



芯高科技
HIGH TECH
TECHNOLOGY LIMITED

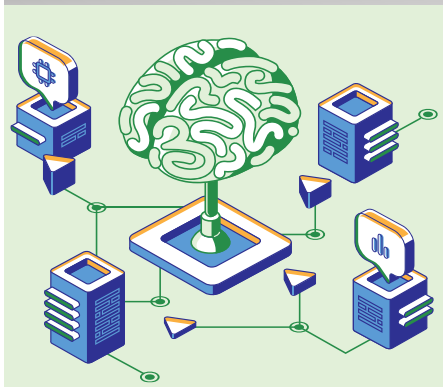


芯高科技有限公司
提供

USB端口模组方案

HTT芯高 重点芯片产品

DC-DC



HT 3000系列
AloT & Smart Home
供电芯片

- **I²C** 数位调控, 实现感应互通的网络管理
- 物联网、智能电控管理、QC电源供应器



HT 6000系列
车用LED大灯, 快充器
供电芯片

- **单晶片**双通道输出
- 具**独立QC3.0**快充, 支援于电源供应器、充电座



HT 7000系列
车用LED大灯, 快充器
供电芯片

- 多功能**单晶片**高频**双通道**输出
- 具**独立QC3.0**快充外, 广泛层面应用

USB-C



HT 5000系列
USB-C / PD, QC快充
协议供电芯片

- 与美国著名高效能电子元件供应商合作
- 认可**USB-PD3.0**快充器, 绿色能源, 降低成本

RGB-LED



HT 1300系列
MR16/RGB LED产品 供电
芯片

- 高效能**模拟及数位**调光模式
- 音乐感应灯、车内饰气氛灯、车头/尾灯用



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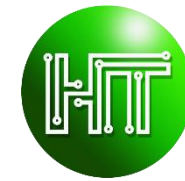
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USB端口产品 / 应用方案

居家设备



USB充电器



壁插



延长线

Internal Use Only

航运设备

陆路



公共汽车



火车



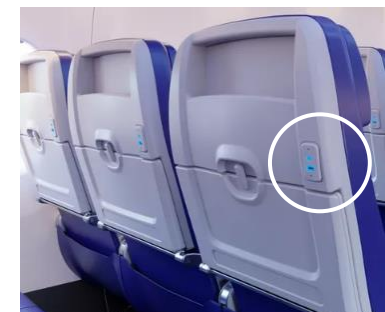
汽车

水路



船/渡轮

航空



飞机



HTT芯片简介及USB应用方案

HT6000系列

高效率、外部 MOSFET 双降压型 DC-DC 控制器

- 输入电压：5V~36V
- 外置MOSFET
- 可选择开关频率
 - › 150kHz，250kHz，350kHz
- 支持CC/CV模式
- 软启动
- EMI抖动（已获专利授权）

HT6329

两个通道皆为外部反馈
支持组合模式

(双通道高效DC-DC，适合双Type-C方案)

HT6122

一个通道内置QC3.0协议
另一个通道为外部反馈

(内置QC3.0，适合Type-A + Type-C方案)

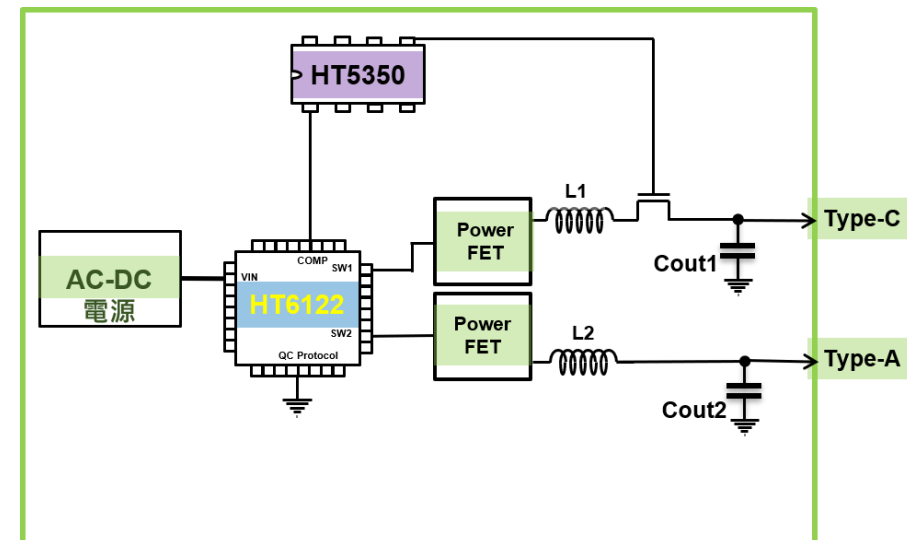
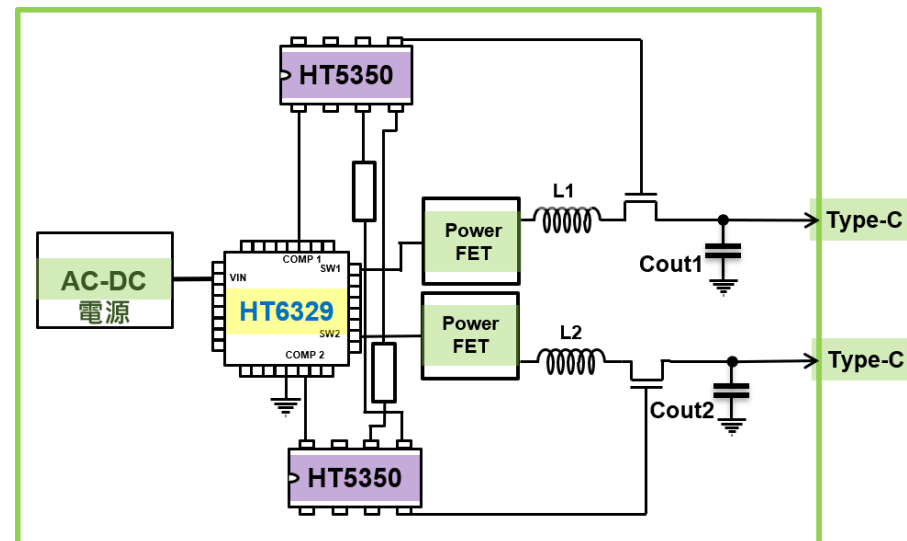
HT5350

USB C 型和 PD 源控制器

- 支持 USB PD3.0 协议
- 支持 QC2.0/QC3.0、BC1.2 DCP 协议
 - 苹果5V,2.4A模式，BC1.2 DCP 模式
 - FCP及AFC快充模式

HT5350

(快充，PD功能齐备控制器方案)

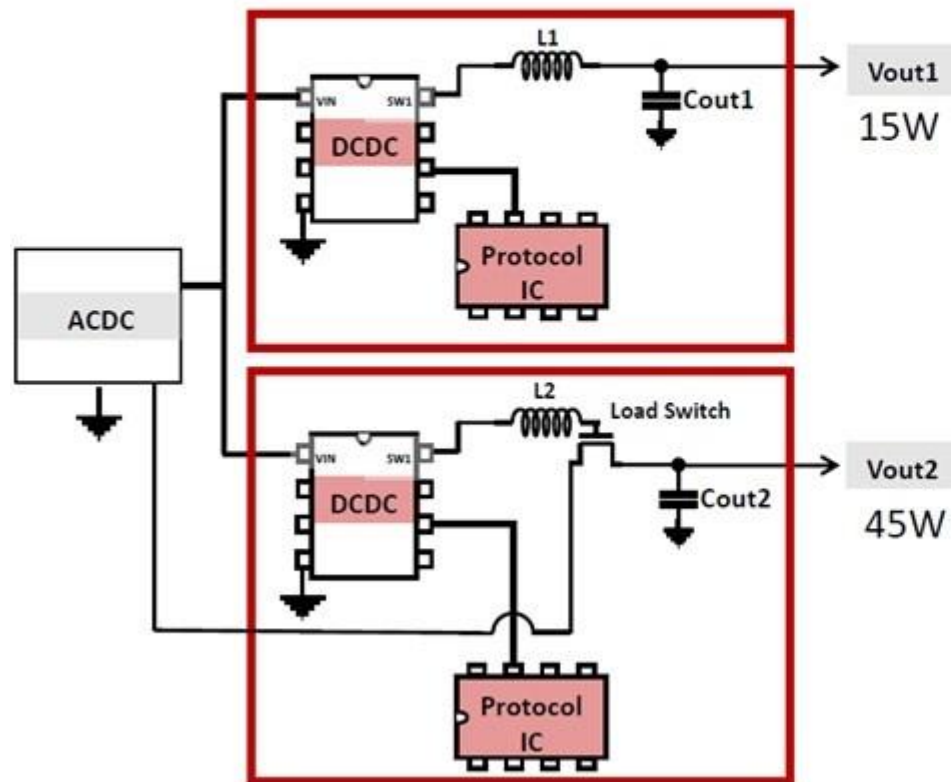




HTT 解決方案比較

其他 60W 方案

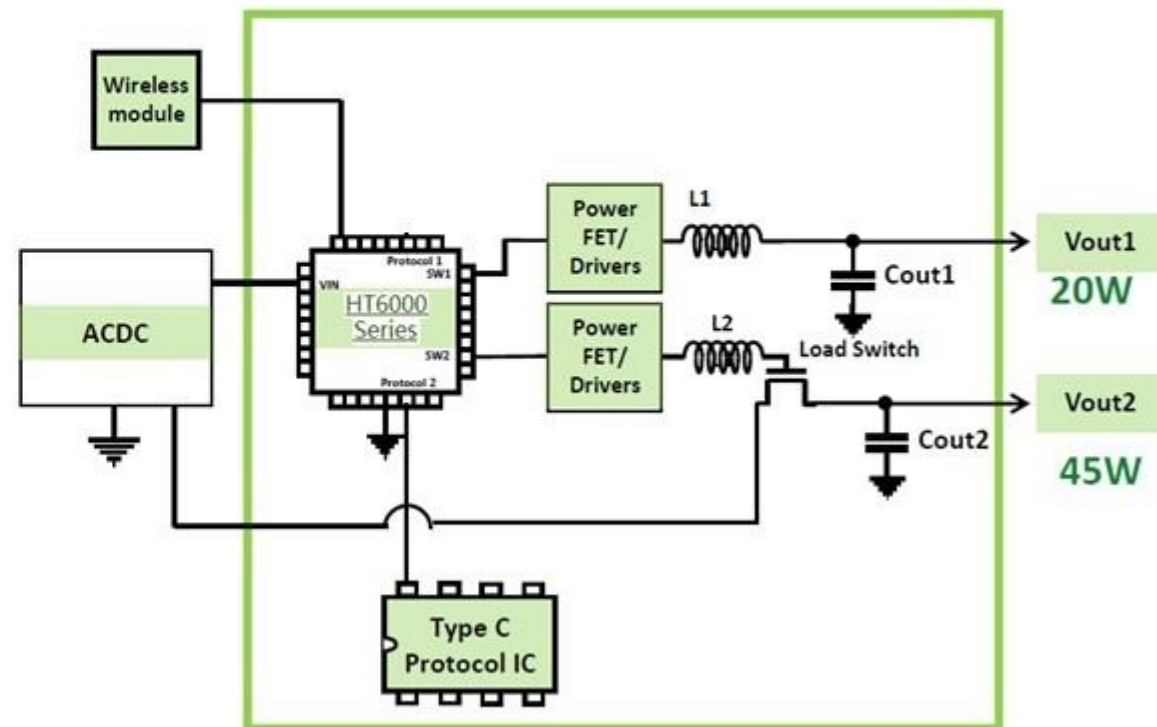
- 15W(A)-45W(C)



HTT 芯高 65W 方案

- ✓ 20W(A)-45W(C)

(節省 > 40%)



