

## PRODUCT SPECIFICATION FOR APPROVAL

### 产品规格承认书

CUSTOMER NAME / 客户名称 : \_\_\_\_\_

CUSTOMER ITEM / 产品名称 : \_\_\_\_\_

PRODUCT MODEL / 产品型号 : \_\_\_\_\_

APP Date / 日期 : \_\_\_\_\_

<b>APPROVAL SIGNATURE / 客户承认签章</b>

Note: Please feedback confirmation in 5 days or it should be executed under this Spec.

备注: 本承认书请在客户收到 5 天内能确认返回, 逾期视为生产时按此承认书的标准执行, 不便之处请谅解!

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APPROVED 批准	SALES BY 业务	QUALITY ASSURE 品管	ENGINEERING 工程

## Product Specification

### 产品规格书

5W+7.5W+10W Three coil module

Product name/产品名称:

5W+7.5W+10W 三线圈模组

Model No/ 产品型号:

U10QT-6082

File number /文件编号:

UW-R-W-238

Revision/版本号:

A1

Date/日期:

2022-02-16



APPROVED BY 批准	CHECKED BY 审核	DESIGNED BY 制作
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## Reversion History / 更新记录

Revision	Date	Changes
A0	2022-2-8	初版发行
A1	2022-2-16	完善规格书功能描述

## 1. Scope/概述

1.1 WPC Qi certified wireless charging module, meets the functional requirements of WPC1.2.4 transmitter module Qi protocol, and compatible with lower version.

本产品符合 WPC1.2.4\_Qi 协议发射模块的功能要求.并且兼容 WPC1.2.4 以下所有版本.

1.2 The Wireless Charging TX Module meet ROHS requirement.

无线供电的 TX 模块符合 ROHS 要求.

## 2. Product Characteristic/产品特点

U10QT-6082 is a WPC 1.2.4 Qi compatible multi-function fixed frequency and voltage regulation wireless charging platform. Its transmission efficiency can reach to  $70\% \pm 5\%$  .Compatible with any WPC Qi certified product, and provide fast wireless charging to Samsung mobile phones .

U10QT-6082 是 WPC 1.2.4 Qi 兼容的多功能定频调压无线充电平台：其传输效率最高点可达  $70\% \pm 5\%$ ，。它可以跟任何 WPC-Qi 认证产品供电或充电；还能为三星手机提供快速无线充电。

It adopts intelligent identification system while its transmitter and receiver unit adopts UART (Universal asynchronous receiver/ transmitter) encrypted transmission control signal which is stipulated by WPC1.2.4 . The console will process the corresponding power adjustment based on the encoding of the receiving unit. The module has fulfilled the WPC1.2.4 Qi requirement and Qi certified.

它采用智能识别系统并且它的发射和接收单元采用 UART（通用异步接收器/发送器）加密传输控制信号，这是由 WPC1.2.4 所规定.控制台将基于接收单元编码进行对应的功率调整。此模块达到了 WPC1.2.4Qi 的要求也是 Qi 的认证产品。

LED LED 指示灯	Operating Status/操作状态					
	Standby 待机	5W RX&Apple 7.5W 5W 接收器和 苹果 7.5W	Samsung Fast Charger 三星快充	Full Charged 充电完成	Abnormal 异常	Power Control 功率调整
D4, Red	Off	Off	Off	Off	On	Blink slow
D6, Blue	Off	On	On	Off	Off	Off
外接 LED	Remark:: Dual-color LED lights, to use a common cathode LED lights; The current of the LED lamp is limited to $\leq 10\text{mA}$ . If $\geq 10\text{mA}$ , please connect the external LDO to power the LED lamp separately 注意: 使用双色 LED 灯时, 要用共阴极的 LED 灯; LED 灯的电流限制在 $\leq 10\text{mA}$ , 如果 $\geq 10\text{mA}$ 时请外接 LDO 单独给 LED 灯供电使用					

