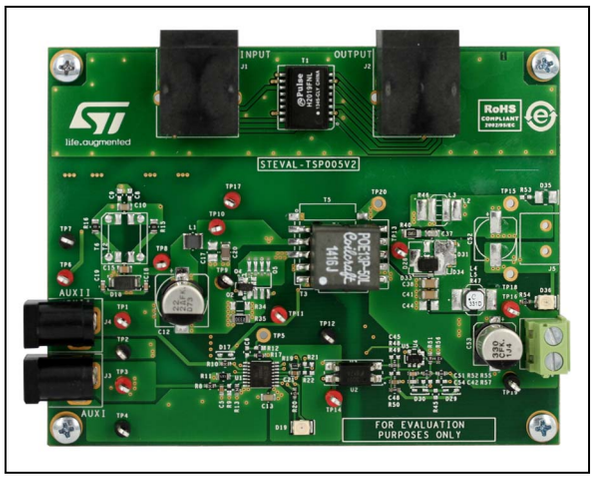
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STEVAL-TSP005V2

Power over Ethernet - PD converter with 5 V 2 A output, standard IEEE 802.3af compliant

Data brief



Description

This document focuses on a reference design for a simple, low cost 5 V 2 A flyback converter based on the PM8800A device.

The PM8800A is a highly integrated device embedding an IEEE 802.3af compliant “Powered Device” (PD) interface together with a PWM controller.

It can be successfully used in all low power, low cost PoE applications.

Features

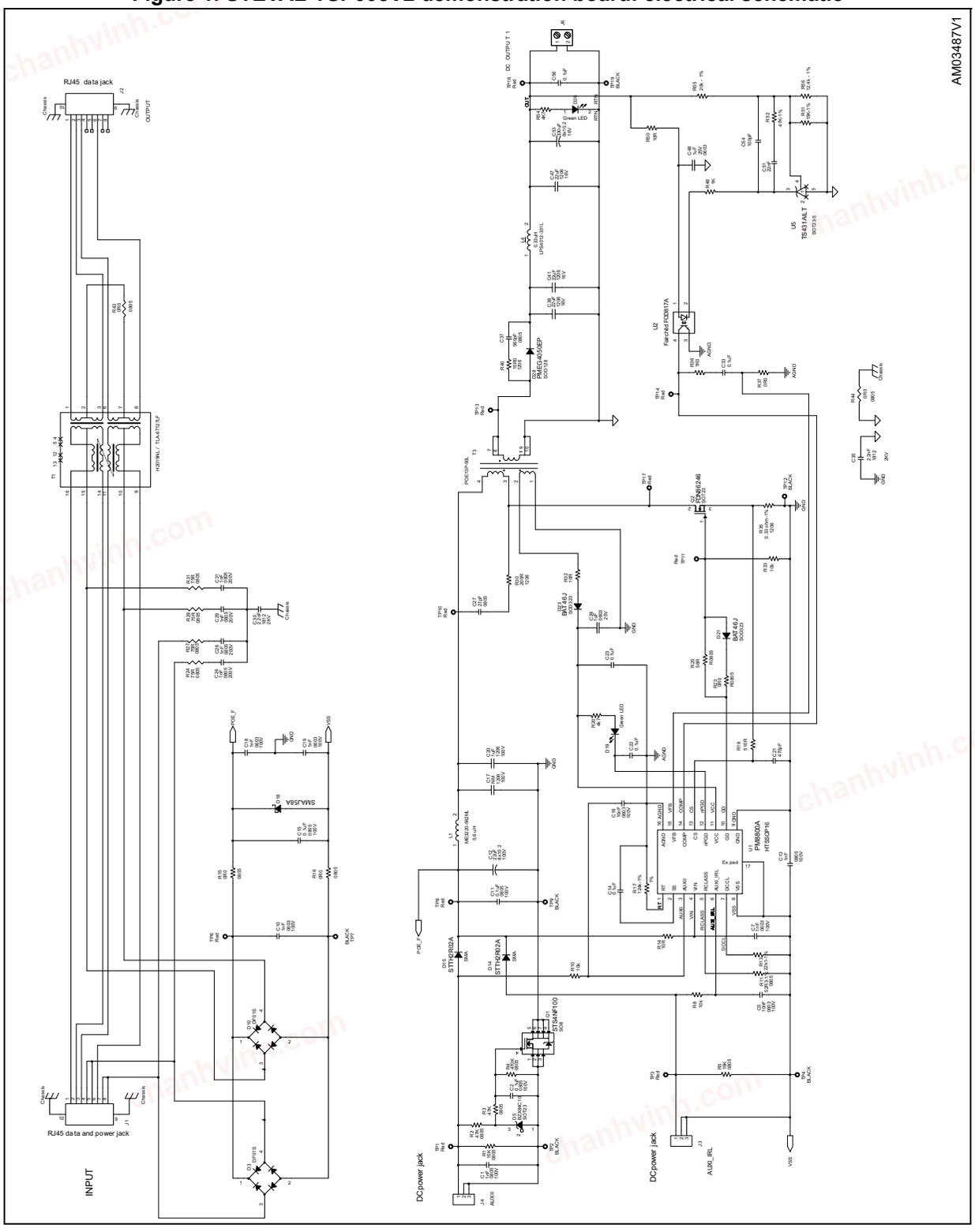
- IEEE 802.3af compliant PD interface
- Works with power supplied from Ethernet LAN cables or from local auxiliary sources
- Line input voltage range: 40 Vdc to 60 Vdc output voltage: 5 Vdc ± 5%
- Output current: 2 A
- Peak-to-peak output ripple: 30 mV
- Efficiency DC-DC full-load: > 86%
- Efficiency overall peak: > 84%
- Transient response $\Delta Vout_{pk\text{-}pk}$ to 50% load step: < 300m V_{pp}
- ΔV in load line case: < 0.5%

