

Customer Name : 하이디스플레이

Date : 2011. 01. 26

SPECIFICATION FOR APPROVAL

Part Name : CCFL INVERTER

Customer Part No. :

DS-Plus Part No. : DS-1305WK (Voltage dimming control)

Approval Sign

Please Return 1 Copy After Approved

DS -Plus Inc.

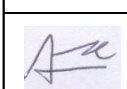
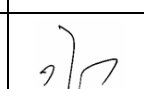
PREPARED	APPROVAL
	

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1. Revision history

No.	DATE	REVISION	DESCRIPTION

2. Features

- High efficiency
- Drive 2 lamps with one module
- Nominal current 8.0 mArms for each lamp
- 10.8V~ 13.2V wide input voltage operation
- Automatically balancing of both side lamp current
- Accurate and stable output current regulation
- Accommodation to various LCD module
- Voltage dimming control
- Long lamp life with soft start
- Protection against lamp open or failure
- Single sided PCB layout
- Low EMI and spurious noise

3. Applications

- Two lamps desk top LCD monitors and display panels
Recommend to use in 15" TFT LCD- Module of LG Philips

4. Absolute maximum ratings

Input supply voltage (V_{IN})	-----	- 0.3V to 13.2V
Output voltage, no load	-----	Internally limited to zero volt
Output current (I_O)	-----	10.0 mArms
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 50 °C
Storage temperature range	-----	- 30 °C to 80 °C
Operating & storage humidity	-----	10 % to 85 %

5. Recommend operating condition

Parameter	Symbol	Recommendation			Units
		Min	R.C.	Max	
Input supply voltage	V_{IN}	10.8	12.0	13.2	V
Full bright lamp current	$I_{O(MAX)}$	7.0	8.0	9.0	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		700		Vrms
Operating ambient temperature range	T_A	0		50	°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}	$V_{IN}=12V, V_{BRT}=0V$	0.70	0.90	1.10	A
Full bright lamp current	$I_{O(MAX)}$	$V_{IN}=12V, V_{BRT}=0V$	7.0	8.0	9.0	mArms
Minimum lamp current	$I_{O(MIN)}$	$V_{IN}=12V, V_{BRT}=5.0V$	1.6	2.6	3.6	mArms
Operating frequency	F_O	$V_{IN}=12V, V_{BRT}=0V$	37	42	47	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		3 : 1		
Striking time		$V_{IN}=12V, V_{BRT}=0V$		0.7		Sec
Sleep current	I_{IN}	$V_{IN}=12V, V_{SLEEP}=0V$			10	mA
Efficiency		$V_{IN}=12V, V_{BRT}=0V$	80	88		%

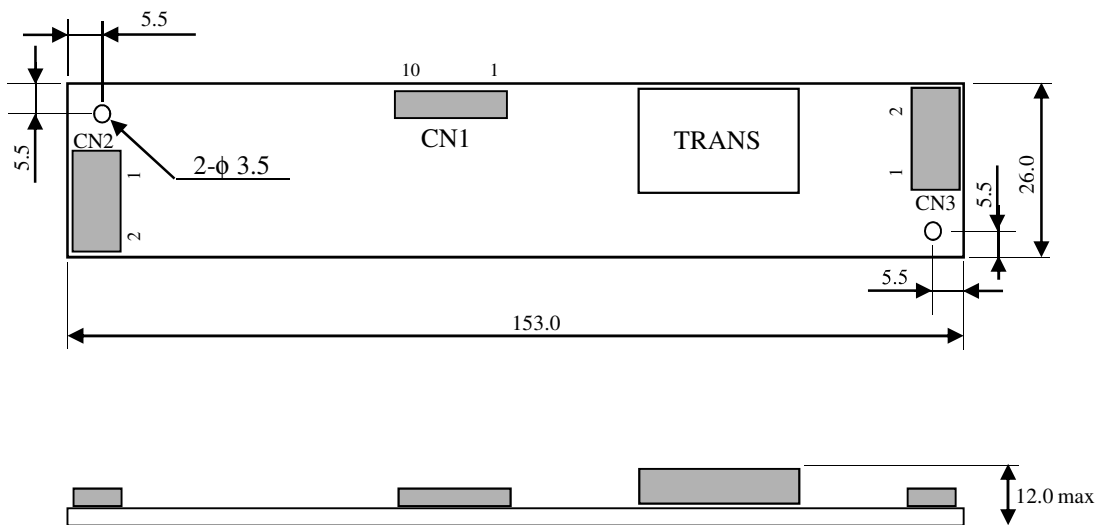
* At the reference 15" LCD-Module(LM151X05) of LG-Philips