## 3. Performance Parameter / 性能参数

3.0	Power input protocol/电源输入协议	QC2.0/QC3.0/PD
3.1	Input voltage & current /输入电压电流	DC5V/3A、DC9V/2.2A
3.2	Working voltage & current/工作电压电流	DC5V/1.65A、DC9V/1.5A
3.3	Output power/输出功率	5W/7.5W/10W
3.4	Power Transfer Efficiency /转换效率	70%±5%
3.5	5W/10W Frequency / 5W/10W 频率	frequency conversion 110KHz-148KHz / 变频 110KHz-148KHz
3.6	Apple 7.5W frequency/苹果 7.5W 频率	127.7KHz
3.7	Ripple noise/纹波及噪音	≤100mV <sub>p-p</sub>
3.8	Operating temperature/工作温度	0-40 °C
3.9	Relative humidity/相对湿度	10% ~ 80%

## 4. Safety Control/安全机制

### 4.1. Short Circuit Protection/短路保护

In the case of short-circuit at the receiver output, the transmitter red light on and stop output. When removed the receiver or short circuit, the transmitter will resume normal operation.

在接收端输出短路的情况下，发射端红色指示灯亮并停止输出。当移除接收或者短路解除时，发射端将恢复正常工作。

### 4.2. Over Current Protection/过流保护

When the receiver load exceeds the rated value(110% - 130%), the overcurrent protection is triggered and the transmitter stops working. When removed the receiver, the transmitter will resume normal operation.

当接收器负载 > 额定值的 110% - 130% 时，触发过电流保护，发射端停止工作，当接收器被移除时，发射端将恢复正常工作。

### 4.3. Overvoltage Protection 过压保护

The product would stop working when the input voltage exceeds the rated value (13V). The Product would be restarted working when the voltage returns to the set value range.

P/S: The input voltage shall not exceed 13.2V in case damage the product.

输入端超过设定过压电压值 13V 时，发射端停止工作。电压恢复设定值范围时重新启动工作。

注意：输入电压不可以超过 13.2V，以防损坏本产品。

### 4.4. Foreign Object Detect (FOD) (1 RMB coin as the standard.)

异物检测（以一元 RMB 硬币为标准。）

4.4.1 When placing the coin onto the center of the product under no-load condition, the transmitter

detected foreign object and reports an error, then stops working. Removes the foreign object to resume normal operation .

空载时放置产品中心，发射端检测到异物并报错，停止工作，移除异物可恢复正常工作。

4.4.2 When placing the load and coin together onto the center of the product, an error is reported within 10s (time varies with different mobile phone models) and the output is closed. Removes the foreign object to resume normal operation .

负载和硬币一起放置产品中心时，10秒（不同手机型号时间不同）之内报错并关闭输出，移除异物可恢复正常工作。

#### 4.5. Over-temperature Protection/过温保护

The NTC temperature protection of the PCBA is  $80\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ . The transmitter stops working when the temperature exceeds the value. Resets the receiver or cools to  $55\text{-}60\text{ }^{\circ}\text{C}$ , the transmitter returns to normal operation (optional replacement with external NTC)

PCBA 贴片 NTC 温度保护设定值为  $80\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ ，当温度超过设定值，发射端停止工作，重新放置接收或者者降温至  $55\text{-}60\text{ }^{\circ}\text{C}$  时，发射器恢复正常工作。（可选择更换成外接 NTC）

#### 4.6. Average Working Time Without Failure 平均工作无故障时间

Working for 20,000 hours, the average failure rate is less than 0.5% du at  $25\text{ }^{\circ}\text{C}$  environment temperature.

工作 2 万小时，在  $25\text{ }^{\circ}\text{C}$  环境下平均失效率小于 0.5%

## 5. Reliability Requirements/可靠性要求

### 5.1. Reliability Test/可靠性测试

Test Items/测试项目	Test conditions/测试条件
Storage at high temperature test/高温存储	+60°C 16Hrs
Storage at low temperature test/低温存储	-20°C 16Hrs
Operating at high temperature test/高温操作	+40°C 8Hrs
Operating at low temperature test/低温操作	-20°C 8Hrs
High & low temperature cycle test 高低温循环测试	55°C(1Hrs)→-20°C(1Hrs)连续 5 次循环

For other tests, please refer to Reliability Test Specification and Reliability Test Report.

