

Customer Name : (주) 하이디스플레이

Date : 2011. 02. 16.

## SPECIFICATION FOR APPROVAL

Part Name : CCFL INVERTER



Customer Part No. :

DS-Plus Part No. : DS-1307WK (Voltage -Dimming )

Approval Sign

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**DS -Plus Inc.**

PREPARED	APPROVAL
	

**Table of content**

<u>Contents</u>	<u>Page</u>
1. Revision history	3/14
2. Features	4/14
3. Applications	4/14
4. Absolute maximum ratings	4/14
5. Recommend operating conditions	5/14
6. Electrical characteristics	5/14
7. Functional pin description	6/14
8. Mechanical dimensions	6/14
9. Test circuit	7/14
10. Heat shock test	7/14
11. Notation of lot number	8/14
12. Packing	8/14
13. Parts list	9/14
14. Circuit diagram	10/14
15. PCB lay-out	11/14
16. Material list	12/14
17. Inspection Report	13,14/14

1. Revision history

No .	DATE	REVISION	DESCRIPTION

## **2. Features**

- High efficiency
- Drive 4 lamps with one module
- Nominal current 6.5 mArms for each lamp
- 10.8 to 13.2V input voltage operation
- Protection against lamp open or failure
- Voltage dimming control : No influence to power ripple
- Long lamp life with soft start
- Low sleep current
- Single sided PCB layout
- Low EMI and spurious noise

## **3. Applications**

- 15~ 19" Desktop LCD monitor
- Industrial LCD Panel

## **4. Absolute maximum ratings**

Input supply voltage ( $V_{IN}$ )	-----	- 0.3V to 14.0V
Output voltage, no load	-----	Internally limited to zero volt
Output current for each lamp( $I_O$ )	-----	9.0mArms
Output power (per lamp)	-----	7.0W
Sleep & bright adjust signal voltage ( $V_{SLEEP}$ , $V_{BRT}$ )	-----	- 0.3V to $V_{IN}$
Ambient operating temperature	-----	0 °C to 60 °C
Storage temperature range	-----	- 30 °C to 80 °C
Operating & storage humidity	-----	10 % to 85 %

**5. Recommended operating conditions** (R.C.)

Parameter	Symbol	Recommendation			Units
		Min	R.C.	Max	
Input supply voltage	$V_{IN}$	10.8	12.0	13.2	V
Full bright lamp current	$I_{O(MAX)}$	6.0	6.5	7.0	mArms
Brightness control voltage range	$V_{BRT}$	0		5.0	V
Lamp on/off control voltage	$V_{SLEEP}$	3.0	5.0	7.0	V
Lamp operating voltage	$V_O$		760		Vrms
Operating ambient temperature range	$T_A$	0		60	°C

**6. Electrical characteristics**

Parameter	Symbol	Conditions*	Specification*			Unit
			Min	Typ	Max	
Input supply voltage	$V_{IN}$		10.8	12.0	13.2	V
Input current	$I_{IN}$	$V_{IN}=12V, V_{BRT}=0V$	1.3	1.8	2.3	A
Full bright lamp current	$I_{O(MAX)}$	$V_{IN}=12V, V_{BRT}=0V$	5.5	6.5	7.5	mArms
Minimum lamp current	$I_{O(MIN)}$	$V_{IN}=12V, V_{BRT}=5.0V$	1.5	2.5	3.5	mArms
Operating frequency	$F_O$	$V_{IN}=12V, V_{BRT}=0V$	53	58	63	KHz
Open lamp output voltage	$V_O$	One or more lamp open	-	-	0	Vrms
Dimming ratio		$V_{IN}=12V, V_{BRT}=0$ to $5.0V$		2 : 1		
Sleep current	$I_{IN}$	$V_{IN}=12V, V_{SLEEP}=0V$			10	mA
Efficiency		$V_{IN}=12V, V_{BRT}=0V$	80	88		%

