



Hi-PF and Low THD Constant Voltage LED Driver

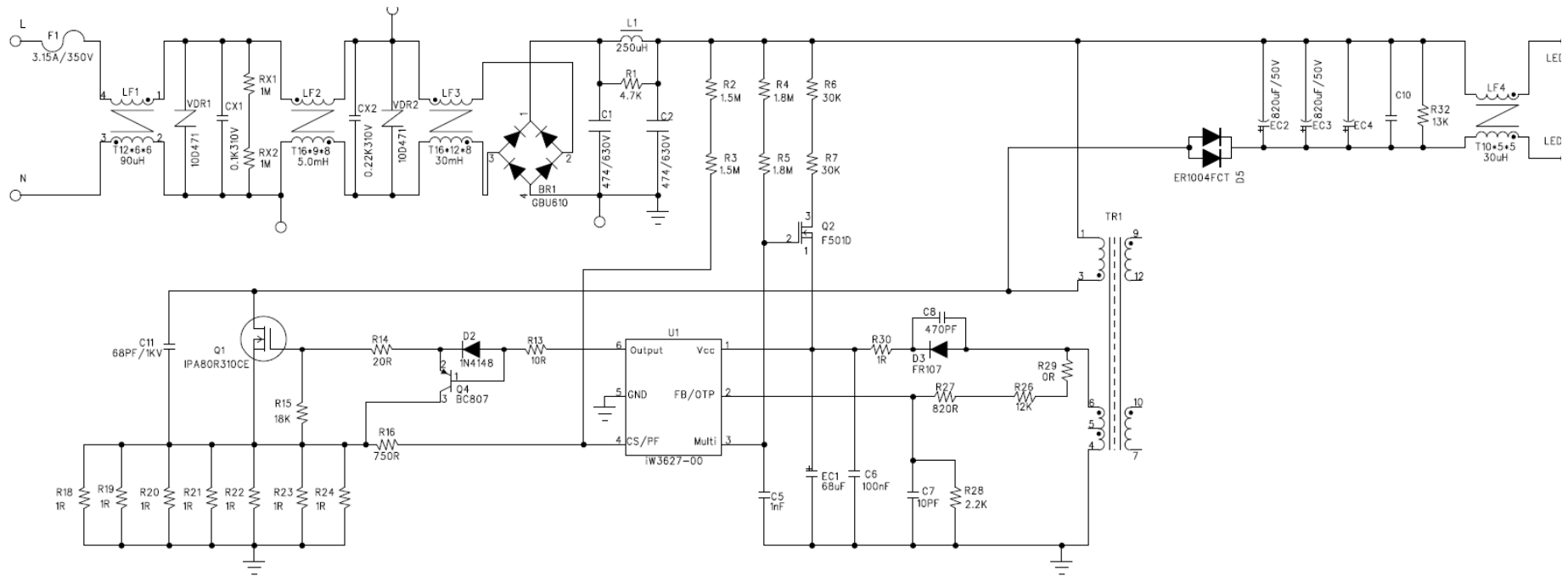
--- iW3627-00

General Design Specification:

1. AC Input Range: 100-264V_{AC}
2. DC Output: 100V1.2A
3. 此产品符合CCC认证标准
4. 使用PSR电路设计，使产品具有高效率，低成本，可靠性高等特点
5. 符合高压直流灯带场合
6. 恒压输出，可做智能产品供电前级，0-10V,调光，调色温等

Description		Symbol	Min	Typ	Max	Units	Comment	
Input								
Voltage		V_{IN}	100	230	264	V _{AC}	2 Wire	
Frequency		f_{LINE}		50/60		Hz		
Open-load Input Power (264V _{AC})						W		
Output								
Const Voltage	Output Voltage	V_{OUT_CC}		100		V	Measured at the PCB connector	
	Output Current	I_{OUT_CC}		1200		mA		
Const Current	Output Voltage	V_{OUT_CC}				V	Min Vout is depend on Vcc	
	Output Current	I_{OUT_CC}				mA		
Total Output Power								
Continuous Output Power		P_{OUT}		120		W		
Over Current Protection		I_{OUT_MAX}		1.5		A	Auto-restart	
Efficiency		η	90			%	Measured at end of PCB	
Power Fact		PF	0.9				Harmonic meet IEC61000-3-2	
Turn on Delay Time					0.5	Sec		
Conducted EMI			Meets EN55015B					
Hi-pot test						KV		
Operation temperature		T_{opr}		40		° C	Free convection, sea level	

