Look into IBIS buffer curves

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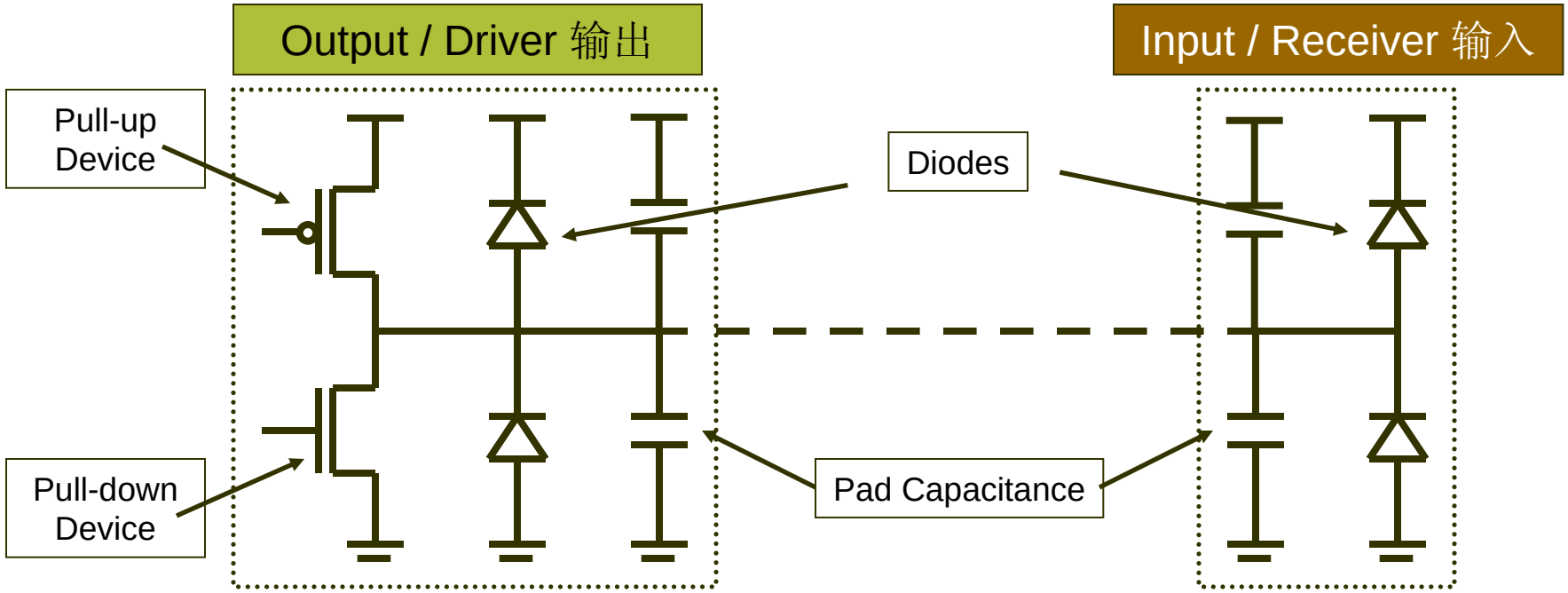
Outlines

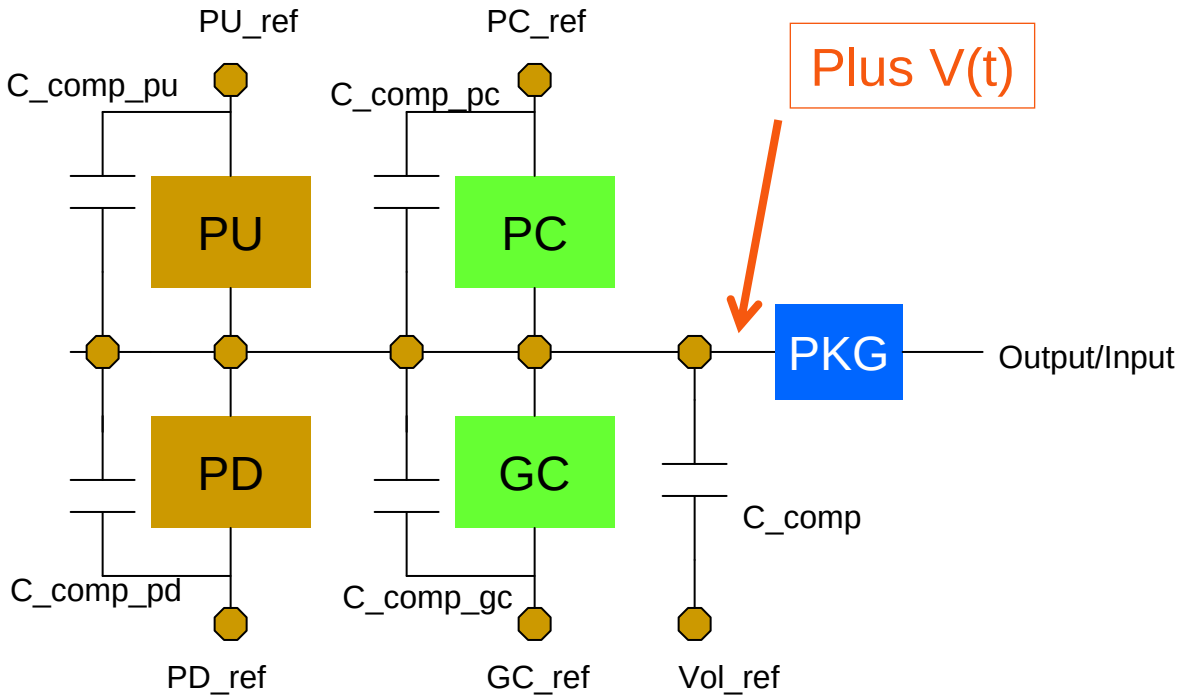
- Buffer Structures
- Buffer Curves in IBIS
- HIGH, LOW, OPEN States
- Loadlines
- Relationship between V-I and V-T Curves
- On-Die Termination using IBIS Submodel
- Conclusions

