

65 nanometer technology node

# CANDIDATES

- UMC65nm
- TSMC65nm (CERN design kit)

# INSTITUTES TSMC65nm CERN

CNRS-IPHC (C37470)  
AGH University of Science and Technology-Physics and Applied  
Computer Science (C40140)  
Brookhaven Science Associates, LLC (C14270)  
CEA IRFU (C21270)  
CNRS-IN2P3-LPNHE (C37670)  
CNRS-IPNL (C37950)  
CNRS-Universite D'Aix-Marseille-CPPM (C37590)  
CNRS-UPSUD-LAL (C21170)  
DESY (C20330)  
EPFL-STI-IMT-ICLAB (C37340)  
Fachhochschule Dortmund (C38650)  
Fermi Research Alliance LLC - Fermilab (C14320)  
GSI Helmholtzzentrum für Schwerionenphysik GmbH (C20880)  
imec IC-link  
Imperial College London (C13480)  
INFN Sezione di Bari (C20710)  
INFN Sezione di Genova (C00270)  
INFN Sezione di Milano (C20630)  
INFN Sezione di Pavia (C21450)  
INFN Sezione di Pisa (C00300)  
INFN Sezione di Torino (C20440)  
Istituto de Fisica Corpuscular (IFIC) (C21230)  
Istituto de Fisica de Altas Energias (IFAE) (C14280)  
KULeuven - ESAT (C37220)  
Laboratoire d'Annecy-le-Vieux Physique des Particules (LAPP)  
(C39060)  
Laboratoire de Physique Corpusculaire de Clermont-Ferrand  
(LPC) (C39400)  
Laboratoire de Physique Subatomique et Cosmologie (LPSC)  
(C14630)  
Laboratorio de Instrumentacao e Fisica Experimental de  
Particulas (LIP) (C21710)  
Max-Planck-Institut fuer Physik (C14330)  
Nikhef the National Institute for Subatomic Physics (C00280)  
OMEGA Ecole Polytechnique (C14640)  
Paul Scherrer Institute (PSI) - C20800  
Politecnico di Bari (C38380)

SILICONGATE LDA (C19390)  
Southern Methodist University SMU - School of Engineering  
(C14350)  
STFC-RAL (C00050)  
Technical University of Crete (TUC) (C39490)  
The Institute of Physics of the ASCR (C47460)  
The Regents of the University of California, Santa Cruz (C06420)  
The Trustees of Columbia University in the City of New York  
(C09030)  
TRIUMF  
UNINOVA (C12310)  
Universita degli Studi di Padova (C39200)  
Universita di Milano-Bicocca - Department of Physics G Occhialini  
(C14800)  
University of Barcelona - Electronics Dept / Faculty of Physics  
(C38660)  
University of Bergen (C37820)  
University of Bonn-Physics (C38890)  
University of California (Regents of the-) - Lawrence Berkeley  
National Lab (LBNL) (C09020)  
University of California, Santa Barbara (C05510)  
University of Geneva (C13630)  
University of Heidelberg - Kirchoff Institute for Physics (C39250)  
University of Michigan - Physics (C06460)  
University of Oslo - Physics (C37360)  
University of Paderborn-Heinz Nixdorf Institute (C37500)  
University of Pennsylvania (C05060)  
University of Perugia (C00740) - Engineering  
University of Salento (C21770)  
University of Sao Paulo - ECS (C50010)  
University of Sevilla - ESI (C38580)  
University of Siegen (C38220)  
University of Split (C48090)  
University of Stanford - SLAC - National Accelerator Laboratory  
(C07000)  
University of Texas at Austin (C06850)  
University of Texas at Dallas (C10360)  
University of Wuppertal - Department of Physics (C12840)

# Features

- TSMC65

- HVT, SVT, LVT, Native, m-low VT
- Unsilicided PO resistors
- MiM Capacitor
- 3M-9M Cu + 2xRDL
- Triple well
- Ultra thick metal
- LP
  - 1.2V (2.5, 3.3) IO
- G
  - 1.0 (2.5, 3.3) IO
- MLM: YES (not now)
- P- substrate(EPI-wafer)

- UMC65

- HVT, SVT, LVT, Native,
- Unsilicided PO resistors
- MiM Capacitor
- 3M-10M Cu
- Triple well
- Ultra thick metal
- 1 to 1.2 VDD
- IO: 1.8 to 3.3 VDD
- MLM: NO

COST INFORMATION IS CONFIDENTIAL

# MPWS

- UMC 65nm
  - MPWS: 6/year
  - MINIASIC: 3/year
- TSMC65nm (+7% for CERN contract)
  - MPWS: 6/year
  - MINIASIC: 5/year
- UMC110nm
  - MPWS: 6/year
  - MINIASIC: 3/year

# FULL RUNS

- UMC:
- TSMC:
- *UMC110nm*
- *The cost of UMC65nm and TSMC65nm is not as big as it was for 110nm node. TSMC comes with +7% extra for the CERN contract.*
- *Still the difference in cost with respect to UMC110nm is a factor 4-5, so we plan to move when we really see that the technology is a showstopper for our applications.*

# Status

- TSMC65nm

- Installed in /afs/psi.ch/project/tsmc65; **REQUIRES SIGNING NDA + access to folder**
- Simulations: ok (preliminary)
- DRC: ok (preliminary)
- LVS: ok (preliminary)

- UMC65nm

- Installed in /afs/psi.ch/project/cadence/cdslib/UMC/UMC65\_B11; nothing needed
- Simulations: ok (preliminary)
- DRC: no
- LVS: no



# TSMC SECURITY ISSUES

- Keep in mind that TSMC is much stricter than UMC with all this security issues, and we could run into problems. Again, nobody who did not sign the personal NDA should be allowed to access anything related to TSMC (including cadence schematics).
- Please do not put any file related to tsmc65 and considered as "confidential information" outside `/afs/psi.ch/project/tsmc65`, or in folders where people not signing the NDA have access, for "security reasons".
- I suggest to use, or to make one or more subfolder, in `/afs/psi.ch/project/tsmc65/Designs`; we can always ask for more space there.