
LED backlight Power Supply Substrate
for LCD manufactured by DENSITRON

KSLBC-3(D1, D2)

Instruction Manual
(First Edition)
01/2012

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■ Installation Precautions

This section covers precautions when installing KSLBC-3 (D1, D2) (LED backlight power supply substrate for LCD manufactured by DENSITRON).

Static Electricity Precautions

- As CMOS-IC is used in the device, take proper measures to deal with static electricity when handling.
- Consider grounding for workers handling the device. For example, the use of an anti-static wrist strap/mat is recommended.

Handling Precautions

- When connecting the LED backlight, be careful of the polarity (anode, cathode).
- When connecting the power, also be careful of the polarity.
- Always power off before removing and inserting connectors.
- Check the LCD data sheet (lifespan of the backlight LED with forward current, etc.), and use the appropriate settings.

■ Warranty and Disclaimer

Warranty

- From a manufacturing standpoint, in order to warrant the functionality and reliability of the Product, Kenic System (the “Company”) may issue a delivery specification to the purchaser of the Product (the “Customer”). The warranty covers the items outlined in the delivery specification.
- Any modifications to the Product by the Customer will not be covered by the warranty.

Disclaimer

The Customer agrees that the Company shall not be held liable for accidents and damages caused by the Product under the following circumstances.

- Use of the Product in conditions not specified in this instruction manual (the “Manual”).
- Breakdown or damage to the Product caused by third-party products not approved and provided by the Company.
- Maintenance and repair work using parts not approved by the Company.
- The Customer did not follow the precautions or operating instructions as set forth in the Manual.
- Use of the Product in situations where the power source, installation environment, and other conditions are beyond the specifications as outlined in the Manual.
- Accidents and damages caused by natural disasters such as fires, earthquakes, floods, and lightning storms.

※Component specifications and external appearance may change without notice. However, if previously agreed to installation dimensions and electrical interface need to be changed due to unforeseen circumstances, the Company will contact the Customer to resolve the issue.

