化，產品保證應協調重新認證測試，包括由開發/產品，質量和可靠性工程確定的全部或部分的原始測試順序。

Our products perform per the specification and criteria described in this document; any usage outside and/or deviating from the specification and criteria described in this document, and/or any alteration, modification, transformation, and application not mentioned in this document must be checked and agreed with ALTW in prior. Failure to check and get our agreement, ALTW will bear no responsibility for any consequence that might arise. It is strongly advised to always check with ALTW for any product application not mentioned in this document and/or applications that need clarifications.

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8. Revision/版本

Document Name		USB3.0		
Revision	ECN NO.	Description	Date	Sign
A		New Initial	2021/12/16	Yuwei Chou 周育璋