Basic I/O Buffer Structure



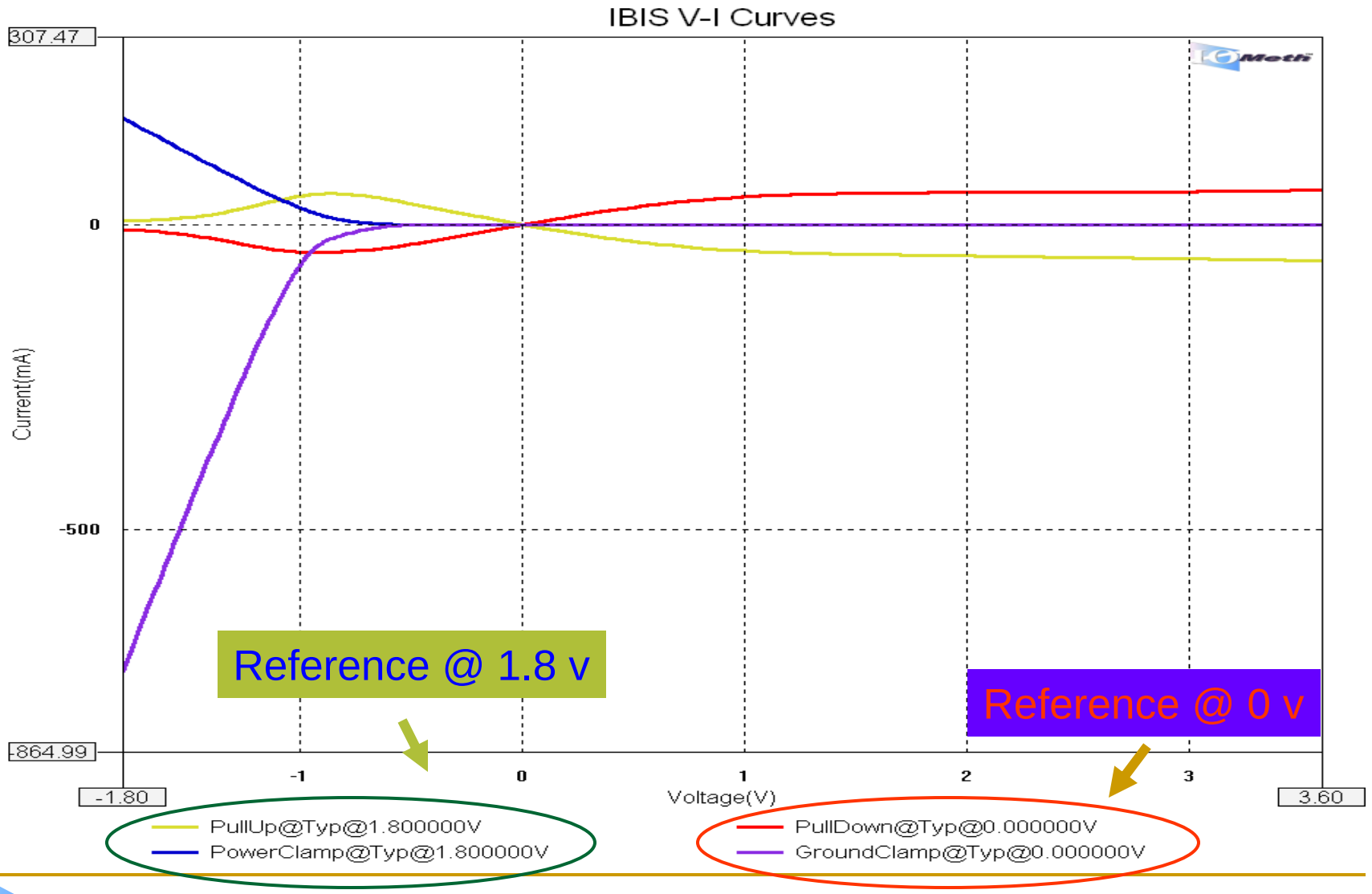
IBIS Buffer Structure

PU – Pullup
PD – Pulldown
PC – Power Clamp
