

EMM9988 PDSwitch Family



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Off-Line Switcher with GaN Technology
for USB PD Type C applications up to 65W

Product Highlights

Compact footprints

- Advanced HV GaN MOSFET
- Integrated PWM control
- Integrated Vcc supply, Vds clamber, Isense resistor, X2 capacitor discharge
- PCB footprints as small as (18x5mm)

Energy efficient

- Efficiency up to 94%+
- Low standby power <60mW
- Meets DoE level VI
- Meets EU's CoC Tier 2

Advanced features

- Unique clamping technology (*Patent Pending*) reduces high frequency EMI
- External snubber is not required
- Frequency jittering further reduce EMI
- Minimizes external EMI filtering components
- Single auxiliary winding direct feed for Vcc supply without extra components.
- Integrated HV startup circuit
- Integrated X2 capacitor discharge capability

Protection features

- Over Temperature Protection
- Over current protection
- Short winding protection
- Input voltage brown out protection

Applications

- High efficiency and compact designs up to 65 W
- USB PD type C adaptor or converter
- Wall mounted USB PD type C power supplies
- Notebook, tablet or laptop adapter
- Generic high density adapter
- High efficiency 80+ power supplies
- Audio amplifier power supplies
- LCD/OLED TV power supplies
- Set-top box power supplies
- Printer power supplies

Output Power Table

P/N	Recommended Output Power
EMM9988A-G4	65W
EMM9988S-G4	65W
EMM9988SS-G4	65W

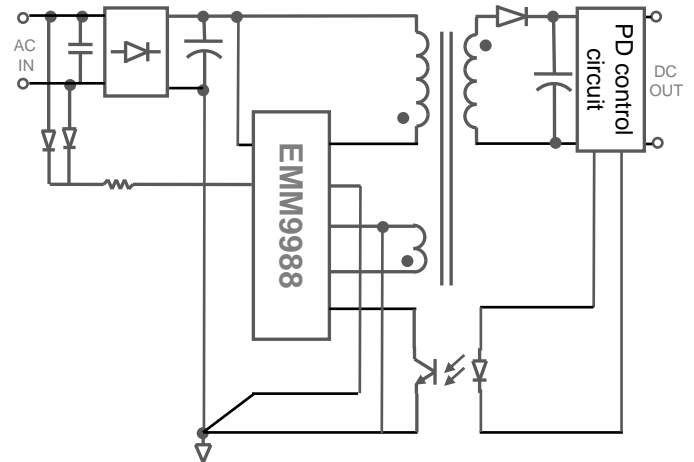


Figure 1 Typical application schematic

Package Outlines

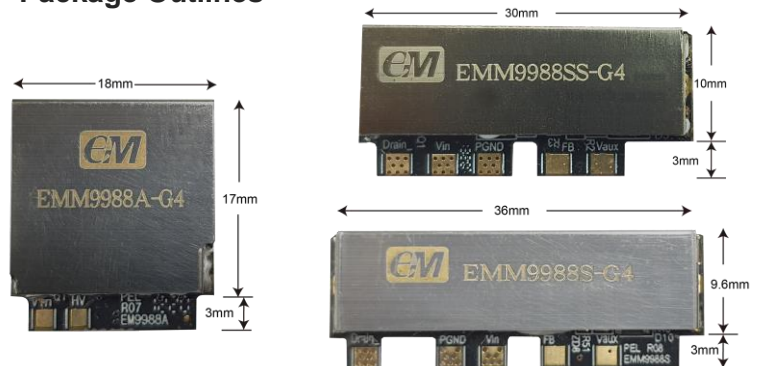


Figure 2 Package outline

Description

The PDSwitch is an integrated flyback power module designed as a solution for high density converter, especially USB PD type C applications.

It incorporates a high voltage GaN MOSFET, a PWM controller, a unique energy recovery voltage clamber, and all necessary auxiliary circuits. It is optimized for Transphorm's GaN MOSFET.