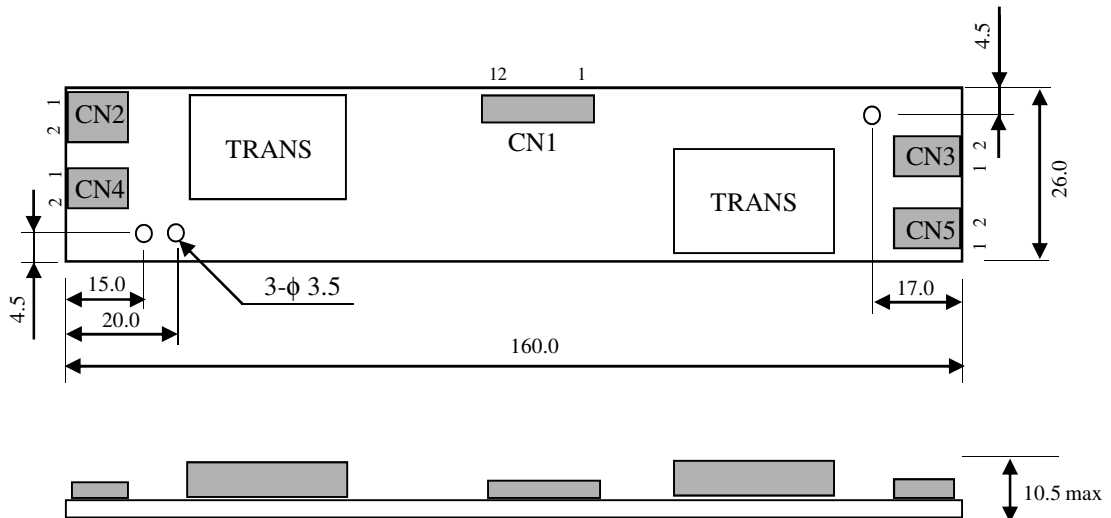
\* At the reference 17"LCD-Module(HT17E13) of BOE-Hydis

