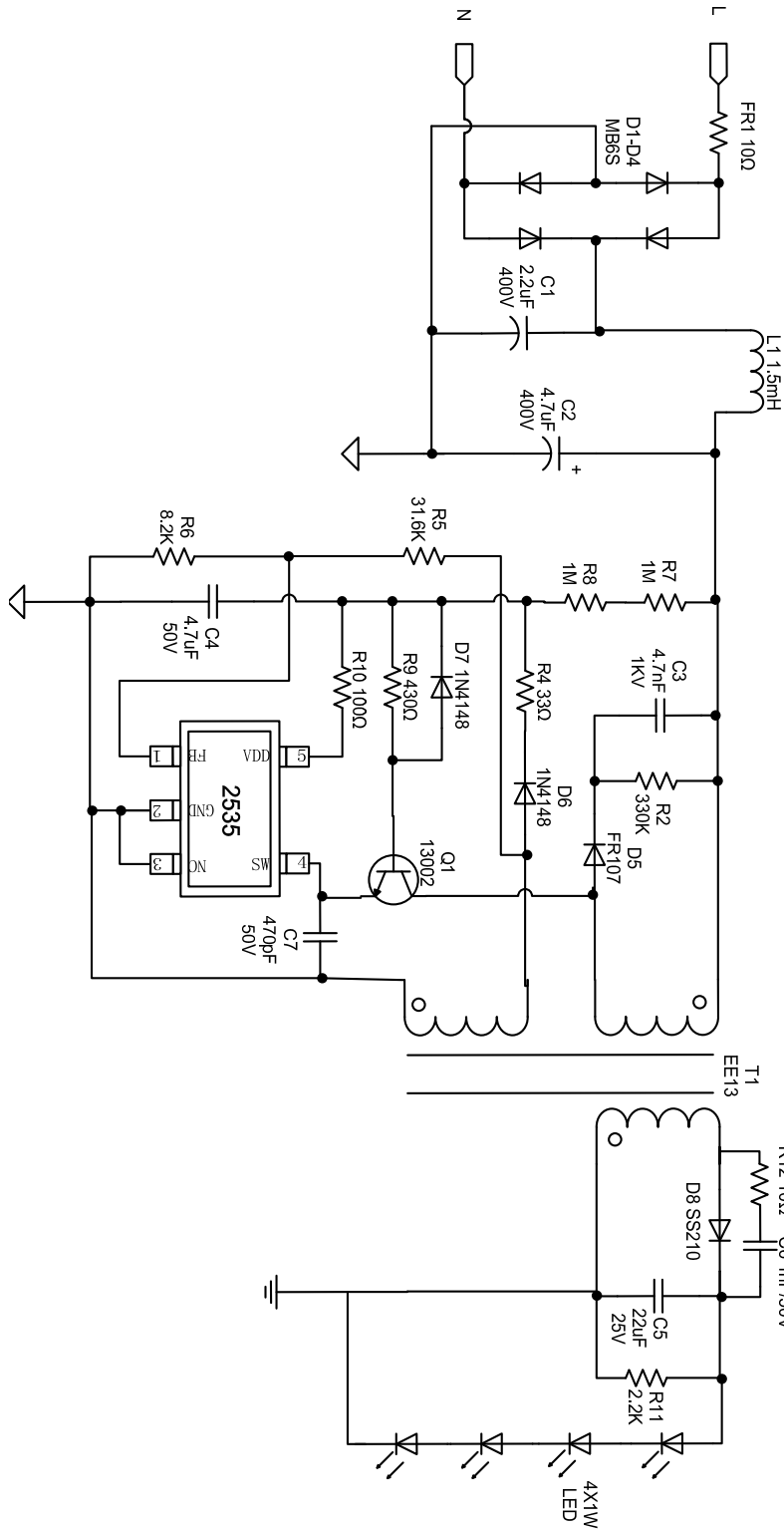


基于2535的低成本小体积3(4)X1W LED驱动应用方案

1. 电路原理图



2. 样机照片

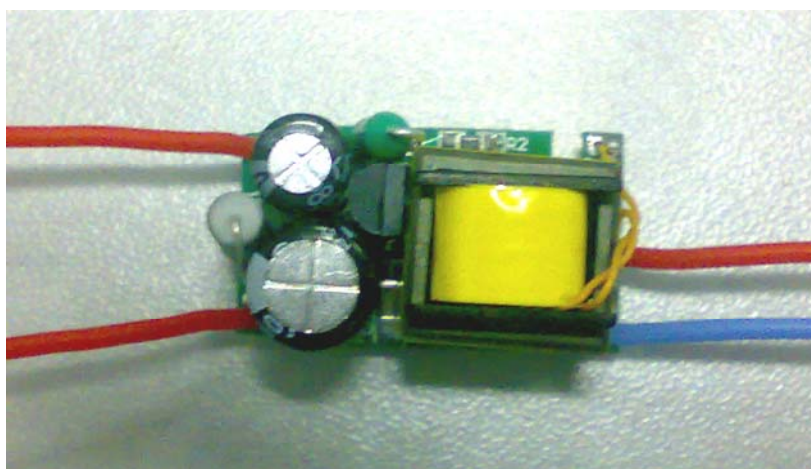


图1, 正面 (26mm x 15mm x 17mm)

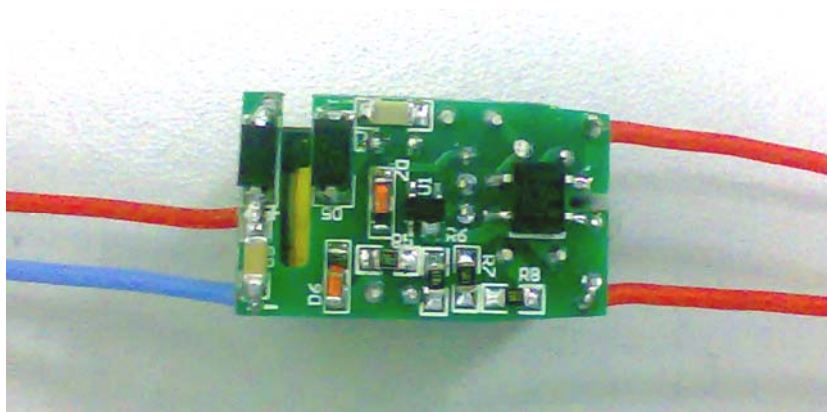


图2, 背面(26mm x 15mm x 17mm)

