

Power Supply Service Manual

PART NO. : 168P-L3L027- K0

DESCRIPTION : _____

VERSION NO. : 1.0

PAGE : 11

DESCRIBED : Wu Zhifeng

CHECKED : Hu Xiangfeng

APPROVED : Bao Xiaojie

Released Date: 2014-10-20

Modification record

Edition	Modification date	Record	Described	Checked	Approved
1.0	2014-10-20	First record	Wu Zhifeng	Hu Xiangfeng	Bao Xiaojie

Contents

NO.	Main contents	Page
1	General Description	1
2	General Introduction of Circuit	2
3	The main chip description	3
4	PCB TopOverlay or BottomOverlay	6
5	Maintenance instructions	7
6	The information of power supply designer	9
7	Schematic diagram	10

Warning

This manual is only used for the experienced service person , and does not apply to the general consumer. The manual does not have warning or alert for the potential hazards caused of the non-technical personnel attempting to repair this product . Electrical products should be an experienced professional and technical personnel for maintenance and repair ,any other person attempts to maintain and repair the products covered by this manual will likely be seriously hurt or even life-threatening.

1. General Description

1.1 General description of power supply

This power supply is suitable for 32" LED TV. For 32" LED panel, supplies 4 channels, each channel nominal current value is 90mA; for 32" mainboard, only supplies +12V power, rated current value +12V/2.5A.

1.2 Main technical specifications

1.2.1 Input Electrical Characteristics

Input Voltage Range	90Vac to 264Vac
Normal Voltage Range	100Vac to 240Vac
Max Input AC Current	2.0Amax at 90VAC input & full load condition
Efficiency(full load)	80%min @ 115Vac,Full Load
Frequency Range	50Hz/60Hz \pm 5%
Inrush Current (cold start)	30Atyp peak, 120Vac; 50Atyp peak, 220Vac
Harmonic Current	Meet GB17625.1-1998/IEC61000-3-2 class D
Power Factor(full load)	NO PFC
Leakage Current	Less Than 0.75mA, 230Vac input
Input Fuse	T3.15A L/250Vac
Standby Power Loss	\leq 0.5W, 240Vac input,+12V/16mA Load

1.2.2 Output Electrical Characteristics

Output Voltage	Regulation	Min. current	Rated current	Peak current
+12V	\pm 5%	0.1A	2.5A	2.8A
+28V	\pm 10%	0.1A	1.18A	1.22A

Note:* pulse width within 100ms .

1.2.3 Output ripple and noise

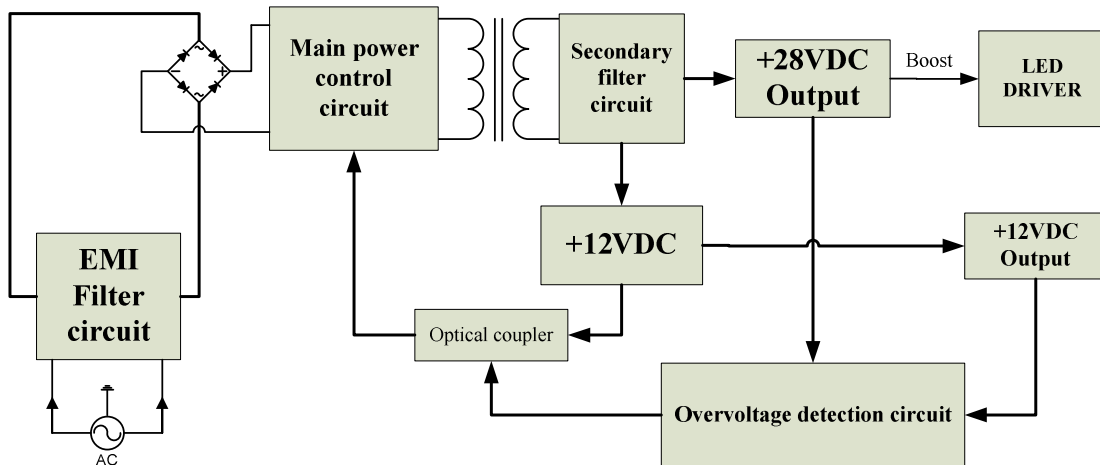
Output Voltage	Ripple & Noise (Max.)
+12V	120mVp-p@25°C; 200mVp-p@-10°C
+28V	280mVp-p@25°C; 200mVp-p@-10°C

Note: 1) Measurements shall be made with an oscilloscope with 20MHz bandwidth.

