

```

////////////////////////////////////
// PLEASE DO NOT EDIT OR COMPILE THIS FILE.
// IT IS MEANT FOR VIEWING PURPOSE ONLY.
//
// All files for configuration: (workDan sim_inh_conn_test config)
////////////////////////////////////

'include "disciplines.vams"
'include "userDisciplines.vams"
// Library - amis500cxascm, Cell - invl_m, View - schematic
// LAST TIME SAVED: Aug 14 11:18:00 2007
// NETLIST TIME: Jan 14 09:09:40 2009
'timescale lns / lns

(* cds_ams_schematic *)
module invl_m1 ( Q, A );
output Q;

input A;
wire (*
integer inh_conn_prop_name = "LVDD";
integer inh_conn_def_value = "cds_globals.\vdd! ";*)
cdsNet0;
wire (*
integer inh_conn_prop_name = "LVSS";
integer inh_conn_def_value = "cds_globals.\vss! ";*)
cdsNet1;
wire (*
integer inh_conn_prop_name = "SUB";
integer inh_conn_def_value = "cds_globals.\sub! ";*)
cdsNet2;

// List of primary aliased buses

wire (*
integer inh_conn_prop_name = "LVDD";
integer inh_conn_def_value = "cds_globals.\vdd! ";
*)
\LVDD_vdd! ;
epm #(.w(2.4), .l(0.6), .as(2.165), .ad(2.165), .ps(7.2), .pd(7.2),
.nrd(0.2957), .nrs(0.2957), .m(1), .mult("1"), .region(1),
.matchingLevel("LOW"))
(* integer passed_mfactor = "m"; *)
PMOS_1 (Q, A, cdsNet0, \LVDD_vdd! );

wire (*
integer inh_conn_prop_name = "SUB";
integer inh_conn_def_value = "cds_globals.\sub! ";
*)
\SUB_sub! ;
enm #(.w(2.6), .l(0.6), .as(2.295), .ad(2.295), .ps(7.6), .pd(7.6),
.nrd(0.2981), .nrs(0.2974), .m(1), .mult("1"), .region(1),
.matchingLevel("LOW"))
(* integer passed_mfactor = "m"; *)
NMOS_1 (Q, A, cdsNet1, \SUB_sub! );

endmodule
// Library - workDan, Cell - sim_inh_conn_test, View - schematic
// LAST TIME SAVED: Jan 14 09:09:37 2009
// NETLIST TIME: Jan 14 09:09:40 2009
'timescale lns / lns

(* cds_ams_schematic *)
module sim_inh_conn_test ( );

// List of primary aliased buses

capacitor #(.c(lp)) C0 (c, vss);

\invl_m (* integer cds_net_set
[0:2] = { "LVDD","SUB","LVSS" };
integer LVDD = "vdd";
integer SUB = "vss";
integer LVSS = "vss";
*) I6 ( .Q(b), .A(a));

invl_m1 (* integer cds_net_set
[0:2] = { "SUB","LVSS","LVDD" };
integer SUB = "vss";
integer LVSS = "vss";
integer LVDD = "vdd";
*) I7 ( c, b);

invl_m1 (* integer cds_net_set
[0:2] = { "SUB","LVSS","LVDD" };
integer SUB = "vss";
integer LVSS = "vss";
integer LVDD = "vdd";
*) I1 ( a, in);

vsource #(.dc(0), .type("pulse"), .val0(0), .val1(5), .period(2u),
.delay(1u), .rise(500p), .fall(500p), .width(1u)) V1 (in, vss);

vsource #(.type("dc")) V2 (vss, cds_globals.\gnd! );

vsource #(.dc(5), .type("dc")) V0 (vdd, vss);

