Demo Board Test Report for LD7831

--- 40V/250mA_LED Lighting Power

Tested by	Reviewed by	Approved by
Yichuan	Renyi	Albert

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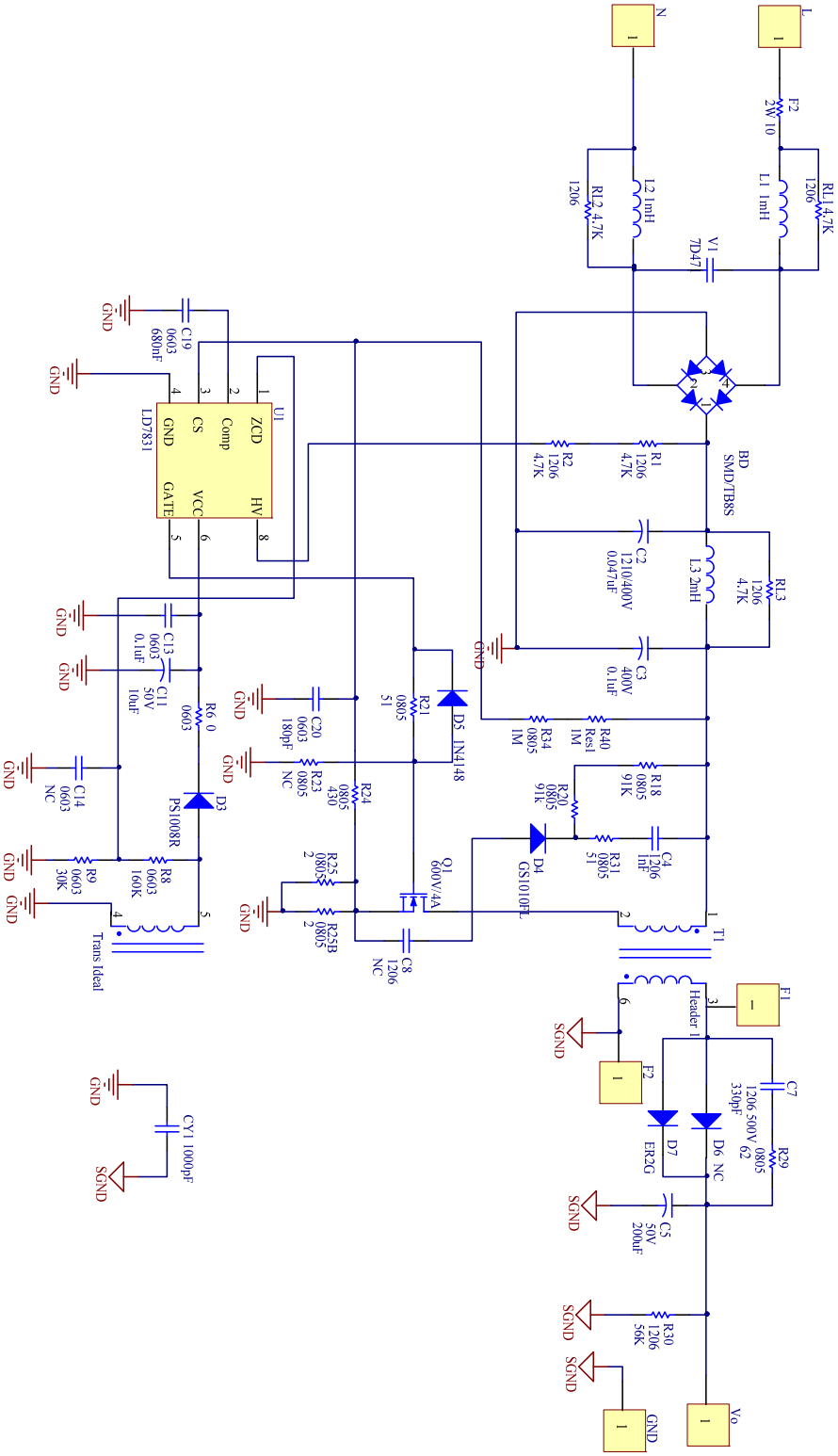
I. Schematic


