NEC LCD Technologies, Ltd.

INVERTER

84PW021

DATA SHEET

DOD-PD-0743 (2nd edition)

This DATA SHEET is updated document fromDOD-PD-0364(1).

All information is subject to change without notice. Please confirm the sales representative before starting to design your system.

INTRODUCTION

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While NEC has been making continuous effort to enhance the reliability of its products, the possibility of failures cannot be eliminated entirely. To minimize risks of damage to property or injury to person arising from a failure in an NEC product, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment and anti-failure features.

NEC products are classified into the following three quality grades:
"Standard", "Special", "Specific"

The ***"Specific"*** quality grade applies only to applications developed based on a customer designated "quality assurance program" for a specific application. The recommended applications of a product depend on its quality grade, as indicated below. Customers must check the quality grade of each application before using it in a particular application.

Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Military systems, aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems (medical equipment, etc.) and any other equipment

The quality grade of this product is ***"Standard"*** unless otherwise specified in this document. If customers intend to use this product for applications other than those specified for ***"Standard"*** quality grade, they should contact NEC sales representative in advance.

CONTENTS

1. OUTLINE

This 84PW021 inverter is for LCD module. Adaptable LCD module is as follows.

Adaptable LCD module
NL10276BC16-01

2. SPECIFICATION

2.1 GENERAL SPECIFICATIONS

Item	Specification	Unit
Size	See "**5.OUTLINE DRAWINGS**".	mm
Weight	49 (max.)	g
Delivery unit	10 (min.)	set

2.2 ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Rating	Unit	Remarks
Power supply voltage		VDDB	0 to +14.0	V	Ta = 25°C
Input voltage	BRTC signal	VBC	0 to +14.0	V	Ta = 25°C VDDB = 12.0V
	BRTI signal	VBI	0 to +5.3	V	
Storage temperature		Tst	-30 to +85	°C	-
Operating temperature		Top	-20 to +70	°C	-
Relative humidity Note1		RH	≤ 95	%	Ta ≤ 40°C
			≤ 85	%	40 < Ta ≤ 50°C
			≤ 70	%	50 < Ta ≤ 55°C
Absolute humidity Note1		AH	≤ 73 Note2	g/m^3	Ta > 55°C

Note1: No condensation
Note2: Water amount at Ta=55°C and RH=70%

2.3 ELECTRICAL CHARACTERISTICS

(Ta = 25°C)

Parameter			Symbol	min.	typ.	max.	Unit	Remarks
Power supply voltage			VDDB	10.8	12.0	13.2	V	Note1, Note2
Power supply current			IDDB	790	880	970	mA	VDDB = 12.0V (At luminance control is maximum.) Note2
Input voltage	BRTC signal	High	VBCH	2.0	-	VDDB	V	-
		Low	VBCL	0	-	0.8	V	
	BRTI signal		VBI	0	-	2.5	V	
Input current	BRTC signal	High	IBCH	-	-	1.5	mA	-
		Low	IBCL	-1.5	-	-	mA	
	BRTI signal		IBI	-1.0	-	-	mA	
Output voltage	Open lamp voltage		VO	950	-	-	Vrms	Note3
	Lamp voltage (at steady state)		VBLH	-	440	-	Vrms	-
	AM signal	High	VAMH	-	5.3	-	V	at malfunction
		Low	VAML	-	0	-	V	at normal
Output current	Lamp current (per lamp)		IBL	4.5	5.0	5.5	mArms	-
	AM signal	High	IAMH	-	-	1.0	mA	-
Oscillation frequency			FO	49	54	59	kHz	-
Luminance control frequency			FB	245	270	295	Hz	-

Note1: When designing of the power supply, take the measures for the prevention of surge voltage.

Note2: The power supply lines (VDDB and GNDB) occurs large ripple voltage while luminance control of LCD lamps. There is the possibility that the ripple voltage produces acoustic noise and signal wave noise in audio circuit and so on. Put a capacitor (5,000 to 6,000μF) between the power source lines (VDDB and GNDB) to reduce the noise, if the noise occurred in the circuit.

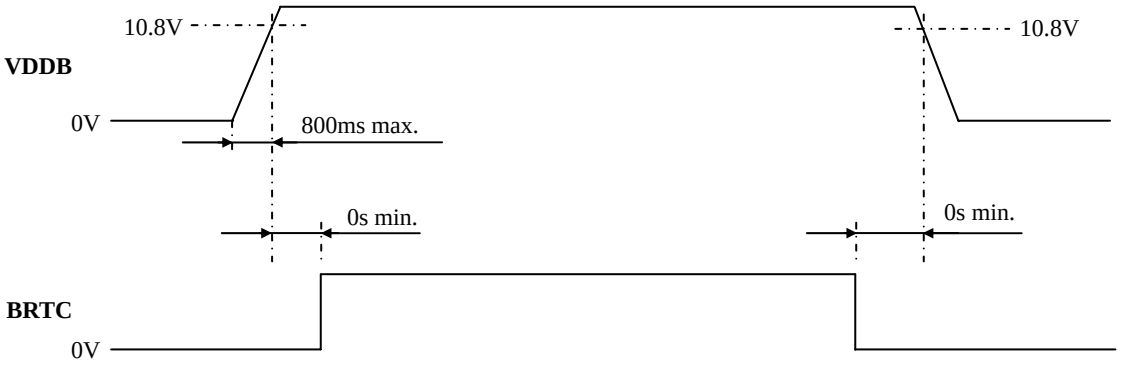
Note3: Measured value with high voltage probe of a load capacitance of 3pF
It is guaranteed that the adaptable LCD module can be turned on at Ta= 0 °C.

2.4 FUSE

Parameter	Fuse		Rating	Fusing current	Remarks
	Type	Supplier			
VDDB	11CT2A	S.O.C. Corporation	2.0 A 72 V	4.0A	Note1

Note1: The power supply capacity should be more than the fusing current. If the power capacity is less than the fusing current, the fuse may not blow for a short time, and then nasty smell, smoking and so on may occur.

2.5 POWER SUPPLY VOLTAGE SEQUENCE



2.6 CONNECTIONS AND FUNCTIONS FOR INTERFACE PINS

CN1 socket (Inverter side): 53261-1171 (MOLEX Inc.) ☆
Adaptable plug: 51021-1100 (MOLEX Inc.)

Pin No.	Symbol	Function	Remarks
1	VDDB	Power supply	Note1
2	VDDB	Power supply	
3	GNDB	Ground	
4	GNDB	Ground	
5	BRTC	Backlight ON/OFF signal	High or Open: Backlight ON Low: Backlight OFF This pin is pulled-up to VDDB in the product. Pull-up resistance: 3.3 kΩ
6	BRTI	Luminance control terminal	Note2
7	BRTH		
8	AM	Alert signal output at malfunction	Note3
9	RSVD	-	Keep this pin Open.
10	RSVD	-	
11	RSVD	-	

Note1: All GNDB and VDDB terminals should be used without any non-connected lines. ☆
Note2: See "**2.7 LUMINANCE CONTROL**".
Note3: If anyone of terminals Pin No. 1, 2 or 4 (CN2 and CN3) opens, then the alert signal (+5.0V) is output.

CN2 socket (Inverter side): SM03 (7-D1) B-BHS-1-TB(LF)(SN) (J.S.T. Mfg Co., Ltd.) ☆
Adaptable plug (Backlight side): BHR-04VS-1 (J.S.T. Mfg Co., Ltd.)

Pin No.	Symbol	Signal	Remarks
1	VBLH	High voltage (Hot)	-
2	VBLH	High voltage (Hot)	-
3	N. C.	-	Keep this pin Open.
4	VBLC	Low voltage (Cold)	-

Note1: VBLH and VBLC must be connected correctly. If customer connects wrongly, customer will be hurt and the module will be broken. ☆

CN3 socket (Inverter side): SM03 (7-D1) B-BHS-1-TB(LF)(SN) (J.S.T. Mfg Co., Ltd.) ☆
Adaptable plug (Backlight side): BHR-04VS-1 (J.S.T. Mfg Co., Ltd.)

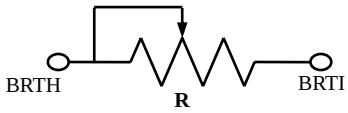
Pin No.	Symbol	Signal	Remarks
1	VBLH	High voltage (Hot)	-
2	VBLH	High voltage (Hot)	-
3	N. C.	-	Keep this pin Open.
4	VBLC	Low voltage (Cold)	-

Note1: VBLH and VBLC must be connected correctly. If customer connects wrongly, customer will be hurt and the module will be broken. ☆

2.7 LUMINANCE CONTROL

<table>
<tr><th>Method</th><th>Adjustment and luminance ratio</th></tr>
<tr><td>Resistor control</td><td>• Adjustment

The variable resistor (R) for luminance control should be 10kΩ ±5%, B curve, 1/10W. Minimum point of the resistor is the minimum luminance. Also maximum point of the resistor is the maximum luminance.
The resistor (R) must be connected between BRTH-BRTI terminals.

• Luminance ratio Note1
<table><tr><th>Resistance</th><th>Luminance ratio</th></tr><tr><td>0 Ω</td><td>20 % (Minimum)</td></tr><tr><td>10 kΩ</td><td>100 % (Maximum)</td></tr></table></td></tr>
<tr><td>Voltage control</td><td>• Adjustment

Voltage control method works, when BRTH terminal is 0V and VBI voltage is input between BRTI-BRTH terminals. This control method can carry out continuation adjustment of luminance.
Luminance is maximum when BRTI terminal is Open.

• Luminance ratio Note1
<table><tr><th>BRTI signal (VBI)</th><th>Luminance ratio</th></tr><tr><td>0 V</td><td>20 % (Minimum)</td></tr><tr><td>2.5 V</td><td>100 % (Maximum)</td></tr></table></td></tr>
</table>

Note1: These data are the target values.

3. RELIABILITY TEST

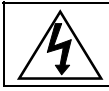
This test is in accordance with the adaptable LCD module. Refer to Reliability Test of the adaptable LCD module.

4. PRECAUTIONS

4.1 MEANING OF CAUTION SIGNS

The following caution signs have very important meaning. **Be sure to read "4.2 CAUTIONS" and "4.3 ATTENTIONS", after understanding these contents!**

This sign has the meaning that customer will be injured by himself or the product will sustain a damage, if customer has wrong operations.



This sign has the meaning that customer will get an electrical shock, if customer has wrong operations.

This sign has the meaning that customer will be injured by himself, if customer has wrong operations.

4.2 CAUTIONS

- **Do not touch the inverter while the inverter is working, because there is a danger that customer will get an electric shock.**
- **Do not remove the inverter protection sheet, because there is a danger that customer will get an electrical shock.**
- **Be sure to wait some time after turning power OFF before starting replacement work, because the inverter is charged at a high voltage after working.**

- **Be sure to wait some time after turning power OFF before starting replacement work, because the inverter is hot after working.**
- **Do not shock the inverter, because there is a danger of breaking.**

4.3 ATTENTIONS 

4.3.1 Handling of the product

① Take hold of both ends without touch the mounting parts when customer pulls out products from packing box. If customer touches it, products may be broken down or out of adjustment, because of stress to mounting parts.
② Take the measures of electrostatic discharge such as earth band, ionic shower and so on, when customer handles the product, because products may be damaged by electrostatic.
③ Do not push-pull the interface connectors while the product is working, because wrong power sequence may break down the product.
④ Do not hook cables nor pull connection cables such as lamp cable and so on, for fear of damage.
⑤ Properly connect the adaptable plug (backlight side) to socket (inverter side) without incomplete connection. After connecting, be careful not to hook the lamp cables because incomplete connection may occur by hooking the lamp cables. This incomplete connection may cause abnormal operation of high voltage circuit.

