

## XL5003 DEMO Borad Manual

### 500301:without electrolytic capacitor

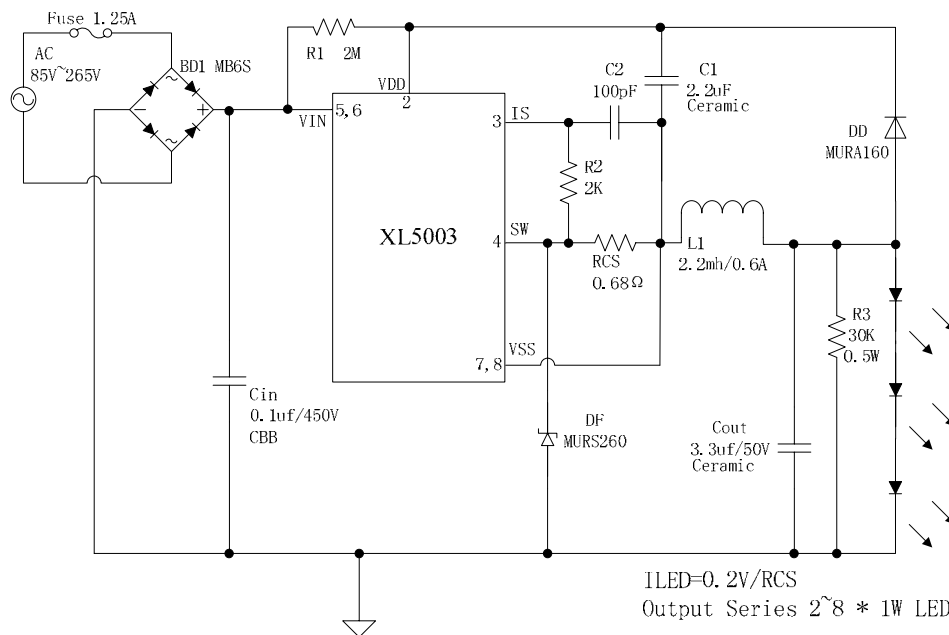
#### Introduction

The document describes a non-isolated, without electrolytic capacitor, high efficiency LED driver designed to drive an LED string at a current of 300 mA from an input voltage range of 85 VAC to 265 VAC. The XL5003 also provides a sophisticated range of protection features including auto-restart for control loop open/short faults and output short-circuit conditions.

High-efficiency, without electrolytic capacitor LED driver design with very low parts count.

This document contains the LED driver specification, schematic, PCB diagram, bill of materials.

#### Schematic



#### Pin Description

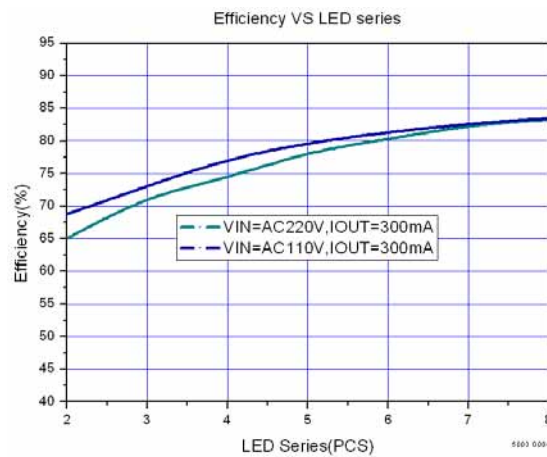
Pin Number	Pin name	Description
1	NC	No Connected
2	VDD	The chip supply voltage
3	IS	Current Sense Pin.(The current sense voltage is 0.2V)
4	SW	Output Switching Pin
5,6	VIN	Input high voltage Pin(Operation voltage 100V~400V)
7,8	VSS	The chip reference ground