GC – Ground Clamp

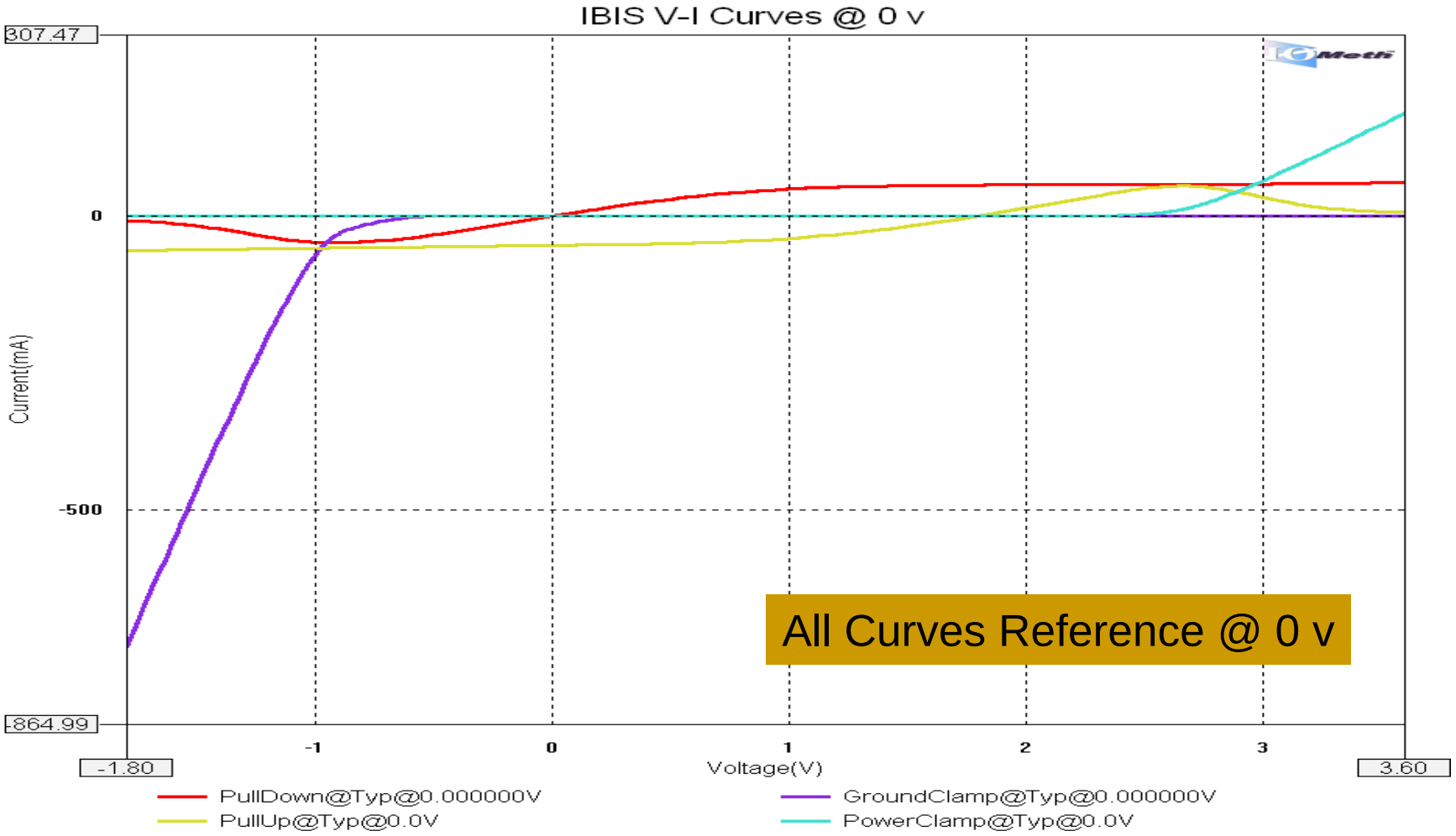


All curve data are independent with own voltage references

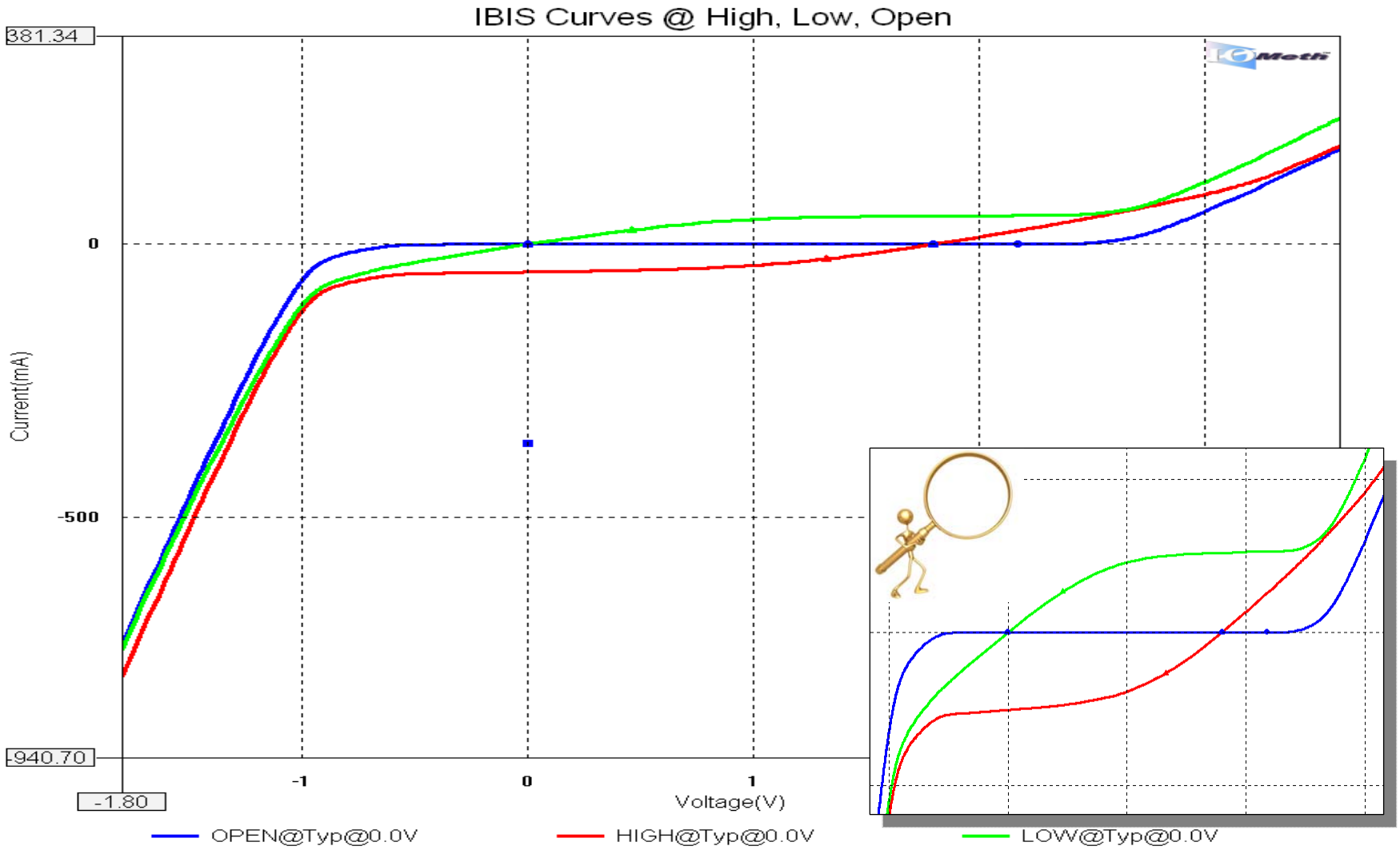
