

## Design Summary

**IC:** L6566B - SO 16-N

**Input:** 80 - 160 Vac ( 48 - 50 Hz ) - Nominal: 80 Vac

**Output:** 48 V (2 % ripple) - 72 W max

**Switching Frequency:** 60 kHz - 120 kHz

**Expected Average Efficiency:** 87 %

**Max. Ambient Temperature:** 60 °C

### Transformer Specifications:

**fsw range:** 60 kHz - 120 kHz - **Lp:** 225  $\mu$ H - **leakage:** 2.25  $\mu$ H

**Primary - Ipk:** 3.5 A - **Irms:** 1.15 A

**Secondary - Irms:** 2.56 A - **Np/Ns:** 3.074

**Auxiliary - Irms:** 34 mA - **Iavg:** 20 mA - **Np/Naux:** 11.719

### Transformer Design:

#### Core:

**Type** EER28 Vertical - **Area Product** 5895 mm<sup>4</sup> - **Orientation** Vertical

**Volume (Ve)** 5250 mm<sup>3</sup> - **Cross-Sectional Area (Ae)** 82.10 mm<sup>2</sup> - **Bobbin Winding Area (Aw)** 71.80 mm<sup>2</sup>

**Bobbin Average Turn Length** 52.20 mm - **Bobbin Centr. Leg Length** 16.70 mm

**Material:** N27, N67, N87, 3C81, 3C90, 3C91, 3C95, PC40, PC44, PC50 or equivalent

**Core Gap:** 0.44 mm

**Inductance factor (AL):** 234 nH/N<sup>2</sup>

**Primary:** Turns 31 - Layers 4 - Paralleled wires 3

**Wire:** Type TIW - **Number of strands** 1 - **Strand copper**  $\varnothing$  0.350 mm

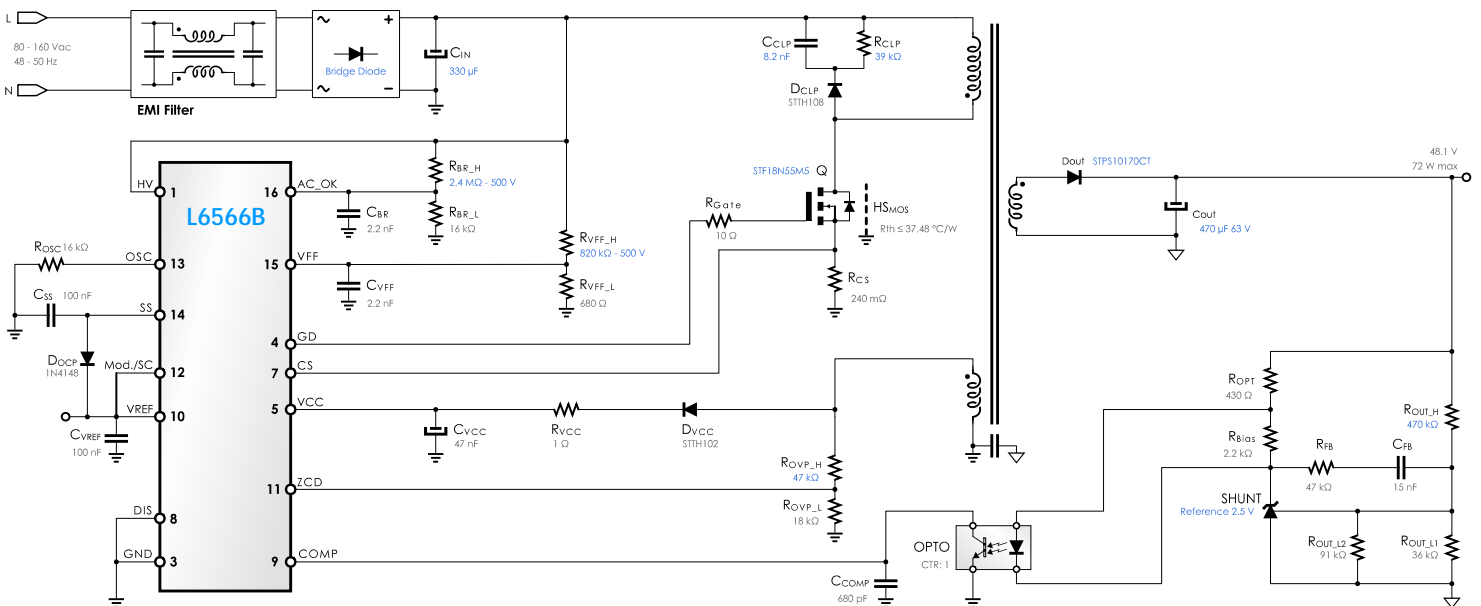
**Wire gross**  $\varnothing$  0.550 mm - **Resistance per meter** 0.1912  $\Omega$ /m

