
Microelectronics Prototyping Services

Access to fabrication of the following technologies:

- 90-nanometre CMOS – STMicroelectronics
- 0.13-micron CMOS – IBM Inc.
- 0.18-micron CMOS – TSMC Ltd.
- 0.35-micron CMOS – TSMC Ltd.
- 0.8-micron High Voltage CMOS (up to 300V) – DALSA Inc.
- Bipolar Linear Array (GA911) – Gennum Corp.

Design kits are available for all technologies and include libraries, IP, and user guides.

MEMS/Microfluidics Prototyping Services

Access to fabrication of the following technologies:

- Glass-based microfluidic technology with metallization (Sensorit) – Micronit Microfluidics BV (Micronit)
- Glass-based microfluidics (Protolyne) – Micralyne
- Surface MEMS (PolyMUMPs) – MEMSCAP
- MetalMUMPs – MEMSCAP
- Silicon-on-Insulator (SOI) MEMS (MicraGem) – Micralyne

Design kits are available for some technologies and include libraries, IP, and user guides.

CAD tools from ANSYS, COMSOL, Coventor and SoftMEMS are available to support design in these technologies.

Photonics/Optoelectronics Prototyping Services

Access to services including:

- III-V prototyping:
 - Epitaxy on InP or GaAs substrates
 - Wafer processing
 - Singulation and coating
- Silicon-based prototyping:
 - Silica on Si (low index contrast) technology
 - Silicon on Insulator (high index contrast) technology

All services are offered in collaboration with the NRC Canadian Photonics Fabrication Centre. A layout and verification tool from Design Workshop Technologies is available to support photonics prototyping.

Digital Design Flow and Tutorial

Documentation providing design example and instructions on the use of digital design tools (Cadence, Mentor, Synopsys). Provides fundamentals of digital design for IP block authoring and block integration. Digital IP includes Memory Compiler from Virage, 0.18-micron CMOS libraries from Artisan. (Current tutorial is from Royal Military College, based on previous CMC version).

Analog Design Flow and Tutorial

Documentation providing design example and instructions on the use of analog design tools (Matlab, Cadence, HSpice). Provides fundamentals of the analog design flow. *Note: These are based on older versions of the CAD tools but the design concepts still apply.*

RF Design Flow

Documentation describing fundamental steps and design methodology checklist for RF design for use with RF design tools (Agilent, Cadence). *Note: These are based on older versions of the CAD tools but the design concepts still apply.*



MEMS Design Flow and Tutorial

Documentation on MEMS device design, modeling and simulation based on the SoftMEMS product (MEMS Pro).

PMC-MIPS Microprocessor Technology

PMC MIPS E9000 core with models (RTL and SystemC) and reference design (based around AMBA IP components). E9000 core is a dual-integer superscalar processor core that can operate at up to 1 GHz and is based on 0.13 μm CMOS technology.

Test Facilities

Access to the following infrastructure:

- National Microelectronics and Photonics Testing Collaboratory (NMPTC) (accessed online or in person):
 - RF – University of Manitoba, fully-automatic wafer probing at up to 110 GHz
 - Photonics – Queens University, device and system testing, 40+ Gbps
 - Mixed Signal – McGill University, analog, digital and RF up to 6 Gbps
 - Digital – University of Toronto, up to 1.2 Gbps on 512 pins, up to 500 Mbps on 256 pins—selective fixtures
 - Equipment pool of over 60 pieces of equipment, including Cascade L150 Microfluidics Prober, Keithley 4200 Semiconductor Characterization System (parameter analyzer), Cascade 40 GHz Microwave Prober, Agilent 40 GHz Vector Network Analyzer, and many more
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Packaging Services

- Package models for microelectronics technologies
 - Supported package types:
 - 20 DIP, 40 DIP, 68 PGA, 84 PGA, 24 CFP, 44 CQFP, 80 CFP, 120 CQFP, 208 PGA
 - Die on glass slide, die on board
 - Flip-chip die attachment for high-speed circuits
 - Electrical models available for 24 CFP, 80 CFP, 120 CQFP, plus documentation on extraction of packaging models
 - Packaging and hybrid integration services for creating microsystem prototypes including the following technologies:
 - Wire bonding, solder and gold bumping, flip-chip attachment, system-in-a-package assembly, and more
 - Bio-containment (selective encapsulation) on a case-by-case basis
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Microsurgery Services

Access to post-fabrication chip repair and editing through microsurgery utilizing focused ion beam – Fibics.

Fixture Boards for IC Testing

- Fixture boards developed by CMC for testing ICs (supporting package type 24-pin CFP up to 9 GHz, type 80-pin CFP up to ~7 GHz, type 120-pin CQFP up to 1.2 GHz)
 - Fixture design flow documentation and consulting services
 - High voltage fixtures for MEMS in DIP40, PGA68, and PGA84 packages
 - Bench-top fixtures for CFP80, CQFP44, PGA68, and PGA84 packages
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See also the Products & Services of the System-On-Chip Research Network
For detailed information on all products and services,
including the pricing schedule for prototype manufacturing, package services and fixtures,
and selected microsystems CAD tools, please consult
CMC's Technology Gateway at <https://www1.cmc.ca/> (registration required)

For more information on any of these, or other products and services, contact info@cmc.ca