原理图



Yuhao DEMO 120W 100V1.2A iW3627 PQ3220

BOM表



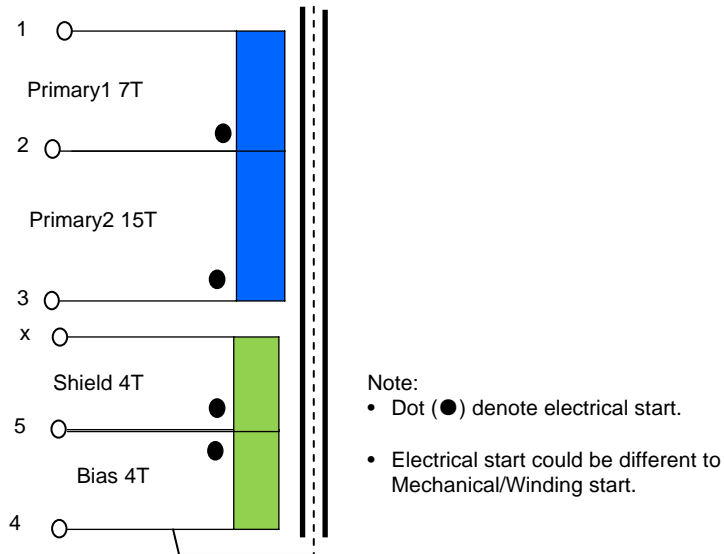
Item	Qty.	Ref.	Description
1	1	U1	iW3627-00, Off-line digital PWM Controller, SOIC-6
2	1	C1	474/630V CBB, PIN=15.0mm Size:18mmx15.5mmx9.5mm
3	1	C2	474/630V CBB, PIN=15.0mm Size:18mmx15.5mmx9.5mm
4	1	C3	2.2nF, 1000V, P=5.0mm
5	1	C5	1nF,50V,X7R,SMD-0805
6	1	C6	100nF,50V,X7R,SMD-0805
7	1	C7	10pF,50V,NPO,SMD-0805
8	1	C8	470pF,250V,X7R,SMD-0805
9	1	C9	100pF,500V,NPO,SMD-1206
10	1	C11	68pF,1000V,NPO,SMD-1206
11	1	EC1	68uF,25V,Low ESR E-Cap, Φ5mmX11mm
12	2	EC2,EC3	820uF, 50V, E-Cap, Φ12.5mmX25.5mm
13	1	CX1	104/310V X2, PIN=10mm Size:13mmx12mmx6mm
14	1	CX2	224/310V X2, PIN=10mm Size:13mmx16mmx8mm
15	2	CY1,CY2	102/400V Y1, Y-CAP,P=10.0mm
16	1	BR1	GBU610, 6A1000V, Bridge Rectifiers
17	1	D1	FR207 2A1000V Fast Recovery Rectifier, DO-15
18	1	D2	1N4148 200mA750V High-speed diode SOD-123
19	1	D3	FR107, 1A1000V, Fast Recovery Rectifier (Trr=500ns) , SOD-123
20	1	D4	5A600V, Diode, TO-220FCT
21	1	F1	F3.15A/350V, BUSS, SS-5FH, Fuse
22	1	L1	250uH, CM-Inductor, Wire: 0.7mmX63.5T Fe-Zn Core:T15.2*8.53*6
23	1	LF1	90uH, CM-Choke,Wire: 0.5mm*2X13.5Ts, Core: T12x6x6 Ni-Zn
24	1	LF2	≥5mH, CM-Choke,Wire: 0.5mm*2X20.5Ts, Core: T16x9x8 12K
25	1	LF3	≥25mH, CM-Choke,Wire: 0.5mm*2X52.5Ts, Core: T16x9x8 12K
26	1	LF4	30uH, CM-Choke,Wire: 0.7mm*2X9.5Ts, Core: T10x5x5 Ni-Zn
27	2	VDR1,VDR2	10D471K, MOV ,P=7.5mm
28	1	Q1	IPA80R310CE 310mΩ 800V, TO-220F
29	1	Q2	F501D, SOT-23-3, Vds=600V, Idss=0.012A, Rds=700Ω
30	1	Q4	BC807, SOT-23-3, Ic=-0.5A Vceo=-45V

BOM表



Item	Qty.	Ref.	Description
31	2	RX1,RX2	1.0MΩ ±5%, SMD-1206
32	1	R1	4.7KΩ ±5%, SMD-1206
33	2	R2,R3	1.5MΩ ±5%, SMD-1206
34	2	R4,R5	1.8MΩ ±5%, SMD-1206
35	2	R6,R7	30KΩ ±5%, SMD-1206
36	2	R8,R9	20Ω ±5%, SMD-1206
37	1	R10	200KΩ ±1%, 2W DIP
38	2	R11,R34	100Ω ±1%, 2W DIP
39	1	R13	10Ω ±5%,SMD-0805
40	1	R14	20Ω ±5%, SMD-1206
41	1	R15	18KΩ ±5%, SMD-0805
42	1	R16	750Ω ±5%, SMD-0805
43	3	R17,R18,R19	1.0Ω ±1%,SMD-1206
44	3	R20,R21,R22	1.0Ω ±1%,SMD-1206
45	3	R23,R24,R25	1.0Ω ±1%,SMD-1206
46	1	R26	12KΩ ±1%,SMD-0805
47	1	R27	820Ω ±1%, SMD-0805
48	1	R28	2.2KΩ±1%, SMD-0805
49	1	R29	0Ω±5%, SMD-1206
50	1	R30	1Ω ±5%, SMD-0805
51	1	R31	43Ω±5%, SMD-1206
52	1	JMP	∅0.5*16mm
53	2	R32,R33	13KΩ ±5%,SMD-1206
54	1	TR1	PQ3220, Transformer,Vertical
55	1	PCB	Sigle Side Board, FR-4
56	1	HS1	Heat sink
57	1	HS2	Heat sink

变压器参数



ELECTRICAL SPECIFICATIONS:

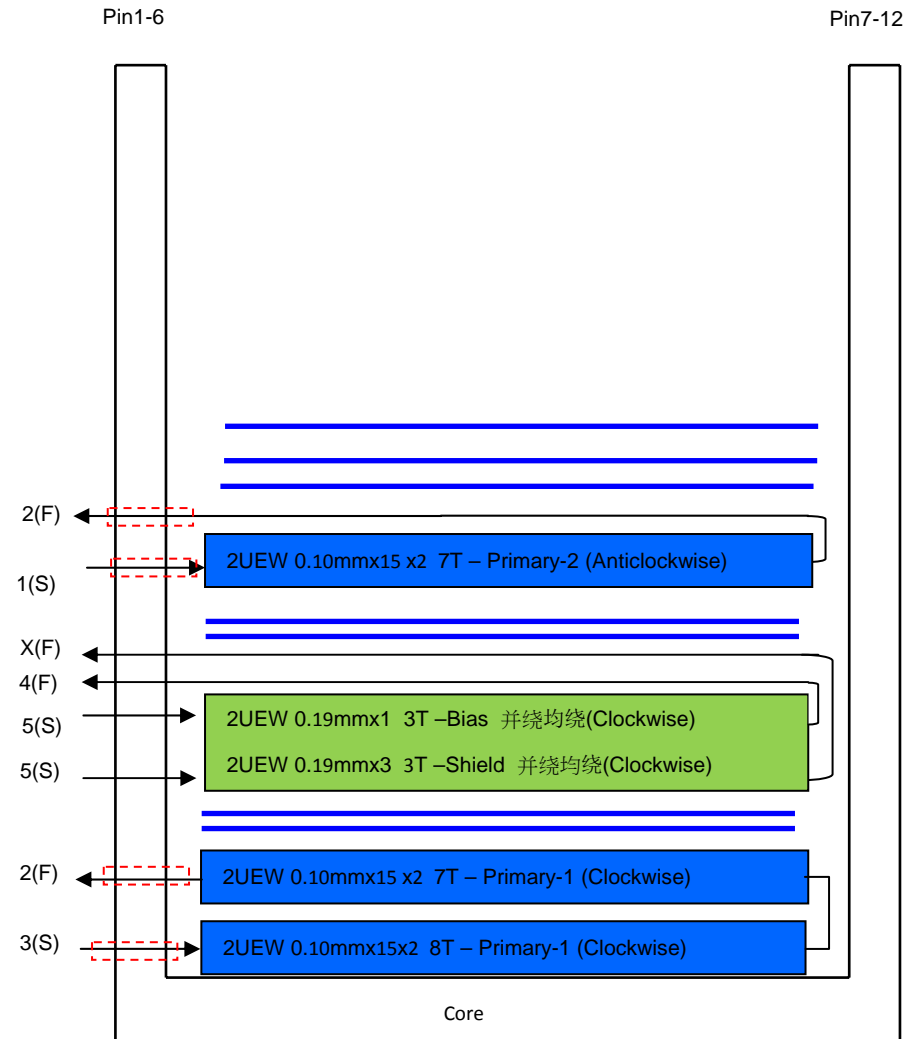
1. Primary Inductance (L_p) = 100uH @10KHz
2. Primary Leakage Inductance (L_k) ≤ 5uH@10KHz
3. Electrical Strength = 3KV, 50/60Hz, 1Min

MATERIALS:

1. Core : PQ3220 (Ferrite Material TDK PC95 or equivalent)
2. Bobbin : PQ3220 Vertical Primary=6, Secondary=6
3. Magnet Wires (Pri) : Type 2-UEW
4. Magnet Wire (Sec) : Triple Insulated Wires
5. Layer Insulation Tape : 3M1298 or equivalent.

FINISHED :

1. remained of Pin6,8,11 and cut Pin2 2/3 after wires termination
2. Core connect to Pin4.
3. Varnish the complete assembly

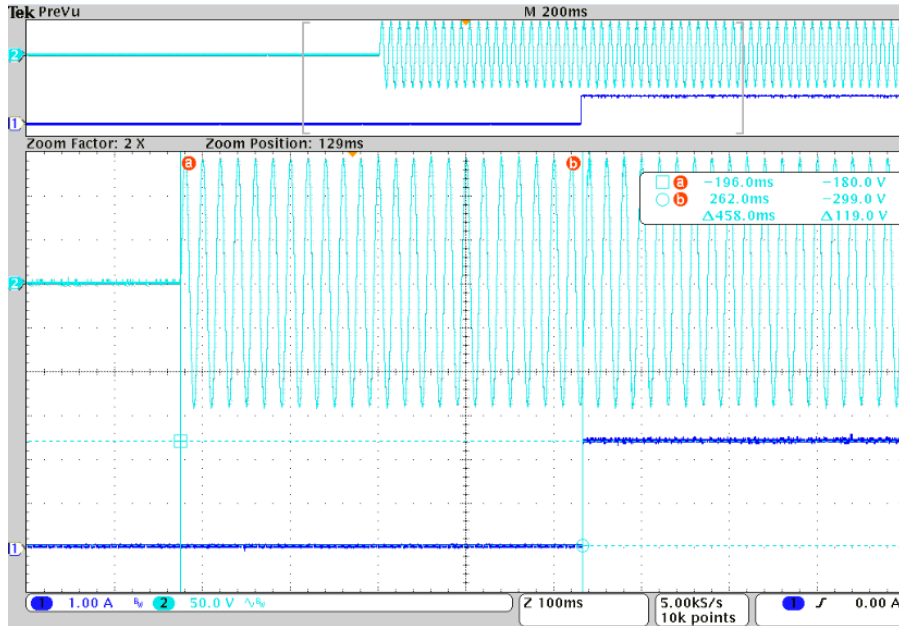


效率测试



Vin (V)	Pin (W)	Iin(max) (mA)	Vout (V)	Iout(max) (mA)	PF	Eff (%)
100	133.11	1331	101.50	1200	0.992	91.50%
120	132.21	1107	101.60	1200	0.991	92.22%
220	131.10	596	101.60	1200	0.970	93.00%
230	130.26	565	101.70	1200	0.965	93.69%
260	129.65	498	101.70	1200	0.951	94.13%