**Secondary:** Turns 10 - Layers 2 - Paralleled wires 3

**Wire:** Type Litz - **Number of strands** 25 - **Strand copper**  $\varnothing$  0.120 mm

**Wire gross**  $\varnothing$  0.947 mm - **Resistance per meter** 0.0678  $\Omega$ /m

**Auxiliary:** Turns 3

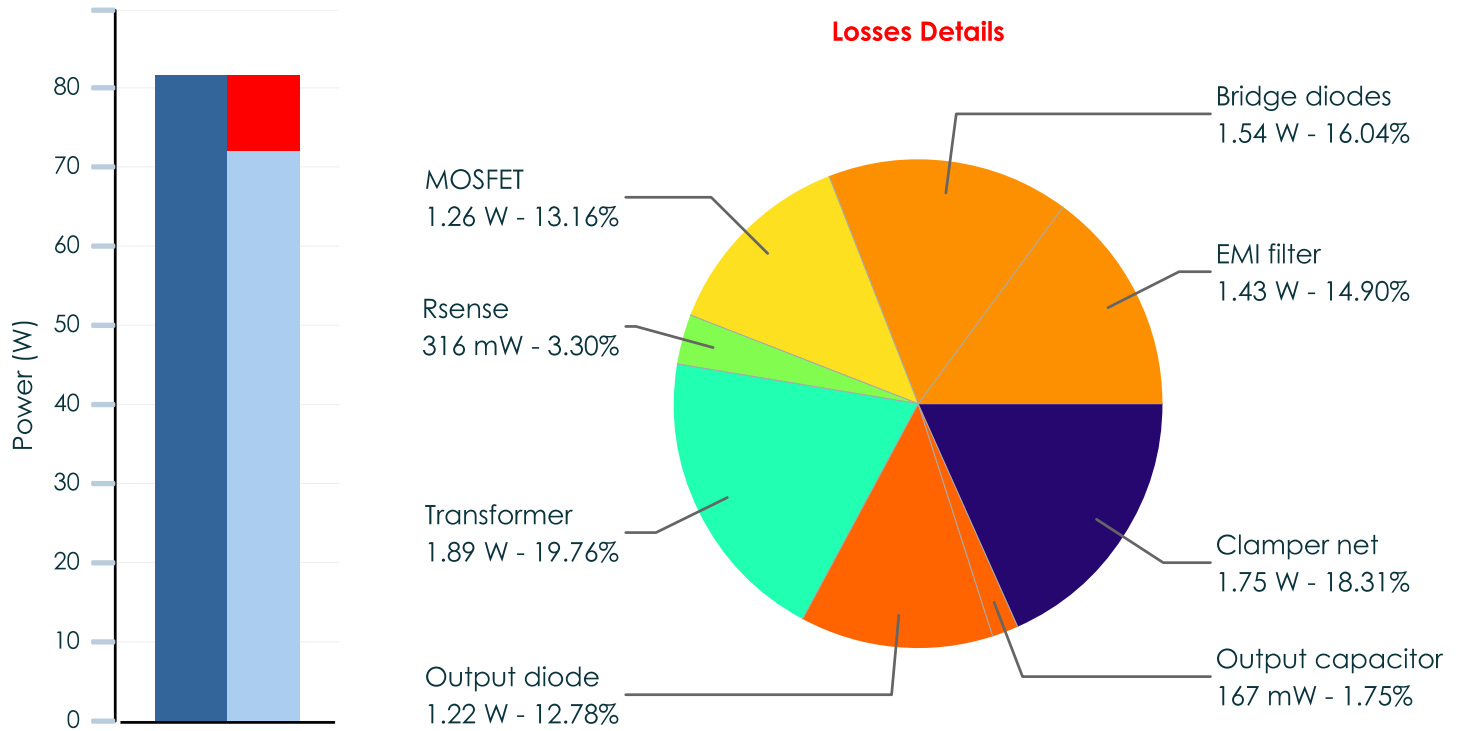


## Bill of Materials

Reference	Value	Description
IC	L6566B	PWM Controller
Q	STF18N55M5	Power MOSFET
HSmos	Rth ≤ 37.48 °C/W	Heatsink
Rgate	10 Ω	Standard Resistor - 5% 250 ppm/°C
Cclp	8.2 nF	300 V capacitor
Rclp	39 kΩ	2W Resistor
Dclp	STTH108	800 V Diode
Rosc	16 kΩ	Standard Resistor - 1% 100 ppm/°C
Css	100 nF	50 V Standard ceramic capacitor
Rcs	240 mΩ	1/2 W Resistor - 5% 250 ppm/°C
Rbr_h	2.4 MΩ - 500 V	High Voltage Resistor - 1% 100 ppm/°C
Rbr_l	16 kΩ	Standard Resistor - 1% 100 ppm/°C
Cbr	2.2 nF	50 V Standard ceramic capacitor
Rovp_h	47 kΩ	Standard Resistor - 5% 250 ppm/°C
