



BIRD194 AND LAB CORRELATION

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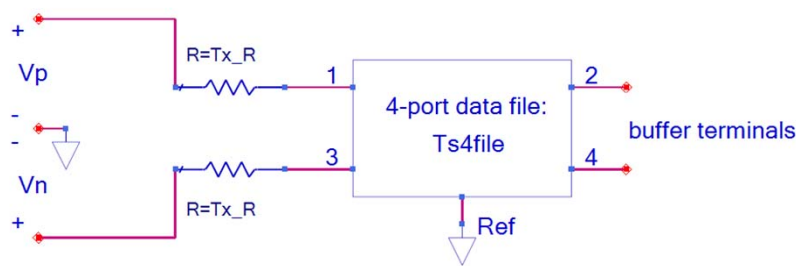
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Current Definitions in BIRD194

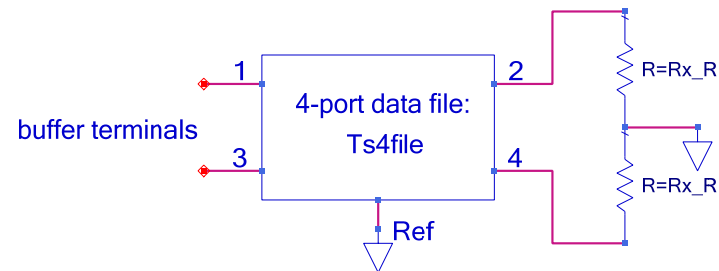
BIRD194 defines Touchstone files to replace IBIS analog data for AMI simulations

TX and RX images from <http://www.ibis.org/birds/bird194.docx>

Note that S4P (4-port Touchstone) is assumed in both cases



TX Definition



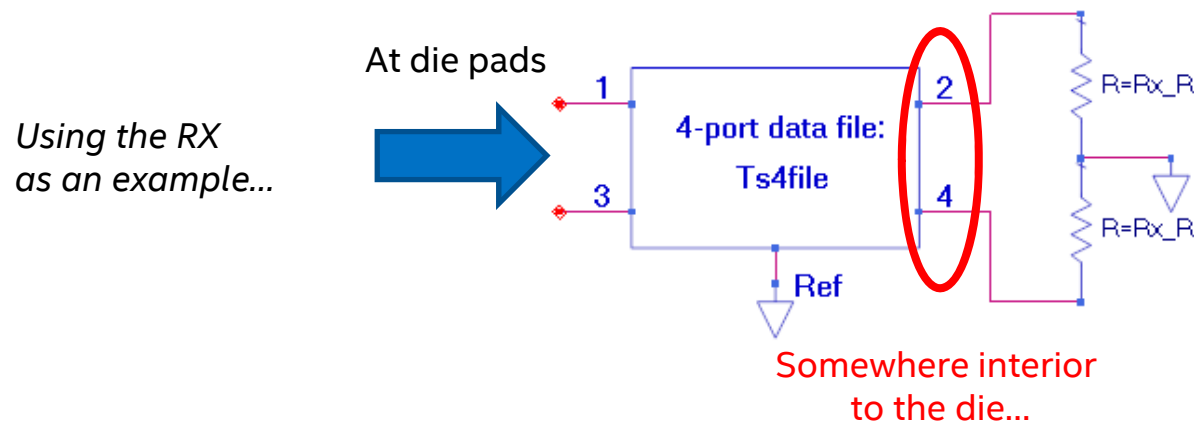
RX Definition

RX_R is optional and defaults to "open"
TX_R is optional and defaults to 0 ohms

Issue – How to Extract from Real Silicon?

In the laboratory, assuming package de-embedding is possible, only an S2P may be available from extraction

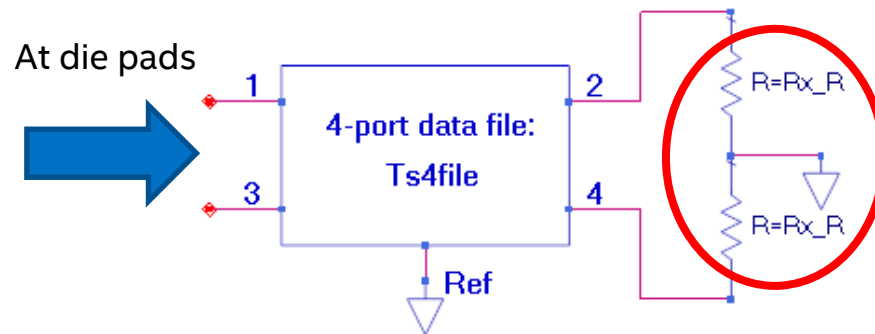
- Probing at the pins or buffer pads should be possible
- Probing more deeply on-die may be impossible or prohibitively expensive



Issue – How to Extract from Real Silicon?