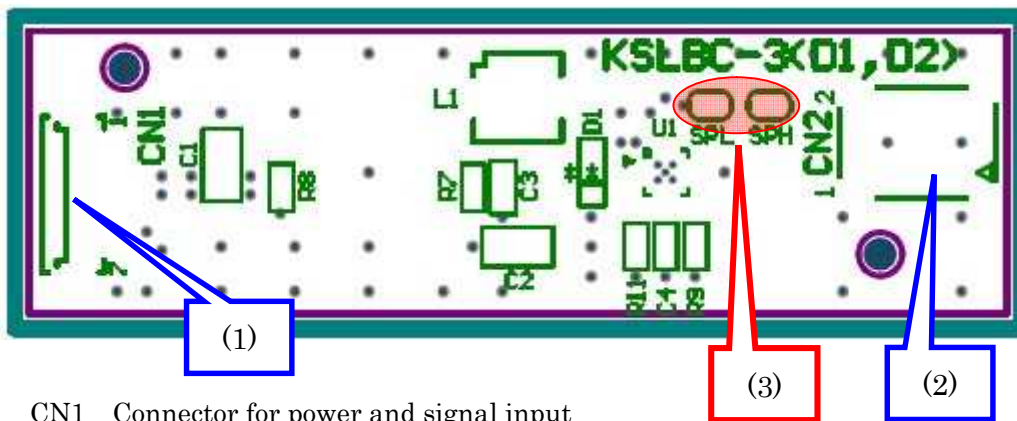
Overview and Features of Product

1. Option (sold separately)

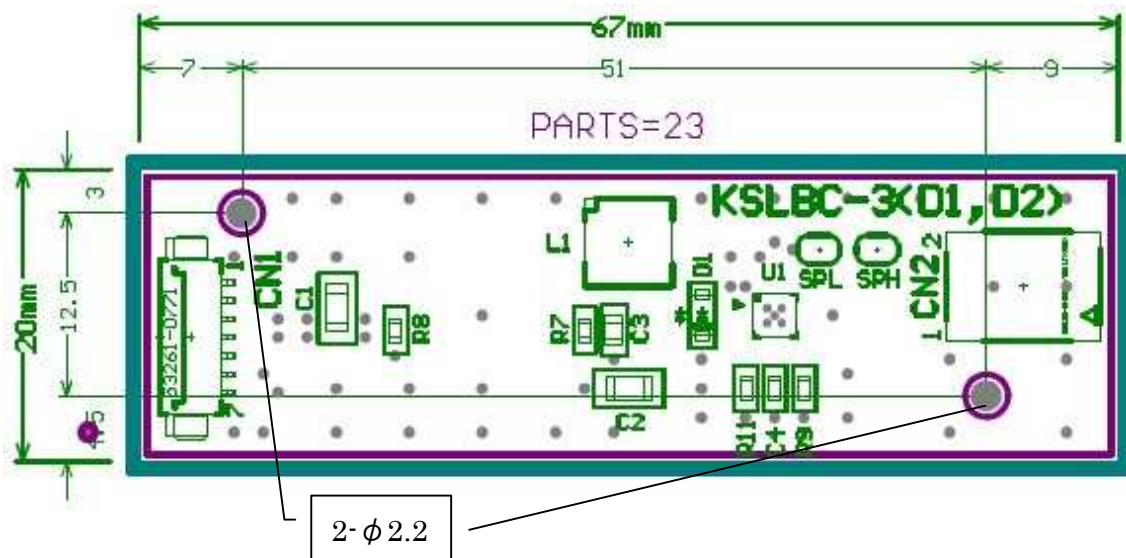
Power supply cable (model number: KSLBC-3 (D1, D2)-7CB)

For CN1

2. Name and Function for the Circuit Board Connectors and Substrate Dimensional Drawing



- (1) CN1 Connector for power and signal input
- (2) CN2 Connector for LED backlight
- (3) SPH,SPL Short pad for output current switch



Substrate Dimensional Drawing for KSLBC-3 (D1, D2)

- Substrate height: 4.4mm (MAX)
Substrate thick: 1.0mm Embarkation parts height: 3.4mm (MAX) CN1

3. Intended Purpose of Product

KSLBC-3 (D1, D2) is a power supply substrate for LED backlight for LCD manufactured by DENSITRON.

Depend on the setting of the short pad (SPH, SPL) on the board, board name (the board itself is the same) and intend LCD may differ.

Board name and Intend LCD

SPH: short SPL: open Board name: KSLBC-3 (D1)

- DLT800600AG104 (DENSITRON 10.4 inch SVGA)

SPH: open SPL: short Board name: KSLBC-3 (D2)

- GVTQ57NPAD4R0 (DENSITRON 5.7 inch QVGA)
- GVTQ57NNAD3E0 (DENSITRON 5.7 inch QVGA No touch panel)

(Caution: Avoid making both SPH and SPL short or open.)

It is possible to control brightness using the PWM signal.