2) Outputs shall be bypassed at the connector with a 0.1uF ceramic capacitor and a 10uF electrolytic capacitor to simulate system loading.

2. Circuit description

2.1 The power circuit diagram



2.2 Each part of the circuit description

2.2.1 the main part of the circuit: TEA1733T

Features

- SMPS controller IC enabling low-cost applications
- Large input voltage range (12 V to 30 V)
- Very low supply current during start-up and restart (typically 10 μ A)
- Low supply current during normal operation (typically 0.5 mA without load)
- Overpower or high/low line compensation
- Adjustable overpower time-out
- Adjustable overpower restart timer
- Fixed switching frequency with frequency jitter to reduce EMI
- Frequency reduction with fixed minimum peak current to maintain high-efficiency at low output power levels
- Slope compensation for CCM operation

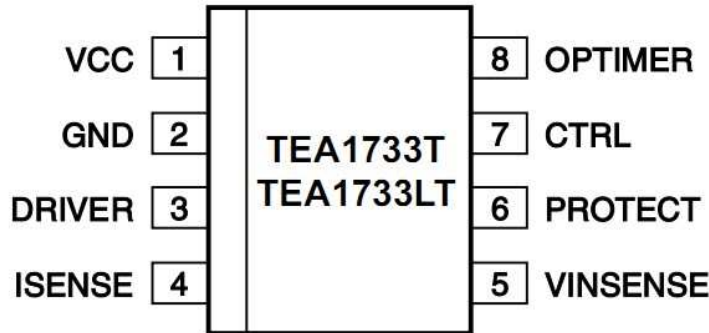
3. The main chip description

3.1 The main chip

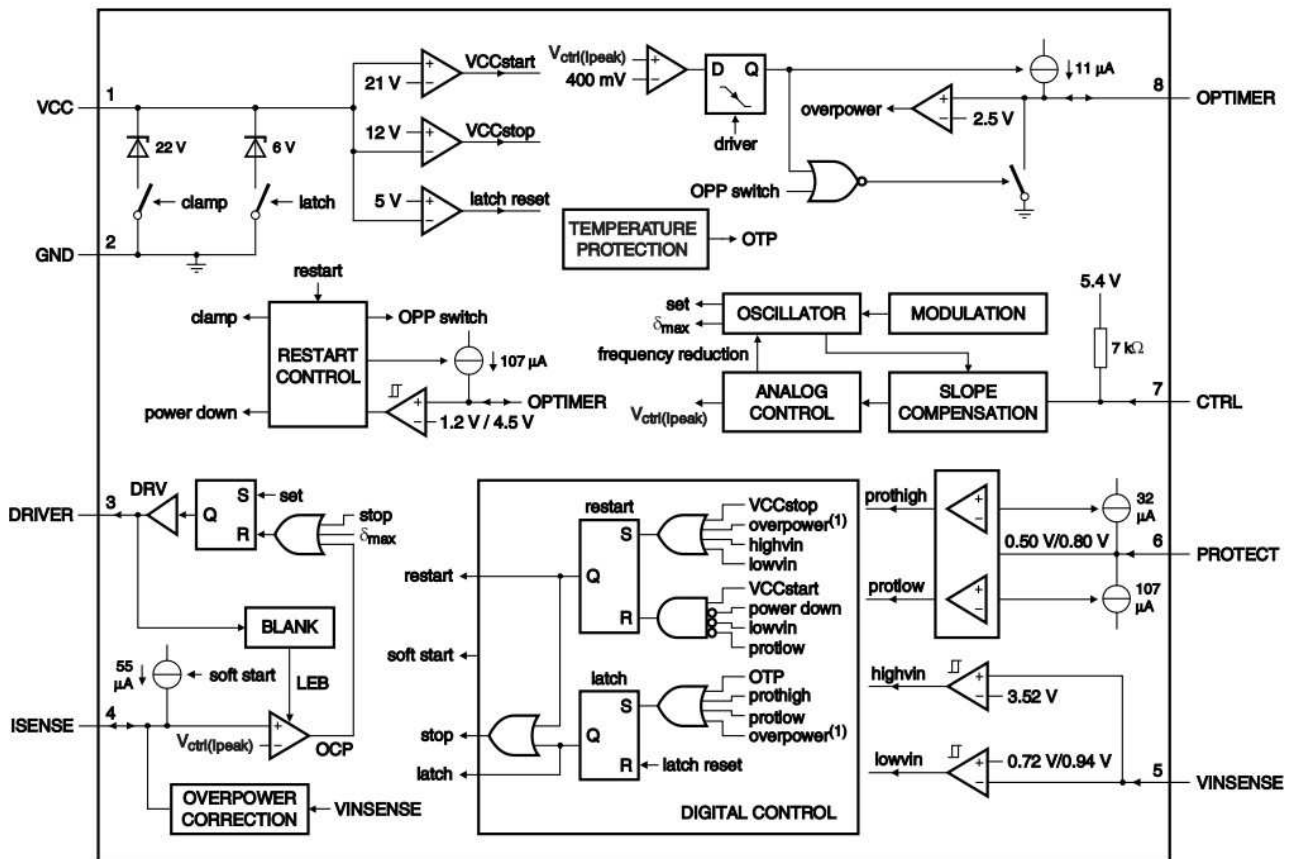
3.1.1 The main chip general description

The main chip of power supply is the TEA1733T which is produced by NXP corporation. The operating mode is CCM (continuous conduction mode), and the operating frequency is 65KHz.

3.1.2 The chip pin information



3.1.3 The chip block diagram



3.1.4 The IC pin description

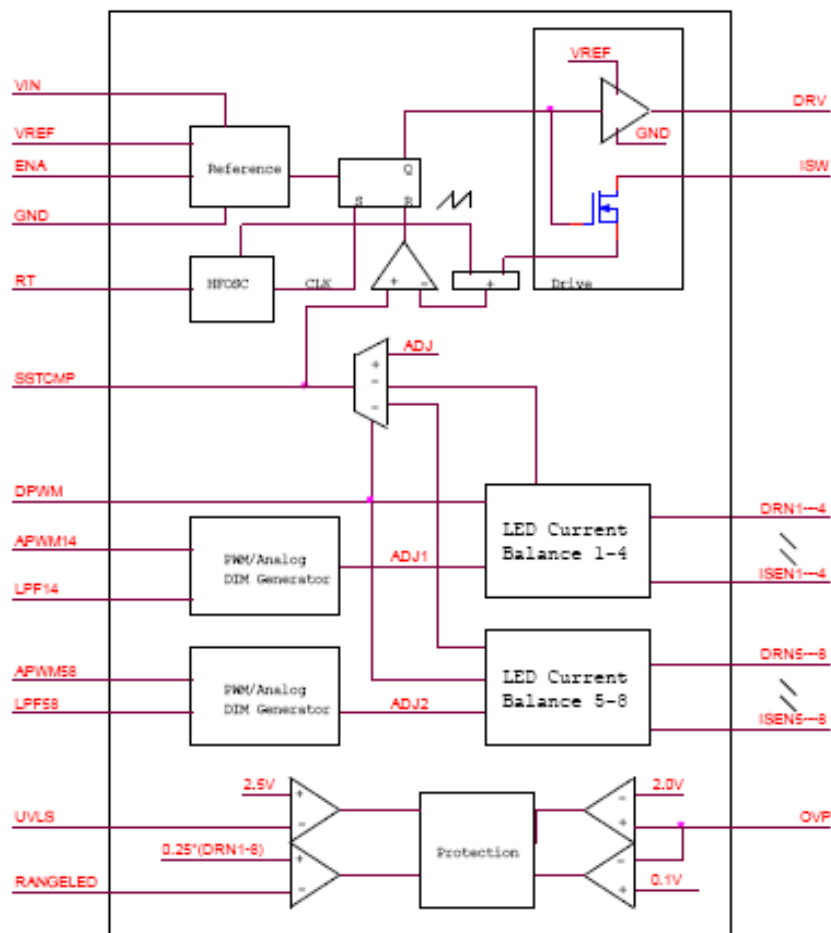
Symbol	Pin	Description
VCC	1	supply voltage
GND	2	ground
DRIVER	3	gate driver output
ISENSE	4	current sense input
VINSENSE	5	input voltage protection input
PROTECT	6	general purpose protection input
CTRL	7	control input
OPTIMER	8	overpower and restart timer