V-I Curves in IBIS model



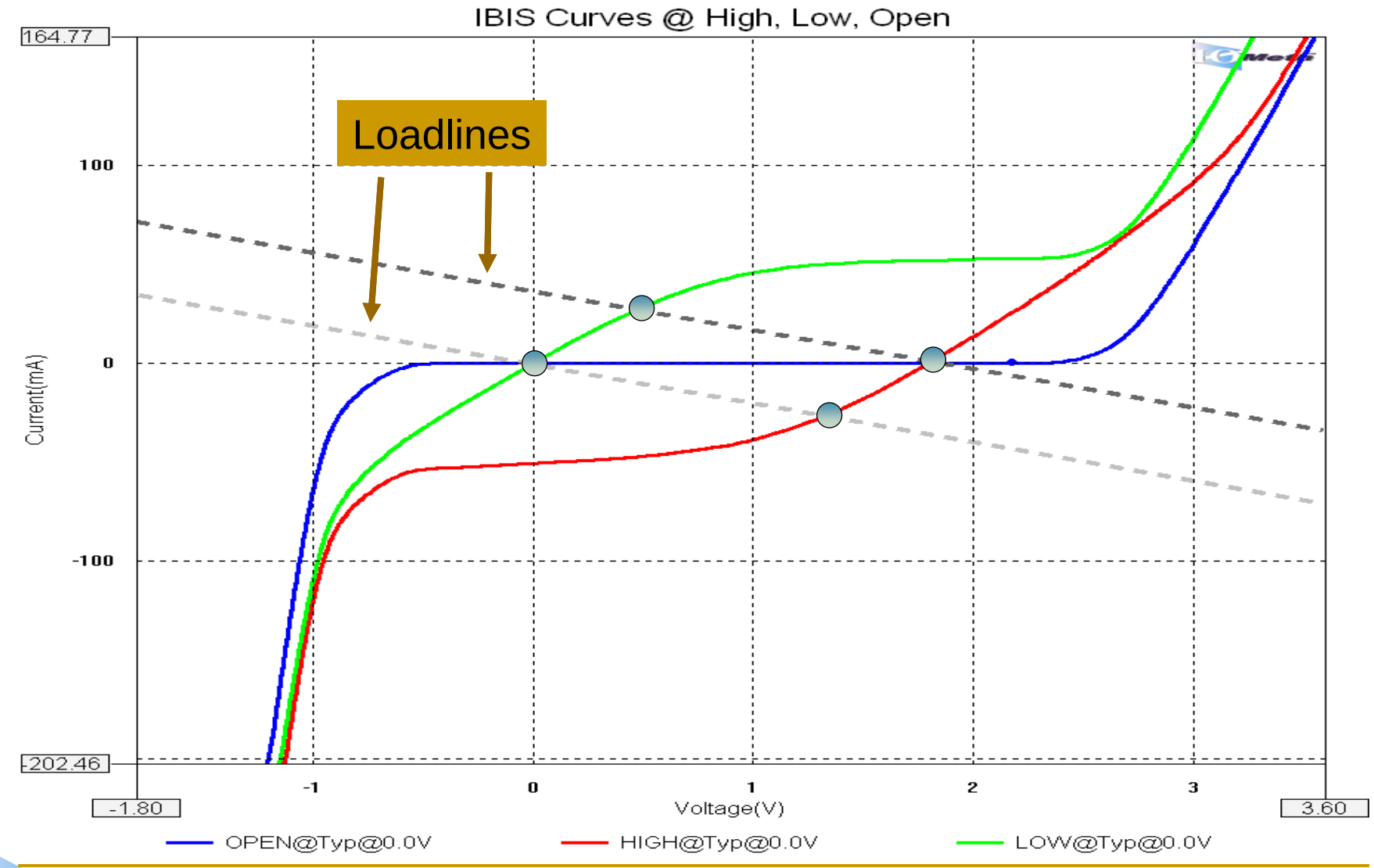
IBIS V-I Curves using the same reference voltages