The only way to make the S2P into an S4P for correlation makes assumptions as to termination

- Termination may not be controllable through test modes
- Verification of termination value is part of the purpose of laboratory correlation in the first place



This becomes an S2P by setting these to a *known* value (need not be zero) and by ensuring the same reference as "Ref" and reference for extraction at ports 1 and 3

Key Questions

Should BIRD194 only support S4P files?

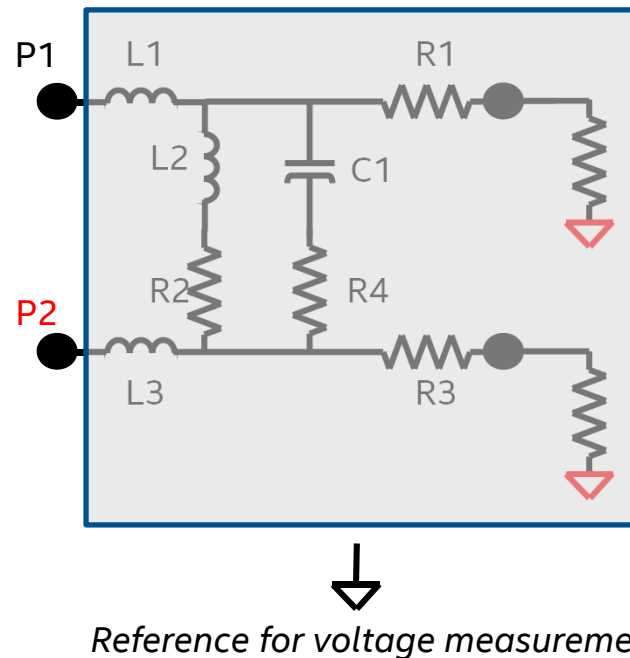
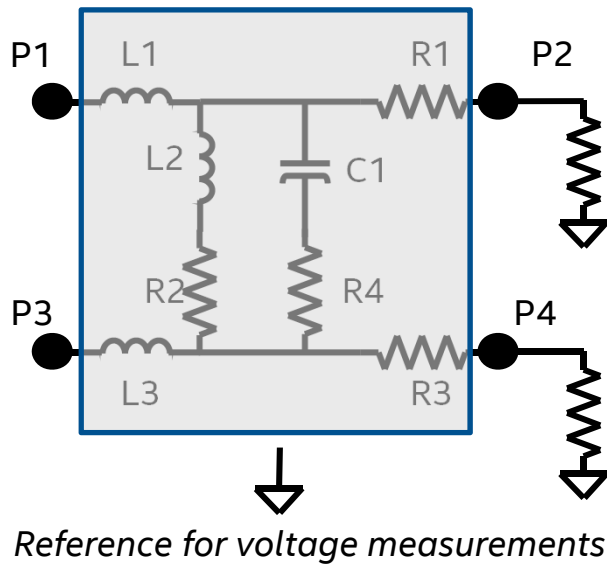
Can S2P files be supported in BIRD194?

- Either explicitly (by direct import)...
- Or through conversion from S4P using stated rules?

Is the referencing for the internal terminations appropriate for conversion to S2P?

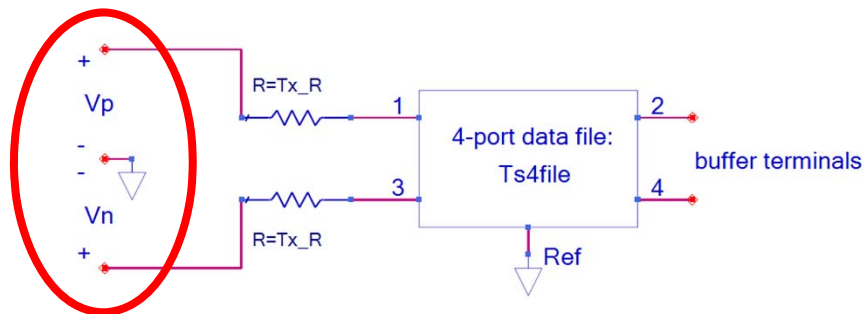
BACKUP

An Example Circuit - RX

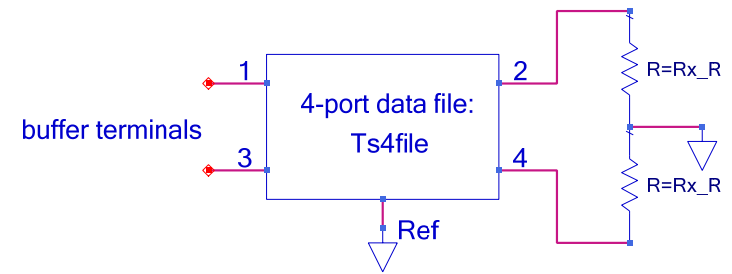


Can the S4P be converted unambiguously to an S2P given the reference definition in BIRD194?

AC Analysis Makes RX and TX Identical



TX Definition



RX Definition

For AC analysis (frequency domain extraction), DC and transient voltage sources go to zero. Therefore, the TX and RX cases become identical (excepting port assignments and Tx_R vs. Rx_R value differences)

