

Fairchild Reference Design

The following reference design supports inclusion of **FL103M** in design of LED illumination. It should be used in conjunction with the FL103M 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	FL103M	85-265V _{AC}	8.4W	24V (0.35A)

Key Features

- Constant-Voltage (CV) and Constant-Current (CC) Control without Secondary-Feedback Circuitry
- Low EMI through Frequency Hopping
- Low Power Consumption in Standby
- Protection Functions: UVLO, Over-Voltage, Over-Current, and Over-Temperature

1. Schematics

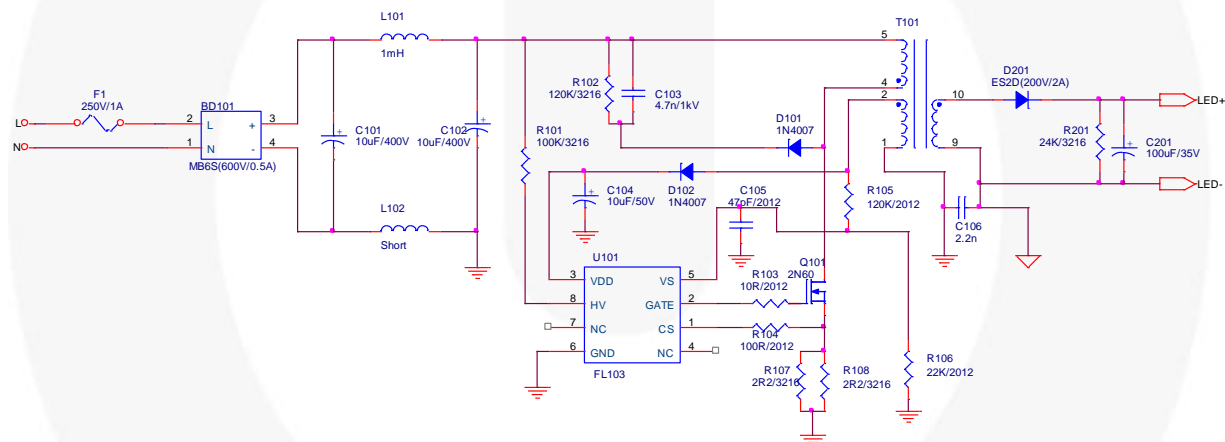
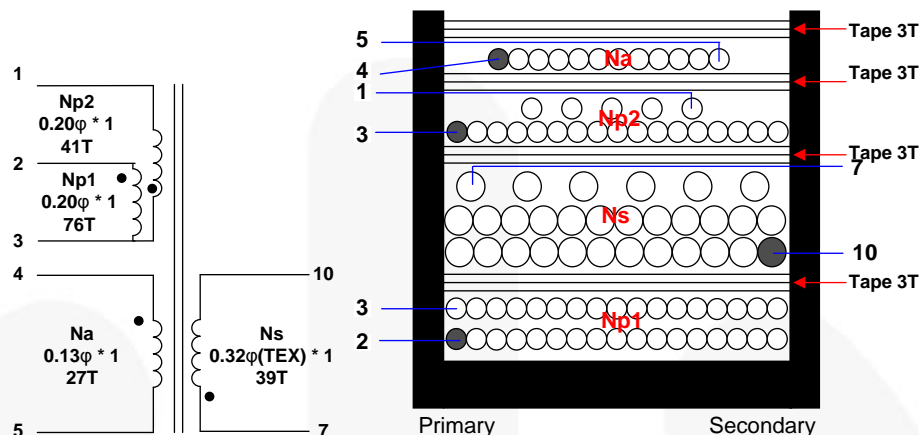


Figure 1. Schematic

2. Transformer

2.1. Transformer Schematic Diagram



2.2. Winding Specification

No.	Winding	Pin (S → F)	Wire	Turns	Winding Method
1	Np1	2 → 3	0.20 Φ * 1	76	Solenoid Winding
2	Insulation: Polyester Tape t = 0.05 mm, 3 Layers				
3	Ns	10 → 7	0.32 Φ (TEx) * 1	39	Solenoid Winding
4	Insulation: Polyester Tape t = 0.05 mm, 3 Layers				
5	Np2	3 → 1	0.20 Φ * 1	41	Solenoid Winding
6	Insulation: Polyester Tape t = 0.05 mm, 3 Layers				
7	Na	4 → 5	0.13 Φ * 1	27	Center Solenoid winding
8	Outer Insulation: Polyester Tape t = 0.05 mm, 3 Layers				

