

Reference Design RD-310

Primary-Side-Regulation PWM with POWER MOSFET – 3.5W Design

Featured Device	Application	Input Voltage Range	Output Voltage (Rated Current)	Rated Output Power	Topology
FSEZ1317	Cell Phone Charger	90~265V _{AC}	5V (0.7A)	3.5W	Primary-Side Regulated Flyback Converter

Key Features

- Low Standby Power Under 30mW
- High Voltage Startup
- Constant-Voltage (CV) and Constant-Current (CC) Control without Secondary-Feedback Circuitry
- Green Mode Function: Frequency Reduction at Light-Load
- Fixed PWM Frequency at 50kHz with Frequency Hopping to Reduce EMI
- Cable Voltage Drop Compensation in CV Mode
- Various Protection Functions: V_{DD} Over-Voltage Protection (OVP), V_{DD} Under-Voltage Lockout (UVLO), and Over-Temperature Protection (OTP)
- 7-Lead Small Outline Package (SOP)

1. Schematic

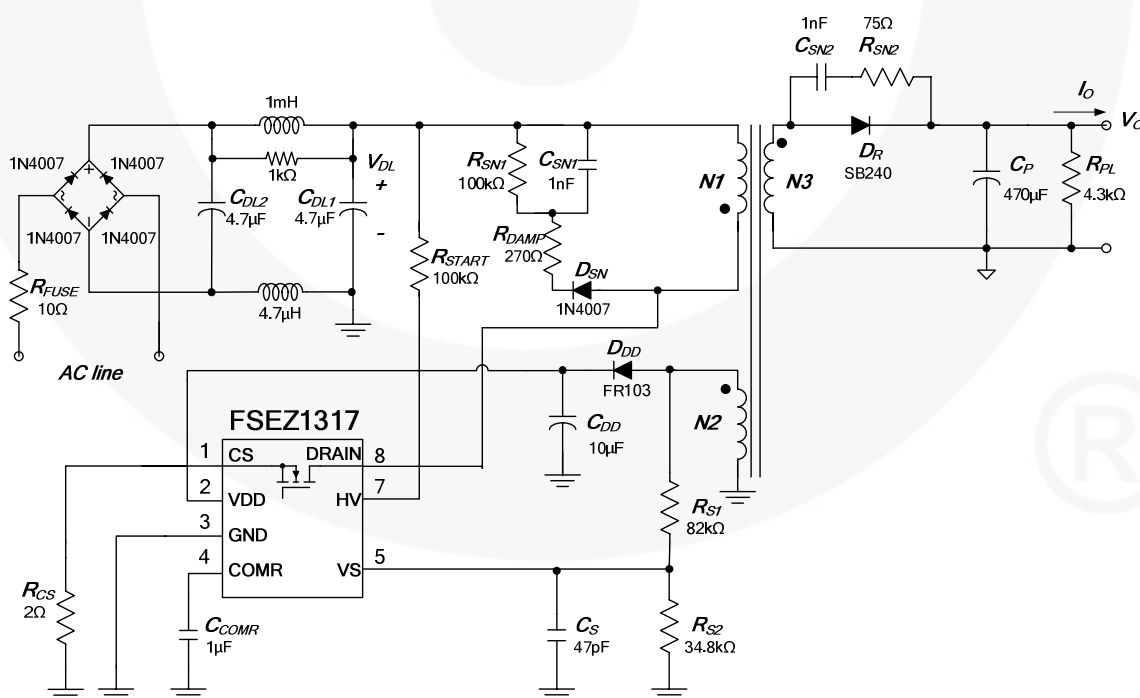


Figure 1. Schematic

2. Transformer

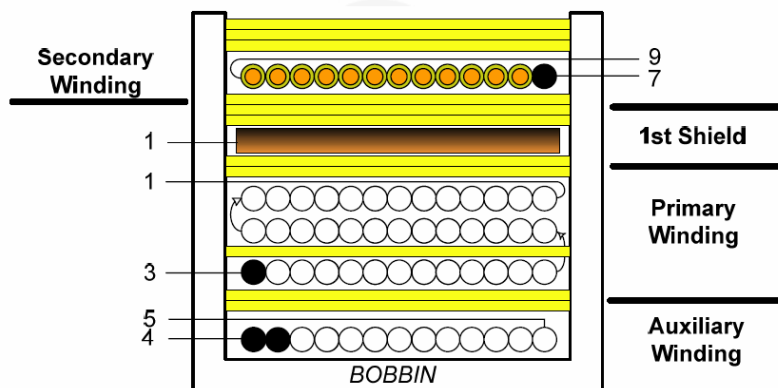


Figure 2. Transformer Schematic Diagram

Notes:

1. When W4R's winding is reversed winding, it must wind one layer.
2. When W2 is winding, it must wind three layers and put one layer of tape after winding the first layer.

