

SPECIFICATION FOR APPROVAL

PRODUCT	: CCFL BACKLIGHT INVERTER
CUSTOMER	: 数源科技
CUSTOMER P/N.	:
DATA POWER P/N.	: DATA-04-19017AH REV. 1.1.2
BOM NO	: DATA-04-19017AH REV. 1.1.2.0
SAMPLES	: 2pcs
DATE	: 2008-11-4

APPROVED BY	NOTE
CUSTOMER SIGNATURE (S)	

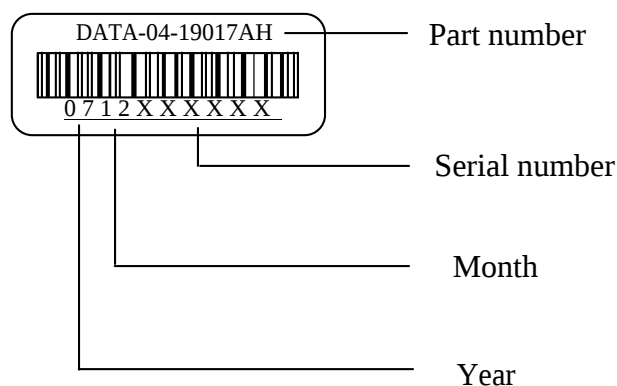
ISSUED BY _____ CHECKED BY _____ APPROVED BY _____

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1. REVISION HISTORY

REV	DESCRIPTION	ENGINEER	DATA
REV1.1.1	一次版本	张 军	2007/12/18
REV1.1.2	二次版本	张 军	2008/6/26



2. GENERAL DESCRIPTION

This DC-AC Inverter was developed for 4CCFL lamps of LCD back lighting system.

3. FEATURES

High performance low consumption special operating temperature

Open lamp protection

Lamp Current Balance Control

Wide Dimming Range

Short lamp protection

4. APPLICATION

The DC to AC back-light inverter is special designed on any type LCD display in implement (i.e. LCD monitor, etc...)

5. SUITABLE LOAD

This document defines the requirements for the CCFL inverter of the TFT-LCD panel

This product is compatible with :

19" ~~4~~ Lamps TFT LCD Module : LTM190M2-L31

6. ABSOLUITE MAXIMUM RATING LF ENVIRONMENT

Temperature operating : -10⁰C -- 50⁰C

Temperature storage : -20⁰C -- 70⁰C

Humidity operating : 10% -- 90RH

Humidity storage : 10% -- 90RH

7. INPUT ELECTRICAL CHARACTERISTICS

8.

No.	PARAMETER	Symbol	MIN	TYPE	MAX	Unit
1	INPUT VOLTAGE	Vin	10.8	12	13.2	V
2	INPUT CURRENT	Iin(Von)		2000	2400	mA
		Iin(Voff)	----	10	24	mA
3	INPUT POWER	Pin	----	24	----	W
4	BRIGHTNESS VOLTAGE	Vbri	0	---	5	V
5	CONTROL VOLTAGE	Enable Von=5V Disable Voff=0V				

8. ADDITIONAL FEATURES

Input current overload protected (fuse protect).

Open Lamp protected (protect for each terminal).

Output shorted protected (short to ground).

