

DP770 The Working principle of the automatic power control circuit:

Main Role of automatic power control circuit: to make sure the amplifier output power is maintained at a constant value, to prevent power amplifier to the overload, To protect the amplifier circuit.

Circuit form is shown in Figure 1:

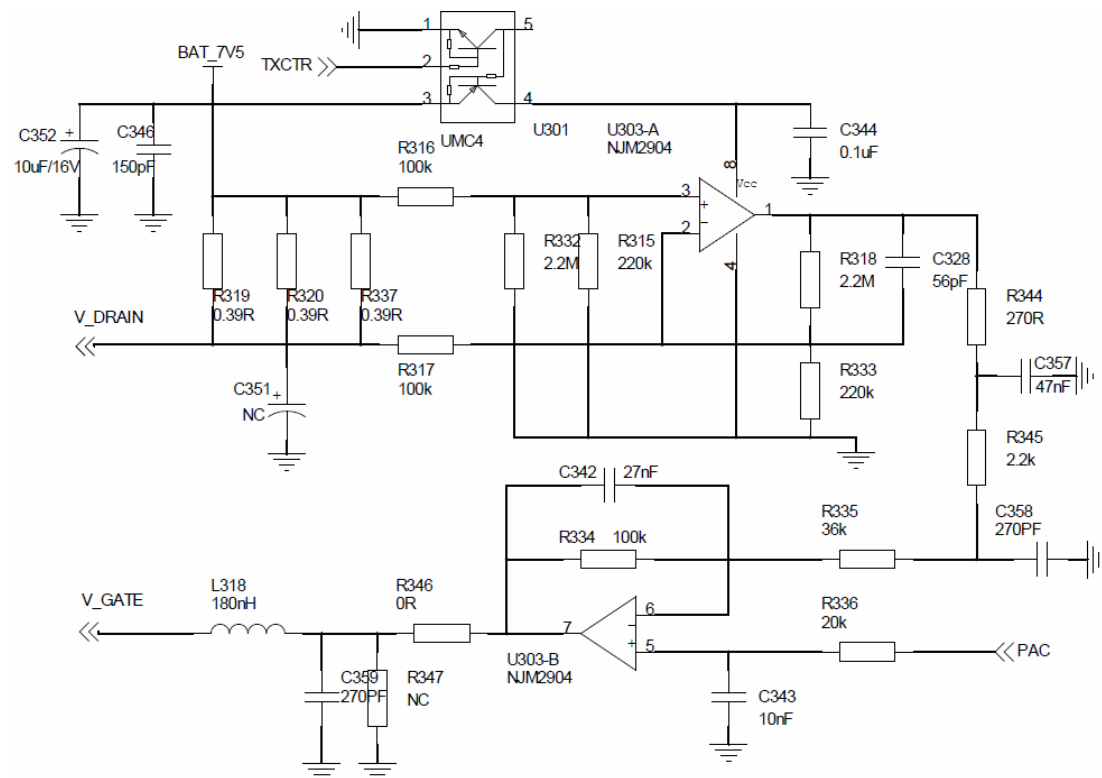


Figure 1

Working principle: In the case of substantially constant operating voltage, The detection and monitoring of power is virtually identical to the current detection and monitoring, in figure 1, BAT_7V5 port is DP770 battery supply voltage, V_DRAIN port is the drain supply voltage for the power amplifier circuit, V_GATE port is the gate supply voltage of the amplifier circuit, The PAC port is the output reference voltage for the DAC, the automatic power control circuit of DP770-02 changes the gate bias voltage through detecting the variation of the drain current that input to the power amplifier, to change an output power by changing the gain. R319, R320 and R337 in parallel with a current sampling resistor is responsible for sampling the current of the amplifier circuit and converting to a voltage differential form, and then amplifier through the first stage op-amp U303_A, the amplified voltage through the second stage op amp and its peripheral circuit of the differential amplifier circuit will compare with the a reference voltage--PAC that output by the DAC module, And outputs a voltage that with the relevant of op amp pressure at both ends, to control the gate voltage of the amplifier circuit, If the transmitter output power is too high, The amplifier current will increase, the output voltage of samples become large at the first stage op-amp U303_A, In the case of PAC is constant, as the output voltage of U303_A

and Voltage difference of U303_A become larger, to make the output voltage of the differential amplification circuit which is composed of U303_B become smaller, The gate bias voltage of the amplifier circuit become smaller, Gain become smaller, the transmitter output power is reduced, And vice versa, In this way, you can ensure that Transmitter output power keep stability even in the different working environment. MCU can achieve power setting and the high and low power switching by changing the PAC voltage.