## Bill of Materials

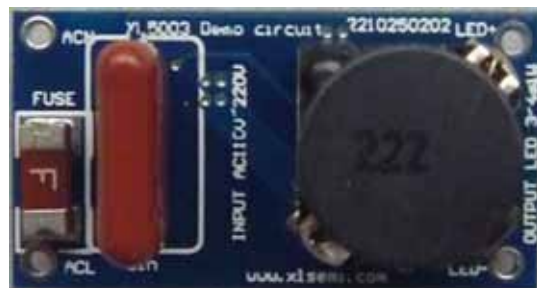
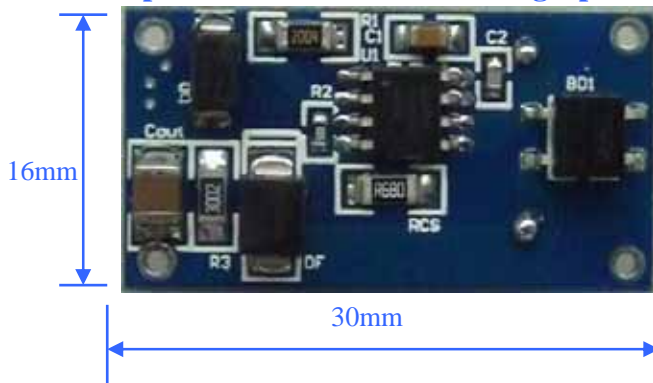
Item	Qty	Ref Des	Description	Mfg Part Number	Mfg
1	1	BD1	600V,1A,Bridge Rectifier,SMD	MB6S	Fairchild
2	1	C1	2.2uF,50V,Ceramic,X7R,0805	C2012X7R1H225K	TDK
3	1	C2	100pF,50V,Ceramic,X7R,0603	C1608X7R1H104K	TDK
4	1	Cin	0.1uF,450V,Film	ECWF2W104KAB	Panasonic
5	1	Cout	3.3uF,50V,Ceramic,X7R,1210	C3225X7R1E335K	TDK
6	1	DD	600V,1A,Ultrafast Recovery,75ns,SMA	MURA160T3G	Onsemi
7	1	DF	600V,2A,Ultrafast Recovery,50ns,SMB	MRUS260T3G	Onsemi
8	1	FUSE	1.25A,250V,SMD	AF2-1.25V125TM	AEM
9	1	L1	2.2mH,0.5A	C12-K7.5L GE-222	Mitsumi
10	1	R1	2M ,1%,1/4 W,Thick Film,1206	RC1206xR-072004L	Yageo
11	1	R2	2K ,1%,1/16W,Thick Film,0603	RC0603xR-072001L	Yageo
12	1	R3	30K ,1%,1/2W,Thick Film,1206	RC1206xR-073002L	Yageo
13	1	RCS	0.68 ,1%,1/4 W,Thick Film,1206	RL1206xR-07R680L	Yageo
14	1	U1	XLsemi,XL5003,SOP8	XL5003	XLSEMI