Core: EE1614S (PC-40)

Bobbin: 10 Pins

2.3. Electrical Characteristics

	Pin	Specification	Remark
Inductance	4 - 5	1.13mH ± 7%	1kHz, 1V
Leakage	4 - 5	Max. 20uH	Short all output pins

3. Performance

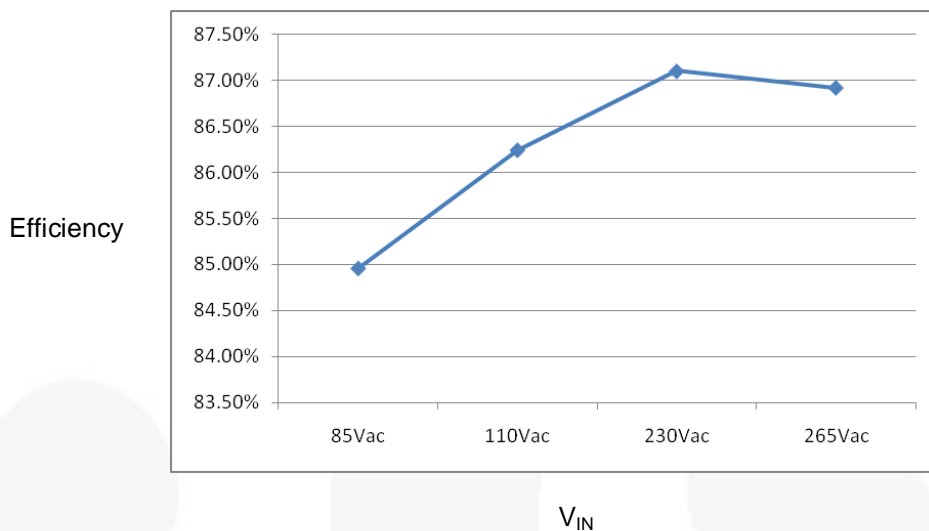


Figure 2. Efficiency Curve

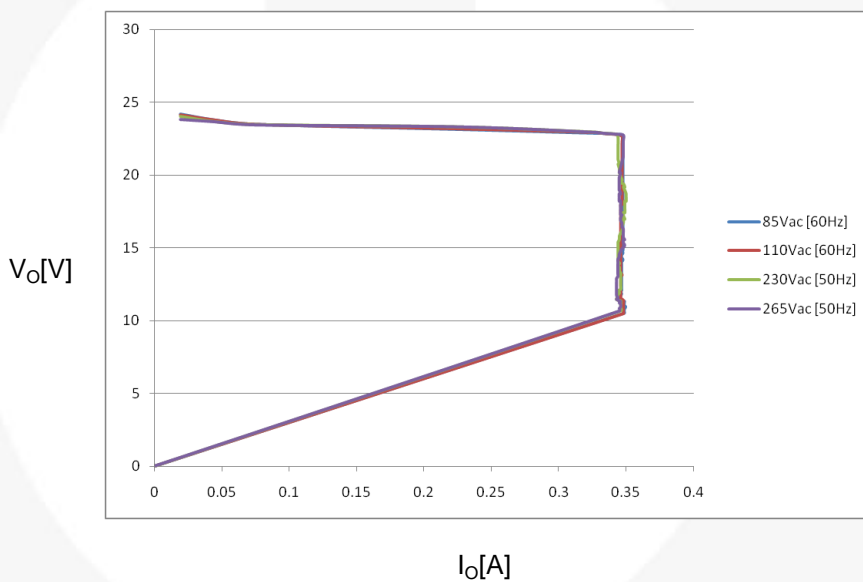


Figure 3. Constant Current Tolerance Using Electric Load (CR)