Rovp_l	18 kΩ	Standard Resistor - 5% 250 ppm/°C
Docp	1N4148	Fast signal diode
Rvff_h	820 kΩ - 500 V	High Voltage Resistor - 1% 100 ppm/°C
Rvff_l	680 Ω	Standard Resistor - 1% 100 ppm/°C
Cvff	2.2 nF	50 V Standard ceramic capacitor
Cvref	100 nF	50 V Standard ceramic capacitor
Cvcc	47 nF	35 V Electrolytic capacitor
Rvcc	1 Ω	Standard Resistor - 5% 250 ppm/°C
Dvcc	STTH102	High efficiency ultrafast diode
SHUNT	Reference 2.5 V	Shunt voltage reference
Rout_h	470 kΩ	Standard Resistor - 1% 100 ppm/°C
Rout_l1	36 kΩ	Standard Resistor - 1% 100 ppm/°C
Rout_l2	91 kΩ	Standard Resistor - 1% 100 ppm/°C
Cin	330 μF	250 V Electrolytic capacitor
BD	Bridge Diode	400 V Bridge rectifier
Cout	470 μF 63 V	63 V - ESR ≤ 39 mΩ - Electrolytic capacitor
Dout	STPS10170CT	Low drop power schottky rectifier
Ccomp	680 pF	50 V Standard ceramic capacitor
Cfb	15 nF	50 V Standard ceramic capacitor
Rfb	47 kΩ	Standard Resistor - 5% 250 ppm/°C