3. PCB绘制图

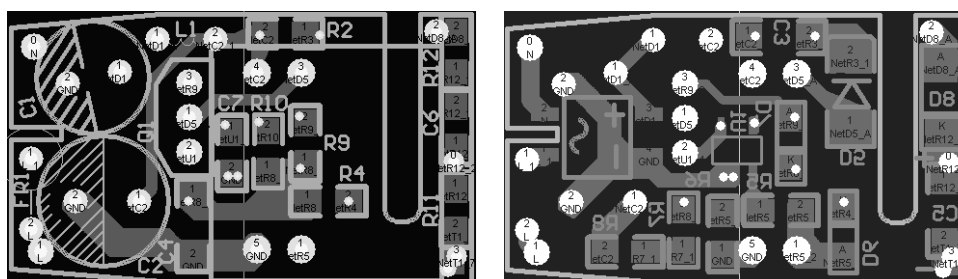


图3, PCB板设计

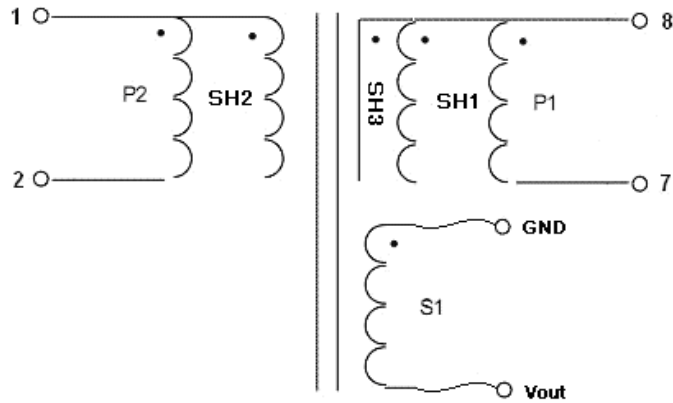
4. 材料清单

序号	元件符号	描述	数量
1	FR1	Resistor,10ohm,1W	1
2	R2	Resistor,330Kohm,5%,SMT,0805	1
3	R4	Resistor,33ohm,5%,SMT,0805	1
4	R5	Resistor, 31.6Kohm,1%,SMT,0805	1
5	R6	Resistor,8.2Kohm,1%,SMT,0805	1
6	R7	Resistor,1Mohm,5%,SMT,0805	1
7	R8	Resistor,1Mohm,5%,SMT,0805	1
8	R9	Resistor,430ohm,5%,SMT,0805	1
9	R10	Resistor,100ohm,5%,SMT,0805	1
10	R11	Resistor,2.2Kohm,5%,SMT,0805	1
11	R12	Resistor,10ohm,5%,SMT,0805	1
12	C1	Capacitor,Electrolytic,2.2uF/400V,6.3x11	1
13	C2	Capacitor,Electrolytic,4.7uF/400V,8x12	1
14	C3	Capacitor,Ceramic,4.7nF/1KV	1
15	C4	Capacitor, Ceramic,4.7uF/50V	1
16	C5	Capacitor, Ceramic,22uF/25V	1
17	C6	Capacitor,Ceramic,1nF/50V	1
18	C7	Capacitor,Ceramic,470pF/50V	1
19	L1	Inductor,1.5mH,0410	1
20	T1	Transformer,Lp=2.1mH,EE13	1
21	D1-D4	Bridge,Rectifier,600V,0.5A,MB6S	1
22	D5	Diode,UltraFast,FR107	1
23	D6	Diode,Switching, 1N4148,1206	1
24	D7	Diode,Switching,1N4148,1206	1
25	D8	Diode,Schottky, SS210	1
26	Q1	Transistor,NPN, 13002,TO-92	1
27	IC1	IC,PWM, 2535BH,SOT-23-5	1

表1: 材料清单表

5. 变压器规格

5.1 示意图



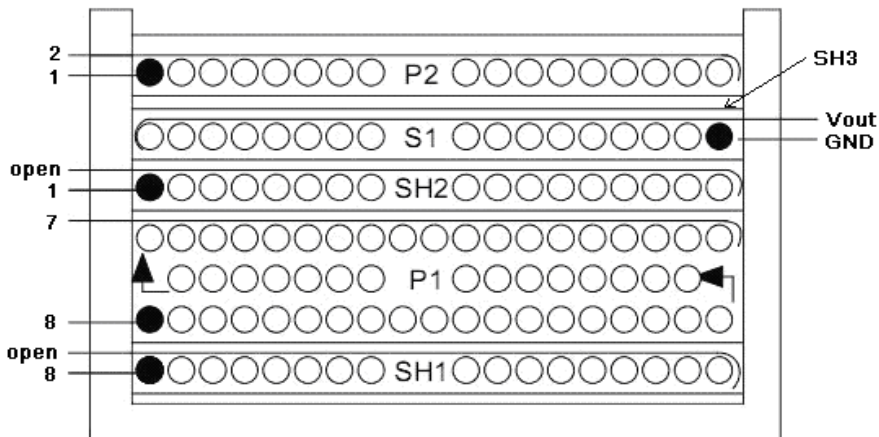
变压器示意图

5.2 材料清单

绕组	脚位		匝数	绝缘导线/铜箔		
	开始	结束		类型	线径/数量	层数
SH1	8	Open	25	2UEW	0.1Φ/2	1
P1	8	7	120	2UEW	0.15Φ/1	3
SH2	1	Open	25	2UEW	0.1Φ/2	1
S1	GND	Vout	24	TEX-E	0.4Φ/1	2
SH3	8	Open	0.9	铜箔	0.025*5mm	1
P2	1	2	26	2UEW	0.15Φ/1	1