**7. Functional pin description**

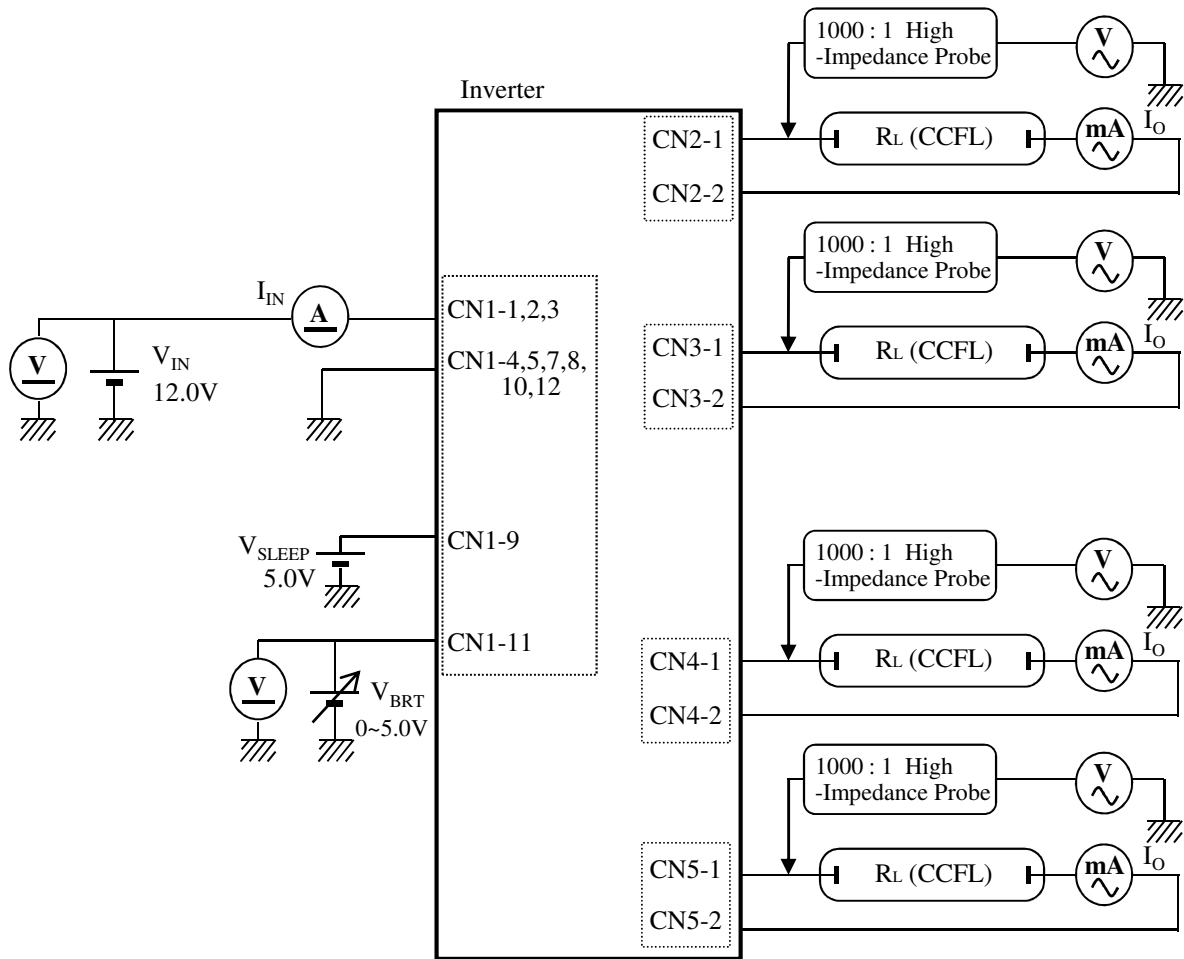
- CN1 Connector : 12505WR- 12A00 (YEONHO or Equivalent)
- CN1- 1,2,3  $V_{IN}$  (DC input ; 12.0V)
  - CN1- 4,5,7,8,10,12  $G_{ND}$  (Power supply return)
  - CN1- 9  $V_{SLEEP}$  (Lamp On/Off control ; Off at Low , On at High)
  - CN1- 11  $V_{BRT}$  (Bright adjust ; 0 to 5.0V)
  - CN1- 6 NC
- CN2,3,4,5 Connector : 35001WR- 02A00 (YEONHO or Equivalent)
- CN2,3,4,5- 1 High voltage
  - CN2,3,4,5- 2 Lamp current return