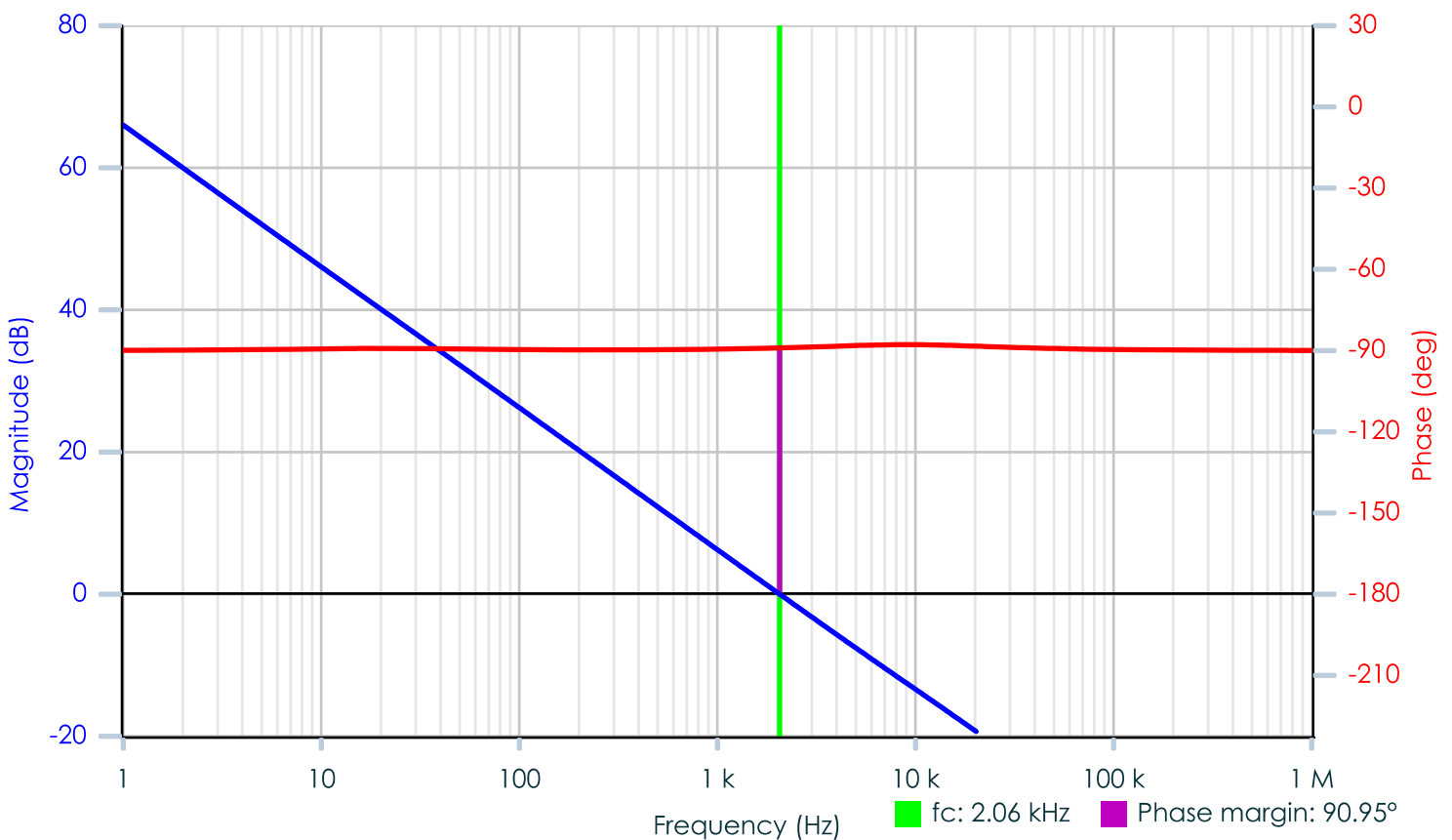
Reference	Value	Description
Ropto	430 Ω	Standard Resistor - 5% 250 ppm/°C
Rbias	2.2 kΩ	Standard Resistor - 5% 250 ppm/°C
OPTO	CTR: 1	Optocoupler - CTR: 1

