DC/DC converter Future Plans

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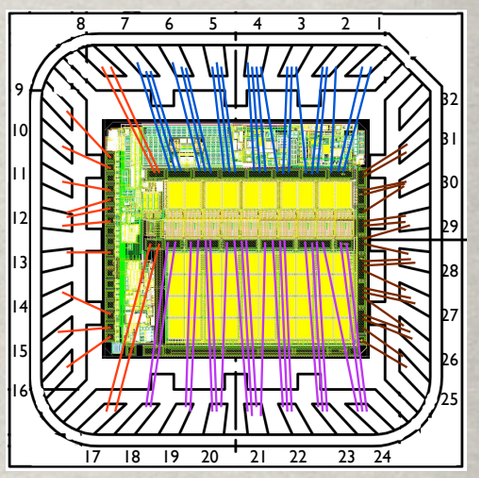
Twepp 2011, Vienna 26-30 September 2011

ASIC design

	AMIS2	IHP1	IHP2	AMIS4
Full control loop	✓	✓	✓	✓
Dead times' handling	Fixed	Adaptive (QSW)	Adaptive (QSW and CCM, sharp transition)	Adaptive (QSW and CCM, smooth transition)
On-chip regulator(s)	No	No	✓	✓
Soft Start	Simple RC	Simple RC with comparators	Full sequence with comparators	State machine
Over-I protection	No	No	✓	✓
Over-T protection	No	No	No	✓
Under-V disable	No	No	No	✓



Used in system tests

Taped-out Jan2011 still under tests, preliminary results

AMIS4: Future plans

Work to be done in AMIS4

A compact and optimized board has been design by Georges (in these days under tests, results soon available) + Focused Ion Beam will be used to modify some connection.

Irradiation test under heavy ions and protons are foreseen in fall 2011

Definition of the bond-diagram for user applications (next weeks)

packaging (Europractice, ASE?) for user applications (fall 2011)

ASIC DESIGN

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Over-T protection	No	No	No	✓
Under-V disable	No	No	No	✓

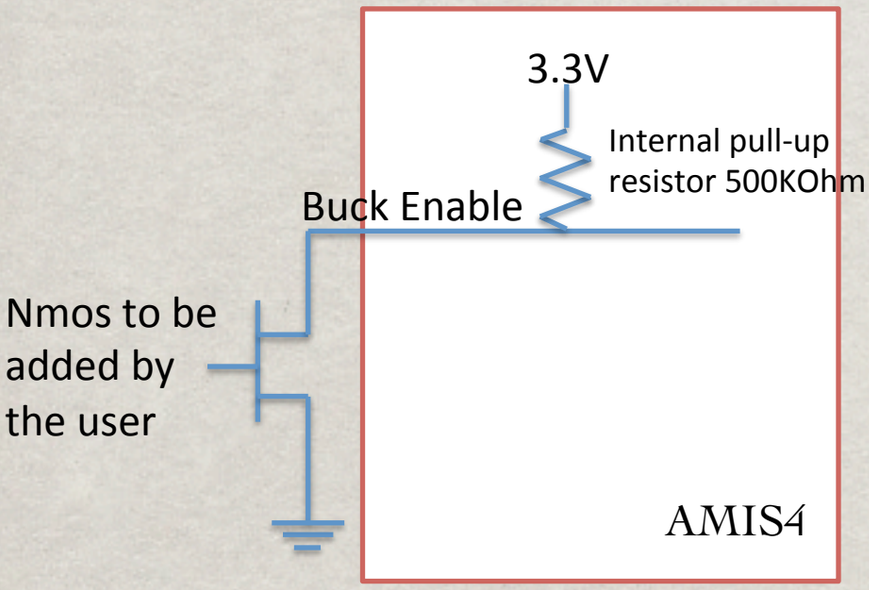
ASIC DESIGN

	AMIS2	IHP1	IHP2	AMIS4	AMIS5
Full control loop	✓	✓	✓	✓	✓
Dead times' handling	Fixed	Adaptive (QSW)	Adaptive (QSW and CCM, sharp transition)	Adaptive (QSW and CCM, smooth transition)	Adaptive (QSW and CCM, smooth transition)
On-chip regulator(s)	No	No	✓	✓	✓
Soft Start	Simple RC	Simple RC with comparators	Full sequence with comparators	State machine	State machine
Over-I protection	No	No	✓	✓	✓
Over-T protection	No	No	No	✓	✓
Under-V disable	No	No	No	✓	✓

as AMIS4
+ small modification for fixing the AMIS4 issues
+ change for System Compatibility (open drain for power good and pull-down for enable)