HT6000 系列，整合雙通道DC-DC芯片，應用上更省空間

IoT的應用

HTT芯片內置I2C, HT3000, HT6000能為IoT應用帶來方便



用家透過手機APP,
利用Wi-Fi 連接,
控制家中的USB智
能電器



安全監控

實時監控現況
安全過熱保障



雲端開關

智能系統連接
獨立即時開關



定時開關

定時開關功能
減少備用耗電



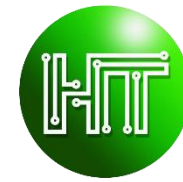
耗電計算

實時計算耗電
精明消費策略

USB產品就能按用家指示開/關機

當HTT芯片接收信號
後就執行供電動作





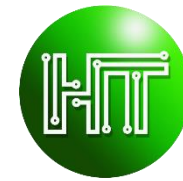
USB 充电头方案



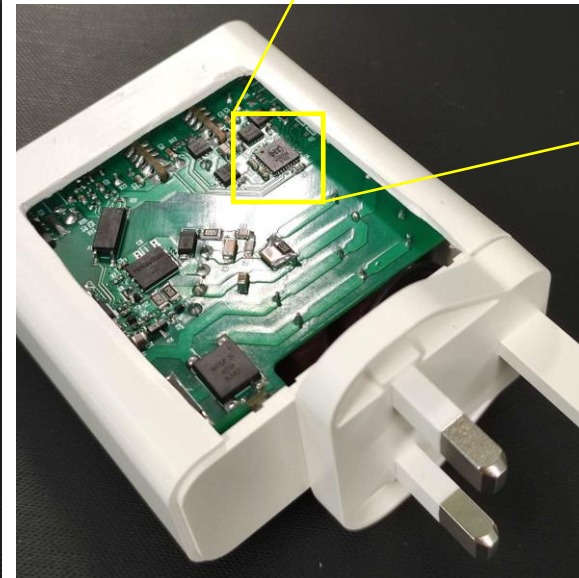
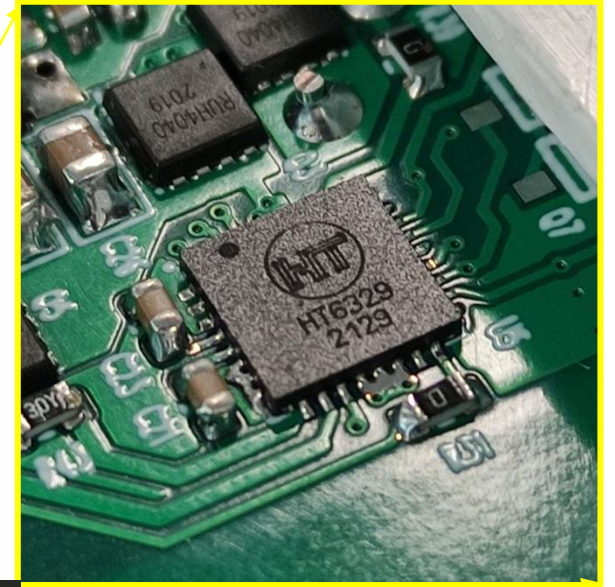
提供应用的芯片

[HT6329](#) / [HT6122](#) DC-DC Converter

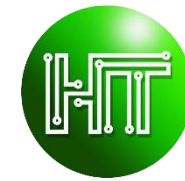
[HT5350](#) PD Protocol



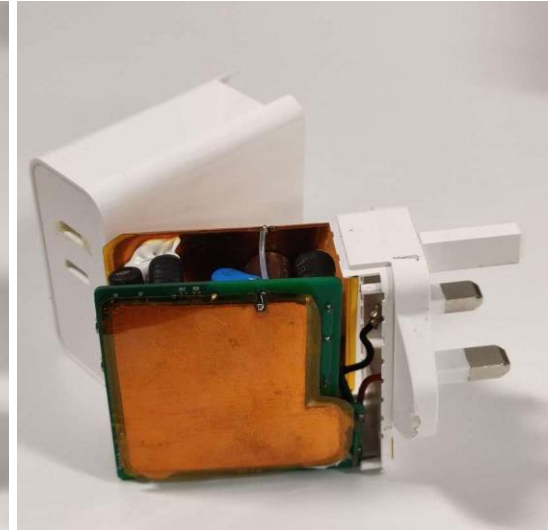
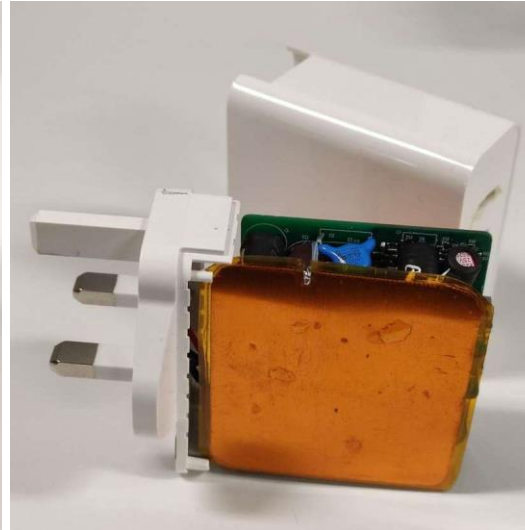
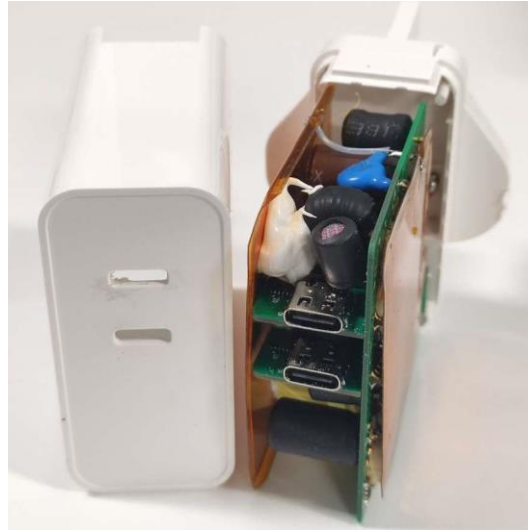
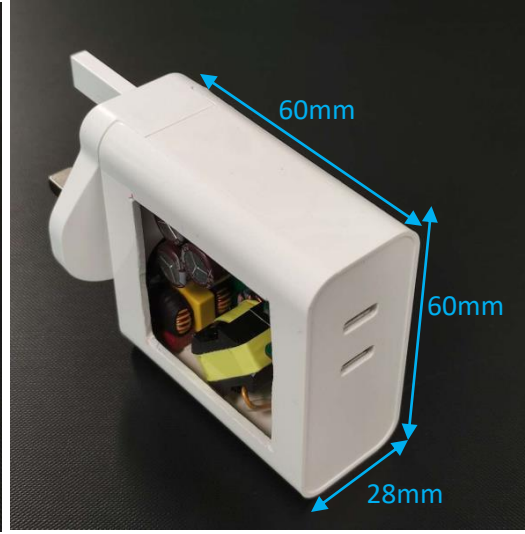
HTT GaN 65W双USB Type-C充电头方案



输入电压	100V~240V 50/60Hz
单端口输出	5V 3A, 9V 3A, 12V 3A, 15V 3A, 20V 3.25A
双端口输出 1	5V 3A, 9V 3A, 12V 3A, 15V 3A
双端口输出 2	5V 3A, 9V 3A
最大功率	65W



充电头模块配置



充电头规格摘要

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操作模式:	单通道	双通道
输入电压	AC 110V-220V	
输出电压和电流范围 (最大输出功率是 15W + 15W)	(5V 3A), (9V 3A), (12V 3A) (15V 3A), (20V 3.25A)	双通道的最大总输出电流为 6A
主要支持的快速充电协议	PD 3.0, QC 3.0*	
尺寸	58mm(长) X 58mm(阔) X 23mm(高)	
最大输出功率	65W	35W + 20W = 55W
负载调节(Load Regulation)准确度	输出电压在不同负载下准确度达 98%#	
最大功率转换效率	Vin 110V 88% / Vin 220V 90%	
短路(Short Circuit)测试	✓	

* QC3.0: Based on QUALCOMM webpage: Charge up to 4 times faster than conventional 5W chargers.
(<https://www.qualcomm.com/news/onq/2015/09/14/introducing-quick-charge-30-next-generation-fast-charging-technology>)

Definition: (Actual Vout / Target Vout) %

Internal Use Only



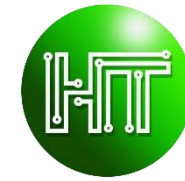
挂墙充电方案



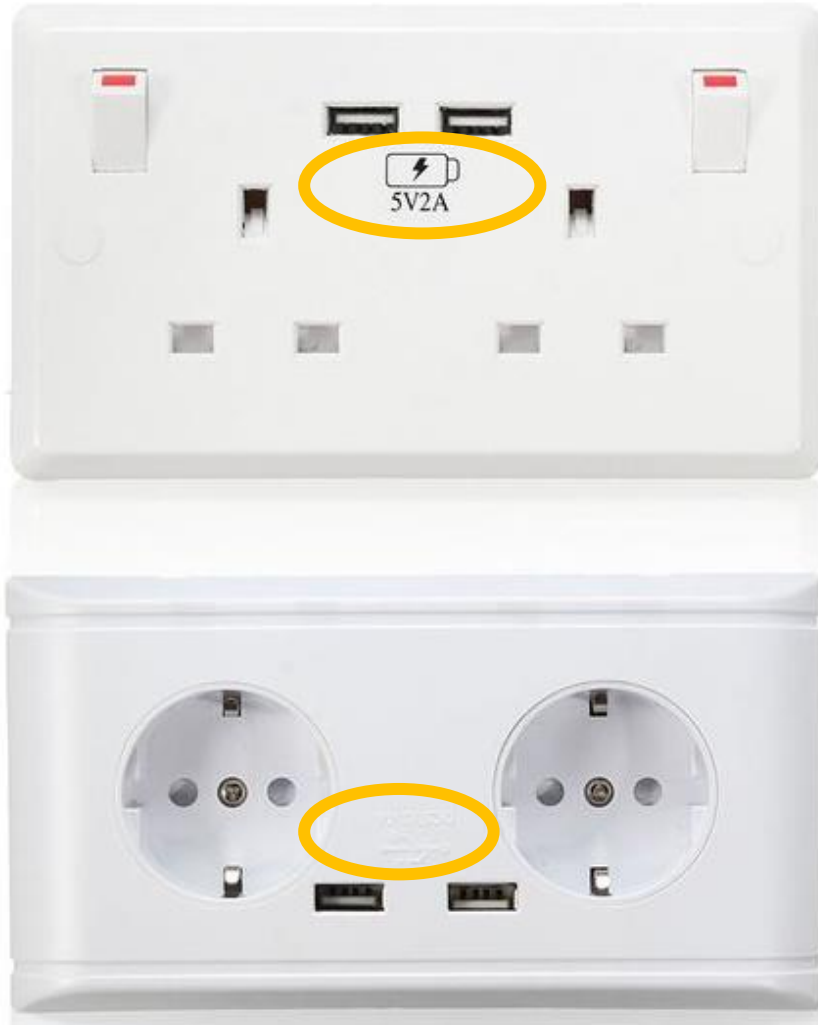
提供应用的芯片

[HT6329](#) / [HT6122](#) DC-DC Converter

[HT5350](#) PD Protocol



General USB wall socket charging specifications



大多数在市场上的产品一般是
 $5V2A = 10W$ 。

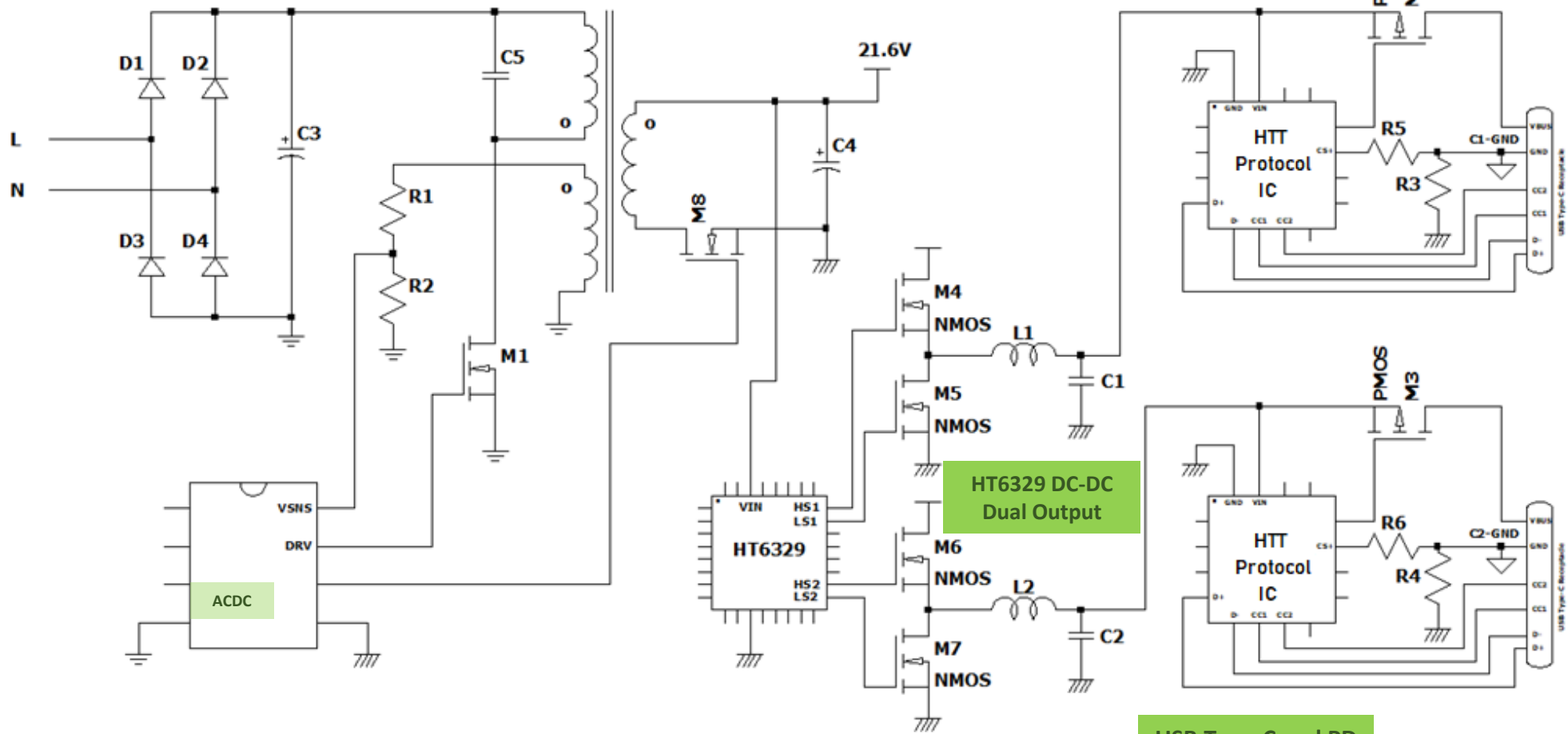
HTT模块可以提供功率为
30W 或 更高
并支持多端口
QC和PD
同时独立
快速充电。