7. Connector and functional pin description

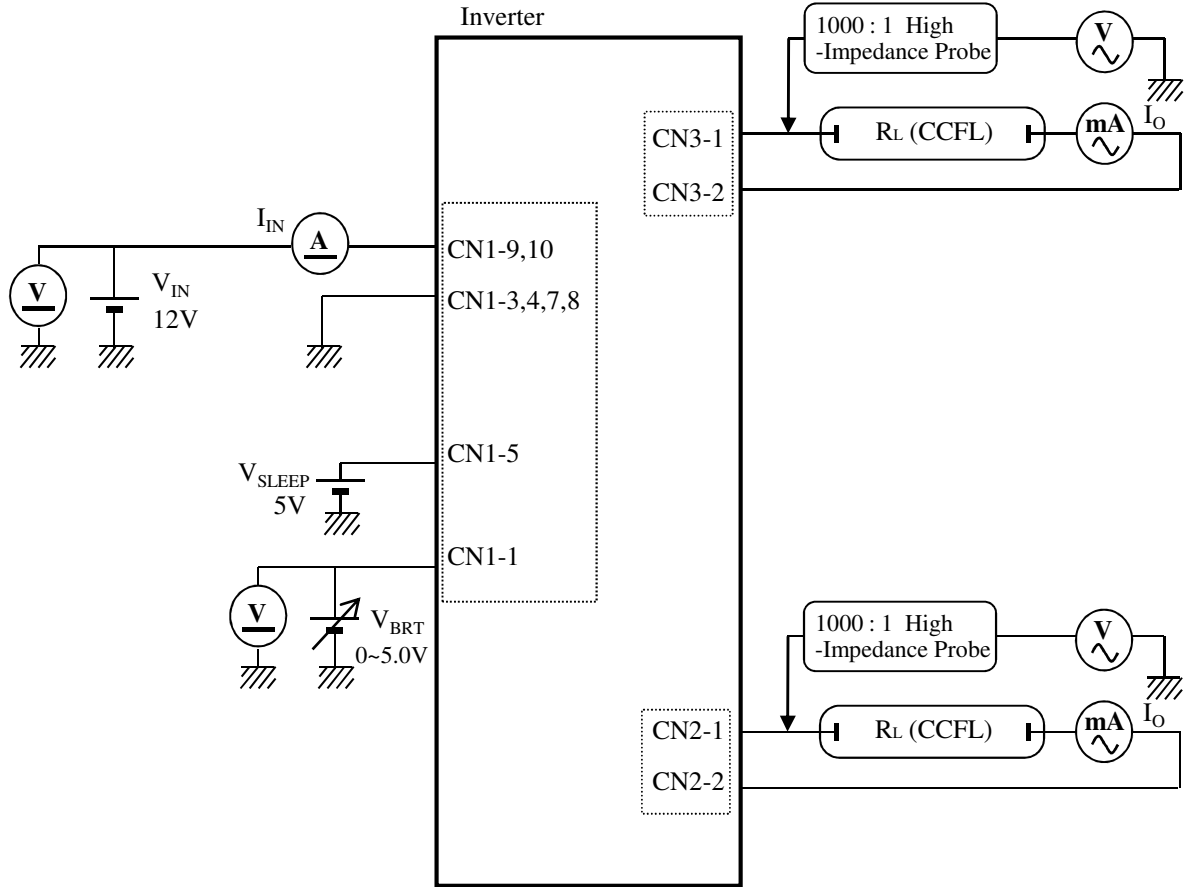
CN1 Connector	:	12505WR- 10A00 (YEONHO or Equivalent)
CN1- 1		V_{BRT} (Bright adjust ; 0 to 5.0V)
CN1- 2,6		NC
CN1- 3,4,7,8		G_{ND} (Power supply return)
CN1- 5		V_{SLEEP} (Lamp On/Off control ; Off at Low, On at High)
CN1- 9,10		V_{IN} (Input power supply)
CN2,3 Connector	:	20015WR- 05A00 (YEONHO or Equivalent) or 35001WR- 02A00 (YEONHO or Equivalent)
CN2,3 - 1		High voltage
CN2,3 - 2		Lamp current return

