**Module:** Folded Cascode Operational Amplifier

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**Module Description:** Folded Cascode Operational Amplifier utilizes the cascode topology both on the pull down and pull up while using a current sink to fold the input transistors. It achieves high gain and medium output swing with a variability over the input common mode, while sacrificing the speed.

**Top Cell Name:** AMP\_FOLDCASCODE65\_v1

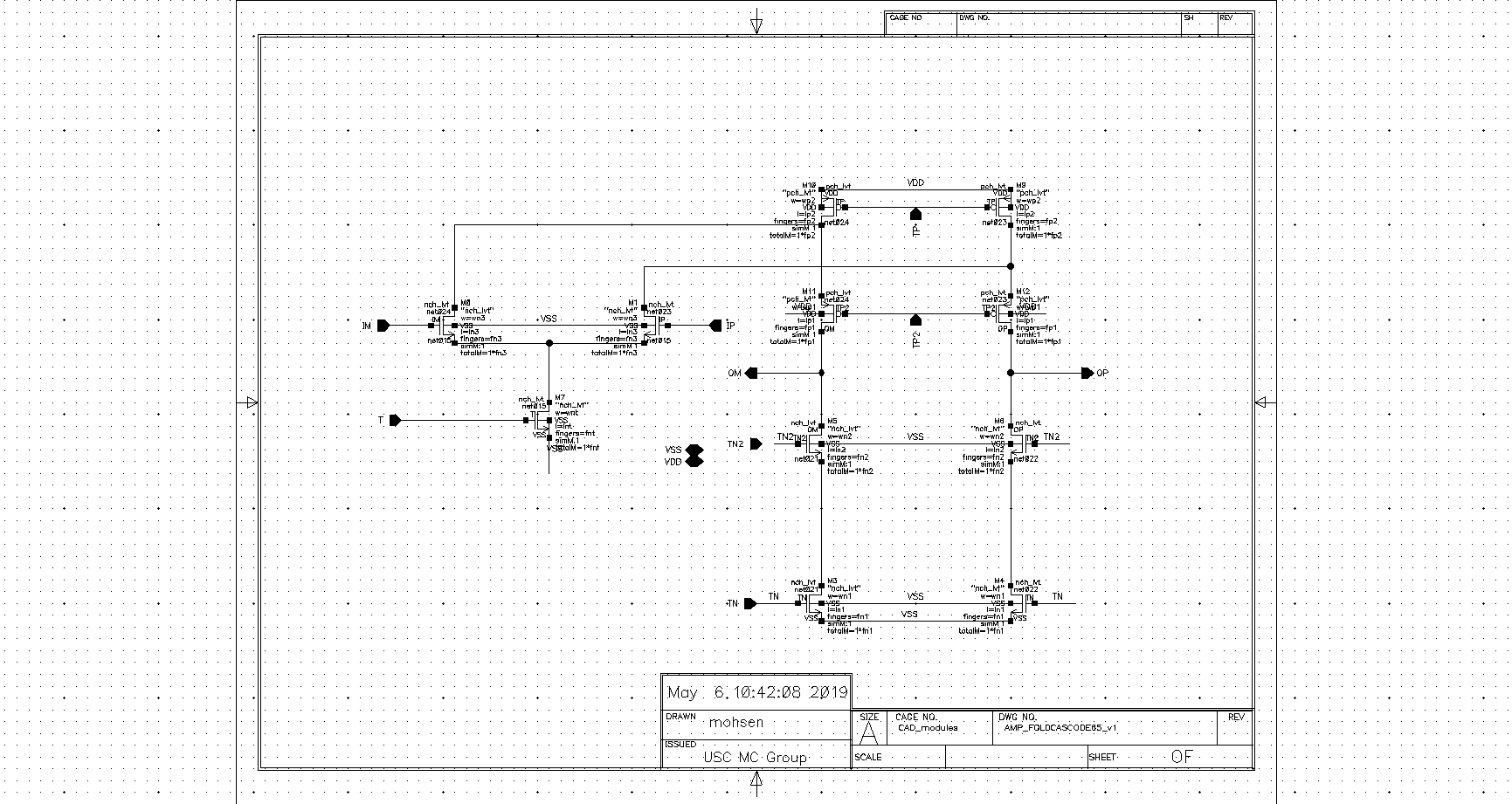
**Technology:** TSMC 65nm CMOS

**PINS:**

|  |  |
| --- | --- |
| Pin Lists |  |
| VDD | Supply Voltage |
| VSS | Ground |
| TP, TP2, TN2, TN, T | Bias voltages |
| IM, IP | Input Differential Voltage |
| OM, OP | Output Differential Voltage |

**Schematic Netlists:** AFC\_v1.scs

**Schematic figures:**



**Testbenches:** AFC\_test.scs

**Parameters:**

|  |  |
| --- | --- |
| Parameters | Symbols |
| Top PMOS # of Fingers |  |
| Top PMOS Length (m) |  |
| Mid PMOS # of Fingers |  |
| Mid PMOS Length (m) |  |
| Mid NMOS # of Fingers |  |
| Mid NMOS Length (m) |  |
| Bot NMOS # of Fingers |  |
| Bot NMOS Length (m) |  |
| Input NMOS # of Fingers |  |
| Input NMOS Length (m) |  |
| Sink NMOS # of Fingers |  |
| Sink NMOS Length (m) |  |
| Sink NMOS Bias (V) |  |
| Common Mode Voltage Input (V) |  |
| Common Mode Voltage Output (V) |  |
| Bot NMOS Bias (V) |  |
| Mid NMOS Bias (V) |  |
| Mid PMOS Bias (V) |  |
| Output Capacitive Load (F) |  |

**Metrics:**

|  |  |
| --- | --- |
| Metrics | Symbols |
| DC Power Consumption (W) | power |
| Output Swing Voltage (V) | swing |
| Common mode voltage gain (dB) | avcm |
| Differential gain (dB) | avd |
| Input Capacitance (F) | cin |
| Unity Gain Bandwidth (Hz) | gbw |
| Output Noise (V^2/Hz) | outnoise |

**Neural Network Model:**

**The H5 file:** reg\_AFC65.h5

**The Json File:** model\_AFC65.json

**The Input Normalization File:** scX\_AFC65.pkl

**The Output Standardization File:** scY\_AFC65.pkl

**The input characterization range of the Model:**

|  |  |
| --- | --- |
| Design parameters |  |
| Symbols | Characterization Range |
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**The estimation error over the metrics:**

