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**CUSTOMER'S ACCEPTANCE
SPECIFICATIONS**
(Backlight Inverters for cold cathode
fluorescent lamp)

TYPE: INV C 657

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RECORD OF REVISION

DATE	PAGE	SUMMARY	Date Code & Rev.
25.DEC.2003		NEW	

1. Scope

- 1.1 This specification shall apply to inverter INVC657 to operate a cold cathode fluorescent lamp in the liquid-crystal module(LCM).
- 1.2 This inverter INVC657 is designed and adjusted for TX14D LCD-module.
(Hitachi's type name)

2. General Specifications

General specifications and condition for use are shown below.

Item	Specification
Cooling condition	Free air flow
Efficiency	75 % min
Weight	8.8g typ
Ambient temperature (direct ambient air of Inverter board)	Operating -10~70deg Stock -20~85deg
Humidity	90 % RH.max.
Corrosive gasses	Not acceptable
Audible sound level	35dB max. at 30cm

3. Electrical Characteristics

3.1. Maximum ratings

Items	Min.	Typ.	Max.	unit	Remarks
Input voltage	---	---	14.0	V	

3.2. Operationg Characteristics

Item	Min	Typ	Max	Unit	Remarks
Input voltage	10.8	12.0	13.2	V	
Input current	280	320	360	mA	at 12.0V MAX
	40	60	80	mA	at 12.0V MIN
Output current	3.5	4.0	4.5	mA	at 12.0V MAX
	1.3	1.8	2.3	mA	at 12.0V MIN
Main frequency	57	67	77	kHz	at 12.0V MAX

All characteristics are measured at TX14D.

- (1) All characteristics are measured by our certain test equipment. The measurement of condition should be stable lighting (more than 30 minutes after startup :at 25+/-1 deg and no breath of wind) (The measurement of input rush current is exception.)
- (2) The electrical characteristics are measured as we show on measurement diagram fig.1. $V_{cc}=12V$.
- (3) As we show on measurement diagram fig.1, the test equipment shall be V1:DC Volt meter (Class0.5) A1:DC Current meter(Class0.5) A2:AC Current meter type2016(Y.E.W) or FLUKE45(FLUKE) V_{cc} :DMS35-2.3(Metronix) .
- (4) The line length of between the lamp and 1pin of CN2(high voltage side) is less than 150mm. The line length of between the lamp and 2pin of CN2(low voltage side) is less than 400mm.

