

TB62D901FNG evaluation board

1. Introduction

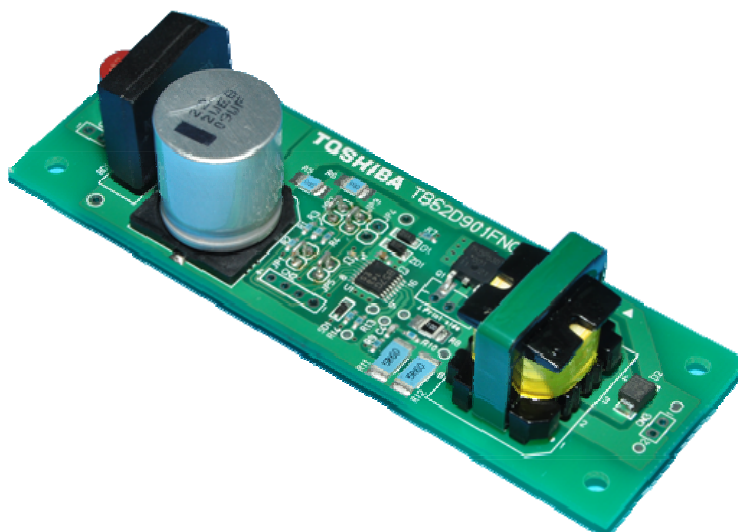
The TB62D901FNG is a constant current driver IC ideal for use in the step-down AC/DC conversion type LED lighting applications.

The TB62D901FNG features architecture with automatic Off time adjustment control that can be used to achieve minimum LED current variations by the effect of fluctuated input voltage or change of LED forward voltage.

The device allows linear dimming or PWM dimming. It has extensive detection functions that are thermal shutdown, over-current detection, over-voltage detection, under-voltage lockout, and current sensing input terminal (ISEN1) open detection.

3. Features

- Operating supply voltage : 12V to 30V
- Dimming function : Linear dimming (by adjustment of LED peak current)
PWM dimming
- Switching frequency : Adjustable of up to 500kHz (MAX)
- Operation mode : Current continuous conduction mode
(Automatic OFF time control mode, Fixed off time mode)
Critical conduction mode
- Efficiency : 90% or more with recommended components
- Detection function : Thermal shutdown (TSD)
: Over-current detection (OCP)
: Over-voltage detection (OVP)
: Under-voltage lockout (UVLO)
: ISEN terminal open detection (IOP)
- IC standby function : EN signal allows standby mode with 0.8mA (MAX) consumption current
- Operating temperature : $T_{opr} = -40\text{ }^{\circ}\text{C}$ to $105\text{ }^{\circ}\text{C}$
- Package : SSOP16-P-225-0.65B