**8. Mechanical dimensions**

Tolerance :  $\pm 0.5$   
Unit : mm

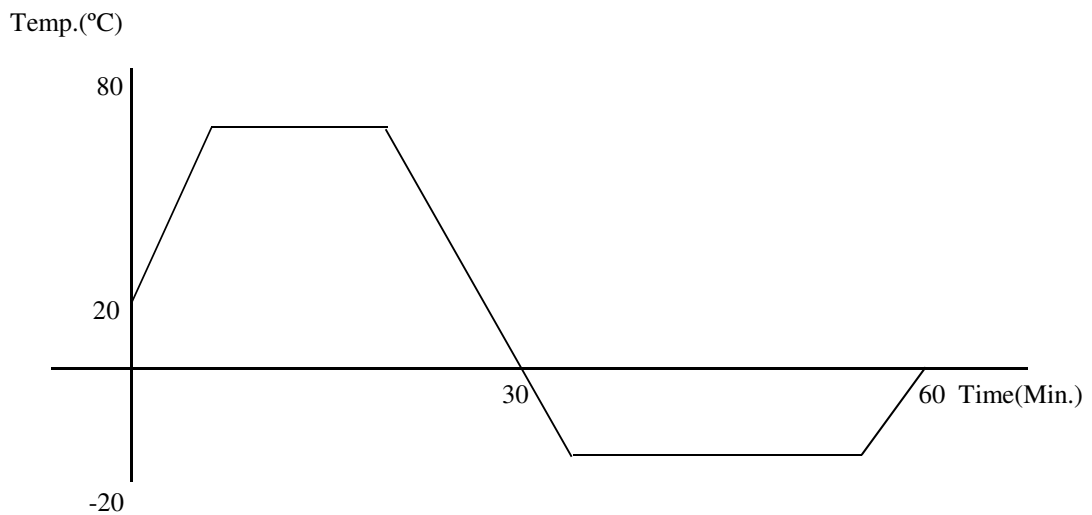


**9. Test circuit**



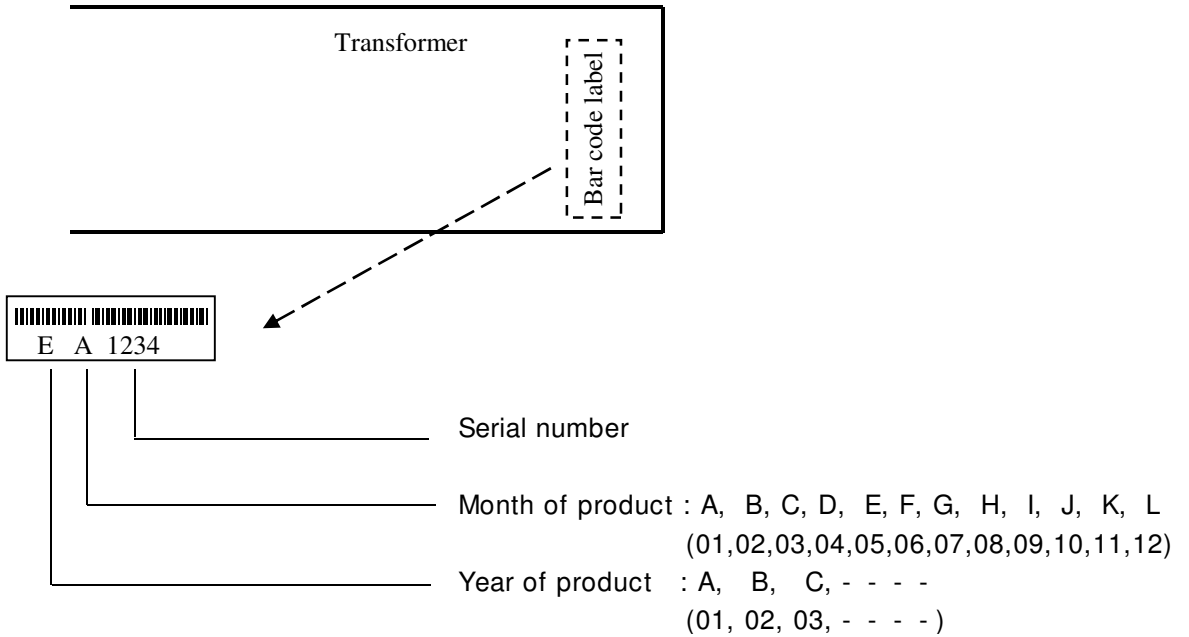
**10. Heat shock test**

20 cycles of test



