

## Universal, Off-Line, High Brightness, 350mA LED Driver

### SUMMARY AND FEATURES

- Wide Input Voltage 85 to 265VAC, 50/60Hz
- Constant Current Regulation for Uniform Illumination
- Output Current Adjustable

### DEMO BOARD GENERAL DESCRIPTION

The FT870-DB-C-01 demo board is a High-Brightness LED power driver to supply a string of LEDs using the FT8701 IC from a universal AC input voltage. The FT870-DB-C-01 can supply a maximum output current of 350mA to drive 9V LED strings from a wide input voltage 85 to 265VAC, 50/60Hz.

The report contains the LED driver specification, a circuit diagram, a complete bill of materials, the printed circuit board layouts, and performance data.

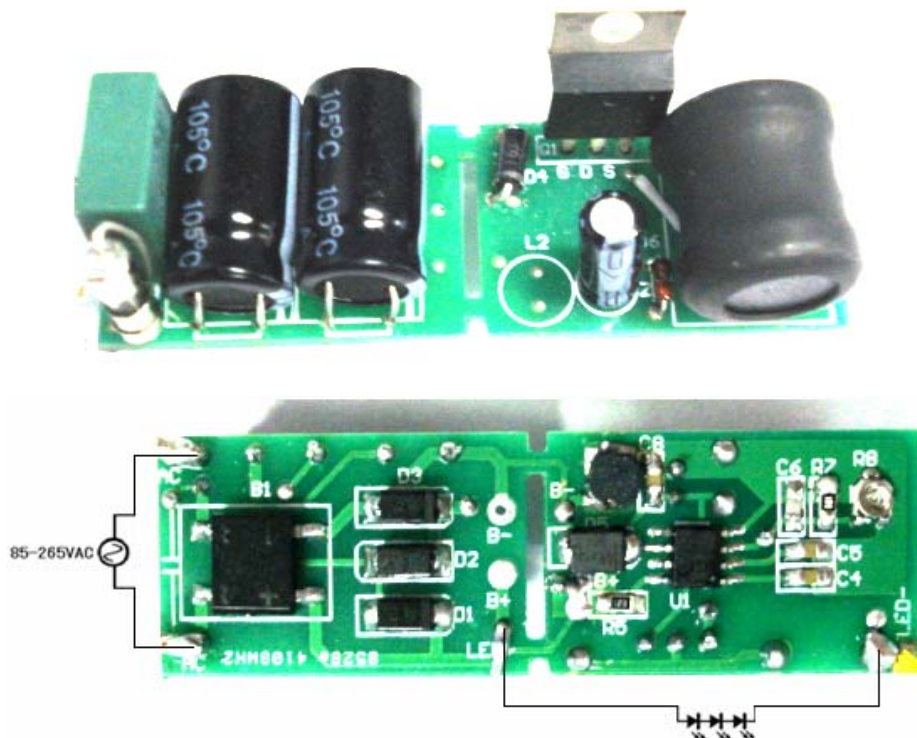


Figure 1. Demo Board Picture

SYSTEM SPECIFICATION

DESCRIPTION	SYMBOL	MIN	TYP	MAX	UNITS	COMMENT
<b>Input</b>						
Voltage	$V_{in}$	85		265	VAC	
Frequency	$F_{line}$		50		Hz	
<b>Output</b>						
Output voltage	$V_{out}$	9.3	9.5	9.7	V	
Output current	$I_{out}$	330	350	370	mA	
<b>Efficiency</b>						
Full Load		76	77	79	%	
<b>Switching frequency</b>						
Oscillator frequency	$F_{osc}$	20	25	30	KHz	
Oscillator Modulation Swing	$\Delta F_{osc}$		$\pm 4$		%	