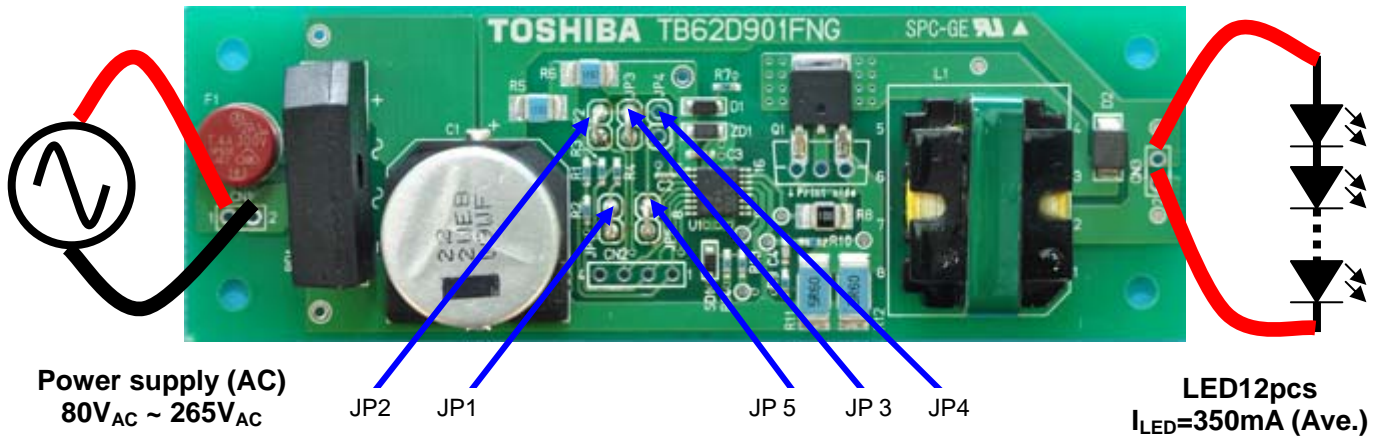


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4. How to use

●4.1 Connection



●4.2 About the jumper

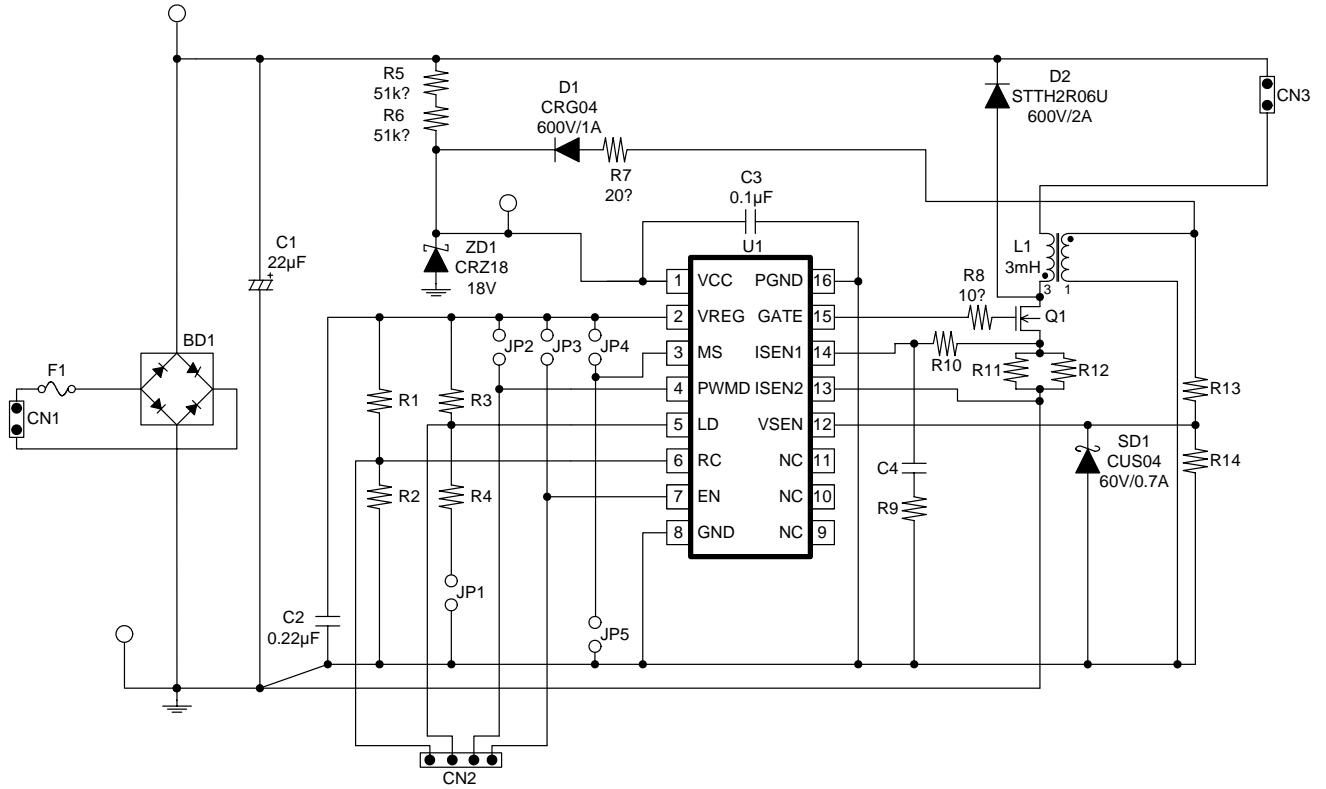
Jumper number	Explanation
JP1	It is a jumper to select the method of LED current peak value ($I_{L(PK)}$) adjustment. When IC is used in linear dimming, remove R3 and R4 and input analog signal to LD terminal from CN2. *When the board is submitted, JP1 is short
R1,R2	It is a jumper to select the method of LED current ripple value (ΔI_L) adjustment. When IC is used in ripple dimming by external analog signal input, open R1 and R2. * When the board is submitted, resistances are connected at both R1 and R2.(Fixed voltage is input)
JP2	It is a jumper to select the use of PWM dimming. JP2 is open: PWM dimming is done. JP2 is short: PWM is not done. * When the board is submitted, JP2 is short.
JP3	It is a jumper to select the use of IC enable function. JP3 is open: IC enable function is used. JP3 is short: IC enable function is not used. * When the board is submitted, JP3 is short.
JP4,JP5	It is a jumper to select the operational mode of TB62D901FNG. JP4 is open and JP5 is short: When using it in the off time self-adjustment mode and the off time fixed mode. JP4 is short and JP5 is open: When using it in the critical mode. * When the board is submitted, JP4 is open and JP5 is short.