```

```
endmodule
// Verilog-AMS cds_globals module for top-level cell:
//   workDan/sim_inh_conn_test.
//   Generated by ADE.
//   Cadence Design Systems, Inc.

// This is an autoGenerated file, any changes done to this file may get lost.

#include "disciplines.vams"
#include "userDisciplines.vams"

module cds_globals;

// Global Signals
electrical \sub! ;
electrical \vdd! ;
electrical \vss! ;
electrical \gnd! ;
ground \gnd! ;

// Design Variables
endmodule

// This is the Cadence AMS Designer(R) analog simulation control file.
// It specifies the options and analyses for the Spectre analog solver.

simulator lang=spectre

simulatorOptions options temp=27 tnom=27 scale=1.0 scalem=1.0 reit01=1e-3 \
vabstol=1e-6 iabstol=1e-12 gmin=1e-12 rforce=1 maxnotes=5 maxwarns=5 \
digits=5 pivrel=1e-3

tran tran stop=20u save=none write="spectre.ic" writefinal="spectre.fc" \
errpreset=conservative maxiters=5 annotate=status

finalTimeOP info what=oppoint where=rawfile

modelParameter info what=models where=rawfile
element info what=inst where=rawfile
outputParameter info what=output where=rawfile

saveUseProbes options currents=all useprobes=yes

# This is the NC-SIM(R) probe command file
# used in the AMS-ADE integration.

#
# Database settings
#
if { [info exists :env(AMS_RESULTS_DIR) ] } { set AMS_RESULTS_DIR $env(AMS_RESULTS_DIR) } else { set AMS_RESULTS_DIR "/export/home/scratch/sims/sim_inh_co
nn_test/ams/config/psf" }
database -open ams_database -into $AMS_RESULTS_DIR -default

#
# Probe settings
#
probe -create -emptyok -database ams_database -all -depth all
probe -create -emptyok -database ams_database -all cds_globals
probe -create -emptyok -database ams_database {sim_inh_conn_test.c}
probe -create -emptyok -database ams_database {sim_inh_conn_test.b}
probe -create -emptyok -database ams_database {sim_inh_conn_test.a}
probe -create -emptyok -database ams_database {sim_inh_conn_test.in}
probe -create -emptyok -database ams_database -flow -ports -depth all
probe -create -emptyok -database ams_database -aicms -all -depth all
```