N
L
F2
2W 10
RL2 4.7K
1206
L2 1mH
L1 1mH
RL1 4.7K
1206
V1
7D471
C19
0603
680nF
GND
U1
LD7831
GND
CS
Comp
ZCD
GATE
VCC
HV
R2
1206
4.7K
R1
1206
4.7K
BD
SMD/TB8S
C2
1210/400V
0.047uF
L3 2mH
RL3
1206
4.7K
C3
400V
0.1uF
C13
0603
0.1uF
C11
50V
10uF
R6 0
0603
C20
0603
180pF
R21
0805
51
D5 1N4148
R34
0805
1M
R40
Res1
1M
C14
0603
NC
D3
PS1008R
R23
0805
NC
R24
0805
430
R20
0805
91k
R18
0805
91K
R9
0603
30K
R8
0603
160K
R25
0805
2
R25B
0805
2
Q1
600V 4A
D4
GS1010FL
R31
0805
51
C4
1206
1nF
C8
1206
NC
Trans Ideal
T1
Header 1
F1
SGND
F2
C7
1206 500V
330pF
D7
ER2G
D6 NC
R29
0805
62
CY1 1000pF
C5
50V
200nF
R30
1206
56K
Vo

Ⅱ. BOM

P/N	Component Value	Note
RL1	4.7KΩ,1206	
RL2	4.7KΩ,1206	
RL3	4.7KΩ,1206	
R1	4.7KΩ,0805	
R2	4.7KΩ,0805	
R8	160KΩ,0603	
R9	30KΩ,0603	
R18	91KΩ,0805	
R20	91KΩ,0805	
R21	51Ω,0805	
R23	NC,0805	
R24	430Ω,0805	
R25	2Ω,0805	
R25B	2Ω,0805	
R31	51Ω,0805	
R60	0Ω,1206	
R29	62Ω,0805	
R30	56KΩ,1206	
L1	1.5mH MCD-0608-152KU	美磊
L2	1.5mH MCD-0608-152KU	美磊
L3	2mH MCD-0608-202KU	美磊
T1	Page 15	LD design

P/N	Component Value	Note
C2	0.047uF/400V, 1210	Murata
C3	0.1uF/400V	Murata
C4	1nF/500V, 1206	
C5	220uF/50V	
C7	330pF/500V, 1206	
C8	NA, 1206	
C11	10uF/50V	
C13	0.1uF/0603	
C14	NA, 0603	
C19	680nF/0603	
C20	180pF/0603	
CY1	1000pF	
D3	PS1008R	
D4	GS1010FL	
D5	1N4148	
D6	2A/400V(ER2G)	Panjit
D7	NC	
BD	TB8S	
V1	7D471	
F1	2W/10Ω Fusible	Tyohm
Q1	4A/600V PO460AI	Niko-sem
IC1	LD7831 D/C:124211-4	Leadtrend

III. EXECUTIVE SUMMARY

Office	Hsinchu
Model Name	LD7831 Demo Board
Version	00
IC	LD7831 D/C:124211-4

1. Current Accuracy

Test Conditions:
Input: 90Vac/115Vac/230Vac/264Vac (60Hz)
Output: CV mode (26V~18V)
Ambient Temperature: 25℃

Output Current(A)					
Vac / Vo	90 V	115 V	230 V	264 V	
40 V	0.248	0.253	0.250	0.248	CC% =(Max-Min)/(Max+Min) =1.6%
38 V	0.250	0.254	0.250	0.248	
36 V	0.251	0.254	0.249	0.247	
34 V	0.252	0.254	0.248	0.247	
32 V	0.253	0.254	0.248	0.246	

Table 1

2. PF and i_{THD} Test

Test Conditions:
Input: 90Vac/115Vac/230Vac/264Vac (60Hz)
Output: CV mode (40V), CR mode (160Ω)
Ambient Temperature: 25℃

PF Test

Load / PF	CV:40V	CV:36V	CV:32V
90Vac	0.997	0.997	0.996
115Vac	0.995	0.994	0.993
230Vac	0.957	0.949	0.938
264Vac	0.934	0.922	0.906