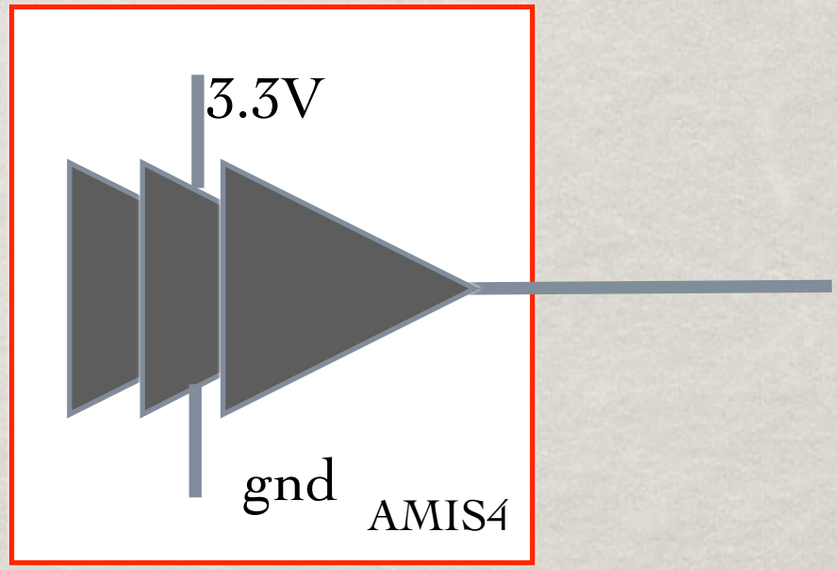
Buck Enable and Power Good in AMIS4

Buck Enable



pull-down configuration

Power Good

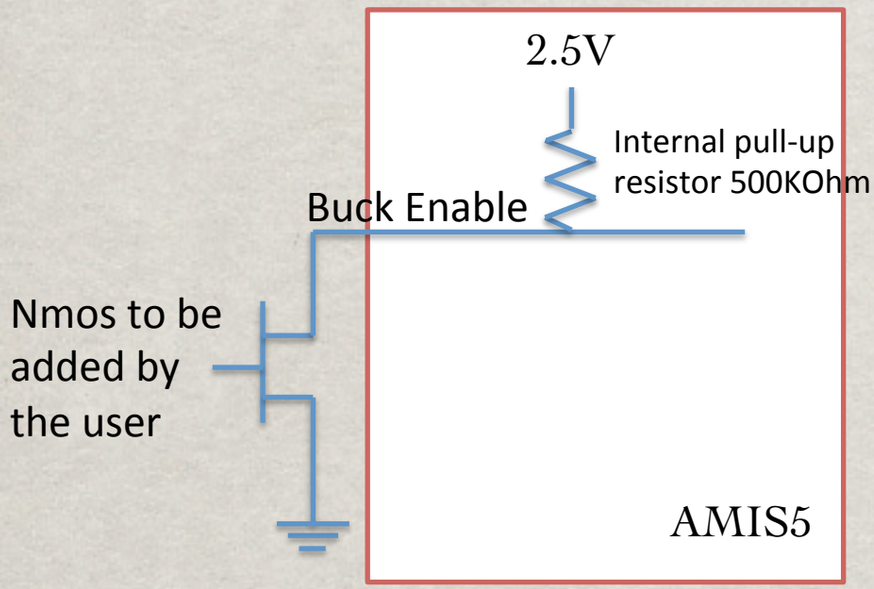


Power Good is

- 3.3V if the converter works without problems
- 0V during the soft start and when a fault from the protection circuits is detected:
  - OverCurrent,
  - OverTemperature
  - input UnderVoltage

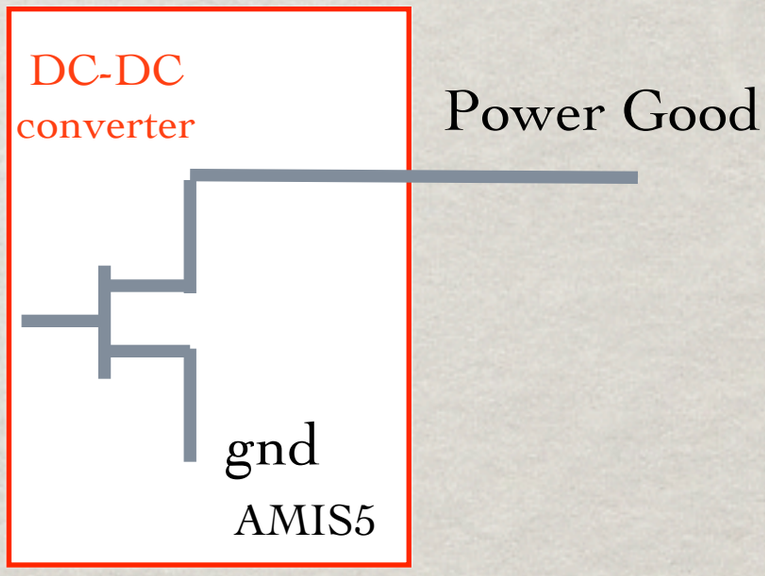
New Signals in future ASIC

Buck Enable



pull-down configuration

Power Good



open drain configuration

PLAN FOR AMIS5

Design of AMIS (fall 2011)

Submission (January 2012)

Chip back in June-July 2012

ASIC design
BACKUP TECHNOLOGY

We are investigating a backup technology :

0.18um High Voltage technology with transistors that can stand 20V.

Preliminary TID and Proton radiation tests gave good results

A test chip has been submitted in July

Radiation (in particular heavy ions) tests will be done during fall 2011

Conclusions