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1 Electrical diagram

Figure 1. STEVAL-TSP005V2 demonstration board: electrical schematic



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2 Introduction

This document details the characteristics and performances of the PM8800A demonstration kit STEVAL-TSP005V2 which has been designed to cover a broad range of power over ethernet (PoE) applications.

The PM8800A is a highly integrated device embedding an IEEE 802.3af compliant powered device (PD) interface together with a PWM controller and support for auxiliary sources.

Even though the PM8800A can be configured to work in both isolated and non-isolated topologies, single or double output; this document focuses on a low cost isolated flyback converter topology with diode rectification, 5 V output voltage with an up to 2 A output current capability.

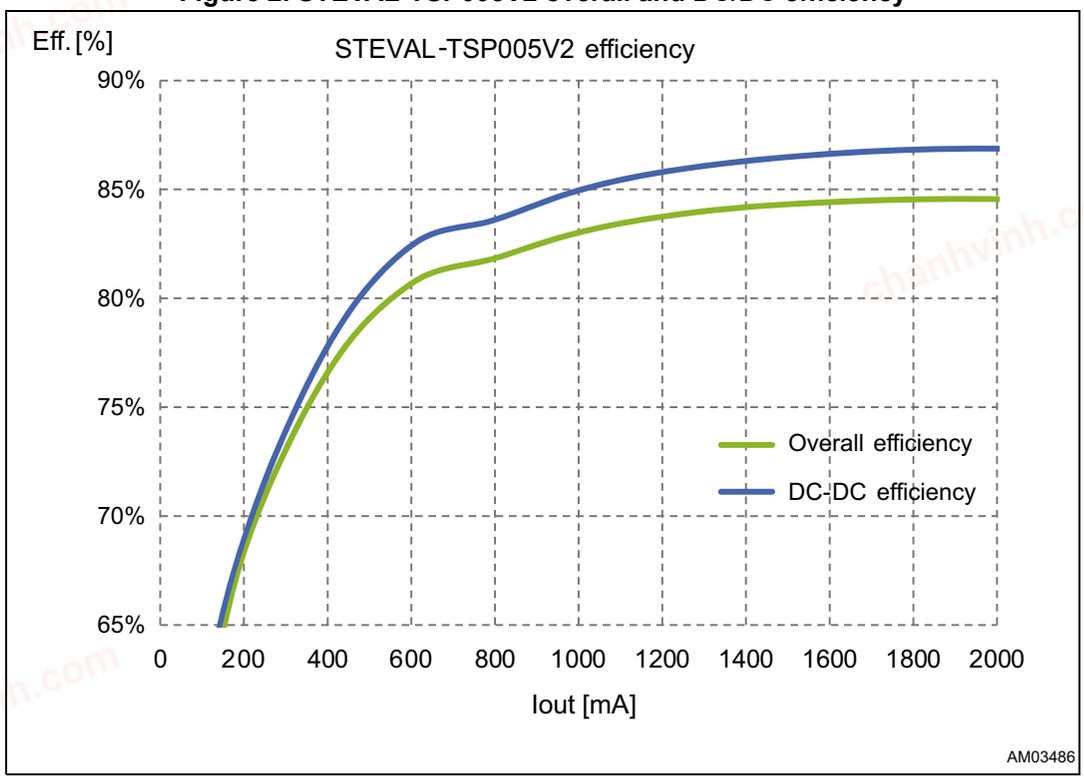
Auxiliary sources can be connected to the board on 2 input connectors. One input (AUX II) allows prevalence of the auxiliary sources with respect to the PoE, while the other input (AUX I) allows the usage of a wall adaptor with voltage lower than the internal PoE UVLO threshold and still benefits from the inherent inrush and DC current limit.

The above mentioned configurations are all supported by the PM8800A demonstration kit as options on the same PCB.

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3 Efficiency

Figure 2. STEVAL-TSP005V2 overall and DC/DC efficiency



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4 References

1. PM8800A - datasheet “Integrated IEEE 802.3af compliant PoE-PD interface and PWM controller with support of external source”.
2. AN4377 - “Power over Ethernet - PD converter with 5 V 2 A output, standard IEEE 802.3af compliant”

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5 Revision history

Table 1. Document revision history

Date	Revision	Changes
30-May-2014	1	Initial release.

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