## Performance Data

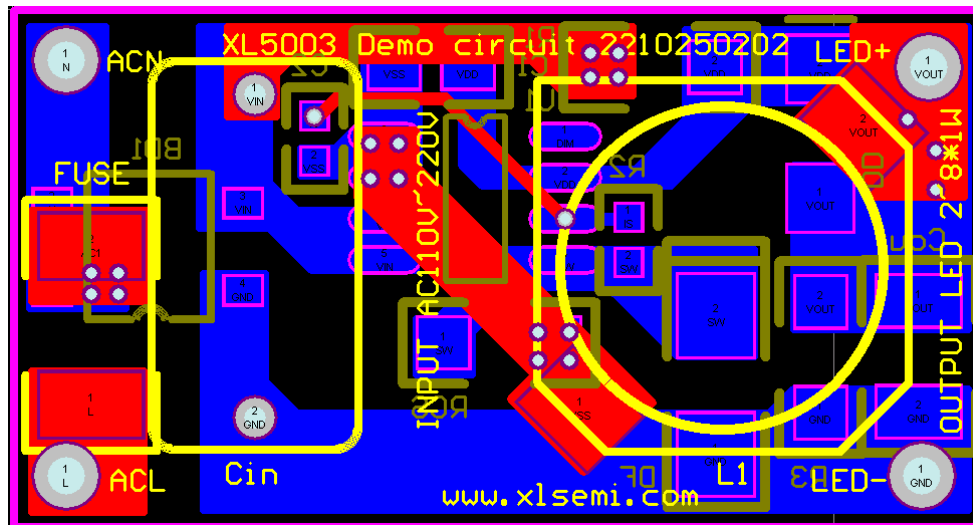
### Efficiency



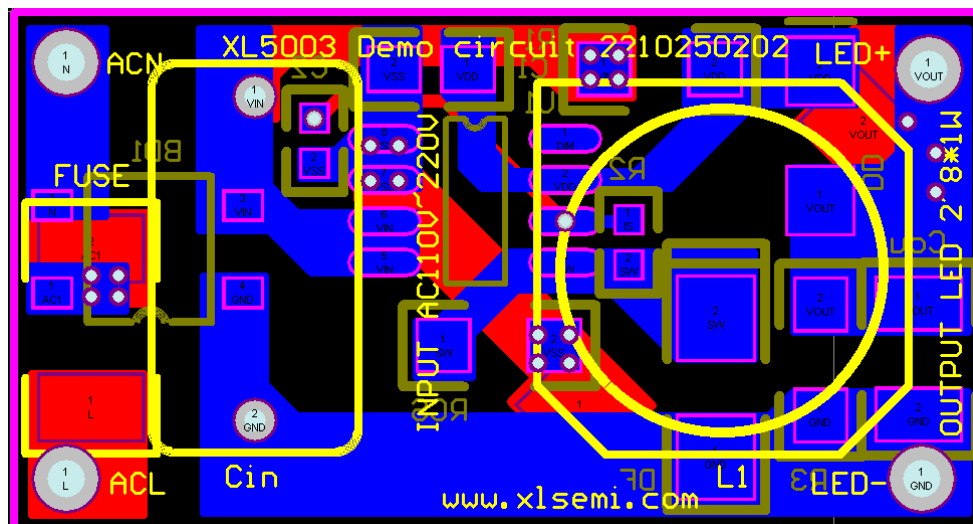
### Populated Circuit Board Photograph.



## PCB Layout



Top side



Bottom side

## 500302:with PFC

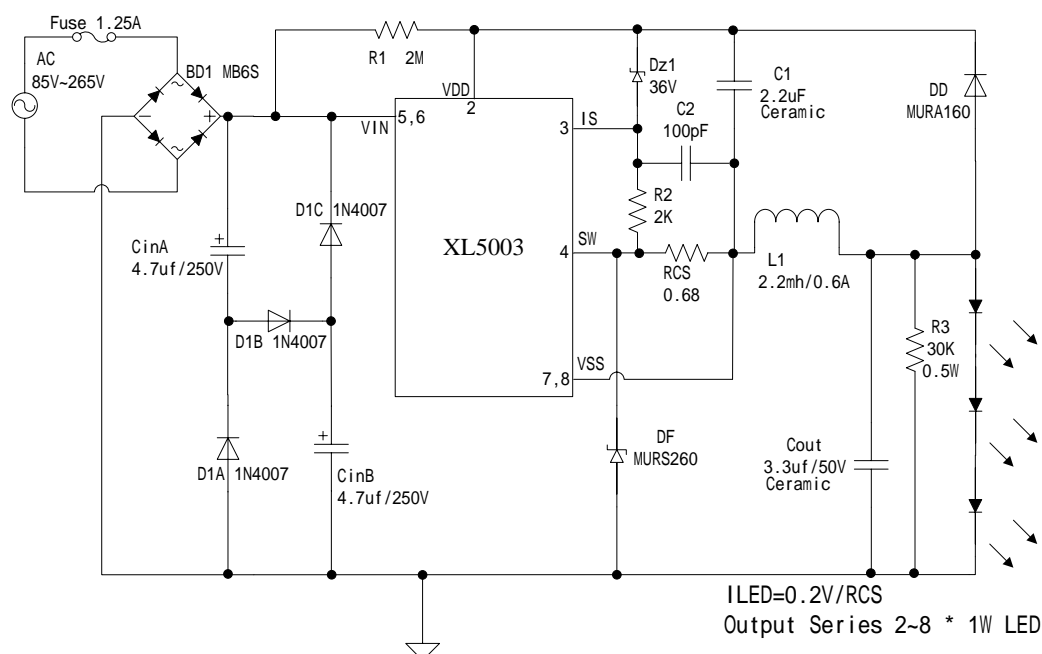
### Introduction

The document describes a non-isolated, power-factor corrected, high efficiency LED driver designed to drive an LED string at a current of 300 mA from an input voltage range of 85 VAC to 265 VAC. The XL5003 also provides a sophisticated range of protection features including auto-restart for control loop open/short faults and output short-circuit conditions.

High-efficiency, power factor corrected LED driver design with very low parts count.

This document contains the LED driver specification, schematic, PCB diagram, bill of materials.