SCHEMATIC

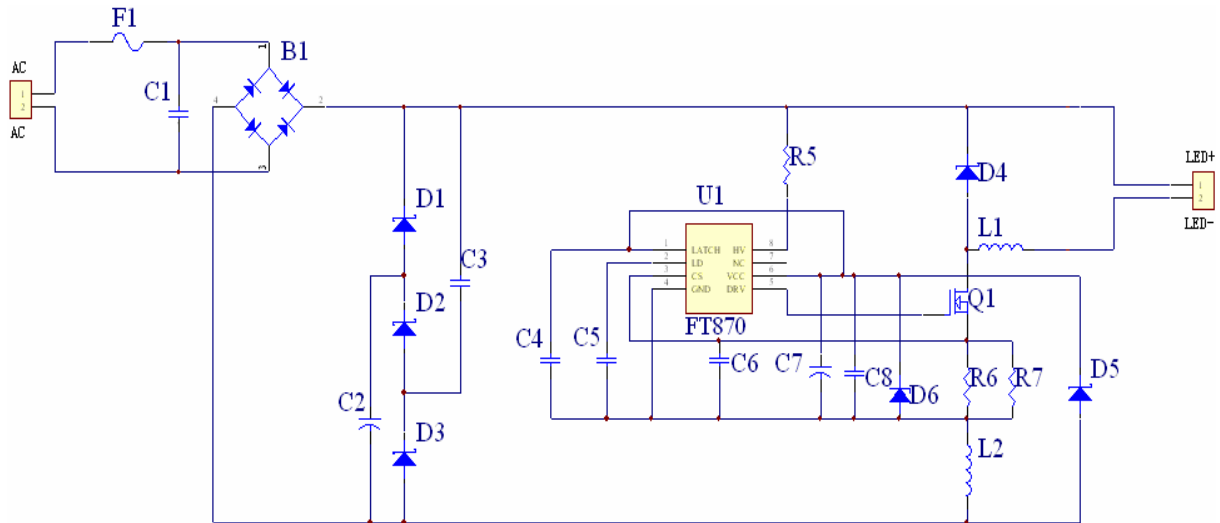
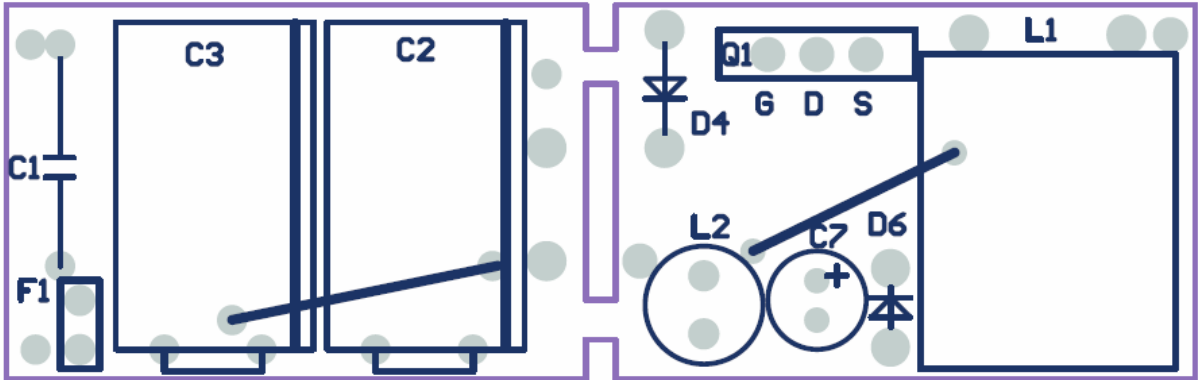
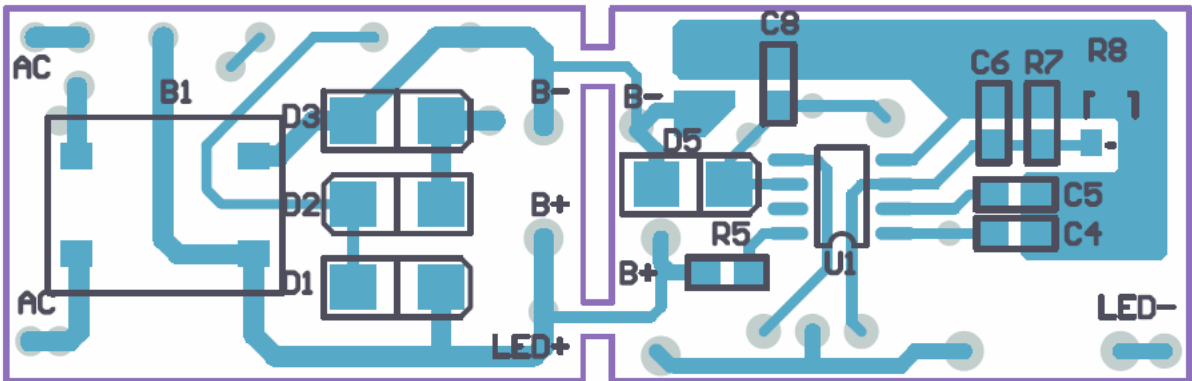


