Würth Elektronik Featured Components

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Power Inductors

- WE-PD SMD Shielded Power Inductor
- WE-LQ SMD Inductor
- WE-HCI SMD Flat Wire High Current Inductor
- WE-LQS SMD Semi-Shielded Power Inductor

Capacitors

- WCAP-CSGP Ceramic Chip Capacitor, Various X5R, X7R
- WCAP-ASLL Aluminum Electrolytic Capacitors
- WCAP-ASLI Aluminum Electrolytic Capacitors

Connectors

- WR-COM USB 3.1 Type C
- WR-COM USB 2.0 SMT Tye B
- WR-DC DC Power Jack THT
- WR-PHD Pin Header
- WR-PHD Dual Socket Header
- WR-TBL Series 2109

LEDs

- WL-SMCW SMD Mono-color Chip LED Waterclear

Switches

- WS-TASV SMT Tact Switch

more than you expect

Additional Terms, warnings, restrictions and disclaimers of the Würth Elektronik and ST-Microelectronics USB Type-C Development Kit (later defined as DEVELOPMENT KIT)

Würth Elektronik (later defined as WE) and STMicroelectronics (later defined as ST) provide the enclosed DEVELOPMENT KIT under the following conditions: The user has to bear all responsibility and liability for the proper and safe handling with regard to this DEVELOPMENT KIT. The user shall indemnify WE and ST from all claims arising from the handling or utilization of the DEVELOPMENT KIT. In case this DEVELOPMENT KIT does not comply with the specifications indicated in the Flyer the DEVELOPMENT KIT may be returned within 30 days from the date of delivery for a full reimbursement of the purchase price.

THE FOREGOING LIMITED WARRANTY IS THE EXCLUSIVE WARRANTY MADE BY WE and ST TO THE USER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. EXCEPT TO THE EXTENT OF THE INDEMNITY SET FORTH ABOVE, NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

No license is granted under any patent right or other intellectual property rights of WE or ST covering or relating to any machine, process and procedure, or combination in which such the DEVELOPMENT KIT or services might be or are used. Our arrangement with the user is not exclusive as WE and ST are currently working with a large number of customers for DEVELOPMENT KITs. WE and ST bear no liability for applications assistance, customer product design, software performance, or infringement of patents or services described in the Flyer.

Code of federal regulations

As noted in the DEVELOPMENT KIT Quick Start Guide, this DEVELOPMENT KIT and/or accompanying hardware may or may not be subject to and compliant with the Code of Federal Regulations, Title 47, Part 15.

For DEVELOPMENT KITs annotated to comply with the Code of Federal Regulations, Title 47, Part 15. Operation is subject to the following two conditions:

(1) This DEVELOPMENT KIT may not cause harmful interference, and (2) this DEVELOPMENT KIT must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This DEVELOPMENT KIT as a Class A digital apparatus complies with Canadian ICES-003. Changes or modifications not expressly approved by the party responsible for compliance could void the users' authority to operate the equipment.

For DEVELOPMENT KITs annotated as not subject to or compliant with the Code of Federal Regulations, Title 47, Part 15. This DEVELOPMENT KIT is intended for use for ENGINEERING DEVELOPMENT, DESIGN, OR EVALUATION PURPOSES ONLY and is not considered by WE and ST to be a finished end product fit for general consumer use. This evaluation board is intended to be operated in a research and development environment under supervision of qualified technicians or engineers for test and measurement purposes. This evaluation board is not designed to fulfill requirements for CE compliance. It generates, uses, and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to the Code of Federal Regulations, Title 47, Part 15, which are designed to provide reasonable protection against radio frequency interference. Operation of the equipment may cause interference with radio communications, in which case the user at its own expense will be required to take whatever measures may be required to correct this interference.

For Feasibility Evaluation Only, in Laboratory/Development Environments. The DEVELOPMENT KIT is not a complete product. It is intended exclusively for preliminary feasibility evaluation in laboratory/development environments by technically qualified electronics experts. Those experts mandatory have to be familiar with the dangers and application risks in connection with handling electrical mechanical components, systems and subsystems. It should not be used as an end product or as a part of an end product.