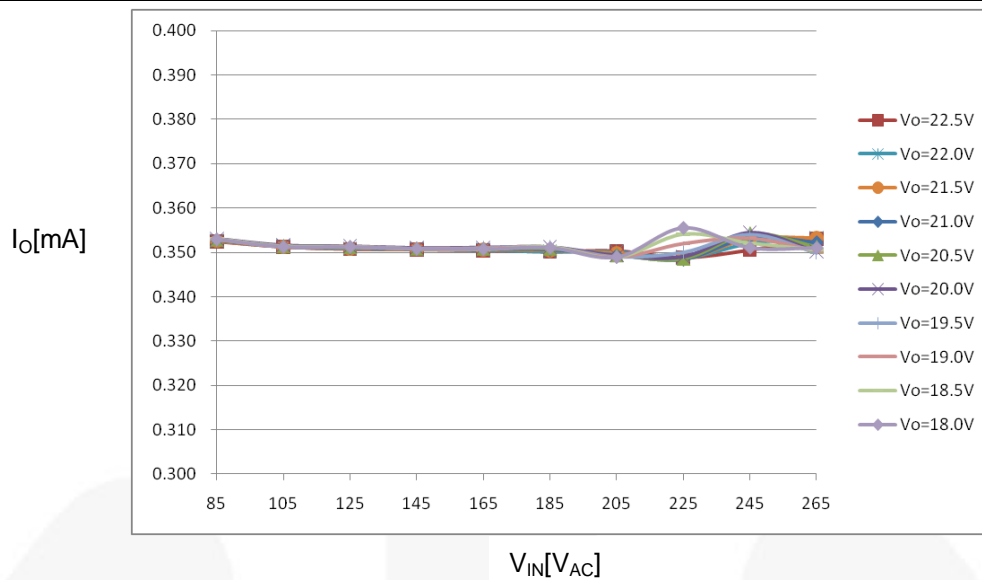


Figure 4. Constant Current Tolerance Using Electric Load (CV)

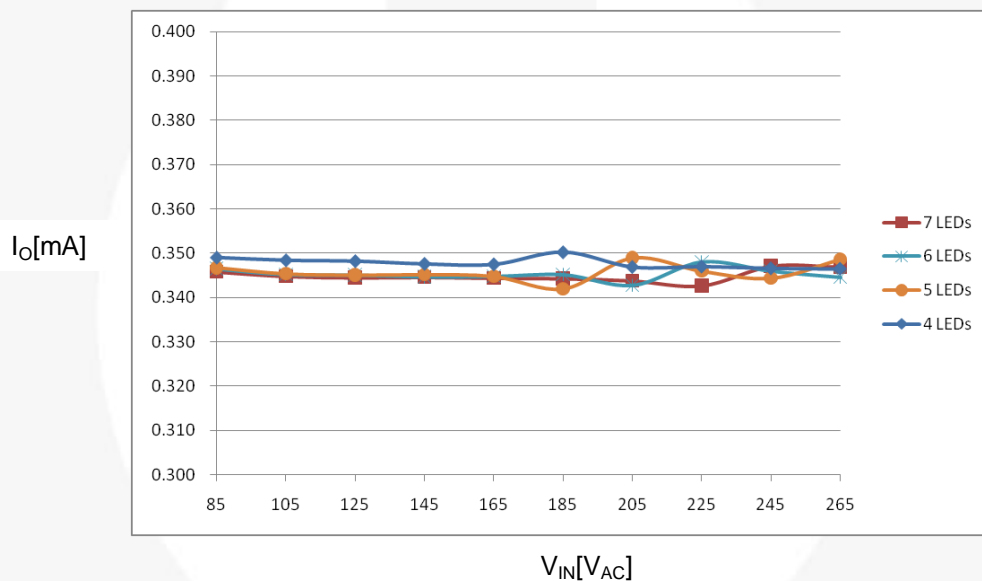


Figure 5. Constant Current Tolerance Using LED Load

4. Related Resources

[Datasheet link FL103](#)

<http://www.fairchildsemi.com/referencedesign/>

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