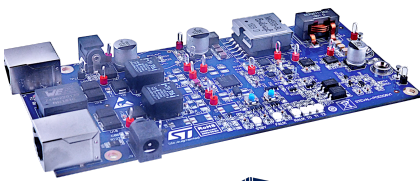


3.3V/20A, active clamp forward converter, Power Over Ethernet (PoE) IEEE 802.3bt compliant reference design



Features

- Features of the [PM8805](#) PoE-PD interface:
 - System in package integrating a double active bridge, a hot-swap MOSFET and a PoE-PD
 - Supports legacy high power, 4-pair applications
 - 100 V N-ch MOSFETs with 0.2 Ω total path resistance for each active bridge
 - Identifies which kind of PSE (standard or legacy) it is connected to and provides successful IEEE 802.3af/at/bt classification indication as a combination of the T0, T1 and T2 signals (open drain)
 - Smart operation mode selection through the STBY, FAUX and RAUX control signals
 - QFN 56 8x8mm package with 43 pins and 6 exposed pads
- Features of the [PM8804](#) PWM controller:
 - PWM peak current mode controller
 - Input operating voltage up to 75 V
 - Internal high voltage start up regulator with 20 mA capability
 - Programmable fixed frequency up to 1 Mhz
 - Soft startup with settable time
 - Soft turn off (optionally disabled)
 - Dual 1 A_{PK}, low side complementary gate drivers
 - GATE2 can be turned off for reduced consumption
 - 80% maximum duty cycle with internal slope compensation
 - QFN 16 3x3mm package with exposed pad

Product summary

High power PoE PD, 3 V up to 20 A active clamp forward evaluation board	STEVAL-POE006V1
PWM peak current mode controller for PoE and telecom systems	PM8804
IEEE802.3bt PoE-PD interface with integrated dual-active bridge	PM8805

Description

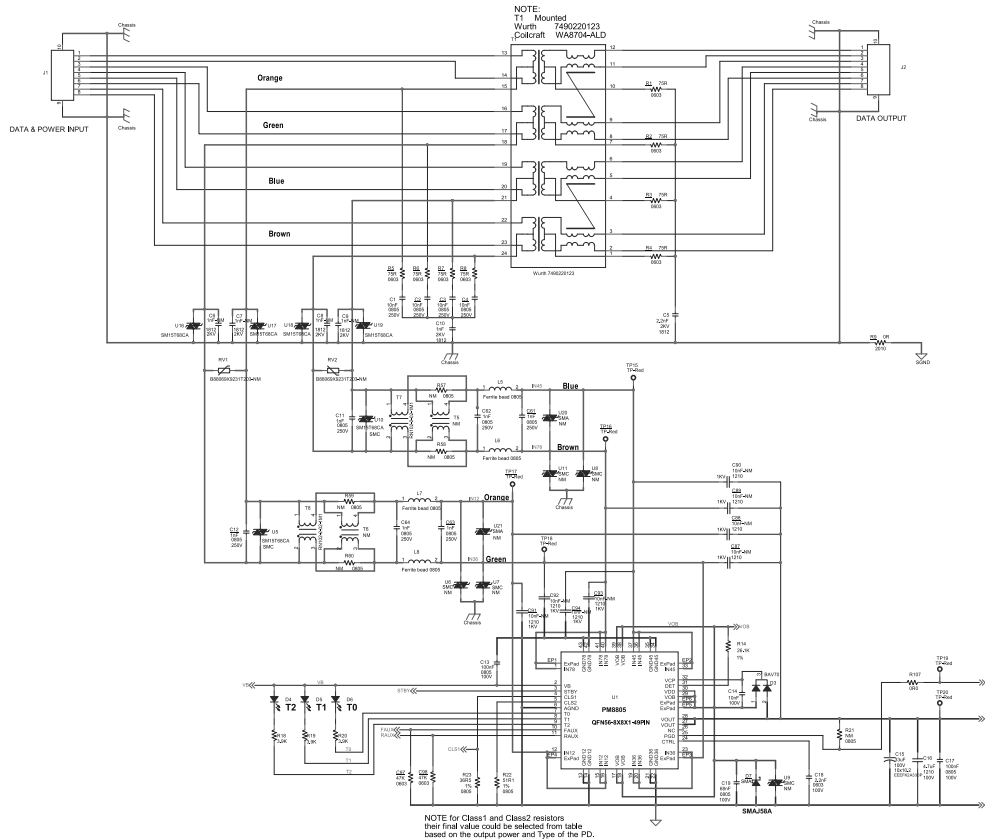
This reference design represents a 3.3 V, 20 A converter solution ideal for various applications including wireless access points, supplied with a PoE-PD interface and a DC-DC active clamp forward converter.