简单的框图



變壓器

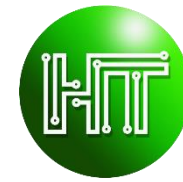
AC輸入



Output 1

Output 2

USB Type-C and PD
Controller



英式USB 挂墙充电方案



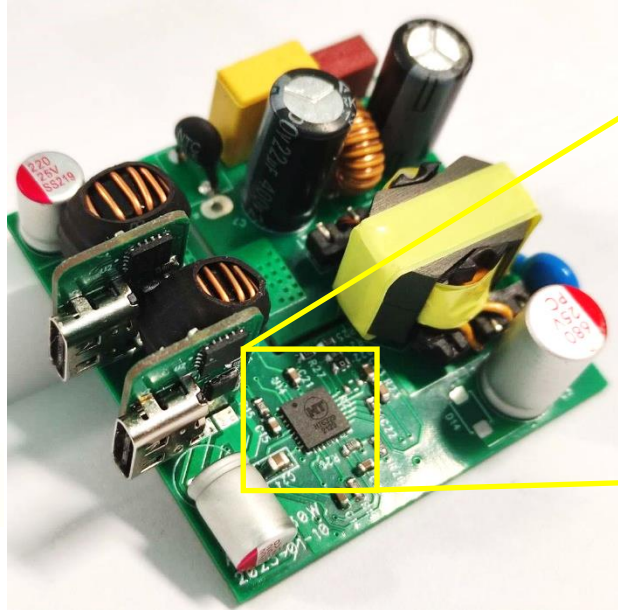
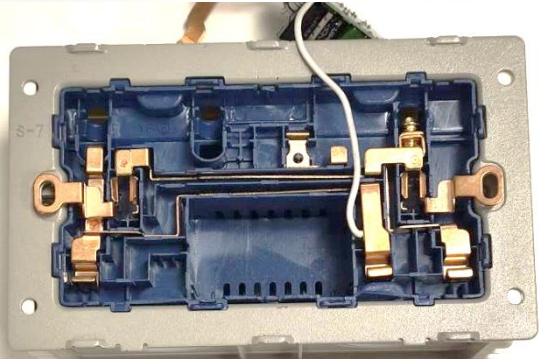
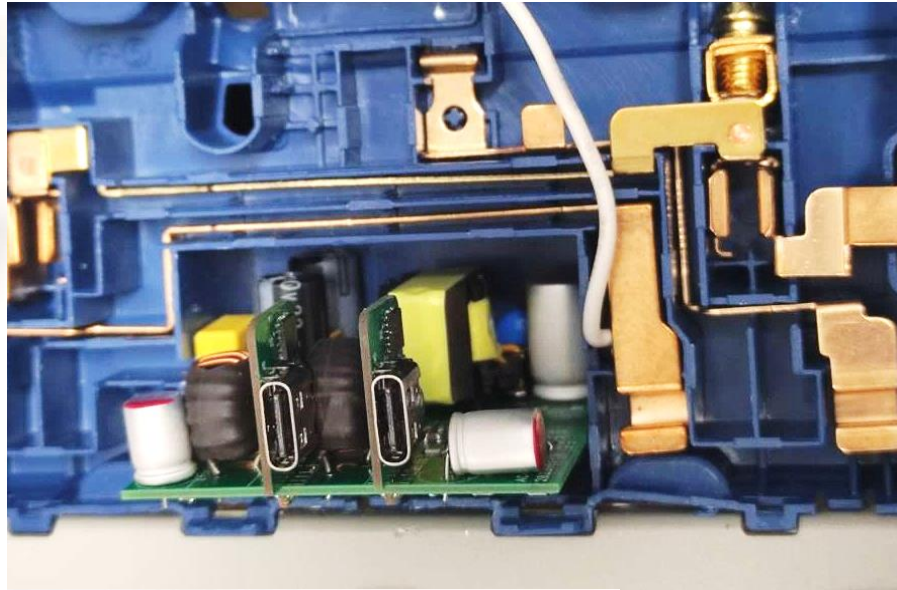
提供应用的芯片

[HT6329](#) / [HT6122](#) DC-DC Converter

[HT5350](#) PD Protocol



HTT 30W双USB Type-C英式挂墙充电方案



Internal Use Only

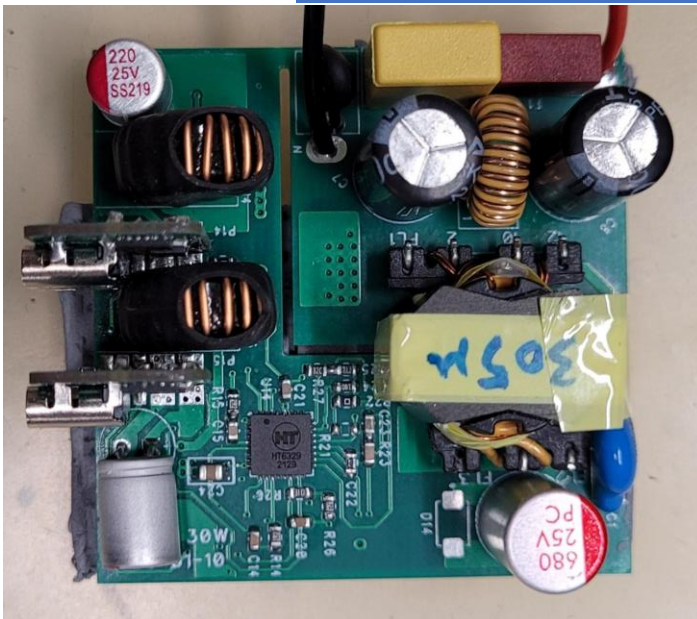
输入电压	200V~240V 50/60Hz
单端口输出	5V 3A, 9V 3A, 12V 2.5A, 15V 2A, 20V 1.5A
双端口输出 1	5V 3A, 9V 1.5A
双端口输出 2	5V 3A, 9V 1.5A
最大功率	30W



英式挂墙充电模块

- 尺寸: 45mm(长) x 45mm(阔) x 23mm(高)

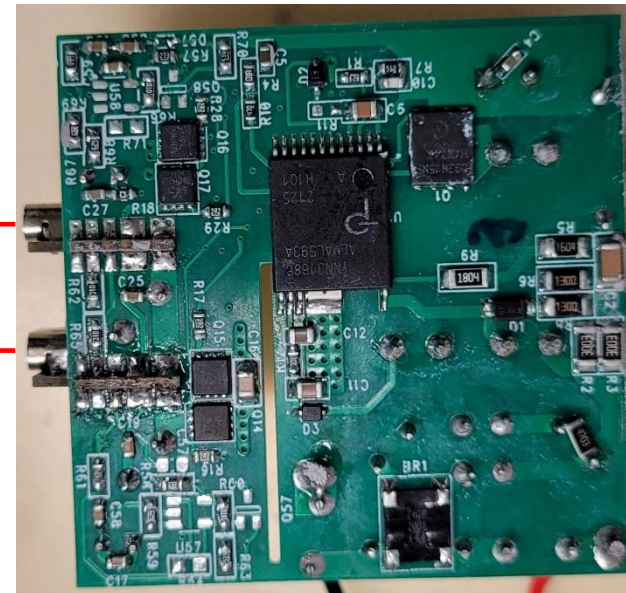
输入220V



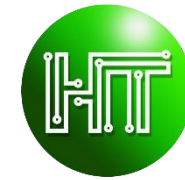
演示板 (顶视图)

输出 1

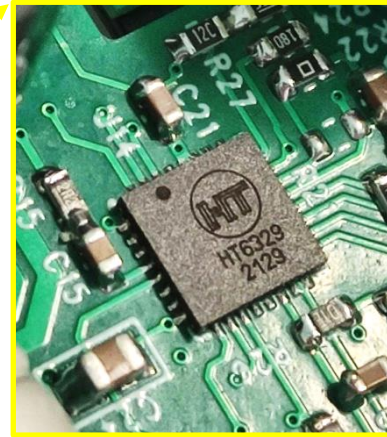
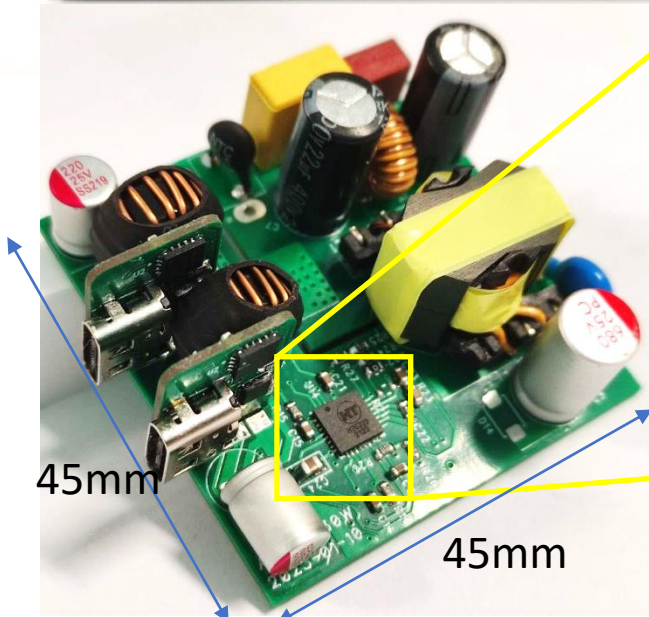
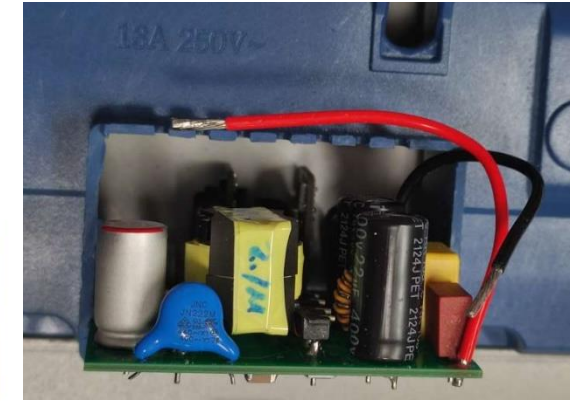
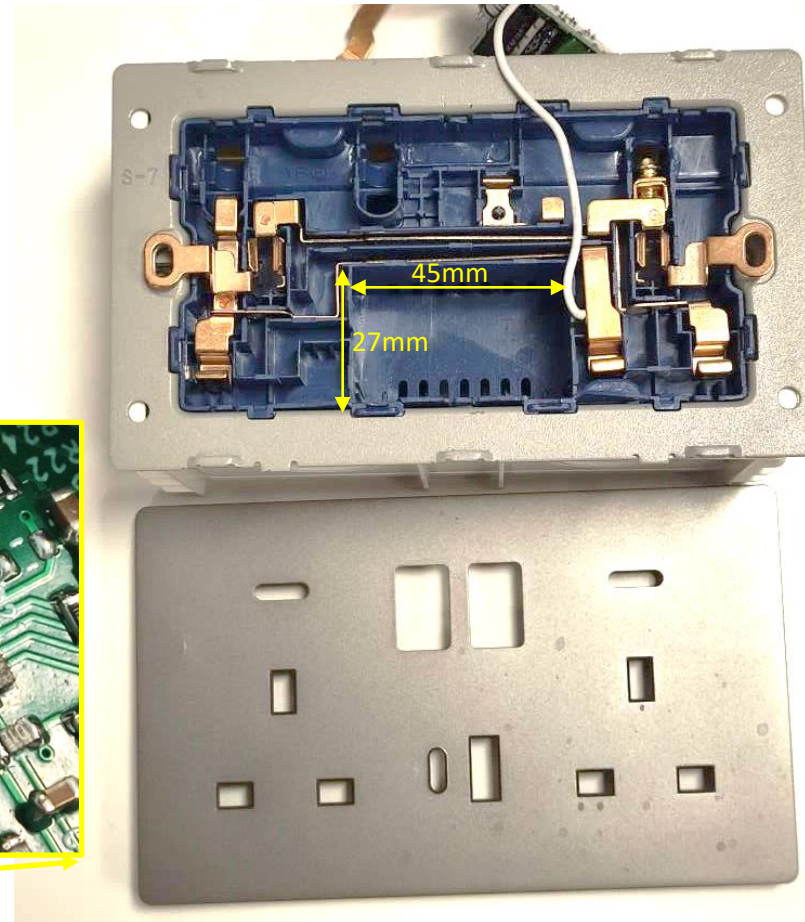
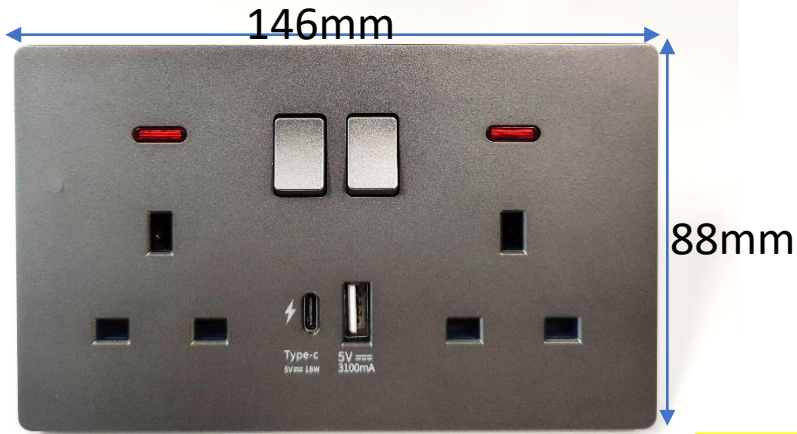
输出 2



