



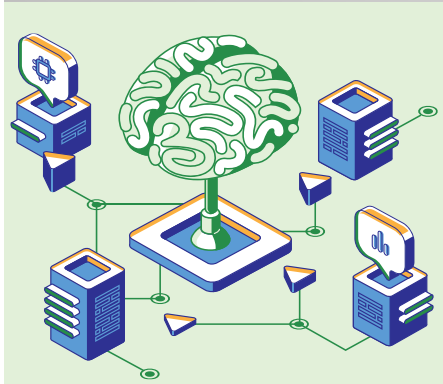
USB port module solutions

by

High Tech Technology Limited

HTT KEY IC PRODUCTS

DC-DC



HT 3000 series
AIoT & Smart Home
Power supply chip



HT 6000 series
Car LED headlights,
Fast charger
Power supply chip



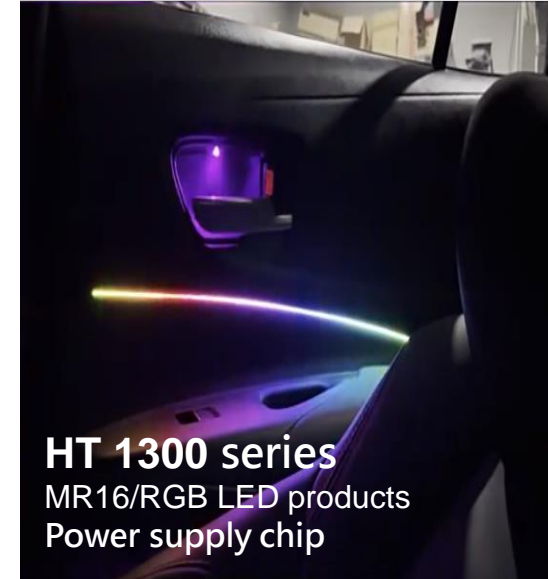
HT 7000 series
Car LED headlights,
Fast charger
Power supply chip

USB-C



HT 5000 series
USB-C / PD, QC Fast charging
Protocol powered chip

RGB-LED



HT 1300 series
MR16/RGB LED products
Power supply chip

- **I²C** Digital control to realize network management of sensor interoperability
- Internet of Things, intelligent electronic control management, QC power supply

- **Single chip Dual channel output**
- Independent **QC3.0** fast charging, applied for various power supply and charging devices

- Multifunctional single chip **high-frequency dual channel** output
- With **independent QC3.0** fast charging, it can be widely used in variety of compact fast chargers and power supplies.

- Cooperate with famous American suppliers of high-performance electronic components
- Approved **USB-PD3.0** fast charger, green energy, reduced cost

- High-efficiency **analog and digital** dimming mode
- Music sensor lights, car interior atmosphere lights, front and rear lamps



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USB port products / application solutions

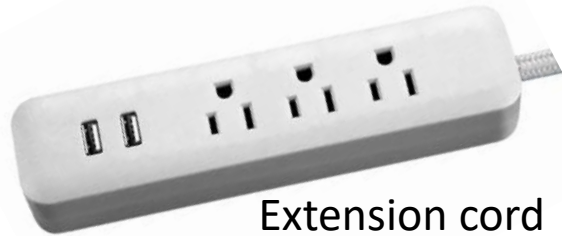
Home equipment



USB charger



wall socket



Extension cord

Internal Use Only

Transportation equipment

Road



bus



train



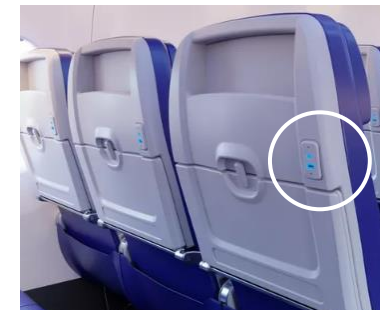
car

waterway



boat / ferry

Air



airplane



HTT chips and USB application solutions

HT6000 series

High Efficiency, External MOSFET Dual Buck DC-DC Controller

- Input voltage: 5V~36V
- external MOSFET
- Selectable switching frequency
 - › 150kHz , 250kHz , 350kHz
- Support CC/CV mode
- soft start
- EMI Dither (patent authorized)

HT6329

Both channels are external feedback and support combination mode
(Dual DC-DC , suitable for **dual Type-C solutions**)

HT6122

One channel has built-in QC3.0 protocol and the other channel is external feedback.
(Built-in QC3.0 , suitable for **Type-A + Type-C solution**)

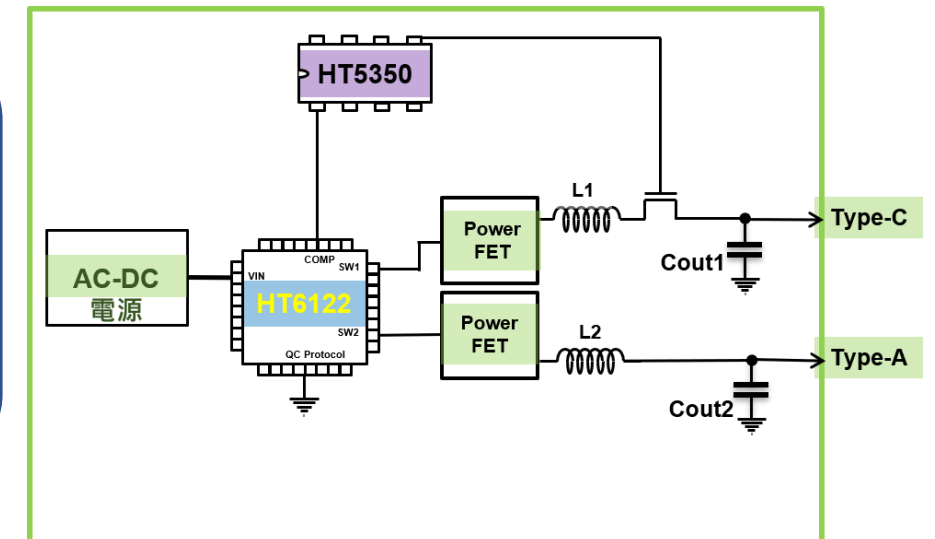
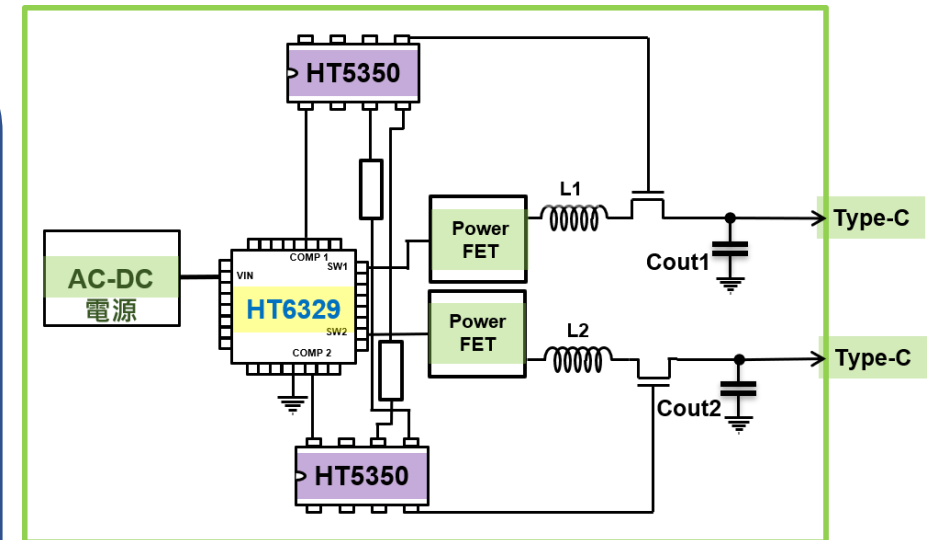
HT5350

USB Type-C and PD Source Controller

HT5350

- Support USB PD3.0 protocol,
- support QC2.0/QC3.0 , BC1.2 DCP protocol
 - Apple 5V, 2.4A mode , BC1.2 DCP mode
 - FCP and AFC fast charging modes

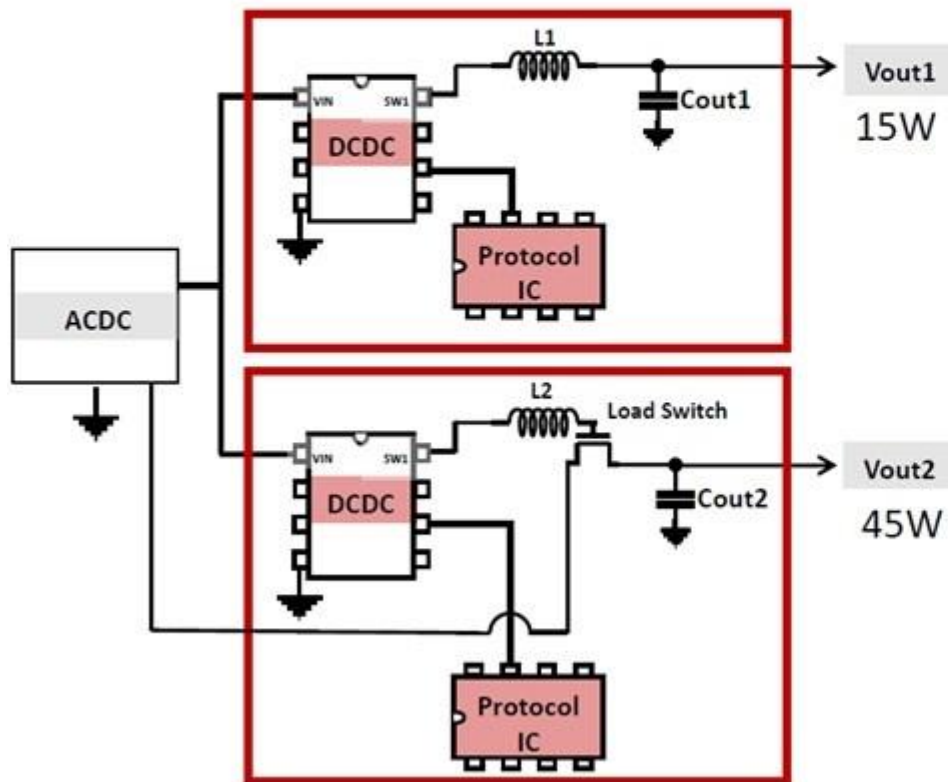
(Fast charging , **full PD function controller solution**)



HTT solution comparison

Other 60W solution

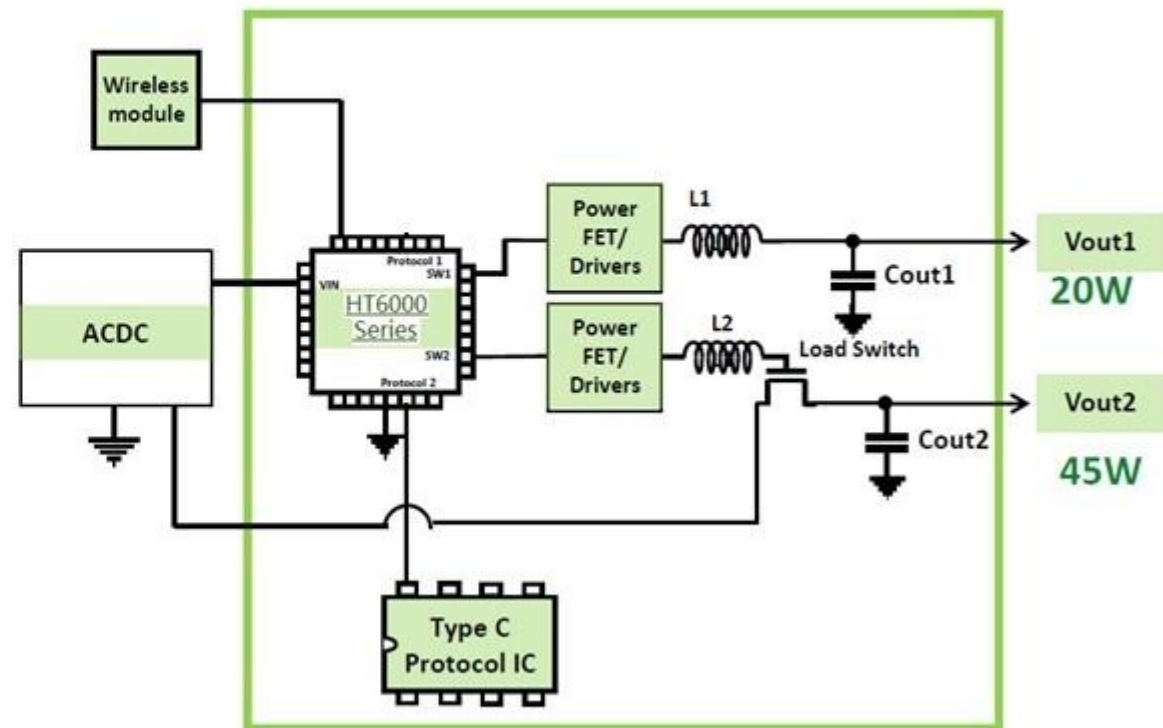
- 15W(A)-45W(C)



HTT 60W solution

- ✓ 20W(A)-45W(C)

Saved > 40%



HT6000 series integrates dual-channel DC-DC chips , saving more space in application.