irun: 06.11-s011: (c) Copyright 1995-2008 Cadence Design Systems, Inc.
 TOOL: irun 06.11-s011: Started on Jan 14, 2009 at 09:09:40 MST
 irun

```

-clean
-UNBUFFERED
-noupdate
-nowarn DLNOHV
-v93
-incdir .
-propspath /projects/20348-900/RevA/local/lib/development/dfii/workDan/sim_inh_conn_test/config/prop.cfg
-timescale 1ns/1ns
-discipline logic
-delay_mode None
-novitalaccl
-access r
-amsmatlab
-amspartinfo ../psf/partition.info
-modelincdir /projects/20348-900/RevA/local/users/djcclemen/
-modelpath /projects/20348-900/RevA/local/lib/public/amis500cx/tech/spectre/amis500cxakxx/Rev2.16//dio-Default.scs (typ):/projects/20348-900/RevA/
local/lib/public/amis500cx/tech/spectre/amis500cxakxx/Rev2.16//res-Default.scs (typ):/projects/20348-900/RevA/local/lib/public/amis500cx/tech/spectre/amis
500cxakxx/Rev2.16//mos-Default.scs (typ):/projects/20348-900/RevA/local/lib/public/amis500cx/tech/spectre/amis500cxakxx/Rev2.16//cap-Default.scs (typ):/pro
jects/20348-900/RevA/local/lib/public/amis500cx/tech/spectre/amis500cxakxx/Rev2.16//bip-Default.scs (typ):/projects/20348-900/RevA/local/lib/public/amis50
0cx/tech/spectre/amis500cxakxx/Rev2.16//var-Default.scs (typ)
-analogcontrol ./amsControlSpectre.scs
-amslic
-input ./probe.tcl
-run
-exit
-ncsimargs "+amsrawdir ../psf"
-simcompatible_ams spectre
-name sim_inh_conn_test:config
-amsconnrules ConnRules_inhconn_full
-amsconnrules ConnRules_5V_full_fast1
/home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/ConnRules_inhconn_full/connect/verilog.va
ms
/home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/L2E_inhconn/module/verilog.vams
/home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/E2L_inhconn/module/verilog.vams
/home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/Bidir_inhconn/module/verilog.vams
/export/home/scratch/sims/sim_inh_conn_test/ams/config/netlist/ihdl/connectLib/ConnRules_5V_full_fast1/connect/verilog.vams
/home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/L2E_2/module/verilog.vams
/home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/E2L_2/module/verilog.vams
/home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/Bidir_2/module/verilog.vams
/home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/E2R/module/verilog.vams
/home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/R2E/module/verilog.vams
/home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/ER_bidir/module/verilog.vams
-v /projects/20348-900/RevA/local/lib/public/amis500cx/logic/verilog_generic/amis500cxascm/Rev3.6/amis500cxascm.v
-v /projects/20348-900/RevA/local/lib/public/amis500cx/logic/verilog_generic/amis500cxapfx/Rev3.2/amis500cxapfx.v
.netlist.vams
./cds_globals.vams
-l ../psf/irun.log
irun: *N,CLEAN: Removing existing directory ./INCA_libs.
file: /home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/ConnRules_inhconn_full/connect/verilog.vams
connect worklib.ConnRules_inhconn_full:vams
errors: 0, warnings: 0
connect worklib.ConnRules_inhconn_mid:vams
errors: 0, warnings: 0
file: /home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/L2E_inhconn/module/verilog.vams
module worklib.L2E_inhconn:vams
errors: 0, warnings: 0
file: /home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/E2L_inhconn/module/verilog.vams
module worklib.E2L_inhconn:vams
errors: 0, warnings: 0
file: /home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/Bidir_inhconn/module/verilog.vams
module worklib.Bidir_inhconn:vams
errors: 0, warnings: 0
file: /export/home/scratch/sims/sim_inh_conn_test/ams/config/netlist/ihdl/connectLib/ConnRules_5V_full_fast1/connect/verilog.vams
'define Vthi 3.5
|
ncvlog: *W,MACRDF (/export/home/scratch/sims/sim_inh_conn_test/ams/config/netlist/ihdl/connectLib/ConnRules_5V_full_fast1/connect/verilog.vams,11|18): te
xt macro 'Vthi' redefined - replaced with new definition.
'define Vtlo 1.5
|
ncvlog: *W,MACRDF (/export/home/scratch/sims/sim_inh_conn_test/ams/config/netlist/ihdl/connectLib/ConnRules_5V_full_fast1/connect/verilog.vams,12|18): te
xt macro 'Vtlo' redefined - replaced with new definition.
'define Tr 1n
|
ncvlog: *W,MACRDF (/export/home/scratch/sims/sim_inh_conn_test/ams/config/netlist/ihdl/connectLib/ConnRules_5V_full_fast1/connect/verilog.vams,13|17): te
xt macro 'Tr' redefined - replaced with new definition.
connect worklib.ConnRules_5V_full_fast1:vams
errors: 0, warnings: 0
file: /home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/L2E_2/module/verilog.vams
module worklib.L2E_2:vams
errors: 0, warnings: 0
file: /home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/E2L_2/module/verilog.vams
module worklib.E2L_2:vams
errors: 0, warnings: 0
file: /home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/Bidir_2/module/verilog.vams
module worklib.Bidir_2:vams
errors: 0, warnings: 0
file: /home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/E2R/module/verilog.vams
module worklib.E2R:vams
errors: 0, warnings: 0
file: /home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/R2E/module/verilog.vams
