**老式TL494\_KA7500半桥ATX电源三极管改进为MOS (发起人：Shadow Ferry)**

**Improve Old Half-bridge ATX Power Supplies from BJT to MOS (Initiator: Shadow Ferry)**

前言：

F.1:生命没有彩排！！！务必确保所有变压器即使在单一介质/热失效时也至少满足加强绝缘！！！F.2:莫要机械模仿！你可能需要按实际情况调节参数，该文也可能存在错误。

F.3:作为业余人士，意在用相似部件微调架构减轻我们共同的地球母亲资源和能源消耗。

F.4:已经大致比较出修改后次级3.3V使用TMBS®或SBR®特殊肖特基的MOS半桥达80 PLUS®银牌等级。

Foreword:

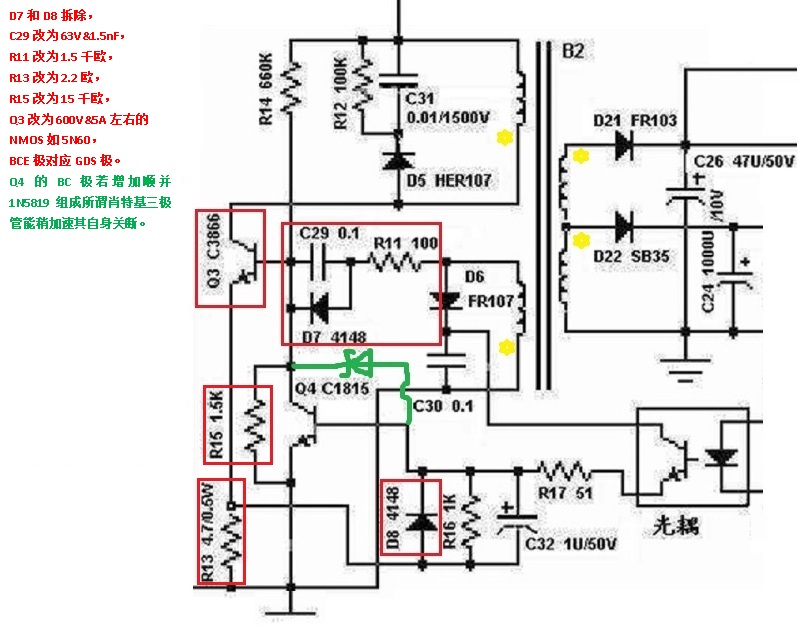
F.1: LIFE IS NOT A REHEARSAL!!! Do make sure that all the transformers are of reinforced insulation at least even if there is a single dielectric/thermal failure!!!

F.2: DO NOT BE A COPYCAT! You may have to adjust the parameters according to your real situation, and also there may be errors in this article.

F.3: As an amateur, the initiator intends to relive the earth, our co-mother, of resource & energy consumption while we are using similar components but tiny different architecture.

F.4: It is roughly compared that the modified MOS half bridge with 3.3V secondary rectification by TMBS® (Trench MOS Barrier Schottky) or SBR® (Super Barrier Rectifier) special Schottkies reaches the 80 PLUS® silver rank.

**回合1：改待机RCC电路**（注意：RCC的辅助绕组同名端不同于常规反激变压器）

**Round 1: Change the standby RCC circuit** (Beware that the magnetic polarity of a RCC’s auxilary winding is different from an ordinary flyback transformer)