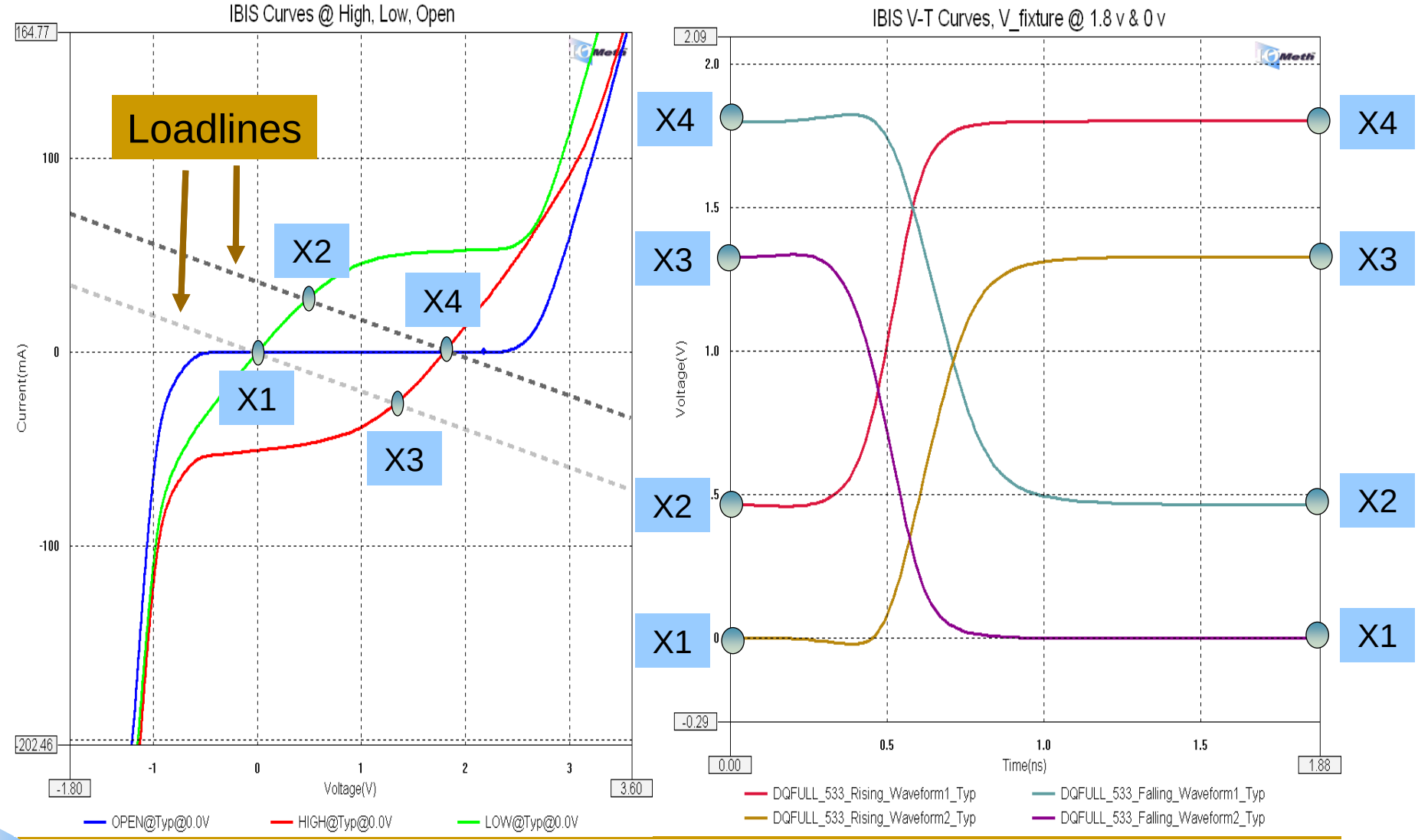
IBIS V-I Curves @ High, Low, Open



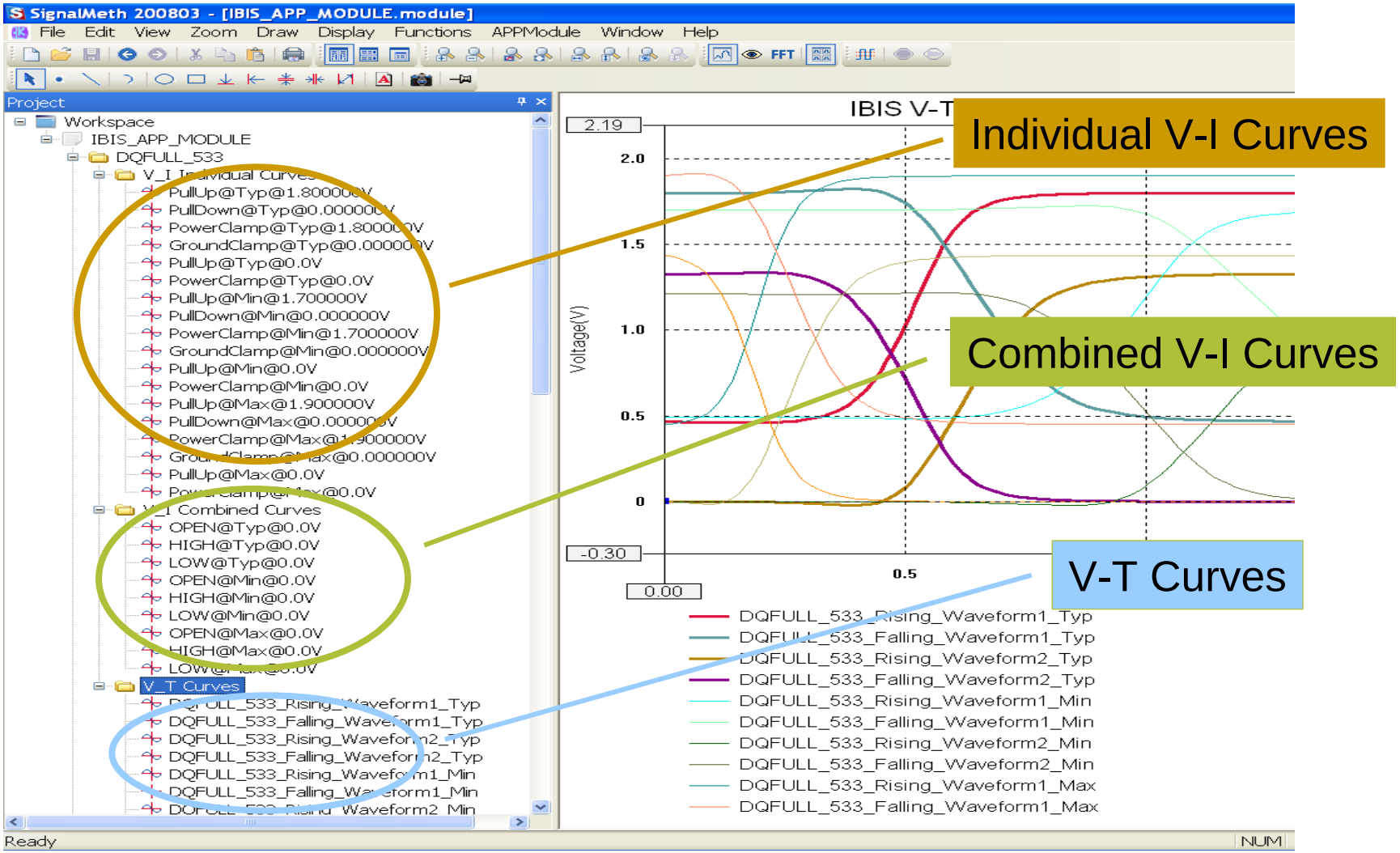
IBIS Curves @ High, Low, Open (Details)



