

Reference Design RD-269

PFC+PWM Combo Controller FAN6921

Featured Device	Application	Input Voltage Range	Output Voltage (Rated Current)	Rated Output Power	Topology
FAN6921	Notebook Adaptor	90~264V _{AC}	19V (4.74A)	90W	BCM Boost PFC and Quasi-Resonant Flyback Converter

Key Features

FAN6921

BCM PFC Converter

- Zero-Current Detection
- Controlled On-Time Technique
- Cycle-by-Cycle Current Limiting
- Internal Leading-Edge Blanking for Current Sensing
- PFC Burst Mode Operation at Light-Load Condition (FAN6920)
- PFC Soft-Burst for Reducing Audible Noise
- Adjustable Burst Operation Voltage Range
- Minimum T_{OFF} for Frequency Limitation

Quasi-Resonant Converter

- Peak-Current-Mode Control
- Cycle-by-Cycle Current Limiting
- Internal Lead-Edge Blanking Time for Current Sensing
- Off-Modulation Technique
- Deep Extended Valley Switching
- Internal Minimum T_{OFF} for Frequency Limitation
- H/L Line Over-Power Compensation
- Internal 5ms Soft-Start

1. Schematic

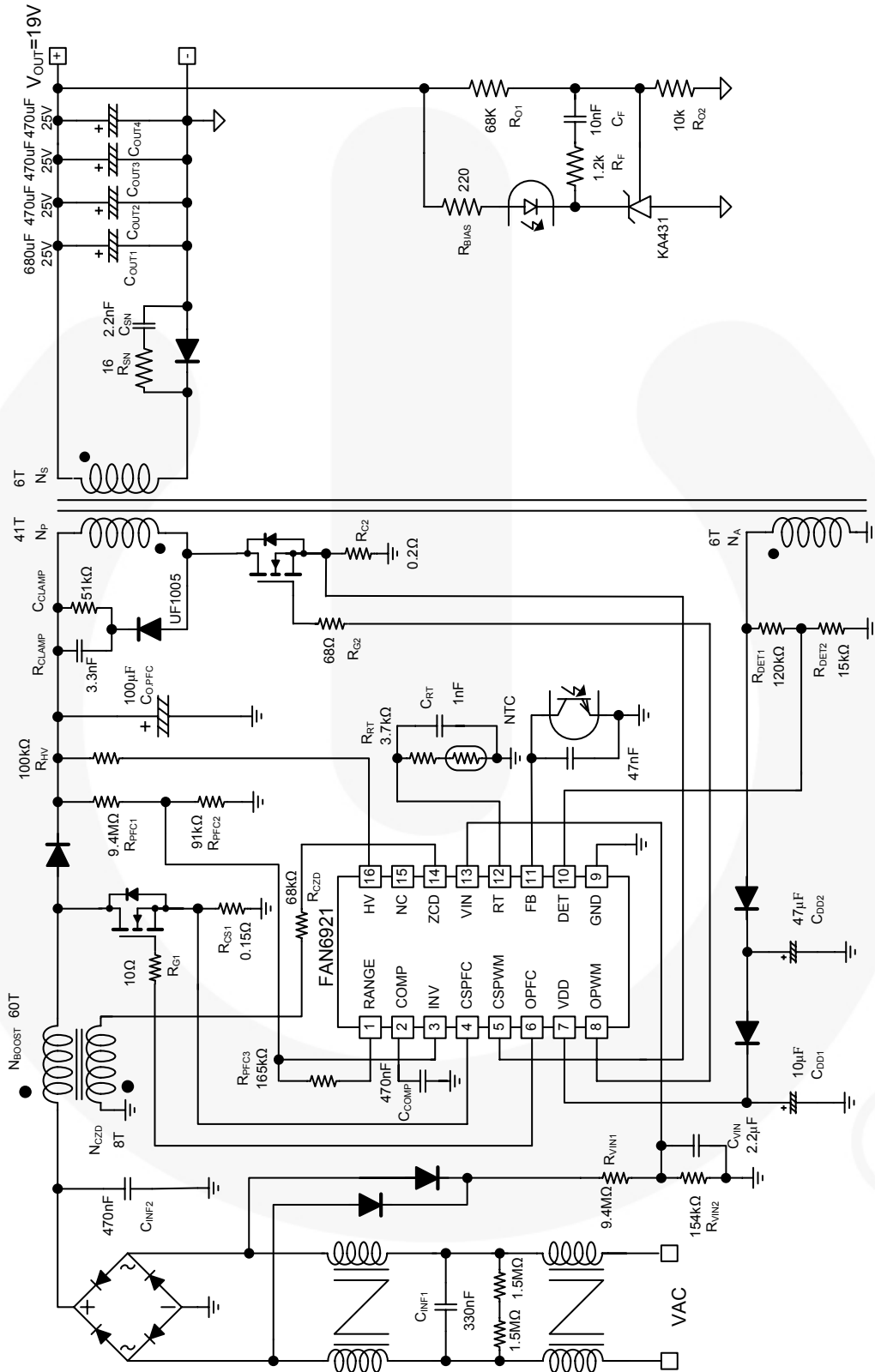


Figure 1. Schematic

2. Boost Inductor

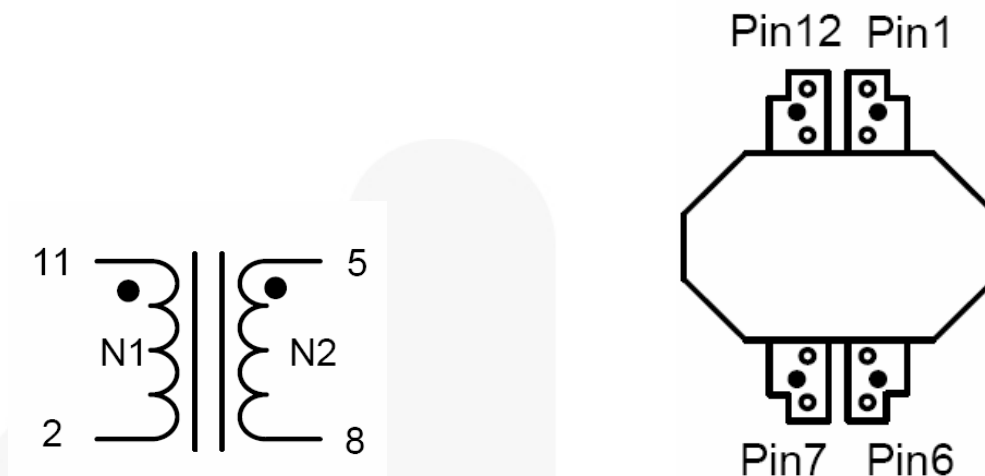


Figure 2. Inductor Schematic Diagram

2.1. Winding Specification

No	Pin (S - F)	Wire	Turns	Winding Method
N ₁	11→2	0.10Φ×40	60Ts	Solenoid Winding
Insulation: Mylar® Tape t = 0.03mm, 3 Layer				
N ₂	5→8	0.20Φ×1	8Ts	Solenoid Winding
Insulation: Mylar® Tape t = 0.03mm, 3 Layer				