●4.3 About the connector

Connector number	Explanation
CN1	1: It is AC power supply is connected. 2: It is AC power supply is connected.
CN2	1: When IC enable function is used, the EN signal is input to this part. 2: When the ripple value (ΔI_L) is adjusted by the external analog voltage input, the voltage is input to this part. 3: When PWM dimming is done, the PWM signal is input to this part 4: When the peak value ($I_{L(PK)}$) is adjusted by the external analog voltage input, the voltage is input to this part.
CN3	1: The anode side of LED is connected. 2: The cathode side of LED is connected.

5. Electrical schematic

Setting of board: Output voltage is 40V, Average output current is 353mA, and Input voltage is 90V_{AC} to 265V_{AC}

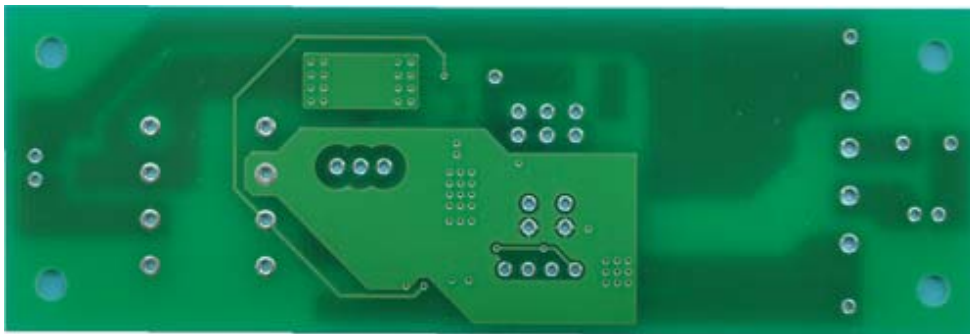


6. Hardware layout

< Top side >



< Bottom side >



7. BOM

Setting of board: Output voltage is 40V, Average output current is 353mA, and Input voltage is 90V_{AC} to 265V_{AC}

Symbol	種別	Characteristic	Part number(Maker)
U1	LED Driver		TB62D901FNG(Toshiba)
D1	Diode	600V/1A	CRG04 (Toshiba)
ZD1	Zener Diode	18V	CRZ18 (Toshiba)
D2	Diode	600V/1A	STTH2R06U(STMicro)
SD1	Schottky Diode	60V/0.7A	CUS04 (Toshiba)
Q1	MOSFET	600V/2.5A/2.2 Ω or 525V/5A/1.2Ω	TK3A60DA(Toshiba) or TK5P53D(Toshiba)
L1	Trance	3mH(winding ratio3:1)	
F1	Fuse	300V/4A	38314000000 (Littelfuse)
BD1	Bridge Diode	800V/8A	KBU8K-E4(Vishay)
C1	Electrolytic Capacitor	22μF/450V	EEV-EB2W220M(Panasonic)
C2	Ceramic Capacitor	0.22μF/6.3V	GRM155B31A224KE18D(Murata)
C3	Ceramic Capacitor	0.1μF/30V	GRM188B31H104KA92D(Murata)
C4	Ceramic Capacitor	100pF/6.3V	
JP1~JP5	Jumper	-	WL-1, JS-1(Mac8)
R1	Resistor	110kΩ/0.1W	
R2	Resistor	430kΩ/0.1W	
R3	Resistor	110kΩ/0.1W	
R4	Resistor	56kΩ/0.1W	
R5	Resistor	51kΩ/0.25W	
R6	Resistor	51kΩ/0.25W	
R7	Resistor	20Ω/0.1W	
R8	Resistor	10Ω/0.25W	
R9	Resistor	10kΩ/0.1W	
R10	Resistor	100Ω/0.1W	
R11	Resistor	5.4Ω/1W	
R12	Resistor	5.4Ω/1W	
R13	Resistor	36kΩ/0.1W	
R14	Resistor	2.4Ω/0.1W	

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