

MD1801 DEMO BOARD TEST REPORT

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Power supply specification

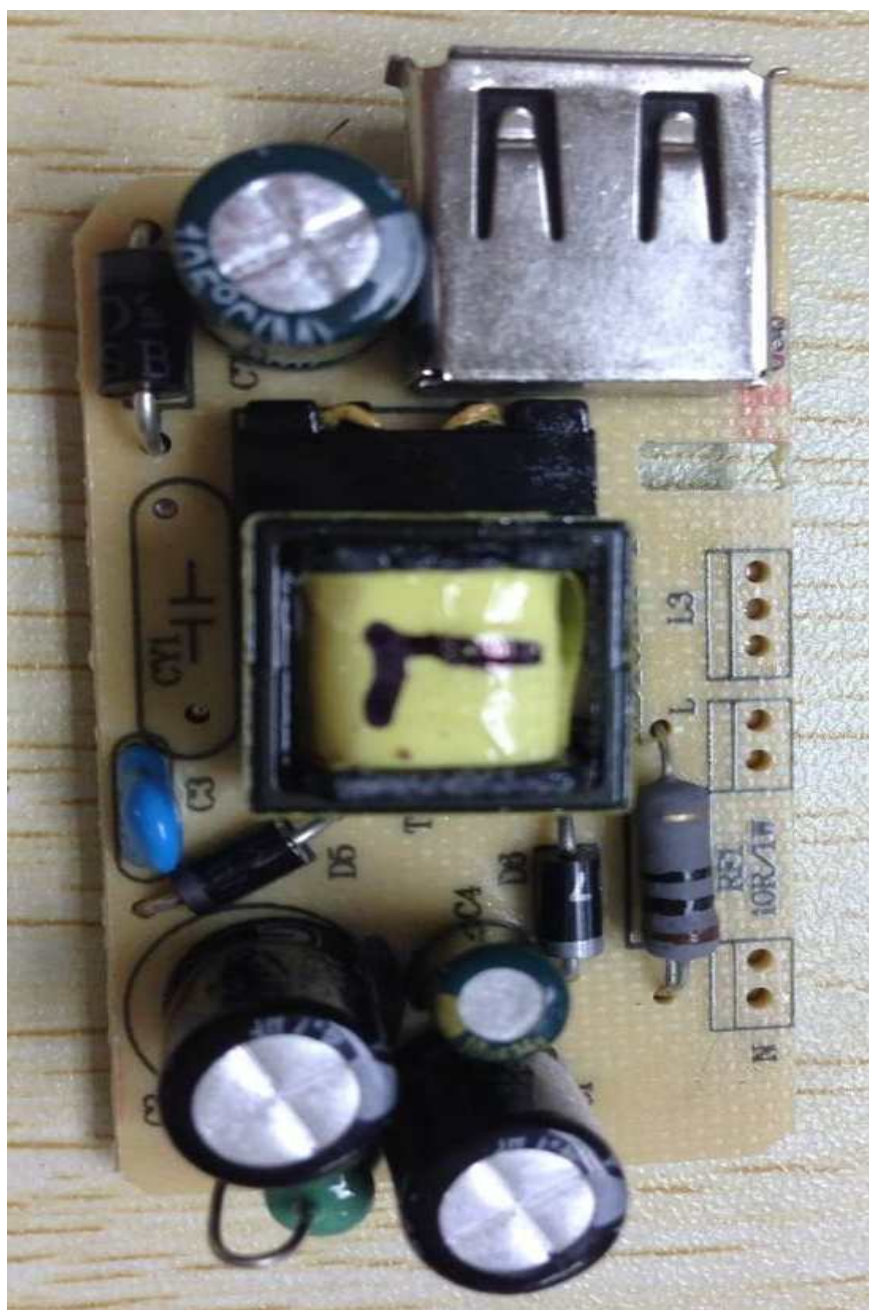
Description	Symbol	Min	Typ	Max	Units	Comment/Condition
Input						
Voltage	V_{in}	90		264	V	2 Wire(L,N)-NO PE
Frequency	F	63		47	Hz	
Standby power				<100	mW	Open Load
Output						
Rating Output Voltage	V_{out}	4.75	5	5.25	V	
Rating load	I_{out}		1		A	
Output Ripple&Noise				<200	mV	See Test Detail
Dynamic load		4.5		5.5	V	See Test Detail
Protection Function Item						
OCP				<1.2	A	
OVP				<6	V	
OTP						
OSP						

Feature

1. High efficiency Meet Energy star V2.0 level 5
2. No-load consumption less than 100 mW
3. SOIC-7 Package (PWM + Power Transistor all in ONE)
4. (PSR)Tight tolerance CV/CC operation without opto-coupler

DEMO Picture

Top Side



DEMO Picture

Bottom Side

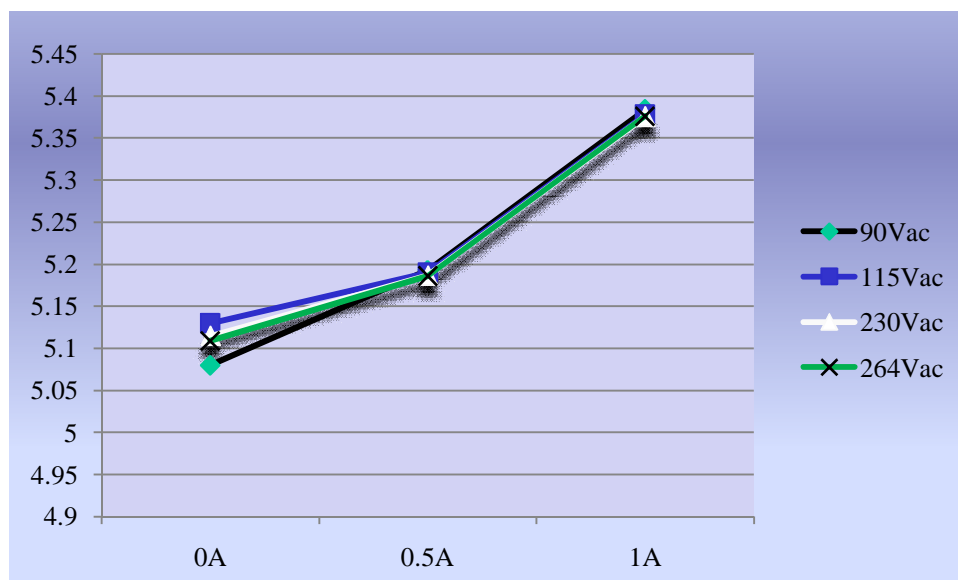


1. Output voltage regulation test:

1-1. CC mode:

V _{out} \ I _{out}	Input Voltage			
	90V _{ac}	115V _{ac}	230V _{ac}	264V _{ac}
0A	5.080V	5.130V	5.115V	5.109V
0.5A	5.193V	5.190V	5.187V	5.186V
1.0A	5.384V	5.378V	5.376V	5.376V

1-2. CC Mode Data Curve:



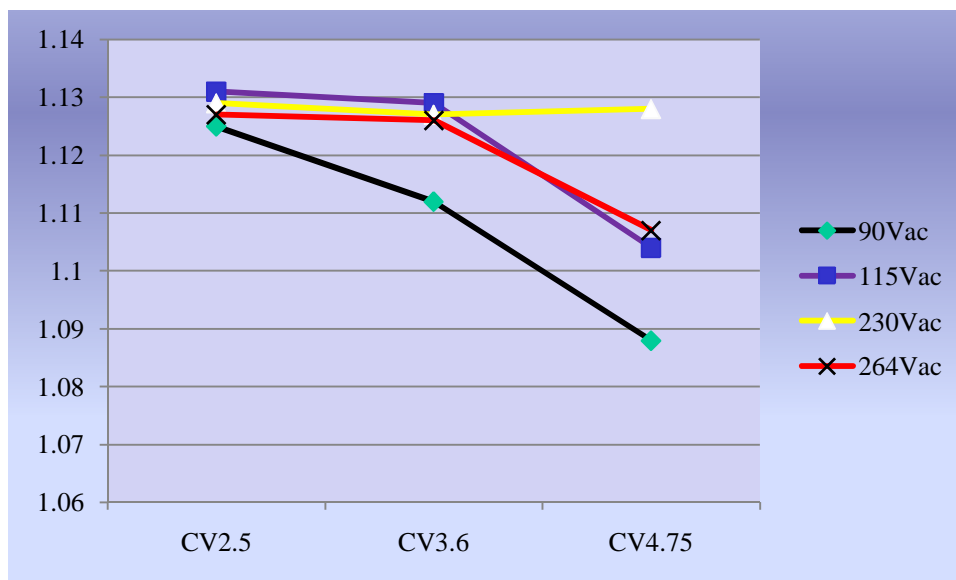
Note :The Test Above At The End Of PCB

1. Output voltage regulation test:

1-3. CV mode:

V _{out} \ I _{out}	Input Voltage			
	90V _{ac}	115V _{ac}	230V _{ac}	264V _{ac}
2.5V	1.125A	1.131A	1.129A	1.127A
3.6V	1.112A	1.129A	1.127A	1.126A
4.75V	1.088A	1.104A	1.119A	1.107A

1-4. CV Mode Data Curve :

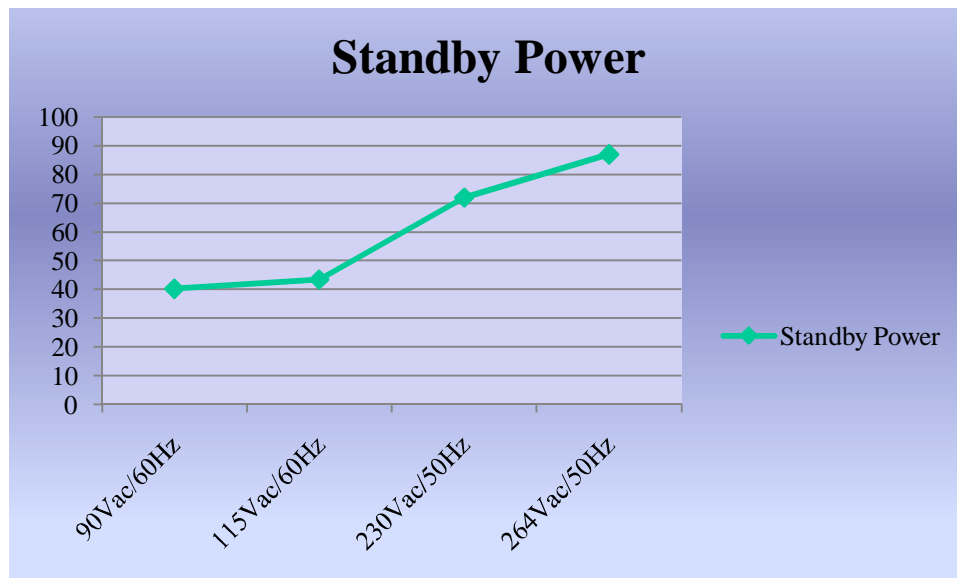


2. Standby power and efficiency test:

2-1. Standby power test:

Input voltage	Input wattage(mW)	Specification	Test result
90V _{ac} /60Hz	40.30	<100mW	PASS
115V _{ac} /60Hz	43.52	<100mW	PASS
230V _{ac} /50Hz	72.0	<100mW	PASS
264V _{ac} /50Hz	87.0	<100mW	PASS

2-2. Standby power Data Curve:

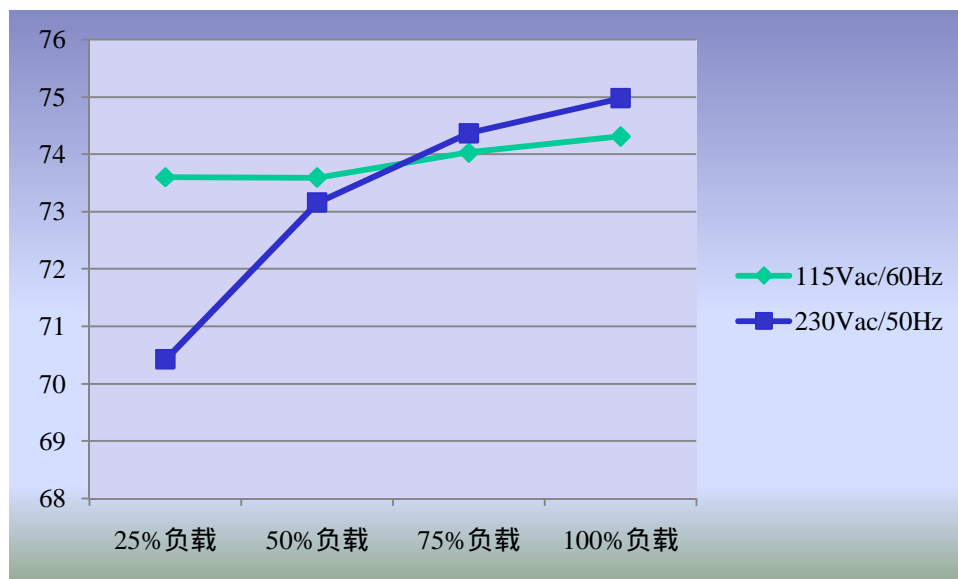


3.Standby power and efficiency test:

3-1.Efficiency test:

Input voltage	Load	I _{out} (A)	V _{out} (V)	Output wattage(W)	Input wattage(W)	Efficiency(%)	Average Efficiency(%)
115V _{ac} /60Hz	25%	0.25A	5.037	1.259	1.711	73.597	73.884
	50%	0.5A	5.184	2.592	3.522	73.595	
	75%	0.75	5.274	3.956	5.343	74.031	
	100%	1A	5.378	5.378	7.237	74.313	
230V _{ac} /50Hz	25%	0.25A	5.048	1.262	1.792	70.424	73.231
	50%	0.5A	5.187	2.594	3.545	73.159	
	75%	0.75	5.275	3.956	5.320	74.366	
	100%	1A	5.372	5.372	7.165	74.976	