演示板 (底视图)



英式挂墙充电模块配置



Internal Use Only

英式挂墙充电模块规格摘要

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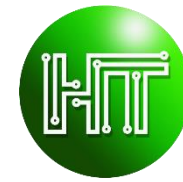
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HIGH TECH
TECHNOLOGY LIMITED

操作模式:	单通道	双通道										
输入电压	AC 220V-240V											
输出电压和电流范围 (最大输出功率是 15W + 15W)	(5V 3A), (9V 3A), (12V 2.5A), (20V 1.5A)	双通道的最大 总输出电流为 6A <table border="1"><thead><tr><th>USB-C1</th><th>USB-C2</th></tr></thead><tbody><tr><td>5V/3A</td><td>5V/3A</td></tr><tr><td>9V/1.65A</td><td>9V/1.65A</td></tr><tr><td>12V/1.25A</td><td>12V/1.25A</td></tr><tr><td>15V/1A</td><td>15V/1A</td></tr></tbody></table>	USB-C1	USB-C2	5V/3A	5V/3A	9V/1.65A	9V/1.65A	12V/1.25A	12V/1.25A	15V/1A	15V/1A
USB-C1	USB-C2											
5V/3A	5V/3A											
9V/1.65A	9V/1.65A											
12V/1.25A	12V/1.25A											
15V/1A	15V/1A											
主要支持的快速充电协议	PD 3.0, QC 3.0*											
尺寸	45mm(长) X 45mm(阔) X 23mm(高)											
最大输出功率	30W	15W + 15W = 30W										
负载调节(Load Regulation)准确度	输出电压在不同负载下准确度达 98%#											
最大功率转换效率	85%	85%										
短路(Short Circuit)测试	✓											

* QC3.0: Based on QUALCOMM webpage: Charge up to 4 times faster than conventional 5W chargers.
(<https://www.qualcomm.com/news/onq/2015/09/14/introducing-quick-charge-30-next-generation-fast-charging-technology>)

Definition: (Actual Vout / Target Vout) %

Internal Use Only



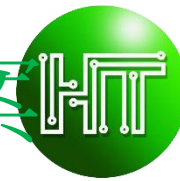
美式USB 挂墙充电方案



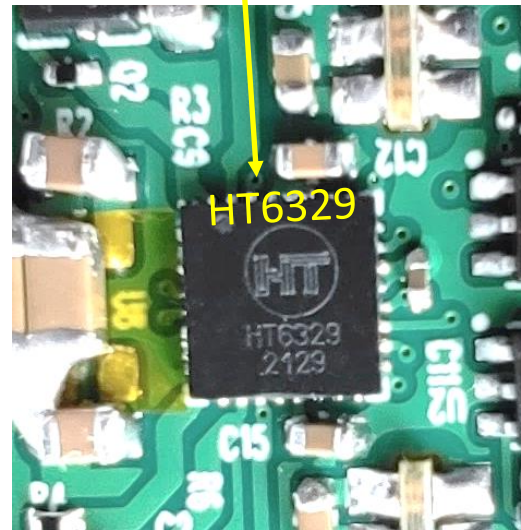
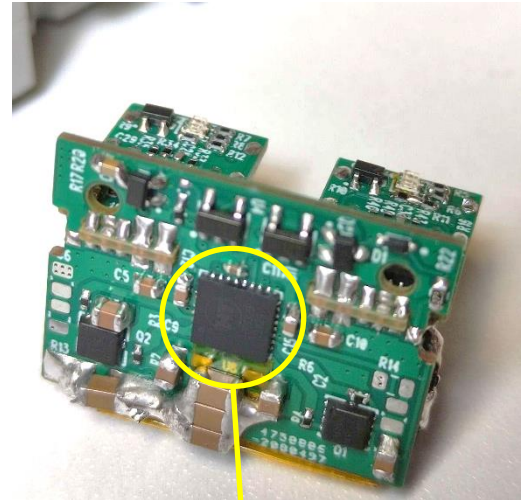
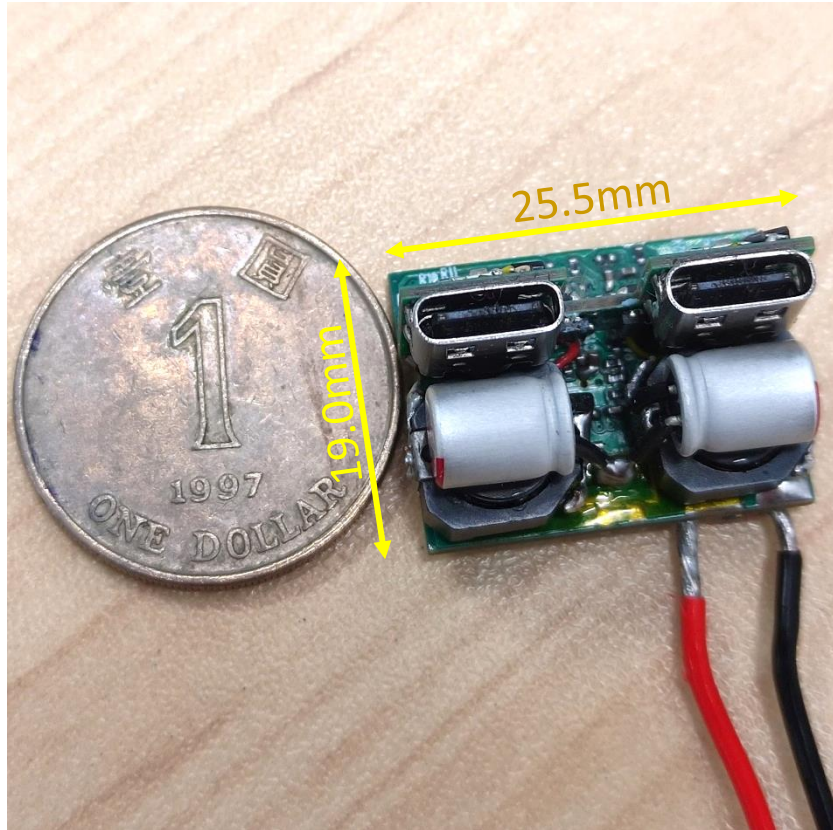
提供应用的芯片

[HT6329](#) DC-DC Converter

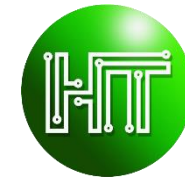
[HT5350](#) PD Protocol



HTT 65W双USB Type-C美式挂墙充电方案



输入电压	100V~240V 50/60Hz
单端口输出	5V 3A, 9V 3A, 12V 3A, 15V 3A, 20V 3.25A
双端口输出 1	5V 3A, 9V 3A, 12V 3A, 15V 3A
双端口输出 2	5V 3A, 9V 3A
最大功率	65W

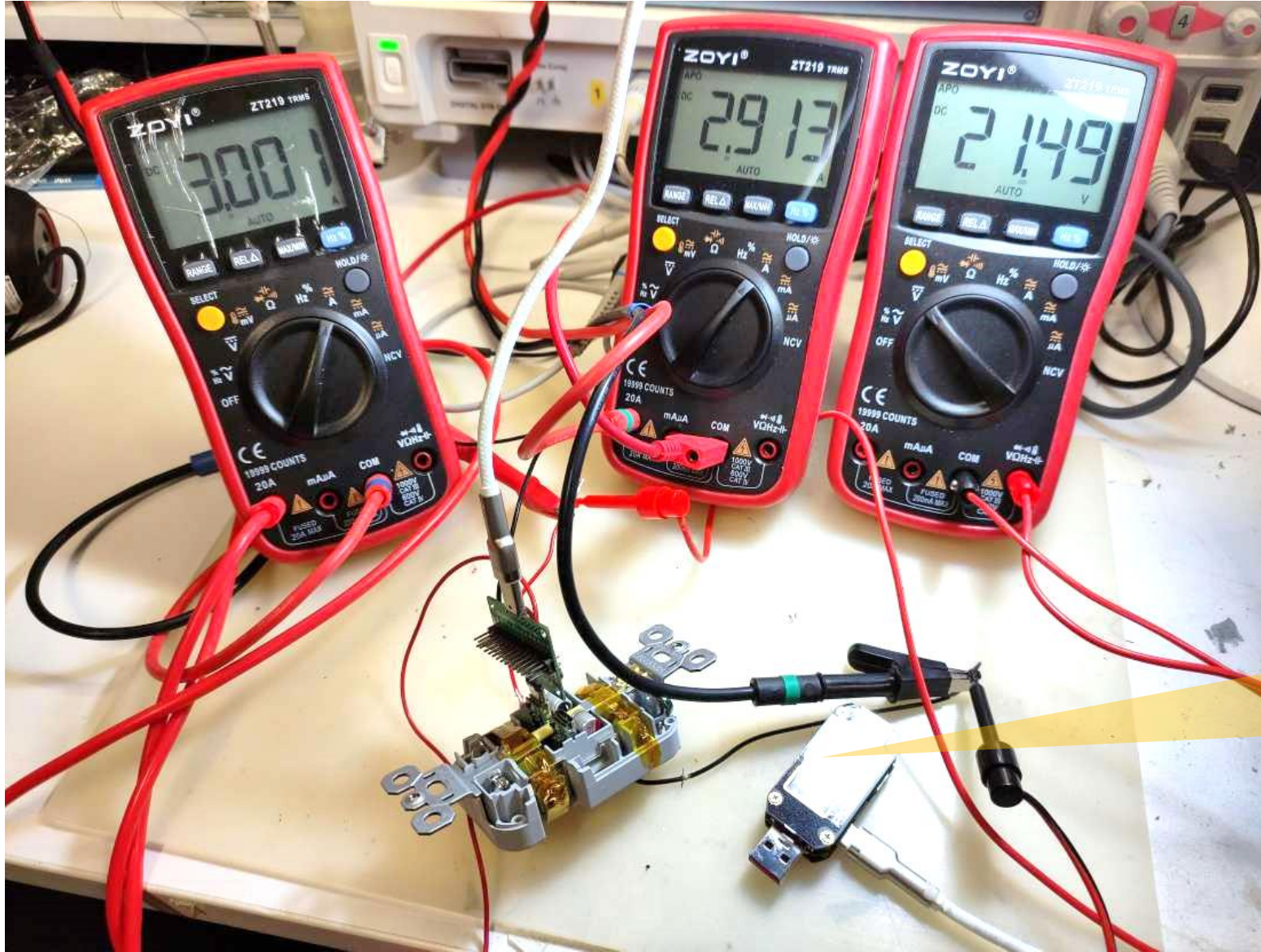


HTT模組 - 效率測試

$I_{out}=3.001A$

$I_{in}=2.913A$

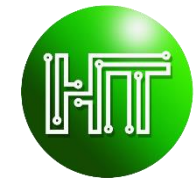
$V_{in}=21.49V$



$$\text{效率} = \frac{V_{out} \times I_{out}}{V_{in} \times I_{in}}$$
$$= \frac{20.09 \times 3.001}{21.49 \times 2.913} = 96.3\%$$