IoT applications

HTT chip has built-in I2C , HT3000, HT6000 can bring convenience



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 charging adaptor solution



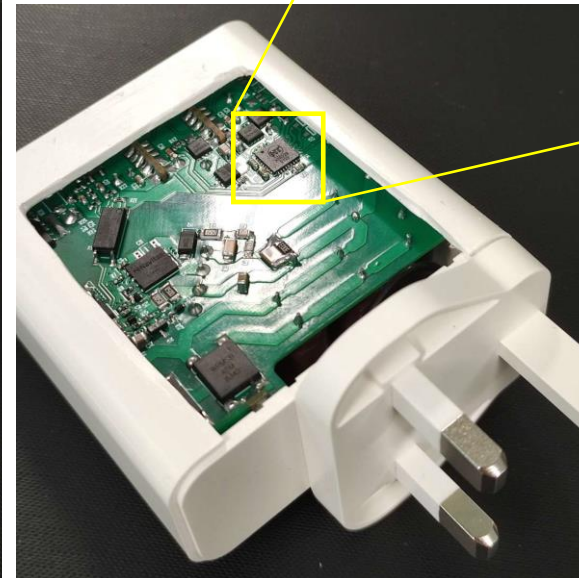
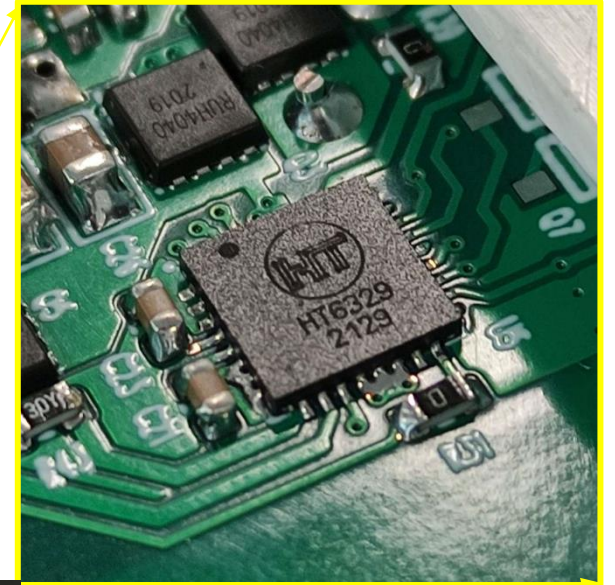
HTT ICs

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

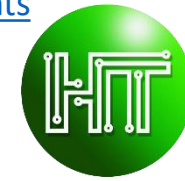
[HT5350](#) PD Protocol



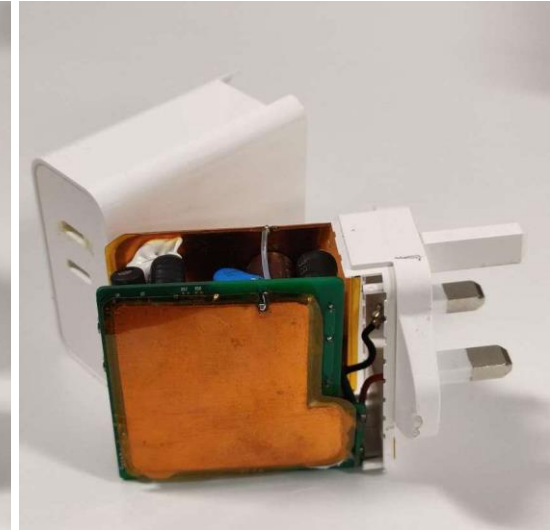
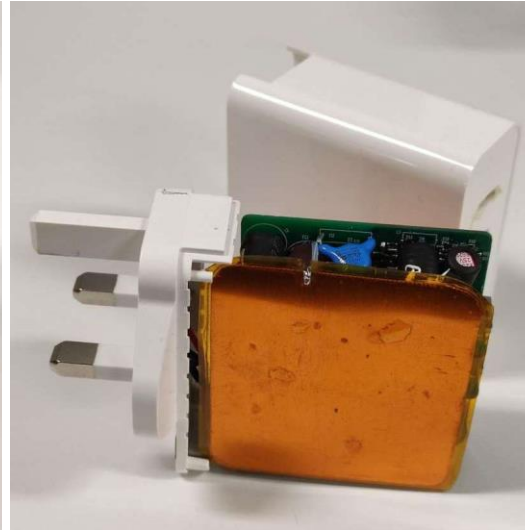
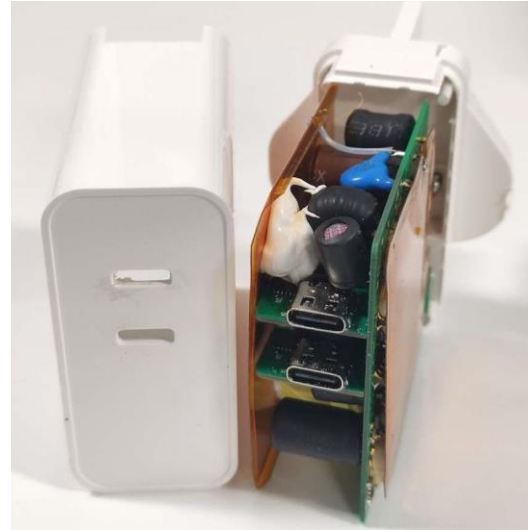
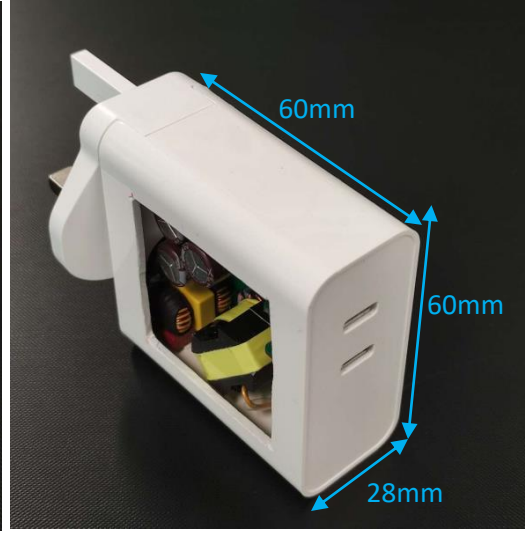
HTT GaN 65W dual USB Type-C charging adaptor solution



Input voltage	100V~240V 50/60Hz
Single port output	5V 3A, 9V 3A, 12V 3A, 15V 3A, 20V 3.25A
Dual port output 1	5V 3A, 9V 3A, 12V 3A, 15V 3A
Dual port output 2	5V 3A, 9V 3A
Maximum power	65W



Charging adaptor module configuration





Summary - charging adaptor specifications

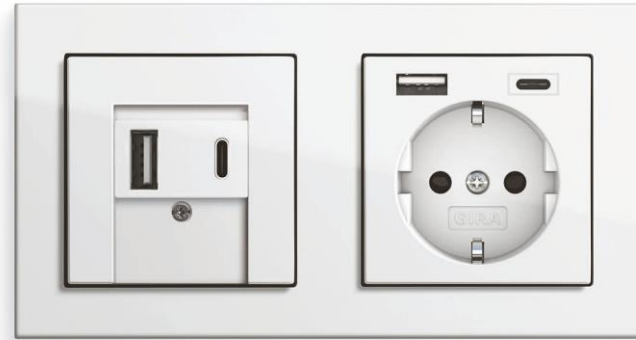
Operating mode :	single channel	dual channel
Input voltage	AC 110V-220V	
Output voltage and current range (Maximum output power is 65W)	(5V 3A), (9V 3A), (12V 3A) (15V 3A), (20V 3.25A)	The maximum total output current of dual channels is 6A
Major fast charging protocols supported	PD 3.0, QC 3.0*	
size	58mm (length) X 58mm (width) X 23mm (height)	
Maximum output power	65W	35W + 20W = 55W
Load Regulation accuracy	Output voltage accuracy reaches 98 % under different loads #	
Maximum power conversion efficiency	Vin 110V 88% / Vin 220V 90%	
Short Circuit test	✓	

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

Definition: (Actual Vout / Target Vout) %



Wall socket charging solutions

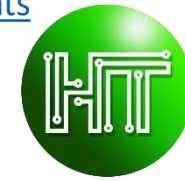


HTT ICs

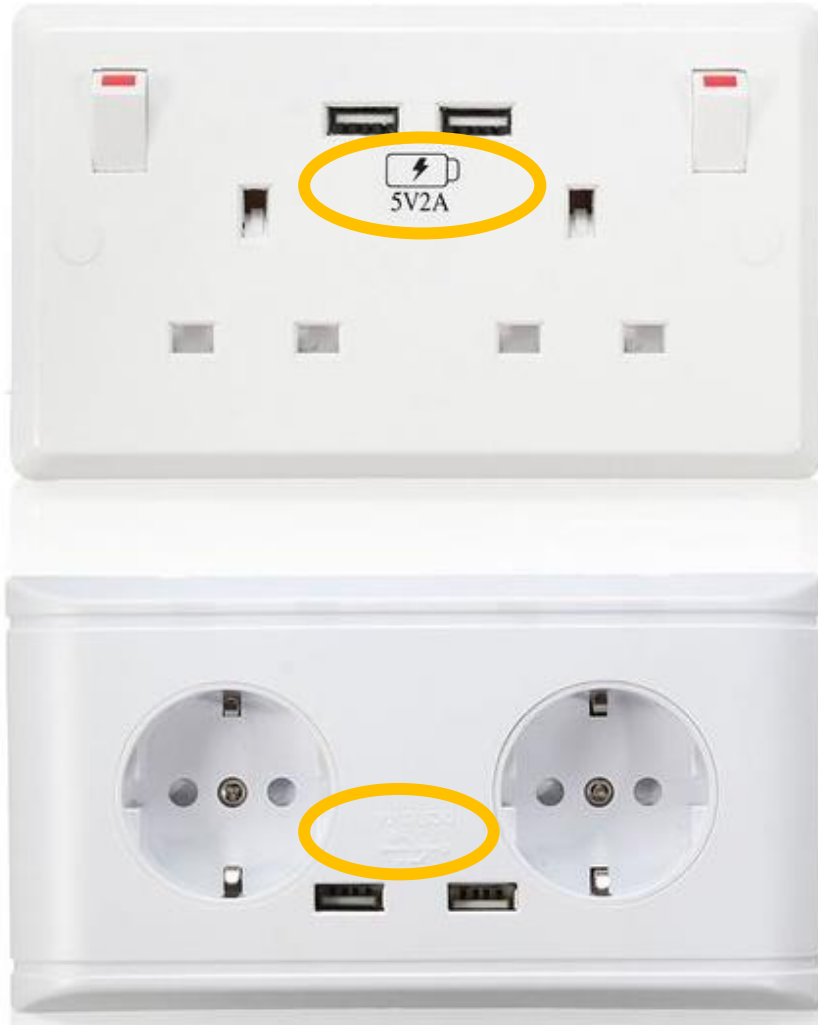
[HT6329](#) / [HT6122](#) DC-DC Converter