The PoE-PD interface is based on the [PM8805](#) system in package device with two active bridges and an IEEE 802.3bt compliant Powered Device (PD) interface. It can be used in all medium-to-high power 2P and 4P high efficiency PoE and PoE+ applications.

The DC-DC active clamp forward converter is designed around the [PM8804](#) PWM controller, which is an integrated solution for smart and efficient 48 V converters, featuring a programmable oscillator for the switching frequency, adjustable slope compensation, dual complementary low-side drivers with programmable dead time, programmable soft start, soft turn off and a programmable current sense blanking time.

1 Schematic diagrams

Figure 1. STEVAL-POE006V1 circuit schematic (1 of 3)



PD Requested Class	Number of PSE class events	Assigned Class	Power Available at the PD (W)	Outputs T0	T1
any	0	0	13.0 W	1	1
0	1	0	13.0 W	1	1
1	1	1	3.84 W	1	1
2	1	2	6.49 W	1	1
2or3	1	2or3	12.0 W	1	1
4or5	2 or 3	4	25.5 W	0	1
5	4	5	40.0 W	1	0
6or7	4	6	51.0 W	1	0
7	5	7	62.0 W	0	0
8	5	8	71.3 W	0	0

PD class	CL11 resistor (Ω)	CL12 resistor (Ω)	Min (mA)	Max (mA)
Class 0	2k	2k	0	40
Class 1	150	150	0.0	12.0
Class 2	80.6	80.6	17.0	20.0
Class 3	51.1	51.1	26.0	30.0
Class 4	36.5	36.5	36.0	44.0
Class 5	36.5	2k	36.0	44.4
Class 6	36.5	150	36.0	44.1
Class 7	36.5	80.6	36.1	44.2
Class 8	36.5	51.1	36.0	44.3

NOTE for Resistors
Where not indicated the body is 0603 and tolerance 5%
NOTE for Capacitors
Where not indicated the body is 0603, the voltage is 100V material X7R and tolerance 10%
100nF 100V is X7R 10% 0805.

Figure 2. STEVAL-POE006V1 circuit schematic (2 of 3)