3.2 The LED driver chip

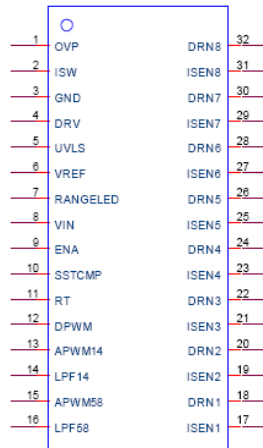
3.2.1 General description

The chip using OZ568GN, is a highly integrated and high performance LED driver that optimized for LCD backlight application.

3.2.2 The chip block diagram



3.2.3 The chip pin information

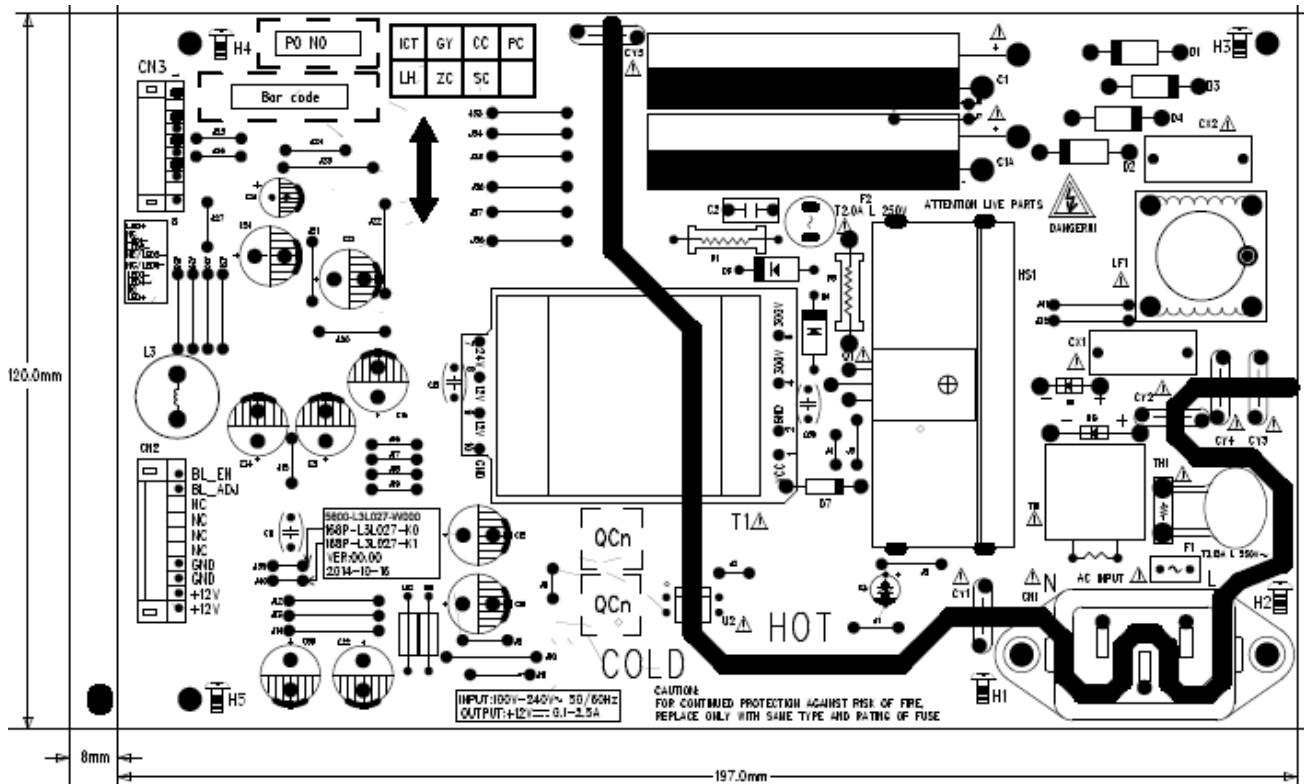


3.2.4 The pin description

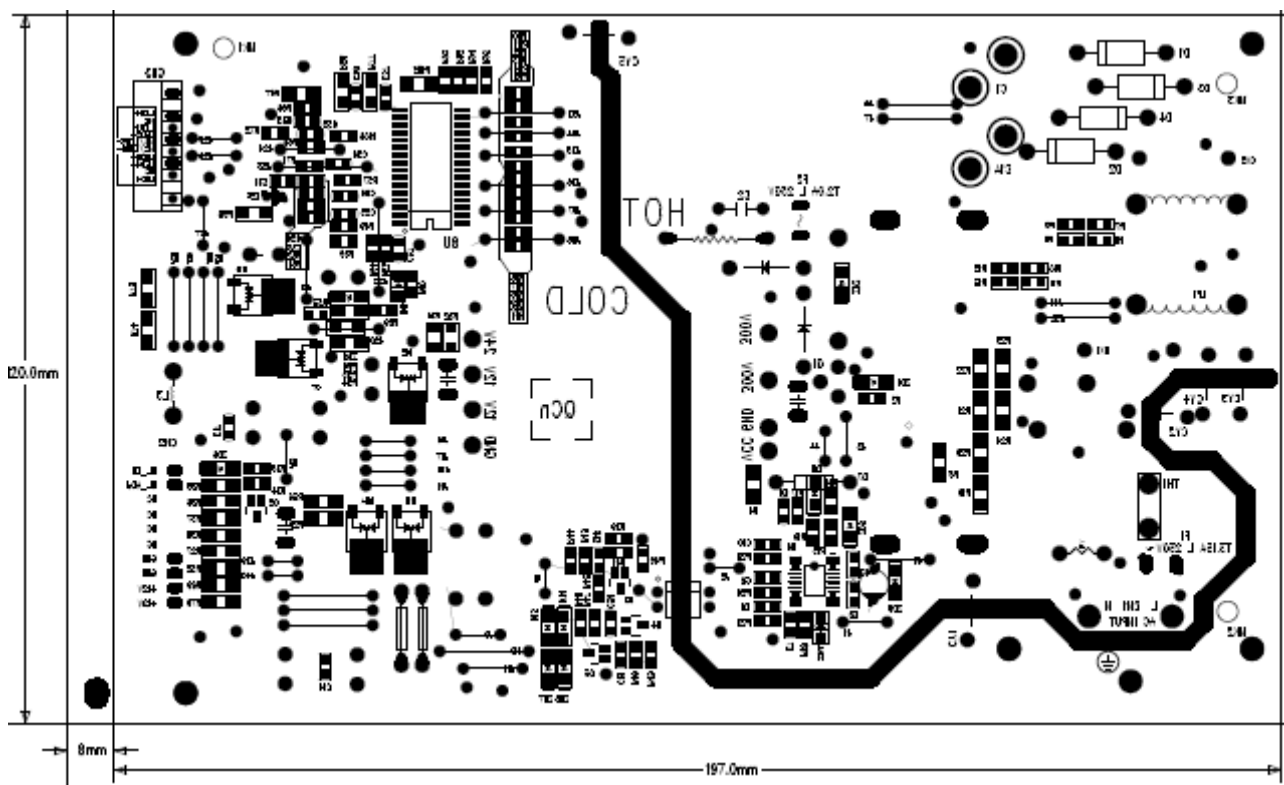
Names	I/O ¹	Pin No		Description
		QFN	SOP	
UVLS	I	1	5	Power supply under voltage lock out detection
VREF	I/O	2	6	6V Regulator Output
RANGELED	I	3	7	LED short circuit protection threshold setting pin
VIN	---	4	8	IC Power Supply
ENA	I	5	9	ON/OFF Control
SSTCMP	I/O	6	10	Soft Start and Control Loop Compensation
RT	I/O	7	11	Resistor to set operating frequency for Boost converter
DPWM	I	8	12	Direct PWM control signal input
APWM14	I	9	13	PWM signal Input for analog dimming control of LED current regulation for channels 1-4
LPF14	I/O	10	14	Low pass filter capacitor for APWM14-to-analog Integrator
APWM58	I	11	15	PWM signal Input for analog dimming control of LED current regulation for channels 5-8
LPF58	I/O	12	16	Low pass filter capacitor for APWM58-to-analog Integrator