[HT5350](#) PD Protocol





General USB wall socket charging specifications

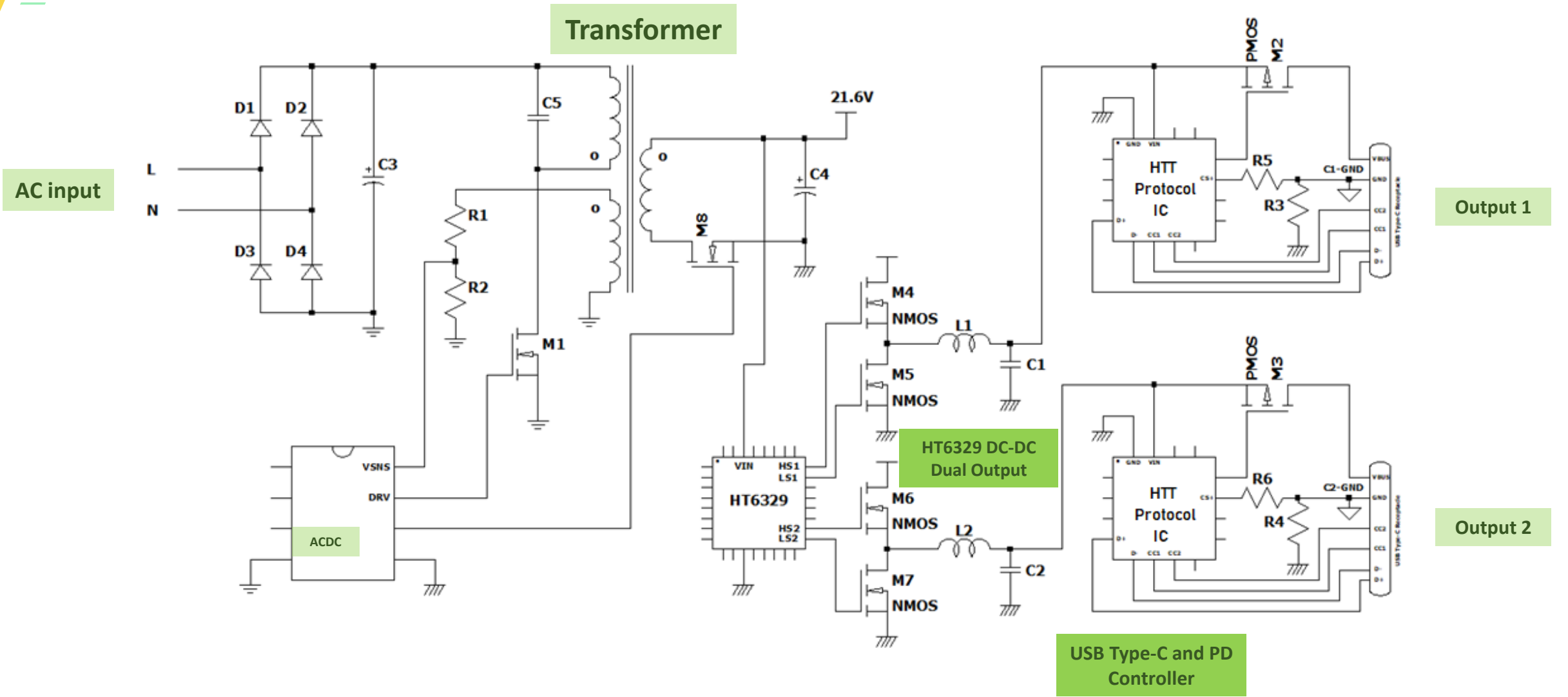


Most products on the general market are $5V2A = 10W$.

HTT module can provide power of **30W or higher** and support multi-ports QC and PD

independent FAST charging simultaneously.

Simple block diagram





UK USB wall socket demo



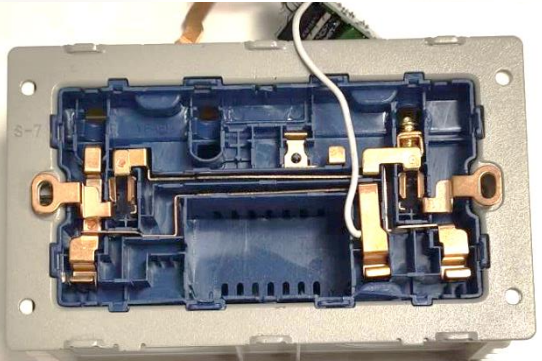
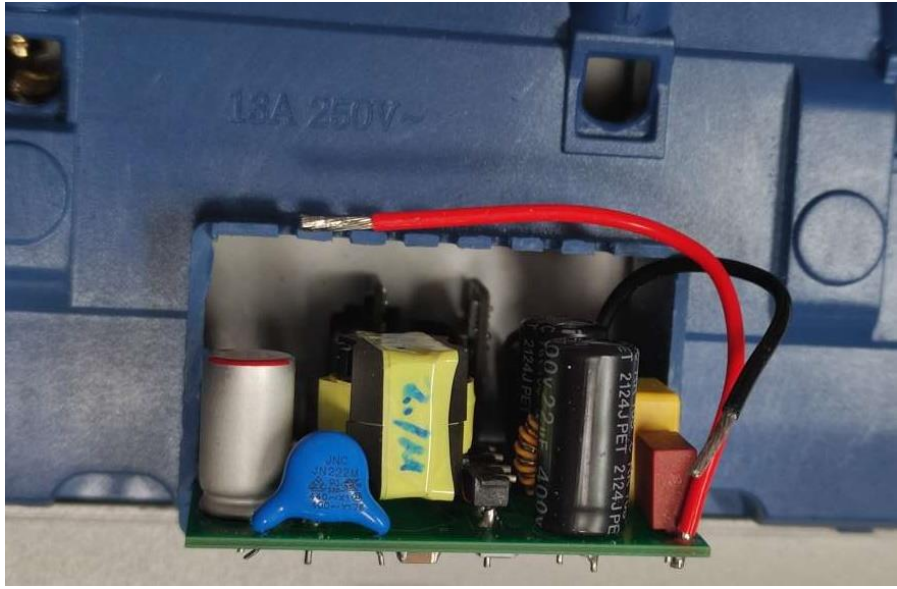
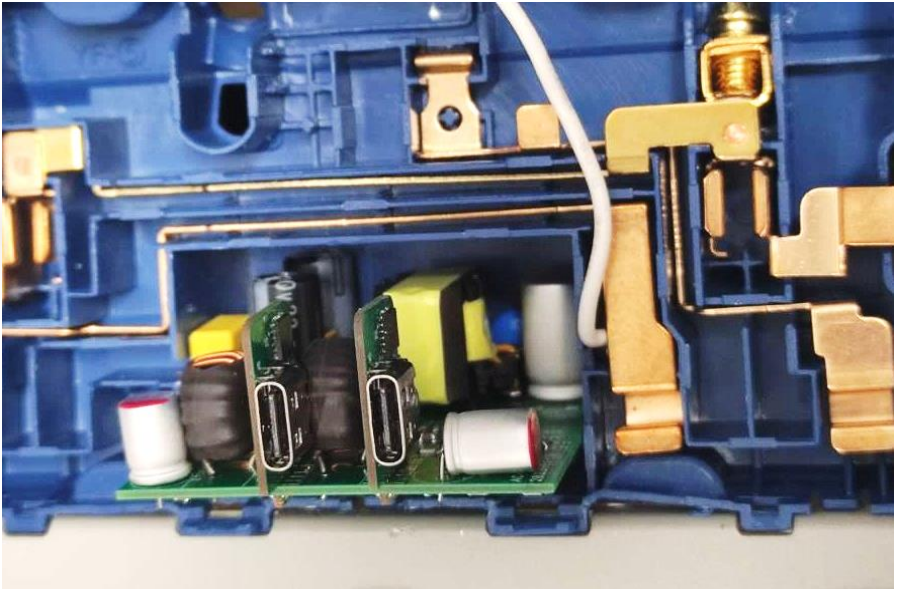
HTT ICs

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

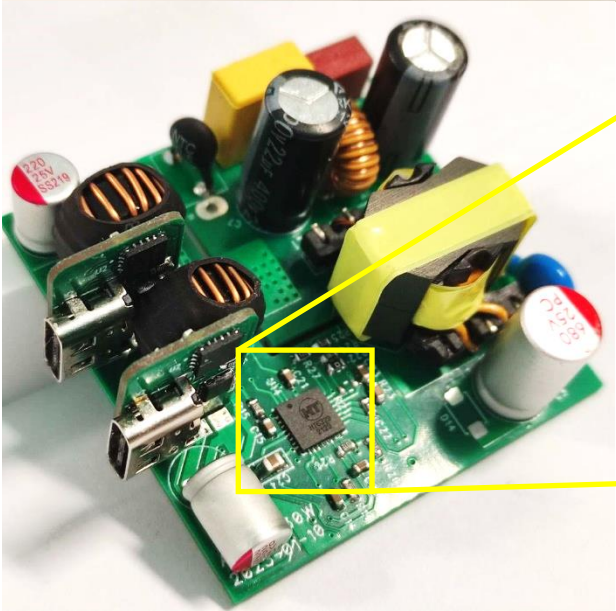
[HT5350](#) PD Protocol



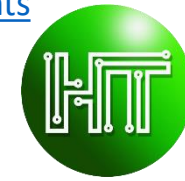
HTT 30W dual USB Type-C module in UK wall socket



