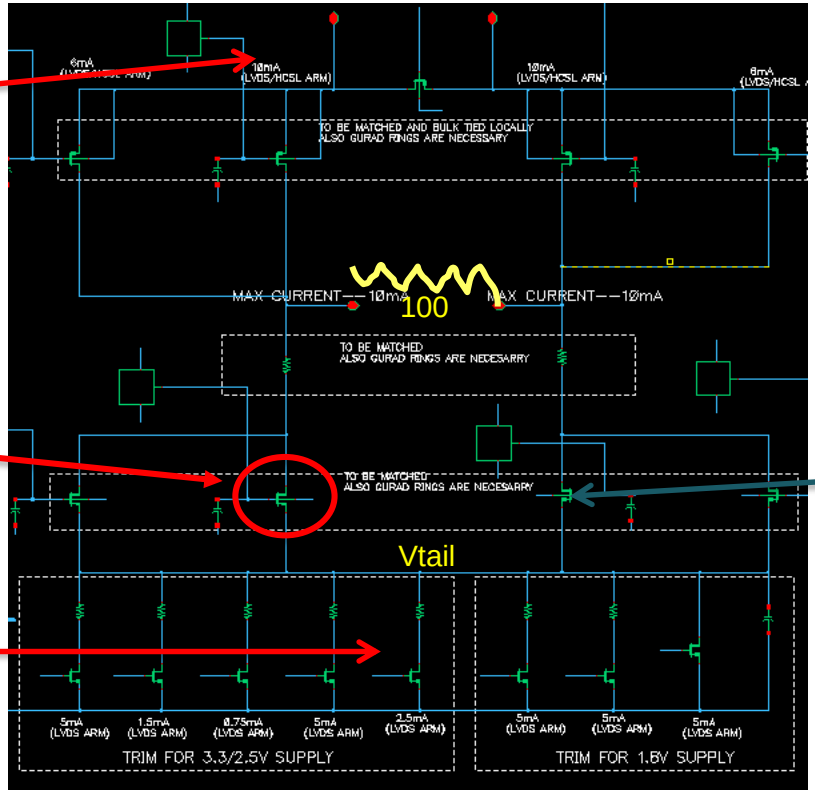
CDCI6214: Low Oscillation Issue

LVDS driver

Current controlled by diffbuf_ibias_trim bits

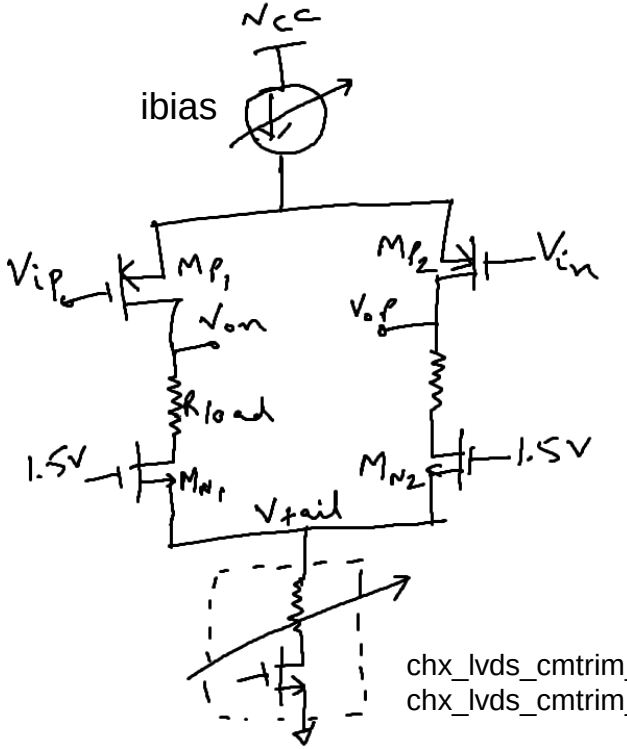
Controlled by 1.5V ldo

These arms control the CM voltage, controlled by cmtrim



Higher common-mode voltage setting (which increases the tail resistance) along with higher bias current setting pushes the Vtail voltage higher and that pushes the NMOS into OFF state causing both Vop and Von to go to supply rail and it will either not swing or swing less