Please refer to the following block diagram

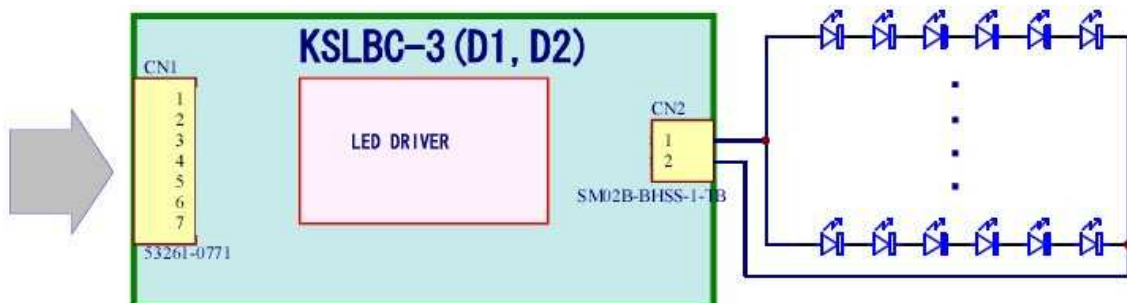


Diagram 1 Block Diagram

◇ Substrate Picture

SPH: short SPL: open

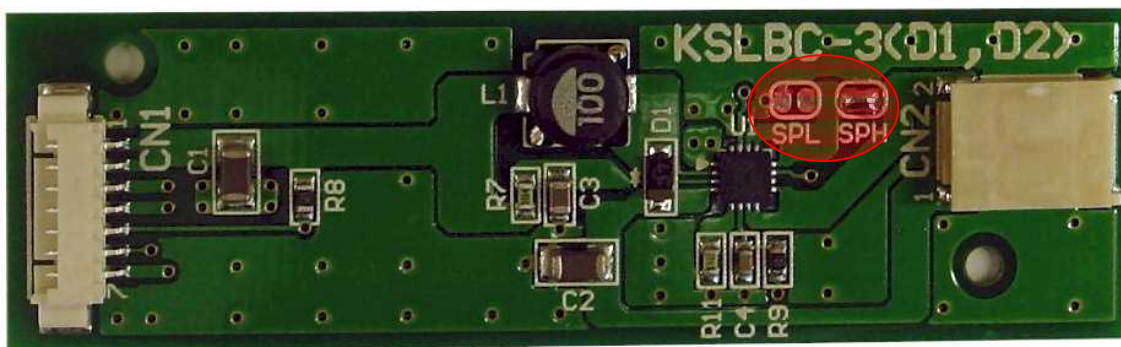


Diagram 2-1 Substrate picture for KSLBC-3 (D1)

SPH: open SPL: short

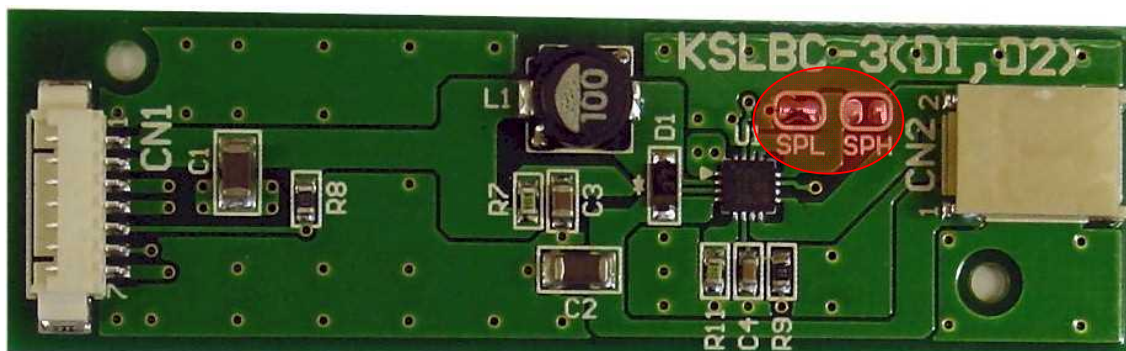


Diagram 2-2 Substrate picture for KSLBC-3(D2)

4. Main Features

- KSLBC-3 (D1, D2) is a LED backlight power supply substrate for LCD manufactured by DENSITRON. (Output from this substrate is one system.)
- As the device is equipped with a built-in overvoltage protection function, damage to the device is prevented even if the LED is cutoff.
- Since an output ON/OFF function is installed, it is possible to control ON/OFF for the LED backlight by the Host-CPU I/O port.
- Since a brightness control function is installed, it is possible to control the LED backlight brightness by PWM output of the Host-CPU, etc.
- Multiple LCDs are supported using the short pad in the board.
- Compact and lightweight, the Product dimensions are 67mm×20mm.

Short pad The state of SPH,SPL		Board name	Intend LCD
SPH	SPL		
short	open	KSLBC-3 (D1)	DLT800600AG104
open	short	KSLBC-3 (D2)	GVTQ57NPAD4R0, GVTQ57NNAD3E0
short	short		Setting prohibition
open	open		Setting prohibition

■ Basic Specifications

1. Absolute Maximum Ratings

Item	Sign	Gauge	Measure	Notes
Input voltage	LEDVCC	-0.3~14.0	V	CN1-No.1, 2 pin
	Vin	-0.3~7.0	V	CN1-No.5, 6 pin
Output voltage	Vout	-0.3~40.0	V	
Output current	Iout	150.0	mA	
Operating temperature limit	TA	-20~75	°C	
Storage temperature limit		-40~85	°C	