Core: RM10
Bobbin: RM10

2.2. Electrical Characteristics

	Pin	Specification	Remark
Primary-Side Inductance	2 – 11	385μH ± 5%	100kHz, 1V

Mylar® is a registered trademark of Dupont Tejin Films

3. Flyback Converter Transformer

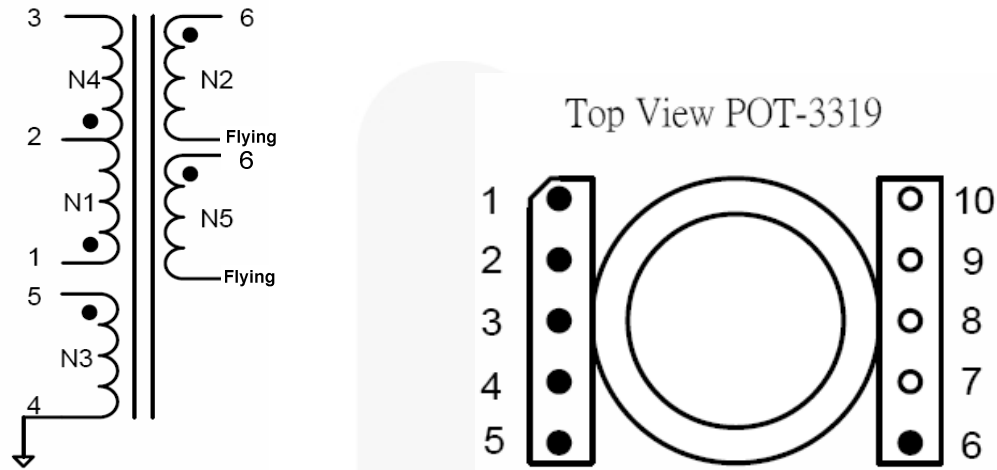


Figure 3. Transformer Schematic Diagram

3.1. Winding Specification

	Pin (S → F)	Wire	Turns	Winding Method
N1	1 → 2	0.45φ×1	21	Solenoid Winding
Insulation: Polyester Tape t = 0.025mm, 3 Layer E1 Shield: 0.025mm × 7mm, 1.1 turns, one end should be connected to pin 4 Insulation: Polyester Tape t = 0.025mm, 3 Layer				
N2	6 → Flying	0.55φ×2	6	Solenoid Winding
Insulation: Polyester Tape t = 0.025mm, 3 Layer				
N3	5 → 4	0.30φ×1	6	Solenoid Winding
Insulation: Polyester Tape t = 0.025mm, 3 Layer				
N4	2 → 3	0.45φ×1	20	Solenoid Winding
Insulation: Polyester Tape t = 0.025mm, 3 Layer E2 Shield: 0.025mm × 7mm, 1.1 turns, one end should be connected to pin 4 Insulation: Polyester Tape t = 0.025mm, 3 Layer				
N5	6 → Flying	0.55φ×2	6	Solenoid Winding
Insulation: Polyester Tape t = 0.025mm, 3 Layer				

Core: POT3319
Bobbin: POT3319

3.2. Electrical Characteristics

	Pin	Specification	Remark
Primary-Side Inductance	2 – 11	700μH ± 5%	100kHz, 1V
Primary-Side leakage Inductance	2 – 11	7μH ± 5%	Short One of the Secondary Windings

4. Typical Performance

Table 1. Standby Power Consumption

Operating Condition	Input Watts
When $V_{IN} = 90V_{AC}$, with No Load	0.167W
When $V_{IN} = 115V_{AC}$, with No Load	0.169W
When $V_{IN} = 240V_{AC}$, with No Load	0.219W
When $V_{IN} = 264V_{AC}$, with No Load	0.236W

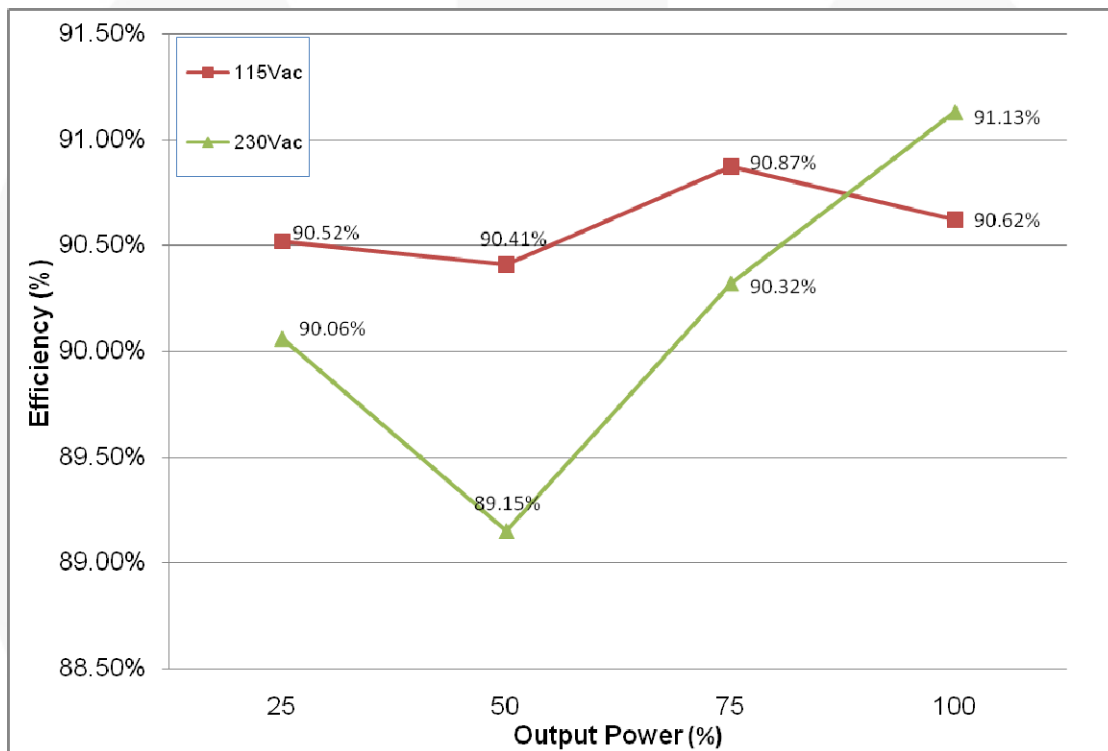


Figure 4. Efficiency

5. Related Resources

[FAN6921MR\(ML\) — Integrated Critical Mode PFC and Quasi-Resonant Current Mode PWM Controller Datasheet](#)

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