Internal Use Only

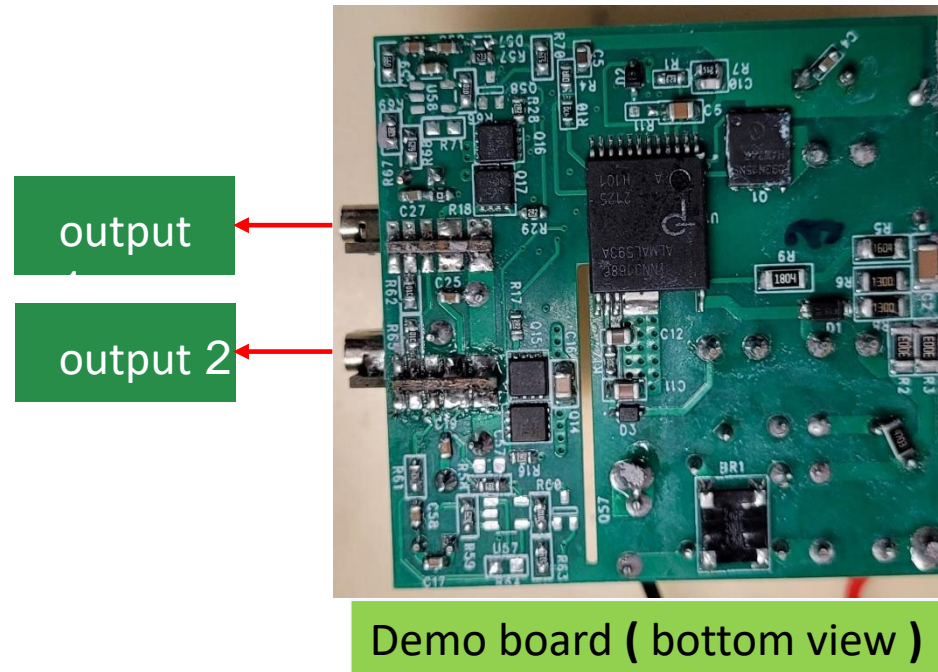
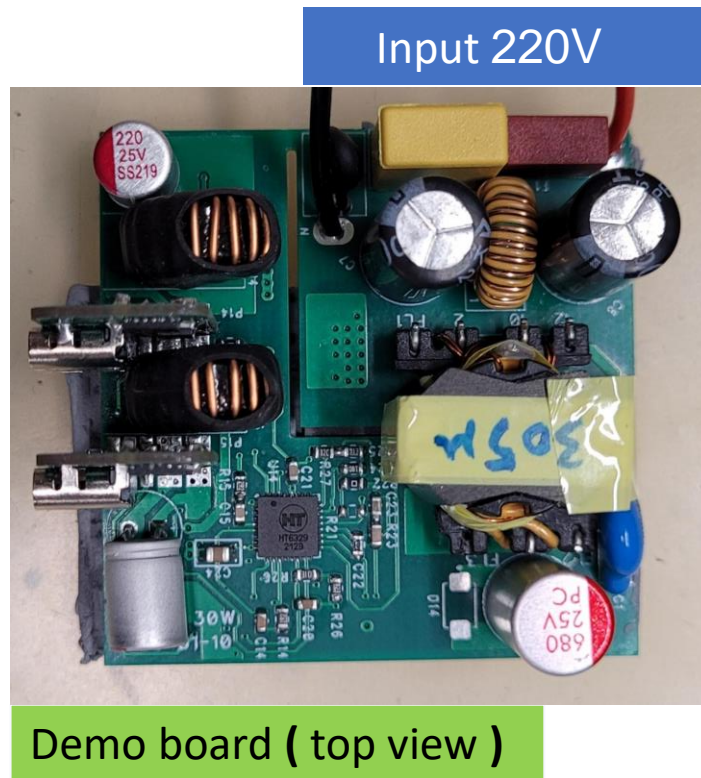


Input voltage	200V~240V 50/60Hz
Single port output	5V 3A, 9V 3A, 12V 2.5A, 15V 2A, 20V 1.5A
Dual port output 1	5V 3A, 9V 1.5A
Dual port output 2	5V 3A, 9V 1.5A
Maximum power	30W



UK wall socket charging module

- Dimensions : 45mm (length) x 45mm (width) x 23mm (height)

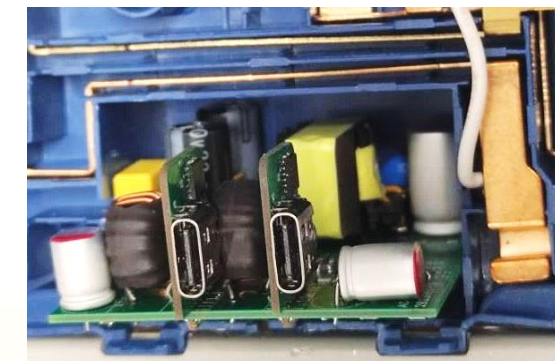
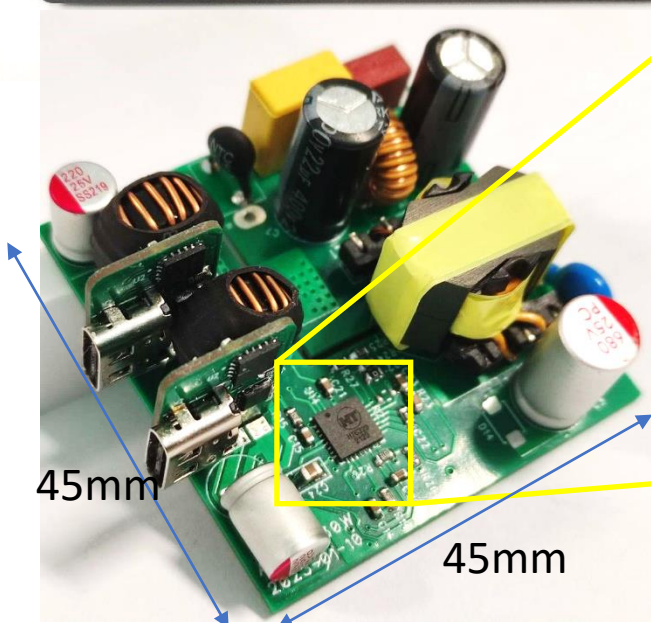
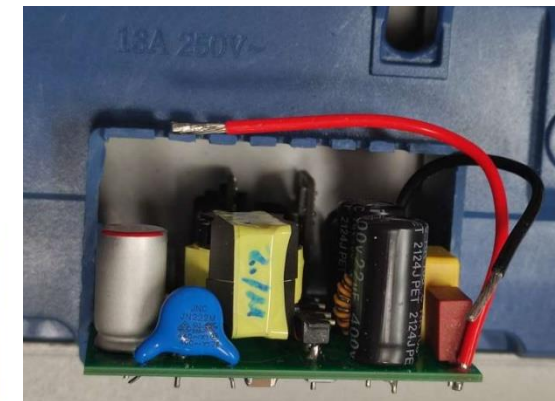
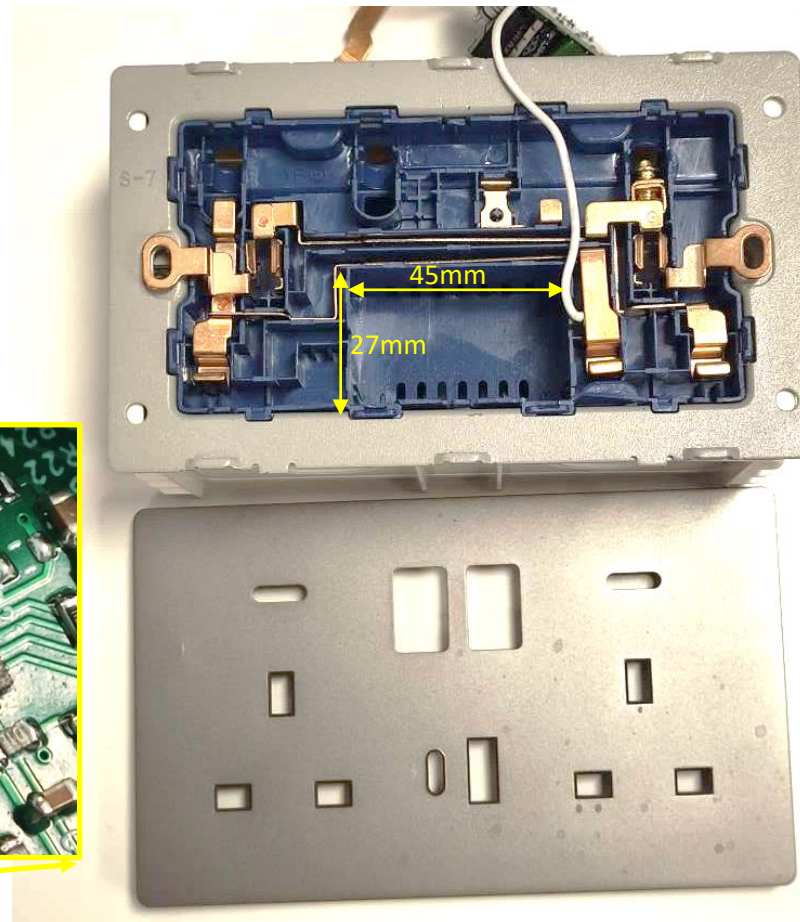
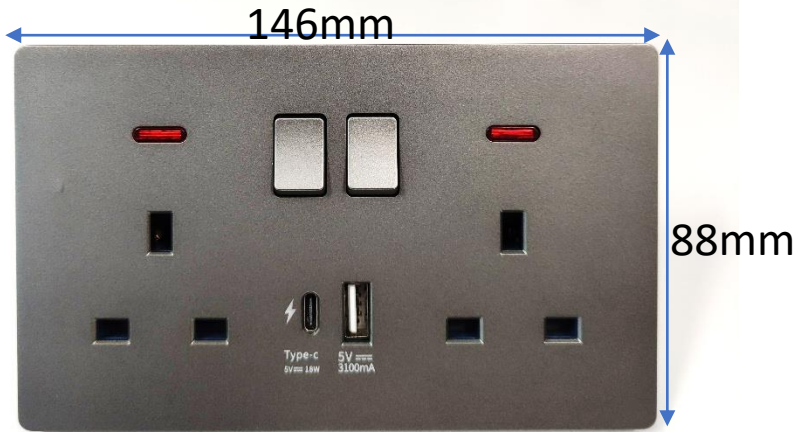


UK wall socket charging module configuration

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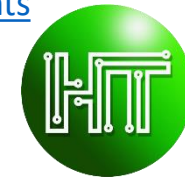
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TECHNOLOGY LIMITED



Internal Use Only

UK wall socket charging modules

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TECHNOLOGY LIMITED

Operating mode :	single channel	dual channel										
Input voltage	AC 220V-240V											
Output voltage and current range (The maximum output power is 15W + 15W)	(5V 3A), (9V 3A), (12V 2.5A), (20V 1.5A)	Dual channel maximum Total output current is 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											
Major fast charging protocols supported	PD 3.0, QC 3.0*											
size	45mm (length) X 45mm (width) X 23mm (height)											
Maximum output power	30W	15W + 15W = 30W										
Load Regulation accuracy	Output voltage accuracy reaches 98 % under different loads #											
Maximum power conversion efficiency	85%	85%										
Short Circuit test	✓											