**Power Losses** @ ( Vin 80 Vac - Pout 72 W )


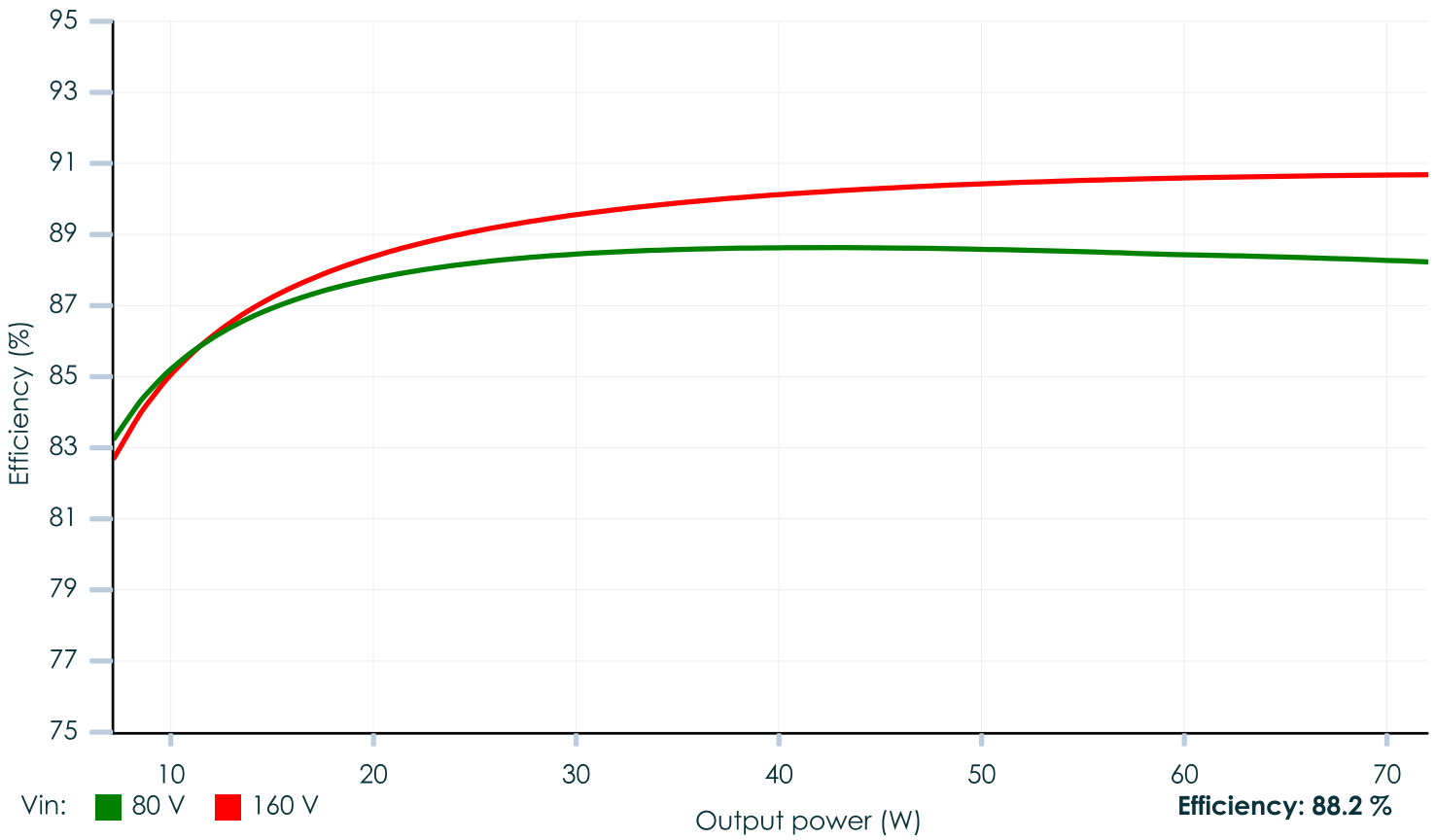
Pin: 81.6 W    Pout: 72 W

Power losses: 9.6 W - 11.77% details

**Efficiency: 88.23%**

**Bode** @ ( Vin 80 Vac - Pout 72 W )


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**Efficiency** @ ( Vin 80 Vac - Pout 72 W )

**Simulation** @ ( Vin 80 Vac - Pout 72 W )

■ @Vin 80 Vac   ■ @Vin 160 Vac