Output LVDS Driver functionality

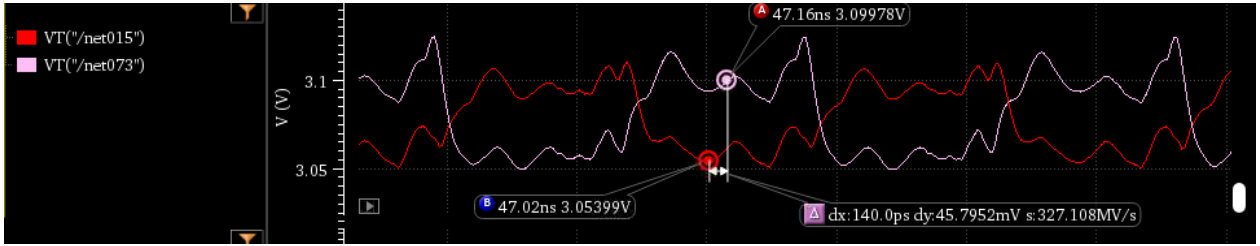


- MP1 and MP2 are input pair
- MN1 and MN2 are protection transistors for bottom tail resistors (which decides the output CM voltage)
- For MN1 and MN2 to be ON, Vtail voltage needs to be lower than certain voltage otherwise it will turn OFF and Vop/Von will go close to Vcc and driver will not be functional
- For higher ibias setting (to get higher output swing), tail resistor needs to be reduced (chx_lvds_cmtrim_dec).

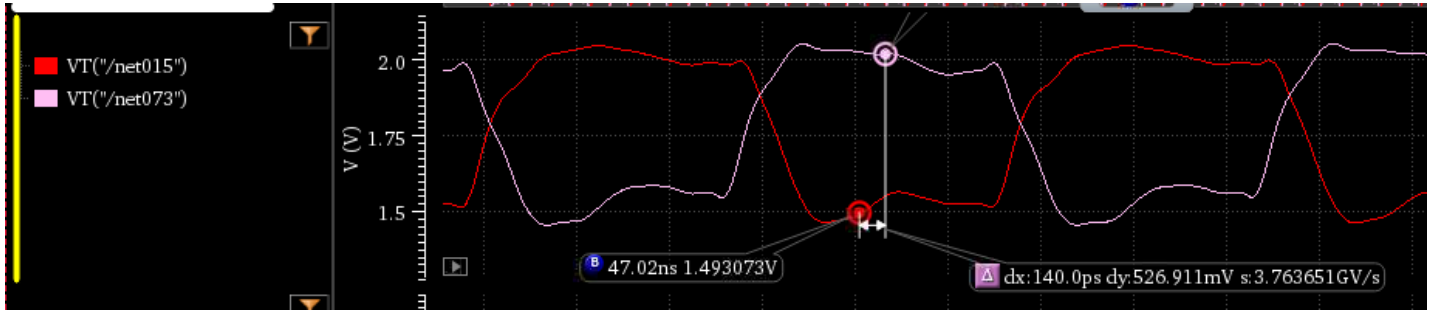
chx_lvds_cmtrim_dec reduces the tail resistance
chx_lvds_cmtrim_inv increases the tail resistance

Simulation Results

net015 and net073 are Vop and Vom nets



Low swing with lvds_cmtrim_inc=10, diffbuf_ibias_trim=3h



Good swing with lvds_cmtrim_inc=00, diffbuf_ibias_trim=3h

LVDS driver recommended settings

- chx_diffbuf_ibias_trim = 0
- chx_lvds_cmtrim_inc = 0
- chx_lvds_cmtrim_dec = 0

If needed higher swing, use below:

- chx_diffbuf_ibias_trim = 3
- chx_lvds_cmtrim_inc = 0
- chx_lvds_cmtrim_dec = 1, 2 or 3 depending on common-mode needs