图R1，Figure R1



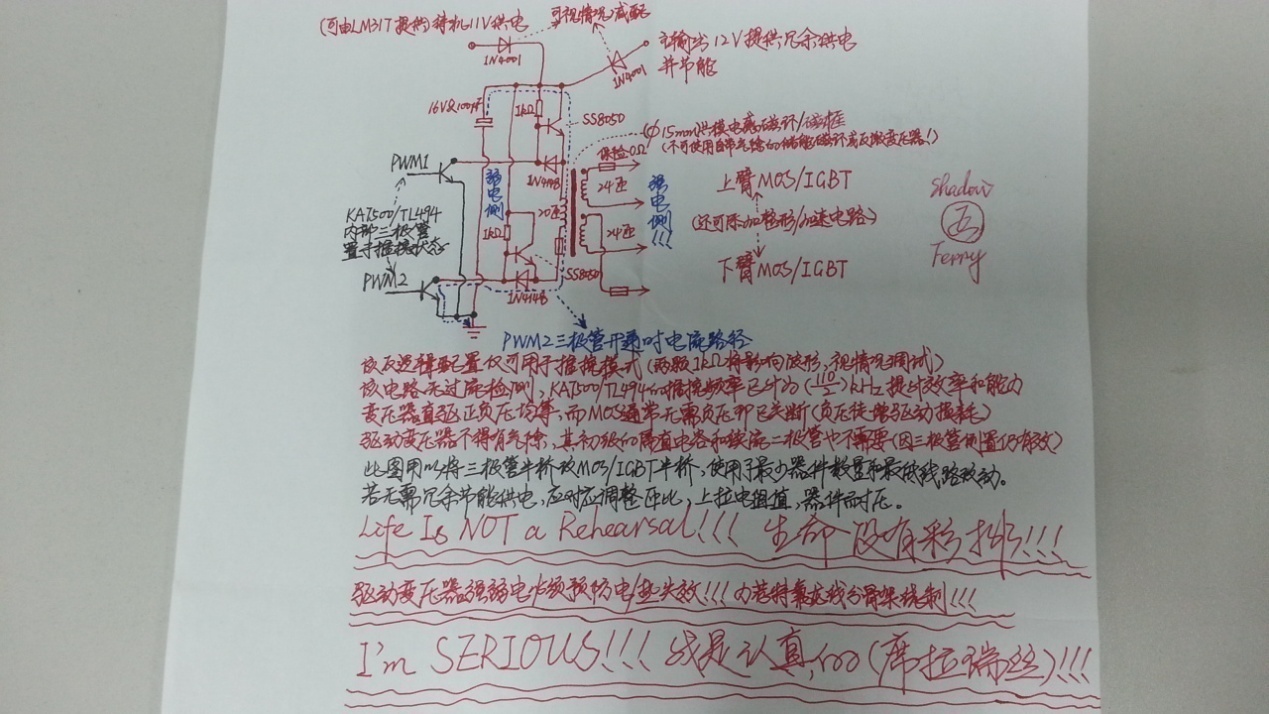
证物R1.1，Evidence R1.1



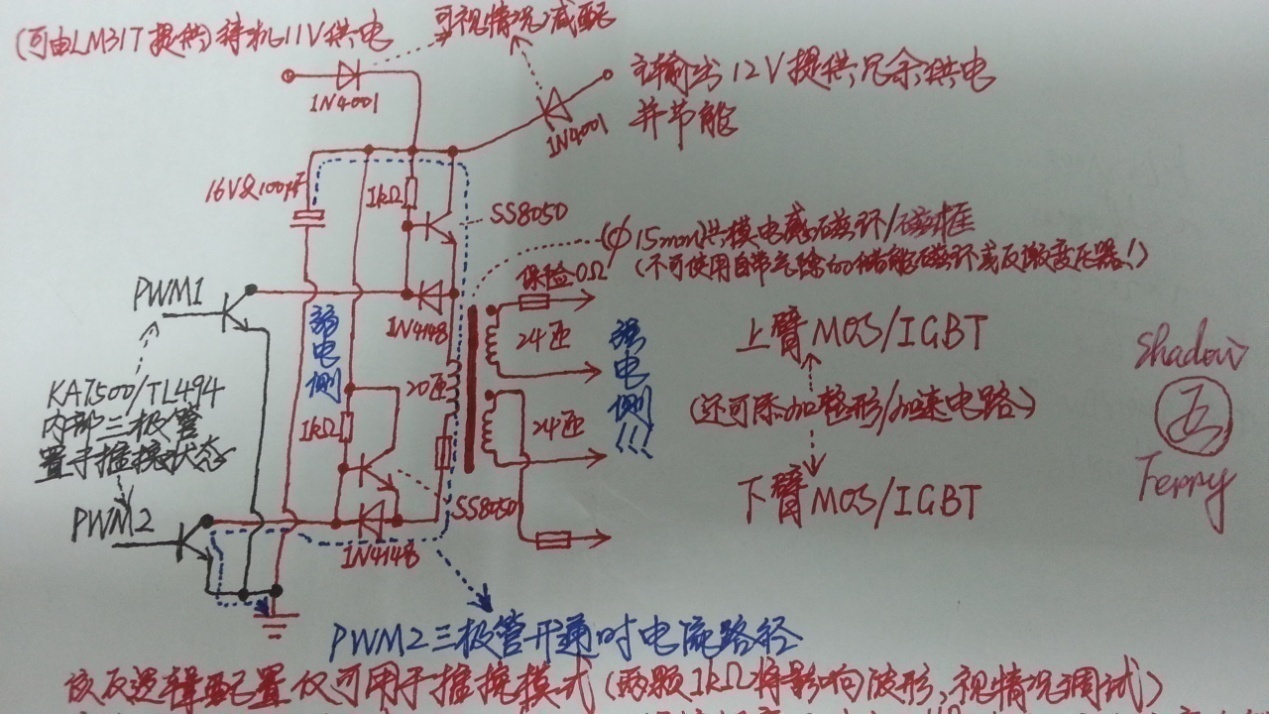
证物R1.2，Evidence R1.2

**回合2：改驱动变压器（必须至少加强绝缘且无任何固有式或预留式气隙！！！）