HT5580: USB-C PD 3.2 High-Power 240W Output Source Controller

APPLICATIONS

- Fast Charge Adaptors
- Car Chargers
- Travel Adaptors
- Note Book Computers
- Electric bike Chargers

GENERAL DESCRIPTION

HT5580 is a highly integrated PD source controller designed for products with USB Type-C PD Source. It supports charging power up to 240W. HT5580 supports multiple PDOs with programmable voltage and current for different applications, such as PPS PDOs, EPR PDOs. All of PDOs are fully compliant with PD3.2 Rev.1.0

HT5580 supports most DPDM charging protocols, such as QC2.0 or QC3.0 by configuring the DP and DM pins which provides excellent compatibility for the legacy devices.

HT5580 integrates a GATE driver to enable the VBUS from VIN to protect the devices connected with Type-C connector.

The high voltage tolerance and protections at CC1, CC2, DP and DM pins provide more reliability for the system.

HT5580 provides the smart power derating function for dual-port charger applications. With a 10−bit A/D converter, IC external temperature via an NTC resistor can be monitored.

HT5580 incorporates various protections, such as Under Voltage Protection (UVP), Over Voltage Protection (OVP), Over Current Protection (OCP), CC1 and CC2 Over Voltage Protection (CC_OVP), and internal Over Temperature protection (I_OTP).

FEATURES

- 32-bit, RISC-V microcontroller
- USB-C 1.3 (PD3.2)
- Maximum charging power 240W
- 28V EPR FPDO, EPR AVS and PPS Supported
  - FPDO: 5V 3A, 9V 3A, 12V 3A, 15V 3A, 20V 5A EPR FPDO: 28V 5A, 36V 5A, 48V 5A
  - SPR AVS: 9V - 20V 5A
    EPR AVS: 15V - 28V 5A
    PPS: 5V – 21V 5A
- Multiple DPDM Charging Protocols Implemented
  - Apple 5V, 2.4A mode
  - BC1.2 DCP mode
  - QC2.0 5V/9V/12V and 20V
  - QC3.0 3.6V~20V continuous model voltage mode with 200mV step adjustment
- Constant Voltage (CV) and Constant Current Limit (CC) Regulation
  - Integrated secondary side compensation circuit, such as TL431
- Built-in VIN and VBUS pins fast discharge scheme
- Small Current Sensing Resistor (5mΩ) for High Efficiency application
- CC1/CC2 Pin Protection up to 50V
- Support cable drop compensation with 0, 50m, 100m/200mΩ selection
- Support Smart Power Derating function at two ports USB application (USB-C or USB-A)
- Integrated VCONN Power for e-Marker Detection
- Sleep Mode Supported

DEVICE INFORMATION

Part Number	Package	Dimensions (mm)
HT5580	QFN16	4.0 x 4.0 x 0.75

High Tech Technology Limited (HTT) reserves the right to make changes at any time, of any products or specifications herein, without further notice. HTT assumes no responsibility for the use of the information, nor does it assume any responsibility for any infringement of patents or other rights of third parties resulting from the use of the information. HTT does not grant any license under patent or patent rights, either implicitly or otherwise.

