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45W Power over Ethernet PD to USB-C/PD Demo

NCP12700 & FUSB3307 Based Solution

Public Information



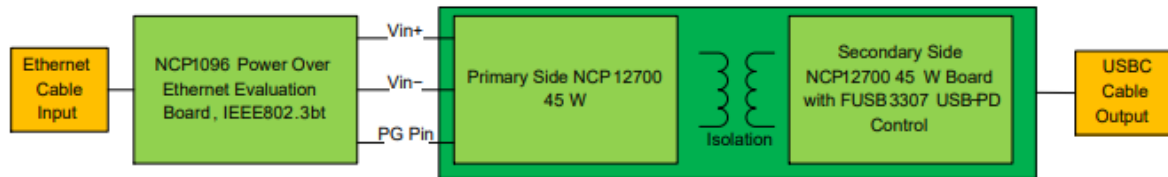
PoE to USB-C/PD NCP12700 with FUSB3307 Demo - 45 W

Specifications and Features

- Power Over Ethernet Compatible Input Range: 37 V to 57 V
- Output: USB-PD 5V-20V Operation
- High Full Load and Average Efficiency
- Very Low Ripple and Noise
- Smooth Startup Operation
- Low Parts Count
- Inherent SCP And OCP Protection
- Thermal and OVP Protection
- Multiple Probe Points for Evaluation
- Compatible with the NCP1096GEVB

Specifications

	PD Output Specification
Output Voltage	5 V, 9 V, 15 V, 20 V
Nominal Current	5V/3A, 9V/3A, 15V/3A, 20V/2.25A
Max Current	5V/3A, 9V/3A, 15V/3A, 20V/2.25A
Min Current	zero