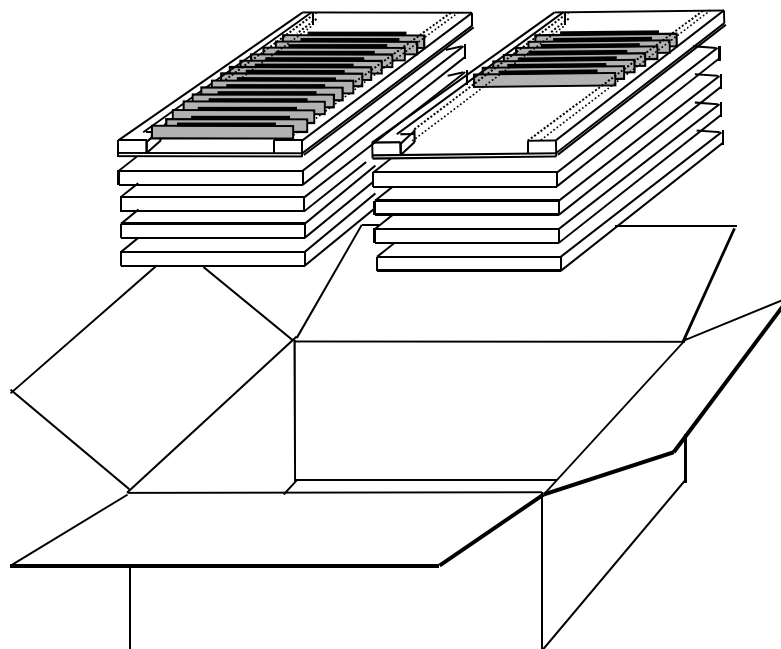
**11. Notation of lot number**

Marking position : Bottom of PWB



**12. Packing**

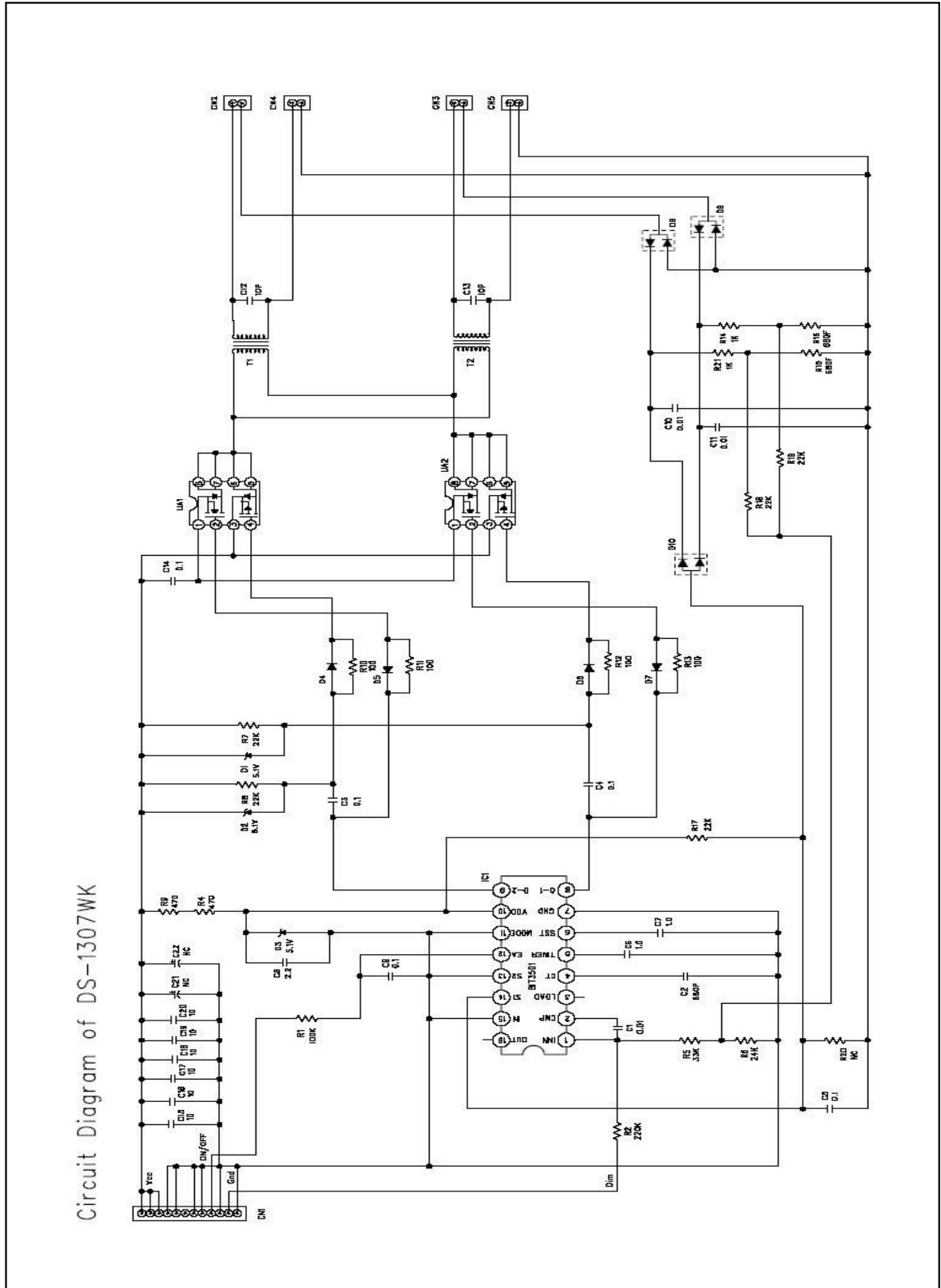
1 Box = 400 Pieces (20 Ea × 10 layer × 2 Row)