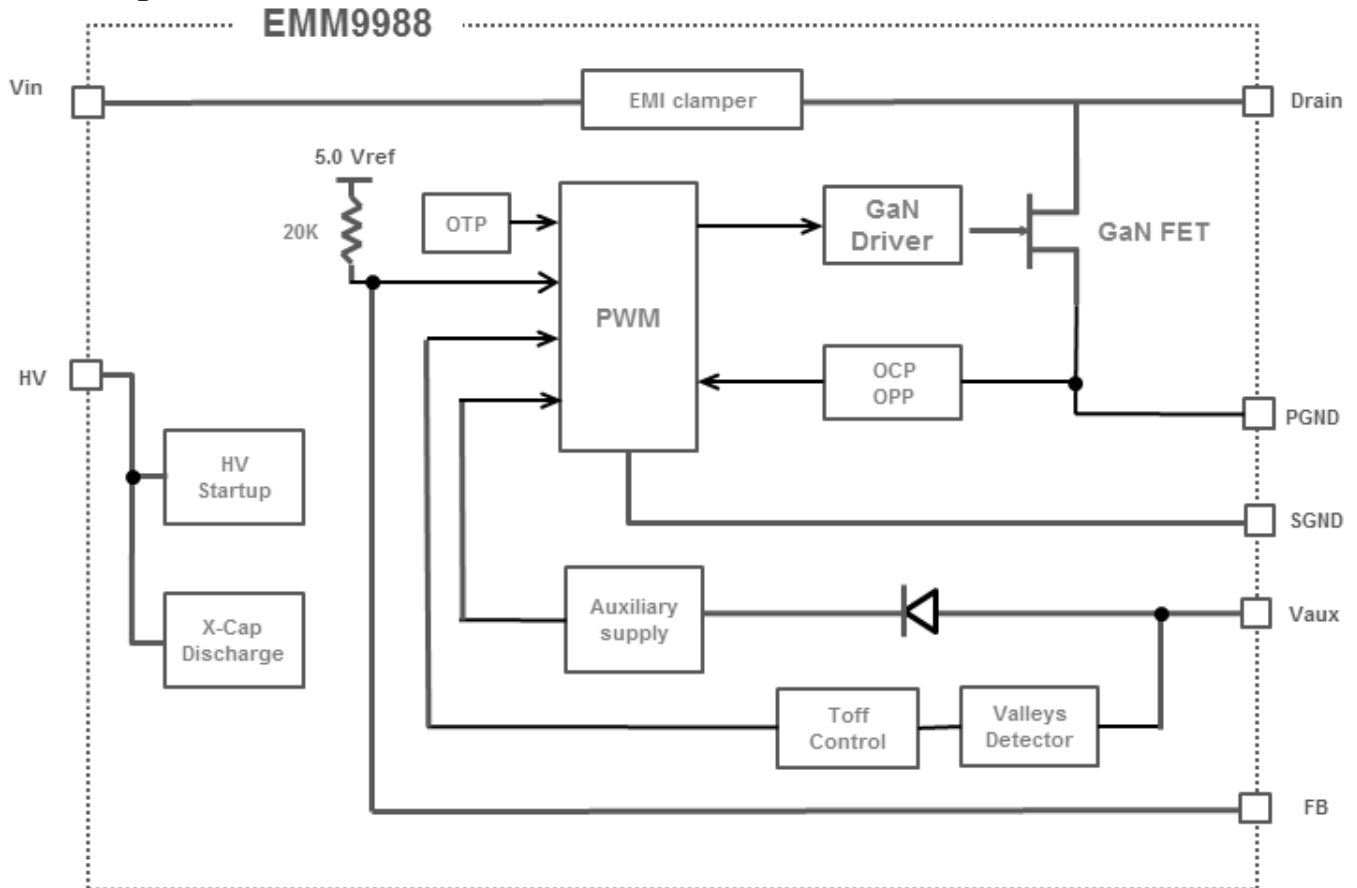
The GaN MOSFET and voltage clamber allow the module switching at high frequency without sacrificing switching losses.

The sophisticated PWM controller ensures the module safe under abnormal conditions, including over load, short circuit, over temperature, etc.

The included auxiliary circuit eliminates most external circuitry, greatly simplifying power supply design in real applications.

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Block Diagram



Pin Functional Descriptions (Pin number refers to EMM9988A)

Pin no.	Pin Name	Function
1	Vin	This pin connects to the internal EMI clamber. It shall direct connect to the input of the flyback transformer to form a complete loop for the Vds clamp.
2	HV	This pin is the input for the high voltage startup and brownout detection circuits. It also contains the line removal detection circuit to safely discharge the X2 capacitors when the line is removed.
3	FB	Feedback input for the PWM controller. Allows direct connection to optocoupler.
4	Vaux	This pin receives auxiliary supply from the auxiliary winding of main transformer. This pin is also used for demagnetization and valleys detection to determine the turn-on of the GaN FET.
5	SGND	This is the signal ground reference.
6	PGND	This is the power ground.
7	Drain	This is the drain terminal of the GaN MOSFET.