### EVAL6574B



# CFL/TL ballast driver preheat and dimming demonstration board based on the L6574

Data brief



#### **Features**

- Dimmable fluorescent lamp ballast
- Multiple T8 lamps application
- Wide range input (85 Vac 265 Vac)
- PF > 0.99, THD < 10%
- Fault ignition protection
- Lamp absence detection

#### **Description**

This design was developed to drive a TL fluorescent lamp of up to 58 W. It is composed of two sections: the PFC using the L6561 controller, and the ballast based on the L6574. The application includes a current feedback that can be used to control the power (and, if necessary, the dimming function) by varying the switching frequency during normal lamp operation. The application also features safety circuitry which activates when an open load or faulty lamp ignition is detected. The PFC pre-regulator allows connection of the application to a wide input voltage range (85 Vac to 265 Vac) providing a Power Factor higher than 0.99 and a THD lower than 10%.

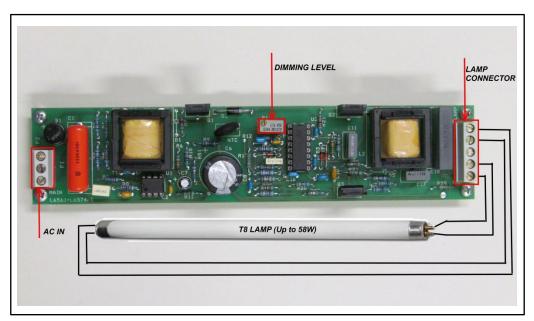
Board description EVAL6574B

### 1 Board description

Table 1: Board electrical specifications

Parameter	Value	
Input voltage	85 Vac to 265 Vac	
Power factor	> 0.99	
THD	< 10%	
Output power	Up to 58 W	
Lamp configuration	Single lamp – tubular T8 model (32 W to 58 W)	

Figure 1: Jumper and connector locations

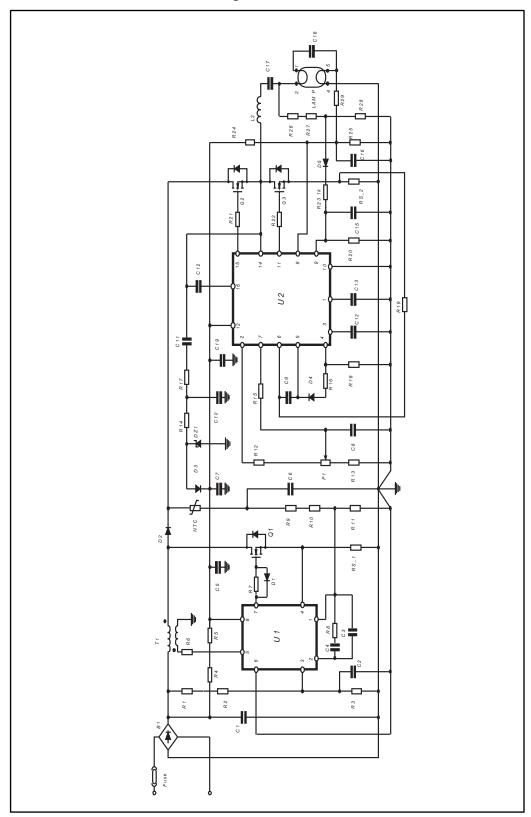


**Table 2: Connector A pinout** 

Name	Туре	Function
MAIN (AC IN)	Screw connector	Input voltage connection
LAMP	Screw connector	Lamp connection

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Figure 2: Schematic



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Table 3: Bill of material

Reference	Part value	Part description
R1	750 kΩ	Resistor 250 mW 1%
R2	750 kΩ	Resistor 250 mW 1%
R3	10 kΩ	Resistor 250 mW 1%
R4	120 kΩ	Resistor 250 mW 1%
R5	120 kΩ	Resistor 250 mW 1%
R6	68 kΩ	Resistor 250 mW 1%
R7	22 Ω	Resistor 250 mW 1%
R8	10 kΩ	Resistor 250 mW 1%
R9	750 kΩ	Resistor 250 mW 1%
R10	750 kΩ	Resistor 250 mW 1%
R11	9.53 kΩ	Resistor 250 mW 1%
R12	82 kΩ	Resistor 250 mW 1%
R13	1.5 kΩ	Resistor 250 mW 1%
R14	10 Ω	Resistor 250 mW 1%
R15	10 kΩ	Resistor 250 mW 1%
R16	100 kΩ	Resistor 250 mW 1%
R17	47 Ω	Resistor 250 mW 1%
R18	100 kΩ	Resistor 250 mW 1%
R19	10 kΩ	Resistor 250 mW 1%
R20	6.8 kΩ	Resistor 250 mW 1%
R21	22 Ω	Resistor 250 mW 1%
R22	22 Ω	Resistor 250 mW 1%
R23	1 kΩ	Resistor 250 mW 1%
R24	390 kΩ	Resistor 250 mW 1%
R25	20 kΩ	Resistor 250 mW 1%
R26	750 kΩ	Resistor 250 mW 1%
R27	750 kΩ	Resistor 250 mW 1%
R28	3.9 kΩ	Resistor 250 mW 1%
R29	6.8 kΩ	Resistor 250 mW 1%
RS_1	0.68 Ω	Resistor 250 mW 1%
RS_2	0.68 Ω	Resistor 250 mW 1%
P1	5 kΩ	Trimmer 10 turns (Bourns / Spectrol)
NTC1	5 Ω	Thermistor 3 W (EPCOS)
C1	330 nF	Film Capacitor 400 V (Panasonic / Rubycon)
C2	10 nF	Capacitor 50 V
C3	220 nF	Capacitor 50 V

