OPM320 Circuit Description-Rev1.18-ENG-c3-v1.6

Case Number is CS2825142- This is a correction and supplemental description for CS2825142.

TXN-Additional Description2-CS2825142-20250615

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Hello.

I attached the new op amp schematic opm320-v1_06-12pcs-2024119-circuit.pdf schematic to you before, and here is the explanation of some changes.

1. Some changes have been made.

2. it is produced with this final change so far.

The new opamp schematic opm320-v1_06-12pcs-2024119-circuit.pdf schematic had final changes as we produced it.

The reasons for the changes are as follows:

1-1. To reduce the power quiescent current, we increased R7 from 75R0 to 100R0 to reduce the reference current.

As a result, the power standby current is about 7mA~12mA in total.

1-2. c3 and c6 were removed from 27pF to 0pF to increase the rolloff frequency of the high frequency band.

That's all the changes. In this state, 1 channel is produced by soldering individual parts to a small PCB, and the single-type product is produced by placing one circuit, and the dual-type product is produced by placing two circuits.

The attached circuit diagram OPM320 Circuit Description-Rev1.3.pdf is also shown and explained.

2.New op amp schematic opm320-v1_06-12pcs-2024119-circuit.pdf This is an explanation of important parts of the schematic.

2-1. Due to the floating phenomenon of the electrodes caused by the high insulation characteristics between the electrodes of the silicon transistor, the voltage of the floated electrodes is easily induced by the surrounding noise and electromagnetic waves, causing the output signal generated to be deformed and mixed with noise. This is due to the fact that silicon transistors have high insulation characteristics, so the insulation is too high.

When the electrodes float, they are in a high-impedance state and are easily induced by ambient noise or electromagnetic waves.

To eliminate and compensate for this floating phenomenon, if a very weak and small constant current is applied to the floating electrode, the floating phenomenon is eliminated because the impedance is lowered by the current flow. Therefore, it is not induced by the surrounding noise or electromagnetic waves and produces a clean output signal.

In this case, we are applying a small constant current, which is a small leakage current. This small leakage current is so small that it does not affect the signal generation.

The magnitude of this small current is such that in a constant current circuit, a 10Mohm resistor is connected between the emitter and the power source, and the constant current circuit is operated so that the voltage across the 10Mohm resistor is maintained at 0.6V.

If there is a voltage of 0.6V across a 10Mohm resistor, the current flowing in the resistor will be 0.6 / 10,000,000 = 0.06uA. The previous current has a small effect on the dynamic range of the amplifier.

You should be able to adjust the current if necessary.

In the attached schematic, these are the Anti-Floating1 and Anti-Floating2 parts.

Anti-Floating1 is connected to a common emitter at the input of the differential amplifier to prevent the emitter terminals from floating.

Anti-Floating2 prevents the collector terminals of the Q8 and Q9 drive amplifiers from floating in the schematic.

In this way, Anti-Floating1 and Anti-Floating2 prevent the electrodes of the silicon transistors from floating, preventing the amplified signal from being induced by ambient noise or electromagnetic waves, and generating a clean output signal.

All of this is shown in the schematic diagram.

This technology is recorded in Patent Registration No:10-2222086-00-00, Name: Electronic circuit for preventing floating.

2-2: An improved bias method is applied to the output push-pull amplifier to improve the driving power of the output load.

In general, push-pull amplifiers apply a constant voltage bias method. This constant voltage bias method works so that the bias voltage is always supplied to the NPN transistor and PNP transistor. For this reason, when the NPN transistor is turned on, the PNP transistor is also turned on, so the PNP transistor is preventing the output terminal from changing to the + direction, and conversely, when the PNP transistor is about to turn on, the NPN transistor is also turned on, so the output terminal is preventing the output terminal from changing to the - direction. For this reason, the output signal is distorted, the dynamics mix is small, and a natural sound is not produced.

To improve these problems, an advanced small signal buffer circuit is applied to the new amplifier circuit, which is described in

Patent Registration No:10-1393932-00-00, Name: SMALL SIGNAL BUFFER AMPLIFICATION,

and the final improved technology is described in

Application Number (Date) 1020130155950 (2013.12.13)

Name: LARGE SIGNAL BUFFER AMPLIFICATION CIRCUIT.

The attached schematic is shown in yellow.

3. I will write down my opinion to improve the performance of the new op amp circuit I attached before if it is integrated with semiconductor. This is the knowledge I have gained during my research, and I think that it will be more effective if it is reviewed and applied when directly integrating it with semiconductor this time.

3-1.In the schematic diagram, the load resistors R1 and R3 of the differential amplifier use SMD 5025 chip resistors with a large current capacity. In order for the amplified signal generated by the load resistor to be a strong, tight, rich, and clean signal, it is desirable to use a component with a high current capacity because this resistor must generate the correct voltage for the current change. If the current capacity of this resistor is low, the signal generated will be weak, thin, dry, and unnatural sounding.

In the schematic diagram, resistors R2, R7, and 220R are all SMD 3216 for the reason that they are used as high current-carrying resistors as possible.

Resistor 22R0 in the push-pull output stage is an SMD 5025. This is also to increase the current capacity of the output signal.

3-2. In the schematic diagram, resistors R2, R7, and 220R are all SMD 3216. The reason for this is to use the highest current-carrying resistors possible.

Resistor 22R0 in the push-pull output stage is an SMD 5025. This is also to increase the current capacity of the output signal.

3-3. To improve the performance of the attached new op amp circuit when integrated with semiconductors, it is recommended that all circuit wire widths be wired with adequate thickness to allow sufficient current to flow. This is to allow enough current to flow so that there is no distortion of the signal.

Thank you.

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Attached Circuit Diagram OPM320 Circuit Description Drawing-Rev1.4