2. Recommended Operating Conditions

CN1-1, 2 LEDVCC CN1-3, 4 LEDGND

Item	Sign	Gauge	Measure	Conditions
Input voltage	LEDVCC	4.7~13.0	V	
Input current	Icc	530	mA	SPH: short, SPL: open TA=25°C LEDVCC=5V,Iout=118.92mA
		205		SPH: short, SPL: open TA=25°C LEDVCC=12V,Iout=118.92mA
		300		SPH: open, SPL: short TA=25°C LEDVCC=5V,Iout=59.46mA
		119		SPH: open, SPL: short TA=25°C LEDVCC=12V,Iout=59.46mA

CN1-5 EN

Item	Sign	Gauge	Measure	Condition
Input voltage	ENVin	1.2~6.0	V	TA=25°C

CN1-6 PWM

Item	Sign	Gauge	Measure	Condition
Input voltage	PWMVin	1.2~5.5	V	TA=25°C
Input frequency	PWMin	0.1~1.0	kHz	TA=25°C

CN2 Output

Item	Sign	Gauge	Measure	Condition
Output voltage	Vout	16.0~38.0 *1	V	TA=25°C
Output current	Iout	0~118.92	mA	SPH: short, SPL: open
		0~59.46		SPH: open, SPL: short

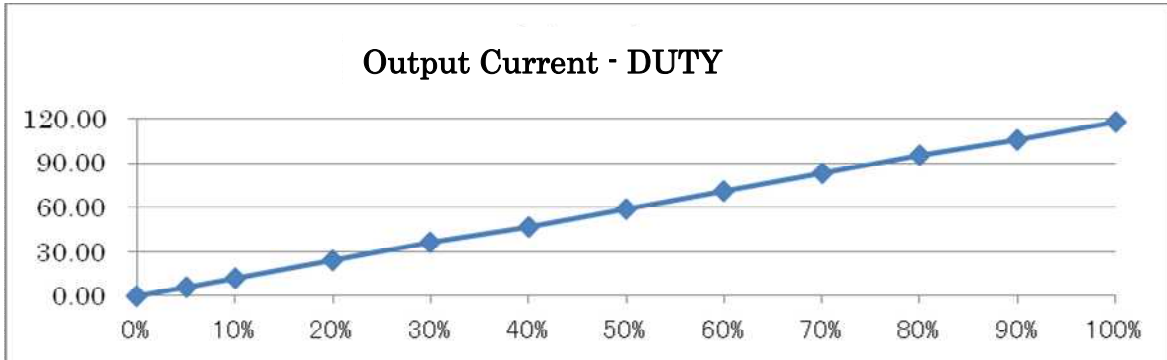
*1 About the LED to connect, use LED with more than 16.0V of Vf.

3. Electrical Characteristics

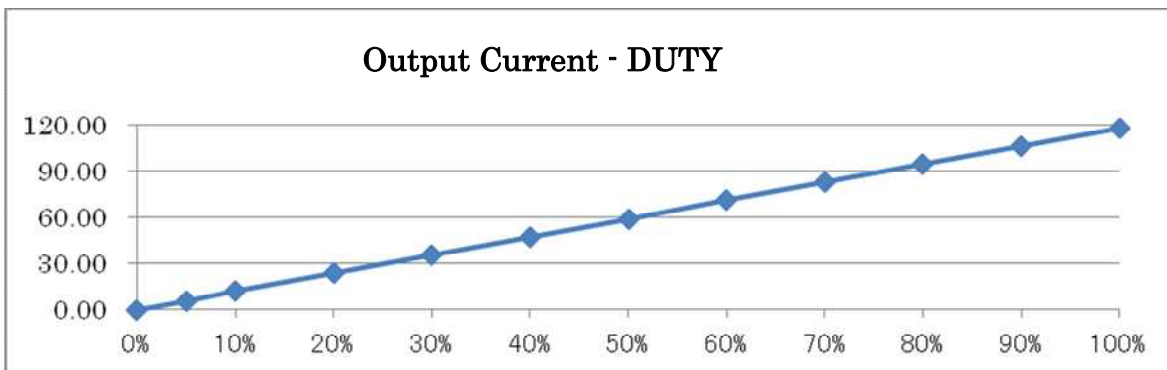
● PWM- Output current characteristics (Setting current 118.92mA)