注：SH1、SH2为屏蔽层， P1、P2为初级， S1为次级。

5.3 装配图



装配图

5.4 电气规格

序号	描述	条件	限值
1	电气绝缘强度	60Hz, 1 分钟, pins 1-4 到 pins 5-6	3000 Vac
2	初级P1电感	Pin1 到Pin2 电感量, 在1Vac & 1kHz	2.1mH ± 0.14mH

6. 性能测试数据

6.1. 短路功耗

输入电压	85 VAC	115 VAC	230 VAC	264 VAC
功耗 (mW)	22	54	170	210

6.2. 效率

条件\Vac	85 VAC	115 VAC	230 VAC	264 VAC
3X1WLED	72.81%	74.64%	75.24%	72.62%
4X1WLED	73.76%	75.9%	77.24%	76.4%

6.3. 输入电压和负载调整率

条件\Vac	85 VAC	115 VAC	230 VAC	264 VAC
3X1WLED	307.2mA	303.2mA	307.1mA	311.1mA
4X1WLED	304.1mA	307.9mA	314.4mA	319.1mA

6.4 雷击

测试条件	测试方法	测试限制	通过/不通过
220Vac 3*1W	火线——零线 5次/45度相位 1次间隔60秒	0.5KV	通过

6.5 EMI测试

6.5.1 传导

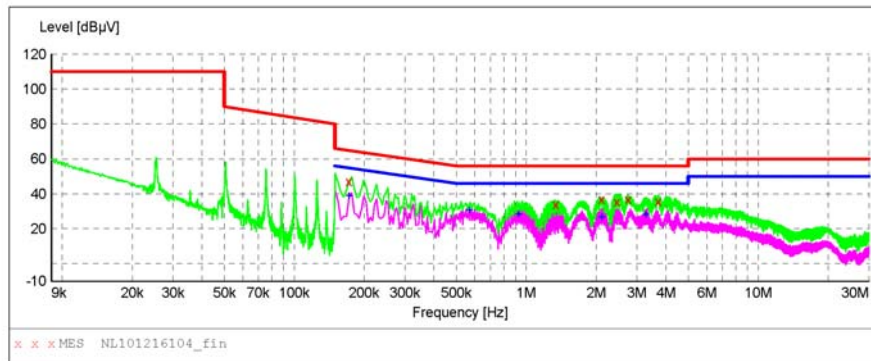
Anbotek Compliance Laboratory Limited

Voltage Mains EN 55015

EUT: LED LIGHT M/N:2535 3*1W
 Manufacturer: AI WEI
 Operating Condition: ON
 Test Site: 1# Shielding Room
 Operator: WELL WANG
 Test Specification: AC 230V 50Hz
 Comment: L
 Temp.=22.2 Hum.=60%

SCAN TABLE: "Voltage (9K~30M) FIN"

Short Description: 9K-30M Disturbance Voltages



MEASUREMENT RESULT: "NL101216104_fin"

12/16/2010 10:16AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.172500	47.10	10.9	65	17.7	QP	L1	GND
1.347000	34.00	9.9	56	22.0	QP	L1	GND
2.116500	36.90	9.8	56	19.1	QP	L1	GND
2.467500	35.50	9.8	56	20.5	QP	L1	GND
2.755500	36.90	9.8	56	19.1	QP	L1	GND
3.709500	35.80	9.8	56	20.2	QP	L1	GND

MEASUREMENT RESULT: "NL101216104_fin2"

12/16/2010 10:16AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.172500	39.00	10.9	55	15.8	AV	L1	GND
0.568500	30.60	9.9	46	15.4	AV	L1	GND
0.928500	28.50	9.9	46	17.5	AV	L1	GND
2.121000	26.70	9.8	46	19.3	AV	L1	GND
3.286500	28.20	9.8	46	17.8	AV	L1	GND