ISEN1	I/O	13	17	LED current sense for control channel 1
DRN1	I/O	14	18	LED current return of control channel 1
ISEN2	I/O	15	19	LED current sense for control channel 2
DRN2	I/O	16	20	LED current return of control channel 2
ISEN3	I/O	17	21	LED current sense for control channel 3
DRN3	I/O	18	22	LED current return of control channel 3
ISEN4	I/O	19	23	LED current sense for control channel 4
DRN4	I/O	20	24	LED current return of control channel 4
ISEN5	I/O	21	25	LED current sense for control channel 5
DRN5	I/O	22	26	LED current return of control channel 5
ISEN6	I/O	23	27	LED current sense for control channel 6
DRN6	I/O	24	28	LED current return of control channel 6
ISEN7	I/O	25	29	LED current sense for control channel 7
DRN7	I/O	26	30	LED current return of control channel 7
ISEN8	I/O	27	31	LED current sense for control channel 8
DRN8	I/O	28	32	LED current return of control channel 8
OVP	I	29	1	Over-Voltage Protection Sense Input
ISW	I	30	2	Power MOSFET Current Sense
GND	---	31	3	GND of IC
DRV	O	32	4	Power MOSFET Driver Output
PAD	---	33	N/A	Bottom pad of QFN package. It is recommended to be connected to GND.