Table 2-1

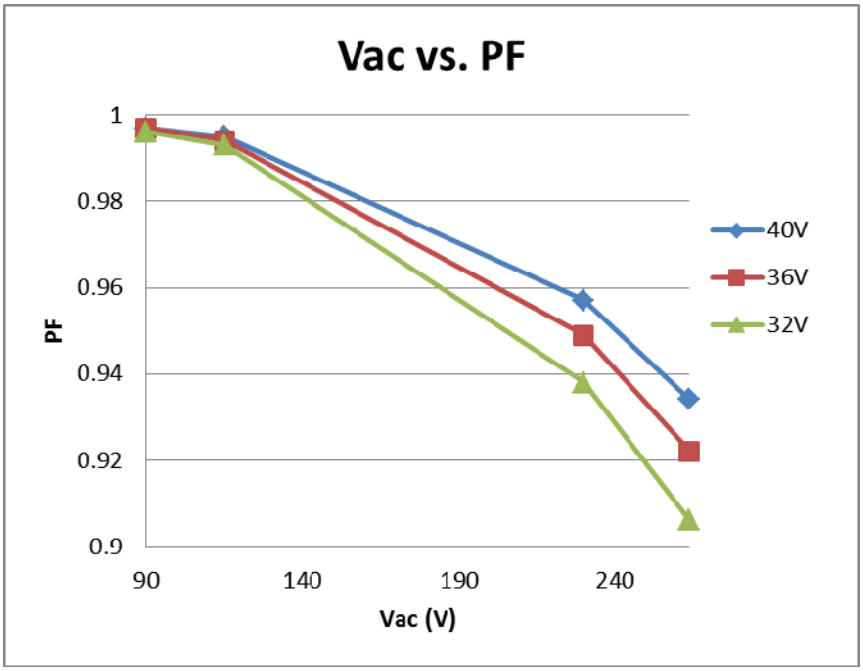


Fig. 2-1 Vac vs. PF

i_{THD} Test

Load / THD(%)	CV:40V	CV:36V	CV:32V
90Vac	7.3	7.4	7.7
115Vac	7.9	8.7	9.4
230Vac	17.2	19.2	20.2
264Vac	20.7	22.3	24.0

Table 2-2

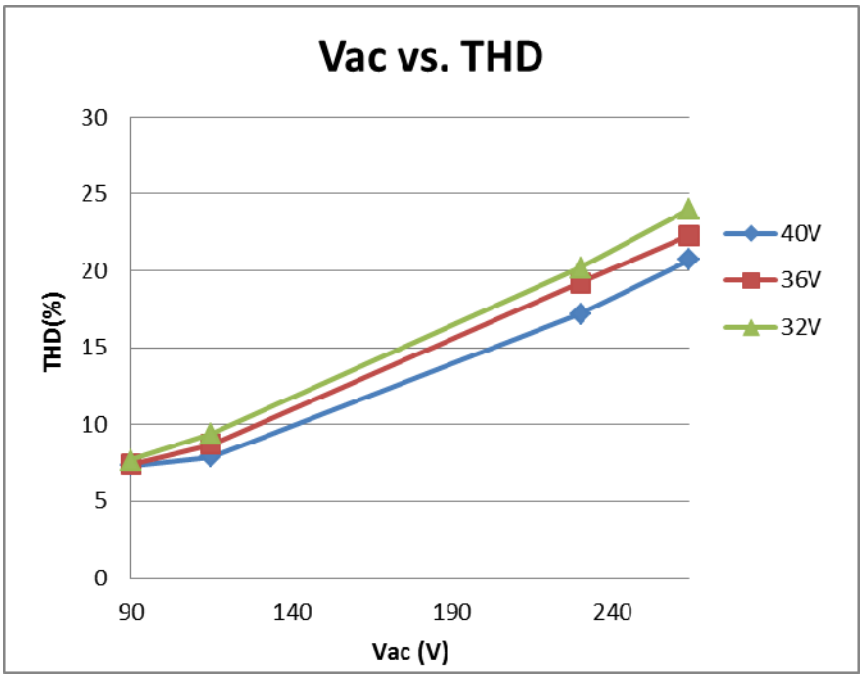


Fig. 2-2 Vac vs. THD

3. Efficiency Test

Test Conditions:
Input: 90Vac/115Vac/230Vac/264Vac (60Hz)
Output: CV mode (40V),
Ambient Temperature: 25℃