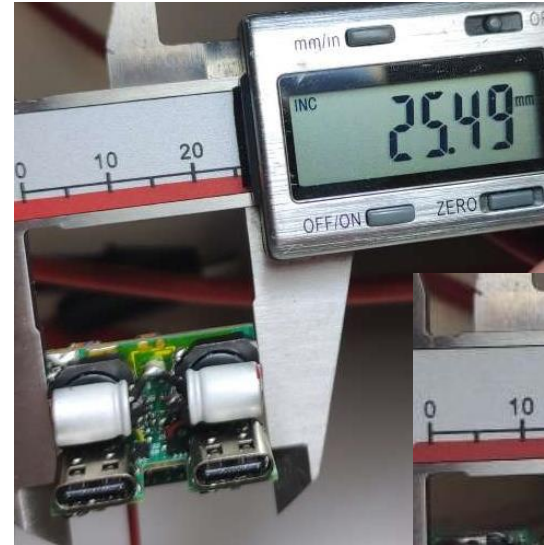
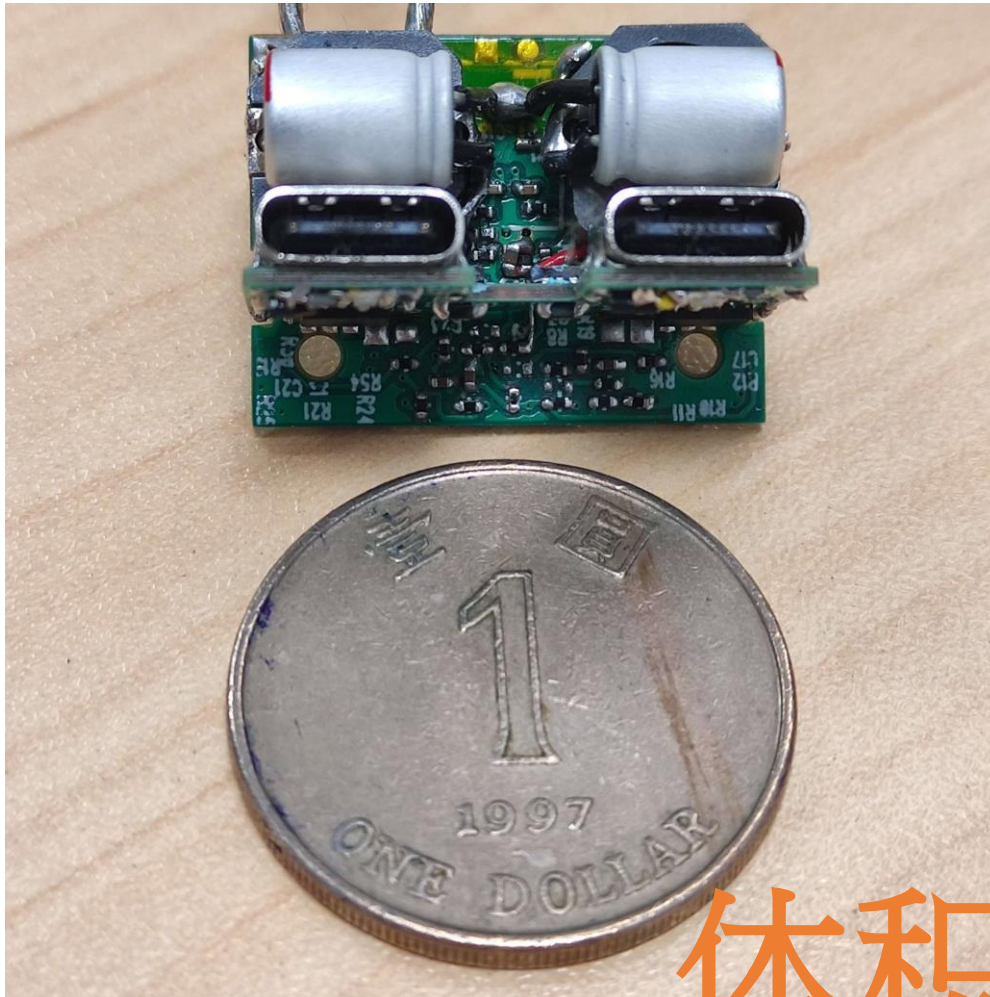
$V_{out}=20.09V$



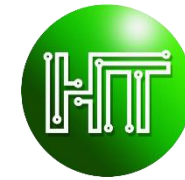


HTT模组方案 - 尺寸大小

尺寸 25.5mm x 19.0mm x 16.0mm



体积小巧



美式墙插市场参考价格

Home / Wall Outlets / Dual USB-C Port Charging Power Delivery (PD) Outlet, 60 Watt, 20A, White



Dual USB-C Port Charging Power Delivery (PD) Outlet, 60 Watt, 20A, White

★★★★★ (4) | Q&A (0)

\$94.99

60W ~USD100

Free 4-Day Shipping!

Pay in 4 interest-free installments of \$23.74 with [shop Pay](#) [Learn more](#)

Part #: T5836-W

Vendor: Leviton

Unknown Estimated Shipping Date per the Manufacturer

Amps : 20 Amps



Watts : 60 Watts



- 1 +



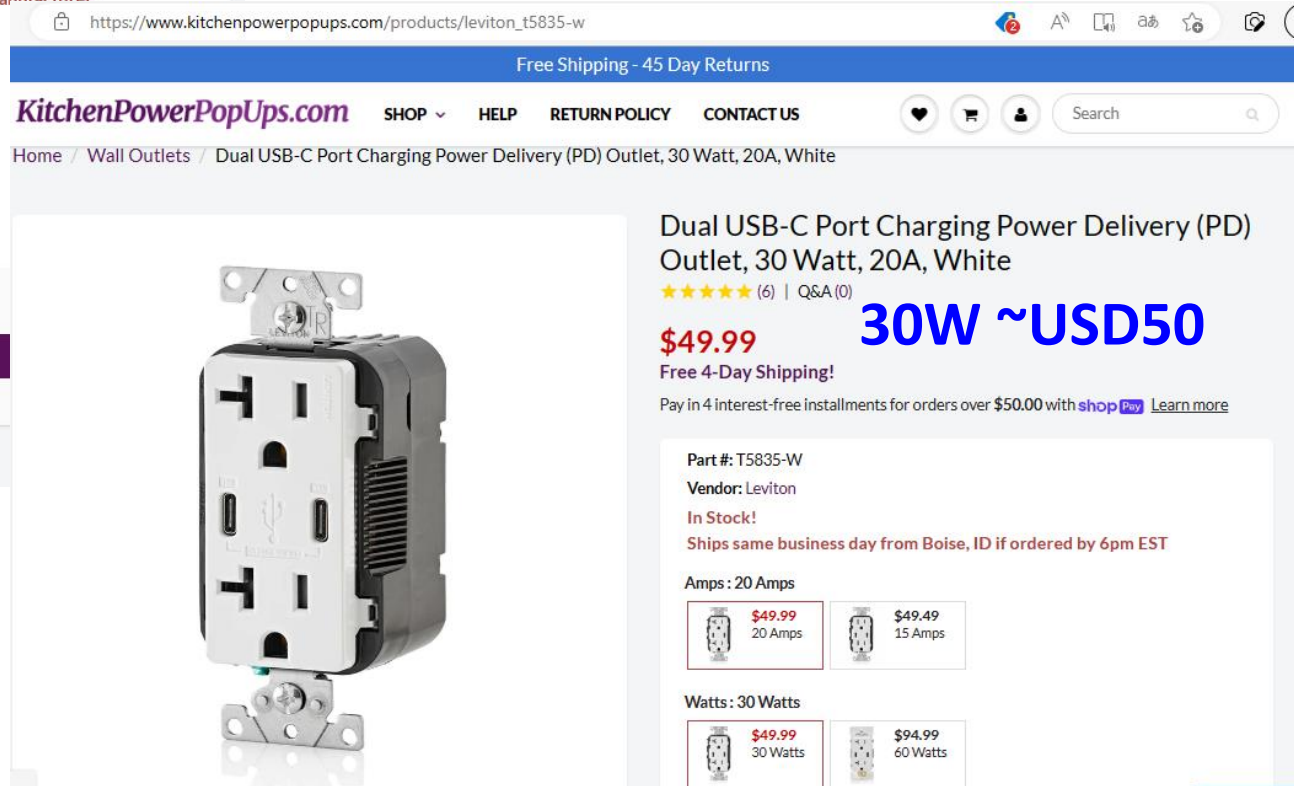
Add to Cart

Order now to ship tomorrow



US/UK Market

- USD50 (30W)
- USD100 (60W)
- ~USD1.67/W



https://www.kitchenpowerpops.com/products/leviton_t5835-w

Free Shipping - 45 Day Returns

KitchenPowerPopUps.com

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Search

Home / Wall Outlets / Dual USB-C Port Charging Power Delivery (PD) Outlet, 30 Watt, 20A, White

Dual USB-C Port Charging Power Delivery (PD) Outlet, 30 Watt, 20A, White

★★★★★ (6) | Q&A (0)

\$49.99

30W ~USD50

Free 4-Day Shipping!

Pay in 4 interest-free installments for orders over \$50.00 with [shop Pay](#) [Learn more](#)

Part #: T5835-W

Vendor: Leviton

In Stock!