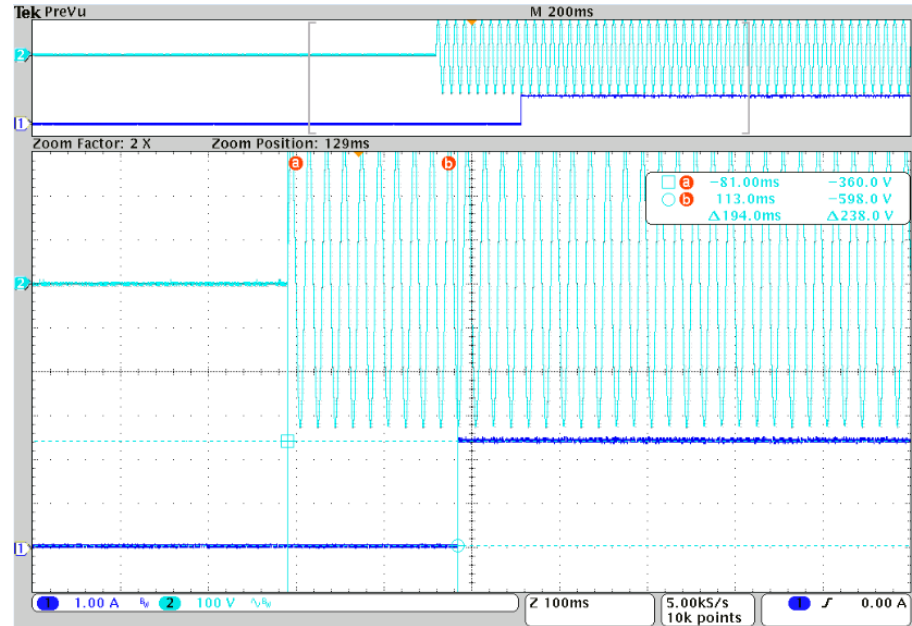
满载起机时间测试



100V_{AC}, Full Load
Vcc cap 68uF

Output cap: 220uF*4
PF>0.993

T_{ST_DELAY}= 458mS

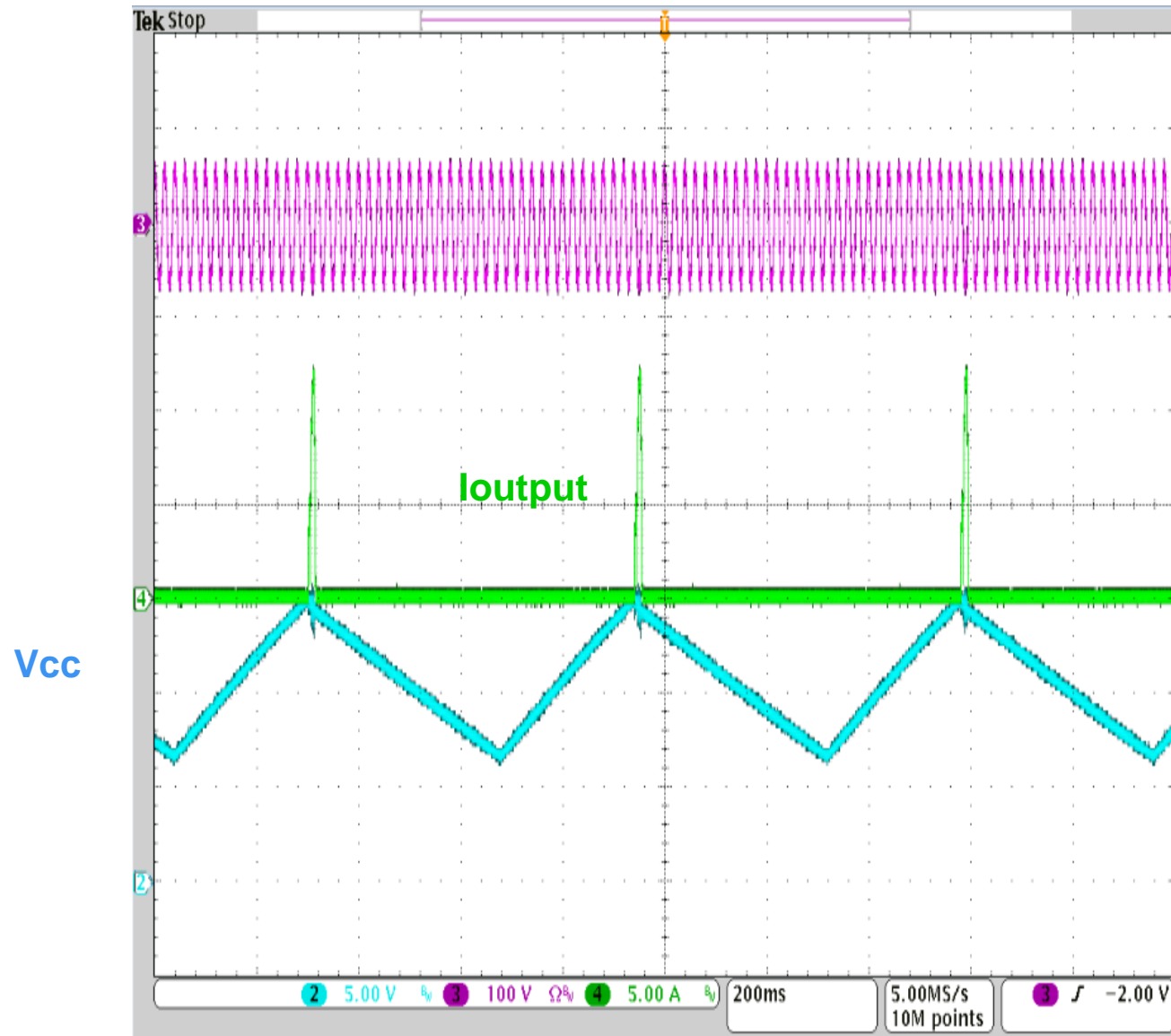


230V_{AC}, Full Load
Vcc cap 68uF

Output cap: 220uF*4
PF>0.968

T_{ST_DELAY}= 194mS