At the time of DLT800600AG104 connection

At the time of the setup of KSLBC-3 (D1)



LEDVCC: 5V PWM: 1KHz Setting current: 118.92mA

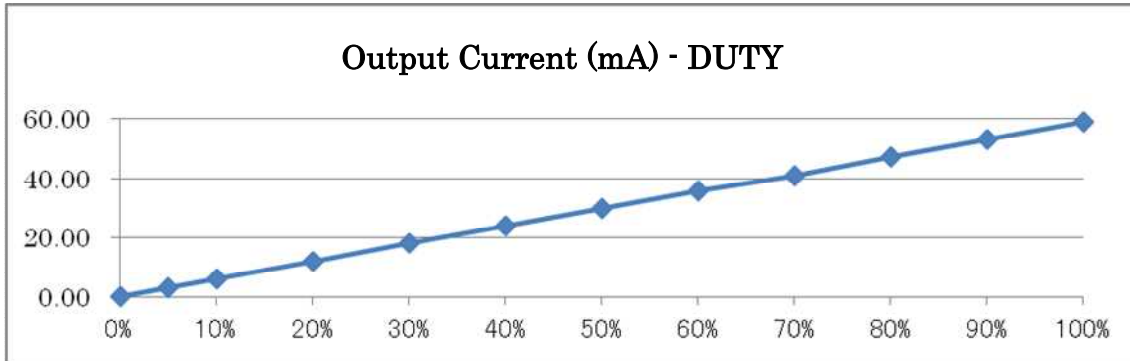


LEDVCC: 12V PWM: 1KHz Setting current: 118.92mA

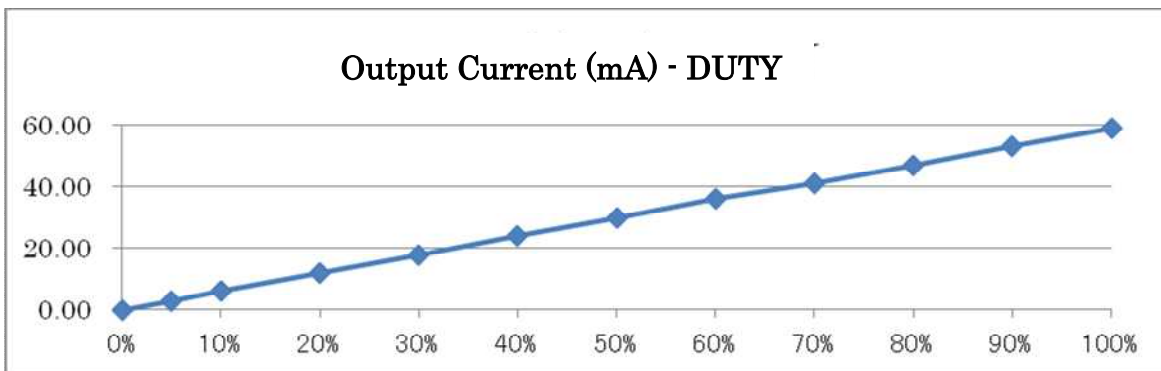
● PWM- Output current characteristics (Setting current 59.46mA)

At the time of GVTQ57NPAD4R0 connection

At the time of the setup of KSLBC-3 (D2)



LEDVCC: 5V PWM: 1KHz Setting current: 59.46mA



LEDVCC: 12V PWM: 1KHz Setting current: 59.46mA

4. CN1 Signal Table for Power and Signal Input Connectors

Pin number	Name of signal	Function
1,2	LEDVCC	Pin for power. Power supply pin.
3,4	LEDGND	Pin for power. Ground connection pin.
5	EN	This is the backlight ON/OFF signal.(H:ON, L:OFF) Pull-up to LEDVCC at 1.2M Ω is already set within the board (R8).
6	PWM	This is the brightness control signal for the backlight. PWM signal input (100%: Max. brightness 0%: Min. brightness) Pull-up to internal power supply (3.15V) at 10K Ω is already set within the board (R9).
7	I0GND	Connection to LEDGND within the board.