DP770 The Working principle of Phase-locked loop system :

Main Role of Phase-locked loop system: To provide a very stable, strong anti-interference, high-frequency carrier signal for Transmitter, to provide a very stable, strong anti-interference, high-frequency local oscillator signal for Receiver.

The parts of Phase-locked loop system: The phase-locked loop system includes the voltage-controlled oscillator VCO (Figure 2), the loop filter (Figure 3) and the frequency synthesizer (Figure 4). Voltage-controlled oscillator use capacitor three-terminal type oscillator circuit, to achieve the desired oscillation frequency by Voltage to Control the varactor diode capacitance, Loop filter used to filter out the output AC noise from divider and phase detector, Frequency synthesizer is mainly used to convert the phase difference between the RF signal of the VCO output with the reference signal to an error voltage, This error voltage, in turn, acts on the VCO, So that the frequency difference is very small when the loop is locked.

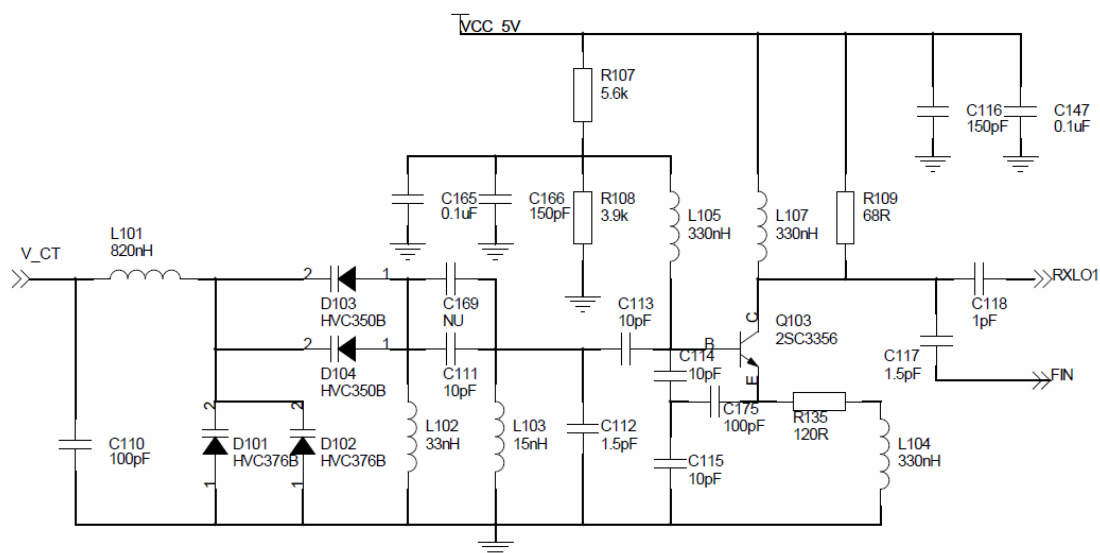


Figure 2

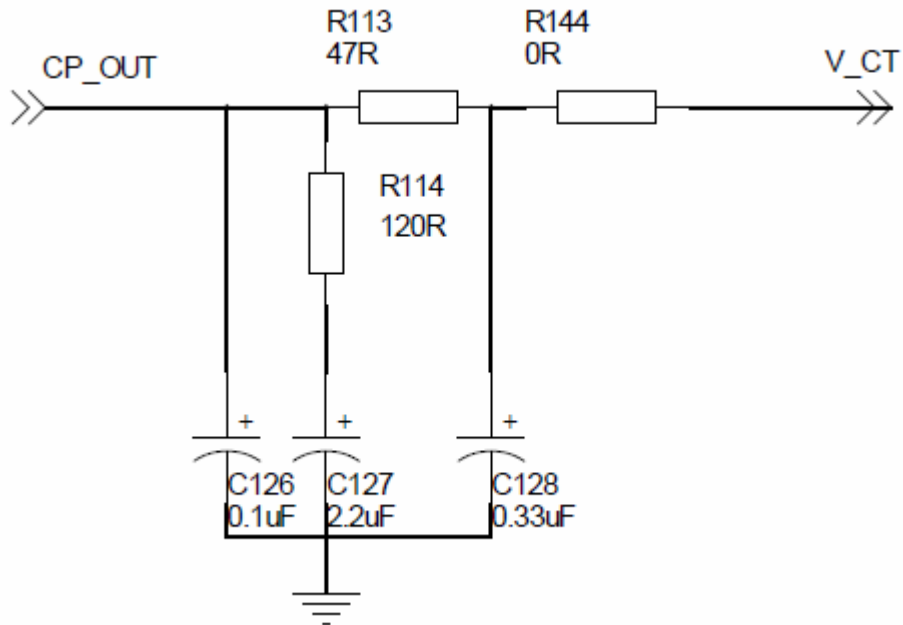


Figure 3

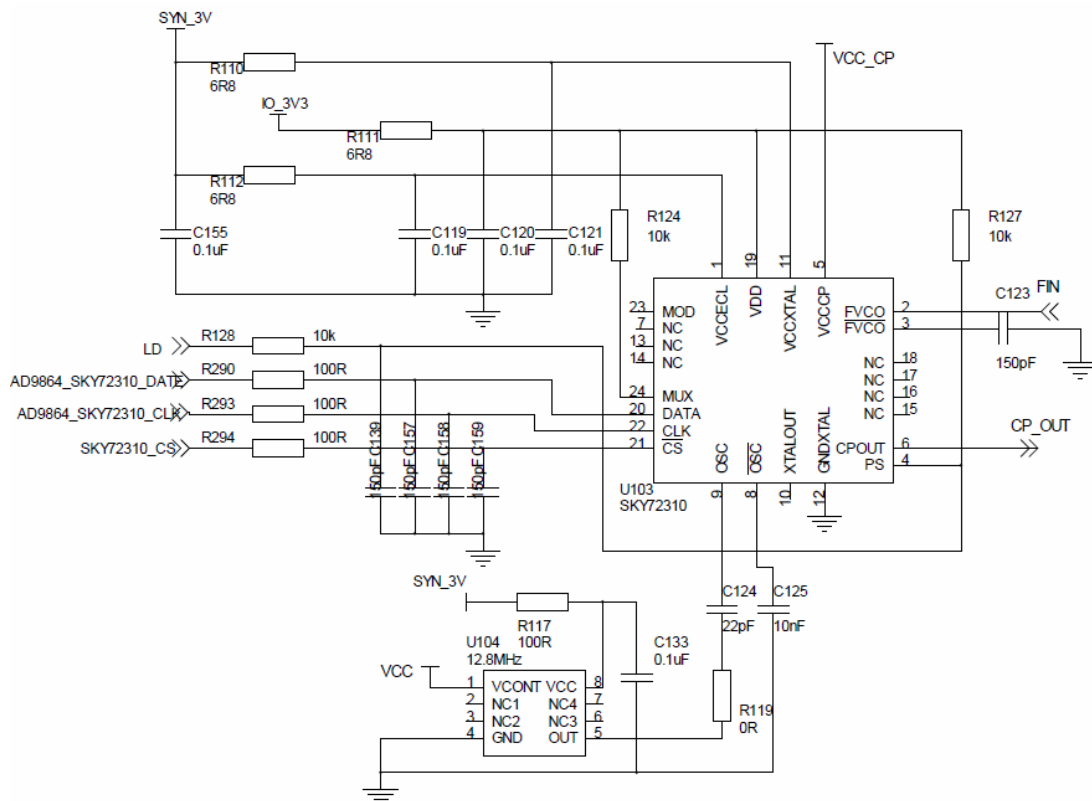


Figure 4

Working principle of Phase-locked loop system: Warming voltage controlled crystal oscillator U104 provides standard frequency of 12.8MHz, standard frequency is divider frequency through the Programmable reference divider of the PLL chip SKY72310, to get the Corresponding to the reference frequency (Depending on the channel set), the oscillation frequency comes

from the VCO, be sent into the PLL chip SKY72310, after dividing by the programmable divider, to compare the phase with Reference frequency, to obtain the error signal, And To obtain an control voltage with the relevant of error frequency through the loop filter filtering, To control the VCO vara-ctor diode, Changing the oscillation frequency of the VCO, to make the VCO frequency reaches the set value and Maintain a very small frequency difference.