短路保护测试

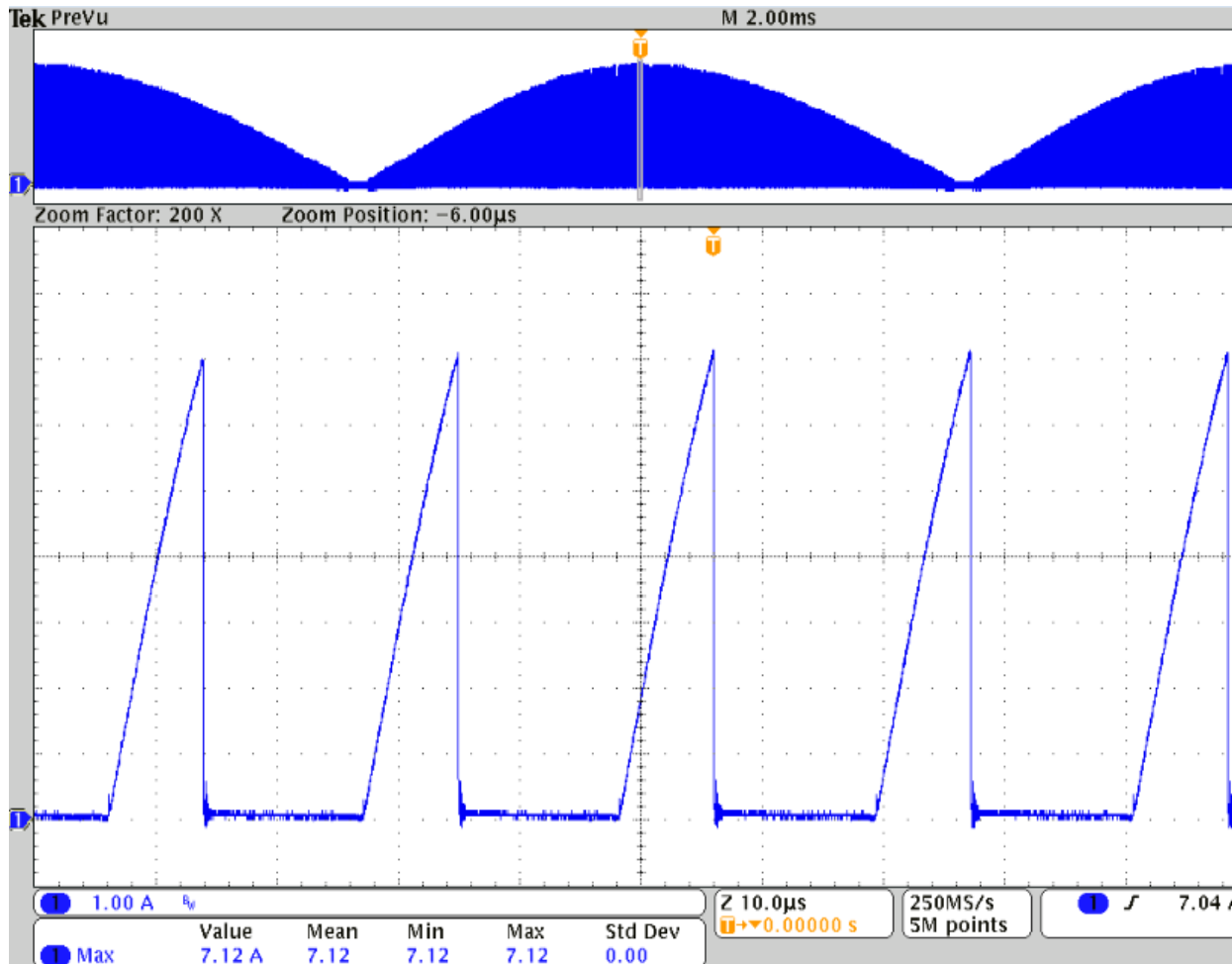


**Vin = 220V, output
Short circuit, Pin
= 2.41 W.**

变压器磁通量测试



($N_p=22T_s$, $L_m=0.1mH$, $A_e=170mm^2$ PQ3220)



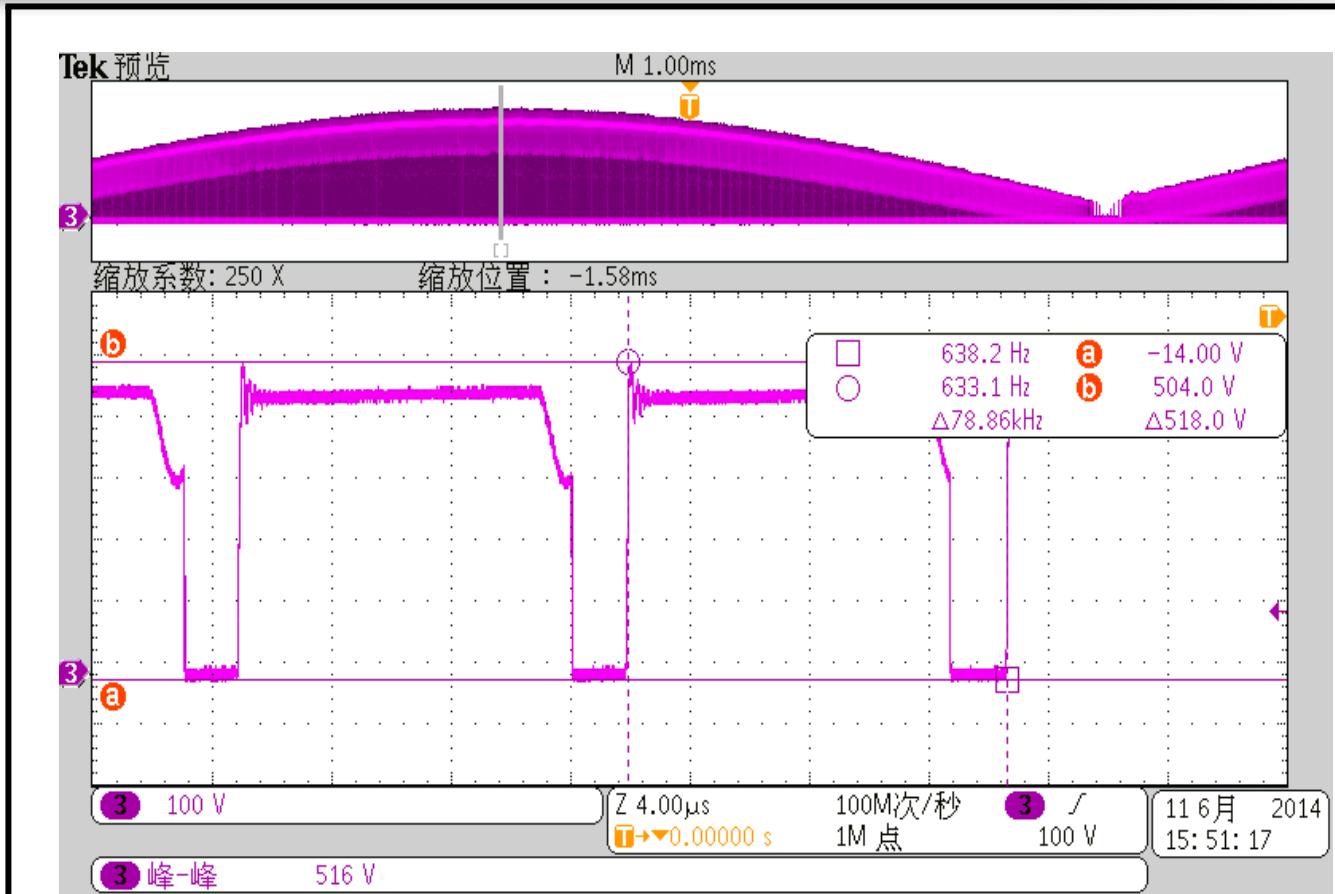
I_p is monitored at 220Vac
and 100V1200mA load