8. Mechanical dimensions

Tolerance : ± 0.5
Unit : mm

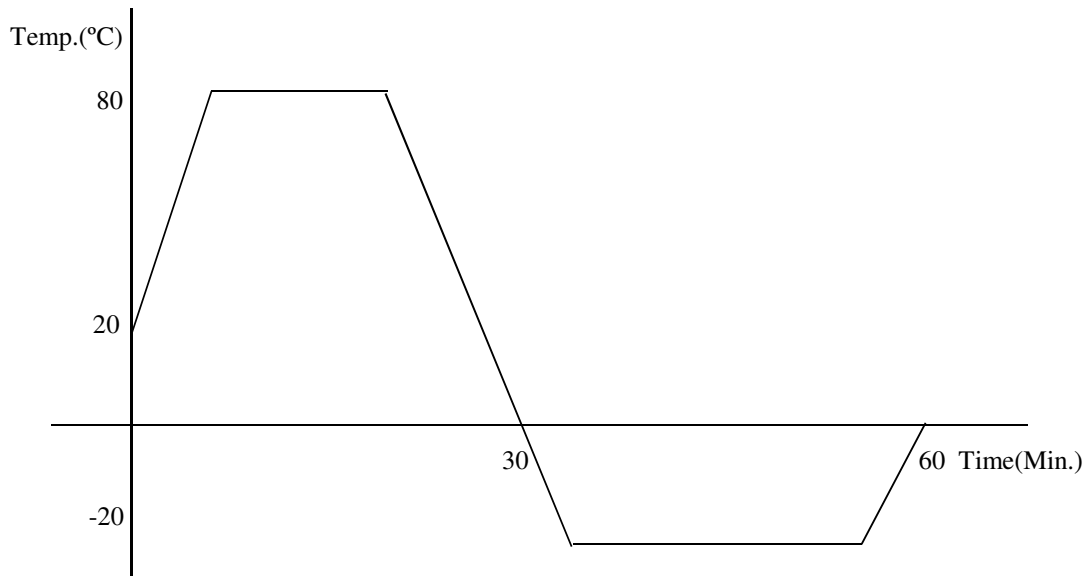


9. Test circuit



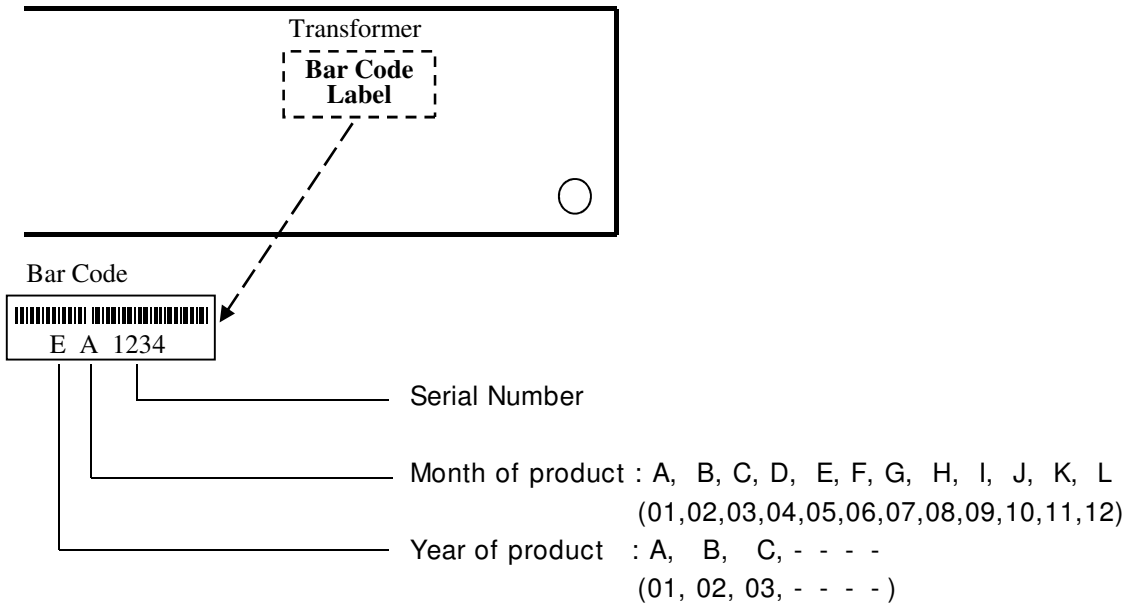