Figure 2. Demo Board Schematic

PCB LAYOUT



Top View



Bottom View

Figure 3. Printed Circuit Layout



**BILL OF MATERIALS**

RefDes	DESCRIPTION	QTY	PACKAGE	MANUFACTURE	MANUFACTURE'S PART NUMBER
B1	400V, 1A single phase diode bridge	1	DF-S	STS	DB104S
C1	0.1µF, 300VAC EMI suppression capacitor	1	Radial		
C2, C3	10µF, 400V electrolytic capacitor	1	Radial		
C4, C5, C8	1nF, 25V ceramic chip capacitor	1	SMD0805		
C6	100pF ceramic chip capacitor	1	SMD0805		
C7	4.7µF,50V electrolytic capacitor	1	Radial		
D1, D2, D3	1000V, 1A diode	1	DO-214		1N4007
D4	600V, 1A ultrafast diode	1	DO-214AA	ON Semi	MUR160T3
D5	600V, 1A ultrafast diode	1	DO-41	ON Semi	MURS160T3
D6	12V, 0.5W Zener diode	1	DO-35		
F1	1A ,250VAC fuse	1	Axial		
L1	2.2mH, 400mA rms, 600mA sat inductor	1	Radial		
L2	18µH, 200mA rms, 600mA sat inductor	1	Radial		
Q1	600V,4A, N-channel FET	1	TO-220		2N60
R5	22KΩ, 1/8W chip resistor	1	SMD0805		
R6	1.2Ω, 1/8W chip resistor	2	SMD0805		
R7	100Ω top adjust trimpot	1	SOT-23		
U1	Universal LED Driver	1	SOP8	FMD	FT870

PERFORMANCE DATA

Efficiency

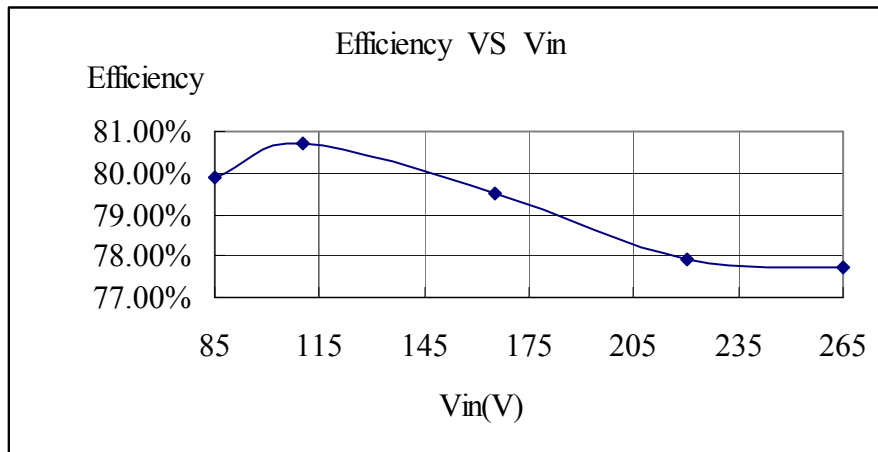


Figure 4 Efficiency vs. Vin

Line Regulation

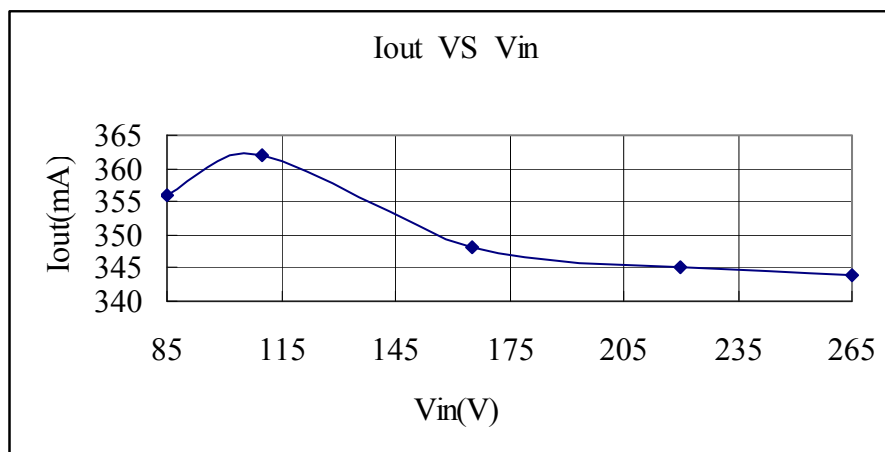


Figure 5 Line Regulation