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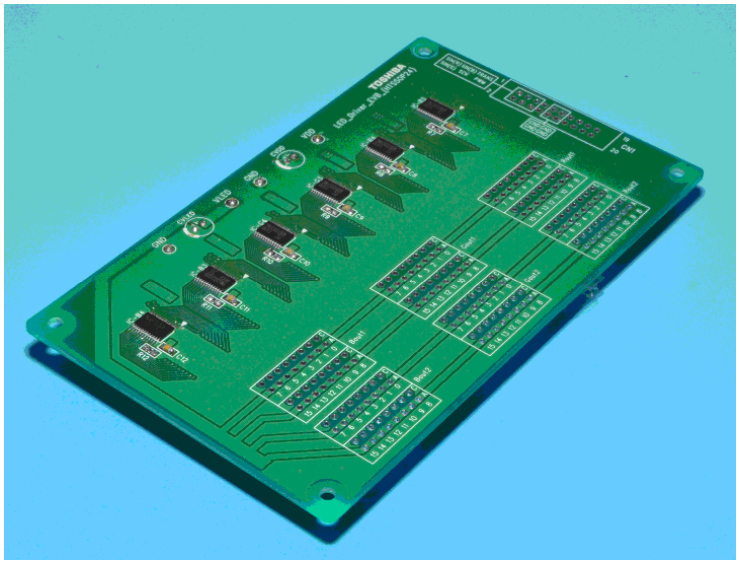
User's guide for TC62D723FNG evaluation board

Introduction

The TC62D723FNG is LED drivers which have the sink-type constant current output. The output gain control function of 8-bit and the PWM grayscale function of 16, 14, 12, and 10-bit are built into this IC. Output current value of 16 channels is set by one external resistance. In addition, the thermal shutdown function, the output open detection function, and the output short detection function are built in. This IC is most suitable for lighting the LED module and the display.

Features

- Supply voltage : V_{DD} = 3.0 to 5.5 V
- 16-output built-in
- Output current setup range : I_{OUT} = 1.5 to 90 mA
- Constant current output accuracy (@ R_{EXT} = 1.2 kΩ, V_{OUT} = 1.0 V, V_{DD} = 3.3 V, 5.0 V)
  : S rank ; Between outputs ± 1.5 % (max)
  : S rank ; Between devices: ± 1.5 % (max)
  : N rank ; Between outputs ± 2.5 % (max)
  : N rank ; Between devices: ± 2.5 % (max)
- Output voltage : V_{OUT} = 17 V (MAX)
- I/O interface : CMOS interfaces (Input of a schmitt trigger)
- Data transfer frequency : f_{SCK} = 30 MHz (MAX)
- PWM frequency : f_{PWM} = 33 MHz (MAX)
- Operation temperature range : T_{opr} = –40 to 85 °C
- 8-bit (256 steps) output gain control function built-in.
- PWM grayscale function built-in. (PWM resolution is selectable)
  16-bit (65536 steps), 14-bit (16384 steps)
  12-bit (4096 steps), 10-bit (1024 steps)
  Selection of teh one-shot output PWM mode or the repeat PWM output mode is possible.
- Thermal shutdown function (TSD) built-in.
- Output error detection function built-in.
  This function has the automatic operation and the command input manual operation.
  Output open detection function (OOD) and output short detection function (OSD) built-in.
- Power-on-reset function built-in. (When the power supply is turned on, internal data is reset)
- Stand-by function built-in. (I_{DD}=1μA at standby mode)
- Output delay function built-in. (Output switching noise is reduced)



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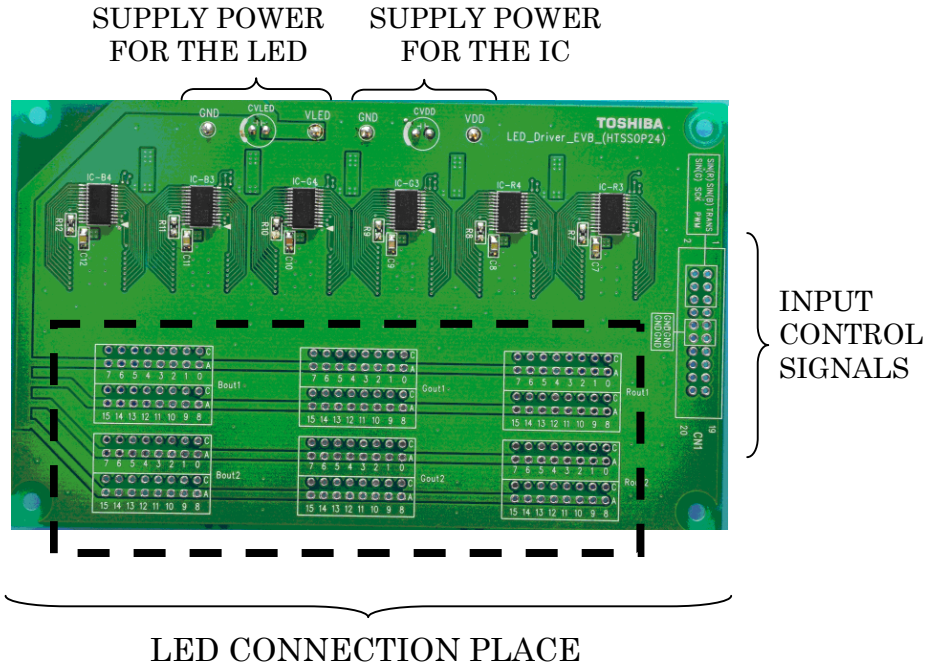


(A: Please connect the anode side of LED, C: Please connect the cathode side of LED.)