Connector used: 53261-0771 (Molex)

Compatible connector: 51021-0700 (Molex)

5. CN2 Signal Table for LED backlight Connector

Pin number	Name of signal	Function
1	LED1+	Connection to anode side of LED
2	LED2+	Connection to cathode side of LED

Connector used: SM02B-BHSS-1-TB (LF) (SN) (JST MFG. CO., LTD.)

Compatible connector: BHSR-02VS-1 (JST MFG. CO., LTD.)

Application Information

6. Connection Example and Reference Circuit Diagram

● Standard Connection Example

Diagram 3 is a standard connection standard connection for KSLBC-3 (D1)

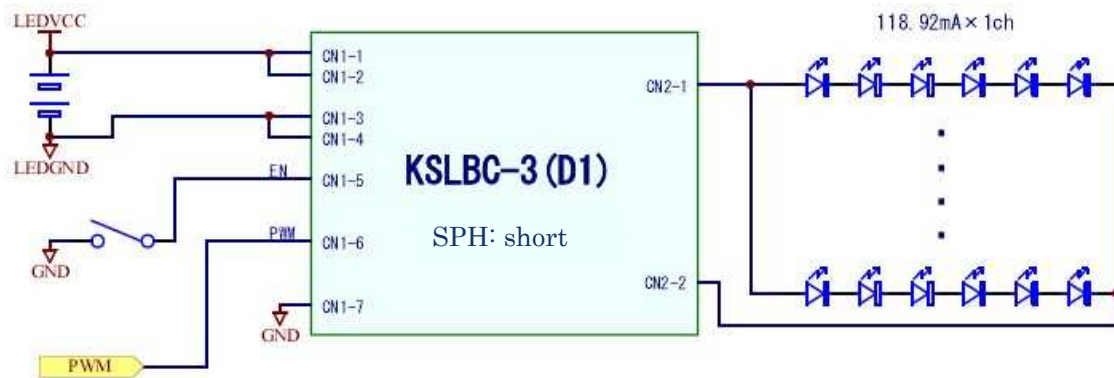


Diagram 3 Entire connection diagram

Diagram 4 is a standard connection standard connection for KSLBC-3 (D2)

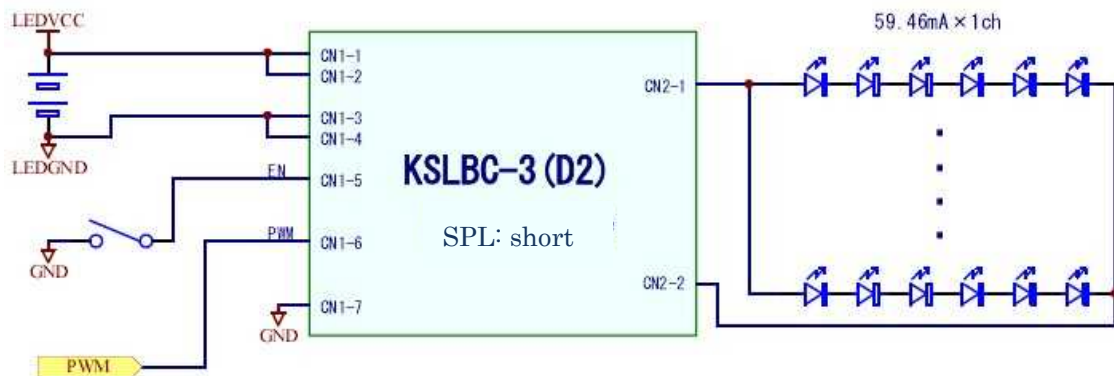


Diagram 4 Entire connection diagram

7. Technical Documentation about the Product

Technical information about the Product is continually updated and posted on the Kenic system website. Please feel free to browse at the URL below.

<http://www.kenic.co.jp/w/>