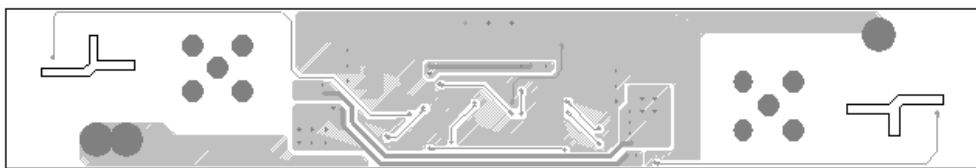




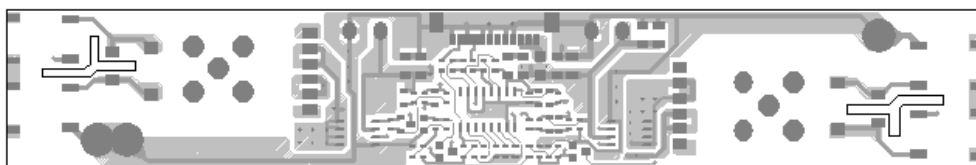
14. Circuit Diagram



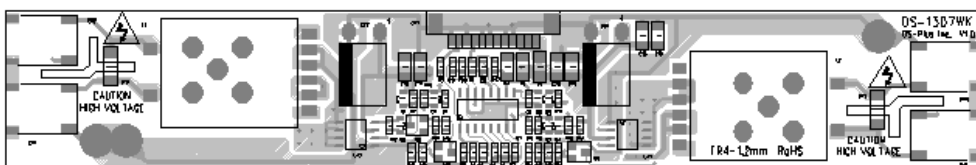
15. PCB Lay- Out



< Bottom Side >



< Top Side >



< Components Lay-Out >

**16. Material List**

Symbol	Component	Type No.	Manufacture	Description
	PCB		ERE Electronics or Equivalent	UL File No.-E213562
CN1	Connector	12505WR-12A00	YEONHO or Equivalent	UL File No.-E108706
CN2,3,4,5	Connector	35001WR-02A00	YEONHO or Equivalent	UL File No.-E108706
△ T1,2	Transformer	DS-2222	DONGHEUNG or Equivalent	See Specification