10. Heat shock test

20 cycles of test



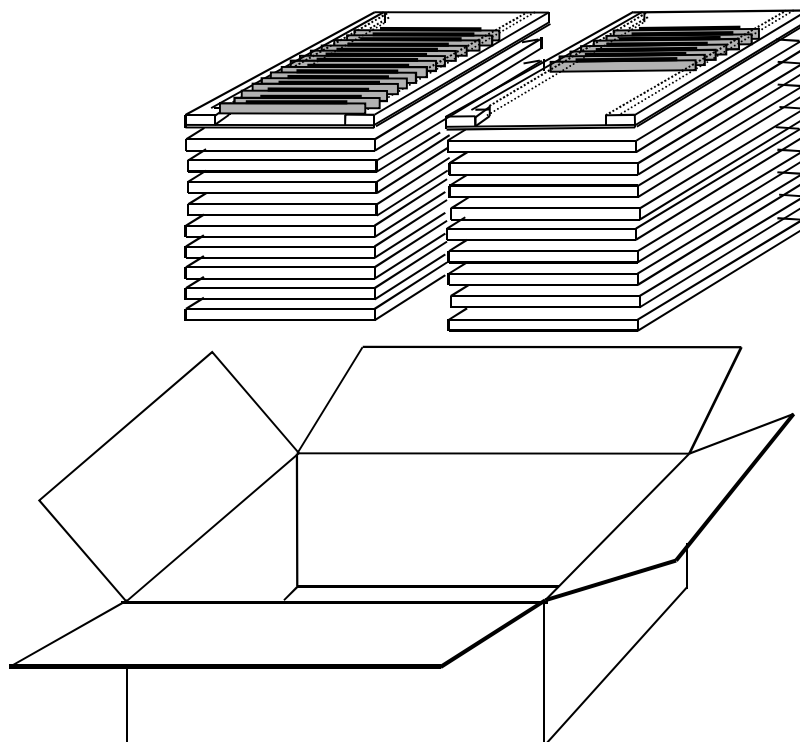
11. Notation of lot number