1.1 Power supply

1.1.1 VDD

Please Supply the VDD to TC62D723FNG through VDD pin.
TC62D723FNG uses a single VDD as its power supply. The operating supply voltage of VDD must be within the range between 3.0 V and 5.5 V.

1.1.2 VLED

VLED is used as a power supply for LED lighting.
VLED recommends more than LED Vf + 1V @LED current 90mA condition.

1.1.3 Power On/Off Sequence

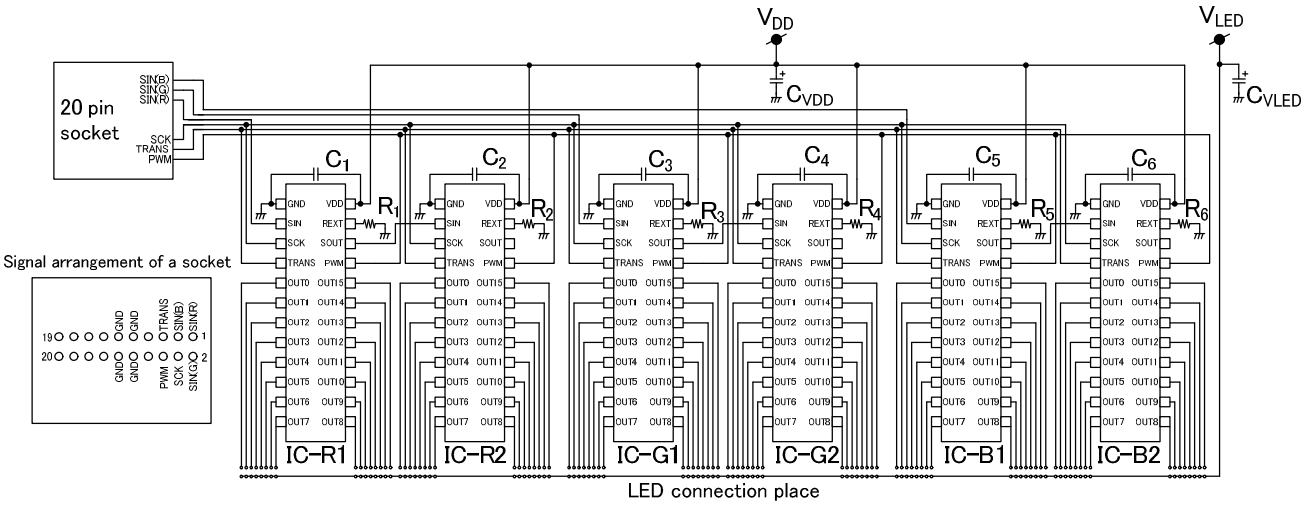
Please input a power supply by the following sequence.
Step 1 : VDD input
Step 2 : VLED input
Step 3 : Control signals input

1.2 Control inputs

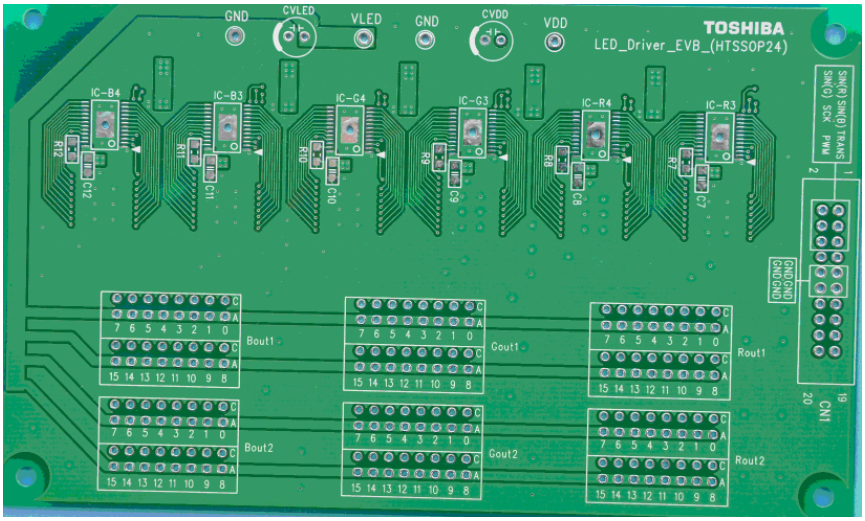
The silk name of a board	A corresponding signal
SIN(R)	SIN signal for IC-R1 & IC-R2
SIN(G)	SIN signal for IC-G1 & IC-G2
SIN(B)	SIN signal for IC-B1 & IC-B2
SCK	SCK signal for all ICs
TRANS	TRANS signal
PWM	PWMCLK signal

*Please refer to TD for the details of each signal.

2 Electrical schematic



3 Hardware layout



4 BOM

Symbol	Remarks	Recommended Value
C7,C8,C9,C10,C11,C12	Ceramic capacitor	0.47μF
CVDD	Electrolytic capacitor	2.2μF
CVLED	Electrolytic capacitor	47μF
R7,R8,R9,R10,R11,R12	Resistance	It is LED current setting resistance. LED current (A) = 1.03(V) ÷ R (Ω) × 16.5

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