module worklib.R2E:vams
errors: 0, warnings: 0
file: /home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools.lnx86/affirma_ams/etc/connect_lib/connectLib/ER_bidir/module/verilog.vams
module worklib.ER_bidir:vams
errors: 0, warnings: 0
file: ./netlist.vams

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module worklib.invl_m1:vams
  errors: 0, warnings: 0
module worklib.sim_inh_conn_test:vams
  errors: 0, warnings: 0
file: ./cds_globals.vams
module worklib.cds_globals:vams
  errors: 0, warnings: 0
file: /projects/20348-900/RevA/local/lib/public/amis500cx/logic/verilog_generic/amis500cxascm/Rev3.6/amis500cxascm.v
module amis500cxascm.invl_m:v
  errors: 0, warnings: 0
ncvlog: *W,LIBNOU: Library "/projects/20348-900/RevA/local/lib/public/amis500cx/logic/verilog_generic/amis500cxapfx/Rev3.2/amis500cxapfx.v" given but not
used.
Total errors/warnings found outside modules and primitives:
  errors: 0, warnings: 4
  Caching library 'amis500cxascm' ..... Done
  Caching library 'worklib' ..... Done
Elaborating the design hierarchy:
ncelab: *N,SFEDPL: Deploying new SFE in analog engine.
Top level design units:
  sim_inh_conn_test
  cds_globals
Discipline resolution Pass...
Doing auto-insertion of connection elements...
Building instance overlay tables: ..... Done
Generating native compiled code:
  worklib.E2L_inhconn:vams <0x18fb3a7b>
    streams: 8, words: 7354
  worklib.L2E_inhconn:vams <0x24407165>
    streams: 9, words: 12483
  worklib.sim_inh_conn_test:vams <0x388ec292>
    streams: 0, words: 0
Loading native compiled code: ..... Done
Building instance specific data structures.
Design hierarchy summary:
      Instances Unique
Modules:           8      13
Primitives:       1       1
Timing outputs:   1       1
Registers:        20      45
Scalar wires:     6       -
Always blocks:    19      36
Initial blocks:   3       8
Cont. assignments: 3       9
Interconnect:     10      -
Simulation timescale: 10ps
Writing initial simulation snapshot: worklib.sim_inh_conn_test:config
Elaborating analog portion of the design hierarchy:
ncsim: *N,SFEDPL: Deploying new SFE in analog engine.
Loading snapshot worklib.sim_inh_conn_test:config ..... Done
Starting analog simulation engine...

Includes RSA BSAFE(R) Cryptographic or Security Protocol Software from RSA
Security, Inc.

Analog Kernel using -ANALOGCONTROL ./amsControlSpectre.scs.
ncsim> source /home/apps/cadence/ius/linux/ius6.1_usr4_isr20080223/tools/inca/files/ncsimrc
ncsim>
ncsim> # This is the NC-SIM(R) probe command file
ncsim> # used in the AMS-ADE integration.
ncsim>
ncsim>
ncsim> #
ncsim> # Database settings
ncsim> #
ncsim> if { [info exists ::env(AMS_RESULTS_DIR) ] } { set AMS_RESULTS_DIR $env(AMS_RESULTS_DIR)} else {set AMS_RESULTS_DIR "/export/home/scratch/sims/sim
_inh_conn_test/ams/config/psf"}
/export/home/scratch/sims/sim_inh_conn_test/ams/config/psf
ncsim> database -open ams_database -into $AMS_RESULTS_DIR -default
Created default SHM database ams_database
ncsim>
ncsim> #
ncsim> # Probe settings
ncsim> #
ncsim> probe -create -emptyok -database ams_database -all -depth all
Created probe 1
ncsim> probe -create -emptyok -database ams_database -all cds_globals
Created probe 2
ncsim> probe -create -emptyok -database ams_database {sim_inh_conn_test.c}
Created probe 3
ncsim> probe -create -emptyok -database ams_database {sim_inh_conn_test.b}
Created probe 4
ncsim> probe -create -emptyok -database ams_database {sim_inh_conn_test.a}
Created probe 5
ncsim> probe -create -emptyok -database ams_database {sim_inh_conn_test.in}
Created probe 6
ncsim> probe -create -emptyok -database ams_database -flow -ports -depth all
Created probe 7
ncsim> probe -create -emptyok -database ams_database -aicms -all -depth all
ncsim: *E,UNKOPT: unrecognized option for the probe [-create] command (-aicms).
ncsim> run

Warning from spectre during initial setup.
sim_inh_conn_test.I7.NMOS_1.enm: 'A2' = 1.2 is larger than 1. Set A2 to 1
and A1 to 0.
sim_inh_conn_test.I7.NMOS_1.enm: 'Cdsc' = -400e-06 is negative.
sim_inh_conn_test.I1.NMOS_1.enm: 'A2' = 1.2 is larger than 1. Set A2 to 1
and A1 to 0.
sim_inh_conn_test.I1.NMOS_1.enm: 'Cdsc' = -400e-06 is negative.
sim_inh_conn_test.I7.PMOS_1.epm: 'A2' = 1.00801 is larger than 1. Set A2 to

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1 and A1 to 0.
sim_inh_conn_test.I1.PMOS_1.epm: 'A2' = 1.00801 is larger than 1. Set A2 to
1 and A1 to 0.
Notice from spectre during topology check.
No connections to node 'cds_globals+sub!'.
Only one connection to the following 3 nodes:
0
sim_inh_conn_test.I7.cdsNet0
sim_inh_conn_test.I1.cdsNet0
No DC path from node 'cds_globals+sub!' to ground, Gmin installed to
provide path.
No DC path from node 'sim_inh_conn_test.b_L2E_inhconn_logic.vdd!' to
ground, Gmin installed to provide path.
No DC path from node 'sim_inh_conn_test.b_L2E_inhconn_logic.vss!' to
ground, Gmin installed to provide path.
No DC path from node 'sim_inh_conn_test.b' to ground, Gmin installed to
provide path.