其他测试请参考《可靠性测试规范》与《可靠性测试报告》

### 5.2 Burn-in test 老化测试

Burn-in for 2hours under  $35\text{ }^{\circ}\text{C} (\pm 5\text{ }^{\circ}\text{C})$ , Nominal input voltage, Nominal load.

在  $35\text{ }^{\circ}\text{C} (\pm 5\text{ }^{\circ}\text{C})$  的环境下，额定输入电压，额定负载，老化 2 小时

## 6. Environment Requirement/环境要求

### 6.1 . Operating Temperature and Relative Humidity/操作温度和相对湿度

$0\text{ }^{\circ}\text{C} - 40\text{ }^{\circ}\text{C}$  20%RH to 80%RH @altitude should be below 10000 feet.

### 6.2 . Storage Temperature and Relative Humidity/储存温度和相对湿度

$-20\text{ }^{\circ}\text{C}$  to  $+60\text{ }^{\circ}\text{C}$  10%RH to 90%RH(non-condensing) @altitude should be below 30000 feet.

## 7. Execution Standards/执行标准(Compatible with these specifications)

### 7.1. EMC Standards/EMC/电磁兼容标准

EN55032	EN55035
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## 7.2. WPC1.2.4\_Qi Standards/ WPC1.2.4\_Qi 标准

7.3. FCC: Only radiated measurements are used to show compliance with FCC limits for fundamental and spurious emissions.

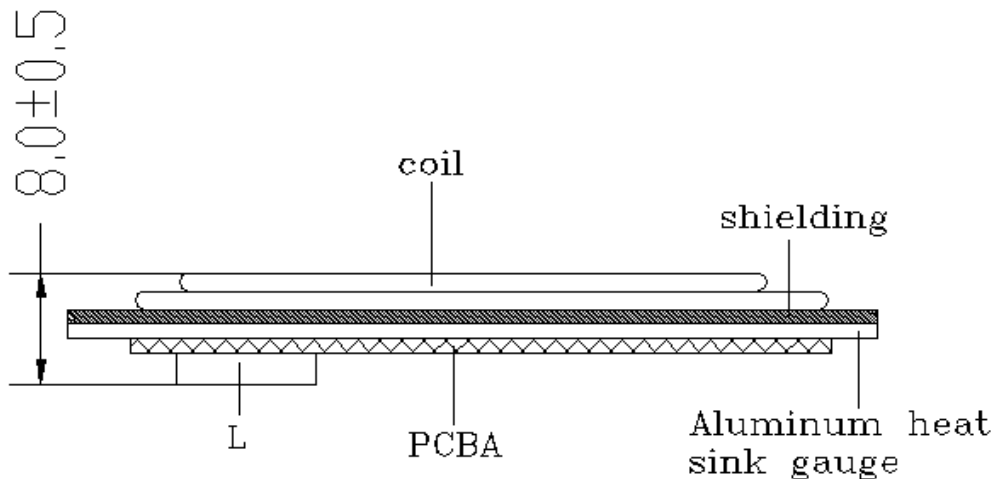
## 8. Photo of Product/产品照片



Module Back Side 模块后面



Module Front Side 模块前面



## 9. Module/模块

### 9.1. Product design proposal / 产品设计要求

According to the standardization of Qi, Please note below 3 points:

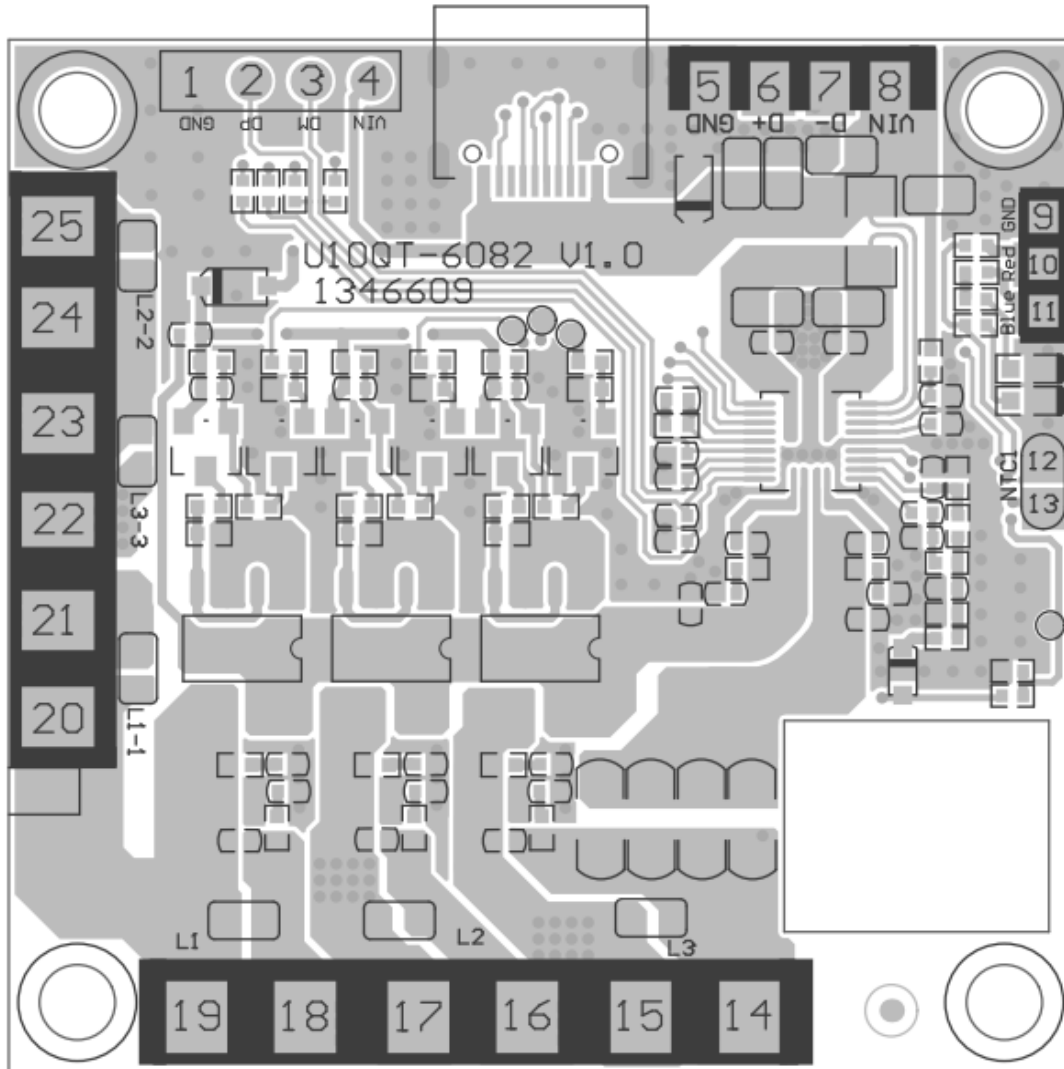
为了要符合 Qi 的标准，有三个项目要注意：

1. The distance between Tx Coil with PCB and other metal components is Min: 4.5mm/  
输出线圈，PCB 和其他金属部件之间的最小距离：4.50mm;
2. The distance between the surface of Tx coil and the surface of product (Working Face) is  $3.0^{+0.5}_{-0.2}$ mm, which means the thickness of the working face plastic is not more than 2.25mm;  
Tx 线圈表面和产品的表面之间的距离（正面）是  $3.0^{+0.5}_{-0.2}$  mm，即正面塑料的厚度不超过 2.25mm
3. The surface distance between Tx Coil and Rx Coil is 3.0 – 4.5mm  
输出线圈和接收线圈之间的表面距离为 3.0– 4.5mm
4. Added cooling device to MOSFET inductor to do heat treatment (similar to the computer CPU cooling method)  
MOSFET 的电感要做散热处理（类似电脑 CPU 的方式用来散热用）
5. In order to pass EMI, it is recommended to connect the PCBA power supply with DC 12V power supply and common-mode inductance.