* 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



US USB wall socket demo



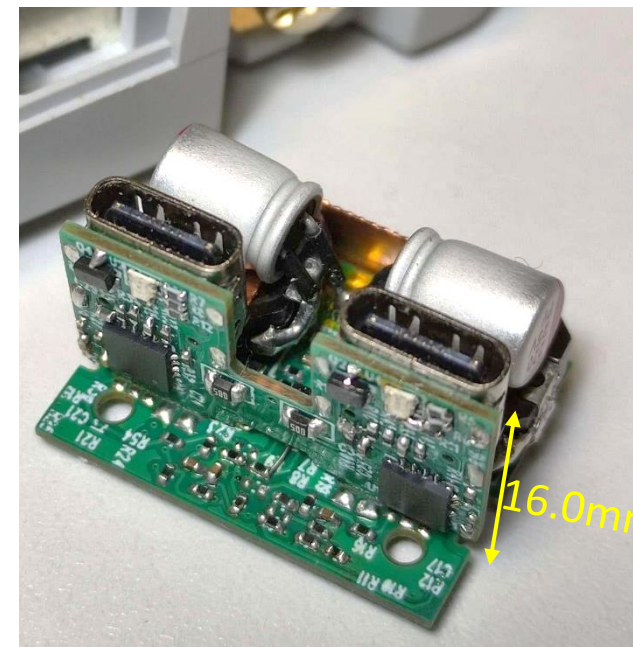
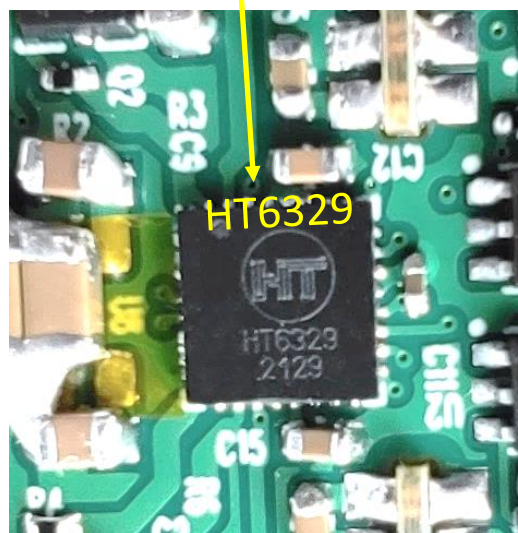
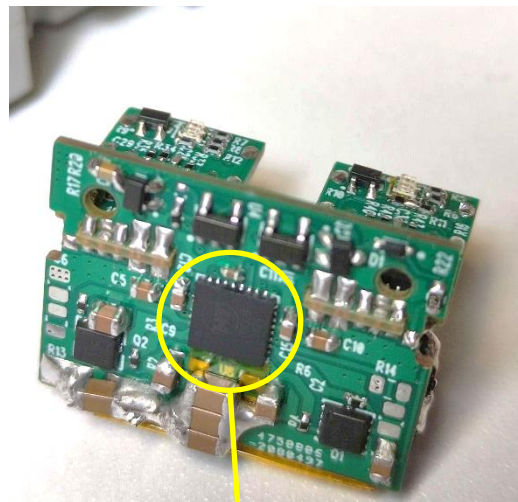
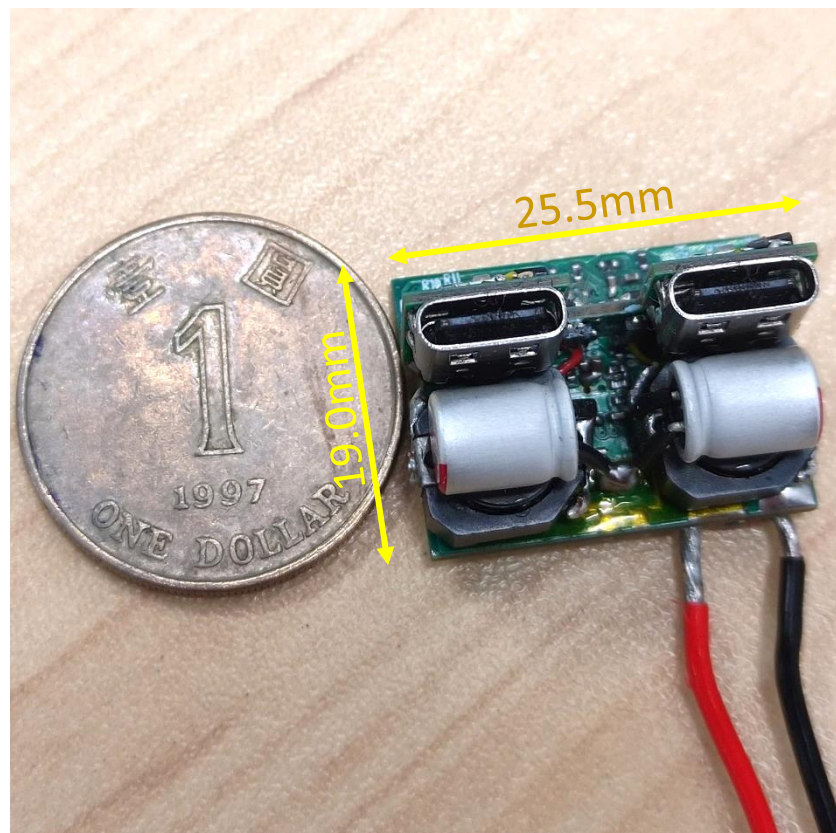
Provide application chips
[HT6329](#) DC-DC Converter
[HT5350](#) PD Protocol

HTT 65W dual USB Type-C module in US wall socket

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Input voltage	100V~240V 50/60Hz
Single port output	5V 3A, 9V 3A, 12V 3A, 15V 3A, 20V 3.25A
Dual port output 1	5V 3A, 9V 3A, 12V 3A, 15V 3A
Dual port output 2	5V 3A, 9V 3A
Maximum power	65W

Internal Use Only

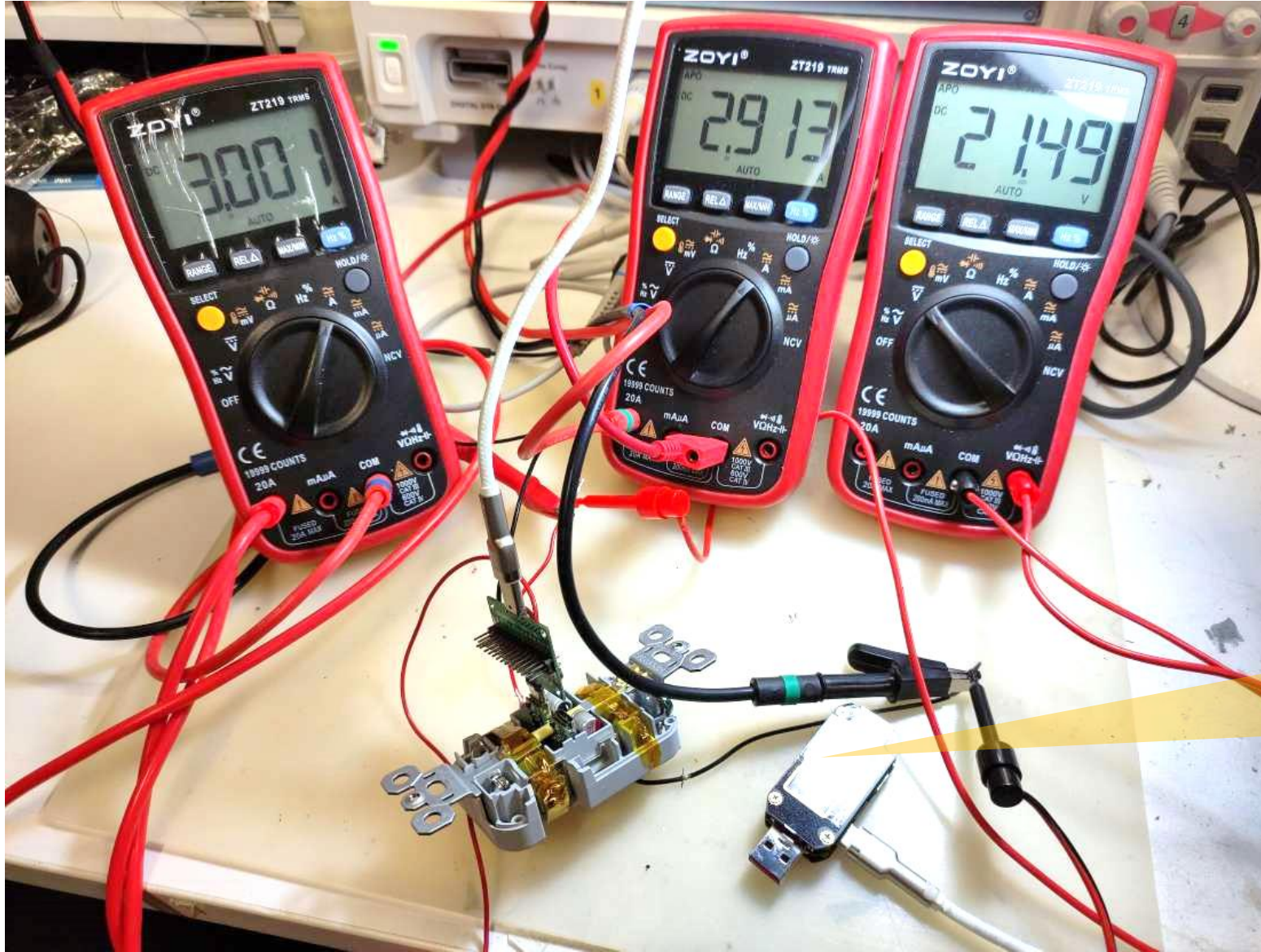


Efficiency test

$I_{out} = 3.001A$

$I_{in} = 2.913A$

$V_{in} = 21.49V$



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

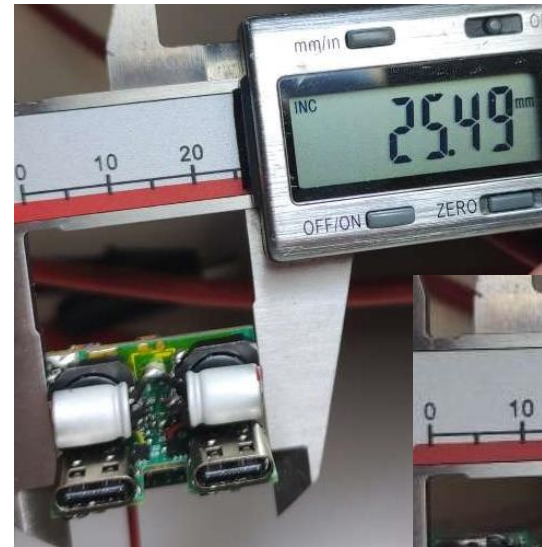
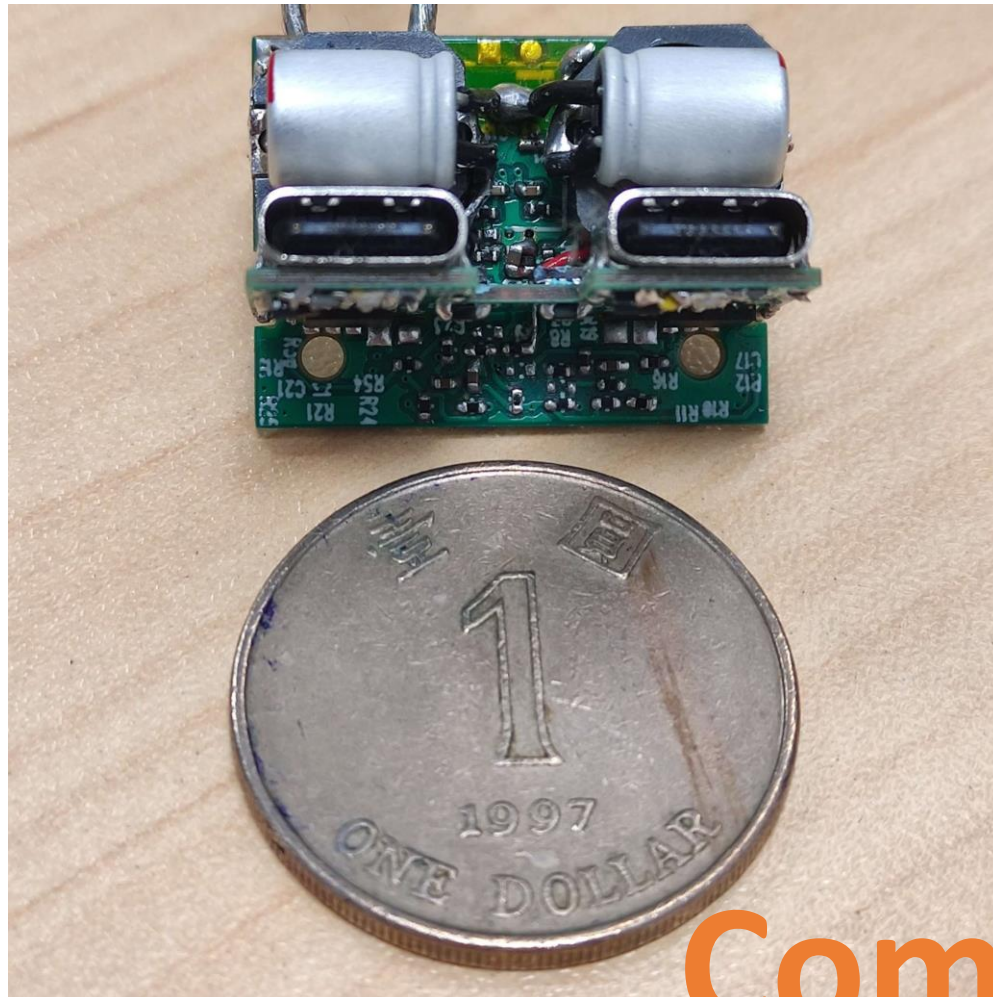
$V_{out} = 20.09V$





Dimensions

Dimensions: 25.5mm x 19.0mm x 16.0mm



Compact size

US wall socket market reference price

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US/UK Market

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

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 ~USD1 00

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



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

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KitchenPowerPopUps.com SHOP ▾ HELP RETURN POLICY CONTACT US

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

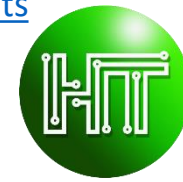
In Stock!