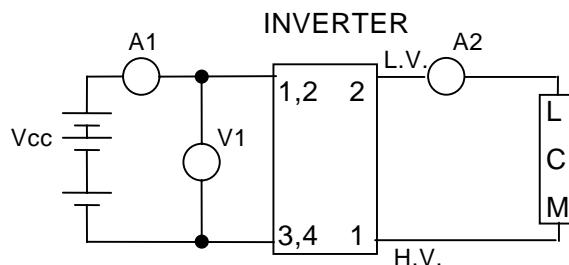


Fig.1 Wiring

3.4. Wiring Diagram

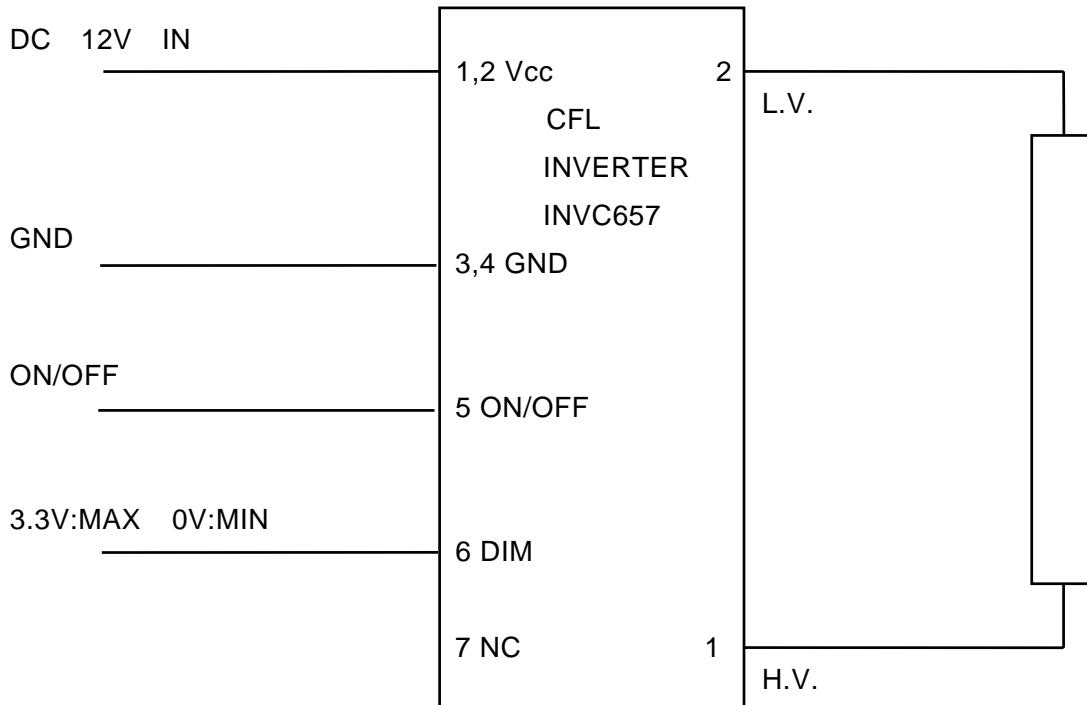


Fig.2 Wiring Diagram

4. Reliability

Item	Test condition
Low temp.oper.	-10deg, 12.0V, 100%output, 500Hrs
High temp.oper.	70deg, 12.0V, 100%output, 500Hrs
Low temp.stock.	-20deg, 500Hrs
High temp.stock.	85deg, 500Hrs
High temp. and high humidity	50deg, 95% 12.0V, 100%output, 500Hrs
Cyclic temp.oper.	0deg – 25deg –50deg 1Hrs each 12.0V, 100%output, 50cycles
Thermal shock	-20deg – 70deg, 0.5Hrs each 100cycles
Vibration	3G, 30~200Hz, 0.5Hrs,xyz-axis
Impact test	50G,xyz-axis

5. Structure

5.1 Dimensions

Reference to drawing P.7

5.2 Interface specification

Input connector CN1:SM07B-SRSS-TB(JST)

Pin No.	Symbol	Comment
1,2	Vcc	Vcc 12.0Vtyp
3,4	GND	GND
5	ON/OFF	OFF at 0V ON at 3.3V~5.0V
6	Dim	brightness control 3.3V at MAX, 0V at MIN
7	NC	---

Output connector CN2:SM02(8.0)B-BHS-1-TB(JST)

Pin No.	Symbol
1	H.V.
2	L.V.

6. Structure and Dimensions

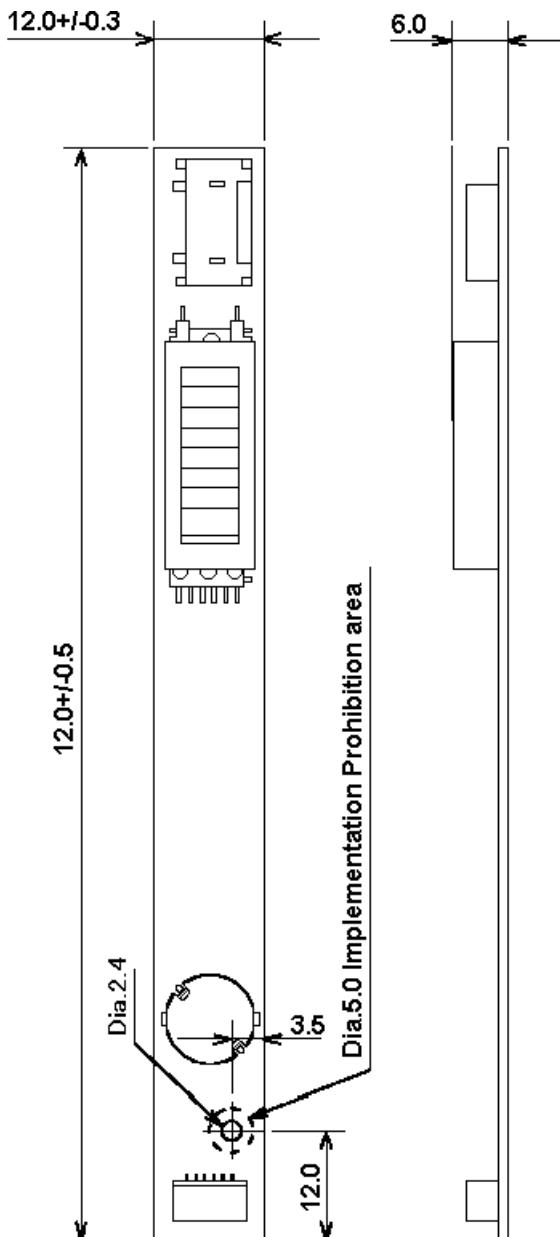


Fig.3 Dimensional Outline

1. Manufacturer's Name : "HITACHI" silk print
2. Manufacture'No : INVC"657" silk print
3. Date code : ex "25N3"

7.Precautions in Design

- 7.1 Please turn off the power supply of the inverter before the out put connector (CN2) be put in or put off. Because voltage of the output connector is very high.
- 7.2 The high-voltage wiring of lamps may affect the characteristics of this product even in the presence of a slight stray capacity of 1 to few pF. So, please check whatever the below points have fully considered.
 - (1) Please use UL1330 equivalents as inverter output leads and keep length within 150mm.
 - (2) Please keep the length of wiring as short as possible and at the same time avoid binding high-voltage and low-voltage leads together and fitting high-voltage leads near the shield.
 - (3) Consider the electric potential of the parts adjacent to a wire because it greatly affects the electric characteristics and startup characteristics.
- 7.3 In the case of put in and put off the connector(CN1), please switch off power supply of the inverter. If power supply is operating it will possible that the inverter break down.
- 7.4 Please pay attention in using the inverter. Because the transformer in the inverter is weak to impact.
- 7.5 If it was exposed to thermal shock(out of order), come to have a crack itself.
- 7.6 Please do not give it any changes, such as reworking it, applying and hardening with adhesives, molding with resin, fixing with tape.
- 7.7 Please make a tight connection output and input connector.(If inverter's connecter contact was imperfection, the components of inverter have high temperature and break down.)

7.8 Pay attention as printed circuit board is bent, and not adding excessive pressure when printed circuit board is built in. (Deterioration and the damage of component are caused, and movements of inverter are out of order.)