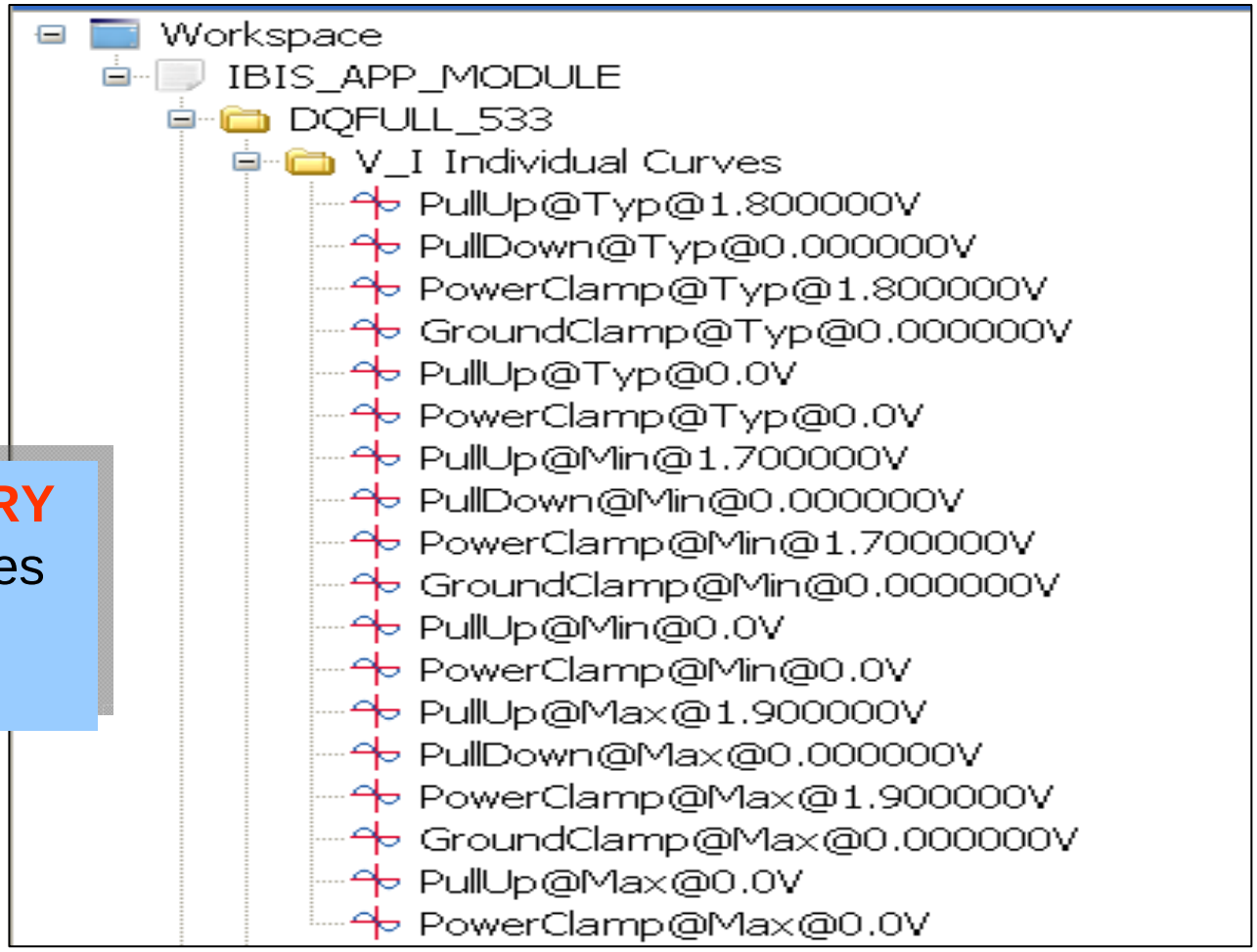
Loadline Crossing



The IBIS Curves to check

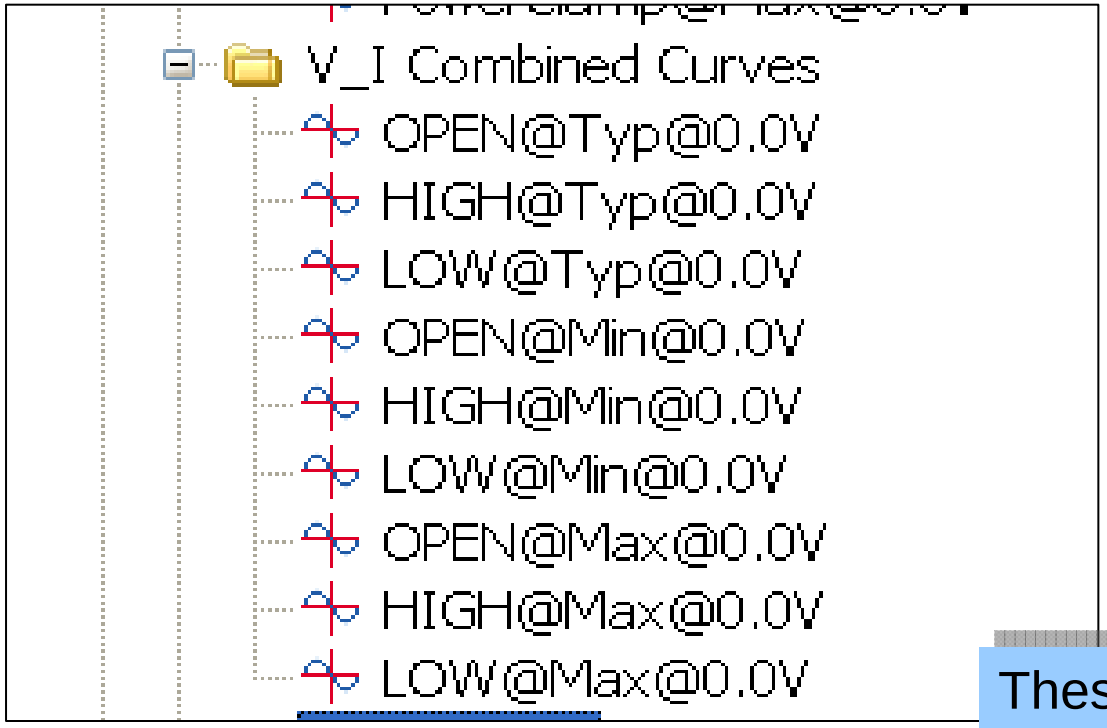


Individual V-I Curves



It is **NECCESSARY** to check the curves with the **SAME** reference voltage

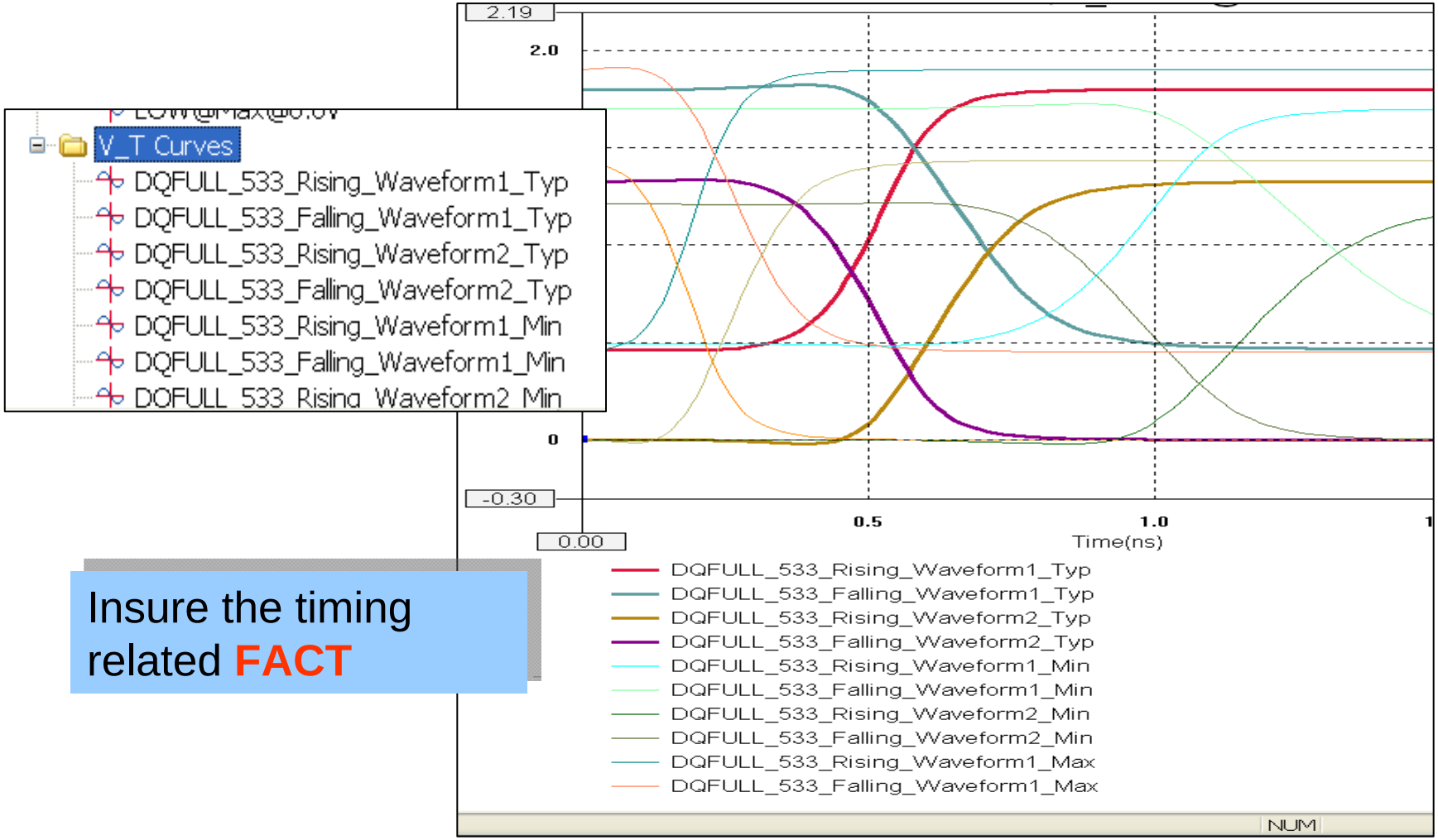
Combined V-I Curves



These are the curves that simulator uses.