Output current balancing $\pm$ 0.5mA

9. OUTPUT ELECTRICAL CHARACTERISTICS

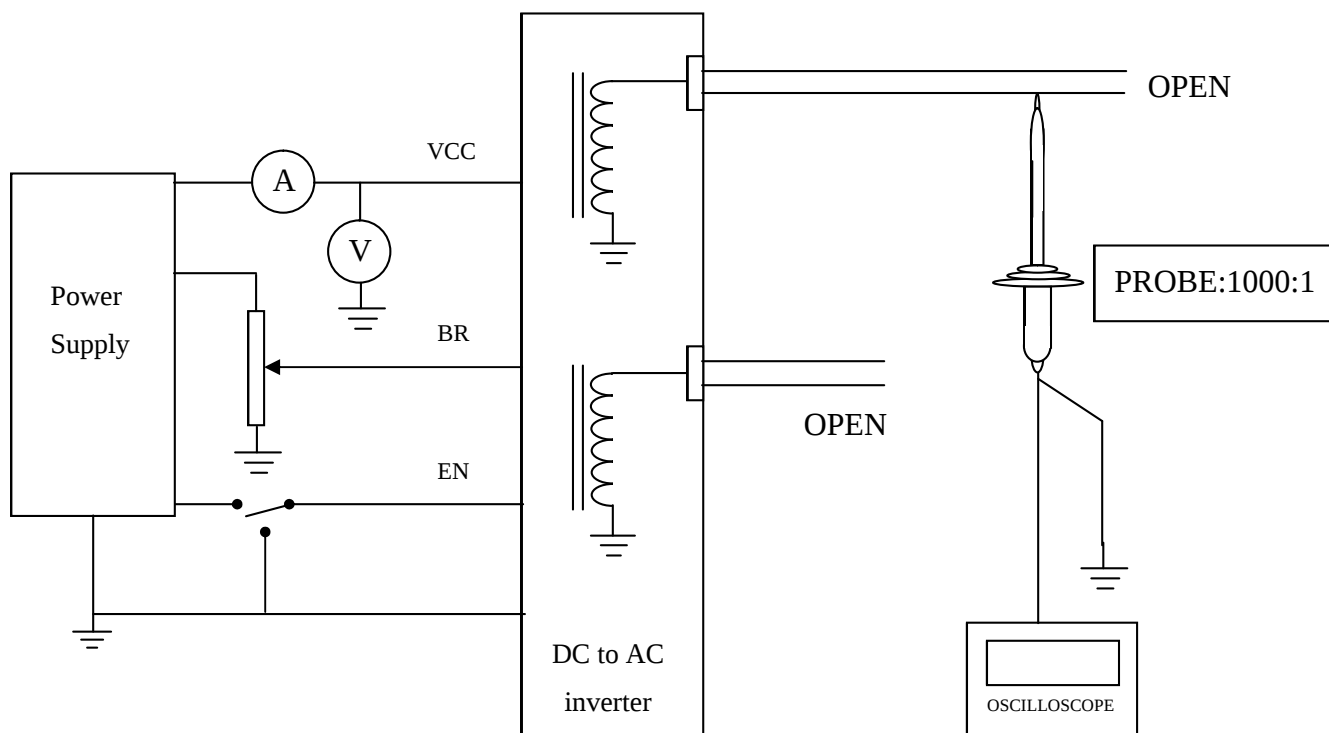
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYPE	MAX	UNIT
Output Current (Each connector)	Iout	Vin=12V Von=5V Vbr=0V RL=80K	6.3	7.0	7.5	mA
	Iout	Vin=12V Von=5V Vbr=5V RL=80K	2.4	3.0	3.6	mA
Output Voltage	Vout	Vin=12V Von=5V Vbr=0V		640		Vrms
Open Lamp Voltage	Vig1	Vin=12V Von=5V Vbr=0V 25°C (NO LOAD)	---	1450	---	Vrms
	Vig2	Vin=12V Von=5V Vbr=0V -5°C (NO LOAD)	---	1780	---	Vrms
Striking time	Tscp	Vin=12V Von=5V Vbr=0V (NO LOAD)	---	0.5	---	Sec
Backlight on/off Control	Von	Normal Operation	2.5	---	5.0	V
	Voff	Shutdown	0	---	1.2	V
Frequency	Fpwm	Vin=12V Von=5V Vbr=0V	40	50	70	KHZ
Efficiency	η	Vin=12V Von=5V Vbr=0V	---	80	---	%

10. PIN ASSIGNMENTS

INPUT:CN1	MODEL:	JH2-20-0548	Supplier	
PIN	SYMBOL	DESCRIPTION	VOLTAGE	
1,2	Vin	Supply voltage	10.8---13.2V	
3	Von/off	Standby/operation	On=5V Off=0V	
4	Vbrit	Dimming control	0V=Max;5V=Min	
5,6	GND			
OUTPUT:CN2-CN5.	MODEL		Supplier	JST
PIN	SYMBOL	DESCRIPTION	VOLTAGE	
1	H-V	High voltage	VOUT	
2	L-V	Low voltage	Gnd	

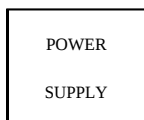
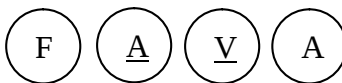
11. Test Circuit Diagram