### Schematic



XL5003 Typical Application with PFC electrolytic capacitor(Mains supply 2~8W LED saving energy Lamp)

### Pin Description

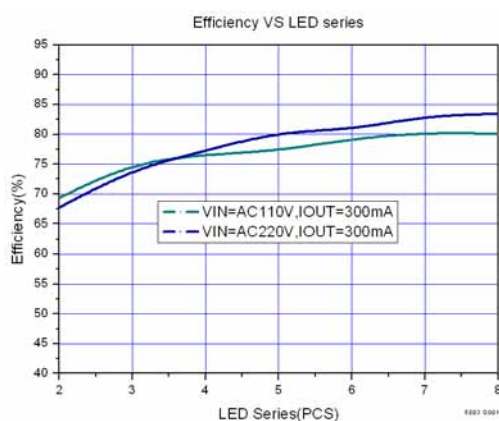
Pin Number	Pin name	Description
1	NC	No Connected
2	VDD	The chip supply voltage
3	IS	Current Sense Pin.(The current sense voltage is 0.2V)
4	SW	Output Switching Pin
5,6	VIN	Input high voltage Pin(Operation voltage 100V~400V)
7,8	VSS	The chip reference ground

## Bill of Materials

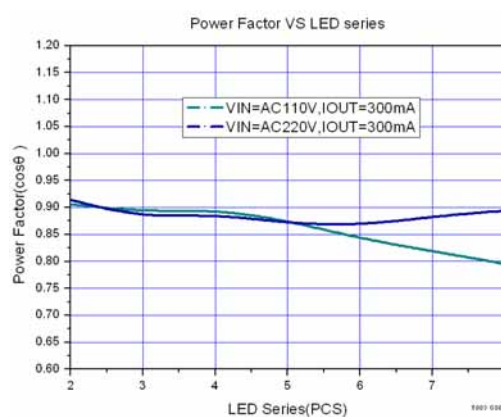
Item	Qty	Ref Des	Description	Mfg Part Number	Mfg
1	1	BD1	600V,1A,Bridge Rectifier,SMD	MB6S	Fairchild
2	1	C1	2.2uF,50V,Ceramic,X7R,0805	C2012X7R1H225K	TDK
3	1	C2	100pF,50V,Ceramic,X7R,0603	C1608X7R1H104K	TDK
4	1	CinA	4.7uF,250V,Electrolytic,(8x11.5)	YXA-250V-4.7uF	Rubycon
5	1	CinB	4.7uF,250V,Electrolytic,(8x11.5)	YXA-250V-4.7uF	Rubycon
6	1	Cout	3.3uF,50V,Ceramic,X7R,1210	C3225X7R1E335K	TDK
7	3	D1A,D1B,D1C	1000V,1A,Rectifier,SMA	MRA4007T3G	Onsemi
8	1	DF	600V,2A,Ultrafast Recovery,50ns,SMB	MURS260T3G	Onsemi
9	1	DD	600V,1A,Ultrafast Recovery,75ns,SMA	MURA160T3G	Onsemi
10	1	DZ1	36V,500mW,Zener,SOD-123	MMSZ5257BT1G	Onsemi
11	1	FUSE	1.25A,250V,SMD	AF2-1.25V125TM	AEM
12	1	L1	2.2mH,0.5A	C12-K7.5L GE-222	Mitsumi
13	1	R1	2M ,1%,1/4 W,Thick Film,1206	RC1206xR-072004L	Yageo
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15	1	R3	30K ,1%,1/2W,Thick Film,1206	RC1206xR-073002L	Yageo
16	1	RCS	0.68 ,1%,1/4 W,Thick Film,1206	RL1206xR-07R680L	Yageo
17	1	U1	XLsemi ,XL5003,SOP8	XL5003	XLSEMI