4. PCB TopOverlay and BottomOverlay

4.1 The power supply TopOverlay



4.2 The power supply BottomOverlay



5. Maintenance instructions

5.1 Common Fault Analysis and Notes

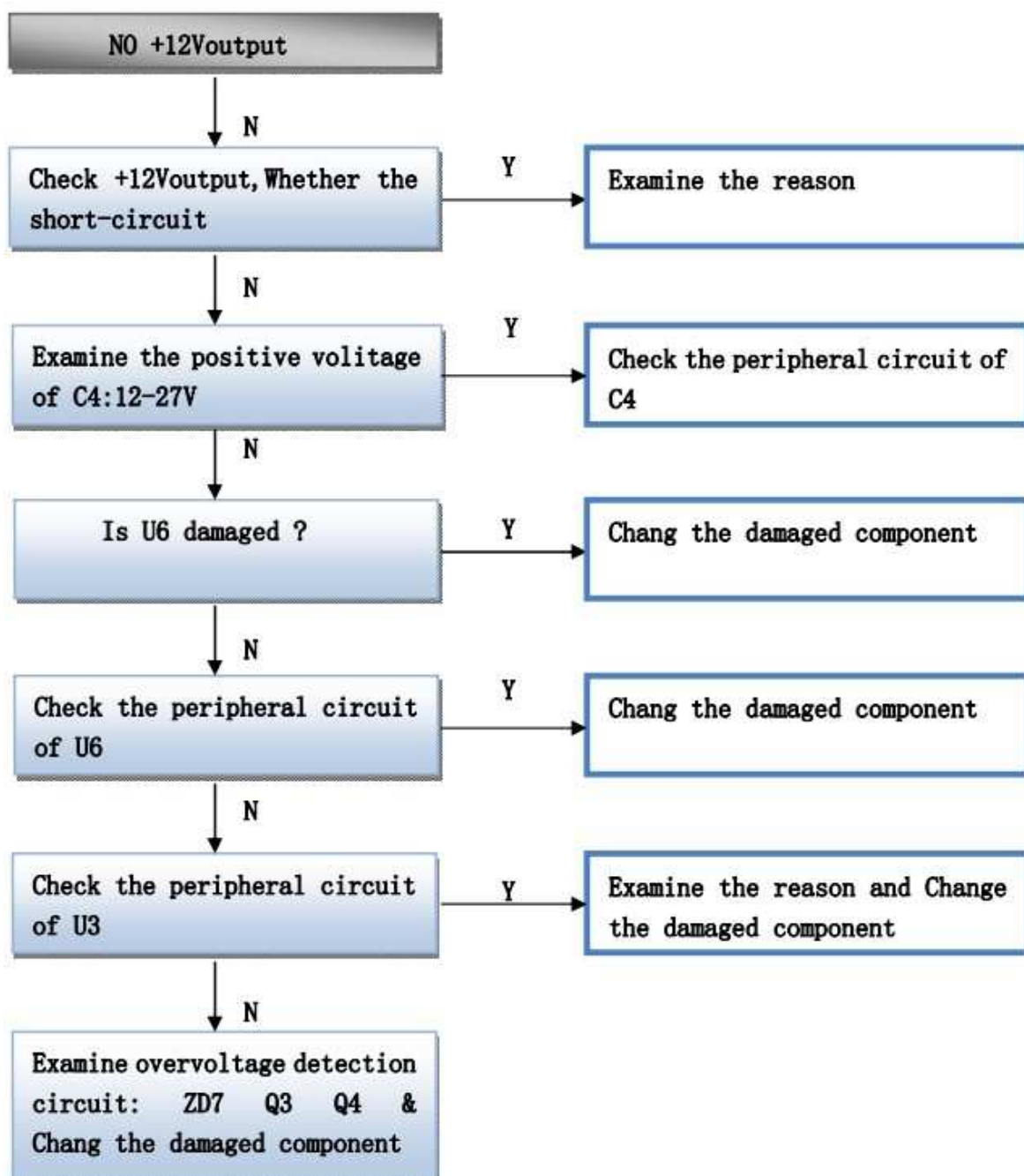
1. No +12V output voltage

If there is no +12V output voltage, we should focus on checking the main chip (U6) and judge whether the IC is operating. Monitor its VIN pin and check voltage is normal or abnormal. If it is normal, firstly, check the main chip peripheral circuit. Secondly, check main chip and judge it has broken or not.

2. +12V output is abnormal

Check the +12V feedback loop, and the reference voltage of the U3 is normal or not.

5.2 Service process



5.3 Port and the connection defined

5.3.1 PIN10 CN2 Connection And Function

N0.	Pin Connection	Function
1	BL_EN	BL_ON/OFF
2	BL_ADJ	BL_PWM
3	NC	NC
4	NC	NC
5	NC	NC
6	NC	NC
7	GND	GND
8	GND	GND
9	+12V	+12V DC OUTPUT
10	+12V	+12V DC OUTPUT

Note: CN2 TYPE : 2.5mm

5.3.2 PIN10 CN3 Connection And Function

N0.	Pin Connection	Function
1	LED+	LED+ OUTPUT
2	NC	NC
3	LED1-	LED- INPUT
4	LED2-	LED- INPUT
5	NC	NC
6	NC	NC
7	LED3-	LED- INPUT
8	LED4-	LED- INPUT
9	NC	NC
10	LED+	LED+ OUTPUT

Note: CN3 TYPE : 2.0mm

5.4 Key components and service parts list

NO.	Material number	Material models	Position number	Function	Substitute Material	Remark
1	4706-T17330-0080	TEA1733T	U6	Main chip		