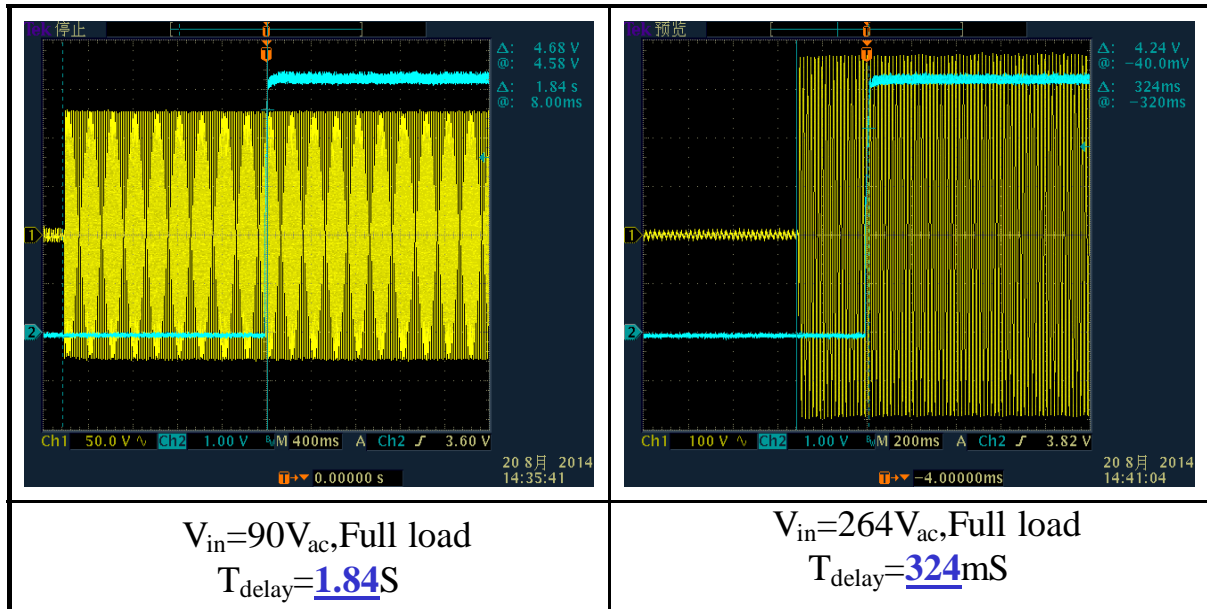
3-2.Efficiency Data Curve:



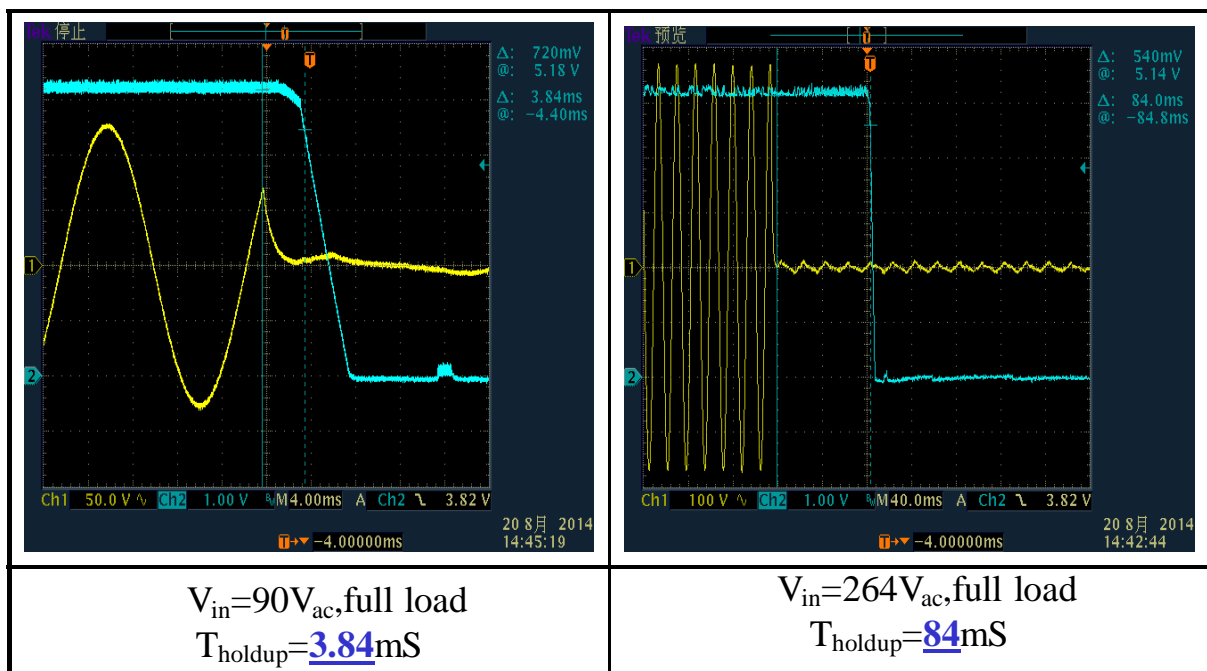
Note :The Test Above At The End Of PCB

4. Time sequence test:

4-1. Start up delay time:

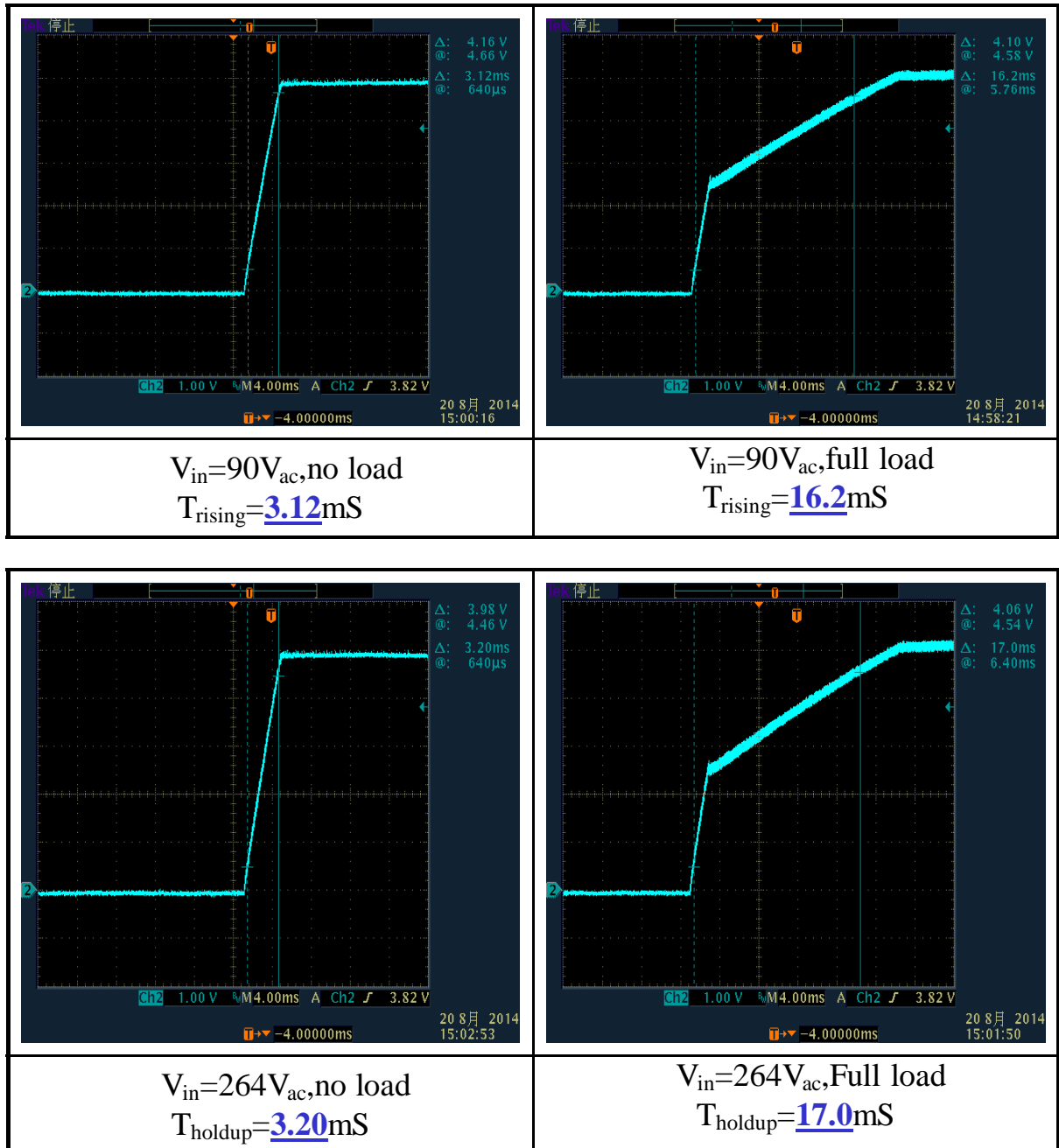


4-2. Turn off hold up time:



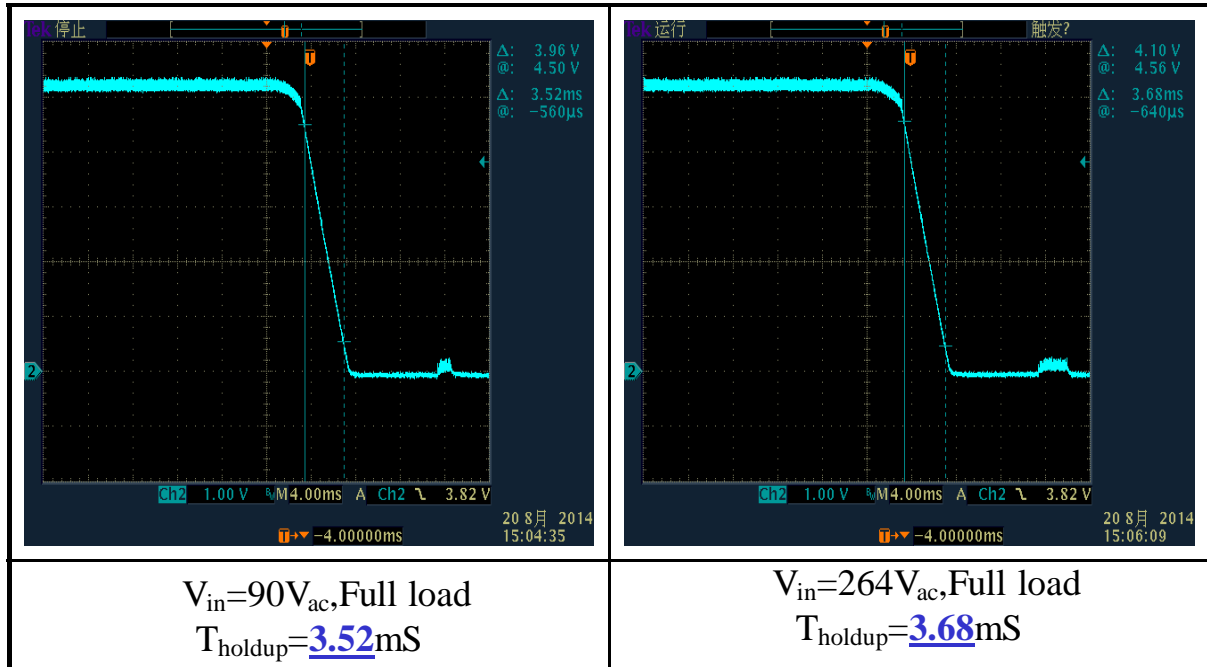
4. Time sequence test:

4-3. Rising time at turn on:

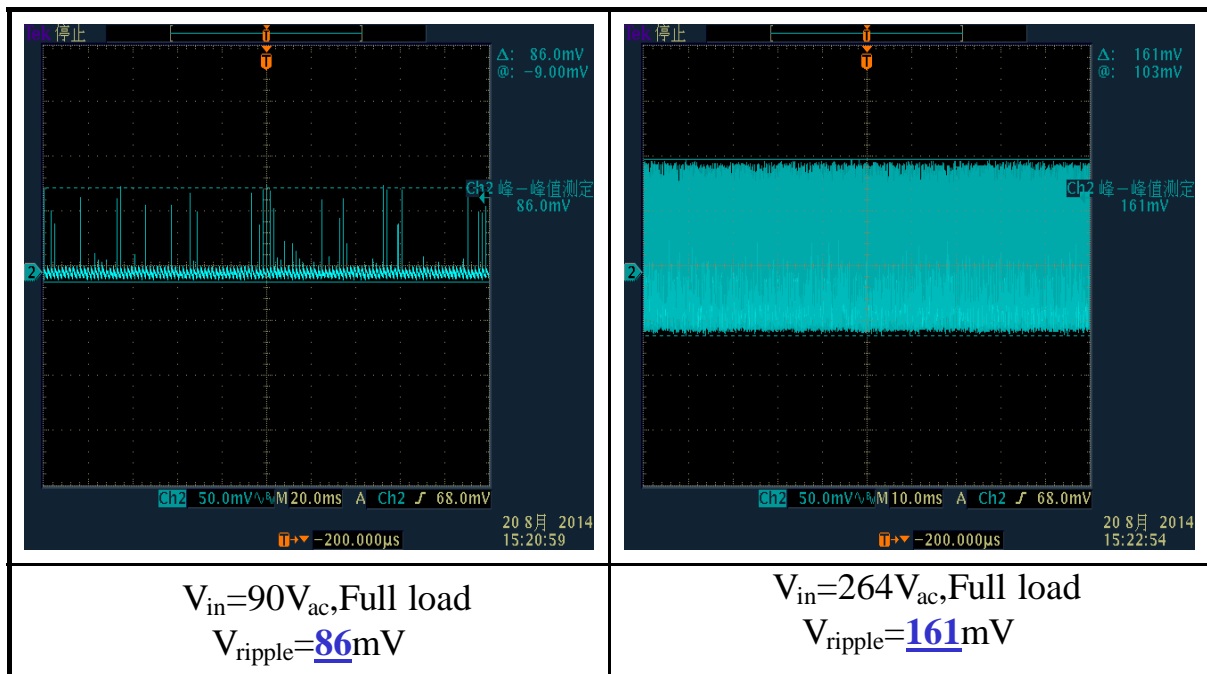
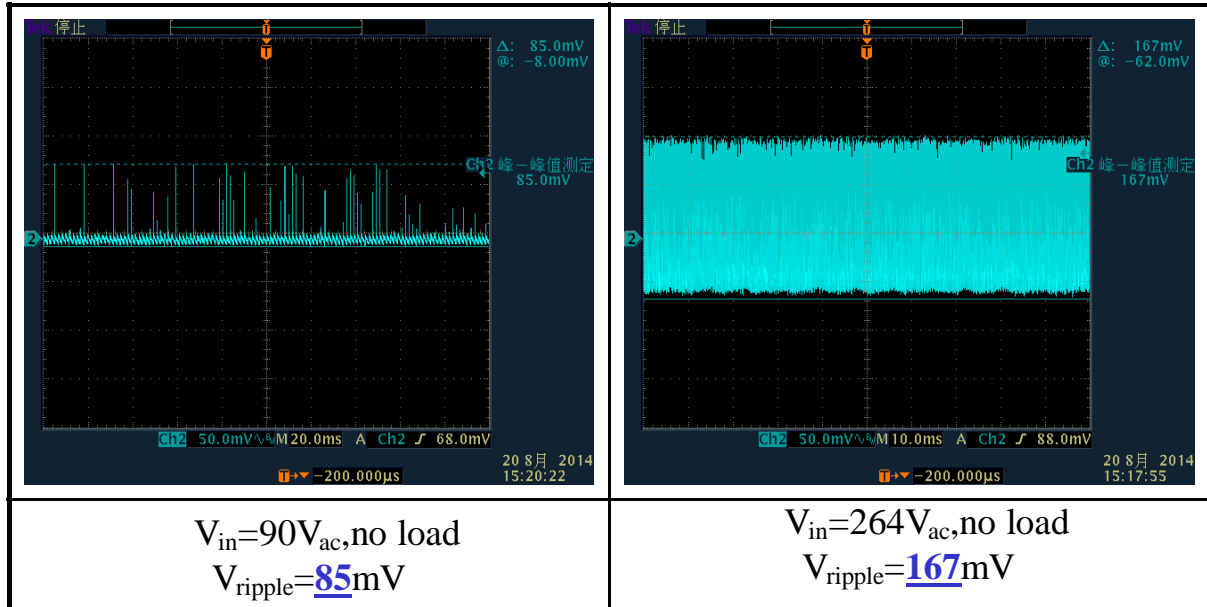