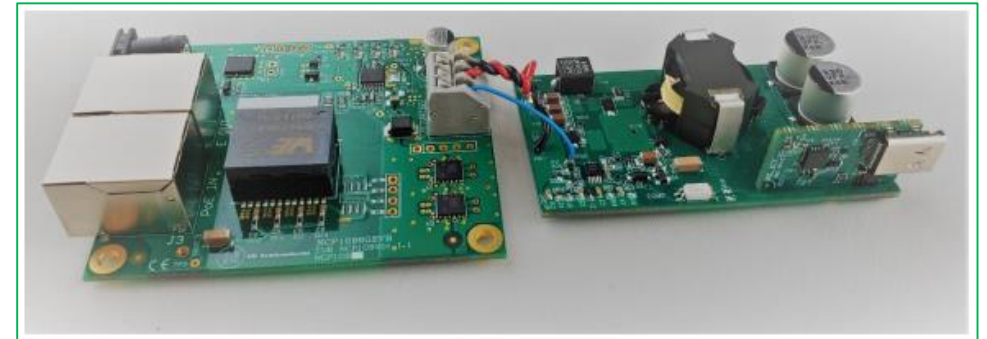


Market & Applications

- Power Over Ethernet to USB PD
- Smart Buildings & Homes

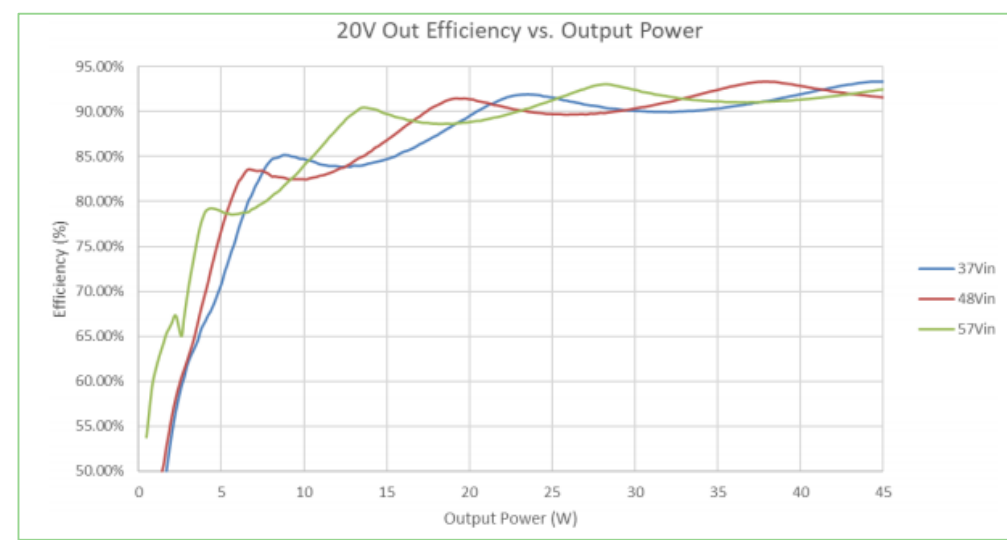
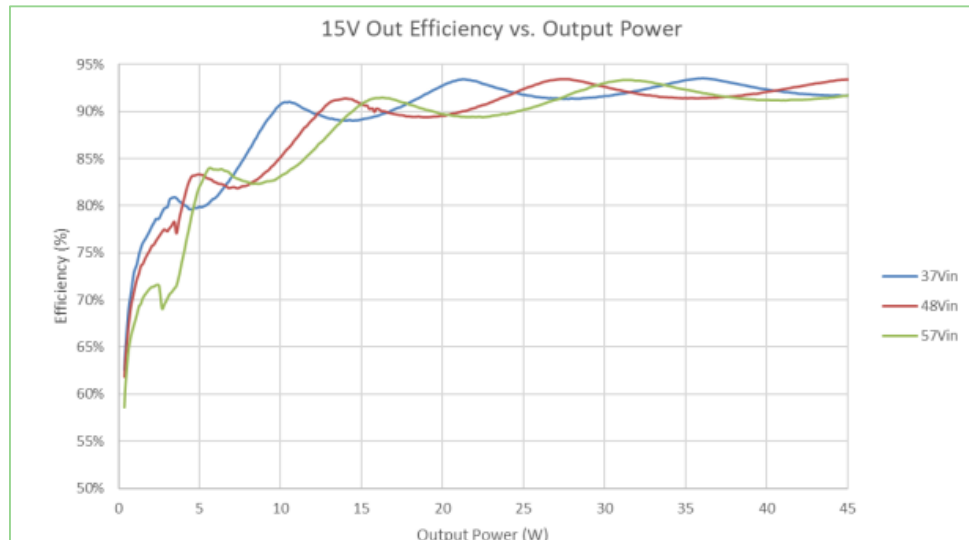
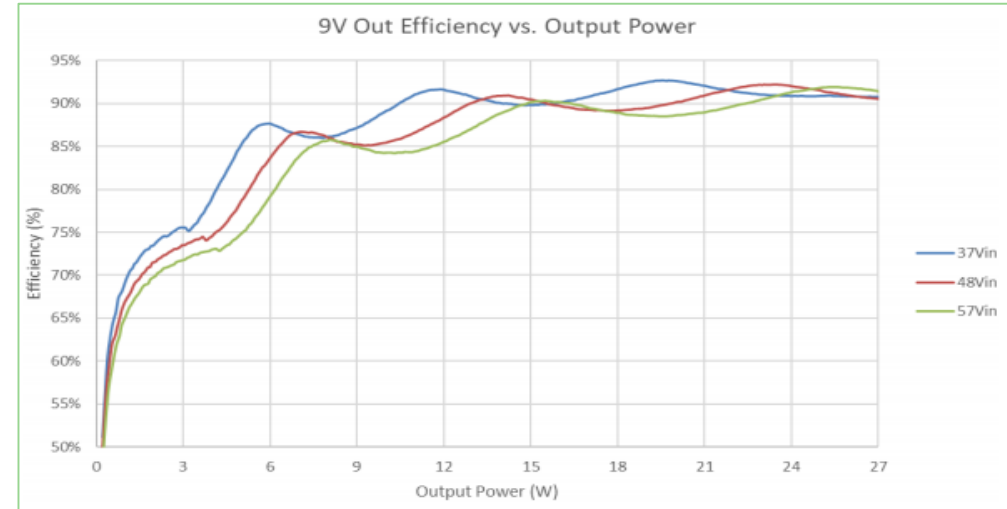
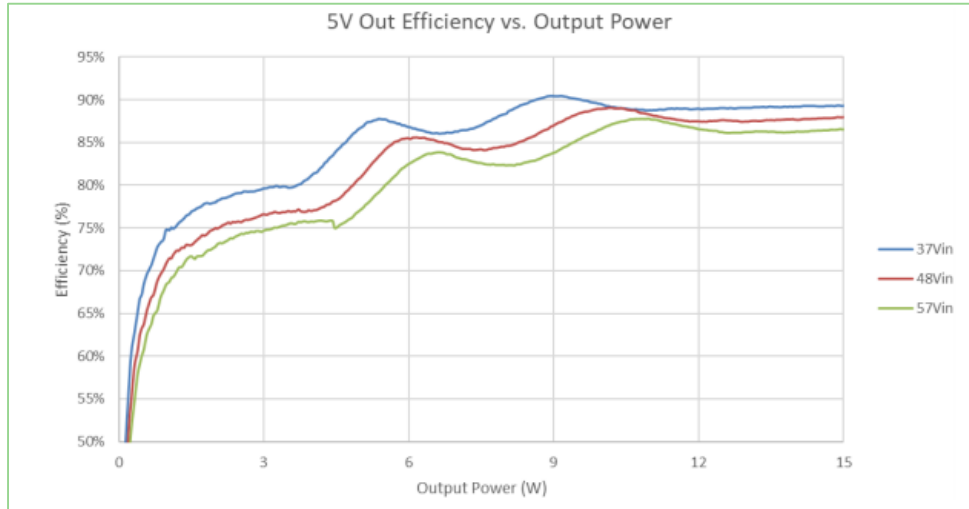
[Design Note](#)