HIGH, LOW, OPEN

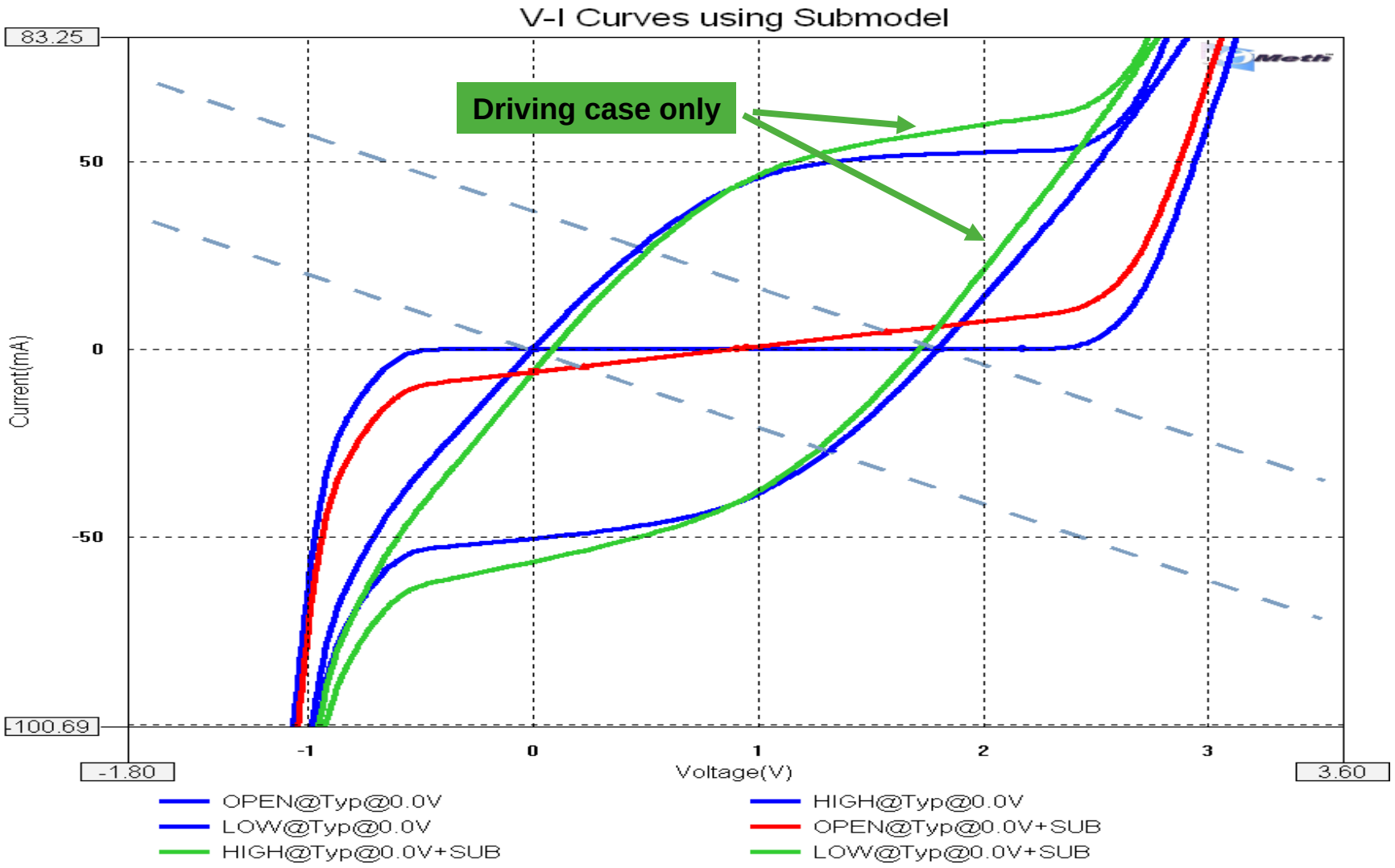
Shown for I/O Buffer. Other types may not have all the states

V-T Curves



Insure the timing related **FACT**

On-die terminations using IBIS Submodel



Conclusions

- IBIS buffer curves are individual and using different reference voltage points
- It is necessary to convert all the curves using the same reference voltage points for checking
- Combined curves for HIGH, LOW, OPEN states are important for validations
- Make sure your V-I and V-T curves are correlated with loadlines
- On-die termination using Submodel needs to be considered for IBIS validations

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