4. Time sequence test:

4-4. Falling time at turn off:



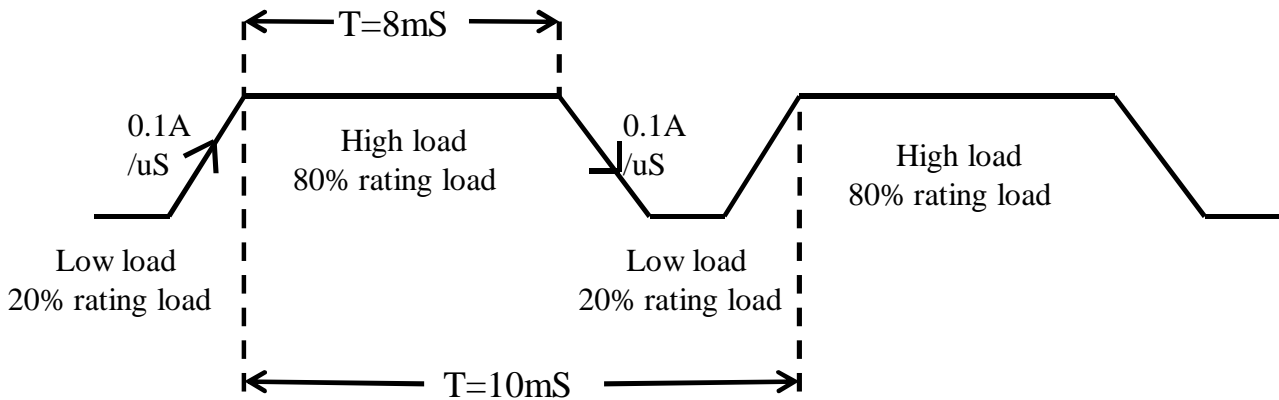
5. Output ripple&noise test:



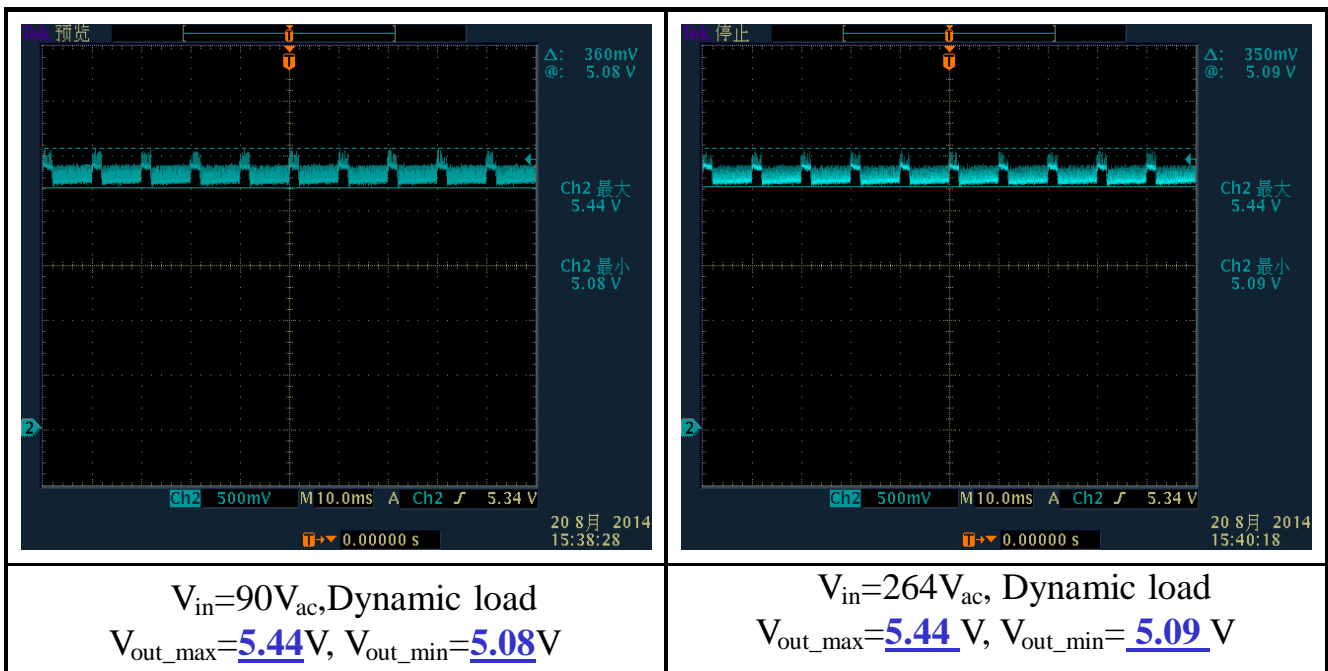
Note:Output terminal is parallel with 10uF E-cap and 0.1uF ceramic-cap.