Bar code label position : Bottom of PWB



12. Packing

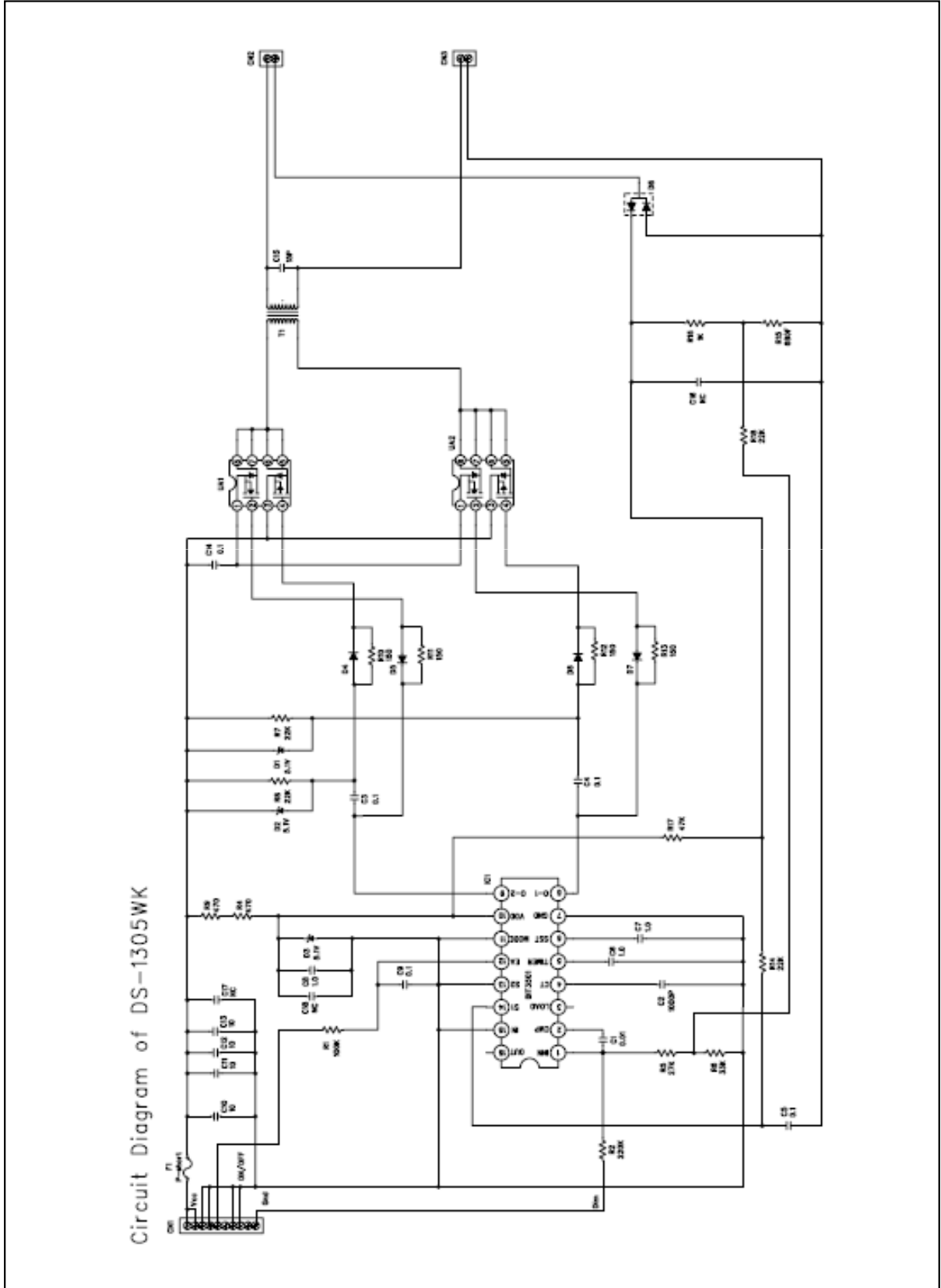
1 Box = 400 Pieces (20 Ea × 10 layer × 2 Row)