11.1 NO LOAD (OPEN LAMP) VOLTAGE-----V OPEN

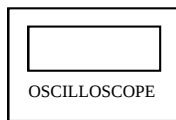


测 试 仪 表

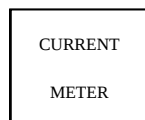
MEASUREMENT EQUIPMENT



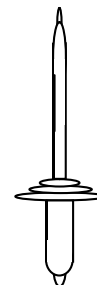
WYK-305B



TDS 3012B

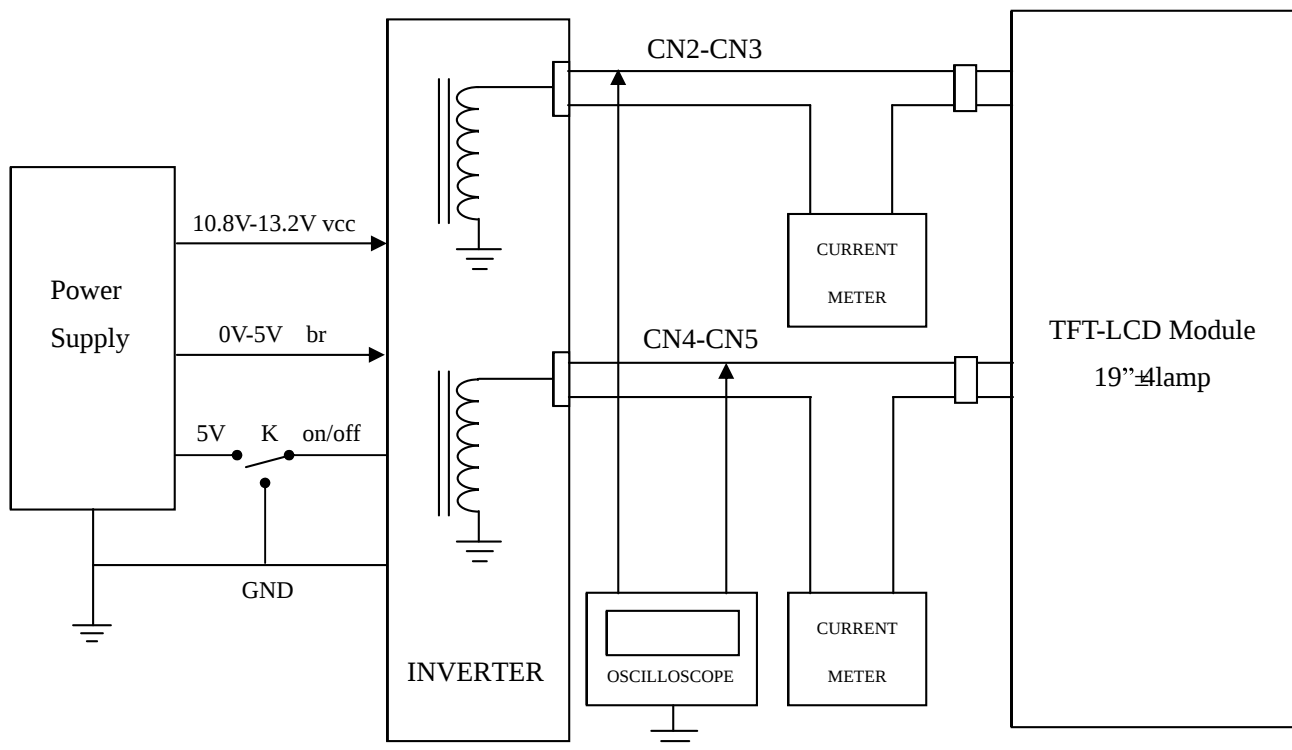


FLUKE 45



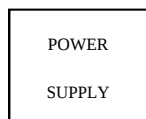
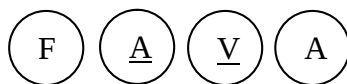
Agilent:N2771A

11.2: Test Circuit Diagram (ON LOAD)

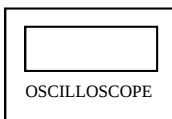


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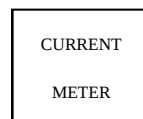
MEASUREMENT EQUIPMENT