Your Sole Responsibility and Risk. You acknowledge, represent and agree that:

a) You have unique awareness of the Federal, State and local regulatory requirements (including but not limited to Food and Drug Administration regulations, if applicable) which affect your products and which refer to your use (and/or the use of your employees, affiliates, contractors or designees) of the DEVELOPMENT KIT for evaluation, testing and other purposes.

b) You are unlimited and exclusively responsible for the safety of your DEVELOPMENT KIT and for the compliance with all relevant laws and other applicable regulatory requirements. Further you have to assure the safety of any activities to be conducted by you and/or your employees, affiliates, contractors or designees, using the DEVELOPMENT KIT. You are also responsible to ensure that any interfaces (electronic and/or mechanical) between the DEVELOPMENT KIT and any human body are designed with suitable isolation and means to safely limit the accessible leakage currents to minimize the risk of electrical shock hazard.

c) Since the DEVELOPMENT KIT is not a completed product, it may not meet all applicable regulatory and safety compliance standards (such as UL, CSA, VDE, CE, RoHS and WEEE) which may normally be associated with similar completed products. You assume full responsibility to determine and/or assure compliance with any such standards and related certifications as may be applicable. You have to use reasonable safeguards to ensure that your use of the DEVELOPMENT KIT will not result in any property damage, injury or death, even if the DEVELOPMENT KIT should fail to perform as specified or expected.

Certain Instructions. It is important to handle this DEVELOPMENT KIT within WE's and ST's recommended specifications and environmental considerations as described in the Quick Start Guide. Surpassing the specified DEVELOPMENT KIT classifications (including but not limited to input and output voltage, current, power, and environmental ranges) may cause property damage, personal injury or death. If there are questions concerning these classifications please contact a WE external sales representative before connecting interface electronics including input power and intended loads. Any loads applied beyond the specified output range may result in unintended and/or inexact operation and/or possible lasting damage to the DEVELOPMENT KIT and/or interface electronics. Please consult the DEVELOPMENT KIT Flyer prior to connecting any load to the DEVELOPMENT KIT output. If there is uncertainty regarding the load specification, please contact a WE or ST external sales representative. During normal operation, some circuit components may have case temperatures greater than 60°C as long as the input and output are maintained at a normal ambient operating temperature. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors which can be identified by using the DEVELOPMENT KIT schematic published in the DEVELOPMENT KIT Flyer.

Please be aware that the devices of the DEVELOPMENT KIT may be very warm in case of placing the measurement test setup close to the DEVELOPMENT KIT during normal procedure. Please ensure that only qualified personnel educated in electronic measurement and diagnostics usually found in development environments should use these DEVELOPMENT KITs.

Agreement to Defend, Indemnify and Hold Harmless. You agree to defend, indemnify and hold WE, ST, its licensors and their representatives harmless from and against any and all claims, damages, losses, expenses, costs and liabilities (collectively, „Claims") arising out of or in connection with any use of the DEVELOPMENT KIT that is not in accordance with the terms of the agreement. This obligation shall apply whether Claims arise under law of tort or contract or any other legal theory, and even if the DEVELOPMENT KIT fails to perform as specified or expected.

Safety-Critical or Life-Critical Applications. If you intend to evaluate the components for possible use in safety critical applications (such as life support) where a failure of the WE or ST product would reasonably be expected to cause severe personal injury or death, such as devices which are classified as FDA Class III or similar classification, you have to specifically notify WE or ST of such intent and enter into a separate Assurance and Indemnity Agreement.

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WÜRTH ELEKTRONIK

USB TYPE-C™ DEVELOPMENT KIT

Up to 100 W Power Delivery

All in one solution

USB Type-C™ Development Kit

Up to 100 W Power Delivery

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WÜRTH ELEKTRONIK

100 W SOURCE

Features

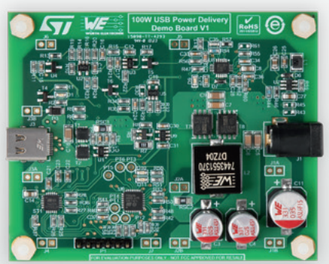
SOURCE default Profiles (PDO):
- 5 V, 3 A
- 9 V, 3 A
- 12 V, 2 A
- 15 V, 3 A
- 20 V, 5 A

- High side current sensing
- Over Voltage protection by STUSB1602
- 5 A cable detection (status LED)

MCU high voltage companion IC

The STUSB1602 is an analog front-end suitable as a companion chip to any kind of MCU. It operates autonomously pure USB-C operations and High voltage protection while guaranteeing “clean” USB PD communication regardless the MCU operating the USB PD stack. With a PD stack running on STM32, STUSB1602 is certified in PDr2.0 as SOURCE, SINK and DRP, and in PDr3.0 as a SOURCE.