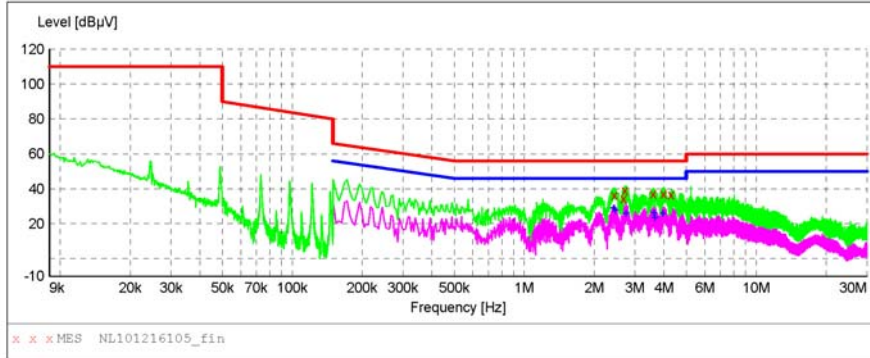
Anbotek Compliance Laboratory Limited

Voltage Mains EN 55015

EUT: LED LIGHT M/N:2535 3*1W
 Manufacturer: AI WEI
 Operating Condition: ON
 Test Site: 1# Shielding Room
 Operator: WELL WANG
 Test Specification: AC 230V 50Hz
 Comment: N
 Temp.=22.2 Hum.=60%

SCAN TABLE: "Voltage (9K~30M) FIN"

Short Description: 9K-30M Disturbance Voltages



MEASUREMENT RESULT: "NL101216105_fin"

12/16/2010 10:21AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
2.454000	36.30	9.8	56	19.7	QP	N	GND
2.683500	34.50	9.8	56	21.5	QP	N	GND
2.719500	39.20	9.8	56	16.8	QP	N	GND
3.601500	37.30	9.8	56	18.7	QP	N	GND
3.993000	37.20	9.8	56	18.8	QP	N	GND
4.312500	36.70	9.8	56	19.3	QP	N	GND

MEASUREMENT RESULT: "NL101216105_fin2"

12/16/2010 10:21AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
2.422500	29.00	9.8	46	17.0	AV	N	GND
2.472000	27.70	9.8	46	18.3	AV	N	GND
2.746500	26.00	9.8	46	20.0	AV	N	GND
3.624000	26.30	9.8	46	19.7	AV	N	GND
3.651000	23.50	9.8	46	22.5	AV	N	GND
3.966000	25.90	9.8	46	20.1	AV	N	GND

6.5.2 辐射



Anbotek Compliance Laboratory Limited
2/F, Langfeng Building, Kefa Road North, Hi-tech Industrial
Park, Nanshan District, Shenzhen 518057, China

Site: 966 Chamber
Tel: (86)755-26014771
Fax: (86)755-26014772

Job No.: File :艾微	Polarization: Horizontal
Standard: (RE)EN55015	Power Source: AC 230V/50Hz
Test item: Radiation Test	Date: 10/12/16/
Temp.(C)/Hum.(%) 24.3 / 55 %	Time: 11/17/14
EUT: 2535 3x1W	Engineer Signature: JUICE XU
Mode: ON	Distance: 3m
Model: 3x1W	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Remark
1	54.8430	50.14	-25.11	25.03	40.00	-14.97	peak	
2	201.4287	46.86	-29.33	17.53	40.00	-22.47	peak	
3	204.2308	47.24	-29.23	18.01	40.00	-21.99	peak	



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2/F, Langfeng Building, Kefa Road North, Hi-tech Industrial Park, Nanshan District, Shenzhen 518057, China

Site: 966 Chamber

Tel: (86)755-26014771

Fax: (86)755-26014772

Job No.: File :艾微	Polarization: Vertical
Standard: (RE)EN55015	Power Source: AC 230V/50Hz
Test item: Radiation Test	Date: 10/12/16/
Temp.(C)/Hum.(%) 24.3 / 55 %	Time: 11/14/45
EUT: 2535 3x1W	Engineer Signature: JUICE XU
Mode: ON	Distance: 3m
Model: 3x1W	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Remark
1	30.0000	51.41	-26.32	25.09	40.00	-14.91	peak	
2	52.7377	55.03	-25.03	30.00	40.00	-10.00	peak	
3	83.7762	56.32	-28.01	28.31	40.00	-11.69	peak	
4	87.7246	56.62	-27.23	29.39	40.00	-10.61	peak	