TYPICAL APPLICATION

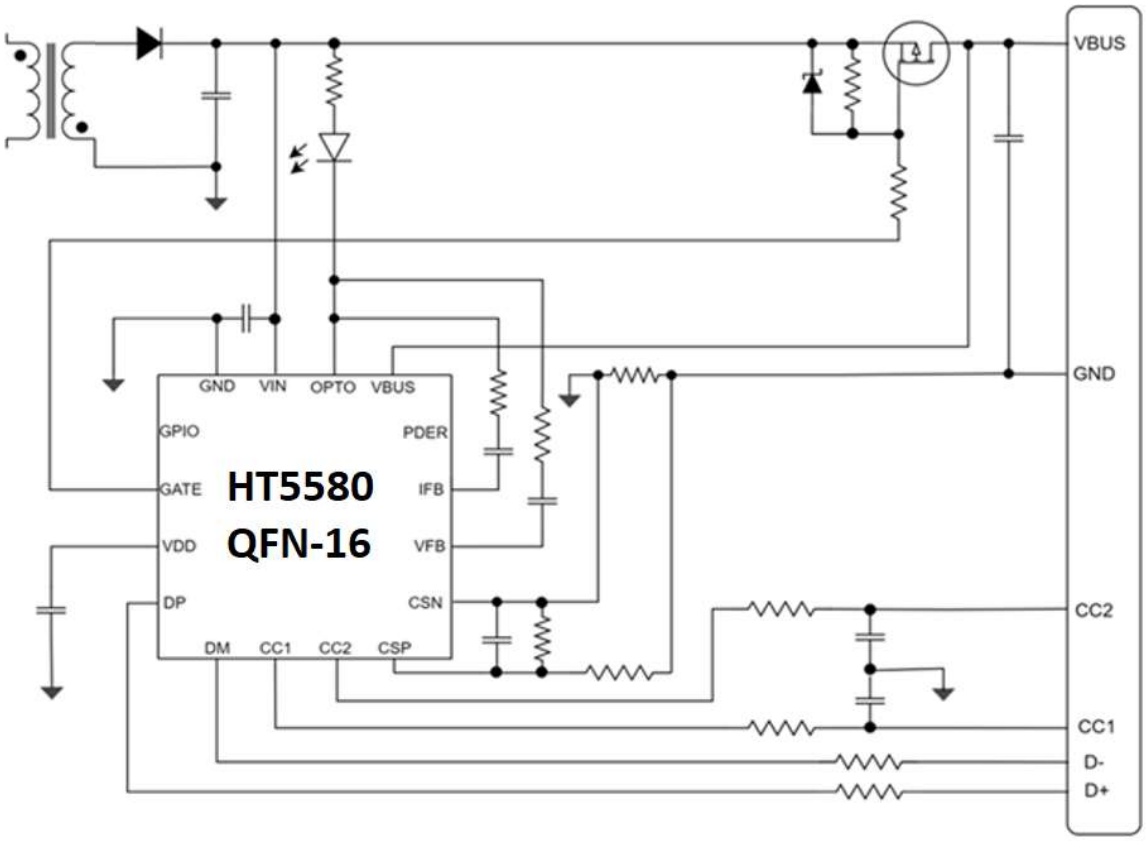

Figure 1. Typical Application Circuit of HT5580

High Tech Technology Limited (HTT) reserves the right to make changes at any time, of any products or specifications herein, without further notice. HTT assumes no responsibility for the use of the information, nor does it assume any responsibility for any infringement of patents or other rights of third parties resulting from the use of the information. HTT does not grant any license under patent or patent rights, either implicitly or otherwise.

PIN CONFIGURATION

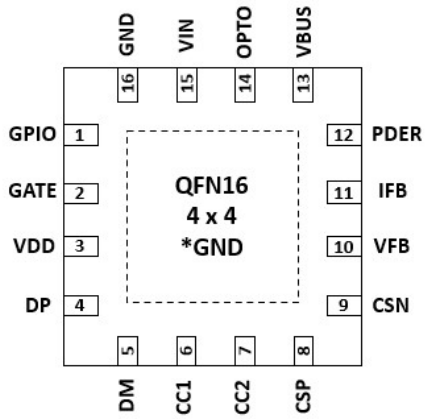

Figure 2. 16-pin DFN 4x4mm^2, (Top View)

Pin Functions

Pin No.	Pin Name	Pin Type	Voltage Type	Pin Description
1	GPIO	Open Drain IO	LV	General purpose IO
2	GATE	Open Drain IO	HV	Open drain gate driver to the gate of PMOS load switch
3	VDD	Supply	LV	Internal LDO output voltage. Connect this pin to GND via an 1uF ceramic capacitor
4	DP	Analog IO	HV	USB D+ line
5	DM	Analog IO	HV	USB D- line
6	CC1	Analog IO	HV	USB Type-C Configuration Channel1
7	CC2	Analog IO	HV	USB Type-C Configuration Channel2
8	CSP	Analog I	LV	Positive input of the current sense amplifier
9	CSN	Analog I	LV	Negative input of the current sense amplifier. Provide a low ohmic connection to GND
10	VFB	Analog I	LV	Voltage loop feedback & compensation.
11	IFB	Analog I	LV	Current loop feedback & compensation.
12	PDER	Analog I	LV	Power derating control pin. It is pulled high internally. Connect different resistors to GND to achieve power derating
13	VBUS	Analog I	HV	VBUS sense and discharge
14	OPTO	Analog I	HV	Opto-coupler cathode pin on the secondary side provides feedback signal to the primary side PWM controller.
15	VIN	Supply	HV	Supply input voltage. Connect this pin to GND via an 1uF ceramic capacitor
16	GND	Ground	HV	Power ground
17	-	Ground	-	Exposed ground if available

*Exposed pad is connected to GND if available

High Tech Technology Limited (HTT) reserves the right to make changes at any time, of any products or specifications herein, without further notice. HTT assumes no responsibility for the use of the information, nor does it assume any responsibility for any infringement of patents or other rights of third parties resulting from the use of the information. HTT does not grant any license under patent or patent rights, either implicitly or otherwise.

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

High Tech Technology Limited (HTT) reserves the right to make changes at any time, of any products or specifications herein, without further notice. HTT assumes no responsibility for the use of the information, nor does it assume any responsibility for any infringement of patents or other rights of third parties resulting from the use of the information. HTT does not grant any license under patent or patent rights, either implicitly or otherwise.