**

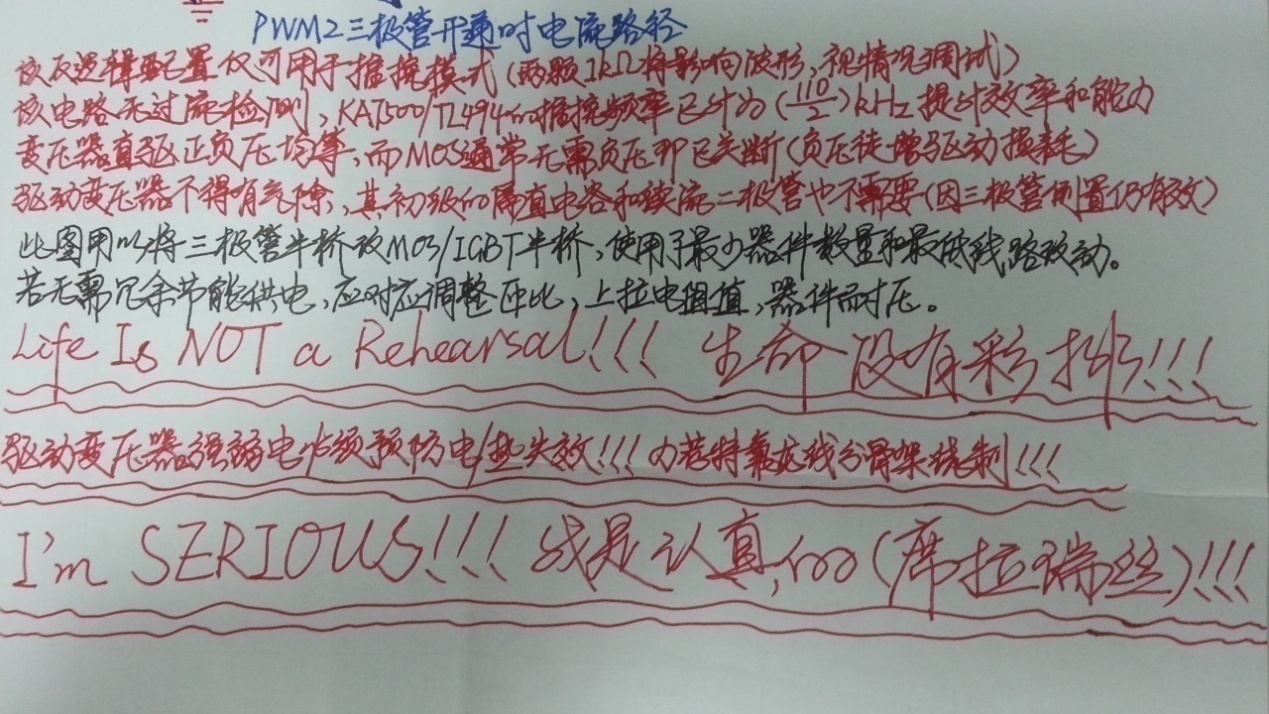
**Round 2: Change the driving transformer (MUST be of reinforced insulation at least & no any gap either inherent or deliberate!!!)**