## Performance Data

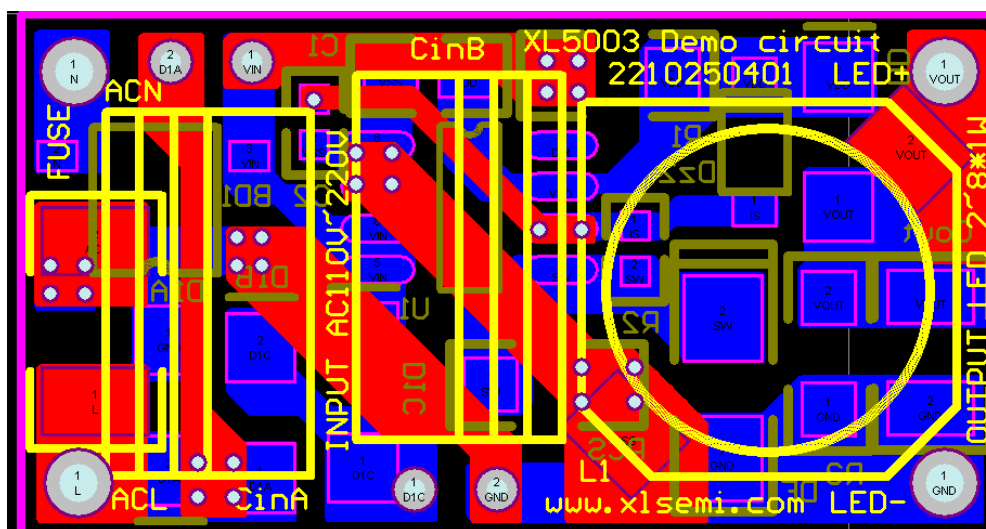
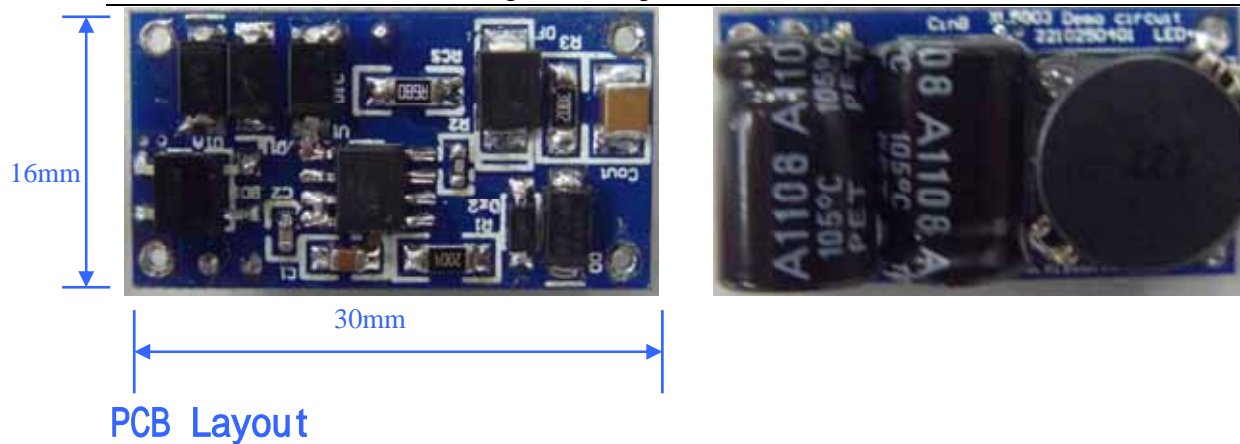
### Efficiency



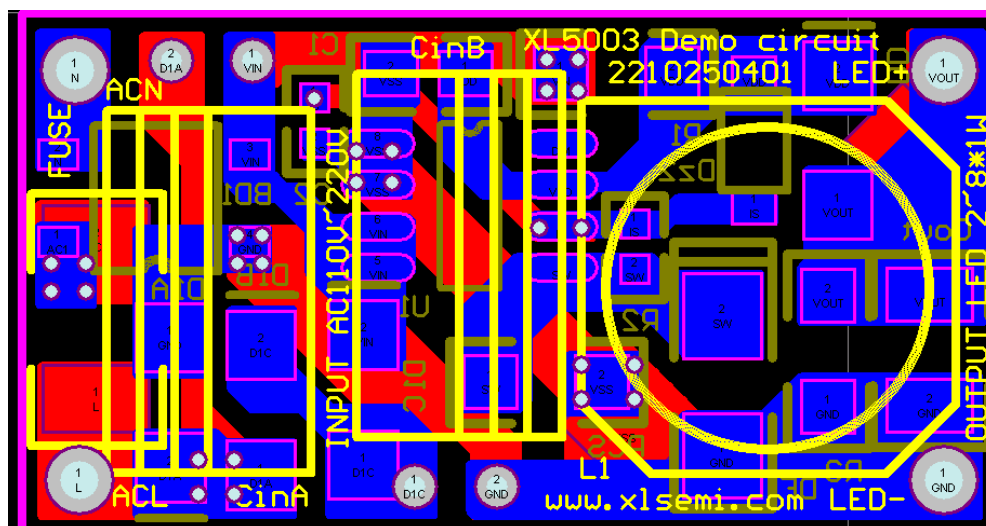
### Power Factor



## Populated Circuit Board Photograph.



Top side



Bottom side