

15-36 W GaN High-Voltage Auxiliary Power Supply for Smart Utility Meters

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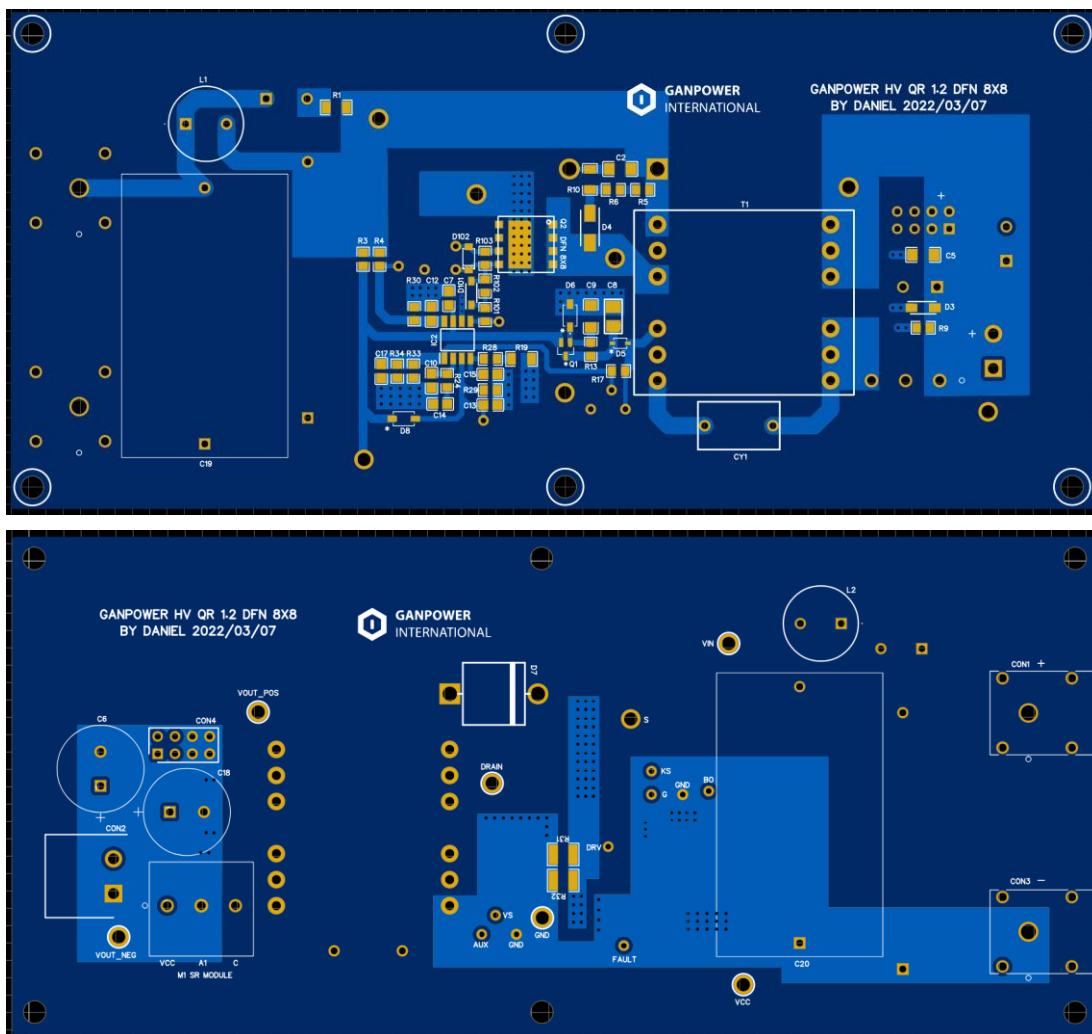
1 Introduction

GPI-HVDCDC-36W-EVB is a highly efficient (89%-95%) and primary-side regulated (PSR) auxiliary power supply. The design provides a stable 5-12 V output voltage and 15-36 W output power over a wide input range from 250 VDC to 1200 VDC. With an efficient diode bridge, the board can be used to power various high-voltage utility meters with three-phase 200-800VAC input at very low power loss.

The board employs the Onsemi NCV1362 quasi-resonant peak current PSR flyback controller, the Onsemi NCP4306 synchronous rectification controller, and the GaNPower GPIHV15DFN 1200V GaN HEMT, which are the latest generation of devices from GaNPower.

Thanks to the very low on state resistance (100 mΩ) and ultra-low gate charge (4 nC) value of the GaN HEMT, the switching losses are significantly reduced, and the board exhibits a superior efficiency for the application up to 95% in light load conditions.

2 Board Overview



3 Specification

Parameters	Values
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Input and Output

Input Voltage	250-1200 VDC
Input Current	34-160 mA
Output Voltage	5-12 V
Output Current	1-3 A
Output Power	15-36 W
Efficiency	89%-95%

Power Switch

Part Number	GPIHV15DFN
Drain-Source Breakdown Voltage	1200 V
Drain-Source DC Current (Max)	15 A
Drain-Source Static On Resistance	100 mΩ
Gate Charge	4 nC
Reverse Recovery Charge	0 nC

Transformer

Dielectric insulation	4000 VAC, 1 min.
Primary Inductance	900 μH ± 10%
Leakage inductance	20 μH typ. / 40 μH max.
Safety standard	IEC62368-1
Pollution degree	1

Application

High-voltage Utility Meters Power Supply
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4 Preliminary Results

Input Voltage	Output Voltage	Output Power	Efficiency
540 VDC	12.8 VDC	5.6 W	93.8%
540 VDC	8.7 VDC	6.7 W	95.2%
540 VDC	5.5 VDC	7.6 W	93.9%
540 VDC	5.5 VDC	12.9 W	94.0%
540 VDC	5.5 VDC	17.7 W	90.8%

* Due to the global chip shortage, the GPIHV15DFN is temporarily out of stock. We temporarily used GPI65015DFN for the preliminary results shown here. Once the GPIHV15DFN is back in stock, the above results will be updated, and more data (including the results with higher input voltage) will be reported.