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

Amps : 20 Amps

Watts : 30 Watts

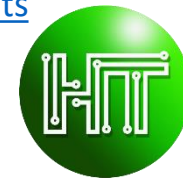
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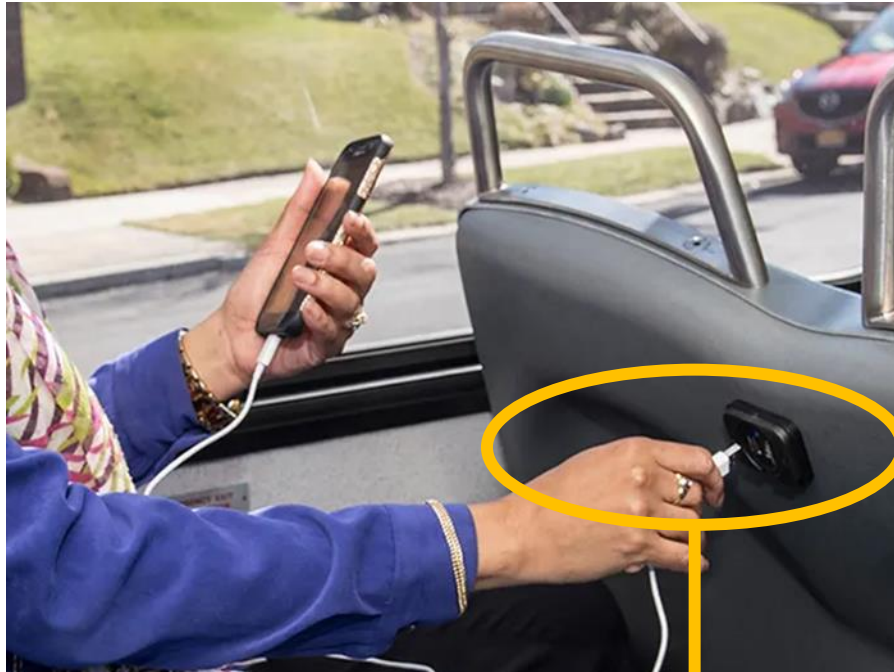
USB power supply solution on transports

HT6329 DC-DC Converter application





USB ports



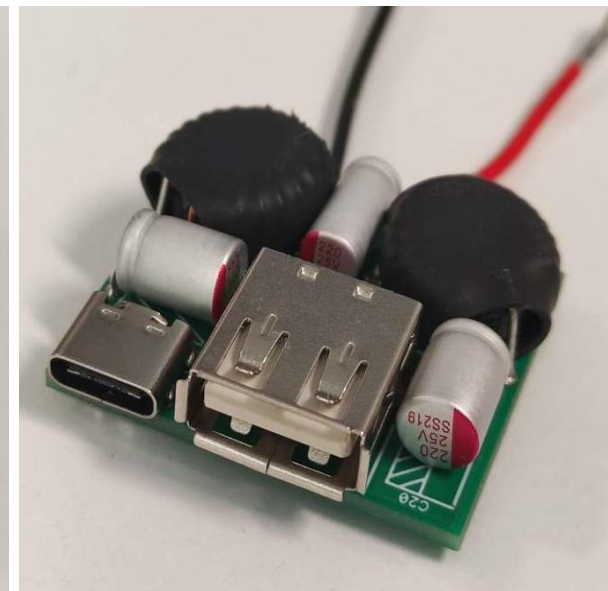
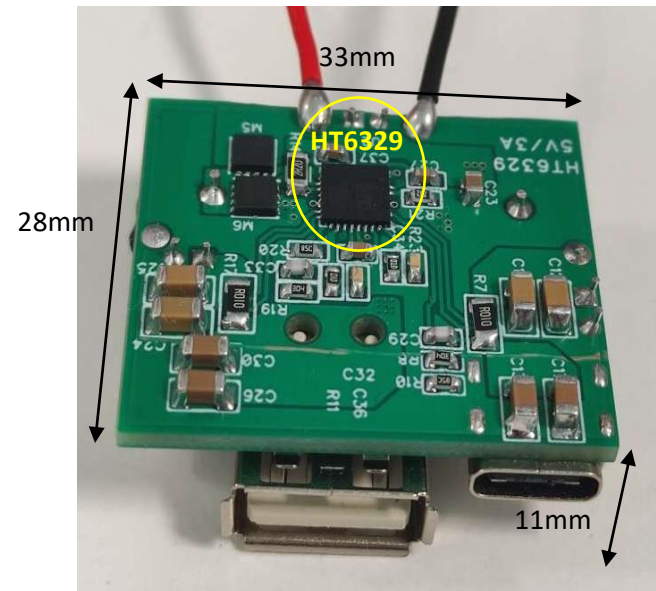
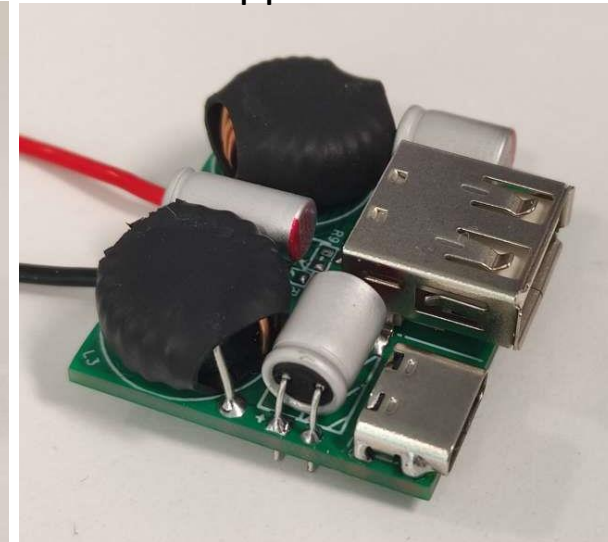
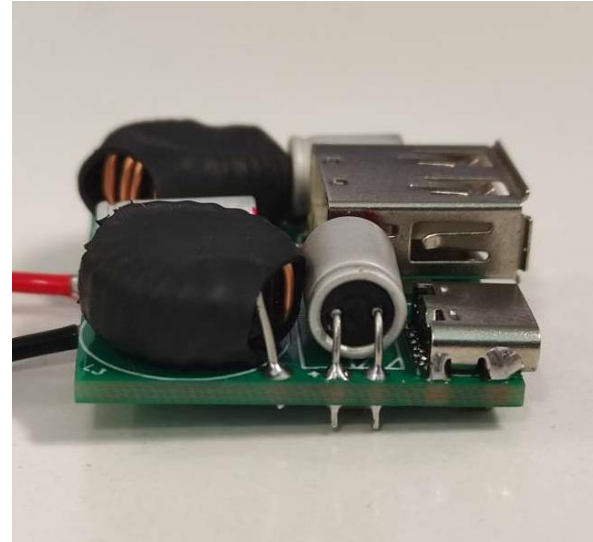
1.1A per port
 $5V \times 1.1A = 5.5W$ max

HTT module can provide
30W power or more



USB power supply solution on transports

HT6329 DC-DC Converter application



	HTT sample specifications
Product Size:	28x33x11mm
product weight:	14.8g
Input voltage range:	7-20V
The output voltage:	5.2V
Output current:	3A per channel , total output 6A
Output Power:	30W
efficiency :	>95%



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

<http://www.hightt.com>



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Appendix I

65W GaN Charging Adaptor Test Report



Test Conditions

Input Voltage

AC 110-220V

Output voltages and current ranges

- 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)