**17. Inspection Report**

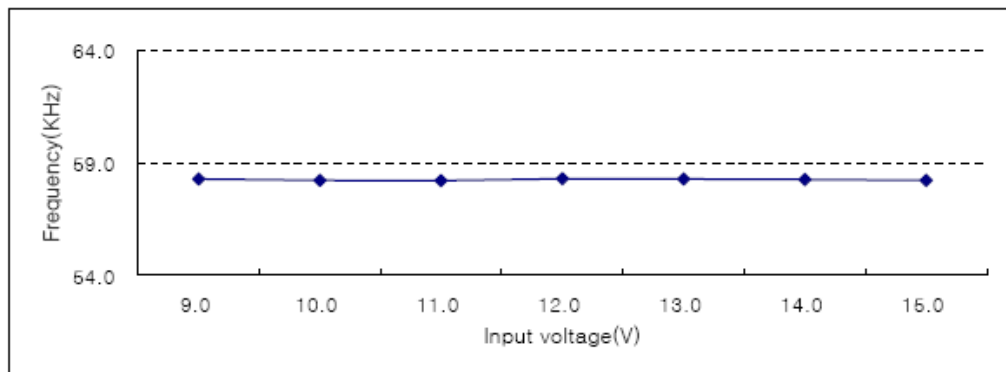
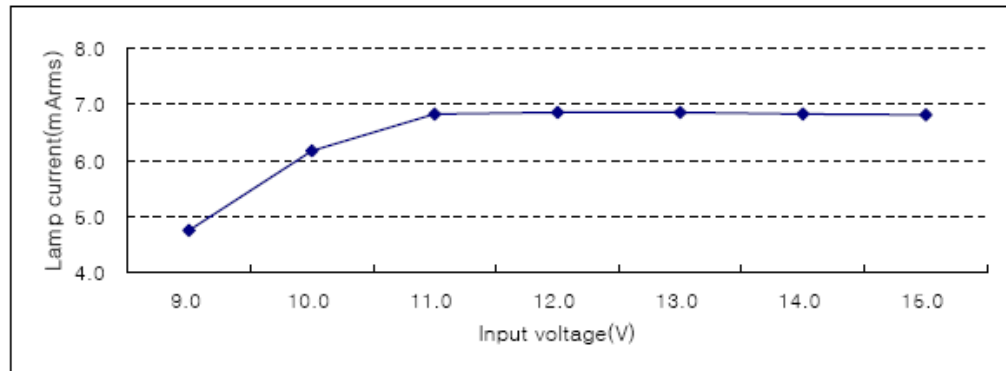
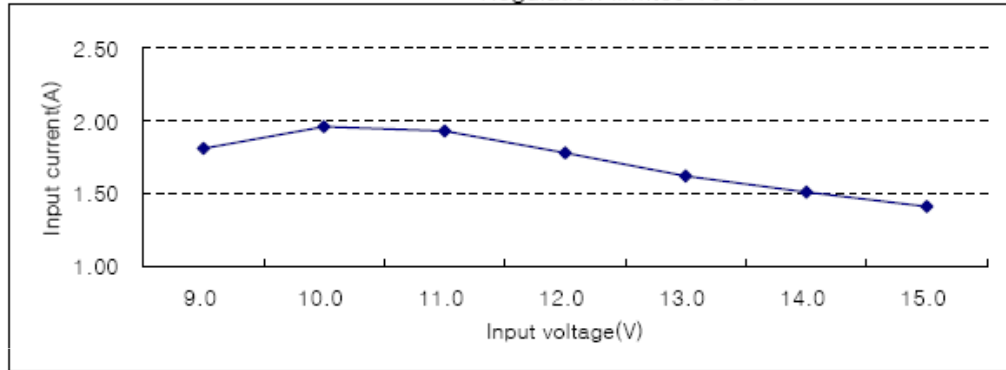
DS-1307WK-Vtg(4Lamp) 12V Inverter Test data(6.5mA)

1. DC Regulation

Test LCD-Module : BOE-Hydis 17"(HT17E13)

	Input voltage(V)						
	9.0	10.0	11.0	12.0	13.0	14.0	15.0
Input current(A)	1.81	1.96	1.93	1.78	1.62	1.51	1.41
Lamp current(mArms)	4.75	6.17	6.82	6.86	6.86	6.83	6.81
Frequency(KHz)	58.3	58.2	58.2	58.3	58.3	58.3	58.2

Regulation limites 10.6V



2. Dimming Control (Input voltage 12V)

	Dimming Control Voltage (V)					
	0	1	2	3	4	5
Input current(A)	1.78	1.60	1.44	1.28	1.12	0.95
Lamp current(mArms)	6.86	6.01	5.15	4.34	3.51	2.61
Frequency(KHz)	58.3	58.4	58.4	58.4	58.4	58.4