WYK-305B

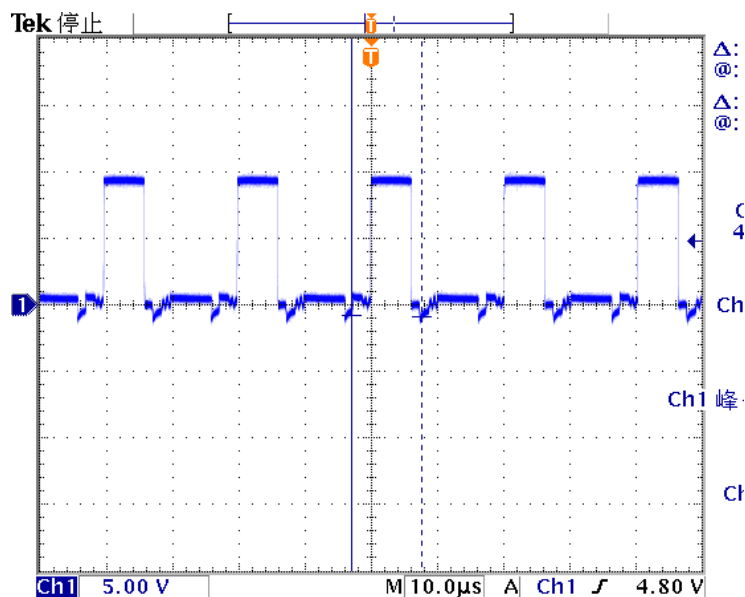


TDS 3012B

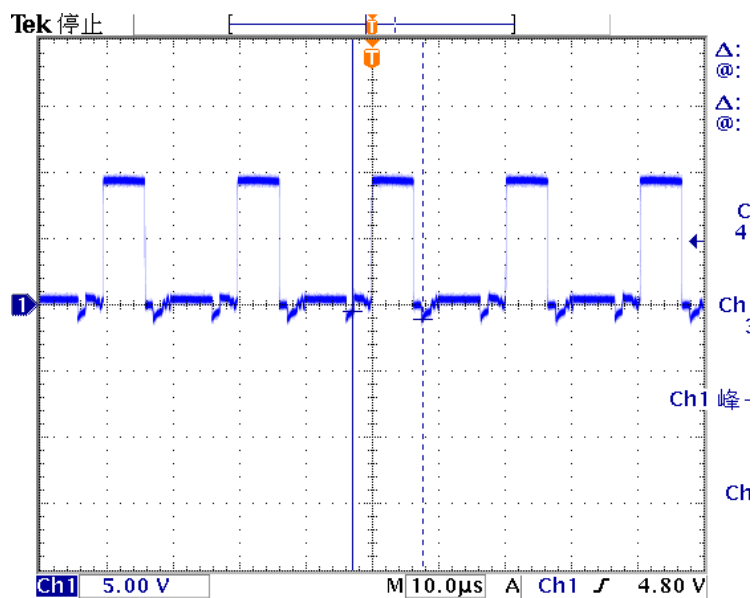


FLUKE 45

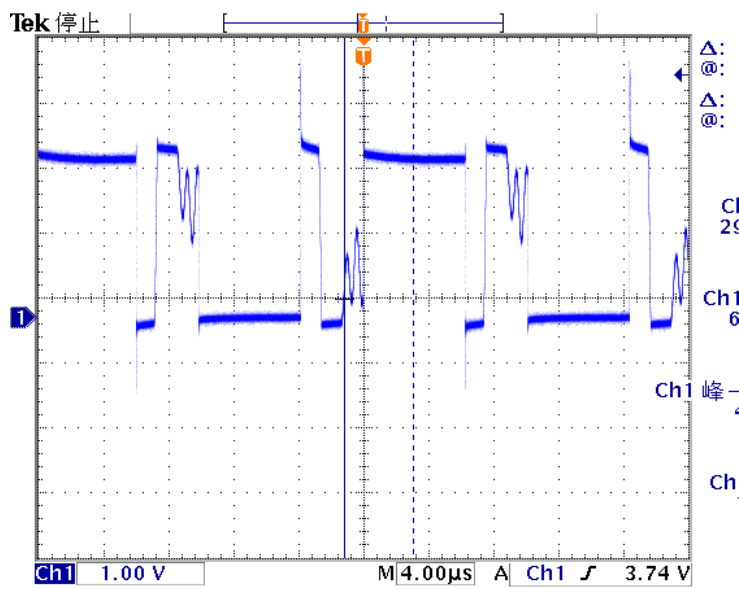
12. MOSFET APM9945 PIN2 WAVEFORM:



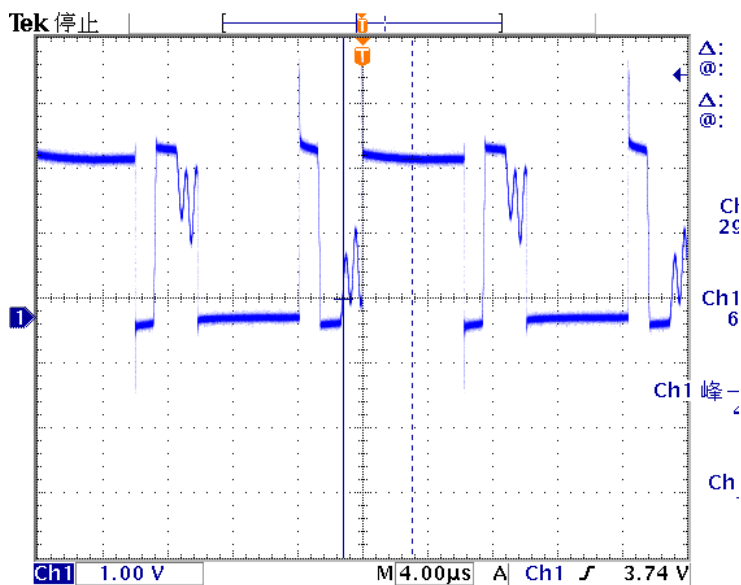
13. MOSFET APM9945 PIN4 WAVEFORM:



14. TRANSFORMER PIN1 WAVEFORM:

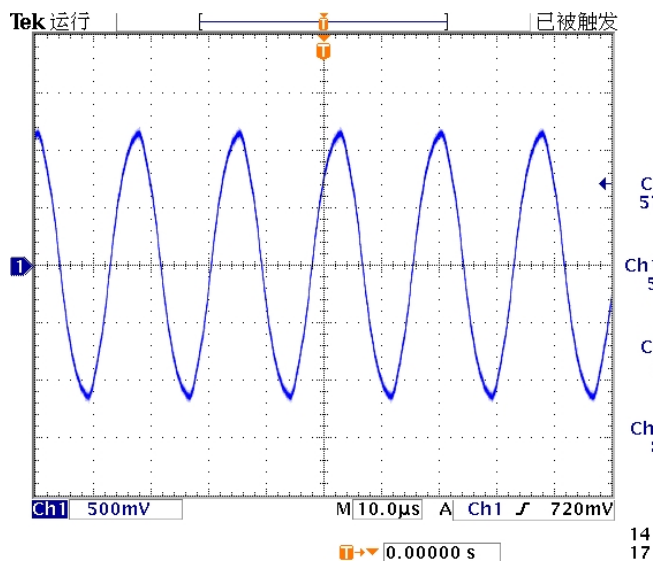


15. TRANSFORMER PIN6 WAVEFORM:

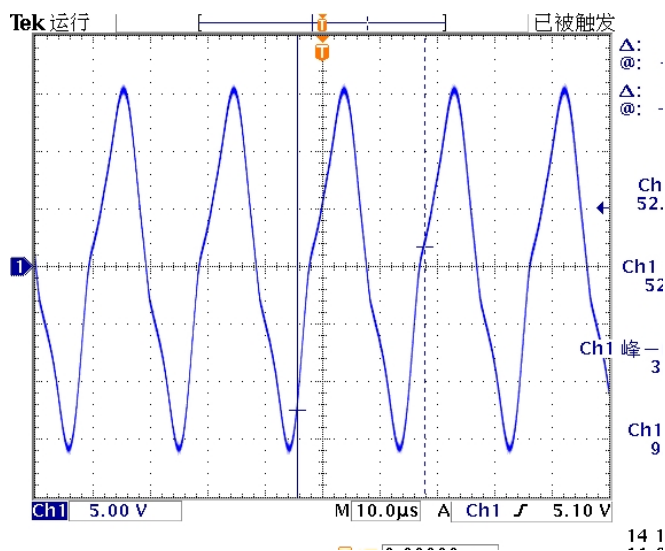


16. OUTPUT VOLTAGE

16.1 WAVEFORM(at 7.0mA):



16.1 WAVEFORM(at 3.0mA):



17. TEMPERATURE TEST REPORT (UNIT: °C) :

环境温度: 27°C

序号	1	2	3	4	5	6	7	8	9	10
被测点	T1	T2	Q1	Q2						
温度	52.2	52.6	51.3	51.1						
温升	25.2	25.6	24.3	24.1						

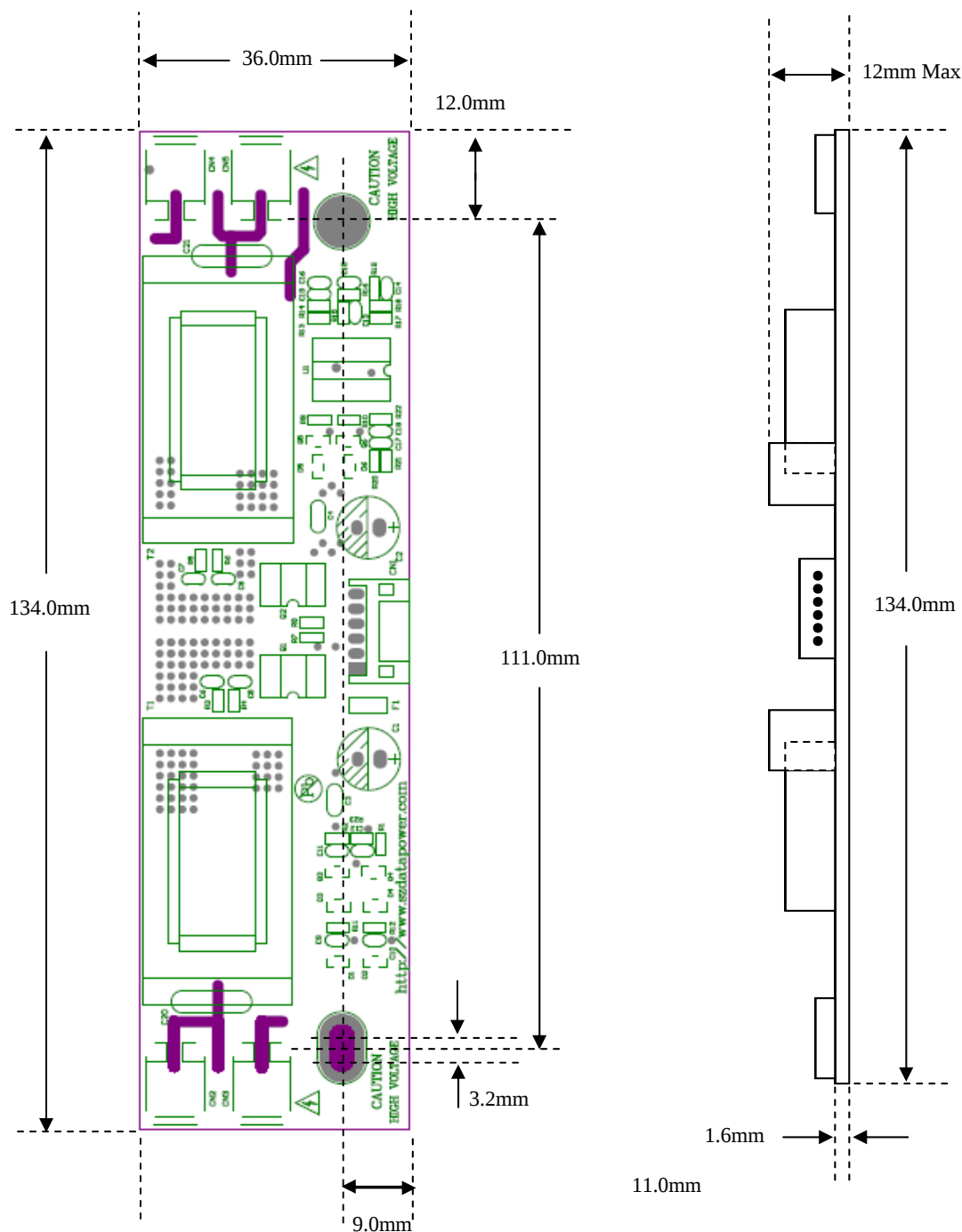
备注: 温度测试用则温箱在最大亮度时进行, 所列温度均为稳定值, 测试仪器用 INFRARED THERMOMETER AZ8866 温度测试仪。