V_{out}(V) / Eff.(%)	P_{in} (W)	I_o (mA)	V_o (V)	Efficiency (%)
90Vac	11.48	0.2484	39.99	86.53
115Vac	11.49	0.2534	39.99	86.56
230Vac	11.22	0.2504	39.99	89.25
264Vac	11.17	0.2481	39.99	88.82

Table 3

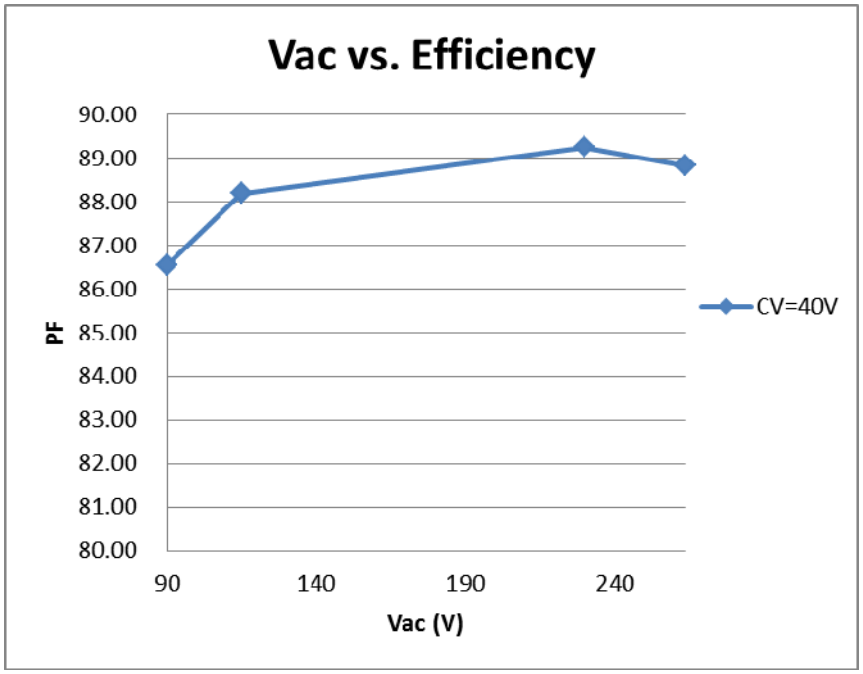


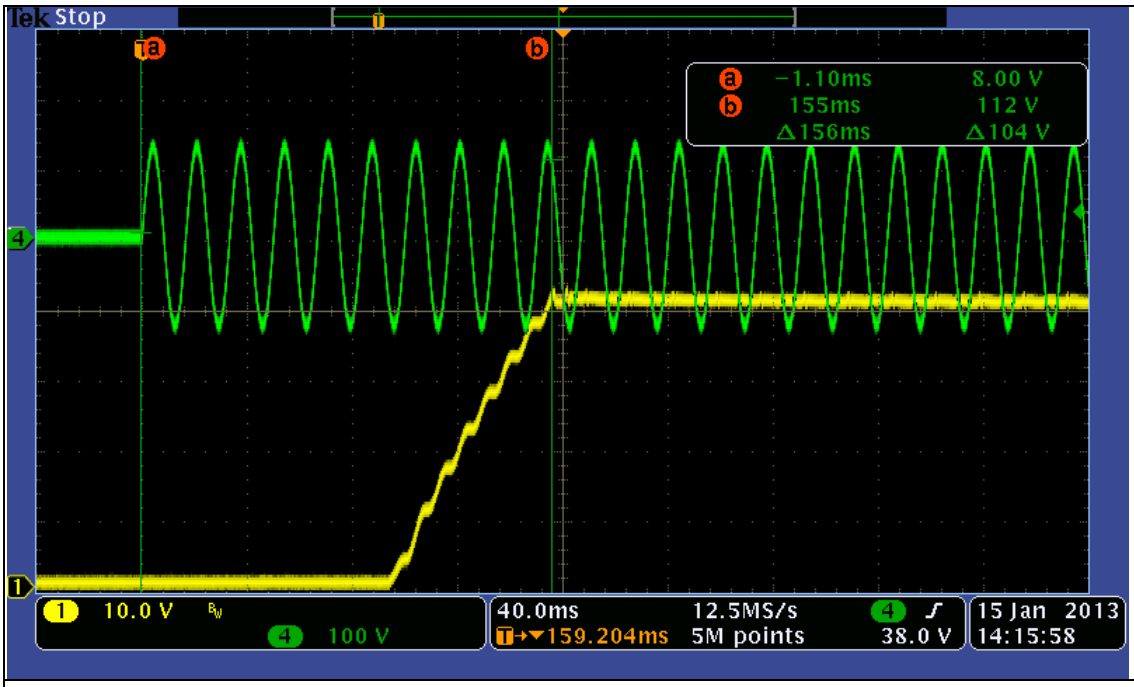
Fig.3 Vac vs. Efficiency

4. Start-up Waveforms

Test Conditions:
Input: 90Vac (60Hz)