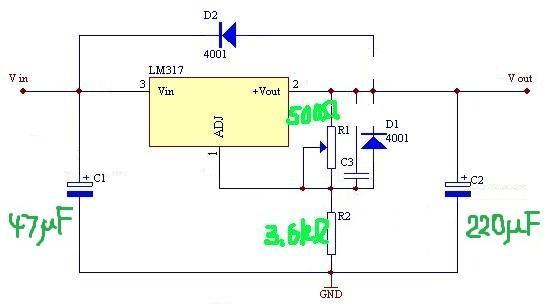
图R2.1，Figure R2.1



图R2.2，Figure R2.2



图R2.3，Figure R2.3

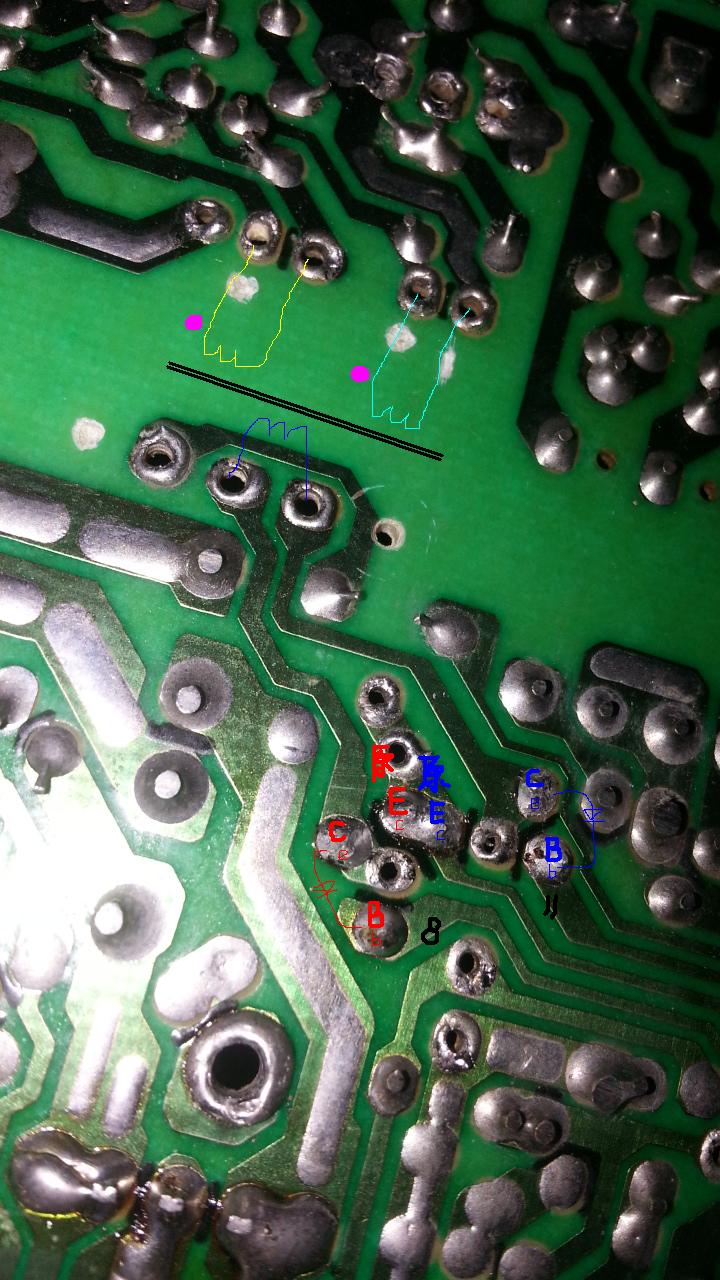


图R2.4，Figure R2.4

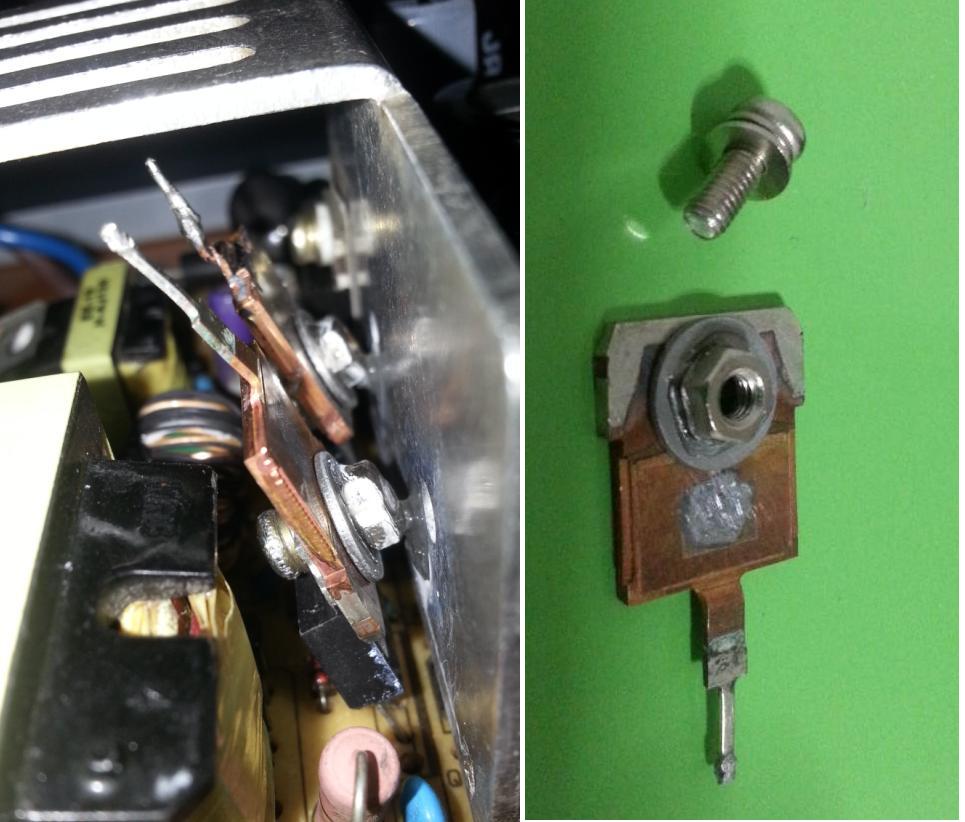


证物R2.1，Evidence R2.1

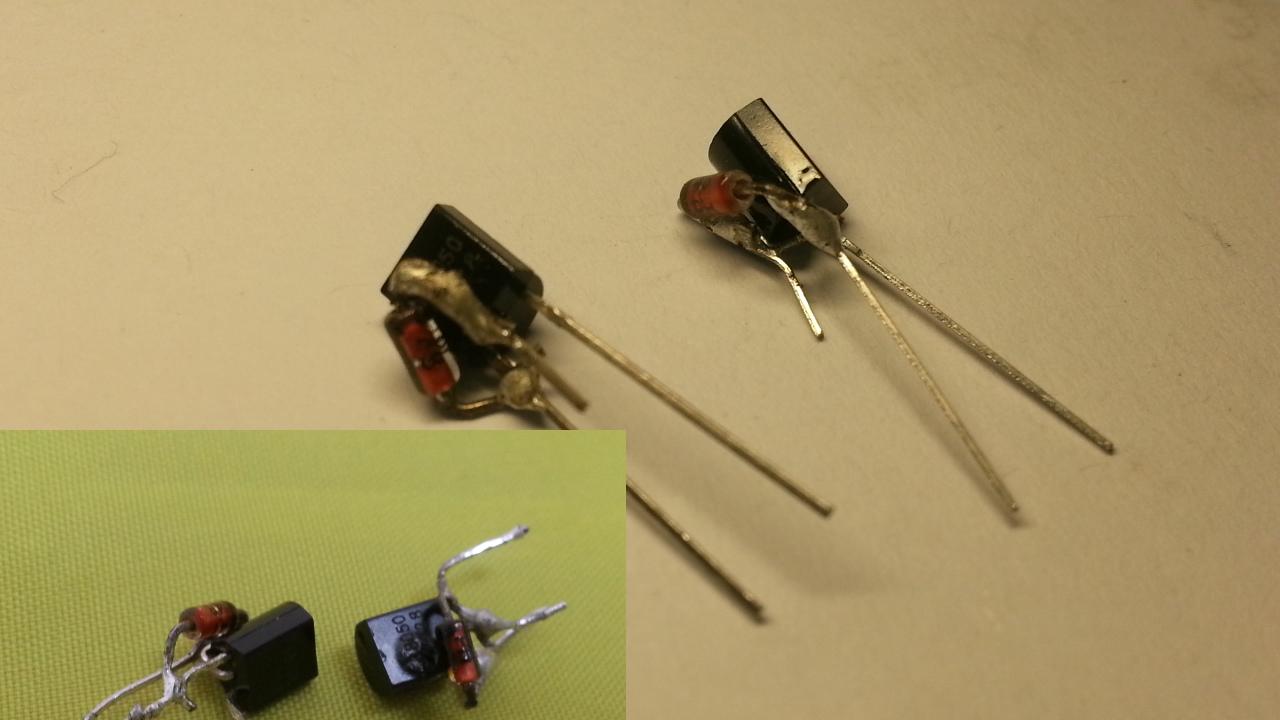


证物R2.2，Evidence R2.2

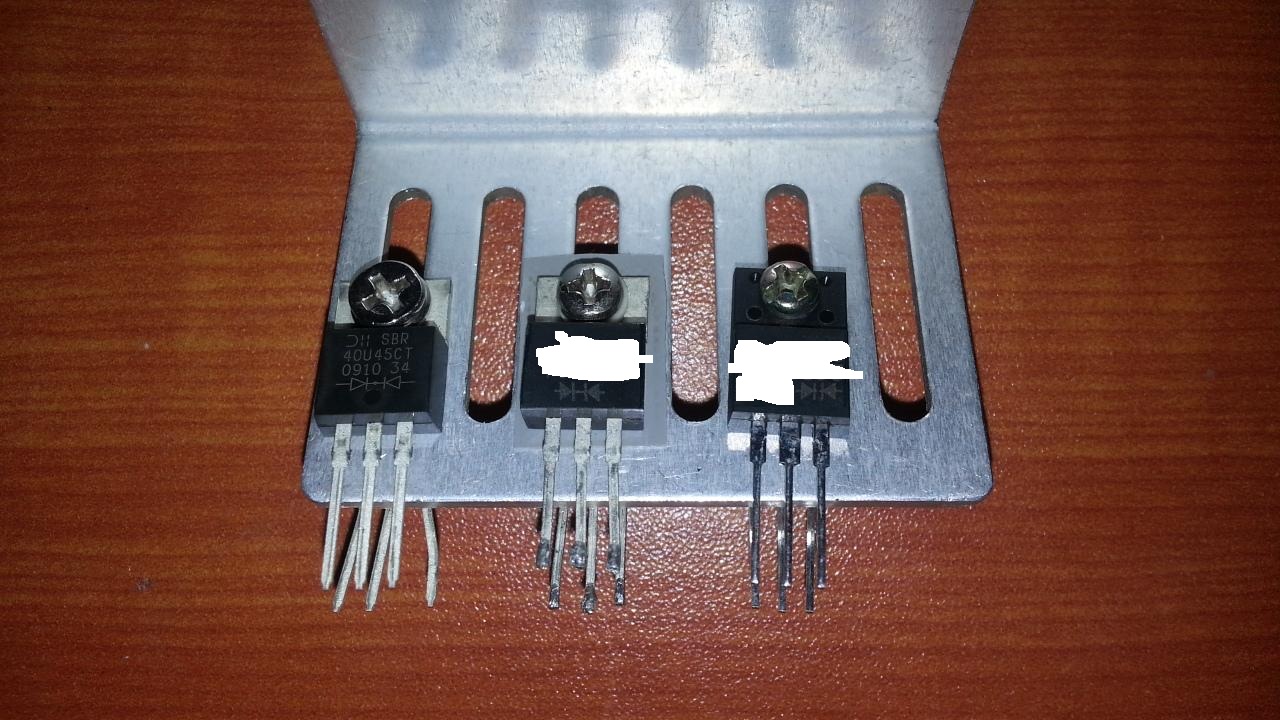
证物R2.3，Evidence R2.3



证物R2.4，Evidence R2.4

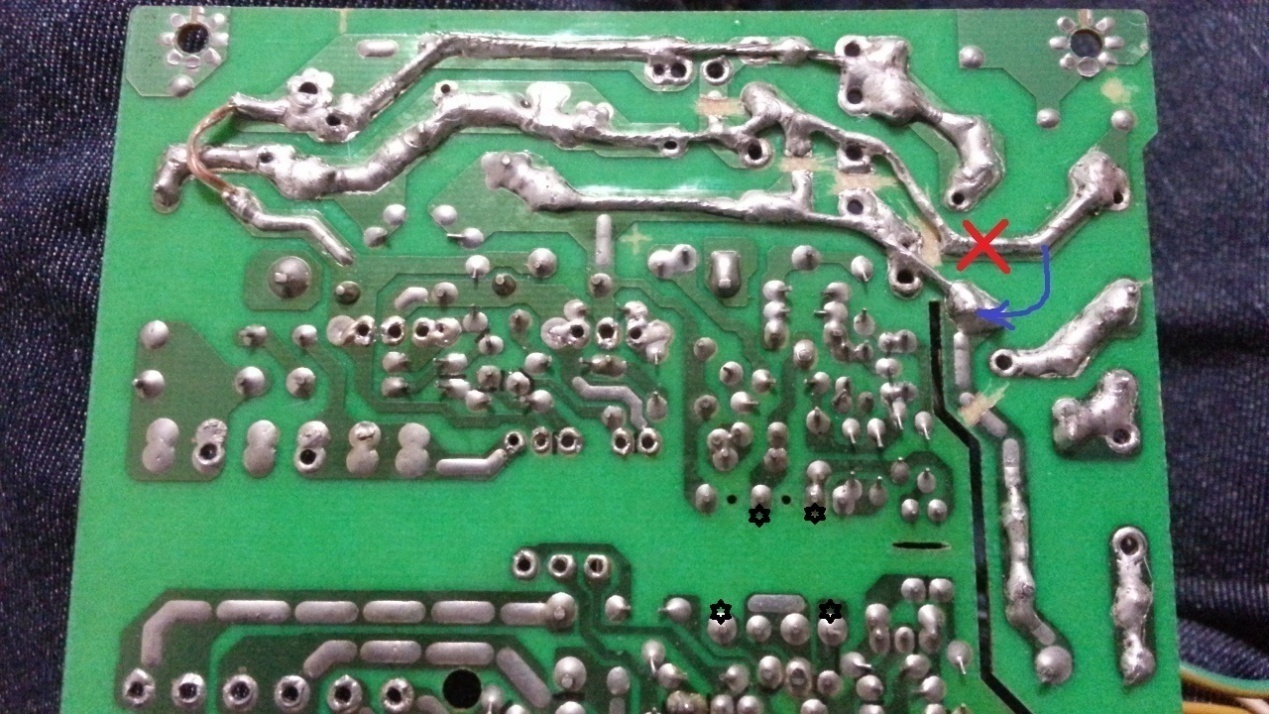


证物R2.5，Evidence R2.5



证物R2.6（所有双二极管各自视为/用作单颗更好），

Evidence R2.6 (All dual diodes are better regarded/used as single respectively)



证物R2.7，Evidence R2.7

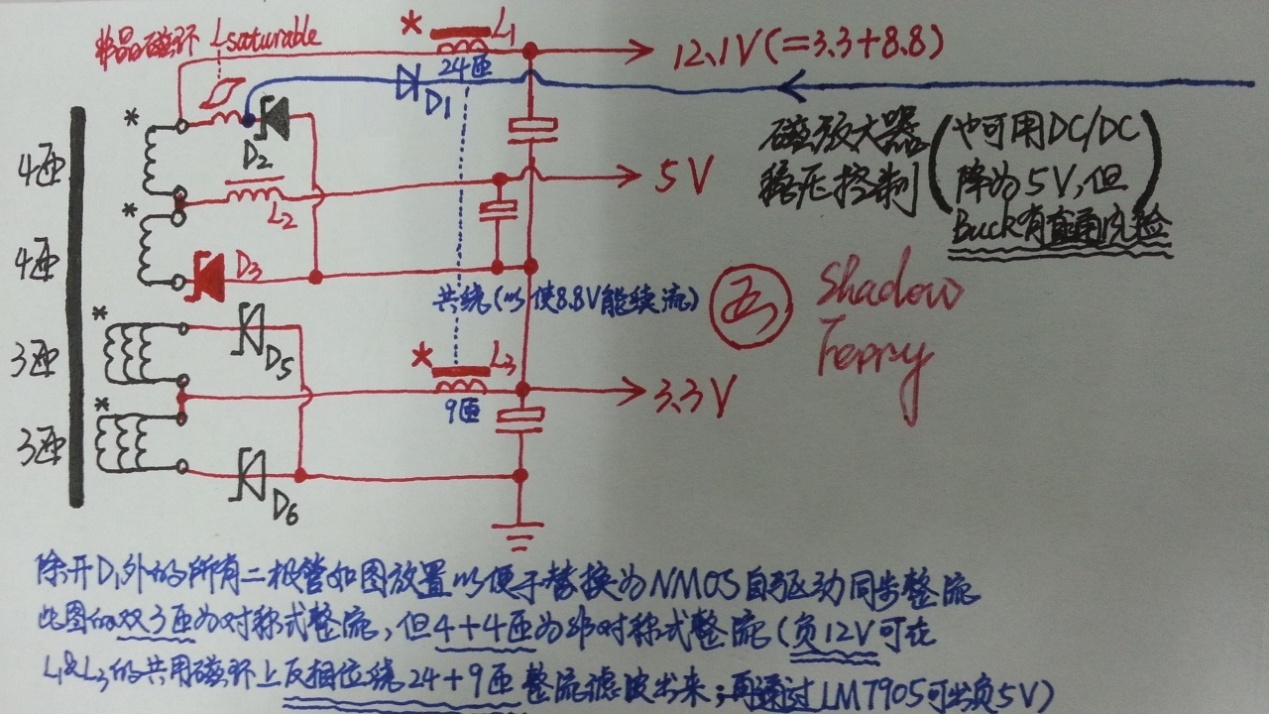


证物R2.8，Evidence R2.8

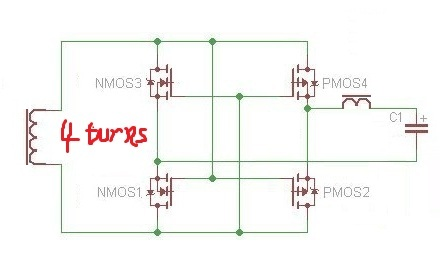
**回合3：重构主变压器**（肖特基二极管都用自驱MOS代替。作者失察，8.8V和5V本不该合并整流器！！！应分开整流&降压或使用对称的桥式CMOS加辅助绕组/桥式肖特基&降压，

因为**4+4匝**在储能电感前**约产生32V会击穿MOS的G极！**）

**Round 3: Reform the main transformer** (To replace Schottky diodes by self-driven MOS. It’s the author’s oversight that the rectifiers of 8.8V and 5V SHOULDN’T HAVE been combined!!! Separate them & step down consequently or use symmetric bridge CMOS rectification with auxiliary windings/bridge Schottkies & buck consequently, because the **4+4 turns generate approx. 32V,** before the energy storage inductor, **which breaks down an MOS’ gate!**)

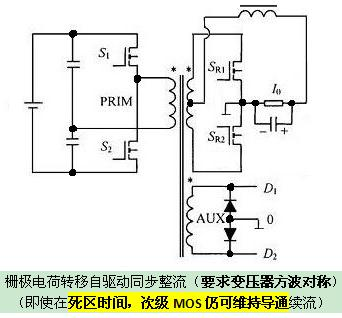


图R3.1（双3匝出3.3V，4+4匝出8.8V），Figure R3.1 (Dual 3 turns for 3.3V, 4+4 turns for 8.8V)



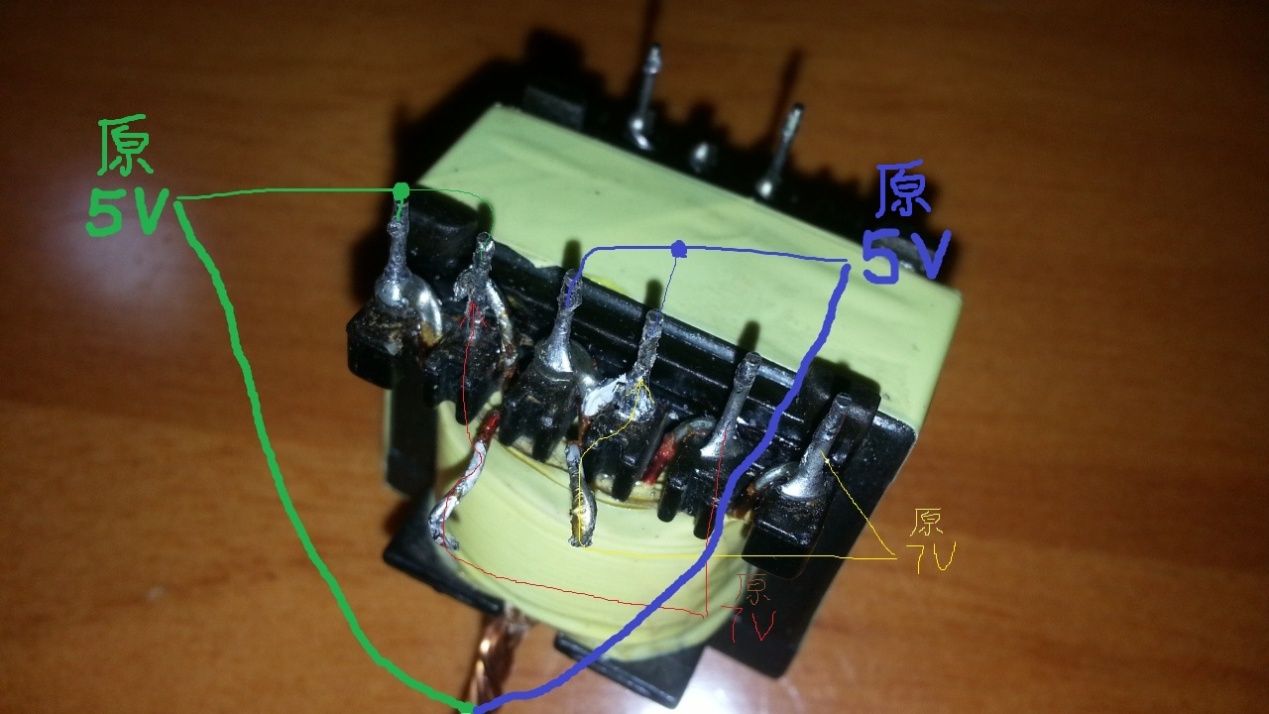
图R3.2（直驱CMOS桥式整流原理图，4匝约产生16V），

Figure R3.2 (Direct-driven CMOS bridge rectification schematic, 4 turns generate approx. 16V)

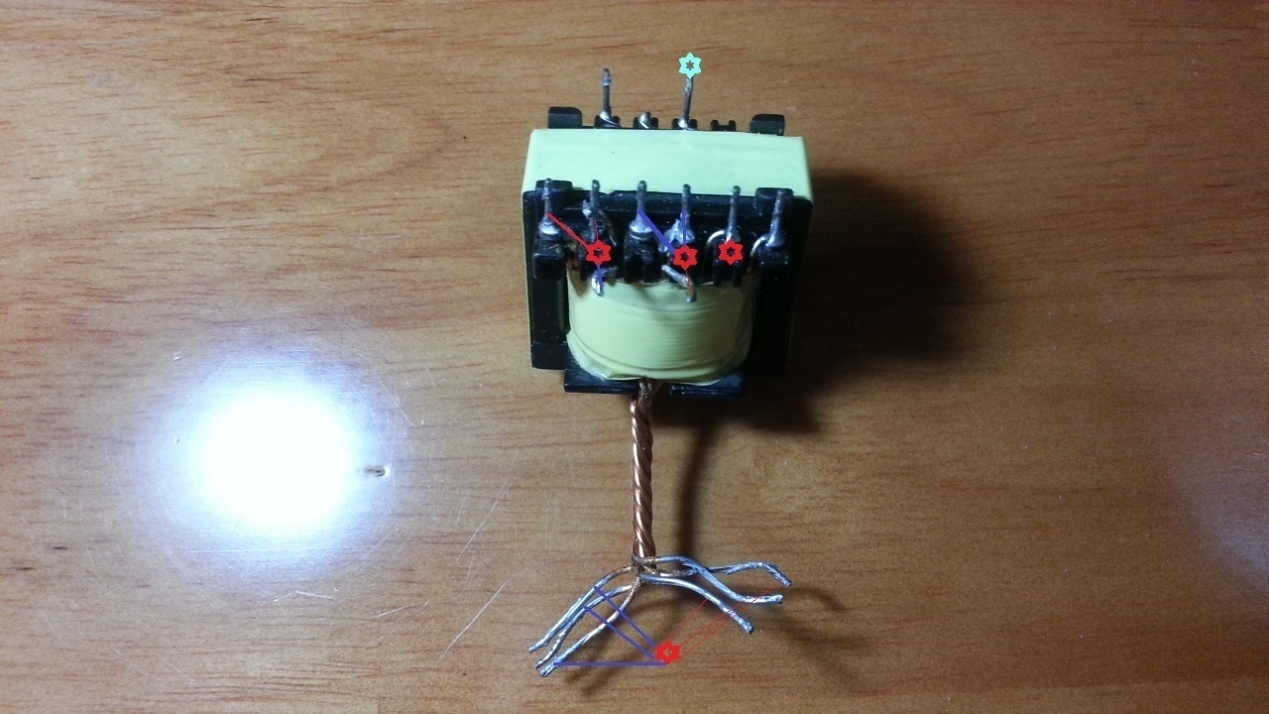


图R3.3（栅极电荷转移自驱动同步整流原理图），

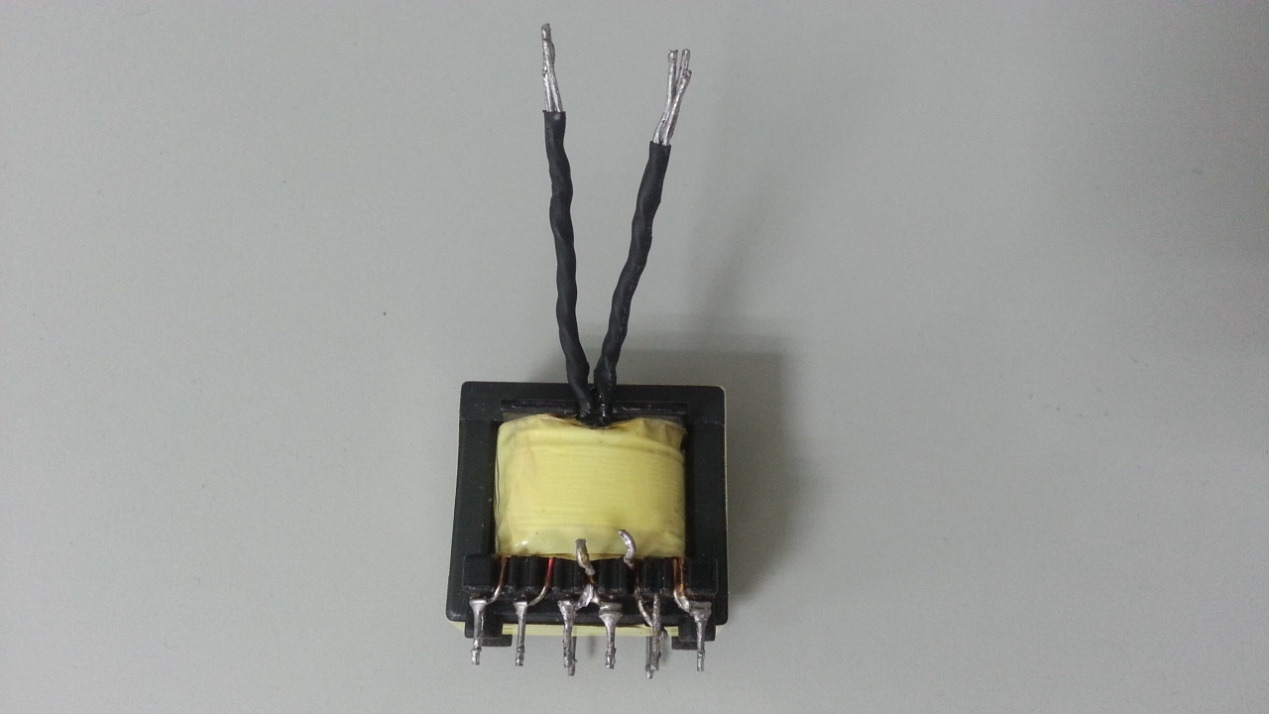
Figure R3.3 (Gate charge transfer self-driven synchronous rectification schematic)



提议R3.1（将原双4匝改为4+4匝），Proposal R3.1 (Reform the original dual 4T to 4+4T)



提议R3.2（标记同名端），Proposal R3.2 (Identify the same magnetic polarity terminals)



提议R3.3（分离原麻花状公共端，不再用作中抽；此法无需对调PCB正负极。

务必借助万用表确保绕组已正确改动！！！），

Proposal R3.3 (Separate the original twisted common terminal, not as center tap any more;

No need to exchange the positive and negative polarities of PCB, in this way.

MUST ensure all necessary change is done properly by multimeter!!!)

**回合4：改半桥前端**

**Round 4: Change the front end of the half bridge**

图R4，Figure R4

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| --- |
| **Drop me a brick or drop me a line?** |
| **Copy of 抛砖引玉** |

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