$I_p=7.12A$

$$B_{MAX} = I_p * L_m / (N_p * A_e)$$
$$= (7120 * 0.1) / (22 * 170)$$
$$= 0.215 \text{ Tesla}$$

B_{MX} 很小，不需担心饱和，只要控制好电流噪声。

MOS管Vds



Test Condition:

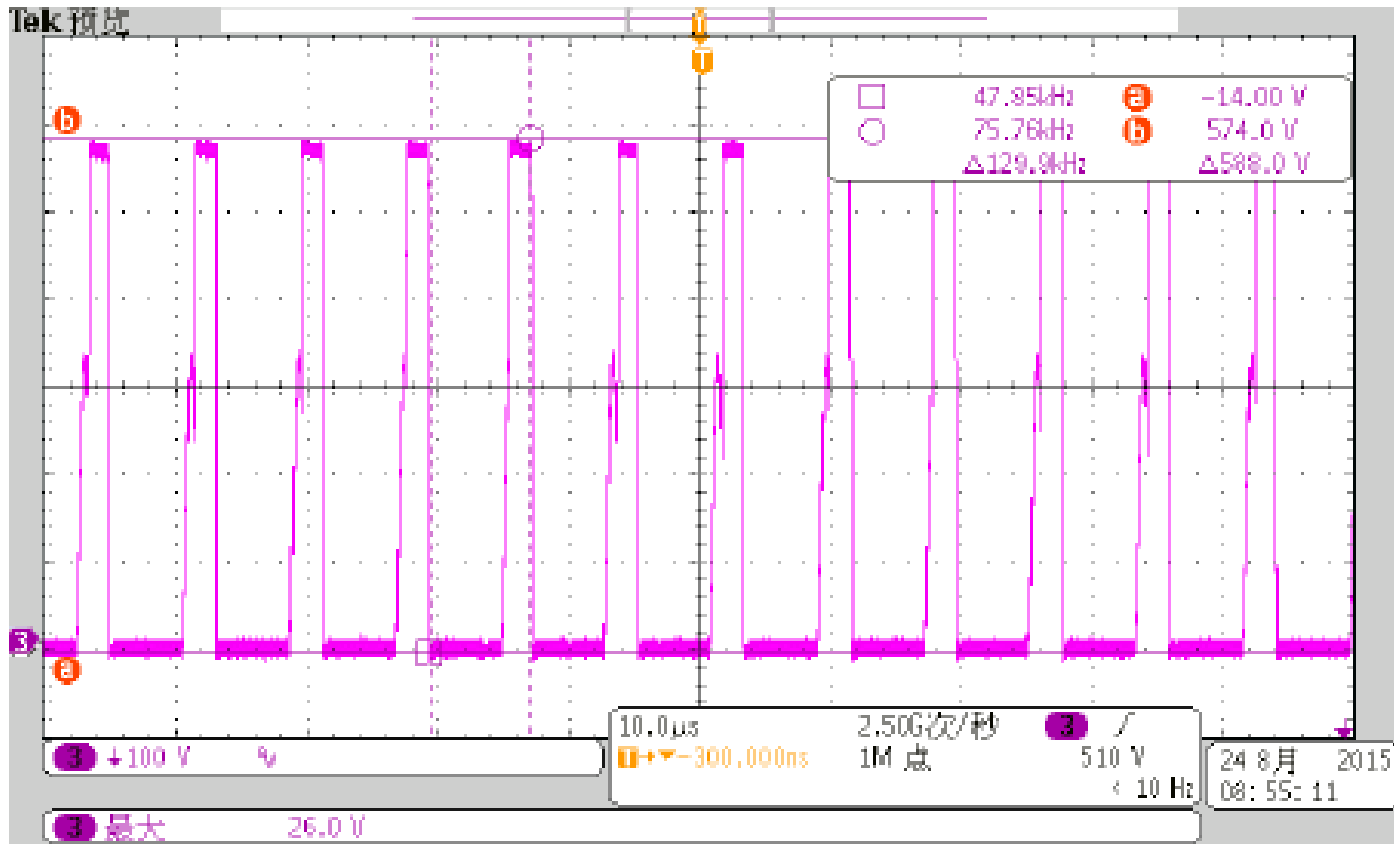
$V_{IN}=264V_{AC}$,

**Output:
35V2400mA**

Result:

$V_{DS_MAX}=516V$

输出二极管峰值电压

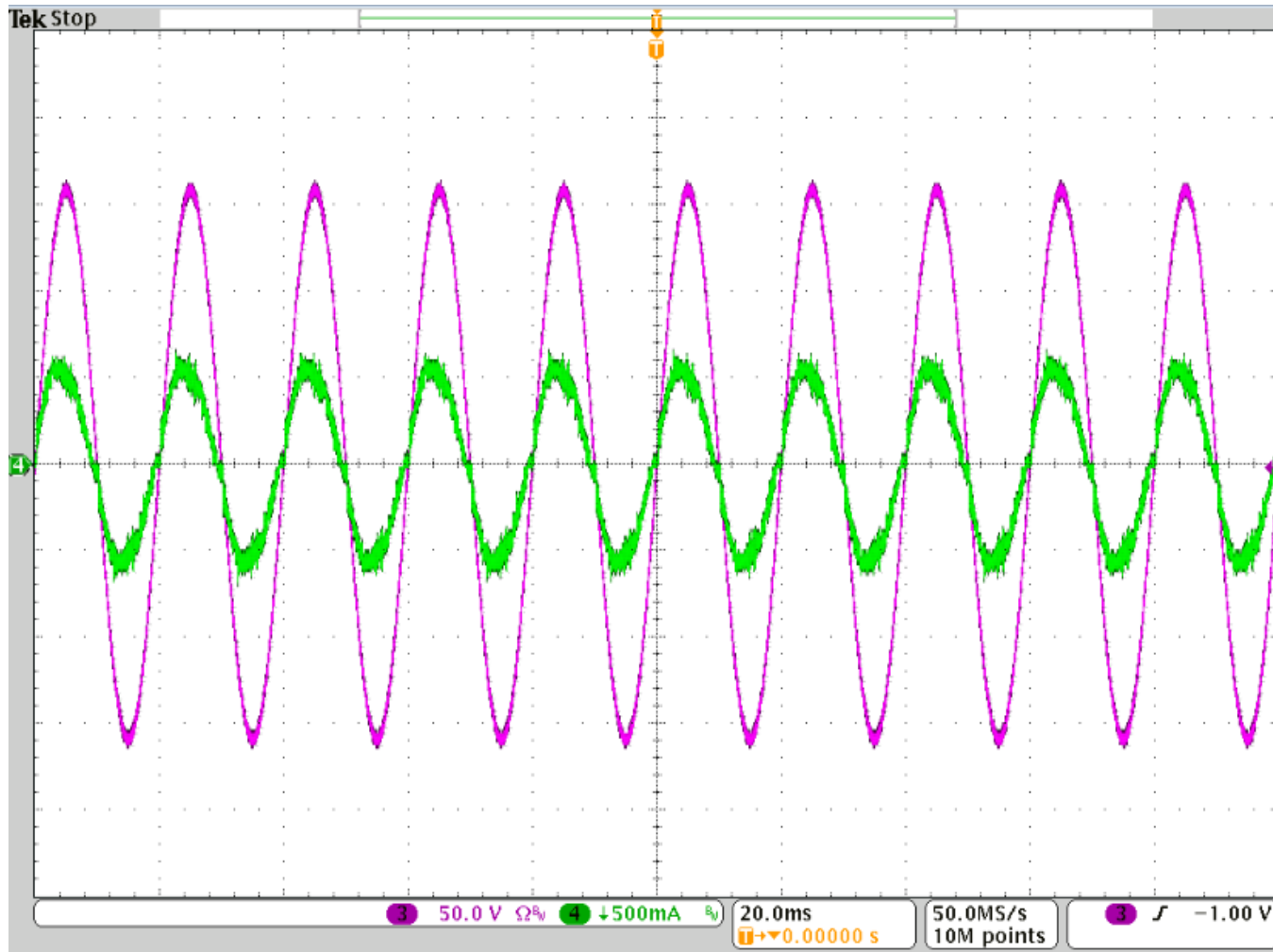


Test Condition:
 $V_{IN}=264VAC$,
Output:100V/1200mA

Result: $V_R = 580V$

Output rectifier diode:
ER506(5A600V)

Vin & Iin



AC input Voltage

AC input current

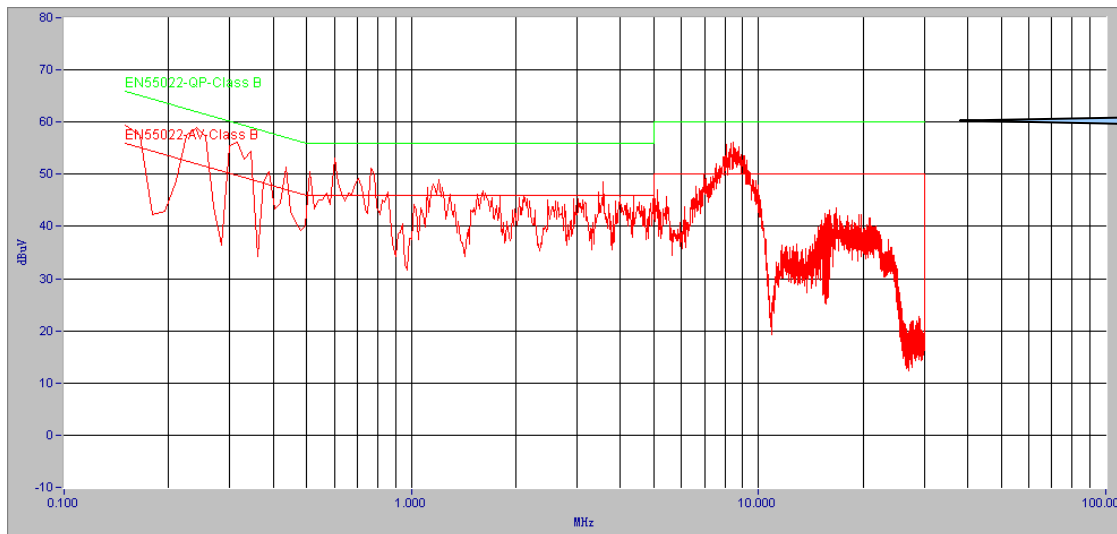
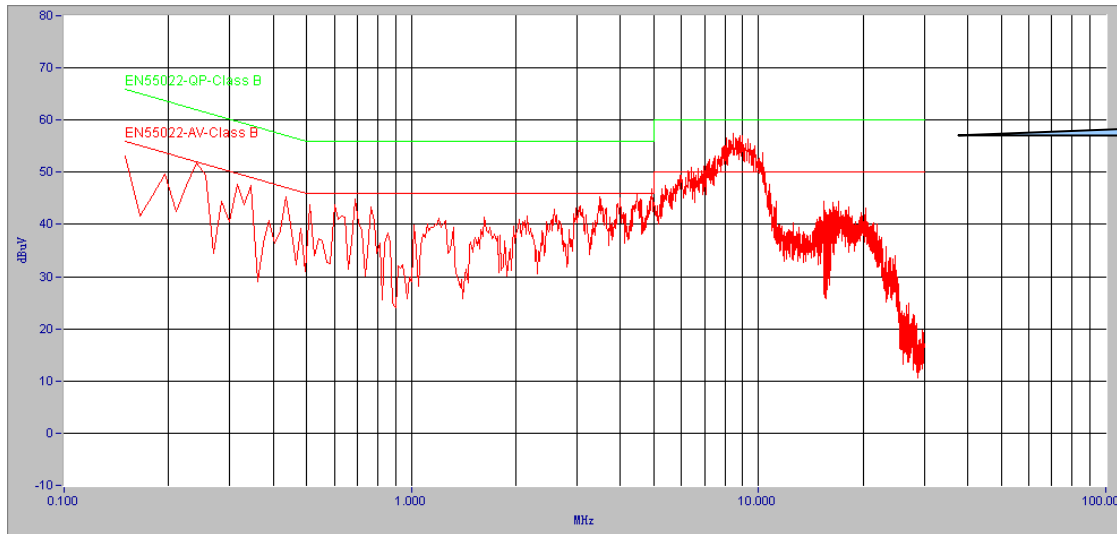
**Vin 230Vac, Output:100V/1200mA
PF:0.968**

