Fairchild Reference Design

The following reference design supports inclusion of **FL6961** in design of LED illumination. It should be used in conjunction with the FL6961 datasheet as well as Fairchild's application notes and technical support team. Please visit Fairchild's website at http://www.fairchildsemi.com.

Application	Fairchild Device	Input Voltage Range	Rated Output Power	Output Voltage (Rated Current)
LED Illumination	FL6961	$90V_{AC}$ - $265V_{AC}$	30W	24V (1.25A)

Key Features

- Boundary Mode PFC Controller
- Low Input Current THD
- Controlled On-time PWM
- Zero Current Detection
- Cycle-by-cycle Current Limiting
- Leading-edge blanking instead of RC filtering
- Low Start-up Current: 10uA (typical)
- Low Operating Current: 4.5mA (typical)
- Feedback Open-Loop Protection
- Programmable Maximum On-Time (MOT)
- Output Over-Voltage Clamping Protection
- Clamped Gate Output Voltage 16.5V

1. Schematics

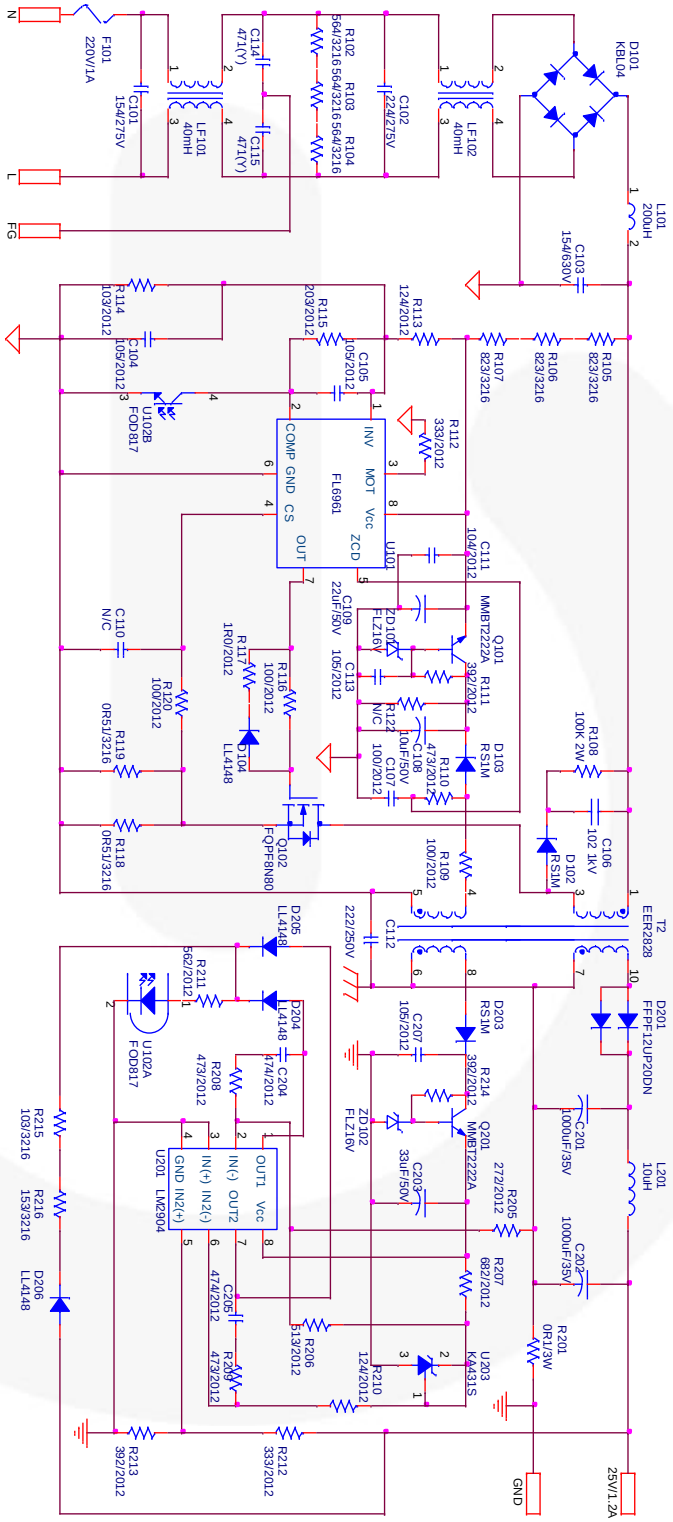

Figure 1. Schematic

2. Transformer

2.1. Transformer Schematic Diagram

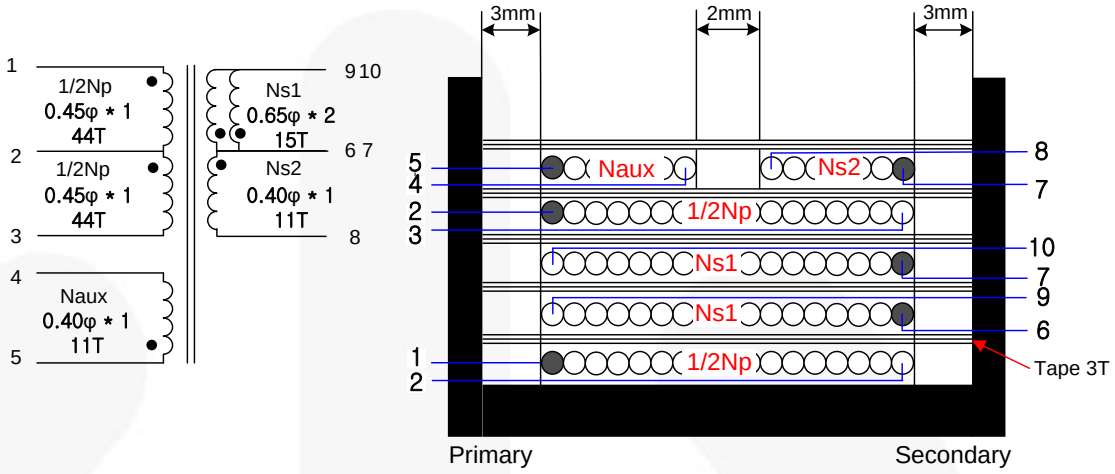

Figure 2. Transformer specifications & construction. [EER2828]

Table 1. Winding specifications.

No	Winding	Pin(S → F)	Wire	Turns	Winding Method
1	1/2Np	1 → 2	0.45φ×1	44 Ts	Solenoid winding
2	Insulation : Polyester Tape t = 0.025mm, 3Layers				
3	Ns1	6 → 9	0.65φ×2	15 Ts	Solenoid winding
4	Insulation : Polyester Tape t = 0.025mm, 3Layers				
5	Ns1	7 → 10	0.65φ×2	15 Ts	Solenoid winding
6	Insulation : Polyester Tape t = 0.025mm, 3Layers				
7	1/2Np	2 → 3	0.45φ×1	44 Ts	Solenoid winding
8	Insulation : Polyester Tape t = 0.025mm, 3Layers				
9	Naux	5 → 4	0.45φ×1	11 Ts	Solenoid winding
	Ns1	7 → 8	0.45φ×1	11 Ts	
10	Insulation : Polyester Tape t = 0.025mm, 3Layers				

Table 2. Electrical Characteristics.

	Pin	Spec.	Remark
Inductance	1– 3	700 uH ±7%	1kHz, 1V
Leakage	1– 3	30 uH Max	Short all output pins