```

Circuit inventory:

```

nodes 11
equations 54
iprobe 16
ahdl simulator 1
bsim3v3 4
capacitor 1
vsource 3
worklib+E2L_inhconn+vams+0x10000001 behavioral 2
worklib+L2E_inhconn+vams+0x10000001 behavioral 1

```

Warning from spectre during initial setup.

```

sim_inh_conn_test.I7.NMOS_1.enm: 'A2' = 1.2 is larger than 1. Set A2 to 1
and A1 to 0.
Further occurrences of this warning will be suppressed.
sim_inh_conn_test.I7.NMOS_1.enm: 'Cdsc' = -400e-06 is negative.
sim_inh_conn_test.I1.NMOS_1.enm: 'Cdsc' = -400e-06 is negative.
Warning from spectre during hierarchy flattening.
3 warnings suppressed.

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```

*****
Transient Analysis 'tran': time = (0 s -> 20 us)
*****

```

Notice from spectre during IC analysis, during transient analysis 'tran'.

```

Gmin = 1 pS is large enough to noticeably affect the DC solution.
dV(sim_inh_conn_test.I7.cdsNet0) = -38.1389 uV
Use 'gmin_check' option to eliminate or expand this report.

```

Important parameter values:

```

start = 0 s
outputstart = 0 s
stop = 20 us
step = 20 ns
maxstep = 200 ns
ic = all
skipdc = no
reltol = 100e-06
abstol(I) = 1 pA
abstol(V) = 1 uV
temp = 27 C
tnom = 27 C
tempeffects = all
errpreset = conservative
method = gear2only
lteratio = 10
relref = alllocal
cmin = 0 F
gmin = 1 pS
maxrsd = 0 Ohm
mos_method = s
mos_vres = 50 mV

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tran: time = 500 ns      (2.5 %), step = 200 ns      (1 %)
tran: time = 1.569 us   (7.85 %), step = 200 ns      (1 %)
tran: time = 2.655 us   (13.3 %), step = 200 ns      (1 %)
tran: time = 3.58 us    (17.9 %), step = 200 ns      (1 %)
tran: time = 4.655 us   (23.3 %), step = 200 ns      (1 %)
tran: time = 5.602 us   (28 %), step = 200 ns      (1 %)
tran: time = 6.602 us   (33 %), step = 200 ns      (1 %)
tran: time = 7.602 us   (38 %), step = 200 ns      (1 %)
tran: time = 8.602 us   (43 %), step = 200 ns      (1 %)
tran: time = 9.602 us   (48 %), step = 200 ns      (1 %)
tran: time = 10.6 us    (53 %), step = 200 ns      (1 %)
tran: time = 11.6 us    (58 %), step = 200 ns      (1 %)
tran: time = 12.6 us    (63 %), step = 200 ns      (1 %)
tran: time = 13.6 us    (68 %), step = 200 ns      (1 %)
tran: time = 14.6 us    (73 %), step = 200 ns      (1 %)
tran: time = 15.57 us   (77.9 %), step = 200 ns      (1 %)
tran: time = 16.6 us    (83 %), step = 200 ns      (1 %)
tran: time = 17.57 us   (87.9 %), step = 200 ns      (1 %)
tran: time = 18.6 us    (93 %), step = 200 ns      (1 %)
tran: time = 19.57 us   (97.9 %), step = 200 ns      (1 %)

```

Number of accepted tran steps = 1530.

Accumulated tran full load time = 180 ms.

Accumulated tran full component evaluation time = 110 ms.

Accumulated tran full preload time = 20 ms.

Accumulated tran full merge time = 10 ms.

Accumulated tran residue-only load time = 70 ms.
Accumulated tran residue-only component evaluation time = 50 ms.
Accumulated tran residue-only preload time = 0 s.
Accumulated tran residue-only merge time = 10 ms.
Accumulated tran factor time = 10 ms.
Accumulated tran solve time = 10 ms.
Accumulated tran output time = 200 ms.
Initial condition solution time = 0 s.

**** AMSD: Mixed-Signal Activity Statistics ****
Number of A-to-D events: 61
Number of A-to-D events in IEs: 61
Number of D-to-A events: 27
Number of D-to-A events in IEs: 27
Number of VHDL-AMS Breaks: 0

Intrinsic tran analysis time = 600 ms.
Total time required for tran analysis 'tran' was 600 ms.

finalTimeOP: writing operating point information to rawfile.
modelParameter: writing model parameter values to rawfile.
element: writing instance parameter values to rawfile.
outputParameter: writing output parameter values to rawfile.
Simulation complete via transient analysis stoptime at time 20 US
Memory Usage - 15.2M program + 291.8M data = 307.1M total
CPU Usage - 0.8s system + 1.0s user = 1.9s total (16.9% cpu)
ncsim> exit
TOOL: irun 06.11-s011: Exiting on Jan 14, 2009 at 09:09:53 MST (total: 00:00:13)