2	476K-Z568G0-0320	OZ568GN	U8	LED driver chip		
3	4655-P27610-00	AOTF10N65	Q1	Main MOS		
4	451S-210100-0S20	LV10T100D	D11 D11A	Secondary Schottky		
5	451S-210200-0S10	MBRD10200CT	D12	Secondary Schottky		
6	5132-06EQ33-0020	SANHE-35-261	T1	transformer		

5.5 Storage, transportation and using conditions

5.5.1 Package

Box must have the product name, model, identification, quality inspection department certification, the date of manufacture and so on.

5.5.2 Transportation

The product adapted to cars, boats, aircraft transport .Transportation should be covered, prevented sunshine and loading lightly.

5.5.3 Storage

Products should be stored in a box if it is not used .The storehouse environment temperature is from -40 °C to -55 °C, related humidity is from 10% to -95%. The storehouse must not allow any harmful gases, flammable ,explosive and corrosive product chemicals, and must not allow strong mechanical vibration, shock and strong magnetic field. Boxes should be at least 20cm high from the ground .The distance from the wall, heat source, windows or air enter is at least 50cm. The storage period is about two years, more than two years should be re-tested under the regulation .

6.Information of Power supply designers

Team II Power Supply,R&D Center

Hu Xiangfeng and Wu Zhifeng

Email: huxiangfeng@skyworth.com
wuzhifeng@skyworth.com