Ships same business day from Boise, ID if ordered by 6pm EST

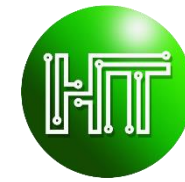
Amps : 20 Amps



Watts : 30 Watts



Internal Use Only



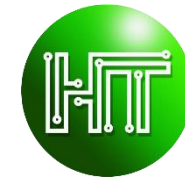
公交USB 供电方案

芯片包括

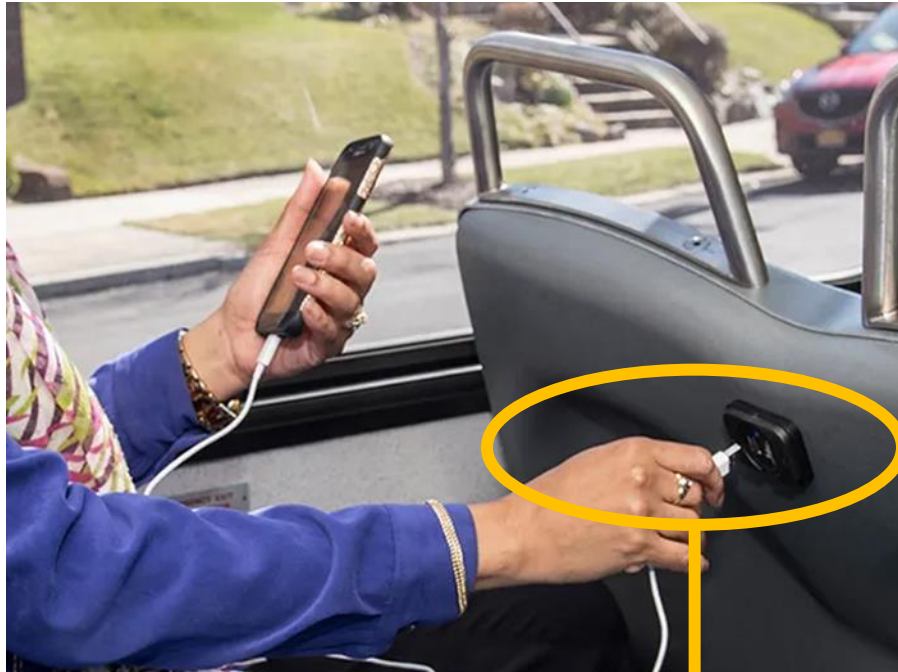
HT6329 DC-DC Converter

應用





公共汽车 / 车辆 / 轮船 上的USB 端口



每端口 1.1A
 $5V \times 1.1A = 5.5W$ 最大

Internal Use Only

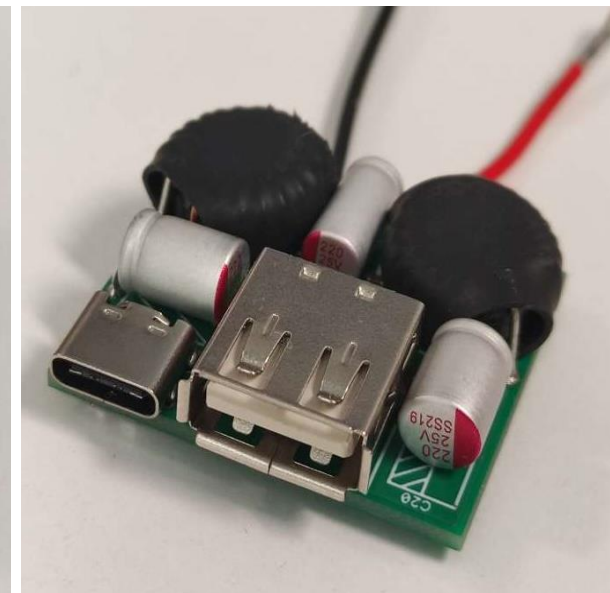
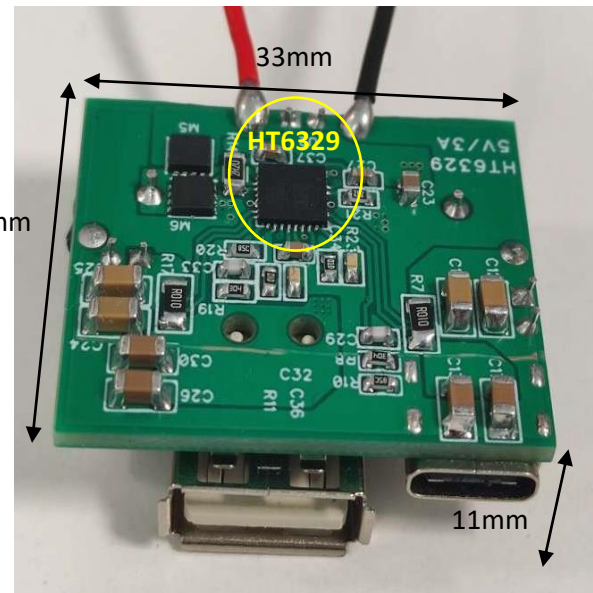
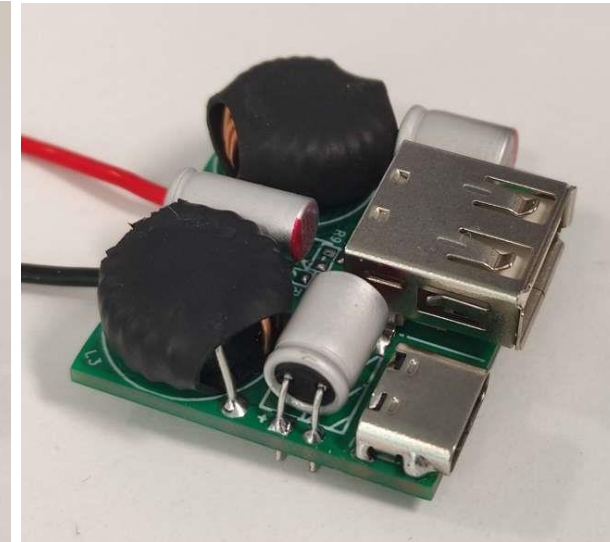
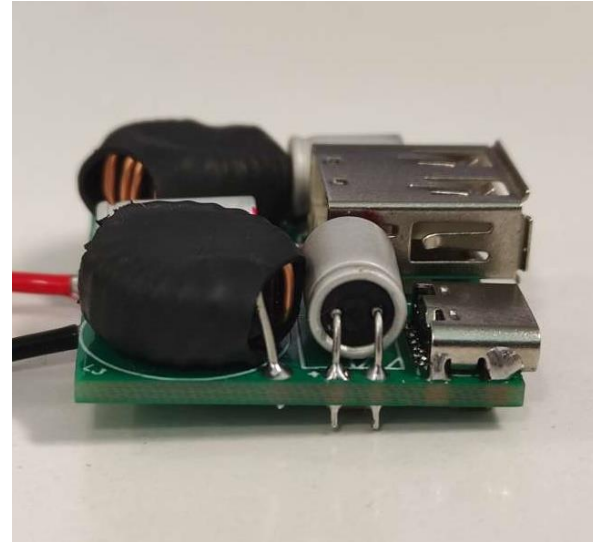


HTT 模组可提供 30W 功率
或者更多



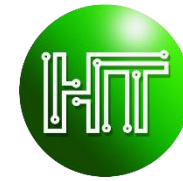
公交USB 供电方案

芯片包括
HT6329 DC-DC Converter
應用



	HTT樣品规格
产品尺寸：	28 x 33 x 11mm
产品重量：	14.8g
输入电压范围：	7-20V
输出电压：	5.2V
输出电流：	每通道 3A，总输出 6A
输出功率：	30W
效率：	>95%

Internal Use Only



Dual Port MaxSpeed Fast Charging is just a *Breeze!*

<http://www.hightt.com>



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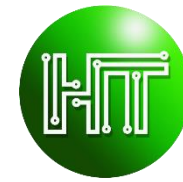
聯絡我們 Contact Us (Hong Kong Office)

Tel: (852) 36195375 Address: Unit 713, 7/F, 12W, 12 Science Park West Avenue,
Email: httadmin@hightt.com Hong Kong Science Park, Shatin, Hong Kong

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附录一

65W 氮化镓适配器的测试结果

测试规格



输入电压

AC 110-220V

输出电压和电流

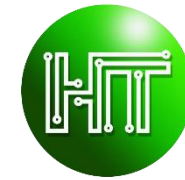
- 5V, 0 – 3A (15 W)
- 9V, 0 – 3 A (27 W)
- 12V, 0 – 3 A (36 W)
- 15V, 0 – 3 A (45 W)
- 20V, 0 – 3.25 A (65 W)

双路输出的总输出电流及功率

- 最大总输出电流为 6 A
- 总功率最高为 65 W

Voltage Transition Waveforms

电压转换波形



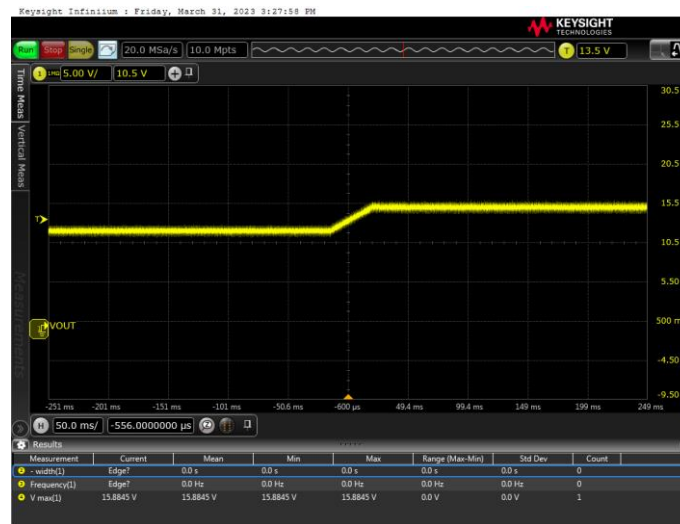
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5V to 9V



9V to 12V



12V to 15V

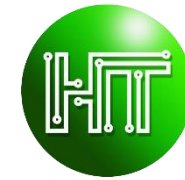


15V to 20V

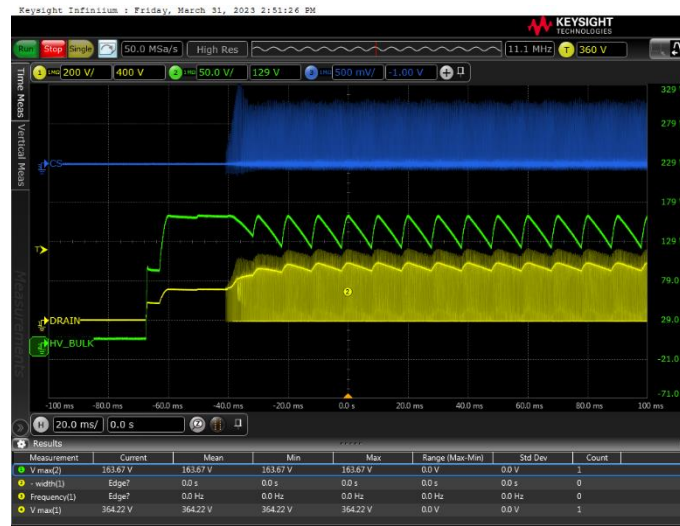
Internal Use Only

Waveforms-Input 115V full load 输入 115V 满载

[返回目录](#)



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Primary SW node Start up



Primary SW node



Secondary SW node



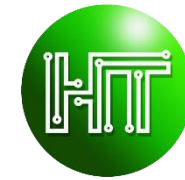
Vout and secondary SW node start up

Internal Use Only

Waveforms-Input 115V No load

[返回目錄](#)

輸入 115V 空載



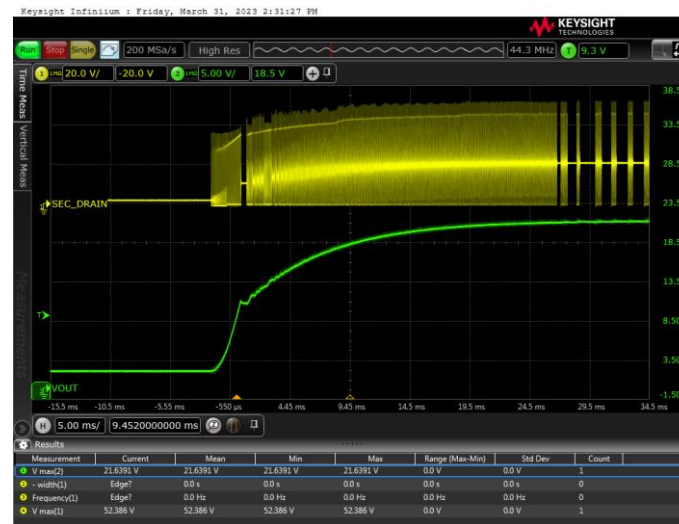
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Primary SW node Start up



Primary SW node



Vout and secondary SW node start up

Internal Use Only

Waveforms-Input 230V full load

返回目錄
輸入 230V 满载



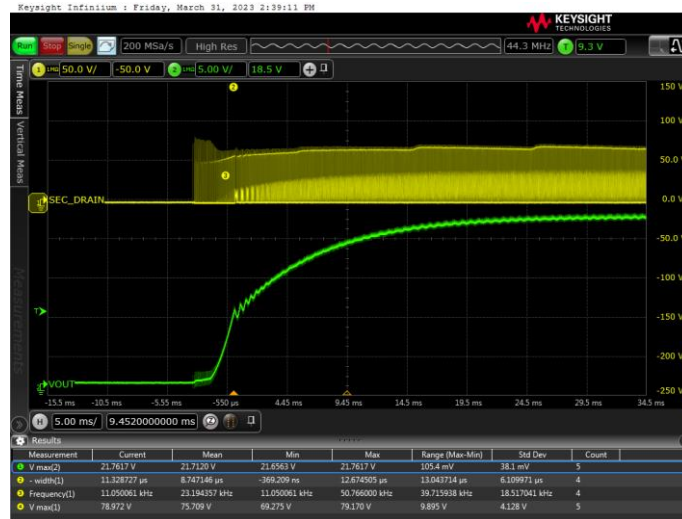
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Primary SW node Start up



Primary SW node



Secondary SW node



Vout and secondary SW node start up

Internal Use Only

Waveforms-Input 230V No load

返回目錄
输入 230v 空载



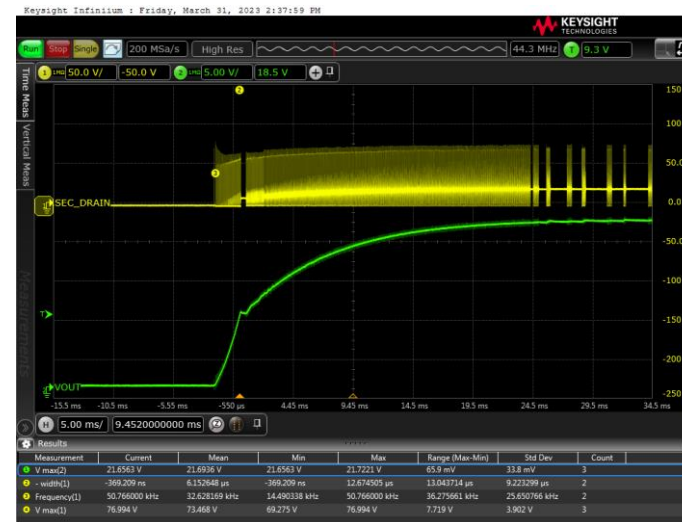
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Primary SW node Start up