18. QUALITY ASSURANCE TEST

TEST RECORD FOR SAMPLES								
INVERTER TEST DATA		TEST INSTRUMENT	WYK-305B2 / TDS3012B FLUKE45					
TYPE	DATA-04-19017AH		TEST DATA					
TEST ITEM	TEST CONDITIONS	SURROUNDING TEMPERATURE	SAMPLE 1					
			CN2	CN3	CN4	CN5		
INPUT CURRENT I _{in} (A)	V _{in} =12V	-5 ⁰ C	1.79					
	ON/OFF=5V	26 ⁰ C	1.78					
	V _{brit} =0V	50 ⁰ C	1.78					
OUTPUT VOLTAGE V _o (V _{rms})	V _{in} =12	-5 ⁰ C	565	567	564	563		
	ON/OFF=5V	26 ⁰ C	565	565	568	562		
	V _{brit} =0V	50 ⁰ C	560	560	560	560		
OUTPUT CURRENT I _o (mA)	V _{in} =12	-5 ⁰ C	6.95	7.03	6.92	6.94		
	ON/OFF=5V	26 ⁰ C	6.97	7.05	6.94	6.96		
	V _{brit} =0V	50 ⁰ C	6.93	7.01	6.90	6.92		
OUTPUT CURRENT I _o (mA)	V _{in} =12	-5 ⁰ C	3.03	3.01	3.07	3.05		
	ON/OFF=5V	26 ⁰ C	3.08	3.03	3.10	3.08		
	V _{brit} =5V	50 ⁰ C	3.11	3.08	3.12	3.13		
OUTPUT FREQUENCY f _L (KHZ)	V _{in} =12	-5 ⁰ C	48.7	48.7	48.7	48.7		
	ON/OFF=5V	26 ⁰ C	48.7	48.7	48.7	48.7		
	V _{brit} =0V	50 ⁰ C	48.7	48.7	48.7	48.7		
Backlight on/off connector (v)	Normal Operation	v _{on}	2.5		-----		5.0	
	shutdown	v _{off}	0		-----		1.2	
Striking time	V _{in} =12, V _{brit} =0V	T _{scp} (sec)	1		1.2		2	
Current Balancing	Normal Operation	H0.2mA				Risistive load		mA
Open lamp protection		latched						
Short lamp protedtion		latched						

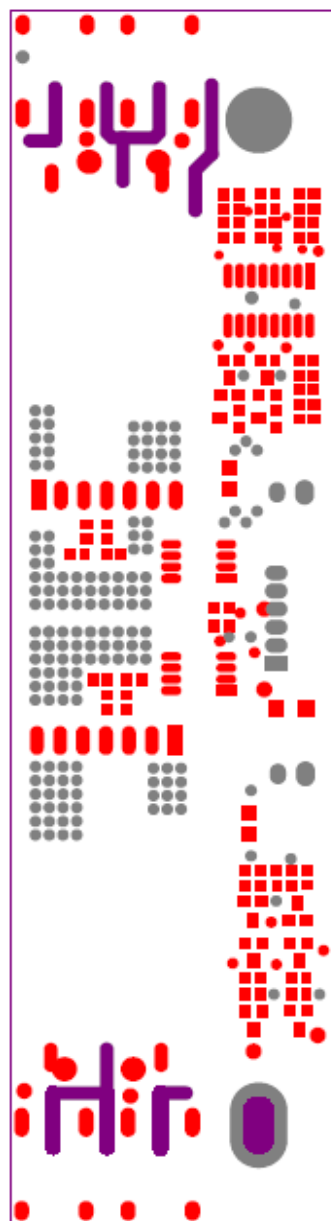
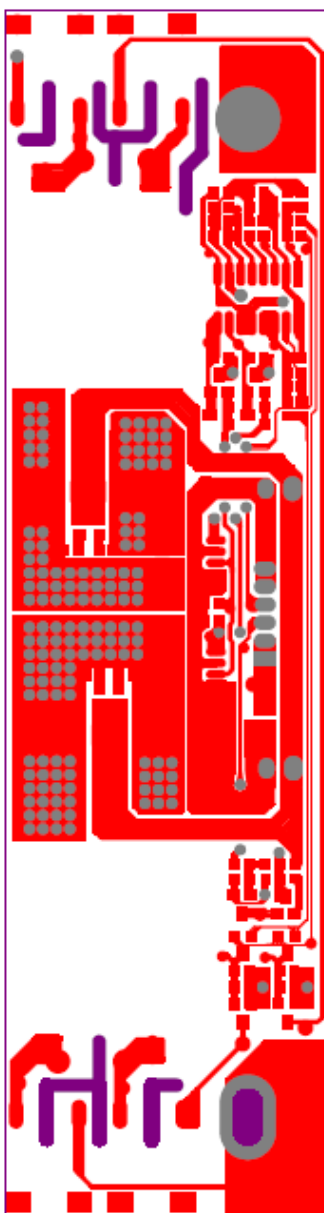
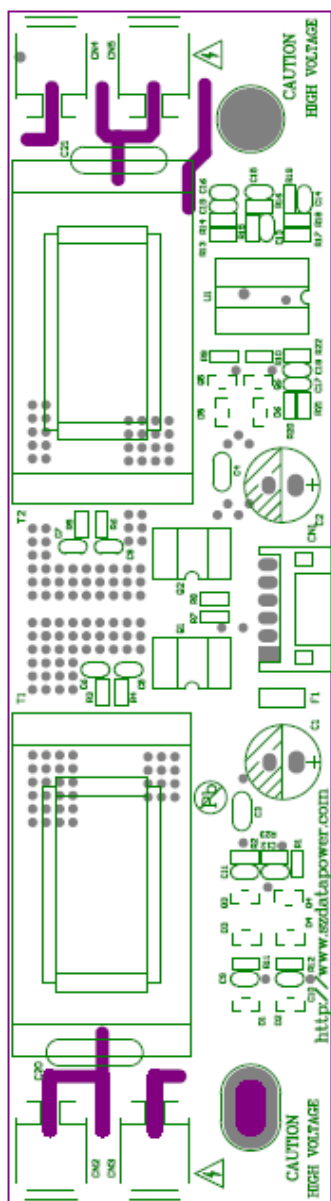
1. RL=80kΩ
2. After running 30min Test Output Current