Output: CV mode (40V)
Ambient Temperature: 25℃

Input	$T_{turn\ on\ delay}$
90Vac	156ms

Table 4

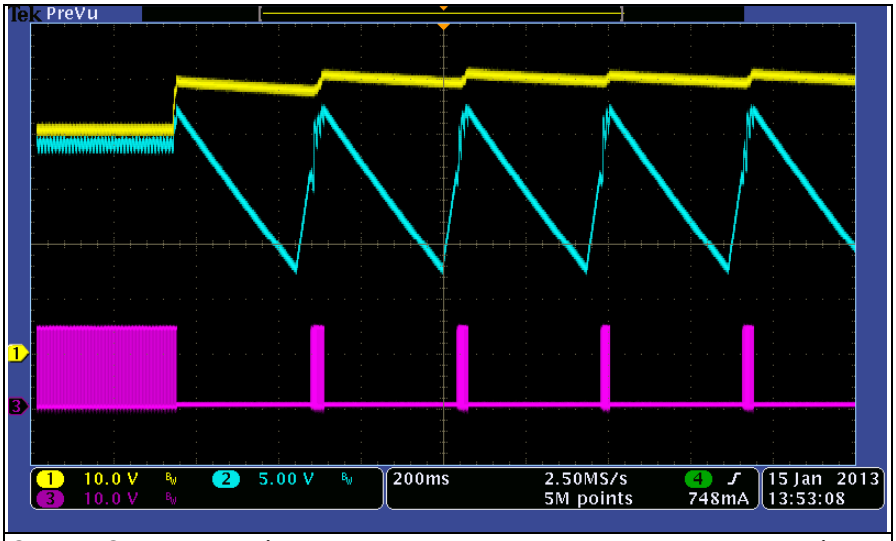


Start-up Waveforms
Vin: 90Vac
O/P : +40V/250mA
CH1: V_{ac}, CH2:V_{out}, CH4:I_{out}

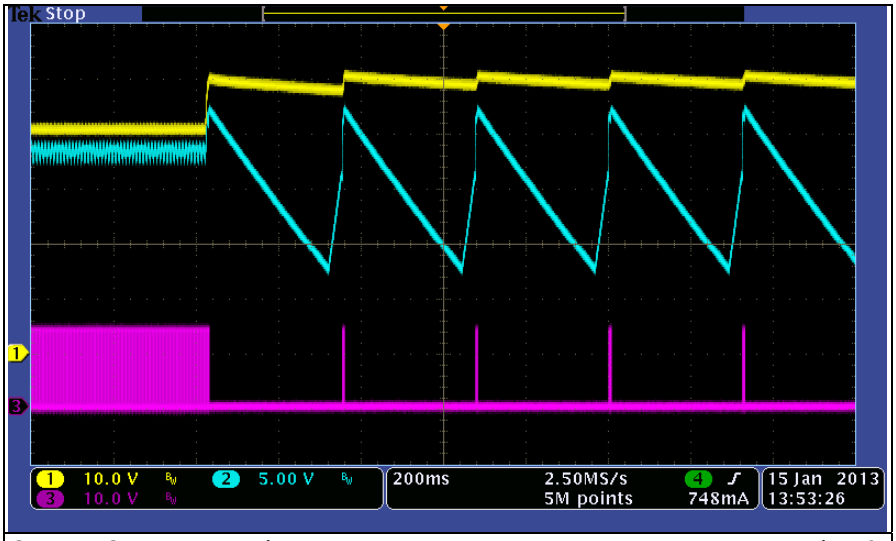
Fig. 4

5. Output Open Test

Test Condition:
Input: 90Vac/264Vac (60Hz)
Output: CV mode (40V)
Ambient Temperature: 25℃