为了好通过 EMI，建议用 DC 12V 的电源外加共模电感连接 PCBA 的电源。

## 9.2 PCBA Port Functional Illustration/PCBA 功能说明



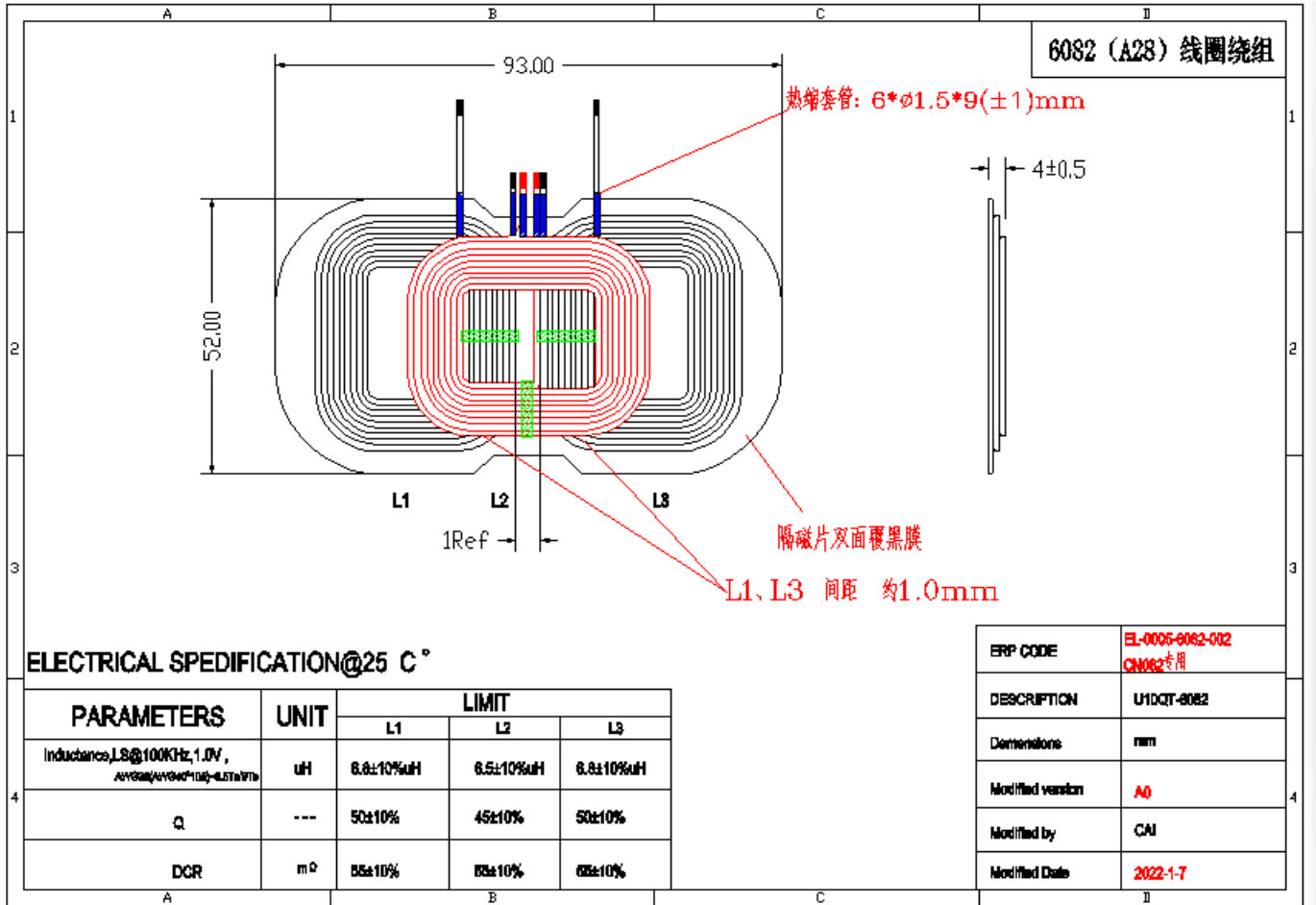
PCB 图

**PCBA Size: 44(±0.5)\*45(±0.5)\*3.8 (±0.2)mm**

Port	Pin1	Pin2	Pin3	Pin4	Pin5	Pin6	Pin7
Function	Burn_GND	Burn_DM	Burn_DP	Burn_VIN	GND	USB/D+	USB/D-
Port	Pin8	Pin9	Pin10	Pin11	Pin12	Pin13	Pin14
Function	VIN	LED_GND	LED_Red	LED_Blue	NTC1-	NTC1+	CoilL3_1
Port	Pin15	Pin16	Pin17	Pin18	Pin19	Pin20	Pin21
Function	CoilL3_2	CoilL2_1	CoilL2_2	CoilL1_1	CoilL1_2	CoilL1-1_1	CoilL1-1_2
Port	Pin22	Pin23	Pin24	Pin25	Pin26	Pin27	Pin28
Function	CoilL3-3_1	CoilL3-3_2	CoilL2-2_1	CoilL2-2_2			

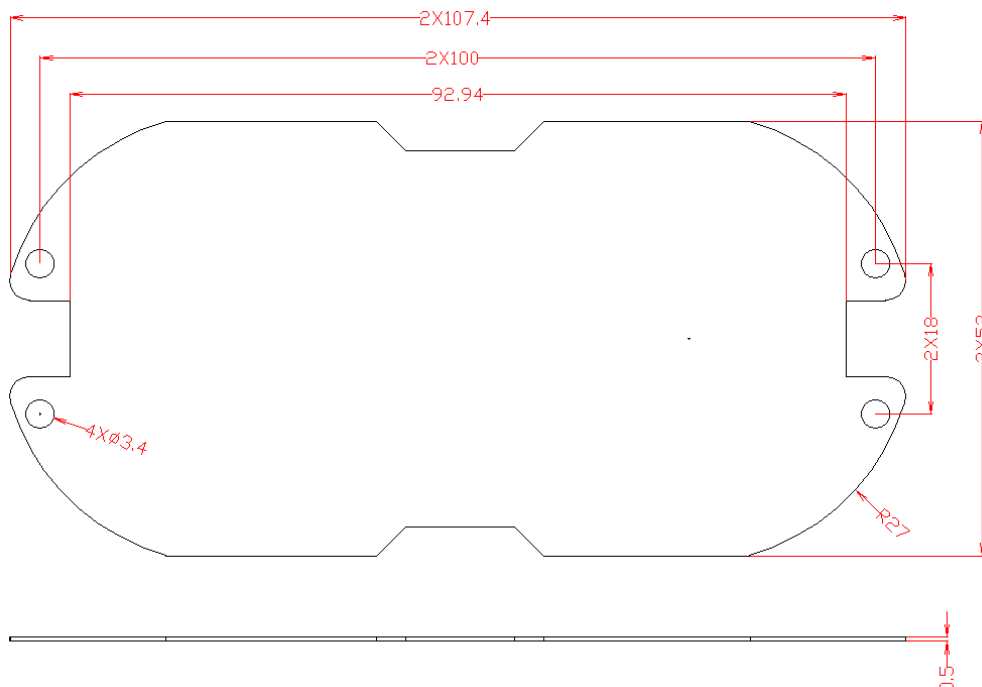
### 9.3. Tx\_Coil Spec: TX 线圈规范

**Coil + Shielding : 93(±0.5)\*52(±0.5)\*4.0(±0.5)mm**



### 9.4. Aluminum heat sink gauge Spec 铝散热片规格

**107.4(±0.5)\*52(±0.5)\*0.5(±0.1)mm**



## 10. Other Features / 其他特性

### 10.1. Weight 重量

51±2g

\*All dimensions are nominal

Device	Package Type	Package Drawing	SPQ	L(mm)	W(mm)	H(mm)
U10QT-6082	Module	MOD				

## 11. Inspection Standards/检查标准

NO.	Test project	Test standard	Sample Level	Test standard
1	Performance			Serious defect:
2	Size			Main defect:
3	Shell, Package			Petit defect:

## 12. Major Test Equipment/测试仪器

- 12.1. DC Supply
- 12.2. Rx\_Module
- 12.3. ELECTRONIC LOAD
- 12.4. DPO3014 Digital Phosphor OSCILLOSCOPE
- 12.5. Logical Analyzer
- 12.6. Q110 Qi BST (Base Station Tester)

## 13. Statement/声明

All rights reserved by LinkCom Manufacturing Co., Ltd. for all of this specification for approval.

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