19. MECHANICAL DRAWINGS

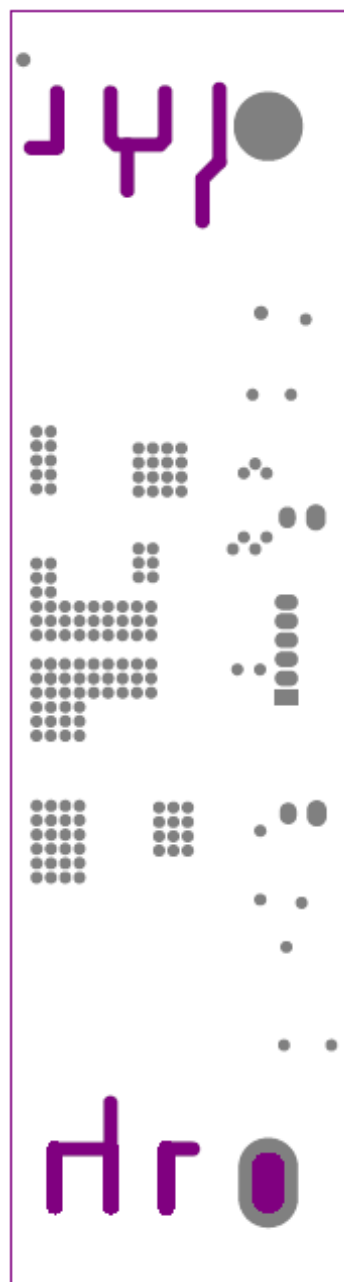
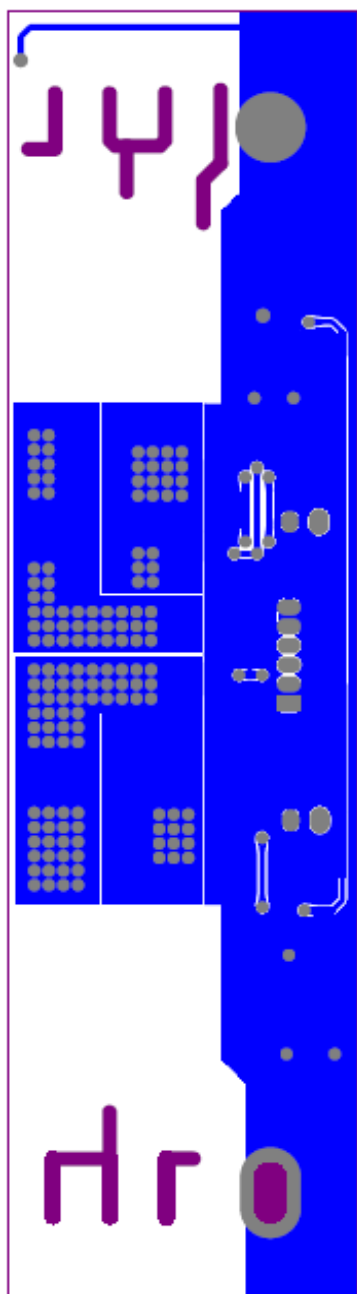