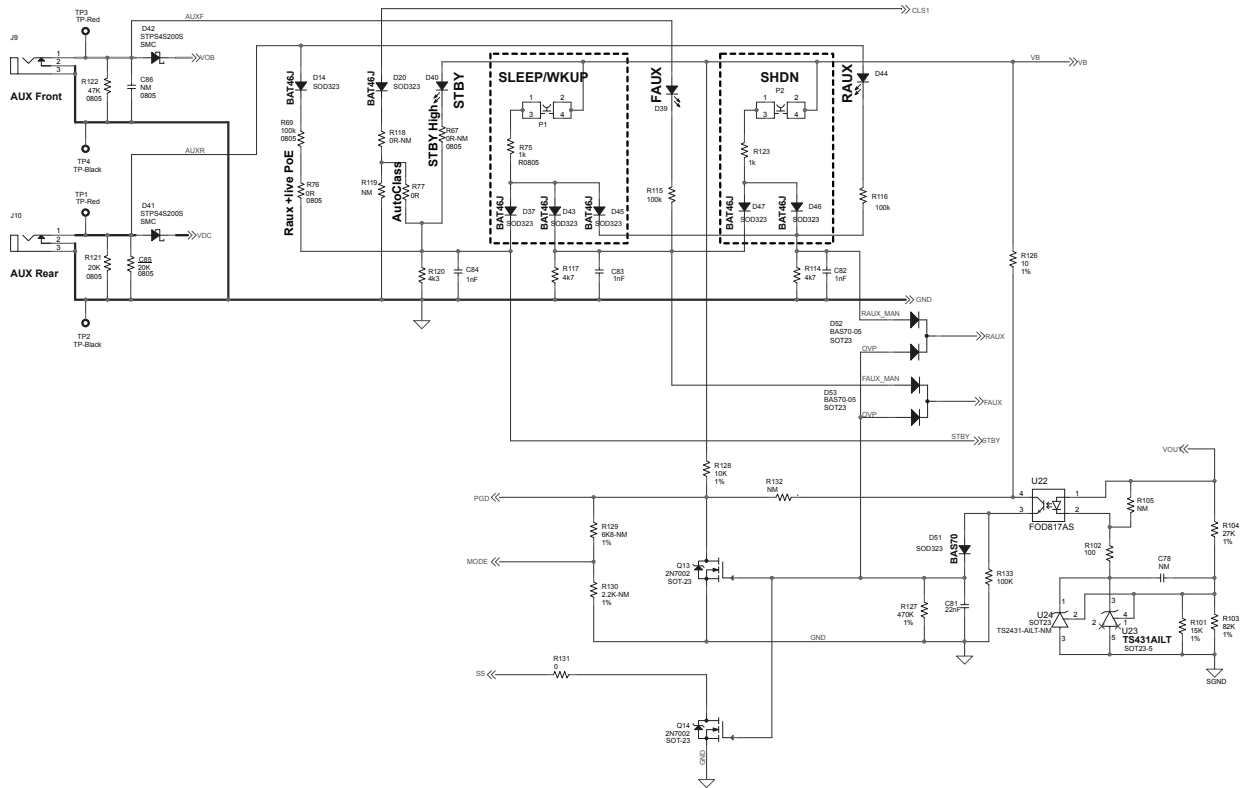
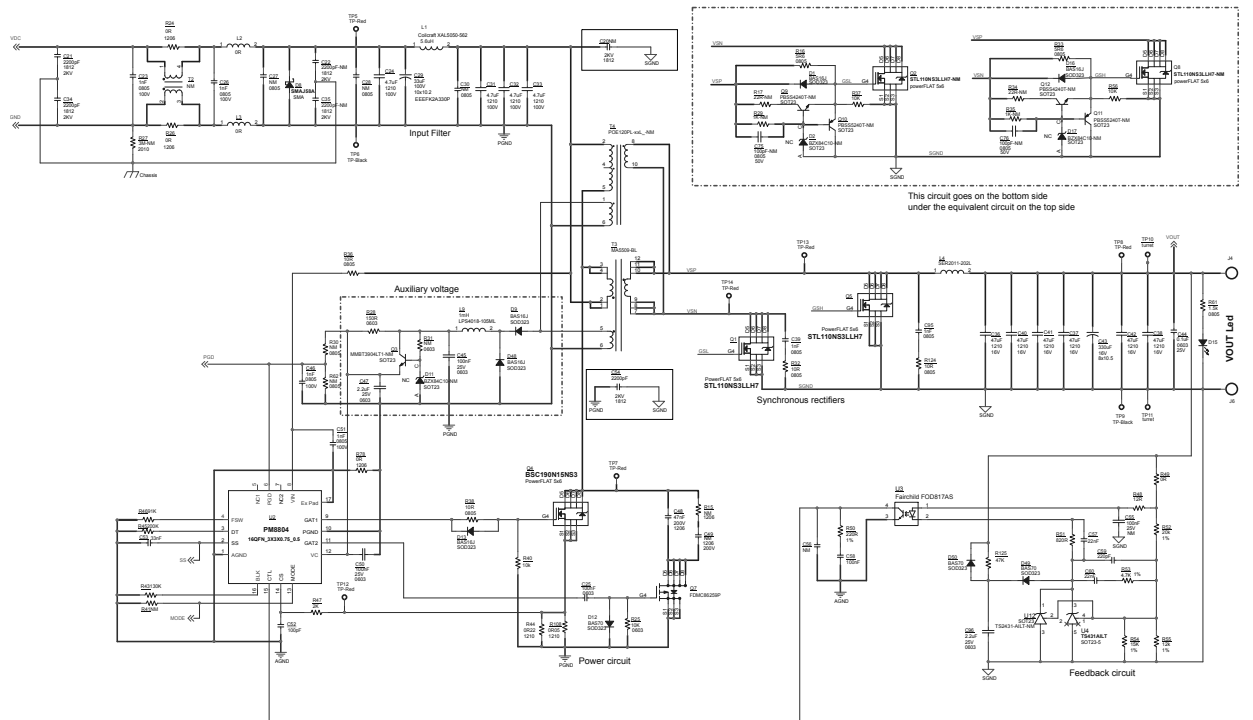


Figure 3. STEVAL-POE006V1 circuit schematic (3 of 3)



Revision history

Table 1. Document revision history

Date	Version	Changes
20-Dec-2018	1	Initial release.
07-May-2019	2	Updated document title. Minor changes to cover page Features and Description .
14-Jun-2019	3	Minor text changes.

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