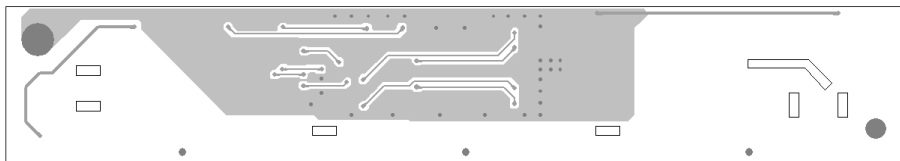
13. Parts List (Voltage Dimming)

NO	SYMBOL	TYPE	MAIN		ALTERNATIVE	
			TYPE	MAKER	TYPE	MAKER
1	IC1	IC	BIT3501	Bitek		
2	UA1,2	Dual-channel FET	TM8958FS	Tech mos	Equivalent	
3	D8	Diode(series connection)	EDS7000	S&E	"	
4	D4,5,6,7	Diode	1SS355	Rohm	"	
5	D1,2,3	Zener	MM3Z5V1T1	Onsemi	"	
6	C15	CC 15pF/3kV-J	4520	Maruwa / Murata	"	
7	C10,11,12,13,14	MLCC, 10 μ F/16V-Z	3216	Walsin	"	
8	C2	MLCC, 0.001 μ F/50V-J	1608	Walsin	"	
9	C1	MLCC, 0.01 μ F/50V-K	1608	Walsin	"	
10	C3,4,5,9	MLCC, 0.1 μ F/50V-Z	1608	Walsin	"	
11	C6,7	MLCC, 1.0 μ F/16V-Z	1608	Walsin	"	
12	C8	MLCC, 2.2 μ F/10V-Z	1608	Walsin	"	
13	R4,9	Resistor 470 Ω J	3216	Walsin	"	
14	R10,11,12,13	Resistor 100 Ω J	1608	Walsin	"	
15	R15	Resistor 680 Ω F	1608	Walsin	"	
16	R16	Resistor 1K Ω J	1608	Walsin	"	
17	R7,8,14,17,18	Resistor 22K Ω J	1608	Walsin	"	
18	R5	Resistor 27K Ω J	1608	Walsin	"	
19	R6	Resistor 33K Ω J	1608	Walsin	"	
20	R1	Resistor 100K Ω J	1608	Walsin	"	
21	R2	Resistor 220K Ω J	1608	Walsin	"	
22	T1,2	Transformer	DS-1822	Dongheung	"	
23	CN1	Connector,10P	12505WR-10A00	YEONHO	"	
24	CN2,3	Connector,2P(大)	20015WR-05A00	YEONHO	"	
25	PWB	153.0*26.0*1.2mm RoHS	DS-1305WK V1.1	ERE Electronics	"	

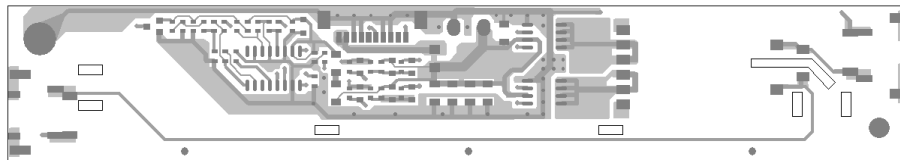
14. Circuit Diagram



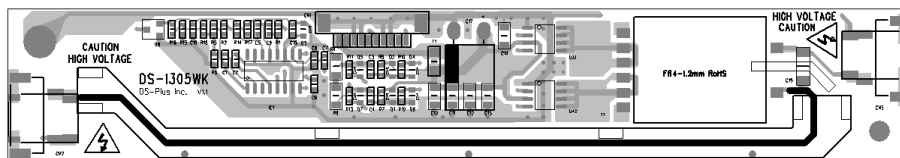
15. PCB Lay- Out



< 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-10A00	YEONHO or Equivalent	UL File No.-E108706
CN2,3	Connector	20015WR-05A00	YEONHO or Equivalent	UL File No.-E108706
△ T1	Transformer	DS-1822	Dong Heung or Equivalent	See Specification