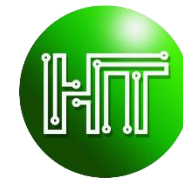


Primary SW node



Vout and secondary SW node start up

Internal Use Only



附录二

30W壁挂式的测试结果

测试规格



输入电压

AC 220-240V

输出电压和电流

- 5V, 0 – 3A (15 W)
- 9V, 0 – 3 A (27 W)
- 12V, 0 – 2.5 A (25 W)
- 20V, 0 – 1.5 A (30 W)

双路输出的总输出电流及功率

USB-C1	USB-C2
5V/3A	5V/3A
9V/1.65A	9V/1.65A
12V/1.25A	12V/1.25A
15V/1A	15V/1A

- 最大总输出电流为 6 A
- 总功率最高为 30 W {15W (5 / 9 / 12 / 20V) + 15W (5 / 9 / 12 / 20V)}

效能测试

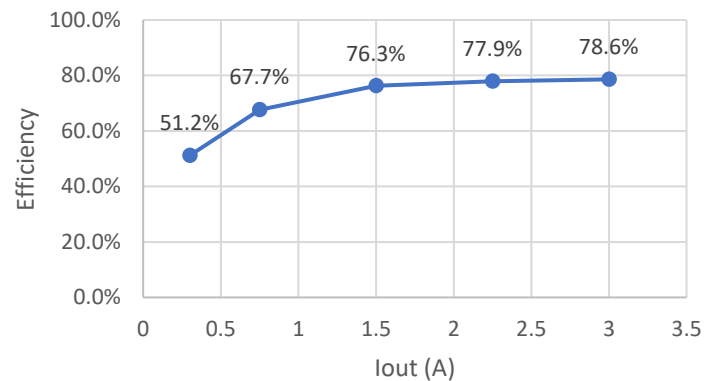
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HT6329 (15W + 15W) Wallmount 充电器应用
雙通道 PD, QC



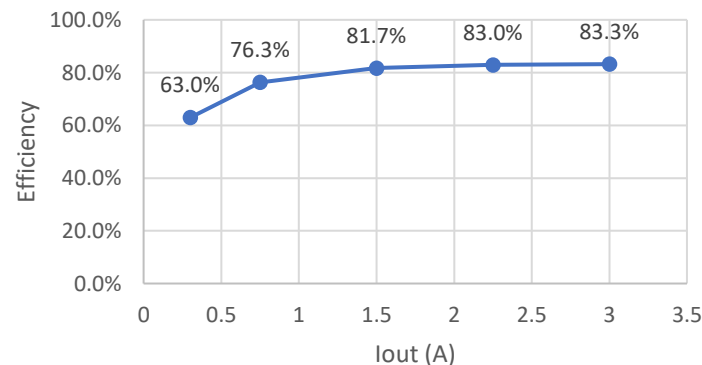
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Efficiency, PDO=5V I_{max}=3A



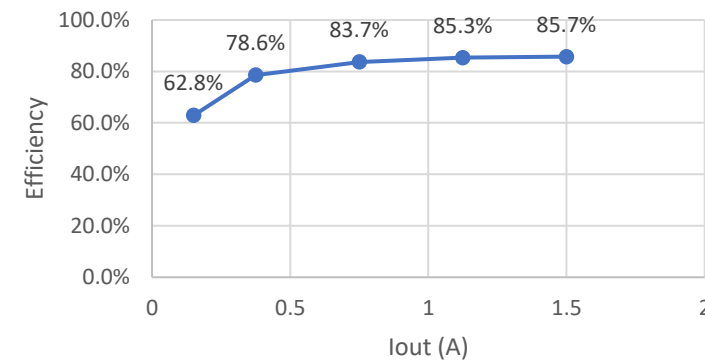
4-point Average Efficiency = 75.2%

Efficiency, PDO=9V I_{max}=3A



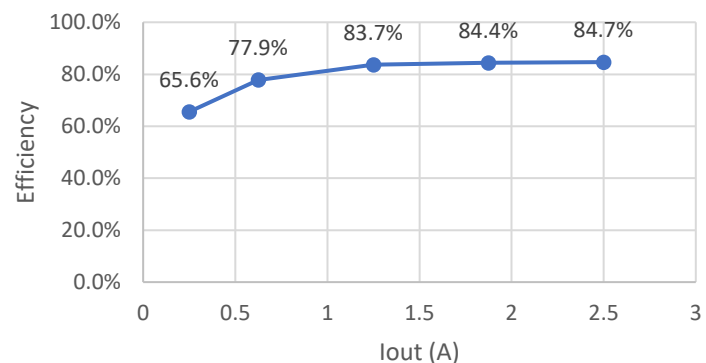
4-point Average Efficiency = 81.1%

Efficiency, PDO=20V I_{max}=1.5A



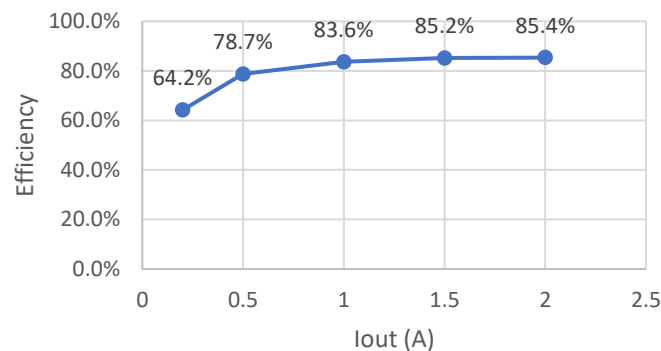
4-point Average Efficiency = 83.3%

Efficiency, PDO=12V I_{max}=2.5A



4-point Average Efficiency = 82.7%

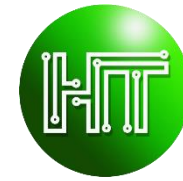
Efficiency, PDO=15V I_{max}=2A



4-point Average Efficiency = 83.2%

Voltage Transition Waveforms

电压转换波形



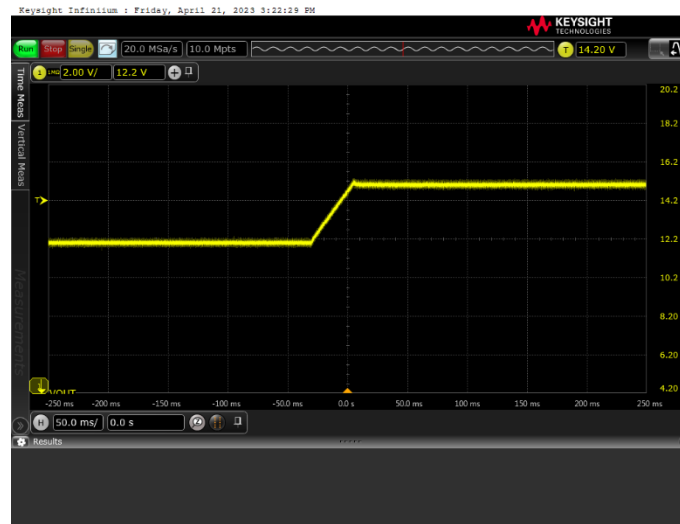
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5V to 9V



9V to 12V



12V to 15V



15V to 20V

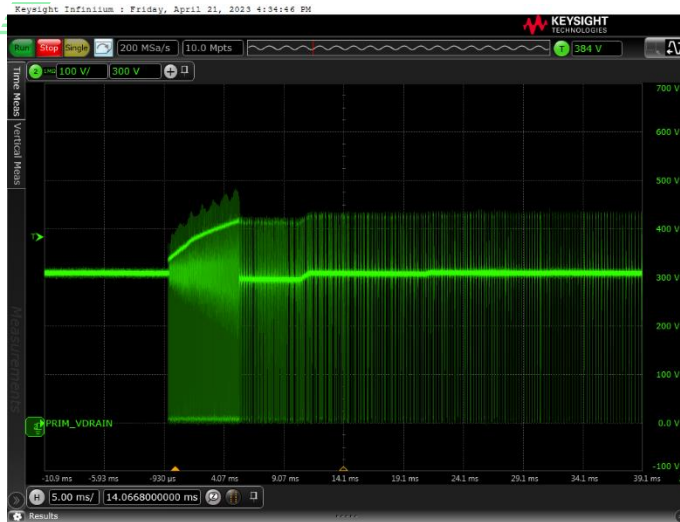
Internal Use Only

Waveforms-at No load 空载时波形

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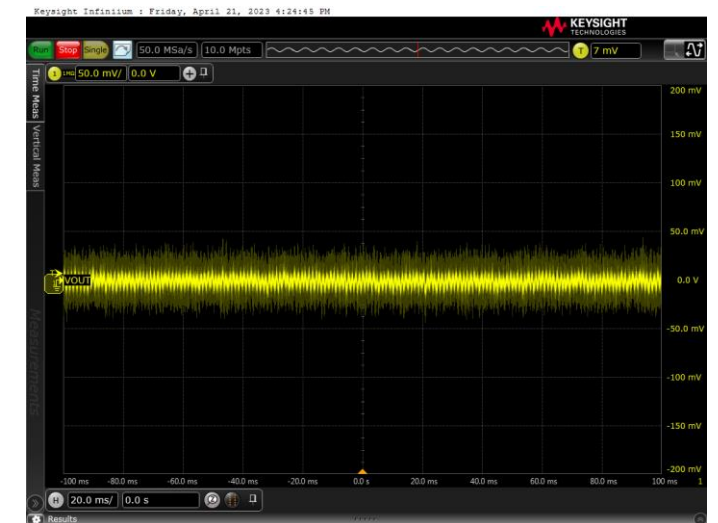
Primary SW node Start up



Vout and secondary SW node start up



Type-C Output at No Load 5V



Type-C Output at No Load 5V Ripple

Internal Use Only

Waveforms-at Full load 满载时波形

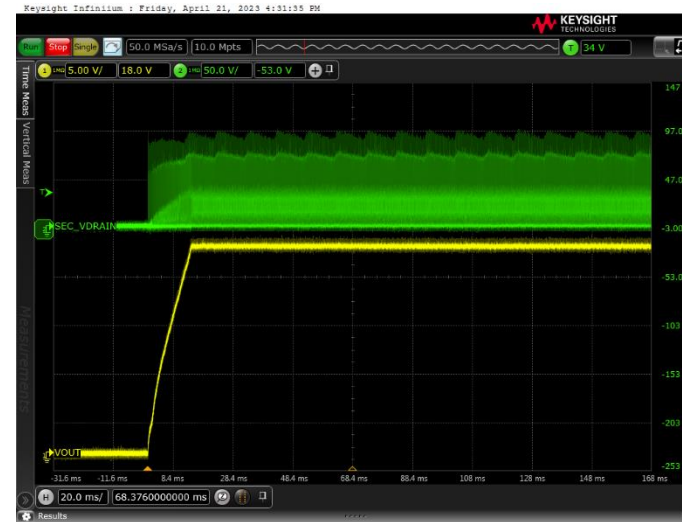
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Primary SW node Start up