Certification ID: 1070031



100 W SINK

Features

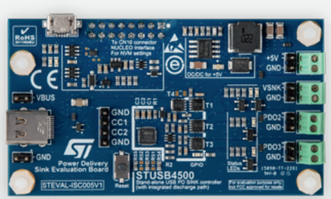
SINK default profiles:
- 5 V, 1.5 A
- 15 V, 1.5 A
- 20 V, 1.0 A

- Easy reconfiguration up to 100 W (with STSW-STUSB002 GUI)
- Dead battery support
- On board 5 V DC/DC to supply MCU

Stand-alone USB PD controller for Sink applications

STUSB4500 is the first USB Power Delivery controller designed to address specifically USB Type-C sink devices. It allows straightforward migration from STD-B, micro-B or custom power plugs to a Type-C connector. STUSB4500 is stand-alone, tiny, safe, certified, and easily customizable.

Certification ID: 1000133



40 W SOURCE

Features

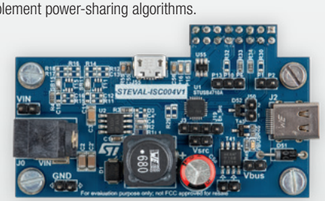
SOURCE default Profiles (PDO):
- 5 V, 3 A
- 9 V, 3 A
- 12 V, 3 A
- 15 V, 2.5 A
- 20 V, 2.0 A

- On-board DC/DC power converter controlled by STUSB4710A
- Full hardware solution
- Short-to-VBUS protections

Stand-alone USB PD Controller for Source applications

The STUSB47 series target power-source applications such as power supplies, power hubs, docking stations, smart plugs and displays. It integrates all the circuitry needed to negotiate Power Delivery with connected devices, and can support up to 5 power profiles (PDO). Trough is embedded non-volatile memory, it is fully customizable and can handle the entire connection setup without the need for a microcontroller.

For multi-port applications, a MCU interface allows the connection of multiple STUSB47 ICs to a microcontroller to implement power-sharing algorithms.



USB Type-C Cable

Features
- USB 2.0 and USB3.1 Gen 1 (5 Gbit/s)
- 5 A current rating
- One cable with power charging, data transfer

STREF-SCS1V1 reference design for USB Power Delivery Sink port

The STREF-SCS001V1 reference design illustrates how to easily and quickly migrate to USB Type-C connector in order to power any application up to 100 W. It is tiny, safe and autonomous. This device is not included in the kit. For more information, please contact your STMicroelectronics sales contact or the STMicroelectronics website.

Attributes & Possible Applications for USB Type-C

- **More Convenient**
  - Thinner
  - Reversible
  - 10x more robust vx micro-B
- **More Power**
  - Up to 15 W (5 V / 3 A) natively
  - Up to 100 W (20 V / 5 A) with PD support
  - Scalable & bi-directional
- **More Speed**
  - USB 2.0 (LS, HS, FS)
  - USB 3.1 (Up to 10 Gbps)
- **More Protocol**
  - Display Port
  - HDMI
  - Ethernet
  - Audio
- **More Secure**
  - Authentication
  - Firmware update

- **Consumer Electronics**
  - TVs
  - Set-Top Boxes
  - Power supplies, AC-DC adapters
  - Power hubs
  - Power banks
  - External hard disk drives
  - Peripherals, smart speakers
- **Battery operated devices**
  - E-cigarettes
  - Power tools
  - Bluetooth speakers
- **Industrial**
  - Wall plugs
  - Printers
  - Home appliances
- **Automotive**
  - USB chargers
  - Infotainment

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