20. PWB LAYOUT DIAGRAM

20.1 : TOP View



20.2 : Bottom View



21.SPARE PARTS

ITEM	COMP,N O	PARTS	TYPE	Color/Mark		MANUFACTURER
1	U1	PWM IC	DP8600	DP8600		DATA-POWER ELECTRONICS CO.Ltd
2	Q1,Q2	MOSFET	ME4946	ME4946		
3	C1,C2	Capacitance	220uF/25v Φ8x9	Orange	CapXon	CAPXON ELECTRONIC INDUSTRIAL COL,LTD
				Brown	SAMXON	MAN YUE ELECTRONICS COMPANY LIMITED
4	D1-D4	DIODE	FHD226	C3+Code		FENGHUA ADVANCED TECHNOLOGY CO.,LTD
			BAV99	A7		HEAD ELECTRONIC TECHNOLOGY CO.,LTD
5	Q5,Q6	Transistors	FSH3906	2A+ Code		FENGHUA ADVANCED TECHNOLOGY CO.,LTD
			MMBT3906L	2A		Chang Jiang Electronics Technology Co., Ltd
6	C20,C21	HV. Capacitor	5pF/3kv	N5 3KV SEC		SUCCESS ELECTRONICS CO., LTD.
				5J 3KV		JUSUN(TAISHAN) ELECTRONICS LTD.
7	F1	FUSE	5A/32V	White	M	AEM Components LTD
				Green	S	Sart Tech Develop CO.,LTD
8	CN1	Connector	KJ-2001WR-6P	6Pin/2.0mm		FULLCONN ELECTRONOC TECHNOLOGY CO.,LTD
						LANDWIN ELECTRONIC CORP.
9	CN2-CN5	Connector	WO1-06100-022 N			FULLCONN ELECTRONOC TECHNOLOGY CO.,LTD
						LANDWIN ELECTRONIC CORP.
10	T1,T2	Transfomer	EEL19-013H	EEL19-013H		ShenZhen DataPower Electronics Co.,Ltd
				EEL19-013H ST-A		ShenZhen Stong Electronics Co.,Ltd
11	SMT Resistor	Resistor	0603/0805 1206			YAGAO CORPORATION ..
12	SMT Capacitor	Capacitor	0603/0805 1206			YAGAO CORPORATION ..
13	PCB	PCB	DP-04-19017 Rev1.1.2H	DP-04-19017 Rev1.1.2H		SHENZHEN SUN KINGFORD PCB.CO.LTD
						SHENZHEN HUAYANUIHAI ELECTRONIC CO., LTD

22. SAFETY PART LISTED :

ITEM	DESCRIPTION		MATERIAL	TYPE	MANUFACTURER	SAFETY NO
1	PCB	DP-04-19017	FR-4/94V-0	401	CHERITH INDUSTRIAL	E228256
				M	LONG JIANG INDUSTRY CO. LTD	E300052
			FR-4/94V-0	J-2	GRANDWORKELECTRONICS CO.LTD	E246366
			FR-4/94V-0	F-M	VICTORY ELECTRTONIC TECHNOLOGY CO LTD	E254215
				KF-4M	KINGFORD ELECTRONICS CO LTD	E162585
				J-2	PACIFIC WIN INDUSTRIAL LTD	E228070
				JY-1	SHENZHEN GOLDORINING CO. LTD	E256237
2	Bobbin	Transformers	L.C.P	E4008	Sumitomo Chemical	E54705
3	Copper Wire	Transformers	UEW	\$ 0.4	Pacflc electrhc wire&cable	E201757
					HOI LUEN ELECTRICAL MFR CO LTD	E164409
4	Copper Wire	Transformers	UEW-F	\$ 0.04	FUJI FINE CO LTD	E81427
					Dalian fuje finf	E193774
5	Tape	Transformers	Tesa 4428	17.5mm	Intertape polymer GROUP	E20780
			PZ	5mm	JingJiang PRESSURE SENSITIVE GLUE FTY	E165111
6	Mylar	Mylar Film	SH71S		SKC CO LTD	E74359
7	Connecter	W01-06100-022N	PA9T/ E90350	G2330-9	FULLCONN INDUSTRY	E204211
		CQ-3502P0240T-1	NY-9T-V0/ CH230N	3.5mm	LAND WIN ELECTRONIC CORP	E159426
8	Connecter	KJ-2001WR-6P	PA6T/ E52579	CH230W	FULLCONN INDUSTRY	E204211
		CQ20030600T	NY-9T-V0/ CH230N		LAND WIN ELECTRONIC CORP	E159426
9	Fuse	0433 005		1206 SIZE	LITTELFUSE INC	E10480
		F1206HI5000V032T			AEM INC	E232989
		S1206 5A			SART ENTERPRISE (HK) LTD	E245449

23. SAFETY CLEARANCE

Safety clearance should be more than 2mm / 2KV.T

24.FAULT CONDITION TEST

Damage to the inverter must not occur such as fire, smoke, break, and molten metal in equipment.

25.IMPORTMANT

Do not attach a conducting tape to lamp connecting wire, if the lamp wire attach to conductive tape, TFT-LCD module have a low luminance and the inverter has abnormal action because leakage current occurs between lamp wire and conducting tape.

If the display arrangement is less friendly such as the asymmetrical wiring forces unequal losses and the lamps receive imbalanced current. Even with identical lamps, illumination may not be balance.

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