Using IBIS Specifications

The IBIS files, initiated by Intel, are an attempt to describe the strength of CMOS output drivers as black boxes, giving only voltage and current values without getting into proprietary circuit details. Xilinx now has IBIS files for all FPGA families.

The problem with IBIS is the large number base; usually you just want to know the strength of the pull-down transistor (sink capability) and the pull-up transistor (source capability). Close to either rail, the outputs are resistive, which means the voltage is proportional to the current.

The following table shows the condensed IBIS information, expressed as output resistance in ohms, for a sink voltage less than one volt above ground, and a source voltage less than one volt below Vcc. For the XC4000 devices, with their n-channel pull-up transistors, the source resistance is calculated between two and three volts.

IBIS specifies minimum and maximum current values, converted here to min and max resistor values. ◆

Device Family	Sink Resistance (ohms)		Source Resistance (ohms)	
	min	max	min	max
XC3000A	13.5	19.2	25.6	40.1
XC3100A	12.3	16.9	29.7	46.0
XC4000	14.4	19.8	25.8	33.1
XC4000E	22.1	27.7	53.3	60.5
XC4000EX	14.4	18.8	48.1	58.7
XC5200	20.5	29.4	32.9	54.0
XC4000XL	14.4	20.5	28.0	41.0