Demo Board Photo



Connected to the NCP1096GEVB POE PD Demo

NCP12700 + FUSB3307: PoE to USB-C/PD 45W – Efficiency charts



NCP12700 - 9V to 160V PWM Current mode, Ultra Wide Flyback Controller

Value Proposition

The NCP12700 is a wide-input range, fixed frequency, peak current mode PWM controller with a highly integrated feature set suitable for implementing single-ended power converter topologies. The device features a high voltage startup capable of operating over a wide input range and supplying at least 15 mA to provide temporary bias to VCC during system startup. The NCP12700 contains a suite of protection features including cycle-by-cycle peak current limiting, timer-based overload protection.

Unique Features

- Ultra Wide Range HV (9 – 200 V) startup regulator
- User Adjustable Over-Power Protection
- Fault pin for thermal and Output over-voltage protection

Unique Features

- Eliminate external startup components
- Easier design across input voltage range
- Interface for thermal and OVP eliminates external protection

Other Features

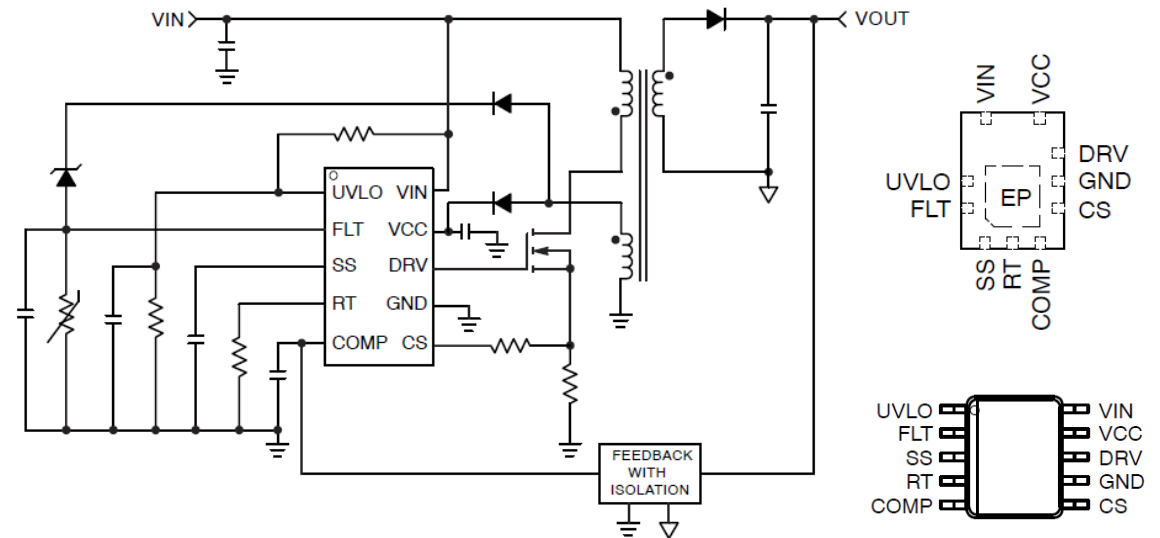
- Programmable oscillator: 100 kHz – 1 MHz
- Internal slope compensation
- Adjustable Soft-Start Ramp
- Input Voltage UVLO with hysteresis
- Shutdown Threshold for External Disable
- Overload Protection with 30 ms Overload Timer
- 1 A Source / 2.5 A Sink Gate Driver

Market & Applications

- Industrial
- Telecom
- Transportation
- Suitable for 2:1, 4:1, 8:1 input range designs



Typical Application Schematic & Pin Out



Ordering & Package information

- NCP12700xDMR2G in Micro10 3*3 (9-100 V)
- NCP12700xMNTWG in WQFN10 3*4 (9-200 V)

▪ See datasheet for complete table



WQFN10
MT SUFFIX
CASE 511DV



MSOP
DN SUFFIX
CASE 846AE



FUSB3307 – USB-C Power Delivery (PD) 3.0 Adaptive Source Charging Controller

Value Proposition

FUSB3307 is a highly integrated USB Type-C 1.4 and Power Delivery (PD) 3.0 fully autonomous source (DFP) controller that can control a DCDC port power regulator or the opto-coupler in the secondary side of an ACDC adapter. It features Programmable Power Supplies (PPS) thus supporting a min 3.3V and max 21V output voltage control. It includes Constant Voltage (CV) & Constant Current Limit (CL) control blocks.

