

Research Migration Project

<https://esim.fossee.in/research-migration-project>



The Research Migration Project is an initiative of FOSSEE, IIT Bombay that promotes the use of eSim for reproducing published research circuits originally implemented using proprietary simulation tools. The objective is to migrate these validated designs to eSim to build an open source resource database.

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Title of the circuit : Design and Simulation of Dual JFET Operational Amplifier (LM353)

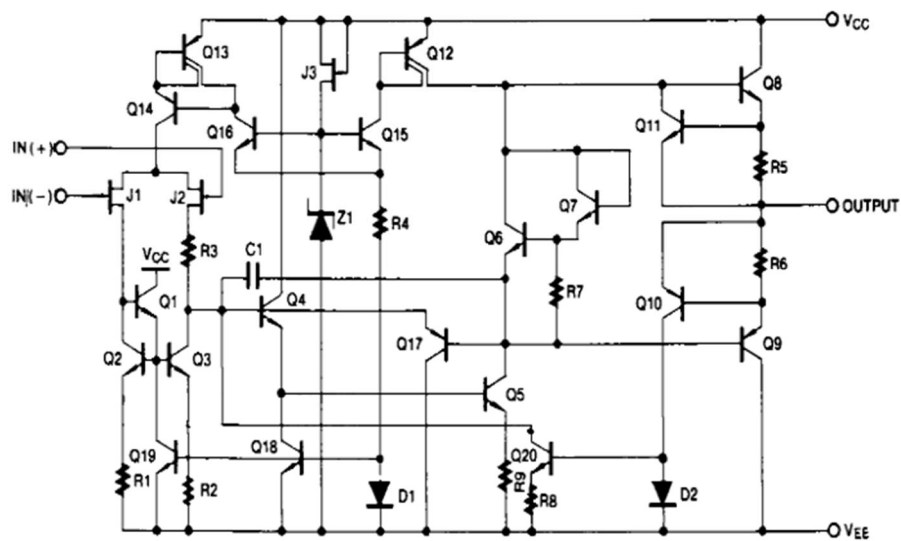
Theory/Description : To design and simulate a dual JFET-input operational amplifier (LM353) for precision analog signal processing applications using transistor-level circuitry. The objective is to achieve high open-loop gain, wide bandwidth, high input impedance, and stable frequency response while maintaining low input bias current and low noise. The performance of the designed operational amplifier is analyzed through DC operating point analysis to verify proper biasing, AC analysis to obtain gain and bandwidth characteristics, and transient analysis to evaluate the dynamic response using the eSim/NGSpice simulation environment.

Reason to reproduce with eSim : The LM353 dual JFET operational amplifier is simulated in eSim to validate its DC biasing, open-loop gain, bandwidth, frequency stability, and dynamic performance using DC, AC, and transient analyses before hardware realization

Expected Outcome: The LM353 dual JFET operational amplifier is expected to provide high open-loop gain, wide and stable bandwidth, high input impedance, and low input bias current, making it suitable for a wide range of precision analog signal processing and amplification applications.

Circuit Diagram:

SCHEMATIC DIAGRAM (One Section Only)



Source/Reference(s):

- [1] Texas Instruments, *LM353 Dual JFET-Input Operational Amplifier Datasheet*, Texas Instruments Inc., USA.
- [2] Fairchild Semiconductor, *LM353 / LF353 Dual JFET Input Operational Amplifier Datasheet*, Fairchild Semiconductor Corporation.
- [3] P. R. Gray, P. J. Hurst, S. H. Lewis, and R. G. Meyer, *Analysis and Design of Analog Integrated Circuits*, 5th Edition, Wiley, 2009.