温升记录

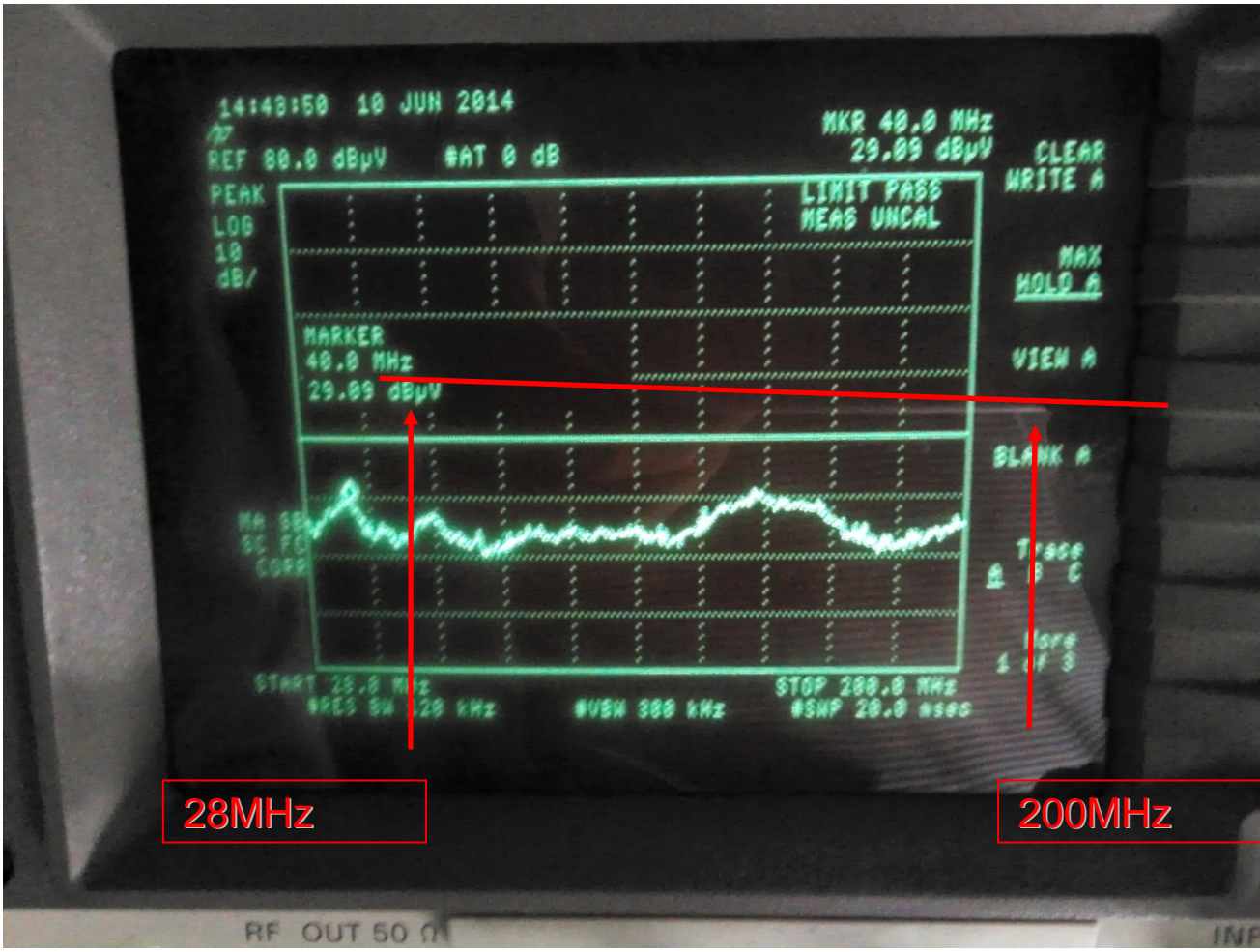


Item	$V_{IN}=100V_{AC}, V_{OUT}=100V I_{OUT}=1.2A$		$V_{IN}=263V_{AC}, V_{OUT}=100V I_{OUT}=1.2A$	
	Temp.(°C)	Rising Temp.(°C)	Temp.(°C)	Rising Temp.(°C)
Transformer(TR1, PQ3220)	89.1	64.1	77.6	52.6
MosFet(Q1, IPA80R280P7)	102.3	77.3	96.5	71.5
Diode(D5,ER506FCT)	101.6	76.6	93.8	68.8
Bridge(BR1, GBU610)	92.8	67.8	90.1	65.1
Inductance(L1, 250UH)	74.6	49.6	70	25
PWMIC(U1, iW3627-00)	77.2	52.2	65.5	40.5
Ambient(Chamber) Temp.	25		25	

传导测试



辐射频谱测试



Test condition: 230Vac 100V1200mA

谢谢!