Dual channel output total current and maximum power

- Maximum output current is 6 A
- Total output power is 65 W

Internal Use Only



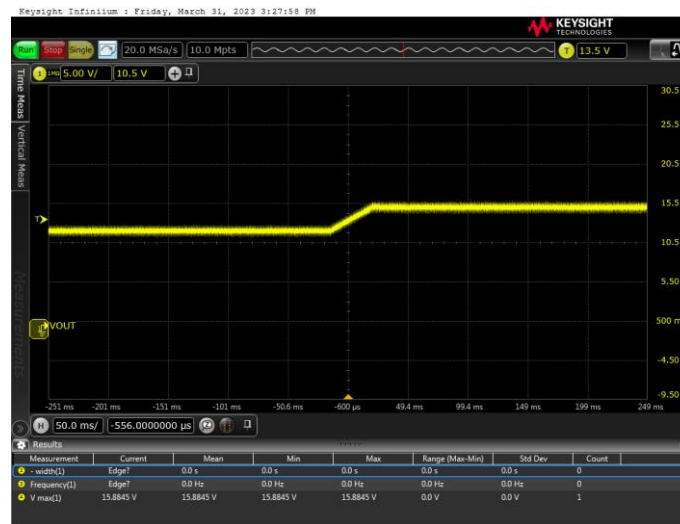
Voltage Transition Waveforms 电压转换波形



5V to 9V



9V to 12V



12V to 15V



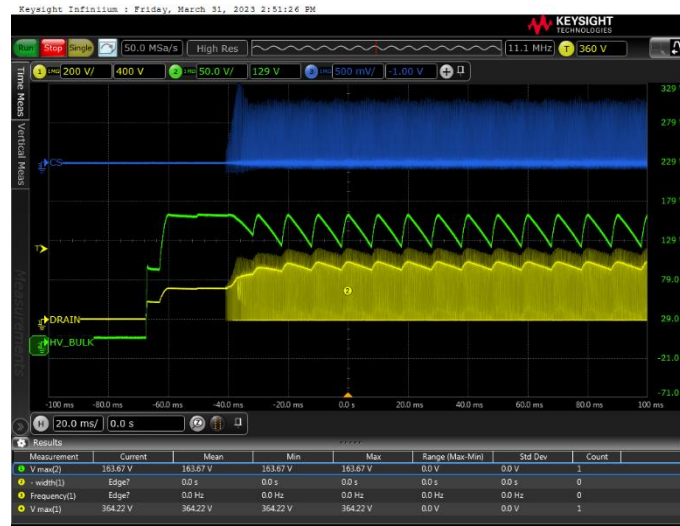
15V to 20V

Waveforms-Input 115V full load 输入 115V 满载

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Primary SW node Start up



Primary SW node

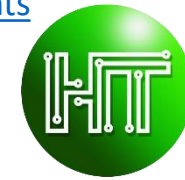


Secondary SW node



Vout and secondary SW node start up

Internal Use Only



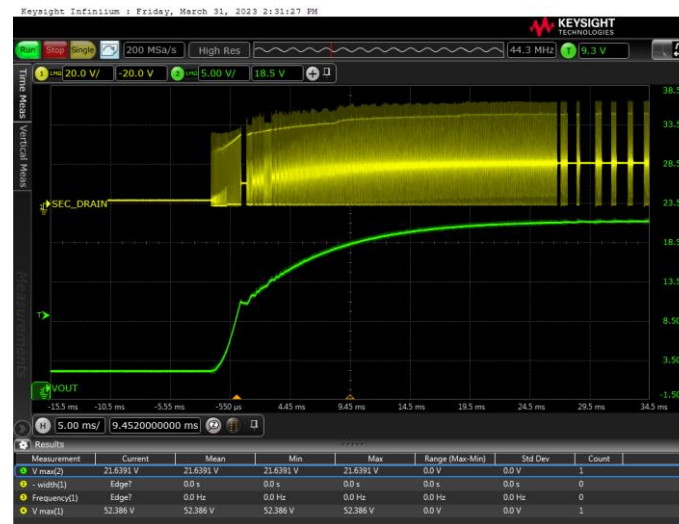
Waveforms-Input 115V No load 输入 115V 空载



Primary SW node Start up



Primary SW node



Vout and secondary SW node start up

Waveforms-Input 230V full load 输入 230v 满载

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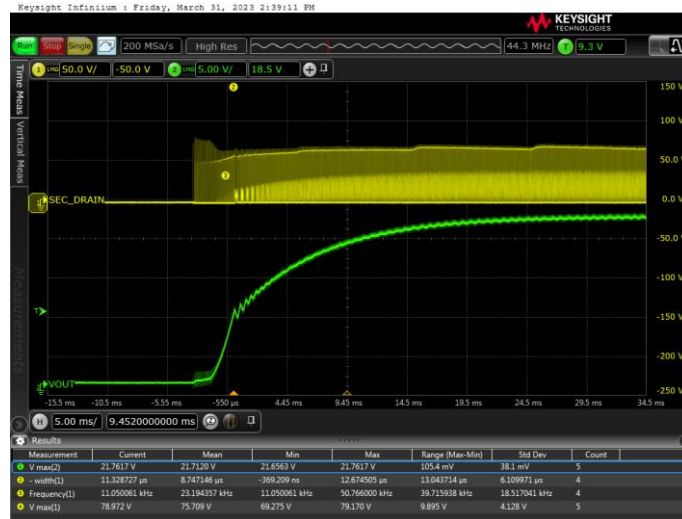
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Primary SW node Start up



Primary SW node



Secondary SW node



Vout and secondary SW node start up

Internal Use Only

Waveforms-Input 230V No load 输入 230v 空载

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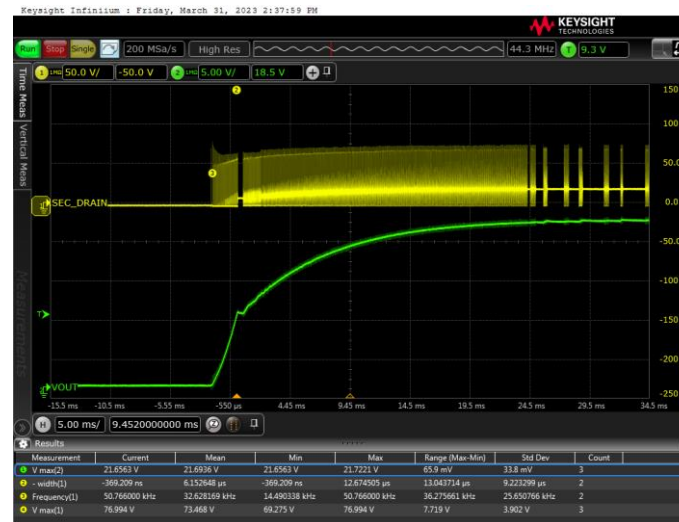
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Primary SW node Start up



Primary SW node



Vout and secondary SW node start up

Internal Use Only



Appendix II

30W Wall socket charger

Test Report

Test Conditions

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HT6329 (15W + 15W) Wallmount 充電器應用
雙通道 PD, QC



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Input voltage

AC 220-240V

Output voltages and current ranges

- 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)

Dual channel output total current and maximum power

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

- Maximum output current is 6 A
- Total output power is 30 W {15W (5 / 9 / 12 / 20V) + 15W (5 / 9 / 12 / 20V)}

Internal Use Only

Efficiency Tests

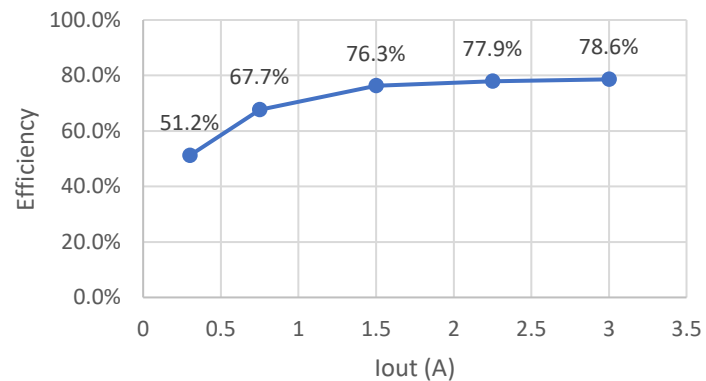
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HT6329 (15W + 15W) Wallmount 充電器應用
雙通道 PD, QC



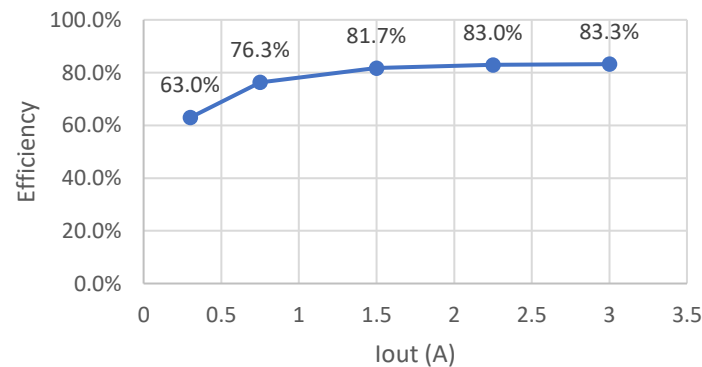
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Efficiency, PDO=5V I_{max}=3A



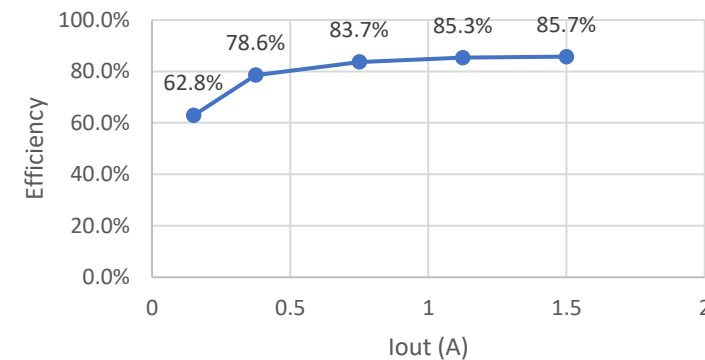
4-point Average Efficiency = 75.2%

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



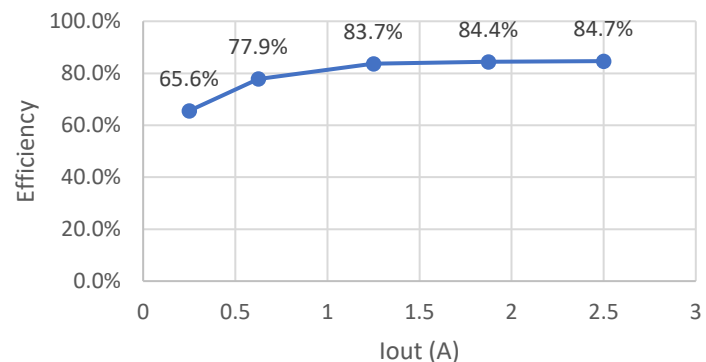
4-point Average Efficiency = 81.1%

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



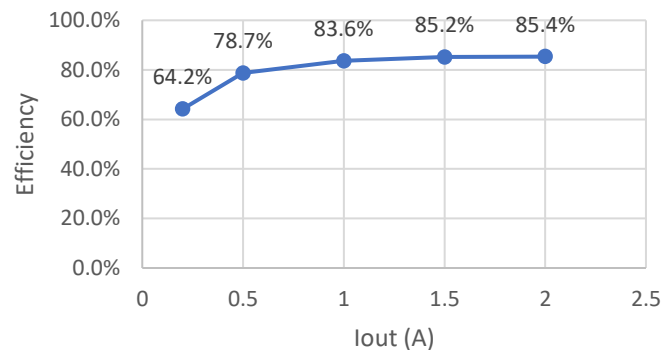
4-point Average Efficiency = 83.3%

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%



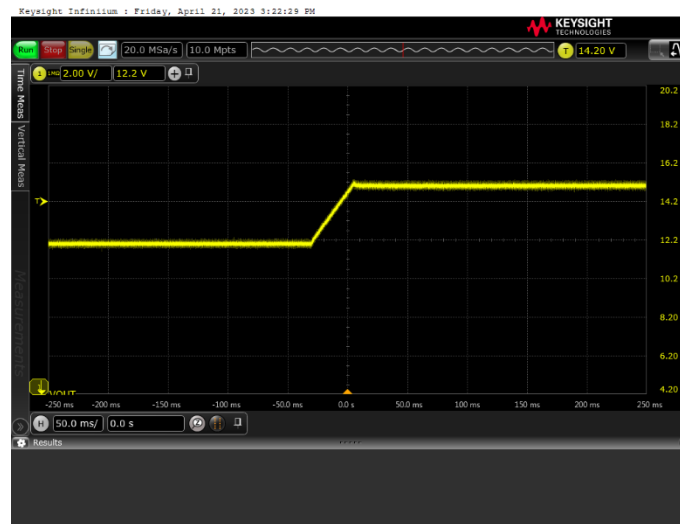
Voltage Transition Waveforms 电压转换波形



5V to 9V



9V to 12V



12V to 15V



15V to 20V

Waveforms-at No load 空载时波形

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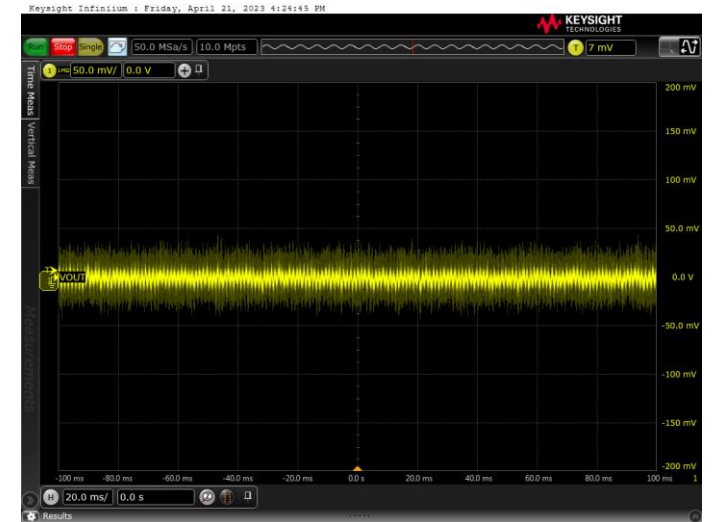
Primary SW node Start up



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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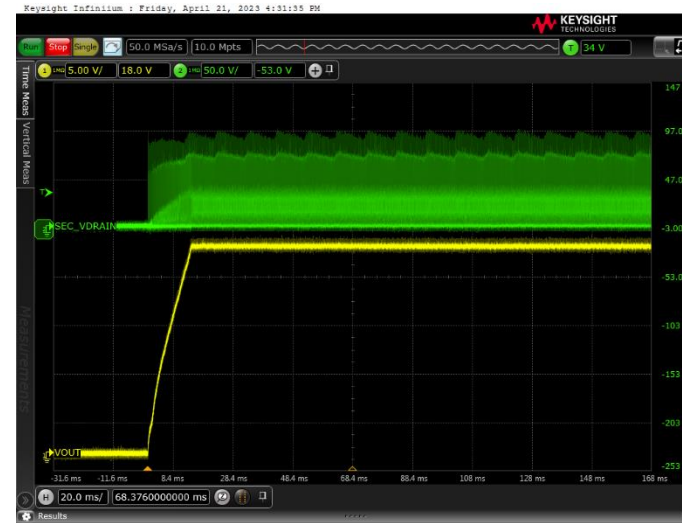
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Primary SW node Start up