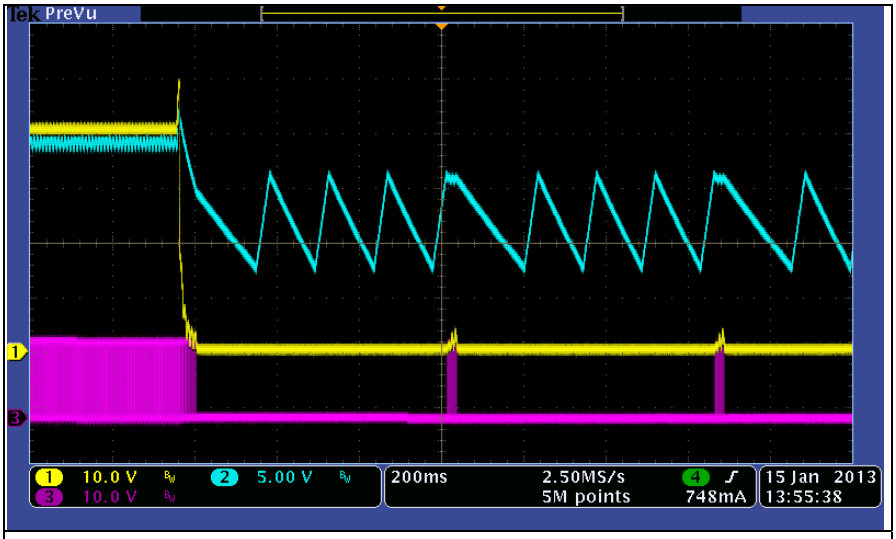
Output Open protection Fig. 5
Vin: 90Vac, O/P : +40V/250mA → Open
CH1: V_{out}, CH2:V_{cc}, CH3:Gate



Output Open protection Fig. 6
Vin: 264Vac, O/P : +40V/250mA → Open
CH1: V_{out}, CH2:V_{cc}, CH3:Gate

6. Output Short Test

Test Condition:
Input: 90Vac/264Vac(60Hz)
Output: CV mode (40V)
Ambient Temperature: 25℃



Output Short protection Fig. 7
Vin: 90Vac, O/P : +40V/250mA→ Short
CH1: V_{out}, CH2:V_{cc}, CH3:Gate

Output Short protection Fig. 8
Vin: 90Vac, O/P : +40V/250mA→ Short
CH1: V_{out}, CH2:V_{cc}, CH3:Gate

7. Power Component Stress Voltage

Test Condition:
- Set the output loads at full load and ambient 25 ºC.
- The PSU test on everyone voltage and frequency.

Check:
- Under Steady state the de-rating shall be below **100%.**
- Under Transient state the de-rating shall be below **100%**.

Result:
Input Voltage: 90Vac/264Vac (60Hz)
Output Power: CV mode (40V)

No.	Location	Max. Rating(V)	Steady State(90V / 60HZ)	
			Measurement	Derating(%)
			V	V
1	Q1	600	305	50.83%
2	D1	200	89	44.50%

Table 5-1

No.	Location	Max. Rating(V)	Transient State(90V / 60HZ)	
			Measurement	Derating(%)
			V	V
1	Q1	600	315	52.50%
2	D1	400	134	33.50%

Table 5-2

No.	Location	Max. Rating(V)	Steady State(264V / 60HZ)	
			Measurement	Derating(%)
				V
1	Q1	600	550	91.67%
2	D1	400	221	55.25%

Table 5-3

No.	Location	Max. Rating(V)	Transient State(264V / 60HZ)	
			Measurement	Derating(%)
				V
1	Q1	600	570	95.00%
2	D1	400	316	79.00%

Table 5-4

8. Transformer Specification:

- Bobbin : RM6, 6PIN
- Core : RM6, PC40
- Inductance(PIN 6 - 1) : 1530uH ±5%@1KHZ/1V
- NP/NS/NVcc : 93/29/13
- F1、F2 上方出線，長 35mm 含 5mm 鍍錫，F2 加黑色套管