2.1. Winding Specification

No.	Terminal		Wire	t_s	Insulation	Barrier Tape	
	S	F			t_s	Primary	Seconds
W1	4	5	2UEW 0.23*1	15	2		
W2	3	1	2UEW 0.18*1	41	1		
				39	0		
				37	2		
W3	1		COPPER SHIELD	1.2	3		
W4	7	9	TEX-E 0.55*1	9	3		
			CORE ROUNDING TAPE		3		

Core: EE16

Bobbin: EE16

2.2. Electrical Characteristics

	Pin	Specification	Remark
Primary-Side Inductance	1 – 3	2.25mH \pm 5%	100kHz, 1V
Primary-Side Leakage Inductance	1 – 3	80 μ H Maximum	Short One of the Secondary Windings

3. Typical Performance

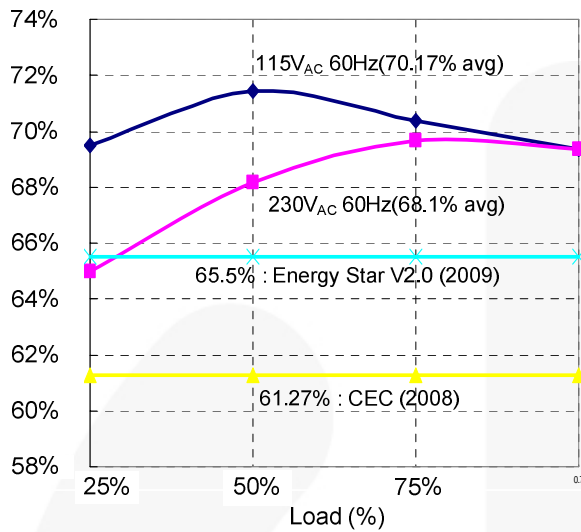


Figure 3. Efficiency

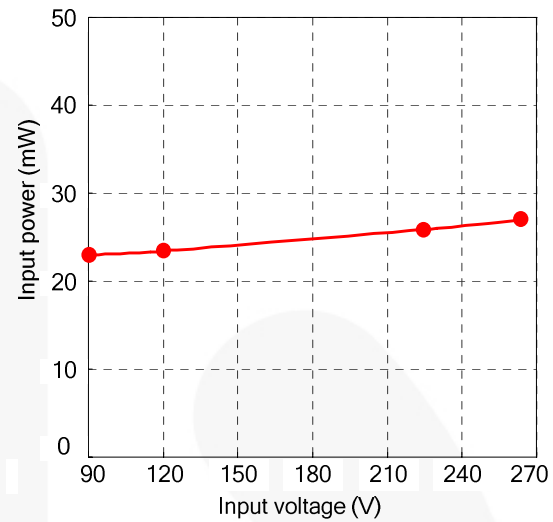


Figure 4. Input Power vs. Input Voltage

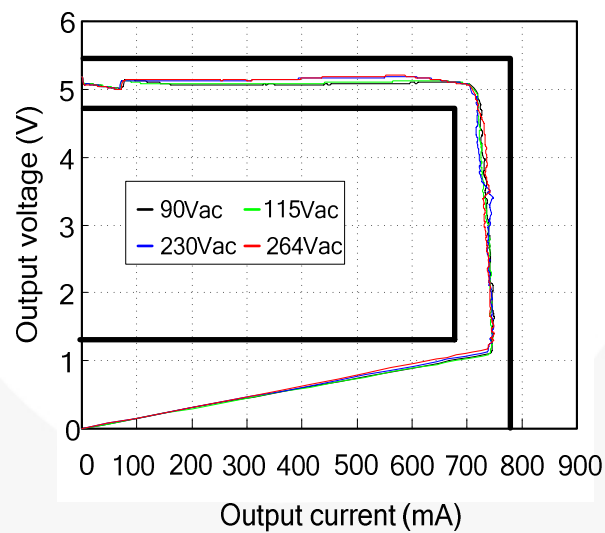


Figure 5. Output Voltage vs. Output Current

4. Related Resources

[FSEZ1317 — Primary-Side-Regulation PWM with POWER MOSFET Integrated Datasheet](#)

[AN-6067 — Design and Application of Primary-Side Regulation \(PSR\) PWM Controller](#)

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