Primary SW node Steady state
Internal Use Only



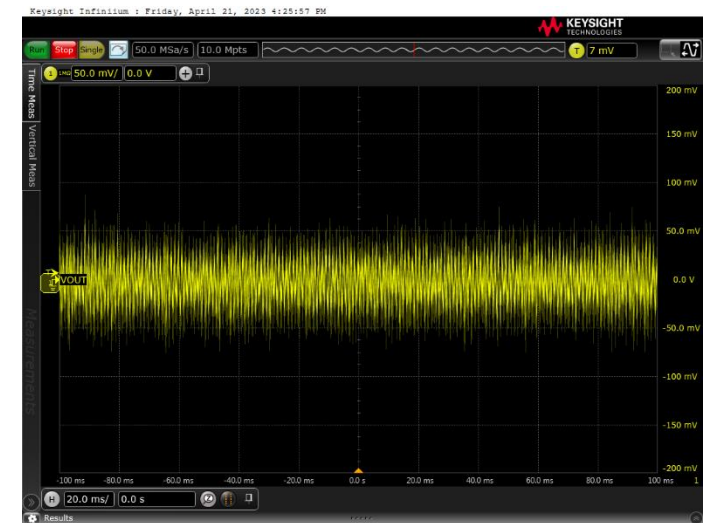
Vout and secondary SW node Start up



Vout and secondary SW node Steady state

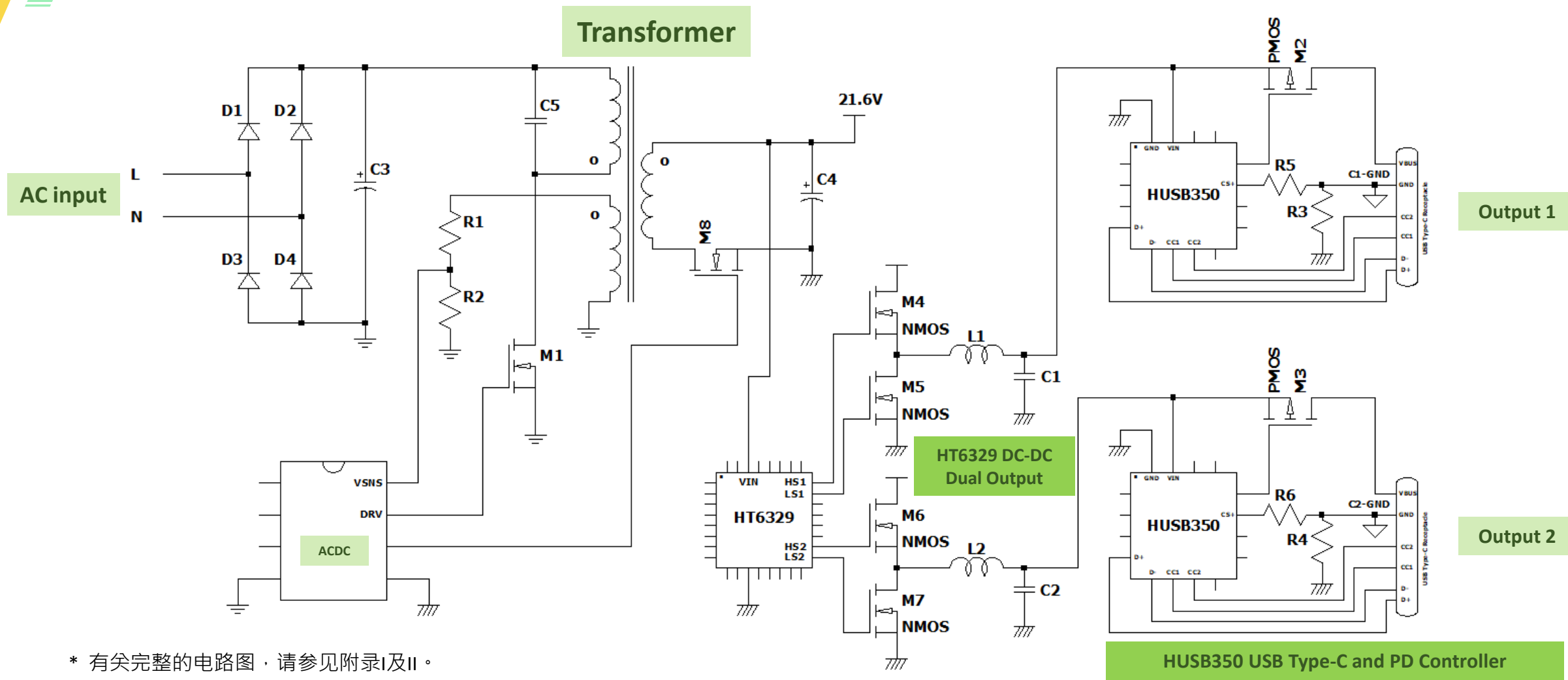


Type-C Output at Full Load 5V



Type-C Output at Full Load 5V Ripple

Simple block diagram

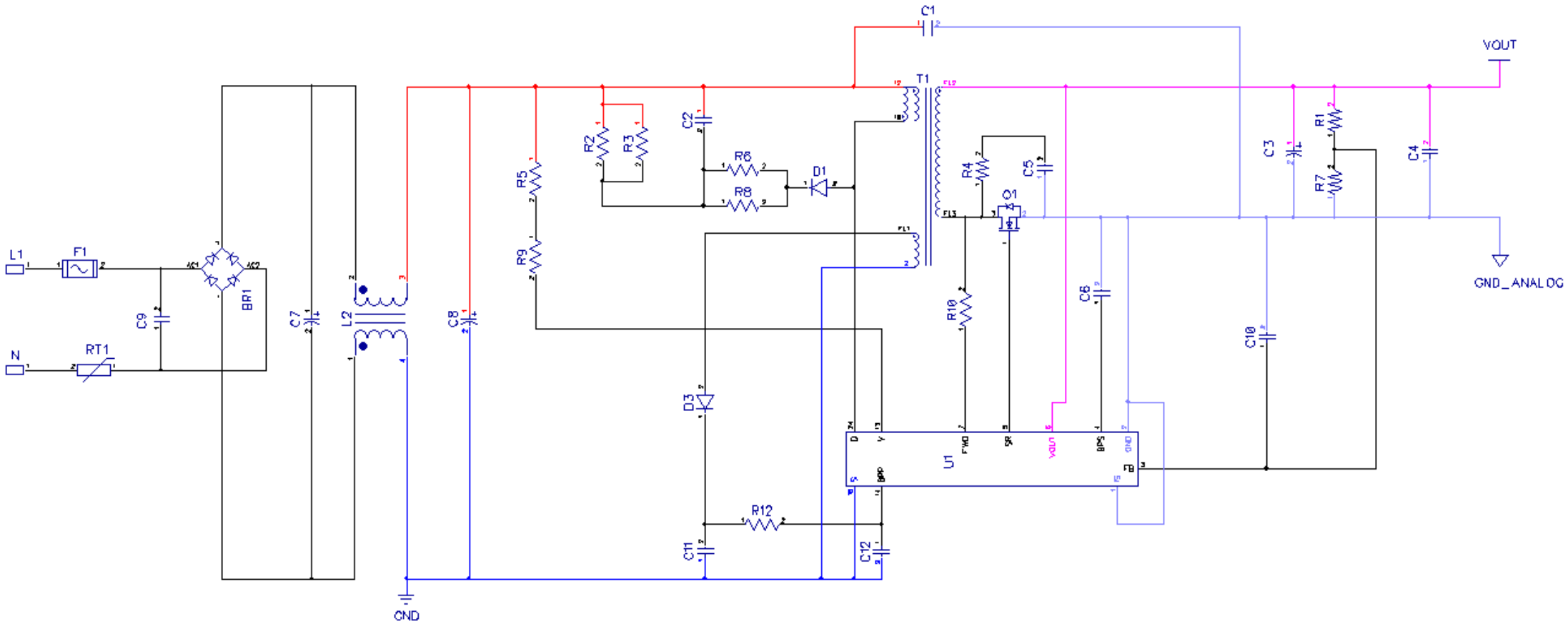


* 有关完整的电路图，请参见附录I及II。



Appendix IIa – AC/DC schematic

- 演示板原理图 (AC/DC部分)



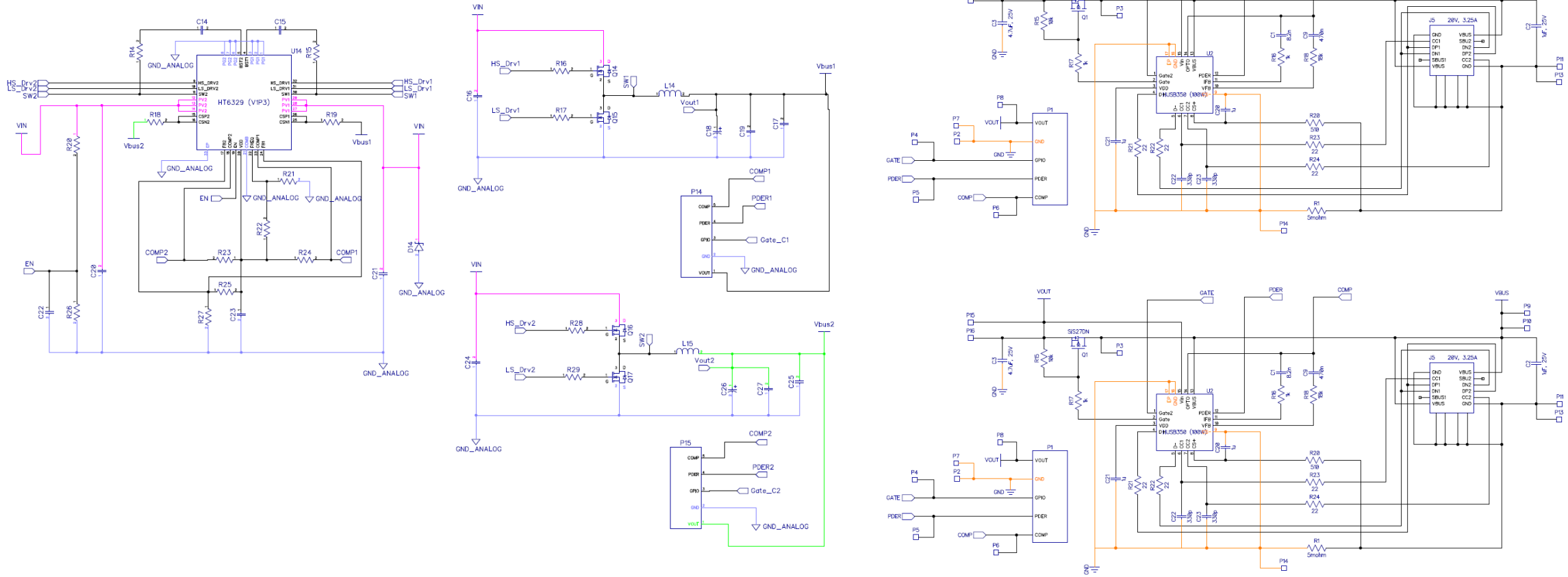
Appendix IIb - HT6329 + HUSB350

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- 演示板原理图 (DC/DC及HUSB350部分)





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Internal Use Only