2.2. Performance

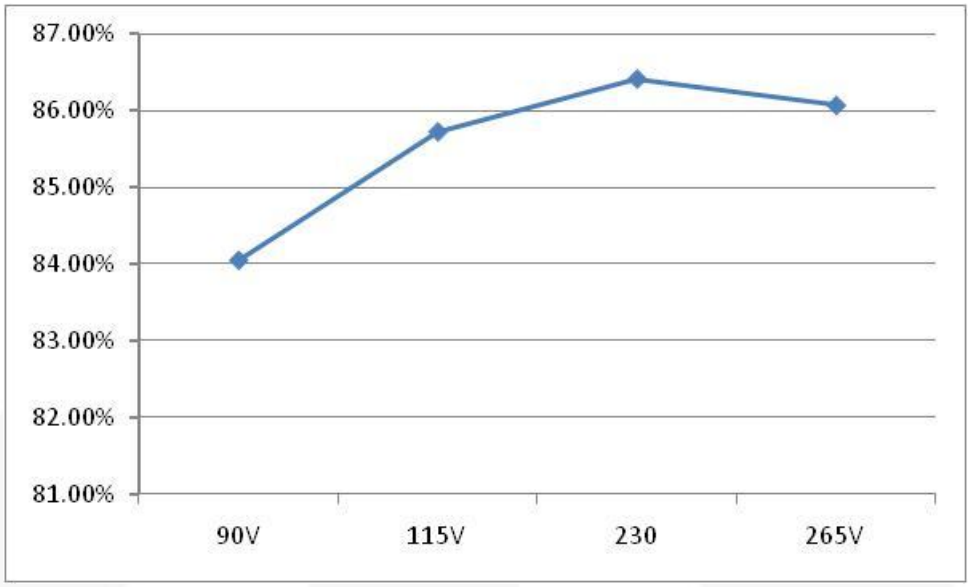

Figure 3. Efficiency Curve

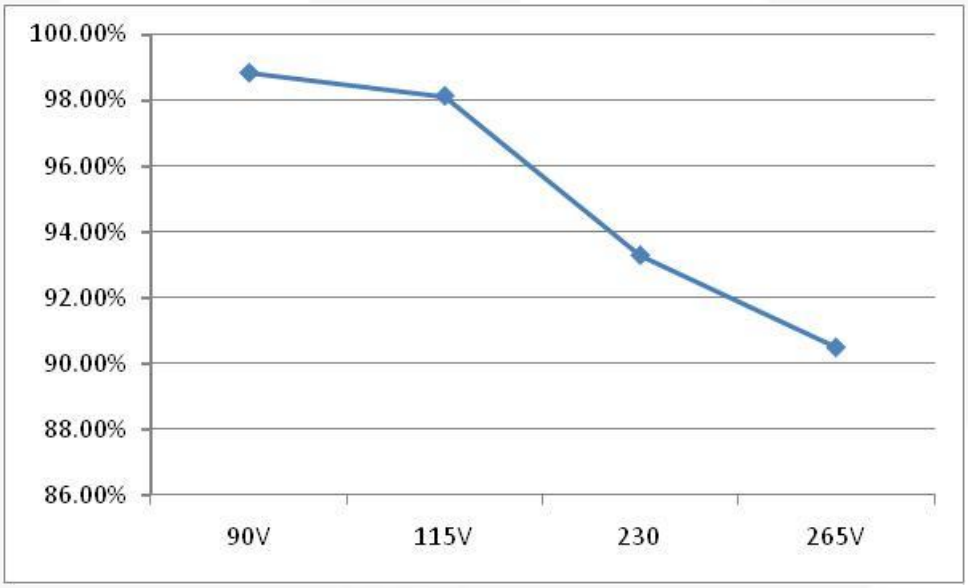

Figure 4. Power Factor Performance

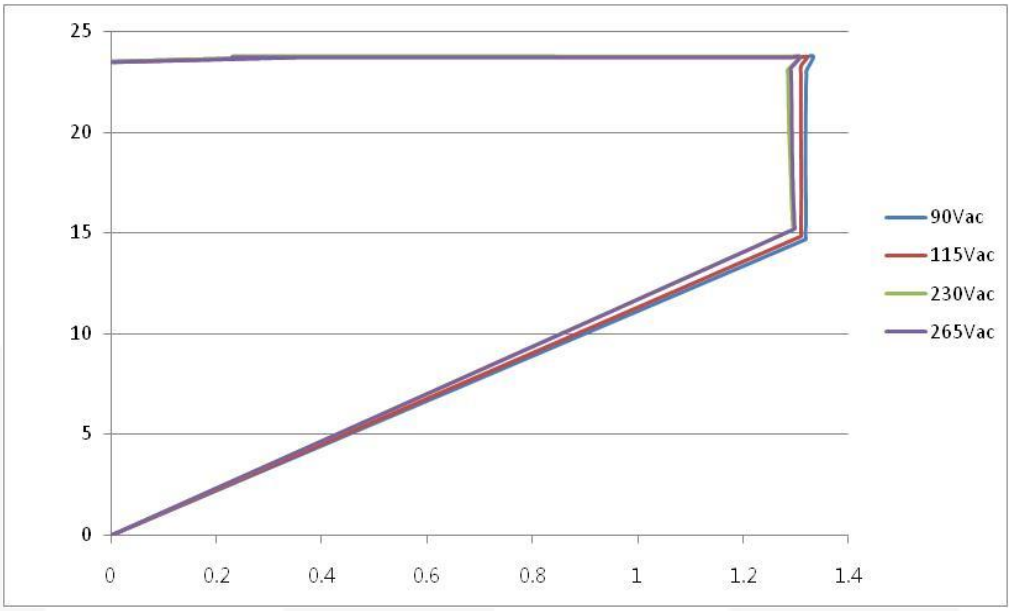

Figure 5. CC/CV Curve

3. Related Resources

Datasheet link FL6961

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