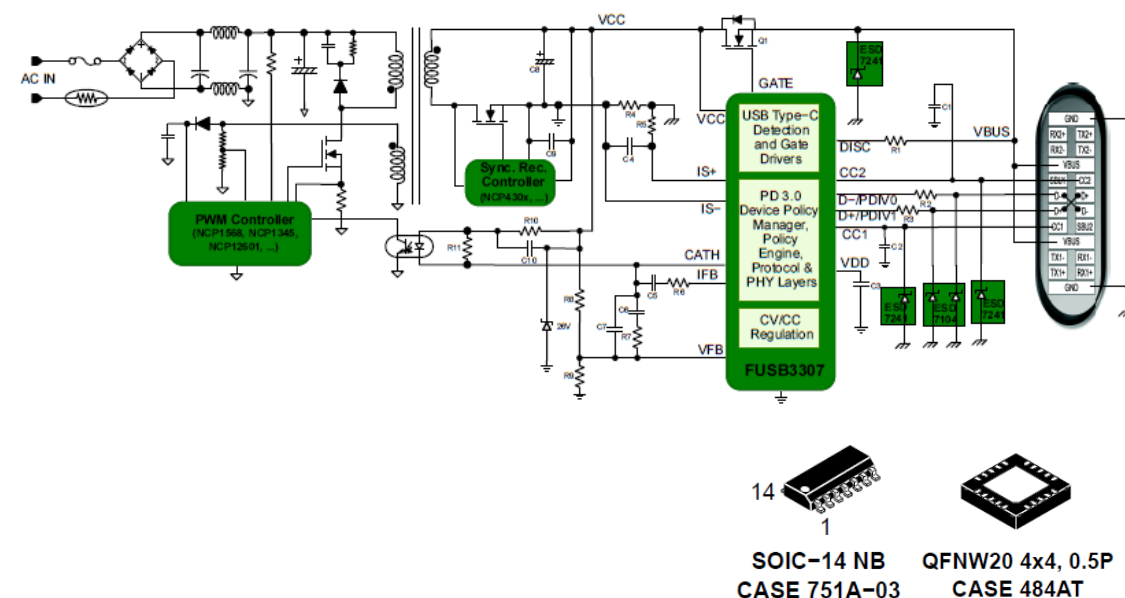
Features

- PD 3.0 v1.2 & Type-C r1.4 Compliant
- Very Low Active Power
- VBUS 3V to 21V (20mV Steps);
- Current control up to 5A (50mA Steps)
- Up to 7 Fixed & Programmable PDOs
- Internal VDD and VCONN Supplies
- Constant Voltage (CV) & Constant Current Limit (CL) Regulation
- CC1/CC2 Pin Protection up to 26 V
- Built-in Cable-Drop Compensation
- Selectable Resistor Divider or Battery Charging (BC1.2) Modes
- Built-in Output Capacitor Bleeding Function for Fast Discharge
- Programmable PD power 16W to 100W

Benefits

- D/A converters for internal references
- Various protections and diagnostics such as Adaptive UVP, Adaptive OVP, OTP and VBUS Fault Detection
- 10bit A/D converter to monitor output voltage, output current, IC internal temperature and external temperature (via an NTC resistor).
- VCONN Over Current Protection (VCONN_OCP and internal and external Over Temperature protection
- Capable of controlling a single or back-to-back N-MOSFETs as a load switch, for a low cost and easier design.
- Small Current Sensing Resistor (5mΩ) for High Efficiency

Typical Application Diagram



Market & Applications

- Battery Wall Chargers for Tablet PCs and Laptops
- AC-DC Type-C/PD Compliant Adapters
- DC-DC Car Chargers for individual Port Control

Ordering information and packaging

Part Number	Operating Temp	Package
FUSB3307D6MX	(-40 ; 85) [°C]	14-Lead Small Outline Integrated circuit (SOIC)
Other trip or package	(-40 ; 105) [°C]	Contact Sales office