6. Dynamic load test:

6-1. Dynamic load definition:



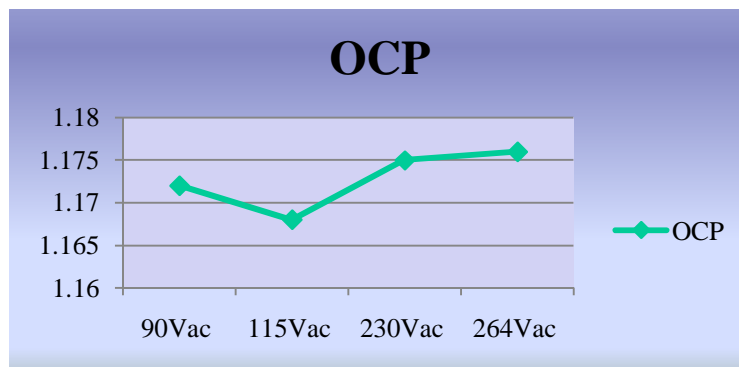
6-2. Waveform of output voltage under dynamic load



7. Protection function test:

7-1. Over current protection test:

OCP(A)	90V _{ac}	115V _{ac}	230V _{ac}	264V _{ac}
	1.172	1.168	1.175	1.176



7-2. Short circuit protection test:

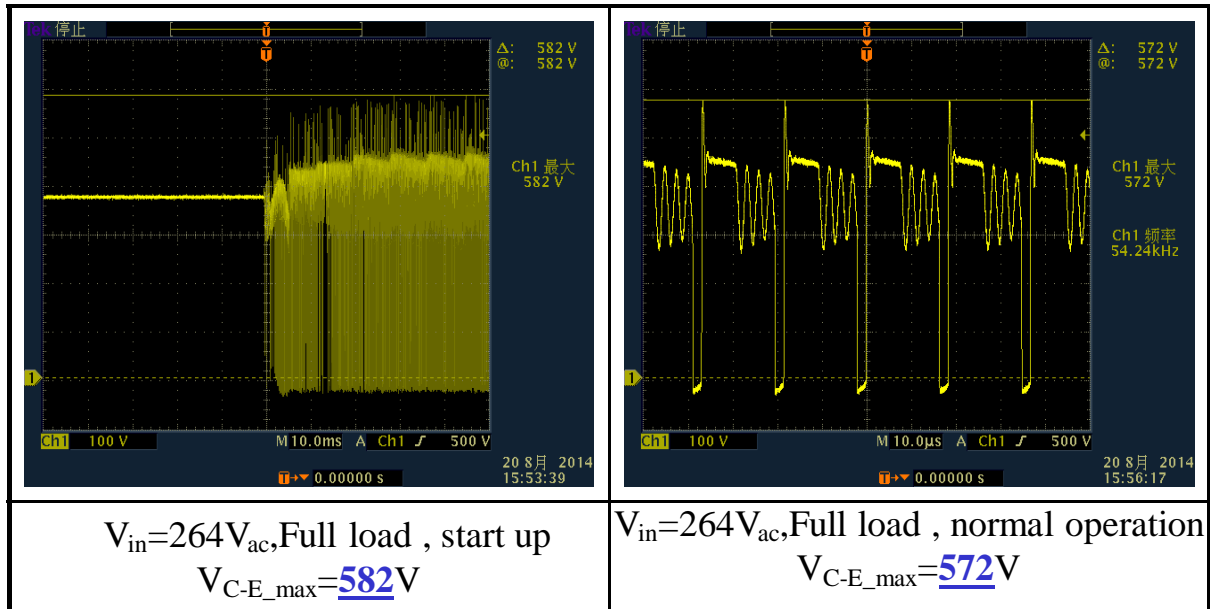
Input wattage under short output	90V _{ac}	115V _{ac}	230V _{ac}	264V _{ac}
Auto recovery /NY	Y	Y	Y	Y

7-3. Over temperature protection test:

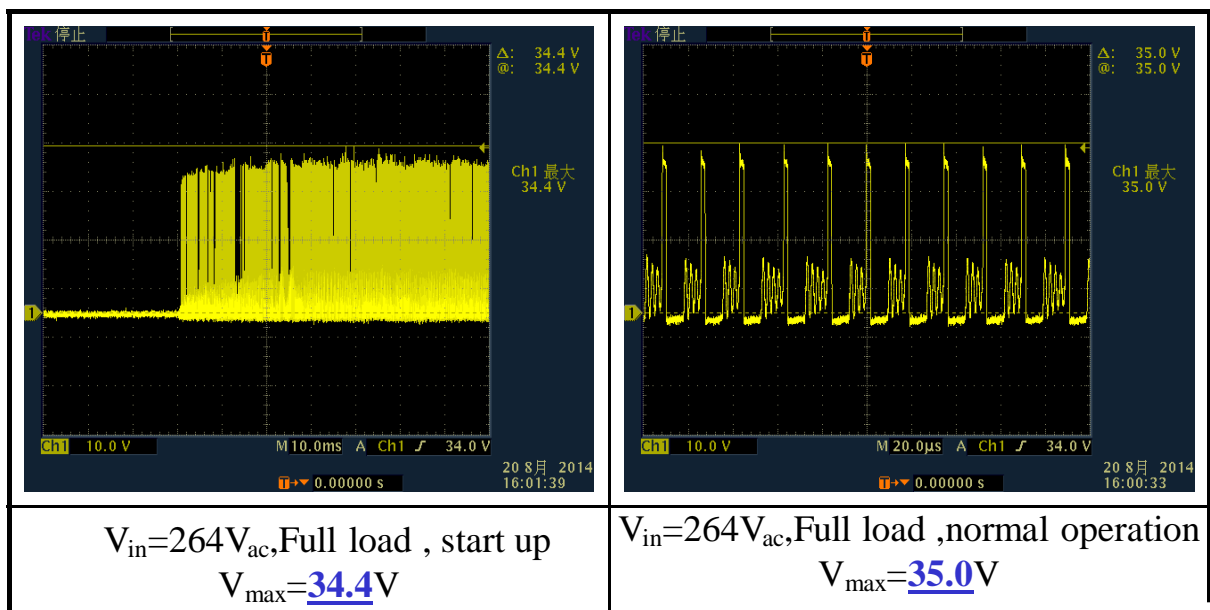
Over temperature protection point is 136 .Auto recovery Y (Y/N)

8.Key component derating test:

8-1.Switching transistor voltage stress test:

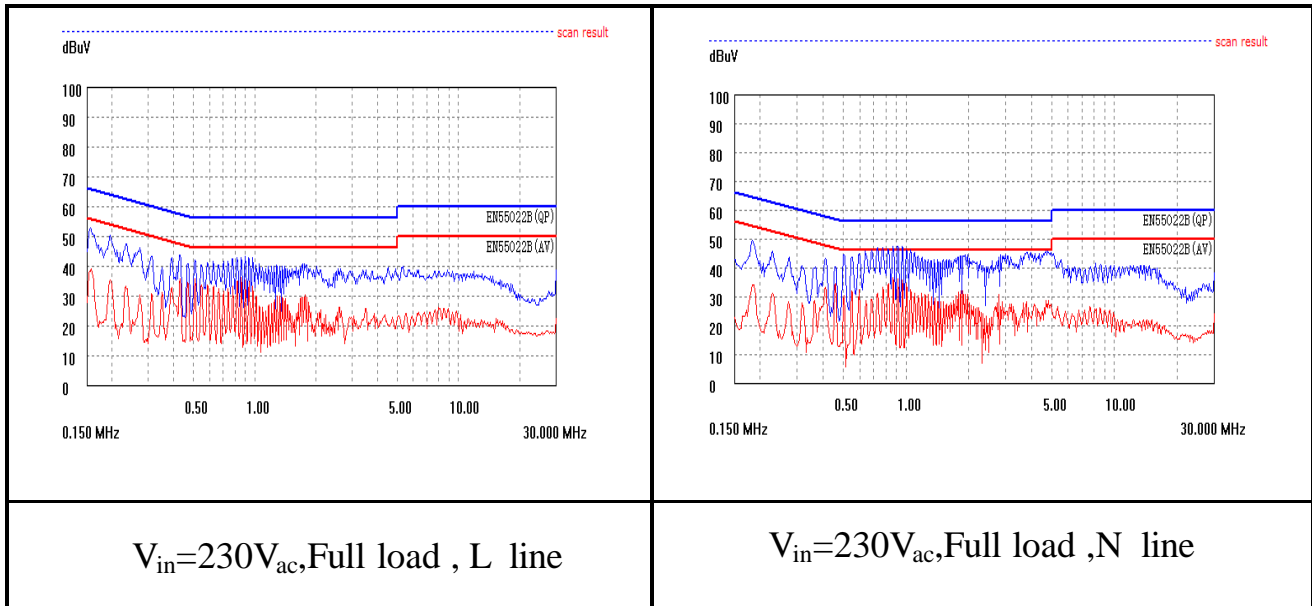


8-2.Schokkty voltage stress test:



9.EMI test: performance @EN55022 class B Limited

9-1.EMI-conduction emission test:

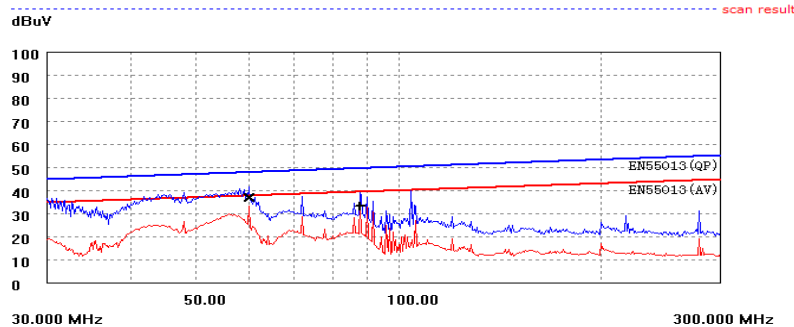


9-2. EMI-radiation emission test :

EMI TEST REPORT

Organization:	Operator:	EUT:
Place:	Time: 2014/8/21/9:16	Test equipment: KH3932
Detector: PK+AV	Test-time(ms): 30	SN: 1332408
Limit: EN55013	Transductor(PK/AV): PK / AV	JZ: 2.13.1978
Remark:		

Start(MHz)	End(MHz)	Step(MHz)
30.000	100.000	0.100
100.000	230.000	0.200
230.000	300.000	0.200

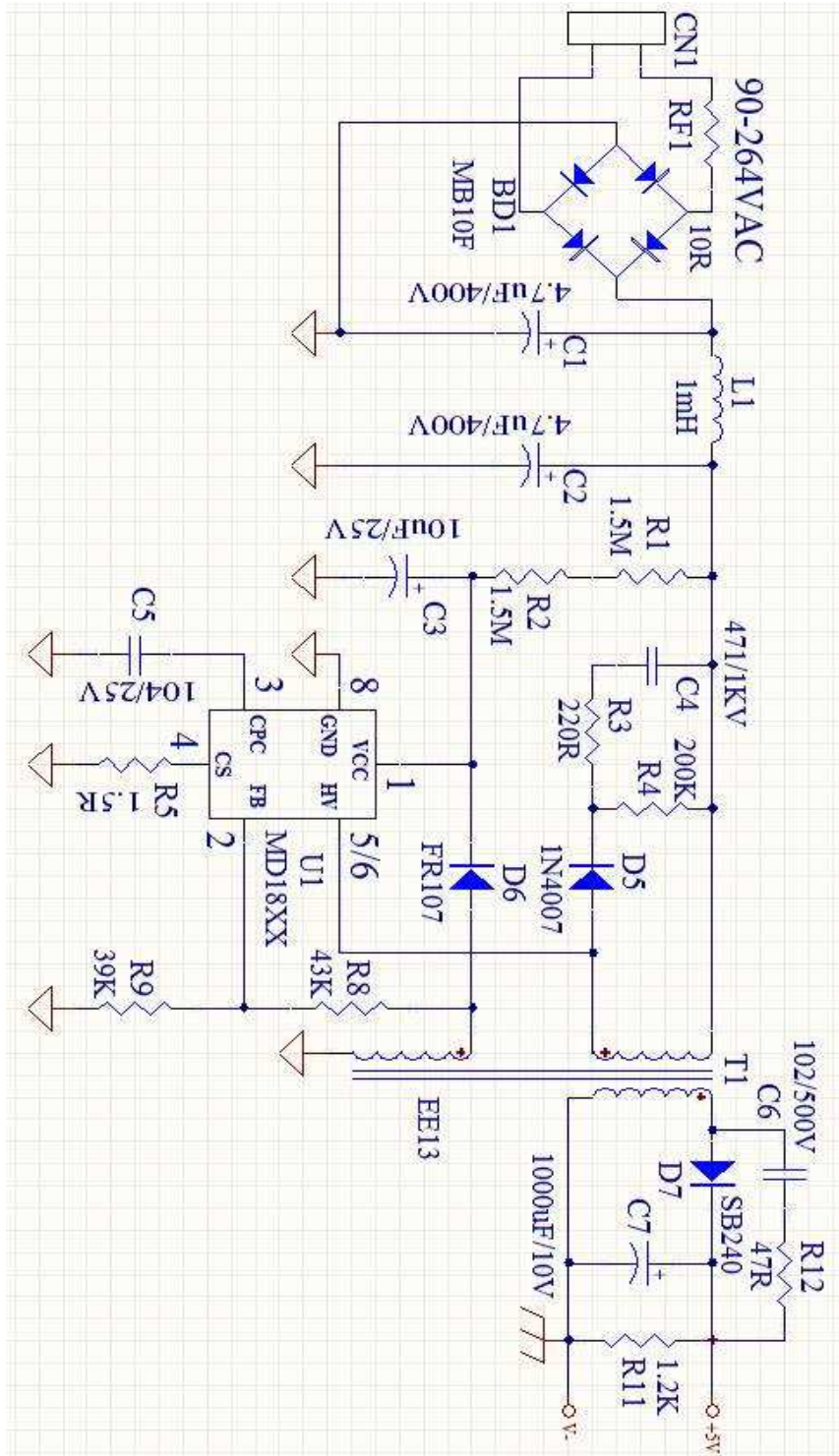


10.Key Component Temperature Rise Test:

Test Condition : Ambient Temperature Is 40 ,Open frame And Load Is Full Load

NO	Component	Temperature()	
		$V_{in}=90V_{ac}$	$V_{in}=264V_{ac}$
1	IC1(MD1812)	78.9	87.3
2	T1-Winding	74.1	77.6
3	T1-Core	71.1	74.2
4	BD1(Rectifier Bridge)	58.9	54.8
5	D6(1N4007,Snubber Diode)	74.6	79.5
6	D7(SB240,Schottky)	85.5	86.9
7			

11. Schematic:

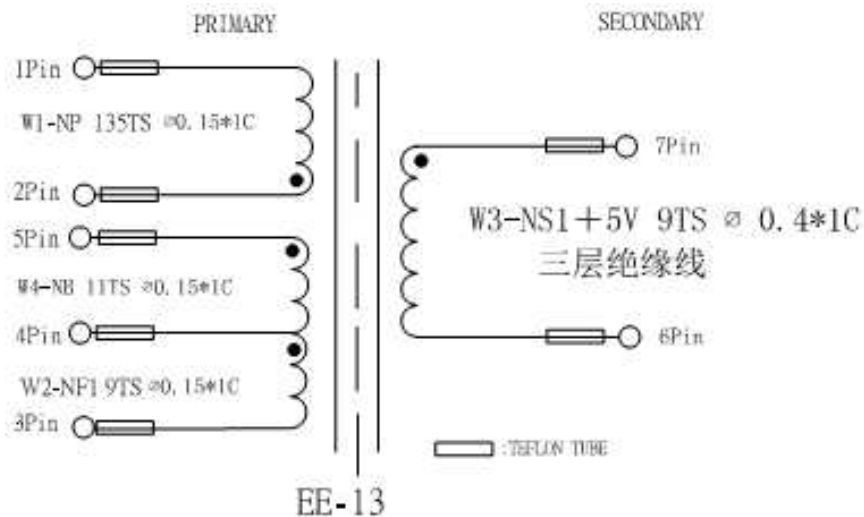


12. Bill Of Material:

产品规格		Input : 90~264Vac ; Output : 5V1A (安规产品)			
初级					
No.	Q'ty	Location	Discription	Pacakge	Remark
1	2	C1 C2	4.7uF, 400V, Electrolytic 105°C	Φ8*12	
2	1	C4	10uF, 25V, Electrolytic ,Low ESR 105°C	Φ5*11	
3	1	C3	470pF, 1000V, Disc Ceramic	Rad	
4	1	D5	1N4007 1000V/1A, Rectifier	DO-41	
5	1	D6	FR107 1000V/1A, Rectifier	DO-41	
6	1	L1	Choke coil 1mH 1W	Axial	
7	1	RF1	10R, 1W Wire-Wound Resistor	Axial	
8	1	T1	Transformer, EE13, 5+2 pins,	EE13	
9	1	U1	MD1801SCG	SOIC-7	
10	1	BD1	MB10F 1000V/1A Bridge	SO-4	
11	2	R1 R2	Resistor SMD 1.5M 1206 5%	1206	
12	1	R3	Resistor SMD 220R 0805 5%	0805	
13	1	R4	Resistor SMD 200K 0805 5%	0805	
14	1	R5	Resistor SMD 1.5R 1206 1%	1206	
15	1	R8	Resistor SMD 6.8K 0603 1%	0603	
16	1	R9	Resistor SMD 5.1K 0603 1%	0603	
17	1	R10	Resistor SMD 82K 0603 1%	0603	
18	1	L2	Resistor SMD 0R 0805 5%	0805	
19	1	C5	Capactor SMD 104, 25V 0603 10%	0603	
次级					
No.	Q'ty	Location	Discription	Pacakge	Remark
20	1	C7	1000 uF, 10 V, Electrolytic,Low ESR, 105°C	Φ8*12	
21	1	USB	USB	DIP	
22	1	D7	S8240 40V/2A, Schottky, DO-15	DO-15	
23	1	R11	Resistor SMD 1.2K 0805 5%	0805	
24	1	R12	Resistor SMD 22R 0805 5%	0805	
25	1	C8	Capactor SMD 102,500V 0805 10%	0805	

13. Transformer Structure:

13-1. Schematic:



用0.2裸铜线贴着原边磁芯接到4Pin

所有绕组的绕线方向统一为1PIN到5PIN方向

N1, N2, N3绕组需要包四层黄胶带

NOTES:

1. 使用EE13 CORE PC40材质
2. 使用EE13 5+2Pin 卧式加长, 排距16mm, 3Pin为空脚, 过锡后剪去一半。
3. 成品務必真空含浸, 磁芯接合處點EPOXY.
4. pin1-pin10中間貼標籤
5. LP: 1.85mH \pm 7%
6. LK: 200uH以下



注：请使用0.2裸铜线
贴着原边磁芯接到4Pin

13. Transformer Structure:

13-2. Transformer winding process:

No.	绕组	线径(材质)	起绕点	端点	圈数	胶带层数	备注
1.	W1 - NP	2UE \varnothing 0.15*1C	2 Pin	1 Pin	135 TS	4 TS	密绕三层
*此绕组平滑密绕三层, 如果超出可稍微调整线径。							
2.	W2 - NF1	2UE \varnothing 0.15*1C	4 Pin	3 Pin	9 TS	4 TS	疏绕一层
*此绕组疏绕一层, 不可密绕。							
3.	W4 - NS	TEX-E \varnothing 0.4*1C	7 Pin	6 Pin	9 TS	4 TS	三层绝缘线
*使用三层绝缘线。							
4.	W3 - NB	2UE \varnothing 0.15*1C	5 Pin	4 Pin	11 TS	3 TS	居中密绕
*此绕组居中密绕。							
5.	W5 - NF2	0.2裸铜线贴着磁芯接到4Pin	4 Pin	磁芯			
*铜线需要镀锡, 紧贴着磁芯。							

13-3. Transformer Test Item:

No.	测试项目	测试条件	测试Pin脚	规格	备注
1.	INDUCTANCE (电感量)	10KHz/1V	1Pin — 2Pin	1.85mH \pm 7%	
2.	L K (漏感)	10KHz/1V 4-5 and Sec Short	1Pin — 2Pin	200uH Max	
3.	HI-POR 高压测试	3500Vac 5mA One Minute	Primary—Secondary	3500Vac 5mA	
		1500Vac 5mA	Primary to Core	1500Vac 5mA	
		1500Vac 5mA	Secondary to Core	1500Vac 5mA	
4.	Insulation Resistance 绝缘电阻	500Vdc	All Windings to Core	>100 Mohms	
		500Vdc	Between windings	>100 Mohms	
5.	DC Resistance DC阻抗		1Pin — 2Pin	< 3 Ohms	

14. PCB LAYOUT:

