# RCC 反激式电路设计表

| RCC Design_Rev1.02 Copyright Wuming Electric Inc. 2003 | 输入 | 信息 | 输出 | 单位 | RCC Design_Rev1.02.xls: RCC Flyback Transformer Design Spreadsheet |
|---|---|---|---|---|---|
| **ENTER APPLICATION VARIABLES** | | | | | Customer |
| VACMIN | 200 | | | Volts | Minimum AC Input Voltage |
| VACMAX | 240 | | | Volts | Maximum AC Input Voltage |
| FI | 50 | | | Hz | Minimum AC input Frequency |
| Fmin | 70 | | | KHz | Minimum OSC Frequency |
| VO | 7 | | | Volts | Output Voltage |
| IO | 0.5 | | | Amps | Output Current |
| eta | 0.7 | | | | Efficiency Estimate |
| Z | 1 | | | | Loss Allocation Factor |
| tC | 3 | | | mSecon | Bridge Rectifier Conduction Time Estimate |
| CIN | 6.8 | | | uFarads | Input Filter Capacitor |
| D | 0.2 | | | | |
| *T* | | | *14.2857143* | *uS* | Max Time of Cycle |
| *Ton* | | | *2.85714286* | *uS* | On time of Cycle |
| *Toff* | | | *11.4285714* | *uS* | Off time of Cycle |
| *d* | *2* | | | *A/mm^2* | 副边线圈电流密度 |
| **ENTER Output Diode Parameters** | | | | | |
| Output Diode | 1N5822 | | | | |
| VR | 60 | | | Volts | Diode Maximum Peak Repetitive Reverse Voltage |
| ID | 3 | | | Amps | Diode Average Forward Current |
| VD | 0.52 | | | Volts | Diode Forward Voltage drop |
| Vo_1 | **12** | | | Volts | Auxiliary Output Voltage |
| VD_1 | **0.6** | | | Volts | Auxiliary Diode Forward Voltage Drop |
| Io_1 | | | | Amps | Auxiliary Output Current |
| Vo_2 | **5** | | | Volts | secound Output Voltage |
| VD_2 | **0.6** | | | Volts | secound Diode Forward Voltage Drop |
| Io_2 | | | | Amps | secound Output Current |
| Vo_3 | **5** | | | Volts | thired Output Voltage |
| VD_3 | **0.6** | | | Volts | thired Diode Forward Voltage Drop |
| Io_3 | | | | Amps | thired Output Current |
| PO | | | **3.5** | | Output Power |
| P | | | **6.02** | | Total Power |
| VB | 21.5 | | | Volts | Driver Output Voltage |
| VD_B | 1 | | | | |
| IB | 0.02 | | | A | Driver Output Current |
| IB_min | 0.0115 | | | A | |
| **ENTER Other Parameters** | | | | | |
| BP | 2300 | | | Gauss | Target Peak Flux Density at Maximum Current limit |
| Direct Switch Type | MJE13001 | | | | |
| Bvceo | 500 | | | Volts | |
| Imax | 0.5 | | | Amps | |
| Hfe | 20 | | | | |
| **Design Parameters** | | | | | |
| VMIN | | | 264 | Volts | Minimum DC Input Voltage |
| VMAX | | | 339 | Volts | Maximum DC Input Voltage |
| IP | | | 0.23 | Amps | Peak Primary current |
| N12 | | | 0.11 | | |
| LP | | | 3280 | uHenrie | **Minimum Primary Inductance** |
| LS | | | 42.97 | uHenrie | |
| RS | | | **3** | OM | |
| **ENTER TRANSFORMER CORE/CONSTRUCTION** | | | | | |
| Core Type | ee16 | *EE16* | | | |
| AE | | *0.192* | | cm^2 | Core Effective Cross Sectional Area |
| LE | | *3.5* | | cm | Core Effective Path Length |
| AL | | *1140* | | nH/T^2 | Ungapped Core Effective Inductance |
| BW | | *8.5* | | mm | Bobbin Physical Winding Width |
| M | 1 | | | mm | Safety Margin Width |
| **Lg** | | | 0.22 | mm | Gap Length NON GLASS BEAD Construction |
| **NP** | | | 171 | Turns | Number of Primary Turns |
| **NS** | | | 20 | Turns | Number of Secondary Turns |
| **NB** | | | 15 | Turns | |
| **RB** | | < | 956 | OM | |
| PIV | | | 40 | Volts | |
| **N1** | | | **34** | Turns | Auxiliary Number of Turns |
| PIV1 | | | 67 | Volts | Auxiliary Rectifier Maximum Peak Inverse Voltage |

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| **N2** | | | **15** | Turns | Auxiliary Number of Turns |
| PIV2 | | | 30 | Volts | Auxiliary Rectifier Maximum Peak Inverse Voltage |
| **N3** | | | **15** | Turns | Auxiliary Number of Turns |
| PIV3 | | | 30 | Volts | Auxiliary Rectifier Maximum Peak Inverse Voltage |
| **Vc** | | | **4.4** | Volts | 稳压电容上电压 |
| **Vz** | | | 4.7 | Volts | 稳压管电压 |
| **Rp** | | >0.092 Wate | 3.48 | OM | 电流检测（电流限制）电阻 |
| **CURRENT WAVEFORM SHAPE PARAMETERS** | | | | | |
| IAVGmax | | | 0.02 | Amps | Maximum Average Primary Current |
| IAVGmin | | | 0.01 | Amps | Minimum Average Primary Current |
| IRMS | | | 0.09 | Amps | Primary RMS Current |
| IR | | | 0.27 | Amps | Primary Ripple Current |
| ISP | | | 2.00 | Amps | Maximum Peak Secondary Current |
| ISRMS | | | 0.82 | Amps | Secondary RMS current |
| IRIPPLE | | | 0.65 | Amps | Output Capacitor RMS Ripple Current |
| ISPMAX | | | 2.15 | Amps | Maximum Power Peak Secondary Current |
| **TRANSFORMER PARAMETERS** | | | | | |
| L | 4 | | | | Number of Primary Layers |
| **BM** | | | **2298** | Gauss | Operating Flux Density at Max Current Limit |
| BAC | | | 1140 | Gauss | AC Flux Density for Core Loss Curves (0.5 X Peak to Peak) |
| ur | | | 1654 | | Relative Permeability of Ungapped Core |
| BWE | | | 26 | mm | Effective Bobbin Width |
| OD | | | 0.15 | mm | Maximum Primary Wire Diameter including insulation |
| INS | | | 0.03 | mm | Taping between primary layers can be eliminated using "Class 0" (Asia), "Grade 2"(Europe) or "Heavy Nyleze" (USA) wire |
| DIA | | | 0.12 | mm | Bare conductor diameter |
| AWG | | | 37 | AWG | Primary Wire Gauge (for low capacitance AWG<= 36 recommended) |
| CM | | | 20 | Cmils | Bare conductor effective area in circular mils |
| CMA | | | **215** | Cmils/Ar | Primary Winding Current Capacity (CMA > 200) |
| CMS | | | 175 | Cmils | Secondary Bare Conductor minimum circular mils |
| AWGS | | | 27 | AWG | Secondary Wire Gauge (Rounded up to next larger standard AWG value) |
| DIAS | | | 0.36 | mm | Secondary Minimum Bare Conductor Diameter |
| DIA1 | | | | mm | 第一副绕组线直径 |
| DIA2 | | | | mm | 第二副绕组线直径 |
| DIA3 | | | | mm | 第三副绕组线直径 |
| Sc | | | **9.59** | mm^2 | 绕组占窗口静面积 |

## RCC 电路