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C5 1	680 nF 100 nF 22 µF	Capacitor 50 V Capacitor 50 V		
C6		Capacitor 50 V		
	22 μF	Capacitor 50 V		
		Electrolytic capacitor, 450 V low ESR		
C7 4	4.7 µF	Electrolytic capacitor, 35 V		
C8 1	100 nF	Capacitor 50 V		
C9 8	8.2 nF	Capacitor 50 V		
C10	4.7 nF	Capacitor 50 V		
C11 6	680 pF	Film capacitor 630 Vdc		
C12 1	100 nF	Capacitor 50 V		
C13	1 μF	Capacitor 50 V		
C14 1	100 nF	Capacitor 50 V		
C15 3	330 nF	Capacitor 50 V		
C16 4	470 nF	Capacitor 50 V		
C17 1	100 nF	Polypropilene capacitor 250 Vdc		
C18 8	8.2 nF	Polypropilene capacitor 1600 Vdc		
C19 1	100 nF	Capacitor 50 V		
F1	T 2A	Fuse 250 Vac – 2 A		
T1		PFC transformer: 1.88 mH, 138 : 13 turns, core E25 – N87 or eq.		
L2 2	2.1 mH	Ballast inductor: 2 mH, 146 turns, core E25 – N87 or eq.		
B1 \	W04M	Rectifier bridge 4 A – 600 V		
D1 1	IN4148	Diode		
D2 ST	TTH1L06	Turbo 2 ultrafast high voltage rectifier		
D3 1	IN4148	Diode		
D4 1	IN4148	Diode		
D5 1	IN4148	Diode		
DZ1 BZ	ZX79C15	15 V Zener diode		
U1 I	L6562	PFC controller		
U2 I	L6574	Ballast controller		
Q1 STF	P5NK50Z	N-channel 500 V − 1.22 Ω Zener-protected SuperMESH™ Power MOSFET		
Q2 STF	P4NK50Z	N-channel 500 V − 2.4 Ω Zener-protected SuperMESH™ Power MOSFET		
Q3 STF	P4NK50Z	N-channel 500 V − 2.4 Ω Zener-protected SuperMESH™ Power MOSFET		
CN1		3 way PCB connector 250 Vac, Pin distance 5.08 mm		
CN2		5 way PCB connector 250 Vac Pin distance 5.08 mm		



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Figure 3: Layout (top layer)

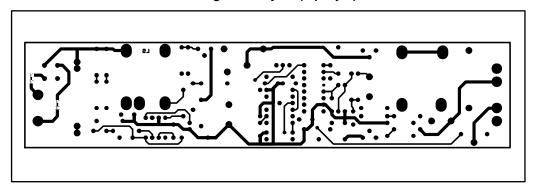


Figure 4: Layout (bottom layer)

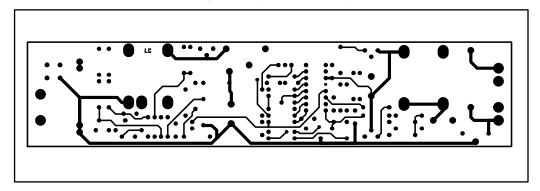
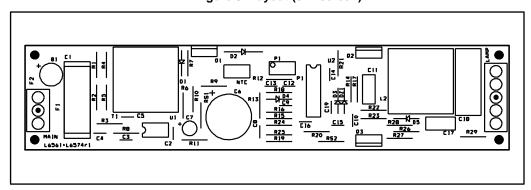


Figure 5: Layout (silk screen)



EVAL6574B Revision history

## 2 Revision history

**Table 4: Document revision history** 

Date	Revision	Changes
23-May-2013	1	First release

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