4.3.2 Environment

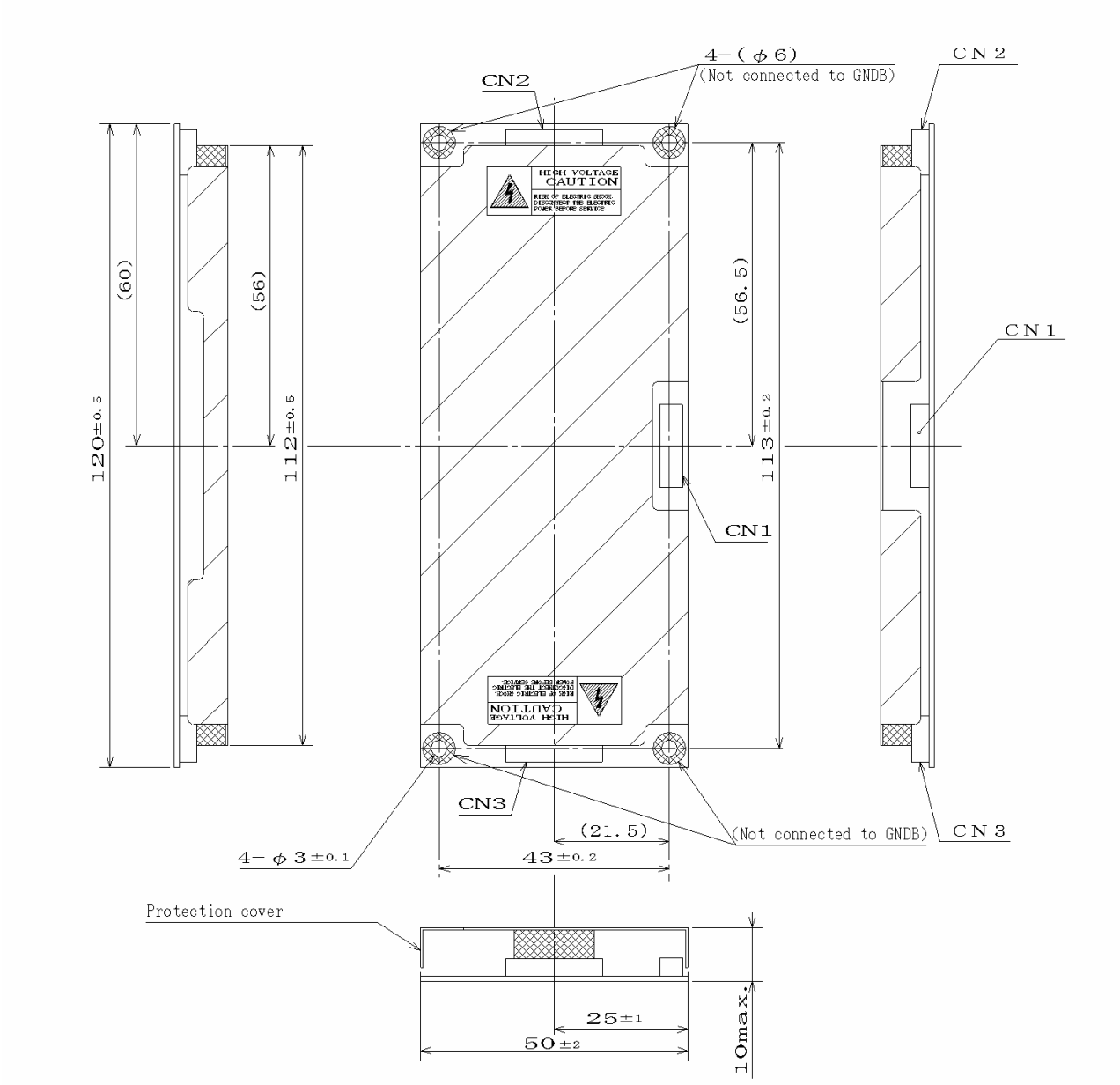
① Do not operate or store in high temperature, high humidity, dewdrop atmosphere or corrosive gases. Keep the product in antistatic pouch in room temperature, because of avoidance for dusts and sunlight, if customer stores the product.
② In order to prevent dew condensation occurring by temperature difference, the product packing box should be opened after leave under the environment of an unpacking room temperature enough. Because a situation of dew condensation occurring is changed by the environmental temperature and humidity, evaluate the leaving time sufficiently. (Recommendation leaving time: 6 hour or more with packing state)
③ Do not operate in high magnetic field. Product may be broken down by it.
④ This product is not designed as radiation hardened.

4.3.3 Other

① All GNDB and VDDB terminals should be used without any non-connected lines.
② Do not disassemble a product without permission of NEC.
③ Pack the product with original shipping package, because of avoidance of some damages during transportation, when customer returns it to NEC for repair and so on.

5. OUTLINE DRAWINGS

(Unit: mm)



Note1: The values in parentheses are for reference.