Vout and secondary SW node Start up



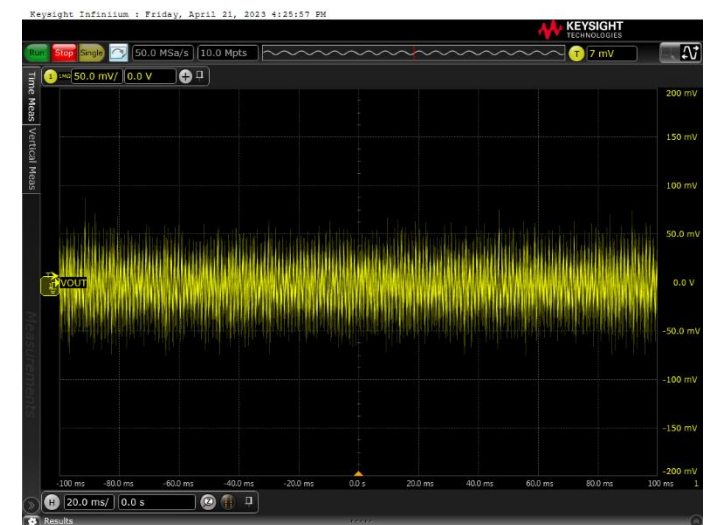
Type-C Output at Full Load 5V



Primary SW node Steady state
Internal Use Only



Vout and secondary SW node Steady state

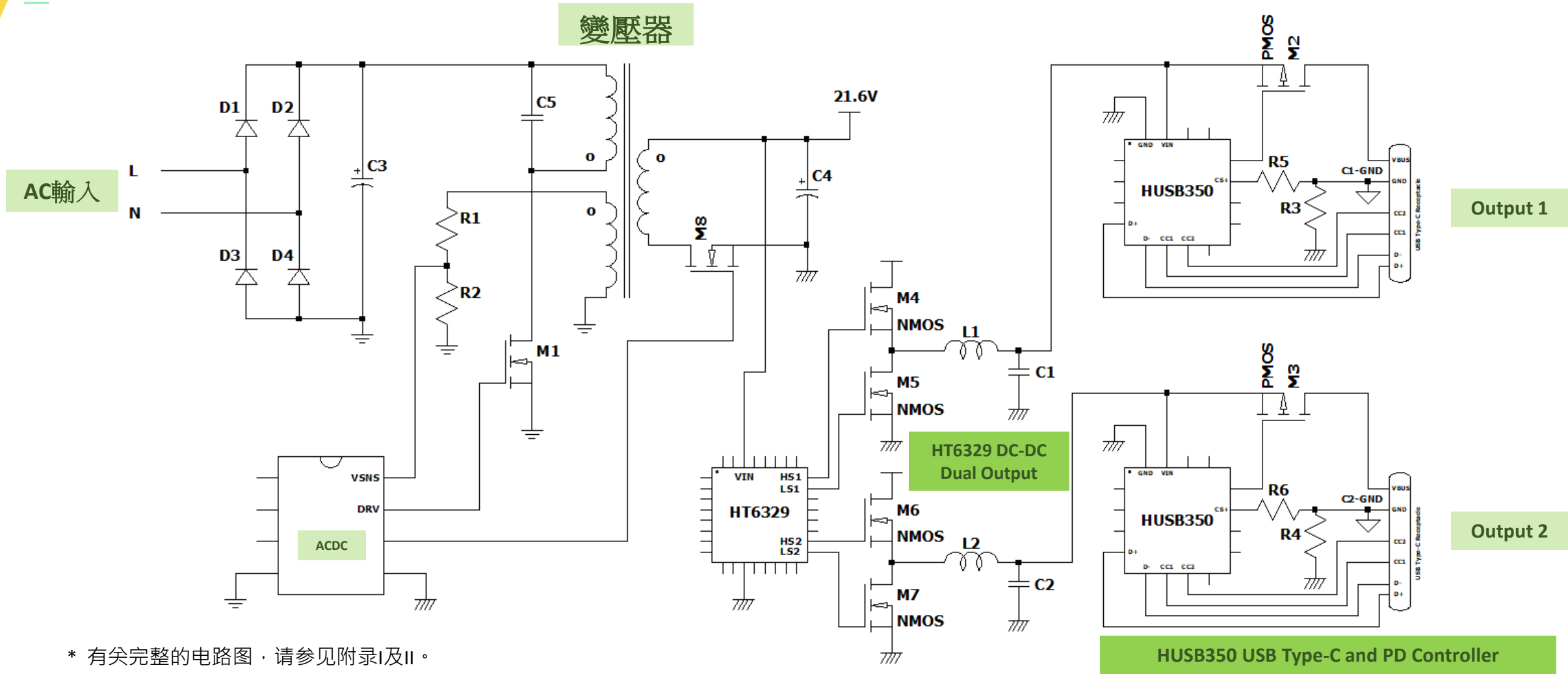


Type-C Output at Full Load 5V Ripple



演示板介紹

變壓器

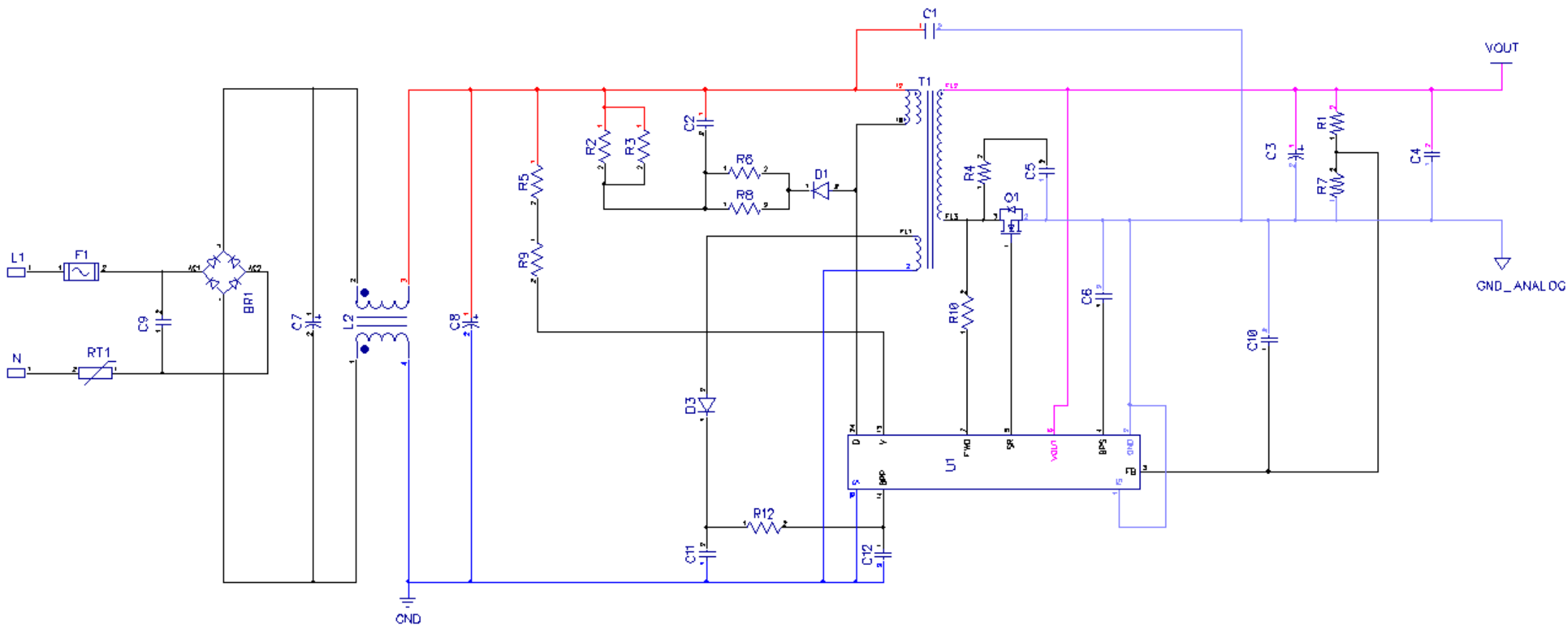


* 有关完整的电路图，请参见附录I及II。



附录 I - AC/DC原理图

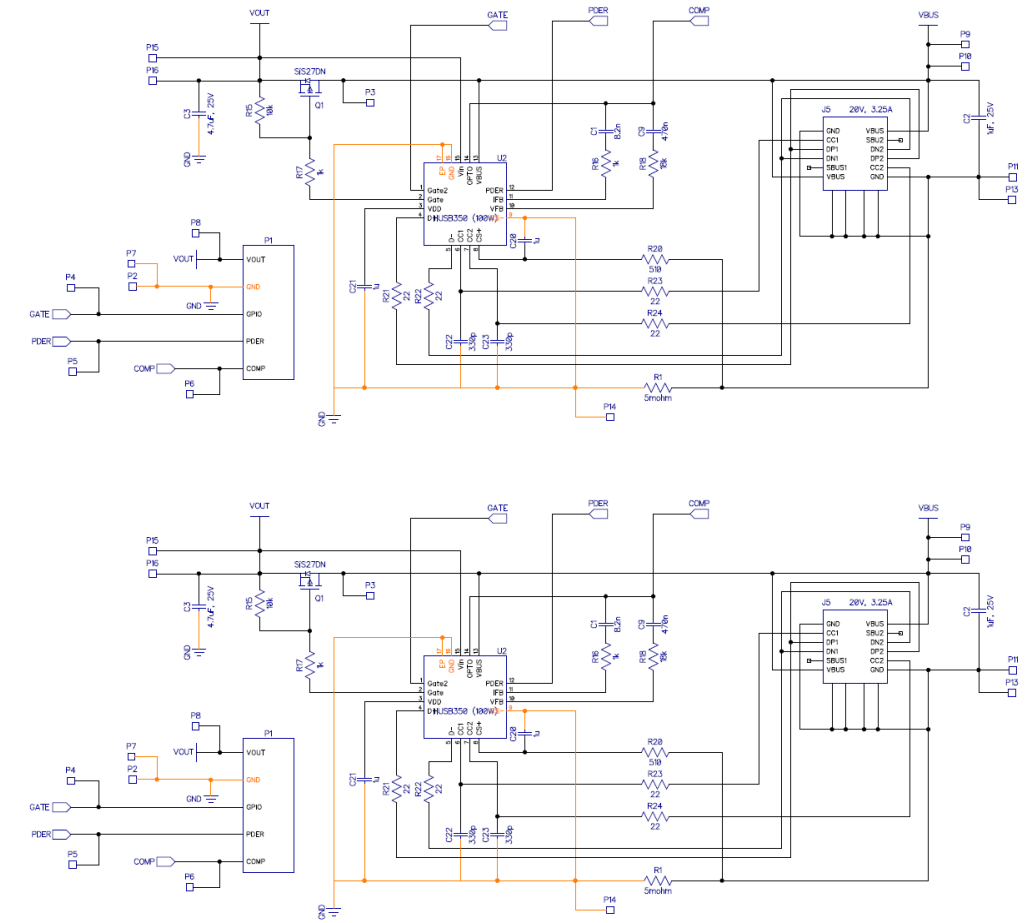
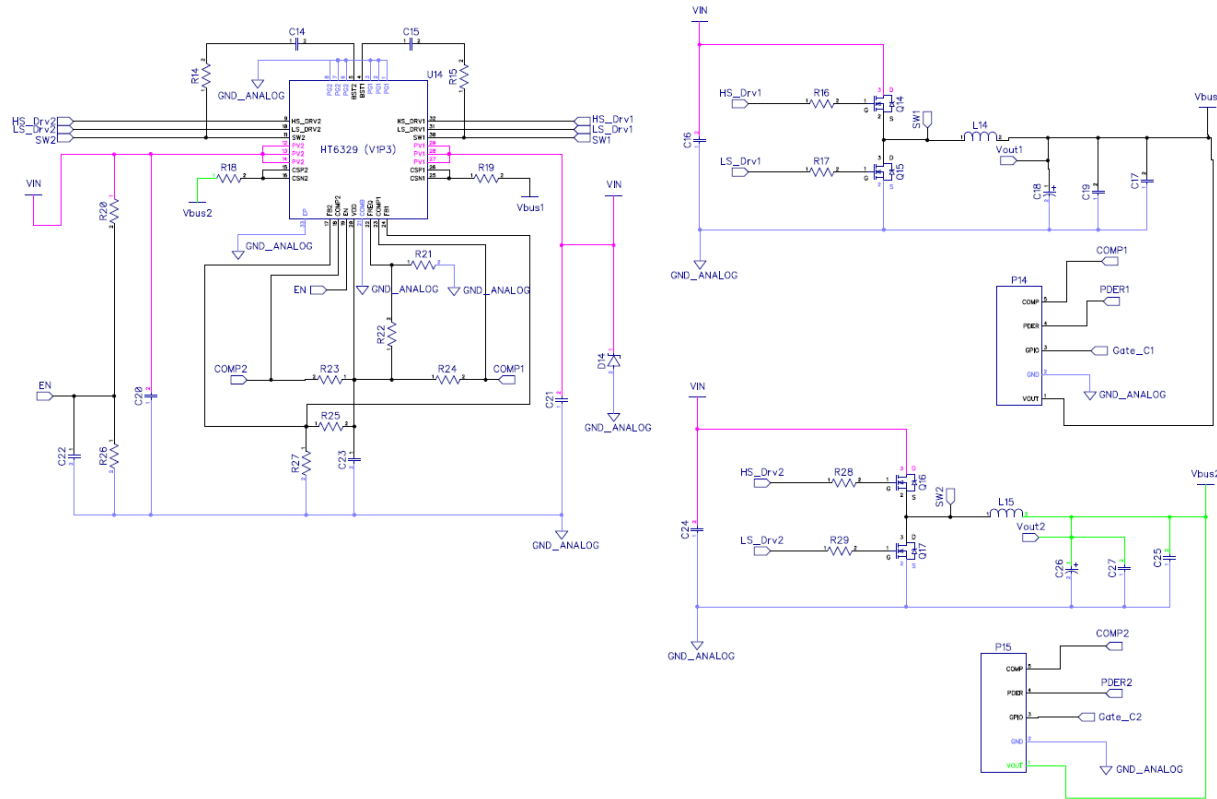
- 演示板原理图 (AC/DC部分)





附录 II - HT6329 + HUSB350

- 演示板原理图 (DC/DC及HUSB350部分)





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